

4.4 Plants and Animals

This section provides an analysis of potential impacts to plant and animal communities and their available habitat within the study area. Impacts to plants and animals from the proposed Project development have been evaluated and weighed to determine whether the proposed Project would have significant impacts affecting on-site wildlife habitat, native plant communities, priority species, designated locally important species, or listed species (federal and state).

Species of particular concern include listed salmonids that currently use the Puyallup River adjacent to the Project site for critical stages of their life cycle: migration, spawning, egg incubation, fry colonization and rearing.

4.4.1 Study Area

The study area for plants and animals includes the Project site and a 0.5-mile radius around the site (Figure 4-32). The 0.5-mile radius accommodates noise and visual disturbance thresholds set by the USFWS for listed species (USFWS 2006). The study area encompasses a range of habitat areas that support both aquatic and terrestrial species, and includes existing agricultural farmland.



Figure 4-32. Approximate Project Area and 0.5-mile-radius Study Area

4.4.2 Relevant Plans, Policies, and Regulations

This section summarizes federal, state, and local regulations related to plants and animals that are applicable to the Project proposal in Table 4-14 and in the following discussion.

Table 4-14. Regulations Overview

Law and Regulation	Description
Federal	
Endangered Species Act (ESA, 16 USC 1531 et seq.)	To ensure that the proposed action is not likely to jeopardize existence of any listed threatened or endangered animal species or result in adverse modification of designated critical habitat.
Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267)	Defines EFH and requires federal agencies to consult with NMFS on activities that may adversely affect EFH.
Sections 404 and 401 of the Clean Water Act (CWA; 33 Code of Federal Regulations [CFR] 26, Subchapter 4, Section 1344)	Section 404 is administered primarily by the USACE and Section 401 by Ecology as a state-agent of the USEPA. These agencies review and permit or certify projects proposing in-water work related to fill in WOTUS.
State	
Growth Management Act (GMA)	Requires all cities and counties in Washington to adopt development regulations that protect critical areas, which include frequently flooded areas, wetlands, streams, and fish and wildlife habitat conservation areas.
Section 401 of the Clean Water Act (CWA; 33 CFR 26, Subchapter 4, Section 1344)	Section 401 is administered at a federal level by the USEPA, which has delegated review authority to Ecology. Ecology reviews and certifies Section 401 water quality permits for projects proposing in-water work in WOTUS.
Washington State Water Pollution Control Act (90.48 RCW)	Ecology regulates wetlands under the state Water Pollution Control Act (RCW 90.48) and the SMA (RCW 90.58). Ecology also provides guidance to local jurisdictions under SEPA to identify wetland-related issues early in permit and review processes. Administrative orders are issued under RCW 90.48.120. Ecology requires that all projects affecting surface waters in the state must comply with the provisions of the state's Water Pollution Control Act, including those waters or wetlands that are not subject to the federal CWA regulations.
Washington State Shoreline Management Act (SMA; RCW 90.58)	The SMA provides for the management of water bodies or watercourses identified as "shorelines of the state." Areas under SMA jurisdiction include the designated shoreline water body; lands within 200 feet upland of the ordinary high-water mark; and associated wetlands and floodplains. With this state law as a foundation, local shoreline management plans are to be developed and regulated by counties and cities.

Law and Regulation	Description
Washington State Department of Fish and Wildlife (WDFW) Hydraulic Permit Approval (HPA) (WAC 220-660)	The WDFW HPA program, regulated under Washington State law (RCW 77.55), ensures that construction in or near state waters is done in such a way as to protect fish and their aquatic habitats. An HPA must be obtained from WDFW by anyone planning hydraulic projects in most marine and fresh waters.
Washington State Department of Ecology NPDES Permit Program	The NPDES permit program controls water pollution by regulating sources that discharge pollutants into WOTUS (CWA, 33 USC Sections 1251 et seq. and WAC2 197-11-200 through 240). Ecology develops and administers NPDES municipal stormwater permits in Washington State. These permits regulate discharges to both surface waters (via surface conveyances) and to groundwaters (via infiltration facilities) of the state.
Local	
Pierce County Critical Areas Regulations (Pierce County Code [PCC] Title 18E)	This ordinance was developed under the directives of the GMA to designate and protect critical areas and to assist in conserving the value of property, safeguarding the public welfare, and providing protection for these areas. Geologic critical areas defined in PCC 18E include volcanic, landslide, seismic, mine, and erosion hazard areas.
Pierce County Stormwater Management and Site Development Manual (PCSWDM)	The PCSWDM provides regulations and detailed guidance on stormwater management, designed to meet Ecology standards (as defined by the USEPA NPDES program), and as required under the County NPDES permit.
Pierce County Critical Areas Regulations (PCC Title 18E Critical Area Regulations)	PCC 18E Critical Areas Regulations were adopted to protect the critical areas of Pierce County from the impacts of development and protect development from the impacts of hazard areas by establishing minimum standards for development of sites that contain or are adjacent to identified critical areas.
Pierce County Comprehensive Plan Policies	The Pierce County Comprehensive Plan is a tool to assist County Councilmembers, planning commissioners, County staff, and others in making land use and public infrastructure decisions. It provides the framework for the County's Development Regulations.
City of Puyallup Stormwater Management Program Plan (SWMPP)	The SWMPP provides guidance on how the City manages its stormwater to meet requirements of the City's NPDES Phase 2 permit, as administered by Ecology.
City of Puyallup Critical Areas Regulations (PMC Chapter 21.06 CRITICAL AREAS)	The Puyallup Critical Areas regulations (PMC Chapter 21.06) are similar to those of Pierce County, as both are designed to meet standards defined in the GMA. However, some regulatory details are different.

Law and Regulation	Description
City of Puyallup Comprehensive Plan (CPCP)	The CPCP includes government planning policies that call for the protection, preservation and enhancement of water resources and other natural environment components. It is <i>“the long-term vision and plan for managing the built and natural environment in the City of Puyallup,”</i> and provides policy guidance used by City staff to make decisions related to growth and development.

Federal

Endangered Species Act (ESA;- 16 USC 1531 et seq.)

The ESA requires that applicants seeking a federal action, such as issuing a permit under a federal regulation, undergo consultation with USFWS and/or NMFS. This is intended to ensure that the action is not likely to jeopardize the continued existence of any listed threatened or endangered animal species or result in the destruction or adverse modification of designated critical habitat. NMFS is responsible for managing, conserving, and protecting ESA-listed marine species. USFWS is responsible for terrestrial and freshwater species. Both NMFS and USFWS are responsible for designating critical habitat for ESA-listed species.

This Act prohibits “taking” of listed species, whether or not consultation with USFWS or NMFS takes place. “Take” means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any species listed as threatened or endangered under the ESA (16 USC 1531 through 1544), or attempt to engage in any such conduct. Such an act may include significant habitat modification or degradation where wildlife is killed or injured wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267)

This act requires fishery management councils to include descriptions of EFH and potential threats to EFH in all federal fishery management plans. It also requires federal agencies to consult with NMFS on activities that may adversely affect EFH.

Sections 404 and 401 of the Clean Water Act (33 Code of Federal Regulations 26, Subchapter 4, Section 1344)

Section 404 of the CWA requires authorization from the Secretary of the Army, acting through the USACE, for the discharge of dredged or fill material into all WOTUS, including wetlands.

In general, since the mid-1980s, WOTUS included all coastal marine waters, freshwater lakes, rivers, and streams in addition to wetlands¹⁵ that were adjacent to or which had either permanent or ephemeral surface water connections to those waters (i.e., “*significant nexus*”). Inclusion of wetlands in the regulatory definition of WOTUS was based partly on the fact that many large wetland systems that cross states lines are used for hunting, fishing, mining, and other interstate commerce activities. Isolated wetlands, those which do not have a surface water connection to other WOTUS at any time, were not typically regulated under federal law.

In March 2023, the Biden Administration finalized a definition of WOTUS (which included wetlands with significant nexus), in response to a series of previous court cases and findings which had resulted in a fluctuating regulatory definition since 2015. However, a recent Supreme Court decision (May 25, 2023 – Sackett v. Environmental Protection Agency) has revised the federal definition of WOTUS to include wetlands only if they have a continuous surface water connection to rivers, lakes, or marine water bodies.

In order to conform with the May 25, 2023, Supreme Court decision, on August 29, 2023, USEPA issued a Final Rule to amend the CWA WOTUS definition that was previously published in the Federal Register on January 18, 2023. The new federal definition of WOTUS “*removes the significant nexus test from consideration when identifying tributaries and other waters as federally protected.*” Effectively, the new definition of WOTUS includes only relatively permanent bodies of navigable water and directly adjacent wetlands sharing the same water table. Therefore, upslope wetlands and smaller tributary seasonal streams that are not directly adjacent to larger rivers, lakes and marine waters are no longer protected under federal law.

Please see the discussion below about state of Washington wetland regulations, which effectively replace the review and permitting functions provided previously under federal Section 404 regulations.

Discharges of fill material in WOTUS or in Waters of the State generally include, without limitation: placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; dams and dikes; artificial islands; property protection or reclamation devices such as riprap, groins, seawalls, breakwaters, and revetments; beach nourishment; levees; fill for intake and outfall pipes and subaqueous utility lines; fill associated with the creation of ponds; and any other work involving the discharge of fill or dredged material.

A USACE permit (for fill impacts to WOTUS) or a certification from Ecology (for fill impacts to Waters of the State) is generally required whether the work is permanent or temporary. Examples of temporary

¹⁵ Wetland definition: “*Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*” This definition of wetlands has been used by the USACE and USEPA since the 1970s for regulatory purposes, and is also applied under Washington State wetland regulations.

discharges include dewatering of dredged material prior to final disposal, and temporary fills for access roadways, cofferdams, storage, and work areas.

Migratory Bird Treaty Act of 1918, as amended (16 USC 703–713)

This act makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations. It is under the regulatory authority of USFWS.

State

Washington State Growth Management Act (RCW 36.70A)

The Washington State GMA (RCW 36.70A) requires all county and local municipalities to identify and protect critical areas by adopting local critical area regulations. The GMA was amended in 1995 to require counties and cities to include the BAS when creating polies and development regulations (RCW 36.70A. 172). Ecology developed guidance for local jurisdictions to implement these requirements in a model critical area ordinance. Critical areas include frequently flooded areas, wetlands, streams, and fish and wildlife habitat conservation areas.

Washington State Shoreline Management Act (RCW 90.58)

The SMA provides for the management of waterbodies or watercourses identified as “shorelines of the state.” Areas under jurisdiction of the SMA include the designated shoreline water body; lands within 200 feet upland of the ordinary high-water mark; and associated wetlands and floodplains. With this state law as a foundation, local shoreline management plans are to be developed and regulated by counties and cities.

Washington State Department of Fish and Wildlife Hydraulic Permit Approval (WAC 220-660)

The WDFW HPA program, regulated under Washington State law (RCW 77.55), ensures that construction in or near state waters is done in such a way as to protect fish and their aquatic habitats. An HPA must be obtained from WDFW by anyone planning hydraulic projects in most marine and fresh waters.

Washington State Water Pollution Control Act (90.48 RCW)

This act requires that all projects affecting surface waters in the state must comply with the provisions of the state’s Water Pollution Control Act, including those waters that are not necessarily subject to the federal CWA regulations.

As a result of the recent Supreme Court decision described above (May 25, 2023 – Sackett v. Environmental Protection Agency), USACE will take a lesser role in regulation of impacts to wetlands that are no longer regulated as WOTUS under Section 404 of the CWA.

However, the State of Washington is still responsible for protecting water quality under Section 401 of the CWA, and Ecology will take over as the primary review agency when a project proposes direct impacts to wetlands that may result in a loss of wetland area (quantity) as defined under the state

Water Pollution Control Act (Chapter 90.48 RCW). In the past, Ecology applied the same authority when regulating isolated wetlands, which were not regulated under federal law.

Per guidance from Ecology's website: *"For non-federally regulated wetlands, applicants must submit a request for an Administrative Order to comply with the state Water Pollution Control Act (Chapter 90.48 RCW). [Ecology] issue[s] Administrative Orders under this act for impacts to wetlands that are not jurisdictional under the federal regulations (e.g., non-federally regulated wetlands or NFRs). These wetlands remain protected under state and local laws and rules."*

Washington State Department of Ecology NPDES Permit Program

The NPDES permit program controls water pollution by regulating sources that discharge pollutants into WOTUS (CWA; 33 USC Sections 1251 et seq. and WAC2 197-11-200 through 240). Ecology develops and administers NPDES municipal stormwater permits in Washington State. These permits regulate discharges to both surface waters (via surface conveyances) and groundwaters (via infiltration facilities) of the state.

There are two types of permits:

- Phase I Municipal Stormwater Permits regulate discharges from MS4s owned or operated by large cities and counties, including Pierce County.
- Phase II Municipal Stormwater Permits regulate discharges from certain "small" MS4s in Washington, including the City of Puyallup.

These permits require local governments to manage and control stormwater runoff so that it does not pollute downstream waters. The current Phase I and Phase II permits were effective Aug. 1, 2019, and will expire on July 31, 2024. New permits will replace the old, applying any regulatory updates to previous permit requirements.

These permits also require local governments to develop and implement a stormwater management program designed to reduce the contamination of stormwater runoff. Typically, this requires creation of a stormwater management site plan for a proposed development, to be submitted for review by the local jurisdiction to ensure concurrence with the state Stormwater Manual for Western Washington (or a locally developed and adopted equivalent manual).

Construction projects that disturb more than 1 acre of land and discharge to surface water or a conveyance system that drains to surface waters must obtain NPDES coverage under the Construction Stormwater General Permit.

Local (County and City)

The Project site is located in unincorporated Pierce County, within the City of Puyallup's UGA and is served by and affects city infrastructure as well as critical areas in the City of Puyallup and its UGA. Wildlife habitat (plants and animals) protection is generally addressed at a local level in a wide range of city or county critical area and stormwater management regulations.

Various Pierce County regulations that impact management of wildlife habitat will be reviewed first followed by a summary of the equivalent or parallel regulation in the City of Puyallup. But City regulations do not apply until such time as the UGA is annexed into the City.

Pierce County Regulatory Review

Pierce County Stormwater Management and Site Development Manual (PCSWDM)

An updated PCSWDM was adopted, effective on July 1, 2021. In relation to the discussion below, changes between the 2015 and 2021 versions were insignificant.

The PCSWDM provides regulations and detailed guidance on stormwater management, designed to meet Ecology standards (as defined by the USEPA NPDES program), and as required under the County NPDES permit.

According to the USEPA NPDES information page, runoff from impervious surfaces in urban and urbanized areas results in greater runoff volumes and faster rates, and is the major contributor of pollutants. This results in changes in hydrology and water quality that often result in changes to habitat, increased flooding, less aquatic biological diversity, and increased impacts from sediment and erosion.

Traditional stormwater management approaches that rely on peak flow storage have generally not targeted pollutant reduction and can exacerbate problems associated with changes in hydrology and hydraulics.

To meet these federal and state standards, the PCSWDM lists minimum requirements and provides guidance as to how to accomplish these goals in Pierce County. Specific to this Project, the following guidance is noted:

- Minimum Requirement #4 in the PCSWDM is related to Preservation of Natural Drainage Systems and Outfalls. It states that runoff cannot cause significant adverse impacts to downstream waters and downgradient properties. It further states that all outfalls are required to use energy dissipation systems, and to *“prevent erosion at and downstream of the discharge location.”*
- In Section B.4.2 Guide Sheet 3B: Protecting Wetlands from Changes in Water Flows (Hydroperiod), the manual states that a wetland’s hydroperiod must be protected and maintained, and that the *“total volume of water into a wetland on daily basis should not be more than 20 percent higher or lower than the pre-project volumes”* and *“total volume of water into a wetland on a monthly basis should not be more than 15 percent higher or lower than the pre-project volumes.”*
- Section B.3: Protection from Pollutants, provides methods to ensure that a wetland is protected from pollutants generated by a development, including use of effective erosion control, application of LID techniques, and provision for treatment of runoff.

A wetland **hydroperiod** is defined as having hydrology at the same time of year and in the same volume as historical conditions.

These stormwater management regulations indicate that the Project site must be managed to protect on-site wetlands and downstream waterbodies from both direct and indirect impacts to water quantity

and quality. Therefore, these regulations apply directly to stormwater system design at the Project site and to future impacts from the already constructed Viking warehouse outfall facility located at the edge of the Puyallup River at the northern end of the Project site. The outfall structure was permitted in 2018 and built in 2020. The eastern portion of the structure is intended for future use as an outfall facility for the Project. However, the already in use western portion of the structure that receives runoff from the Viking Warehouse facility is not performing as intended, as has been described in a separate Deficiencies Report (NHC&SCJ, February 2023). According to the Project Shoreline Substantial Development Permit Hearing Examiner decision from 2018, future permit review will be required to determine whether the eastern half of the outfall structure is code compliant and can be safely used as an outfall for the Project site.

Under this requirement, runoff cannot cause significant adverse impacts to downstream waters and downgradient properties; all outfalls are required to use energy dissipation systems; and erosion must be prevented at and downstream of the discharge location.

The PCSWDM requires that volumes equivalent to 91 percent of the runoff volume, as estimated by an approved continuous runoff model (approximately equivalent to the 6-month, 24-hour storm event) must receive some form of basic treatment prior to release to the Puyallup River. Volumes/flows greater than this can be released to the river without treatment. Volume V of the PCSWDM provides guidance as to the definition of basic treatment and facilities that may be used to meet the standard.

Project stormwater design information describes that enhanced rather than basic treatment would be used prior to releasing overflow to the Puyallup River. Table 4-15 below is from the PCSWDM, Vol. V – Runoff Treatment BMPs, Figure 2.1 Treatment Facility Selection Flow Chart. Table 4-15 provides a list of facilities that can be used for basic versus enhanced treatment of stormwater.

Table 4-15. Runoff Treatment Facilities

Basic Treatment	Enhanced Treatment
Biofiltration Swales	Large Sand Filter ^a
Filter Strips	Treatment Wetland ^a
Basic Wet Ponds	Compost Amended Vegetated Filter Strip ^a
Wet Vault	Two-Facility Treatment Train
Treatment Wetlands	Bioretention ^a
Combined Detention/Wet Pool	Media Filter Train
Sand Filters	Emerging Technologies ^a
Bioretention	
Media Filter Drain	
Emerging Technologies ^b	

Source: Adapted from PCSWDM Vol. V – Runoff Treatment BMPs, Figure 2.1 Treatment Facility Selection Flow Chart

^a When Phosphorous Control and Enhanced Treatment are required, the Large Wet Pond and certain types of emerging technologies will not meet both types of treatment requirements. A different or an additional treatment facility will be required to meet Enhanced treatment.

^b Emerging Technologies are simply other techniques not specifically listed above that can be documented to attain the same or greater level of water quality.

These regulations and their intended effects on protecting wetlands and water quality in the Puyallup River (i.e., plant communities and associated wildlife habitat) are also discussed in Sections 4.2 Surface Water and 4.3 Groundwater.

Pierce County Critical Areas Regulations (PCC Title 18E Critical Area Regulations)

Under the GMA (RCW 36.70A.060), local governments are required to establish policies and development guidelines to protect the functions and values of critical areas: rivers, streams, lakes, wetlands, floodplains, aquifer recharge areas, and others.

PCC 18E Critical Areas Regulations were adopted to protect the critical areas of Pierce County from the impacts of development and protect development from the impacts of hazard areas by establishing minimum standards for development of sites that contain or are adjacent to identified critical areas. Pierce County is in the process of reviewing an update to critical areas regulations, which is expected to be complete in 2024. The current version of Title 18E was last updated in 2021.

PCC 18E Critical Areas Regulations include the following sections designed to provide protection to critical areas and/or their buffers, all of which have some impact on fish and wildlife habitat, and all of which are present on the Project site.

- Wetlands,
- Regulated fish and wildlife species and habitat conservation areas,
- Flood hazard areas,
- Erosion hazard areas, and
- Landslide hazard areas.

Mitigation Sequencing (PCC 18E.40.050) is required in Pierce County when a developer is considering potential impacts to critical areas. Under Mitigation Sequencing rules, initial avoidance of the impact is required if possible. However, if avoidance is not possible, the impact must be minimized and mitigated as outlined below. Mitigation for alterations to habitat areas must achieve equivalent or greater biological functions and must address adverse impacts upstream and downstream of the development site.

PCC 18E.030.050 Mitigation Sequencing

A. Mitigation. All regulated development activities in wetlands or buffers shall be mitigated according to this Title subject to the following order:

- 1. Avoiding the impact altogether by not taking a certain action or parts of actions;*
- 2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology or by taking affirmative steps to reduce impacts;*
- 3. The following types of mitigation (in the following order of preference):*
 - a. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;*
 - b. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;*

c. Compensating for the impact by replacing or providing substitute resources or environments. The purchase of credits from an in-lieu fee mitigation program (ILF program) or wetland mitigation bank may be an acceptable means of meeting this requirement for compensation (see Chapters 18G.20 and 18G.30 PCC);

4. Monitoring the impact and compensation and taking appropriate corrective measures; and

5. Mitigation for individual actions may include a combination of the above measures.

PCC 18E.30 (Wetlands) assigns standard wetland buffer widths based on an initial Category Rating score (Categories I, II, III, or IV), then adjusts the baseline buffer based on the proposed Land Use Intensity (High, Moderate, or Low). Wetland buffer widths range from a minimum of 25 feet to greater than 150 feet.

The County does not impose mitigation requirements on Category III wetlands smaller than 2,500 square feet and Category IV wetlands smaller than 10,000 square feet, as long as they are not contiguous to other wetlands, are not in a shoreline jurisdiction and are not part of a wetland mosaic. (However, federal law still protects and regulates these smaller wetland systems under Section 404/401 of the CWA, as described above.)

PCC Section 18E.40 (Regulated Fish and Wildlife Species and Habitat Conservation Areas), defines activities allowed in stream buffer areas and defines stream buffer widths in relation to Stream Type and Water Type, as listed below in Table 4-16.

Table 4-16. PCC 18E.40 Stream Buffers and Water Type

Water Type	Water Body Criteria	Buffer Width
Type S1	Marine Shoreline Critical Salmon Habitat	100 feet from the OHWM
Type F1	Fish-bearing streams, including waters diverted for fish hatcheries, and 1,500 feet upstream from the point of diversion, and tributaries, if important to protect downstream water quality.	150 feet from the OHWM
Type F2	Fish-bearing streams adjacent to a landslide hazard area as set forth in Chapter 18E.80 PCC.	150 feet from the OHWM or the minimum buffer distance required in PCC Chapter 18E.80 , whichever is greatest
Type N1	Perennial or seasonal non-fish bearing streams within 0.25 mile of the confluence with a Type F stream.	115 feet from the OHWM
Type N2	Perennial or seasonal non-fish bearing streams that are either more than 0.25 mile upstream from the confluence with a Type F stream or are not connected at all to a Type F stream.	65 feet from the OHWM
Type N3	Lakes or ponds that do not support any critical fish species	35 feet from the OHWM

Source: PCC Title 18E, Table 18E.40.060-1 Fish and Wildlife Habitat Conservation Areas Buffer Requirements (updated in 2018)

In areas where impacts to the Shoreline are proposed, the Project will be subject to Mitigation Requirements (PCC 18E.40.050), and a Habitat Assessment report is required (PCC 18E.40.030.B.4 [Fish and Wildlife Conservation Area Review Procedures, Habitat Assessment]). Information about what is required in the report is detailed in PCC 18E.40.030.B.5.c and PCC 18E.40.070, but must include specific discussion about the following:

- How natural shoreline processes will be maintained and will not result in increased erosion or alterations to, or loss of, shoreline substrate within 0.25 mile of the site.
- How erosion control measures will not adversely impact critical fish or wildlife habitat areas or associated wetlands.
- How the proposed mitigation measures (per PCC 18E.40.050) will ensure that no net loss of intertidal or riparian habitat or function occurs as a result of erosion control measure.

Details about what areas will be planted to achieve “*equivalent or greater biological functions*” than the pre-existing condition. PCC Section 18E.40.040(B)5 (Streambank Stabilization): Streambank stabilization to protect new structures from future channel migration is only permitted when using bioengineering or soft armoring techniques, and will comply with requirements described in PCC Chapter 18E.70 (Flood Hazard).

PCC Chapter 18E.40.040(B)11 (Stormwater Conveyance Facilities) describes limitations to placing stormwater conveyance structures (such as an outfall and pipes) in the riverine buffer zone. They may be allowed subject to all of the following standards:

- No other feasible alternatives with less impact exist;
- Mitigation for impacts is provided;
- Stormwater conveyance facilities shall incorporate fish habitat features;
- Vegetation shall be maintained and, if necessary, added adjacent to all open channels and ponds in order to retard erosion, filter out sediments, and shade the water.

PCC Chapter 18E.70 (Flood Hazard) describes limitations on development in a regulated floodplain. The regulations are intended to minimize losses due to floods and to provide rules about activities allowed within flood hazard areas. These rules specifically describe an intent to minimize adverse impacts to critical fish and wildlife habitat areas (18E.70.040 A.1.a). Depending on the type of flooding and precision of flood mapping available, areas within 150–300 feet horizontal from a flood zone, and 2–10 feet elevation above a base flood elevation may require analysis to determine what activities may be allowed. In general, new development in a flood zone is discouraged, but may be allowed with proper engineering, mitigation and floodproofing, as long as the Project does not “*cause an adverse impact to crucial fish or wildlife habitat.*”

Erosion and flow conveyance protection is required in the floodplain to minimize risk of riverine erosion.

Flow Conveyance. *New excavated conveyance areas shall be equivalent to existing conveyance within the flood fringe. Equivalent shall mean a mechanism for transporting water from one point to another using an open channel system.*

Erosion Protection. *Development shall be protected from flow velocities greater than 2 feet per second through the use of bio-engineering methods or, when bio-engineering methods have been deemed insufficient to protect development, then hard armoring may be utilized. All erosion protection shall extend 1 to 3 feet, depending on development requirements, above the base flood elevation and shall be covered with topsoil and planted with native vegetation. (See Figure 18E.70-14 in Chapter [18E.120](#) PCC.).*

PCC Chapter 18E.110 (Erosion Hazard Areas) defines areas with potential erosion hazard that may result in land retreat, usually related to impacts from an adjacent water body, but also from unprotected surface erosion. At the Project site, the Riverine Erosion Hazard Area definition applies, which regulates “the suspected risk of erosion through either loss of soil, slope instability, or land regression [which] is sufficient to require additional review to assess the potential for active erosion activity or apply additional standards.” This regulation applies on river floodplains mapped by FEMA adjacent to the Puyallup River. In general, new structures are prohibited, but may be allowed with proper engineering, mitigation, maintenance and floodproofing.

PCC Chapter 18E.80 (Landslide Hazard Area) defines areas that may be subject to mass movement due to a combination of geologic, seismic, topographic, hydrologic, or manmade factors. Indicators of a potential hazard include obvious evidence of failure, but also include area with slopes greater than 20 percent and relief greater than 20 feet, or slopes greater than 40 percent and relief greater than 15 feet, or sloped areas with soft or liquifiable soils, and others. Pierce County has provisionally identified areas that meet these slope characteristics, and these areas require a geological assessment.

The standard buffer from top of slope is the greater of these two—50 feet from top of slope or a distance of one-third the height of the slope, for facilities located at the top of slope, or as recommended by the geologist to ensure safe operations. The setback may be increased if there is considered to be an increased risk downslope from stormwater drainage impacts.

Pierce County Shoreline Master Program (PCC Title 18S Development Policies and Regulations – Shorelines)

PCC Title 18S—the current Pierce County Shoreline Master Program—was adopted in 2018 and is in the process of being updated (Ordinance 2022-37s, effective December 2022). PCC Title 18S establishes allowed uses, and defines buffers, setback requirements, and mitigation requirements for regulated waterways. PCC Title 18S identifies the Puyallup River at the Project site as a shoreline of the state with a shoreline environmental designation of Conservancy (Pierce County Shoreline Designations maps, October 2019). The regulated shoreline area includes all lands within 200 feet of the OHWM, plus all floodplains within 200 feet of the edge of the floodway and to the outer edge of all associated wetlands.

Thus, the entire floodplain and the floodplain wetlands at the Project site are in the regulated Shoreline jurisdiction and are subject to SMP regulations.

PCC Section 18S.20.040 Conservancy Shoreline Environment Designation (SED). "The intent of the Conservancy SED is to conserve and manage existing natural resources

and valuable historic and cultural areas while providing recreational benefits to the public and while achieving sustained resource utilization and maintenance of floodplain processes. Shoreline ecological functions should be preserved by avoiding development that would be incompatible with existing functions and processes, locating restoration efforts in areas where benefits to ecological functions can be realized, keeping overall intensity of development or use low, and maintaining most of the area's natural character. "

Pierce County Comprehensive Plan Policies

The Pierce County Comprehensive Plan was developed under the provisions of the GMA (Chapter 365-196, WAC). The Comprehensive Plan is a tool to assist County Councilmembers, planning commissioners, County staff, and others involved in making land use and public infrastructure decisions. It provides the framework for the County's Development Regulations. The current Pierce County Comprehensive Plan (effective October 1, 2021) defines goals and policies used by the County when making decisions related to growth and development, as relates to long-range County planning.

The GMA outlines 14 goals for the development and adoption of a comprehensive plan and development regulations, but specific to this section (4.4 Plants and Animals), the following GMA planning goals specifically apply:

- Open Space and Recreation: Retain open space, enhance recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks and recreation facilities. (RCW 36.70A.020(9))
- Environment: Protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water. (RCW 36.70A.020(10))

The Environmental Element (Chapter 7) of Pierce County's Comprehensive Plan describes approaches for maintaining the natural environment, including sections on fish and wildlife, vegetation retention, water quality, and wetlands. Specific primary goal groups in the Environmental Element include (each with associated specific, detailed goals):

Working to ensure application of current best available science:

- GOAL ENV-6: Recognize the adopted Pierce County Shoreline Master Program is the Shoreline Element of the Comprehensive Plan.
- GOAL ENV-7: Establish a long-term plan to evaluate and mitigate the cumulative impacts of land use activities on shorelines.
- GOAL ENV-14: Designate and protect all critical areas using best available science.

Conserving and restoring native vegetation, particularly in wetland and riparian areas:

- GOAL ENV-1: Conserve and protect critical and environmentally sensitive areas.
- GOAL ENV-2: Ensure native vegetation is retained and protected in public and private development
- GOAL ENV-11: Establish appropriate long-term protection to ensure no net loss of wetlands
 - Policy ENV-11.4: Require wetland mitigation for impacts that cannot be avoided.

Maintaining and/or improving terrestrial and aquatic ecosystems to maintain viable, reproducing populations of plants and animals.

- c. GOAL ENV-5: Protect aquifers and surface waters to ensure that water quality and quantity are maintained or improved.
 - i. Policy ENV-5.11: Protect water quality and quantity necessary to support healthy fish populations.
- d. GOAL ENV-8: Maintain and protect habitat conservation areas for fish and wildlife.
 - i. Policy ENV-8.2: Place regulatory emphasis on protecting and achieving no net loss of critical habitat areas.
 - ii. Policy ENV-8.3: Maintain fish and wildlife movement corridors.
 - iii. Policy ENV-8.4: Emphasize the importance of healthy riparian corridors.
- e. GOAL ENV-9: Maintain and where necessary improve terrestrial and aquatic ecosystems so that they maintain viable, reproducing populations of plants and animals.
- f. GOAL ENV-11: Establish appropriate long-term protection to ensure no net loss of wetlands

City of Puyallup Regulatory Review

As described above, the Project site is located in unincorporated Pierce County, within the City of Puyallup's UGA. It is served by and affects city infrastructure and critical areas in the City of Puyallup and its UGA. Protection of plants and animals is generally addressed at a local level in a wide range of city or county stormwater and critical area management regulations, but also in related code that regulates impacts to wildlife habitat.

Various Pierce County Regulations that impact wildlife habitat were reviewed first above, but are followed below by a short, comparative discussion about equivalent or parallel regulation in the City of Puyallup. But City regulations do not apply until such time as the UGA is annexed into the City.

City of Puyallup Stormwater Management Program Plan (SWMPP)

The City of Puyallup's 2020 SWMPP was updated in 2022 to describe actions Puyallup will take to maintain compliance during the 2020 Permit period, as required by the City's Phase 2 NPDES Permit (i.e., August 1, 2019, through July 31, 2024). The 2022 SWMPP provides guidance on how the City manages its stormwater to meet requirements of the City's NPDES Phase 2 permit, as administered by Ecology. Under the SWMPP, the City has made LID the preferred approach for new development, in order to *"minimize impervious surfaces, native vegetation loss, and stormwater runoff in all types of development situations where feasible."*

The Phase 2 Permit allows the City to discharge stormwater runoff into Waters of the State (i.e., streams, rivers, lakes, wetlands) as long as the City implements certain water quality programs designed to protect water quality. This goal is to be attained by reducing discharge of pollutants *"to the maximum extent practicable"* by using specific BMPs.

The BMPs are grouped under several program categories, including but not limited to Stormwater Planning; MS4 Mapping and Documentation; Controlling Runoff from Development; Redevelopment; and Construction Sites, Operations and Maintenance, and Monitoring

The NPDES Phase 2 Permit (SWMPP Section S5.C.8) requires the City to implement a program designed to prevent and reduce runoff pollutants from surfaces that discharge to the City stormwater system. This would include requiring implementation of source control BMPs from current operations or, as needed, requiring construction of treatment facilities to reduce pollutants associated with existing land use.

In addition, under SWMPP Section 9.1, the city is required to define maintenance standards that are “*as protective, or more protective [SIC] of facility function*” than those specified in the Ecology Manual. And for facilities that do not have maintenance standards, the City is required to develop a maintenance standard.

Under SWMPP Section 10, the City is required to have a program in place to ensure that permanent stormwater facilities are checked after major storm events to determine whether the facility was damaged or requires maintenance.

City of Puyallup Critical Areas Regulations (PMC Chapter 21.06 CRITICAL AREAS)

Under the GMA (RCW 36.70A.060), local governments are required to establish policies and development guidelines to protect the functions and values of critical areas: rivers, streams, lakes, wetlands, floodplains, wildlife habitat, erosion and landslide hazard areas, and others. The Puyallup Critical Areas regulations (PMC Chapter 21.06) are similar to those of Pierce County, as both are designed to meet standards defined in the GMA. However, some regulatory details are different.

The PMC critical area regulations were most recently updated in 2022. These regulations apply to lands directly west of the Project site, which are within the City of Puyallup, and will apply to any future Project site development after annexation into the City. Ideally, the PMC Chapter 21.06 Critical Areas regulations are not in conflict with similar and parallel County regulations, which apply to the current Project site located in the City’s UGA.

Under PMC Section 21.06.930, the City of Puyallup defines standard wetland buffer widths in relation to Category rating score (Categories I, II, III, and IV) and land use intensity (Low, Moderate, and High). Buffer widths range from a minimum of 25 feet up to 300 feet.

The City does not regulate (i.e., buffer or impose mitigation requirements) wetlands smaller than 1,000 square feet (if not along a riparian corridor or part of a wetland mosaic), and does not regulate Category IV wetlands smaller than 4,000 square feet as long as the wetland is not associated with a shoreline, is not part of a wetland mosaic, does not score more than five or more points when rated, does not contain priority or critical habitat, and the impacts are fully mitigated in accordance with conditions from Ecology and/or USACE.

PMC Article X (Sections 21.06.1010 through 21.06.1080) (Fish and Wildlife Species and Habitat Conservation Areas) defines activities allowed in stream buffer areas and defines stream buffer widths in relation to Stream Type and Water Type, as listed below in Table 4-17.

Table 4-17. Stream and Riparian Buffer Widths

Water Type	Water Body Criteria	Standard Buffer Width
Type I	“Shorelines of the State” within the city’s corporate limits and the urban growth area, specifically the Puyallup River and Clarks Creek, below Maplewood Springs	150 feet from the OHWM
Type II	Other fish-bearing streams or streams with significant recreational value, or with significant wildlife habitat functions; within the city’s corporate limits and UGA, known Type II streams, including but not limited to Deer Creek, Diru Creek, Meeker Ditch, Rody Creek, Silver Creek, Wildwood Creek, Woodland Creek, and Wapato Creek	100 feet from the OHWM
Type III	Streams with perennial or intermittent flow that are not used by anadromous fish	50 feet from the OHWM
Type IV	Intermittent or ephemeral streams less than 2 feet wide at the OHWM that are not used by anadromous or resident fish	35 feet from the OHWM
Non-riparian habitat areas	Must support or have a primary association with federally listed species, state priority habitats and species, or habitats and species of local importance	Determined on a site-by-site basis

Source: Adapted from PMC Section 21.06.1050 Stream and Riparian Buffer Widths

PMC Chapter 21.06, Section 21.06.1050 Fish and Wildlife Habitat Conservation Areas, Performance Standards – Stream and Riparian Buffer Widths (Chapter 21.06 effective date 2022; Section 21.06.1050 last updated in 2006)

PMC Chapter 21.07 (Flood Damage Protection, a separate chapter but incorporated by reference in PMC Chapter 21.06 Critical Area regulations) describes limitations on development in a regulated floodplain. The Flood Damage Protection regulations are intended to protect human life and health, minimize public costs associated with flood control and relief projects, minimize damage to public facilities, and meet requirements for maintaining eligibility for flood insurance and disaster relief.

These rules specifically describe methods intended to control alterations to natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters, and to controlling filling, grading, dredging and other development which may increase flood damage.

Applicants for development permits in a floodplain area are to submit a professional habitat assessment report (described previously) describing effects of the proposed development (during both construction and operation) on floodplain functions and documenting that the proposed development will not result in “take” of any species listed as threatened or endangered under the ESA. The functional impacts that are to be described include a requirement for a hydrologic and hydraulic analyses in accordance with standard engineering practice to ensure that the proposal avoids “take” of listed species. The report must also describe flood storage capacity impacts; channel migration and bank stability impacts; riparian vegetation impacts; habitat forming and isolation impacts; impacts to floodplain refuge for fish during higher velocity flows; and impacts to spawning substrate.

Development permits will be denied if the proposal will result in “take” of any species listed as threatened or endangered under the ESA, unless the Applicant provides the City with evidence that the federal and state permits required to authorize such take have been obtained.

PMC (Article XII. Geologically Hazardous Areas) defines areas that are susceptible to erosion, landslides, earthquake, volcanic activity, or other potentially hazardous geological processes. Alteration of geologically hazardous areas and their buffers is initially prohibited but may be allowed based on the

degree to which risks posed by geologically hazardous areas to public and private property and to public health and safety can be mitigated. Removal of vegetation with soil-stabilizing functions from an erosion or landslide hazard area or related buffer is prohibited.

Erosion hazard areas and Landslide hazard areas may affect wildlife habitat through either erosion impacts to downslope wetlands or slope failures cause loss of slope vegetation or loss of downslope habitat features. For that reason, point discharges from surface water facilities and roof drains onto or up-slope from an erosion or landslide hazard area is prohibited except where the release can be controlled in a way to avoid erosion or slope failure, and only when the release water can be infiltrated in the downslope buffer surface.

- Section 21.06.1240 Performance standards – Landslide and erosion hazard area buffers. This section describes when and how to apply buffers near these hazard areas when a slope is steeper than 15 percent and has a height of more than 10 feet. The two slope classes are 16–39 percent and greater than 40 percent. Standard buffers are calculated as follows but may be increased based on geotechnical recommendations: for slopes greater than 15 percent and less than 40 percent, the standard buffer is the slope height divided by 2.
- For slopes greater than 40 percent, the standard buffer is the same as slope height or 25 feet, whichever is greater.
- For slopes with vertical elevation between 10–25 feet, the minimum buffer is the height divided by 2, regardless of slope, as long as there are no other risk factors.
- To protect slope stability (and associated wildlife habitat), the slope and buffer are to remain or be replanted in dense native woody vegetation.

[City of Puyallup Shoreline Master Program \(PSMP\) \(Ordinance No. 3101 updated in 2016\)](#)

The Puyallup Shoreline Master Program (PSMP) establishes allowed uses, and defines buffers, setback requirements, and mitigation requirements for regulated waterways. The Puyallup SMP regulates land uses and modifications, restoration goals, and public access plans for the Puyallup River and Clarks Creek. The Puyallup River at the Project site is a Shoreline of the state and is recognized as a shoreline of statewide significance (Chapter 6, PSMP). The City has assigned an environmental designation of Puyallup River Urban Conservancy. The regulated shoreline jurisdiction includes all lands within 200 feet of the OHWM, plus all floodplains within 200 feet of the edge of the floodway and to the outer edge of all associated wetlands.

Thus, the entire floodplain and the floodplain wetlands in the City directly adjacent to the Project site are in the regulated shoreline jurisdiction and are subject to PSMP regulations.

Chapter 6 of the PSMP also describes management policies that are to be applied in addition to other regulations in the PSMP:

- Manage designated critical areas along the Puyallup River shoreline, including fish and wildlife habitat areas, wetlands, and frequently flooded areas to protect or restore ecological functions provided by such areas.

- Utilize buffers, setbacks, water quality measures, and vegetation conservation or enhancement measures to regulate and inform the design of proposed development along the Puyallup River shoreline.
- Allow a variety of urban uses as established by the Comprehensive Plan and zoning code, where the development of such uses is done in a manner that protects or enhances ecological functions and/or public access.
- Prioritize uses and development that are water-oriented or incorporate public access, recreation, or shoreline restoration elements.
- **Work cooperatively with Pierce County, neighboring cities, tribes, and state natural resource agencies in development of flood control and/or habitat restoration along the Puyallup River.**

City of Puyallup Comprehensive Plan

The 2015 City of Puyallup Comprehensive Plan (CPCP) was last updated in 2020. The CPCP includes government planning policies that call for the protection, preservation and enhancement of water resources and other natural environment components. These City policies are provided for context because the proposed development is within the City's UGA, which includes shared habitat and associated natural systems with the County. The CPCP is described as *"the long-term vision and plan for managing the built and natural environment in the City of Puyallup."*

The CPCP is described as *"the long-term vision and plan for managing the built and natural environment in the City of Puyallup."* It provides policy guidance used by City staff to make decisions related to growth and development while still recognizing that the City's "green infrastructure" is the foundation to healthy growth. Key strategies listed to maintain the city's environmental assets—as related to management of plants and animals—are summarized below:

- Establish and maintain City-wide critical areas and habitat corridor maps as needed to assess interaction between key environmental assets
- Use a science-based approach to ensure no net loss of critical areas' ecological functions and values
- Maintain and strive to enhance a healthy natural ecosystem through environmental stewardship programs that engage the citizens of Puyallup
- Foster high quality of life through tree retention, fostering clean air, minimizing noise and light pollution, and maintaining scenic vistas

The Natural Environment Element (Chapter 2) describes approaches for managing the environment to meet requirements of the GMA. This includes protecting and assessing potential impacts to critical areas, such as wetlands, CARAs, fish and wildlife habitat, frequently flooded areas and geologically hazardous areas, and adoption of a "no-net loss" approach. Specifically, salmon are described as being keystone species that are used as benchmark indicators of environmental health.

Goals and Policies that relate to management of fish and wildlife habitat conservation area management at and near the Project site include (but are not limited to):

Sustainability and Environmental Stewardship:

- *Goal NE-1: Safeguard the natural environment by meeting the needs of the present without compromising the ability of future generations to meet their own needs.*
 - *Policy NE-1.1: Establish policy and regulations that consider and implement Best Available Science when making environmental decisions, where applicable.*
- *Goal NE-2: Lead and support efforts to protect and improve the natural environment, protect and preserve environmentally critical areas, minimize pollution, and reduce waste of energy and materials.*

Critical Areas:

- *Goal NE-3: Protect, integrate and restore critical areas and their aesthetic and functional qualities through conservation, enhancement and stewardship of the natural environment.*
 - *Policy NE-3.1: Implement projects and programs that include adaptive management based on Best Available Science to revise policies, regulations and programs as needed to reflect changes in scientific advancement and local circumstances.*
 - *Policy NE-3.3: Implement monitoring and adaptive management to programs and critical areas mitigation projects to ensure that the intended functions are retained and, when required, enhanced over time.*
 - *Policy NE-3.5: Conserve and protect environmentally critical areas from loss or degradation. Maintain as open space hazardous areas and significant areas of steep slopes, and undeveloped shorelines and wetlands.*
 - *Policy NE-3.6: Avoid land uses and developments that are incompatible with environmentally critical areas; protect critical area functions based on the intensity of land uses near them.*

Geologically Hazardous Areas:

- *Goal NE-4: Preserve and enhance the natural scenic qualities, ecological function and value, and the structural integrity of hillsides to protect life, property and improvements from landslide, erosion and volcanic hazards.*
 - *Policy NE-4.6: Promote soils stability by the use of natural drainage systems and retention of existing vegetation in Geologically Hazardous Areas.*

Critical Aquifer Recharge Areas:

- *Goal NE-5: Preserve and protect aquifer recharge and well-head protection zones from hazardous substances and land uses which could denigrate ground water quality.*
 - *Policy NE-5.5: Encourage retention of open spaces, tree protection areas, and other areas of protected native vegetation with a high potential for groundwater recharge.*
 - *Policy NE-5.6: Utilize low impact development techniques—such as pervious surfacing materials and rain gardens—to mimic natural processes of stormwater infiltration.*

Frequently Flooded Areas:

- *Goal NE-6: Minimize the potential for injury and property loss associated with flooding while preserving and restoring the ecological function and value of flood prone areas.*

- *Policy NE-6.1: Reduce the amount of effective impervious surface in floodplains and uplands contributing runoff to downstream floodplains.*
- *Policy NE-6.3: Strive towards no net loss of the structure, value, and functions of natural systems constituting Frequently Flooded Areas by requiring that all development actions in Frequently Flooded Areas to provide analysis for potential habitat related to listed endangered species, in accordance with federal FEMA requirements.*
- *Policy NE-6.5: Direct uses that require substantial improvements or structures away from areas within the 100-year floodplain.*

Wetlands:

- *Goal NE-7: Identify and protect wetland resources and ensure “no net loss” of wetland function, value and area within the city.*
 - *Policy NE-7.2: Require buffers adjacent to wetlands to protect the ecological functions integral to healthy wetland ecosystems. Buffer sizes should be tailored to protect the wetland’s functions within the surrounding landscape and buffer, particularly when the wetland provides a high level of habitat value.*
 - *Policy NE-7.3: Use mitigation sequencing guidelines when reviewing projects impacting wetlands. This involves, in the following order:*
 - a. avoiding the impact altogether by not taking a certain action or parts of actions;*
 - b. minimizing the impact by limiting the degree or magnitude of the action and its implementation;*
 - c. rectifying the impact by repairing, rehabilitating, or restoring the affected environment;*
 - d. reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and*
 - e. compensating for the impact by replacing or providing substitute resources or environments.*
 - *Policy NE-7.4: Ensure the amount of mitigation required reflects the value and function of the wetlands affected by the project, the risk that the mitigation may fail, the temporal loss of wetlands functions and values, the spatial locations of the mitigation, and the difficulty of replacing many wetlands functions and values. For these reasons, require in general a significantly larger area of mitigation than the area of wetlands impacted.*

Water Quality:

- *Goal NE-8: Protect, improve and enhance the quality of all aquatic resources city-wide through best management practices, with a distinct emphasis on mimicking natural processes and use of low impact development techniques.*
 - *Policy NE-8.1: Maintain surface water quality necessary to support native fish and wildlife meeting state and federal standards over the long term. Restore surface waters that have become degraded to provide for fish, wildlife, plants, and environmentally conscious human use of the water body.*

- *Policy NE-8.5: Control the flow of nutrients (especially phosphorus), heavy metals, and other pollutants into streams, rivers, local ponds and lakes and natural wetlands. Require treatment measures where the development results in discharges to surface or groundwaters.*
- *Policy NE-8.8: Protect and enhance rivers, streams and lakes, including riparian and shoreline habitat, to protect water quality, reduce public costs, protect and enhance fish and wildlife habitat, and prevent environmental degradation. Protect both perennial and intermittent streams to preserve natural hydraulic and ecological functions, fish and wildlife habitat, recreational resources, and aesthetics.*
- *Policy NE-8.9: Maintain natural hydrological functions within the city's ecosystems and watersheds and encourage their restoration to a more natural state.*
- *Policy NE-8.13: Encourage restoration and enhancement of the Puyallup River, Clarks Creek and associated tributaries (such as Meeker Creek), other riparian stream corridors, wetlands, and associated buffers with priority given to areas associated with listed species and TMDL water-cleanup plans.*

Fish and Wildlife Habitat:

- *Goal NE-9: Identify and protect fish and wildlife areas within the city by engaging citizens in restoration.*
 - *Policy NE-9.2: Protect and restore native vegetative buffers adjacent to all stream bodies throughout the city. Preserve and restore regional biodiversity with a focus on promoting native species and avoiding and eliminating invasive species.*
 - *Policy NE-9.4: Protect and restore native vegetative buffers adjacent to all stream bodies throughout the city.*
 - *Policy NE-9.5: Protect and regulate land uses within 200' of Clarks Creek, the Puyallup River and associated wetland areas, through the Puyallup Shoreline Master Program (SMP).*
 - *Policy NE-9.10: Protect natural resources having a primary association with Species of Concern, Priority Species, and Species of Local Importance.*
 - *Policy NE-9.11: Participate in regional efforts to recover species listed under the Endangered Species Act (ESA), such as the Chinook Salmon.*
 - *Policy NE-9.14: Protect salmon, steelhead and other fish, plants, and wildlife that rely on the aquatic environment by protecting and improving water quality.*
 - *Policy NE-9.20: Encourage conservation and sustainability throughout the city by minimizing impacts to wildlife and water quality through practices, such as limiting the use of toxic pesticides and fertilizers, incorporating alternative pest management methods, and providing public education about such practices.*
 - *Policy NE-9.25: Ensure management of noxious weeds and invasive species are an integral part of landscape plans for new development. Work with Pierce County, Pierce Conservation District and Washington State Departments to target the management of noxious weeds.*

4.4.3 Affected Environment

The Project site proposal is to construct seven warehouses and associated utility and pavement infrastructure. The site is located on currently farmed land adjacent to the Puyallup River, which is regulated by Pierce County as a shoreline of statewide significance and a fish-bearing stream (PCC Title 18S and Title 18E). Water quality in the Puyallup River adjacent to the Project site is currently documented as having Category 1 (Low risk) impacts from occasional exceedance of bacteria and Ammonia-N criteria; Category 2 (Moderately Low risk) impacts from high copper content (per Puyallup Tribe data), high pH and low dissolved oxygen readings, and Category 5 (High risk) exceedance of 32°F temperature limits. However, data detailing ongoing water quality monitoring work in the Puyallup River is limited.

The EIS team carried out on-site visits in March 2019 and during March and August 2021 to collect data about site conditions for the EIS work. Previous reports prepared by the developer's consultants related to assessment of plants and animals impacts on site were also reviewed by the EIS team, including but not limited to:

- SoundView Consultants: reports prepared for the Project site:
 - March 2016 Critical Areas and ESA Assessment and Conceptual Floodplain Restoration Plan
 - March 2016 report was updated and replaced by a September 2016 Critical Areas Assessment report; which was subsequently updated and replaced by the final draft (accepted by Pierce County) December 2016 Critical Areas Assessment
- Talasea Consultants: reports were prepared for the Viking warehouse site. The stormwater outfall structure described in the report was intended to accept future stormwater flows from the Project site. Therefore, aspects of the Talasea reports also apply to the Project site, specifically information related to the outfall structure and assessment of conditions in the Puyallup River.
 - January 2017 Biological Evaluation
 - March 2018 JARPA form and Detailed Mitigation Plan

The affected environment for purposes of this section (4.4 Plants and Animals) includes the Project site and adjacent habitats within 0.5 mile (Figure 4-32). The Project site is actively managed agricultural land on a post-glacial alluvial terrace located on the left bank of the Puyallup River. There are two terrace features on site, a high elevation terrace to the southwest, where it is proposed to build the Project warehouses, and a low elevation terrace to the northeast along the Puyallup River, which is an active floodplain. There are four identified scrub/shrub and emergent wetlands on the property and a well-developed, but narrow, naturally vegetated riparian buffer plant community along edge of the Puyallup River that contains mostly native vegetation (Figure 4-34). Portions of the 100-yr floodplain have been regularly plowed and planted with agricultural crops.

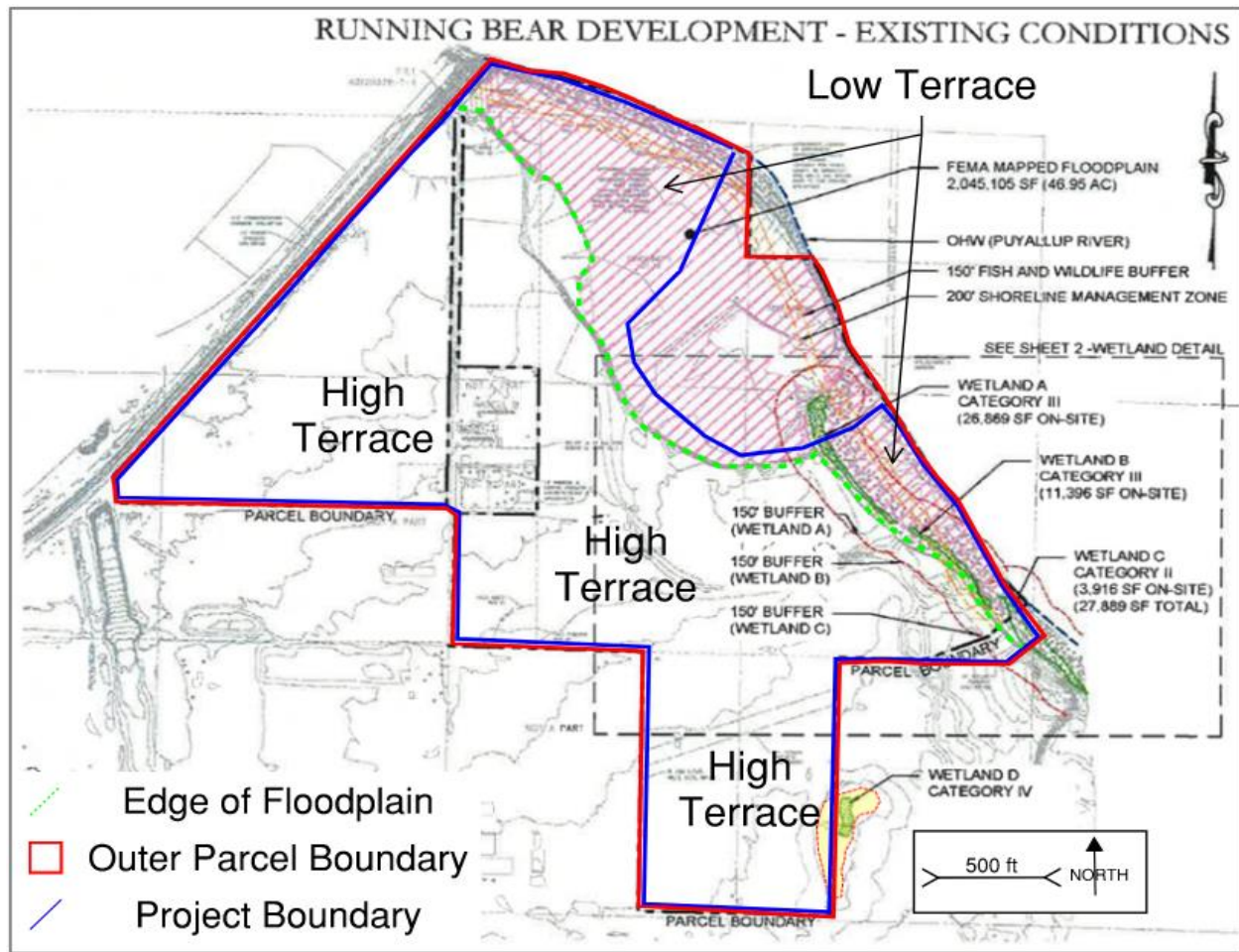


Figure 4-34. Map of FEMA Floodplain and Wetlands A, B, and C Delineated by SoundView Consultants (SVC 2016) and Expanded Outline of Wetland D per EIS Team Delineation 2020 (yellow polygon).

The Puyallup River borders the northeastern boundary of the Project site and is regulated under Title 18E PCC Development Regulations- Critical Areas as a Fish and Wildlife Habitat Conservation Area and under Title 18S PCC Development Policies and Regulations- Shorelines, with a Shoreline Environmental Designation of Conservancy. The Puyallup River is also classified as a Type FI (fish-bearing) waterbody, for which Pierce County Critical Area regulations requires a buffer width of 150 feet from ordinary high water (PCC Title 18E 2021). The County's SMP Shoreline jurisdiction extends 200 feet landward from the OHWM, but is wider within the Project area as the shoreline jurisdiction also includes the entire floodplain and wetlands A, B and C. The Conservancy Shoreline standard buffer/setback is 100 feet wide, as measured from the OHWM at the River. When there are differences between the Critical Area and the SMP regulations the most protective setback or buffer is applied. The 150 ft critical area buffer is most restrictive, and therefore applies.

Vegetation and Wildlife Habitat

Most of the Project site is currently used for agriculture, growing various crops including bulb flowers and rhubarb. Wildlife habitats in the Project study area range from urban development and agricultural

areas (low quality) to riparian forested and wetland habitats (moderate to high quality). Research and field reconnaissance carried out in February 2021 documented four Priority Habitats in the Project site, including snags and logs, riparian areas, freshwater wetlands, and riverine habitats.

Agricultural Areas

The agricultural fields in the uplands and floodplains are regularly tilled between crops, and no plants aside from common weeds grow between the rows or in the alleyways. This results in minimal native vegetation and wildlife habitat in upland and farmed floodplain areas. Weedy or invasive species along the edges of the agricultural fields were documented by the EIS team during a field reconnaissance site visit in February 2021. These included native species, such as mullein (*Verbascum thapsus*), western dock (*Rumex occidentalis*), and stinging nettle (*Urtica dioica*), and introduced species, such as Japanese knotweed (*Fallopia japonica*), Scotch broom (*Cytisus scoparius*), Himalayan blackberry (*Rubus armeniacus*), English holly (*Ilex aquifolium*), English ivy (*Hedera helix*), poison hemlock (*Conium maculatum*), common evening primrose (*Oenothera biennis*), redstem filaree (*Erodium cicutarium*), birdseye speedwell (*Veronica persica*), and tansy ragwort (*Jacobaea vulgaris*).

Aquatic Habitat Conditions

The Project site is located adjacent to the Middle Reach of the Puyallup River. The Puyallup River which is regulated by Pierce County as a shoreline of statewide significance and a fish-bearing stream (PCC Chapter 18S.10 and Title 18E). The Middle Reach starts at RM 10.3 (the confluence with the White River) and extends upstream to RM 17.4 (the confluence with the Carbon River). The basin that flows to this section of the River is approximately 438 square miles (Geoengineers 2003).

The Puyallup-White Watershed supports several salmonid species. The reach of the Puyallup River adjacent to the site near RM 10 (“Project reach”) is used as a migration corridor to access tributaries in the upper Puyallup River basin. The upper Puyallup provides spawning and rearing habitats for all of these salmonids, and the reach adjacent to the Project site also provides documented rearing or spawning habitat for some of these salmon species.

The White River merges with the Puyallup River approximately 0.5 mile downstream from the Project site and supports the last Spring Chinook salmon (*Oncorhynchus tshawytscha*) run in the South Puget Sound (Pierce County 2018).

6PPD Pollutant

New research from Tian et al. (2021, 2022) and others (McIntyre and Kolodziej 2021) has identified a tire rubber derived chemical in stormwater runoff—the antioxidant 6PPD (often found in microscopic tire wear particles) and its soluble byproduct 6PPD-q. Road friction causes tiny tire particles break off and fall to the road surface. As a result, this pollutant is common in stormwater runoff from paved surfaces. This chemical has been found to have toxic effects on trout and salmon species, with highest sensitivity to date reported in coho salmon, and moderately high sensitivity in brook trout and rainbow trout (i.e., steelhead species). Research on impacts to other salmonids is ongoing. Characteristic toxicity symptoms include increased ventilation, gasping, spiraling, and loss of equilibrium shortly before death, which is reported to occur within 1–96 hours of exposure at very low concentrations of the pollutant.

Brinkmann et al. (2022) evaluated potential for acute toxicity of 6PPD-q to rainbow trout, brook trout, arctic char, and white sturgeon and reported 96-hr acute toxicity thresholds (LC50) of 1.0 µg/L or less for the two trout species, indicating lethal sensitivity in these trout species. Tian et al. (2022) reported a revised juvenile Coho salmon LC50 of less than 0.1 µg/L, indicating substantial lethal sensitivity to 6PPD-q in coho. Lethal impacts to other salmon species are assumed but not yet fully documented.

Stormwater impacts to coho and other salmonids that affect ability to survive and reproduce during various life stages have been clearly documented. However, most of those studies focused on impacts during juvenile life stages, and not much research was carried out to assess impacts on spawning salmonids.

A basin-level study assessing impacts of stormwater runoff on salmon was conducted in the Puget Sound in 2011 and 2017 (Feist et al. 2011, 2017). This work was completed prior to more recent 6PPD research (described above) that was initially reported in 2019. The Feist et al. (2011, 2017) research showed that increased mortality to coho during the fall spawning season (i.e., which precluded successful spawning) were caused by toxic contaminants in runoff to urban streams. Field surveys carried over the past 10–20 years have documented high coho mortality rates prior to successful spawning in the central Puget Sound Basin (Feist et al. 2011, 2017). Affected fish *“become disoriented and show surface swimming, gaping, a loss of equilibrium, and finally death on a timescale of a few hours. Loss rates to die-offs are typically high, e.g., 60–90% of an entire fall run within a given urban stream.”*

The 2011 study carried out spatial analyses designed to identify the relationship between land cover types (e.g., roadways, impervious surfaces, forests) and coho mortality. Results indicated that spawner mortality was positively correlated with the relative proportion of roads, impervious surfaces, and commercial property within a basin. The data was used to identify and map basins throughout the Puget Sound where coho spawner die-offs were considered likely.

The 2011 map analysis was carried out prior to construction of the Viking warehouse and the outfall (which occurred in 2018/2019), and thus did not include assessment of impacts from the Viking warehouse impervious surfaces in the basin mapping assessment. However, in the Puyallup River at the Project site, the predicted mortality rate in the 2011 analysis was 10–50 percent—a moderate to high risk of coho mortality during spawning periods. The Deer Creek basin directly west (which flows to the Puyallup) was mapped as having a high risk of mortality.

Follow up research by Feist et al. in 2017 was expanded to include 51 spawning sites in both urbanized and rural basins throughout the Puget Sound and was re-evaluated to include consideration of possible interactions between landscape and climate. The statistical analysis in 2017 was more conservative and included a prediction uncertainty assessment. The updated study verified that urbanization associated with road density and traffic intensity, among other variables, were positively related to coho spawning mortality, but adjusted the predicted mortality rates in the basins with moderate road and traffic intensity to 10–40 percent, and in the high intensity basins, adjusted predicted mortality rates to more than 40 percent (Figure 4-35).

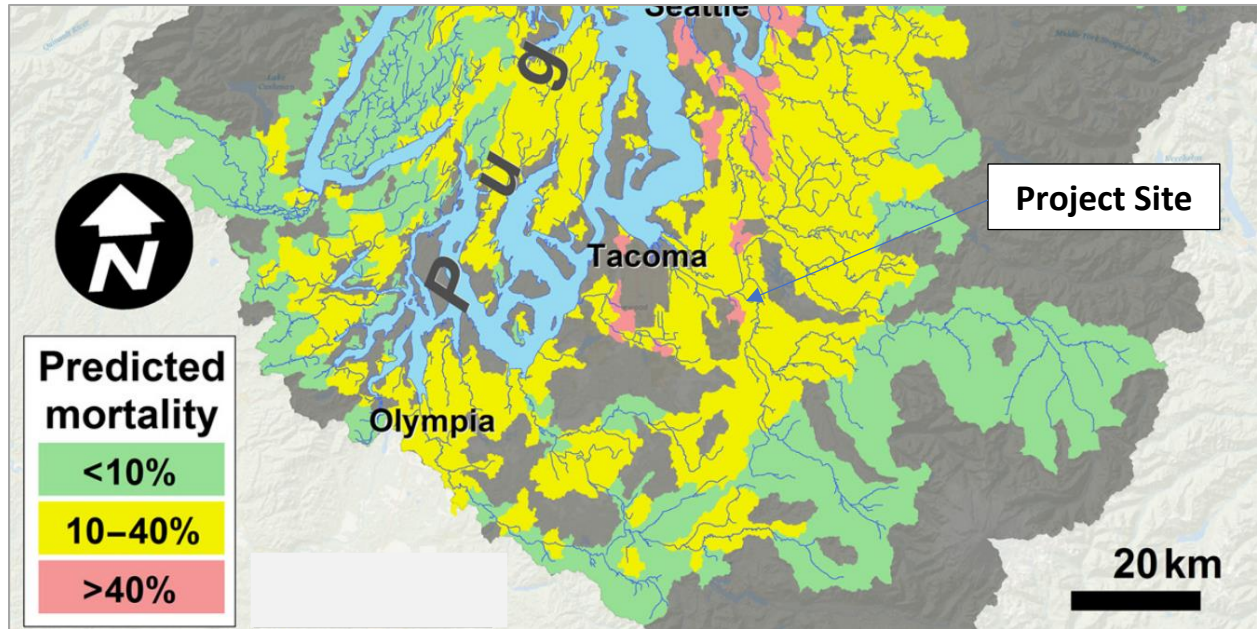


Figure 4-35. Figure Copied from Feist et. al, (2017) Showing 10–40 Percent Coho Mortality was Expected in the Puyallup River at the Project Site, Based on 2017 Land Use Conditions, as a Result of Urban Runoff Pollutants

Under future conditions proposed at the Project site, which would convert more than 100 acres of farmland to impervious surface with 100 percent of runoff from paved surfaces directed to the river, the mortality prediction of the combined Viking/Project basin is expected to be grouped with the high intensity Deer Creek basin, located directly adjacent to the west (i.e., a predicted mortality rate of more than 40 percent).

Impacts to other salmonids were not directly addressed in the Feist et al. (2011, 2017) studies, which were focused on assessing vulnerability of the Puget Sound coho population segment, considered a sentinel or indicator species and a species of concern under the ESA. More recent research by others, described above (Tian et al. 2021, 2022; McIntyre and Kolodziej 2021; Brinkman et al. 2022) indicates that coho are also most sensitive to 6PPD, but also show that steelhead and chinook (listed species) are also sensitive to 6PPD, and thus may be similarly affected during spawning and other life cycle periods.

T Ecology published new guidance in June 2022 (Ecology [D]) and October 2022 (Ecology [E]), which provides information about this pollutant. The primary pathway of 6PPD-q transport is runoff from roads and parking areas or through conveyance systems (storm drainpipes and catch basins) to surface waters or direct discharges to surface waters, such as is proposed at the Project site.

Stormwater treatment infrastructures that use infiltration, sorption, filtration, and/or effectively capture tire wear particles are expected to reduce the toxicity from 6PPD-q. Preventive operation and maintenance, such as street sweeping and catch basin cleaning, are likely helpful in preventing the transport of tire wear debris and reducing the magnitude of the problem. (Ecology [D], October 2022)

The currently proposed Project stormwater management plan does not implement BMPs that may be used to minimize this pollutant prior to discharge into the Puyallup River. With no BMPs using prescriptive infiltration, sorption, filtration or sedimentation treatment, potential for minimizing levels of 6PPD-q (soluble) and fine sediment or tire particles containing 6PPD (solid or precipitate) is low. Without appropriate treatment, research indicates a moderate to high potential for illegal take of listed and sensitive species near the stormwater outfall, and potential for downstream impacts to other species from bioaccumulation.

Salmon Habitat Documentation

According to WDFW SalmonScape mapping (WDFW SalmonScape 2023), the Puyallup River provides documented habitat for both a fall run and spring run of chinook salmon (*Oncorhynchus tshawytscha*), sockeye salmon (*Oncorhynchus nerka*), coho salmon (*Oncorhynchus kisutch*), pink salmon (*Oncorhynchus gorbuscha*), chum salmon (*Oncorhynchus keta*), winter steelhead (*Oncorhynchus mykiss*), and bull trout (*Salvelinus confluentus*). The White River, which merges with the Puyallup River approximately 0.5 mile downstream from the Project reach, diverts the sockeye salmon run as well as the last spring Chinook salmon run in the South Puget Sound (WDFW SalmonScape 2023). All other species listed above use the reach adjacent to the Project site.

Talasea Consultants prepared a biological evaluation report in 2017, which assessed baseline conditions in the Puyallup River adjacent to the Project site. They described most water quality and habitat parameters as being either “at risk” or “not properly functioning” (Talasea 2017), indicating a degraded baseline condition. According to Talasea (2017), due to the general lack of pool-riffle complexes or gravel beds, the Project reach does not contain optimal spawning or rearing habitat for state or federally listed salmonids (Talasea 2017).

However, WDFW SalmonScape mapping indicates that the Project reach includes documented spawning for the pink salmon, documented rearing for the fall Chinook and coho, and documented presence (i.e., migration) of bull trout, winter steelhead, and fall chum. Therefore, the reach adjacent to the Project site provides critical habitat and a migration corridor for listed salmon species, allowing them to move between the open ocean and the upper Puyallup watershed where high-quality spawning and rearing habitat is present.

The Puyallup River up to River-Mile 14 has been identified as EFH for chinook, coho, and pink salmon (NOAA 2021b). The surrounding basin (and entire Puget Sound basin) is also mapped as EFH for Pacific groundfish, which depend on saltwater habitats and estuaries, including the furthest extent of saltwater intrusion upriver (Pacific Fishery Management Council 2020).

Of the salmonids present, the chinook, steelhead, and bull trout are federally listed as threatened species, and the coho is federally considered a species of concern. Protection of listed species is required under federal and local law. In addition, the coastal cutthroat and pink salmon are listed by Pierce County as Species of Local Importance (PCC 18E.40), and thus are to be protected.

Salmon might access the Project floodplain during high-water flood events, but due to ongoing farming and plowing actions in the floodplain, there are no significant current off-channel habitat swales or

drainages to provide effective and safe refuge during or after floods, which indicates potential for stranding during flood events.

Outfall Structure on the Floodplain

An existing outfall structure is located on the bank of the Puyallup River at the far northern end of the Project site (Figure 4-36 and Figure 4-37). The outfall structure was purposefully built to create a lower elevation notch in the riverbank, which was previously part of the high bank river levee at that location.

The ponding behind the levee in the past had affected farm fields in the floodplain by limiting access during flood events and by depositing significant volumes of sandy sediment. Creating the notch was intended to allow floodwaters to flow across the floodplain and back into the river, without ponding behind the levee.

In addition to providing throughflow for Puyallup River flood waters, the outfall receives stormwater runoff volumes from the already constructed Viking warehouse, roads, and parking surfaces, which are located directly adjacent to and southwest of the Project site. The outfall structure is intended to control and dissipate power from runoff flow velocities, and to reduce potential for scouring and erosion at the edge of the river. The outfall structure is also intended to receive future stormwater runoff volumes from the Project warehouse complex (seven warehouses, parking areas, and roads) and the greater stormwater basins upslope from both the Viking and Project sites.

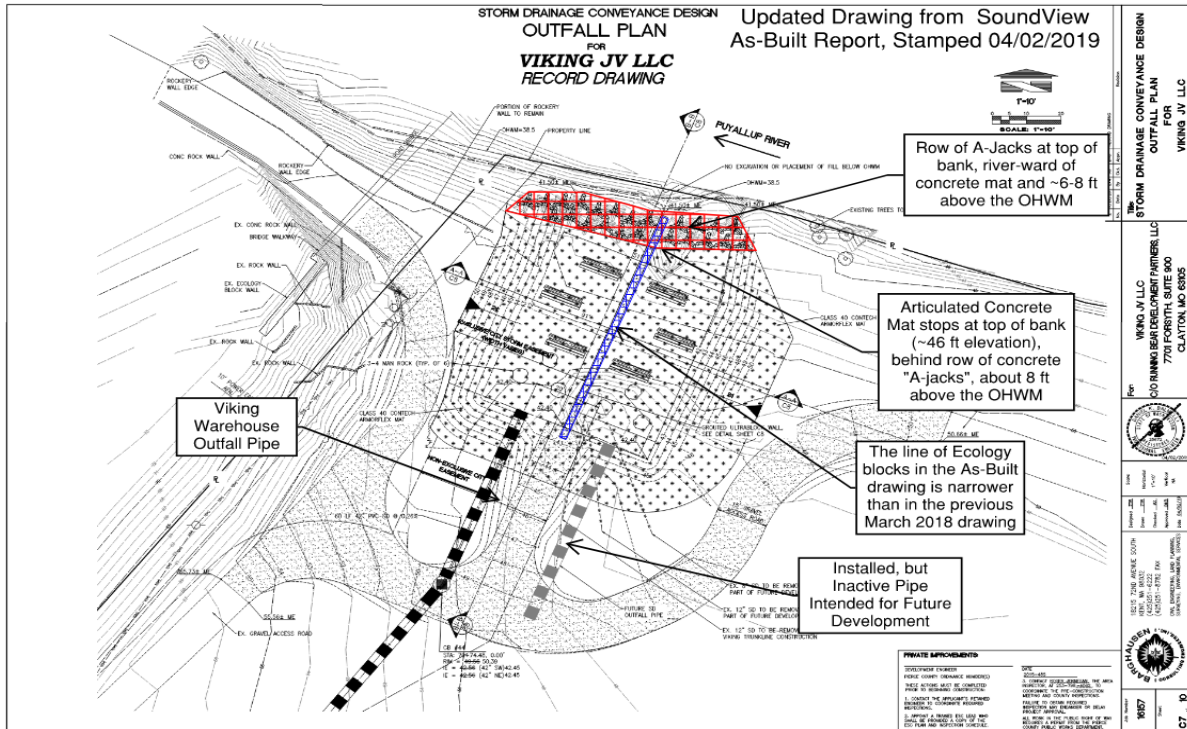


Figure 4-36. Adapted Plan View of As-Built Changes from the Originally Approved Outfall Structure Design

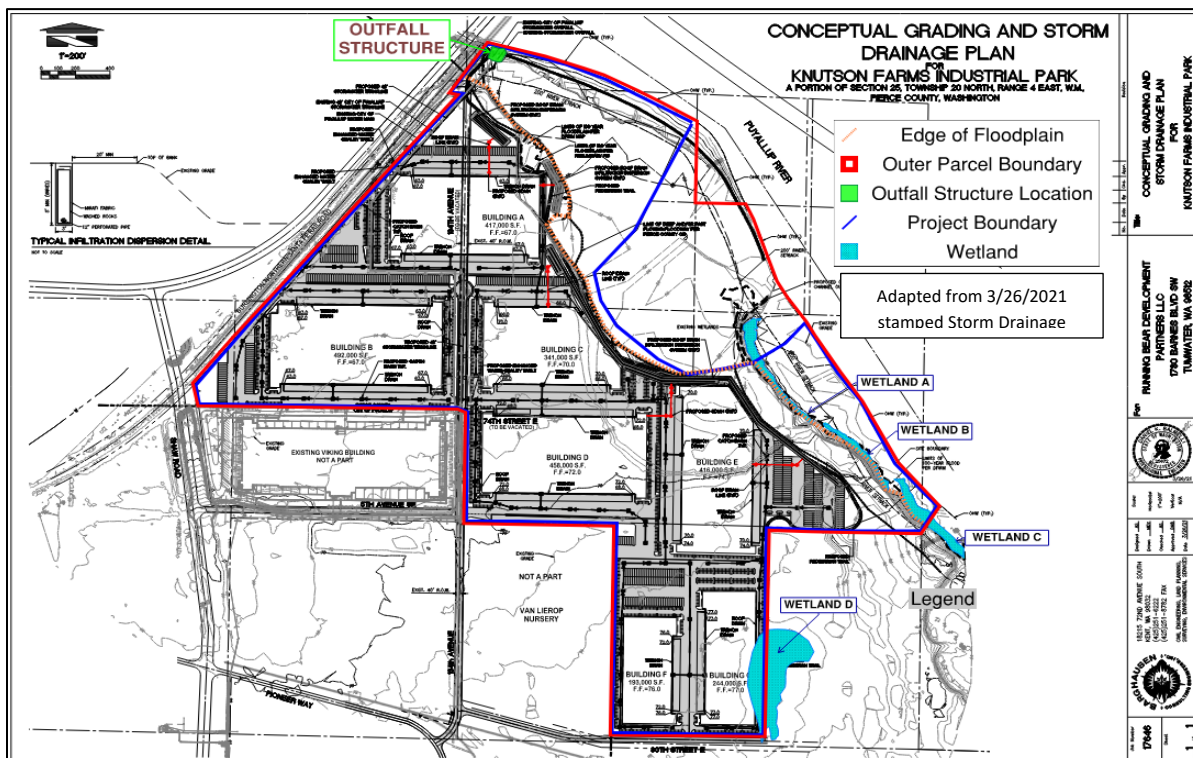


Figure 4-37. Showing Location of Stormwater Outfall Structure at Northern End of the Project Site

Chapter 18E.40.040(B)11 (Stormwater Conveyance Facilities) describes limitations to placing stormwater conveyance structures (such as an outfall and pipes) in the riverine buffer zone. They may be allowed subject to all of the following standards:

- No other feasible alternatives with less impact exist;
- Mitigation for impacts is provided;
- Stormwater conveyance facilities shall incorporate fish habitat features; and
- Vegetation shall be maintained and, if necessary, added adjacent to all open channels and ponds in order to retard erosion, filter out sediments, and shade the water.

PCC Chapter 18E.70 (Flood Hazard) describes limitations on development in a regulated floodplain. These rules specifically describe an intent to minimize damage to critical fish and wildlife habitat areas (18E.70.040 A.1.a). In general, new development in a flood zone is discouraged, but may be allowed with proper engineering, mitigation and floodproofing, as long as the Project does not “*cause an adverse impact to crucial fish or wildlife habitat.*”

A detailed mitigation plan (TDMP 2018) for the Viking Warehouse project prepared by Talasea Consultants in 2018 indicated that plantings in and around the outfall structure were intended as mitigation to compensate for loss of vegetated riparian buffer habitat that had previously existed at the outfall location. The TDMP 2018 also described a requirement for at least three years of monitoring once planting was complete.

An As-Built report prepared by SoundView Consultants in September 2020 (SVC 2020) was submitted to Pierce County, intended to document that the mitigation plan had been implemented as described in the TDMP 2018. Pierce County code requires that both the plant installation phase and the monitoring phase are bonded. Specific mitigation plan requirements are provided in PCC 18E.30.070 – Appendix C. Financial guarantees are required during the installation and monitoring phases, as described in Chapter 18E.10.080 Critical Area Protective Measures.

Pierce County accepted the SVC 2020 report and released the plant installation phase bond. However, the monitoring phase, which was described in TDMP 2018 as starting immediately following planting was not initiated until December 2022. A combined Year 1 and Year 2 Monitoring Report was submitted to Pierce County in December 2022. The report indicated that by planting 57 new plants, the mitigation area was brought into compliance and met Performance Standard requirements of the approved Mitigation Plan (Talasea 2018). However, the monitoring report did not describe whether additional monitoring would be needed to document survival of the newly installed plants, nor did it address significant impacts from sediment collection within the outfall, and erosive loss of the riverbank and associated plant materials at the outside edge of the outfall structure.

The impacts at the riverbank were also being addressed through a parallel WDFW HPA permit review process, which was initiated in 2018 (Permit 2018-6-194, issued October 2018). Under that HPA, at least 80 percent of the riverbank vegetation (installed in fall 2019) was required to survive for at least 3 years (the duration of required HPA monitoring). The bioengineering erosion control treatment at the riverbank, which included a cover of coir netting, creation of a sandy bank and installation of willow wands, was required to survive the 100-year event. However, most of the plant and soil materials were washed away during subsequent winter floods in 2019, 2020, 2021, and 2022 (none of which were 100-

year events). This failure, in addition to some large boulders from the outfall construction eroding and falling into the river, precipitated a correction request (November 16, 2022) from WDFW and a new HPA (issued April 24, 2023). Repair efforts at the riverbank in early 2023 (required 2023 HPA) have placed new willows wads, installed some coarse woody debris (willow root wads and trunk) and installed a brush mattress intended to replace the lost bioengineering functions. However, according to feedback from EIS hydraulics experts, the strength and stability of the newly installed materials are not expected to survive hydraulic impacts from expected flooding in the upcoming 2023–2024 winter.

Mitigation area conditions will be discussed in more detail below and in Section 4.2 Surface Water, but current conditions at the outfall structure, as evaluated by the EIS team, indicate that due to a combination of scouring and erosion from flooding and the existing stormwater outfall volumes emanating from the Viking warehouse site, the mitigation plan designed to protect the riverbank and replace wildlife habitat functions has failed. Additional corrective measures, such as installation of hard armoring (as recommended by EIS team hydraulics experts) along key sections of the riverbank, repairs to the outfall structure and/or replanting less impacted native vegetation areas along the riverbank would be needed to ensure that the mitigation area meets the WDFW HPA standards as well as the Talasea 2018 mitigation plan performance standards associated with preservation of native vegetation at the riverbank, and other critical area protection requirements described in Pierce County critical area regulations (PCC 18E.40.050). This work is needed to ensure that the Project does not further degrade habitat in the mitigation area and along the riverbank, future repairs and replanting plans should address and mitigate for expected future impacts from significantly greater proposed future flows from the Project site.

Terrestrial Habitat Conditions

The most valuable terrestrial wildlife habitats on the Project site are the vegetated riparian buffers and wetlands. This includes a narrow strip of riparian forest plant community, ranging from 25–50 feet in width, that occurs along the river at the northeastern edge of the site floodplain, separated from the rest of the floodplain by a narrow dirt farm road that provides access to currently farmed areas within the floodplain. There are three PEM/PSS wetlands (Wetlands A, B, and C) in the floodplain to the southeast. The fourth on-site wetland (Wetland D, PEM/PSS) is located in upland farm and pasture areas in the southeastern portion of the Project proposed warehouse area, outside of the floodplain (Figure 4-37 and Figure 4-38).

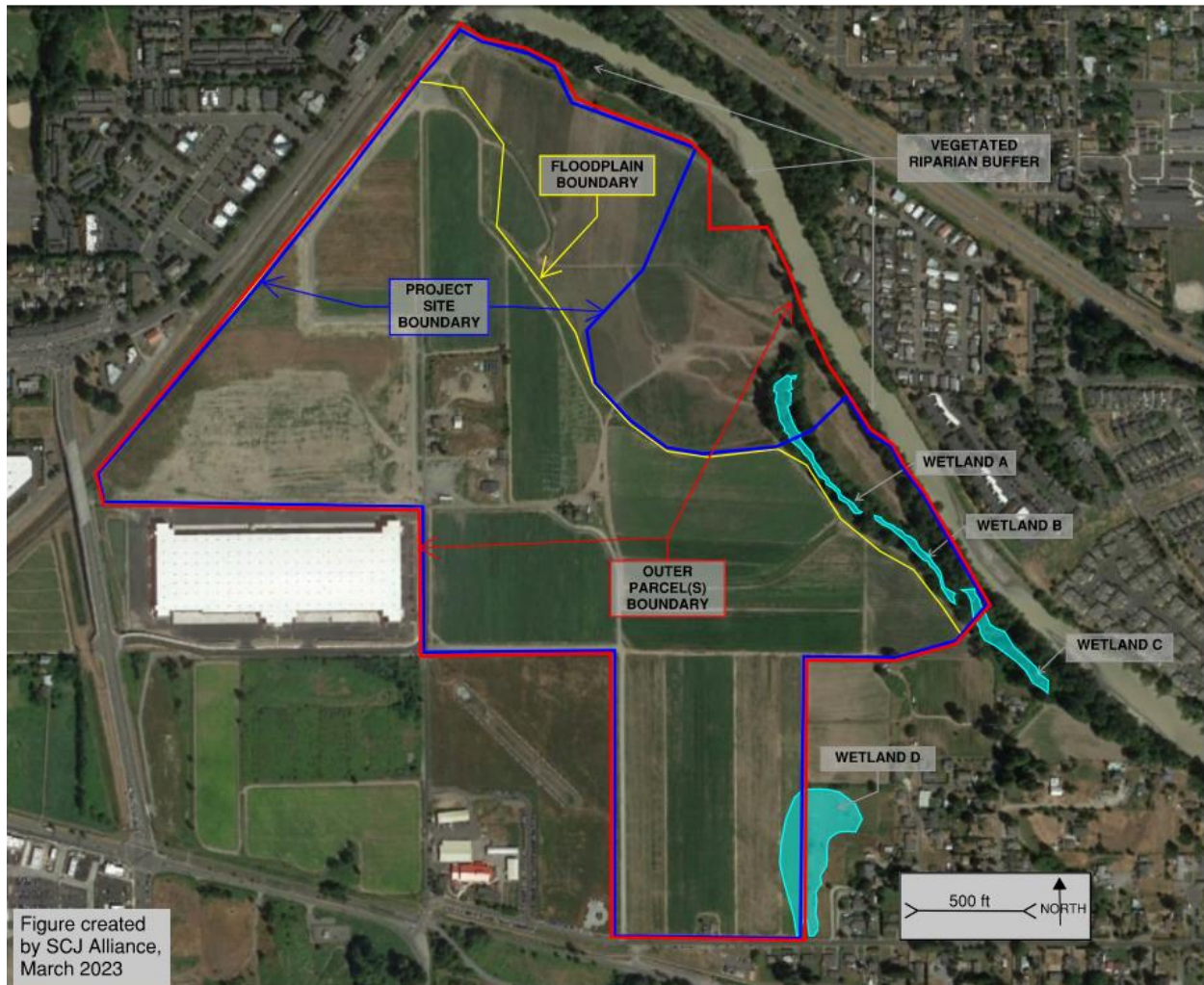


Figure 4-38. Showing Vegetated Riparian Buffer and Wetland Habitats in the Project Site

The existing 25- to 50-foot-wide riparian forested areas along the Puyallup River provide nesting, resting and forage habitat for migratory and resident songbirds and provide cover for mammals and birds. Snags and logs were observed within these areas, which are priority habitats due to their high value to wildlife and their relative scarcity within highly developed reaches of the Puyallup River. Small cavities observed in these on-site snags provide support for small mammals, woodpeckers, or cavity nesting ducks, which have been infrequently documented on site (Cornell 2021).

The Puyallup River and the Wetlands A, B, C, and D provide a water source for wildlife in the floodplain during various parts of the year, and the vegetated riparian area along the river provides an important local wildlife corridor for both terrestrial and aquatic species.

Riparian Buffer and Floodplain Habitat Areas (Shoreline Jurisdiction)

Under Title 18E PCC Development Regulations – Critical Areas (PCC Title 18E), the Puyallup River (a Type F1 fish-bearing stream) is assigned a 150-foot riparian buffer. The River is also regulated as a shoreline under Title 18S Development Policies and Regulations – Shorelines. The regulated Shoreline Jurisdiction includes all areas within 200 feet of the OHWM at the river, plus all associated floodplains within 200

feet of the floodway (as mapped by Pierce County), and wetlands on the floodplain. Figure 4-38 shows the Pierce County mapped floodway in relation to the proposed warehouse development boundary. The Project's regulated Shoreline Jurisdiction extends from the edge of the river to the outer or landward edge of the floodplain boundary.

Approximately 47 acres of the study area are designated as FEMA mapped floodplain (Figure 4-38), all of which falls within the Project site Shoreline jurisdiction. The Project site does not contain a full levee, due to construction of the outfall structure described above, and due to past breaches during flood events rendering some sections of the levee non-functional. There is periodic but overall minimal protective armoring along most of the Project site shoreline.

Riparian floodplains downstream of the Project site have been disconnected from the riverine environment by dikes and in some cases have been substantially affected or eliminated by filling. However, there is some remnant riparian habitat along the river's edge within the Project site and on commonly owned parcels outside of the Project site boundary, but within commonly owned areas of the floodplain (Figure 4-38). This riparian habitat was described previously as being a narrow strip of riparian forest plant community that occurs along the river at the northeastern edge of the site floodplain. The 25–50-foot-wide forested strip is significantly less than the standard 150-foot-wide critical area buffer required for the Puyallup River. The rest of the 150-foot buffer zone includes a dirt farm road and annually plowed and planted farmlands.

The northern portion of the floodplain is mostly plowed and farmed. The southern portion of the floodplain is partially cleared from past farming, but also contains three narrow, linear wetlands at the outer, landward edge of the floodplain, running along the base of the upper terrace (described in more detail below).

The riparian strip at the river's edge is forested with black cottonwood trees (*Populus balsamifera*), various willow species (*Salix spp.*), red alder (*Alnus rubra*), big-leaf maple (*Acer macrophyllum*), and western red cedar (*Thuja plicata*). The understory includes native shrubs, such as osoberry (*Oemleria cerasiformis*), baldhip rose (*Rosa gymnocarpa*), and herbaceous plants like coltsfoot (*Petasites palmatus*), stinging nettle, and ladyfern (*Athyrium filix-femina*).

Introduced invasive species are also present in the riparian area, including but not limited to several non-native blackberry species, Japanese knotweed (*Reynoutria japonica*) and reed canarygrass (*Phalaris arundinacea*). In the western side of the constructed stormwater outfall, non-native invasive watercress (*Nasturtium officinale*) is the dominant volunteer plant species. Some of the farm fields are currently fallow, supporting various pasture grasses interspersed with invasive or weedy species, such as Japanese knotweed, Scotch broom, and Himalayan blackberry.

At the northern end of the Project site, south of the existing outfall structure (shown above in Figure 4-36 and Figure 4-37), a berm along the west side of the dirt farm road mentioned previously appears to be composed of sandy flood deposits that were cleared from the adjacent farm field in the floodplain following past flood events. The berm is vegetated with many weedy species, such as Himalayan blackberry, poison hemlock, tansy ragwort, and common evening primrose.

Freshwater Wetlands On Site

There are four depressional wetlands on the Project site: Wetlands A, B, C, and D. Their locations and shapes are depicted in Figure 4-38, and their characteristics are described below in Table 4-18. Wetland hydrology is further detailed in Section 4.2 Surface Water. These wetlands are also described in a Critical Areas Assessment Report prepared by Soundview Consultants and submitted to Pierce County in December 2016 (SVC 2016).

Table 4-18. Project Site Wetland Characteristics

Wetland Title	Classification	Approximate Wetland Size/Area (square feet)	Buffer condition	Buffer Width ^a (feet)
Wetland A	Category III	26,869	Forested	150
Wetland B	Category III	11,396	Forested	150
Wetland C	Category II	31,547 ^b	Forested	150
Wetland D	Category IV	132,237 ^c	Farmed	50

Source: Adapted from SVC 2016 report

^a PCC 18E.30.070, Appendix F

^b Approximately 3,900 square feet on site

^c Previously incorrectly described as being < 0.5 acres and entirely off site to the east.

Wetland A (Category III), B (Category III), and C (Category II) are depressional wetlands located in the floodplain at the base of steep slopes between the currently farmed upper terrace and the Puyallup River. The hydrology of Wetlands A, B, and C was previously described by others as being driven by a seasonally high water table, surface water runoff, and direct precipitation (SVC 2016). However, the EIS team found that although Wetlands A, B and C may occasionally receive hydrology from periodic flooding, groundwater seeps emanating from the edge of the upslope terraces are instead the primary source of hydrology, as described in Section 4.2 Surface Water.

Wetlands A, B, and C are Palustrine Scrub-Shrub/Palustrine Emergent (PSS/PEM) wetlands, but the surrounding buffer is dominated by a forest plant community. The forested overstory is dominated by willows (Pacific and Scouler's), red alder, and black cottonwood, while the understory contains a diverse assemblage of native woody shrubs, including salmonberry (*Rubus spectabilis*), red-osier dogwood (*Cornus sericea*), elderberry (*Sambucus racemosa*), western hazelnut (*Corylus cornuta*), and snowberry (*Symphoricarpos albus*), as well as herbaceous plants such as soft rush (*Juncus effusus*), manna grass (*Glyceria sp.*), stinging nettle (*Urtica dioica*), and American vetch (*Vicia americana*). Invasive species present in uplands around the wetlands include Himalayan blackberry, Japanese knotweed, and reed canarygrass (SVC 2016; EIS team field work 2019 and 2021).

Wetlands A and B offer moderate foraging and nesting for small birds, amphibian breeding sites protected from fish, and wildlife migration corridors. Wetland C provides a higher quality habitat for aquatic invertebrates, amphibians, and wetland associated mammals (SVC 2016).

Wetland D is a Category IV PEM/PSS wetland that straddles the Project site boundary near the southeast corner of the site. It was previously described by the Applicant's biologist(s) as being too small to be regulated (i.e., buffered) by Pierce County and only occurring east and outside of the Project site boundary (SVC 2016). However, the EIS team re-delineated Wetland D in 2019, and found that it extended onto the Project site, and was about 3 acres in size—large enough to be regulated under

County and federal regulations. This finding was corroborated by the Pierce County Hearing Examiner in 2018. An updated Wetland D report was prepared by the EIS team in 2021.

Wetland D is highly disturbed from ongoing farming and pasture use, and, being formed in the base of an internally draining depression, is naturally disconnected from the river and floodplain. It receives hydrology from seasonally rising groundwater on and adjacent to the Project site and from surface water inflows from 80th Street East. Wetland hydrology was documented by the EIS team as persisting and/or ponding from -1 foot to +1 foot relative to the soil surface well into the growing season both in the field and in the aerial photo record.

Wetland Buffers

PCC Critical Area regulations for wetlands and the proposed use on the Project site resulted in Wetlands A, B, and C being assigned 150-foot buffers. The existing vegetated habitat buffer areas to the west of these three wetlands are steeply sloped up to the edge of the upper terrace (i.e., the surface where warehouse development is proposed). These buffers are dominated by bigleaf maple, black cottonwood, and red alder, but also are dominated by invasive woody shrubs and vines in the understory, especially Himalayan blackberry and Japanese knotweed. Buffers north and east of the wetlands are in the floodplain, and include forest and shrub dominated areas and also previously plowed and farmed surfaces that are grass dominated.

While no new activity was observed, aged evidence of beaver activity was documented in the Wetland C buffer during the February 2021 site reconnaissance by the EIS team.

Under Pierce County regulations, Wetland D is assigned a 50-foot buffer. On-site portions of Wetland D and its buffer are farmed, limited by when the seasonal wetland hydrology diminishes by early summer. The on-site wetland and its buffer (west of the eastern Project boundary) are currently dominated by annually planted agricultural crops, common pasture weeds and dirt farm roads. Because Wetland D occurs on both sides of the eastern parcel boundary, the 50-foot buffer area also extends off site to the east into a wet pasture. The off-site wetland and its buffer include small areas with young trees and shrubs, but is dominated by actively grazed pasture grasses and Himalayan blackberry.

Sensitive or Protected Fish and Wildlife

Table 4-19 summarizes the list of potentially regulated species per federal and state records and describes the likelihood of occurrence in the study area.

Table 4-19. Regulated Species with Potential Occurrence in the Study Area

Species	Listing Status and Local Importance	Presence of Designated Critical Habitat (Federal)	Likelihood of Occurrence in the Study Area (higher potential indicated by BOLD text)
Terrestrial Species			
Gray Wolf (<i>Canis lupus</i>)	Federal: Recently delisted State: Endangered Local: NA	Population: Western DPS. No critical habitat has been designated for this species.	No indication of gray wolf in the study area (WDFW 2021a). The nearest known pack is the Teanaway Pack, located approximately 64 miles from the site.
Osprey (<i>Pandion haliaetus</i>)	Federal: Not warranted State: NA Local: Local Importance (PCC 18E.40)	There is no designated critical habitat for this species.	No osprey nests observed on site, but they are likely to use the Puyallup River project reach for hunting. The Puyallup River is mapped as breeding habitat for Osprey (Seattle Audubon 2021), and their hunting ranges can extend 16–14 miles from the nest (Rodrick and Milner 1991).
Marbled Murrelet (<i>Brachyramphus marmoratus</i>)	Federal: Threatened State: Endangered Local: NA	Population: USA (CA, OR, WA). There is designated critical habitat for this species.	No indication of the presence of marbled murrelets in the study area (WDFW 2021a). There is no designated critical habitat (nesting areas) for the Marbled Murrelet near the study area and they are not believed to use habitats within the populated Puget Sound lowlands. Birds may traverse the site when accessing a nest site in the Cascade Mountains from a feeding area within the Puget Sound.
Streaked Horned Lark (<i>Eremophila alpestris strigata</i>)	Federal: Threatened State: Endangered Local: NA	There is designated critical habitat for this species.	No indication of the presence of the Streaked Horned Lark in the study area (WDFW 2021a); they are not likely to use habitats in or near the study area.
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	Federal: Threatened State: Endangered Local: NA	Population: Western U.S. DPS. There is designated critical habitat for this species. None occurs within the study area	No indication of the presence of the yellow-billed cuckoo in the study area (WDFW 2021a). It is highly unlikely to occur in the study area. The yellow-billed cuckoo was last known to breed in Washington in 1930 and is considered extirpated from the state.
Aquatic Species			
Bull Trout (<i>Salvelinus confluentus</i>)	Federal: Threatened State: Candidate Local: NA	Population: Coastal U.S. DPS There is designated critical habitat within the study area.	Bull Trout are documented within the Project reach of the Puyallup River (WDFW 2021a). Critical habitat of the bull trout occurs within the project reach of the Puyallup River. The primary constituent elements (PCE) of designated critical habitats are described in 70 FR 185.

Species	Listing Status and Local Importance	Presence of Designated Critical Habitat (Federal)	Likelihood of Occurrence in the Study Area (higher potential indicated by BOLD text)
Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	Federal: Threatened State: Candidate Local: NA	Population: Puget Sound ESU There is designated critical habitat within the study area.	Chinook salmon are documented within the Project reach of the Puyallup River. Habitat uses designated for the Puyallup River reach adjacent to the Project are: rearing and migration (StreamNet) and documented rearing (SalmonScape). Critical habitat of Chinook occurs within the Project reach of the Puyallup River (NOAA 2021). The PCE of designated critical habitats are described in 70 FR 52629.
Coho Salmon (<i>Oncorhynchus kisutch</i>)	Federal: Species of Concern State: NA Local: NA	Population: Puget Sound/Strait of Georgia DPS No critical habitat has been designated for this population.	Coho salmon are documented within the Project reach of the Puyallup River (WDFW 2021a). Habitat uses designated for the Puyallup River reach adjacent to the Project are rearing and migration (StreamNet) and documented rearing (SalmonScape).
Coastal Cutthroat Trout (<i>Oncorhynchus clarkii clarkii</i>)	Federal: Not warranted State: NA Local: Local Importance (PCC 18E.40)	Population: Resident Coastal Cutthroat Trout. No critical habitat has been designated for this population.	Coastal cutthroat are mapped as using the Project reach (WDFW 2021a). These anadromous fish migrate between the ocean and spawning habitats higher in the watershed and are likely to use the Project reach as a migratory corridor.
Fall Chum Salmon (<i>Oncorhynchus keta</i>)	Federal: Not warranted State: NA Local: Local Importance (PCC 18E.40)	Population: Puget Sound/Strait of Georgia Chum ESU. No critical habitat has been designated for this population	Chum salmon are mapped as using the Project reach for migration (WDFW 2021a), as well as tributaries upstream and downstream of the Project reach for spawning and rearing. Documented use of the Project reach includes: migration only (StreamNet) and documented presence (SalmonScape).
Pink Salmon (Odd Year) (<i>Oncorhynchus gorbuscha</i>)	Federal: Not warranted State: NA Local: Local Importance (PCC 18E.40)	No critical habitat has been designated.	Pink salmon have been documented rearing in the Project reach. Documented use of the Project reach includes: migration, spawning, and rearing (StreamNet) and documented spawning and rearing (SalmonScape)
Rainbow Trout (<i>Oncorhynchus mykiss</i>)	Federal: Not warranted State: NA Local: Local Importance (PCC 18E.40)	No critical habitat has been designated.	Rainbow trout are a species of local importance (PCC 18E.40). They are mapped as using the Project reach in the WDFW PHS maps (WDFW 2021a).
Sockeye Salmon (<i>Oncorhynchus nerka</i>)	Federal: Not warranted State: NA	No critical habitat has been designated for this population.	Sockeye salmon are a species of local importance (PCC 18E.40). They are mapped as using the Puyallup River through the confluence with the White River, as a migratory corridor (WDFW 2021a).

Species	Listing Status and Local Importance	Presence of Designated Critical Habitat (Federal)	Likelihood of Occurrence in the Study Area (higher potential indicated by BOLD text)
	Local: Local Importance (PCC 18E.40)		
Winter Steelhead (<i>Oncorhynchus mykiss</i>)	Federal: Threatened State: NA Local: NA	Population: Puget Sound DPS There is designated critical habitat within the study area (81 FR 9251)	Steelhead are documented within the Project reach of the Puyallup River. Habitat uses designated for the Puyallup River reach adjacent to the Project are: migration only (StreamNet) and documented presence (SalmonScape). Critical habitat of Steelhead occurs within the Project reach of the Puyallup River (NOAA 2021). The PCEs of designated critical habitats are described in 78 FR 2725.

Source: IPaC 2021, NOAA 2021, StreamNet 2021, WDFW PHS 2021, and WDFW SalmonScape 2021

Note: NA = not applicable

Federal, state, and local data reported in Table 4-19 indicates potential for five federally listed (threatened, endangered, or proposed for listing) terrestrial species to occur in or near the Project study area (USFWS 2021), including the gray wolf, marbled murrelet, streaked horned lark, and yellow-billed cuckoo. However, none of these species are known to occur in the Project study area, and occurrence is considered highly unlikely. There is no documentation of any state or federally listed terrestrial species or any terrestrial species of concern within the Project study area (WDFW PHS 2021).

Three state and/or federally listed fish species (chinook salmon, winter steelhead, and bull trout) and one species of concern (coho salmon) have been documented to occur within the Project study area, which includes the confluence with the White River (WDFW 2021a). Four additional, but currently unlisted priority fish species are described in WDFW databases as occurring within the Project study area. These species include pink salmon, fall chum salmon, cutthroat trout, and sockeye salmon.

The WDFW database indicates that spring-run chinook salmon and sockeye salmon (federally listed) do not pass the Project site, but instead migrate up the White River at the confluence with the Puyallup River 0.5 mile downstream of the Project reach. All other species described above have been documented as using the Project reach (WDFW 2021b) during migration. According to others (Talasea 2017), no spawning or rearing of any the listed species of fish is expected to occur within the reach adjacent to the Project site. However, the WDFW SalmonScape database indicates that pink salmon have been documented as spawning within the reach adjacent to the Project site, and both Fall chinook and coho have been documented as using the same reach for rearing habitat.

The Project site is located within the Pacific flyway migration route, which extends from Alaska to Patagonia, and thus may periodically support migratory birds, including waterfowl, neotropical migrant songbirds, shorebirds and other birds that may use habitats at the Project site seasonally or during migration.

Areas within the Project study area have been mapped as having waterfowl concentration areas by the WDFW. Similar birds may be expected to congregate in wetlands on site during the winter or during spring and fall migration seasons.

Two additional species of local importance and their associated habitat areas, defined in PCC Chapter 18E.40 (Regulated Fish and Wildlife Species and Habitat Conservation Areas), were identified as likely to utilize the Project study area. These species are osprey (*Pandion haliaetus*), and native/wild rainbow trout (*Oncorhynchus mykiss*).

Listed Plant Species

No federal or state-listed plant species are documented or were observed within the Project study area (WDNR 2021c).

During EIS Project scoping, there was a comment saying that wild lupine grow in the Project site. There are at least 20 lupine species in Washington, but most are not listed species. Kincaid's Lupine (*Lupinus sulphureus*, also known as sulfur lupine or *Lupinus oreganus*) is listed, but is a prairie species, found in oak savannah habitats mostly in northwest Oregon and southwest Washington. This species has variable flower colors, from light bluish or purple to yellowish or cream, fading to an orangish brown. None were observed on site. *Lupinus sabinianus* (Sabin's lupine) is on some lists as being rare or threatened. It has a distinctive yellow flower, but it only grows in southeast Washington and northeast Oregon.

4.4.4 Impacts

This section describes the potential for environmental impacts to plants and animals that may result from Project implementation.

Methodology

This analysis evaluates potential for construction and operations at the Project site to impact plant and animal resources. Impacts were characterized by comparing existing conditions with the potential for habitat loss, and by evaluating proximity of construction activities to suitable or occupied fish and wildlife habitat, sensitive plant communities, critical area and shoreline buffer requirements and critical areas. This evaluation was performed by reviewing public reports and public databases, publicly available GIS mapping layers on land cover, wetlands, and species presence; and technical reports prepared for the proposed Project.

The following public records and literature were reviewed (and others):

- USFWS and NMFS habitat recovery plans available for ESA listed species
- Puyallup River Watershed Assessment (PRWC 2014)
- Climate Change Impact Assessment and Adaptation Options (Puyallup Tribe 2016)
- WDFW's Priority Habitats and Species (WDFW 2019a)
- USFWS's endangered species information (USFWS 2020)
- WDNR Natural Heritage Program Rare Plants List (WDNR 2021c)
- State Wildlife Action Plan (WDFW 2015)

The following technical reports were reviewed (and others):

- Biological Evaluation - Van Lierop Property Stormwater Outfall Project, Talasea Consultants, Inc. (2017).
- Detailed Mitigation Plan (TDMP 2018), Puyallup River Outfall, Talasea Consultants Inc., March 2018,
- Critical Areas Assessment Report – Knutson Farms Industrial Park. Soundview Consultants (September 2016, Revised December 2016).
- Revised Knutson Industrial Transportation Impact Analysis, TENW Transportation and Engineering Northwest for Michelson Commercial Realty and Development, LLC (2017).

A significant impact from construction and/or operations would occur if there was:

- Injury, death, or harassment of federal or state listed endangered or threatened species;
- Reduction of habitat quality or quantity that could substantially affect the critical survival activities (breeding, rearing, and foraging) of listed species;
- Substantial interference with the breeding, feeding, or movement of native resident or migratory fish, bird, amphibian, or mammal species;
- Noncompliance with critical areas regulations, or
- If these impacts cannot be mitigated through compliance with critical areas ordinances or implementation of BMPs.

Impacts Analysis

No Action Alternative

Under the No Action Alternative, the construction and operation of the Project would not occur. No Project-related impacts to plants and animals would result.

Assuming the same agricultural activities would continue on site, then existing plant and animal communities would continue to function as they do currently. No new development or increased human activity would be introduced on site and no additional vegetation clearing would occur outside of what is standard and allowed under farming practices; no additional wildlife habitat would be disrupted; impacts to special status species would remain the same. The current degraded vegetation communities and animal habitat conditions associated with continued farming practices would persist indefinitely.

Existing levels of the 6PPD pollutant in the Puyallup River would not increase as a result of proposed new flow volumes from the Project site.

Proposed Project

Construction Impacts

The Project schedule indicates an overlap between construction and operations phases at the Project site. The Applicant has indicated that they plan to complete construction over a period of 4 years, with construction starting at the north end of the site (warehouses A to E), followed by construction of warehouses F and G. Construction of each warehouse would take 15–18 months, with construction of some warehouses occurring simultaneously to meet the overall 4 year construction schedule. Up to 150 employees would be expected on site at any one time during construction.

Construction of each warehouse would occur in three stages:

1. Grading and filling
2. Installation of on-site utilities
3. Warehouse construction

Therefore, once construction of basic infrastructure (roads and utilities) is complete around each new warehouse, operations would be initiated while other warehouses are still under construction. Thus construction impacts would overlap with operations impacts for three to four years until the entire warehouse complex has been built.

Vegetation

According to the 2017 Talasea Biological Evaluation report, during construction of the existing outfall structure (which was completed in fall of 2020), approximately 2,500 square feet of the left bank of the River would be impacted by construction of the existing stormwater outfall (Figure 4-35 and Figure 4-36). The outfall structure construction was completed in September 2020, and therefore, impacts related to initial clearing of the riverine buffer and site excavation and grading needed to build the outfall structure have already occurred. However, based on several recent and ongoing site assessments by the EIS team, the outfall structure is currently unstable and eroding. Conditions at the outfall were recently documented in a separate report, Viking Warehouse Facility Stormwater Outfall Deficiencies Report, prepared for the City of Puyallup by NHC and SCJ Alliance, February 2023. A more detailed discussion is provided in Section 4.2 Surface Water.

Most of the vegetation that was planted in and around the outfall structure per the approved Talasea mitigation plan (TDMP 2018) has been scoured or washed away during winter flooding events or has been buried by flood sediments. Under current conditions, impacts to vegetation in and near the outfall in the Puyallup riparian zone are significant. Recent repairs and plantings at the riverbank carried out to satisfy a WDFW HPA Correction Request and addition of 57 new plants to the native planting areas around the outfall have addressed some of these issues but have not yet been proven to meet the required standards through subsequent monitoring work.

Because no monitoring work was carried out and no monitoring reports were provided until late December 2022, the EIS team carried out mitigation planting area and outfall assessments during 2020, 2021, 2022 and 2023. Results of this work indicated that to meet the Pierce County permit monitoring and maintenance requirements and related stormwater and WDFW HPA regulations, both the outfall structure and the mitigation planting areas and would require ongoing monitoring, repair, replanting, and potentially redesign prior to Project construction phases, which would eventually result in sending new stormwater volumes to the riverbank through the outfall before it is performing adequately.

During construction phases on the rest of the Project site, all vegetation on the high terrace where the warehouses would be sited would be cleared. This part of the Project site is currently farmed and plowed semi-annually. Therefore, impacts to native vegetation and animal habitat across the upper terrace would be negligible. Aside from the outfall structure, no construction is proposed on the lower terrace floodplain. However, the floodplain would continue to be farmed as it has been historically for an undefined period. Therefore, aside from vegetation impacts described above near the stormwater

outfall structure, vegetation conditions in the floodplain are not expected to change during construction phases.

Impacts to Wetland Habitat

Under the current proposal, construction impacts on the high terrace (where the warehouses would be sited) are expected to eliminate or reduce the volumes of seasonal stormwater infiltration, which would result in changes to the timing or volumes of groundwater hydrology feeding from the upper terrace to Wetlands A, B, and C (located in the floodplain to the east), and to Wetland D (located on the high terrace in the southeast corner of the proposed warehouse complex).

Impacts to wetland or buffer vegetation that is dependent on current hydrologic patterns (timing and volumes of seasonal stormwater infiltration) may result in significant impacts to native plant communities and associated wetland habitat ecosystems in the Project site. The Applicant proposes to infiltrate roof runoff from several warehouses, with the proposed infiltration galleries located along the top of slope at the outer edge of the high terrace. However, there is no associated geotechnical assessment report describing how the galleries were designed to ensure that they do not affect downslope stability (as required in code), and no hydroperiod assessment has been carried out, as would be needed to define the timing and volumes of hydrology needed to sustain the wetlands. There is no mitigation proposal provided by the Project developer describing how potential impacts to Wetland A, B, C, and D hydroperiods will be mitigated.

Wetland D was previously described in the 2016 SVC Critical Areas Assessment Report as being located off site to the east and too small to be regulated (i.e., buffered) by Pierce County. However, subsequent work by the EIS Team determined that Wetland D was large enough to be regulated (approximately 3 acres) with about 1/3 of the wetland area occurring within the Project site boundary (as described in Knutsen Farms Industrial Park Wetland D Report, 2021, prepared by SCJ Alliance for the City of Puyallup). Therefore, the wetland is regulated and buffered under Pierce County regulations. To date, no mitigation proposal has been provided by the Applicant to address proposed fill of the on-site portions of Wetland D and its buffer.

It is currently proposed by the Project developer to build a warehouse in the area currently covered by part of Wetland D and its on-site buffer. Unless the site design plans are revised to change the warehouse coverage or location, this plan would result in (not-yet permitted) fill of approximately one-acre of Wetland D and the on-site portions of its 50-foot buffer during construction.

According to Pierce County regulations, filling a wetland and its buffer cannot be permitted without first evaluating the fill option through a mitigation sequencing protocol (PCC 18E.030.050). Mitigation sequencing requires that the impact is avoided if at all possible, but if not possible, as described in code, the impacts must be minimized and fully mitigated, as prescribed in County (PCC 18E.030.050) and federal law (Section 404 and 401 of the CWA). Pierce County Critical Areas Regulations allow exceptions (PCC 18E.20.050) if application of the regulations would deny all reasonable use of a site and a proposed project cannot meet the prescriptive standards for critical areas. However, even if the fill is approved under a Pierce County permit review process, the proposed wetland fill must still be evaluated and permitted through a permit process administered under Ecology.

Currently, there is no mitigation proposal or permit describing how mitigation sequencing was evaluated to avoid all impacts to Wetland D critical areas, or if by not taking certain actions, impacts could be minimized by limiting the degree or magnitude of the action, or how the impacts will be mitigated. Therefore, until there is an approved mitigation plan addressing Wetland D impacts, any fill at Wetland D as currently proposed would result in a net loss of wetland and buffer area during construction phases. This is a significant impact and is in conflict with no-net loss policies at a federal, state, and local level.

If fill is allowed, impacts of on-site fill would potentially displace surface hydrology or may change the pattern of hydrology sources, either of which can impact vegetation and hydrology in the remaining off-site portions of Wetland D, which are located east of the property line on parcels owned by others and not controlled by the Applicant. Despite the fact that off-site areas are currently used as animal pasture with low value habitat conditions, without an appropriate mitigation plan designed to ensure that off-site impacts at least maintained and do not degrade current habitat conditions, potential vegetation and hydrologic impacts to off-site areas are deemed significant.

These wetland hydrology and fill impact issues must be addressed before any new construction grading or clearing occurs on the upland terrace.

Weedy and Invasive Plant Species

Construction activities could result in the spread and colonization of existing on-site noxious weeds during site grading. Implementation of standard construction BMPs could be used minimize the potential for significant weed seed transmission impacts during construction. These impacts could be further minimized by active pre-emptive control of certain high-risk species on site, such as Japanese knotweed and Scotch broom. Noxious weed control throughout the Project site is one of many mitigation opportunities.

Terrestrial Wildlife

Impacts to wildlife and habitat due to loss of seasonal agricultural vegetation in currently farmed areas, grading earthwork, and noise and light pollution could occur during Project construction activities. Removal of agricultural vegetation on the upper terrace would reduce marginal foraging habitat for birds, small mammals, and bats that currently utilize the agricultural crops and associated insects as part of their diet. Earthwork could result in mortality of individual ground-dwelling species, such as amphibians and small mammals. Construction clearing and grading activities and construction of proposed infiltration trenches (described in detail in Section 4.2 Surface Water and displayed in Figure 4-39) along the upland edge of the high terrace (near buffers associated with Wetlands A, B, and C) and along the eastern fence line at Wetland D could result in permanent loss of breeding, feeding and nesting habitat.

Most of the current on-site breeding, feeding and nesting habitat occurs in the adjacent floodplain wetlands (Wetlands A, B, and C) and in the 25–50-foot-wide strip of vegetated riparian area along the Puyallup River, described previously. Wetland D provides some habitat, but because it managed as farm and pasture, it does not provide as valuable habitat as the floodplain wetlands and riparian buffer. The narrow strips of shrub and tree habitat in and near the floodplain are currently used by a wide variety of birds, mammals, or waterfowl at various times of the year. To ensure that impacts to on-site wildlife habitat are insignificant, preservation and expansion of riparian habitat along the river (which is currently significantly less than the standard 150-foot critical area buffer) and preservation of hydrology timing and volumes feeding to Wetlands A, B, and C are of primary importance. Action necessary to preserve ongoing wetland hydroperiods must occur during construction phases to ensure there is no gap in the hydrology source or timing that would change or eliminate wetland habitats or vegetation communities in the floodplain.

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well as the sensitivity of the individual species. If most construction activities occur during standard working hours, impacts from noise would be limited to about one third of the day, and would not typically be considered significant, since none of the common urban bird, amphibian or mammal species expected to occupy on-site habitats are listed or considered sensitive.

Light impacts to existing wetland and floodplain habitats could be minimized by preservation or expansion of the existing buffer vegetation and other naturally vegetated habitat areas adjacent to Wetlands A, B, and C, and ensuring that safety or construction lights point down and/or away from the adjacent wetlands. Light and noise impacts at the remaining off-site portions of Wetland D are not expected to be as significant, as the wetland is already subject to light and noise impacts from regular farming activities.

This noise and light disturbance during construction phases would be temporary and is not expected to result in long-term impacts to the more valuable on-site wildlife habitat in the floodplain after construction is complete. Therefore, noise and light impacts to wildlife habitat during construction are expected to be non-significant following implementation of standard mitigation practices used to minimize these impacts.

Sensitive Plant and Animal Species

Construction of the proposed Project is not expected to affect special-status plant species because no plant species or potentially suitable habitat were identified. Neither are any federal or state-listed terrestrial animal species expected to occur in the study area.

In relation to potential for impacts to listed salmonids in the Puyallup River, no new stormwater impacts to the floodplain or river are anticipated during early construction phases, since surface would still be relatively permeable and construction erosion control BMPs usually involve ensuring no release of construction runoff to surface waters. However, runoff from impervious paved areas and warehouse roofs would increase over time as construction progresses, and at some point would direct stormwater overflows to the outfall structure. Without assessment and repairs to the outfall discussed previously, this may result in increased erosion and bank failure at the River, a significant impact during construction phases.

In addition to potential for erosion and sediment impacts to the Puyallup River from the existing outfall structure, increased runoff volumes from paved surfaces within the new warehouse complex may have significant impacts to listed and sensitive salmonids in the Puyallup River. Feist et al. (2011, 2017) documented a direct relationship between coho spawner mortality and the relative proportion of roads, impervious surfaces, and commercial property within a basin, associated with pollutants in stormwater runoff, and predicted 10–40 percent mortality to coho spawners in the Puyallup adjacent to the Project site from current stormwater runoff pollutants. Recent research from Tian et al. (2021, 2022) and others (McIntyre and Kolodziej 2021) has identified a tire rubber derived chemical in stormwater runoff—the antioxidant 6PPD (often found in microscopic tire wear particles) and its soluble byproduct 6PPD-q. This pollutant is common in stormwater runoff from paved surfaces. This chemical has been found to have toxic effects on trout and salmon species, with highest sensitivity to date reported in coho salmon, and moderately high sensitivity in brook trout and rainbow trout (i.e., steelhead species). Research on impacts to other salmonids is ongoing. Characteristic toxicity symptoms include increased ventilation,

gasping, spiraling, and loss of equilibrium shortly before death, which is reported to occur within 1–96 hours of exposure at very low concentrations of the pollutant.

Brinkmann et al. (2022) evaluated potential for acute toxicity of 6PPD-q to rainbow trout, brook trout, arctic char, and white sturgeon and reported 96-hr acute toxicity thresholds (LC50) of 1.0 µg/L or less for the two trout species, indicating lethal sensitivity in these trout species. Tian et al. (2022) reported a revised juvenile Coho salmon LC50 of less than 0.1 µg/L, indicating substantial lethal sensitivity to 6PPD-q. Lethal impacts to other salmon species are assumed but not yet fully documented.

Ecology published new guidance about 6PPD in June 2022 (Ecology [D]) and October 2022 (Ecology [E]), which provides BAS information and feedback about how to best manage this serious pollutant in order to avoid take of listed species, as required in federal law. The primary pathway of 6PPD-q transport is runoff from roads and parking areas or through conveyance systems (storm drainpipes and catch basins) to surface waters or direct discharges to surface waters, such as is proposed at the Project site.

Properly designed dispersion, infiltration, or biofiltration BMPs work best for minimizing impacts from 6PPD due to its high tendency to adsorb to organic matter. The most effective treatment media would include organic material, clay, or another material with comparable sorption characteristics (i.e., high Cation Exchange Capacity).

Two categories of BMPs designed to reduce impacts from the tire oxidant pollutant have been preliminarily identified and described by researchers:

- Stormwater Flow and Treatment BMPs
- Source Control BMPs

The currently proposed stormwater management plan does not implement BMPs that can effectively remove this pollutant prior to directing excess runoff into the Puyallup River. With no BMPs using prescriptive infiltration, sorption, filtration or sedimentation treatment, potential for effective removal of 6PPDq (soluble) and fine sediment or tire particles containing 6PPD (solid or precipitate) is low. Without appropriate treatment research indicates moderate to high potential for take of listed species near the stormwater outfall, and potential for downstream impacts to other species from bioaccumulation.

Protection of listed species is required under federal and local law, and in relation to current Project site design, this newly identified impact to surface water quality which increases risk to listed salmonids in the river adjacent to the Project site may require re-assessment or redesign of stormwater management facilities. Protecting listed salmonids in response to the new information about tire chemicals would also be consistent with Pierce County's Comprehensive Plan policies for using best available science and adaptive management for critical areas (Goal ENV-14, Goal ENV-15, Policy ENV-15.3).

Impacts from this pollutant to surface water quality and related potential for significant impacts to listed salmonids are discussed in more detail in Section 4.2 Surface Water.

Operations Impacts

Vegetation

Following construction of the proposed Project, operation of the warehouse facility on the high terrace is not anticipated to result in new impacts to remaining vegetation communities. The vegetation within the warehouse complex on the high terrace would be limited to landscaping. The only remaining unmanaged plant communities would be those that still persist in the lower elevation, farmed, but otherwise undeveloped floodplain areas. This assertion includes an assumption that farming activities in the lower floodplain would not be expanded in such a way as to clear and farm new areas that currently support mostly native forest and shrub plant communities. However, weeds in the floodplain are expected to expand over time if no direct control mechanisms are proposed. Active noxious weed control, planting native trees and shrubs in the floodplain, and restoration planting of native species in previously farmed areas can be used to minimize this impact.

The already constructed stormwater outfall structure in the northern floodplain is expected to require periodic repair and maintenance over time, which may result in clearing or replanting vegetation in and around the outfall structure. This work is expected to be carried out under requirements of the mitigation plan permit, as would be reviewed and approved by the appropriate regulatory agencies.

However, there is no current plan from the Project for assessment, repair, or replanting to address existing current conditions, including loss of planted habitat mitigation vegetation surrounding and outside of the outfall structure, and including loss of bioengineering vegetation within the outfall structure, and erosion and loss of the riverbank at the outside edge of the outfall. Without this work to correct deficiencies in the outfall structure (as described in the NHC and SCJ, February 2023, Viking Warehouse Facility Stormwater Outfall Deficiencies Report), future impacts to the outfall from a significant increase in future stormwater volumes from the new Project warehouse complex may result in significant impacts from loss of vegetation, erosion, and bank failure.

Impacts to Wetland Habitat

The proposed infiltration facilities must be specifically designed to send adequate volumes of infiltrated stormwater from the outer edge of the high terrace toward the floodplain wetlands. If these infiltration facilities do not provide enough hydrology during the rainy season (winter and spring months), a loss of wetland area in the floodplain (Wetlands A, B, and C); and degradation of wetland-associated plant communities in the floodplain is expected. No detailed information has been provided regarding the expected volume flows from the infiltration trenches, and most of the proposed trench locations are not upslope from the targeted wetlands. Therefore, hydrology from the trenches may not be enough to reach or support the intended target wetlands.

Furthermore, the proposed locations for the infiltration trenches have not been assessed by a geotechnical specialist. The proposed infiltration facilities are sited at the outer edge of the high terrace, at the top of a steep slope, an area that meets the definition of a landslide hazard area, per PCC Chapter 18E.80 Landslide Hazard Area (i.e., areas that may be subject to mass movement). Potential hazard areas include slopes greater than 20 percent and relief greater than 20 feet, or slopes greater than 40 percent and relief greater than 15 feet, or sloped areas with soft or liquifiable soils, and others. The standard buffer from top of slope is defined by a combination of slope steepness and height. The

standard setback is the greater of these two—50 feet from top of slope or a setback distance of one-third the height of the slope measured from the top of slope, or as recommended by the geologist to ensure safe operations. The setback may be increased if there is considered to be an increased risk downslope from stormwater drainage impacts. The proposed trench locations do not appear to meet the setback requirements described above.

In relation to not yet permitted fill impacts at Wetland D, there is no current description of the required mitigation sequencing assessment and no mitigation plan that would describe what is proposed to compensate for fill at Wetland D. Without this information, a similar degradation of wetland functions and values in the remaining off-site portions of Wetland D is expected. The impacts would result from changes in wetland and buffer area, and changes to hydrology timing, volume, and duration (hydroperiod).

As described in more detail in Section 4.2 (Surface Water), hydrology related impacts to wetland vegetation communities might be mitigated by building properly designed and located infiltration facilities, which would direct water to these wetlands in timing, volumes, and duration patterns similar to the current hydroperiod pattern. The current proposal does not provide this assurance. Under the current proposal, significant impacts to vegetation and associated animal habitats in and abutting the floodplain wetlands (A, B, and C) and at Wetland D are anticipated when the warehouse facility is operational.

These impacts are not consistent with requirements of PCC Chapter 18E – Critical Area Regulations, nor with guidance in the Pierce County Shoreline Master Plan, which requires that a project is designed to *“ensure that shoreline development is established and managed in a manner that protects existing ecological functions and ecosystem-wide process and that mitigates adverse impacts to ecological functions.”*

Terrestrial Wildlife

There are no listed or sensitive terrestrial species likely to be found in the study area. Only aquatic species in the study area are listed.

The Project could result in long-term disturbance to wildlife habitat on the floodplain and along the Puyallup River as a result of noise, light and glare, and stormwater runoff. Because there is minimal if any wildlife habitat on the actively farmed upper terrace, most habitat impacts at the Project site are expected to be to the floodplain areas and steep terrace slope faces rather than on the upper terrace.

Operational noise, light and glare and the increase of human activity could result in wildlife avoidance, disruption of species' social structures, avoidance, or abandonment of previously occupied habitat in floodplain areas. Operational noise may result in species avoidance of the adjacent floodplain and riparian area due to the introduction of new noises associated with Project operations. However, these impacts are expected to be limited to common wildlife species and are not expected to affect any listed terrestrial species (gray wolf, marbled murrelet, streaked horned lark, and yellow-billed cuckoo), as they are not known to occur in the Project area. Therefore, no significant impacts to listed wildlife species would be expected.

Appendix A: Setting in the Parks, Recreation and Open Space (PROS) plan (Chapter 10 of the City of Puyallup Comprehensive Plan) provides a description of various habitats and species that occur within the City. Most of these animals are tolerant of urban impacts as long as habitat and migration corridors remain undisturbed. But migratory songbirds are considered less tolerant of urban development impacts and related noise.

Common small mammals in wooded areas include chipmunks, rabbits, marmots, skunks, and raccoons. Larger mammals include black-tailed deer, coyote, and occasional bears, bobcats, and cougars. Bird species include crows, jays, nuthatches, woodpeckers, sparrows, winter wrens, ruffed grouse, blue grouse, quail, band-tailed pigeon, turtle dove, pheasant, partridge, Merriam's turkey, owls, hawks, Osprey, and eagles.

Wetlands and agricultural areas within the Project study area have been mapped as waterfowl concentration areas by the WDFW. Habitat changes on the farmed upper terrace would occur as a result of removal of existing undeveloped or agricultural lands, which would eliminate marginal forage and habitat previously available for birds and small mammals common throughout the Project area. Operation of the facility could result in the decrease in wildlife habitat, and common species use of existing habitat could change. However, because there are no listed terrestrial species, and only common urban wildlife species already considered to be tolerant of urban impacts are expected to occupy the site, no significant impacts to these species are expected.

Discussion related to potential aquatic habitat impacts is provided in the section below.

Sensitive Plant and Animal Species

As previously described, federally listed species documented as occurring in the Puyallup River adjacent to the Project site include the coastal–Puget Sound bull trout (*threatened*), Puget Sound ESU chinook salmon (*threatened*), Puget Sound DPS Winter Steelhead (*threatened*) and Puget Sound DPS coho salmon (species of concern). The Puyallup River is a primary migration corridor for these species and other salmonids, and both forage and potential floodplain refugia are available within the Puyallup River and some of its associated floodplains.

Four additional, but currently unlisted priority fish species are described in WDFW databases as occurring within the Project study area. These species include pink salmon, fall chum salmon, cutthroat trout, and sockeye salmon.

The WDFW database indicates that spring-run chinook salmon and sockeye salmon (federally listed) do not pass the PROJECT site, but instead migrate up the White River, about 0.5 mile downstream of the Project site at the confluence with the Puyallup River. In addition to the above species being documented as using the Project reach during migration, the WDFW SalmonScape database indicates that pink salmon have been documented as spawning within the reach adjacent to the Project site, and both Fall chinook and coho have been documented as using the same reach for rearing habitat.

Recent research (not yet addressed in current stormwater manuals) indicates that exposure to very small concentrations of oxidized tire degradants in stormwater can cause injury and acute mortality in salmonids (Chow et al. 2019; Tian et al. 2020, 2021; French et al. in prep.; Ecology (D), June 2022, and Ecology (E), October 2022). Project-related increased impervious surfaces and increased traffic are

expected to result in greater concentrations of the 6PPD toxins in new volumes of stormwater runoff. Runoff volumes from all paved areas and from some roof areas are currently proposed to be sent to the river. The plan indicates that the stormwater will receive “enhanced” rather than “basic” treatment, both of which have a specific definition in the manual. Basic treatment is allowed for outfalls to the Puyallup River, but both basic and enhanced treatment protocols still allow storm volumes in excess of the 6-month, 24-hour storm to overflow directly to the river with no treatment. This is allowed in the current Stormwater manual for the Puyallup, a river that is considered to have high volume flows year-round and thus is assumed to be less susceptible to pollution impacts from stormwater inflows.

According to WSU scientists (Dr. J. McIntyre, personal communication, 2020; Tian et al. 2019), treatment to reduce or remove these tire degradants from stormwater runoff is most likely to be accomplished by either infiltration through an organic rich sand media or by directing runoff across a broad, shallow grass-lined swale of a specific length. Work to define adequate treatment methods is ongoing. Without specific stormwater treatment design to address this newly defined pollutant, there is potential for impacts from inadequately treated runoff to harm or kill resident or migratory listed fish species at or near the outfall, as well as potential impacts to downstream areas from bioaccumulation.

State and local stormwater permit general requirements require the applicant to control surface water runoff and minimize the potential for damage from uncontrolled runoff, including impacts to listed species. However, the recommended BMPs in the stormwater manual in combination with the fact that direct outfall is allowed in the Puyallup River may not be sufficient to reduce impacts from 6PPD.

Adding new volumes of storm water runoff to the River from new paved surfaces in the Project complex that would contain the 6PPD pollutant would increase current levels of the pollutant in the river. Cumulative impacts from direct outfalls to rivers and streams throughout the Puget Sound over time has already resulted in many documented mortality events. This recently discovered pollutant has been identified as the most toxic and causes salmon to die at very low concentrations (less than 1 micron/liter). It was previously unidentified, and thus could not be effectively treated. This incremental increase in 6PPD over time from direct inflows to the Puyallup River may cause a significant impact to the fishery resource and result in take of listed species.

PCC Critical Areas Regulations require that mitigation for alterations to habitat areas must achieve *equivalent or greater* biological functions and must address adverse impacts upstream and downstream of the development site.

Federal law precludes “take” of listed species, and new research documents that mortal effects to salmonids occur from very low concentrations of the 6PPD pollutant. Therefore, without stormwater management revisions designed to treat and reduce this pollutant of concern, potential for “take of listed species” is high, due to mortal impacts from introducing new volumes of this pollutant to the Puyallup River at the proposed outfall location. This potential unmitigated impact to listed species is considered significant.

Alternative 1 – Rail Transport

Construction Impacts

Construction of Alternative 1 would result in similar construction impacts as the proposed Project. Except for a small area between the Project site and Meeker Southern railroad, and construction of the track extensions from the BNSF mainline/Meeker Southern interchange, most of the ground disturbance for construction of the rail line would occur within the same construction footprint as the proposed Project; therefore, the impacts would be similar to those described for construction of the proposed Project.

Operations Impacts

Alternative 1, which involves using rail rather than roads in some of the warehouse complex area, is unlikely to have a different operational impact on vegetation and wildlife—including sensitive or listed aquatic species—than the Proposed Project. Despite the possibility that train noise may be more concentrated, and thus louder near tracked areas, overall noise levels in the floodplain, most being at a distance from the primary train track (assumed to run along the western Project edge) would be similar, and it is assumed that the general approach to stormwater management would remain the same. There would be a slight decrease in the total number of trucks on site—suggesting that the level of tire oxidant pollutant would be decreased—but the trip reduction is not significant enough, based on the information in Section 4.9 Transportation, to change the analysis regarding 6PPD impacts. Therefore, Alternative 1 is likely to result in similar impacts to plants and animals, including the listed salmonids in the Puyallup River.

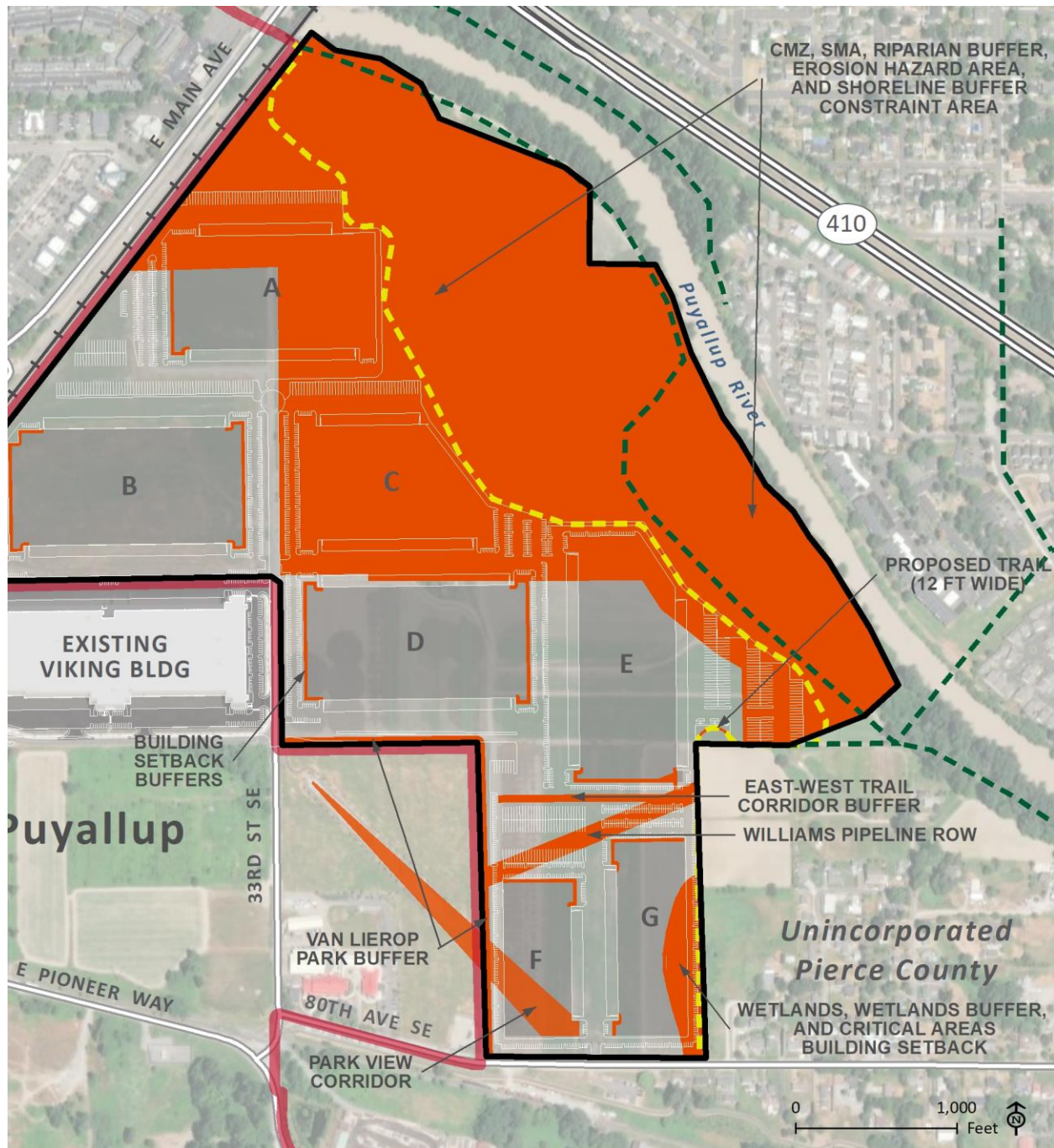
Alternative 2 – Reduced Intensity Alternative







Under WAC 197-11-440(4)(5), an EIS is directed to analyze reasonable alternatives, which “*shall include actions that could feasibly attain or approximate a proposal’s objectives, but at a lower environmental cost or decreased level of environmental degradation.*”

As such, Alternative 2 considers the potential impacts that would result if the mitigation measures that reduce the site footprint of the facility, as outlined in Section 3 Project Description, were adopted by the Applicant (Figure 4-40). Under Alternative 2, the total footprint of the facility would be reduced from about 2.6 million SF to about 1.7 million SF (about 35 percent footprint reduction). The following mitigation measures to reduce intensity would be applied:

- All warehouses would include a minimum 15-foot-wide landscape bed to be provided along the entire length of blank wall facades of buildings.
- Warehouses would not be constructed on lands designated Rural Buffer Residential (RBR) in the city Comprehensive Plan. The RBR designation reflects development restrictions associated with the shoreline buffer constraint area, the riparian buffer adjacent to the Puyallup River, and the erosion hazard area. This would eliminate Warehouse C and would reduce the footprint of Warehouses A and E.
- Warehouse F would be reduced in size to avoid blocking the prime view corridor from Van Lierop Park.

- Warehouse G would be reduced to avoid fill impacts to on-site portions of Wetland D and its on-site buffer, in accordance with Pierce County Code 18E.40.050.



- | | | |
|--|--|---|
|  Project Site |  Site Constraints |  Proposed Trail |
|  Proposed Warehouse |  City Boundary |  Proposed Pedestrian Trail |

*See Figure 4-55 for the
Van Lierop Park Concept Plan

Figure 4-40. Alternative 2 – Reduced Intensity Alternative

Construction Impacts

Construction of Alternative 2 would result in similar impacts during construction as the proposed Project. During construction phases, Alternative 2 would result in fewer construction vehicle trips due to the reduced Project size and footprint of the facility. During grading and filing phases, up to 1,270 total construction vehicle trips (or up to 215 trips per day) would be expected. During utilities installation work, up to 100 total construction vehicle trips (or up to four trips per day) would be expected. During warehouse construction (which includes building and paving roads and parking areas), up to 1,560 construction vehicle trips (or up to 40 trips per day) would be expected.

Due to Alternative 2's reduced footprint, temporary and permanent impacts analogous to the proposed Project would occur, but at a smaller scale and farther from some of the environmentally sensitive areas on site. Fill impacts at Wetland D and its on-site buffer would not occur, and potential landslide hazard areas near the top of slope at the eastern edge of the high terrace would not be developed.

However, Alternative 2 does not change the current proposal to redirect most site runoff to the Puyallup River, and therefore, does not address the need to correct erosion related failures at the outfall structure, which are affecting riverine habitat. Alternative 2 does not address the need to protect listed species in the River from new impacts of 6PPD, which would result from introduction of new runoff volumes from newly paved areas being directed to the river, and it does not specifically address the need to maintain current hydrology sources for the on-site wetland habitats during construction phases. Additionally, no description of actions would be needed to control infestation by weedy species in the undeveloped areas between the edge of the high terrace and the new warehouse area boundary. Mitigation actions that may be applied to reduce these impacts on plants and animal habitat during Construction phases are described in the Mitigation Measures (Section 4.4.5) below.

Mitigation actions for other impacts associated with a smaller construction footprint were identified and described in other sections of this EIS (Section 4.1 Earth Resources, mitigation measures ER-1 through ER-10; Section 4.5 Land Use mitigation, measures LU-2 through LU-4; Section 4.6 Recreation, mitigation measures REC-2 through REC-3; Section 4.7 Aesthetics, mitigation measure AES-1; Section 4.10 Health and Safety, mitigation measures HS-1 through HS-5; and Section 4.13 Noise, mitigation measures N-1 and N-2).

Operations Impacts

The Operations impacts associated with Alternative 2 would be similar but slightly less than those described for the proposed Project, due to the smaller Project area footprint. The number of daily vehicle trips generated by the Project warehouse complex under Operational phases for Alternative 2 would be reduced by about 21 percent and the overall impervious surface cover on the high terrace would be decreased by about 33 percent, as compared to the proposed Project.

Under the proposed Project, there would be a maximum of 8,724 daily net vehicle trips (Project Traffic Impact Analysis). In comparison, Alternative 2 would generate 998 daily heavy-duty vehicle trips and 4,846 passenger car/light-duty truck (i.e., delivery van) trips, a total of 5,844 trips per day. Alternative 2 would also require up to 1,000 employees/day during operations (i.e., 1000 trips/day from commuting employees). In sum, Alternative 2 would result in a daily traffic volume decrease of about 21 percent.

As a result of the Alternative 2 reduced impacts approach, there would be a reduction in total impervious surface and a decrease in the number of daily traffic trips, but the general approach to stormwater management would remain the same; therefore, the impacts to water quality and impacts to listed species at the river remain the same. Thus, under Alternative 2, the current levels of 6PPD in the river would still increase relative to current background conditions in the river due to new inputs from new paved surfaces, and on-site wetland habitats are still expected to become smaller or disappear entirely due to a decrease in infiltration and associated groundwater hydrology volumes. These are both considered significant impacts. Mitigation actions that may be applied to reduce these impacts to plants and animal habitat during long-term Operational phases are described in Mitigation Measures (Section 4.3.5).

4.4.5 Mitigation Measures

This section summarizes Project impacts on plants and animals under the current proposal and describes mitigation measures that could be implemented to avoid or minimize impacts both during Construction phases and during full Operational phases after construction is complete. Prior to initiation of construction, the proponent is expected to obtain the necessary federal, state and local permits and to prepare the appropriate plans that are required to protect plants and animals, which at this location would be substantially the same as described in Section 4.2 Surface Water, including but not limited to an NPDES Construction Stormwater General permit, a SPCC Plan, a construction SWPPP, and a federal 404/401 permit. The proponent would be expected to comply with the conditions of approval under any permit issued.

Construction and Operational Impacts

Impacts on plants and animal habitat during the Construction phases would be from initial clearing, grading, and filling; installation of utilities (trenching and installation of conduit and pipe); stormwater runoff; and work associated with construction and paving of parking lots, roads, and warehouses.

Impacts during the Operational phases would primarily result from methods used to manage stormwater runoff, and from traffic both on and off site. Operational impacts specific to the not-yet-defined businesses that would operate out of the warehouses are not addressed in this EIS.

During construction, direct impacts on plants and animals could occur from release of pollutants from construction equipment—gas, diesel and/or oil spills, and from grading and clearing activities—which would gradually reduce infiltration across the upper terrace, affecting hydrology sources supporting floodplain wetland habitats. As impervious surface increases over the course of construction—pavement and buildings—potential for greater volumes of runoff containing 6PPD pollutants flowing into the Puyallup River also increases.

During Operations, the most significant continued impact to plants and animals would be from the significant increase in runoff volumes and an associated increase in 6PPD pollutants in the new runoff being sent to the Puyallup River. The increased runoff volumes may further destabilize the existing outfall structure, affecting bank stability and sending eroded materials into the river, and may continue to cause habitat planting area failures in the Puyallup River riparian buffer. Other impacts may include a decrease in Wetlands A, B, and C acreage over time due to loss of hydrology sources; a direct loss of

1 acre of wetlands and its buffers at Wetland D ,and impacts to remaining off-site portions of Wetland D water quantity and quality.

As currently proposed, the Project stormwater management plan would decrease seasonal stormwater infiltration across the upper terrace which may result in a decrease in floodplain wetland habitats, an increase in erosion potential and sediment movement at the edge of the river, and an increase in polluted runoff from upland paved surfaces. This would impact the Puyallup River and floodplain habitats during both Construction and Operational phases. Mitigation options that may help to avoid or minimize impacts during construction and operations are discussed below. Some of the mitigation options are substantially similar to mitigations described in Section 4.2 Surface Water, but in this chapter are instead focused on mitigating for impacts to plant communities and animal habitats (P&A).

P&A-1. Clearing and grading work causing spread and colonization of noxious weeds.

Pre-emptive control of problem weedy species is consistent with Pierce County Comprehensive Plan Policy ENV-2 for protecting native vegetation in public and private development.

- Proper implementation of key BMPs would minimize the potential for these impacts, such as:
 - Hydro-mulching and direct seeding of bare ground as soon as possible after clearing and grading would control erosion while also minimizing expansion of invasive species.
 - Pre-emptive targeted clearing and appropriate annual use of herbicides to remove and control high-risk species (such as Japanese Knotweed, Scotch broom and Himalayan blackberry) in and around construction areas, would greatly reduce the risk of spreading.
- Develop a native planting plan and weed control plan for any vacated farmland area, both on the floodplain and on the upper and middle terraces.

P&A-2. Evaluate riverine and floodplain habitat conditions in and around the outfall.

The outfall is located in the floodplain and riverine buffer zone at the edge of the Puyallup River at the northern end of the site. The accepted 2018 Talasea mitigation plan (TDMP 2018) proposed habitat plantings in the area surrounding the outfall. The 150-foot riverine buffer zone in that area was previously impacted by farming activities, but also included some naturally vegetated riverbank areas.

No annual monitoring work was carried out and no annual reports (per PCC 18E.40.070 – Appendix E Monitoring Requirement) were provided until December 2022. To cover this gap in information, the EIS team carried out field assessment of the outfall and surrounding mitigation planting area, and identified problems caused by scour and erosion from repeated river flooding and stormwater discharge from the upland areas (Viking warehouse and pavement).

Significant future increases from new Project stormwater discharge to the outfall would most likely exacerbate the existing scour and erosion problems and would increase direct outfall volumes of runoff to the river. Increased future flows would increase current scour and erosion impacts to fish and wildlife habitats associated with the riverine ecosystem and with the replanted riparian areas around the outfall structure. Corrective mitigation action is needed to redesign, replant, and repair the outfall and mitigation planting areas prior to sending new Project flows from the Project site through the outfall.

- The area within and surrounding an outfall structure is not an appropriate location for a habitat mitigation planting area, because a managed stormwater control structure would require regular access and vegetation removal/maintenance actions and thus would not effectively replace the lost forested riverine buffer habitat with a comparable or better condition buffer habitat.
 - Update the existing TDMP 2018 mitigation plan to consider designing and installing a new habitat mitigation planting site away from the stormwater outfall location, such as increasing the forested buffer width upstream of the outfall structure within the vegetated riparian buffer for the Puyallup River, to replace lost floodplain and riverine buffer habitat functions more effectively and sustainably long-term.
- The Project engineer should provide a separate outfall structural engineering monitoring plan specific to the outfall structure design intent and should provide key Performance Standards that will be applied during monitoring to determine if the structure is performing within its intended limits and to differentiate from the TDMP 2018 habitat planting plan goals.
 - The outfall structure condition and continued function should be evaluated and monitored annually by a qualified, independent engineer, to ensure that the outfall structure, floodplain, and river bank habitat areas do not degrade over time.
- If the updated TDMP habitat mitigation plan leaves the mitigation planting site in the same location (surrounding the outfall structure), the plan should clearly describe and address:
 - How to address expected habitat vegetation impacts from annual flooding, sediment deposition, and bank erosion, and should clearly describe how bank failure at the edge of the outfall structure will be mitigated to avoid new erosion and sediment impacts to the riverine ecosystem habitats and riverine buffer habitat functions.
 - A need for monitoring stormwater runoff quality (first flush and during standard storms) to document levels of 6PPD and other new pollutants introduced by new Project pavement runoff that may affect listed species in the river.
 - A Contingency Plan is needed in the updated TDMP describing how impacts to listed species would be minimized if monitoring reveals 6PPD in new runoff volumes.
 - Develop new performance standards designed to document:
 - How new mitigation plantings will thrive within the range of expected annual scour and sediment deposition events;
 - When changes to habitat vegetation cover or survival indicate failure of the TDMP habitat replacement plan; and
 - New performance standards that define clear levels of effective control and reduced cover by invasive weedy species in and around the outfall structure.
 - Remove all assessments of outfall **structural** issues from the updated TDMP (habitat mitigation plan) and concentrate on describing the habitat mitigation plan design intent, how to measure success of key habitat features.

- Technical monitoring of the structure and function of the engineered outfall structure should be carried out by a licensed professional engineer or hydrogeologist, not by wetland or habitat specialists.
- To ensure that the intended riverine forested buffer habitat replacement functions are well-established in the highly variable floodplain ecosystem before the end of the monitoring period, the updated TDMP time period should be increased from 3 years to 5 years following the necessary replanting of the buffer habitat areas.
- Take other corrective actions as needed to meet TDMP Performance Standards over time and to be consistent with the Pierce County Comprehensive Plan policies listed in Section 4.4.2.

P&A-3. Re-evaluate current stormwater management strategy.

The current proposal is to send all runoff from on-site parking lots, roads, and three warehouse roofs to the river, and to send runoff from four roofs to infiltration trenches sited at the top of the terrace slope to the east. If instead, all parking lot and roads runoff were infiltrated using BMPs designed to remove the 6PPD pollutant (and other pollutants) from the runoff (as described in research by WSU scientists, Ecology, and others), the potential for significant water quality and water quantity impacts affecting listed salmon species in the river described above could be reduced.

- Re-evaluate the current stormwater management strategy and consider broadly applying LID infiltration practices to treat all parking lot and road runoff prior to directing to the river. These mitigation actions would be consistent with protection of listed species required under federal and local law, and also with Pierce County's Comprehensive Plan policies listed in Section 4.4.2, particularly those policies and goals that require application of best available science and adaptive management for critical areas, using LID practices to maintain water quality for fish, and eliminating harm to water quality from stormwater discharges through use of on-site infiltration and other means (Goal ENV-14, Goal ENV-15, Policy ENV-15.3, Policy ENV-5.14, Policy U-32.2). This should include:
 - Making design changes to significantly reduce or eliminate new flows to the outfall structure at the north end of the site, to ensure that existing stormwater systems on site are designed to protect existing plant and animal habitat functions as needed to meet Pierce County Critical Area Regulations requirements.
 - Apply mitigation strategies in accordance with storm water regulations and effective BMPs identified by recent research related to 6PPD tire chemical impacts on listed salmonids.
 - Apply other LID treatment options (discussed above and in Section 4.2.3) where shown to effectively address the 6PPD water quality impact on fisheries resources.
 - Reduce impervious surfaces on site and apply LID techniques as needed to maintain the floodplain wetland hydrology sources -- to support current ground water storage and transmission functions and to maintain current hydrology volumes flowing to Wetlands A, B and C wetland habitats.

P&A-4. Wetlands A, B, C and D Habitat and Hydroperiod Protection

The groundwater source for hydrology supporting Wetlands A, B, C, and D is likely to decrease as a direct result of increase in impervious surface on the high terrace—paving and buildings. The proposed stormwater management system would divert most site runoff directly to the river and would disrupt groundwater inputs by paving and developing most of the high terrace surface area; additionally, there is not currently enough information about the wetland hydroperiod to design an effective and successful wetland hydrology support strategy. Without an active plan to maintain the current wetland hydroperiod (i.e., hydrology volumes and hydrology timing) throughout both construction and operations phases, current habitat functions at Wetlands A, B, C, and D are expected to shrink or disappear over time. Mitigation Measure P&A-3 would reduce potential for changes to the wetland hydroperiods:

- The location and design of the proposed infiltration trenches must be evaluated by an appropriately qualified and experienced professional engineer or hydrogeologist, and a technical report describing the results and mitigation options is needed.
 - The steep, sandy slopes below the proposed trench locations must be able to withstand hydraulic loading pressures to ensure that the slopes will not fail as a result of the added water at top of slope. Failure could impact floodplain habitats at the toe slopes but could also affect stability of immediately adjacent upland infrastructure and warehouses. Other infiltration facility designs or locations may be needed to protect high terrace warehouse complex infrastructure as well as wetland habitat.
 - Carry out infiltration testing in proposed infiltration areas, to determine potential volume and flow rates during winter months when stormwater is available and soils are fully charged.
 - Redesign or relocate infiltration facilities as needed to ensure maintenance of adequate hydrology to Wetlands A, B, C and D during long-term operations.
- The hydroperiod of the on-site wetlands has not been monitored or documented. This information is critical to properly design and locate infiltration facilities and other design features intended to provide wetland hydrology to on-site wetland wildlife habitats in appropriate volumes at the right times of year, as required under Pierce County stormwater regulations and critical area regulations (as described previously).
 - The Applicant should conduct groundwater and surface water monitoring prior to final site design as needed to define the hydroperiod for on-site wetlands (A, B, C, and D), and use the resulting information to put plans in place for maintaining future wetland hydroperiods during both construction and operation.
 - A hydroperiod assessment report is needed to define the timing and volumes of hydrology needed to sustain the wetlands, including a mitigation plan describing how potential impacts to Wetland A, B, C and D hydroperiods will be mitigated.

- The Applicant should finalize site design and construction plans after hydroperiod monitoring is complete as needed to allow for revisions to the stormwater management plan.
- Pre-design wetland hydroperiod monitoring should take place over at least one wet season.
- Long-term monitoring wells in wetland areas should be installed to document during construction and operations that hydrology timing and volumes are adequate to maintain historic wetland conditions, as required under both stormwater regulations and critical area regulations (as described previously).

P&A-5. Wetland D Habitat Protection (more details provided in Section 4.2 Surface Water, Mitigation SW-7)

- An updated Wetland D report was prepared by the EIS team, describing a larger wetland area that extends onto the Project site, and which also includes a wetland buffer.
- Because Wetland D is larger than what was previously evaluated by Pierce County, a new critical area assessment addressing consistency with mitigation sequencing requirements should be conducted with County staff to determine if the proposed site development plan, which would result in partial filling of Wetland D, complies with mitigation sequencing requirements set forth in PCC 18E.30.050. This would ensure that the Applicant has properly followed standard avoidance and site planning design as needed to avoid or minimize loss of approximately one acre of wetland plus its associated on-site buffer at Wetland D.
 - County staff should consider that avoiding fill impacts at Wetland D and its on-site buffer appears to still allow for reasonable economic use of the Project site.
 - County staff should also consider that other mitigation issues discussed in the EIS indicate environmental impacts (e.g., land use, recreation, aesthetics) that may also indicate a need for site redesign in the area of Wetland D to avoid other significant impacts.
- If the County (the permitting agency) determines that appropriate avoidance and minimization mitigation sequencing has been followed, and thus allows Wetland D and its buffer to be filled -- a new state and county permit review process addressing fill impacts to Wetland D and its on-site buffers would be needed prior to construction. The updated TDMP will be expanded to document the mitigation sequencing process and the planned fill impacts at Wetland D. The updated TDMP will also describe the additional mitigation that will be carried out to compensate for loss of on-site portions of Wetland D and its buffer.
 - Off-site impacts from filling (sediment movement and hydroperiod impacts) and translocation of water storage volumes must be taken into account in the updated TDMP.
 - To meet general requirements of County and federal regulations, related to mitigation timing, at least initial stages of implementation of the TDMP should typically be completed prior to final permitting and site design approval.

4.4.6 Significant Unavoidable Adverse Impacts

Under the current proposal, there are unavoidable significant impacts to plants and animals on and adjacent to the Project site, related to proposed filling at Wetland D, stormwater management impacts on water quality at the outfall related to erosion, sediment, and new volumes of 6PPD laden stormwater runoff to the river, and changes to plant communities in the on-site wetlands, floodplains, and riparian buffer areas.