5. FRESHWATER RESOURCES

This section describes the baseline conditions and potential direct and indirect impacts on freshwater resources associated with the proposed project, and the measures to mitigate these potential impacts. Freshwater resources include surface water, groundwater, and wetlands. Potential impacts on marine waters are addressed in Chapter 7, Marine and Nearshore Resources.

5.1. LAWS, REGULATIONS, AND GUIDANCE FOR FRESHWATER RESOURCES

Table 5-1 provides a summary of the laws, regulations, and guidance applicable to freshwater resources.

Table 5-1: Laws, Regulations, and Guidance for Freshwater Resources

Regulation, Policy, or Guideline	Freshwater Resources Protected Under Regulation, Policy, or Guideline	Description
Federal		
Clean Water Act (CWA) (33 USC 1251 et seq.)	Surface Water Wetlands	Pursuant to Section 404 of the CWA and Section 10 of the Rivers and Harbors Act, the U.S. Army Corps of Engineers (USACE), is responsible for administering a regulatory program that requires permits for certain activities in waters of the U.S., including wetlands. Under Section 404, the USACE regulates the discharge of dredged or fill material into waters of the U.S., including wetlands. Under Section 10, the USACE regulates structures and/or work in or impacting the course, condition, or capacity of navigable waters of the U.S. The USEPA has delegated its authority to some states, including Washington, to administer the 401 permitting program. Issuance of a 401 Certification means that Ecology has reasonable assurance that the applicant's project would comply with state water quality standards and other aquatic resources protection requirements under Ecology's authority.
National Pollutant Discharge Elimination System (NPDES)	Surface Water Groundwater	Section 402 of the CWA authorizes discharges of pollutants, such as stormwater and industrial wastewater, from point sources into waters of the U.S. through the NPDES permitting program. The USEPA has delegated its authority to states to administer the NPDES permitting program. Ecology regulates stormwater runoff from construction sites through a series of general and individual permits. Under the Stormwater Phase II Final Rule, all construction activities that disturb one or more acres of land are regulated and require a permit.

Regulation, Policy, or Guideline	Freshwater Resources Protected Under Regulation, Policy, or Guideline	Description
Sole Source Aquifer (SSA) Protection Program	Groundwater	The SSA protection program, authorized under the Safe Drinking Water Act (42 USC § 300f et seq.), is designed to protect drinking water in areas that rely almost entirely on groundwater as their water source. These include areas with few or no alternatives to the groundwater resource and, where, if contamination occurred, using an alternative source of drinking water would be extremely expensive. Any potential impacts on SSAs or other critical aquifers, or potential impacts that adversely impact any surface water supplies, would be controlled through these requirements.
Flood Insurance Program	Surface Water Wetlands	The National Flood Insurance Program (NFIP) is a federal program managed by the Federal Emergency Management Administration (FEMA) that allows property owners in participating communities to purchase flood insurance, with rates established through the National Flood Insurance Rate Maps. In the proposed project area, the Skagit County Planning and Development Services Department administers the program for the state of Washington. Implemented regulations include the Floodplain/Wetlands Environmental Review Requirements (10 Code of Federal Regulations 1022.12) and Executive Orders 11988 and 13960 (see Sections 1.8.10 and 1.8.14 of the Executive Orders).
State		
Drinking Water/Source Water Protection (RCW 43.20.050)	Groundwater	The Washington State Board of Health, through cooperation with environmental agencies, is responsible for ensuring safe and reliable public drinking water and protecting public health through the protection of drinking water sources.
Model Toxics Control Act (MTCA) and Cleanup Regulation (RCW 70.105D; WAC 173-340)	Surface Water Groundwater	MTCA establishes a program for developing site-specific cleanup standards so hazardous substances would not threaten human health or the environment and for holding liable parties responsible for cleanup of contaminated sites.
Oil and Hazardous Substance Spill Prevention and Response (RCW 90.56)	Surface Water	Establishes an oil spill prevention and spill response program to protect the state of Washington's waters and natural resources from oil spills.
Sediment Management Standards for Waters of the State of Washington (WAC 173-204)	Surface Water	Establishes sediment management standards for of the state, including marine waters, low salinity and freshwater surface waters.
Stormwater Management Manual for Western Washington	Surface Water	Provides guidance on stormwater quantity and quality management.

Regulation, Policy, or Guideline	Freshwater Resources Protected Under Regulation, Policy, or Guideline	Description
Water Pollution Control Act and Water Quality State of Washington (RCW 90.48)	Surface Water Groundwater	Under this act, the state of Washington has established water quality standards to, "maintain the highest possible standards to insure the purity of all waters of the state consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the state, and to that end require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the state of Washington."
Water Resources Act of 1971 (RCW 90.54)	Surface Water Groundwater	Sets forth fundamentals of water resource policies for the state to ensure that waters of the state are protected and fully used for the greatest benefit to the people.
Washington State Coastal Zone Management Program (WCZMP)	Surface Water Wetlands	Washington manages its coastal zone through a partnership with the federal government under its approved Coastal Zone Management Program (CZMP). Under the CZMP, Washington has the authority to determine whether activities requiring federal licenses or permits are consistent with the state's coastal program.
Washington State Hydraulic Code (WAC 220-660)	Surface Water Wetlands	Any person who wishes to conduct a hydraulic project is required to obtain a construction permit called the hydraulic project approval (HPA) from the Washington Department of Fish and Wildlife (WDFW). The purpose of the HPA is to ensure that construction or performance of hydraulic work (construction or performance of work that would use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh waters of the state) is done in a manner that protects fish life.
Washington State Shoreline Management Act (RCW 90.58)	Surface Water Groundwater Wetlands	Provides a statewide framework for managing, accessing, and protecting shorelines of the state Washington.
Water Quality Standard for Surface Waters of the State of Washington (WAC 173-201A)	Surface Water	Establishes water quality standards for surface waters of the state of Washington that are consistent with public health and public enjoyment of these waters and the propagation and protection of fish, shellfish, and wildlife.
Local		
Skagit County Critical Areas Ordinance (SCC 14.24)	Surface Water Groundwater Wetlands	Local development regulations are designed to protect environmentally sensitive areas and ecosystems (Critical Areas) that are designated for protection and management under the Growth Management Act. The Critical Areas relevant to this chapter are: • Frequently flooded areas (see Section 5.3) • Aquifer recharge areas (see Section 5.4) • Wetlands (see Section 5.5) Further detail on the regulations specific to each resource in this chapter are provided in the following table rows.

Regulation, Policy, or Guideline	Freshwater Resources Protected Under Regulation, Policy, or Guideline	Description
Skagit County Critical Areas Ordinance (SCC 14.24)	Groundwater	Critical Aquifer Recharge Areas are identified by Skagit County as, "areas that, due to the presence of certain soils, geology, and surface water, act to recharge groundwater by percolation" (SCC Chapter 14.24.310). Skagit County regulates two categories of aquifer recharge areas, Category I and Category II areas. Category I areas include the following: • Areas designated as SSA areas under the federal Safe Drinking Water Act • Areas identified by the County as potential or existing sea water intrusion areas • Areas designated as "wellhead protection areas" (WAC 246-290 and 291) • Areas within 0.5 mile of a surface water source limited stream as designated under SCC 14.24.340(3)(c) Aquifer recharge areas throughout the County not identified as Category I areas are designated as Category II areas.
	Surface Water	Skagit County regulates Frequently Flooded Areas under the CAO as areas within the floodway and 100-year floodplain, as identified on the official Flood Insurance Rate Map for Skagit County (SCC Chapter 14.24.600-630). Development within designated special flood hazard areas such as the 100-year floodplain must adhere to specific requirements including conformance with flood damage prevention standards in SCC 14.34 and the international building codes and must not alter the floodplain boundaries or adversely impact species protected under the ESA.
	Wetlands	With few exceptions, Skagit County regulates all wetlands under the CAO. Wetlands are defined by Skagit County as generally including swamps, marshes, bogs and lakes that meet the wetland criteria outlined by the County (SCC 14.04.020). The county does not include artificial wetlands as regulated wetlands such as irrigation and drainage ditches, grass-lined swales, farm ponds, detention facilities, wastewater treatment facilities or other unintentionally created wetlands. Category III and IV wetlands, classified in accordance with the Washington State Wetland Rating System for Western Washington (Hruby 2004), may be exempted or partially exempted from the provisions of the CAO and may be altered by filling or dredging if they meet certain criteria outlined in SCC Chapter 14.24.230(6).
Skagit County Shoreline Master Program (SCC 14.26)	Surface Water Groundwater Wetlands	The Shoreline Master Program (SMP) is comprised of local land use policies and regulations designed to manage shoreline use. The SMP protects natural resources for future generations, provides for public access to public waters and shores, and plans for water dependent uses. It was created in partnership with the local community and Ecology and must comply with the Shoreline Management Act and Shoreline Master Program Guidelines.

Regulation, Policy, or Guideline	Freshwater Resources Protected Under Regulation, Policy, or Guideline	Description
Skagit County Stormwater Management (SCC 14.32)	Surface Water	Skagit County requires specific stormwater management measures, including obtaining an appropriate development permit, for land clearing and land disturbing activities, grading, installation or expansion of a building, creation or replacement of impervious surfaces and other construction activities (SCC Chapter 14.32). Applicants are required to submit a stormwater site plan that is compliant with Ecology's 2012 Stormwater Management Manual for Western Washington, as amended in December 2014 (SCC 14.32.040), including stormwater pollution prevention provisions for erosion and sediment control.
Skagit County Grading Permit	Surface Water Groundwater Wetlands	A Fill and Grade Permit may be required for any ground disturbing activity.

5.2. STUDY AREA AND METHODOLOGY

This section describes the boundaries of the areas that were assessed for impacts, and the specific procedures used to assess potential impacts of the proposed project on water resources.

5.2.1. Study Area

Freshwater resources include surface water, groundwater, and wetlands. Freshwater resources in the study area are shown on Figure 5-1. The proposed project includes development in the areas within the refinery boundaries planned for the proposed project components, and road improvements on North Texas Road adjacent to the refinery to the south. One of the proposed project areas within the refinery, the New Tanks Area, requires development on previously undeveloped land; the other areas would be constructed within developed areas of the refinery. The study area is the refinery property boundaries plus North Texas Road. Nearshore and marine waters are addressed in Chapter 7, Marine and Nearshore Resources.

Specifically, the freshwater study area includes the following:

- Surface waters within or immediately adjacent to the discrete components of the proposed project that are all contained within the refinery boundaries and consist of man-made drainages ditches and open water ponds and wetlands
- Floodplains, including the 100-year and 500-year floodplains (as designated by FEMA), within or immediately adjacent to the discrete components of the proposed project
- Groundwater resources including shallow subsurface groundwater and underlying aquifers overlain by the proposed project
- Freshwater wetlands within or immediately adjacent to the discrete components of the proposed project

5.2.2. Methodology

To evaluate potential impacts on freshwater resources, baseline conditions for these resources, including groundwater, surface water, wetlands, and floodplains were described. Baseline conditions were documented from proposed project plans and procedures (see Chapter 2, Proposed Action and Alternatives), field studies, public records, and scientific studies. Field investigations undertaken at the proposed project area that were used to support this analysis include:

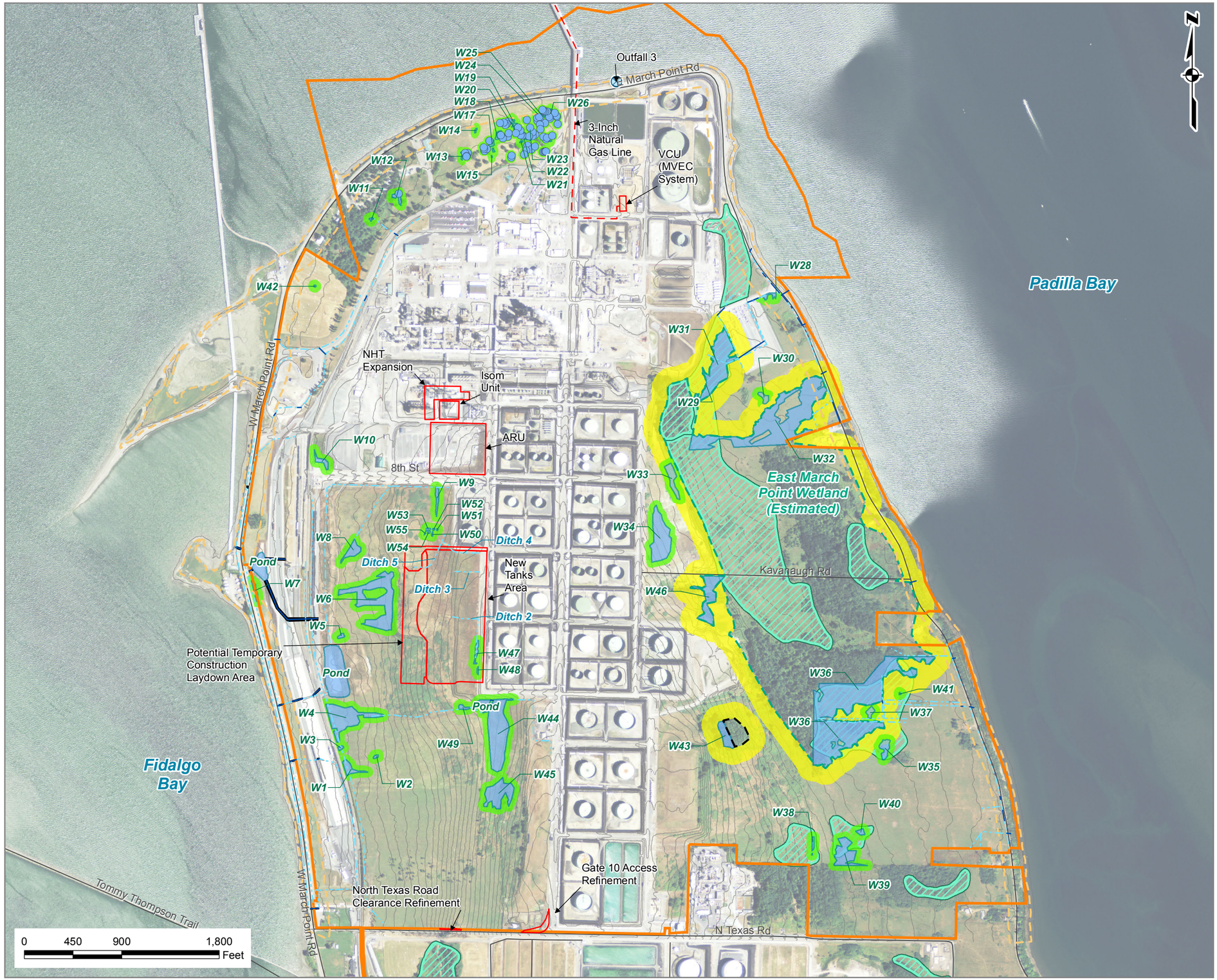
- A geotechnical report completed for the proposed project (AECOM 2016)
- A series of wetland delineations, including assessment of upland vegetation within the proposed project area and nearby areas of the refinery in 2014 and 2015 (Tesoro 2015b, CH2M Hill 2015a, b, c, d)
- A wetland inspection of 10200 West March Point Road (Wetlands 47 and 48) by the USACE (Seattle District) in April 2015 (Tesoro 2015a, 2015c)
- A jurisdictional determination letter from the Corps of Engineers (USACE 2015)
- A site walkover by a state of Washington wetland specialist from the Washington Department of Ecology (Ecology) in June 2015 (Ecology 2015)

Database searches and other desktop information were used to identify freshwater resources with the potential to occur within the study area. The database sources that were used are referenced throughout the chapter, as applicable. The primary data sources include the following:

- The U.S. Fish and Wildlife Service National Wetland Inventory
- Federal Emergency Management Agency and Ecology Flood Hazard maps
- Skagit County Critical Area maps

Potential impacts on freshwater resources that were evaluated as part of this analysis were determined through a public scoping process and by considering the proposed project's potential to impact these resources. Potential impacts on freshwater resources that could occur during both construction (short term) and operations (long term) of the proposed project were considered in the analysis. A series of scoping meetings were conducted during the scoping period for the proposed project, with the public, tribes, and government agencies providing verbal and written comments. The primary issues related to freshwater resources that are addressed in this section include:

- Degradation of water quality
- Alteration of hydrology
- Wetland loss or degradation



Notes:
Wetlands data provided by Tesoro.
Contours shown are at 5 ft intervals.
The proposed improvements will add approximately 18 acres of impervious surface. Impervious surface added at New Tanks Area and VCU (MVEC System) only.
Source: USDA National Agricultural Imagery Program, flown 7/15/2013 at 1 m per pixel
NAD 1983 UTM Zone 10N

Figure 5-1
Site Wetlands and Surface Waters
Tesoro Anacortes Refinery
Clean Products Upgrade Project
Draft Environmental Impact Statement
Anacortes, Washington

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A significant impact on surface water was defined as an impact that would result in:

- Degradation of water quality to the extent that surface waters no longer meet the Water Quality Standards for Surface Waters of the State of Washington, and the change in quality is unlikely to be reversed over several seasons or years without intervention
- Permanent alteration of the hydrology of a natural and/or high quality stream or river, at a watershed scale
- Permanent change to floodplain hydrology, including floodplain boundaries, storage, capacity, and flood velocities

A significant impact on groundwater was defined as an impact that would result in:

- Degradation of groundwater quality to the extent that groundwater no longer meets the state of Washington primary drinking water quality standards and the change in quality is unlikely to be reversed over several years without intervention
- Ongoing or permanent measurable changes in groundwater hydrology including aquifer characteristics, groundwater flow, volume, and seasonality across March Point

A significant impact on wetlands was defined as an impact that would result in:

- Permanent loss of a jurisdictional wetland, particularly a high quality wetland, which would impact wetland functions at a watershed scale
- Measurable changes to wetland hydrology impacting wetland functions at a watershed scale that would not be reversed within several growing seasons without intervention

The impact analysis results are summarized by characterizing the significance for each potential impact on freshwater resources. The process for characterizing the significance of each potential impact involved analyzing the magnitude, geographic extent, and duration of the impact (see Chapter 1, Section 1.7, Methodology). Based on the analysis results, the significance of each potential adverse impact was defined as either *less than significant* or *potentially significant*. Criteria for assessing the significance of potential adverse impacts on freshwater resources are included in Table 1-B.3 in Appendix 1-B, Impact Criteria Tables.

In addition to the potential impacts that could occur during regular and routine construction and operation activities over the life of the proposed project, impacts may also result from an unplanned event. In the case of this chapter, land-based spills occurring at the refinery fall into this category. The methodology for evaluating impacts related to unplanned events follows the same methodology as for planned events—impacts are characterized as to their potential magnitude, geographic extent, and duration. However, for unplanned events, if the impact of the unplanned event is *potentially significant*, then the likelihood, or probability, of an event occurring is assigned using a qualitative scale of probability categories described as Negligible, Low, Medium, or High (see Chapter 1, Section 1.7, Methodology).

5.3. SURFACE WATER

5.3.1. Affected Environment

Surface waters generally include creeks, streams, rivers, lakes, ponds, wetlands, estuaries, and marine waters. The amount of water in a surface water system is dependent on quantity and timing of precipitation, storage in the watershed, soil permeability, climate and evaporation rates, and watershed land cover. Surface waters present within the study area are limited to man-made drainage ditches constructed as part of the refinery's stormwater conveyance system, and open water ponds/wetlands. Wetlands are discussed separately in Section 5.5. Marine waters and estuaries are discussed separately in Chapter 7, Marine and Nearshore Resources.

The study area is located within the lower part of the Skagit/Samish Water Resource Inventory Area (WRIA), also known as WRIA 3. The WRIA's largest rivers, the Skagit and the Samish rivers, discharge to marine waters to the south (Skagit Bay) and north (Samish Bay) of the study area. The study area is near the bottom of the watershed, and downstream of the mouth of these large rivers.

The study area is located on the northern half of March Point. Topography within the study area is relatively flat, with elevations ranging from about 100 to 200 feet above mean sea level (amsl). The land slopes gently to the west and north toward Fidalgo Bay and east toward Padilla Bay. Surface water on the peninsula consists of a series of wetlands and intermittent drainages, some of which are connected to each other and to the surrounding bays. Surface water within developed parts of the refinery drains to the refinery's wastewater sewer system. Surface water in undeveloped parts of the refinery generally drains to Fidalgo Bay or Padilla Bay from the ridge that runs north/south along the peninsula.

Approximately 380 acres of the 1,020-acre refinery property is developed. Of the 380 acres, about 50 acres consists of process area that discharges to the oily water sewer (OWS) system. The remaining 330 acres discharges to the stormwater sewer (SWS) system. Both systems are directed to the refinery's Wastewater Treatment Plant (WWTP) and managed under the NPDES Industrial Wastewater Discharge Permit under Outfall 001 (see Figure 5-1). The proposed project would be constructed mostly in previously developed areas within the refinery, with the exception of the New Tanks Area and Potential Temporary Laydown Area. These components would be located on undeveloped land consisting of upland vegetation and intermittent storm drainages. Table 5-2 presents an overview of the current surface type and drainage for each proposed project component. The 3-inch natural gas line and DSU are not included in Table 5-2, because runoff from these locations drains to marine waters, and is addressed in Chapter 7, Marine and Nearshore Resources.

Table 5-2: Overview of Surface Type and Drainage of Each Proposed Project Component

Project Component	Area of Soil Disturbance (acres)	Current Surface Type	Existing Drainage
VCU	0.15	Grassed surface adjacent to refinery process units.	Stormwater either infiltrates or drains to the SWS system.
NHT	0.12	Paved or hard-packed surface	OWS and SWS conveyance system
Isom Unit	0.45	Paved or hard-packed surface	OWS and SWS conveyance system
ARU	4	Paved or hard-packed surface	OWS and SWS conveyance system
New Tanks Area	18	Permeable grassed surface	Infiltration, sheet flow, and drainage ditches that flow to the west (Ditch 2, 3, and 4). Drainage ditches do not connect to other surface waterbodies.
Potential Temporary Construction Laydown Area	5	Permeable grassed surface	Infiltration, sheet flow, and Ditch 5. Ditch 5 does not connect to any other surface waterbodies.
North Texas Road Refinements	0.37	Permeable grassed surface	Infiltration and sheet flow to drainage ditches along North Texas Road.
Total	28.09		

Surface drainages within the study area were identified and delineated between 2005 and 2015 by URS and CH2M Hill (Tesoro 2015c) (Figure 5-1 and 5-2). As shown on Figure 5-2, these ditches are in the vicinity of the New Tanks Area and potential temporary laydown area components of the proposed project. The total length of the four man-made stormwater drainage ditches (Ditches 2, 3, 4, and 5) in the study area, as well as the potential length that would be impacted by the proposed project are shown in Table 5-3 and are illustrated on Figures 5-1 and 5-2.

Table 5-3: Stormwater Drainage Ditches in the New Tanks Area

Stormwater Ditch	Total Length (feet)	Length Impacted (feet)	Drainage
Ditch 2	605	605	Drains to the west then terminates in uplands.
Ditch 3	234	234	Drains to the west, then terminates in uplands.
Ditch 4	382	263	Drains to the west, then northward, then terminates in uplands.
Ditch 5	509	400	Drains to the south west, and terminates in uplands.

Source: Tesoro 2015c

As described in the proposed project's drainage ditch assessment, Ditches 2, 3, 4 and 5 are not waters of the U.S. under CWA Section 404 jurisdiction (Tesoro 2015c), and therefore are not regulated by USEPA or USACE. The drainages are isolated, man-made ditches, excavated through uplands to drain stormwater away from the facility. Except for disturbance of the side slopes by cattle, these ditches are relatively unchanged from when they were constructed either during or shortly after clearing and grading for construction of the refinery in the 1950s (based on aerial photographs). The drainages are related to stormwater and terminate in upland areas at least 100 feet from the nearest downslope wetland with no significant nexus to traditional navigable water or to a relatively permanent waterbody (i.e., Wetland B/W6; see Section 5.5.1).

There are no human uses of the water in the drainage ditches and these ditches do not have a use designation since they are not considered waters of the state.

A small area within the refinery boundary is mapped as within the 100-year floodplain on the FEMA Flood Insurance Rate Map (Panel 5301510225C [Skagit County Panel 225] effective January 3, 1985). The 3-inch natural gas line and DSU are located on the causeway and wharf, within the mapped 100-year floodplain. The other proposed project components are located upland of the 100-year floodplain (see Figure 5-3).

5.3.2. Potential Impacts on Surface Water

Impacts are described separately below for construction and operations and are summarized in Section 5.3.2.4.

5.3.2.1. Impacts on Surface Water from Construction

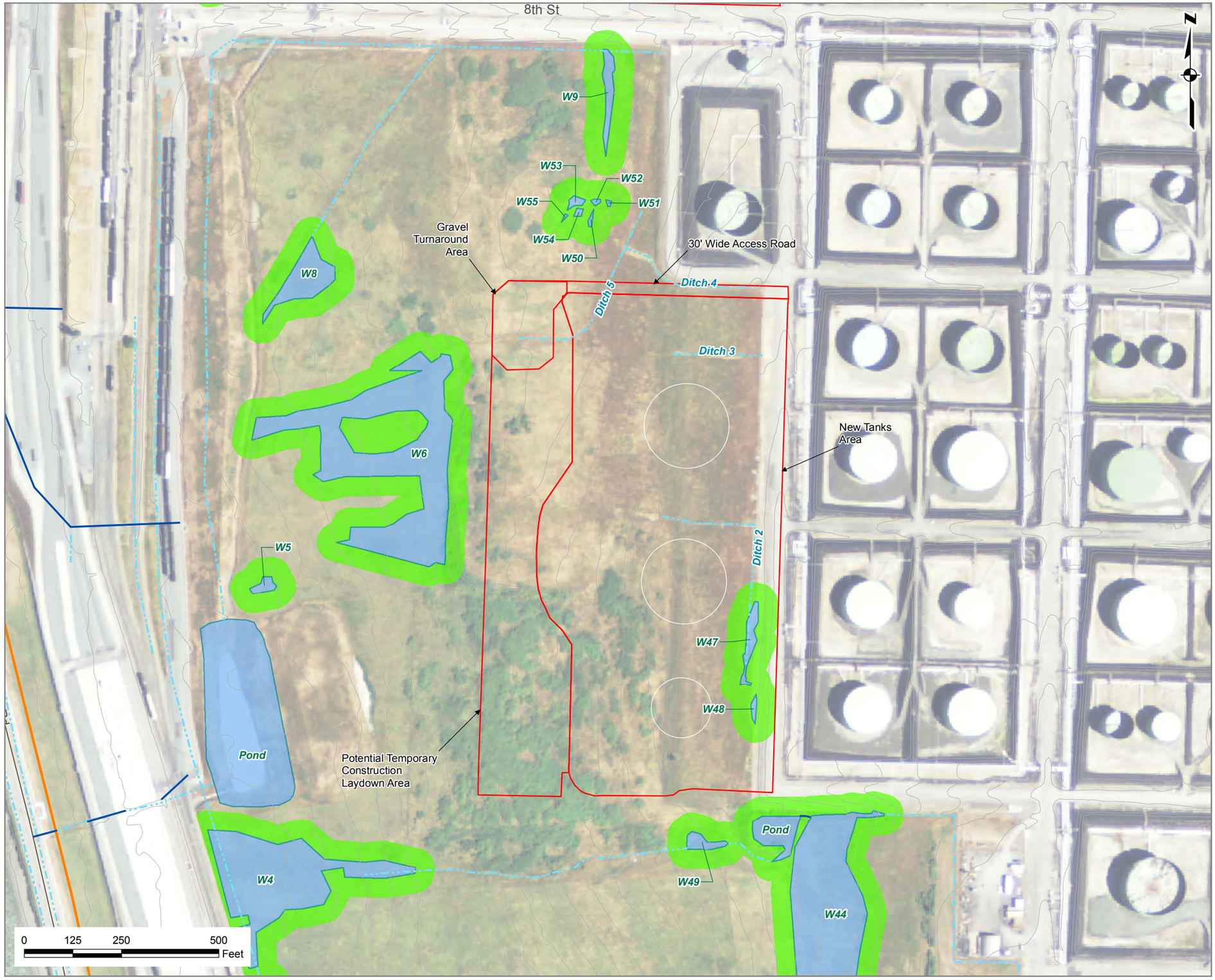
Construction activities have the potential to impact surface water by degrading water quality through the release of soil to water or altering floodplain hydrology.

Degradation of Water Quality due to Increased Sediment

Construction activities, including clearing, grading, excavation and storage, and transport of fill materials have potential to release soil to surface waters. This could result in increased turbidity and deposition of sediment in ditches and wetlands surrounding the proposed project area, and potentially Padilla and Fidalgo bays. Excavation, grading, compacting, paving, and rerouting underground lines are all planned for the NHT, the Isom Unit foundation, the ARU, the MVEC System, and the New Tanks Area. Grading and fill activities would also be completed during construction as part of the North Texas Road Refinements.

Site preparation work would result in temporary exposure of soils. The complete construction program is expected to occur over a 19-month period; however, exposure of soils from construction-related surface disturbance would last no more than 6 months at any given location.

In total, up to 28 acres of land would be disturbed during construction. The proposed project would directly disturb approximately 24 acres of land including 4.7 acres for the NHT, Isom Unit, ARU, and VCU within developed areas of the refinery; 18 acres for the New Tanks Area; and 0.4 acres for the improvements along North Texas Road. In addition, approximately 5 acres may be temporarily disturbed for use as a construction laydown area west of the New Tanks Area. Surface runoff from the approximately 4.7 acres of disturbance within the developed portion of the refinery would drain to the existing OWS and SWS. The surface runoff would be treated at the WWTP prior to discharge into Fidalgo Bay. Therefore, it is unlikely that sediment-laden runoff from areas that drain to the OWS and SWS would enter receiving waters.



Legend

- Culvert
- Drainage Ditch
- Proposed Project Areas
- Tesoro Refinery Boundary
- Delineated and Approximate Wetlands
- Wetland Buffer (50ft, Category IV)

Notes:
Wetlands data provided by Tesoro.
Contours shown are at 5 ft intervals.
The proposed improvements will add approximately 18 acres of impervious surface. Impervious surface added at New Tanks Area and VCU (MVEC System) only.
Source: USDA National Agricultural Imagery Program, flown 7/15/2013 at 1 m per pixel
NAD 1983 UTM Zone 10N

Figure 5-2
New Tanks Area Layout and Wetlands
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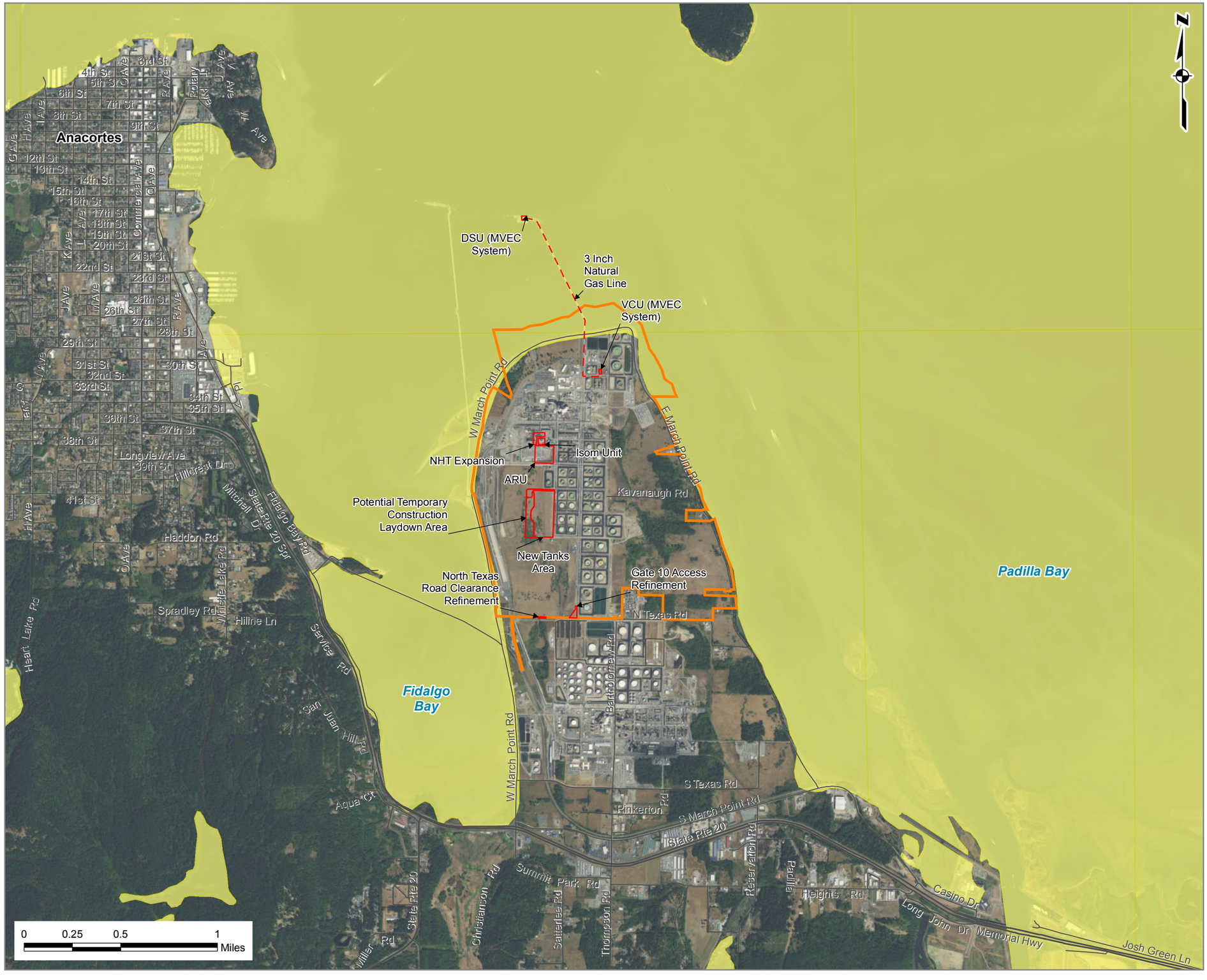

Notes:
Q3 Flood Hazard Data provided by Federal Emergency Management Agency and Washington Dept of Ecology.
Source: USDA National Agricultural Imagery Program, flown 8/19/2015 at 1m per pixel
NAD 1983 UTM Zone 10N

Figure 5-3
FEMA Flood Hazard Zones
Tesoro Anacortes Refinery
Clean Products Upgrade Project
Draft Environmental Impact Statement
Anacortes, Washington

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The approximately 23.4 acres of land that would be disturbed does not currently drain to the OWS and SWS. This includes land in the New Tank Area, Potential Temporary Laydown Area, and land near the North Texas Road Refinements. Stormwater from these areas would drain through sheet flow toward Fidalgo Bay and would also infiltrate to groundwater. Stormwater at the New Tank Area and Temporary Laydown Areas would also drain to detention ditches, where it would infiltrate to groundwater and evaporate. If soil was released into stormwater at locations that do not drain to the OWS or SWS, sediment would be deposited in ditches and surrounding grassed areas.

Construction impacts related to the New Tanks Area would be related to the clearing of vegetation and topsoil, grading and filling areas (in some cases raising the grade by up to 6 inches), and burying of drainage lines, catch basins, tank ring wall bases, and other components.

Disturbance of existing structural fill during excavation of the New Tanks Area, outside existing developed areas of the refinery, may cause soil erosion with the potential to temporarily impact water quality in the vicinity of the proposed project. The stormwater conveyance ditches installed along the perimeter of the new containment berms and roadways in the New Tanks Area would be connected to the existing facility stormwater conveyance system. Until this occurs, stormwater would be managed in accordance with construction stormwater pollution prevention plan (SWPPP) and temporary erosion and sediment control (TESC) Plan. Impacts on surface waters could be caused by erosion within these ditches; however, the ditch bottoms and walls would be compacted to guard against erosion. The ditches would also be designed and installed at a gradient that facilitates complete drainage to eliminate pooling of runoff. Concrete reinforcements would be installed in the ditch walls where changes in flow direction or elevation could cause scouring or degradation of the ditch bottoms or banks.

Multiple staging and laydown areas have been identified for the proposed project (see Chapter 2, Section 2.7, Construction of Proposed Facilities). Most of these areas are previously disturbed or are previously developed areas within the existing refinery that are already connected to the refinery's stormwater conveyance system. The one area that is not currently developed is the potential temporary construction laydown area located directly west of the New Tanks Area (Figure 5-2). Construction staging and laydown areas would be in place throughout proposed project construction activities, lasting up to 19 months; however, soils exposed during grading and site preparation work would only be exposed for up to 6 months. If used, the area would be restored to grazing land after construction is complete. The North Texas Road Refinements would require grading and fill placement in two areas, the Gate 10 Access Refinement, and the North Texas Road Clearance Refinement, along the road for approximately 1,000 feet from March Point Road. Runoff and stormwater in this area is not connected to the refinery's stormwater system and would either infiltrate through the structural fill or would sheet flow to drainage ditches along North Texas Road. The following measures would be implemented during construction to minimize the likelihood of soils being transported into surface waters:

- A construction SWPPP would be prepared that would identify applicable BMPs in accordance with the Stormwater Management Manual for Western Washington to minimize or prevent the discharge of sediment to waters of the state (such as covering stockpiled soils and installing silt fencing around construction areas).
- Under the construction SWPPP, sediment runoff would be controlled by implementing a series of BMPs, including the installation and maintenance of temporary silt barriers such as reinforced silt fences and check dams. Dewatering of natural groundwater accumulation and stormwater runoff would occur by sheet flow runoff through these temporary silt barriers.
- During construction of the tank containment berms, and upon completion of the tank containment berms, additional sediment containment silt barriers would be installed adjacent and parallel to the exterior of the base of the berm and maintained until stabilization of the tank berms and adjacent disturbed soils outside the berms has been achieved.
- After installing the tank containment berms, but prior to placing the facility in service, any stormwater accumulation within the berms would be routed to the existing stormwater system per existing facility protocols.
- Construction boundaries would be established to limit surface disturbance to only those areas that require disturbance as part of construction (and avoiding impacts outside these boundaries).
- A TESC plan would be developed that would include measures to limit the amount of sediment leaving the construction site such as clearing limits, soil cover measures, dust control, sediment retention, surface water control, dewatering control, perimeter protection, and soil stabilization measures.
- Temporarily disturbed areas would be revegetated so that soil exposed during site preparation activities would be temporary, lasting no more than 6 months.

Additional details regarding construction BMPs are provided in the proposed project's NPDES Construction Storm Water Permit (see Appendix 2-B, NPDES Permit) and are discussed in Chapter 2, Proposed Action and Alternatives.

Should proposed project controls fail, sediment could be deposited in nearby ditches. Ditches within the refinery are low quality ecological habitat, and ditches that will be directly disturbed within the New Tanks Area are not connected to waters of the state. The extent of potential surface water quality concerns would be limited to within the refinery and to the immediate vicinity of the Texas Road Refinements. Potential changes in water quality would be short-term and surface water quality is expected to return to pre-disturbance baseline conditions once temporarily disturbed areas have been revegetated. Consequently, impacts on surface water resources due to the proposed project's soil disturbance activities would be ***less than significant***.

Drainage Pattern Alterations Due to Construction

Resources within the New Tanks Area and potential temporary construction laydown area include upland pasture, wetlands, and several man-made ditches that drain to a stormwater facility. Wetlands are discussed separately in Section 5.5. Construction of the New Tanks Area includes removal and/or rerouting of a total of 1,502 feet of existing stormwater ditches including Ditches 2, 3, 4, and 5. To prepare for construction of the proposed project, Ditch 2 and 3 would be permanently removed and Ditch 4 and 5 would be rerouted along the north side of the New Tanks Area. The drainages are isolated, man-made ditches that have been excavated through uplands to drain stormwater away from the facility. As described in Section 5.3.1, Ditches 2, 3, 4, and 5 are not waters of the U.S. under CWA Section 404 jurisdiction (Tesoro 2015c), and therefore are not regulated by USEPA or USACE.

These ditches were constructed for stormwater management and terminate in upland areas at least 100 feet from the nearest downslope wetland with no significant nexus to traditional navigable water or to a relatively permanent waterbody (i.e., Wetland B/W6; see Section 5.5.1). There are no human uses of the water in the drainage ditches and these ditches do not have a use designation since they are not considered waters of the state. After construction of the New Tanks Area, runoff that currently terminates in the upland area west of the New Tanks Area would instead be directed into the facility's SWS system and discharged according to the Tesoro NPDES Industrial Wastewater Discharge Permit.

Impacts on these drainages as a result of construction of the proposed project would be ***less than significant*** based on the magnitude of the change—the drainages have non-jurisdictional status, are isolated, man-made ditches, provide minimal stormwater control, limited habitat function, and are of overall low quality. In addition, the geographic extent of the change is small due to the small size and isolation from adjacent waterbodies of Ditches 2, 3, 4, and 5, and rerouting of Ditches 4 and 5.

Floodplain Alterations Due to Construction

Construction within floodplains has the potential to alter floodplain hydrology by, for example, changing the path of flood waters, the speed of movement of flood waters or the total area of inundation. Two proposed project components, the 3-inch natural gas line and the DSU, are located within the 100-year floodplain. These proposed project components would be installed on the existing causeway and wharf structure and therefore would not result in any alteration of current floodplain surface hydrology. The elevation of the causeway deck varies from a minimum of approximately +19 feet up to +32 feet mean lower low water (MLLW=0 feet). While the floodplain data on the FEMA Flood Insurance Rate Map (Panel 53029C0075E effective February 2, 2007) does not specify the elevation to which floodwater is anticipated to rise during the base flood, it is considered very unlikely that a flood level would reach the height of the causeway deck (at least 19 feet above the water). Therefore, the natural gas line and DSU would not be expected to impact floodplain hydrology.

All other proposed project components would be located outside the mapped floodplain, so would not impact the movement of flood waters. Therefore, as there are no changes that would increase flooding (magnitude of change), and no changes in flooding areas (geographic extent), the impact on floodplains from construction of the proposed project would be ***less than significant;*** see Table 5-3.

5.3.2.2. Impacts on Surface Water from Operations and Maintenance

Operations and maintenance of the proposed project has the potential to alter surface water drainage patterns and surface water quality. Replacement of permeable surfaces (such as grassed areas) with impermeable surfaces (such as pavement or hard-packed soil) prevents infiltration of stormwater into the ground. If the ability of stormwater to be absorbed into the soil is reduced, then the volume of stormwater runoff increases. This can result in increased surface water velocities, increased potential for flooding, and increased risk of erosion and sediment entering surface waters.

The existing NPDES permit, which would be modified to accommodate the proposed project, requires that Tesoro capture stormwater that falls within the developed portion of the refinery and treat it in the refinery's WWTP. The treated water is then discharged to marine waters (see Chapter 7, Marine and Nearshore Resources). The controlled drainage areas and outfalls are shown on Figure 1 in Appendix 2-A, Existing Programs and Operations.

The proposed project would create an additional 15.18 acres of impermeable surface, which is approximately equivalent to a 1.5 percent increase in the area of impervious surfaces within the refinery (see Table 5-4). This includes approximately 14.66 acres for the New Tanks Area, 0.15 acres for the VCU, and 0.37 acre for North Texas Road. This increase would not create a significant increase in volume of wastewater already treated in the WWTP at the refinery.

Table 5-4: Percentage Change Relative to Refinery Boundary and Developed Areas

	Current Area (acres)	New Impervious Area (acres)	Percent Change
Total area of the refinery	1,020	15.18	1.5
Total developed area	380	15.18	4.0

The majority of this increased impermeable surface area would occur in the New Tanks Area. After construction of the New Tanks Area, runoff that currently terminates in the upland area west of the New Tanks Area would instead be directed into the facility's SWS system and discharged in accordance with the Tesoro NPDES Industrial Wastewater Discharge Permit. Pasture west of the New Tanks Area may receive less stormwater runoff during operations. Pasture is dominated by non-native plant species and is considered to have little ecological value (see Chapter 6, Terrestrial Vegetation and Wildlife). Wetlands are discussed in Section 5.5.

Smaller areas of impermeable surfaces would be created for the VCU and North Texas Road Refinements. The VCU area currently drains to the OWS and SWS, and would continue to drain to those systems during operations. The North Texas Road Refinements are outside the refinery boundary and would not drain to the OWS or SWS. Runoff from this area would either infiltrate through the structural fill or would sheet flow to existing drainages along North Texas Road.

Following construction of the proposed project components, there would be no further changes to surface water drainage patterns from the proposed project.

Stormwater that falls within the developed areas of the refinery (including newly developed areas) would be treated in the refinery's WWTP, according to the requirements of the refinery's NPDES permit. The existing SWS, OWS, and WWTP have adequate storage capacity to meet the increased runoff. In addition, the design of newly created stormwater ditches would include measures to prevent erosion within ditches, for example, by hardpacking surfaces and using concrete reinforcements where there is a risk of scouring.

Impacts associated with the proposed project are limited to disturbance of man-made drainage ditches, and a small percentage increase in the area of impervious surfaces within the refinery. The proposed project would therefore not alter the hydrology of natural or high quality streams or rivers. In addition, the routing of stormwater within the refinery boundary to the OWS and SWS for treatment in the WWTP would further prevent the potential for degradation of surface water quality. Therefore, the impact of standard operations and maintenance of the proposed project on surface water would be ***less than significant***.

5.3.2.3. Impacts on Surface Water from Spills

This section addresses impacts from a spill related to the proposed project. A spill would have an impact on water quality if the material reached surface water. Surface water resources in the study area are limited to man-made ditches making up the refinery's stormwater conveyance system and wetlands. Groundwater is discussed separately in Section 5.4, and wetlands are discussed in Section 5.5.

Refinery Spills during Construction

Construction activities present a risk of an unplanned release of hazardous materials, such as fuels, lubricants, oils, or hydraulic fluids stored in laydown areas during construction and at truck loading and unloading areas. If the spill volume was sufficiently large, the spill might reach a drainage ditch, temporarily reducing water quality in the ditch. Spills during construction would most likely to be associated with material storage or fueling and equipment maintenance, and would be small in volume.

Multiple layers of spill prevention and response measures are currently in place at the refinery, and would be in place for the proposed project during construction. These include the following measures:

- Spills would be prevented by undertaking regular monitoring and maintenance of construction equipment.
- Secondary containment would be used around temporary chemical storage and equipment refueling areas so that if material was released, it would be held at the immediate release location.
- Stormwater and oily water within developed portions of the refinery would be captured in a sewer system, which routes stormwater runoff and oily water to the WWTP for treatment.

- For areas outside developed portions of the refinery, temporary stormwater controls would be used during construction.
- Trained personnel and response equipment would be available to support spill response activities.

These measures are described in further detail in Chapter 2, Section 2.7.6, Construction Site Controls, and Section 2.8.5, Operational Site Controls. With these controls in place, spill response would be immediate and potential disturbance from spill response activities would be temporary.

In the event that one or more of the above controls failed, spilled materials could be released to surface waters. However, the potential for spills during construction are limited to relatively small volumes of materials, and it is unlikely that multiple levels of controls would fail simultaneously.

However, based on the spill prevention and response measures described above, it is expected that if a spill did occur at the refinery during construction, the impacts on surface water would be limited and would be temporary, as spills would be contained and/or cleaned up immediately. Impacts on water quality would be short term, and would not extend beyond the boundaries of the refinery. Therefore, the impact of refinery spills on surface waters during construction would be ***less than significant***.

Refinery Spills during Operations and Maintenance

Operation of the proposed project presents a risk of releases of hazardous materials such as xylene, reformate, sulfolane, ammonia, perchloroethylene, and other petroleum products to surface waters in the proposed project area.

The proposed project would introduce three new petroleum-based products or processing chemicals to the refinery: mixed xylenes that would be produced at the refinery and aqueous ammonia and sulfolane which would be brought to the refinery to support manufacturing. Five new tanks would be operated including three at the New Tanks Area (a 193,000 bbl mixed xylenes product tank, a 384,000 bbl mixed xylenes product tank, and a 384,000 bbl reformate feedstock tank), and two at the ARU (a 4,029 bbl solvent storage tank and a 4,079 bbl boiler feedwater tank).

Spills could occur during transfer operations, from transfer pipeline or valve leaks, pump or sump failures, overfilling storage tanks, or from routine maintenance activities. Spills during operations could involve larger spill volumes than during construction. If an uncontrolled spill occurred, it could lead to contamination of surface waters, including surface water in wetlands, ponds, and ditches. However, control measures are in place to prevent spills and to rapidly respond to a spill if one was to occur.

As described above, multiple layers of spill prevention and response measures are currently in place at the refinery, and would be in place for the proposed project. These measures are documented in operations and maintenance standards such as the Wastewater Pollution Prevention Plan (Tesoro 2004); Spill Prevention, Control, and Countermeasure Plan (SPCC;

Tesoro 2012); and Oil Spill Contingency Plan (OSCP; Tesoro 2016a). These plans would be updated as necessary to incorporate the proposed project components. Implementation of the updated plans would include the following control measures:

- Tanks and other structures would be constructed in accordance with the International Building Code adopted by Skagit County (SCC 15.04), and equipment would be inspected frequently for evidence of corrosion and leaks to minimize the risk of a spill due to faulty equipment.
- Secondary containment would be placed around tanks and pumping areas so that if a release did occur, it would be captured at the immediate location before spreading to other parts of the refinery.
- The NHT, Isom Unit, ARU, MVEC System, and the New Tanks Area would be connected to the existing OWS so that stormwater runoff and oily water from these areas would be routed to the WWTP for treatment. Sulfolane would not be routed to the WWTP as it is not compatible with the WWTP system; separate measures are in place for sulfolane (see the adjacent callout box).
- Spill response measures are in place to quickly clean up any spills.
- Personnel are trained in spill prevention and response measures.

Measures to Address Sulfolane Spills

Sulfolane management practices and procedures, including recycling and treatment methodologies, would be developed prior to start-up operations as a component of the refinery's Process Safety Management Program. Planned control measures include:

- Collect and recycling
- Closed sewer system to collect stormwater in the area around the sulfolane tank that would be isolated and quality verified to check sulfolane concentration prior to releasing to the OWS system
- Secondary containment around the sulfolane storage tank and pumps that transfer sulfolane to the ARU process

These measures are described in further detail in Chapter 2, Section 2.7.6, Construction Site Controls, and Section 2.8.5, Operational Site Controls. With these controls in place, spill response would be immediate, and potential disturbance from spill response activities would be temporary.

In the event that one or more of the above controls failed, spilled materials could be released to surface waters. However, based on the multiple layers of spill prevention and response measures, it is unlikely that spilled materials would reach surface waters, particularly because refinery drainage is collected (excluding along the wharf or causeway), and nearly all spills that could potentially occur within the refinery and reach a drainage ditch would be contained and routed to the SWS or the OWS during normal operations and subsequently treated at the WWTP. Further, the materials, in particular the more volatile materials such as mixed xylenes, reformate, ammonia, and other volatile components of petroleum products, would dissipate fairly quickly.

The measures described above are expected to minimize the probability of a spill during operations. Accounting for the control measures that would be in place to prevent a spill and for the response measures to be implemented in the event of a spill, it is considered unlikely that, if a

spill did occur at the refinery, the materials would travel outside the developed portion of the refinery to surface waters. Therefore, the impact of refinery spills on surface waters during operations and maintenance would be ***less than significant***.

5.3.2.4. Summary of Potential Impacts on Surface Water

The potential impacts of the proposed project discussed in this section are summarized in Table 5-5.

Table 5-5: Summary of Potential Impacts on Surface Water

Impact Topic	Impact Summary	Potential Impact Significance	
		Less than Significant	*Potentially Significant*
Construction			
Degradation of Water Quality due to Increased Sediment	Up to 28 acres of land would be directly disturbed during construction activities. This disturbance could release sediment-laden runoff to man-made ditches and low quality wetlands, although this is unlikely due to the implementation of BMPs.	✓	
Floodplain Alterations	The wharf and causeway are located within the mapped 100-year floodplain and the new infrastructure would be installed on the existing structures. However, construction activities in this area will occur on the existing causeway deck, 19 feet above the water. This is likely above the height of floodwaters, so would not interfere with the movement of flood waters in the 100-year floodplain.	✓	
Operations			
Changes in surface water flow or drainage patterns	In general, increases in impervious surfaces have potential to increase the volume of surface water runoff. However, the proposed project would increase the area of impervious surface within the refinery by only 1.5%. The small percentage increase in stormwater runoff can be accommodated in the existing stormwater collection and treatment system.	✓	
Unplanned Events			
Spill at the refinery during construction	There is potential for spills of fuels, lubricants, oils, or hydraulic fluids at tank storage areas and truck loading and unloading areas within the refinery. In the event of a spill, water quality of ditches and wetlands within the refinery could be degraded. However, BMPs would be in place to prevent spills and respond in the event of a spill. Non-jurisdictional ditches and wetlands within the refinery have low levels of function, and ditches are not connected to waters of the state.	✓	
Spill at the refinery during operations	There is potential for accidental releases of hazardous materials such as sulfolane, xylene, reformate, and other petroleum products to surface waters within the refinery. In the event of a spill, water quality of ditches and wetlands within the refinery could be degraded. However, BMPs would be in place to prevent and respond to spills. Ditches and wetlands within the refinery have low levels of function, and ditches are not connected to waters of the state or waters of the U.S.	✓	

5.3.3. Potential Impacts of the No Action Alternative

Under the no action alternative, Tesoro would not proceed with the proposed project. Because no construction or operations would take place under the no action alternative, there would be no new impacts on surface water resources.

5.3.4. Additional Mitigation Measures

No additional mitigation measures are recommended beyond the embedded controls that are already incorporated into the proposed project design.

5.4. GROUNDWATER

This section discusses the affected environment and potential impacts related to groundwater resources including shallow subsurface groundwater and underlying aquifers overlain by the proposed project.

5.4.1. Affected Environment

No SSAs or wellhead protection areas occur in the study area. The nearest SSAs to the study area are located to the north across Fidalgo Bay at Guemes Island and to the south at Whidbey Island. There are also no surface water source limited streams within 0.5 mile of the study area.

The proposed project area is not underlain by a drinking water aquifer. However, according to the County's Category 1 Aquifer Recharge Areas map (Skagit County 2010), the proposed project is located within an area identified by the County as potential or existing sea water intrusion areas. In these areas, projects with a groundwater withdrawal are assessed for potential impacts on groundwater from seawater intrusion. Prohibited activities in these areas involve those that would significantly degrade groundwater quality; reduce the recharge to aquifers currently or potentially used as a potable water source; or that may serve as a significant source of base flow to a flow-sensitive basin stream.

The topography at March Point rises from sea level to an elevation of approximately 160 feet amsl, which is the top of a ridge bisecting the study area from north to south. Topography within the proposed project area is relatively flat, with elevations ranging from approximately 100 to 200 feet amsl, sloping gently to the west/northwest toward Fidalgo Bay, and north/northeast toward Padilla Bay (see Chapter 3, Section 3.4.1, Affected Environment). Groundwater flow in the vicinity of the proposed project is likely to follow the same east, north, and west trend as surface waters, given the nature of the regional topography.

Groundwater in the study area occurs in some locations within a few feet of the ground surface as shallow perched groundwater (i.e., shallow groundwater that is separated from the regional water table by an unsaturated zone). Groundwater also occurs in deeper aquifer systems that consist of dense sand layers interbedded between dense to very dense silty sands, silt, clays and gravel layers known as Pleistocene glaciomarine outwash deposits (see Chapter 3, Section 3.4.1, Affected Environment). Previous reports have described the hydrology as a complicated groundwater regime of glacially consolidated and discontinuous sand layers

interbedded within denser silt, clay, and gravel layers (AECOM 2016; Skagit County and Ecology 2016). The interbedded glacial outwash of sand, gravels, silts, and clays extend approximately 300 feet deep to the underlying Goat Island Terrane metasedimentary rocks.

Mapping from the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) indicates the developed portion of the refinery and the New Tanks Area are mostly underlain by excessively drained artificial fill (NRCS 2016). The NRCS map these soils as having a high infiltration rate (high rate of water transmission to groundwater) when thoroughly wet (NRCS 2016).

The area west of the New Tanks Area, including the potential temporary construction laydown area, is mapped as being underlain by poorly drained native Bow and Coveland gravelly loam soils (NRCS 2016). The NRCS (2016) reports that these soils have a slow-to-very-slow rate of water transmission.

Groundwater depths within the study area vary from a minimum of 3 feet below ground surface (bgs) in the New Tanks area and up to 30 feet bgs in the ARU area. Groundwater levels fluctuate seasonally due to precipitation variations, temperature impacts, and drainage conditions, and could also be impacted by construction activities. Groundwater levels collected during prior geotechnical investigation programs within the study area are summarized below for the proposed project areas. The location of groundwater monitoring wells is shown in Figure 5-4.

5.4.1.1. NHT/Isom Unit

During drilling of previous borings, groundwater was encountered in seven borings at depths ranging from 20 to 40 feet bgs, with an average high depth of approximately 20 feet bgs, (AECOM 2016). Shallow perched water within the artificial fill was observed at some locations within a few feet of the ground surface.

Previous geotechnical studies referenced in the AECOM 2016 report identified groundwater elevations that correspond to depths of roughly 20 feet or more in the east half of the site to less than 10 feet in the west half (URS 2008; PGG 2006). The earlier reports identified the primary water table for the site at elevations close to sea level (corresponding to elevations of +5 to +12 feet in 1970), in a deep sand layer identified as “Zone A” pre-Vashon sand.

5.4.1.2. ARU

Groundwater was not encountered in two borings previous drilled within the ARU site into fine sand and silt at depths of approximately 35 to 40 feet bgs (AECOM 2016). However, groundwater was encountered at depths ranging from 33 to 40 feet bgs to the north, to the east and to the west of the ARU site in borings completed in 1961, 1970, and 2014, respectively. Therefore, the 2016 AECOM study concluded that the depth to groundwater in the ARU area generally appears to range from 30 to 40 feet bgs. This is approximately 20 to 40 feet below the total depth of the ARU working surface elevation.

Legend

Groundwater Monitoring Wells
- Existing Wells
- Well Status Unknown
- Proposed 3-Inch Natural Gas Line
- Proposed Project Areas
- Tesoro Refinery Boundary

Notes:
Groundwater monitoring well data provided by Tesoro.
Source: USDA National Agricultural Imagery Program, flown 7/15/2013 at 1 m per pixel
NAD 1983 UTM Zone 10N

Figure 5-4
Groundwater Monitoring Wells
Tesoro Anacortes Refinery
Clean Products Upgrade Project
Draft Environmental Impact Statement
Anacortes, Washington

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5.4.1.3. MVEC

Groundwater was observed in only one boring previously dilled within the MVEC site at a depth of approximately 7 feet bgs in the artificial fill; the water encountered at this depth was determined as likely being a perched condition (AECOM 2016). Similarly, groundwater was observed perched in the silty clay at a depth of 4 feet bgs in a boring completed about 350 feet to the northwest in 1954. However, groundwater was also encountered at a depth of 35 feet bgs in the underlying silty clay layer in a boring completed about 160 feet to the south of the MVEC area in 1957. The 2016 AECOM study concluded that groundwater would be approximately 9 to 20 feet or more below the top of pad elevation of the MVEC System since placement of about 2 to 12 feet of fill is planned for the northwest side of the site to construct the MVEC pad.

5.4.1.4. New Tanks Area

Groundwater was encountered in two borings at depths of 17 to 18 feet bgs during drilling in the New Tanks Area (AECOM 2016). Groundwater was also observed in two deeper interbedded layers at 54 feet and again at 65 feet bgs. Perched groundwater was previously encountered at 13 to 15 feet bgs in two borings completed north of the New Tanks Area in 1993 (Dames & Moore 1993). The AECOM study concluded that the highest groundwater elevations in the New Tanks Area are approximately 3 to 8 feet below the proposed tank pad elevation, which appears to be a perched condition.

5.4.2. Potential Impacts on Groundwater

The proposed project would not impact any SSAs or wellhead protection areas, as none occur in the study area (the nearest being across Fidalgo Bay at Guemes Island). The proposed project is located within an area identified by the County as a potential or existing sea water intrusion area. Groundwater would not be withdrawn from a well during construction or operation of the proposed project and water would not be discharged to groundwater (Tesoro 2015b). Groundwater at the refinery is not used as a potable water source and, according to the County's Category 1 Aquifer Recharge Areas map (Skagit County 2010), groundwater from the proposed project area does not flow to a flow-sensitive basin stream. Potential sources of groundwater impacts during proposed project phases are discussed below, and impacts are summarized in Section 5.4.2.4.

5.4.2.1. Impacts on Groundwater from Construction

Site construction activities could directly impact groundwater resources if groundwater is encountered during construction. If construction activities encounter groundwater, dewatering would be required to allow construction to continue. Construction dewatering lowers the water table, and has potential to impact surface waters that are fed by groundwater.

AECOM (2016) identified that perched groundwater may be encountered at various depths and locations throughout the site during the excavation process. Perched groundwater is isolated from other water sources, and therefore impacts resulting from dewatering of perched groundwater are likely to be restricted to the immediate location of dewatering.

Groundwater other than perched groundwater is not expected to be encountered at the NHT, Isom Unit, ARU, and MVEC areas; however, it could be encountered at the New Tanks Area (AECOM 2016). In most areas, grading would be limited to the ground surface area above groundwater, as fill is preferred to grading in most of the proposed project area. According to the geotechnical report (AECOM 2016), groundwater could be encountered where cuts approach 15 to 20 feet when excavating for the New Tanks Area. If groundwater was encountered at the New Tanks Area, the volume of groundwater that may need to be removed could result in changes to groundwater at that location or could impact nearby surface waters that are fed by groundwater. The probability of encountering groundwater would depend on seasonal fluctuations in groundwater levels due to precipitation variations, temperature impacts, drainage conditions, and construction activities. Variations in groundwater levels would be monitored during proposed project construction, particularly during grading or excavating activities, to avoid encountering groundwater.

If dewatering was required, this could impact aquifer characteristics by lowering the water table; however, the impact would be temporary (limited to no more than 6 months of active soil disturbance in any given area), and would be limited in extent to the area immediately surrounding construction. Therefore, impact on aquifer characteristics from dewatering, if required, is expected to be ***less than significant***.

5.4.2.2. Impacts on Groundwater from Operations and Maintenance

Physical changes in groundwater or aquifer hydrology could occur as a result of permanent subsurface structures built directly within groundwater systems, or a permanent reduction in the area of permeable surfaces, which reduces infiltration of stormwater to groundwater.

Permanent subsurface structures, such as the pad for the product tanks in the New Tank Area and concrete auger-cast piles, could come into contact with groundwater, permanently modifying subsurface conditions. Foundations for most structures would be shallow, and grading is predominantly limited to the ground surface area above groundwater, as fill is preferred to grading in most of the proposed project area. If there is insufficient space for shallow foundations, drilled piers or auger cast-in-place concrete (augercast) piles may be used. Drilled piers would be at least 8 feet deep unless site conditions allow for shallow foundations to be used. Sufficient depth would be present in the areas selected for the processing units and associated equipment for the proposed project with one exception. Due to the relatively shallow groundwater in the New Tanks Area and the depth of the planned excavation, groundwater may be encountered. The geotechnical report prepared for the proposed project recommended that the tank pad design include a drainage system to maintain groundwater levels below the pad and also to control erosion of the eastern slopes where the groundwater may exit the slope as seepage (AECOM 2016). The drainage system, if required, would be tied into the SWS system which would direct the excess groundwater to the refinery's WWTP.

The proposed project would create an additional 15.18 acres of impermeable surface, approximately equivalent to a 1.5 percent increase in the area of impervious surfaces in the refinery (see Table 5-4). Water from the majority of the new impervious surfaces, predominantly

from the 14.66 acres of new impervious surfaces within the New Tanks Area, would represent a new source of stormwater that would be routed to the WWTP, rather than allowed to infiltrate to groundwater. Collection of this stormwater within the New Tanks Area could impact the groundwater levels and subsequent flow to the west of the New Tanks Area. However, groundwater is not a significant source of water for adjacent wetlands to the west (see Wetlands discussion in Section 5.5).

Based on the small increase in impermeable surface area and the positioning of most project components outside groundwater systems, the impact on groundwater recharge from operation of the proposed project is expected to be ***less than significant***.

5.4.2.3. Impacts on Groundwater from Spills

This section addresses impacts on groundwater from a spill related to the proposed project.

Refinery Spills during Construction

Construction would require the use of heavy machinery and fuels, oils, and other hazardous liquids that would be stored or used within construction areas. Hazardous liquids such as fuels, oils, and lubricants have the potential to contaminate stormwater. Without proper controls, stormwater could come into contact with these liquids and then seep into the ground and contaminate local groundwater. Ground surfaces exposed during construction provide a preferential pathway for potentially contaminated stormwater to infiltrate into the ground.

As described in Section 5.3.2.3, many layers of spill prevention and response measures would be in place during construction. These include regular inspections of construction equipment, use of secondary containment, stormwater management, and spill response measures. These measures would minimize the risk of a spill occurring and impacting groundwater.

In the event that one or more of the above controls failed, spilled materials could be released to groundwater. However, the potential for spills during construction are limited to relatively small volumes of materials, and it is unlikely that multiple levels of controls would fail simultaneously.

If a spill was to occur during construction, it would likely be a small volume and would be contained and/or cleaned up immediately. Therefore, the impact on groundwater from a refinery spill during construction would be ***less than significant***.

Refinery Spills during Operations and Maintenance

Operations and maintenance activities could result in accidental product spills on lands or surface waters within the refinery. Larger spills of xylene, reformate, sulfolane, ammonia, perchloroethylene, and other petroleum products if spread beyond the containments and impervious surfaces of the refinery and subsequently could infiltrate into the ground and contaminate groundwater.

As described in Section 5.3.2.3, many layers of spill prevention and response measures would be in place during construction and operations. These include compliance with building standards, regular inspections of equipment, use of secondary containment, stormwater management, and

spill response measures. Regarding groundwater, there is no underground piping carrying hazardous materials or underground petroleum-based material storage tanks present at the refinery. These measures would minimize the risk of a spill occurring and impacting groundwater. If control systems are functioning, accidental spills of petroleum products or other hazardous materials would be contained and directed towards the WWTP for treatment.

If a spill outside a containment area were to occur, the refinery's spill response procedures would be implemented to control, contain, and clean up the spill as soon as possible. The containment measures and spill response plans minimize the risk of pollutants from hazardous materials migrating to groundwater. Therefore, the impact on groundwater from refinery spills during operations and maintenance would be ***less than significant***.

5.4.2.4. Summary of Potential Impacts on Groundwater

The potential impacts of the proposed project discussed in this section are summarized in Table 5-6.

Table 5-6: Summary of Potential Impacts on Groundwater

Impact Topic	Impact Summary	Potential Impact Significance	
		Less than Significant	*Potentially Significant*
Construction			
Changes in groundwater or aquifer characteristics due to construction	If groundwater were encountered during construction, dewatering would be required to lower groundwater levels to below the excavation level until construction is complete. The lowering of groundwater would be temporary.	✓	
Operations			
Changes in groundwater or aquifer characteristics due to operations	The groundwater drainage system at the New Tanks Area would maintain groundwater levels below the pad, thereby lowering groundwater levels. The diversion of surface water from newly created impermeable surfaces could also reduce infiltration to groundwater; however, this will occur in a relatively small area. Groundwater at this location is not a significant source of water for adjacent wetlands to the west.	✓	
Unplanned Events			
Spill at the refinery during construction	There is potential for spills of fuels, lubricants, oils or hydraulic fluids at storage areas and truck loading and unloading areas within the refinery. A spill could potentially contaminate groundwater; however, BMPs would be in place to minimize the risk of contamination. If a spill did occur, and groundwater was contaminated, impacts would be short term while remediation was undertaken.	✓	
Spill at the refinery during operation	Spills could occur due to leaking storage tanks, over-filling of tanks, leaking transfer lines, fueling, or maintenance activities. If spilled materials reached a non-impervious surface, they could infiltrate to groundwater. Spills during operations are unlikely to occur due to implementation of many layers of spill prevention and response measures. In the unlikely event that a spill did occur and was not contained, and groundwater was contaminated, impacts on groundwater would be short term while remediation was undertaken.	✓	

5.4.3. Potential Impacts of the No Action Alternative

Under the no action alternative, Tesoro would not proceed with the proposed project. Because no construction or operations would take place under the no action alternative, there would be no new impacts on groundwater resources.

5.4.4. Additional Mitigation Measures

No additional mitigation measures are recommended beyond the embedded controls already incorporated into the proposed project design.

5.5. WETLANDS

5.5.1. Affected Environment

Wetlands perform important functions in the environment for both water storage and ecological habitat. USEPA's definition of wetlands is:

> Wetlands are areas where water covers soil all or part of the time. Wetlands are important because they protect and improve water quality, provide fish and wildlife habitats, store floodwaters and maintain surface water flow during dry periods. (USEPA 2016)

Wetlands that could be impacted in the proposed project area are shown on Figure 5-2. Figure 5-1 shows all wetlands within the refinery boundaries. These wetlands were identified by trained personnel who completed a wetland delineation and then categorized them based on their functions and values using the Washington State Wetland Rating System (Hruby 2004). Wetland delineation is conducted to determine the existence (location) and physical limits (size) of a wetland for the purpose of federal, state, and local regulations (Ecology 2016). Wetlands are categorized based on the functions they provide and their value as a resource. Wetlands provide multiple functions such as improving water quality, reducing floods, and providing wildlife habitat based on their size, location, and physical characteristics. Wetlands also provide value such as ecological, economic, recreational, or aesthetic importance. Wetlands in the state of Washington are categorized into one of four categories using the state wetland rating system, from Class I to Class IV, with Class I representing the highest value requiring the most protections, and Class IV the least valued (Ecology 2014).

The study area for evaluating potential impacts on wetlands includes wetlands within 300 feet of the discrete proposed project components. Estuary and marine wetlands are discussed separately in Section 7, Marine and Nearshore Resources.

Wetlands located within the study area were identified and delineated between 2005 and 2015 by URS and CH2M Hill (Tesoro 2015c; CH2MHill 2015a, b, c, d; URS 2005, 2006) (Figure 5-1). Wetlands identified within 300 feet of the New Tanks Area are summarized in Table 5-7 (Figure 5-2) and were analyzed for this assessment. This distance was determined based on the wetland site assessment requirements in the Skagit County Code (SCC 14.24.220).

Table 5-7: Summary of Wetlands Located in the Proposed Project Area

Wetland Name	Wetland Rating[a]	Cowardin Class	Hydrogeomorphic (HGM) Class	Total Area (acres)	Buffer Width (feet) for High Intensity[c]
W6	IV	PEM	Depressional[b]	2.33	50
W44	IV	PEM	Depressional[b]	2.23	50
W47	IV	PEM	Depressional[b]	0.09	50
W48	IV	PEM	Depressional[b]	0.015	50
W49	IV	PEM	Depressional[b]	0.06	50
W50	IV	PEM	Depressional[b]	0.007	50
W51	IV	PEM	Depressional[b]	0.004	50
W52	IV	PEM	Depressional[b]	0.007	50
W53	IV	PEM	Depressional[b]	0.02	50
W54	IV	PEM	Depressional[b]	0.008	50
W55	IV	PEM	Depressional[b]	0.002	50

PEM = Palustrine Emergent wetland
[a]Category IV wetlands are of lowest quality requiring the fewest protections.
[b]Depressional wetlands are located in topographic depressions below the regular ground surface.
[c]Standard buffer width per Skagit County Code (SCC) 14.24.230. The standard buffer width values shown correspond to high land use intensity.

As part of the alternative analysis described in Chapter 2, Section 2.7, Construction of Proposed Facilities, the location of the New Tanks Area was chosen to minimize impacts on wetlands within refinery property. The location of the New Tanks Area was identified as having the least impact on existing wetlands based on the results of the initial site selection process (see Chapter 2, Section 2.8, Operational Changes Due to the Proposed Project). Two small wetlands (W47 and W48) are located within the footprint of the New Tanks Area. These wetlands were rated as Category IV wetlands and were assigned the hydrogeomorphic (HGM) class of depressional wetlands in the *CPUP Wetland Delineation and Ditch Assessment* (Tesoro 2015b). The two wetlands were identified as isolated wetlands dominated by heavily grazed herbaceous non-native vegetation (marsh cudweed, *Gnaphalium uliginosum*) (Tesoro 2015a, b, c) and were subsequently confirmed by the USACE during the on-site jurisdictional determination as being isolated (USACE 2015).

According to the delineation report (CH2M Hill 2015b), these two wetlands are small, man-made wetlands that have formed in depressions in the artificial fill west of the existing storage tank areas of the refinery. They are classified as palustrine emergent (PEM) wetlands with a low potential to provide habitat functions due to being sparsely vegetated and of low habitat complexity. The proximity of the refinery, small size, fragmentation from other habitats, and heavy grazing also reduce their habitat functions. They receive water from stormwater runoff from refinery facilities and from precipitation, and have intermittent outlets that drain to a man-made stormwater drainage ditch, and are not connected to the other wetlands, ponds, or Fidalgo Bay. As such, they have a moderate potential to provide water quality functions and a low potential to provide hydrologic functions. As a result, they are rated as Category IV wetlands (CH2M Hill 2015b).

During the initial permitting stage of the proposed project, Tesoro obtained concurrence from the USACE, USEPA, and Ecology that impacted wetlands and ditches in the proposed project area are not waters of the U.S. under CWA Section 404 jurisdiction or waters of the state. On April 17, 2015, the USACE conducted an on-site jurisdictional determination of wetlands within this study area and determined that wetlands W47 and W48 and Ditches 2, 3, 4, and 5 are not waters of the U.S. and therefore work within these areas does not require authorization from the USACE under Section 404 of the CWA (USACE 2015).

On June 19, 2015, Ecology conducted an on-site inspection of those areas of the proposed project that could impact critical areas, including two wetlands that were identified in the New Tanks Area, Wetlands W47 and W48 (Ecology 2015). Skagit County Planning and Development Services also attended the on-site inspection. Ecology determined that the wetlands are man-made depressional features that are not regulated as waters of the state by Ecology. According to Ecology's determination, the area planned for the New Tanks Area "consists of a fill pad that was created in the 1950s by excavating soil from the existing tank area to the east and compacting this soil into a level terrace" (Ecology 2015). The soils, identified as Xerorthents, were artificially created and then compacted such that precipitation perches in shallow depressions in the area and then drains to the west via shallow excavated ditches. In addition, Ecology stated that the soils in the area are, "not mapped for hydric soil, there is no historical record of wetlands in this area, the compacted soils perch runoff in shallow depressions that are drained by the ditches, and they provide minimal wetland functions" (Ecology 2015). As a result of Ecology's determination, work within these areas does not require authorization from Ecology and compensatory mitigation for filling the wetlands is not required.

Wetlands W47 and W48 do not meet the definition of wetlands under the County code (SCC 14.04.020), as they are man-made depressional wetlands consisting of grass-lined swales (Tesoro 2015c).

Wetlands to the north (W50 to W55) and to the west (W6) of the New Tanks Area are isolated Category IV wetlands. The two wetlands to the south (W44 and W49) are Category IV wetlands that are hydraulically connected to each other and to Fidalgo Bay by a series of ditches and ponds. The rest of the wetlands in the area are also Category IV wetlands, some of which are isolated and some of which are hydraulically connected to each other and to Fidalgo Bay by a series of ditches and ponds. Wetlands were also identified further to the south, west, and north as well as outside the study area on the east side of the refinery property (see Figure 5-5).

Coastal wetlands are present throughout the shorelines in the study area. Most of these wetlands are classified as estuary or marine wetlands by the National Wetland Inventory (NWI), which is compiled by the U.S. Department of Fish and Wildlife Service (USFWS). Estuarine and marine wetlands are evaluated in Chapter 7, Marine and Nearshore Resources. Coastal freshwater wetlands located along the shoreline adjacent to marine waters are hydraulically isolated from wetlands within the study area. The coastal freshwater wetlands are also above the mean higher high water (MHHW) level, and, therefore, hydraulically isolated from estuary and marine wetlands evaluated in Chapter 7, Marine and Nearshore Resources.

5.5.2. Potential Impacts on Wetlands

Impacts are described separately below for construction and operation. Impacts to wetlands are summarized in Section 5.5.2.4.

5.5.2.1. Impacts on Wetlands from Construction

Loss of Wetlands

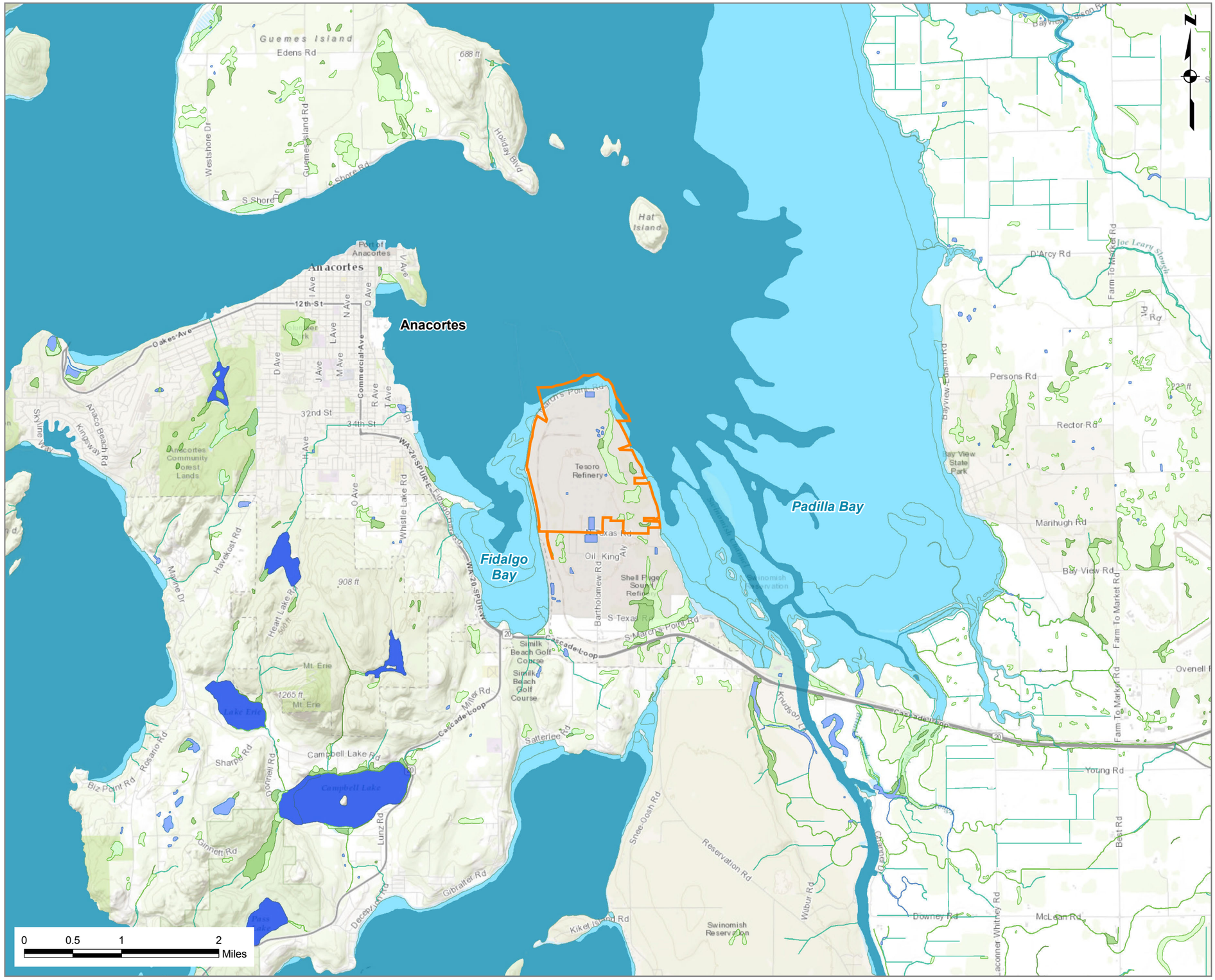
Construction of the proposed project would permanently remove two small isolated, man-made wetlands (W47 and W48). Wetlands W47 and W48 are rated as Category IV, depressional wetlands and have a combined area of 0.15 acres (0.09 acres for W47, and 0.015 acres for wetland W48) (Tesoro 2015c). As described in Section 5.5.1, neither the USACE nor Ecology took jurisdiction over these wetlands. During construction of the New Tanks Area, these two wetlands would be excavated to an average depth of 11 feet bgs, and approximately 1,600 cubic yards and 270 cubic yards of dredge material would be removed from Wetlands W47 and W48, respectively. The entirety of both wetlands would be permanently removed.

Impacts to these wetlands as a result of construction of the proposed project have been determined to be ***less than significant*** based on the magnitude of the change, i.e., the wetlands have non-jurisdictional status, are small size, isolated, provide minimal habitat function, moderate water quality protection, and are of overall low quality (Category IV). In addition, the geographic extent of the change is small due to the small size of the two impacted wetlands and isolated status from other wetlands and habitats.

Disturbance or Degradation of Remaining Wetlands

Beyond removal of wetlands W47 and W48, there is potential for construction activities to disturb or degrade other nearby wetlands. This includes potential physical disturbance to wetlands due to construction equipment, or increased turbidity and sediment deposition due to sediment-laden runoff from nearby construction areas entering wetlands. The nearby wetlands are Category IV (i.e., low quality) wetlands, and are isolated from each other and Fidalgo Bay.

As described in Section 5.3, BMPs would be in place during construction to prevent the release of sediment into surface waters, including surface waters within wetlands. Other than W47 and W48, which would be removed, construction activities would occur outside of wetlands and their associated buffers. Wetlands and their associated buffers in the immediate vicinity of construction activities would be marked with high visibility fencing to prevent disturbance during construction.



Legend

- Tesoro Refinery Boundary

National Wetlands Inventory Data

- Freshwater Emergent Wetland
- Estuarine and Marine Wetland
- Estuarine and Marine Deepwater
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine

Notes:
Wetlands data provided by the National Wetlands Inventory
Source: ESRI Topographic Web Mapping Service
NAD 1983 UTM Zone 10N

Figure 5-5
Vicinity Wetlands
Tesoro Anacortes Refinery
Clean Products Upgrade Project
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Construction BMPs would be maintained to prevent the release of sediment into wetlands until stabilization of construction areas, containment berms, and adjacent disturbed soils outside these areas have been achieved. Upon completion of construction activities, stormwater accumulation in the containment berms would be routed to the SWS in accordance with facility protocols.

Due to the low function level of the adjacent wetlands, and in consideration of implementation of engineering controls and BMPs described above and in Section 5.4.2, the impact on wetlands from construction of the proposed project would be ***less than significant***.

5.5.2.2. Impacts on Wetlands from Operation and Maintenance

Loss of Wetlands

No wetland areas would be filled during operation and maintenance of the proposed project. Similarly, following removal of the two small man-made wetlands (W48 and W49) during construction, no wetlands are located within the proposed project area and no other direct disturbance such as vegetation clearing or changes to hydrology, soil quality, or water quality would occur. As such, the impact on wetlands directly as a result of operation and maintenance of the proposed project would be ***less than significant***.

Changes in Water Quality or Function

Impacts on both surface water and groundwater quality have potential to impact the function of wetlands. As described in Section 5.3.2 and 5.4.2, operations and maintenance of the proposed project has potential to impact groundwater and surface water due to:

- Conversion of currently permeable surface to impermeable surface, which could reduce the volume of stormwater infiltrating to groundwater, equivalent to a 1.5 percent increase in impermeable surfaces at the refinery
- Routing of stormwater in the New Tanks Area to the WWTP, which would reduce the volume of stormwater runoff from this location
- Contamination resulting from uncontrolled release of stormwater or wastewater during routine operations and maintenance

As described in Sections 5.3.2 and 5.4.2, the proposed project is unlikely to impact surface water or groundwater due to uncontrolled stormwater runoff or wastewater, as stormwater and wastewater are, and would continue to be, collected and directed to the refinery's WWTP.

Development of the New Tanks Area would prevent stormwater from infiltrating to groundwater at the New Tanks Area, and would prevent rainwater falling at the New Tanks Area from travelling as sheet flow to wetlands to the west. This has potential to reduce the input of both surface water and groundwater to wetlands surrounding the New Tanks Area. Wetlands W5, W6, and W8 are located west of the New Tanks Area (see Figure 5-1) where stormwater from the New Tanks Area would currently flow. These wetlands are on land used for cattle grazing and are Category IV wetlands of low ecological value (CH2M Hill 2015d). The wetland delineation report identified that the main sources of water for the on-site wetlands appear to be direct

precipitation and surface water runoff in limited areas (CH2MHill 2015a, b, c, d). No visible evidence of groundwater discharge was observed during the wetland delineation. Field studies indicate that the water feeding W6 is dominated by groundwater seepage from a groundwater supply that would not be impacted by the proposed project (Tesoro 2016b). This conclusion was based on observations of groundwater seepage during a field visit on April 17, 2015, as well as upland surface soil samples indicating a different source from the groundwater system that would be potentially encountered during construction of the New Tanks Area.

Considering that the wetlands west of the New Tanks Area are low quality and have a low function level, that the wetlands do not appear to be fed by groundwater that may be impacted by the proposed project, and that the increase in impermeable surface area at the refinery is a relatively small percentage, the impact on wetlands from operation of the proposed project would be ***less than significant***.

5.5.2.3. Impacts on Wetlands from Spills

Construction, operations, and maintenance activities could result in accidental product spills on lands or surface waters within the refinery. As described previously, construction activities present a risk of an unplanned release of hazardous materials such as fuels, lubricants, oils, or hydraulic fluids. Spills during construction would most likely be associated with material storage or fueling, and would be small in volume. Larger spills of xylene, reformate, sulfolane, ammonia, perchloroethylene, and other petroleum products could possibly flow to wetlands on refinery property if not appropriately managed. If controls failed and spilled materials reached wetlands, water quality in the refinery wetlands would be degraded until spill response actions were completed and/or the spilled materials broke down in the environment (xylenes and reformate break down quickly, see Chapter 13, Marine Transportation).

As described in Sections 5.3.2.3 and 5.4.2.3, multiple layers of spill prevention and response measures would be in place during construction and operations, including compliance with building standards, regular inspections of equipment, use of secondary containment, stormwater management, and spill response measures. These measures would minimize the risk of a spill occurring and impacting wetlands.

Based on the implementation of these spill prevention and response measures, it is expected that, if a spill did occur, the extent of spilled materials would be limited to the immediate spill location and would be temporary, as spills would be cleaned up immediately. Further, the quality of wetlands in the vicinity of the proposed project is low and the extent of the wetlands is not large. Therefore, impacts on wetlands from a spill and the spill response would be ***less than significant***.

5.5.2.4. Summary of Potential Impacts on Wetlands

The potential impacts of the proposed project discussed in this section are summarized in Table 5-8.

Table 5-8: Summary of Potential Impacts on Wetlands

Impact Topic	Impact Summary	Potential Impact Significance	
		Less than Significant	*Potentially Significant*
Construction			
Loss of wetlands	Two isolated wetlands (W47 and W48) would be permanently filled in as part of the proposed project. These wetlands are non-jurisdictional; are small (total of 0.15 acres); provide minimal habitat function; moderate water quality protection; and are of overall low quality (Category IV).	✓	
Disturbance or degradation of remaining wetlands	Construction activities are unlikely to directly disturb wetlands or cause a release in sediment laden runoff that would degrade wetlands, due to the implementation of BMPs. The wetlands within the refinery near the proposed project area are low value (Category IV), are not rare or unique, and provide minimal wetland functions.	✓	
Operations			
Direct wetland loss	No wetlands would be lost during operations.	✓	
Degradation of water quality or wetland function	Development of the New Tanks Area would prevent stormwater from infiltrating to groundwater at the New Tanks Area, and would prevent rainwater falling at the New Tanks Area from travelling as sheet flow to wetlands to the west. The wetlands near the New Tanks Area are Category IV, indicating lowest level of function, and do not appear to be fed by groundwater that may be impacted by the proposed project.	✓	
Unplanned Events			
Spill at the refinery during construction and operations	If controls failed, a spill occurred, and spilled materials reached wetlands, water quality in the refinery wetlands would be degraded until spill response actions were completed and/or the spilled materials broke down in the environment. However, due to the multiple layers of spill prevention and response measures in place, it is unlikely that materials would be spilled, and that spilled materials would reach wetlands.	✓	

5.5.3. Potential Impacts of the No Action Alternative

Under the no action alternative, Tesoro would not proceed with the proposed project. Because no construction or operations would take place under the no action alternative, there would be no new impacts on wetland resources.

5.5.4. Additional Mitigation Measures

No additional mitigation measures are recommended beyond the embedded controls already incorporated into the proposed project design.

5.6. CUMULATIVE IMPACTS

As described above, construction and operation of the proposed project could result in less than significant impacts on water resources. Within the study area, there has been significant past agricultural, industrial, commercial, and residential growth that has resulted in impacts on freshwater resources. No development projects involving changes to wetlands, surface water drainage patterns, or surface water, or groundwater quality were identified in the March Point area. Cumulative impacts as a result of the proposed project in addition to the past impacts on freshwater resources are considered to be negligible. These impacts would be minimized by construction BMPs and localized to the Tesoro Anacortes Refinery site.

5.7. REFERENCES

AECOM. 2016. *Mixed Xylenes Project—Tesoro Refinery*. Report of the Geotechnical Investigation, AECOM Job No. 60394663.

CH2M Hill.2015a. *Tesoro Refinery Upland Verification and Ditch Assessment – West of Tanks 12 and 13 (Ditches 2, 3, 4, and 5)*. May 22, 2015.

_____. 2015b. *Tesoro Refinery Wetland Delineation and Ditch Assessment, Northwest Study Area–Wetlands W47 and W48 (Revised)*. May 21, 2015.

_____.2015c. *Tesoro Refinery Wetland Delineation and Ditch Assessment for Wetlands–W44. W45, and W49 and Ditches 1 and 6 in the Southwest Study Area (West of Tanks 3, 5 and 7)*. May 22, 2015.

_____. 2015d. *Tesoro Refinery Wetland Verification Report Update–Wetlands - W6, W8, W9, W50 through W55, and Ditches 4 and 5*. May 22, 2015

Dames & Moore. 1993. *Report of Geotechnical Investigation–Part I, Proposed LTSR Sphere and Naphtha Tank, Shell Clean Fuel Project, Anacortes Refinery, Anacortes, Washington, for Shell Oil Company*. Dames & Moore Job No. 00216-409-016. May 28.

Ecology (Washington State Department of Ecology). 2014. *Wetlands: Washington State Wetland Rating System*. Accessed: November 2016. Retrieved from: http://www.ecy.wa.gov/programs/sea/wetlands/ratingsystems/

_____. 2015. *Wetland Findings for Tesoro Clean Products Upgrade*. Letter. July 2, 2015.

_____. 2016. *Well Database*. Accessed: November 2016. Retrieved from: https://fortress.wa.gov/ecy/waterresources/map/WCLSWebMap/WellLogSearchResult.aspx?imageName=00112868.tif&region=NWRO&folder=00092&xcoord=1142147&ycoord=1157090&search_scope=&result_num=10&welllogid=112868

Hruby, T. 2004. *Washington State Wetland Rating System for Western Washington–Revised*. Washington State Department of Ecology Publication # 04-06-025.

PGG (Pacific Groundwater Group). 2006. *Tesoro Anacortes Refinery, Site 3 Hydrogeology and Groundwater Chemistry*. February 2, 2006.

NRCS (Natural Resources Conservation Service). 2016. *Web Soil Survey*. United States Department of Agriculture. Accessed: January 2017. Retrieved from: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

Skagit County. 2010. *Aquifer Recharge Area Map—Category 1 Areas*. SCC 14.24.310. January 11, 2010.

Skagit County and Washington Department of Ecology. 2016. *Shell Anacortes Rail Unloading Facility Draft Environmental Impact Statement*. October.

Tesoro (Tesoro Refining & Marketing Company LLC). 2004. *Wastewater Pollution Prevention Plan*. Third Revision. October 25, 2004.

_____. 2012. *Refinery Spill Prevention Control and Countermeasure Plan*. July 27, 2012.

_____. 2015a. *Isolated Wetlands Information Sheet Form: Clean Products Upgrade (CPU) Project*. May 22, 2015.

_____. 2015b. *Washington Department of Ecology Nationwide Permit 10 Application: Clean Products Upgrade Project Wetland Delineation and Ditch Assessment*. May 2015.

_____. 2015c. *Washington State Joint Aquatic Resources Permit Application (JARPA) Form: Clean Products Upgrade (CPU) Project*. June 22, 2015.

_____. 2016a. *Anacortes Refinery Oil Spill Contingency Plan*. Revision 10. February 2016. Approved March 24, 2014, Expires March 24, 2019.

_____. 2016b. *SEPA Checklist: Clean Products Upgrade Project.* June 2015, updated November 2016.

URS. 2005. *Wetland Delineation Report, Future Refinery Expansion Site*. Prepared for Tesoro Refining and Marketing Company by URS, Seattle, Washington. November 1, 2005.

_____. 2006. *Wetland Delineation Report, Coker Staging Area*. Prepared for Tesoro Refining and Marketing Company by URS, Seattle, Washington. April 27, 2006.

_____. 2008. *Report of Geotechnical Investigation, Benzene Reduction Facility, Tesoro Refinery, Anacortes, Washington,* prepared for Tesoro. URS Job. No. 33761139. September 17.

USACE (U.S. Army Corps of Engineers). 2015. *USACE Jurisdictional Determination Letter*. June 1, 2015.

USEPA (United States Environmental Protection Agency). 2016 *Wetlands: What is a Wetland?* Accessed: November 2016. Retrieved from: https://www.epa.gov/wetlands/what-wetland.

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