3. Potential Effects of the Project

How did WSDOT evaluate the project's potential effects on water resources?

The potential direct effects of this project were evaluated using the criteria established in the Surface Water Discipline Report Checklist in WSDOT's Environmental Procedure Manual (EPM) (WSDOT 2008b). This step-by-step process compares the alternatives by clearly identifying all significant construction activities, operational impacts of each alternative, and for this specific project, the long-term effects of the facility remaining in place after pontoon production is complete.

How would construction of the casting basin project affect water resources?

For this project, construction effects are those effects anticipated during construction of the new casting basin, operational support facilities, and mitigation features. To support the use of the casting basin, each build alternative would include operational support facilities, such as an access road, onsite concrete batch plant, large laydown areas, water handling and treatment areas, office space, a rail spur, and a parking area for workers.

The primary construction activities that could affect surface water resources would be soil disturbance from site grading and preparation, concrete curing, and incidental spills of petroleum products from construction vehicles. The primary construction activity that could affect groundwater resources would be dewatering of the Anderson & Middleton and Aberdeen Log Yard alternatives during site preparation and construction.

What are construction, operational, and long-term project effects and how are they measured?

Effects describe how the project would directly affect the built or natural environment.

Construction effects are effects that would occur while the new casting basin, ancillary and pontoon moorage facilities, and any mitigation features are built.

Operational effects are effects that would occur when the pontoons are being built at the new casting basin facility in Grays Harbor and at the CTC facility in Tacoma.

Long-term effects are effects that would remain after pontoon production is complete, effects of mooring pontoons over an indefinite period of time, and effects associated with mitigation features expected to remain after completion of the project.

Surface Water

No Build Alternative

No construction activities would occur under the No Build Alternative. As such, there would be no construction effects on surface water at this facility.

CTC Facility

As discussed above, no construction activities would occur at the CTC site for the proposed project. As such, there would be no construction effects on surface water at this facility.

Grays Harbor Build Alternatives

Both the Anderson & Middleton and Aberdeen Log Yard sites would require the same construction activities, including site preparation involving excavation and grading for construction of the casting basins, laydown areas, and other Operational Support Facilities (for example, office buildings, employee parking lot). Additional construction effects on surface water from both these facilities could be the discharge of high pH waters (defined as any waters with pH levels greater than 8.5) coming in contact with curing concrete in the casting basin forms.

Development of either site would occur under the conditions specified in the approved Construction Stormwater General Permit (Ecology 2005b). This permit has a number of monitoring and discharge conditions that would be implemented to prevent these specific impacts on surface water. Construction of either alternative would require the development of a temporary erosion and sediment control (TESC) plan as part of the overall Stormwater Pollution Prevention Plan (SWPPP) and a spill prevention control and countermeasures (SPCC) plan. The SWPPP plan would specify BMPs to prevent release of sediments and high pH water in stormwater, whereas the SPCC would prevent accidental releases of petroleum products to site surface waters.

What is sparging?

Sparging is the practice of bubbling a gas through a liquid. This practice is used to treat high pH (greater than 8.5) water that has been in contact with curing concrete. Bubbling carbon dioxide through this water acts to neutralize these high pHs to meet the permit effluent limits.

For example, the approved Construction Stormwater General Permit requires sites disturbing 1 acre or more and involving significant concrete work (defined as greater than 1,000 cubic yards poured concrete or recycled concrete) to monitor stormwater for pH and adjust any waters with pH greater than 8.5. This adjustment can typically be done by sparging this water with carbon dioxide prior to discharge. This permit has similar requirements for monitoring stormwater turbidity and the use of appropriate BMPs to prevent the discharge of water with greater than 25 nephelometric turbidity units (NTUs). Implementation of the required TESC, SWPPP, and SPCC plans, along with the other monitoring and BMP requirements of the Construction Stormwater General Permit, would prevent any adverse effects on surface water features at either the Anderson & Middleton site or Aberdeen Log Yard site alternatives.

Nephelometric Turbidity Units

International standard units for the measurement of turbidity. Turbidity is a measure of the light-scattering element of liquids resulting from suspended materials.

Groundwater

No Build Alternative

No construction would occur under the No Build Alternative, and there would be no construction effects on groundwater resources.

CTC Facility

As discussed above, no new site construction activities would occur at the CTC site under any of the alternatives considered here. As such, there would be no construction effects on groundwater at this facility.

A zone of dewatering influence is created when groundwater is pumped from a well causing groundwater to flow to the well from every direction, rather than following the natural gradients. The pumping well creates an artificial discharge area by drawing down (lowering) the water table around the well. This area of drawdown is called the zone of dewatering influence.

Anderson & Middleton Alternative

Dewatering during construction of the Anderson & Middleton site would affect local groundwater systems by removing water from the underlying aquifer in a localized area. The dewatering system would be centered under or near the proposed casting basin prior to excavation. It could lower groundwater levels proximate to the excavation, creating a zone of dewatering influence around the site as shown in Exhibit 13. The estimated zone of dewatering influence represents the approximate extent of 2 feet of drawdown created by a temporary dewatering system operating for 2 years. Based on observations of seasonal groundwater fluctuations of approximately 2 feet at the adjoining IDD #1 site, the shallow soil has been predisposed to consolidation from a 2-foot change in water level.

Aberdeen Log Yard Alternative

As at the Anderson & Middleton site alternative, dewatering during construction of the Aberdeen Log Yard site would affect local groundwater systems by removing water from the underlying aquifer. The proposed excavation would act as a sink and lower groundwater levels proximate to the excavation, creating a zone of dewatering influence around the site as shown in Exhibit 13. At least some portion of the site's soils are composed of silts that are prone to settlement post-construction.

How would pontoon-building operations affect water resources?

For this project, operational effects are those effects anticipated during construction of pontoons at either of the new casting basins (either Anderson & Middleton site or Aberdeen Log Yard site alternatives) and the CTC facility. Operation at any of the alternative sites would produce

Source: WSDOT (2005, 2006) Aerial Photo, Grays Harbor County (2006) GIS Data (Street), Landau (2009) GIS Data (Dewatering drawdown). Horizontal datum for all layers is State Plane Washington South NAD 83; vertical datum for layers is NAVD88.

Dewatering drawdown area

Build Alternative Site

Exhibit 13. **Build Alternative Site Estimated Dewatering Drawdown**

Pontoon Construction Project

Washington State Department of Transportation

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two types of water – process water and stormwater. Process water would be water used in the construction of pontoons in the casting basin, as well as water used to clean the casting basins prior to float out of the completed pontoons.

Stormwater would be generated from impervious surfaces at the site such as access roads, offices, parking areas, and laydown areas (Exhibit 2).

Surface Water

No Build Alternative

No construction would occur under the No Build Alternative, and there would be no operational effects on surface water resources.

CTC Facility

Construction of pontoons at the CTC site is not expected to result in any new effects on Blair and Hylebos Waterways or Commencement Bay because the operation would be required to comply with the current NPDES permit conditions, and the expected conditions of the renewed permit, for this site. These permit conditions would require any stormwater discharge to meet water quality criteria intended to prevent the discharge of contaminated stormwater to the Blair Waterway and Commencement Bay.

Anderson & Middleton Alternative

Operational effects (those occurring during the defined period of time that the basin is producing pontoons) could occur from the production and discharge of process water and stormwater from this site. However, as discussed above, stormwater would be treated using approximately six wet ponds. These wet ponds would be located within the water treatment area of the Anderson & Middleton site (Exhibit 2). Furthermore, by directly discharging the treated stormwater to Grays Harbor, there would be no flow effects on any local streams or rivers.

Process water would be regulated by the Sand and Gravel Permit that requires treatment for TSS removal and pH control, similar to elevated pH water that can result from concrete construction as described in the construction effects section above. Process water treatment would involve adding a flocculant to remove suspended sediments, and carbon dioxide sparging for pH neutralization. Online monitoring would be used to determine whether or not these treatments are necessary in order to meet state limits for TSS and pH for discharging this material to marine-receiving environments.

Aberdeen Log Yard Alternative

Operational effects (those occurring during the defined period of time that the basin is producing pontoons) could occur from the production and discharge of process water and stormwater from the Aberdeen Log Yard. Stormwater would be treated using approximately 9 wet ponds. These wet ponds would be located within the water treatment area for the Aberdeen Log Yard site (Exhibit 2). With a direct discharge of treated stormwater to Grays Harbor, there would be no flow effects on any local streams or rivers.

Process water would be treated for TSS removal and pH control, similar to elevated pH water that can result from concrete construction as described in the construction impacts section above. Process water treatment would involve adding a flocculant to remove suspended sediments and carbon dioxide sparging for pH neutralization. Online monitoring would be used to determine whether or not these treatments are necessary in order to meet state limits for TSS and pH for discharging this material to marine-receiving environments.

Groundwater

Operation effects on groundwater would result from any dewatering required to maintain casting basin integrity during pontoon construction and storage.

No Build Alternative

No construction would occur under the No Build Alternative, and there would be no operational effects on groundwater resources.

CTC Facility

Based on the complete build-out at the CTC site, there would be no operational effects on groundwater at this site from constructing any pontoons for this project.

Grays Harbor Build Alternatives

Effects on groundwater from dewatering would be the same as identified in the construction effects section above for both Grays Harbor build alternatives, but would continue longer during the operation period.

How would the project affect water resources in the long term?

For this project, long-term effects are the effects of the new casting basin and Operational Support Facilities remaining in place after pontoon

production is complete and effects associated with mitigation features expected to remain after construction.

Surface Water

No Build Alternative

There would be no additional long-term effects on surface waters under the No Build Alternative.

CTC Facility

Long-term effects on surface water resources at the CTC site would be unchanged from current conditions. With no planned construction or change in operations and with this site operating under the conditions of an individual stormwater NPDES permit, there would be no difference to the quality of the discharge than what the surface waters are currently receiving.

Grays Harbor Build Alternatives

Long-term effects from operation and maintenance of the Anderson & Middleton site and Aberdeen Log Yard sites would be minimal. Overall quality of treated stormwater would be the same compared to stormwater discharged from the site or improved due to proposed treatment. The existing stormwater system drains each site and channels this discharge to the same receiving environment (Grays Harbor), and the proposed improvements would function during operation and long-term maintenance.

Current plans for long-term storage and maintenance of the site post-operation are for the casting basins to be left dry. Consequently, any water flowing out of the casting basins during this period would be considered process water and would continue to be discharged under the conditions of the NPDES permit. The flocculant/sparging treatment system for process water would consistently produce higher-quality discharges, leading to a slight improvement in surface conditions in the nearshore area.

Groundwater

No Build Alternative

There would be no long-term effects to groundwater under the No Build Alternative.

CTC Facility

No long-term effects on the CTC site groundwater resources are expected from the proposed project, because there are no proposed project activities (such as dewatering) at this site that could affect groundwater.

Grays Harbor Build Alternatives

Long-term effects from the continued groundwater dewatering at both the Anderson & Middleton site and Aberdeen Log Yard site alternatives could result in settling and compaction of site soils. However, the general input of groundwater to Grays Harbor would be relatively unaffected by the proposed project. This is because the amount of groundwater at these sites is small relative to the overall groundwater movement in the area. The groundwater removed by long-term dewatering could either be re-injected into the local aquifer or discharged directly to Grays Harbor.

How would the alternatives compare in their effects on water resources?

The effects of constructing, operating, and maintaining either the Anderson & Middleton site or the Aberdeen Log Yard site alternatives would be similar, because both alternatives include: (1) use of the CTC facility, (2) construction and operation of basic stormwater treatment facilities, (3) construction and operation of process water treatment facilities, and (4) dewatering of site groundwater with the formation of a similarly shaped, but differently sized zone of dewatering influence. While the volumes of water between the two sites for dewatering are different along with the expanse of the zone of dewatering influence, the direct discharge of these waters to Grays Harbor would offset any differences.

The No Build Alternative would contrast with the Build Alternatives because no construction or operation would occur under this alternative.

4. Mitigation

What measures does WSDOT propose to reduce project negative effects?

The measures described above for surface water effects would ensure that the proposed project complies with the applicable federal, state, and local regulations. These measures consist of the following:

- Stormwater treatment
- Process water treatment
- TESC
- SWPPP
- SPCC
- Construction BMPs
- Concrete containment and disposal

As such, there would be no further mitigation requirements for effects to surface waters for the proposed project.

For groundwater, mitigation measures are currently being considered, such as recharge of dewatering discharge or installation of a groundwater cutoff wall along the northern edge of the site to curb expansion of the zone of dewatering influence beyond the site boundaries. Recharge of dewatering discharge requires an injection system consisting of wells and/or trenches to convey discharge back into the groundwater system. Such systems are typically less expensive to install than cutoff wall technologies, but have longer-term maintenance and operations costs associated with additional power for pumping systems, regular injection well rehabilitation, and routine maintenance of the conveyance system (see Exhibit 12). The implementation of these measures would be determined during the detailed design phase and would depend on technical feasibility to achieve desired result at an appropriate cost.

How could WSDOT compensate for unavoidable negative effects?

Because there would be no unavoidable negative effects, there is no requirement to compensate for these types of effects.

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