Section 2.11 – Surface Water Runoff

WAC 463-60-215
Proposal – Surface water runoff.

The application shall describe how surface-water runoff and erosion are to be controlled during construction and operation to assure compliance with state water quality standards. The application shall describe in general detail the content of the construction and operational storm water pollution prevention plans that will be prepared prior to commencement of construction and/or operation of the facility.

(Statutory Authority: RCW 80.50.040 (1) and (12). 04-21-013, amended and recodified as § 463-60-215, filed 10/11/04, effective 11/11/04. Statutory Authority: RCW 80.50.040(1) and Chapter 80.50 RCW. 81-21-006 (Order 81-5), § 463-42-215, filed 10/8/81. Formerly WAC 463-42-330.)

Section 2.11 Surface Water Runoff

2.11.1 Stormwater Erosion Control during Construction

Managing construction stormwater to reduce the discharge of contaminated stormwater runoff requires implementing specific procedures on site before construction activities begin. Additionally, monitoring, maintaining, and overseeing erosion control practices are necessary to ensure strict compliance. Site-specific erosion control plans and a comprehensive stormwater pollution prevention plan (SWPPP) will be submitted to EFSEC before construction.

A preliminary SWPPP is attached as Appendix C. The plan includes a preliminary site-specific erosion and sediment control plan, construction best management practices (BMPs), and construction phase enforcement procedures.

A final SWPPP, which will be submitted to EFSEC prior to construction, will meet the requirements of the NPDES Industrial Permit and State Construction Stormwater General Permit and reflect final construction plans. The final plan also will include provisions for permanent stormwater management as discussed further in section 2.11.2. Once completed and submitted to EFSEC, the implementation of the construction BMPs is the responsibility of the contractor, supervised by the Applicant's resident inspector, and enforced by EFSEC.

Site Construction

Site-specific BMPs for temporary erosion and sediment control are identified in the SWPPP and erosion and sediment control plans. BMPs have been selected from the Stormwater Manual and will comply with the permit issued for the project by EFSEC.

Construction activities will be sequenced and controlled to limit erosion. Clearing, excavation, and grading will be limited to the areas necessary to construct the project. Interim surface protection measures, including dust control, straw matting, and erosion control blankets, will be required to prevent erosion. Final surface restoration will be completed within 14 days of the area's final disturbance.

Sediment control measures used throughout construction will be designed based on a 10-year design storm. Water quality measures (other than sediment removal) will be based on the 6-month, 24-hour design storm. All construction practices will emphasize erosion control over sediment control. Temporary cutoff swales and ditches will be installed to route stormwater to the appropriate sediment trap and discharge location. A summary of construction-related BMPs is provided below.

Table 2.11-1. Construction Source Control BMPs

BMP Devices	Area 200 Unloading & Office	Area 300 Storage	Dock Area 400 Marine Terminal	Pipeline Alignment Area 500 Transfer Pipelines	Area 600 West Boiler	Rail Infrastructure
Silt Fencing	X	X	X	X	X	X
High Visibility Fencing	X	X		X		
Sediment Pond	X	X				

BMP Devices	Area 200 Unloading & Office	Area 300 Storage	Dock Area 400 Marine Terminal	Pipeline Alignment Area 500 Transfer Pipelines	Area 600 West Boiler	Rail Infrastructure
Straw Wattles		X	X	X		
Inlet Protection	X	X	X	X	X	X
Stabilized Construction Entrance	X	X			X	
Temporary Seeding/Mulching		X	X	X	X	
Concrete Washout	X	X				
SWPPP	X	X	X	X	X	X

Water of hydrostatic testing be obtained from the City or Port systems and will be discharged through the onsite stormwater treatment systems for disposal through the existing stormwater systems. Water used for flushing and hydrostatic testing will be tested and treated to removal chlorination of other constituents if necessary prior to its discharge to ensure compliance with discharge limits. Testing water will be released at a controlled rate from onsite storage facilities and monitored to ensure safe conveyance through downstream system.

2.11.2 Permanent Stormwater Management

Existing land cover on the site is primarily gravel or compacted fill material. Vegetation on the site is sparse and is generally limited to short (6 to 8 inches) herbaceous plant material. No wetlands or wetland vegetation are present on the site. The total combined site area comprises approximately 41.5 acres, and the developed impervious area is estimated to be 38.2 acres.

The Port receives approximately 38.9 inches of rain per year measured at the Simmons Rain Gauge located at 16001 N. Simmons Road in Portland, Oregon and maintained by the City of Portland Bureau of Environmental Services as reported by the USGS Oregon Water Science Center. The Ecology stormwater manual requires stormwater to be designed assuming rainfall patterns follow a Type I-A distribution. Permanent stormwater management and compliance with City and Ecology standards require construction of storm drain systems to collect and treat stormwater.

The Facility's new development and redevelopment will comply with VMC Section 14.25 and will be regulated by the City's January 17, 2007 NPDES Western Washington Phase II Municipal Stormwater Permit and the mandatory provisions it incorporates from the 2012 edition of the Ecology stormwater manual. The following table summarizes changes to land coverage resulting from this project.

Table 2.11-2. Drainage Basin Areas

	On-site Drainage Areas				Off-site Drainage Areas	
	Existing Impervious Surface	Replaced or Maintained Impervious Surface	Separated Impervious Roof Runoff	Impervious Surface Converted to Landscaping	Impervious Surface Contributing to Project Drainage System	Replaced Impervious Surface
Area 200 Unloading and Office	8.65 ac	4.07 ac	4.21 ac	0.37 ac	0.06 ac	-
Area 300 Storage	20.85 ac	12.84 ac	6.39 ac	1.62 ac	-	0.17 ac
Area 400 Marine Terminal	1.00 ac	0.90 ac	0.03 ac	0.07 ac	0.08	-
Area 500 Transfer Pipelines	4.47 ac	4.47 ac	-	-	-	-
Area 600 West Boiler	0.46 ac	0.16 ac	0.15 ac	0.15 ac	0.04 ac	-
Rail Infrastructure	4.63 ac	4.63 ac				
Total	**2.21 ac**	**27.07 ac**	**10.78 ac**	**2.21 ac**	**0.18 ac**	**0.17 ac**

The land-disturbing activity that will be carried out by the project will exceed the regulatory threshold of the City's NPDES Phase II permit for application of the standards for water quality treatment. Therefore, minimum requirements 1 through 9 of the Ecology stormwater manual apply to the project. A detailed discussion of compliance with all minimum requirements is attached in the stormwater report in Appendix F.

The project therefore will require compliance with the following standards and regulations.

- Ecology Stormwater Manual
- City of Vancouver Municipal Code (VMC)VMC 14.24, 14.25 and 14.26
- City Surface Water General Requirements (revised September 2009)
- Port Industrial General Stormwater Permit
- Port Municipal Phase II General Stormwater Permit
- 40 CFR 112

The project requires compliance with all nine of the minimum requirements set forth in the Ecology stormwater manual.

2.11.2.1 Source Control BMPs

Operational and structural source control BMPs are designed to exceed the requirements of Chapter 2, Volume IV of the Ecology stormwater manual. Onsite operations, including unloading, pumping, transfer, and storage of crude oil and miscellaneous materials, are conducted in covered facilities designed to keep stormwater from entering the structures and mixing with industrial activities. Transfer of crude oil at the dock is completed with a closed piping system where oil transfer will not be exposed to stormwater. To the maximum extent possible, all industrial activities are protected from stormwater.

Secondary structural containment measures are in place; they consist of rail drip pans along the unloading terminal, double bottom tanks with in situ monitoring for the tank farm, and an impervious lined berm that surrounds the tank farm and is sized to exceed the storage requirements of 110 percent of the largest tank plus a 100-year rainfall event. Secondary containment system at the rail unloading building are conveyed to double-walled storage tanks

located near the office building where the contents will be hauled offsite to permitted disposal or recycling facility. A series of manually controlled pumps that discharge to hydrodynamic separators, oil water separators, and water quality filter vaults evacuate the stormwater contained within the tank farm berm. During storm events, the pumps are manual on, automatic off. Each time, the pumps must be turned on manually, with the manual on switch located where visual inspection for oil sheen is required.

Parking and access areas are designed with a combination of catch basin filters and filter vaults to treat stormwater runoff. Filter vaults are designed to include an oil-water separating baffle for added protection from miscellaneous oil drips.

Maintenance, including equipment and parts wash, will be conducted in a covered portion of the rail unloading building. All wastewater produced will be pumped to the secondary containment tanks.

Spill containment measures along the pipeline alignment (Area 500) will comply with 40 CFR 112.7 by providing secondary containment, inspections, and contingency planning. The most likely spill event is small drips resulting from nicks, corrosion pinholes, or gasket seal failures resulting in discharges less than 5 gallons. An example of secondary containment that can address these discharges is to confirm or retrofit all stormwater inlets within the contributory drainage area of the pipeline alignment with spill control devices to contain small oil leaks or spills.

2.11.2.2 Operational Source Control BMPs

In addition, containment drip pans and other containment measures will supplement the structural source control BMPs. A comprehensive site-specific spill prevention control and countermeasures (SPCC) plan will be developed in accordance with 40 CFR 112; a preliminary outline of the SPCC plan is attached as Appendix B.2.

Table 2.11-3. Applicable Structural Source Control & Operational BMPs

Subbasin No.	S411 Landscaping and Lawn/Vegetation Management	S412 – Loading & Unloading Areas	S415 – Maintenance of Public & Private Utility Corridors & Facilities	S417 – Maintenance of Stormwater Drainage & Treatment Systems	S421 – Parking & Storage of Vehicles and Equipment	S422 – Railroad Yards	S425 – Soil Erosion & Sediment Control at Industrial Sites	S426 – Spills of Oil & Hazardous Substances	S427 Storage of Liquids in Permanent Aboveground Tanks	S431 Washing & Steam Cleaning of Vehicles/Equipment/Building Structures
Area 200 Administrative and Support Buildings	X	X	X	X	X			X	X	
Area 200 Rail Offloading Area		X	X	X		X	X	X		X
Area 300 Containment Berm	X			X			X	X	X	
Area 300 & 700 Support Buildings & Parking	X	X	X	X	X		X	X		
Area 400 Marine Terminal	X	X	X	X	X		X	X		

Subbasin No.	S411 Landscaping and Lawn/Vegetation Management	S412 – Loading & Unloading Areas	S415 – Maintenance of Public & Private Utility Corridors & Facilities	S417 – Maintenance of Stormwater Drainage & Treatment Systems	S421 – Parking & Storage of Vehicles and Equipment	S422 – Railroad Yards	S425 – Soil Erosion & Sediment Control at Industrial Sites	S426 – Spills of Oil & Hazardous Substances	S427 Storage of Liquids in Permanent Aboveground Tanks	S431 Washing & Steam Cleaning of Vehicles/Equipment/Building Structures
Area 500 Transfer Pipeline				X				X		
Area 600 West Boiler	X	X		X	X		X			
Rail Improvements				X		X	X	X		

2.11.2.3 Water Quality Treatment Analysis and Design

In accordance with the City's General Requirements, the Western Washington Hydrology Model (WWHM) with a continuous storm event was used to size the stormwater treatment system. Per the General Requirements, the water quality storm is the 6-month, 24-hour event, as estimated using the WWHM. A simplified model for each subbasin was developed in the WWHM 3.0 software. Water quality model results are included in the stormwater report in Appendix F. This estimated peak flow was used to size the stormwater treatment system.

2.11.2.4 Flow Control Analysis and Design

The project discharges to existing Columbia River outfalls through existing manmade conveyance pipelines. This project is categorically exempt from the flow control provisions of the stormwater manual. According to Appendix I-E of the manual, the Columbia River is listed as a flow control-exempt water body.

Conveyance pipelines and structures on site were sized for the 100-year storm to ensure safe conveyance. The pipeline running along the south side of the rail unloading building was additionally analyzed to ensure capacity to convey 1,000 gpm of water entering the system at the extreme west and east ends of the building from the fire suppression systems. Conveyance pipelines were designed using Manning's equation assuming that the pipelines are flowing at 75 percent of capacity. Grade of the proposed pipelines was determined assuming 2.5 feet per second using the 2-year storm event.

2.11.3 Permanent Waterways

All of the permanent surface water runoff will be collected, treated, and conveyed in permanent constructed conveyances from source to discharge. All conveyances constructed with this project will be inlets, pipelines, manholes, and vaults. No permanent above-grade surface waterways will be constructed with this project. Surface water runoff from the Storage Area will be treated to enhanced water quality standards and discharged to the existing Terminal 4 stormwater system. The capacity of the Terminal 4 stormwater system was sized to accommodate flows from the Storage Area assuming the entire Parcel 1A was impervious. Discharges will be conveyed through existing pipelines to an existing outfall to the Columbia River.

Discharges from Area 200, Area 600, rail improvements, and portions of Area 500 will be treated to basic levels and discharged to the existing Terminal 5 stormwater system. The Terminal 5 conveyance system flows through manmade conveyance to water quality ponds located west of Terminal 5 for final treatment prior to discharge through an existing outfall to the Columbia River.

Discharges from Area 400 will be treated and conveyed to existing infiltration swales located immediately north of the site. The MVCU, as proposed, may impact approximately 4 percent of the treatment capacity of the bio-swales located immediately south of the Subaru facility. These swales treat water from the 25-acre basin including Subaru, CalPortland, and Marine Terminal Area. To mitigate for loss of treatment capacity of the swale, a new filter strip located along the south side of the southernmost swales will be constructed and will treat stormwater from more than 4 percent of the total basin acreage. No additional stormwater will be infiltrated.

The remaining project, consisting of a portion of Area 500 along the old Gateway Avenue, is considered within the Port's general use area. Stormwater will be collected through existing inlets and a conveyance system and discharged into the Port's stormwater treatment systems at either Terminal 4 or Terminal 5 for treatment prior to discharge through existing outfalls to the Columbia River.

Upland construction activity will not affect any permanent waterways. Existing downstream conveyances, treatment systems and/or infiltration facilities are already receiving stormwater from the Facility areas. See Sections 3.3 and 3.4 for a detailed discussion of design and construction methodologies for dock improvements in relation to protecting and preserving natural waterways.