

## Section 2.6 – Water Supply System

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### WAC 463-60-165 Proposal – Water supply.

1) *Water intake and conveyance facilities. The application shall describe the location and type of water intakes, water lines, pipelines and water conveyance systems, and other associated facilities required for providing water to the energy facility for which certification is being requested.*

(2) *Water supply and usage alternatives. (a) The applicant shall consider water supply alternatives, including use of reclaimed water, water reuse projects, and conservation methods. The application shall describe all supply alternatives considered, including the associated cost of implementing such alternatives, and the resulting benefits and penalties that would be incurred. (b) The application shall include detailed information regarding using air cooling as an alternative to consumptive water use, including associated costs. (c) The application shall describe water conservation methods that will be used during construction and operation of the facility.*

(3) *Water rights and authorizations. An applicant proposing to use surface or groundwater for the facility shall describe the source and the amount of water required during construction and operation of the energy facility and shall do one or more of the following: (a) Submit a water use authorization or a contractual right to use water supplied by a municipal corporation or other water purveyor; or (b) Submit a water right permit or water right certificate issued by the department of ecology for the proposed facility in an amount sufficient to meet the need of the facility. If the permit and/or certificate has been issued five years prior to the submittal date, the applicant shall provide evidence that the water right permit is in good standing, or that the certificate has not relinquished through nonuse; or (c) For applications for new surface or groundwater withdrawals, or applications for water right changes or transfers of existing rights or certificates for withdrawal, the applicant shall submit appropriate application(s) for such rights, certificates or changes in rights and certificates, to the department of ecology prior to submittal of the application for site certification to the council. The application for site certification shall include report(s) of examination, identifying the water rights, or water right changes, submitted to and under review by the department of ecology, the quantities of water in gallons per minute and acre feet per year that are eligible for change, together with any limitations on use, including time of year. The report(s) of examination shall also include comments by the Washington state department of fish and wildlife with respect to the proposed water right applications under review by the department of ecology. (d) Mitigation. The application shall contain a description of mitigation proposed for water*

*supply, and shall include any and all mitigation required by the department of ecology pursuant to the review of water rights or certificates, or changes to water rights or certificates required in (c) of this subsection.*

*(Statutory Authority: RCW 80.50.040 (1) and (12). 04-21-013, amended and recodified as § 463-60-165, filed 10/11/04, effective 11/11/04. Statutory Authority: RCW 80.50.040(1). 92-09-013, § 463-42-165, filed 4/2/92, effective 5/3/92. Statutory Authority: RCW 80.50.040(1) and Chapter 80.50 RCW. 81-21-006 (Order 81-5), § 463-42-165, filed 10/8/81. Formerly WAC 463-42-400.)*

## **Section 2.6 Water Supply System**

The Facility will require potable water for domestic purposes, process water, and emergency fire suppression water. All water required for the Facility is proposed to be obtained from the City's water utility. The Facility will connect to the City's existing water distribution network and construct necessary water service connections.

### **2.6.1 Water Intake and Conveyance Facilities**

The City's existing water distribution facilities are adjacent to or located on the site. The Facility's water service will be connected to the City's existing distribution network in accordance with the City's water design and construction requirements. Necessary water metering and cross-connection control will be installed at each of the connection locations between the on-site water facilities and the public water distribution system. Multiple water service connections will be constructed because of the multiple discontinuous areas that are part of the project.

The project will not require the development of new water sources. The City currently has water rights for 108 million gallons per day (mgd) and has developed supply capacity (without storage) of 80.6 MGD. The City's water supply is obtained entirely from groundwater sources using 40 existing wells spread across 72 square miles. Online system storage includes approximately 24.5 million gallons which equates to roughly 11 hours of maximum day demand. Current peak demand is approximately 55 mgd (Tyler Clary, City of Vancouver, Personal Communications, August 12). The City has provided a letter confirming that its supply and distribution system has sufficient capacity to accommodate the project. The letter is included in Appendix E.

### **2.6.2 Water Supply and Usage Alternatives**

A brief review of available water supplies compared the City's and the Port's water systems. Both provide potable-quality water. Both obtain water from local aquifers, provide water treatment, and have storage facilities. However, the Applicant selected the City as the water supplier for the project. The City's system provides source supply, storage, and distribution system redundancy. A portion of the City's water system is shown in Figure 2.6-1.

Water reuse is included with the water treatment system and package boiler units described in section 2.6.4. The boiler plants proposed consist of a closed loop system in which a maximum 10 percent of the total boiler water is blowdown or lost to the atmosphere during condensation; the remaining 90 percent is reused in each steam cycle. The possibility of reusing treated wastewater from the City's Westside Wastewater Treatment Plant (WWTP) located approximately 1 mile east of Area 300 for the required process water was investigated. But because of the need for significant off-site pipeline improvements and additional water treatment to provide suitable process water, this possibility was determined to be infeasible.



**Legend**

- Transmission Mains
- Distribution Mains



**Figure 2.6-1. Water Transmission Mains**

### **2.6.3 Water Rights and Authorizations**

The Facility is not requesting new water rights or authorizations. All water will be acquired from the City water utility. Anticipated annual water use is estimated to be 22 million gallons with a maximum daily water use of 87,400 gallons per day (gpd). A request for utility services was submitted to the City for the Facility. The City indicated in a response letter attached in Appendix E that the City has sufficient supply and distribution system capacity for the proposal.

Construction of the Facility is expected to utilize two 10,000-gallon water trucks per day for a total of 20,000 gallons each day. Testing and commissioning the pipelines, tanks, and water lines will require additional water for pipeline flushing and hydrostatic testing. Testing and commissioning the transfer pipelines and storage tanks will be sequenced to reuse as much testing water as possible on site. Assuming no water reuse, testing and commissioning will require a total of 98.4 million gallons of water. With reuse, a total of 20 million gallons of water is expected to be required for testing and commissioning.

### **2.6.4 Process Water**

Process Industrial processes at the Facility are limited to the transfer and storage of crude oil. Process water for the Facility is limited to the boiler plants, miscellaneous part and equipment wash, and cooling water for the fire suppression pumps.

Two boiler plants, one each in Area 300 and Area 600, will provide steam to heat crude oil within the rail cars and storage tanks. The majority of the process water will be maintained in a closed loop system. However, some process water for the boilers will be necessary for makeup water to replenish the equivalent of steam lost in the system, blowdown water, cooling water, and water treatment. Some steam is lost during the condensate process as the water is returned to the boiler. Blowdown water is used for flushing particulates from the boiler system. Cooling water is used at the outlet of the boiler for temperature pre-treatment. Cleaning water softener used to polish the boiler feed water requires occasional batches of backwash. The total of all process water for the boilers, including all sources of process water, is summarized in Table 2.6-1.

Inside the rail unloading area (Area 200), there is a process water line for the occasional use of a single pressure washer to clean miscellaneous piping fittings, work surfaces, and equipment. At a maximum, the pressure washer will be rated for 5 gallons per minute (gpm). Conservative water use estimates for the miscellaneous part/equipment wash is included in Table 2.6-1.

The Rail Unloading Area, Storage Tanks, and Marine Terminal Areas are protected with emergency fire pumps. The fire pumps selected for this project require a heat exchanger and cooling water supply to maintain operational engine temperatures. A maximum 35 gpm of cooling water supply is required each week for the required 30-minute maintenance cycling. Once a year fire pump flow testing is additionally required. Fire pump cooling water for the maintenance cycling is included in Table 2.6-1.

**Table 2.6-1. Process Water Uses and Rates**

<b>Industrial Process</b>	<b>Average Water Use (gpd)</b>	<b>Maximum Water Use (gpd)</b>
Area 200		
– Miscellaneous Part/ Equipment Wash	2,400	5,000
– Fire Pump	100	200
Area 300		
– Boiler Building	3,000	3,700
– Fire Pump	100	200
Area 400 – Fire Pump	100	200
Area 600 – Boiler Building	48,400	69,600
<b>Total Process Water</b>	<b>54,100</b>	<b>78,900</b>

The anticipated maximum day process water demand is approximately 54.8 gpm. Process water will be isolated from the potable water using approved reduced pressure cross-connection control devices. The annual water usage will vary based on the density and viscosity of the raw crude oil, the volume of crude requiring heat and the ambient air temperatures, with lower ambient temperatures requiring higher water usage.

### **2.6.5 Potable Water**

Potable water for the Facility is limited to the amount needed to serve the Administrative and Support Buildings (Area 200), a single restroom inside the Boiler Building (Area 300), and landscape irrigation and will be used predominantly for general kitchen and restroom facilities. A water use consumption rate of 50 gallons per person per day was used for the average, with a 15 percent added for maximum flow. The water use rate of 50 gpd was determined following a review of the Ecology Criteria for Sewage Works Design (sewer design manual) and additional engineering judgment. The sewer design manual lists a maximum of 35 gpd for industrial factory sewer rates in Table G2-2 Design Basis for New Sewage Works. An additional 15 gpd were added because a larger proportion of employees will probably use washbasins and shower facilities.

A total worker population of 110 employees is assumed, with four using the restroom facility at Area 300. The remaining 106 employees are assumed to use the facilities located at the Administrative and Support Building portion of Area 200. Workers will be assigned to Area 400, the Marine Terminal area. Bottled water will be provided for those employees; only irrigation water is included as part of Area 400. Table 2.6-2 shows a breakdown of the potable water uses and rates.

**Table 2.6-2. Potable Water Uses and Rates**

<b>Potable Water Uses</b>	<b>Average Water Use (gpd)</b>	<b>Maximum Water Use (gpd)</b>
Area 200 – Administrative and Support Buildings	5,300	6,100
Area 300 – Storage Boiler Building Restroom	200	200
Landscaping Irrigation	1,500	2,200
<b>Total Potable Water</b>	<b>7,000</b>	<b>8,500</b>

The maximum daily potable water demand is equivalent to the need for 6 gpm. Potable water use will be isolated from non-potable process water using approved double check cross-connection control devices. The annual water usage will vary based on ambient air temperatures and rainfall, with lower ambient temperatures and higher rainfall requiring less irrigation water usage.

### **2.6.6 Mitigation Measures**

Mitigation measures for the water supply consist of the monetary contribution required by the City for water connections and new services. Service connection fees, system development charges, and industrial water use billing will be paid to the City. Connection fees and system development charges paid at the time of building permit application and application for water service is compensatory mitigation paid to the City for the long-term impacts to water rights, source development, system storage, and distribution piping.

The connection to the City water supply system will be made consistent with standard specifications adopted by the City. Backflow devices will be tested yearly per State requirements.