



Water Supply, Wastewater, and Stormwater Management Options for Washington Wineries



Optimal management of water is one of the top environmental decisions wineries can make. Implementing water-use efficiency measures and sound process wastewater and stormwater management are the cornerstones of a sustainable water cycle at wineries. Developing sustainable management practices for your facility will involve reviewing best management practices developed throughout the industry as well as creating your own.

Sustainability means making choices that require more rigorous management efforts than simply meeting regulatory thresholds. The State Environmental Policy Act (SEPA) process provides a way to identify possible environmental impacts that may result from a proposed winery project. Outlined below are the minimum water use, wastewater, and stormwater regulatory requirements, along with additional suggested actions for sustainable water and wastewater management.

Water Supply Options

Below are options for obtaining water for wineries. Some of these will be available in your area and some will not.

Purchase water from a municipal water supplier

This is usually the simplest and most reliable way to obtain water. The water supplier is then responsible for meeting state Department of Health water supply quality requirements and having a water right. Ready municipal supply in many areas and ease of starting water use can make this an attractive option.

Use a groundwater well (less than 5,000 gallons per day)

An on-site groundwater well may be a good supply source in some situations. A facility using less than 5,000 gallons per day of groundwater may use the water under the exempt well clause in the state water law provided that the groundwater use will occur in a watershed that has not been closed to further groundwater withdrawals without mitigation. Contact your nearest Department of Ecology (Ecology) regional office for information. See: [Groundwater water right permit exemption](http://www.ecy.wa.gov/programs/wr/comp_enforce/gwpe.html)¹

¹ http://www.ecy.wa.gov/programs/wr/comp_enforce/gwpe.html

A winery withdrawing more than 5,000 gallons per day of groundwater must obtain a water right unless a valid water right permit or certificate already exists. See next item.

Use surface water or groundwater (more than 5,000 gallons per day)

A winery using any surface water or more than 5,000 gallons per day of groundwater must obtain a water right unless a valid water right permit or certificate already exists. Obtaining water rights can be a long-term process, particularly in much of Eastern Washington. Some areas may already be fully appropriated—meaning that no new water rights are available.

- If you do need a water right, information is available from Ecology Water Resources Program and this website. [Water right information](#)²
- The following website provides a summary of water availability in different parts of the state. [Water Availability in your Watershed](#)³

Buy and transfer water from someone with an existing water right

In some limited cases, there may be a nearby water user interested in selling water or a water right. Ask Ecology staff or your local realtor for information.

Collect and use rainwater from the rooftops

A water right is not required for rooftop rainwater harvesting. Once you have collected the rainwater there are no limitations on its use provided it is used onsite only. However, given the lack of rainfall in Eastern Washington, the economics of rainwater collection may not pencil out or will work only during a portion of the year. Water collected from paving or other non-rooftop areas requires a water right before use. See: [Rainwater Collection](#)⁴

Improved water efficiency

Within your own facility, there may be ways to save water (and money) using barrel washers; low-volume spray nozzles; reusing process or cleaning water; use of drought tolerant outdoor landscaping; and other methods. The Washington Association of Wine Grape Growers prepared WineryWise checklists that can walk you through some of these options. Free technical, non-regulatory assistance is also available. See: [Technical Assistance for Industries](#)⁵

Although there are a variety of ways to obtain a water supply—remember, in your area, some *may* or *may not* be available. You should carefully consider this in your site selection.

For more water supply information
Contact Ecology's Water Resources staff in your region to get additional information. [Department of Ecology Regional Offices](#)¹

² <http://www.ecy.wa.gov/programs/wr/rights/water-right-home.html#HowDoI>

³ http://www.ecy.wa.gov/programs/wr/rights/wrpenapp_avail.html

⁴ <http://www.ecy.wa.gov/programs/wr/hq/rwh.html>

⁵ <http://www.ecy.wa.gov/tree/index.html>

Process Wastewater Management

Obtaining an industrial wastewater permit

All wineries planning to discharge to surface or groundwaters must apply for an industrial wastewater permit. Wastewater permit applications for wineries submitted to Ecology are dealt with on a case-by-case basis. It is necessary for all wineries to contact the appropriate Ecology regional office (see below) to get further information about permit requirements and to discuss possible treatment options.

When wineries plan to discharge wastewater to a municipal wastewater treatment plant, they must notify the treatment plant prior to initiating discharges of wastewater to the sewer. The high strength and fluctuating discharge rate of a winery have the potential to cause difficulties with treatment plant operations. Some form of flow equalization and reduction in strength before discharging to the sewer may be required. Thus, wineries should contact their municipal wastewater treatment provider to understand any required pretreatment steps prior to discharging into the collection system.



Treatment and Discharge Options

The regulatory options for treating wastewater may not always be clear to new or expanding wineries. Winery wastewater treatment must effectively remove dissolved sugars and related organic compounds. Microorganisms require oxygen to break down sugars and other organic molecules. This oxygen consumption is called soluble biochemical oxygen demand (sBOD). Winery process wastewater that is treated and discharged must meet regulatory discharge requirements for all parameters, including sBOD. Total biochemical oxygen demand may also be considered in instances where substantial non-soluble to soluble conversion may occur over time, such as influents to storage lagoons.

Depending on the volume and characteristics of the winery process wastewater, Ecology may approve the following treatment and discharge options:

1. Trucking or piping the winery wastewater to a municipal sanitary treatment facility.
2. Operation of an on-site wastewater treatment system that includes discharging via
 - a. Crop irrigation
 - b. Evaporation
 - c. Trucking or piping of treated water to a municipal sanitary system

Ecology will generally *not* approve releasing winery wastewater to any septic tank system. Winery wastewater does not receive adequate treatment in a septic system. Drain fields associated with septic tanks generally plug quickly due to the high load of solids in the wastewater. The acidic nature of winery wastewater, its high soluble oxygen demand, and its low phosphorus and nitrogen content do not support a microbial population that can adequately digest sugars and other organics in a septic system or drain field. Regulations preclude the use of septic tanks and drain fields for treatment of industrial wastewaters.

Ideas for Sustainable Wastewater Management

Evaluate your options every three to five years

It is important for a winery to rigorously review its wastewater management options every few years. The winery's growth, plus technological and regulatory changes over time, can result in the need to revise and improve wastewater management practices.

Consider beneficial use options for process wastewater

Process wastewater is suitable for a beneficial use when treated adequately and reliably. New wastewater treatment technologies may be applicable to your winery. Various types of bioreactors (treatment systems that use microorganisms) including membrane bioreactors and activated sludge systems can be used for wastewater flows as low as 3,000 gallons per day.



Consider evaporation as a generally less desirable option in the sustainability ladder

The best outcome for wastewater is its ultimate beneficial use, rather than its evaporation. However, there are situations where evaporation may be the best available option. Please note, if you build evaporative lagoons, Ecology must approve engineering and design specifications. In addition, you must line all lagoons with a synthetic liner such as high-density polyethylene. Since it is common for liners to leak, groundwater monitoring wells will likely be required for single-lined lagoons to insure that they do not degrade the groundwater beneath the site. Groundwater monitoring wells may not be required for a double-lined lagoon with a leak-detection system. The appropriate Ecology Water Quality Program regional office will help you determine the requirements that pertain to your facility.

Consider the cleaning and sanitation chemical load in the wastewater

Review the quantity and compatibility of the cleaning and sanitation chemicals used within the facility when evaluating wastewater management options. Consider using “lean” techniques such as value stream mapping to review cleaning and sanitation procedures to ensure that you are using the most appropriate chemical, in the right amount, at every stage of the process.

Weigh the pros and cons of land application carefully

Land application of winery wastewater for crop irrigation is an option, particularly in central and eastern Washington. It can be successful with adequate planning and monitoring. Yet, land application may open wineries to liability if degradation of soil and groundwater resources results.

The main requirement for all land application treatment systems is that you do *not* apply wastewater in an amount that exceeds the agronomic rate for the crop. Additionally, treatment of the wastewater, such as solids screening, prior to land application may be necessary.



Parameters of concern for land application and treatment of wastewater include total dissolved solids (TDS), pH, and soluble biochemical oxygen demand (sBOD). You must not exceed the site-specific groundwater standard for TDS. The chosen crop must be tolerant to the pH of the wastewater. Consult with the Ecology regional office on what the acceptable sBOD loading is for your location. Ecology generally requires a lined storage impoundment to store the wastewater during the non-growing season.

Other considerations for land application (treatment) systems:

1. Excessive sBOD loading can cause soils to become anaerobic inducing the release of metals into the groundwater that were previously held in the soil and rock matrix. In this way, soluble complexes of iron⁶ and arsenic⁷ can contaminate the groundwater. For instance, Bird's Eye[®] and Coca-Cola in Michigan⁸ became involved in litigation due to land application practices that occurred years before. In Washington, a similar case in the early 1990s settled for \$1.5 million dollars⁹.
2. A sufficient amount of storage capacity must be provided so that land application does not occur when the soil is saturated or frozen.
3. A sound land application system design must account for the location and soil type, available acreage, topography, crop nutrient and water uptake rates, and the quality and quantity of the wastewater that is produced. Refer to: [Guidance for designing a land treatment system](#) and [Irrigation Management Practices to Protect Ground Water and Surface Water Quality State of Washington](#)¹⁰. Alternatively, review WAC 173-240 for general guidance.
4. It will be necessary to keep written records of the quality and quantity (gallons/day) of winery process wastewater that is land-applied, the location of each application, the low temperature, and total precipitation during application. Wastewater parameters to record include: concentration (mg/L) of TDS, sBOD, pH, temperature, nitrate nitrogen and total Kjeldahl nitrogen (TKN).
5. Refer to Ecology's guidance for preparing engineering reports for land treatment systems: [Guidelines for Preparation of Engineering Reports for Industrial Wastewater for Land Application Systems](#)¹¹.

Contact your Water Quality Program regional office for more information or for case-specific treatment design guidance: www.ecy.wa.gov/programs/wq/wtp/rgnoffice.html.

Free assistance from soil scientists is available through the Natural Resources Conservation Service and the local conservation districts. To find the office in your area go to: <http://offices.sc.egov.usda.gov/locator/app>.

A cautionary note: The Soil Conservation Service does not focus on the issue of groundwater protection. An opportunity exists for the industry, technical assistance providers, and regulatory agencies to organize and work on land treatment issues specific to the wine making industry.

⁶ Johnston, R.B. and Singer, P. C., *Solubility of Simple site (Ferrous Arsenate): Implications for Reduced Groundwater and Other Geochemical Environments* in *Soil Science Society of America Journal*, vol. 71, January-February, 2007

⁷ Welsh, A.H. November 20-23, 2001 *Arsenic Cycling in Groundwater in Arsenic in the Asia-Pacific Region*, Adelaide, Australia, p. 89-90

⁸ Rust in the water has property owners upset: Cases around U.S. include Erin Brockovich lawsuit against Birds Eye[®] (Published by MSNBC on August 20, 2009) www.msnbc.msn.com/id/32491852/ns/us_news-environment/. Other reports of a related case can be found at: www.mlive.com/news/kalamazoo/index.ssf/2009/09/some_paw_paw_residents_unhappy.html, and http://www.mlive.com/business/west-michigan/index.ssf/2010/04/paw_paw_residents_sue_coke_ove.html

⁹ *Situations in Eastern Washington Involving Wastewater Treatment* in *Sunrise Review of Soil Scientists*, WA Department of Licensing, December 2005, pages 14-16.

¹⁰ www.ecy.wa.gov/programs/wq/wastewater/landtreatmentfactsheet.pdf & <http://cru.cahe.wsu.edu/CEPublications/em4885/em4885.pdf>

¹¹ www.ecy.wa.gov/biblio/9336.html

Stormwater Management

Stormwater is water that flows across the ground when it rains or when snow and ice melt. Stormwater can be a significant cause of degradation to surface waters. If stormwater from a facility is leaving or has the potential to leave the site, coverage under Ecology's Industrial Stormwater General Permit may be required. If you keep stormwater onsite or industrial activities all occur indoors, the winery may qualify to opt out of this permit requirement. *Many small wineries can manage site operations to opt out of the stormwater permit.*

Typically, at a winery, exposure of the winemaking process to precipitation does not occur with the exception of at the crush pad. While in use, you should divert crush pad runoff to the process wastewater treatment system.



You should *never* allow process wastewater or any other waste to drain into the stormwater systems. They usually drain directly to lakes, rivers, and streams that support fish and wildlife. Storm drains originate in the street, parking lots, and lawn areas and the metal grates, underground pipes, city ditch systems, and pipes under driveways are common parts of stormwater drain systems. Wastes, like soap and barrel rinses, are strong organic wastes and harmful to aquatic life. State law allows fines for polluting streams. Cities and counties regulate discharges to their storm drains and may assess fines or other penalties to individuals or businesses that dump or direct non-stormwater (including winery wastes and by-products) to the storm drain system.

For further stormwater management information:
www.ecy.wa.gov/programs/wq/stormwater/index.html

If you need this document in a format for the visually impaired, call 360-407-6764. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.