

Waldport Drinking Water Protection Plan: Risk Identification and Prioritization

The vulnerability of a drinking water source to contamination may be related to natural conditions as well as the land uses and activities occurring in the watershed. Identifying and prioritizing potential risks will form the foundation for developing strategies to protect drinking water quality.

Step 1: Our first step is to identify and describe these potential risks. In particular, we are trying to identify risks that are not included in the Updated 2016 Source Water Assessment (SWA) that may require additional information from DEQ, OHA, or other sources. Please provide input on the potential risk categories, risks, and descriptions in the tables. Table 1 describes potential risks to the North Fork Weist Creek, South Fork Weist Creek, and Eckman Creek watersheds. Please consider: Is the risk applicable to the City’s source water areas? Do the risk descriptions need any revisions? Are any risks missing?

Step 2: Risks can be prioritized based on the likelihood of their occurrence and the severity of their impacts to drinking water sources (e.g., water quality and water quantity impacts) and infrastructure. The approach used for scoring risks defines “likelihood” as the likelihood of the identified risk impacting the water source and causing the impacts described in the Description column of the table. “Impact” is defined as the severity of the impact of those risks if they were to affect the water source. Using a scale of 1-5, select ratings for each of these two aspects for each risk using the scale below.

Likelihood	Impact				
	Insignificant (1)	Minor (2)	Moderate (3)	Severe (4)	Catastrophic (5)
Rare/very unlikely (1)	Low	Low	Low	Low	Medium
Unlikely (2)	Low	Low	Medium	Medium	Medium
Possible (3)	Low	Medium	Medium	Medium	High
Likely (4)	Low	Medium	Medium	High	High
Almost certain (5)	Medium	Medium	High	High	High

Table 1. Risks to the North Fork Weist Creek, South Fork Weist Creek, and Eckman Creek Watersheds

Risk Category	Risk	Description	Likelihood Ranking	Impact Ranking	Risk Ranking
Natural Hazards	Drought and Low Streamflows	<p>The City’s drinking water source are relatively small, rain-fed creeks with limited natural storage. Drought or hot and dry conditions can reduce soil moisture and can impact vegetation, canopy density, and evapotranspiration dynamics that play a role in sustaining flows. Prolonged dry periods can greatly reduce baseflow in these creeks, threatening the City’s ability to meet peak summer demand, and thereby increasing the potential need for water curtailment. Seasonal drought conditions are becoming increasingly frequent in Oregon coastal watersheds, and shifts in climate are expected to result in longer summer dry seasons.</p> <p>Lower streamflows have water quality impacts, including that they concentrate naturally occurring and anthropogenic pollutants, such as nutrients and pathogens, due to decreased dilution capacity. Lower flows may elevate stream temperatures, decreasing dissolved oxygen and increasing algal and bacterial growth, which further impacts source water quality.</p> <p>The City typically does not divert water 24/7 and it has up to 2.6 MG of treated water storage, which can help mitigate the impacts of low streamflows and drought conditions. The City does not project significant population growth and does not have large increases in demand due to seasonal tourism, reducing potential additional water demand.</p>	3	5	High

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	Wildfire	<p>A wildfire in the City's source water areas would likely strip vegetation from slopes, exposing soils and accelerating erosion. Post-fire runoff typically contains fine sediment, ash, heavy metals, nutrients, and elevated levels of total organic carbon, all of which degrade source water quality and increase water treatment challenges. In addition, burn areas can alter runoff patterns and reduce groundwater recharge, contributing to prolonged impacts beyond the fire season. Fire suppression chemicals may also enter the water system, depending on response activities.</p> <p>Human activity, particularly recreation and power lines, increase the probability of ignition. In 2022, several small fires occurred in the nearby Siuslaw National Forest, exemplifying the potential risk.</p>	3	5	High
	Earthquake	<p>Waldport is located within the Cascadia Subduction Zone, which is forecasted to produce a major seismic event in the next 50 years with up to a 37% probability. A major earthquake could damage intakes, pipelines, pump stations, or transmission lines. The City's intakes and associated infrastructure are particularly vulnerable to ground movement and soil liquefaction. In addition to direct infrastructure damage, earthquakes can trigger landslides, particularly on the steep, unstable slopes in the City's source water areas. These slides can introduce large volumes of sediment and debris into the streams, making the water too turbid to treat without significant intervention. Road access</p>	2	5	Medium

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		to the intakes and treatment plant may also be compromised, delaying response and repair.			
	Severe Storms	<p>While heavy winter rain and strong coastal storms are typical for Waldport, recent climate shifts have increased the frequency of short-duration, high-intensity storms that produce floods and debris flows. These events are particularly concerning in steep headwater areas, like the headwaters of North and South Fork Weist Creek.</p> <p>Runoff from severe storms often carries sediment, nutrients, and surface contaminants into the stream network, increasing turbidity and potentially overwhelming treatment systems. Ice storms and high winds may also cause tree mortality and fallen limbs that can damage power lines, disable intake pumps, and create hazardous conditions for field operations. While emergency power backup exists, prolonged outages may compromise water supply resilience.</p> <p>The City's operations and infrastructure are designed to withstand such conditions. For example, the City utilizes stored water during high turbidity events and windfall cleanup is a regular part of City operations. As a result, the impact of severe storms is relatively low.</p> <p>Severe storms may be a particular concern in combination with other risks, such as areas prone to landslides, locations of recent timber harvest, or burned areas.</p>	4	2	Medium
	Landslides (SWA)	Landslide areas with slope instability are present along North Fork Weist Creek, including next to the	2 (Weists) 3 (Eckman)	4 (Weists) 4 (Eckman)	Medium

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		<p>intake, and landslide deposits have been identified in the upper Eckman Creek watershed. A landslide in Eckman Creek is anticipated to be more likely to have an impact on water supply due to the greater size of the watershed compared to landslides occurring in the other source water areas.</p> <p>Landslides may block stream channels, disrupt intakes, and deliver large pulses of sediment that increase turbidity beyond treatable thresholds. In extreme cases, slope failures may also damage infrastructure or limit access for maintenance crews. Road cuts, timber harvest activities, and natural slope instability all increase the likelihood of surface and deep-seated landslides during heavy rainfall or seismic events.</p>			
	Highly Erodible Soils	<p>DEQ’s Revised Updated USWA identifies 100% of the City’s source water areas as having highly erodible soils within 300 feet of a stream, and a large portion has severe erosion potential. Erosion increases turbidity in creeks, which can impact the City’s ability to treat the water.</p> <p>The City’s water system operations and infrastructure are built to withstand high turbidity events. The City has the capacity to store up to 2.6 million gallons (MG) of water, which can meet demands during periods when turbidity increases to the point that the City needs to stop diverting water. High turbidity events typically last 48 hours or less. The City can also use more water</p>	5	2	Medium

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		treatment chemicals if needed, but the City typically avoids this due to the expense.			
	Turbidity (SWA)	<p>Heavy rainfall, landslides, or upstream disturbances can increase turbidity levels in source waters. Elevated turbidity may interfere with water treatment processes by clogging filters and increasing the need for additional chemicals. It can also indicate upstream erosion that could impact long-term water quality.</p> <p>As described under Highly Erodible Soils, the City's water system operations and infrastructure are built to withstand high turbidity events.</p>	5	2	Medium
	Riparian Invasive Species	Invasive plant species in riparian areas (e.g., knotweed and yellow flag iris) cause increased soil erosion and silting that impacts intakes and increases the need for more chemical water treatment.	1	3	Low
Forest Management	Clearcut Harvest (SWA)	Clearcut harvest in the City's source water areas may increase erosion and sediment delivery to creeks that could increase turbidity and may alter flow regimes. Specific impacts to the soil, such as moisture retention and sediment transport, depend on the location of the clearcut and the harvesting practices used. Other factors affecting the level of impact include elevation, slope steepness, and the direction of the slope. Streamflow impacts also vary depending on the season, characteristics of the given location, length of time since the previous harvest, and practices used. Short harvest rotations would	5	2	Medium

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		<p>present a greater impact than longer harvest rotations.</p> <p>Under the Oregon Forest Practices Act recently revised by the Private Forest Accord, protective buffers have been increased along waterways (buffer widths vary based on the size of the stream and whether it contains salmonid species), new design standards for forest roads have been implemented, and more trees are to be retained on steep slopes to improve slope stability, reduce erosion, and benefit habitat.</p>			
	Non-clearcut Harvest or Thinning	<p>Non-clearcut logging and thinning may have similar types of impacts as clearcut harvesting, such as increased erosion and creek turbidity, but the impact is expected to be less. Additionally, illegal theft of trees (unrelated to industrial timber harvest) is somewhat common and impactful.</p>	5	1	Medium
	Chemical applications	<p>Herbicides are commonly applied following timber harvest in industrial forests to suppress competing vegetation after harvest and promote conifer growth. In the City's source water areas, chemicals are applied manually and the forest stands would typically be treated 1-3 times during a 40-harvest rotation. Aerial application does not occur in Waldport's source water areas. Chemical applications could pose a water quality risk if conducted close to waterways or just before rain events, or if improper handling occurs. Applications near roads, ditches, or unbuffered riparian areas have a higher likelihood of reaching source water during storm events. An impact</p>	3	2/3	Medium

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		<p>would be incident dependent, influenced by such factors as the scale, location, and season of use.</p> <p>Chemical applications are regulated by several public agencies, with use dictated by the Forest Practices Act and pesticide label laws. Waterways have required buffers where chemical applications cannot occur. The USFS, which is one landowner in the City's source water areas, currently does not use chemical applications.</p> <p>The City is notified prior to chemical applications. In response, the City communicates with those applying chemicals and pauses diversion of water for several days (instead relying on stored water) immediately after some chemical applications out of abundance of caution.</p>			
	Access Roads (SWA)	<p>Most roads in the City's source water areas are unpaved, gravel roads that can develop ruts and create challenging conditions for vehicles. Road building, maintenance, and usage may increase erosion and creek turbidity. Wet weather haul by logging trucks and road construction can contribute to erosion, particularly in stream crossings and near waterways. Vehicle usage increases the risk of leaks or spills of petroleum products or other hazardous materials, as well as increases the possibilities for human-caused fires. However, well-maintained access roads could enable more rapid response to reported forest fires that could help decrease the impacts of wildfire.</p> <p>The revised Oregon Forest Practices Act requires new roads to have improved design standards and</p>	4	1	Low

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		<p>requires commercial forest managers to inventory, maintain, and manage roads, and then upgrades to roads are expected to be implemented to achieve compliance over the next 20 years. In addition, logging trucks are prohibited from forest roads that have deep ruts or layers of mud during wet weather.</p>			
	Riparian Impacts of Forest Practices	<p>Vegetation along streambanks provides critical ecological and water quality functions, offering shade, stabilizing banks, and filtering sediment.</p> <p>Where riparian trees are removed or thinned, water temperatures may increase, and sediment may enter the creeks and increase turbidity.</p> <p>The revised Oregon Forest Practices Act includes new standards that increase protective buffers along waterways, dictating buffer widths based on the size of stream and whether the stream contains certain salmonid species. In the City's source water areas, riparian zones may be degraded by past harvest activity or road encroachment, as well.</p> <p>Legacy riparian management has caused some forest composition issues.</p>	3	2	Medium
	Mining (SWA)	<p>Two basalt mining operations/quarries are present in the City's source water areas: Eckman Creek Quarry/rock crushing and Pankey Pit. The mining operations have the potential to impact water quality through stormwater (both have DEQ permitted stormwater discharges). Leaks from heavy equipment and storage tanks (above ground and underground) and improper handling of mining wastes may contaminate drinking water</p>	4	4	High

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		sources. Land disturbance may increase erosion and contribute to sedimentation and high turbidity in streams.			
Rural Residential	Rural Homes (SWA) and landscape care	Rural homes (less than 10) are present in the Eckman Creek watershed, across a road from the creek. Construction activities—including road grading, excavation, and clearing—can lead to erosion and sediment delivery to nearby streams, particularly on sloped terrain. Improper management of stormwater runoff, especially from roofs and impervious surfaces, may route contaminants (e.g., petroleum residues, waste, or fertilizers) into surface waters. Improper use and storage of chemicals, such as those used for landscaping, may also result in contamination of nearby waterways. Clearing of riparian vegetation or disturbances to riparian zones may also impact water quality. Crushed vehicles may be used for bank stabilization by some landowners, presenting potential risks to water quality.	1	1	Low
	Septic Systems (SWA)	<p>The rural homes present in the Eckman Creek watershed are outside of Waldport’s municipal sewer service and rely on on-site septic systems for wastewater disposal. When functioning properly, these systems pose minimal risk. However, failures due to poor maintenance, aging infrastructure, or siting on shallow or saturated soils can allow untreated waste to leach into nearby waterways.</p> <p>Parts of the City’s source water areas have poorly draining soils or shallow groundwater tables, making them marginal for conventional septic</p>	1	1	Low

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		systems. Surfacing effluent, clogged drainfields, or outdated designs can contribute pathogens, nitrates, and organic material to the water supply. Failures often go undetected without inspection or complaint.			
	Domestic Wells	Private wells are common in rural Lincoln County and provide drinking water to residents in the City's source water areas. Improperly constructed, poorly maintained, or abandoned wells can create vertical pathways for contaminants to reach groundwater—particularly if surface pollutants are introduced during flooding or land use activity. Wells lacking anti-backflow devices may route contaminants into shallow groundwater zones that connect to stream baseflow.	1	1	Low
Municipal	Aging Municipal Infrastructure (SWA)	Aging infrastructure may impact the ability to divert, store, and distribute water. Leaks may increase the demand for water beyond what customers actually need.	4	5	High
	Sabotage/Vandalism of municipal infrastructure/ Cybersecurity concerns	Deliberate damage to water infrastructure may impact the ability to divert and deliver water. While rare, intentional sabotage or vandalism of water infrastructure poses serious consequences for small systems with limited redundancy. Damage to intake gates, fencing, telemetry, or chemical feed equipment may impair treatment or cause regulatory violations. Cybersecurity is an increasing concern for municipal water providers. Remote access to SCADA systems, insufficient firewall protections, or phishing attacks may lead to loss of monitoring control or false data reporting. Water system	1	4	Low

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		operations and communications could be negatively impacted.			
	Development/ Tourism	The City experiences tourism, but much less than other coastal cities in the region. Seasonal tourism has the potential to increase water demand. The City does not expect significant further development as there is limited availability of economically viable land left.	1	1	Low
Other	Encampments and Dumpsites	Informal campsites and illegal waste dumps occur in the City's source water areas, though to a lesser degree than in some neighboring watersheds. Until now, old homesites and the comparatively poor accessibility of the watershed have discouraged encampments and dumpsites in areas, but that may change in the future. USFS Road 53 is a hotspot for vehicles and dumping. These sites may contain human waste, food scraps, chemical containers, vehicles leaking petrochemicals and other contaminants (an abandoned vehicle is suspected to be the source of low-level detections of ethylbenzene and xylene; the vehicle was removed immediately upon discovery), which pose a direct threat to source water quality. During rain events, pollutants may be mobilized into nearby drainage paths or surface waters. Lack of sanitation facilities can also lead to pathogen contamination, while household waste may leach persistent pollutants into soil and groundwater.	3	3	Medium
Other	Ethylbenzene and xylene (SWA)	Ethylbenzene and xylene are volatile organic compounds (VOCs) commonly associated with petroleum products and industrial solvents. They are found in gasoline, paints, varnishes, and some degreasing agents. These compounds are not	3	3	Medium

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		<p>naturally occurring in the environment and pose both acute and chronic risks to human health when present in drinking water. Both are regulated under the Safe Drinking Water Act with established Maximum Contaminant Levels.</p> <p>In the Waldport source water area, it is suspected that these chemicals enter the environment through vehicle abandonment in the upper watershed (Forest Service Road 53, in particular). Historically, gates have prevented access; however, the gates were removed in recent years. While decommissioning roads or re-installation of gates is possible, it also impacts recreational access.</p>			

(SWA) = Risk identified in the source water assessment

Other potential risks have been identified based on Drinking Water Protection Plans developed by other Mid-Coast communities.

