



COMMUNITY PLANNING & ECONOMIC DEVELOPMENT

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Website: ThurstonCPED.org

Creating Solutions for Our Future

Ashley Arai, Director

TO: Thurston County Planning Commission

FROM: Claire Swearingen, Associate Planner

DATE: July 1, 2026

SUBJECT: Critical Aquifer Recharge Areas Gap Analysis

BAS Overview

Note: *This memo was created prior to the Planning Commission's June 17, 2026 meeting. Per discussion at that meeting, future gap analyses will provide additional in-text citations for relevant best available science and regulatory code sections. This memo and the gap analysis for geologically hazardous areas will be updated as time permits.*

Introduction

Critical aquifer recharge areas (CARAs) are parts of the environment where soil conditions and other factors help surface waters to infiltrate into groundwater. In the current Critical Areas Ordinance (CAO), CARAs are regulated under TCC Chapter 24.10. The WAC defines CARAs as follows:

“Critical aquifer recharge areas’ are areas with a critical recharging effect on aquifers used for potable water, including areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water, or is susceptible to reduced recharge.”

Because water can infiltrate into the ground easily in these areas, they are important for replenishing groundwater resources, but are also susceptible to contamination. The most sensitive CARAs include areas with very coarse soil types, which allow for quick infiltration with little filtering of contaminants, and areas near wellheads, called wellhead protection areas.

Geologic formations under the soil can also impact the sensitivity of a CARA. Aquifers, and the groundwater they contain, are a critical part of the hydrologic cycle. There are two main types of aquifer; contained aquifers and water-table aquifers. Contained aquifers are surrounded by materials that don’t allow water to pass through easily, putting them under pressure. Water often springs up out of these aquifers, creating artesian wells such as those in Downtown Olympia. Water-table aquifers are not contained under pressure, so they can rise and fall with rainfall and drought, and are more susceptible to contamination.



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Protecting groundwater involves understanding the locations and characteristics of aquifers and water quality threats, planning for implementation of protective rules, and monitoring for contamination and other risks. Protecting CARAs ensures that Thurston County has clean water for drinking, and helps support other important habitat like streams, rivers, and lakes.

Functions and Values

Groundwater is a primary source of drinking water in Thurston County, and protecting it from contamination or depletion is important for maintaining human health and safety. If aquifers cannot recharge due to changes on the surface (like increased impervious areas), drinking water wells run dry. If water is contaminated by chemicals from spills or sewage from septic systems, people may become sick. Other factors, like climate change, sea level rise, and water overconsumption can impact the quality and quantity of available groundwater. The Critical Areas Ordinance (CAO) can help when a specific development might impact a CARA, but other programmatic approaches can help mitigate impacts at a larger scale.

Aquifers also help provide a consistent source of cold water to streams, lakes, and rivers, especially in the hot, dry season in the late summer and early fall. Many species of fish, especially salmonids, rely on clean, cold water for spawning habitat. Groundwater can discharge through springs or streambanks year-round, and aquifers keep water cold inside the earth. Human impacts and climate change mean that stream temperatures are rising, and water quantity is low in the dry season. Cold, full streams are important for habitat quality and fish survival, and if aquifers cannot recharge, many aquatic species may not have a healthy habitat. If aquifers are contaminated, those contaminants can make their way to surface waters, and harm the environment and human health.

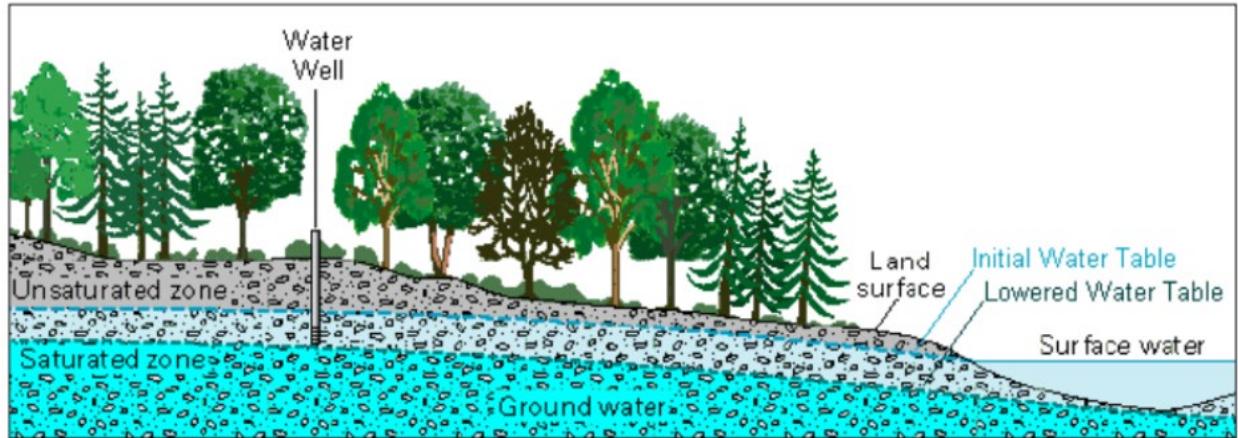


Figure 1. Image from *Critical Aquifer Recharge Areas Guidance*, WA Dept. Of Ecology, 2021. If the groundwater level drops too low, both the stream and the well could dry up. The water table drops when discharge (water flowing out) is greater than recharge (water flowing in).

Contamination Risk

The vulnerability (or risk of contamination) of a CARA is determined by two major factors. The first is the CARA's susceptibility to contamination, which is determined by the geologic setting of the aquifer. The depth of the aquifer, the soil types and geologic formations above it, and the speed at which the groundwater moves all affect susceptibility. The second is the possibility of contamination. Threats of contamination can come from many kinds of human development, and include things like contaminated runoff, chemical spills, and failing septic tanks. Part of the strategy for protecting CARAs is to ensure that high-risk activities are kept away from susceptible areas, and that proper mitigation efforts are used to reduce risk.

Climate Change and Human Impacts

CARAs can be impacted by a variety of factors related to climate change and human development on the landscape. Climate change affects the timing and intensity of precipitation, often resulting in hotter, dryer summers, and more intense rainfall events in the rainy seasons. Intense dry seasons can require people to draw more out of groundwater, especially for watering crops, and disrupt surface water features, like wetlands, which can have a recharging effect on aquifers. Intense rainfall in the wet seasons, combined with increased impervious area from human development, can lead to high peak surface flows and flooding. In this case, more water moves across the surface,



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and through rivers and streams to the sea, rather than infiltrating into groundwater to be stored. When flooding occurs, floodwaters can become exposed to contaminants and then carry those contaminants to both surface water and groundwater. Sea level rise can also cause saltwater infiltration into aquifers, making the water inside unsuitable for drinking or watering crops. Wildfires can release airborne contaminants that settle into ground and surface waters, and the loss of forest to wildfires increases fast-moving runoff after rain, decreasing the amount of water available to infiltrate into aquifers.

Protection Strategies and Permitting

Thurston County GeoData maintains publicly available maps that identify CARAs, and indicates their sensitivity based on susceptibility characteristics. The Critical Areas Ordinance plays an important role in minimizing potentially harmful activities in CARAs by restricting land uses and outlining development requirements for potentially contaminating uses. Outside of the CAO, Thurston County's Environmental Health department regulates septic systems through the Thurston County Sanitary Code, helping to prevent contamination from septic waste. Development projects must also comply with stormwater requirements. Thurston County also approaches groundwater conservation programmatically through streamflow restoration efforts, acquiring water rights to offset permit exempt wells, monitoring and modeling hydrologic and environmental factors, and other programs aimed at protecting water quality and quantity. The CAO protects CARAs by regulating new development as it occurs.

Gap Analysis

The following gap analysis highlights potential changes to the existing CAO that came from initial Planning Commission feedback, public comment to date, recommendations from County staff who implement the existing CAO, and County, state or federal agency staff with relevant subject matter expertise. These changes have been made to the draft CAO update—this table and the descriptions that follow provide rationale for the proposed changes, and are intended to serve as a reference.

Code Section	Title	Recommendations	Reason
24.10.010	Critical Aquifer Recharge Areas Designated	Include designation criteria in code section	Accessibility, usability, and transparency
24.10.010	Critical Aquifer Recharge Areas Designated	Remove outdated references	Refer accurately to maps, tables, data, and departments.

24.10.010	Critical Aquifer Recharge Areas Designated	Designate areas near deep underground injection control wells as CARA I	Expert opinion, piercing confining layers increases CARA sensitivity
Table 24.10-1	Prohibited and Restricted Uses and Activities Within Critical Aquifer Recharge Areas	Allow for infiltration of reclaimed water, manual aquifer recharge, and aquifer storage and recovery	Additional guidance and permitting processes from the Dept of Ecology and federal government have come out since the last update
Table 24.10-1	Prohibited and Restricted Uses and Activities Within Critical Aquifer Recharge Areas	Updated language regulating Underground Injection Control Wells	Consistency with state law
24.10.190	Reclaimed water, aquifer storage and recovery, and managed aquifer recharge	Allow for infiltration of reclaimed water, manual aquifer recharge, and aquifer storage and recovery	Additional guidance and permitting processes from the Dept of Ecology and federal government have come out since the last update
Table 24.10-3	Critical Aquifer Recharge Areas Geologic Features	Remove table	Out of date with current data
Table 24.10-4	Critical Aquifer Recharge Area Soil Series	Remove Table	Out of date with current data

24.10.010 Critical Aquifer Recharge Areas Designated

Designation criteria should be added to the chapter in clear language, with reference to publicly available maps, for the sake of clarity, accessibility, and transparency. This also makes the code easier to navigate. Reference to outdated tables, maps, and department names should be removed. Code language should support GeoData's ability to keep maps updated to use the best available science without causing a conflict in code. CARA designations should also reflect the change in susceptibility caused by deep underground injection wells, when they pierce a confining layer in the subsurface geology. This recommendation is based on staff subject matter expert input.



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Table 24.10-1 Prohibited and Restricted Uses and Activities Within Critical Aquifer Recharge Areas and 24.10.190 Reclaimed water, aquifer storage and recovery, and managed aquifer recharge

During the last major CAO update, there was not enough information to make a decision on allowing for the infiltration of reclaimed water into aquifers. Since then, both the State of Washington and the federal government have published guidance on the use of reclaimed water, and practices for managed aquifer recharge and aquifer storage and recovery. In addition, since the current CAO was adopted the LOTT Clean Water Alliance has studied this issue extensively in response to community questions and in preparation for its planned future operations. The use table should now be updated to reflect the available information, and permitting processes available through the Washington Dept. Of Ecology. Additionally, language regarding underground injection control wells should reflect the provisions of WAC 173-218.

Table 24.10-3 Critical Aquifer Recharge Areas Geologic Features and Table 24.10-4 Critical Aquifer Recharge Area Soil Series

These tables should be removed, as some of the categorizations used are now in conflict with the current best available science. Removing tables also allows for critical areas maps to be kept up to date as new data becomes available without causing a conflict with code.