

Cedar River Water and Sewer District Jurisdiction Plan Annex

Introduction

Cedar River Water and Sewer District (CRWSD) was formed in 1960 and is in southeast King County. CRWSD provides water and sewer service to approximately 36 square miles. There are approximately 25,400 water customers within the service area which includes the community of Fairwood, portions of the City of Maple Valley, City of Renton, and a large area of unincorporated King County.

The primary water supply for CRWSD is the Lake Youngs Reservoir. Lake Youngs receives potable water from the Cedar River Watershed, which is a closed area of approximately 96,000 acres lying between Hobart and the crest of the Cascade Mountains. CRWSD purchases the bulk of its drinking water from Seattle Public Utilities (SPU) via a 60-year water supply contract serving primarily residential areas of unincorporated King County and the Cities of Maple Valley and Renton.

CRWSD's sewer service area is located east of Renton near the Lake Youngs watershed. Renton and King County Water District No. 90 adjoin CRWSD on the north, separated by the Cedar River with Molasses Creek and Soos Creek Water and Sewer District on the west and south and the Urban Growth boundary on the east. CRWSD does not treat its customers' sewage, the sewage is conveyed to a King County trunk line and on to King County's Regional Treatment Facility located in the City of Renton.

CRWSD's geology is largely the result of prehistoric glacial activity. The most common soil type in the area is known as the Alderwood series, which includes moderately well drained gravelly sandy loams that are 24 to 40 inches deep over consolidated glacial till. The next most common type is the Everett series. Everett soils are gravelly and are underlain by sand and gravel. In certain areas, principally basins and lowlands, organic materials such as peat and muck occur in depths up to ten feet. Other soils include small areas of a variety of soils including, but not limited to, muck, silt loam, riverwash, sandy loams, and mixed alluvial land.

The community CRWSD serves is located in a thriving region that includes both urban and rural areas, as well as undeveloped spaces. Residents and visitors enjoy access to all the amenities offered in an urban area, while still being able to enjoy the numerous scenic parks and available trails.

Jurisdiction Profile

- Special Purpose District
- Water Customers: 25,400
- Water Service Area: 36 Square Miles
- 6 Water Reservoirs
- 10 Water Pump Stations
- 27 PRV Stations
- Sewer Customers: 15,200
- Sewer Service Area: 4 Square Miles
- 3 Sewer Lift Stations



Jurisdiction Point of Contact:

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CEDAR RIVER VICINITY MAP

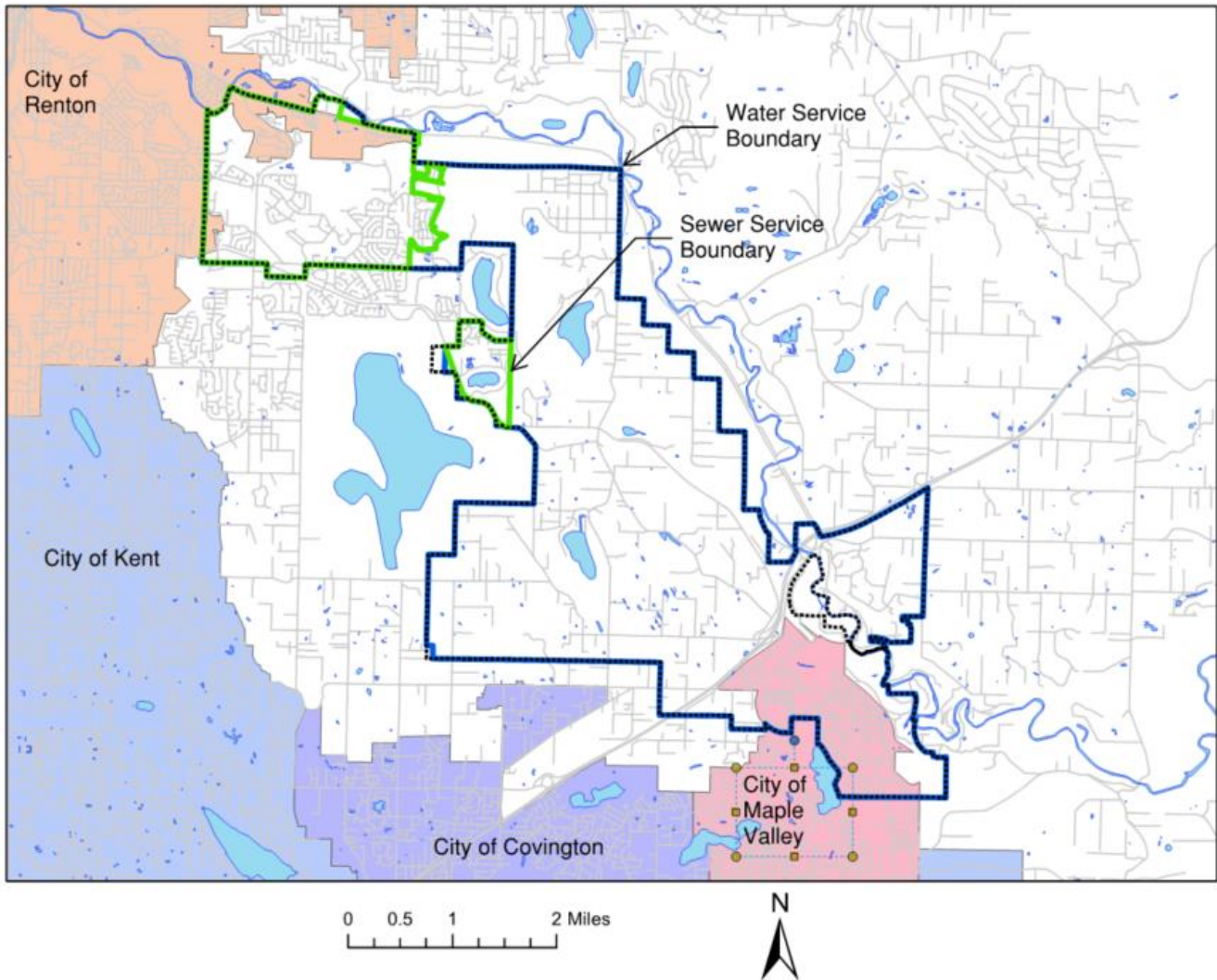


Figure 1: Cedar River Water and Sewer District Water and Sewer Corporate Boundary Map.

Development Trends

CRWSD has expanded in both water and sewer per equivalent residential unit by 7.4% in the last five years. CRWSD's service area continues to see stable population growth due to new housing developments, remodel or expansion of existing building, and aging care communities, especially within the urban growth boundary. The increased development within the urban growth boundary is resulting in more development in sensitive areas. Considering the development trend, CRWSD will continue to prioritize hazard mitigation for its facilities within sensitive areas. CRWSD is a dedicated team focused on providing top tier service while sustaining infrastructure reliability, regulatory compliance, and long-range planning.

Cedar River Water and Sewer District Risk Summary

Hazard Risk and Vulnerability Summary

HAZARD*	RISK SUMMARY**	VULNERABILITY SUMMARY	IMPACT SUMMARY
Avalanche	CRWSD is not located near any Avalanche Hazard Areas.	N/A	N/A
Earthquake	Approximately 20% of the water service area and approximately 15% of the sewer service area are in liquefaction zones ranging from low to high risk.	CRWSD has approximately 12 PRVs, 2 water interties, 20% of the water distribution system, and 15% of the sewer system located in liquefaction areas.	Damage from an earthquake and/or liquefaction would greatly reduce water and sewer service availability, reliability and quality. Asbestos concrete (AC) water mains are traditionally susceptible to ground movement.
Flood	Less than 1% of CRWSDs water system is located within the 100-Year floodplain.	CRWSD has two crossings of the Cedar River, one under the river and one suspended under a bridge. Little risk is anticipated to these crossings. Otherwise, a minor portion of the water distribution system is located in the flood plain.	Damage to water pump lift stations and PRVs, resulting in loss of water service for customers.
Landslide	Less than 3% of the total land area served by CRWSD is within Landslide Hazard Areas.	CRWSD has several pipe systems located within landslide hazard areas, especially north of Fairwood.	Damage from landslide would greatly reduce r the availability, reliability and quality of water and sewer service to customers.
Severe Weather	Drought, Tornado, Wind Events, and Severe Storm Events pose minimal risk to water and sewer facilities.	Most facilities are located underground or within concrete structures so direct damage to assets is likely minimal. Facilities are vulnerable to power failure.	Severe weather could damage above ground water and sewer facilities and/or result in a power failure, which could lead to loss, or reductions in water and sewer services for customers.
Severe Winter Weather	Winter weather may cause freezing in water distribution system. This poses minimal risk as utilities have been buried with appropriate cover.	Above ground water reservoirs and distribution appurtenances may be frozen, damaging existing water systems.	Severe winter weather could damage above ground water and sewer facilities and/or result in a power failure, which could result in potential loss, or reduction in, water and sewer services for customers.
Tsunami	CRWSD is located inland and is at minor risk from	N/A	N/A

	Tsunami's originating from the Pacific Ocean.		
Volcano	There are 5 active volcanoes in the Cascade Mountain range that pose a risk to CRWSD. The closest is Mount Rainier. CRWSD is too far away to receive damage from blast or pyroclastic flows but may receive ashfall.	If CRWSD were to receive ashfall, public health would decline, increasing demand of water. In addition, water quality will decrease as CRWSDs main source of water, Lake Youngs, would be exposed and contaminated.	Transportation may be impacted for CRWSD employees.
Wildfire	Wildfire poses minimal risk to water and sewer assets.	Facilities are vulnerable to power failure. Transportation routes could be impacted.	Potential loss of power for facilities and thus loss/reduction of water and sewer services for customers. Additional stress on water facilities to control/fight wildfire in the District's service area could lead to additional damage to facilities.
Civil Disturbance	Civil disturbance proposes minimal risk to underground facilities. Small risk to above ground facilities	Above ground facilities may be damaged during a civil disturbance. Facilities are also vulnerable to power failure.	Damage to critical facilities is likely minimal, if any.
Cyber Attack	Telemetry information for water and sewer system would be at risk.	A lack of telemetry may lead to inability to respond to damage in either the water or sewer system.	Loss of water and sewer system control. Damage to critical facilities and/or unprotected customer information. Backup of CRWSD system data is completed regularly.
Dam Failure	Chester Morse Dam is the only upstream dam. The failure of this dam would reduce the available water provided from Seattle Public Utilities who provides CRWSD with drinking water.	Initial washout from dam failure could damage facilities. Chester Morse Lake could be drained and there would be a lack of water supply at Lake Youngs.	Lower water supply. Emergency storage at reservoir sites would need to be conserved.
Hazardous Materials Incident	Hazardous Materials Incident poses a minimal threat to water systems. Sewer systems are not likely impacted.	Drinking water quality may be reduced. Damage to existing facilities including lift stations and storage.	Damage to critical facilities.
Public Health Emergency	Water and sewer systems would be vulnerable due to lack of maintenance from lack of staff. In addition, water and sewer systems will be in higher demand, placing	Water and sewer systems at a higher risk under normal operating conditions.	Damage to critical facilities, lack of water supply and/or sewer capacity. Lower available staff to operate systems.

	more stress on the existing systems.		
Structure Fire	Minimal risk for underground facilities. Above ground facilities at risk but most are concrete or steel structures.	Potential loss of system capacity or ability to provide water and sewer services.	Damage to critical facilities.
Terrorism	Above ground facilities at risk.	Potential loss of system capacity or ability to provide water and sewer services.	Damage to critical facilities. CRWSD is required under the 2018 America's Infrastructure Act to complete and certify a Risk and Resiliency Assessment by June 30, 2021 based on its population served. CRWSD must update its Emergency Response Plan 6 months after certifying its Risk and Resiliency Assessment. This furthers the work in the Hazard Mitigation Plan that is addressed herein.

* All hazards have been mapped at a regional level per King County.

**Based on King County mapped hazards

Hazard Overview Map

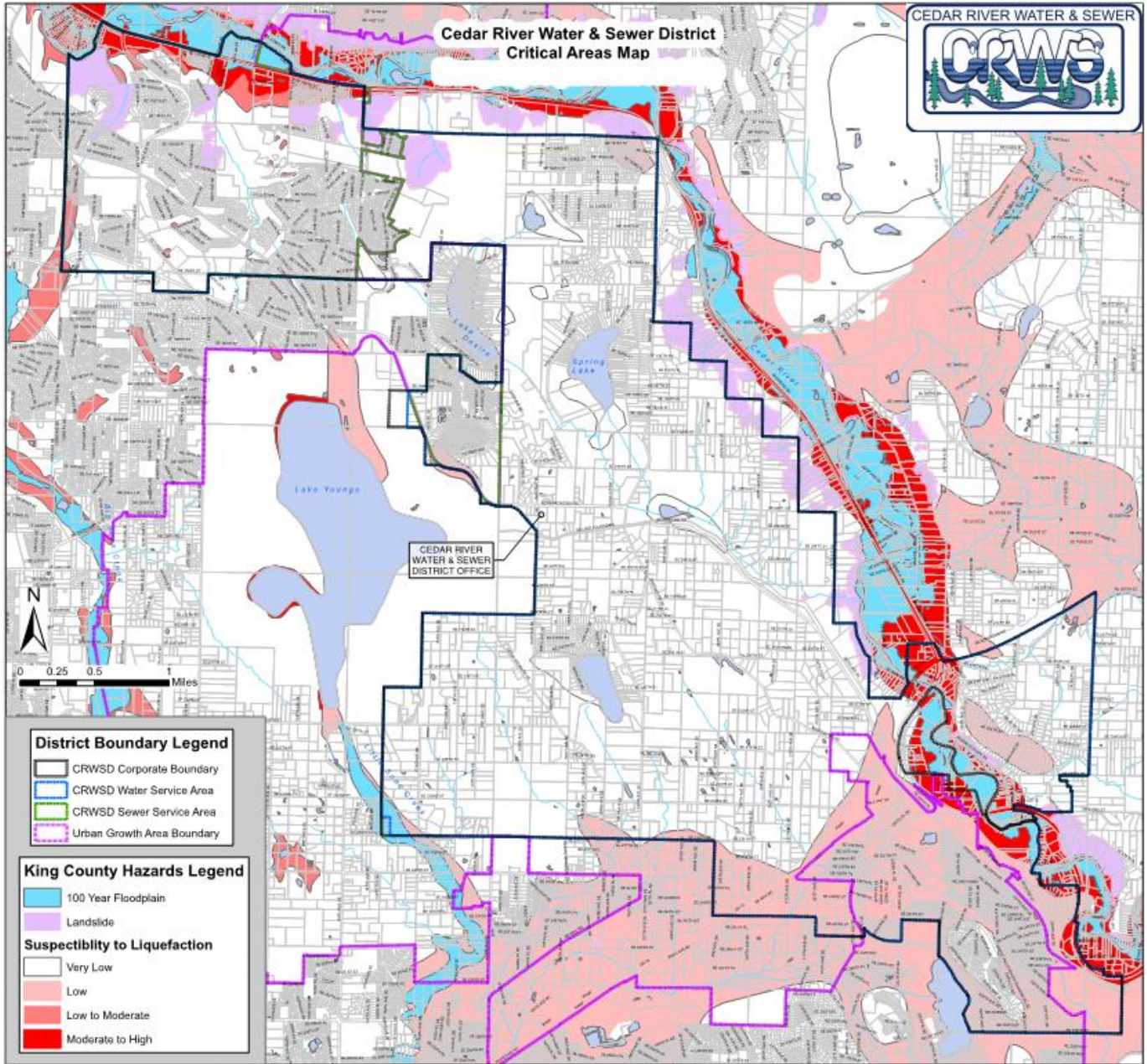


Figure 2: Cedar River Water and Sewer District Hazard Map.

Facilities information is not included herein due to its sensitive nature. This information can be found by contacting CRWSD office to review.

Assets at Risk

CRWSD has more than 145 miles of water pipe, 48 miles of sewer pipe, 11 water pump stations, 27 pressure reducing valves (PRV), and 3 sewer lift stations that are all critical to its operation. Only the facilities that are in mapped hazard areas are listed in the following table:

ASSET	VALUE (\$)*	RISK SUMMARY	VULNERABILITY SUMMARY	IMPACT SUMMARY
PRV W-7	\$200,000	Liquefaction	Damage to PRV	Loss of Service
PRV C-14	\$200,000	Liquefaction	Damage to PRV	Loss of Service
PRV C-2	\$200,000	Liquefaction	Damage to PRV	Loss of Service
PRV E-31	\$200,000	Liquefaction	Damage to PRV	Loss of Service
PRV E-32	\$200,000	Liquefaction	Damage to PRV	Loss of Service
PRV E-35	\$200,000	Liquefaction	Damage to PRV	Loss of Service
PRV E-34	\$200,000	Liquefaction	Damage to PRV	Loss of Service
Covington Intertie PRV	\$200,000	Liquefaction	Damage to Intertie	Loss of Service, Loss of emergency water service
PRV E-44	\$200,000	Liquefaction	Damage to PRV	Loss of Service
PRV E-43	\$200,000	Liquefaction	Damage to PRV	Loss of Service
PRV E-40	\$200,000	Liquefaction, Flood	Damage to PRV	Loss of Service
ULID 10 Water Booster Station	\$125,000	Landslide	Damage to booster pump Station	Loss of Service
5% of Water System*	\$13,398,000	Liquefaction and/or Flood	Damage to water distribution system	Loss of service, reduced water quality
10% of Sewer System*	\$20,275,200	Liquefaction and/or Flood	Damage to sewer collection system	Loss of service, environmental impacts, health issues
CRWSD Office	\$4,258,302**	Liquefaction	Emergency Coordination Center	Inefficient emergency response

*Estimated Values

**Insurance Value

Plan Update Process

First, to understand the planning process, CRWSD reviewed the three questions listed below. CRWSD understands and discussed the value of hazard mitigation planning. CRWSD remains committed to participating and supporting the King County Regional Hazard Mitigation Planning, now and in the future.

The following has been incorporated into the process below:

1. What is valued in our community? (asset assessment)
 - a. Maintaining clean and reliable water and sewer services is top priority. CRWSD has been providing high quality water and sewer services at a reasonable rate since 1960 and remains committed to the community it serves to continue that tradition.
2. What values are at risk or exposed to hazards? (risk assessment)
 - a. Providing water and sewer services to the community is the value at risk due to natural hazards such as liquefaction, flood, and landslide. CRWSD has identified assets at risk and remains committed to mitigating those risks to the maximum extent possible.
3. How will we protect what we value? (strategies)
 - a. CRWSD assets at risk will continually be reevaluated. The strategies identified here are starting points that further CRWSDs commitment to provide safe and reliable services.

The process used to prepare this Annex is as follows:

- The first step was to confirm and identify CRWSDs commitment related to hazard mitigation and convene the planning team.
- Next, CRWSD participated in the Regional Planning process.
- Then hazards affecting CRWSD facilities were mapped and identified.
- The next two steps were to determine the potential for damage to CRWSD facilities by the hazards identified and to discuss the activities CRWSD has currently taken to mitigate potential hazard damage.
- Following this, it was necessary to identify the strategies CRWSD will implement to mitigate impact to its critical facilities.
- CRWSD completed it public outreach process.
- The final step is to adopt the Annex to the King county Regional Plan and review monitoring and maintenance requirements.

The following documents the planning process shown above:

Plan Update Timeline

PLANNING ACTIVITY	DATE	SUMMARY	ATTENDEES
Introduction Meeting	5/28/2019	Introduction/Overview of HMP Planning Process. Discuss template requirements.	CRWSD Planning Team King County Strategist
Regional Hazard Mitigation Workshop	6/27/2019	HMP Workshop – Identifying hazards	CRWSD Planning Team, King County, and Regional Participants
Regional Hazard Mitigation Workshop	7/25/2019	HMP Workshop - Strategies	CRWSD Planning Team, King County, and Regional Participants
Hazard Identification, Strategy, and Vision Meeting	8/21/2019	Identifying natural hazards that threaten the CRWSD water and sewer infrastructure, determining	CRWSD Planning Team

		mitigation methods and applications, and establishing vision.	
Regional Funding Workshop	8/22/2019	Reviewing funding opportunities and FEMA application process.	CRWSD Planning Team, King County, and Regional Participants
City of Maple Valley Study Session	9/23/2019	Providing an overview of the CRWSD hazard mitigation plan to the City of Maple Valley City Council and the Public	General Public, Maple Valley City Council, CRWSD Planning Team
City of Maple Valley Emergency Preparedness Fair	9/28/2019	Providing an overview of the CRWSD hazard mitigation plan to the general public.	General Public, CRWSD Planning Team
Final Submission	10/2019	Draft Annex Submitted to King County	N/A

Cedar River Planning Team

NAME	TITLE	ORGANIZATION	CONTRIBUTION
Mike Amburgey	General Manager	CRWSD	CRWSD Manager - Data review, hazard identification, strategy evolution
Daryl Remillard	Operations Manager	CRWSD	CRWSD Technical Lead, Data review, hazard identification, strategy evolution
Pam Cobley	Project Manager	Stantec	Project Manager - Data review, hazard identification, strategy evolution, HMP development
Mitchell Boyd	Engineer in Training	Stantec	Technical Writer, Data review, hazard identification, strategy evolution, HMP development

Public Outreach

Public Outreach Events

EVENT	DATE	SUMMARY	ATTENDEES
Maple Valley Study Session	9/23/2019	Outreach event to educate the public on localized natural hazards and how the utilities are planning to mitigate the impacts to critical assets.	General Public, CRWSD Planning Team
Maple Valley Emergency Preparedness Fair	9/28/2019	Opportunity for public to be educated on local natural hazards and how local municipalities and utilities are mitigating potential impacts to critical facilities.	General Public, City of Maple Valley, CRWSD Planning Team, City of Covington, Soos Creek Water and Sewer District.
Public Comments	9/23/2019, 9/28/2019	Receive public input regarding hazard mitigation, as needed.	General Public

Upon preliminary approval by approving agencies, CRWSD Board of Commissioners will review and approve CRWSD Annex to the Regional Plan.

Cedar River Water and Sewer District Hazard Mitigation Program

Hazard mitigation strategies were developed through a two-step process. CRWSD convened an internal planning team to identify a comprehensive range of mitigation strategies. These strategies were then prioritized using a process established at the county level and documented in the base plan.

Hazard mitigation strategies in CRWSD include a new supply connection point for the east portion of CRWSD which provides hydraulic improvements and system redundancy, conduct a seismic analysis for existing water reservoirs and retrofitting, as necessary, and providing onsite backup power generation for water pump stations and sewer lift stations.

Plan Monitoring, Implementation, and Future Updates

CRWSD participates in mitigation plan monitoring. Updates on mitigation projects are solicited by King County for inclusion in the countywide annual report. As part of participating in the 2020 update to the King County Regional Hazard Mitigation Plan, CRWSD agrees to convene their internal planning team as needed or annually as requested by King County, to review their progress on hazard mitigation strategies and to update the plan based on new data or recent disasters.

The next Regional Hazard Mitigation Plan update is expected to be due in April 2025. CRWSD plans to participate in future updates. King County will lead the regional planning effort, beginning at least 18 months before the expiration of the 2020 plan.

To implement the Annex, CRWSD has adopted the updated hazard areas and the risks that impact the water and sewer facilities. CRWSD has prioritized utility projects in accordance with the new hazard areas. From the last hazard mitigation plan update, CRWSD has replaced multiple utility lines vulnerable to earthquake and/or landslide areas.

The goals and strategies of the Hazard Mitigation Plan will be incorporated into the CRWSD Comprehensive Water and Sewer Plans, as necessary or deemed mutually beneficial, when the plans are updated.

The mitigation strategies can also be implemented as capital improvement projects, through the CRWSD annual Capital Improvement Program. The Capital Improvement Program Cedar River Water and Sewer District Hazard Mitigation Plan

Plan Goals

As CRWSD will be annexed under King County's Hazard Mitigation Plan, CRWSD will adopt the goals established by King County's Regional Hazard Mitigation Steering Committee. This committee has adopted King County's Determinants of Equity as their mitigation plan goals. These include:

1. Access to affordable, healthy food,
2. Access to health and human services
3. Access to parks and natural resources
4. Access to safe and efficient transportation
5. Affordable, safe, and quality housing
6. Community and public safety
7. Early childhood development
8. Economic development
9. Equitable law and justice system
10. Equity in government practices
11. Family wage jobs and job training
12. Health built and natural environments
13. Quality education
14. Strong, vibrant neighborhoods

Of these goals, the most applicable goals CRWSD will pursue related to the hazard mitigation plan are goals 2, 6, 10, 12, and 14.

(CIP) describes the anticipated improvements or modifications to both the water and sewer systems. The CIP addresses required repairs to the water and sewer systems, planned replacement of aging facilities, upgrades to existing facilities to provide additional capacity for projected growth and construction of general facilities to aid growth and operation and maintenance improvements. The capital improvement projects will be implemented, as funding becomes available and deemed mutually beneficial to the operations and maintenance of the systems.

The Hazard Mitigation Plan identified hazards that may impact the water and sewer infrastructure. These will also be considered during the development and updates to the CRWSD Risk and Resiliency Assessment and Emergency Response Plan. Both of these documents are required under the 2018 Update to the Bioterrorism Act for water utilities serving more than 3,300 population.

Additionally, the CRWSD supports other jurisdictions that overlap its service area. CRWSD routinely coordinates with the land use agencies within its service area concerning pending land use changes, proposed utility projects, proposed transportation projects, and proposed revisions to comprehensive plans and design guidelines. CRWSD remains committed to providing the infrastructure necessary to meet the needs of its service area. CRWSD also understands that there could be potential growth in the future that could present a hazard to its facilities as a result of the pending plan changes or projects. To mitigate these impacts, future plan changes or projects will be reviewed for hazards that have been identified in the Hazard Mitigation Plan Annex.

Continued Public Participation

CRWSD and its partnering agencies maintain public outreach capabilities, focusing on personal preparedness and education. Information on ongoing progress in implementing the hazard mitigation plan will be integrated into public outreach efforts. This will provide CRWSD customers, already engaged in personal preparedness efforts, with context and the opportunity to provide feedback on CRWSDs progress and priorities in large-scale mitigation. In the vertical integration of risk-reduction activities from personal to local to state and federal, it is important that the public understand how its activities support, and are supported by, larger-scale efforts.

Hazard Mitigation Authorities, Responsibilities, and Capabilities

Plans

PLAN TITLE	RESPONSIBLE AGENCY	POINT OF CONTACT	RELATIONSHIP TO HAZARD MITIGATION PLAN
CRWSD Water and Sewer Comprehensive Plan	CRWSD	General Manager	Identifying capital improvement projects and mitigating hazards found in the hazard mitigation plan.
Emergency Response Plan	CRWSD	General Manager	Identifies actions to be taken to respond to a hazard event. Staff will be adequately trained to better respond during disaster events.
Capital Improvement Plan	CRWSD	General Manager	Identifies and prioritizes projects on an annual basis. Mitigation projects in the hazard mitigation plan are included, as prioritized.
Vulnerability Assessment (2004)	CRWSD	General Manager	Evaluation of critical facilities to better protect against malevolent acts.
Risk and Resiliency Assessment	CRWSD	General Manager	New EPA requirement to assess critical facilities to better protect from malevolent attacks, cyber-attacks, and natural hazards. Certification for CRWSD is due by June 30, 2021.

Programs, Policies, and Processes

PROGRAM/POLICY	RESPONSIBLE AGENCY	POINT OF CONTACT	RELATIONSHIP TO HAZARD MITIGATION PLAN
Codes, Regulations, and Development Standards	CRWSD	General manager	Ensures new water and sewer facilities are designed to consistent and current standards.
Emergency Response Plan	CRWSD	General Manager	Training and preparing for hazard related response.
Northwest WARN Agreement?	CRWSD	General Manager	Collaborative effort between government and private sector critical infrastructure partners with a goal of near real-time information sharing to help protect regional/national infrastructures, communities, and the public.
Mutual Aid Agreement	CRWSD	General Manager	Allows water and sewer systems to receive rapid mutual aid and assistance from other systems in an emergency or hazard event.
Adjacent Jurisdiction Coordination	CRWSD	General Manager, Operations Manager	CRWSD coordinates regularly with its adjacent jurisdiction project to provide an efficient process of completion and opportunities for joint projects.
Building Codes	Cities of Maple Valley and Renton, King County	Local regulatory agencies	New projects and construction to meet current codes.
Critical Areas Ordinance	King County and the Cities of Maple Valley, and Renton	City and County planning departments	New projects and construction to current standards.
Fire Flow Requirements	Local agency fire districts	Local fire marshal	Ensures new facilities and improvements are designed to current standards.

Entities Responsible for Hazard Mitigation

AGENCY/ORGANIZATION	POINT OF CONTACT	RESPONSIBILITY(S)
Cedar River Water and Sewer District	Board of Commissioners	Approving entity and implementation of capital projects.
Cedar River Water and Sewer District	General Manager	Development, prioritization, review, and implementation of mitigation strategies.

Hazard Mitigation Strategies

Mitigating impacts to CRWSD facilities is a high priority to ensure CRWSD can meet its goal of providing safe, reliable, and top-quality water and sewer services. In order to do that, CRWSD has identified the following projects:

- Install a second water supply line to the east area of CRWSD to improve system hydraulics, redundancy and reliability,
- Conduct seismic analysis for water reservoirs, retrofitting as necessary, and
- Provide onsite backup power generation for three remote sites.

CRWSD did not participate in the last Regional Hazard Mitigation Plan update. Its existing standalone Hazard Mitigation Plan, which expired in 2015, included the following projects:

2010 Hazard Mitigation Strategy Status

STRATEGY	DESCRIPTION	PRIORITY	STATUS
East Area Second Water Supply Line, Bridge Crossing	Install a second water supply line that crosses Cedar River to improve system hydraulics and redundancy.	High	Complete
Water Tank Seismic Study	Study all water reservoirs for seismic resiliency, prioritizing the central reservoir.	High	To be scheduled

2020 Hazard Mitigation Strategies

STRATEGY	LEAD AGENCY/POC	TIMELINE	PRIORITY
East Area Second Water Supply Line	CRWSD, General Manager	2-Year – Pipeline replacement design. 5-Year – Pipeline Construction Long-term – Maintenance of new pipeline	High
Water Tank Seismic Analysis and Retrofit	CRWSD, General Manager	2-Year – Study Central Reservoir. 5-year - Prioritize studies for remaining water reservoirs. Long-Term - Complete Water Tank Seismic Retrofit, if applicable.	High
Onsite Backup Power Generation	CRWSD, General Manager	2-Year Objectives – Installation of three onsite generators at remote sites. 5-Year Objectives – Identify additional sites requiring onsite power generation or portable connection and implement plan for installation schedule. Long-Term Objectives – All water pump station and sewer lift stations to be electrical and have local onsite backup generators or portable generator connections.	High



Hazard Mitigation Strategy

East Area Second Water Supply Line			
Lead Points of Contact (Title) Cedar River Water and Sewer District (CRWSD)	Partner Points of Contact King County	Hazards Mitigated/Goals Addressed Hazards: Earthquake, Liquefaction, and Flooding. Goals: 2,6,10,12, and 14	Funding Sources: CRWSD Operating Revenue, HMPG, PWTF, DWSRF Estimated Costs: \$1,500,000.00
<p>Strategy Vision/Objective</p> <p>The vision of CRWSD is to provide reliable clean water and sewer services to all its customers. The objective CRWSD is pursuing to achieve this goal is to install a secondary water supply pipeline to serve the eastern CRWSD area.</p>			
<p>Mitigation Strategy</p> <p>CRWSD will be installing a secondary water supply pipeline to service the east area of CRWSD. Currently, there is only a single water supply to serve this area. Adding the secondary water supply line will improve system hydraulics and improve redundancy and reliability.</p>			
2-Year Objectives	5-Year Objectives		Long-Term Objectives
Identify secondary water supply pipeline layout and any sections of pipeline that to be replaced.	Design secondary water supply pipeline.		Construct secondary water supply pipeline to provide improved reliability and redundancy.
<p>Implementation Plan/Actions</p> <p>CRWSD will determine the secondary water supply line layout. Secondary pipeline design will then commence followed by construction.</p>			
<p>Performance Measures</p> <p>Improved system hydraulics, redundancy, and reliability to that area of the CRWSD.</p>			

Water Tank Seismic Analysis and Retrofit

Lead Points of Contact (Title) Cedar River Water and Sewer District (CRWSD)	Partner Points of Contact: Not applicable	Hazards Mitigated /Goals Addressed Hazards: Earthquake, Liquefaction Goals: 2,6,10,12,14	Funding Sources: CRWSD Operation Revenue, HMGP Estimated Costs: \$50,000 per study
<p>Strategy Vision/Objective</p> <p>The vision of CRWSD is to provide reliable clean water and sewer services to all its customers as soon as possible after an earthquake event. The objective CRWSD is pursuing to achieve this goal is to study the resilience of all existing water reservoirs.</p>			
<p>Mitigation Strategy</p> <p>CRWSD will conduct seismic studies on all existing water reservoirs. The Central Reservoir is of highest priority, followed by all other reservoirs. All water reservoirs are not located within mapped hazard areas but is critical to the resiliency of the CRWSD water system and the ability for CRWSD to provide service for its customers. Should any water reservoirs be found lacking per the current standards, seismic retrofit projects will be designed and executed per assigned priority.</p>			
<p>2-Year Objectives</p> <p>Identify if existing water reservoirs are vulnerable to seismic events, prioritizing the Central Reservoir.</p>	<p>5-Year Objectives</p> <p>If the Central Reservoir is vulnerable to seismic events, begin resiliency design.</p> <p>Complete seismic analysis for other water reservoirs.</p>	<p>Long-Term Objectives</p> <p>All CRWSD water reservoirs are seismically resilient, to the maximum extent possible.</p>	
<p>Implementation Plan/ Actions</p> <p>CRWSD will evaluate the need for seismic resiliency for the Central Reservoir followed by all other water reservoirs. If seismic resiliency upgrades are required, begin the resiliency design process and implement improvements. Seismic retrofits are anticipated to be completed in the long-term unless otherwise prioritized.</p>			
<p>Performance Measures</p> <p>Complete seismic analysis for all vulnerable water reservoirs. If seismic retrofit is required, retrofit vulnerable water reservoirs.</p>			

Onsite Backup Power Generation

Lead Points of Contact (Title) Cedar River Water and Sewer District (CRWSD)	Partner Points of Contact (Title) Local Land Use Agency, as needed	Hazards Mitigated / Goals Addressed Hazards Mitigated: Earthquake, Severe Weather, Winter Weather Goals: 2,6,10,12,14	Funding Sources: CRWSD Operating Revenue, HMGP Estimated Costs: \$150,000 per generator
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Strategy Vision/Objective

The vision of CRWSD is to provide reliable clean water and sewer services to all its customers as soon as possible after an earthquake event. The objective CRWSD is pursuing to achieve this goal is to install onsite backup generators for critical water pump stations and sewer lift stations.

Mitigation Strategy

Provide permanent on-site power generation at water pump stations and sewer lift stations, as needed. Alternatively prepare portable backup generators with appropriate transportation methods to be installed temporarily at water pump stations and sewer lift stations, as required.

2-Year Objectives	5-Year Objectives	Long-Term Objectives
Install onsite generation at 3 remote pump stations sites as identified in the 2019-2028 Capital Improvement Plan.	Identify additional water pump stations and sewer lift station where it would be beneficial to have backup power generation. Develop costs for implementation.	Install and maintain onsite backup power generation or portable connections at critical water pump stations and sewer lift stations. These will be prioritized as needed.

Implementation Plan/Actions

CRWSD will determine which water pump stations and sewer lift stations may benefit from onsite backup power generation. Afterward, CRWSD will prioritize which stations where onsite backup power generation will be installed. Adjust power generation needs for either onsite or availability for temporary portable connection, as necessary. Implement improvements according to the prioritized schedule, determined by CRWSD.

Performance Measures

Prioritize the list of water pump stations and sewer lift stations that may require onsite power generation and schedule for implementation. Adjust power generation needs for either onsite or availability for temporary portable connection, as necessary.