

Section 16: Rainbow Water and Fire District Annex to the Lane County Multi-Jurisdictional



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2024 – 2028 Planning Cycle

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(Resolution #24-XX)



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Acronyms (A)

Table 16.7.1: Acronyms

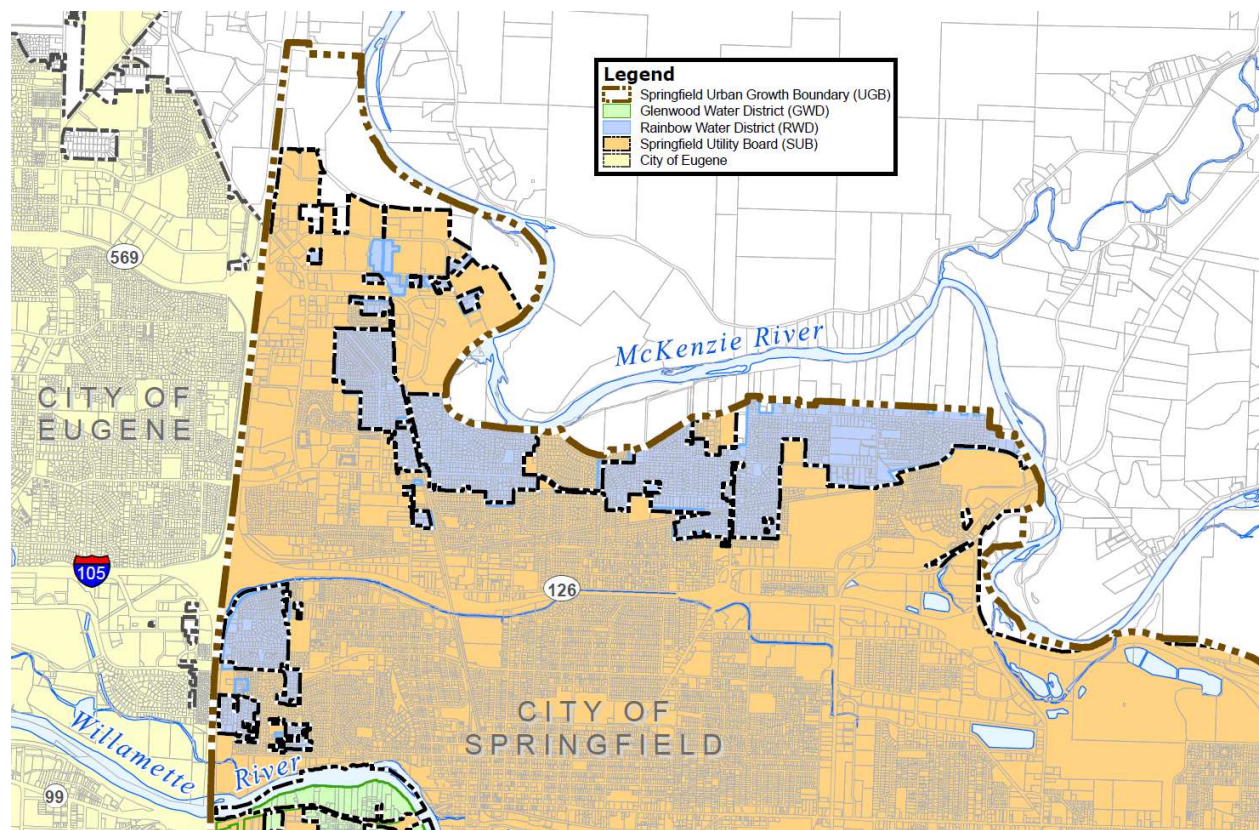
A	Description	A	Description
COE	City of Eugene	HRA	Hazard Risk Assessment
COS	City of Springfield	MIA	Mitigation Action Item(s)
DLCD	OR Dept. of Land Conservation & Development	MWMC	Metropolitan Wastewater Mgmt. Comm.
DPW	Development & Public Works	MJNHMP	Multi-Jurisdictional Nat. Haz. Mit. Plan
EDI	Equity, Diversity, Inclusion	NHMP	Natural Hazard Mitigation Plan
EM	Emergency Management	OEM	Oregon Dept. of Emergency Mgmt.
EPUD	Emerald People’s Utility District	PW	Public Works
EWEB	Eugene Water & Electric Board	RWD	Rainbow Water District
FEMA	Federal Emergency Mgmt. Agency	SUB	Springfield Utility Board
GIS	Geographic Information Systems	WPRD	Willamalane Park and Recreation District

16.01 Introduction and History

In 2006 Rainbow Water District (RWD) began participating in the then City of Eugene and City of Springfield natural hazard mitigation planning efforts as a community partner. In 2017, COE and COS transitioned their NHMP to a multi-jurisdictional NHMP and invited area partners to join as an annex plan. In 2020 the COE/COS MJNHMP was expanded to include an annex location for local utility service providers. RWD developed and submitted an individual agency annex plan to the MJNHMP. The 2020 MJNHMP was successfully updated and renewed by FEMA.

Early 2024 the renewal process was underway; however, conversations about greater integration of planning efforts across the county became the focal point. COE made a proposal to transition to the Lane County multi-jurisdictional NHMP as there were already 8 cities and 3 utility providers as annex plan participants. Consensus was reached by the current annex holders and with approval from County, State and FEMA achieved the transition pathway was outlined May of 2024. RWD received approval from the governing board and began transferring to the County annex template and hazard quantification process with the goal of completion by end of September 2024.

Map 16.8.1 RWD Service Area



16.02 Jurisdictional Profile and Background

Rainbow Water District was incorporated as a domestic water supply district by a Lane County election held August 22, 1949. On June 9, 1952, Lane County voters also empowered the district to protect its inhabitants from fire, which Rainbow has fulfilled by contracting with Eugene-Springfield Fire (via the City of Springfield) under an intergovernmental agreement for fire protection and emergency medical services. In 1985, Rainbow formally changed its name to Rainbow Water and Fire District to provide clarity on property tax bills but continues to do business as Rainbow Water District.

Rainbow is a special district, a political subdivision of the State of Oregon serving residents of unincorporated Lane County adjacent to the Springfield city limits. Rainbow's primary purpose is to provide water for domestic use, secondarily providing fire protection and operating a small system of streetlights on higher volume county roads in Rainbow's service area. A five-member Board of Commissioners, elected by the residents within its service boundaries, governs the district. RWD employs seven employees. The Board is responsible to adopt this plan and fund priority activities. The Superintendent will oversee plan implementation.

- **Population served:** 23,338 (2023 estimate¹)
- **Land area served:** 8.0 square miles (Rainbow-served portions of north/west Springfield)
- **Land area owned:** 23.3 acres

Rainbow provided drinking water information for the 2014 NHMP but has formally participated in the Eugene-Springfield NHMP process since 2019, making this the second iteration of the utility's annex. As before, the annex notes Rainbow-specific variances from the Eugene-Springfield Area NHMP base plan (Sections 1-4, 6). Variances arise from differing risk profiles between jurisdictions due to utility-specific compliance regulations, capabilities, and locations of critical infrastructure. Public outreach activities are located in section 16.10.

16.2.1: Water System

Rainbow provides drinking water to 2,382 residential customers within its county service area in north Springfield. Rainbow also provides water under a wholesale contract to the Springfield Utility Board (SUB) for use by residential, commercial, industrial, and public sector customers inside the city limits.

The utility maintains permitted and certificated water rights to use groundwater from eleven wells located at four different wellfield facilities in North Springfield. Groundwater is pumped to the surface and disinfected with chlorine. Transmission piping delivers the treated water to the distribution system for consumption. Rainbow's wells produce about 1.5 billion gallons of drinking water each year.

Chase Well #2 is classified as groundwater under the influence of surface water and receives additional filtration. The Chase Wellfield also raises the pH of the water to reduce the potential for corrosion. The Weyerhaeuser Wellfield is jointly owned and operated by Springfield Utility Board, and has additional treatment provided by granular activated carbon filters and raises the pH of the water to reduce the potential for corrosion in household plumbing.

¹ County and City customers in north Springfield comprise about 37% of the population of Springfield, which was estimated at 63,078 per the July 1, 2023 estimate from Portland State University.

Rainbow operates two storage reservoirs (Kelly Butte and Moe Hill/Vitus Butte) to store water for fire protection and daily demand in the North System. (Springfield Utility Board is a part owner of Moe Reservoir, and has six other reservoirs to serve other parts of Springfield.) The discharge pressure of the deep well pumps delivers water directly to the reservoirs. Base level system pressure is regulated by water level in the storage reservoirs. Rainbow’s 2023 annual water operating budget is \$2.6 million, including debt service and capital outlay, operations and maintenance costs.

- **Reservoirs:** 2 (5 million gallons total capacity)
- **Wells:** 11 (including 3 jointly owned with Springfield Utility Board)
- **Water transmission/distribution system:** 12 miles

The estimated value of major water utility assets, in historical cost and insured values (when value approximates replacement costs) is listed below (Table 16.7.2).

Table 16.7.2 Estimated Value of District Assets

Water Utility Asset Type	Historical Cost June of 2024	Insured Values
Land	\$174,292	-
Water Treatment & Controls	\$3,272,945	\$1,891,690
Source of Supply & Pumping	\$2,496,018	\$2,944,150
Distribution System	\$2,073,960	-
Transmission & Reservoirs	\$2,336,493	\$6,338,518
General Plant	\$491,463	\$801,081
Completed Construction, not yet classified	-	-
Construction Work in Progress	-	-
TOTAL	\$10,845,171	\$11,975,439

16.2.2: Anticipated Service Trends

Rainbow primarily serves single family residential county customers on septic systems. Most new development takes place inside the City of Springfield limits, to allow higher densities and connection to public sewer. Because of this development pattern, Rainbow sees very little new construction activity, yet helps serve new City customers through the wholesale contract with SUB.

As property within the boundaries of Rainbow is annexed to the City, water customers are transferred to SUB who will be the eventual water provider as the City expands. Small infill housing developments have provided new customers, however, so the Rainbow customer count has been stable and is anticipated to remain steady for the duration of this plan.

The Springfield area has experienced modest population growth, but more efficient plumbing codes and irrigation practices have offset increased demand to keep water consumption trends relatively flat. Annual usage is weather dependent, so seasonal fluctuations still do occur.

With the low volume of private development, Rainbow staff have been able to support the management and operation of several rural water systems in unincorporated areas of Lane County. Rainbow contracts to operate: Marcola Water District, Deerhorn Community Water Association, Shangri-La Water District, and Shenandoah Homeowners Inc. These small systems operate independently with their own water supplies, governing boards and part-time operators, under the supervision of Rainbow’s licensed staff. Rainbow also supports the Blue River Water District in an advisory and administrative capacity.

16.03 Natural Hazard Mitigation Meetings and Work Sessions

Development of the RWD materials for the Natural Hazard Mitigation Plan involved participation by both internal and external partners to RWD. Some of these efforts were collaborative with the two primary cities of Eugene and Springfield leading the efforts. Area partners included municipalities, public works, school districts, county emergency management, fire districts, utility providers, healthcare providers, community and volunteer organizations.

The process followed FEMA’s prescribed model for organizing resources, identifying hazards, evaluating risk, identifying mitigation actions, and prioritizing mitigation projects. For additional details regarding the planning process, please refer to Section 6 of Volume I of the county base NHMP plan.

Subject matter discussed during work sessions included an overview of the plan and projects contained in the existing plan. This review resulted in the evaluation and removal of some projects from the original plan. It also allowed the group to decide what remaining projects would be updated with the new costs associated with them. Systems and concepts considered included infrastructure resiliency, safeguarding the transportation network, city planning, floodplain management, public safety, and securing public and private facilities.

The following two tables outlines work sessions internally with RWD staff and governing board and as part of a collaborative group with the COE/COS NHMP partners.

Table 16.7.3: RWD Internal Work Sessions

Name/Title	Topic	Meeting Dates
Jamie Porter, RWD Superintendent Eric Carlson, RWD Assistant Superintendent	Review Hazard Risk Assessment Review 2020 MAI’s and select new MAI’s	08/26/24
Jamie Porter, RWD Superintendent Eric Carlson, RWD Assistant Superintendent Jodi Sanders, RWD Office Manager RWD Board of Commissioners	Review 2024 NHMP Annex Plan Draft 01 at Board Work Session	09/11/24

[Source: Rainbow Water District]

Table 16.7.4: RWD City/County NHMP Committee and Workgroup Participation

2024 NHMP Annex Planning Committee and Workgroup EWEB Participation (City/County NHMP Groups)				
City NHMP Committee (1)	County NHMP Committee (2)	MAI & Annex Plan Workgroup (3)	Haz. Risk Assessment Workgroup (4)	Public Engagement Workgroup (5)
07/22/24	2/7/23 – Plan	07/22/24	04/16/24	03/13/24 - Workgoup
04/29/24	Renewal Work	06/17/24	03/21/24	
02/05/24	Session 1	06/05/24*		

10/23/23 08/28/23 04/24/23 01/23/23		05/23/24 03/13/24 02/29/24		08/22/24 – RWD Customer Event 09/04/24 – Website Updates w/ Survey 09/04/24 - Eugene Presentation #1 09/10/24 – Spfld Presentation #2
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[Source: Rainbow Water District]

- 1) City of Eugene/Springfield (COE/COS) NHMP Committee – met quarterly, concluded 07/22/24
- 2) County of Lane NHMP Committee – semi-annual during maintenance cycle, became member of County Plan June of 2024.
- 3) COE/COS – Annex Specific Mitigation Action Item Review and Annex Plan Discussions
 - *Transition Discussion – City to County NHMP
- 4) COE/COS – Hazard Risk Assessment (HRA) Workgroup
 - Purpose – evaluate the 2020 assessment, evaluate transition to the state HRA methodology, then work towards finalizing assessment. June of 2024 City of Eugene opted to disband their individual plan and move towards the County NHMP. RWD utilized the County HRA to finalize their internal agency HRA.
- 5) Public Engagement Campaign Workgroup
 - Participated in the COE/COS public engagement campaign development process and then the implementation of the campaign.
 - 03/13/24 - Workgroup Meeting
 - 09/04/24 - Shared Media Release/Announcement/Social Media Posts/Survey
 - 09/04/24 – Supported Eugene public presentation
 - 09/10/24 – Supported Springfield public presentation
 - 09/11/24 – Board Work Session to review draft NHMP annex
 - 8/22/24 - Hosted 75th Anniversary Customer Appreciation Event – provided information on the NHMP Annex, engaged the public and answered questions about the annex and how RWD may be impacted by natural disasters.

16.04 Hazard Quantification

Table 16.7.5 lists past occurrences of natural hazards affecting RWD over the past 20 years and where data is available, the estimated damage to RWD assets for each incident. In many cases, RWD facilities were indirectly impacted due to regional power outages or transportation disruptions, with no significant monetary damages and the costs for impacts were managed with operational funds.

Table 16.7.5: Natural Hazard Events

Type of Event	FEMA Disaster # (if applicable)	Incident Timeframe	Preliminary Damage Assessment (RWD)	Estimated Damage (Lane County)
Severe Winter Storm	TBD	January 12 – 27, 2024	Data Unavailable	TBD
Lookout Mtn Wildfire	N/A	August 5 – October 13, 2023	Data Unavailable	
Holiday Farm Wildfire	DR-4562-OR	September 7 – November 3, 2020	Data Unavailable	\$62M
Severe Winter Storm	DR-4432-OR	February 25 – March 4, 2019	Data Unavailable	\$14.2M
Windstorm	N/A	April 7, 2017	Data Unavailable	
Severe Winter Storm/Freezing Rain	DR-4296-OR	December 14 -17, 2016	Data Unavailable	\$8.9M
Severe Winter Storm/Windstorm	DR-4258-OR	December 6 – 23, 2015	Data Unavailable	\$1.3M
Severe Winter Storm	DR-4169-OR	February 6 – 14, 2014	Data Unavailable	\$6.7M
Severe Winter Storm	DR-4055-OR	January 17-21, 2012	Data Unavailable	\$1.4M
Severe Winter Storm	N/A	March 21-26, 2012	Data Unavailable	
Windstorm	N/A	March 13 - 16, 2011	Data Unavailable	
Severe Winter Storm	N/A	December 27 – 29, 2008	Data Unavailable	
Windstorm	N/A	February 2-4, 2006	Data Unavailable	
Windstorm	DR-1405-OR	February 7-8, 2002	Data Unavailable	\$3.9M

[Source RWD and Lane County]

Table 16.7.6 presents the ranking of hazards of concern to RWD using the quantification method developed by Oregon Department of Emergency Management. This methodology characterizes risk based on history of events, probability of and vulnerability to future events, and the maximum threat posed in a worst-case scenario. Weighting factors (WF) are applied to produce a total risk score to rank the relative risk of each hazard.

Table 16.7.6: RWD Hazard Quantification Results

Hazard Risk Quantification Summary: RWD Assessment Conducted: March – August 2024 Assessment Tool: State of Oregon – Hazard Analysis Methodology Assessment Reviewed by: - RWD Internal Staff Review – 08/26/24 - COE/COS NHMP Committee – 07/22/24 - Lane County Emergency Management – pending - Public Feedback Via Digital Survey – September 2024 – see attachment XXX for summary	Scoring	
	160 - 240	High
	80 – 160	Moderate
	0 - 80	Low

Hazard Type / Weight Factor (WF)	History WF x 2	Probability WF x 7	Vulnerability WF x 5	Maximum Threat WF x 10	Weighted Score	Weighted Score Rank	2024 RWD Rating
Flood	12	49	45	90	196	1	High
Winter Storm	18	63	40	70	191	2	High
Earthquake	6	28	50	100	184	3	High
Wildfire	14	49	40	70	173	4	High
Windstorm	14	42	45	70	171	5	High
Extreme Weather (Heat)	16	56	30	50	152	6	Moderate
Drought	16	49	15	20	100	7	Moderate
Volcano	4	14	10	40	68	8	Low
Landslide	2	7	5	50	64	9	Low
Tsunami	2	7	5	10	24	10	Low

[Source: RWD Internal Review Team]

Individual Hazard Discussions

As the table above indicates, RWD's risk ranking very similar to the Lane County Planning area. However, some variations exist due to differences in the vulnerability and maximum threat to RWD assets and customers to certain hazards. Like Lane County, winter storms, wildfire and earthquakes ranked high. However, flooding ranked highest and extreme heat ranked lower in RWD's analysis than for Lane County. These differences are explained below.

Drought [Rating #7 – Score 100 out of possible 240, Moderate Rating]

According to the last 20 years of data from the U.S. Drought Monitor, severe and extreme drought conditions are occurring with increasing frequency in Lane County. Lane County declared State of Drought Emergencies in both 2015 and 2021, and moderate to extreme drought occurred in 2019 and 2022 as well. Climate change studies indicate that the Western Cascades will experience less overall precipitation, reduced snowpack and more frequent heatwaves, all increasing the probability of drought.

Drought has some direct and indirect impacts on Rainbow's water supplies. Rainbow's wells are drilled into aquifers that are recharged by the McKenzie River. Chase Well #2 is classified as groundwater under the direct influence of surface water, and treated to surface water standards. Low stream flows can contribute to toxic algal blooms, with some elevated risk of cyanotoxins reaching Chase Well #2. More concerning is the potential for reduced aquifer recharge causing the water table to drop, reducing pumping capacity and increasing pumping costs. Rainbow encourages water conservation through a tiered usage rate structure, and issues public advisories to encourage responsible water use. Curtailment plans are in place if needed for an extreme situation.

Earthquake [Rating #3 – Score 184 out of possible 240, High Rating]

Fault lines exist near Rainbow's service territory that can produce crustal earthquakes, although these are fairly uncommon. The most recent earthquake was in 2015, a 4.2 magnitude earthquake centered in Walterville. No Rainbow facilities were damaged in this event. Western Oregon is also susceptible to a magnitude 9.0 Cascadia Subduction Zone (CSZ) earthquake which is expected to produce strong to severe ground shaking in and around Springfield. Extensive damage to electric, water and communications infrastructure is expected, particularly in areas where soil liquefaction is likely. Studies indicate that areas between east Springfield and Walterville have high susceptibility to liquefaction.

Oregon Department of Emergency Management estimates there is a 37% chance of a CSZ earthquake in the next 50 years. While Rainbow is working to fortify critical infrastructure against such an event, damage to power supplies, water distribution mains and customer service lines would leave much of our community without water or power for weeks or longer. Given the size and magnitude of such an event, Federal resources would be needed for restoration and therefore, earthquake risk is high.

Extreme Weather [Rating #6 – Score 152 out of possible 240, Moderate Rating]

Heat waves with several days of peak temperatures over 100 degrees are not uncommon in the RWD service area. In the past, these were tempered by nighttime cooling that protected electric infrastructure from over-heating and allowed buildings without air conditioning to cool down. Most recent extreme heat events such as the June 2021 heat dome, where Eugene experienced a high of 111 degrees, put greater

strain on utility infrastructure and heightened public health risks. Climate change induced trends indicate we may experience a greater frequency of extreme heat events in the future.

Utility impacts from extreme heat include local and regional power outages due to electrical equipment failures. This can be amplified when the aquifers are stressed (due to seasonal pumping / less recharge from lower river levels) but customers are increasing outdoor watering to double or triple typical daily usage.

Flooding [Rating #1 – Score 196 out of possible 240, High Rating]

Rainbow's service area includes portions of the McKenzie River floodplain that are prone to flooding events. Upstream reservoirs and dams effectively control flooding under most, but not all, circumstances. Significant and prolonged flooding has the potential to damage equipment, and saturated soils can lead to water main breaks. Historically, Rainbow has experienced minimal direct damage to its assets from prior floods, including during the 1996 '100-year' flood event. In the future, climate change and higher instream flows due to atmospheric river events and/or heavy rain on burn-scarred landscapes in the watershed may increase the frequency and severity of flooding events.

Rainbow's newest facilities were built above the 100-year flood level, but older facilities dating back to the 1950s and 1960s are located near the McKenzie River and continue to have some elevated risk. Improved monitoring and treatment capabilities at the Chase Water Treatment Plant are in place to manage any turbidity issues impacting water quality at Chase Well #2. Parts of supply well infrastructure could be inundated and restored relatively easily after flood water receded, but the reduced capacity during system recovery could have a significant impact.

Since the last NHMP, the City of Springfield has identified the need for major improvements to the 42nd Street Levee, and any levee breach or localized flooding due to backups in the drainage channel could directly impact Rainbow's office and central hub for control system communications and business center data storage. The newer concerns over flood risk have elevated this specific hazard significantly.

Landslide [Rating #9 – Score 64 out of possible 240, Low Rating]

Rainbow has no upper level pumping zones, just two hilltop reservoirs with transmission piping that could be susceptible to landslide activity. Since the 2019 NHMP, SUB and Rainbow made some seismic improvements to Moe Reservoir that included a new transmission main with restrained joints. Landslide activity has the potential for heavy damage in a worst case scenario, but the low probability and relatively low vulnerability results in landslide risk being ranked low.

Volcano [Rating #8 – Score 68 out of possible 240, Low Rating]

According to the Oregon Natural Hazard Mitigation Plan, the Three Sisters region has a clear history of volcanic eruptions, but none documented in the last 15,000 years. Ashfall from an eruption at South Sister or any nearby volcano could potentially impact water quality 60 or more miles downstream, increasing turbidity adjacent to wellfields and triggering a shutdown of Chase Well #2 which is under the influence of surface water. Rainbow's other wells are protected from turbidity impacts, but ash clogging vents in motors and vehicles could have indirect impacts on response times and delay recovery efforts. Due to the small probability of future occurrences and limited impacts, volcano hazard is ranked low.

Wildfire [Rating #4 – Score 173 out of possible 240, High Rating]

Lane County's 2020 Community Wildfire Protection Plan (CWPP) divides Lane County into three distinct ecoregions and describes the overall wildfire risk for the Willamette Valley Ecoregion, where most Rainbow assets and customers are located, as generally low to moderate risk. Areas of higher risk might include heavily treed areas such as around Moe Reservoir.

The Cascades Ecoregion, which includes the McKenzie Valley, was classified as moderate to high risk due to the predominance of forested lands with mountainous topography, frequent lightning events and limited access for firefighting resources. Based on historical occurrences, there is a high probability of future wildfire occurrences in the Cascades region.

Wildfire smoke incursions degrade air quality in the valley on an annual basis, creating unhealthy air for days to weeks at a time. While smoke does not directly impact RWD infrastructure, RWD will make operational adjustments to protect workers from prolonged exposure to poor air quality.

Despite greater focus on wildfire mitigation by electric providers such as EWEB, proximity to and increasing frequency of wildfire activity will result in more frequent use of public safety power shutoffs (PSPS) that result in regional power outages. The possibility of both direct wildfire impacts and indirect impacts such as loss of power and communications on a regional level results in a risk ranking of high.

Windstorm [Rating #5 – Score 171 out of possible 240, High Rating]

Windstorms producing sustained gusts of over 40 mph are typically part of a winter or heavy rainstorm event. These events occur every few years and cause localized power outages and infrastructure damage. Extreme wind events occur with less frequency but can result in extensive damage to property and electric infrastructure that RWD relies upon to power water facilities. If the windstorm is accompanied by wind or snow, more extensive damage occurs due to tree-related impacts to powerlines

Peak gusts reached 70 mph during the February 2002 storm and the December 2015 storm caused over \$1.3M in damage countywide (both events were federally declared disasters). RWD relies on electric utilities which are also susceptible to straight-line wind events, which can produce strong, dry east winds and increase risk of a fast-growing wildfire. The possibility of both direct wind damage and indirect impacts such as loss of power and communications on a regional level results in a risk ranking of high.

Winter Storm [Rating #2 – Score 191 out of possible 240, High Rating]

As Table 16.7.6 indicates, winter storms occur with relative frequency. Damage typically results from storms that deliver a combination of heavy, wet snow, ice and/or wind. While these types of winter storms may not be severe enough to trigger a disaster declaration, some still require an ICS response for Rainbow to effectively manage the repair and restoration process. Considering both disaster-declarations and ICS-responses together, a severe winter storm can be expected about every other year. Damage often includes power outages due to impacts on electric utilities. A five-day freezing rain and ice accumulation event in January 2024 nearly resulted in a loss of ALL water supplies for both Eugene and Springfield. RWD's office ran on a generator for 12 days, and backup power was necessary to maintain water supplies for Eugene and Springfield. With widespread power outages and transportation system impacts, full restoration could take upwards of two weeks, and mutual aid from neighboring utilities and/or contract crews can be constrained, delaying service restoration. Due to the frequency of winter storm events and potential for widespread damage, winter storm risk is ranked high.

New Development in Hazard Areas

RWD has very little new development, mostly infill projects whereby large lots may subdivide or add an accessory dwelling unit (ADU). RWD's service area lies on the valley floor, with no pressure to develop in the floodplain or on steep slopes. There are areas with heavier vegetation and orchard or other trees that can increase risks due to wildfire, but RWD's service area is protected by a robust system of fire hydrants and a fire protection contract with Eugene Springfield Fire.

16.05 Mitigation Action Items (MAI's)

This section describes mitigation projects identified by the Rainbow Water District during the planning process. See Section 4 of Volume I for additional information regarding mitigation action item methodology and prioritization.

RWD has assigned a primary and secondary natural hazard for each of their mitigation action items – with each hazard having at least 1 mitigation action item assigned.

Section 16.05 reviews the status of the action items from the previous plan (2020 – 2024) and identifies the new items being added for the 2024 – 2028 plan:

1. 2020 – 2024 MAI's Summary: Status summary tables followed by individual item summaries.
2. 2024 – 2028 Planned MAI's Review: Summary of planned items and individual item summaries.

16.05.01: 2020 – 2024 Items Summary

Through RWD's Board-approved capital improvement plans, the utility has completed many of the mitigation action items described in the 2020 NHMP, with just a few more complex, multi-year projects carrying over into the new planning cycle.

Table 16.7.6: 2020 – 2024 MAI's Summaries

MAI's - Status Summary 2020 - 2024			
Status	Total	%	
Complete	3	38%	
In Progress	4	50%	
Withdrawn	1	13%	
Total	8	100%	

MAI's - FEMA Categories 2020 - 2024			
FEMA Categories	Total	%	
Structure & Infrastructure	8	100%	
Total	8	100%	

MIA's - Hazards 2020 - 2024		
Hazard	Primary	Secondary
Drought	0	2
Earthquake	6	1
Extreme Weather	0	4
Flooding	1	5
Landslide	0	4
Wildfire	1	4
Windstorm	0	4
Winter Storm	0	4
Volcano	0	4
Total	8	32

[Source: Rainbow Water District]

Mitigation Action Item	#2020.50 - Upgrades Seismic - Pipes and Valves
Location	Rainbow Water District Service Area
Coordinating Agencies	Rainbow Water District
Implementation Timeframe	2017-2021
Estimated Cost	\$535,000
Potential Funding Sources	Operational
Hazards Mitigated	Flooding
FEMA NHMP Category	Structure & Infrastructure
Comments	Install flexible joints and seismically activated isolation valves at Moe Hill (Vitus Butte) Reservoir.
Progress Since Last Plan	<ul style="list-style-type: none"> • <i>2020 Plan Conclusion Status:</i> Complete 8/1/2020 • <i>Carryover to 2024:</i> No • <i>Accomplishments:</i> In order to reduce the risk of pipe-to-reservoir connection failure and loss of stored water during a seismic event, we installed a seismic valve and double-ball flexible expansion joints on Moe Reservoir’s inlet/outlet piping and drain/overflow piping. A Flo-Loc seismic valve controller is able to close a valve (electric motor actuator with a battery backup) upon sensing an approximate 7.0 magnitude quake. This valve is connected to the control system and settings can be adjusted by water operators. • <i>Challenges:</i> Springfield Utility Board is a part-owner of this reservoir, and it was a multi-year project to coordinate the design and construction and take the tank out of service for a period of time while the contractor was making new connections.

Mitigation Action Item	#2020.51 - New Install - Chlorine Gas Valve Actuators
Location	Rainbow Water District Service Area
Coordinating Agencies	Rainbow Water District
Implementation Timeframe	2018-2020
Estimated Cost	\$50,000
Potential Funding Sources	Operational
Hazards Mitigated	Earthquake Flooding Wildfire
FEMA NHMP Category	Structure & Infrastructure
Comments	Install automatic valve actuators for chlorine gas cylinders at all wellfields (Chase equipped 2018).
Progress Since Last Plan	<ul style="list-style-type: none"> • <i>2020 Plan Conclusion Status:</i> Complete 11/1/2022 • <i>Carryover to 2024:</i> No • <i>Accomplishments:</i> Rainbow Water District uses 150-lb chlorine gas cylinders for water disinfection at five treatment locations (two installations at Chase Wellfield). Sites have chlorine gas detectors that can alert operators via our telemetry system. We added electric actuators (with a battery backup) to allow automatic closure of the

	<p>valves through a remote command issued by a water operator or upon the detection of chlorine gas above a user-defined threshold level. Actuators have been procured and installed at Chase Wellfield (2 locations), I-5 Wellfield, Weyerhaeuser Wellfield, Q Street Well.</p> <ul style="list-style-type: none"> Challenges: Work was performed in phases to spread expenses over multiple budget years. We attempted to purchase some used components to reduce the expense of the project, and that caused some parts incompatibility between different models. We ended up starting over and buying some new components to fix compatibility issues.
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Mitigation Action Item	#2020.52 - New Install - Emergency Communication
Location	Rainbow Water District Service Area
Coordinating Agencies	Rainbow Water District
Implementation Timeframe	2019-2021
Estimated Cost	\$30,000
Potential Funding Sources	Operational
Hazards Mitigated	Landslide Windstorm Winter Storm
FEMA NHMP Category	Structure & Infrastructure
Comments	Install HAM radio and emergency data transmission antennas at Kelly Butte and/or Moe Hill Reservoirs in coordination with Lane County radio repeater expansion.
Progress Since Last Plan	<ul style="list-style-type: none"> <i>2020 Plan Conclusion Status:</i> In Progress <i>Carryover to 2024:</i> Yes Accomplishments: Concept started small, touring the site with a local ham radio group in July 2018. Explored a possible tower attached to the top of the Kelly Butte Reservoir, but a structural engineer expressed concerns in April 2019 and the idea moved to a standalone tower. Toured the Moe Reservoir site with Michael Harman, manager of the Regional Radio System for Lane County, in April 2023. Shared prior cell tower siting studies to explore the concept of a shared facility at Moe Reservoir. This concept is desirable but funding is not currently available. Challenges: Staff time and access to funding. Kelly Butte may need an easement for a standalone tower. Both Kelly and Moe Reservoir locations could involve some land use planning approvals, and a more exhaustive investigation is not likely to be considered until funding seems possible.

Mitigation Action Item	#2020.53 - New Install - Redundant Control System
Location	Rainbow Water District Service Area
Coordinating Agencies	Rainbow Water District
Implementation Timeframe	2019-2021
Estimated Cost	\$35,000
Potential Funding Sources	Operational
Hazards Mitigated	Earthquake
FEMA NHMP Category	Structure & Infrastructure
Comments	Install redundant control system capability at Chase WTP.
Progress Since Last Plan	<ul style="list-style-type: none"> • <i>2020 Plan Conclusion Status:</i> Complete 1/1/2021 • <i>Carryover to 2024:</i> No • <i>Accomplishments:</i> Rainbow Water District has installed a redundant SCADA server at the Chase Wellfield to provide a data backup and alternate control and operations ability to the 42nd Street headquarters location. Data is incrementally backed up via fiber optic connection to ensure rapid recovery is possible in the event of facility damage or evacuation at the primary control location. • <i>Challenges:</i> Required coordination between business network and controls system consultants, as well as working with Springfield Utility Board who operates the fiber and has some shared control system components at the 42nd Street location.

Mitigation Action Item	#2020.54 - New Install - Procure NOAQ Boxwall
Location	Rainbow Water District Service Area
Coordinating Agencies	Rainbow Water District
Implementation Timeframe	2019-2021
Estimated Cost	\$20,000
Potential Funding Sources	Operational
Hazards Mitigated	Earthquake
FEMA NHMP Category	Structure & Infrastructure
Comments	NOAQ Boxwall or equivalent for flood protection at Chase WTP.
Progress Since Last Plan	<ul style="list-style-type: none"> • <i>2020 Plan Conclusion Status:</i> Withdrawn • <i>Carryover to 2024:</i> No • <i>Accomplishments:</i> Rainbow Water District met with the City of Springfield to consider participating in a joint order of portable flood barriers that could be stored in anticipation of a flood event. Rainbow’s procurement would encircle the Chase Wellfield Water Treatment Building and provide some level of increased flood protection. • <i>Challenges:</i> The barriers would be more effective when dewatering pumps can operate to remove water that seeps past the barrier, but

	<p>water would likely cover the roadway during a flood event, preventing staff from safely accessing the site to maintain pumps. It would be safer and more cost effective for staff to take some smaller protective measures, such as sandbags or plywood and plastic against the doors of our building, and not attempt to keep this facility in operation during a flood event. Other water sources would be utilized instead.</p>
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Mitigation Action Item	#2020.55 - New Install - Transfer Switch and Generator
Location	Rainbow Water District Service Area
Coordinating Agencies	Rainbow Water District
Implementation Timeframe	2019-2021
Estimated Cost	\$250,000
Potential Funding Sources	Operational
Hazards Mitigated	Drought Earthquake Wildfire
FEMA NHMP Category	Structure & Infrastructure
Comments	Install transfer switch at I-5 wells and obtain trailer-mounted generator for Chase or I-5 wells.
Progress Since Last Plan	<ul style="list-style-type: none"> • <i>2020 Plan Conclusion Status:</i> In Progress • <i>Carryover to 2024:</i> Yes • Accomplishments: Rainbow Water District obtained a portable generator under a SPIRE grant that can operate 2 or 3 of the 5 wells in the Chase Wellfield. This may be connected via an existing manual transfer switch. NEW: Rainbow has hired an electrical engineer to design panel upgrades and install a manual transfer switch that could facilitate either a portable or possibly a permanently-installed generator. Design may be used to seek grant funding for generator procurement and installation. • Challenges: The SPIRE generator is owned by the state and may be required for service in another location deemed a higher priority. The ability to operate Chase wells is contingency upon generator availability. At the I-5 Wellfield, the large motors will require an electrical upgrade and generator siting issues need to be resolved.

Mitigation Action Item	#2020.56 - New Install - Emergency Water Distribution Site
Location	Rainbow Water District Service Area
Coordinating Agencies	Rainbow Water District
Implementation Timeframe	2019-2023
Estimated Cost	\$75,000
Potential Funding Sources	TBD
Hazards Mitigated	Flooding
FEMA NHMP Category	Structure & Infrastructure
Comments	Develop three small emergency water distribution sites located at or near private wells with tested water.
Progress Since Last Plan	<ul style="list-style-type: none"> • <i>2020 Plan Conclusion Status:</i> In Progress • <i>Carryover to 2024:</i> Yes • <i>Accomplishments:</i> Tested Northwood Church irrigation well in August 2016. Made contact with the church again in September 2020 and learned they are moving to a new location and selling their building. Need to resume conversation with new owner once the sale goes through. (Northwood is still building a new facility as of May 2024.) • In Fall 2023 we distributed emergency water storage containers as part of a customer service promotion, to encourage the concept of self-preparedness. • <i>Challenges:</i> Some of the better sites at schools and parks are served by the neighboring water utility, and there are challenges in coordinating our efforts. The project could entail using emergency wells instead of just transported water, adding complexity to the concept.

Mitigation Action Item	#2020.57 - New Install - All Restraint Water Mains
Location	Rainbow Water District Service Area
Coordinating Agencies	Rainbow Water District
Implementation Timeframe	2019-2029
Estimated Cost	\$ TBD - Two times the cost of standard piping.
Potential Funding Sources	Operational
Hazards Mitigated	Flooding Windstorm Winter Storm
FEMA NHMP Category	Structure & Infrastructure
Comments	Use all-restraint water mains for landslide risk transmission mains.
Progress Since Last Plan	<ul style="list-style-type: none"> • <i>2020 Plan Conclusion Status:</i> In Progress • <i>Carryover to 2024:</i> Yes • <i>Accomplishments:</i> Restrained joints may eliminate the need for concrete thrust blocks and simplify the work in some aspects, but

installation time can be slower to bolt piping at each joint and material costs are roughly double, increasing the overall project cost.

- Challenges: Yes. It is still relevant. With the new standard, new piping projects will continue to be constructed using joint restraint techniques and increase system resiliency over time. As of May 2022, Rainbow is installing a new 8” ductile iron water main along Hayden Bridge Road from 33rd to 38th Streets, and this is our first fully-restrained project.

16.05.02: 2024 – 2028 Planned Items Summary

The following initiatives are the planned mitigation action items for the new planning cycle. 3 of the 8 items were carried over from the 2020-2024 planning cycle with 5 new items added. RWD is the lead agency and funding source for these initiatives unless otherwise noted.

MIA's - FEMA Categories 2024 - 2028			
FEMA Categories	Total	%	
Structure & Infrastructure	8	100%	
Total	8	100%	

[Source: Rainbow Water District]

MIA's - Funding Estimates 2024 - 2208			
Funding Type	QTY	Estimate	
Operational	8	\$ 3,487,500	
Total	8	\$ 3,487,500	

MIA's - Hazards 2024 - 2028		
Hazard	Primary	Secondary
All Hazards	0	0
Drought	1	3
Earthquake	4	2
Extreme Weather	0	3
Flooding	0	2
Landslide	0	2
Wildfire	1	4
Windstorm	1	3
Winter Storm	1	3
Volcano	0	5
Total	8	27

Mitigation Action Item - A	New Install - Diversified Control System	
Location	System-Wide, Springfield	
Coordinating Agencies	Rainbow Water District	
Implementation Timeframe	2024-2029	
Estimated Cost	\$75,000	
Potential Funding Sources	Operational	
Hazards Mitigated	Earthquake Extreme Weather Windstorm Winter Storm Volcano	
FEMA NHMP Category	Structure & Infrastructure	
Comments	Install decentralized control system to reduce likelihood of a single point of failure interrupting water system operations. Project to include radio, microwave or cellular connections to provide protection against failed landline connections.	
Progress Since Last Plan	N/A – New project for 2025 Plan	
Current Site Photos		

Mitigation Action Item - B	New Identify Location and Install - Bulk Water Fill Station	
Location	Springfield	
Coordinating Agencies	Rainbow Water District	
Implementation Timeframe	2026-2028	
Estimated Cost	\$35,000	
Potential Funding Sources	Operational	
Hazards Mitigated	Drought Extreme Weather Wildfire Windstorm Volcano	
FEMA NHMP Category	Structure & Infrastructure	
Comments	Install bulk water fill station to allow people experiencing drought and water service disruption to load and transport water.	
Progress Since Last Plan	N/A – New project for 2025 Plan	
Current Site Photos		

Mitigation Action Item - C	New Install - Transfer Switch and Generator	
Location	Chase Wellfield, Springfield	
Coordinating Agencies	Rainbow Water District	
Implementation Timeframe	2025-2029	
Estimated Cost	\$150,000	
Potential Funding Sources	Operational	
Hazards Mitigated	Drought Earthquake Extreme Weather Wildfire Windstorm Winter Storm Volcano	
FEMA NHMP Category	Structure & Infrastructure	
Comments	Design and install transfer switch and permanent generator for running up to three Chase wells.	
Progress Since Last Plan	N/A – New project for 2025 Plan	
Current Site Photos		

Mitigation Action Item - D	Structural Evaluation of Chase and I-5 Wellfield facilities.	
Location	Chase & I-5 Wellfields, Springfield	
Coordinating Agencies	Rainbow Water District	
Implementation Timeframe	2024-2029	
Estimated Cost	\$30,000	
Potential Funding Sources	Operational	
Hazards Mitigated	Earthquake	
FEMA NHMP Category	Structure & Infrastructure	
Comments	Study to review critical equipment anchorage and assessment of building's seismic risk.	
Progress Since Last Plan	N/A – New project for 2025 Plan	
Current Site Photos		

Mitigation Action Item - E	New Install - Emergency Communication	
Location	Kelly or Vitus Butte, Springfield	
Coordinating Agencies	Rainbow Water District	
Implementation Timeframe	2025-2028	
Estimated Cost	\$30,000	
Potential Funding Sources	Operational	
Hazards Mitigated	Earthquake Extreme Weather Wildfire Winter Storm Volcano	
FEMA NHMP Category	Structure & Infrastructure	
Comments	Install HAM radio and emergency data transmission antennas at Kelly Butte and/or Moe Hill Reservoirs in coordination with Lane County radio repeater expansion.	
Progress Since Last Plan	N/A – New project for 2025 Plan	
Current Site Photos		

Mitigation Action Item - F	New Install - Transfer Switch and Generator	
Location	I-5 Wellfield, Springfield	
Coordinating Agencies	Rainbow Water District	
Implementation Timeframe	2026-2029	
Estimated Cost	\$250,000	
Potential Funding Sources	Operational	
Hazards Mitigated	Drought Earthquake Flooding Flooding Wildfire Windstorm Winter Storm Volcano	
FEMA NHMP Category	Structure & Infrastructure	
Comments	Install two VFDs, one transfer switch and permanent 250 kW generator for powering either of the two I-5 wells.	
Progress Since Last Plan	N/A – New project for 2025 Plan	
Current Site Photos		

Mitigation Action Item - G	New Install - Emergency Water Distribution Site	
Location	System-Wide, Springfield	
Coordinating Agencies	Rainbow Water District	
Implementation Timeframe	2025-2029	
Estimated Cost	\$75,000	
Potential Funding Sources	Operational	
Hazards Mitigated	Drought Earthquake Flooding Flooding Landslide Wildfire Winter Storm Volcano	
FEMA NHMP Category	Structure & Infrastructure	
Comments	Develop three small emergency water distribution sites located at or near private wells with tested water.	
Progress Since Last Plan	N/A – New project for 2025 Plan	
Current Site Photos		

Mitigation Action Item - H	Chase Water Transmission Main Upgrades and Seismic Evaluation	
Location	Chase Wellfield, Springfield	
Coordinating Agencies	Rainbow Water District	
Implementation Timeframe	2019-2029	
Estimated Cost	\$2,842,500	
Potential Funding Sources	Operational Two times the cost of standard piping.	
Hazards Mitigated	Earthquake Landslide	
FEMA NHMP Category	Structure & Infrastructure	
Comments	Install replacement all-restraint transmission main at Chase Wellfield for improved seismic resiliency in area at risk for lateral spreading.	
Progress Since Last Plan	N/A – New project for 2025 Plan	
Current Site Photos		

16.06 Plan Implementation and Maintenance

RWD has outlined its internal roles and delegation of responsibilities for maintaining and renewing their annex to the County NHMP.

16.6.1 Annex Plan Coordination: The NHMP annex plan will be coordinated by district Superintendent and will be responsible for:

- identifying and collaborating with internal RWD staff to support the hazard quantification review, mitigation action update/selection process and plan renewal process
- participating as the representative from RWD to the County NHMP Committee, liaison to County staff and other area Cooperators
- reviewing, recommending and incorporating updates to the annex during the plan renewal cycle
- maintaining updates to the mitigation action items and including new items added during the maintenance cycle or at the renewal cycle
- coordinating and/or supporting the public engagement process during the plan renewal cycle or outreach during the maintenance cycle
- coordinating the review and approval by the RWD Board of the annex plan

16.6.2 Training Requirements: RWD will require the following training for RWD personnel who support the maintenance and/or renewal of the NHMP annex.

Table 16.7.9: RWD NHMP Training Requirements

Course #	Title	Purpose	Staff Assignment
FEMA IS-93B	Introduction to Hazard Mitigation	Introduction for those who are new to emergency management and/or hazard mitigation; intended to train those who have responsibility for or participating in NHMP activities. es.	Superintendent and Assistant Superintendent (Operations Manager)
FEMA IS-18A	Local Mitigation Planning Training	The goal is to provide an overview of the requirements for local hazard mitigation plans that are found in the FEMA Local Mitigation Planning Policy Guide.	Superintendent

16.6.3 Plan Integration:

Rainbow thrives on serving in the middle ground between our much larger neighboring city water utilities and the very small rural county water systems. Resiliency efforts have focused on both aspects, helping the small systems operate through and recover from disasters, and directly contributing to the water needs of the interconnected urban water system. The priority placed on mitigation and preparedness is reflected in the significant progress made with mitigation action items in the last five-year cycle, and further demonstrated by Board of Commissioner approval of budgets and policies in a public meeting setting.

Despite Rainbow’s small size, significant effort is expended by staff to participate in local water association and emergency planning efforts, networking and leveraging opportunities with larger neighbors to elevate our emergency response capacity and capabilities.

RWD annex will continue to utilize as guidance, connect with and/or collaborate in the following critical plans, agreements and statutes:

- Oregon Revised Statutes, Chapter 264 - Conveys the statutory authority to operate as a domestic water supply district.
- 1995 Urban Services Agreement - Guidance for coordination of water services inside the Springfield Urban Growth Boundary.
- 2006 Mutual Aid Agreement for Cooperative Interties - Provision for the emergency exchange of water between Eugene Water & Electric Board (EWEB), SUB and Rainbow, with the Eugene-Springfield water utilities sharing water supplies during times of potential or actual water shortage.
- 2018 Water Management and Conservation Plan (joint SUB & Rainbow) - Required submission to Oregon Water Resources Board that includes water curtailment response. (Five-year progress report provided June 28, 2023.)
- 2021 Water System Master Plan (joint SUB & Rainbow) - Outlines long-term planning options for resiliency, reliability and optimization of the joint SUB and Rainbow water System.
- 2021 Emergency Response Plan and Risk & Resilience Assessment - Comprehensive water supply and customer delivery risk assessment, mitigation actions, and incident-specific response guidance to identified natural hazards and human-caused events.
- Oregon Water/Wastewater Emergency Response Network - Voluntary mutual aid agreement between Oregon utilities to share resources and equipment, and improve emergency planning, coordination, and training.
- RWD Capital Improvement Plans - Describes routine capital work like water main replacements, and large multi-year projects typically financed through grants, loans or bonds.
- Drinking Water Risk Communications Plan - Outlines incident-specific communication strategies and messages to provide timely and accurate information to internal/external stakeholders during water supply disruptions.

16.6.4 Mitigation Action Items Coordination:

Mitigation Action Items are segregated into the 4 FEMA categories and assigned based on RWD service/operational areas. The Superintendent coordinates the annual updates of the MAI’s and NHMP Annex Plan as outlined below in table 16.7.10.

Table 16.7.10: MAI’s Coordination

Process	Description of Process
Exploration of New MAI’s	Exploration of new MAI’s may come from a variety of ways: <ul style="list-style-type: none"> • New or Upgraded Regulatory Requirements • Capital Improvement Planning • Actual Event or Exercise Response – After Action Review/Improvement Plans • Planning Updates – Mitigation, Climate, Operations, • Public/Cooperator Feedback/Collaboration
Selection of New MAI’s	New MAI’s may be recommended by the Superintendent, general staff, Board of Commissioners, and other area cooperators. The recommended MAI’s are forwarded to the Superintendent for consideration and inclusion within the NHMP Annex plan. As needed, the Superintendent will consult with Assistant Superintendent (who serves as the Operations Manager) and/or Board of Commissioners.
Coordination of MAI’s	MAI’s are segregated into the 4 FEMA categories with assignment of coordination by like disciplines within RWD. <ul style="list-style-type: none"> • Structure & Infrastructure [Operations, Admin] • Plans/Regulations [Operations, Administration] • Natural Systems Protection [Operations & Admin] • Education & Outreach [Admin] Superintendent will utilize a progress report for tracking of the MAI through conclusion of the item; this may be assigned to individual staff persons as needed. Progress reports will be updated at least annually and then evaluated for carryover during the plan renewal cycle. The Superintendent will coordinate the summary of the MAI’s to the County for inclusion in the County base NHMP plan every 5 years.
Funding to Support MAI’s	RWD administration will provide support for any grant development for the MAI’s and/or for consideration within the agency operational budget. MAI projects will be prioritized based on agency needs and/or align with the capital improvement plan. It is anticipated that some items may not be accomplished for multiple fiscal years due to lack of operational funding or applicable federal grant funding.
Conclusion of MAI’s	Superintendent will finalize the progress reports of concluded MAI’s and update the County as part of the plan renewal process.

16.6.5 Public Engagement:

RWD participated in collaborative public engagement campaign with the City of Eugene, City of Springfield, Eugene Water & Electric Board, and Willamalane Park and Recreation District as part of the 2024 plan renewal.

- Campaign Content – Focus Areas:
 - Orientation to NHMP purpose and transition to County NHMP
 - RWD NHMP Annex to County plan
 - Overview of hazard risk assessment results
 - Overview of selected mitigation action items
 - Solicitation of feedback from public and cooperators on the campaign focus areas via survey and in-person feedback during presentation sessions
- Campaign Events – the following outlines the conducted events with community members on the above focus areas:

Table 16.7.11: Scheduled Public Engagement Events

Date/Time	Type	Intent	Audience	#
03/13/24	Presentation – In Person	Provide overview of the NHMP, purpose, mitigation action items, etc.	RWD Staff, Board of Commissioners and Public	10
08/22/24 1-4pm [Springfield]	RWD Customer Appreciation Open House	75 th Anniversary Event – staff hosted a table to share draft NHMP annex, goals, and proposed mitigation action items	RWD Staff, Board of Commissioners and Public	100
08/26/24*	Media Release	Announce NHMP Presentations, Public Feedback Requested, Transition	Public & Cooperators	*
09/04/24 6-7:30pm [Eugene]	Presentation – In Person	NHMP Overview, Transition to County, Survey, Solicit Public Feedback	Public & Cooperators	
09/10/24 5:30-7pm [Springfield]	Presentation – In Person	NHMP Overview, Transition to County, Survey, Solicit Public Feedback	Public & Cooperators	
09/11/24 5:30-6:00 pm [Springfield]	Board Work Session	Provide NHMP Annex Overview, review Hazard Rankings and proposed MAI’s	RWD Staff and Board of Commissioners, Public	

*Media Release initiated by COE was on behalf of all annex holders and was shared with regional media partners, area cooperators, city social media, city website, city subscribers to city information.