COTTAGE GROVE
DRINKING WATER PROTECTION PLAN

April, 2015

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Executive Summary

The Cottage Grove Drinking Water Protection Plan (Plan) was produced through the combined efforts of involved citizens, City of Cottage Grove staff, Coast Fork Willamette Watershed Council staff, and Oregon Department of Environmental Quality (DEQ) staff. The purpose of this Drinking Water Protection Plan is to protect the water quality within the Row River watershed, the sole source of drinking water for the Cottage Grove community.

The Cottage Grove Plan process involved the public and utilized local knowledge. The Source Water Assessment (DEQ, 2000) for the Cottage Grove Drinking Water Source Area was updated and enhanced through this effort.

The Plan process included:

- Researching and providing useable information on sensitive areas and potential contaminant sources.
- Incorporating Committee knowledge and research information into an enhanced inventory.
- Utilizing existing risk information and local knowledge to refine risk ratings for potential contaminant sources.
- Developing management strategies to reduce or eliminate the risks to the drinking water source posed by potential contaminant sources.
- Developing a Contingency Plan that identifies the primary potential threats to the water supply, and presents procedures that will be followed should the threats materialize.
- Documenting a procedure for siting future water systems that outlines the steps that would need to be taken if the existing Row River source should become unusable or if community growth requires more capacity than is available from the present source.

The Plan is recognized as a useful tool for protecting the viability of businesses and households in the City of Cottage Grove and within the watershed. The Plan will be approved by the Oregon Drinking Water Services (DWS) under the Oregon Health Authority, as well as the Department of Environmental Quality.

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Acknowledgements

The Cottage Grove Drinking Water Protection Plan (Plan) was produced through the combined efforts of involved citizens, City of Cottage Grove staff, Coast Fork Willamette Watershed Council staff, and Oregon Department of Environmental Quality staff.

The Technical Advisory Committee reviewed inventory information, provided local knowledge for the inventory of potential contaminant sources, participated in the ranking of the potential contaminant sources, and assisted in the development of management strategies to address potential contaminant sources. The Technical Advisory group provided information during Plan meetings, and also provided technical advice via email, conversations, and published documents.

All parties involved in the process, and interested parties that may present themselves in the future, will be critical for the successful implementation of this Plan.

Technical Advisory Committee

Pamela Reber - Coast Fork Willamette Watershed Council
James Mough – Coast Fork Willamette Watershed Council
Amanda Ferguson - City of Cottage Grove
Ray Pardee - City of Cottage Grove
Frasier McDonald - Lane County
Jeff Ziller - Oregon Department of Fish and Wildlife
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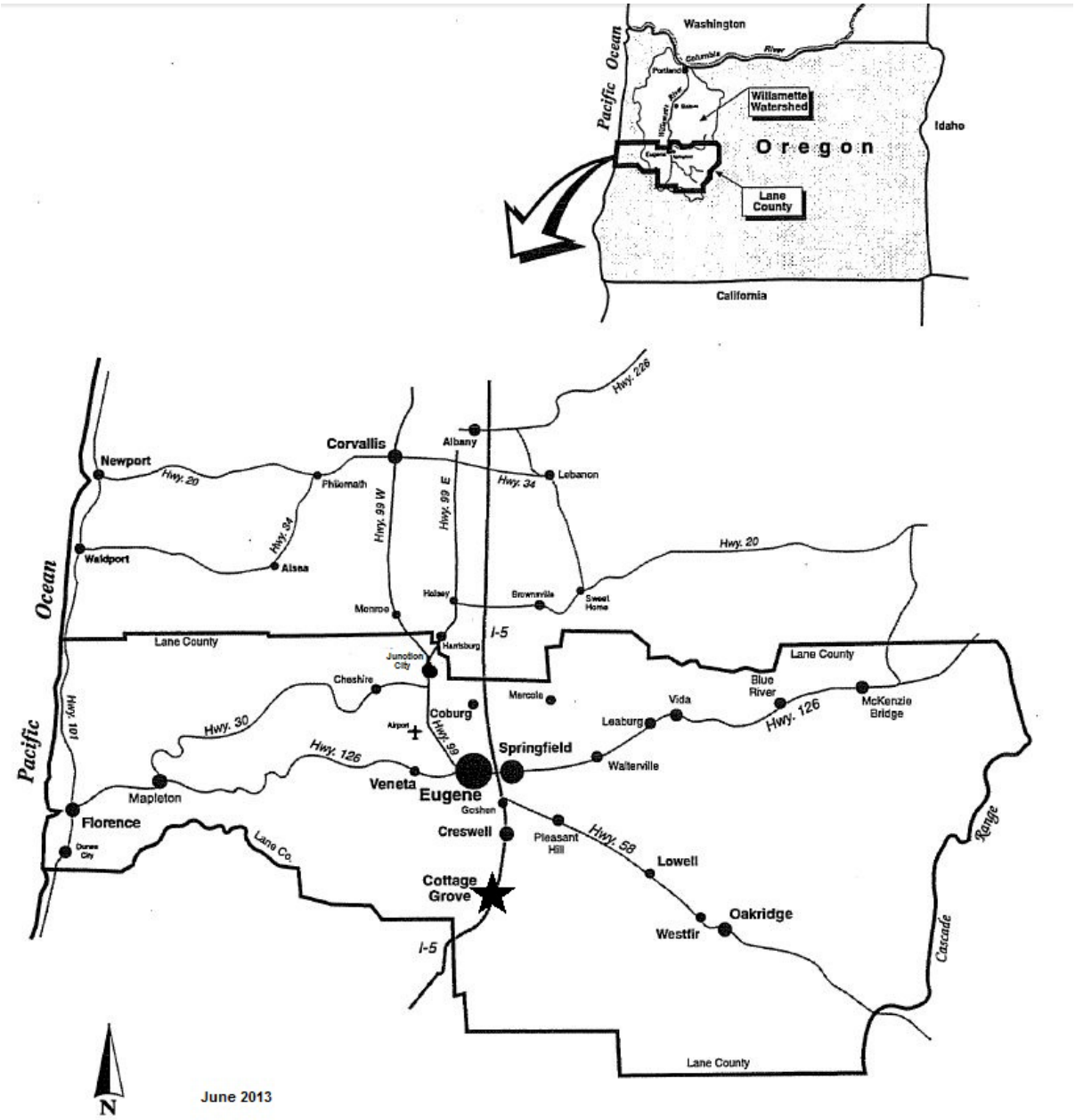
Cottage Grove Drinking Water Protection Plan

Area Map



Chapter 1: Introduction

Background

In 1996, Congress amended the Safe Drinking Water Act, implemented new requirements, and provided resources for state agencies to assist communities in protecting the sources of their public water supplies. The U.S. Environmental Protection Agency (EPA) developed guidelines for implementing the new requirements to conduct "source water assessments." In Oregon, the Oregon Health Authority (OHA) and the Department of Environmental Quality (DEQ) conducted the source water assessments. The Source Water Assessment (SWA) for the City of Cottage Grove was completed in 2000. The City of Cottage Grove SWA included a delineation of the source area supplying the public water system, identification of areas sensitive to contamination, an inventory of potential contamination sources in the area, and a susceptibility analysis. The purpose of the Drinking Water Protection Plan is to build on the information provided in the Source Water Assessment and utilize local and expert knowledge to determine management strategies to protect the water source (ODEQ/OHA, 2002).

A state approval process for local jurisdictions that develop plans is included in the state voluntary drinking water protection program. The DEQ and OHA Administrative Rules provide the framework for developing a drinking water protection program leading to this approval. The voluntary drinking water protection program is built on the belief that local communities are best suited to developing their own drinking water protection program based on the needs and land uses within the community. The DEQ and OHA developed a guidance manual to assist local communities in following these rules and preparing a drinking water protection plan. The Oregon Wellhead Protection Program Guidance Manual (ODEQ/OHA, 1996) was utilized in the process of creating the Cottage Grove Drinking Water Protection Plan.

The creation of a Drinking Water Protection Plan is voluntary for Oregon communities. The benefits of having a drinking water protection plan in place and implementing the Plan as prescribed are many. The Plan addresses past, current, and future potential contaminant sources. It suggests ways to resolve these problems, therefore protecting the health of the consumers. Contamination reduction and avoidance also reduces the costs and difficulties of treating water at the water treatment plant. The creation and implementation of the Plan may assist the City of Cottage Grove in obtaining future funding and reducing monitoring needs and costs.

Purpose

The overriding purpose of this project is to develop a drinking water protection plan that supports high quality and quantity of water that benefits the health and economic viability of the community.

There are seven primary goals of this project:

1. Involve the public in the creation of a Drinking Water Protection Plan for their community.
2. Enhance the SWA inventory by collecting existing information not included in the Source Water Assessment and utilizing the diverse local knowledge of the Committee citizens.
3. Refine the SWA sensitive areas with GIS and LIDAR data and additional geologic information.
4. Reassess the susceptibility analysis by overlaying the refined sensitive areas with the enhanced inventory.
5. Develop management strategies for all potential contaminant sources identified through the planning process. Prioritize the management strategies and include them in the Drinking Water Protection Plan.
6. Create a Contingency Plan for possible interruption and/or contamination of the water supply system.
7. Create a procedure for siting new future water system sources.

Source Water & Intake

Cottage Grove is located in southern Lane County, at the confluence of the Coast Fork Willamette River and the Row River. The City of Cottage Grove relies solely on the Row River for its drinking water supply. The intake facility is located on the eastern border of city limits and supplies roughly 9,785 citizens through the use of approximately 4,033 water meters.

The drinking water for Cottage Grove is supplied by the Row River. The intake is located in the Row River Watershed in the Coast Fork Willamette Sub-Basin in the Upper Willamette Basin, Hydrologic Unit Code (HUC) #17090002. This intake supplies the Row River Water Treatment Plant, which is located near the intake within the Row River Nature Park. The Row River Water Treatment Plant's capacity was doubled from two million gallons a day (mgd) to 4mgd in 2008 through membrane treatment units. As of July 2009, the plant produces approximately 2.4 mgd. Water production remains just above the amount of water consumed. The plant's intake structure has an air-burst screen-cleaning system and National Marine Fisheries Service-compliant fish screens.

The streams that contribute to the Row River intake facility extend upstream for 34 miles, encompassing an area approximately 371 square miles. The boundaries of this "Drinking Water Source Area" (DWSA), identified by the DEQ, lie entirely outside of city jurisdiction (DEQ, 2000). The drinking water protection area includes the rural unincorporated communities of Culp Creek and Dorena, as well as residential areas known as Diston and Walden. In general, the watershed supports a timber, agriculture, and recreation-based economy. Most of the drinking water protection area is located in Lane County, with a very small area located in Douglas County under the jurisdiction of the U.S. Forest Service.

Natural Features and Land Use

The delineated drinking water protection area is primarily dominated by managed forest land uses in the upper reaches and by residential and limited commercial development along the main rivers, creeks and Dorena Reservoir. Elevations range from approximately 600 feet at the intake to 6,000 feet at Fairview Peak. Major tributaries include the Row River, Brice Creek, Sharps Creek, Layng Creek, and Mosby Creek. Most of the tributaries and water bodies in the Row River Watershed are listed on the 303(d) list for water quality impairment, with temperature, mercury, and flow or habitat modification being the most frequent contaminants. The following chart lists current (2010) water quality impairments for the Row River Watershed.

Water Quality Impairments for Streams in Cottage Grove's Drinking Water Source Area (Row River Watershed) (2010):

Dorena Lake	Aquatic Weeds or Algae, Mercury
Row River	Aquatic Weeds or Algae, Biological Criteria, Temperature, Flow Modification, Mercury
Brice Creek	Temperature, Habitat Modification
King Creek	Temperature
Layng Creek	Temperature
Martin Creek	Temperature
Mosby Creek	Temperature, Habitat Modification
Sharps Creek	Temperature, Habitat Modification

Geology and Soils

Cottage Grove's Drinking Water Source Area (DWSA) is within the Cascade Mountain physiographic province. The geology of the DWSA is associated with rock units of the Western Cascades, generally consisting of a mixture of volcanic and sedimentary units. Most of the source water area is underlain primarily with Tertiary-aged volcanic rock. East of Dorena Reservoir, there are extensive deposits of basaltic and basaltic andesite lava flows and breccia. The most common formation in this area is the Fisher Formation (Tfe), which is comprised of andesitic lapilli tuff, breccias, and water-laid and air fall silicic ash (Mosby).

The area has steep mountainous headwaters carved by alpine glaciations during the last ice age (Weyerhaeuser, 1999). The Bureau of Land Management (BLM) noted evidence of slope instability in the watershed as evidenced by at least six large landslide deposits identified with aerial photos.

Soils in the area vary from the alluvial soils found in the floodplains and valley stems to xeric soils in the foothills and lower elevations areas, to udic soils found in the middle to higher elevations. In general, the soils are well drained, fine textured, and moderately deep to deep. Shallow and or gravelly/stony soils are located on some of the steep slopes or narrow ridges within the source water area (BLM, 1999, Row River). The northeastern area of the DWSA, including the Layng Creek Watershed, is characterized by basaltic rock units.

Climate

The climate in the DWSA is characteristic of Western Oregon: marine west coast climate. Moisture occurs primarily in the fall, winter, and spring months. The air masses are typically warm with the predominant precipitation in the form of rainfall. Winters are cool, but snow and freezing temperatures are common only at higher elevations. The transient snow zone for the region is considered to be between 2000'-4000'. Summers are dry, contributing only 20 percent of annual moisture between the months of April and September. Average annual rainfall is between 40"-50" at lower elevations with over 60" occurring at higher elevations.

Ownership and Management

Land ownership within the source water area consists of mostly Umpqua National Forest land and Weyerhaeuser timber land. Other represented interests include the Bureau of Land Management, rural residential private ownership, other private timber companies, the U.S. Army Corps of Engineers, and Lane County.

The Lane County Zoning designations within the DWSA include Exclusive Farm Use, Forest zones, and Rural Residential zones with varying densities.

Infrastructure and Recreation

The Dorena Dam impounds the Row River at river mile 7.5, forming Dorena Reservoir. The reservoir is approximately 4 miles long and ¾ mile wide, holding 72,050 acre feet of water. The Dam is an earth fill structure constructed in 1949. (BLM, 1999) All of the tributaries, except for Mosby Creek, flow into Dorena Reservoir.

According to the BLM, there are six rock quarries within the Row River Watershed, with more in the source water area as a whole. These have historically been used to produce crushed rock aggregate for construction projects. The BLM points out that the area does have future development potential for quarry rock and leasable minerals. A small area, approximately 3 acres, is considered to have potential for gold mining.

There are also a multitude of recreational opportunities within the DWSA. Dorena Reservoir is a high-use recreational area including boating, fishing, and water sports. There are also hiking and biking opportunities, including the Row River Trail, a National Scenic Bikeway that extends the length of Dorena Reservoir from Cottage Grove to Culp Creek.

Responsible Management Authorities (RMAs)

The City of Cottage Grove Water Utility is managed by Cottage Grove Public Works. A Superintendent oversees plant operation. The treatment plant operator is responsible for proper treatment of incoming water, maintenance of the plant, monitoring, meter reading, and other duties.

Row River Watershed lies within the jurisdiction of the Lane County government. Chapter 9 of the Lane County Code includes regulations for solid waste, waste disposal, erosion prevention, and tree conservation. Enforcement of these regulations pertains to this plan.

The Upper Willamette Soil and Water Conservation District (SWCD) services the area and provides a regional forum for interested people, groups and agencies to bring forward conservation needs currently not being met. Upper Willamette SWCD cooperates with landowners, land occupiers, other natural resource users, other local governments as defined in ORS 174.116, and with agencies of the government of Oregon and of the United States in projects, programs, and activities to provide for the conservation of renewable natural resources of the state and thereby conserve and develop water resources and water quality and preserve wildlife habitat (paraphrased from ORS 568.225(1) and (2)).

The Coast Fork Willamette Watershed Council (CFWWC) is composed of volunteers led by a group of volunteer board members and managed by an Executive Director. The mission of the CFWWC is to enhance the Coast Fork Willamette Watershed through investigation, restoration, education, and stewardship. The CFWWC coordinates with experts to conduct studies, collect data, and develop restoration strategies in addition to conducting targeted water quality monitoring.

The City of Cottage Grove, the Row River Watershed, and the entire surrounding area remains under the regulation of the State of Oregon. State agencies provide pertinent services in regards to this plan including, but not limited to: Oregon State Police, Oregon Department of Environmental Quality, Oregon Health Authority Drinking Water Services, Oregon Department of Agriculture, Oregon Department of Fish and Wildlife, Oregon Water Resources Department, and Oregon Department of Forestry.

Federal jurisdiction encompasses a large portion of the DWSA. The Bureau of Land Management (BLM) manages approximately 32,000 acres within the area. The U.S. Forest Service manages approximately 84,115 acres within the area. The U.S. Army Corps of Engineers manages and operates Dorena Dam, Spillway and Reservoir. The Environmental Protection Agency carries out the Safe Drinking Water Act and Clean Water Act and developed guidelines for implementing the requirements to conduct source water assessments.

Chapter 2: Public Participation

Public participation was encouraged throughout the planning process. All Advisory Committee meetings were advertised and open to the public to attend and comment. In addition, the Coast Fork Willamette Watershed Council bi-monthly newsletter highlighted events and progress relating to the Drinking Water Protection Plan. Two other prominent public participation aspects of this plan are the Technical Advisory Committee and the city-wide Riparian Management survey conducted by the City.

Technical Oversight Committee

The Row River Technical Oversight Committee served as the Technical Advisory Committee (TAC) for this plan. Represented interests included key agencies present in the DWSA, including: Bureau of Land Management, U.S. Forest Service, U.S. Army Corps of Engineers, Oregon Department of Fish and Wildlife, and Weyerhaeuser. The TAC met on two occasions between 2013 and 2014 to discuss and revise plan strategies.

The TAC consisted of:

Pamela Reber - Coast Fork Willamette Watershed Council
James Mough – Coast Fork Willamette Watershed Council
Amanda Ferguson - City of Cottage Grove
Ray Pardee - City of Cottage Grove
Frasier McDonald - Lane County
Jeff Ziller - Oregon Department of Fish and Wildlife
Shannon Richardson - Oregon Department of Fish and Wildlife
Ken Homolka – Oregon Department of Fish and Wildlife
Brian Bickford - Bureau of Land Management
Steven Liebhardt – Bureau of Land Management
Wes Messenger - Army Corps of Engineers
Doug Garttles – Army Corps of Engineers
Allie Gusey - U.S. Forest Service
Ted Huffman - U.S. Forest Service
Jason Wilcox – U.S. Forest Service
Nicole Nielsen-Pinkus – McKenzie River Trust
Jacqueline Fern – Oregon Department of Environmental Quality
Kevin Fenn – Oregon Department of Agriculture

The TAC advised the City of Cottage Grove regarding each individual organization's internal management strategies as they relate to watershed health, as well as agency priorities and resources available to assist in strategy implementation. This information was provided during Plan meetings, and also via email, conversations, and published documents.

The objectives for the Committee were to:

1. Inform the enhanced inventory with local knowledge, and comment on presented inventory materials.

2. Steer the direction of the Drinking Water Protection Planning process through input provided at the public meetings.

3. Provide local knowledge on the existence and extent of each type of Potential Contaminant Source (PCS) by systematically reviewing all types of Potential Contaminant Sources in a public meeting.

4. Discuss viable management strategies to address the PCSs. Make final decisions on the Management Strategies to be included in the Plan.

5. Review the complete draft of the Plan, provide comments, and suggest edits.

The City of Cottage Grove was responsible for developing the Emergency Plan, as well as the Contingency Plan for addressing future water needs included in this plan.

Riparian Corridor Survey

The City of Cottage Grove conducted a Riparian Management survey in July 2012 to assess attitudes and habits of property owners who live along streams and rivers within the City's Urban Growth Boundary. Questions included inquiries regarding trusted information sources, preferred outreach methods, management challenges, and perceived importance of stream or riparian features.

The survey had 12 questions and took approximately 5 minutes to complete. It was made available on the City of Cottage Grove and the Coast Fork Willamette Watershed Council's websites. A hard copy mailing was sent to streamside property owners within the urban growth boundary. A paper form of the survey was also available at the City of Cottage Grove booth at the Bohemia Mining Days Festival in July, 2012.

The "Riparian Corridor Water Quality Survey" was available on-line for 10 weeks. Data and comments received during this period will be used to help determine public outreach goals and methodology for the Drinking Water Protection Plan.

The full survey report can be found in the appendix. Below is a short summary of key findings as they pertain to this plan.

A clear majority of respondents found non-governmental organizations and OSU extension service as trustworthy sources for property management decision information. Few respondents indicated that they would seek advice from Federal, State, County, or local government officials or agencies. The preferred forms of outreach and education included newsletters (60%), website

information (54%), and workshops (43%). Tours of local gardens examples was also a popular method (34%).

When asked about perceived barriers to making property improvements, respondents identified financial constraints as the number one difficulty (60%). Respondents also cited government land use restrictions (45%), lack of labor (40%), and lack of knowledge (37%) as barriers to modifying their property.

Property owners identified several stream characteristics as important functions. Those included wildlife/fish habitat, erosion and flood control, and visual privacy and access. Improved wildlife/fish habitat (65%), protecting property for future generations (64%), water quality, and scenic beauty (60%) were the main priorities for landowners. Property value and prevention of flooding were also listed as very important by 42%. Providing income or profit was seen as less important. 80% of respondents agreed that riparian vegetation is important for erosion and flood control as well as providing wildlife habitat. The majority of respondents also agree that riparian areas are expensive to maintain (51%). Aesthetic qualities such as having the best looking lawn or flowers and trees overhanging property lines was of little importance to respondents.

These findings have implications for public outreach measures surrounding contaminant sources within the community of Cottage Grove as well as residents that live outside city jurisdiction but within the drinking water source areas. These implications are discussed further in Chapter 6, Management of Potential Sources of Contaminants.

Open House

The City conducted a Public Open House in April, 2014 to provide citizens of Cottage Grove an additional opportunity to comment and give input on the planning effort. The project's key components were explained to participants and suggestions and comments were encouraged. The open house was partnered with a tour of the Drinking Water Treatment Facility on the Row River to provide an educational component for residents on where their drinking water comes from. Suggestions and comments received were reviewed by City staff and incorporated into the plan where appropriate. Information regarding the open house was made available online for those unable to attend. Notice of the open house was sent to all property owners along a riparian corridor as part of the Riparian Newsletter, and was included in the Coast Fork Willamette Watershed Council's spring newsletter. Approximately one dozen residents attended the open house.

Chapter 3: Delineation of the Drinking Water Source Area

The mapping of the drinking water source area or the DWSA is an important aspect of the assessment and protection of a public water system. A delineation of the DWSA provides the community with the knowledge of the geographic area that provides the source of water that drains to the intake. This information allows the water supplier as well as community residents to develop management strategies that will have the largest impact on protecting the drinking water source. It is an equally valuable tool for notifying the public of their presence within a sensitive area.

The drinking water source area for the City of Cottage Grove was identified by DEQ in 2000 to meet the requirements of the 1996 Safe Drinking Water Act amendments. The DWSA is composed of the area of the Row River watershed upstream of the City of Cottage Grove Water Treatment Facility intake. The surface water source area extends upstream for 34 miles, encompassing an area approximately 371 square miles. The boundaries lie entirely outside of city jurisdiction.

The drinking water for the City of Cottage Grove is supplied by the Row River. The intake is located in the Row River Watershed in the Coast Fork Willamette Sub-Basin in the Upper Willamette Basin, Hydrologic Unit Code (HUC) #17090002. This intake supplies the Row River Water Treatment Plant, which is located near the intake within the Row River Nature Park. The Row River Water Treatment Plant's capacity was doubled from two million gallons a day (mgd) to 4mgd in 2008 through membrane treatment units. As of July 2009, the plant produces approximately 2.4 mgd. Water production remains just above the amount of water consumed. The plant's intake structure has an air-burst screen-cleaning system and National Marine Fisheries Service-compliant fish screens.

Chapter 4: Drinking Water Source Area Inventory

The State's 2000 Source Water Assessment report for Cottage Grove delineates the DWSA and identifies contaminant sources within the designated area. This Drinking Water Protection Plan expands and updates the DEQ's inventory with local knowledge and new information.

The DEQ mapped a total of 45 potential contaminant sources within the City of Cottage Grove's drinking water protection area, all of which are located in sensitive areas. The sensitive areas within the City of Cottage Grove's drinking water protection area include areas with high soil permeability, high soil erosion potential, high runoff potential, and areas within 1000' from the river/streams. Potential contaminant sources, if located in these areas, pose a greater potential to impact the water supply.

The City of Cottage Grove utilized the 2000 Source Water Assessment existing Potential Contaminant Source list, DEQ results from an updated regulatory database search, and accompanying potential impact descriptions to identify potential risks in the inventory assessment phase. Using DEQ information coupled with local knowledge, the updated inventory mapped a total of 55 potential contaminant sources (see Appendix for complete list). These sources fell into seven categories:

1. Agriculture
2. Forestry Practices
3. Industrial/Commercial
4. Infrastructure
5. Natural Hazards
6. Recreation
7. Residential

Agriculture

Agricultural activities in the Drinking Water Source Area include both commercial and hobby farms. Hobby farms include backyard gardens and small livestock herds including horses, cows, sheep, and other farm animals. Larger scale agriculture activities do not presently exist within the DWSA but may in the future.

Potential non-point source pollutants associated with agriculture include sediments, nutrients, pathogens, oxygen-depleting organics, and pesticides.

Forestry Practices

Timber Harvest

Forestry practices include activities related to growing and harvesting timber. Pollutants typically associated with forest practices include nutrients, sediments, organics, and heat. Erosion and subsequent sedimentation results from timber harvest, road construction, stream crossings, and high intensity fires.

Timber harvest on forested lands, including cutting and yarding, has the potential to contribute sediment, nutrients, chemical residue from fertilizer and/or pesticide applications, and organic matter runoff to stream channels. The actual impacts of these activities depend on the proximity to streams and sensitive areas such as slopes and landslide hazard areas.

Managed Forest Land – Herbicide Application

The Oregon Forest Practices Act requires planting tree seedlings within two years after a timber harvest. Many forest landowners choose to use herbicides to control unwanted vegetation that could be detrimental to tree seedlings. Herbicides are often viewed as the most cost-effective means for reforestation purposes (ODF).

Managed Forest Land – Road Density

Roads can be significant contributors of runoff/sediment to stream channels. They can influence the timing and magnitude of stream flows in a watershed. They can also be a barrier to some terrestrial and aquatic species (BLM, 1995).

Road-stream crossings used by motor vehicles pose a potential risk to the drinking water source. Vehicle accidents at or near crossings could lead to spilled fuel and fluids entering the source water. This situation constitutes a high risk contaminant source in a sensitive area. In addition, access roads have the potential to contribute sediment to stream channels. Industrial forest roads in particular, used predominantly by large logging trucks, contribute to sedimentation along the road and into the stream channel. It is estimated that 2,663 tons of sediment per year is delivered to streams via road routing in the Mosby Creek Watershed area alone (BLM, 2000).

Industrial/Commercial

A variety of commercial and industrial businesses are located in the DWSA. They include logging and construction companies, nurseries, auto gas stations (both active and historic), sand and gravel operations, wood/paper processing mills, and machine shops. These represent potential point and non-point sources of pollution mainly through storm sewer runoff. Some possible contaminants include gasoline and its additives, oil and grease, SOCs, VOCs, inorganics, temperature increases, and heavy metals. Among the metals are arsenic, barium, cadmium, copper, lead, mercury, and zinc.

Infrastructure

There are a variety of physical and organizational structures throughout the study area that are needed for the operation of local communities. They include dams, utility stations, waste transfer stations, and water treatment plants.

One dam exists in the DWSA for hydroelectric and flood control purposes. Dams and powerhouse operations typically involve the use of fuels, paints, solvents, and coolants/lubricants. Although containment facilities are present at these facilities, some risk may be associated with accidental spills and overfilling. It is important that they are inspected at regular intervals to ensure they will perform properly if needed.

Natural Hazards

Harmful Algal Blooms (HABs)

Warm, calm water and nutrients contribute to the rapid growth of both green algae and cyanobacteria (blue-green algae). Blooms can occur anytime of the year, but are most common between June and September. A few types of blue-green algae can develop toxins, which, if swallowed, can cause diarrhea, nausea, cramps, fainting, numbness, dizziness, tingling, and paralysis. Skin contact can cause rashes or irritation. Children and pets are at greatest risk.

A study conducted by Oregon State University researched the risk to Willamette Valley drinking water posed by algal blooms in the region and the potential presence of toxic cyanobacteria. Based on analysis of the 2011 and 2012 bloom seasons, the report concluded that Dorena Reservoir has a low toxigenicity and appears to present low toxicity risks to the Cottage Grove drinking water supplies.

As the previous study suggests, although some blue-green algae have the potential to produce toxins under the right conditions, toxins are not always produced, and when produced, are not always at levels that are harmful (OHA, 2013). Management strategies that promote healthy riparian areas and reduce sediment delivery will address phosphorus sources and reduce the risk of blue-green algae blooms.

Testing to monitor for HABs will continue to be carried out by the Oregon Health Authority through their Harmful Algae Bloom Surveillance program. Ongoing testing is necessary to monitor the situation, as of the 12 raw samples taken in 2013, 6 tested positive for microcystin at the intake.

Recreation

The areas surrounding Dorena Reservoir, as well as the Brice Creek and Layng Creek areas, have a high volume of recreation activities. This includes Corps of Engineers and Forest Service campgrounds, county and municipal parks, and multi-use bicycle trails. Dorena Reservoir is a high-use recreational area including boating, fishing, and water sports. There are also hiking and

biking opportunities, including the Row River Trail, a multi-use paved trail that extends from the City of Cottage Grove to Culp Creek.

Potential contamination from these activities includes petroleum products, solvents, paints, oils and grease, and untreated or partially treated human waste (nutrients and pathogenic microorganisms). Sedimentation and turbidity can also be an issue. Turbidity is the measure of relative clarity of a liquid. Stream bank erosion may be caused by boaters and anglers. Soil erosion caused by off-trail hiking and other activities can increase the sediment load of the watershed.

Residential

Residents, particularly those who live adjacent to the river or a tributary, have an important role to play in the stewardship of the Drinking Water Source Area and maintaining excellent water quality. Several communities within the DWSA, including Disston, Culp Creek, Dorena, and Mosby Creek, exhibit residential clusters of private properties with household and automotive refuse stored within feet of the stream banks.

Potential contamination from these areas includes urban stormwater runoff, nutrients, pathogens, metals, petroleum products, toxic chemicals, and increased biochemical oxygen demand. Not only does this result in additional expense of treating potable water, but they also have a detrimental result for fish, wildlife, and the entire ecosystem.

Chapter 5: Susceptibility Analysis

The DEQ/DHS guidance manual for source water assessments recommends that once the entire boundary of the source area is delineated, that "sensitive areas" be also identified and delineated within the watershed. The purpose of the sensitive area delineation is to prioritize a subset of the watershed for the contaminant inventory and protection strategies in order to focus efforts on the portion of the source area that is most susceptible to contamination.

Susceptibility can be defined as the potential for contamination in the drinking water protection area to reach the intake on the surface water body being used by a public water system for drinking water purposes. Whether or not a particular drinking water source becomes contaminated depends on three major factors: 1) the occurrence of a facility or land use that releases contamination; 2) the location of the release; and 3) the hydrologic and/or soil characteristics in the watershed that allow the transport of the contaminants to the surface water body.

The first step of a susceptibility analysis is to identify those parts of the watershed that are most sensitive to contamination. This was accomplished after the delineation phase of this assessment.

The second step involves the inventory of potential contaminant sources within the drinking water protection area. Each possible contaminant source is then categorized as a lower, moderate, or higher-relative risk to the surface water body. This step was accomplished in the inventory phase of the assessment.

The final step is to combine the results from the sensitive area and potential contaminant source inventories. The results are analyzed in terms of: current, past, and future land uses; their time-of-travel relationship or proximity to the intake site; and their associated risk rating. Land uses that are closest to the intake and those with the highest associated risk pose the greatest threat to a drinking water supply. The presence and locations of the potential contaminant sources within the sensitive areas will determine where the water system has the highest susceptibility to contamination.

For the purposes of the Drinking Water Protection Plan, Cottage Grove elects to maintain the 1000 foot sensitive area designation outlined by DEQ in the 2000 Source Water Assessment. All areas within 1000 feet of a water body are deemed "sensitive areas" within the DWSA.

In addition, the Dorena Dam and Spillway, operated by the Army Corps of Engineers, creates a boundary between upstream potential contaminant sources and those that have a more direct path to the intake facility. Currently, monitoring data comparing contaminants entering the reservoir with the level discharged at the Dam are unavailable. This is an area for possible future monitoring to better understand the relationship the reservoir and Dam serve as a possible barrier to contaminants reaching the intake downstream. Despite the lack of data, in general, those contaminant sources located downstream of the Dam pose a greater and more immediate threat to the drinking water supply. There are four potential contaminant sources located downstream of the Dam that will be given priority for management.

Potential Contaminant Source Ranking

At the June 2013 meeting the TAC participants ranked eleven "High Risk" possible contaminant sources both by perceived threat, and by agency objectives. "Medium" and "low" risk contaminants are addressed in this report; however, the TAC only sought to prioritize the higher risk contaminants. Medium and low risk contaminants are discussed later in Chapter 7. Eight TAC members were present and participated in this ranking exercise.

The following table displays the results from that ranking exercise in terms of high, medium, and low priority for both categories. High priority PCS's are those that received the most votes in the first through fourth designations. Medium priority PCS's are those that received the most votes in the fifth through eighth designations. Low priority PCS's are those that received the most votes in the ninth through eleventh designations.

Table 1. Perceived Risk Ranking

Potential Contaminant Source	High Priority Ranked Top 4	Medium Priority Ranked 5-8	Low Priority Ranked 9-11
Septic Systems – High density	**6**	2	0
Crops- Irrigated	**5**	1	2
Managed Forest Land- Road Density	**5**	2	1
Managed Forestland, Clear-Cut	**4**	3	0
Gravel Pit/Random Dump Sites	3	**4**	1
Wood/Paper Processing Mills	3	***2**	3
Residential, Junk/ Scrap Sites	2	**5**	1
Mining Activities	2	**5**	0
Waste Transfer Stations	1	**4**	3
Utility Stations	1	2	**5**
Auto Gas Stations - Historic	0	4	***4**

*Indicates additional decision applied to break tie.

Table2. Agency Prioritization Ranking

Potential Contaminant Source	High Priority Ranked Top 4	Medium Priority Ranked 5-8	Low Priority Ranked 9-11
Crops- Irrigated	**5**	2	0
Gravel Pit/Dump Sites	**5**	1	0
Managed Forest Land- Road Density	**4**	1	1
Mining Activities	**4**	1	1
Septic Systems – High Density	**4**	1	0
Managed Forestland, Clear-Cut	**3**	1	1
Residential, Junk/ Scrap Sites	3	***3**	0
Utility Stations	1	**2**	0
Waste Transfer Stations	1	1	**2**
Auto Gas Stations - Historic	0	2	***2**
Wood/Paper Processing Mills	0	1	**2**

*Indicates additional decision applied to break tie.

Priority will be given to implement management strategies that address the “High Priority” contaminant sources from this ranking exercise. Those include:

- Crops- Irrigated
- Gravel Pit Dump Sites
- Managed Forest Land- Road Density
- Managed Forest Land – Clear Cut
- Septic Systems – High Density
- Mining Activities

Phase 1 Plan Implementation

The City of Cottage Grove contracted with Guy Sievert of E-Systems Services to develop management strategies that address these high priority contaminant sources in 2014/15. The appendix includes the report of this implementation stage. As part of their analysis, E-Systems performed on-site inspections and meetings with property owners to update the contaminant source list. This updated Potential Contaminant Source list is included in the appendix.

Chapter 6: Management of Potential Sources of Contaminants

This chapter discusses management strategies for each potential contaminant source identified in the inventory stage of this plan. Management strategies provide a process for reducing or eliminating the threat posed to the drinking water supply. These management strategies will be used by the City of Cottage Grove as tools to protect the drinking water source. The sensitive area inventory, risk ranking, and management strategy protocol allows the City of Cottage Grove and other stakeholders to focus their limited resources on areas deemed particularly susceptible to contamination.

In general, best management practices for addressing potential contaminant sources involve a stepped process of outreach and education. Given Oregon's regulatory framework and local jurisdiction barriers, outreach and public education is of the highest importance for protecting the drinking water supply. The Overall Management Strategy encompasses this aspect and considers all potential contaminant sources in its protocol.

In addition to the Overall Management Strategy, the Technical Advisory Committee developed several targeted management strategies to address each potential contaminant source. A discussion of those strategies follows.

Overall Management Strategy Protocol

Initial Contact

- Send letters to landowners notifying them of their location within the City of Cottage Grove DWSA. Addresses for every landowner in the DWSA are included in the binder accompanying this Plan.

- Include pertinent maps

If known problem exists:

- Send letter to landowner notifying them of their location within the Cottage Grove DWSA.

- Letter should encourage the landowner to contact and work with the appropriate entity/agency for technical and financial assistance for designing and implementing Best Management Practices (BMPs) to address known problematic Contaminant Sources on their property.

- Include fact sheets to address PCSs that may be located on their property. PCS fact sheets are included in the binder accompanying this Plan.

- Include pertinent maps

If known problem remains unresolved and is a known Contaminant Source causing harm to the drinking water source:

The City of Cottage Grove or the Coast Fork Willamette Watershed Council can file a complaint with the pertinent state agency, and/or seek assistance from partner agencies:

Agriculture – Upper Willamette Soil Water Conservation District (SWCD), OSU Extension, Natural Resource Conservation Service (NRCS), Oregon Department of Agriculture (ODA)

Forestry – Oregon Department of Forestry (ODF), Oregon Department of Fish & Wildlife (ODFW), OSU Extension, NRCS, Upper Willamette SWCD, or private forestry consultant

Rural Residential – OSU Extension "Living on the Land" program, Lane County Sanitation Department (septic systems), Lane County Code Enforcement, DEQ

Transmission Lines – Utility Companies, Lane County Sheriff, DEQ

Transportation, Gas Station – Oregon Department of Transportation (ODOT), DEQ

Mine/Gravel Pit – Oregon Department of Geology and Mineral Industries (DOGAMI), DEQ

Historic waste dumps/landfills – Lane County, DEQ

Drinking Water Treatment Plants – DEQ, Oregon Heath Authority (OHA)

Effectiveness and Awareness Management Strategies

The Plan Committee held a kick-off/open house at the Drinking Water Treatment Facility to promote the Drinking Water Protection Plan in the community. News articles in the Coast Fork Willamette Watershed newsletter advertised and provided information on the open house.

The Committee's public involvement concept, as discussed in the Plan meetings, included providing an array of information including the Plan, maps, fact sheets, and access to agency staff.

The Committee also reviewed management strategies evaluated from other municipal drinking water plans and agreed on prioritizing the implementation of the following management strategies.

Signage for Drinking Water Source Area

The Committee discussed placing signs along roadways to indicate the boundaries of the DWSA. The signs would include a local spill response hotline phone number, and 911 emergency

response numbers. If general funds are not available for this strategy, grant funds may need to be sought.

OSU Extension "Living on the Land" Public Education Courses

The Plan Committee proposed partnering with Oregon State University (OSU) Extension to hold additional "Living on the Land" classes aimed at rural landowners addressing wells, septic, riparian areas, etc. The classes were held in April of 2013 and were well attended. The City and Coast Fork Willamette Watershed council will explore using existing resources available from appropriate entities/agencies to initiate and facilitate additional workshops. Resources for workshops are available for Agriculture, Forestry, and Rural Residential Land Use management to reduce the risk levels of PCSs in the Drinking Water Source Area.

Recognition for Drinking Water Stewards

The Committee suggested recognition of landowners in the DWSA who manage their land in such a way that reduces or eliminates the risks posed by PCSs associated with their land use category. This acknowledgment might consist of a letter of appreciation, placard, certificate, or press release.

The CFWWC will partner with the City to develop a plan for recognition of Drinking Water Stewards as part of the Phase II Implementation plan (see following text) in 2016.

Watershed Health Curriculum Programs

The idea of incorporating Watershed Health education into local school curriculum appealed to the Plan Committee. The objective of this strategy would be to encourage and promote education of students in issues related to watershed health and protection of the Row River Watershed as a valuable resource. The City could partner with local schools to include readily available Watershed lesson plans into curriculum plans. The benefits of supporting the education of elementary, middle, and high school level students in understanding the various water quality, biological, and cultural issues that surround the health and future of the watershed are numerous and far reaching.

The Al Kennedy Alternative High School currently operates a program called the Kennedy Conservation Corps. This group of students has been active in wetland maintenance and mitigation, vegetation management, and habitat restoration activities throughout the Cottage Grove area. This program holds promise for expanding into Watershed Health education with opportunities for students to gain hands on experience in the field.

As part of the Bikes to Blooms Partnership, the City will work collaboratively with Al Kennedy staff to utilize the expertise of the Kennedy Conservation Corps in on-going projects to further their watershed health curriculum. The 2013-15 Handshake Grant between the USACE, City, and Al Kennedy which includes the students' growing and planting of thousands of prairie plants for USACE habitat restoration is an example of this partnership.

Chemical/Hazardous Materials Roundup

The Committee agreed that hazardous material roundups can provide necessary options for rural residents to dispose of materials they no longer need. Lane County currently has a waste collection program and this strategy would work to enhance the already existing efforts. Increased frequency and awareness of roundups is important to cleaning up hazardous chemicals that may be stored inappropriately within the DWSA.

The City should work with Lane County and the CFWWC to investigate the development of a voluntary cleanup effort. Household hazardous Waste Roundups should be organized in the watershed by Lane County Solid Waste Management on an annual basis.

Public Education (newsletters, mail inserts)

The Plan Committee placed a high importance on public education and awareness and providing various means for residents to learn about their location within the DWSA as well as practices they can employ to help improve or maintain watershed health. The City of Cottage Grove will explore water bill mail inserts, newsletter updates from the City as well as the Coast Fork Watershed Council, and other various public outreach methods.

The City of Cottage Grove should also engage in interagency coordination with applicable entities/agencies and create public partnerships to address the contaminant sources discussed in this Plan.

In order to address this priority, the City has entered into the first two implementation phases of the plan – Phase I with E-Systems Services, focusing upon the development of collaborative agreements to ensure interagency and property owner coordination, and Phase II with the Coast Fork Willamette Watershed Council, focusing upon landowner outreach and public education (see below). The Phase I Implementation Plan is included as an appendix to this plan.

Additional Strategy Considerations

The Plan Committee also wanted to include strategies that may become feasible at a future point in time. These are strategies that may not be currently viable due to lack of manpower, political capital, or financial resources. Nonetheless, they are to be considered as options should the opportunity and capability arise.

- Disaster Preparedness and Spill Response Plan
- Land Acquisition
- Volunteer Clean Up Group
- Grant assistance for Septic System Maintenance/replacement

Phase 1 Implementation

In 2014, the City retained the consulting group of E-System Services (ESS) to review the draft Plan developed by the Plan Committee and make specific recommendations for Phase 1 Plan implementation. In addition, ESS was asked to begin the process of securing a memorandum of understanding (MOU) between the City and key stakeholders in the watershed. Based on the extensive work leading to the draft Plan and the excellent cooperation from City staff and others, ESS was able to successfully complete its review and offer recommendations for updates and action items related to the City's goal of safe and available drinking water for its residents. Phase 2 Plan Implementation will include a public education component and outreach on the individual landowner level.

As part of this review, ESS met with numerous stakeholders in the Row River & Mosby Creek watersheds and representatives of federal, state and county agencies that have some regulatory authority over activities in the source water protection area. ESS also consulted with several regional and national organizations that are active in the area of source water protection. If there was one message that was common to all it was there are no magic bullets in source water protection. There are a number of stakeholders with differing missions and objectives within every watershed. Given the lack of clear regulatory protection of source water, it is up to water system managers to take whatever actions they can to improve water quality, lessen the risk of threats to their supply and provide cost-effective future treatment options.

The draft Plan identified eighty threats at fifty-five sites. As part of this review ESS visited many of those sites to reexamine the level of threat they presented. Based on that review ESS has made recommendations on re-prioritizing the individual threat levels identified in the Plan. The revised threat list and map appear in the Appendix.

The two key land-owners/managers in the Mosby Creek basin are Weyerhaeuser and the Bureau of Land Management. In meetings with these entities ESS has proposed areas of collaboration and support for activities that would protect water quality and quantity in this key tributary. Many of these activities are already in place, so the proposed agreements simply secure continued commitment to source water protection. An overall Row River Collaborative Agreement is in Appendix B. MOUs with the Bureau of Land Management and Weyerhaeuser are in Appendices C and D, respectively.

The ESS review is focused on source water protection, preventing activities that may be harmful to the quality of water in the Row watershed, and increased monitoring for those activities that are not controllable under current law or agreements. Although water quantity is not currently a concern within the Plan, the potential impact of climate change may in the future cause changes in current flow cycles that could pose a future problem for the City.

The ESS report is divided into the following sections; general findings and recommendations, education and outreach, reviews of forestry, agriculture, and land use potential threats, and specific issues with Dorena Dam, its reservoir and Mosby Creek. Timelines for implementation are also included. The full report is included in the appendix of this plan.

Phase II Land Owner Outreach

For 2015-16, the Cottage Grove Drinking Water Protection Implementation Plan is for the Coast Fork Willamette Watershed Council (CFWWC) to work with the City of Cottage Grove to reach rural residents and owners of potential contaminant sources in the source water area. The Row River is a priority area for the CFWWC. Their organization has established working relationships with area residents, agencies and land managers that are specific to project implementation in the areas of riparian enhancement, aquatic habitat, and voluntary cooperation with water quality improvements (livestock fencing, e.g.).

Riparian health will be the focus of phase I of the implementation project; contaminant sources such as underground tanks (LUSTs, USTs, ECSIs), septic tanks, and derelict metal/rural garbage dumping will be the focus of the enhanced assessment work. To achieve improved riparian conditions and a refined understanding of possible strategies for reducing contamination risks in the watershed, CFWWC will conduct outreach/education via mailings, site visits, and a landowner workshop and conduct invasive removal and planting activities with willing residents. Enhanced assessment will prioritize the reduction of water quality threats and remediation efforts based on an increased understanding and needs of local residents and property owners.

Chapter 7: Contingency Plan

The management strategies and protocol discussed in the previous chapter are centered on proactive efforts aimed at protecting the drinking water supply from possible contamination. It is as equally important for the City of Cottage Grove to prepare for an actual contamination should the possible contamination scenarios occur. A contingency plan is a designed response to the contamination or disruption of Cottage Grove's current water supply. The contingency plan focuses on:

- Identification of the primary potential threats to the water supply.
- Developing procedures that will be followed should threats materialize.

Procedures and operating protocols for emergency response are contained within the Cottage Grove Water System Emergency Response Plan (attached as Appendix to this property).

Contingency Elements

Cottage Grove's contingency plan addresses the ten key elements required by the Oregon Drinking Water Protection Program and OAR 333-061-0057(4) including:

1. Potential threat to the drinking water supply;
2. Protocols for incident response;
3. Prioritization of water usage;
4. Identify key personnel and development of notification roster;
5. Identify short-term and long-term replacement of potable water supplies;
6. Identify short-term and long-term conservation measures;
7. Provide for plan testing, review and update;
8. Provide for new and continuing training of appropriate individuals;
9. Provide for education of the public; and
10. Identify logistical and financial resources.

1. Potential Threats and Response Protocols

Primary threats to Cottage Grove's drinking water system are related to an interruption of water delivery or contamination of the water supply. The TAC has identified the most likely types of events that could cause an interruption in delivery and/ or contamination of the water supply.

A. Equipment and Power Failure
B. Contamination of Raw Water Source
C. Chemical Spills
D. Stormwater Contamination
E. Sabotage/ Terrorism
F. Earthquakes, Volcanoes, and Other Natural Disasters

The City of Cottage Grove Public Works Department has drafted a Water System Emergency Response Plan that details response protocols for each of these scenarios. That document is included as an appendix to this plan, but will be maintained separately so as to remain flexible and responsive to changing operational requirements.

2. Protocols for Incident Response

This section details the appropriate response for the most likely potential threats listed in section one. Please refer to the Water System Emergency Response Plan (WSERP) for a more in-depth description of protocols for each type of response.

A. Equipment, Piping, and Power Failure

(See Section 4, Emergency Equipment and Water Supplies, WSERP)

1. Rely on water source capacity and power system redundancy.
2. In the short-term, rely on water tank storage.
3. Apply conservation measures.

B. Contamination of Raw Water Source

(See Section 5, Hazard Specific Immediate Actions and Procedures to Lessen Impacts, WSERP)

The required response to detection of contamination at a raw water source depends on whether the contamination is less than or exceeds the maximum contaminant level (MCL). The MCL is considered to be the maximum allowed concentration that a contaminant can be present in drinking water without posing a significant health risk. The community has applied a much higher standard in responding to man-made chemicals. Every effort will be made to eliminate any detectable amounts of these man-made substances from the drinking water supply.

Notify the Department of Environmental Quality (DEQ) of any confirmed detection. (Contact Portland phone duty 971-673-0405 or local technical services contact 541-726-2587).

Notify the Oregon Health Authority - Drinking Water Services for spills and sewage overflows at (971) 673-0405 (M-F 8:00-5:00). For after-hours, call the Oregon Emergency Response System at 1-800-452-0311.

If the contamination approaches the Maximum Contaminant Level:

1. Turn off affected intake facility. Take immediate corrective action and consult with Oregon Health Authority technical services.

2. Follow Oregon Health Authority Public Notice requirements.

3. Determine if water distribution system is contained.

4. Implement containment procedures to prevent contaminate from spreading throughout system.

5. Send news release to the local media.

6. Flush affected system and reservoirs.

7. Implement curtailment plan as needed.

8. Expand cooperation with agencies investigating the contamination.

C. Chemical Contamination Spills

1. Follow protocol for emergency response, above.

2. Notify the Oregon Emergency Response System.

3. Shut off nearby public water supply intake facilities down-gradient of contamination as an immediate precaution.

4. Monitor outflows to receiving drainage ways for contaminants; Public Works should take extra precautions to prevent contaminant runoff.

D. Storm Water Discharge Contamination

1. Follow protocol for emergency response, above.

2. Notify the Oregon Emergency Response System because a contaminant release in the Cottage Grove area surface waters could impact fish and wildlife, including threatened or endangered species.

3. Notify the Oregon Department of Environmental Quality of releases/spills if released to surface water body.

4. Shut off nearby public water supply intake facilities down-gradient of contamination as an immediate precaution.

5. Monitor outflows to receiving drainage ways for contaminants; Public Works should take extra precautions to prevent contaminant runoff.

E. Sabotage/ Terrorism

Acts of terrorism or sabotage are conducted by someone whose intent is to instill fear or induce harm to people and facilities. Even though it may seem unlikely, it would only take one well-staged event to undermine confidence in drinking water safety. Being prepared and knowing what to look for are crucial elements of preventing an attack on the system.

There are many potential threats to drinking water systems, including chemical, biological or radiological contamination as well as damage to infrastructure and computer systems. In most cases, contamination using biological or chemical agents would cause the most concern for a drinking water system. The threat is real, and drinking water systems need to enhance security around facilities and be prepared to respond.

F. Earthquakes/Volcanoes (natural disasters)

Damage resulting from the earth shifting along geologic faults resulting in shaking and settling of the ground can cause severe structural damage to virtually all water system facilities, including sources, transmission and distribution lines, storage reservoirs, and pump-houses. The water system in Cottage Grove is especially vulnerable to damage resulting from a Cascadia subduction zone earthquake. Pipelines are especially vulnerable to failure from permanent ground deformation (resulting from liquefaction and landslides), because the deformation causes push-on pipe joints to separate.

The City's Emergency Response Plans should evaluates what facilities are at risk during an earthquake, what can be done to mitigate impacts and what actions can be taken to respond to such an event. The Water System Protection Plan includes specific protocols for earthquakes for the drinking water system (see Section 5, WSERP).

3. Prioritization of Water Usage

This element prioritizes community needs in case the water supply is interrupted and or a replacement supply is necessary.

1. Fire Department
2. Senior Centers
3. Residential
4. Industrial/ Commercial
5. Schools
6. RV parks

7. Parks
8. Car washing, gardens, lawns
9. Agricultural uses

4. Key Personnel & Notification Roster

In the event of an emergency situation threatening the water supply, key people must be notified and response procedures coordinated among the City, the Fire District, Lane County, and State of Oregon personnel.

1. Call 9-1-1. If a call is received by the 9-1-1 center, the Fire District and City Police Department are to be dispatched to the event of an emergency spill.

2. Report sewer spills and overflows to the Oregon Emergency Response System (OERS) 24-hour hotline at 1-800-452-0311. If release flows to a surface water, report to DEQ.

3. Notify City Public Works immediately (541-942-3349) if a spill occurs within the Drinking Water Protection Area. The police and public works personnel are responsible for aiding the fire chief in adequate, appropriate, and safe actions.

The nature of the incident determines who is dispatched. If the incident involves a vehicle accident, the police department is often the first to be notified.

- If the event is non-vehicle related and a spill is reported, the appropriate fire department is normally the first to be notified by the 9-1-1 dispatch center.
- Both fire and police will be notified if a contaminant is known to be present.
- The incident commander will notify dispatch of the need for the Regional HAZMAT Response Team.
- With all spill reports in the Cottage Grove area, the Dispatch Center will notify the Cottage Grove Public Works Treatment Plant and relay all information available.
- During an emergency spill event, an incident command center is established to safely control the situation. The incident command system is dynamic, meaning that as events unfold, roles and responsibilities of personnel may change as the situation progresses.
- The person in charge may also change depending on which agency responds first.

Key Personnel

Key personnel and their roles are listed below. An up-to-date list of these persons' name and their contact information will be posted in specific locations in each agency office.

Cottage Grove Police (Emergency 9-1-1) and Administrative Police personnel are often the first to be dispatched and respond to an emergency event. Police are in charge of public safety until fire personnel arrive, then the incident command control is relinquished to fire personnel. At the

direction of the fire district incident commander, the police are responsible for keeping the area secured and providing support help.

South Lane County Fire & Rescue. 233 East Harrison Avenue, Cottage Grove, OR 97424 (541) 942-4493.
The fire chief or other designated fire personnel will be responsible for determining if local personnel can adequately and safely respond to a spill event. The incident commander will contact Oregon Emergency Response System and request a Regional HAZMAT Response Team if the situation and/or contamination is beyond local equipment and personnel capabilities. If it is determined that local response is adequate, the incident commander determines and directs what is needed from police, Public Works, and other City personnel through a unified command system.

Cottage Grove Public Works Director (541) 942-3349.
This person coordinates necessary actions, making any decisions regarding the operation of the water system. The Director provides technical assistance and backup support as directed by the incident commander. It is this person's responsibility to inform the incident commander of the spill location within the DWPA and suggest any additional precautionary measures that need to be considered. Operational situations that may affect the Department will be coordinated directly with the responsible department representative as soon as possible. The OHA will be immediately notified in the event of any drinking water contamination. The City Manager will designate a media relations person who will prepare a press release and handle all media contacts for the District.

Cottage Grove Water Superintendent (541) 942-7094.
This person coordinates necessary actions, making any decisions regarding the operation of the Cottage Grove water system. Cottage Grove Water Superintendent provides technical assistance and backup support as directed by the incident commander. It is this person's responsibility to inform the incident commander of the spill location within the DWPA and suggest any additional precautionary measures that need to be considered. Operational situations that may affect the City will be coordinated directly with the responsible City representative as soon as possible. The OHA will be immediately notified in the event of any drinking water contamination.

Lane County Sheriff's Office, Emergency Manager (541) 682-6744.
The Lane County Manager should be notified and will inform the Lane County Public Health Department, Oregon Emergency Management, and the Oregon Emergency Response System, who in turn notifies other appropriate state agencies. Usually, the fire chief notifies the county coordinator if the event requires county resources for response. However, if the county coordinator is notified first, he will notify the City of Cottage Grove Water Department when a spill emergency occurs within the DWPA.

Other officials to be notified include:

- Cottage Grove City Manager (541) 942-5501
- Cottage Grove Mayor (541) 942-2936
- Oregon Emergency Response System (OERS) 800-452-0311
- Oregon Health Authority (OHA): 1-971-673-0405

- Oregon Department of Environmental Quality (DEQ) 888-997-7888
- National Response Center: 1-800-424-8802
- Oregon Water Resources Department (WRD), Water Master: 541-682-3620
- Oregon State Fire Marshall: 503-378-3473
- Oregon Department of Fish and Wildlife (ODFW): 541-902-1384
- CHEMTREC 1-800-424-9300, www.cmahq.com

Call the Oregon Health Authority - Drinking Water Services Emergency Response System Notification number to report spills and sewage overflows. This toll-free telephone number is available 24-hours a day, every day at 1-800-452-0311.

5. Replacement of Water Supply

In the event of an emergency, the minimum water needs of the community must be met with water that meets applicable health standards. Short-term options are those where the alternative supply is needed for a few hours or days. Long-term options are considered for a permanent replacement supply.

Short-Term Drinking Water:

- Implement curtailment plan and practices.
- Bottled water (The City will establish distribution sites and allocation rates per household based upon events)

Intermediate-Term Drinking Water:

- Import water from neighboring sources following OHA recommended hauling procedure.
- Deliver potable water from non-affected supply with private tanker trucks and/or National Guard
- Make water available for only a short duration each day and issue a Boil Water notice to insure public health; and, when applicable, insert language for bacteriological concerns.

Long-Term:

- Implement conservation practices (per Chapter 13.05 of the Cottage Grove Municipal Code)
- Develop new wells
- Construct well treatment facility(s)
- Construct surface water treatment plant
- Purchase water from Creswell or EWEB Water District

A key concern for the City is that its entire water supply relies on a sole source, consisting of the Row River. In the event of an emergency, such as a chemical spill or malicious attack, the City may be able to shut down and restart its self-contained drinking water treatment plant.

Cottage Grove primarily relies on Dorena reservoir capacity to meet water demands. The City of Cottage Grove has two active storage reservoirs providing 4.3 million gallons (MG) of storage.

The City's water conservation and management measures can be a significant factor in slowing the growth of demand for water, but are not likely to eliminate all such growth.
As previously described, the majority of the City's water use is for residential use, which has an average per capita use. Moreover, the City has an average household daily per capita use of 200 gallons per month. These low values and trends are likely to continue given the City's conservation efforts such as its rate structure and landscape ordinance. The City intends to implement the various water management and conservation practices outlined in the Water System Emergency Response Plan in an effort to maximize the benefits of conservation, as well. However, the City's actual water production is significantly less than its authorized water rights. The City needs to take action to address its water infrastructure constraints. The City may need to pursue additional water storage capacity within the 20-year planning period of the Water System Emergency Response Plan.

6. Conservation

Conservation of water use will lessen demands on Cottage Grove's public water supply system in the event of an emergency situation. The extent of conservation and curtailment measures necessary will depend on the nature and extent of the emergency. According to City Code, Sections 13.05.030 and 13.05.040, conservation and good utilization of water is encouraged, but is not regulated; however, leak repair and prevention of water waste is required. The city encourages its water customers to conserve water at all times by:

A. Implementing efficient watering techniques for lawn and landscaping.
B. Utilizing low flow water fixtures.
C. Avoiding waste of water resulting from nonessential uses from water leaks.

7. Plan Testing, Review, and Update

This contingency plan will be evaluated, reviewed, and updated based on an annual review and mock exercise. The City will review any personnel or situational changes and make adjustments to the Plan annually. A copy of the Contingency Plan is included in the City's Water System Emergency Response Plan. The Water System Emergency Response Plan is reviewed and updated quarterly with corrections or modifications to the plan taking place during that process. In addition a simulated emergency (Mock exercise) will allow emergency responders to make necessary adjustments to the plan. Mock exercises will also serve as an educational tool for local citizens, reminding the community of the importance of protecting their drinking water supply and of the curtailment measures that might be imposed in the event of an emergency.
The Public is informed of the exercise via the Public Works web site and local media.

8. Personnel Training

To be effective, contingency plans must rely on properly trained people operating within a well-organized and effective system with up-to-date information. County and state emergency responders have been professionally trained to deal with HAZMAT responses. Local personnel are also trained in initial HAZMAT Response because they could be the first to arrive on site. Police officers receive HAZMAT Awareness level training as part of their officer training program. Currently, all fire personnel receive HAZMAT Operations level of training. With this

training, local personnel are able to adequately identify and contain many hazardous materials. The City of Cottage Grove has a Hazard Communication Plan that details required training frequencies and content, and is managed and updated by the Safety Committee.

The City of Cottage Grove Emergency Operations Plan dictates Incident Command System training (ICS) training based on job assignment/responsibilities. Employees in the following positions are required to complete ICS training as indicated:

Community Development Director/Emergency Manager:
ICS 100, 200, 300, 400, 700, 702a, 703a, 704, 706, & 800

City Manager, Public Works Director, Police Chief, City Planner (Asst. Emergency Manager):
ICS 100, 200, 700, 300, 400, 800

Police Administrative Team:
ICS 100, 200, 700, 300, 400, 800

City Engineer & Public Works Supervisors:
ICS 100, 200, 700, 703a

Community Services Director, Finance Director, Volunteer Coordinator, Line Police Officers, & Line Public Works Personnel:
ICS 100, 200, 700

The Emergency Manager verifies training levels annually. This position is also responsible for annual exercises and maintenance of the City's Emergency Operations Plan.

9. Public Education

Public notification and education information builds and maintains support for the plan. It further encourages assistance and understanding when an emergency arises and the plan is put into effect. Management strategies for this plan have a strong educational imperative that satisfies this component of the contingency plan. However, before an emergency occurs, residents and businesses must be informed about the conservation and curtailment measures they will be expected to apply. The City's website (www.cottagegrove.org), Facebook page, and Facebook App will be used to disseminate information, as will the reverse 911 system as necessary in the event of an emergency. Curtailment notification will be implemented as required by Chapter 13.05 of the Cottage Grove Municipal Code (written notification to property owners, advertisements in the local paper and radio/television announcements). Annual summer disaster education programs will include water bill inserts and newsletter mailings focusing on flooding, family preparedness in the event of emergencies, and water conservation techniques.

10. Resources

The City should participate in an emergency response situation only to the extent of providing assistance and information regarding the water system and the particular needs of the community. The City should not attempt any clean up on its own, although containment may be necessarily appropriate. The responsible party is legally obligated to report and clean up

chemical releases. If no responsible party is found, the community may need to finance contamination clean up or treatment. Potential funding sources include:

- State emergency funds
- Federal emergency funds
- A bond measure for replacement, treatment, or cleanup needs.

Chapter 8: Siting Future Water Sources

In 2008, Cottage Grove upgraded its water treatment facility to a membrane filtration system with an expandable capacity able to handle projected water demand for the next 30 years. Currently the plant is capable of operating at 4 million gallons a day (MGD) with an expansion capacity up to 8 MGD. This rate is sustainable at a minimum river flow of 40 cubic feet per second (CFS) which has historically only been recorded once on the Row River at the intake location. A full build-out of the current facility is planned to take place in stages along with expected population and demand growth. The capacity of the Drinking Water Treatment Facility, as well as the existence of sufficient water rights for 30 years of growth indicates that the source should continue to be adequate for the foreseeable future.

A new source of drinking water may have to be developed if the existing Row River source should become unusable. Should development of a new source become necessary, the process would likely include the following:

- Transfer of water rights
- Geological survey to determine possible sources
- Site identification
- Land purchase, lease, or easement
- Design and construction of intake and/or wells
- Submittal of design plans to OHA for plan review as required
- Connection to treatment and distribution systems

It is anticipated that any new proposed water source will likely be within the delineated Drinking Water Source Protection Area boundary discussed in this report. Information provided in this plan regarding the watershed characteristics will be used to facilitate the selection process of any new future water sources. If a new water supply must be developed, the data and analysis contained within this document will aid in the process. As soon as a new source is determined, delineations will be completed and added to protection areas.

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List of Acronyms

BLM	Bureau of Land Management
BMP	Best Management Practice
CFWWC	Coast Fork Willamette Watershed Council
CFS	Cubic Foot per Second
DEQ	Department of Environmental Quality
DHS	Department of Human Services
DOGAMI	Oregon Department of Geology and Mineral Industries
DWSPA	Drinking Water Source Protection Area
DWPA	Drinking Water Protection Area
DWSA	Drinking Water Source Area
HUC	Hydrologic Unit Code
MCL	Maximum Contaminant Level
MGD	Million Gallons per Day
NRCS	Natural Resource Conservation Service
ODA	Oregon Department of Agriculture
ODF	Oregon Department of Forestry
ODOT	Oregon Department of Transportation
OHA	Oregon Health Authority
ORS	Oregon Revised Statutes
PCS	Potential Contaminant Source
RMA	Responsible Management Authority
SLF&R	South Lane Fire & Rescue District
SLSD	South Lane School District
SWCD	Soil and Water Conservation District
SWA	Source Water Assessment
TAC	Technical Advisory Committee
WSERP	Water System Emergency Response Plan

Appendix

1. *Toxic Cyanobacterial Risk to Drinking Water in the Willamette Valley* Report, 2013
2. DEQ Source Water Assessment, 2000
3. Riparian Corridor Management Survey Report, 2012
4. Cottage Grove Water System Emergency Response Plan
5. Maps
6. Potential Contaminant Source index, 2014