

October 5, 2016

To: Susan Eastman
 USEPA Region 10

From: Tom Pattee
 Groundwater Coordinator
 Drinking Water Services
 Oregon Health Authority

Subject: Oregon’s Implementation of Source Water Protection

The Oregon Health Authority’s Drinking Water Services and its partner agency the Department of Environmental Quality’s Drinking Water Protection Program are, through the attached June 2016 update and tables, supplying information to the EPA regarding the status of implementation of Source (Drinking) Water Protection in Oregon and activities directed toward that end during the FY2015-2016 time period. A summary of the implementation efforts is given below, more definitive information follows in the June 2016 update document.

Summary:	Implementation Number of PWSs (includes "Buyers")	Implementation Population (Population + Buyer Pop)	Total Number (Active CWSs - includes SWP/GWP/GU)	Total Population (Population of Active CWSs including SWP/GWP/GU)	% by number of CWSs	% population
Substantial Imp - GW CWS	146	381,326				
Substantial Imp - SW CWS	156	2,492,931				
Substantial Imp All CWS	302	2,874,257	873 ⁽¹⁾	3,483,389 ⁽¹⁾⁽³⁾	35%	83%
Substantial Imp – NTNC	42	12,551				
EPA Target ⁽⁴⁾					49%	59%

(1) The total number of systems and population includes PWSs with substantial implementation plus wholesale buyers that have the PWS listed as their primary source. It does not include PWSs listed as "inactive" or PWSs where the seller is indicated as an emergency or secondary source. It also does not include transient non-community (NC) water systems or NP (non-public) water systems regulated under Oregon regulations.

(2) Population and Wholesale (buyer) Population for systems with substantial or initial implementation were updated 30JUN2016.

(3) Numbers in red (total number of systems and total pop) are estimates from Data Online for Community PWSs as of 25SEPT2016. EPA will insert these numbers for the final reporting based on their SDWIS data pull. Oregon has adjusted SDWIS population numbers to removed double counting for systems that strictly provide wholesale water (JWC, SFWB, and NCCWC).

(4) EPA national targets are taken from "FY2017 National Water Program Guidance: Addendum", EPA 800-R-16-002, U.S. Environmental Protection Agency.

During this reporting period, Oregon has again focused on recognizing individual and collective steps that community water systems or other regional entities take that result in a reduction of risk to drinking water resources. The definitions Oregon uses for initial and substantial implementation are given below.

Initially implemented is defined in Oregon as any protection follow-up to the Source Water Assessment, including enhancing the delineation and/or inventory, using the assessment data to clarify the potential risk that a specific activity may pose, forming a local team to address protection issues, etc.

A **Substantially implemented Strategy** occurs when Oregon agencies determine that strategic protection actions have been taken to appropriately reduce the risk of potential contamination within the community water system drinking water source area, based on the state/local identified significant threats and sensitivity of the source water or source area. These strategic protection actions can be performed at the state, regional, and/or local levels. If single source water areas can be grouped (i.e., wells in a single aquifer, wells in a cluster, intakes or intakes and wells in the same watershed) each of the community water systems would be considered to have taken strategic protection actions.

Oregon's source water protection activities for both the DEQ and OHA for the period ending June 30, 2016 are summarized in the attached text.

Oregon Drinking Water Protection Activities

The Oregon Health Authority's (OHA) Drinking Water Services and its partner agency, the Department of Environmental Quality's (DEQ) Drinking Water Protection Program, implement Drinking Water Protection in Oregon. Oregon's Drinking Water Protection activities for both the DEQ and OHA for the period ending June 30, 2016 are summarized in the following format:

June 2016 Update Contents

Source Water Assessment Data Availability and Use

Assisting Individual Public Water Systems

Statewide and Regional Projects

- Oregon Coastal Drinking Water Protection Planning Resource Guide
- New Updated Surface Water Source Water Assessments
- New Updated Groundwater Source Water Assessments
- Clackamas River Drinking Water Protection Work
- McKenzie River Drinking Water Protection Work
- DEQ Webpage Update and Improvements
- Non-Point Source Coordination
- Pacific Northwest Drinking Water Providers Partnership
- Consultation on BLMs Resource Management Plan Revisions
- State Agency Input to FERC on Draft EIS for Pipeline Construction
- Forest Wildfires – Drinking Water Risk Tracking
- Coordination with the Oregon Toxics Reduction Strategy
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Coordination with State and Federal Agencies

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Coordination with Rural Nonprofit Organizations

- National Rural Water Association (NRWA)
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Implementation Results as of June 2016

Percentage of Community Water Systems Protected

Percentage of Population Protected

Year-to-Year comparison

Attachment A – Oregon DWP Implementation Status as of 30 JUN 2016

Attachment B - Figures

Source Water Assessment Data Availability and Use

Oregon continues to improve access to data about drinking water source area assessments. Maps and downloadable statewide GIS shape files of drinking water source areas and potential sources of contamination are available on (with some example links):

[DEQ's Drinking Water Protection](#) website

[DEQ's Facility Profiler](#) - a location based system showing DEQ permit holders and cleanup sites; significant revisions to the system were initiated in early 2013

[DEQ's LASAR](#) Web (Laboratory Analytical Storage and Recovery) a database for air and water quality monitoring data.

DEQ's GIS web page

DEQ's GIS Library

DEQ GIS Web (WMS) Server

OSU Institute for Natural Resources (Oregon Explorer) website

Oregon Geospatial Data Clearinghouse

<http://spatialdata.oregonexplorer.info/geoportal/catalog/main/home.page>

Integrated geospatial models have played an increasing role in GIS work as emphasis at the basin and regional activities focus on areas of concern. DEQ also regularly provides drinking water data to local governments, Federal contractors, and consultants when effective security of the data is provided.

Assisting Individual Public Water Systems

As of June 30, 2016 a total of 302 community water systems (35% of Oregon's community water systems) have "substantially implemented" a strategy to protect their drinking water. Based on last year's numbers, the percent of community water systems that minimized the risk to public health through substantial source water protection efforts increased by 2%. Substantially protected water systems include many of Oregon's larger communities and serve approximately 2,874,257 Oregonians, which accounts for 83% of the estimated 3,483,389 Oregonians served by community water systems.

"Substantial implementation" occurs when Oregon agencies determine that actions have been taken to appropriately reduce the risk of potential contamination within the community water system drinking water source area. These strategic actions can be performed at the state, regional, and/or local levels.

Both OHA and DEQ regularly provide technical assistance to water systems that request it, regardless of whether their intention is to develop a full drinking water protection plan or simply identify and implement key protective measures for their source water. Many of these systems, and the state assistance provided, do not qualify for "substantial implementation" status, but their interest and positive correspondence

demonstrates an awareness of the issues and a desire to be involved to the extent their resources allow.

Statewide and Regional Projects

Oregon Coastal Drinking Water Protection Planning Resource Guide

DEQ developed a draft resource guide in 2015 to provide the basis for updated source water assessments (Updated SWAs), including new mapping of natural/anthropogenic features and information on susceptibility; links to government agency and non-profit organizations that may be able to assist; and information for how to improve collaboration with upstream partners and landowners to protect and improve source water quality.

The draft resource guide went out for review in September 2015. The timber industry and the Oregon Department of Forestry had significant concerns about the content of the document since so many of the coastal watersheds are primarily private forests. The Governor's Natural Resource Office intervened and a series of meetings and subsequent conversations followed. DEQ determined the best course of action was to start preparing individual Updated Source Water Assessments instead of continuing with the Resource Guide in early 2016.

DEQ is moving forward with the development of statewide "Resource Guides" for both groundwater and surface water sources (see below). This guidance will expand on what is in the Updated SWAs and provide additional information and tools to determine local priorities and strategies for protecting the source water areas. As the scope and content is developed, we will ask for additional input and review from sister agencies, industry organizations, non-profits, and the public water systems.

New Updated Surface Water Source Water Assessments

New Updated SWAs will be prepared by DEQ for all surface water public water systems in 2016 and 2017. The first priorities for the Updated SWAs are the coastal watersheds serving public water systems. There are 50 small- to moderate-sized watersheds on Oregon's Coast that currently serve as community drinking water sources. These are the highest priorities for updated assessments because *coastal community water systems experience unique issues due to their geographic setting, climatic and geological vulnerabilities, and seasonal tourist demands that other parts of the state do not necessarily experience.*

The first draft Updated SWA was issued in early May 2016. The City of Seaside Updated SWA document served as a prototype for review. Due to industry concerns, DEQ voluntarily went out for public comment and review with the draft Updated SWA document. DEQ opened public comment to solicit comment on the content and format of an Updated SWA prototype. This public comment period allowed partner state agencies, stakeholders, and public water providers an opportunity to help make the information more useful and relevant.

DEQ opened the public comment period on May 18, 2016 by issuing a *Public Notice Request for Comments* and sent the document for review to the following:

- Partner state agencies – ODF, ODA, WRD, OHA
- Oregon Coastal Caucus – eight members of the Oregon legislature
- Public water systems – direct email to 50 coastal systems
- Stakeholders – OFIC, OFS, OFB, EcoTrust, Geos Institute, WildEarth Guardians
- DEQ Homepage and WQ websites
- DEQ Basin Coordinators
- Regional Solutions Team
- GovDelivery – 6,745 subscribers, interests including CWSRF, NPS, Onsite, TMDLs, WQ Standards, etc.

DEQ received 15 sets of comments on the Updated SWA prototype prior to closing the public comment period on June 20, 2016. Comments were received from 7 public water systems, 3 nonprofits, 2 agencies, 1 industry group organization, and 2 private citizens. The comments helped to improve the document. There were some comments to add more details to the Updated SWAs. There were no comments received requesting the removal of any text/maps from the document, or that the Updated SWA be shortened. One of the most significant revisions based on public review comment was to expand the description of data sources---a new Appendix was added with six pages of descriptions and details about the maps, symbols, and the metadata. We also noted that DEQ will work directly with public water systems to address their needs for understanding active landslides and shallow landslide susceptibilities within their drinking water source area.

The first Updated SWA finalized after the revisions from the public comment period was sent out in early July 2016. The next set of six Updated SWAs have been completed and will be sent out in October 2016. More Updated SWAs will be completed every week until all surface water systems have received their updated reports, likely early 2017.

New Updated Groundwater Source Water Assessments

In the Fall of 2015, OHA began making plans to update Groundwater Source Water Assessments (Groundwater SWAs) with recent potential contaminant source data. In addition, OHA recognized that there are many groundwater-based water systems and drinking water sources that have come into existence since the original assessments were released (1998 to 2005). To prioritize the groundwater-based water systems for receiving an Updated SWA, OHA ran database searches and reviewed water system files to identify new groundwater systems, new groundwater drinking water sources, and abandoned groundwater drinking water sources. Using that information, OHA has prioritized the workload for the Updated SWA project in the following manner:

1. Obtain Latitude and Longitude coordinates for drinking water sources that have not been previously GPSed

2. Delineate preliminary Drinking Water Source Areas for all active community and non-transient non-community drinking water sources that are new since the original SWAs were released.
3. For community and non-transient non-community water systems that don't have a SWA or have a new active groundwater drinking water source, provide an Updated SWA that contains new maps, potential contaminant source inventory, best management practices for high priority potential contaminant sources, and source water protection resources.
4. Provide Updated SWAs for community and non-transient non-community water systems that have not added a new groundwater drinking water source since their original SWA was released.
5. Delineate Outreach Areas (a fixed radius that is roughly equivalent to a 2-year water supply) for all active transient non-community drinking water sources that are new since the original SWAs were released.
6. For transient non-community water systems that don't have a SWA or have a new active groundwater drinking water source, provide new maps and outreach resource materials for minimizing risks from acute illness threats.

As of June 30th 2016, OHA had identified 672 drinking water sources that needed accurate locations and had obtained accurate locations for 45% of them. Accurate locations were obtained by a variety of means such as site visits, transfer of locational data from County Health Department staff, and review of local maps. However, the vast majority of locational data has been collected by site visits which allows OHA staff to review materials with water system personnel and receive input regarding local concerns with respect to drinking water quality. Conversations with water system personnel has also revealed potential contaminant sources that are not mapped or tracked by regulatory agencies.

OHA determined that the most efficient way to estimate the drinking water source area for all active community and non-transient non-community wells that are lacking mapped source areas was to electronically batch process the delineations using an ArcGIS model that employs the Calculated Fixed Radius (CFR) method. DEQ staff agreed to develop the ArcGIS model with OHA staff input. The CFR method is based on estimated annual water use, aquifer thickness, and aquifer porosity. The drinking water source area is based on a 15-year water supply with subsequent 5-yr, 2-yr, and 1-yr source areas also identified. This methodology is consistent with prior OHA efforts for smaller water systems serving less than 500 individuals. As of June 30th 2016, DEQ staff were in the process of completing the ArcGIS CFR model for OHA use with an anticipated August 2016 completion date.

OHA has been working in conjunction with DEQ to develop a template and instruction guide for the Updated SWA that will be distributed to community and non-transient non-community groundwater systems. DEQ has been developing web-based mapping and potential contaminant source inventory tools and instruction guides for OHA staff to use while compiling Updated SWAs. OHA has been working on the template content and organization. As of June 30th 2016, OHA and DEQ staff were in the process of

completing the report template and instruction guide for OHA staff with an anticipated August 2016 completion date.

Clackamas River Drinking Water Protection Work

The Clackamas River Water Providers (six municipal water providers on the Clackamas River that serve over 300,000 people) continue to implement regional strategies in the Clackamas watershed. The Clackamas River Water Providers (CRWP) have made significant progress addressing risk from septic systems pesticide use, pharmaceuticals, potential spills, hazardous chemical use, algal blooms, and other point and non-point sources. See the [Clackamas River Water Providers Annual Report](#) at <http://www.clackamasproviders.org/watershed-programs/> for more information on risk reduction programs. In FY2014-2015, CRWP received one of the Drinking Water Source Protection (2014) grants for boater education and signage. The purpose of the project is to reduce pollutants from boaters and recreational users on the river. The signs are now installed in multiple locations near high recreational access points and parks.

McKenzie River Drinking Water Protection Work

Eugene Water & Electric Board (serving nearly 200,000 people) continues to implement robust drinking water protection strategies in the McKenzie River watershed. In 2014, EWEB initiated a Voluntary Incentives Pilot Program that assigns dollar values for natural processes that benefit the watershed and compensates landowners for stewardship practices. EWEB also had significant accomplishments in 2015 addressing risk from forestry, agriculture, septic systems, development, and potential spills as well as having highly effective watershed monitoring and education/outreach programs. In 2015, EWEB's Source Protection Program was awarded the American Water Works Association (AWWA) Exemplary Source Water Protection Award.

DEQ Webpage Update and Improvements

Significant content and format changes are being made to the DEQ Drinking Water Protection website in order to meet new standards from the Oregon Department of Administrative Services. As one of the upgrades and improvements to the new site, DEQ developed a Drinking Water Source Protection Interactive Map Viewer for the State of Oregon website based on a Geocortex platform. This map viewer will help public water systems and their communities identify and protect sources of drinking water, including streams, lakes, reservoirs, and groundwater aquifers. The application allows the viewer to identify land uses and potential sources of pollutants identified on regulatory databases within public drinking water source areas. The map includes both groundwater and surface water drinking water source areas, information from regulatory databases (DEQ and other agencies), and a land use/ownership layer. Maps can be produced and data, related to potential contaminant sources, can be output to tables that allow further evaluation and technical assistance work. The web map can be accessed at <http://www.deq.state.or.us/wq/dwp/dwp.htm>. The website page also provides notes on the development and limitations of the map viewer as well as the key to the symbols and terms.

Non-Point Source Coordination

DEQ's nonpoint source analyst for drinking water regularly assists the Nonpoint Source program with forestry and agriculture issues, provides reviews on NPS program efforts, and participates in committees working to improve FPA rules for stream protection-benefits to fish and drinking water, especially in western Oregon. In conjunction with the TMDL program, staff have begun the process of evaluating whether current forest practice rules are protective of water quality with regard to turbidity and sediment, important for drinking water protection. Pesticide application on forestlands within Drinking Water Source Areas is a major community concern. Ongoing studies, existing research, and new analysis of data will be evaluated in cooperation with the Oregon Department of Forestry.

One of Oregon's 303(d) listed waterbodies is the Siletz River upstream on the intake for the City of Siletz. A Total Maximum Daily Load (TMDL) for turbidity/suspended sediment is currently being developed and the nonpoint source analyst for drinking water is working on that TMDL as well as other sediment-based TMDLs, evaluating natural and human sources of sediment pollution to the listed waterbodies in the Mid-Coast Basin of Oregon. In addition to analyses of existing data, staff are conducting an in-depth review of existing scientific literature with regard to sediment pollution and land management; a contractor is assisting in this effort with financial support from EPA. The review will allow the DEQ DWP and other Water Quality programs to use verified science to demonstrate connections between land management, changes in sediment movement, and impacts to drinking water and other beneficial uses. The TMDLs will document known and potential sediment sources, set allowable limits of sediment inputs to the waterbodies, and detail management measures and monitoring needed. Information from the TMDLs may be used to inform changes to riparian and steep slope protections on forest and agricultural lands.

Pacific Northwest Drinking Water Providers Partnership

DEQ is collaborating with the USDA Forest Service, BLM, EPA Oregon Ops, Washington Department of Health, and the Geos Institute to develop concepts for watershed restoration and improvement projects within municipal watersheds. As part of this collaboration, Geos Institute is applying for grants to help Oregon communities achieve water development goals in ways that are more efficient and provide important ecological co-benefits. The agencies have also consolidated other federal and state funding to create a source for providing smaller grants to public water systems for watershed protection work. One of the strategies is to develop green infrastructure in individual communities, document project outcomes, and use the resulting data to introduce the approach to other communities where appropriate. The projects are designed to understand and then demonstrate the efficacy and potential cost advantages of watershed restoration methodologies to meet water development needs for municipalities. In each project, efficacy and costs will be monitored so that water managers can use that information to understand when watershed restoration is a viable and cost effective investment for delivering benefits to their customers. DEQ staff are assisting public water systems, Geos, BLM, and USFS with GIS and database support as projects are implemented in source areas.

In 2016, the Drinking Water Providers Partnership coordinated to provide funding to the following projects:

- Fiddle & Billy Moore Creeks Riparian Enhancement / Siuslaw SWCD
- Floras Creek Drinking Water Protection / Curry Soil and Water Conservation District
- Glide Water Association Partnership / Umpqua National Forest
- Grant Creek Stream & Wetland Restoration / Siuslaw Soil and Water Conservation District
- South Fork Aerial LWD Enhancement / Polk Soil and Water Conservation District
- Eagle Point Lagoons Floodplain Rehabilitation Project Design / City of Eagle Point
- Upper South Umpqua Aquatic Habitat Improvement Project Phase V -- Emerson Bridge Replacement / South Umpqua Rural Community Partnership
- Lower South Fork McKenzie River Floodplain Enhancement Project / McKenzie River Ranger District
- Schooner Creek Sediment Reduction / Salmon Drift Creek Watershed Council
- Baker City Water Source Fencing / City of Baker City
- West Fork Canyon Creek Instream Restoration / Partnership for the Umpqua Rivers
- Stouts Fire Salmon/Watershed Restoration / South Umpqua Rural Community Partnership

Consultation on BLM's Resource Management Plan Revisions

Drinking water protection staff continued coordination on the proposed changes to the management of the Oregon & California Lands (O&C lands) in western Oregon, administered by the BLM. This work included providing BLM with information on risks to drinking water, locations of drinking water source areas, and analyzing the risk to water quality associated with different alternatives for riparian protection, travel management, and wildfire risk reduction. Staff coordinated with Oregon Departments of Forestry and Fish and Wildlife to provide comments from the State of Oregon that are consistent with preventing increases in risks to drinking water provisions during timber harvest and reducing risks of catastrophic wildfires on O&C lands.

State Agency Input to FERC on Draft EIS for Pipeline Construction

Drinking water protection staff provided review and comment on the Environmental Impact Statement for several regional energy pipeline projects to ensure the construction and operation would minimize potential impacts to public water systems and the local drinking water supplies.

Forest Wildfires – Drinking Water Risk Tracking

DEQ and OHA drinking water protection staff continued to track forest wildfires where they occurred within drinking water source areas. Up-to-date fire perimeter data is obtained daily from both USFS and state ODF sites, then evaluated using mapping tools for proximity to highly erodible soils and land ownership. The data and maps will

provide information on erosion within the source areas as the winter rain season approaches. The maps will be included in evaluations for emergency grant funding for public water systems in the case of high turbidity at the intakes due to impacts from the fires. DEQ and OHA will use the guidelines developed in FY2013-2014 to evaluate emergency grant applications to assist communities in restoring burned areas upstream of intakes, or implementing other sediment stabilization techniques. In FY 2015-16, a fire in the Willamina drinking water watershed was tracked and information on the intake location and risk was provided to ODF during the fire response work.

Coordination with the Oregon Toxics Reduction Strategy

DEQ drinking water staff continues working toward implementation of the agency-wide comprehensive, integrated approach to address toxic pollutants in the environment. DEQ's cross-media toxics reduction strategy was developed through the assistance of 11 separate DEQ programs that already address some aspect of toxic management, including drinking water protection. The objectives of this strategy include optimizing agency resources by focusing on the highest priority pollutants in a coordinated way, implementing actions that reduce toxic pollutants at the source, and establishing partnerships with other agencies and organizations to increase the effective use of public and private resources. The drinking water protection program input has included assistance in identifying sources of toxics, selecting toxic reduction priorities, implementation of pesticide collection events, and prioritizing the statewide human health risks. Current 2016 work focuses on pesticide collection events, implementation of the Governor's Executive Order for chemical reduction in products, and revising the 2012 strategy report as a committee. The existing report is available on DEQ's Toxics Reduction website.

Watershed Basin Assessments and Agricultural Water Quality Management Plans

DEQ continues to develop drinking water-specific sections and data input for the Watershed Assessment Reports and for Agricultural WQMPs, including identifying drinking water sources, drinking water quality issues, potential contaminant sources and recommendations for action. The Agricultural WQ Plans are developed to prevent and control water pollution from agricultural activities and soil erosion on rural lands and include BMPs that protect sources of drinking water from all forms of contamination. The watershed assessments draw on the expertise of DEQ's 17 water quality sub-programs including recommendations for actions that DEQ (and others who are interested in these basins) can take to improve water quality. To date, the drinking water input for the agricultural plans have been developed for the Clackamas, Crooked River, Greater Harney, Goose/Summer Lakes, Hood River, Lost River, Lower Deschutes, Lower Willamette, Mid-Coast, Mid-Deschutes, Middle John Day, Powder and Wasco plan areas. Drinking water input for the watershed assessments has been developed for the North Coast, South Coast, Deschutes, Rogue, Powder/Burnt, Clackamas/Sandy, Umatilla, Umpqua, and Willamette basins.

Coordination with Soil and Water Conservation Districts and Watershed Councils

DEQ is continuing to grow our relationship with SWCDs and watershed councils and is helping public water suppliers make connections with these partners. DEQ has

participated in regional conversations and presented at several the Network of Watershed Councils and Oregon Association of Conservation Directors conferences providing information on how to identify local drinking water providers and the benefits of basin partnerships.

Watershed-based Implementation Efforts

DEQ is working directly with multiple public water systems in a basin or subbasin to encourage protection strategies on a watershed scale basis. This includes coordinating with surface water providers in the Rogue River, Willamette, Umpqua, Siletz, and Clackamas subbasins. DEQ is also expanding on previous projects to help PWSs cost-effectively address similar risks. For example, work completed by the Clackamas River Water Providers using DWSRF funds address septic system risks is now being used in the source area for Rivergrove Water District's groundwater supply and is also being used in the Molalla watershed.

New Statewide Groundwater Resource Guide

To support place-based planning and the use of the Updated Source Water Assessments for public water systems, **DEQ is also preparing Resource Guides for Drinking Water Source Protection.** Two separate Resource Guides for statewide groundwater and surface water are being developed in 2016 and 2017. Currently, DEQ is working directly with our state agency partners to ask for their input on the scope for the new groundwater document. Other stakeholders will have an opportunity to review and provide input during development of the draft. DEQ met with the Oregon Department of Agriculture partners to begin discussing the recommendations for local place-based planning and technical assistance for agricultural lands. DEQ and ODA will work together to develop an approach for local landowners and technical assistance providers to reduce offsite migration of pesticides.

The Groundwater Resource Guide will include sections addressing regulatory overviews, Oregon groundwater characterization, other related water quality projects, land uses and regulatory authorities, guidance on how to do place-based planning, and strategic protection based on groundwater priorities for the public water system. The first draft of the Groundwater Resource Guide is estimated to go out for review in October 2016.

Certification of Updated Groundwater Drinking Water Source Area Delineations

Periodically updating drinking water source areas for groundwater systems can be critical for those community water systems actively involved in drinking water source protection. Drinking water source areas for groundwater sources may require modification due to the addition/abandonment of water system wells, changing pumping patterns between wells, population growth, and/or a need to more accurately identify the drinking water source area around the groundwater intake. Since 2005, OHA has received 7 delineation projects, covering nine community water systems, to review for OHA certification. Three of these projects, involving five community water systems, were funded through the OHA Drinking Water Source Protection Grant Fund. OHA

received no additional requests for certification of newly delineated groundwater source areas during FY2015-2016.

Coordination with State and Federal Agencies

Forest and Agriculture

DEQ continues to work with other state and federal agencies to raise the profile of the need for drinking water protection in Oregon, including the Department of Agriculture, Department of Forestry, US Forest Service, USDA, and the BLM, to raise the priority level for drinking water protection in Oregon. Source Water Assessment data is provided as needed to other agencies to facilitate incorporation of protection strategies into their respective programs. Furthermore, this coordination has identified new opportunities for DEQ and OHA to enhance the depth and quality of technical assistance provided to public water systems.

Oregon Water Resources Department

OHA continues to work with the Oregon Water Resources Department (OWRD) to integrate drinking water source protection with water quantity programs and projects. During FY2015-2016 OHA staff participated on OWRD advisory committees, collaborated with OWRD staff on several projects, and worked with OWRD and various consultants to encourage the development of source water protection in conjunction with Aquifer Storage and Recovery (ASR) projects.

Continued participation on the OWRD Groundwater Advisory Committee and on the Well Construction Rules Advisory Committee allows OHA to provide OWRD with comments and recommendations regarding the impact of OWRD policy and procedures on public water system operations and drinking water source protection implementation efforts.

Under the OHA - OWRD Memorandum of Agreement (MOA) regarding public water supply groundwater systems (finalized and implemented during FY2014–2015), OHA and WRD continue to coordinate reviews and activities when necessary and provide mutual assistance with respect to regulated public water system activities. These efforts help ensure that management decisions related to applicable drinking water systems are fully and efficiently coordinated to protect Oregon's water resources and Oregon's aquifers, while fulfilling the requirements of the Safe Drinking Water Act.

In Oregon, OWRD issues limited licenses and permits for ASR projects. When reviewing applications, OWRD coordinates with OHA and DEQ to review and address water quality issues. Most ASR projects in Oregon are operated by community water systems that are regulated by OHA. OHA staff involvement includes; reviewing proposed ASR projects during the Limited License and Permit application processes, reviewing License/Permit modifications/extensions, and reviewing annual ASR reports. OHA evaluates the ASR well and the receiving aquifer susceptibility to contamination using sensitivity analysis tools and potential contaminant source inventory data

developed during Source Water Assessment activities. Water systems with ASR projects are encouraged to protect both their ASR project source water and native groundwater near the ASR project. The OHA review also ensures that for each ASR project, injected and recovered water monitoring requirements meet SDWA standards. During FY2015-2016, in addition to reviewing the annual ASR reports, OHA commented on and/or provided technical assistance on seven drinking water related ASR projects involving community water systems and four additional projects that were exclusively irrigation related.

Other OHA Programs

The Source Water Assessment database and GIS resources continue to be utilized to assist other OHA projects, especially in the emergency spill response notification network, Harmful Algae Bloom notification network, Plan Review process, groundwater under the direct influence of surface water monitoring program, wellfield analysis determinations, SOC use monitoring waivers, water system Consumer Confidence Reporting, and continued implementation of the Groundwater Rule.

With respect to Harmful Algae Blooms (HAB), OHA recognizes their associated unregulated cyanotoxins present a threat to source water quality throughout Oregon. Therefore, we have been proactively helping water systems with HAB for several years and have developed an “Algae Resources for Drinking Water” website that has several resources posted including; algae maps developed using source water assessment GIS resources, best management practices, a response flow chart, treatment information, and links to other helpful websites/documents. OHA believes that testing the water for cyanotoxins is the only way to know for certain if the water is safe to drink. In 2008 and 2009 OHA began asking at-risk water systems to test their raw and finished water weekly when impacted by a HAB. The financial costs associated with conducting this testing was prohibitive for most water systems to test their raw and finished water weekly when impacted by a HAB and OHA received many complaints about the toxin analysis and shipping costs. Eventually it was proposed that OHA cover costs associated with the shipping and toxin analysis for HAB impacted public water systems. The proposal was accepted and OHA continues spending implementation dollars directly on HAB monitoring.

Currently, OHA is working with Lake Superior State University (LSSU) in an Intergovernmental Agreement to perform the toxin analysis and shipping services for HAB impacted water systems. The agreement with LSSU has been very beneficial for OHA, public water systems, and the general public in Oregon. During FY2015-2016, OHA spend approximately \$13,370 of implementation money on cyanotoxin testing and shipping. OHA staff continue to work with EPA regarding ongoing HAB related projects including; the City of Myrtle Creek’s cyanotoxin management plan, the review of risk communication materials yet to be published, Health Advisory values for two of the cyanotoxins, development of UCMR4, and any future regulatory actions or technical assistance guidance as requested.

OHA Drinking Water Source Protection staff continue to use Source Water Assessment tools to provide critical guidance regarding groundwater drinking water sources. Guidance and recommendations include evaluation of both proposed and final construction of new groundwater sources; susceptibility from sanitary setback deficiencies; and investigations of confirmed e.coli detections in raw source water. During FY2015–2016, OHA Drinking Water Source Protection staff provided guidance and recommendations in 119 separate cases. The assessment of well/spring construction and aquifer characteristics during Plan Review helps ensure that each new public water supply well/spring meets current construction standards and if susceptible to fecal contamination, ensures that the well/spring is appropriately flagged for 12 months of source water assessment monitoring under the Groundwater Rule. In situations where e.coli has been confirmed in the raw water source, the evaluation helps identify if the well/spring is susceptible to being under the direct influence of surface water and/or should be reconstructed to minimize the potential for on-going e.coli contamination. Data regarding evaluation results are maintained by OHA in the water system's Source Water Assessment file to be used later when OHA Drinking Water Source Protection staff have an opportunity to re-evaluate the water system for a Source Water Assessment update/modification.

GIS resources generated and maintained by the Oregon DEQ during the Source Water Assessments are also used to review monitoring reduction requests submitted to OHA by community water systems. Community water systems may request a "Wellfield Determination" to identify the Entry Point most susceptible to contamination for representative sampling of VOCs and SOC's provided their sources are; on separate Entry Points, located close together, and draw water from the same aquifer. A community water system may also request a SOC Use Waiver which involves documenting SOC's used within the identified Drinking Water Source Area as per current landuse practices, potential contaminant sources identified during the Source Water Assessment, water quality sampling results, and reported chemical use within the local County. During the current reporting period, OHA staff received three requests for Wellfield Determinations. There were no requests for SOC Use Waivers during the current reporting period.

OHA continues to make use of their SWA database to implement the Groundwater Rule in Oregon. In December 2009, OHA opted to utilize the hydrogeologic sensitivity assessments (generated as a result of the SWAs) to identify wells and springs that should conduct 12 months of source assessment monitoring due to their susceptibility to viral contamination. In 2012, OHA developed an automated sample tracking system and began issuing violations to public water systems that did not collect required monthly assessment monitoring samples. OHA continues to use the automated sample tracking system. As a result, compliance with monthly sampling results has increased, monthly sampling results are quickly evaluated, and monthly monitoring schedules are quickly closed out once monitoring requirements have been met.

To date, monthly source assessment monitoring has been completed on 407⁽¹⁾ groundwater sources identified as susceptible to viral contamination. Of those, 36 have

(1) It was reported last year that 412 groundwater sources had completed the required monthly assessment monitoring. Later, it was determined that only 399 had completed the monthly assessment monitoring as of June 30, 2015

been confirmed as virally contaminated. OHA staff has reviewed and updated SWA data for each of the contaminated sources and made recommendations for either permanent installation of 4-log inactivation/disinfection or reconstruction of the source. If the aquifer was the primary pathway for contamination, 4-log inactivation/disinfection was recommended. Source reconstruction was recommended if inadequate source construction appeared to be the primary pathway for contamination. OHA and DEQ staff work collaboratively to identify source water protection tools for those water systems where 4-log inactivation/disinfection is installed as a permanent solution.

Other DEQ Programs

The DEQ SWA database and GIS resources continue to be utilized to assist other DEQ programs, especially in the Land Quality Division to identify priority areas for cleanup work, underground storage tanks, heating oil tanks, household hazardous waste areas, dry cleaners, brownfield sites, and site assessments. Staff collaborated with DEQ's Site Assessment/Cleanup program to provide recommendations and data on potential areas of interest for Site Assessment for their 2015-17 Cooperative Agreement with EPA, as well as a cleanup site recommendation for 2016 work on VOCs. DEQ and OHA staff also regularly contact public water systems to make them aware of upcoming Household Hazardous Waste, pesticide, and pharmaceutical collection events. DEQ and OHA are providing those water systems with a packet of materials that can be used to inform their customers, rural households, and businesses within their Drinking Water Source Area of each event.

DEQ Drinking Water Protection (DEQ DWP) staff continue to work with other DEQ programs to improve the geospatial representations of locations and prevent impacts to public water systems within the source areas. Coordination with the Water Quality Assessment group assures that other parameters related to water quality are included in their ongoing analysis. Drinking water source areas are included in Oregon Incident Response Information System to facilitate notification of downstream risks from spills/releases to streams. DEQ DWP staff also regularly provide input addressing NPDES permit issues. Input is provided to help develop priorities for the annual CWA 319 RFP for public water systems with nonpoint source contamination issues to enable the systems to be ranked within the priority list for analysis by basin. DEQ DWP also frequently coordinates with the Nonpoint Source program staff on overlapping priorities and input on statewide policy issues such as agricultural and forestry projects.

Coordination with Rural Nonprofit Organizations

National Rural Water Association (NRWA)

OHA and DEQ coordinate work with the state NRWA affiliate (Oregon Association of Water Utilities) through monthly coordination meetings, providing comments on workplans, providing technical assistance, speaking at conferences/workshops, and receiving annual updates of their progress in the area of Source Water Protection. Much of their Source Water Protection work since 2006 is reflected in our reported numbers to date. Our database indicates that they have provided Source Water

Protection assistance to 14 community water systems classified as substantially implemented and 43 community water systems classified as initially implemented. Our database also indicates that they have provided Source Water Protection assistance to 7 non-transient non-community water systems classified as substantially implemented and 10 non-transient non-community water systems classified as initially implemented.

Rural Community Assistance Corporation (RCAC)

The Rural Community Assistance Corporation (RCAC) does not have program funding dedicated solely to source water protection in EPA Region 10. Still, RCAC continues to coordinate with OHA and DEQ with outreach and education, training, technical assistance, and access to resources related to source water protection in Oregon. RCAC has participated on monthly conference calls with the Oregon Source Water Protection Workgroup including OHA, DEQ, and Oregon Association of Water Utilities (OAWU) and provided updates on activities with priority communities to address compliance and issues related to source water including:

- River Village – Compliance with arsenic at drinking water source. RCAC helped River Village develop a project scope of work and contract to hire an engineer to conduct an engineering feasibility study with funding through OHA's Sustainable Infrastructure Project Planning grant program.
- City of Sodaville – Drinking water quantity limitations. RCAC helped the City of Sodaville leverage an Emergency Community Water Assistance Grant (ECWAG) for \$129,475 to address water shortages during prolonged summer droughts. Work is currently being conducted to rehabilitate drinking water wells based on an engineering study completed last year.

RCAC will continue coordinating with the Oregon Drinking Water Protection Program, including opportunities to promote source water protection in Oregon under programs as possible next year.

State Revolving Fund: Drinking Water Source Protection Loans and Grants

Oregon DEQ and OHA continued to promote the use of the Drinking Water Protection Fund for drinking water source protection grants and loans. During FY2015–2016, thirteen letters of interest (LOI) were received for Drinking Water Source Protection grant funding. Six LOI for surface water systems were reviewed and scored by DEQ and seven LOI for groundwater systems were reviewed and scored by OHA. Final project rankings were compiled once scoring was completed and recommendations for projects to be funded were passed on to Business Oregon, Infrastructure Finance Authority (IFA) in June 2016. IFA will be working with the selected water systems to complete the paperwork required before project funds can be released. A total of seven drinking water protection projects were recommended to IFA with funding awards totaling \$208,457. Projects recommended for funding include activities such as:

Riparian and in-stream restoration to reduce turbidity, temperature, and Harmful Algae Bloom occurrence; expanded turbidity monitoring to identify pollutant sources and implement BMPs in riparian areas; Decommission roads and stabilize slopes to reduce sediment erosion and turbidity; study and evaluate alternatives for roadway spill containment upslope from a primary water source; decommission stormwater injection wells near water supply wells and divert stormwater to an alternative treatment location; purchase easements or land to restrict public access to a highly sensitive area near a public water supply wellhead; and develop spill prevention and response plans for spill pathways into the river above a water system's intakes.

Information Sharing

Trainings and Workshops

DEQ and OHA remain involved in a number of workshops and conferences supporting drinking water protection outreach in the reporting period. These included Rural Communities Assistance Corporation, Oregon Association of Water Utilities, American Water Works Association Short Schools, OHA Small Water System Training Courses, OHA Drinking Water Advisory Committee meetings, and numerous watershed council and County Soil and Water Conservation District meetings, as well as landowner workshops.

DEQ and OHA have initiated an outreach program targeting smaller community water systems through the League of Oregon Cities, Small Cities Support Network. The League is an organization that represents 242 incorporated cities. Their Small Cities Support Network meetings are designed to assist smaller communities in successfully completing projects and learning new ways of overcoming challenges. DEQ and OHA staff have been successful in getting on the agenda for regional network meetings and presenting information on drinking water source protection concepts, incentives, and grant funding opportunities.

Publications

OHA and DEQ contribute drinking water protection articles to the "Pipeline" newsletter sent to local officials at Oregon community water systems. The Pipeline articles provide updates for regional and statewide projects, such as the Drinking Water Source Monitoring results, and highlight examples of local communities that have implemented drinking water protection strategies.

Geospatial data

DEQ continues to provide support in delineating drinking water source areas for surface water systems and to acquire or produce new data layers that broaden our ability to evaluate potential contaminant sources within those delineated areas. Well documented data layers are shared with state and federal agencies and are made available to public water systems consulting firms, and the public. Maps are produced to provide a visual component for analysis purposes. Presentations to GIS groups are made to share methodology and discover other potential contaminant sources.

Implementation Results as of June 2016

Percentage of Community Water Systems Protected

Table 1 shows implementation status in Oregon as of June 30th, 2016 and is broken out into Substantial Implementation achieved in FY2015-2016 and cumulative numbers through the end of FY2015-2016, including Initial Implementation. Table 1 indicates that 17 additional community water systems and one additional non-transient non-community water system achieved substantial implementation during FY2015-2016.

Currently there are 873 community water systems in the state, a net increase of three water systems since the last reporting period. Increases in the total number of community water systems within the state occur when the addition of new community water systems is greater than the number of community water systems lost through system consolidation and/or declines in service population to the point where the water system is no longer regulated under the Safe Drinking Water Act.

During FY2015-2016, the total number of community water systems with substantial implementation in Oregon increased by 16 from 286 to 302. It is assumed that the difference between the number of additional community water systems that achieved substantial implementation (17) and the increase in the total number of community water systems that have achieved substantial implementation (16) is the result of system consolidation or population decline and subsequent deregulation. As a result, 35% of all community water systems in Oregon have now achieved substantial implementation, an 8% increase since 2012, as shown in Table 2.

The EPA national target for the percent of community water systems where risk to public health is minimized through substantial source water protection is 49%. As shown in Table 2 (and graphically in Attachment B), Oregon continues to make year over year advances toward meeting the national target. The development of new web-based drinking water source protection tools by DEQ and release of updated Source Water Assessments during 2016 and 2017 should help increase the number of community water systems that achieve substantial implementation in Oregon by increasing water system awareness and communication between water system personnel and OHA/DEQ staff.

Community water systems that achieve initial implementation of source water protection strategies are water systems that have shown some interest in drinking water source protection and may be interested in implementing protection strategies. Compared to last year's totals, Table 1 indicates that seven additional groundwater community water systems and one community surface water system achieved initial implementation during FY2015-2016. As a result, 50% of all community water systems in Oregon have achieved initial implementation. The number of community water systems that have achieved initial implementation includes both those that have achieved substantial protection strategies and those that have not. The percentage of community water

Table 1.

	Implementation Number of PWSs (includes "Buyers") ⁽¹⁾	Implementation Population (Population + Buyer Pop) ⁽¹⁾	Total Number (Active CWSs – includes SWP/GWP/GUP)	Total Population (Pop of Active CWSs including SWP/GWP/GUP)	% by number of PWSs	% Population
Summary						
Systems with Substantial Implementation achieved in FY2015-2016						
Substantial Imp – GW CWS	13	9,460				
Substantial Imp – SW CWS	4	25,695				
Substantial Imp – All CWS	17	35,155				
Substantial Imp – NTNC	1	300				
Cumulative Counts for Oregon through the end of FY2014-2015						
Substantial Imp – GW CWS	146	381,326				
Substantial Imp – SW CWS	156	2,492,931				
Substantial Imp – All CWS	302	2,874,257	873	3,483,389	35%	83%
Substantial Imp – NTNC	42	12,551				
Initial Imp – GW CWS	257	518,176				
Initial Imp – SW CWS	180	2,631,352				
Initial Imp – All CWS (includes Subs)	437	3,149,528	873	3,483,389	50%	90%
Initial Imp – NTNC (includes Subs)	89	31,577				

systems that have achieved initial implementation exceeds the national target for substantially protected community water systems, suggesting that there is capacity for Oregon to achieve the national target.

Since they include place of work and schools, OHA and DEQ continue to work with non-transient non-community water systems, to achieve substantial implementation status. As of June 2016, a total of 42 non-transient non-community water systems have "substantially implemented" a strategy to protect their drinking water. OHA believes schools comprise a sensitive population and thus it is an important investment in public health to include them as priority water systems for implementation assistance. So, we include in our outreach efforts about eleven small schools that fall below the formal definition of a public water system. No additional non-transient non-community water systems achieved initial implementation during FY2015-2016.

Percentage of Population Protected

Table 1 shows that the population of the community water systems that achieved substantial implementation of source water protection strategies during FY2015-2016 is 35,155. Currently, there are 2,874,257 Oregonians served water by community water systems that are substantially protected. When compared to last year's results, this is an increase of 61,230 Oregonians that are substantially protected. These numbers suggest that 42% of the increase in the number of Oregonians substantially protected in the last year was due to population growth within community water systems where risks to public health had been minimized through source water protection efforts that were reported before FY2015-2016.

The EPA national target for the percent of the population served by community water systems where risk to public health is minimized through substantial source water protection is 59%. As Table 1 shows, the number of Oregonians served by community water systems is 3,483,389 and the number served by community water systems that have minimized public health risks through substantial source water protection is 2,874,257 or 83% of the community water system service population in Oregon. As shown in Table 2 (and graphically in Attachment B), Oregon continues to exceed the national target for the percent of population protected and continues to protect a larger percentage of the population served by community water systems.

Table 1 shows that the population of the community water systems that have achieved initial implementation is 3,149,528. Compared to last year's totals, this indicates that the population associated with community water systems that have achieved Initial Implementation has increased by 58,986 Oregonians. This is due in part to the addition of 8 community water systems that have taken some follow up action toward drinking water source protection. The overall result is that 90% of Oregonians obtain their water from a community water system that has had an interest in drinking water source protection. In addition, there are 12,551 Oregonians that are substantially protected through the efforts of non-transient non-community water systems and there are at least

31,577 Oregonians that are regularly served water by non-transient non-community water systems that have had an interest in drinking water source protection.

Table 2

Substantial Implementation	FY2012 ⁽¹⁾	FY2013 ⁽¹⁾	FY2014 ⁽¹⁾	FY2015 ⁽¹⁾	FY2016⁽¹⁾
Number of CWSs	237	252	264	286	302
Percent of CWS systems	27%	29%	30%	33%	35%
Population served	2,717,048 ⁽²⁾	2,783,615 ⁽²⁾	2,788,714	2,792,652	2,874,257
Percent of Population	81% ⁽²⁾	83% ⁽²⁾	83% ⁽²⁾	82%	83%
Average Population Per Protected CWS System	11,464	11,046	10,563	10,578	9,517

1. Population numbers reflect retail population only.
2. In Oregon's FY2012 reporting, an error was made in calculating the population of wholesale customers for several PWSs that are strictly wholesale providers. This resulted in an over-reporting of population served by approximately 12-13%. The populations were corrected in reporting for FY2013. Additional corrections were made to the Total Population number for Oregon in the FY2014 reporting.

Year-to-Year Comparison

Table 2 is a corrected year-to-year results comparison of substantial implementation for community water systems in Oregon that includes the total number of surface water and groundwater-based community water systems that have achieved substantial implementation and the population served by these systems for the last 5 years. The FY2012 through FY2016 figures represent retail numbers for community water systems and their populations only. Retail numbers include populations of those purchasing community water systems where the substantially protected purchased water is the primary water source. Note that population counting errors were discovered during FY2013 and FY2015 and as a result the FY2012 population served number and percent of population numbers were amended to correct for those errors.

Table 2, like Table 1, shows that substantial implementation totals for community water systems and the overall percentage of community water systems substantially protected increased in FY2016. Table 2 also shows a slight increase in both the population substantially protected and the overall percentage of population substantially protected.

In Oregon, many of the larger community water systems achieved substantial implementation years ago. Based on current SDWIS Oregon data, the average population served by an Oregon community water system is approximately 3,990. Therefore, as smaller community water systems achieve substantial implementation, the average population protected per protected community water system should decrease until it matches the average community water system population. Table 2 shows that since 2012 there has been a steady decrease in the average population per community water system that is substantially protected. This continued decrease in the average population for a substantially protected community water system represents the

success that DEQ, OHA, OAWU, and RCAC have achieved in providing technical assistance on regional projects and smaller community water systems.

The data shown in Table 2 and the Figures in attachment B show that Oregon continues to exceed the EPA national target for the percentage of the population served by community water systems where risk to public health is minimized. The data also show that Oregon continues to make progress toward the EPA national target of the percentage of community water systems where risk to public health is minimized. Since most large Oregon community water systems are already substantially protected, to meet the EPA national target for percentage of community water systems protected, OHA and DEQ will have to continue focusing technical assistance and outreach efforts on small community water systems. We believe that the updated source water assessment project will increase our contact with these small community water systems and will help raise the awareness level regarding potential drinking water quality risks.

Attachment A:

Oregon DWP Implementation Status as of 30 JUN 2016

Summary:	Implementation Number of PWSs (includes "Buyers") (*)	Implementation Population (Population + Buyer Pop) (*)	Total Number (Active CWSs - includes SWP/GWP/GUP)	Total Population (Population of Active CWSs including SWP/GWP/GUP)	% by number of PWSs	% population
Systems with Substantial Implementation achieved in FY2014-2015						
Substantial Imp - GW CWS	13	9,460				
Substantial Imp - SW CWS	4	25695				
Substantial Imp All CWS	17	35,155				
Substantial Imp - NTNC	1	300				
Cumulative Counts for Oregon						
Substantial Imp - GW CWS	146	381,326				
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Substantial Imp All CWS	302	2,874,257	873	3,483,389	35%	83%
Substantial Imp - NTNC	42	12,551		74,272		
Initial Imp - GW CWS	257	518,176				
Initial Imp - SW CWS	180	2,631,352				
Initial Imp - All CWS (includes Subs)	437	3,149,528	873	3,483,389	50%	90%
Initial Imp - NTNC (includes Subs)	89	31,577				

***NOTES:**

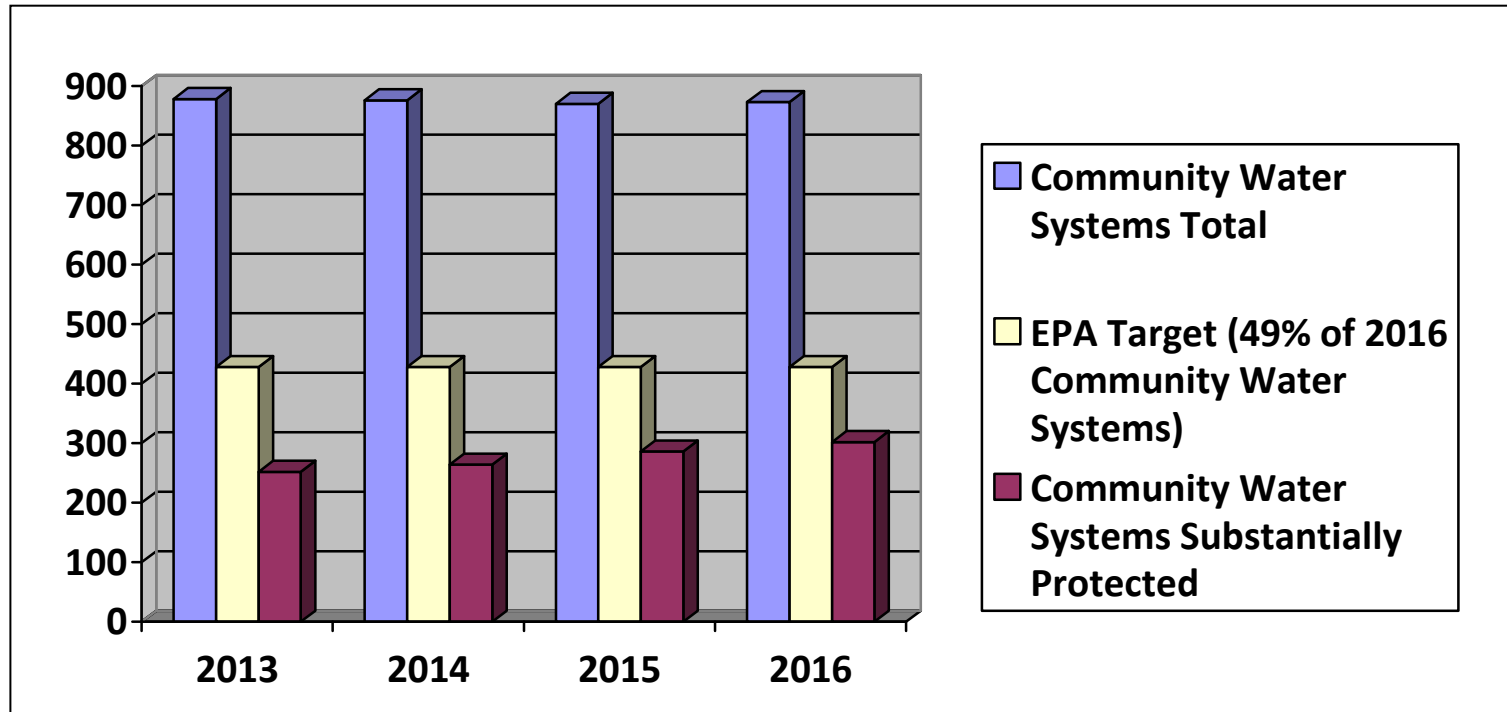
(1) The total number of systems and population includes PWSs with substantial implementation plus wholesale buyers that have the PWS listed as their primary source. It does not include PWSs listed as "inactive" or PWSs where the seller is indicated as an emergency or secondary source. It also does not include transient non-community (NC) water systems or NP (non-public) water systems regulated under Oregon regulations.

(2) Population and Wholesale (buyer) Population for systems with substantial or initial implementation were updated 30JUN2016

(3) Numbers in red (total number of systems and total pop) are estimates from Data Online for Community PWSs as of 30JUN2015. EPA will insert these numbers for the final reporting based on their SDWIS data pull. Oregon has adjusted SDWIS population numbers to remove double counting for systems that strictly provide wholesale water (JWC, SFWB and NCCWC).

Attachment B: Figures

Year to Year Number of Community Water Systems vs Number of Community Water Systems Substantially Protected



Year to Year percent of Oregonians Served by Community Water Systems that are Substantially Protected

