

Pipeline

Oregon's public drinking water sources

Drinking water source monitoring

by Dave Leland and Sheree Stewart

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The Oregon Department of Human Services (DHS) and Oregon Department of Environmental Quality (DEQ) drinking water protection team recently developed and implemented a first-phase "2008-09 Drinking Water Source Monitoring" project. The project was funded through the federal Drinking Water Revolving Fund set-asides for local assistance-drinking water protection. The project collected screening level data from drinking water sources within areas supporting multiple land uses.

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Drinking water emergency?

by Tony Fields

Got a drinking water emergency? The Drinking Water Program provides after-hours and weekend accessibility for drinking water emergencies. To reach us:

- During our normal business hours, 8 a.m.-5 p.m., Monday-Friday, call us directly at 971-673-0405 and ask for the drinking water phone duty person.
- Outside of normal business hours, call the Oregon Emergency Response System (OERS) at 1-800-452-0311 or 503-378-6377. They will contact the Drinking Water Program's on-call manager, who will then contact you. When you call, please have the following information ready:
 - Your name and agency;
 - Your telephone number,
 - Type of incident and the materials involved;
 - Location/time of incident;
 - Background/how the incident occurred;

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Staff updates

Ron Hall retired in November 2009 from his position as manager of the Protection, Planning and Certification Unit of the Drinking Water Program. Ron joined the Health Division in 1976, and worked in every aspect of environmental public health during his career, including two extensive assignments in drinking water. He also participated in three overseas humanitarian relief efforts. His wealth of knowledge and experience benefited the many different programs he worked in and the many people who had the opportunity to work with him. We wish him well!

Tony Fields of the Drinking Water Program accepted a 12-month developmental assignment as interim manager of the PPC unit. At the completion of this assignment, we will recruit to fill the manager position.

Congratulations to **Carrie Gentry** who recently passed the Oregon Professional Engineering exam, and is now a registered PE in Oregon!

See current org chart on page 11

Drinking water emergency? — continued from page 1

- On-scene contact and how to reach them;
- Severity of incident — threat to people, property, or the environment;
- Actions taken — containment, evacuation;
- Responsible party and telephone number.

Be sure to prominently display these phone numbers in your emergency plan and be sure all staff have access to and are familiar with your plan. You should also include your own local county emergency manager in your emergency plan and in your emergency communications.

Questions? Call Tony Fields at 971-673-2269.

Anthony Fields, B.S., REHS, CP-FS, is the security coordinator for the Drinking Water Program / 971-673-2269 or anthony.j.fields@state.or.us

Labeling coliform sample locations

by Chuck Michael



With change comes an opportunity for review of past practices. This has become apparent with the start of the Ground Water Rule (GWR). One practice that needs to be reviewed is sample locations under the Total Coliform Rule (TCR).

As a reminder, all routine and temporary routine samples under the TCR must be sampled in the distribution system. This is something that has not been reviewed in the past. It has become evident this review is now needed so that samples are applied to the correct rule. To clearly identify that TCR samples are in the distribution system, please refrain from including words or names that could refer to sources such as “well,” “spring,” “well house” and “raw” in the sample location.

When marking samples for GWR compliance, please be very descriptive in the sample location section by including which well or spring is being sampled and the facility ID. These facility IDs can be found under “system information” on our Data Online Web page at <http://170.104.63.9/>.

With your help in this we can clearly identify what rule each sample is for and ensure the samples meet compliance requirements.

Chuck Michael is a compliance officer in the Data Management, Compliance and Enforcement Unit of the Drinking Water Program / 971-673-0420 or charles.e.michael@state.or.us

Be sure to send your public notice to the state

by Chuck Michael

State and EPA rules require water suppliers to issue a public notice for all violations and situations when public health is compromised. Public notices fall into three categories or tiers. The criteria and reporting time frames for these tiers are as follows:

- **Tier 1 notice** — A Tier 1 notice is required where the water quality will result in a significant potential for adverse effects on health. The public notices must be issued within 24 hours and submitted to the state within 10 days. Reasons for a Tier 1 notice include but are not limited to:
 - Confirmed *E. coli* samples;
 - Nitrate or nitrite MCL results;
 - Waterborne disease outbreaks;
 - Loss of pressure;
 - Any other situation where the Drinking Water Program instructs a Tier 1 notice to be issued.
- **Tier 2 notice** — Unless instructed to issue a Tier 1 public notice, a Tier 2 notice is required where the water quality has a potential for serious adverse effects to public health. The public notices must be issued and submitted to the state within 30 days of the violation or the instruction to issue — whichever occurs first. Reasons for a Tier 2 notice include but are not limited to the following:
 - Total coliform MCL violations;
 - Chemical MCL violations not included in Tier 1;



- Treatment technique violations;
 - Violation for not correcting identified deficiencies in a timely manner;
 - Any other situation where the Drinking Water Program instructs a Tier 2 notice to be issued.
- **Tier 3 notice** — A Tier 3 notice is required when a system has any violation not requiring a Tier 1 or Tier 2 notice. The public notice must be issued and a copy submitted to the state within one year. For community systems, reporting of violations is part of the annual consumer confidence report and satisfies this requirement. The most common causes for these notices are monitoring and reporting violations, which includes late submittal of the results to the state.

The Drinking Water Program will begin assigning violations in April 2010 for failure to submit copies of the public notices. All water systems requiring a Tier 1 or Tier 2 public notice must submit a copy of the notice to the state to avoid receiving a violation for failure to issue the notice.

Chuck Michael is a compliance officer in the Data Management, Compliance and Enforcement Unit of the Drinking Water Program / 971-673-0420 or charles.e.michael@state.or.us

Preparing for the flu?

Pandemic influenza guide for water systems available

by Tony Fields

Late in 2007, the U.S. Department of Homeland Security (U.S. DHS), in association with the Association of State Drinking Water Administrators (ASDWA) and the U.S. DHS Federal Emergency Management Agency (FEMA), published a guide to help critical infrastructure sectors plan for and prepare for a pandemic influenza event. Part of this document includes an annex specific to drinking water utilities, and is now available on the Drinking Water Program's Web site at www.oregon.gov/dhs/ph/dwp.



The annex document consists of 11 tasks designed to prepare the water system for pandemic influenza, and includes supporting activities and questions the water system should consider while planning for an event.

Two additional sources of guidance for current and upcoming influenza seasons include "Guidance for Businesses and Employers to Plan and Respond to the 2009 – 2010 Influenza Season," and "Preparing for the Flu: A Communication Toolkit for Businesses and Employers." These guides

were developed by the CDC to assist businesses and employers in developing and implementing a business continuity plan in the event of an influenza outbreak. These documents, along with additional fact sheets and reference guides, can be downloaded at www.flu.gov.

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Updating the coliform reporting form

by Rachael Gruen

The Drinking Water Program (DWP) is updating the coliform reporting form to accommodate samples required for compliance with the Ground Water Rule. All water systems are to use this updated version. Instructions on how to fill out this form and guidance on the new sample types have been included with this update. Be sure to include identifying information when submitting source samples, such as which well or spring the sample is coming from (i.e., "SRC-AA well #1"). DWP expects to have this finalized version of the form online at <http://oregon.gov/DHS/ph/dwp/labs.shtml> by April 1, 2010, and requires that results be reported on this version (3.2) no later than June 1, 2010. The new version of the form can alternatively be obtained from your laboratory.

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This data was collected to determine whether there are potential human health concerns from contaminants not currently regulated under the federal Safe Drinking Water Act. Project leaders also sought to determine pollution prevention and technical assistance priorities for drinking water sources.

Staff from DEQ's Laboratory and Environmental Assessment Division collected groundwater and surface water samples from 13 drinking water sources identified as particularly susceptible to contamination through assessments conducted earlier by DHS and DEQ (see Stewart, *Insider* #373). In 2008 and 2009, laboratory staff collected samples above the surface water intakes serving the cities of Detroit, Gold Hill, Jefferson, Riddle, Seaside, and Hillsboro. They also collected samples at the supply wells for Independence, Oakridge, Keizer, Spray, Avion (Bend), Vale, and Whispering Pines Mobile Lodge in Corvallis.

Samples were analyzed for a broad array of several hundred compounds, including:

- Oregon-specific herbicides
- Insecticides
- Pharmaceuticals
- Volatile organic compounds ("VOCs"—including cleaners)
- Fire retardants
- Polycyclic aromatic hydrocarbons (PAHs)
- Plasticizers

DHS reviewed and interpreted analytical results from the DEQ laboratory and gave the information to the individual public water systems. Data from the project shows that very low measurable levels of some contaminants are present in these water sources, and that these levels are far below applicable standards or guidelines where those

exist. The project team will start a new phase of monitoring this spring, focusing on systems with one primary type of risk/land use in the source area and those where community officials have requested state testing due to potential high risks of future contamination.

Key findings

The data from the 2008-09 testing revealed that there are very low levels of contaminants present in the source waters sampled. DHS toxicologists analyzed DEQ's laboratory results to provide interpretative information to the public water supplier and local community officials at each source water site. DHS compared the sample results to: current SDWA drinking water standards; secondary standards; or health guidance levels in scientific publications and toxicological research information. Most contaminant levels were orders of magnitude lower than any established standards or regulatory limits.

2008-09 source water sampling results may be broadly summarized as follows:

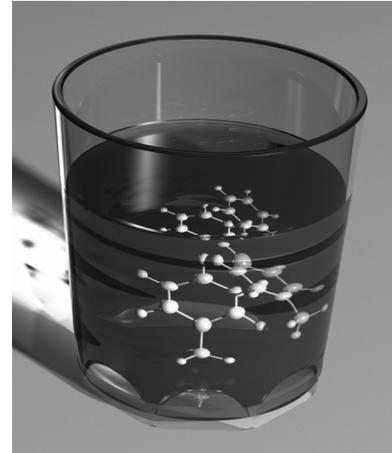
- 28 percent of samples analyzed from surface water sources had at least one contaminant
- 22 percent of samples from wells had at least one contaminant
- Two groundwater samples (at one well) were found to have arsenic and manganese at levels above the secondary drinking water standards
- Eight surface water samples (at five intakes) were found to have aluminum at levels above the secondary drinking water standards
- The highest number of contaminant detections in surface water included microbes, steroids/hormones, metals, phthalates, and pesticides

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- The highest number of contaminant detections in groundwater included steroids/hormones (cholesterol), metals, and pesticides (Atrazine)
- One surface water source contained three pharmaceuticals at low levels: Sulfamethoxazole (an antibiotic), Carbamazepine (a mood stabilizer), and Diphenhydramine (an antihistamine)

In the surface water sources sampled, the insecticide DEET was found at 85 percent of the sites, the herbicides Atrazine and Diuron were found at 43 percent of the sites and Fluometuron was detected at 28 percent of the sites. Overall, pesticides were present in 29 percent of surface water source samples, but the highest concentrations were at levels below the state's water quality criteria for aquatic life, health-based levels, or drinking water standards (where available). Diethylphthalate and Bis(2-ethylhexyl) phthalate were found at 57 percent of the sites. Metal compounds were identified in almost half of the sites sampled. The highest number of detections included aluminum (at 100 percent), barium and manganese (at 57 percent). Since most metals in Oregon waters are from natural sources and attach to suspended clays in streams, it is not unusual to find high concentrations in source waters. Where the secondary maximum contaminant levels were exceeded for aluminum and manganese, the levels are likely significantly reduced by the drinking water treatment facility. Conventional treatment processes reduce turbidity and suspended solids from the source water with filtration. Finished drinking water samples at these public water systems met the established federal drinking water standards.

In the groundwater sources, the herbicide Atrazine was detected in 40 percent of the samples, but the levels never exceeded the drinking water standard. In the limited number of samples that were



analyzed for steroids and hormones, all of them had coprostanol (considered a marker for human wastes). This can come from both onsite septic systems, as well as from wastewater treatment discharges upstream. Arsenic and manganese were also found in high concentrations at separate sample sites (arsenic is a very common natural contaminant in Oregon's groundwater). The high levels of both arsenic and manganese are indicative of geologic formations supplying the well water. In many areas of Oregon, these metals are quite common and treatment is necessary to reduce those levels where the drinking water standards are routinely exceeded. Metals were found at about half of the well sites sampled, but most were well within acceptable drinking water standards.

As part of the project's susceptibility analysis, DEQ also evaluated land uses/activities for source areas of each of the intakes and wells. Project staff conducted further evaluation of potential sources of contaminants on a site-by-site basis for each contaminant detected. These sources likely arise from multiple land uses and activities in the watershed or recharge area for the wells. Since the levels were very low in this initial sampling project, DHS and DEQ will use the data analysis to determine potential associations with sources and to provide technical assistance to public water systems to reduce concentrations of source water contaminants.

Potential sources of contaminants

Present contaminants for surface water and their potential sources include:

- MICROBES (*E. COLI*), STEROIDS and HORMONES are human waste byproducts and are likely from upstream wastewater discharge, high-density onsite septic systems discharging to groundwater, or heavy recreational uses.
- METALS can be from industrial or wastewater discharge, but most likely come from natural suspended clays in streams. In surface waters where metals were found, the concentrations were higher in the



spring, which may be indicative of potential agricultural fertilizer sources.

- PHTHALATES are contaminants from plastics, perfumes, car care products, cosmetics and flooring. Phthalates in surface water can come from the breakdown of PVCs, plastics or flooring materials. Other very likely sources are wastewater discharges and high-density housing with onsite septic systems, since the compounds are found in so many household products.
- PESTICIDES can enter surface waters from agricultural fields, forests, urban lawns, and roadside spraying. Results from this drinking water source monitoring suggest the primary sources are orchards, irrigated crops,

harvested forests, and high-density housing. The insect repellent DEET enters surface waters from swimmers or wastewater from baths/showers after application to skin. DEET is very persistent once it enters a water body.

- PHARMACEUTICALS were detected in source waters that have both multiple wastewater treatment discharges upstream, as well as high-density housing using onsite wastewater disposal. It is well documented that drugs are primarily found in human urine and can also come from improper disposal of unused drugs in toilets.

Present contaminants in groundwater and their potential sources include:

- STEROIDS and HORMONES are very likely linked to human waste byproducts released through onsite septic systems into groundwater. The most common marker of these byproducts is coprostanol, found in human feces.
- METALS are very common in Oregon's groundwater resources from natural geologic formations but are also found in stormwater runoff/infiltration from urban areas and agricultural fertilizer applications.
- PESTICIDES are found at low levels in wells surrounded by agricultural activities and high-density housing. Household lawn applications of pesticides can contribute as many pesticides to local groundwater resources as large-scale crop irrigation and spraying.

Next steps

EPA and state public health and environmental agencies across the country are seeking to address emerging contaminant issues in drinking water.

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Determining what is “safe” water for public health and aquatic health is difficult. There are many toxic contaminants for which there are no national or international drinking water standards. The synergistic and cumulative effects of the various compounds that have been detected in water are not known. DHS and DEQ will continue to track the new data and toxicological research and adjust work plans and priorities as necessary. The drinking water protection efforts are also closely linked to other current DEQ and DHS toxics monitoring and pollution prevention initiatives, especially the DEQ Toxics Reduction project (see Masterson, *Insider* #452) and the Oregon Toxics Monitoring Program (see: www.deq.state.or.us/lab/wqm/toxics.htm).

In 2010, DHS and DEQ will move into Phase II of the Drinking Water Source Monitoring project. This will likely include sampling locations with more specific sources of potential contaminants.

The DHS/DEQ team is currently evaluating several options for the next set of sampling locations.

Current thinking is that Phase II will combine two criteria, including:

- 1) Source areas for public water systems that have requested monitoring and have verified susceptibility to contaminants, and where those risks encompass large portions of the watershed or recharge area. About 25 percent of the Phase II monitoring can be dedicated to those systems that request monitoring based on known risks and concerns. This would address important strategic objectives; since 2003, the agencies’ strategic plan has included an objective to address specific concerns from public water systems, environmental health officials or local/county governments.
- 2) Those public water system source areas with discreet risks of contamination in close proximity to intakes or wells. These would include systems that have large-scale, single land-use risks or activities that are high-priority Tier 1 and 2 systems. For example, intakes or wells would be sampled where source areas include all agriculture, all urban, an NPDES-permitted facility discharge just upstream, or all forests. This will allow DHS and DEQ to determine more about those individual sources and corresponding risks.

Conclusion

Based on current scientific literature and research, data generated from the first phase (2008-09) of the Drinking Water Source Monitoring project does not suggest there is reason for immediate public health concern. Through the drinking water protection efforts, DHS and DEQ will continue to work to reduce levels of contaminants in source waters to provide the highest quality waters to public water system treatment plants. Reducing

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Operator Certification Corner:

2008 exam results

by Dottie Reynolds

The following are exam passing rates by type and level for all of 2008:

Summary

The national average in 2008 for the distribution passing rate was 44.75%. The national average in 2008 for the treatment passing rate was 44.25%. While Oregon's passing rates are better than the national rates, we have experienced a decrease in those passing the exam. In Oregon, the passing rate for 2008 decreased substantially for both distribution and treatment from past years: The 2006 passing rates for distribution were 77% and for treatment, 76%. The 2005 passing rates for distribution were 82% and treatment, 75%. The 2004 passing rates for distribution were 82% and treatment, 77%. Administrators, please ensure that the operator has had ample opportunity for exam study and review classes along with the necessary experience.

There are exam references and study materials with sample questions that prepare you for the exams. You can acquire material for the exams by going to our Web site at www.oregon.gov/dhs/ph/dwp where we provide Web links to class reviews and other study resources. We recommend that

you utilize the need-to-know criteria to determine the study materials for the core competencies for the type of certification you hold. We would like to see future passing rates at 80% -100%, and eventually all of you passing the exams! Take pride in your choice of profession in knowing that your competence and dedication is protecting public health and the environment while providing an essential service to your community!

<i>Distribution</i>		
	# passing/# of examinees	passing rate for 2008:
Level 1	98/137	71.5%
Level 2	51/83	61.4%
Level 3	26/39	50%
Level 4	4/20	20%
Totals	179/279	64.2%
<i>Treatment</i>		
Level 1	33/45	88%
Level 2	19/34	55.9%
Level 3	16/16	100%
Level 4	2/7	28.6%
Totals	70/102	68.6%

Remember, you may now go to our Web site at <http://oregon.gov/DHS/ph/dwp/certif.shtml> for passing results on exams up to the past six months. Results will be posted three to four weeks after exams have been taken. Phone calls for results are not allowed.

Dottie Reynolds is the Operator Certification Program coordinator in the Drinking Water Program / 971-673-0426 or dottie.e.reynolds@state.or.us

levels of contaminants in source waters serving public water systems will translate into safer drinking water after treatment.

DEQ and DHS drinking water team will continue to prioritize statewide program efforts and local technical assistance using all available data sources. The near-term strategy for addressing new “emerging” micro contaminants includes: collecting more specific data to assess drinking water risks; continuing to evaluate potential exposure risks based on scientific research; and actively minimizing the input of toxics from known sources (primarily by waste collection events and public education).

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Sheree Stewart is coordinator, Drinking Water Protection, Oregon Department of Environmental Quality, 503-229-5413 or e-mail: stewart.sheree@deq.state.or.us

Meeting calendar

Drinking Water Advisory Committee
Department of Human Services
Diane Weis/971-673-0427
April 21, 2010
July 21, 2010

All meetings are held at the Public Utility Commission Office, 550 Capitol St. NE, Salem, OR 97310

Cross Connection Advisory Board

Go to: www.oregon.gov/DHS/ph/crossconnection/docs/AdvisoryBoardSchedule.pdf.

Oregon Environmental Services Advisory Council

Go to: www.oesac.org/meeting_schedule.

Training calendar

CEUs for Water System Operators

Check www.oesac.com for new offerings approved for drinking water.

OAWU

503-873-8353

Apr. 8	Making Sense out of the Ground Water and Other Rules
Apr. 14	Source Water Protection Planning
May 5-6	Water Treatment/Distribution Certification Review
May 11	Filter Maintenance
May 11-12	Water Treatment/Distribution Certification Review
May 12	Source Water Protection Planning
May 26	Control Valves by GC Systems
June 8	Confined Space

Oregon APWA Training Program

541-994-3201

Apr. 27-30	Spring Chapter Conference
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Cross Connection/Backflow Courses

Backflow Management Inc. (B)

503-255-1619

Backflow Assembly Tester Course

Apr. 26-30	Portland (B)
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Backflow Assembly Tester Recertification

May 4-5	Portland (B)
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Backflow Management Inc.

503-255-1619

June 30	Confined Space Entry
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Small Water System Training Course

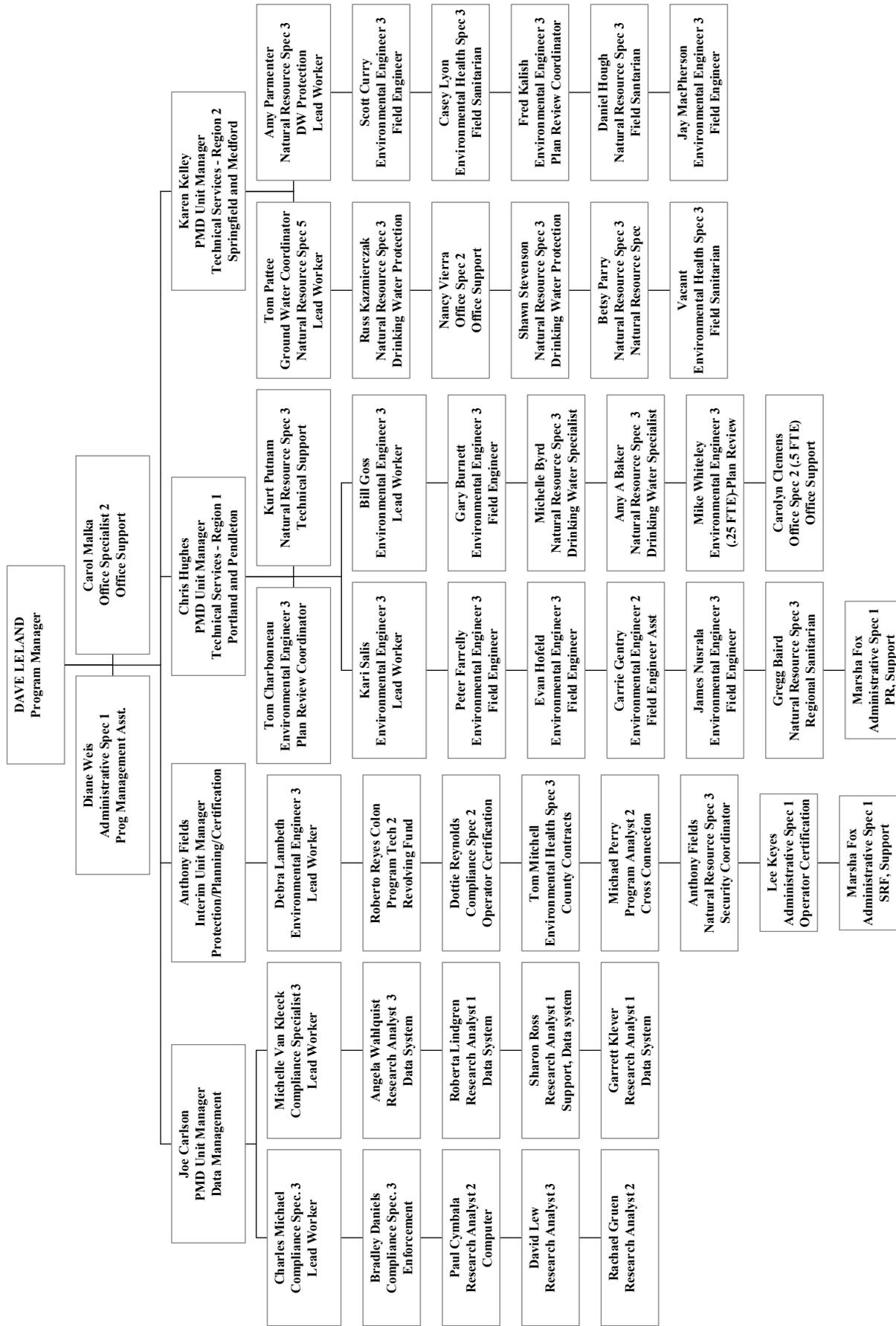
OAWU

503-873-8353

April 7	Hillsboro
April 21	The Dalles
May *	Coos Bay, Eugene/Springfield
June *	Pendleton

* Dates to be announced

CURRENT DRINKING WATER PROGRAM ORGANIZATIONAL CHART



Department of Human Services
Drinking Water Program
P.O. Box 14450
Portland, OR 97293-0450

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