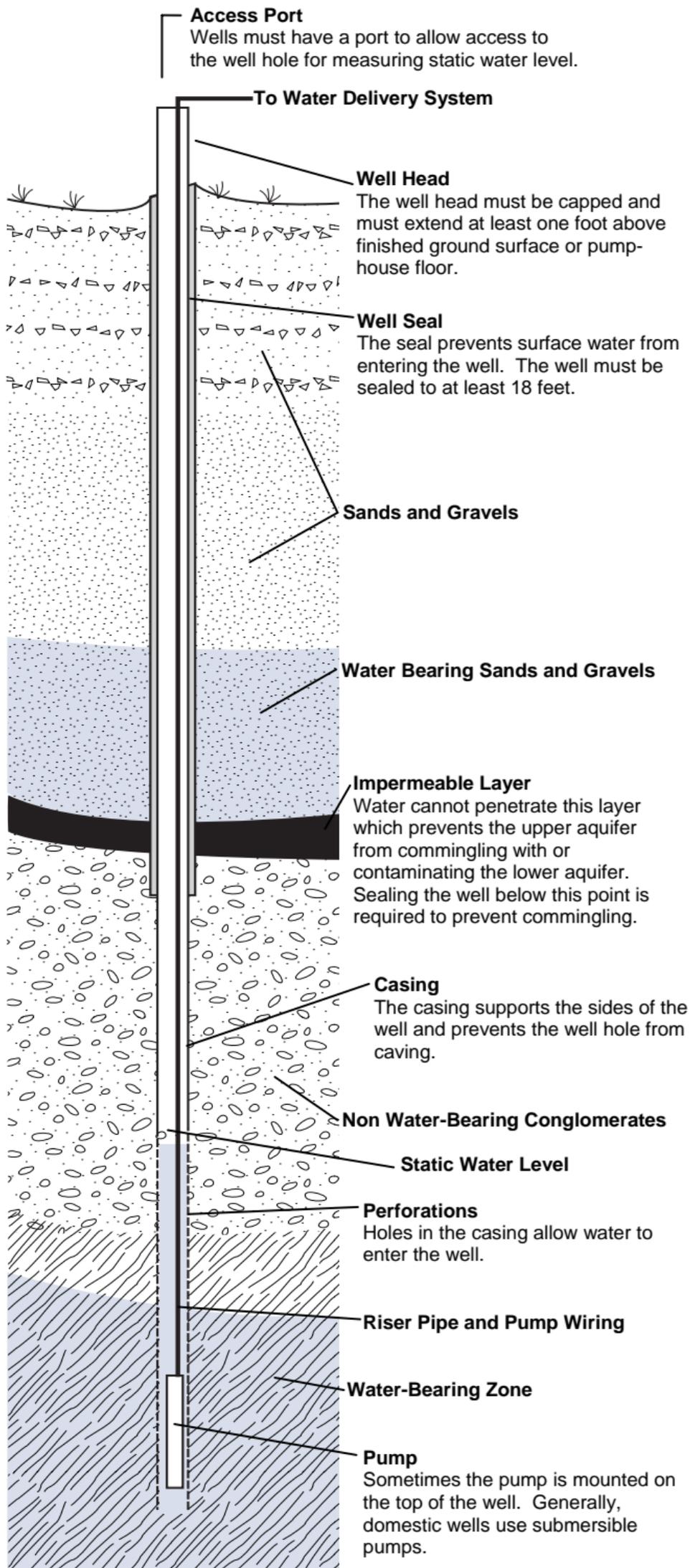


*A
consumer's
guide to*

WATER WELL
CONSTRUCTION,
MAINTENANCE,
and
ABANDONMENT

State of Oregon
Water Resources
Department

August 2006



This booklet provides general information about well construction, maintenance, and abandonment laws and practices in Oregon.

The information included is primarily for those individuals who wish to construct, abandon, or contract for the construction or abandonment of a water well in Oregon. It may also be helpful to people wanting to buy or sell property, and to people who own land on which existing wells are located.

This information is subject to change. Please call the Water Resources Department (WRD) to verify its current applicability.

Finding Ground Water

The amount and quality of ground water in an area can depend on yearly rainfall, geologic conditions, topography, distance to nearby wells, and surface water supply. You can learn about the quantity and quality of well water in your area from local water well constructors and neighbors. A local well constructor can help you estimate well depth, yield, and cost.

WATER WELL REPORTS (WELL LOGS)

Another useful tool for learning about your local ground water is the water well report, often called a “well log.” Well logs are prepared by the well driller as required by Oregon water law. Well logs provide information on geologic formations encountered in a well and list details concerning well design, construction, and yields. They are a basic tool used in checking for ground water availability.

WRD has well logs for most of the water wells drilled in Oregon since 1955. However, the likelihood of finding records for wells drilled after 1970 is much higher than for older wells.

Well logs are available on the Department's website: www.wrd.state.or.us.

From the home page, select "Find a Well Log." There are numerous ways to query the information. The most useful way is to search under Township, Range, and Section. The data for all of the wells in the section(s) will be displayed on the screen. You may view an image of the well log if you have Adobe Acrobat Reader® on your computer. Adobe Acrobat Reader can be downloaded for free at www.adobe.com.

WATER WITCHES

Water witches or "dowsers" claim to predict the presence of water with hand-held tools such as forked twigs or metal rods. Since there is no scientific basis to dowsing, most geologists do not recommend the practice. Although most water witches charge only a modest fee, the U.S. Geological Survey and National Ground Water Association advise against employing a water witch to search for ground water.

Estimating Your Water Needs

To estimate your daily peak water demand, add the appropriate quantities of water for all uses which would likely occur. Peak demand in the home normally occurs at the beginning of the day, at bedtime, or during laundry or irrigation uses. The following guide will help you determine peak demand.

Type of Use

DWELLINGS Gallons per day

Single family..... 50-75/person

Multi-family..... 40/person

Estate units..... 65-150/person

Lawn and garden..... 50-1,000

LIVESTOCK Gallons per animal per day

Cattle/steer..... 12

Dairy (plus maintenance)..... 35

Goat..... 2

Hog..... 4

Horse/mule..... 12

Sheep..... 2

POULTRY

Chickens..... 5-10 per 100

Turkeys..... 10-18 per 100

Some domestic water systems are designed to store water during times of low demand (such as night time). This stored water can be used later to supply water during peak demand (laundry, lawn watering). An experienced pump installer or plumbing contractor can plan a water system based on your needs and water source. In contrast to a domestic well, an irrigation well must be able to produce water at steady high rates for extended periods of time. Irrigation systems must be carefully designed to minimize pumping costs and to prevent excessive drawdown of the well.

Locating Your Well

Water well constructors have local knowledge and experience with state regulations; they can help you site your well.

The following standards apply to the placement of wells:

- Locate the well away from septic tanks, sewage disposal areas (such as a drain field), and other sources of contamination such as stock yards, storm sewers, privies, or refuse dumps. WRD requires a *minimum* distance of 50 feet from septic tanks and 100 feet from sewage disposal areas. Soil type and topography in your area may require greater distances.
- Increase the distances in areas of highly permeable formations (i.e. sand and gravel).
- Run drainage away from the well on all sides; divert up-slope drainage away from hillside wells.
- Locate the well above (higher in grade) disposal areas if possible.
- Locate the well at least five feet from buildings to allow easy access during maintenance, repair, testing, or redrilling. Remember to plan future well construction or repairs before building a shelter around the well.
- Locate the well in an area free from flooding or plan extra precautions to protect it.
- Site your well as far as possible from neighboring wells. When wells are close together, they may interfere with each other.
- Site your well a safe distance from your property line. This will prevent difficulties with neighboring septic systems and boundary line inaccuracies.
- State law requires two business days notice if you dig deeper than 12 inches. Call the Oregon Utility Notification Center at (800) 332-2344.
- Be aware of transmission lines and of overhead powerlines where the drill rig will set up.

After legal, health and safety requirements, the main consideration in locating your well is convenience. If conditions allow, locate the well near where you will use the water and near a power source.

Contact your county health and planning departments for additional well location and permit requirements before you drill.

Obtaining Water Rights

Under Oregon law, all ground water is considered a public resource. In general, a water right permit must be obtained before using water from any well.

The following uses of ground water *do not* require making application for a water right permit.

- Group and single-family domestic use up to 15,000 gallons per day.
- Stock watering.
- Watering any lawn and/or non-commercial garden totaling one-half acre or less in area.
- Down-hole heat exchangers.
- Any *single* industrial or commercial development up to 5,000 gallons per day.

These exempted uses are on a per-property or per-development basis and cannot be increased. For example, you cannot double the amount exempted by adding a second well.

If you have questions regarding your ground water use and the requirement to obtain a water right permit, contact WRD's Customer Service Group at (503) 986-0801.

A number of Oregon counties may also require permits for certain developments. Contact your county government for local rules.

For uses requiring a water right permit, you must file an application with the Department, including a map of the proposed site to be developed. The application review process takes about eight months. This time allows the Department to review the application and also provides an opportunity for public comment on the proposed use. Application forms, a list of Certified Water Right Examiners, and rules and statutes governing well construction in Oregon are available on WRD's website at www.wrd.state.or.us.

The Oregon Water Resources Commission is responsible for managing the ground water resource. In many areas, high demand on the ground water supply has required that new uses be restricted or prohibited. The uses which may be affected can also include those for which water rights are not required. Before making any expenditures on a planned well, you should consult with the Department to confirm that your planned use of water is permitted by the Department. (District watermaster offices are listed at the end of this brochure.)

Well Construction Standards

Oregon's well construction standards are designed to protect the ground water resource and the public by preventing contamination of the aquifer.

A copy of the well construction standards, OAR 690-200 through 690-240, may be found on WRD's website or by contacting the Department at (503) 986-0900.

In some cases, it may not be possible to construct or abandon a well in a manner that meets the minimum construction standards. When the minimum construction standards cannot be met, the person responsible for drilling, altering, or abandoning the well must make application for a “special standard” from the Department. A special standard allows deviation from the minimum well construction standards. The request must be obtained before completing the work.

Common Well Terms

WELL DEPTH can be measured by using a weighted line. The depth should be close to the depth recorded on the required well log.

CASING is steel or plastic pipe installed to prevent the borehole from caving in and to seal the upper portion of the well. The total length of casing used should be the same as that recorded on the well log.

SEALING the space between the borehole wall and the casing helps prevent commingling or contamination of the aquifer. The seal should be placed in one continuous operation from the bottom upward. A proper seal consists of neat cement (cement and water) or bentonite (a dry clay) which extends from the ground surface to the depth required by the construction standards that apply to the particular well. State standards require a minimum 18-foot seal.

COMMINGLING occurs when a well draws water from more than one aquifer. In no case shall a well be constructed to tap into multiple aquifers.

DEVELOPMENT involves vigorously pumping the well to help clean out drill cuttings and to maximize production of the well. Development should result in a well which produces sand-free or mud-free water when operated properly.

ACCESS PORT — All wells must have an access port for measuring the water level or a pressure gauge for measuring artesian pressure. The access port must be unobstructed. If an airline is installed for measuring the water level, it must not block the access port. Make sure the access port is capped and that all other openings are plugged, sealed, or designed to prevent surface water from entering the well casing.

TOP TERMINAL HEIGHT — The casing head or pitless unit of any well must extend at least 12” above the finished ground surface or pumphouse floor, and 12” above the local surface runoff level.

YIELD TEST — The driller will conduct a yield test to see how much water the well produces. One of these methods is used: pump, air, or bailer. The static water level, the date, the drawdown at the end of the test period, the pumping rate, and the length of the test period are recorded on the well log. Note whether the water level stabilized during the test. A one-hour minimum yield test is required upon completion of every well. Oregon law requires owners of wells requiring a water right (usually large industrial or irrigation wells) to conduct a well pump test once every ten years and report the results to the Department.

WELL IDENTIFICATION NUMBER — A preprinted stainless steel label should be attached to the well casing within 30 days of well construction. This unique number identifies your well and will be used to track any future modifications to the well. *Please do not remove or cover this label.*

WELL LOG — A well log or well report is a physical description of how your well was constructed. You should receive a copy of your water well report (well log) from the water well constructor. You may also be able to obtain a

copy on the Department's website or by contacting the Department. Keep your copy of the well log. This is one of the more important records of your property.

Selecting a Water Well Constructor

Be sure to choose a water well constructor who is licensed and bonded to construct water wells in Oregon. Names of local water well constructors are available from the following sources:

- Through the Department's website www.wrd.state.or.us.
- The Oregon Ground Water Association.
- Your local telephone directory.
- Your neighbors.
- The Water Resources Department's Salem office or your district watermaster.

The Department maintains files on all licensed constructors. The public is encouraged to ask for references and check them. Department records show bonding, licensing, and may also include formal enforcement proceedings.

Questions to ask before selecting a constructor:

- Do you have a valid Oregon water well constructor's license and bond?
- How long have you been in business and constructing wells?
- Do you have references?
- Do you provide a written agreement or contract?
- Does it cover the work to be performed?
- Does it include details and costs of well construction?

- Are the following items in the checklist mutually agreed upon?

CHECKLIST

This checklist will help ensure there is agreement between you and the well constructor about what is to be done. All of the items below should be addressed:

- Hole diameter, changes in diameter with depth;
- Casing material and diameter, cost per foot;
- Who will identify location of drainfields, septic tanks, and other sources of contamination;
- Drive shoe, if necessary;
- Approximate depth of well (set limits based on geology and individual needs) and cost per foot;
- Liner pipe, if necessary;
- Sealing method; interval and costs;
- Well development - duration, rate per hour or per day, completion criteria (for example, sand-free or mud-free water), drawdown;
- Intake diameter, perforated casing material, or screens;
- Well disinfection;
- Additional costs if the well is a flowing artesian well;
- Abandonment procedures if the well is unusable;
- Pump and installation costs (if the constructor provides this service);
- Itemized costs;
- Guarantee of materials and quality;
- Start and completion dates;
- Well identification number;
- Type of sanitary seal (well cap);
- Additional specific items.

Drilling Your Own Well

A water well is much more than just a hole in the ground. To prevent ground water contamination, a well must be constructed using proper methods and equipment. Licensed and bonded water well constructors have the equipment, knowledge, and experience required for proper well construction. For this reason, the Department discourages landowners from drilling a well by themselves.

If you decide to construct, alter, deepen, or abandon a water well by yourself on your own property, you will have two responsibilities:

1. Obtain a Landowner's Water Well Permit from the Department. You must submit an application, file a \$5,000 landowner's bond, and a \$25 application fee.
2. Construct, alter, deepen, or abandon the well according to ground water law and the general standards for construction and maintenance of water supply wells in Oregon.

You may obtain an application for a Landowner's Water Well Permit, a bond form, and a copy of current state well construction standards and regulations from WRD's website at www.wrd.state.or.us.

A landowner who desires to deviate from the minimum well construction standards must obtain a "special standard" (allowing exception from the standards) from the Department prior to completing the work.

Purchasing and Installing a Pump

Well pumps are sold by pump dealers, some water well constructors, plumbing supply dealers, and various retail outlets. The water well

constructor can tell you the well production and drawdown of the yield test. Using this information and the well diameter, you can select a pump to meet your water needs. The delivery system should produce enough water while using as little energy as possible. Selecting a pump with a capacity greater than the well yield can cause problems, such as muddy or sandy water, pump failure, or even well failure.

Several types and sizes of pumps are used in domestic wells. Each has certain advantages, depending on the depth to water, the size of the well, and the amount of water needed. Your pump supplier can recommend the best type and size for your needs. Selection of a pump too large for your well has no advantages and may damage your well.

Maintaining Your Well

Some simple well maintenance and record-keeping will help protect the quality of your water and your well.

WATER QUALITY — Have a water sample analyzed for bacteriological quality at least once a year. Have a sample checked for chemical quality (such as hardness or specific conductance) every five years. Changes in water quality provide early warning of defective surface casing, seals, or contaminated aquifers. Many local water treatment or conditioning businesses, and some local Health Department offices or independent laboratories will perform these tests for a fee.

WATER LEVEL — Keep a permanent record of the depth to water from a reference point such as the top of the well casing. These measurements will provide an early warning of water supply problems. Measure the water level at least twice a year and record the time and date.

Measurements should be made on approximately the same dates each year, usually in the spring and fall. Let the well sit without pumping for at least one to two hours before measuring. If you have any questions about how to do this, ask your constructor.

SHELTER — Do not store poisons, pesticides, petroleum products, or other hazardous materials in your pumphouse or near your well. Do not use the pumphouse to shelter animals.

COVER — Periodically check the sanitary seal/well cap on top of the casing (well) to ensure it is in good repair.

GENERAL MAINTENANCE — Take care in working or mowing around your well. Keep the top of the well at least one foot above the ground. Keep your well records, including a copy of your well log, pump information, water quality, and flow testing information in a safe place.

The landowner has the ultimate responsibility for maintenance of their well(s). If well construction problems are discovered that may contribute to contamination or waste of the ground water resource, the Department may require repairs or abandonment to eliminate the problem. The Department will look first to the well constructor to determine if the well was constructed to standards. However, if the constructor is unable or unwilling to perform the repairs, the landowner may assume the responsibility. Problems with the well, due to age or a change in site conditions, may require repairs or abandonment of the well, which are the responsibility of the landowner.

Abandoning Your Well

Unused wells that are not properly abandoned can cause ground water contamination, waste, or loss of artesian pressure. Ultimately, landowners can be held responsible for harm to the ground

water resource resulting from old or unused wells. Oregon's well abandonment standards are designed to prevent contamination of the well or aquifer by surface and subsurface leakage which may carry harmful chemicals or bacteria. The standards also seek to prevent physical injury, waste of water and loss of artesian pressure. The Department has minimum standards that describe the acceptable methods for two types of well abandonment.

TEMPORARY ABANDONMENT — A well is considered temporarily abandoned when it is taken out of service. Owners of temporarily abandoned wells intend to bring the well back into service at a future date. Temporarily abandoned wells must be covered by a watertight cap or seal which prevents any materials from entering the well.

PERMANENT ABANDONMENT — A well is considered permanently abandoned when it is completely filled so that movement of water within the well is permanently stopped. With the exception of hand-dug wells, a permanent abandonment must be performed by a licensed water well constructor, or the landowner under a Landowner's Water Well Permit.

The appropriate permanent abandonment method will depend on information obtained from an examination of the well log and an onsite investigation of the well. Generally, a drilled well with steel or plastic casing will be abandoned by either removing or ripping the casing and filling the borehole with cement from the bottom up. Any pump, wiring, or debris in the well must be removed before the cement is placed.

If a review of the well log indicates that the well is a filter or gravel-packed well (where pea gravel is used to screen out loose geologic material in the well), the Department must preapprove any abandonment method. A greater potential exists for harm to the ground water

resource from incorrect abandonment of this type of well due to the artificial gravel-pack material.

If a hand-dug well is to be abandoned, you must notify the Department and obtain approval for the abandonment method before beginning the abandonment. Typically, a hand-dug well free of debris may be abandoned by filling the well with cement or concrete to above the water-bearing zone and then clean fill (not gravel) to land surface. Hand-dug wells containing debris may be subject to other abandonment methods.

For more specific information about well abandonment, contact a well constructor or the Department.

Sharing Water

If you plan to construct a well to serve more than one household, a carefully drawn agreement should be negotiated. Generally, legal advice is sought for such an important document between water users and well owners. The agreement should address these questions:

- Who will maintain the well?
- Who may access the well for maintenance?
- Under what conditions can the property on which the well is located be bought and sold?
- How will power costs and water availability be shared?
- What is each party's interest or right to use the water?
- What type of organization will manage operation of the well now and in the future?
- How will costs of well reconstruction or pump replacement be shared?
- How will the 1/2 acre of irrigation exempt from a water right permit be divided among the parties?

Consult with your lending institution about their restrictions on lending for shared wells.

If the well serves multiple households, it is considered a public water system. Public water systems are regulated by the Oregon Department of Human Resources, Drinking Water Program. The Drinking Water Program should be contacted for further requirements.

Lending Institutions

If you need help financing your new well, check with lending institutions in your area before you look for a well constructor. Some lenders have specific requirements for well production, water quality, and well depth, and may have standards for sharing wells with one or more neighbors.

Several types of loans for well construction are available. The cost of a well may be included in a loan for construction of a home. Sometimes interim loans are needed to cover the cost of the well until you receive financing for home construction. These are available from a variety of lending institutions.

Additional Information

Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, Oregon 97301-1266
Tel: (503) 986-0900
Fax: (503) 986-0902
Web: www.wrd.state.or.us

DHS Drinking Water Program
800 NE Oregon Street, Suite 611
Portland, Oregon 97232-2162
Tel: (971) 673-0405

District Watermasters



Greg Beaman

District 1, Tillamook
 (503) 842-2413 x119
 FAX (503) 842-3680

Michael Mattick

District 2, Springfield
 (541) 682-3620
 FAX (541) 746-1861

Bob Wood

District 3, The Dalles
 (541) 506-2650
 FAX (541) 506-2651

Eric Julsrud

District 4, Canyon City
 (541) 575-0119
 FAX (541) 575-0641

Tony Justus

District 5, Pendleton
 (541) 278-5456
 FAX (541) 278-0287

Shad Hattan

District 6, La Grande
 (541) 963-1031
 FAX (541) 963-9637

Rick Lusk

District 8, Baker City
 (541) 523-8224
 FAX (866) 214-3493

Ron Jacobs

District 9, Vale
 (541) 473-5130
 FAX (541) 473-5522

June Miller

District 10, Burns
 (541) 573-2591
 FAX (541) 573-8387

Jeremy Giffin

District 11, Bend
 (541) 388-6669
 FAX (541) 388-5101

David Poe

District 12, Lakeview
 (541) 947-6038
 FAX (541) 947-6063

Larry Menteer

District 13, Medford
 (541) 774-6880
 FAX (541) 774-6187

Kathy Smith

District 14, Grants Pass
 (541) 471-2886 x222
 FAX (541) 471-2876

David Williams

District 15, Roseburg
 (541) 440-4255
 FAX (541) 440-6264

Mike McCord

District 16, Salem
 (503) 986-0889
 FAX (503) 986-0903

Vern Church

District 17, Klamath Falls
 (541) 883-4182 x223
 FAX (541) 885-3324

Darrell Hedin

District 18, Hillsboro
 (503) 846-7780
 FAX (503) 846-7785

Mitch Lewis

District 19, Coquille
 (541) 396-3121 x254
 FAX (541) 396-6233

Sabrina White

District 20, Oregon City
 (503) 722-1410
 FAX (503) 722-5926

Joel Clark

District 21, Condon
 (541) 384-4207
 FAX (541) 384-2167



State of Oregon
WATER RESOURCES DEPARTMENT
725 Summer Street NE, Suite A
Salem, Oregon 97301-1266
(503) 986-0900
www.wrd.state.or.us