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WATER

Water is considered to be one of the most abundant resources on Earth, yet only one percent of it is actually drinkable. It is therefore vitally important to protect and conserve this resource. Marion County currently has four designated areas where groundwater is limited, along with many streams that are in need of some remediation.

The local, state, and federal governments have, with some success, put in place regulations, policies, and strategic plans that work to protect these waters. The success of these efforts rely heavily on property owners being proactive in protecting the waters that pass through their property. Luckily these governments also provide grants and educational resources to their citizens to assist in the enhancement and protection of our waterways. A good first step for property owners is to become familiar with the features within the landscape that directly relate to the health and quality of our waters.

SECTIONS

3.1 Watersheds

3.2 Water Rights

3.3 Irrigation

3.4 Wells

3.5 Septic





WATERSHEDS

Everyone lives in a Watershed

Watersheds and their hydrological features provide key functions to natural ecosystems. Destroying or altering these features in any way can have a huge impact upon the natural environment. A watershed is defined as an area of land where all of the water that falls upon it, is under it, or drains off of it, converges into specific lakes, rivers, streams, wetlands, or oceans. Watersheds are bounded by topographical high points known as divides, such as ridges, hills, or mountaintops. Watersheds come in different shapes and sizes, with the larger ones such as the Willamette River Basin being divided into smaller subbasins. Our actions on the land directly affect the water quality and quantity for all communities living downstream.

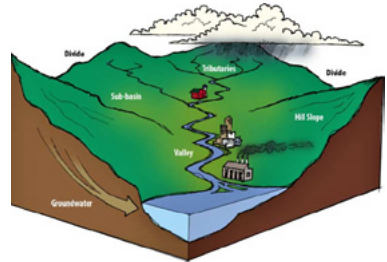


Figure 1 - Watershed Diagram
Courtesy of Ducks Unlimited Canada

WILLAMETTE RIVER WATERSHED

Marion County lies within the Willamette River Watershed (Basin) which is Oregon's largest watershed at 11,500 square miles. Roughly 70 percent of the state's population currently lives within this watershed. The valley's population is expected to nearly double by 2050 making it the fastest-growing region in Oregon. This makes protecting the watershed an important goal for Oregon and the future of the region.

The Willamette Valley is characterized by mild wet winters and warm dry summers, with fertile soils that make the valley the most important agricultural producing region in Oregon. As the pressures of development increase, conflict between the natural environment and urbanization will also increase. With approximately 96 percent of the valley floor (Willamette Ecoregion) in private ownership, conservation efforts and watershed protection must rely primarily on voluntary actions by property owners.

Development has already greatly altered the valley from its historic environment of grasslands, oak savannas, wet prairies and other open habitats. The Willamette River has been disconnected from its natural floodplain and much of the historic wildlife habitat is fragmented.



Courtesy of Riversphere/Tulane University

WETLANDS

Wetlands and their adjacent ecological transition zones are important features of a watershed. The flow of water, the cycling of nutrients, and the energy of the sun meet to produce a unique ecosystem characterized by its hydrology, soils, and vegetation. Wetlands can be classified into four general categories: marshes, swamps, bogs, and fens.

Wetlands have two primary characteristics: (1) hydric (water logged)

soils and (2) water-tolerant plants. Even when water isn't visible these indicators will still be present.

Wetlands are home to thousands of species and provide important breeding areas. Wetlands' natural systems are critical to maintaining the ecological balance of a region. They help reduce flooding by storing water, and help reduce water pollution through their filtering and cleansing abilities.

RIPARIAN AREAS

Riparian areas are defined by the Natural Resources Conservation Service as ecosystems that occur along waterways and water bodies. They act as the transition between the wet (aquatic) lands and the dry (terrestrial) land. A healthy riparian area will be highly vegetated with ideal riparian vegetation, good shade, and an abundance of woody and organic debris. Plant roots provide the bank with increased stability while mini-

mizing sediment runoff. Riparian buffers should be between 25-100 feet wide depending on surrounding land uses. Properly managed riparian areas provide property owners and the environment with numerous benefits. Riparian areas are vital to the natural ecosystem, thus **property owners are highly discouraged from altering or removing riparian vegetation.**

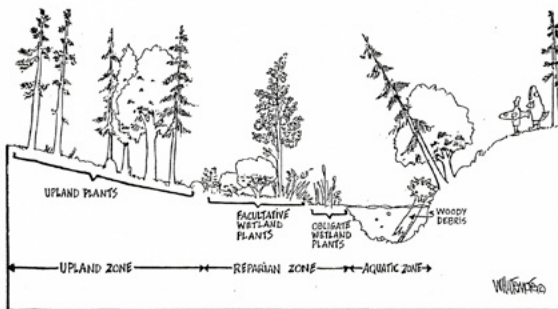


Figure 2 - Healthy Riparian Area
Courtesy of Adopt a Stream Foundation

Ecological Benefits

- Reduces water pollution
- Reduces flooding
- Reduces erosion
- Protects fish habitat
- Provides nutrients
- Provides wildlife habitat

Additional Resources

[Willamette River Basin Atlas](#)

www.fsl.orst.edu/pnwerc/wrb/Atlas_web_compressed/PDFtoc.html

[EPA: Wetlands](#)

water.epa.gov/type/wetlands/index.cfm



WATER RIGHTS

First in Time, First in Right

Water Rights are required if property owners are interested in using water for uses other than domestic. They come in two types, surface and ground. Property owners are encouraged to find out from the Oregon Water Resource Department (OWRD) if their property has water rights or not and if so, to acquire the documentation for that right. If you currently have a permit, it is in your interest to work on acquiring a certificate.

Key Terms

Priority Date: Oregon water rights are based on seniority. The first person to obtain a water right is the last to be shut off.

Beneficial Use: The specific intended use of the water.

Diversion Point: The point where water is removed from a stream.

Appropriation Point: the point where groundwater is removed, i.e. a well.

Appurtenance: The area where water is allowed to be used.

Losing Water Rights: If you have a permit, water rights can be cancelled for not continuing to "prove up". A water right once established must be used beneficially at least once every five years (ORS 540.610), if not it is considered forfeited and is subject to cancellation.

EXEMPT USES

Some water uses do not require a water right. For a full list visit the Oregon Water Resource Department's website. www.wrd.state.or.us

Ground Water Exemptions

- Single or group domestic purposes, not to exceed 15,000 gallons per day.
- Industrial or commercial purposes not to exceed 5,000 gallons per day.
- Stock watering.
- Watering lawns or non-commercial gardens under 1/2 acre in area.

Surface Water Exemptions

- Qualified reclaimed water uses.
- Qualifying stock water uses.
- Emergency fire-fighting.
- Certain forest management activities.
- Certain diversions promoting soil conservation.

VESTED RIGHTS



If you have a water right on your property with a priority date that pre-dates these dates, you should apply to the OWRD for a certificate. Proof of your priority date is required.

WATER RIGHT ACQUISITION

Water Right Types: Ground and Surface

- 1st** Apply for a permit from the OWRD. Once a permit is issued, it allows the property owner to begin constructing a water system.
- 2nd** Construct the water system and use water based on permit conditions.
- 3rd** Hire a certified water right examiner (CWRE) to validate the water system.
- 4th** If all conditions of the permit have been met, a certificate is issued.

WATER RIGHT TRANSFER

Water rights have very specific designations on where water can be used on your property, for what, the amount, when, and from where you can extract the water. Before changing any of these components, the water right holder needs to receive approval for a water right transfer from the Oregon Water Resources Department or else that part of the water right could be lost.

When water rights are transferred, they must be “proved up” in order to receive a certificate for the new right. The initial priority date on the water right will be maintained after the transfer.

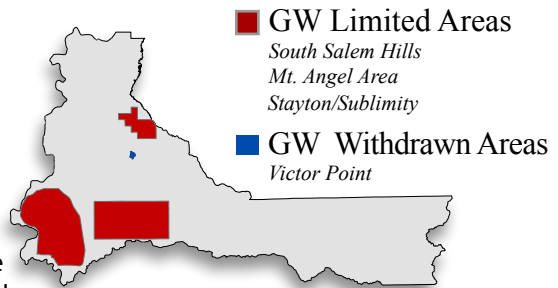
There are multiple types of transfers available for water users: permanent, temporary, and instream. For more information visit the OWRD website.

GROUNDWATER (GW) MANAGEMENT AREAS

These areas are defined by the OWRD to prevent excessive declines in groundwater. There are currently three GW Limited Areas and one GW Withdrawn area in Marion County.

GW Limited Areas do allow new water rights, but are restricted to a few designated uses. Check with OWRD for a complete list of possible uses.

After September 2001 the OWRD put a moratorium on drilling new wells within the GW Withdrawn Area. Residents can, however, conduct maintenance on existing legal wells that are impaired.



Stay Informed

Every Tuesday the Oregon Water Resource Department releases information on current water right applications. Check regularly for any new water right activities in your area. apps.wrd.state.or.us/apps/misc/wrd_notice_view/?notice_id=21

WATER STORAGE

Constructing a pond or reservoir of any size to store water requires a permit from the OWRD. A secondary water use permit is required to use or divert the water that is being stored. Water storage is generally allowed from November through June.

Reservoirs with a dam height of 10 feet or greater and that store 9.2

acre-feet or more of water require engineering plans and specifications that must be approved by the OWRD prior to the construction of the reservoir. There is an expedited permitting process for individuals building reservoirs with a height of less than 10 feet and that store less than 9.2 acre-feet of water.

“Watering a lawn larger than a ½ acre using ground water requires a water right.”

RAINWATER HARVESTING

Marion County property owners may collect and use rain water from impervious surfaces on their property without a permit. But, if you install an above grade tank of 5,000 gallons or more, a building permit is required. When developing a rainwater harvesting system, you should first establish the amount of water available and your water needs. The size of the cistern needed will depend on the amount of water you want to collect and what you want to do with

that water during a specific time frame. Different activities require different amounts of water. Crop irrigation requires roughly 2 - 2½ acre feet of water per acre during the June to September growing season. The rainwater catchment formula will help define how much water is available for collection from a roof. Contact the Marion SWCD and local government agencies for assistance and possible grants.

Rainwater Catchment Formula

$$\text{ROOF AREA} \times \text{Annual Rainfall} \times 0.46 = \text{GALLONS OF WATER PER YEAR}$$

1 acre foot = 325,851 gallons

1 person = 50 - 70 gallons per day

Additional Resources

[Oregon Water Resource Department](http://www.wrd.state.or.us/)

www.wrd.state.or.us/

[An Introduction to Oregon's Water Laws](http://www.oregon.gov/OWRD/PUBS/aquabook.shtml)

www.oregon.gov/OWRD/PUBS/aquabook.shtml

[Oregon Water Resource Department Publications](http://www.wrd.state.or.us/OWRD/PUBS/index.shtml)

www.wrd.state.or.us/OWRD/PUBS/index.shtml



IRRIGATION

Over-irrigating costs you money

Irrigation in Marion County is vital to maintaining its active and vibrant agricultural community. Irrigation is needed in the county during the summer months when rainfall is limited and crops are growing. Depending on the system and management used, there are maximum efficiencies that can be reached. An efficient irrigation water application system coupled with good water management can save property owners money by reducing energy costs and increasing the amount of land irrigated.

IRRIGATION SYSTEMS AND MANAGEMENT

The type of irrigation system and the quality of management defines the limits on application efficiency one can achieve. Irrigation management plays the largest role in achieving high levels of irrigation efficiency. It is possible to install a high efficiency system and still have low application efficiencies due to improper management. Choose accordingly and be aware of the required labor and operational maintenance associated with that particular system. The three commonly used irrigation methods in Marion County are: surface, sprinkler and micro.

Key Factors of an Irrigation System

- Crop water requirement.
- Application uniformity.
- Water supply reliability.
- Operational precision.
- Water use efficiency.
- Economic returns.

Attainable Irrigation Efficiencies

SYSTEM TYPE	EFFICIENCIES (%)
SURFACE SYSTEMS	
Level Border	60-80
Furrow	60-80
Graded Border	55-75
Wild Flood	25-40
SPRINKLER SYSTEMS	
Linear Move	75-90
Center Pivot <small>low pressure</small>	75-90
Fixed Solid Set	70-85
Center Pivot <small>high pressure</small>	65-80
Hand Move	60-75
Traveling Gun	60-70
Stationary Gun	50-60

MICRO - IRRIGATION SYSTEMS

Sub/Surface Drip	85-95
Micro Spray	85-90

Courtesy of ATTRA www.attra.ncat.org

WATER DISTRICTS

Marion County currently has four user-owned water districts that deliver water and maintain drainage in specific areas of the county.

- Santiam Water Control District,
- Sidney Irrigation Cooperative,
- East Valley Water Control District,
- Lake Labish Water Control District.

There are two types of water districts: Irrigation and Water Control. A Water Control District has the ability to manage more than one resource, while an Irrigation District only delivers irrigation water.

Water districts provide property owners within the district with the required infrastructure for obtaining water from the point of diversion to their property. Property owners are required to pay an annual fee for the use of the infrastructure. The Districts are required to maintain the ditches and other aspects of the system. Property owners are asked not to alter or change district irrigation ditches in any way. A water right is required to use the water from a canal or ditch that is adjacent to your property.

“Be aware that what appears to be a stream on your property might be an irrigation or drainage ditch.”

WATER CONSERVATION VIA IRRIGATION SCHEDULING

Weather Based Monitoring – Monitor weather (temperature, rainfall, humidity, and crop evapo-transpiration) patterns to schedule irrigation application. Computer-based programs and local weather stations should be used for scheduling.

Soil Based Monitoring – The available water-holding capacity of a soil depends on soil texture and organic matter content. Monitoring the soil moisture during the growing season will help reduce water loss through over-irrigating. Soil moisture monitoring can be done by the “feel and appearance” method or via more sophisticated methods.

Evaporation Based Monitoring – With a close growing crop, water evaporation from an open water source can approximate the evapo-transpiration (ET) rate of the crop. ET gauges, which operate on the same principle, are available to more precisely monitor evaporation for irrigation scheduling.

Additional Resources

Irrigation in the Pacific Northwest
irrigation.wsu.edu/

Web Soil Survey
websoilsurvey.nrcs.usda.gov/app/HomePage.htm

NOAA National Weather Service
www.weather.gov

AgriMET
www.usbr.gov/pn/agrimet/



WELLS

A domestic water source

Many residents in Marion County are not connected to a municipal water source and must rely upon a well for their domestic water uses. Roughly 500,000 citizens in Oregon use a household well and are required to protect, test and purify the water to keep their family safe. Having a basic knowledge of the mechanics and issues related to a well will assist property owners with identifying and solving problems when they arise.

LOCATE AN EXISTING WELL

If you know or suspect a well is the source of your water, locate the well. It most likely will be a three- to six-inch pipe sticking out of the ground near the home. You should also locate the pipe that connects the well to

your house so you do not disturb it. The direct path from where the pipe enters the house to the well is mostly likely where the pipe is located. Private locating companies can assist in locating the pipe and the well.

WELL LOG

Well logs are kept by the Oregon Water Resources Department to track the current state of wells, even dry wells. Well logs can be used to get information about ground water in an area prior to drilling a well or buying property. The well logs contain

information on: how often wells were deepened, how much water is being produced, and water depth. Doing research and having a plan prior to buying property should help minimize unanticipated surprises.

WELL TEST

It is smart to have well water tested prior to purchasing a home.

Chemical Tests are recommended to be done every 2 – 3 years.

Biological Tests should be done yearly.

Owners of a permitted or certified well are responsible for having a **Pump Test** every 10 years. This test can be administered by a well driller or a pump vendor. The information gained should be submitted to the OWRD for planning purposes.

Well Tag

Wells that are deepened, drilled or altered are required to have a well tag. Well tags are provided by the OWRD. Wells should be tagged prior to selling a property.

WELL PERFORMANCE

In order to evaluate the performance of a well, baseline information is necessary. This information can assist in determining well maintenance and rehabilitation scheduling.

- What is the static water level in the well prior to use?
- What is the pumping rate after a specified period of pumping?
- What is the water level in the well after a specified period of pumping?
- Is the water clear and free of sand and silt?
- How rapidly does the water level recover after pumping?

COMMON WELL ISSUES

Yearly maintenance and upkeep of a well is good practice for prolonging its life and keeping drinking water safe. Yearly water tests will provide the needed information for identifying possible health concerns related to water quality.

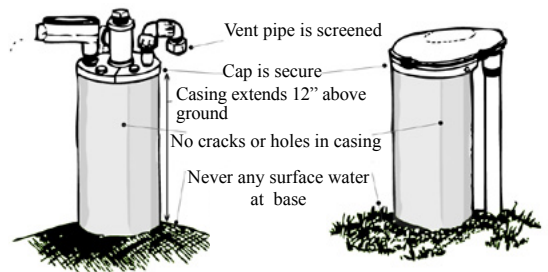


Fig.1 - Areas to check on a well
Courtesy of ODA

Water Quality: All ground water contains some gases and minerals; acceptability and desirability of these materials is a matter of personal preference. Be aware that some problems invisible to the naked eye, such as hardness or high bacterial counts, do require treatment, while other issues that are more obvious may not be detrimental to one's health and do not need to be treated.

Well Stops Working: First, check the power source; has a fuse blown or the pump died? The worst case scenario is that the well is dry. Contact a professional well driller if this occurs.

Additional Resources

[Water Well Owner's Handbook](http://www1.wrd.state.or.us/pdfs/Water_Well_Booklet_2010.pdf)

www1.wrd.state.or.us/pdfs/Water_Well_Booklet_2010.pdf

[Department of Human Services: Drinking Water Program](http://www.oregon.gov/DHS/ph/dwp/index.shtml)

www.oregon.gov/DHS/ph/dwp/index.shtml

[How to Disinfect a Well](http://www.co.marion.or.us/HLT/PH/EHS/water/well.htm)

www.co.marion.or.us/HLT/PH/EHS/water/well.htm



SEPTIC SYSTEM

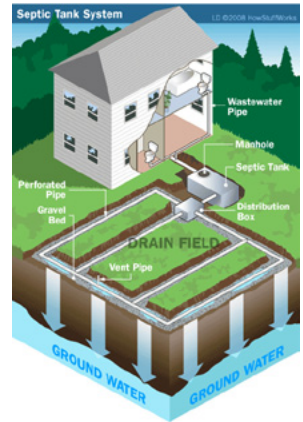
Your on-site sewer system

If your property has a septic system, it is important to understand how it works and what is required to maintain the system in order to maximize its life expectancy. Maintenance is the key to a properly functioning and long-lasting septic system. A failed septic system can contaminate local water sources and cause serious public health risks and environmental harm.

HOW IT WORKS

Septic systems consist of two main parts; the septic tank and the drain field.

Waste water enters the septic tank where it needs to sit for at least a day to separate out heavy (sludge) and light solids (scum) from the water. As more water enters the septic tank, it pushes out waste water into the drain field. The drain field provides additional bacteria treatment as the material passes through perforated pipes, into a gravel bed and then into the soil. Overuse of the system, even for a short period of time, can cause water to be released into the drain field without being properly separated in the septic tank. This can contaminate ground water and damage the system by clogging the pipes.



Courtesy of How it Works Discovery

IMPORTANCE OF MAINTENANCE

- **Cost** – Septic systems are expensive to repair or replace. Lack of maintenance is a primary reason for early failure.
- **Health and Safety** – A failed septic system can release inadequately treated solid waste into natural water sources creating a risk to public health.
- **Property Value** – A failed system can lower property value. In addition, occupational permits might not be approved because of a failed system.

“Household soap, grease and garbage disposals are highly detrimental to a septic system”

REQUIRED MAINTENANCE

Monitoring the functionality of the septic system and conducting maintenance accordingly is your best bet for maintaining a healthy septic system. Following these rules will help prolong the life of your septic system.

- Schedule annual inspection.
- Develop a septic tank pumping schedule for your tank. Pumping frequency depends on the size of the tank, household water use and the volume of solids. Most tanks are designed for a three- or more-year pumping cycle.
- It is a good idea to supervise cleaning to make sure it is done properly.
- Divert rainwater from the drain field.
- Check faucets and toilets for leaks. Make repairs if necessary.

CAUSING HARM TO THE SYSTEM

Some actions can cause serious damage to the septic system and can reduce the life expectancy of the system. Properly managing the site of the septic system will also help prolong the system's life. Following these simple guidelines will help keep your system safe.

- Flush only easily digested organics and water down the drain. Refrain from flushing items that could be placed in the trash; napkins, cigarette butts, dental floss, feminine products, pharmaceuticals or condoms.
- Minimize your use of household soaps and chemicals. They can destroy helpful bacteria that assist in the breaking down of solid waste in the system. Small amounts of drain cleaner can kill the needed bacteria and disrupt the system.
- Experts believe that septic tank additives are unnecessary and provide little to no benefit for a properly managed system.
- Avoid driving or parking on top of the system.
- Plant only grasses near or above the drain field and tank.
- Avoid allowing animals to graze on the drain field.

Additional Resources

National Environmental Service Center: Septic Systems

www.nesc.wvu.edu/subpages/septic.cfm

EPA: Septic Systems

cfpub.epa.gov/owm/septic/index.cfm