

**LEAGUE FOR WOMEN VOTERS
WATER STUDY
DESCHUTES COUNTY
NOVEMBER 2008**

DESCHUTES COUNTY(fastest growing county in Oregon, from 2000 to 2007 it grew 39.4%)

STATISTICS AND FACTS

Established December 13, 1916

Population 160,810 as of July 1 2997 **Median Age**

| | | |
|-----------------------|--------|------|
| Bend | 77,780 | 34.8 |
| LaPine | 1,590 | 44.7 |
| Redmond | 24,805 | 32.7 |
| Sisters | 1,835 | 38.8 |
| Unincorporated | 54,810 | 38.1 |

24.80% under 18, 7.80% from 18 to 24, 28.60 % from 25 to 44, 25.70% from 45 to 64 and 13.10 % were 65 or over

Area 3,055 square miles, of which 3,018 square miles is in land, and 37 square miles of it is water. Total water is 1.20%

Incorporated cities: Bend, LaPine, Redmond, Sisters
Unincorporated communities: Alfalfa, Brothers, Deschutes River Woods, Hampton, Millican, Sunriver, Terrebonne, Three Rivers, Tumalo

Average

| Temperature | City | Jan Min | Jan Max | Jul Min | Jul Max |
|--------------------|----------------|----------------|----------------|----------------|----------------|
| | Bend | 21 | 41 | 45 | 81 |
| | Redmond | 22 | 41 | 47 | 85 |
| | Sisters | 21 | 42 | 42 | 84 |
| | LaPine | 19 | 40 | 40 | 86 |

Average

| Precipitation | City | inches |
|----------------------|----------------|---------------|
| | Bend | 11.70 inches |
| | Redmond | 8.62 inches |
| | Sisters | 14.18 inches |
| | LaPine | 15.10 inches |

Average
Snowfall 33.8 inches (120 inches to 200 inches in Cascade Mountain Range)

Principal
Industries Tourism, retail trade, secondary wood products, recreational equipment, aviation, advertising agencies, real estate, medical facilities, financial

institutions, computer software and other high technology.

Top 10 private employers in Central Oregon in 2008

| Rank | Companies | Employees |
|-------------|--|------------------|
| 1. | St. Charles Medical Center | 3, 088 |
| 2. | Les Schwab Tire Center (Region) | 1, 500 |
| 3. | Bright Wood Corporation | 1, 057 |
| 4. | Sunriver Resort | 950 |
| 5. | Mt. Bachelor | 886 |
| 6. | T-Mobile | 824 |
| 7. | Safeway (Region) | 666 |
| 8. | Wal-Mart (Region) | 623 |
| 9. | TRG Customer Solutions (formerly iSKY) | 564 |
| 10. | Bend Memorial Clinic | 510 |

5 million visitors visit the Bend area annually. 800,000 stay overnight. 1.7 million are day visitors

GEOLOGY

The overall defining landscape of Deschutes County is primarily marked with that of lava flows. Most of the lava found in the county issued forth from Newberry Volcano located just south of Bend. Because of this, Deschutes County is the most cave-rich in the state of Oregon. Larger volcanoes dot the entire landscape of Deschutes County, ranging from the prominent Three Sisters, Mt. Washington, Mt. Bachelor, Broken Top, Newberry, Tumalo Mountain, Maiden Peak and others.

CLIMATE

Deschutes County lies in the part of Oregon along the eastern side of the Cascades. It is within two different climate divisions. Climate Division 5 (High Plateau) and Climate Division 7 (South Central Oregon)

See precipitation and snow charts on page 1

More information is available from the following:

http://www.ocs.oregonstate.edu/county_climate/Deschutes_files/Deschutes.html

<http://www.edforco.org/.docs/pg/10023>

<http://www.co.deschutes.or.us/go/visiting/area-profile/statistics-and-facts>

WATERSHEDS

Deschutes County gets its surface and groundwater from the Deschutes River watershed, also known as the Deschutes Basin. As for water use, 40% of its water is used for agriculture, 30% for hydroelectric power, 8% for industry, 6% for household use and only 1% for drinking. This

constitutes approximately 370 billion gallons per day.

DESCRIPTION

The headwaters of the Deschutes River is Little Lava Lake, a lake in the Cascade Mountains located approximately 26 miles northwest of the city of LaPine. The river flows south into

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Crane Prairie Reservoir then into a second reservoir (the Wickiup Reservoir), from there it heads in a northeasterly direction past the resort community of Sunriver into the city of Bend. In Bend, much of the rivers' waters is diverted, as a result, the river is much smaller when it leaves the city. The river continues north from Bend, past the city of Redmond. As it heads north through the central Oregon desert, the river carves a gorge. By the time it reaches Lake Billy Chinook (a lake formed by Round Butte Dam), the river is joined by the Crooked and Metolius rivers. Beyond the dam, the river continues to flow north (one of the few in the US to do so) in a gorge well below the surrounding countryside. It passes through the Warm Springs and Kah-Nee-Ta resort. There are two main sections of the river that are popular for whitewater rafting. The upstream section is a short segment upriver from the city of Bend. The lower and more heavily used section is from the town of Warm Springs downstream to just above Sherars Falls. The river ends its confluence with the Columbia River, 5 miles southwest of Biggs Junction.

MAIN TRIBUTARIES

The main tributaries are Snow Creek, Brown's Creek, the Little Deschutes River, Fall River, Spring River , Squaw Creek and Tumalo Creek.

RIVER USE

Much of the flow of the upper Deschutes River is diverted into canals to irrigate farmland. Irrigation Districts take as much as 97% of the rivers' flow in the summer months. The growth of cities like Bend and Redmond also increased demand on the rivers' water, which is over allocated. Because the existing canals lose 65% of their water due to leaks and evaporation, there is pressure to convert these canals into pipelines, a move that is resisted by many locals for historic or scenic reasons. There are thirteen golf courses throughout Bend, Redmond and Sunriver.

WATERSHED'S CONDITION

Rapid population growth is the most challenging issue facing this area. Deschutes County currently is the fastest growing county in Oregon. As of 2005, Deschutes County had some 63 groundwater systems with completed delineations. The Deschutes River Conservancy, the Deschutes Land Trust, the Deschutes Watershed Council, and many other stakeholders work together to monitor the Deschutes Basin.

POTENTIAL CONTRIBUTORS TO WATER POLLUTION

The DEQ and other state and local agencies have collected data and conducted several groundwater quality studies in the Deschutes Basin. They have studied potential contributors to pollution including the following: bacteria, runoff and erosion from agricultural and forest lands, leaching of pollutants to groundwater, eroding streambanks, runoff from roads and urban areas,

waste discharges from pipes, livestock grazing, irrigation water use and drainage, application and storage of crop nutrients and farm chemicals, sewage treatment plants, municipal sludge spread on fields, off-road vehicles, railroad beds, hydroelectric dams, high concentration of deer, elk, antelope, and feral swine.

They also studied how pollutants can be carried to the surface water or groundwater through the actions of rainfall, snowmelt, irrigation, and leaching. Increased heat input due to vegetation removal, seasonal flow reduction, changes in channel shape and floodplain alteration is also a major source of water quality impairment.

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More information is available from the following:

<http://www.deq.state.or.us/lab/techrpts/groundwater/DeschutesBasinGW.htm>

<http://www.deschutesriver.org.or>

<http://www.deschutes.org/go/government/departments/community-development>

<http://www.deschutesriver.org/FAQ/default.aspx>

The two main concerns, however, of Deschutes County are Mirror Pond and the Groundwater Protection Project for Southern Deschutes County.

MIRROR POND

Mirror Pond is the area of the Deschutes River located downtown Bend between Galveston Bridge and Newport Bridge. Mirror Pond was created by the Pacific Power and Light hydroelectric dam that is located just upstream of the Newport Avenue Bridge.

The problem with Mirror Pond is the Pond is filling in with sediment at an unnaturally rapid rate. If sedimentation continues unchecked, broad mudflats will characterize portions of the Pond in late summer and fall. The management of releases from Wickiup reservoir and use of the river upstream of Bend as an irrigation conduit substantially increases sediment loads above those that would occur naturally. In general, when the Deschutes River enters the Bend city limits, several historic dams (Colorado Dam, Newport Dam (Pacific Power), Portland Bridge/Tumalo Dam, and North Dam) result in a wider, shallower river channel that slows flows and decreases the available shade. This results in sediment deposition, higher water temperatures, and increased weed and algae growth that conspire against a healthy, sustainable river system.

Sedimentation first became a major problem in Mirror Pond in the late 1970s and early 1980s. In 1984 the City dredged the Pond. At that time, the project engineer predicted that unless changes were made in the management of upstream flow, the Pond would again require dredging in about 20 years.

According to the Mirror Pond Technical Committee, a committee of technical experts brought together to develop a better understanding of the options available and to predict future impacts to help the decisionmakers make decisions based on sound science. The committee conservatively estimates that they have approximately five to ten years from the summer 2006 to act. This gives

them time to complete necessary studies, conduct advanced planning, gather public input, and proceed in approving and implementing a well-planned solution that addresses the main problematic symptom of sedimentation.

More information is available from the following:

Mirror Pond Technical Committee Summary Report
Mirror Pond Technical Committee meeting summaries
Draft Sedimentation Working Paper (June 2006)
Deschutes Resource Conservancy
Deschutes Water Authority
Upper Deschutes Watershed Council
USBR Federal Deschutes Project
http://www.ci.bend.or.us/mirror_pond.html

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PROTECTION PROJECT FOR SOUTHERN DESCHUTES COUNTY/ SEPTIC SYSTEMS ON WATER QUALITY IN THE LAPINE AREA

BACKGROUND

The population of rural residential areas near LaPine in southern Deschutes County and northern Klamath County, Oregon, has grown rapidly since the 1960s. Most of the areas lie within a tract adjacent to the Deschutes and Little Deschutes Rivers that extend roughly 25 miles south of Sunriver. Existing and future homes on more than 9,300 residential lots in the area now use or will use individual, on-site septic systems for wastewater disposal and shallow wells for water supply. At least 50% of these wells draw ground water from the upper 50 feet of shallow aquifer that underlies the area.

Studies and sampling as far back as 1982 have shown isolated problem area where elevated nitrate levels greater than the EPA's maximum contaminant level of drinking water had been found in the groundwater. Due to high levels of nitrite in the groundwater beneath the LaPine business core area, a step-sewer system was installed in 1982. A step system incorporates individual residential septic tanks where the effluent is pumped to a treatment facility and solids are retained in the tanks.

In 1999, Deschutes County and the ODEQ identified the need for a better understanding of the processes that affect the movement and chemistry of nitrogen in the aquifer underlying the LaPine area. In order to develop strategies for managing ground-water quality, the USGS (US Geological Study), in cooperation with Deschutes County and ODEQ (Oregon Department of Environmental Quality), began a study in February of 1999. The project was funded at 5.5 million dollars by the EPA. The project lasted 4 ½ years and was coordinated by ODEQ with direct assistance from County staff. A 1.5 million dollar portion of the project funding was directed to the USGS for completion of a 3-dimensional groundwater model designed to characterize the transport and fate of nitrogen in the groundwater aquifer within the area. According to these scientific studies nitrates in the groundwater will eventually exceed safe drinking water standards if nothing is done to address the problem. The DEQ issued a statement of an existing health hazard in South County based on these scientific studies. These studies also proved that agriculture (primarily pasture) represents only about 4% of the study area. The four

golf courses in the study area cover less than .4% of the study area and are located where they would affect few if any wells. Animal waste contribution is much less than that of humans, and it is deposited on the land surface, where various processes remove nitrogen. Assuming fertilizer is applied to landscaping or small lawn areas at recommended rates, very little nitrogen infiltrates below the root zone and into the groundwater. Therefore, the problem is that standard septic systems, even properly functioning septic systems, discharge nitrates into the groundwater and, ultimately the rivers of Deschutes County.

PROBLEM

On February 28, 2007, Deschutes County began their public notice process and scheduled three public hearings for the month of March in LaPine. Meetings were held on March 13, 2007, March 20, 2007 and March 27, 2007. Since the hearings the citizens of South County voiced significant opposition to the ordinance drafted by the County staff. The citizens wanted to know:

- 1. Why the groundwater model and final reports had not been released for public view?**
- 2. Why such an urgency, if they were going to allow 14 years to enforce the ordinance?**
- 3. Why the cost associated with complying to the proposed ordinance were so high?**

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Cost vary from retrofitting your existing system (\$10,000) to putting in a new system (\$30,000+ dedicated phone lines and maintenance contracts)

One very contentious issue involved low lying lots situated close area rivers. Sometime in the past couple of years, the county began identifying lots where they suspected groundwater rose to within 24 inches of the ground surface as “Red Lots”. The County formulated their ordinance so these lots cannot be developed.

Another issue was that very few in the community knew that meetings on the proposed County ordinance were scheduled. The flyers announcing the hearings were in the tax statement mailings. Due to the use of “LaPine” in the notices, some of the people that lived in the northern portion of the proposed area thought that they were not affected. On May 15, 2007, the DEQ agreed to meet with South Deschutes citizens at the LaPine School. Also in attendance was County Commissioner Tammy Baney, the police and an estimated 300-350 citizens. The community had formed a Citizen Action Group (CAG). They asked to work with the County but the County Planning Director answered that the CAG has to first be recognized by the County Commission. It never was. Citizens also expressed resentment toward the Deschutes County staff. On the day following the meeting someone placed signs in the Sunriver area stating that the groundwater beneath the area was polluted. This created quite a stir and many, many phone calls. The County issued a rebuttal notice stating the drinking water was safe.

SOLUTION?

On July 23, 2008, the County Commissioners adopted local rule with Ordinance 2008-12 and Resolution 2008-021. CAG turned in 2, 314 signatures to place the local rule referendum on the spring ballot. On October 24, 2008 the Deschutes County Clerk confirmed this. The referendum asks County voters to make the decision to approve or reject the “local rule”. The ordinance is not effective until after the vote.

Questions:

1. Will the whole county vote, not just the people in south county?
2. What happens if the “local rule” is defeated?

More information is available from the following:

<http://pubs.usgs.gov/fs/2007/3103/>

<http://www.deschutes.org/go/objectid/B3A385FF-BDBD-57C1-994B5EDA63CD12CC/index.cfm>

<http://newberryeagle.com/viewnews.php?newsid=6&id=1>

<http://www.restorethedeschutes.org/>

http://or.water.usgs.gov/pubs_dir/WRIR00-4162/

[http://en.wikipedia.org/wiki/Deschutes_River_\(Oregon\)](http://en.wikipedia.org/wiki/Deschutes_River_(Oregon))

<http://deshutesriver.org/>

<http://www.deq.state.or.us/lab/techrpts/goundwater/DeschutesBasinGW.htm>

DRINKING WATER

Within Deschutes County, there are 184 public water systems (systems that supply water to 4 or more homes) that serve approximately 131,000 people. These systems include large community systems such as Bend, Redmond, LaPine, Sunriver, etc. but also include small “transient” systems serving campgrounds, restaurants, or rest areas. Shared or private well account for the remaining 29,000-30,000 people in the County.

All but one of the 184 systems get their water from groundwater via wells. Only the city of Bend draws surface water from Bridge Creek. Surface water must be treated and therefore the city filters the water and then adds chlorine to ensure there are no organisms in the finished drinking water. In addition to the surface source, Bend uses approximately 20 wells to meet its demand. Redmond, LaPine, Sunriver and Sisters all use wellwater.

The Drinking Water Program administers and enforces drinking water quality standards for the 184 public water systems within Deschutes County. The program provides services to Public Systems to reduce health risks and increase compliance with drinking water standards including required routine monitoring.

Only public water systems serving 3,300 or less people are regulated by Deschutes County. Examples of these systems are small communities, subdivisions, workplaces, schools, restaurants,

and campgrounds. Private or shared wells supplying 3 or less homes do not fall under Drinking Water Program rules.

Locally, one common source for private drinking water is from cisterns. Cisterns are large tanks (usually made of concrete) for storing water. If the cistern is filled by a water hauler from an approved source it is generally considered safe.

Deschutes County does not have laboratory facilities and cannot test water. There are, however, two certified labs in the area that can test for any water constituents.

Pyxis Labs in Redmond: 548-0972

Umpqua Research in Bend: 312-9454

Homeowners can collect samples themselves or have the lab collect them. Special sample bottles are needed and are available at the labs. Special sampling techniques should also be followed. It is recommended that homeowners test their water for bacteria quarterly or bi-annually and nitrates once a year.

Federal law requires public water systems to take routine water samples and report the results to the state. Typically, public community systems sample for the presence of bacteria every month, nitrates every year and a variety of chemicals every 3 years. Only certified laboratories can analyze and interpret samples.

Deschutes County monitors and ensures the required samples. Failure to properly sample and report water quality can result in fines and/or closure of any facilities served by the system.

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More information is available from the following:

http://www.gobend.com/Utility_Directory.htm

jeffco.deschutes.or.us

<http://www.co.us/go/living-here/health-services/environmental/public-health/>

WATER COMPANIES:

Agate Water, Apache 541-382-2855

Avion Water Company 541-382-5342

Bend City Water 541-388-5515]

Cimarron City Water 541-389-7480

Circle C 541-548-6116

City of Redmond 541-923-7765

City of Sisters 541-549-6022

Indian Meadow Water 541-549-5300
Laidlaw Water District 541-389-1255
Long Butte Water 541-383-2863
Rimrock Estates Water 541-548-0272
Roats Water 541-382-3029
Sun Mountain Water 541-382-7309
Terrebonne Domestic 541-548-2727
Water Wonderland/Sunriver 541-593-2902
Sunriver Utilities 541-593-4197

WASTEWATER TREATMENT UTILITIES

Wastewater Treatment Utilities are extremely hard to plan because each has different objectives, depending on the different characteristics in their area.

Wastewater characteristics are their components(organisms, pathogens, oil, grease, nutrients, solids, gases), strength, volume, flow, temperature, and pH. Because of the variety of wastewater characteristics, communities need to access each source individually. For example, public restrooms may generate wastewater with some characteristics similar to sewage, but usually at higher volumes and at different peak hours. The volume and pattern of wastewater flows from rental properties, hotels, and recreation areas often vary seasonally as well. Laundries differ from many other sources because they produce high volumes of wastewater containing lint fibers. Restaurants typically generate a lot of oil and grease. In addition, many industries produce wastewater high in chemical and biological pollutants as dairy farms and breweries.

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Again, estimating flow volumes for systems is a complicated task. Engineers must allow for additional flows during wet weather due to inflow and infiltration of extra water into sewers. Excess water can enter sewers through leaky manhole covers and cracked pipes and pipe joints, diluting wastewater, which affects its overall characteristics. This can increase flows to treatment plants sometimes by as much as three or four times the original design load.

OVERVIEW OF THE SEWAGE TREATMENT PROCESS

“Sewage” is the water-borne wastes of a house or community and consists of both solid and liquid material. It is transported by pipe to either a septic tank, for an on-site treatment for the home, or to a central sewage treatment plant serving a community. The sewage treatment process is a natural process of cleaning and recycling water.

SOLIDS AND SLUDGE—At a sewage treatment plant, the incoming raw sewage is passed through a series of screens to remove solid objects, such as piece of wood or plastic, for

preliminary treatment. The collected debris is disposed of in a landfill. The sewage then travels through a grit removal system, which allows grit, sand, and smaller solid material to settle out. The remaining sewage flow continues on to sedimentation tanks or ponds which allow the organic solids, or sludge, to settle out. The sludge is pumped into digesters where it is organically decomposed by natural bacteria. The digested sludge may be dehydrated and transported off-site for use as a soil conditioner or fertilizer, as it is rich in organic matter. Sludge often has strong odors. Removing the solid materials finishes the “primary” treatment. The clarified wastewater, or effluent continues on for further treatment.

WASTEWATER-- With the solid organic and inorganic material removed, the wastewater or “effluent” next goes to aeration ponds for “secondary” treatment. This is the biological treatment process that uses oxygen and microorganisms to remove dissolved organic matter from the wastewater. Aeration is part of the natural process where microorganisms consume organic matter as their food source and break down the organic content. The oxygenated wastewater then moves on to another pond for further aeration and microbial action.

“Tertiary” treatment involves the last stage of the process where the effluent is polished by passing through a series of very fine filters. It is also chlorinated for disinfection. Chlorination kills the microorganisms as the final treatment. Treatment systems may add a chlorine-neutralizing chemical to the treated wastewater. The treated effluent is then ready for disposal or reuse. In many parts of the country, as well as within the state of Oregon and Deschutes County, treated effluent is disposed of by discharging it into rivers or waterways. Using reclaimed water for beneficial uses is becoming more popular, particularly as existing treatment facilities are upgraded or new ones are being constructed. Permitted uses of the wastewater depend on the level of treatment of the effluent. Common uses include irrigation of crops, greenhouses, or golf courses. The type of use determines what the required treatment level is for the wastewater. Oregon DEQ Division 54 rules govern land application.

Properly treated wastewater does not have objectionable odors. Sampling, monitoring, and Deschutes County with DEQ oversight ensures that facilities are properly maintained and operated.

Below are the names of all the sewage treatment facilities in Deschutes County:

| Name | Population served | Cost to user |
|---------------------------------|--------------------------|---------------------|
| City of Bend | 78,000 | \$27-\$29 a month |
| City of Redmond | 16,500 | \$70 (water+sewage) |
| City of Sisters | 1,760 | \$50-\$65 a month |
| LaPine Special Sewer District | 458 | \$32-\$42 a month |
| Oregon Water Wonderland Unit II | 668 | \$42 a month |
| River Meadows | 194 | \$360 a year |

| | | |
|--------------------------------|--------------|--------------------------|
| Sunriver Utilities Co. | 4,285 | \$48-\$55 a month |
| Eagle Crest | 1,500 | \$40-\$50 a month |
| Black Butte Ranch | 530 | \$45-\$53 a month |
| Cline Butte Utility Co. | 679 | \$35.38 a month |

Most of these fees differ from month to month, some add other fees to this bill, so I just gave a conservative range.

All have maintenance programs, such as street and basin cleaning. All are carried out on a regular basis.

All have Master Plans and they are constantly revising them. None of them want to project growth because of the economy in Deschutes County.

More information is available from the following:

Oliver Fick, Management Analyst 541-317-3016

Wendy Edde, Water Resources Specialist 541-317-3000

http://www.ci.bend.or.us/public_works/stormwater/stormwater_utility_fee.html

This paper was edited from interviews with many people, ten management plans, and over 70 web sites, by Nancy Ruel (npruel@yahoo.com) I hope this is what you want.

Let me know if you need any more information.