Deschutes County Community Development Department
Groundwater Protection Project for south Deschutes County
Frequently Asked Questions

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Local Rule for southern Deschutes County

Q Why did the County adopt the Local Rule?

A The County seeks to protect groundwater, and ultimately the rivers, in the region from pollution. Research has shown that the groundwater is:

- Being polluted by conventional onsite wastewater treatment systems, and
- Connected to the rivers of the region.

Q What is the Local Rule?

A The Local Rule is part of the Deschutes County Code that requires that:

- New development (on bare land) uses the best performing nitrogen reducing systems currently available for use in Oregon. If future development installs the best system possible the costs for existing system upgrades are kept as low as possible
- All existing systems are upgraded by November 15, 2022. The intent is to give property owners a long period of time in which to plan for and install upgrades to their onsite systems, connect to sewer or take some other action shown to protect water quality.

Q What is the area affected by the Local Rule?

A The Local Rule affects the areas between Sunriver and the Klamath County border that are unincorporated and/or not authorized for sewer. These areas are more formally described as the unincorporated portions of Deschutes County contained in Townships 12, 20, 21, 22 and Ranges 9, 10, and 11, except those areas authorized for sewer.

Q Why do we need a local rule now?

A In short, the more time that passes before the problem is fixed, the longer the fix takes and the more expensive it becomes. The Oregon Department of Environmental Quality, Deschutes County and the US Geological Survey have studied the groundwater in the region since 1994. Water quality sampling shows that the pollution problem is starting to show up in groundwater and some drinking water wells now.

Q Will this rule be expanded to affect all of Deschutes County?

A Southern Deschutes County contains the most vulnerable and the most studied aquifer in the county. Because of the research, including water quality measurements, in this area, the rule applies to this area only. If future research shows that other parts of the county need similar protection, then action to protect water quality may be initiated in those areas as well.

Q What are the treatment standards and how are they set?

A The different colors on the treatment standard map (labeled Exhibit "A" to Ordinance 2008-021) show the performance standards existing systems need to meet in order to protect groundwater in the area. For example, the white areas would meet the lowest

performance standard (at least 35% reduction and a maximum level of 30 mg/L total nitrogen in the effluent).

The treatment standards have been set according to each area's development patterns and environmental sensitivity. These standards have been adopted in the rule by reference and any future changes to the standards will require action by the Board of County Commissioners.

Q Does the Local Rule require drinking water standards for onsite treatment system effluent?

A No. Actually the map shows that the majority of the area (areas in white) would have a treatment standard more lenient than the drinking water standard (30 mg/L performance standard vs. 10 mg/L for drinking water). The rule includes standards that range from about 30 mg/L to 10 mg/L total nitrogen in treatment system effluent. The range of standards reflects the range of circumstances (including housing density, the proportion between existing and future development, and the sensitivity of the aquifer) within the area affected by the rule.

Q Why isn't there a single performance standard for existing systems?

A Groundwater studies show that different areas of south Deschutes County are different in terms of the density of development, the proportion of existing to future development, and the vulnerability of the groundwater to contamination. As a result the nitrogen reduction standard for existing systems can vary from 30 mg/L to less than 10 mg/L total nitrogen. The variable standard helps keep the treatment level as low as possible in order to keep upgrade costs as low as possible and provide as many treatment choices as possible.

Q Is the standard going to change in the future?

A The groundwater study and model shows that the proposed plan will solve the problem. Further, the nitrogen reduction achieved by the onsite system combined with soil treatment in the drainfield or sand filter produces a high quality discharge that can rival municipal wastewater treatment systems.

Q Will I be required to upgrade at time of sale?

A The Local Rule does not require upgrades at the time of sale. However, the financing options that are available when properties are sold can make the upgrade more feasible at that time.

Q Is this a permanent solution?

A Yes. Many studies have shown that advanced onsite wastewater treatment systems available today provide treatment that rivals municipal sewage treatment systems. Also, in 1997, the US Environmental Protection Agency reported to the US Congress that onsite systems are permanent alternatives to sewer systems as long as they are properly sited, installed, and maintained. Since that time, the US EPA has funded significant research, including $5.5 million for the La Pine National Demonstration Project, to identify onsite system designs and products and operation and maintenance programs to reduce future reliance on sewer systems.

Q How are you going to enforce the 14 year compliance date?

A The existing County code enforcement policies are expected to continue to apply for the foreseeable future. Currently the county works diligently with violators to achieve compliance before taking the case to court. Ultimately, the Board of County Commissioners will need to decide how enforcement action is taken. An important issue to consider is how to honor the financial commitment made by those who have complied versus the burden of the upgrade requirements on those who have not.

Q Are variances included in the rule?

A Yes. The rule provides for variances in three circumstances: protected hydro-geologic settings, severe economic or personal hardship, or in circumstances where sewer is coming.

Q Does Section 13.14.040(D), Groundwater Level Determinations, put applications on hold indefinitely?

A This section codifies a procedure followed by Deschutes County Environmental Health Division for about fifteen years. The procedure is based on a DEQ rule that states that groundwater level determinations must be made based either on soil characteristics or measurements of groundwater levels (OAR 340-071-0130(23)). In compliance with DEQ rule, these applications are denied until the appropriate groundwater level measurements can be made. Deschutes County procedure adds the step of taking actual groundwater level measurements after a winter during which at least average levels of precipitation fell. If precipitation levels are below average during one year, the applications are held until the next year with at least average precipitation.

Q Why is development restricted on lots with high groundwater levels?

A Development on lots with high groundwater levels affects many other resources including wetlands, flood plain capacity, riparian area protection for river water quality, wildlife habitat, groundwater, and road networks. Therefore, the county included siting standards that prevent the use of easements, dewatering, or filling of high groundwater areas in the rule because it codifies current county practice and the feedback from the public and state and federal agencies. Specifically in 1998, public opinion directed the County not to allow development on high groundwater lots.

Q What is the market value of lots in high groundwater areas?

A The 2007 market value for high water table lots in south Deschutes County was about $20,000 - $30,000. Buildable lots in the same region marketed for $70,000 - $100,000.

Q Why is there a three-year sunset clause?

A Specific feedback during the public comment period for the Local Rule, particularly from Oregon DEQ, requested that the County investigate changing Deschutes County policies to allow development in high groundwater areas. Deschutes County, with funding from the Oregon Department of Land Conservation and Development, began work in 2008 with a technical committee. Ultimately, the information from the technical committee and public feedback will help develop a recommendation for the Board of County Commissioners on whether to change current County procedures related to development in high groundwater areas of south Deschutes County.

Onsite Wastewater Treatment Systems

Q What do the new systems do?

A Nitrogen reducing systems add a process beyond what conventional systems can do to reduce nitrates to harmless nitrogen gas.

Q What onsite system will I have to use to meet the performance standard? Are there choices of onsite systems available?

A Currently, there are two or three systems that meet each level of proposed performance standards. A site evaluation will determine what kind of drainfield or sand filter will be required on a specific property, but the property owner has the choice between the types of nitrogen reducing systems that meet the performance standard for their area.

Q Why are there so few systems available to use? There seem to be many different systems available nationally.

A Oregon DEQ must first approve systems for use in the state before any Oregon county may issue permits to use these systems. During the La Pine National Demonstration Project, Oregon DEQ investigated many systems used in other parts of the US, including systems available in Canada and Europe. Many other onsite wastewater treatment systems exist across the U.S. and internationally in addition to those tested during the La Pine National Demonstration Project. Since the DEQ changed the onsite rules in 2005, several systems have applied for and been approved for listing and it is expected that more manufacturers and designers will apply for listing in the future.

Q Has the performance of test systems in Deschutes County been monitored since the end of the La Pine National Demonstration Project?

A Oregon DEQ has not monitored the test systems since funding for the La Pine Project ended. Deschutes County did not pursue additional funds to monitor the systems because the EPA considered the evaluation conducted by the La Pine Project as fully adequate for the purposes of the project.

Q Do I need a repair permit to upgrade or retrofit my onsite system?

A DEQ rules require permits for any alterations, repairs or replacements of existing onsite wastewater treatment systems.

Q Do I have to hire a certified installer to install an upgrade to my system?

A DEQ rules require certification of persons responsible for installing onsite systems in Oregon. As a result, installers operating in Oregon are certified as having the skills to install onsite systems. In addition, each manufacturer certifies installers to work on their systems to ensure that their systems are installed properly to maintain their certification with NSF (formerly National Sanitation Foundation).

Q Can I use my existing system as part of the upgrade?

A Yes, if the existing septic tank and/or drainfield is sound and the proper size, they may be fit to be used with the retrofit. If the tank needs to be abandoned because it is leaking or damaged, the normal practice is to abandon the tank on site by either crushing it and back filling the hole or by filling the tank with rock or other material to eliminate the collapse hazard. Likewise, if the drainfield needs replacing, a suitable area will be found to install a new field. The costs of replacing the drainfield or tank will be eligible for coverage by the County's financial assistance programs.

Q How big is a nitrogen reducing system? Will it take more room than a conventional system?

A The treatment unit is typically no larger than a septic tank and can be located to one side or after the septic tank. Some designs allow the treatment unit to be located above the septic tank to save space on the property. If a new dispersal area is needed, the drainfield can be downsized to around 150 linear feet and the sand filter to about 120 square feet.

Q Aren't old leaky steel septic tanks more of a pollution problem than properly functioning conventional systems?

A The amount of nitrogen discharged from a septic tank that is leaking is the same as that discharged from a septic tank to a drainfield. In addition, because most steel tanks in the region have already been changed out, less than 10% of the nearly 6,500 existing onsite systems have steel tanks.

Q How often will these system need to be replaced?

A System manufacturers state their systems are designed to serve for the life of the residence with proper siting, installation, operation, and maintenance. Maintenance is the most important element for any onsite system because small problems are caught before they become big enough to cause system failure. Because the treatment unit discharges higher quality effluent than septic tanks, drainfields are typically protected from failures resulting from pollutant overload.

Q What happens during a power failure?

A Most properties are without water when the power is out, which minimizes the water flowing into the wastewater treatment system. In addition, most systems, including sand filters, which rely on pumps, incorporate additional storage capacity within the system to serve during a power outage. Obviously, if the house is equipped with a generator, the generator can help run the onsite system as well as the water pump.

Groundwater Study & Model

Q What was included in the groundwater study?

A Many sources of information were pulled together or developed for the most recent study, including both existing and new water quality and geological data for the region. The groundwater studies are documented in:

- Morgan, D.S., Hinkle, S.R., and Weick, R.J., 2007, Evaluation of approaches for managing nitrate loading from on-site wastewater systems near La Pine, Oregon: U.S. Geological Survey Scientific Investigations Report 2007-5237, 64 p.
- Williams, J.S., Morgan, D.S., and Hinkle, S.R., 2007, Questions and answers about the effects of septic systems on water quality in the La Pine area, Oregon: U.S. Geological Survey Fact Sheet 2007-3103, 6 p.
- Hinkle SR, Bohlke, JK, Duff, JH, Morgan DS, Weick RJ, 2007. Aquifer-scale controls on the distribution of nitrate and ammonium in ground water near La Pine, Oregon, USA. Journal of Hydrology, 333, 486-503.

Q Is the science valid?

A The US Geological Survey published the papers cited above. Before a paper or a scientific investigations report can be approved for publication, the manuscript must be reviewed by third party experts in the field. Reviewers are asked, among other considerations, to evaluate whether the manuscript:

- Is original
- Is methodologically sound
- Follows appropriate ethical guidelines
- Has results which are clearly presented and support the conclusions
- Correctly references previous relevant work

Q How was groundwater quality monitored?

A Oregon DEQ sampled a large network of monitoring and drinking water wells multiple times over a three year period. Sample analyses included groundwater levels and water quality measurements like the different forms of nitrogen, chloride, and bacteria.

Q What are sources of nitrate pollution in south Deschutes County?

A Residential onsite wastewater treatment systems are the largest source (about 96%) of nitrate pollution based on a survey of land uses and development in the region using Community Development Department records, Assessor's records and field work. In addition, nitrogen isotope analyses by the USGS confirmed that the source of nitrogen is human sewage (data presented to the public on March 13, 2007 and published by Hinkle, et al, "*Aquifer-scale controls on the distribution of nitrate and ammonium in ground water near La Pine, Oregon, USA*." Journal of Hydrology, 2007, 333, pp. 486-503.)

Q What did the study of pharmaceuticals, personal care products and viruses find?

A The study reported in "*Organic Wastewater Compounds, Pharmaceuticals, and Coliphage in Ground Water Receiving Discharge from Onsite Wastewater Treatment Systems near La Pine, Oregon*" (Scientific Investigations Report 2005-5055, available at http://or.water.usgs.gov/proj/or186/new_site/reports.html) found that:

- Viruses are reduced within short distances of the drainfield
- Some household contaminants and pharmaceuticals travel with water, but most are removed within short distances of the drainfield
- Treatment provided by the unsaturated zone below the drainfield provides important protection by allowing removal of viruses and certain pharmaceuticals and household contaminants.

Q What is the three-dimensional (3-D) groundwater model?

A The 3-D groundwater model is a representation of the geology and how water flows beneath southern Deschutes County and northern Klamath County. All of the water quality and geological data collected in the region were used to develop the model. Information used to build the model includes geology, stream flow data, water quality data, precipitation patterns, building rates and patterns, seasonal residences, et cetera. The model incorporates all of this information so that it represents historic and current situations accurately and can be used to predict future conditions.

The calibration and testing process for the model includes running historic scenarios to determine how well the model reproduces existing conditions. If the model reproduces history and existing conditions accurately, then confidence in that model's ability to predict future conditions is high. The biggest source of error in models like this is the element of time. For example, the three-dimensional model developed for southern Deschutes County used the historic building rates for the period between 1960 and 1999 and assumed a building rate based on the historic record for future development scenarios. If the actual building rate is lower or higher than the assumed rate, the time at which pollution plumes develop and move is either sooner or later than the model prediction.

Q Why can't we require new development to meet the standard and worry about the existing houses later?

A Existing development is about 68% of the total pollution load, which means that it has much more of an impact on water quality than future development. The 3-D groundwater model shows that requiring nitrogen reducing systems on new development helps reduce the pollution load but does not do enough to protect overall water quality.

Q My well was just tested and it's OK - why?

A Most people are drinking water that fell as rain or snow 20 or 30 years before development began in the region. Because groundwater moves slowly most of the pollution from development has not yet reached the depths tapped by most drinking water wells. However, the pollution currently in the upper (younger) sections of the aquifer is moving down and through the aquifer and is starting to show up in deeper wells. Drinking water well samples have shown that between 5% and 8% of the wells produced water with greater than 5 mg/L of nitrate-nitrogen.

Q What is the urgency of taking action to protect the groundwater now? Why don't we wait until we see more of a problem in people's wells?

A Nitrate contamination is currently not a widespread problem in drinking water wells because the nitrate pollution is concentrated in the portions of the aquifer above the levels tapped by most wells. But, over time, the pollution will travel down through the aquifer towards the levels tapped by drinking water wells. As we wait to start solving the problem the pollution load in the aquifer gets bigger from all the existing houses and new houses being occupied. This means the aquifer will need more time to cleanse itself. Higher pollution levels also can mean more expensive solutions for existing homeowners.

Q What other wells were sampled in addition to the 200 shallow monitoring wells?

A About 200 drinking water wells were sampled for both groundwater flow data and water quality in the same manner as the shallow monitoring wells. Plus, a series of nested wells provided additional detailed data on groundwater flow and chemistry at varying depths. The nested wells consist of a series of well groups that cluster 3-4 wells in a single spot that tap different depths of the aquifer. This large population of wells provided detailed information on groundwater flow and the aquifer's capacity to handle contamination.

Q Why are nitrate levels greater than 1 part-per-million (ppm) considered contamination? DEQ's fact sheet "Nitrate in Drinking Water" states that "a nitrate level of up to 3 ppm is generally believed to be naturally-occurring.

A DEQ data from wells where there are no human activities to impact water quality shows that naturally occurring nitrate in south Deschutes County and northern Klamath County are on the order of 0.5 mg/L or less (nitrate-nitrate as N). Nitrate levels greater than this are from human activities. The nitrate level that occurs naturally in this part of Central Oregon may be different in other environments in other parts of Oregon.

Q Have nitrate levels reached 7 mg/l anywhere in the region?

A Yes, groundwater quality samples taken by DEQ show that the groundwater beneath standard and sand filter systems installed in 2000 exceeded 7 mg/L by the end of 2004. Sampling by both DEQ and USGS further showed that regionally this pollution has been moving down and through the aquifer over time and, in areas where the discharges have been occurring the longest, has started contaminating drinking water wells.

Q How were population growth rates determined for the USGS model?

A Population growth rates are determined using long term house building rate information from County permit records.

Q Are there data showing that nitrates from septic systems migrate to the aquifer?

A Data collected in south Deschutes County show that individual onsite systems discharge high levels of nitrate to soil that then migrates to and through the aquifer. For example, within a year of beginning operation, the groundwater 26 feet below a new standard system in the La Pine National Demonstration Project contained up to 45 mg/L nitrate-nitrogen within a year of installation. The groundwater under sand filter systems in the project averaged 56 mg/L nitrate-nitrogen.

Q Groundwater samples in 1982 revealed nitrate levels ranging from 10 – 40 mg/l. Why wasn't action taken then?

A These groundwater samples were taken in the La Pine core area and this information ultimately led to construction of the La Pine sewer system and the creation of the La Pine Sewer District.

Q Who provided the data the USGS used in their models?

A The samples were collected by a team of USGS, Oregon DEQ, and Deschutes County staff. Sample analyses and quality assurance were provided by the Oregon DEQ laboratory (in accordance with quality assurance/quality control procedures specified by EPA certification). Some samples were analyzed by the USGS's national laboratory with the same attention to quality assurance/quality control.

Q What scientific reports are available for review?

A Most of the scientific reports are available on the web for review at http:/or.water.usgs.gov/proj/or186. In addition, the raw data is available for download from the Groundwater Protection Project page (www.deschutes.org/cdd/gpp/). Oregon DEQ has published periodic groundwater reports that are available on the DEQ website at: http://www.deq.state.or.us/pubs/legislativepubs/index.htm.

Cost and Financial Assistance

Q How much are these systems going to cost?

A Current estimates from distributors and installers of nitrogen reducing systems range between $9,000 and $17,000 depending on the system chosen, condition of the existing system, and site characteristics.

Q How much does system maintenance cost?

A Current estimates from maintenance providers ranges from $25 to $35 per month depending on the type of system installed. The billing cycle (for example, monthly vs. annual billing) is arranged between the homeowner and the maintenance provider.

Q What financial assistance programs are available now?

A Currently the Pollution Reduction Credit Program is on hold because Elk Horn Land Development has obtained all the credits needed for their next phase of development. The County is investigating how to purchase PRCs during those periods that developers do not need them.

A The US Department of Agriculture Rural Development Program provides loans and grants to low income residents for home improvements, including onsite system improvements.

Q Is financial assistance available for system maintenance costs?

A Traditionally, maintenance costs for onsite systems are the responsibility of the homeowner and that is expected to continue to be the case in most situations. The County is exploring the possibility of contracting with a circuit rider to assist low income households with their onsite system maintenance needs.

Q Why weren't more financial assistance programs in place before the rule is adopted?

A Deschutes County is working with area financial institutions to create financial assistance programs to help offset the cost of upgrading systems. Current plans include assistance in the form of loans to be repaid at the time of property sale in the future to more conventional loans and grants. Final decisions on specific programs will be made if the Local Rule becomes effective. Currently, the County has an estimated $35 million in assets that can be used to help solve the problem over time. The funds will be targeted at those homeowners with the greatest need.

Q Why doesn't the County wait until the costs are better understood?

A The market for nitrogen reducing systems is changing, which means the costs are changing as well. Costs will continue to change as long as new systems continue to be approved for use in Oregon.

Q Isn't it less expensive to sewer?

A Not necessarily. In 1997, a sewer feasibility study estimated the per lot cost of centralized sewer between $19,000 and $28,000 (assuming $3,000 per acre for the treatment sites). Since that time, the cost of land for treatment sites and the costs for the materials needed to construct transmission lines and the treatment plant have increased. In comparison, the most recent estimates from contractors and distributors show that the nitrogen reducing systems will range in cost between $6,000 and $18,000 depending on the quality of the existing system. (The sewer feasibility study is available on the "Why use onsite?" page of the Groundwater Protection Project website at www.deschutes.org/cdd/gpp/)

Q What County permit fees are required to install an upgrade to my existing system?

A The FY 06-07 major repair permit costs $360. Electrical permit fees for onsite systems are about $80. The fees, in addition to other installation costs, may be covered by the financial assistance programs.

Q How much does a maintenance service provider contract cost?

A The costs for maintenance are established by the private maintenance service provider and depend on the type of treatment system and drainfield installed. These range between $300 and $420 per year or $25 to $35 per month. Whether you pay monthly or annually depends on your contract with maintenance service provider.

Water Quality Standards and Health Effects of Nitrate

Q Why is the County concerned about nitrates in the groundwater?

A Deschutes County is concerned with complying with state groundwater quality standards. State of Oregon rules for groundwater quality protection establishes 7 mg/L for nitrate-nitrogen as a trigger to take action (ORS 468B.180). This standard is based on the Safe Drinking Water Act maximum contaminant level of 10 mg/L nitrate-nitrogen in public drinking water supplies.

Q Are nitrates a health hazard?

A The Safe Drinking Water Act standard for nitrate was set in order to protect infants from methemoglobinemia, or blue baby syndrome. Since that time, other studies have pointed to possible links between nitrate ingestion and certain types of cancers. Research on these links is ongoing. More information is available from the Oregon Department of Human Services, Office of Environmental Public Health at: 503-731-4015 or http://www.oregon.gov/DHS/ph/ophs/.

Q Are nitrates the only pollutant of concern?

A No, there are many pollutants of concern in human sewage. Fortunately, as long as the onsite systems are located and installed and maintained properly they will treat for known contaminants of concern. In addition, recent research has shown that maintaining proper separation distances in native soil between the bottom of the drainfield and groundwater will remove many emerging contaminants like pharmaceuticals and personal care products.

Q Does EPA have a standard for drinking water in private wells?

A The EPA drinking water standards do not protect private wells. EPA's standard for safe drinking water of 10 mg/L nitrate-nitrogen applies only to public drinking water supplies. The EPA recommends that private well owners test their wells regularly to make sure their water is safe but there are no rules to ensure that homeowners with private wells drink water of the same quality as municipal water system users.

The performance standards in the proposed Local Rule are based on the Oregon groundwater quality protection standard of 7 mg/L.

Q Does nitrate in drinking water cause cancer?

A Nitrate in drinking water has been implicated in the occurrence of certain types of cancer. A study published in the journal Epidemiology found a positive association between bladder cancer and ovarian cancer and long-term, low level (2.5 mg/L nitrate-nitrogen) ingestion of nitrate in drinking water. (Weyer et al, 2001. *Municipal Drinking Water Nitrate Level and Cancer Risk in Older Women: The Iowa Women's Health Study*. Epidemiology, May 2001, Vol. 11. No 3, pp 327 – 338.).

Sewers

Q Why not sewer? (Part 1) How are sewers created or expanded in rural areas?

A The creation of new or the expansion of existing sewer systems outside an urban growth boundary or unincorporated community (rural areas) is governed by Oregon administrative rules (OAR 660-011-0060) adopted by the Land Conservation and Development Commission (LCDC). The rule defines any wastewater treatment system that serves more than one lot or parcel as a sewer system. Two processes for creating or expanding sewers in rural areas could apply to the south Deschutes County region:

- OAR 660-011-0040(4) through (7), when DEQ determines that a public health hazard exists and that there is no practicable alternative to sewer (the problem cannot be solved using onsite systems), and
- OAR 660-011-0060(9) and OAR 660, division 4, when an exception to Goal 11 is adopted and there is an imminent health hazard for which there is no practicable alternative to sewer.

Q Why not sewer? (Part 2) Why does the State of Oregon discourage the use of sewers in rural areas?

A In simple terms, sewers equal cities. Statewide land use rules restrict the creation or expansion of sewers in rural areas because the presence of sewers is the basic element in defining whether an area is a city or not. Further, Goal 11 specifically states that sewer systems can be created or expanded only if there is an existing or imminent health hazard AND if there is no practicable alternative to sewer (in other words the problem cannot be solved using onsite systems). The onsite system field study during the La Pine National Demonstration Project focused on finding onsite wastewater treatment systems that protect groundwater quality as practicable alternatives to sewers.

Q Why not sewer? (Part 3) Why doesn't the county challenge state rules (Goal 11) to sewer the area?

A In 1998, the public said to use onsite wastewater treatment options for most of the region and the County adopted this public feedback into Comprehensive Plan goals and policies. To achieve this goal, the Oregon DEQ and the County cooperated on the La Pine National Demonstration Project to identify onsite systems that would protect the groundwater as practicable alternatives to sewer.

A The public said to extend sewers only in two specific places in south Deschutes County where sewers existed already. As a result, the system serving Oregon Water Wonderland Unit 2 was expanded to serve that entire subdivision and the system serving the La Pine urban unincorporated community was expanded to serve the new La Pine neighborhood and the commercial area in Wickiup Junction. Again, this public feedback was adopted into the County's Comprehensive Plan.

Q Why not sewer? (Part 4) Aren't sewers cheaper than onsite systems?

A Not necessarily, upgrades to existing systems have been costing between $9,000 and $17,000. Most system upgrades are expected to fall into the lower cost range because the age and quality of existing systems and their components is known from permit records in the County's database.

A In 1997, KCM, Inc. (now KCM-TetraTech) performed a feasibility study on establishing sewers in 17 subareas of the south county region. The costs found during this study ranged between $19,000 and $28,000 per lot. In Los Osos, California, a recent study showed the costs for a sewer system serving about 4,800 households to range between $17,000 and $22,000. Currently, no construction grants are available for establishing new sewers. The construction of new sewers would be paid for by loan programs with area residents paying the full cost over time.

Other

Q Why are the rural areas of south Deschutes County defined as "dense development?"

A Most of the residential development outside of unincorporated community boundaries or city limits in rural areas in southern Deschutes County occurs where the zoning code specifies a minimum lot size as 10 acres. Almost all of the existing residential lots in south Deschutes County are significantly smaller than this minimum lot size. These lots are considered "dense development" because it is approaching urban densities in a rural setting. This characterization does not refer to Crescent Creek which was planned inside an unincorporated community boundary (before La Pine incorporation) at urban densities as provided for in the zoning code for that area.

Q How long have public outreach efforts been taking place?

A Public outreach efforts began in 1996 with the Regional Problem Solving Project's stakeholder committees. Public participation processes continued through 1998 and 1999 with public meetings and hearings during adoption of the amendments to the County's Comprehensive Plan. Outreach events continued throughout the La Pine National Demonstration Project and Groundwater Protection Project. Importantly, a public meeting in May 2003 (attended by 100 – 120 people including the Board of County Commissioners) provided the results of the groundwater study, three-dimensional model, and the onsite system field test. Oregon DEQ amended the state onsite rules effective March 2005 after a public participation process to give counties the authority to issue permits for nitrogen reducing onsite systems. This was the same period during which the County sought EPA funding for the Groundwater Protection Project. Public participation efforts continued with the Groundwater Protection Project with the Transferable Development Credit program amendments and the proposed Local Rule.

Q Is it true that vegetation and fish will die out if too much nitrate is removed from the environment?

A No. Native fish and vegetation existed with levels of naturally occurring nitrates in the environment of less than 0.12 mg/L in the rivers. This level is at least 17 times less than the best performing onsite system that discharges about 2 mg/L. The true concern is if too much nitrogen reaches the rivers. Increased levels of nitrogen in the rivers or lakes causes overgrowth of aquatic plants and algae that then use up oxygen in the water and leads to fish kills.