



State of Oregon
Department of
Environmental
Quality

Implementation Of Oregon's Groundwater Quality Protection Act

January 2001



This report has been prepared by the Department of Environmental Quality (DEQ) in accordance with the requirements of the Groundwater Quality Protection Act of 1989, Oregon Revised Statute 468B.162(3). The report describes the status of groundwater quality in Oregon and efforts made in the past biennium to protect, conserve and restore Oregon's groundwater resources.

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Executive Summary

The Oregon Groundwater Quality Protection Act of 1989 (ORS 468B.150-190) sets a broad goal for the State of Oregon – to prevent groundwater contamination while striving to restore and maintain the high quality of Oregon’s groundwater resources for present and future uses. The Department of Environmental Quality (DEQ) has primary responsibility for implementing Oregon’s groundwater protection program. DEQ implements the program through partnerships with the Oregon Health Division, Water Resources Department, Department of Agriculture, Oregon State University, and many other state, local, and private organizations, businesses, and individuals.

The Groundwater Quality Protection Program is a critical component of Oregon's overall water quality protection and management strategy. The program focuses on addressing area-wide groundwater contamination resulting wholly or in part from nonpoint source pollution, and protects rural residential drinking water supplies as well as other beneficial uses of groundwater. These efforts also help maintain the water quality of Oregon's rivers and streams by improving and protecting the quality of groundwater that interacts with surface waters.

Major accomplishments of the Groundwater Quality Protection Program for the 1999-2001 biennium include:

Completion of the groundwater quality assessment for the Milton-Freewater area. While no area-wide contamination was identified, the detection of bacteria and nitrate raises some cause for concern. Continued monitoring and educational outreach is recommended.

Initiation of the Upper Willamette Basin groundwater assessment. High nitrate levels have been detected in groundwater samples throughout the study area and pesticides have been detected in localized areas.

Conducted a trend analysis for the Northern Malheur County Groundwater Management Area. The analysis shows areas where groundwater quality is not improving as quickly as anticipated. This provides information about where to target groundwater protection efforts.

Initiation of the La Pine National Demonstration Project. This project, funded by a \$5.5 million, 5-year federal grant, is being undertaken to address projected nitrate contamination problems arising from the dense aggregation of on-site septic systems. The project includes many elements, including extensive groundwater monitoring and installation and testing of up to 200 innovative (denitrifying) septic systems.

Development of a Statewide Groundwater Vulnerability Model. The results will help agencies and others target and prioritize their assessment and protection efforts to areas where groundwater resources are the most vulnerable.

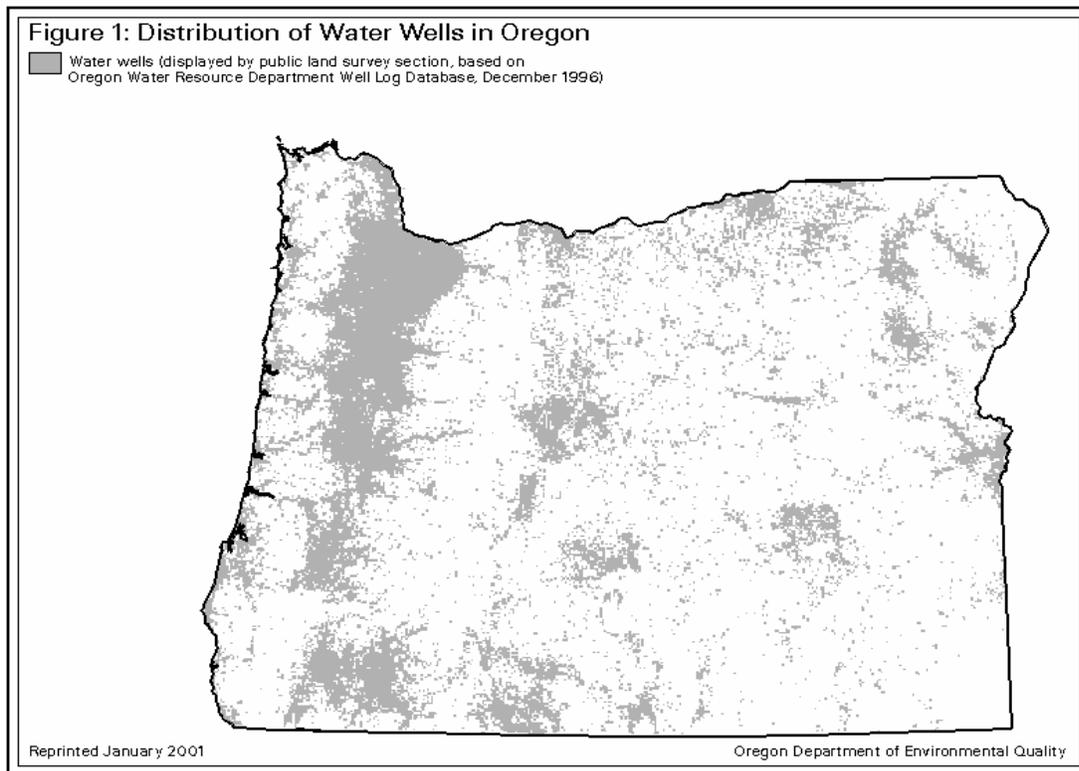
Maintained regional monitoring networks and continued implementation of the action plans for the Lower Umatilla Basin and Northern Malheur County Groundwater Management Areas. The results of monitoring efforts and implementation of best management practices are used to evaluate the effectiveness of the management plans in reducing groundwater contamination.

Introduction

The Oregon Groundwater Quality Protection Act of 1989 (ORS 468B.150-190) sets a broad goal for the State of Oregon – to prevent groundwater contamination while striving to restore and maintain the high quality of Oregon’s groundwater resources for present and future uses. This resource has many valuable uses and functions:

- Groundwater makes up approximately 95% of Oregon’s available freshwater resources.
- Groundwater is the primary source of drinking water in Oregon and its use is increasing over time. Approximately 70% of all state residents, and over 90% of rural residents, rely on groundwater as their drinking water source.
- Oregon’s businesses require clean groundwater for industries such as food processing, dairies, manufacturing, and the computer chip industry.
- Groundwater provides irrigation for Oregon agriculture and water for livestock.
- Groundwater supplies base flow for most of the state’s rivers, lakes, streams and wetlands. In many streams, the inflow of cool groundwater may be essential for lowering stream temperatures to the range required by sensitive fish species.

As surface water resources are used to capacity, Oregonians are becoming more dependent on groundwater resources and they expect those resources to remain clean, available and useable. Figure 1 shows where wells are being used to tap groundwater resources.



Vulnerability to Contamination

Groundwater is present at varying depths beneath almost every land surface. As such, it is vulnerable to contamination from activities that take place on the land as well as direct discharges to or below the ground surface. Unless an impermeable layer lies between an aquifer and the ground's surface, groundwater can be contaminated by fluids that seep into the ground carrying pollutants with it. This is a particular threat to the majority of domestic wells that are constructed in the shallow, unconfined aquifers commonly found in Oregon's valleys.

The major groundwater contaminants of concern in Oregon are nitrate-nitrite as nitrogen (nitrate) and pesticides. Nitrate contamination can arise from a variety of land uses, including agriculture, densely packed septic systems, poorly managed animal feeding operations and over application of wastewater effluent to the ground surface. Other contaminants of concern are volatile organic compounds and petroleum and petroleum by-products. Sources of these contaminants may include leaky underground storage tanks, spills, and stormwater runoff.

Groundwater Quality Protection in Oregon

The Groundwater Quality Protection Program is a critical component of Oregon's overall water quality protection and management strategy. The program focuses on addressing area-wide groundwater contamination resulting wholly or in part from nonpoint source pollution, and protects rural residential drinking water supplies as well as other beneficial uses of groundwater. These efforts also help maintain the water quality of Oregon's rivers and streams by improving and protecting the quality of groundwater that interacts with surface waters.

The Department of Environmental Quality (DEQ) has primary responsibility for implementing Oregon's groundwater protection program. It implements the program through partnerships with the Oregon Health Division, Water Resources Department, Department of Agriculture, Oregon State University, and many other state, local, and private organizations, businesses, and individuals. A summary of the groundwater protection responsibilities of several state agencies is presented in Table 1.

Table 1: Oregon Groundwater Protection Responsibilities

AGENCY	GROUNDWATER PROTECTION RESPONSIBILITIES
Department of Environmental Quality (DEQ)	Coordinates interagency groundwater program communication.
	Designs and conducts targeted groundwater quality investigations statewide.
	Responds to area-wide groundwater contamination by working with local citizens to develop an action plan to address sources.
	Issues wastewater discharge permits (NPDES and WPCF) that include groundwater protection requirements.
	Certifies drinking water protection plans for public water systems.
	Shares implementation of the source water protection assessment program with OHD.
	Administers federal Underground Injection Control program.
	Promotes public education and community involvement in groundwater protection programs and citizen monitoring.
	Establishes groundwater quality reference levels and concentration limits.
	Administers a federally funded nonpoint source grant program.
Maintains a groundwater quality database and data repository.	
Water Resources Department (WRD)	Characterizes aquifers and water availability.
	Approves water right applications for withdrawals of groundwater.
	Implements regulations regarding well construction and decommissioning.
	Maintains database of location and construction of wells.
	Coordinates reviews for aquifer storage and recovery projects.
Oregon Health Division (OHD)	Administers public water system monitoring programs.
	Administers real estate transaction well-testing program.
	Administers and shares implementation of the source water assessment program with DEQ
	Certifies delineation of wellhead protection areas.
	Provides technical assistance to public water systems on well construction issues.

*Table 1: Oregon Groundwater Protection Responsibilities
Continued*

Oregon Department of Agriculture (ODA)	Provides technical assistance and coordination regarding groundwater quality-related best management practice implementation.
	Administers a groundwater quality research grant program.
	Develops and implements a pesticide management program.
	Implements Confined Animal Feeding Operations regulations
	Develops or assists in development of management plans for agricultural areas per ORS 468B.184.
	Provides pesticide analytical services for groundwater assessments
Oregon State University (OSU), Agricultural Extension Service and Experimental Stations	Assists with identification of areas vulnerable to groundwater contamination and conducts nitrate testing of local wells.
	Conducts research regarding soil and groundwater contamination and best management practices to prevent contamination.
Department of Land Conservation & Development (DLCD)	Reviews comprehensive plans for communities to ensure they are consistent with goal of the <i>Groundwater Quality Protection Act</i> (ORS 468B.155).
Oregon Department of Transportation (ODOT)	Ensures that the goals of the Groundwater Protection Act are incorporated in all aspects of highway and road design and construction.

Groundwater Monitoring and Assessment Program

One of the requirements of the Groundwater Protection Act (ORS 468B.190) is to conduct an ongoing statewide groundwater monitoring and assessment program to identify and characterize the quality of Oregon’s groundwater resources. Specific requirements are to evaluate areas that are especially vulnerable to contamination, identify long-term trends in groundwater quality, evaluate the ambient quality of groundwater resources and identify emerging groundwater quality problems.

DEQ prioritizes areas for assessments using criteria such as sensitivity of the aquifer to contamination, growth pressures in the area, evidence of existing or emerging groundwater contamination, land uses that pose a risk to groundwater quality, and population density. Assessments typically involve a brief hydrogeologic and land use evaluation, careful well screening, and quality-controlled sampling and analysis.

Since 1980, DEQ has conducted 45 groundwater quality assessments. Table 2 provides a summary of the findings. Nitrate was the most commonly detected contaminant, followed by pesticides, volatile organic compounds, and bacteria. In 57% of the study areas, 10% or more of the sampled wells contained contaminant concentrations that exceeded a federal drinking water standard.

*Table 2 - Groundwater Quality Assessment Projects
Summary as of January 2000*

County	Project Name	No. of Wells Sampled	Contaminants Found	Level of Contamination¹	Date Last Monitored
Baker	Haines	14	Pesticides	Moderate	1989
Clackamas	Boring	25	VOCs ²	Moderate	1990
Clackamas	Canby	21	Nitrate, Pesticides	Moderate	1993
Clackamas	Milwaukie	34	VOCs	Moderate	1989
Clatsop	Clatsop Plains	83	Nitrate	Moderate	1998
Crook	Prineville	11	VOCs	Low	1990
Crook	Prineville	20	Nitrate	High	1993
Curry	Harbor Bench	15	Pesticides, Nitrate	Moderate	1991
Deschutes	Bend	8	None	None	1990
Deschutes	LaPine	65	Nitrate	High	1982
Deschutes	LaPine	103	Nitrate	High	Ongoing
Harney	Burns/Hines	17	None	Low	1994
Hood	Hood River	11	Nitrate	Low	1995
Jackson	Jackson County	30	None	None	1992
Jackson	North Bear Creek Valley	19	Nitrate, Pesticides, VOCs	Moderate	1995
Josephine	Grants Pass	53	VOCs	Low	1994
Klamath	Klamath Falls	50	Nitrate	Moderate	1990
Lane	Coburg	28	Nitrate	Moderate	1994
Lane	Florence-Clear Lake Aquifer	24	None	None	1981
Lane	Junction City	20	Nitrate, VOC	High	1993
Lane	Santa Clara/River Rd	26	Nitrate, Bacteria	High	1980
Linn	Dever-Conner Albany	3	Nitrate	Moderate	1984
Linn	Lebanon-Albany	19	Nitrate	Low	1993
Linn	North Albany	33	VOCs, Nitrate	Moderate	1996
Linn	Scio	14	Bacteria	High	1988
Malheur	Northern Malheur GWMA ³	234	Nitrate, Pesticides	High	Ongoing
Marion	French Prairie	9	None	None	1985
Marion	Jefferson	5	Pesticides	Moderate	1985
Marion	Lake Labish	3	Nitrate	Moderate	1985
Marion	Mission Bottom	90	Nitrate, Pesticides	High	1986
Marion	Woodburn	21	Nitrate, Pesticides	Low	1993
Mult/Colum.	Sauvie Island	3	Nitrate	Moderate	1985
Multnomah	Mid-Multnomah	25	Nitrate, VOCs	Moderate	1995
Sherman	Rufus	4	Nitrate	High	1996
Tillamook	Tillamook	25	Nitrate, VOCs	Low	1998
Umatilla	Milton-Freewater	70	Nitrate, Bacteria	Moderate	1999
Umatilla - Morrow	Lower Umatilla Basin GWMA	281	Nitrate, Pesticides	Moderate	Ongoing
Union	City of Imbler	24	Nitrate	High	1986
Union	Upper Grande Ronde	36	Nitrate, VOCs	Low	1993
Wasco	Mosier	12	None	Low	1987
Washington	Farmington/Hillsboro	15	Pesticides	Moderate	1986

Table 2 - Groundwater Quality Assessment Projects

Continued

Statewide	OHD Public Water Supply Survey	70	Nitrate, Pesticides	Moderate	1987
Statewide	OHD Real Estate Transaction	13,847	Nitrate, Bacteria	Moderate	Ongoing
Statewide	National Pesticide Survey (OR)	7	None	None	1989
Statewide	Vol. Nitrate Testing Program	1,641	Nitrate	Moderate	1993

¹Level of Contamination:

- Low Less than 10% of wells had a contaminant level over the drinking water standard.
- Moderate 10%-25% of wells had a contaminant level over the drinking water standard (10 mg/L).
OR, 25% or more of wells had nitrate levels of at least 5-10 mg/L or any well had an
compound detected.
- High More than 25% of wells had a contaminant level over the drinking water standard.

³Groundwater Management Area

²Volatile Organic Compound

During the 99-01 biennium, DEQ has been involved with three groundwater quality assessments. The Milton-Freewater groundwater assessment was completed, and assessments in the Upper Willamette Basin and La Pine area are ongoing. In addition, DEQ undertook a statewide groundwater vulnerability project. Each of these efforts is described below.

Milton-Freewater Assessment

The shallow, coarse-grained aquifer in the Milton-Freewater area has been identified as being at risk due to the presence of industrial and commercial activities, onsite systems and agriculture which have a high potential for causing contamination. During April 1999, DEQ collected and analyzed groundwater samples from 30 wells in the Milton-Freewater area, looking at more than 50 constituents including nutrients, metals, pesticides and bacteria. Only two constituents – bacteria and nitrate – raised concern. The following conclusions were made based on the assessment:

- Bacteria (specifically *E. Coli* and/or fecal coliform) were the only analytes detected at levels of concern in any of the wells sampled in April 1999. Four wells were resampled for bacteria in October of 1999.
- The presence of low levels of bacteria in April 1999 and absence of bacteria in October 1999 is consistent with the erratic bacteria occurrence noted in previous studies.
- Nitrate was detected in all wells but at concentrations below the 10 mg/l drinking water standard.
- Lower nitrate concentrations were observed in areas close to the Walla Walla River and dominated by flood irrigation while higher nitrate concentrations (as high as 6.6 mg/l) were observed in areas farther from the river and dominated by sprinkler irrigation.
- A possible explanation for the nitrate distribution is a flushing of nitrate through the soil column and coarse-grained aquifer, and/or dilution of nitrate within the aquifer, by the relatively large amounts of water associated with flood irrigation and the water percolating from the river into the aquifer.

Based upon this assessment, no area-wide contamination was identified. However, due to the erratic occurrence of bacteria and the historical presence of nitrate and bacteria throughout the study area, periodic analysis of groundwater samples from private drinking water sources was recommended. Educational outreach is needed to inform citizens in the study area of ways to reduce the risk of groundwater contamination. Public outreach and education is also needed to for citizens interested in learning about the health effects of nitrate and bacteria and/or available technology to treat nitrate and bacteria in their drinking water systems.

Upper Willamette Basin Assessment

Groundwater is a principal source of drinking and irrigation water for a large number of residents in the Upper Willamette Valley, with almost all rural residents relying on private wells for their water supply. Groundwater assessments conducted by DEQ in 1993 and 1994 documented significant groundwater contamination from nitrate and other pollutants in the Willamette Valley lowlands between Eugene and Albany. As shown in Figure 2, 20% of the wells sampled had nitrate concentrations in excess of the federal drinking water standard (10 mg/l). The highest level detected within the study area was 31 mg/l. The studies also raised concerns about pesticide contamination. As a rapidly developing portion of the state with known groundwater contamination, the Upper Willamette Basin has been identified by DEQ as a high priority area for addressing nonpoint source groundwater problems.

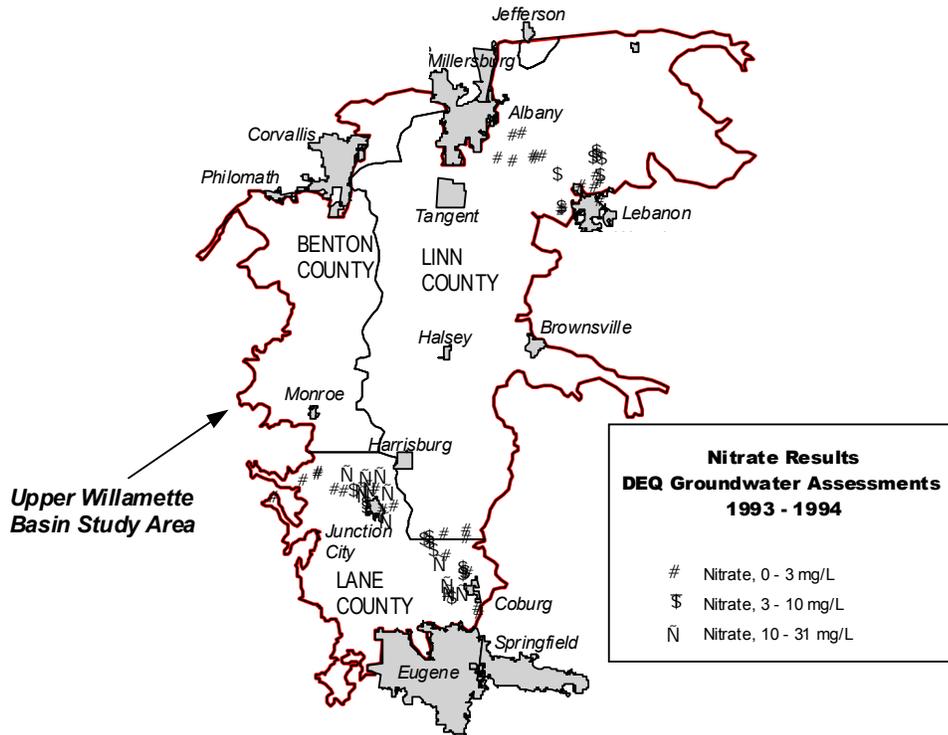
In August 2000, DEQ began a focused initiative to monitor and assess groundwater problems in the Upper Willamette Basin. The assessment will attempt to explain how, where, and why groundwater contamination occurs in the Valley, with an initial focus on nitrate throughout the study area and pesticides in localized areas. The results of this study will provide the information necessary to understand the baseline groundwater quality and geographic extent of groundwater degradation.

The Upper Willamette Basin groundwater project fits nicely into the Oregon Plan for Salmon and Watersheds and DEQ's overall watershed protection strategy. The timeframe for establishment of Total Maximum Daily Loads (TMDLs) in the Willamette Basin has been accelerated to 2003. The Department of Agriculture is in the process of developing Water Quality Management Plans under SB1010 for the Willamette Basin. DEQ and OHD are currently conducting source water assessments for public water systems in the Willamette Basin as required by the federal Safe Drinking Water Act. Several communities have developed, or are developing, Drinking Water Protection Plans. Groundwater protection strategies developed in the Upper Willamette Basin will be coordinated with these efforts.

During the remainder of the biennium and through June 2002, DEQ staff will undertake the following tasks:

- Sample 200 to 300 private wells.
- Analyze groundwater samples.
- Prepare a stakeholder involvement plan.
- Evaluate and report assessment results.
- Determine if the delineation of a Groundwater Management Area (GWMA) is required.
- Establish a local technical advisory/stakeholders committee, if GWMA is declared.
- Plan and perform a streamlined technical study of the GWMA, if declared.

Figure 2: Concentration Of Nitrate In The Upper Willamette Basin Groundwater Assessment Study Area



La Pine National Demonstration Project

The La Pine region was platted in the 1960’s and 1970’s prior Oregon’s land use planning laws. Within a 125 square mile corridor near the Deschutes and Little Deschutes Rivers, 15,000 lots of one-half to one acre were platted. The prevalent use of on-site systems in this densely populated rural area creates a threat to groundwater – the sole source of drinking water in this area characterized by shallow groundwater and rapidly draining soils. Oregon Water Resources Department records list over 4,000 domestic water wells in the area. In addition, there are about 100 community water supply wells serving small-scale subdivisions, schools and businesses in the region.

In the mid-1990s, Deschutes County and DEQ undertook an assessment of the impact of residential development in the La Pine region on groundwater quality. The outcome of this effort was a prediction that nitrate levels in groundwater would exceed the federal maximum contaminant level of 10 mg/l within 20 years.

In 1999, the United States Congress awarded a \$5.5 million 5-year grant to DEQ and Deschutes County in an effort to protect La Pine’s groundwater as part of the National Decentralized Wastewater Treatment and Disposal Demonstration Project. The La Pine region was selected to evaluate innovative nitrogen reducing technologies and to use a three-dimensional groundwater flow and contaminant transport model as a planning tool.

The La Pine project includes elements to:

- Install and retrofit up to 50 innovative denitrification systems in the most problematic high-density areas.
- Initiate a systems maintenance infrastructure.
- Establish a 130-well groundwater monitoring network of existing private and public water supply wells.
- Conduct laboratory testing of on-site systems to evaluate performance and effects on groundwater quality.
- Conduct 3-dimensional groundwater flow and nitrogen contaminant fate and transport modeling, and optimum lot density assessment based on model results.
- Establish a low-interest loan fund for septic system repair.
- Establish a method for development right transfer, lot purchase and other legal obligations associated with properties to decrease overall lot density.

To date, 16 innovative on-site systems and 3 control on-site systems have been installed. The effect of these systems on groundwater quality is being monitored through a network of more than 100 monitoring wells and several extensive sampling events involving public and private wells. In addition, data has been collected to evaluate groundwater and surface water interaction along the Deschutes and Little Deschutes Rivers within the study area.

Preliminary findings indicate that dissolved oxygen is deficient in some areas of the groundwater aquifer and not in others. Nitrate concentrations were not detected in the oxygen deficient water. However, ammonium was detected in several wells greater than 80 feet deep indicative of naturally derived ammonium. Generally, these water quality parameters indicate early stages of groundwater degradation and nitrate plume development derived from existing on-site systems.

Statewide Groundwater Vulnerability Analysis Project

DEQ is using a statistical-geographic approach to evaluating the vulnerability of groundwater contamination on a statewide basis. The project will use data from DEQ's Groundwater Assessment Program and OHD's Drinking Water Program to identify quantitative patterns between water quality, physical factors, and human activities. The goal of this project, due for completion in 2001, is to provide a tool to help identify areas with the greatest potential for groundwater contamination so that efforts can be targeted to prevent or avoid further contamination of the resource.

Groundwater vulnerability is determined by analyzing the physical characteristics that influence groundwater (e.g., precipitation, infiltration rate, etc.) in conjunction with anthropogenic (human) factors that may present a contamination risk (e.g., land use, point sources of pollution). The project will produce generalized statewide and regional maps of groundwater sensitivity and vulnerability that can be used to establish a statewide ranking of priority areas for future groundwater assessments. Other uses of the study's results include data for TMDL analyses, identification of future sampling/monitoring sites, determination of mapping needs and effective management of limited agency resources.

Groundwater Management Areas

Data from the groundwater assessment program are used to identify localized or area-wide groundwater contamination problems. If area-wide contamination is found at consistently high enough levels, an area could be declared a Groundwater Management Area (GWMA)¹. When this situation arises, the Groundwater Protection Act requires the establishment of a local Groundwater Management Area Committee comprised of affected and interested parties. This committee works with state agencies to develop and implement an action plan to reduce groundwater contamination originating from point and nonpoint source pollution in the area.

Oregon currently has two GWMA's – the Northern Malheur County Groundwater Management Area and the Lower Umatilla Basin Groundwater Management Area. DEQ is currently assisting with the implementation of the GWMA Action Plans, which includes maintaining groundwater quality monitoring networks, reviewing existing data to water quality assess trends and supporting local efforts to implement Best Management Practices (BMPs) to maintain and restore groundwater quality.

Northern Malheur County Groundwater Management Area

The Northern Malheur County GWMA was declared in 1989 after significant groundwater contamination was identified in the northeastern portion of the county where land use is dominated by agriculture. Thirty-four percent of the wells sampled had nitrate levels above the drinking water standard of 10 mg/l. The presence of the pesticide Dacthal was an additional concern. Sampling confirmed that most of the contaminated groundwater is present in the shallow alluvial sand and gravel aquifer which receives a large proportion of its recharge from canal leakage and irrigation water.

The Northern Malheur County Action Plan, dated December 1991, includes recommendations that allow farmers to customize BMPs to their farm's needs. The Committee chose to implement the Action Plan on a voluntary basis recognizing that individuals, businesses, organizations, and governments will, if given adequate information and encouragement, take positive actions and adopt or modify practices and activities to reduce contaminant loading to groundwater. The success of the action plan is gauged by both the adoption of BMPs and improvement of water quality within the GWMA.

The Natural Resources Conservation Service and Soil and Water Conservation District are working with farmers to develop water quality plans to address groundwater concerns. Alternative irrigation and fertilization management practices have been designed and recommended for the area. To date, approximately 210 water quality plans have been developed, accounting for 35% to 40% of the total acreage in the Northern Malheur County GWMA.

Currently, DEQ samples a network of approximately 38 wells every other month for analysis of nitrate and Dacthal and does a more complete analysis approximately once a year. A formal trend analysis of nitrate and Dacthal was conducted in 2000 using the 8.5 years of data since implementation of the Action Plan. The analysis did not indicate an area-wide nitrate trend; rather, it showed a mix of increasing, decreasing, and flat nitrate trends across the area. The trend analysis also revealed an area-wide downward trend for Dacthal. Recommendations from the trend analysis include focusing additional

¹ ORS 468B.180. The Department of Environmental Quality shall declare a ground water management area if, as a result of information provided to the department or from its statewide monitoring and assessment activities under ORS 468B.190, the department confirms that, as a result of suspected nonpoint source activities, there is present in the ground water:

(a) Nitrate contaminants at levels greater than 70 percent of the levels established pursuant to ORS 468B.165; or
(b) Any other contaminants at levels greater than 50 percent of the levels established pursuant to ORS 468B.165.

attention on areas where groundwater quality is not improving as quickly as anticipated. Progress is being made at the ground surface, however it may take years or even decades for groundwater quality to return to natural background levels.

Lower Umatilla Basin Groundwater Management Area

The Lower Umatilla Basin Groundwater Management Area was declared in 1990 after nitrate contamination was identified in the northern portions of Umatilla and Morrow Counties. Groundwater samples from private wells identified nitrate contamination above the 10 mg/l drinking water standard in 33% of the samples collected from the area. DEQ worked together with the Water Resources Department and Oregon Health Division on a comprehensive study of the area in the early 1990s that identified five potential sources of nitrate loading to groundwater:

1. irrigated agriculture
2. land application of food processing water
3. septic systems (rural residential areas)
4. confined animal feeding operations, and
5. washout lagoons at the Umatilla Chemical Depot

The Lower Umatilla Basin Action Plan was finalized in December 1997. This voluntary plan focuses on education and outreach, identifying and encouraging adoption of appropriate BMPs, and making soil sampling and groundwater nitrate testing equipment and supplies available for local use. In addition, over 90% of the total acres in the Lower Umatilla Basin GWMA are covered by an irrigation water management plan

Similar to Northern Malheur County, DEQ samples a network of approximately 38 wells every other month for analysis of nitrate. Approximately once a year, these wells are sampled for a larger list of contaminants including major ions, metals, and additional pesticides. These data are being used to evaluate changes in groundwater quality over time in response to adoption of BMPs. Implementation of the Action Plan also includes ongoing community outreach and education efforts highlighting groundwater quality concerns and solutions.

Source Water Assessment and Drinking Water Protection Programs

The federal Safe Drinking Water Act requires states to develop a drinking water protection program for public water supplies (surface water and groundwater sources). DEQ and OHD manage this program for Oregon. A primary responsibility of the two agencies is to conduct "source water assessments" that delineate the groundwater and surface water source areas and identify potential sources of contamination. The assessments must be completed by January 2003. In Oregon, 2735 public water systems will receive full or limited assessments. Consistent with existing statutory authorities, OHD conducts the delineations and sensitivity analyses for groundwater systems. DEQ is responsible for delineations and inventories for surface water systems, and also provides some direct technical assistance to communities as they determine how to protect their local drinking water sources.

The source water assessments provide the basis for a community to voluntarily develop a plan to protect the source area that supplies their drinking water. The primary incentive for local communities to develop and implement drinking water protection is the benefit of a more secure source of high quality water. Other incentives may include a reduction in public water supply monitoring requirements and the reduced likelihood of costs for replacement and/or treatment of contaminated drinking water.

DEQ has certified drinking water protection plans for the communities of Coburg, Junction City, Maupin, Powell Valley Water District, Rainbow Park Mobile Home, Rogue Lea Estates, Rainbow Water District, and Springfield. The communities of Eugene, Portland, Gresham, Beaverton, Hubbard, Salem, Veneta, Fairview, Interlachen, and Troutdale are in the final stages of developing protection plans. In addition, DEQ estimates that at least 400 public water systems are in some phase of developing drinking water protection plans as of July 2000.

Future Program Direction

In order to make efficient use of limited resources within the Groundwater Protection Program, the program will focus on targeted areas where significant groundwater quality problems have been documented. DEQ will maintain its role in implementing action plans for the two Groundwater Management Areas in Malheur County and the Lower Umatilla Basin and will continue its efforts in the Upper Willamette Basin and La Pine area.

New partnerships and collaborations with other programs, such as watershed councils, the Healthy Streams Partnership and various state and local agencies, are essential to the success of groundwater protection efforts. The objective is to educate the players on the role of groundwater in watershed protection and partner with these ongoing efforts to ensure that groundwater protection is included in water quality plans currently being drafted for watersheds, basins, and sub-basins of the state.

The primary objectives for the Groundwater Quality Protection Program in the 2001-2003 biennium include the following:

- Continue to monitor and identify areas of the state with area-wide groundwater contamination and to inform communities of the extent and source of the problem (as resources allow).
- Complete a streamlined technical study of the Upper Willamette Basin, and develop an action plan to reduce area-wide groundwater contamination if a GWMA is declared.
- Complete the Statewide Groundwater Vulnerability Mapping and Analysis Project and use the results to help identify areas for future assessment.
- Continue to implement the Lower Umatilla Basin and Northern Malheur County Groundwater Management Area Action Plans and evaluate the performance or success of the management plans in reducing groundwater contamination.
- Continue regional groundwater monitoring networks in the Lower Umatilla Basin and Northern Malheur County GWMA's.
- Develop and utilize methods to address on-site septic system density issues.
- Provide technical assistance to communities developing Drinking Water Protection Plans.
- Continue funding and support of research, education, and implementation of best management practices for groundwater protection.
- Increase awareness of the importance of protecting groundwater quality as an integral part of watershed protection.
- Include groundwater quality protection in watershed-based initiatives, where appropriate.