

STATE OF OREGON

Pesticide Management Plan for Water Quality Protection



Oregon Department of Agriculture
Oregon Department of Environmental Quality
Oregon Department of Forestry
Oregon Health Authority

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Executive Summary

Under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and the 2011-2013 Joint EPA OPP/OECA State Tribal Cooperative Agreement Guidance, Section 2.2.2, EPA encourages states to develop and implement State Water Quality Pesticide Management Plans. Oregon's Plan describes the policies, management measures and regulatory approaches that the State of Oregon uses to protect ground and surface water from contamination with pesticides currently registered and used in Oregon.

This plan sets forth a process for preventing and responding to pesticide detections in Oregon's ground and surface water resources by managing the pesticides that are currently approved for use by EPA in both agricultural and non-agricultural (e.g. urban) settings. The plan does not address issues relating to so-called "legacy" pesticides that are no longer marketed, such as DDT/DDE, aldrin, dieldrin, chlordane, and heptachlor. The Department of Environmental Quality (DEQ) addresses issues of environmental contamination by legacy pesticides through a separate process under the Clean Water Act.

The plan strives to protect public drinking water supplies and the environment from pesticide contamination while recognizing the important role that pesticides have in maintaining a strong state economy, managing natural resources and preventing human diseases.

Four agencies in the State of Oregon have a large responsibility for the overall quality of the state's water resources: the Oregon Department of Agriculture (ODA), Oregon Department of Environmental Quality (DEQ), Oregon Department of Forestry (ODF) and the Oregon Health Authority (OHA). The foundation for this plan is based on cooperative and coordinated interactions among these four agencies as part of an effort to make Oregon's water quality programs more consistent and resource efficient.

The overall plan relies on the formation of a Water Quality Pesticide Management Team (*WQPMT*) composed of representatives from each of the four agencies responsible for water quality in Oregon. This team will act as a coordinating advisory team between state agencies and key stakeholders.

This document presents the specifics of a pesticide management strategy that addresses the coordination of agency and stakeholder activities for:

- Selecting and prioritizing Pesticides of Interest and Pesticides of Concern
- Establishing water quality guidelines and reference points
- Conducting watershed vulnerability assessments
- Designing and conducting monitoring efforts
- Evaluating and managing monitoring data
- Recommending and facilitating management options
- Developing communication strategies

I. Strategy Overview

Under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), the EPA encourages states to develop and implement pesticide management plans (PMPs).

The *Oregon State Pesticide Management Plan for Water Quality Protection* outlines the roles, policies and legal authorities of each government agency with responsibilities for protecting Oregon's water resources from pesticides and the process by which these activities will be coordinated.

Major Objectives

- Evaluate pesticides that occur or have the potential to occur in surface and groundwater at concentrations approaching or exceeding human health or ecological water quality guidelines/reference points.
- Prevent and/or reduce the frequency of occurrence and concentrations of high-risk pesticides in waters of the state through coordination of legal authorities and key stakeholders.

Program Scope

The scope of this plan is to address pesticide related issues to human and aquatic health in surface and groundwater resulting from the legal use of registered pesticides, as specified by their labels. This plan applies across all land uses, including urban, agricultural and forestry point and non-point pesticide sources, both permitted and non-permitted. Under state and federal law, a point source means a discernable, confined, and discrete conveyance from which pollutants may be discharged. Anything that is not a point source is a non-point source.

When registering a pesticide, the EPA considers the potential risk of the pesticide on water quality. EPA places restrictions or advisory statements on the pesticide label to mitigate that risk. However, national level controls may not be adequate at local levels. Implementation of this plan will provide additional protections for Oregon waters beyond those provided by the EPA.

The Oregon Pesticide Management Plan for water quality protection emphasizes assessment and prevention of surface and groundwater contamination with pesticides. Based on the evaluation of monitoring data, the plan outlines steps that may be taken to manage the risk of pesticide contamination in Oregon's water. The core aspects of the PMP involve inter-agency coordination around the following areas: planning, monitoring, analysis and interpretation of data, and effective response measures.

II. State Agency Legal Authorities and Coordination

This plan is part of an effort to make water quality programs across the state more consistent and resource efficient and is to be implemented by four agencies involved with ground and surface water management (**Table 1**). These agencies legal authorities and their roles and responsibilities under this plan are described in detail in **Appendix A**.

Table 1: Legal authorities of the agencies represented on the *Water Quality Pesticide Management Team (WQPMT)*

AGENCY	DESCRIPTION	LEGAL AUTHORITY
<p><i>Oregon Department of Agriculture (ODA) – Pesticides Division</i></p>	<p>Addresses Registration, Distribution and Use of pesticides in Oregon as well as Licensing and Certification for Pesticide Applicators and Operators.</p> <p>Establishes policies, guidelines and specific requirements and restrictions for the implementation of ORS 634.</p>	<p><i>FIFRA</i> <i>Oregon Revised Statutes (ORS) 634</i> <i>Oregon Pesticide Control Act</i></p> <p><i>Oregon Administrative Rules (OAR 603-057)</i></p>
<p><i>ODA-Natural Resources Division (NRD)</i></p>	<p>Authorizes ODA to develop and implement an Agricultural Water Quality Management Area plan for agricultural and rural lands where required by state or federal law. The department has developed and adopted agricultural water quality management area plans in the applicable geographic areas. These plans are reviewed periodically.</p> <p>Establishes policies, guidelines and specific requirements for the development and content of plans as allowed in ORS 568. Coordinates program activities of the State's Soil, Water & Conservation Districts (SWCDs).</p>	<p><i>Agricultural Water Quality Management Act;</i> <i>(ORS 561.191);</i> <i>Oregon Revised Statutes (ORS 568)</i></p> <p><i>Oregon Administrative Rules (OAR 603-090)</i></p>
<p><i>Oregon Department of Environmental Quality (DEQ)</i></p>	<p>Directs DEQ to cooperate with other agencies of the state to prevent or mitigate pollution of waters of the state.</p> <p>Enforcement Procedure and Civil Penalties</p> <p>Groundwater</p> <p>Water Quality Standards</p> <p>Total Maximum Daily Loads (TMDLs)</p>	<p><i>CWA</i></p> <p><i>Oregon Revised Statutes (ORS) 468B</i></p> <p><i>OAR 340-012</i> <i>OAR 340-040</i> <i>OAR 340-041</i> <i>OAR 340-042</i></p>
<p><i>Oregon Health Authority (OHA)</i></p>	<p>Administers and enforces drinking water quality standards for public water systems in the state of Oregon. The drinking water program emphasizes prevention of contamination through source water protection, technical assistance to water systems and training of water system operators.</p>	<p><i>The Safe Drinking Water Act (U.S.C. §300f et seq.);</i> <i>Oregon Revised Statutes (ORS 448)</i></p>

AGENCY	DESCRIPTION	LEGAL AUTHORITY
<i>Oregon Department of Forestry (ODF)</i>	Sets policies, procedures, and standards for forest practice regulation in Oregon. Grants the Oregon Board of Forestry exclusive authority to adopt further procedures and standards in the forest practice rules. Prescribes additional standards beyond those protections provided by the EPA/FIFRA for natural resource protection when chemicals (including pesticides) are used in forest environments.	<i>Forest Practices Act (ORS 527.610 to 527.770, 527.990 & 527.992)</i> <i>Forest practice rules (OAR 629-620)</i>

Additional state agencies and other organizations may be involved in programs and activities by providing information, expertise and resources, as needed. These include, but are not limited to:

State/Government Agencies

- Local Soil and Water Conservation Districts (SWCDs)
- Oregon State University Agricultural Experiment Station (OSU-AES)
- Oregon Department of Fish and Wildlife (ODFW)
- Oregon Occupational Safety and Health Division (OR-OSHA)
- Oregon Department of Land Conservation and Development (DLCD)
- Oregon Department of Transportation (ODOT)
- Oregon Water Resources Department (WRD)
- Oregon Watershed Enhancement Board (OWEB)
- Oregon Department of Geology and Mineral Industries (DOGAMI)
- Governor's Natural Resources Cabinet

Public and Private Organizations

- Local Groundwater Management Area Committees
- Local Advisory Committees (LACs)
- Commodity Groups
- Pesticide Registrants
- Local Agricultural Chemical Suppliers
- Private Crop Consultants
- Environmental Groups
- Oregon Health and Science University (OHSU)
- Oregon State University Extension Service – IPM, Water Programs and Pesticide Education

Federal Agencies

- United States Geological Survey (USGS)
- US Fish and Wildlife
- United States Department of Agriculture - National Resource Conservation Service (USDA-NRCS)
- United States Environmental Protection Agency (US EPA)
- US Department of Health and Human Services (US DHHS)
- National Oceanic and Atmospheric Administration (NOAA)

Coordination Mechanism: Water Quality Pesticide Management Team

The Water Quality Pesticide Management Team (*WQPMT*) was formed in 2007 to coordinate and facilitate this plan. This team, working under a Memorandum of Understanding, consists of core representatives from the Oregon Department of Agriculture (ODA), the Department of Environmental Quality (DEQ), the Department of Forestry (ODF) and the Oregon Health Authority (OHA) (Figure 1). The *WQPMT* operates under a Memorandum of Agreement signed by the Agency Directors in December 2009. Additional members will be included from USGS, OSU and various other agencies and local entities and key stakeholders when appropriate.

The multi-agency *WQPMT* facilitates communication and coordination between state agencies and key stakeholders to develop and implement policies and procedures set forth by this Plan. The *WQPMT* does not have independent regulatory authority. The team has a role in analyzing and managing water monitoring data and recommending appropriate response measures (Figure 2). Implementation of decisions will include *WQPMT* members and other specialists depending on the specific issues being addressed.

Figure1. WQPMT model: member agencies, programs, stakeholders, interactions and outputs

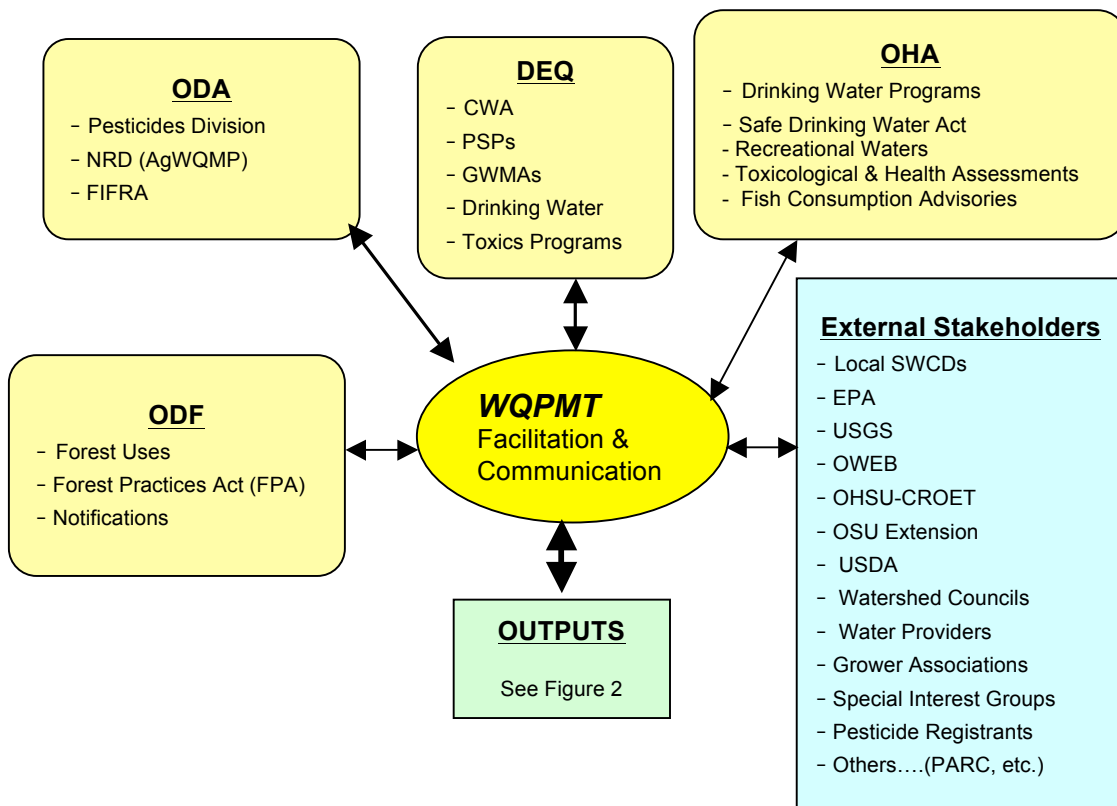
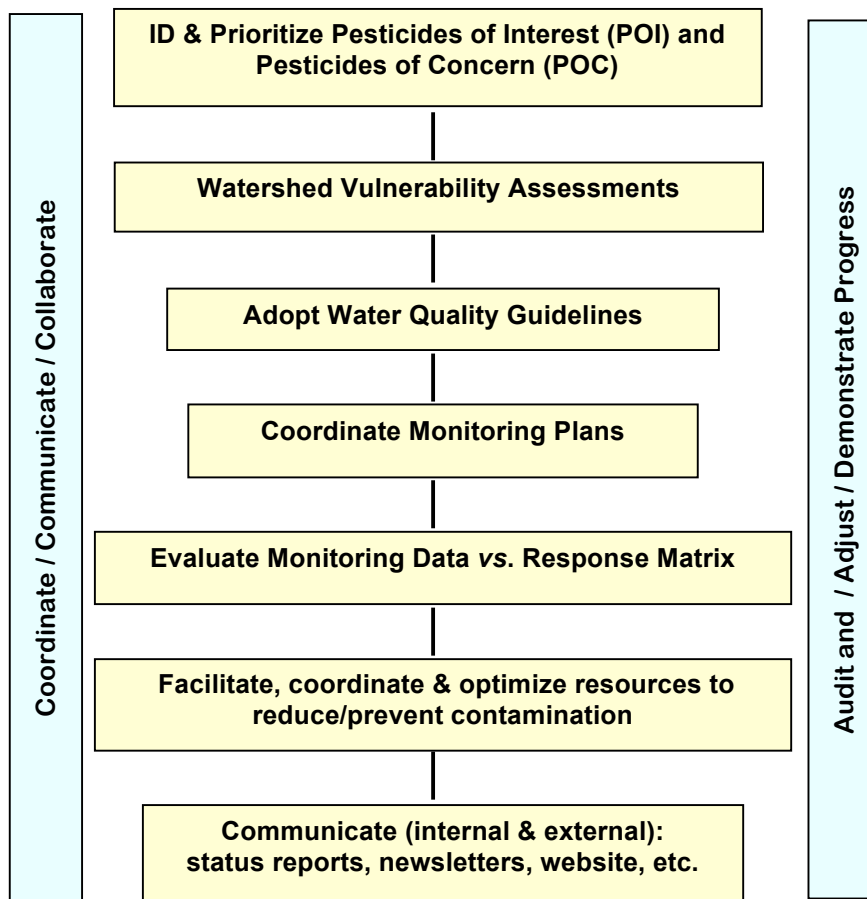


Figure 2. Overview of the general process, activities and outputs of the WQPMT



III. Data Management

Monitoring

Monitoring and data analysis are critical tools for tracking the status and trends of pesticides in Oregon’s water. It is the goal of the *WQPMT* to facilitate and coordinate monitoring plans and activities and to use the data for making decisions about managing water quality. Monitoring data will be used to define the extent of contamination and possible sources so that appropriate pesticide management actions can be chosen and to demonstrate the effectiveness of management measures.

Existing Monitoring Projects and Programs

In addition to using ongoing ambient monitoring programs, the *WQPMT* will draw upon the expertise and resources of many federal, state, and local agencies, stakeholder groups, and the pesticide industry to coordinate targeted monitoring efforts focused on pesticides of interest and concern.

The *WQPMT* will periodically review new water quality monitoring data to evaluate the need to actively coordinate the managed use of pesticides that present water quality concerns. The *WQPMT* will also examine and make recommendations for future monitoring needs in response to vulnerability assessments and pesticide detections.

Prevention should be a major objective of any water quality program. Monitoring strategies must give considerable weight to sensitive methodologies capable of detecting pesticides before they reach levels of concern. However, once initial monitoring has detected the presence of a pesticide at or above an established benchmark, *confirmation monitoring* may be needed to confirm detections and identify the geographic extent and possible sources of contamination. Any combination of these monitoring goals can be going on at the same time in a specific watershed. One role of the *WQPMT* will be to help coordinate the resources and activities of these efforts.

When a pesticide is detected that approaches or is above a water quality benchmark, the *WQPMT* will facilitate confirmation monitoring through the relevant agency (usually DEQ) and will review any existing monitoring data to check for previous detections and trends.

Identification of the source of contamination is key to initiating effective response actions. *WQPMT* members will work with registrants, growers, applicators and local organizations as sources of expertise in local pesticide use. If contamination is found in a Source Water Protection area for groundwater, the *WQPMT* will consult with OHA and DEQ to determine a time frame that will meet all agencies' needs for action.

Effectiveness monitoring is initiated after management measures are implemented to reduce contamination in an area in order to determine if those measures are working. The *WQPMT* will facilitate the development of Quality Assurance Project Plans (QAPPs) and the design and implementation of a local pesticide management plan.

Effectiveness monitoring can take several forms. Although water sampling is the most direct approach to evaluating response measures, it may take a long time for a positive or negative change in concentration to be measurable over a large area. Groundwater sampling can also be very expensive. Direct monitoring of water resources for pesticide levels can often determine whether a pesticide-specific management plan is effective. However, indirect monitoring, such as sampling for aquatic macro-invertebrates may also provide valuable information on the impact of pesticides on aquatic life.

Once site-specific data establishes the effectiveness of a management measure, the evaluation of the effectiveness of that measure over a broad area can be coordinated by the *WQPMT* through such means as applicator surveys and pesticide sales/use records which may allow long-term monitoring to be reduced.

Support by commodity groups and the pesticide industry will influence the type of effectiveness monitoring that can be implemented and the effect of various management strategies.

Quality Assurance

Oregon is committed to basing pesticide management decisions on data that are suitable for their intended use. When possible, all new environmental data will be of known and documented quality as defined in Quality Assurance Project Plans (QAPPs). QAPPs describe the intended data uses, the level of quality to be obtained, and data acceptance criteria for monitoring projects in which samples are collected. For example, data that will be used as a basis for regulatory action will be of the highest quality and have the strictest acceptance criteria. An aspect of a QAPP for groundwater monitoring would be the criteria for selecting wells so that samples will provide representative information for decision-making. ODA and DEQ each have EPA-approved Quality Management Plans (QMPs) which document how DEQ and ODA will plan, implement and assess the effectiveness of quality assurance and quality control operations.

Data obtained from other sources will be collected and analyzed using that source's quality assurance procedures. In those cases, the WQPMT will examine the quality control that was used in collecting data. The team will only consider data which are of sufficient quality for the intended purpose. For example, data of questionable quality would not be used to create regulations but may be used to initiate follow-up sampling and to increase outreach activities until follow-up results are available.

Surface Water Monitoring

Ambient Surface Water Monitoring Program

DEQ's Watershed Assessment monitoring provides data to assess the status and trends of the quality of Oregon's surface water. Monitoring programs include a 144-site ambient river network, and assessments using randomly selected locations in sensitive areas. Ambient river sites are sampled bi-monthly. The data are used to track water quality changes over time and to determine where water quality does not meet standards. The Watershed Assessment Section of DEQ uses these data to determine sources of pollutants and how much comes from those sources. Those data are then used to establish Total Maximum Daily Loads (TMDLs). The project coordination group, using factors such as pesticide use patterns in the immediate area and analytical capabilities at that time, then determines which pesticides will be included on the analyte list for any given project.

See: <http://www.deq.state.or.us/lab/wqm/watershed.htm>

Willamette Toxics Monitoring Program

DEQ received funds from the 2007 Oregon Legislature to establish a watershed toxics monitoring program. Implementation of the program is underway, starting in the Willamette Basin watershed, and DEQ is on track to:

- Monitor for toxic pollutants that are the greatest threat to human health and the environment in the Willamette River Basin (and, eventually, other watersheds in Oregon);
- Identify toxic pollutants that are found at elevated levels in the basin and take measures to reduce them;
- Build a Web-based tool that will provide the public with information about permitted wastewater discharges and toxics data.

DEQ will analyze for a range of current use pesticides in the water samples collected as part of the Willamette Toxics Monitoring Program.

Pesticide Stewardship Partnership (PSP) Monitoring

Since 1999, DEQ has been using a voluntary, collaborative approach called Pesticide Stewardship Partnerships (PSPs) to identify problems and improve water quality associated with pesticide use at the local level.

PSP projects are currently in place in the following five watersheds: Clackamas, Pudding, Yamhill, Hood and Walla Walla. Grab samples are collected at between 5 and 8 stream locations, depending on the watersheds. The primary sample collection period is the spring (March 15 – June 15), when pesticide spraying is typically most prevalent and intense. Some fall samples are collected to determine seasonal differences and the impacts of storm-related runoff.

The PSP monitoring has been focused on organophosphate insecticides and two triazine herbicides. However, in 2009 DEQ significantly expanded the number of pesticides captured in its laboratory analyses. In addition, DEQ and partner agencies are developing plans for expanding into new watersheds and monitoring groundwater if more resources can be secured for the PSP Program.

This program is described in more detail under Voluntary Approaches of the Management Options section.

DEQ-OHA Drinking Source Water Monitoring Project

As a follow up to drinking source water assessments, OHA and DEQ began working together in 2008 to conduct toxics substance monitoring of raw drinking water sources (prior to treatment) associated with selected public water systems in Oregon (<http://www.deq.state.or.us/wq/dwp/swrpts.asp>). This monitoring effort includes both surface and groundwater systems, and analyzes for a number of current use pesticides that are POIs. OHA and DEQ plan to continue twice-yearly monitoring of source water if funding remains available.

Safe Drinking Water Information System (SDWIS)

Public drinking water systems must monitor for certain pesticides [OAR 333-061-0036]. US EPA maintains a website with drinking water information on chemical detections, violations, and enforcement actions for each system. The database can be accessed at http://www.epa.gov/enviro/html/sdwis/sdwis_ov.html

Groundwater Monitoring

The vulnerability of groundwater to pesticides can generally be evaluated separately from that of surface water, but in some areas groundwater vulnerability may be directly linked to surface water issues. In addition to groundwater assessments, pesticide use and their attributes can also be included to further refine risk assessments.

Oregon has limited monitoring and data resources available to adequately assess pesticides trends in groundwater. Until funding and staffing for a statewide ambient groundwater monitoring program are made available, *WQPMT* will continue to rely on drinking water monitoring data and area wide assessments from other federal, state and local agencies.

The *WQPMT* will work with state, local and private agencies to ensure that any groundwater pesticide monitoring data are evaluated in a timely manner and reported to the appropriate authority for determining response measures.

Oregon's Groundwater Protection Act (ORS468B.190) gives DEQ primary responsibility for implementing Oregon's groundwater protection program. Specific requirements include (1) the identification of areas of the state that are especially vulnerable to contamination; (2) assessment of long-term trends in groundwater quality; (3) evaluation of the ambient quality of groundwater resources; and (3) identification of any emerging groundwater quality problems. Data from these assessments may provide the basis for DEQ to declare a Groundwater Management Area if area-wide problems are found.

Between 1980 and 2000, DEQ conducted 45 groundwater quality assessments in Oregon. These assessments covered approximately 6.4% of the total land and 30.8% of the area where groundwater is used. The data provided a general rating of the overall quality of the groundwater resources available for use as drinking water. The data show that nitrate is the most commonly detected contaminant, followed by pesticides, volatile organic compounds, and bacteria, respectively. To evaluate impairment, DEQ compares levels of detected contaminants to federal drinking water standards. Unfortunately, most pesticides do not have drinking water standards.

Groundwater (GWMA) Management Area Monitoring

In the Lower Umatilla Basin, Malheur, and Southern Willamette Basin Groundwater Management Areas, samples are collected by DEQ and are analyzed for legacy and current use pesticides by ODA laboratory. This program

is described in more detail under Voluntary Approaches of the Management Options section.

USGS Monitoring Programs

In addition to the State initiatives, USGS conducts assessments of surface, ground and drinking water in Oregon under the National Water Quality Assessment (NAWQA) program. Groundwater quality data were collected during 1993 from 70 shallow domestic wells. In 2004-2005 USGS monitored for a large number of pesticides in the Columbia River estuary (<http://pubs.usgs.gov/ds/2006/213/#download>).

The NAWQA Program also conducted surface water monitoring in the Willamette Basin (<http://pubs.usgs.gov/circ/circ1161/>).

The USGS recently issued a report (<http://pubs.usgs.gov/sir/2008/5027/>) compiling four USGS studies from 2000 - 2005 in the Clackamas River sub-basin. It reports on the presence of various pesticides in the Clackamas River and a number of key tributaries. Information on other USGS activities in Oregon can be found at: <http://or.water.usgs.gov/>.

Forestry Monitoring Program

The Forest Practices Act (FPA) and forest practice rules direct ODF to monitor the effectiveness of regulations governing chemical use in forest operations. Pesticide monitoring projects since 1992 indicate that compliance with the rules generally leads to adequate protection of water quality, fish, wildlife, and riparian vegetation. Despite this, some monitoring questions remain. In addition, ODF foresters inspect pesticide application operations as time and other workloads allow, and have found that most applications are in compliance with the rules. In 2000, ODF completed a study of aerial pesticide applications, indicating that water resources, aquatic organisms, and riparian management areas were being adequately protected under current rules. (See Dent, Liz and J. Robben. 2000. Aerial Pesticide Application Monitoring Report, Oregon Department of Forestry, Salem, Oregon.) Although conclusive for the specific question asked, the 2000 study also identified additional unanswered monitoring and research questions. In 2002, ODF and cooperators developed an overall forest practices monitoring plan, which includes these additional questions.

Data Storage and Sharing

DEQ LASAR Database

All DEQ monitoring data, including monitoring conducted by watershed councils that are submitted to DEQ, are stored in the Laboratory Analytical Storage and Retrieval (LASAR) database (<http://www.deq.state.or.us/lab/lasar.htm>). The database is accessible to the public via the internet. DEQ plans to include monitoring data from other sources in the future.

“Comprehensive Pesticides and Groundwater Database”

Between 1997-2004 the Agricultural Chemistry Research and Extension program at OSU developed a comprehensive pesticides and groundwater database. Data were retrieved from “Legacy”, a static, archived database (containing data through 1998) and “STORET” an operational system actively being populated with water quality data.

Several state and federal agencies have uploaded information to STORET, including OR DEQ, EPA Headquarters and Region 10, U.S. Bureau of Reclamation, U.S. Forest Service, USGS, U.S. Army Corp. of Engineers, NOAA, EPA Monitoring Branch, EPA Environmental Research Lab, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Department of the Interior and EPA Office of Toxic Substance. However, OSU no longer maintains this database.

Pacific NW Water Quality Data Exchange (PNWQDE)

A typical approach to data management is to put all data into a centralized database. Mixed data types, formats and quality of data sets make this approach problematic at best. In 2002, Oregon DEQ, as part of a Pacific Northwest Consortium, received an EPA Challenge grant to develop a common format to catalog and distribute water quality data.

The *PNWQDE* works off a ‘data-mapping’ format that allows data to be stored at the source and directs a web-based search engine to search for individual sources. Data are accessed from various sources in one common format. Currently, the initial developmental stage for this version contains data from Washington Department of Ecology, Idaho Department of Environmental Quality, Alaska Department of Environmental Conservation, Oregon Department of Environmental Quality and Oregon Department of Human Services.

Data Assessment

Water Quality Guidelines

Water quality guidelines include both regulatory standards or criteria and non-regulatory benchmarks. Benchmarks derived from toxicology studies are numeric values used for assessing the relative severity of risk to human health and the environment posed by contamination. Benchmark values are based on the current state of knowledge and methodologies that measure acute and chronic effects of single chemicals. The effects of multiple chemical exposures are not reflected in benchmark values therefore, such effects are not directly addressed by the Pesticide Management Plan (PMP). Indirectly, health concerns surrounding multiple chemical exposures are addressed in the plan through its emphasis on preventing water contamination.

The severity of contamination relative to a pesticide's benchmark will be a major factor for selecting pesticides to manage and the preferred management measures. Established federal water quality standards for the pesticides in question, will be used if available.

Human Health Numerical Guidelines

Human health numerical guidelines will be derived from a variety of sources. Sources used by Oregon's PMP for human health guidelines include:

- **MCLs** - Maximum Contaminant Levels (MCLs) are regulatory standards for drinking water established by OHA under OAR 333-061-0030.
- **HALs** - Health Advisory Levels (HALs) are non-regulatory benchmarks for drinking water established by the US EPA and available online at <http://www.epa.gov/waterscience/criteria/drinking/>)
- **HBSLs** - Health Based Screening Levels (HBSLs) are non-regulatory benchmarks for drinking water established by the United States Geological Service (USGS). In the absence of existing federal or state human health guidelines, the WQPMT, led by OHA and in consultation with DEQ, will evaluate other potential sources for health-based information.

Aquatic Life Numerical Guidelines or Benchmarks

The EPA Office of Water (OW) has an established methodology that has been used to set enforceable water quality standards for a range of pollutants discharged to surface water. Oregon has adopted many EPA standards into its DEQ rules. These water quality criteria are found in OAR 340-041-0033 (Table 20). However, there are very few up-to-date numeric water quality standards for currently used pesticides. EPA-OW and EPA-OPP are in the process of harmonizing methodologies for establishing water quality criteria. The WQPMT recommends coordinating with this effort for the purpose of establishing enforceable water quality standards in the long-term. However, in their absence, the WQPMT is faced with the challenge of selecting scientifically viable surrogate water quality benchmarks that are protective of aquatic life in Oregon waters, based on established methodologies, and can be used to make preventive and management decisions. EPA's Office of Pesticide Programs has developed aquatic life benchmarks for 57 pesticides.

In the short-term, the WQPMT recommends using the EPA Office of Pesticide Programs (OPP) established aquatic life benchmarks http://www.epa.gov/oppefed1/ecorisk_ders/aquatic_life_benchmark.htm) as a way to conduct a preliminary screen of monitoring data for pesticides of interest and concern. These benchmarks are intended as general reference points and not as specific guidance levels. This screening process will help prioritize actions until Oregon benchmarks are established..

303(d) Listed Water Bodies and Total Maximum Daily Loads (TMDLs)

The Clean Water Act, Section 303(d), requires that Total Maximum Daily Loads (TMDLs) be developed for waters that do not meet water quality standards. In

Oregon, most 303(d) listings are due to “legacy” pesticides that are no longer marketed, such as DDT/DDE, aldrin, dieldrin, chlordane, and heptachlor. There are a few water bodies listed for currently used pesticides: chlorpyrifos (Indian Creek, Lenz Creek, Neal Creek in the Hood River watershed plus West Fork Palmer Creek in the Yamhill River watershed), azinphosmethyl (Neal Creek), and pentachlorophenol (Willamette River).

See: <http://www.deq.state.or.us/wq/assessment/rpt0406/search.asp>.

In addition, recent DEQ monitoring, conducted as part of the Pesticide Stewardship Partnership Program (PSP), has detected chlorpyrifos and azinphosmethyl at concentrations above water quality criteria in the Walla Walla, Clackamas and Pudding River watersheds. These detections will result in future 303(d) or related listings of impaired waters in Oregon.

Once a water body is placed on the 303(d) list by the Oregon Department of Environmental Quality (DEQ), the CWA requires States to develop a clean water plan, called a Total Maximum Daily Load (TMDL). This plan may or may not include ODA regulatory initiatives (e.g. label restrictions) to bring pesticide levels below a water quality standard.

TMDLs describe the maximum amount of pollutants from municipal, industrial, commercial and surface runoff sources, including natural background, which can enter the river or stream without violating water quality standards. TMDLs for the currently used pesticides in the water bodies listed above have not yet been developed. However, DEQ, in coordination with ODA, ODF and local stakeholders, is implementing voluntary “Pesticide Stewardship Partnerships” (PSPs - see more on p. 20). If successful, they can be valuable programs for protecting water quality and avoiding the need for some of the current, more regulatory approaches. More information is available at <http://www.deq.state.or.us/wq/TMDLs/TMDLs.htm>.

Pesticides of Interest (POIs) and Pesticides of Concern (POCs)

As part of the Consolidated Pesticide Cooperative Agreement for water quality with the EPA, ODA must report on the status of pesticides found in ground and surface water. Reports are due once a year as described in the Cooperative Agreement.

Using the definitions and metrics described below, the *WQPMT* annually selects and prioritizes the Pesticides of Interest and Concern using the following criteria:

- Previous water quality monitoring data (both within Oregon and surrounding states);
- Pesticide impact on environmental and human health;
- Established water quality standards or benchmarks;
- The potential to occur in surface & groundwater based on the pesticide's physical and chemical properties; and
- Pesticide use, land use patterns and BMPs applied in key watersheds.

When appropriate the WQPMT will coordinate selections with the other states in EPA Region 10 (Washington, Idaho and Alaska) to help align and coordinate efforts. Selected Pesticides of Interest (POIs) and Pesticides of Concern (POCs) will then be entered into the EPA Water Quality Reporting Database (POINTS) and communicated to state agencies.

Based on EPA guidance, ODA uses a three-tier approach to assess water quality conditions and the progress of protection efforts. These steps are:

1. Evaluate Pesticides of Interest (POI)
2. Manage Pesticides of concern (POC)
3. Demonstrate progress

Pesticides of Interest (POI):

Pesticides of Interest are those pesticides that have been identified by the states in a survey conducted by the State FIFRA Issues Research and Evaluation Group (SFIREG) in 2005 (**see Appendix B**). This list can also include pesticides that impair water quality under the Clean Water Act Section (CWA) 303(d) and other pesticides Oregon or its tribes wish to add. This list represents those pesticides that have the *potential to occur in ground or surface water at concentrations approaching or exceeding Federal, State, or Tribal human health or ecological reference points*. A pesticide of interest could be an active ingredient alone or the active ingredient collectively with its degradates. The WQPMT annually conducts an evaluation of this list to determine which pesticides, if any, have the potential to contaminate water in watersheds and aquifers throughout the state.

The reporting metric for POIs ***Evaluated*** is:

$$\frac{\text{Evaluated POIs}}{\text{Total Number of POIs}} \times 100\%$$

The WQPMT is responsible for reviewing available data for pesticides of interest and for making recommendations to ODA and other agencies on the need to actively manage them.

Pesticides of Concern (POC):

This second measure quantifies Oregon's efforts to manage pesticides that have been identified as posing a risk to water resources. A pesticide of concern is a *POI which is determined to approach or exceed – or known to approach or exceed - a human health or environmental reference point in a local area, thus posing possible risks to human or ecological life*. In most cases, an evaluation is based on available monitoring data from within the state. A pesticide of concern is prioritized and elevated to a higher management level to ensure that concentrations are maintained or reduced below an established benchmarks.

The reporting metric for POCs ***Managed*** is:

$$\frac{\text{\# POC Evaluated}}{\text{\# POC Identified}} \times 100\%$$

Pesticides Under Management with Demonstrated Progress:

The third measure attempts to quantify the number of managed POCs that have demonstrated progress toward being maintained or reduced to a concentration in water below its reference point.

The reporting metric for ***Demonstrated Progress*** is:

$$\frac{\text{\# POCs managed showing progress towards reduction or maintenance of concentrations below their reference points}}{\text{Number of POCs Managed}} \times 100\%$$

Reporting of Pesticides of Interest, Concern and those being managed and demonstrating progress is accomplished through the EPA Water Quality Reporting Database (POINTS) (<http://www.points.wsu.edu/>). For all three metrics the goal is to reach 100%. However, it may take many years to reach that goal. Milestones for reaching the goals will be incorporated into the annual ODA-EPA Cooperative Agreement.

IV. Watershed Vulnerability Assessments

Prevention of water contamination is a major component of effective resource management. One approach is to proactively prioritize prevention and monitoring efforts by identifying areas that may be potentially vulnerable to pesticide contamination.

The WQPMT will assess state water bodies' potential vulnerabilities to pesticide contamination (watershed studies, etc.) in order to understand and prioritize the relative sensitivity of the State's water resources to pesticide contamination. Assessment criteria will include those used to select POIs and POCs plus watershed-related criteria such as hydro-geological properties, climate, land-use, pesticide use, current BMPs, GIS data and the presence of willing stakeholder partners and organizations. DEQ and OHA will provide expertise on risk assessment, hydrogeology, ground and surface water vulnerability and investigations of contamination of drinking water supplies and surface waters that support threatened and endangered aquatic species. Oregon State University can provide additional expertise on the fate, transport and effects of pesticides in the environment.

Oregon promotes drinking water protection through a partnership between DEQ and OHA. One part of the statewide groundwater assessment effort is for state agencies to collect monitoring data from residential drinking water wells. This effort is managed by OHA. Another method of assessment involves a groundwater investigation by DEQ. This type of assessment typically includes a brief hydro-geological and land use evaluation, careful well screening, and quality-controlled sampling and analysis. DEQ prioritizes areas for assessment 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, and population density.

OHA and DEQ recently worked together to ensure the completion of Source Water Assessment Reports for all public water system in Oregon. In 2005 OHA and DEQ completed these assessments for 2400 public water systems. As a result, DEQ and OHA have developed a combined "Drinking Water Protection" database that includes a significant amount of data related to the location, delineation, inventory, sensitivity analysis and susceptibility analysis for each source assessed. See: <http://www.deq.state.or.us/wq/dwp/results.htm>

Individual communities can use assessment results to voluntarily develop a plan to protect the source area. Technical assistance is available and is provided to the communities by DEQ and OHA. As an incentive for developing drinking water protection plans, DEQ offers plan certification, which may be useful for obtaining monitoring exemptions or future grants. Other agencies will also be involved in providing technical assistance as protection plans are developed. For example, on agricultural land, ODA can provide assistance under the Agricultural Water Quality Management Act.

Some communities have passed ordinances or provided voluntary BMPs to protect their source areas. Although there is no comprehensive listing of these activities throughout the State, DEQ provides examples that address pesticides on their website. For examples, see the Wallowa County ordinances and the Columbia South Shore Well Field Wellhead Protection Program (Portland) on: <http://www.deq.state.or.us/wq/dwp/assistance.htm>

Resulting vulnerability assessments will be used to recommend and guide resources and follow-up in areas where issues arise.

V. Evaluation and Response Procedures

One of the roles of the *WQPMT* is to review and evaluate monitoring data on pesticides that are currently approved for use by EPA in both agricultural and non-agricultural settings. Evaluations of data collected from ground and surface water sources, based on water quality benchmarks and other factors, determine if a pesticide poses a significant risk to the beneficial uses of Oregon's water resources. The *WQPMT* would determine whether a pesticide is likely to approach or exceed a human health or environmental reference point within localized areas, and needs management. The goal of management efforts would be the overall reduction of a pesticide's concentration and its frequency of detection in local watersheds. Both annual and historical, longer-term detection

frequencies are considered.

The *WQPMT* will use a two-tiered approach, initially using a matrix to visually assess and communicate surface water (Table 1) or groundwater (Table 2) monitoring results in a specific watershed. Based on this initial assessment, response recommendations will be determined using the various options listed in Table 3 (surface water) or Table 4 (groundwater). *WQPMT* assessments will be communicated in timely reports and communication with local stakeholders.

Table 1: SURFACE WATER ASESMENT MATRIX (location specific)

	Percent of Reference Concentration		
Detection Frequency	>100% (Level 3)*	>50% (Level 2)	10-50% (Level 1)
>50% (Level C)	3C	2C	1C
26 - 50% (Level B)	3B	2B	1B
1 - 25% (Level A)	3A	2A	1A

* May qualify as a Pesticide of Concern (POC)

Table 2: GROUNDWATER ASESMENT MATRIX (location specific)

	Percent of Reference Concentration		
Detection Frequency	>75% (Level 3)*	>50% (Level 2)*	10-50% (Level 1)
>70% (Level C)	3C	2C	1C
26 - 50% (Level B)	3B	2B	1B
1 - 25% (Level A)	3A	2A	1A

* May qualify as a Pesticide of Concern (POC)

At this point, the State or EPA may not have adopted a regulatory standard, so an unofficial reference point may need to be used. In addition to an established benchmark concentration, the *WQPMT* will use a "weight-of-evidence" approach to evaluate the potential environmental impact of pesticides. In addition to local monitoring data, factors that may be included in an evaluation are (1) the pesticide's toxicity and environmental fate, (2) possible sub-lethal effects, (3) its co-occurrence with other pesticides and the potential synergistic or additive effects of such mixtures, (4) pesticide use patterns and application methods, (5) watershed vulnerability assessments, and (6) monitoring studies in neighboring state or watersheds with similar conditions. If a pesticide is determined to have a potential impact within a given location it becomes subject to a number of targeted activity options designed to further assess the extent of the occurrence, the possible impact on human or environmental health and management options that may be implemented to address the concern.

The *WQPMT* will review monitoring data against established water quality standards or reference points and recommend a combination of actions by individual agencies depending on the pesticide detected, its detected concentration, the frequency of detection and the source of contamination. The *WQPMT* will use management options at various levels of contamination compared to an established water quality reference point and the frequency of

detections in a local area. The *WQPMT* can recommend that a state agency select pesticide management measures that are increasingly stringent in response to higher contamination concentrations and/or detection frequencies. Use of the matrix does not replace an agency's consideration of its legal mandates. If a pesticide is designated as a Pesticide of Concern that reflects a potential impact on environmental or human health, a range of management activities may be implemented to address these concerns.

This plan acknowledges that increasingly stringent management measures are needed for higher contaminant concentrations and will use a tiered set of response options triggered by increasing levels of confirmed contamination. Response categories for surface water and groundwater are presented below in Tables 3 and 4, respectively. The responses described below are a list of options and do not necessarily represent a checklist of activities that need to be completed in sequence. The designated state agencies and their specific voluntary and/or regulatory options are described in more detail under Section VI (Management Options).

Table 3: Surface Water Response Categories and Management Options	
1 - Detection frequency 1-50% and >50% of reference concentration (Levels 1A, 1B, 2A, 2B in Table 1)	
<ul style="list-style-type: none"> a. Evaluate weight-of-evidence for potential impact on aquatic life. b. Re-evaluate monitoring program. c. annually assess monitoring results. 	
2 - Detection frequency above 50% BUT below reference concentration (Levels 1C, 2C in Table 1)	
<ul style="list-style-type: none"> d. Evaluate weight-of-evidence for potential impact on aquatic life. e. Evaluate data vs. historical detections of pesticides and use patterns. f. Include detected pesticide(s) in outreach and educational efforts. g. Initiate planning for PSP and/or AgWQM activities. h. If continued high detection frequencies for two or more years, elevate to Response Category 3 and possible status as a POC. 	
3 - One year of detection above reference concentration (Levels 3A, 3B, 3C in Table 1)	
<ul style="list-style-type: none"> a. Evaluate against labeled uses, application methods, overall weight-of-evidence assessment. b. Evaluate need for conformational and source identification information. c. Evaluate historical extent of occurrence and use. d. Partner with local stakeholders to determine source and appropriate voluntary reduction measures and consider appropriate BMPs and management actions. e. Work with stakeholders to consider alternative control chemicals and/or methods. f. Include detected pesticide(s) in outreach and educational efforts. g. Initiate PSP and/or AgWQM activities. h. Expand monitoring efforts. i. Elevate to POC status. 	
4 - Detection in two of three years above reference concentration	
<ul style="list-style-type: none"> a. Evaluate extent of pesticide occurrence within a local watershed and across the state. b. Continue to work with stakeholders to determine source and the implementation of additional voluntary and mandatory BMPs and use restrictions. c. Work with stakeholders to implement alternative control chemicals and/or methods. d. Plan and implement follow-up monitoring efforts. 	
5 - Detection above reference concentration after BMPs are implemented	
<ul style="list-style-type: none"> a. Implement additional regulatory restrictions, and/or mandatory BMPs. b. Coordinate with DEQ on potential 303(d) listing. c. Implement program to determine effectiveness of regulatory actions. d. Initiate enforcement actions for cases of misuse or illegal disposal. 	

Table 4: Groundwater / Drinking Water Response Categories and Management Options	
1 - Detection frequency above 70% and between 10-50% of reference concentration (Level 1C)	
<ul style="list-style-type: none"> a. Evaluate weight-of-evidence for potential impact on human health. b. Evaluate data vs. historical detections of pesticides and use patterns. c. Include detected pesticide(s) in outreach and educational efforts. d. ODA would coordinate with DEQ to initiate activities for Groundwater Management Area (GWMA). 	
2 - Detection between 50 & 75% of reference concentration (Levels 2A, 2B, 2C)	
<ul style="list-style-type: none"> a. Evaluate against labeled uses, application methods, overall exposure-hazard assessment. b. Evaluate need for conformational and source identification data. c. Evaluate historical extent of occurrence and use. d. Partner with local stakeholders to determine source and appropriate voluntary reduction measures. e. ODA would coordinate with DEQ to initiate Groundwater Management Area (GWMA) and additional monitoring. f. Include detected pesticide(s) in outreach and educational efforts. g. Designate pesticide as a Pesticide of Concern (POC). h. Implement mandatory BMPs or use restrictions. 	
3 - Detection >75% of reference concentration (Levels 3A, 3B, 3C)	
<ul style="list-style-type: none"> a. Implement use restrictions. b. Evaluate extent of pesticide occurrence within a local watershed and across the state. c. For private water, ODA would coordinate with DEQ to initiate Groundwater Management Area (GWMA) and/or additional follow-up monitoring. d. For public water systems, ODA would coordinate with OHA to initiate voluntary and/or regulatory measures to reduce contamination. e. Work with stakeholders to determine source and the implementation of voluntary and/or mandatory BMPs. f. Work with stakeholders to implement alternative control chemicals and/or methods. e. Designate pesticide as a Pesticide of Concern (POC). f. Initiate enforcement actions for cases of misuse or illegal disposal. 	
4 - Detection >75% of reference concentration after BMPs or use restrictions implemented	
<ul style="list-style-type: none"> a. Implement regulatory restrictions and/or mandatory BMPs. b. For private water impacts ODA would coordinate with DEQ to initiate Groundwater Management Area (GWMA). g. For public water systems, ODA would coordinate with OHA to initiate regulatory measures. c. Implement program to determine effectiveness of regulatory actions. d. Initiate enforcement actions for cases of potential misuse or illegal disposal. 	

VI. Management Options

Possible Agency Response Options for current-use pesticides

ODA	DEQ	ODF	OHA
<ul style="list-style-type: none"> • Registration (SLN labeling) • Label revisions • Use restrictions • Training & Certification • Education • BMPs • Support monitoring • Enforcement 	<ul style="list-style-type: none"> • Monitoring • Education • Outreach <ul style="list-style-type: none"> ○ PSPs ○ GWMAAs • BMPs • TMDLs • Enforcement • SWPP 	<ul style="list-style-type: none"> • Revise Forest Practices Chemical Rules • Revise Guidance Documents • Education • BMPs 	<ul style="list-style-type: none"> • Drinking Water Standards • Education • Outreach • Enforcement

Prevention of pesticide contamination in surface or groundwater based on their proper use and disposal, is the foundation upon which water protection programs and efforts are based. However, once a pesticide is detected in water, a continuum of management options, from voluntary to enforcement/regulatory actions, are available. Selection of management options is dependent on a number of variables as described under the Response Measures section. ODA-coordinated responses to pesticide detections should include a variety of non-regulatory, voluntary actions such as outreach initiatives to inform local applicators of water quality issues associated with pesticide use. These outreach activities can include presentations and newsletters to watershed groups, pesticide applicators and commodity groups. However, regulatory approaches such as label restrictions, local use restrictions and pesticide cancellations can be employed if it is determined that a pesticide in water poses a serious threat to human and/or aquatic life. The option of using regulatory actions, however, is often dependent on the existence of enforceable water quality criteria.

Programs that likely will be implemented in vulnerable areas include: the voluntary development of Best Management Practices (BMPs), pesticide applicator certification and training and outreach to commodity, industry, and other interested groups. Proactive vulnerability assessments can also be conducted to prioritize prevention programs in areas of high and moderate vulnerability. The exact emphasis on various voluntary vs. regulatory measures will be described in locally focused, chemical-specific plans that will be developed through a public process and consideration of agency legal mandates.

Because this plan is part of the Cooperative Agreement between EPA and ODA, it does not commit any agencies other than ODA to continue implementation of any listed activity. Should the current activities of other agencies be discontinued or change significantly, ODA will revise this Plan.

Voluntary Approaches

Voluntary-based stewardship by pesticide users is critical for maintaining high water quality. Oregon recognizes prevention measures must be “do-able” from the grower and applicator’s perspective. Community awareness and involvement are key aspects of efforts to protect Oregon’s waters from pesticide contamination. Ultimately, it is the acceptance and implementation by pesticide users that will produce the desired end results.

Pesticide Stewardship Partnerships

Since 1999, DEQ has used a voluntary, collaborative approach called the Pesticide Stewardship Partnerships (PSPs) to identify problems and improve water quality associated with pesticide use at the local level. DEQ’s partners in these efforts include OSU Extension, SWCDs, watershed councils, grower groups, and ODA.

The PSPs are funded through federal grants and use local expertise in combination with water quality sampling and toxicology expertise of DEQ to

encourage and support voluntary changes that result in measurable environmental improvements. A key component of this program is an annual monitoring program to measure pesticide levels in local water resources and provide feedback on the effectiveness of selected use practices. The first PSPs were implemented in the Hood River and Mill Creek (The Dalles) Basins, and have resulted in generally decreasing concentrations of pesticides in surface waters over time. Currently, active PSPs exist for the Hood River, Walla Walla, Clackamas, Pudding and Yamhill river basins. The PSP in the Yamhill basin is a pilot project to evaluate whether the PSP approach can be used effectively in conjunction with TMDL development. Data from these areas are shared with local stakeholders and used to identify possible mitigation practices to reduce pesticide levels if needed.

Agricultural Water Quality Management Program (AgWQM)

The Agricultural Water Quality Management Program (AgWQMP) is responsible for developing and implementing agricultural pollution prevention and control programs to protect the quality of Oregon's waters. The Agricultural Water Quality Management Program has evolved in response to water quality programs and requirements under various state and federal laws, such as the Clean Water Act and the Agricultural Water Quality Management Act (AgWQM Act), passed in 1993 by the Oregon legislature.

Working in partnership with the 45 local SWCDs, ODA identified 39 watershed-based Agricultural Water Quality Management Areas across the state. Water Quality Specialists within the AgWQMP worked with local farmers, ranchers, and community leaders to serve as Local Advisory Committee (LAC) members for each management area. Each LAC identified local water quality problems and opportunities for improvement. The 39 resulting Agricultural Water Quality Management Area Plans, now approved by the Board of Agriculture, guide the resolution of agricultural water quality issues in the 39 management areas. As the LACs created the plans, they also developed companion administrative rules for that management area. The rules provide an enforceable backstop to ensure all landowners do their part to avoid and resolve water quality problems. These area plans and rules are reviewed and evaluated by the LAC members every two years to determine effectiveness.

Groundwater Monitoring and Assessment Program

Oregon's Groundwater Protection Act (ORS 468B.190) requires the DEQ to declare a Groundwater Management Area (GWMA) if area-wide groundwater contamination, caused primarily by non-point source pollution, exceeds certain trigger levels. Trigger levels are 50% of the drinking water standard for contaminants and 70% of the nitrate drinking water standard. GWMA Action Plans include the maintenance of groundwater monitoring networks, reviewing existing data to assess trends and supporting local efforts to implement Best Management Practices (BMPs) to maintain and restore groundwater quality.

The Groundwater Protection Act also requires the establishment of a local Groundwater Management Committee comprised of affected and interested parties. The committee works with and advises the state agencies that are required to develop an action plan that will reduce groundwater contamination in the area. Declaration of a GWMA by DEQ is a management option should contamination by a pesticide occur.

GWMA's have been declared for three areas in the State. Those areas are: the Lower Umatilla Basin, the Northern Malheur County, and the Southern Willamette Valley Groundwater Management Areas. All these areas were declared due to nitrate contamination. However, the Northern Malheur County GWMA also addresses contamination by a pesticide.

See: <http://www.deq.state.or.us/wq/groundwater/groundwater.htm>

In the Northern Malheur County Groundwater Management Area, groundwater samples from private water wells identified nitrate contamination and the presence of the pesticide DCPA (known by the brand name Dacthal) and its breakdown products. Traditional fertilizer and agricultural chemical application practices are believed to be the main source of the contamination.

The action plan for this GWMA includes detailed information on water quality, identification of contaminant sources, and Best Management Practices (BMPs) to improve groundwater quality. A BMP for banded rather than broadcast application of DCPA was developed and implemented by growers. However, researchers later demonstrated that other products with shorter half-lives could control weeds in onions at lower cost. With the registration of pendimethalin, most growers rapidly switched from DCPA because of lower in costs, more effective control, and improved environmental effects. DCPA inventories in Malheur County were depleted by the end of 1998 and no DCPA was applied in Malheur County during 1999. While DCPA is still legally available for use, it is unlikely that local growers will return to the widespread use of DCPA. Instrumental in the changes were the "on farm" demonstrations by OSU Cooperative Extension – supported by the Idaho Eastern-Oregon Onion Committee – that showed the superior effectiveness of pendimethalin and its ability to control dodder. Both the adoption of banding over broadcasting DCPA and the substitution of pendimethalin for banded DCPA took place at the voluntary initiative of growers. See: "Northern Malheur County Groundwater Management Area BMP Implementation Report December 29, 2003" and other information available at:

<http://www.deq.state.or.us/wq/groundwater/nmcgwma.htm>.

Community & Industry Education and Outreach

Education of pesticide users is a major component of Oregon's water protection strategy. It includes both general information on water issues for all pesticide users and detailed technical information for specific groups. Education should also address areas such as Integrated Pest Management (IPM), Sustainable Agriculture and pesticide-free pest control.

Community outreach is directed to the both the general public and the regulated community. Chemical-specific management plans, requirements, restrictions and updates are distributed through industry newsletters, directed mailings, radio announcements, newspaper articles, and public meetings. Notifications when a public water supply system is impacted are accomplished as needed by OHA.

Presentations to the general public and interested groups will provide a basic introduction to the state's efforts to protect water from pesticides as well as the concept of chemical-specific state management plans. Presentation length, content and style will be tailored for the different audiences as appropriate.

ODA also makes presentations on water quality protection to commodity groups and professional meetings attended by pesticide applicators. The details of ODA's voluntary education efforts are described in the annual Cooperative Agreement work plan. ODA, in conjunction with other involved agencies, participates in public workshops to discuss chemical-specific management plans. Workshops may target growers in vulnerable geographic areas, specific pesticides, agricultural practices or commodities.

There are many commodity groups in Oregon. Most have annual meetings and newsletters to keep their membership informed. Commodity groups provide an excellent opportunity to work with and educate groups of growers about chemical-specific management plans and associated best management practices.

Many pesticide user groups hold annual meetings where speakers present a variety of topics of interest to their organization. Often these groups offer recertification credits for a portion of the talks relating to pesticides. ODA and OSU Extension provide speakers upon request for some of these meetings or for employee training sessions. ODA uses these opportunities to discuss general information and specifics on water quality protection.

ODA Certification and Training

All private pesticide applicators of "Restricted Use Pesticides" (RUPs - pesticides considered to pose a serious hazard to human health or the environment), commercial applicators and public pesticide applicators must be adequately trained, certified by passing a test, and be licensed in the proper pesticide use category before they can apply pesticides. ODA is responsible for managing the pesticide licensing and recertification programs for individuals who apply, distribute or consult on the use of pesticides. ODA's licensing program includes ten license types and more than twenty exam categories. Once licensed, an individual must keep their knowledge up-to-date by attending workshops on pesticide topics or retesting. ODA works with OSU Extension, as well as qualified industry professionals, to produce training materials and workshops. ODA will also provide speakers for recertification courses upon request. In Oregon, pesticide applicator training includes information on preventing water contamination and the certification tests contain questions related to water quality protection.

ODA Newsletter

The “ODA Pesticides Quarterly” is published by ODA’s Pesticides Division and contains information on Division activities, pesticide issues, regulatory issues and new regulations. The newsletter is mailed to all pesticide license holders, registrants and others on the mailing list. Urgent issues and advisories are communicated electronically via email.

Risk Reduction (Prevention) Measures

Pesticide risks may be reduced when pesticides are applied properly and prescriptively. Evaluation of risk reduction measures may be accomplished through applicator surveys, evaluation of sales and use records and monitoring. Risk reduction measures include the application of best management practices and the OHA Wellhead Protection Program.

Best Management Practices (BMPs)

BMPs are methods or practices used to control or reduce point and non-point source pollution. BMPs provide a framework for integrated nutrient and pesticide management. The proper combination of BMPs provides protection of both ground and surface water. Technical assistance is available to growers through existing programs administered by OSU Extension, ODA - Natural Resources Division, DEQ, SWCDs, USDA-NRCS and others.

Source Water Protection Program

OHA services Oregon’s Wellhead Protection Program. Mandated by amendments to the Federal Safe Drinking Water Act in 1986, the program applies to all federally defined public water systems using water as their source. This is a pro-active program intended to prevent contamination of water used for drinking water. It is an important preventative program that is an integral part of the pesticide management plan.

401 Certification Program

Section 401 of the CWA requires that any federal license or permit to conduct an activity that may result in a discharge to waters of the Nation must receive a water quality certification from the State where the activity will occur. In Oregon, DEQ is responsible for reviewing proposed projects under this requirement.

For projects that require a dredge and fill 401 certification that involve golf courses, ball fields, vineyards, nurseries, etc, DEQ requests that Integrated Pest Management (IPM) plans be submitted as part of the review process. These plans must outline how pesticide and fertilizer applications will be minimized, the types of pesticides that will be used, and the where applications will be applied relative waterways. DEQ’s review includes ensuring that the proposed project is designed to be consistent with the Washington Toxics Coalition vs. USEPA

decision (Jan 2004) regarding buffers for 22 listed pesticides near Oregon salmonid streams.

Finally, a discussion of prevention measures is incomplete without the mention of research. Research on pesticide movement in soils and application methodology is an important element of prevention programs. It results in better management practices and vulnerability assessment tools. ODA will continue to encourage and support research in this area by universities, private industry and others.

Regulatory Approaches

ODA has the authority to impose regulations to prevent and respond to pesticide contamination. Regulatory approaches such as state imposed use-restrictions and geographical bans can be used if it is determined that an agricultural chemical poses a threat to water quality and those threats cannot be addressed through voluntary management measures. Such actions take place in the areas where contamination is confirmed. In other areas of similar or higher vulnerability where monitoring has not yet been implemented, responsible agencies will conduct assessments designed to determine the need for regulatory action. Regulatory solutions may be used when monitoring data supports the need. Most regulatory activities involve rulemaking and a public process.

Pesticide registration and labeling

All pesticides distributed and used in Oregon must be annually registered as either a General Use Pesticide or a Restricted Use Pesticide (RUP). Product labels are regularly reviewed to ensure that label instructions are compliant with EPA and OR requirements. Compliance with label language is a key component of a pesticide water quality protection program. All RUPs are sold only by licensed pesticide dealers and purchased and used only by licensed pesticide applicators. General Use Pesticides may be purchased and used by the general public or commercial applicators. The registration of additional uses of pesticides through Special Local Need applications is another mechanism of regulating the impact of pesticides on water resources through registration activities.

Under FIFRA, ODA has primary responsibility for enforcing use restrictions on pesticide labels. ORS 634.372 makes it illegal for any person to use a pesticide inconsistent with its labeling instructions. ODA will continue to enforce the label directions designed to protect water quality as a basic component of its prevention approach.

Where contamination is not decreasing after voluntary and/or mandatory approaches have been implemented, then regulatory measures may be used. The WQPMT, using the Response Matrix approach of this Plan, will be responsible for reviewing these situations and recommending specific actions based on local use practices, vulnerability assessments, levels of contamination and the period of contamination. Several regulatory options are available to ODA to further control the use of pesticides, including pesticide reclassification and pesticide use restrictions. Regulatory solutions may be used when monitoring data supports the

need. In Oregon, most regulatory activities involve rulemaking and a public process.

Pesticide Reclassification

Pesticides posing a heightened risk to water resources will require intensive management and an adequate tracking mechanism if use is continued. Reclassification from general use to restricted use is an option that would provide a mechanism for tracking sales and use through record keeping requirements. Reclassification as a Restricted Use Pesticide (RUP) ensures that only a licensed pesticide dealer can distribute the pesticide to certified applicators or their duly authorized representatives. Due to the required training and testing, users of RUPs are expected to be in better compliance with the additional use restrictions on the product label aimed at mitigating the pesticide's hazards. RUP classification also requires dealers and applicators to keep sales and use records, which allows ODA to track a pesticide's use in an area.

For those pesticides not identified as RUPs by federal rule, if voluntary preventive measures have not provided the degree of protection desired, ODA can classify a pesticide as State Restricted Use if it determines that it poses a serious threat to water, even if water monitoring has not yet detected it in the State. ODA conducts routine inspections to ensure that only licensed dealers sell RUPs only to certified applicators. The Department also conducts inspections of pesticide users to ensure they are certified and licensed to apply RUPs.

Pesticide Use Restrictions and Use Prohibition Areas

If pesticides are applied according to the label and state restrictions still fail to prevent contamination, implementation of additional restrictions will be considered. These restrictions should reduce the amount of pesticides introduced into the environment and diminish the potential for pesticide leaching. Pesticide use restrictions could include designating setback areas, use prohibition areas, and limited use areas.

Setback or buffer areas can be established beyond OHA wellhead protection zones. Buffer areas may also be designated around surface water features that are hydro geologically connected to groundwater recharge areas and identified as vulnerable or sensitive areas.

Use prohibition areas are those areas where due to the extreme vulnerability of the aquifer, responsible agencies make the determination that there are no BMPs sufficient to protect the water. In general, following the spirit of the Response Matrix, voluntary management practices will be tried first. If voluntary management practices are ineffective in protecting the water resource, the use of prohibition areas will be considered.

Limited-use areas include vulnerable aquifers where it has been determined that additional BMPs will be able to protect water resources, but where a "Use Prohibition" designation is not necessary. "Limited use" will also apply to areas having verified positive detections that have not responded to other voluntary preventive measures. Pesticide usage may be subject to the following limitations or restrictions:

- Restrict application method;
- Limit maximum application rates;
- Prohibit use on certain soil types;
- Prohibit use on certain crops;
- Limit timing of application; and
- Restrict type of formulation that can be used.

Enforcement of Pesticide Label Restrictions

Oregon has a comprehensive inspection and enforcement program to ensure compliance with product labels and Oregon pesticide laws and rules. ODA enforcement staff conducts routine inspections and responds to complaints to determine if use violations have occurred.

ODA routinely conducts inspections and investigations to ensure compliance with water quality protection requirements on pesticide labeling. Those inspections include surveys of pesticide labels in the marketplace to ensure they have the restrictions required by EPA and routine inspections of pesticide users to ensure they are following those label restrictions.

Wastewater and Stormwater Permits

DEQ's wastewater and stormwater management program regulates discharge of pollution from point sources. Point sources operate under the terms of a federal National Pollutant Discharge Elimination System (NPDES) or state Water Pollution Control Facilities wastewater discharge permits issued by DEQ. Although municipal wastewater and stormwater discharges are considered point sources, these systems collect pollutants (including pesticides) from a range of residential, industrial and commercial lands. For example, non-point runoff of pesticides applied to lawns and gardens in urban and suburban areas drain to municipal stormwater systems, and is then discharged to surface water.

For pesticides applied for aquatic weed control, these permits can provide additional protections beyond the label. Additional water quality sampling can be required to determine if the user is in compliance with the terms of the permit. DEQ can also add other requirements such as a spill contingency plan and integrated aquatic vegetation management plan.

Based on a 2006 court ruling, a NPDES Pesticide General Permit (PGP) may be required for discharges to waters of the U.S and the state of biological pesticides and chemical pesticides that leave a residue. Permits cover the following use patterns into, over or near water: (1) wide area mosquito and other flying insect control, (2) aquatic weed and algae control, (3) aquatic nuisance animal control, and (4) forest canopy pest control. There are two specific circumstances in which a permit is not required: 1) agricultural stormwater runoff; and 2) irrigation return flow.

Hazardous Waste Program

To prevent water quality impacts, DEQ provides technical assistance to pesticide users on managing waste pesticides.

See: <http://www.deq.state.or.us/lq/hw/pesticide.htm>

If water contamination occurs because of pesticide disposal that is not described on its label, DEQ may address it through their hazardous waste regulations (OAR 340-100 et seq.) Section 340-109 deals specifically with management of pesticide waste.

Underground Injection Control (UIC) Program

The intent of the UIC program is to protect groundwater resources, primarily used for drinking water, from contamination. Injection systems are any man-made design, structure or activity, which discharges below the ground or subsurface. This program implements rules in OAR 340-044. For example, OAR 340-044-0015(2)(g) prohibits agricultural drainage wells into which water contaminated with pesticides might be injected.

Non-point Source Program

Non-point source pollution comes from numerous sources such as roads, farms, logging, mining, farming, grazing, urban stormwater, and recreational facilities. Clean Water Act Section 319 requires states to have non-point source (NPS) management programs. DEQ coordinates and directs the work with other state, local and federal resource management agencies to gather needed water quality, land management and best management practice information, and evaluate their adequacy to meet water quality standards and TMDL load allocations. Through this program, DEQ also provides grant money to local organizations for projects such as watershed restoration, monitoring, and public education.

Since 2001, the 319 program has funded 15 projects that deal with pesticides in Oregon. These projects range from monitoring pesticides levels in streams to pesticide collection events.

Responsibilities of Water Suppliers

Under OAR 333-061-0025, water suppliers are responsible for taking all reasonable precautions to assure that water delivered to water users does not exceed maximum contaminant levels (MCLs). The MCLs listed in OAR 333-061 include several currently used pesticides. The responsibilities of water suppliers include routinely collecting and submitting water samples for laboratory analyses and taking immediate corrective action when the results of analyses indicate that MCLs have been exceeded. The water supplier must notify all customers in the system, as well as the general public in the service area, when an MCL has been exceeded. Water suppliers must report the results of these analyses to OHA (OAR 333-061-0040). OHA enforces these requirements through OAR 333-061-0090.

See:

<http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater/Pages/rules.aspx>

Under OAR 333-61-036 (3) (C), if pesticide contamination at or above a pesticide MCL occurs, quarterly monitoring is required. The system will not be considered in violation of the MCL until it has completed one year of quarterly monitoring. Compliance with the MCL is determined by a running annual average at each sampling point. If any sample result causes the running annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately. Community water systems are required to provide customers with an annual "consumer confidence report" that includes a list of contaminants in their water. If it is determined that a public health hazard exists, various control measures could include closing the source, blending the water with other sources to reduce the concentration or adding treatment systems. It is the water supplier's responsibility to provide clean water but their action may not address the source of the contamination. As described elsewhere in this section, there are several ways to address the source of contamination, including local source water protection ordinances, Groundwater Management Areas, Pesticide Stewardship Partnerships, pesticide use restrictions, and regulations by several different state agencies.

Private Wells

OHA and DEQ do not test (or pay for testing of) private wells. Unless a private well involves a specific project, no state agency is funded to provide free testing. Well owners can have their well water tested at a nearby laboratory at their own expense.

If test results from a private well indicate contamination, the OHA Drinking Water Program can provide information. It can also assist with information on how to disinfect the well if there are problems with microbiological contaminants, provide fact sheets for chemicals, or information on how to address other problems.

If test results show a private well has toxic contaminants at concentrations above federal drinking-water standards, the responsibility for follow-up falls to the DEQ, rather than OHA. As DEQ resources allow (depending on the magnitude of the problem and the number of persons affected), they may investigate alternative water supplies and seek the source(s) of contamination.

See: <http://www.deq.state.or.us/wq/dwp/pwofaqs.htm>

Forest Practice Chemical Rules

The Private Forests Program of the Department of Forestry administers the FPA and the forest practice rules. The program has foresters in field offices throughout the state. The Private Forests Program also has staff positions in Salem that help support program activities.

Department foresters focus on communication with landowners and operators (including pesticide applicators) before operations begin to help ensure compliance with forest practice regulations. As time and other workloads allow, the foresters also inspect ongoing and completed operations to evaluate compliance and recommend or require corrective action. In most instances, the emphasis on education and assistance, along with positive attitudes of most landowners and operators, results in voluntary compliance. In the relatively few instances each year where there are rule violations, the Department may take enforcement action. The first-line enforcement tool is often the written statement of unsatisfactory condition, which is essentially a warning ticket with direction to take immediate action to correct minor resource damage. For more serious violations, or for situations where the operator has not complied with instructions to correct minor damage, the Department may issue citations, which usually have civil penalties attached. For very serious, willful violations, the Department may issue citations with criminal penalties (this is warranted only rarely). Orders to repair damage always accompany citations, if repair is feasible. Where pesticide related investigations involve allegations of harm to humans, their property, or natural resources, the Department works closely with the Pesticide Analytical and Response Center, the Oregon Department of Agriculture, and other agencies as appropriate. The ODA has final authority to conduct investigations and take enforcement action, including the imposition of civil penalties, when a violation of label restrictions and contamination has occurred on forestlands. See: <http://www.oregon.gov/ODF/privateforests/pesticides.shtml>

Compliance and Technical Assistance

Compliance and technical assistance provides an opportunity for individuals to receive assistance from regulators to understand how to implement regulatory requirements and chemical-specific management plans. Compliance and technical assistance can help reduce violations by providing a better understanding of the requirements and specific actions required of the individual.

VII. Communications

As part of the Cooperative Agreement with the EPA, ODA must report on the status of pesticides found in ground and surface water. Reports are due once a year as described in the Cooperative Agreement.

The *WQPMT* will issue annual reports concerning monitoring results, the establishment of water quality benchmarks or reference points, networking activities, key issues and recommended management measures. In addition, other available means of communication including newsletters and web-based systems may be used.

To ensure the opportunity for participation from all stakeholders, a public notice and an open public comment period, the length being determined by the level of risk to human health or aquatic life, will be provided for significant proposed PMP decisions. This notice will be provided through a formal notice for final proposed BMPs and any proposed changes to pesticides determined to be commonly detected in groundwater or a surface water pesticide of concern. Information

reviewed by the *WQPMT* on pesticides in water resources, will be made available to the public as part of the comment process.

APPENDIX A

Agency Legal Authorities and Responsibilities

Oregon Department of Agriculture (ODA)

The mission of the ODA is 1) to ensure food safety and provide consumer protection, 2) to protect the natural resource base for present and future generations of farmers and ranchers, and 3) to promote economic development and expand market opportunities for Oregon agricultural products.

The three broad policy areas of the mission statement are interdependent. Without a strong and healthy natural resource base there would be little or no agricultural production to promote and market. Without assurance that the food produced in Oregon is safe, there is little chance that many agricultural products will be of interest to potential customers.

ODA - Pesticides Division

The Pesticides Division of ODA is the lead agency for regulating the use of pesticides. The Oregon Pesticide Control Act (ORS 634) authorizes ODA to regulate the registration, distribution, sale and use of pesticides; provide certification and licensing of all users of restricted-use pesticides; responsibility for fertilizer registration, and investigates pesticide related incidents in Oregon. It seeks to protect people and the environment from possible adverse effects of pesticide use while maintaining the availability of pesticides for beneficial uses.

Some of ODA's authority is derived from the US EPA's delegation of FIFRA authority to ODA. Since 1976, ODA annually has entered into cooperative agreements with the EPA regarding the implementation of FIFRA in Oregon. These activities include (1) enforcement of pesticide regulations, (2) certification of pesticide applicators and (3) the protection of workers, endangered species and ground and surface water from the harmful effects of pesticides.

In Oregon, compliance with label language is the cornerstone of achieving an effective water quality protection program. All pesticides distributed in Oregon must be registered by ODA. These pesticides are classified and registered either as a *Restricted Use Pesticide* (RUP) or a *General Use Pesticide*. In addition to routine registration, products are reviewed for Experimental Use Permits (EUP), Special Local Needs registrations under Section 24c of FIFRA (SLN), and Emergency Exemptions from registration under Section 18 of FIFRA. Restricted use pesticides (RUPs) may be sold only by licensed pesticide dealers and may be purchased and used only by licensed pesticide applicators. General use pesticides may be bought and used by the general public or by commercial applicators.

ODA-Pesticides Division administers a comprehensive pesticide enforcement program to ensure compliance with FIFRA and Oregon pesticide laws and rules through the gathering of information on distribution, sales and use of pesticides. Enforcement staff work with applicators, citizens, and industry and routinely conduct inspections and respond to misuse complaints to determine if violations of state and/or federal pesticide laws have occurred.

ODA is a member of the Pesticide Analytical Response Center (PARC). PARC is a multi-agency program that responds to pesticide-related incidents in Oregon. PARC does not have regulatory authority. Its primary function is to coordinate investigations, collect and analyze information about reported incidents of pesticide exposure and take necessary enforcement action when necessary. PARC maintains regular contact with the OSU Extension Service, USEPA, and other public and private organizations to facilitate the investigation of specific incidents, identify potential problems, and assist in developing solutions.

The mission of ODA is consistent with the goal of the Oregon water pollution control statute [ORS 468B.015], which directs and guides many of the multi-agency activities of this PMP. The goal of the Statute is, in part:

“To protect, maintain and improve the quality of the waters of the state for public water supplies, for the propagation of wildlife, fish and aquatic life and for domestic, agricultural, industrial, municipal, recreational and other legitimate beneficial uses; ...”, and

“To provide for the prevention, abatement and control of new or existing water pollution.

The Statute defines “waters of the state” to include both surface and underground waters.

ODA - Natural Resources Division

The Natural Resources Division’s mission is to conserve, protect and develop natural resources on public and private lands so agriculture will continue to be productive and economically viable in Oregon. Two primary program areas administered by ODA-NRD include the Agricultural Water Quality Management Program (AgWQMP) and the SWCDs.

The AgWQMP is responsible for addressing water pollution associated with agricultural lands and activities. Major objectives include the development and implementation of agricultural pollution prevention and control programs to protect the quality of Oregon’s waters. The Program has evolved in response to requirements under various state and federal laws, such as the Clean Water Act and the Agricultural Water Quality Management Act, formally known as Senate Bill 1010 passed in 1993 by the Oregon legislature.

Working in partnership with the 45 local Soil and Water Conservation Districts, ODA identified 39 watershed-based Agricultural Water Quality Management Areas across the state. The plans identify measures and strategies for

landowners to prevent and control water pollution resulting from agricultural activities. The AgWQM planning process begins once water quality issues in a watershed are identified. A plan is then required by state and/or federal law. One example of such a “trigger” for the planning process is a listing by DEQ under section 303(d) of the federal Clean Water Act.

DEQ has identified many streams throughout Oregon that do not meet water quality standards. As part of the overall water quality standards for Oregon waterways, DEQ is developing Total Maximum Daily Loads (TMDLs) for streams statewide. TMDLs are defined as the amount of pollution a body of water can absorb from a variety of sources, including agricultural activities, and still meet water quality standards. Each activity is allocated a percentage of the TMDL determined for that stream.

Each watershed plan has a Local Advisory Committee (LAC) consisting of stakeholders residing in the watershed and is responsible for developing a draft action plan to address water quality issues arising from agricultural activities. Under the AgWQM Area Plan, local operators are asked to address identified problems including pesticide contamination in ground or surface waters. The AgWQM Act provides flexibility so that landowners in each watershed are involved in the development of their own approaches to local problems. Farmers and ranchers are encouraged to choose their own ways of meeting established water quality goals. ODA does not dictate to Oregon farmers and ranchers any specific activities, but rather gives them opportunities to manage issues as long as they are following their local AgWQM Area Rules. Those who continually refuse to follow specific rules could be assessed with civil penalty.

ODA’s Role in the Water Quality Pesticide Management Plan:

- Address water quality issues using their legal authority under FIFRA, CWA and state laws.
- Coordinate with SWCDs to act as Local Management Agencies to implement their Agricultural Water Quality Management Area Plans.
- Provide expertise and recommendations on agricultural practices, pesticides, mitigation measures and BMPs.
- Coordinate with pesticide users to implement voluntary management measures.
- Initiate regulatory actions when appropriate to reduce or mitigate the impact of pesticide use on the state’s water resources.
- Coordinate with other state agencies to develop and implement water monitoring strategies and programs.
- Facilitate *WQPMT* meetings.

Oregon Department of Environmental Quality (DEQ)

DEQ has broad authority under the federal Clean Water Act as well as Oregon State statutes and associated administrative rules to develop and implement programs to protect and enhance the quality of the waters of the state to ensure public health and the environment are protected.

DEQ's responsibilities include setting water quality standards; performing studies of water bodies; setting total allowable loads for water quality limited streams; analyzing water quality monitoring data to determine problem areas and developing strategies, programs, rules or legislation to address the identified problems; assisting regional staff in implementing permitting programs through training, guidance development, rule interpretation and rule development; providing financial assistance to qualifying municipalities for construction of sewage treatment facilities; certifying qualified sewerage plant operators; managing the municipal sewage sludge and industrial pretreatment programs; assisting regional staff in implementing the on-site sewage disposal program; licensing septic tank pumpers and installers; and developing programs to control non-point sources of pollution.

In Oregon, statutory authority for development and enforcement of water quality policies lies with several different state agencies, primarily the DEQ, and also with the ODA, ODF, and OHA. In addition to administering its own programs, DEQ is responsible for coordinating interagency management of water quality as necessary to achieve the goal of ORS 468B.155, the protection of Oregon's Waters of the State for a wide range of uses, such as drinking water, recreation, fish habitat, aquatic life and irrigation.

DEQ continues to implement several prevention and response programs that address pesticides. DEQ's involvement in protection of drinking water is discussed under the section "Oregon Health Authority" due to the partnership that the two agencies have in that effort.

DEQ's various water quality programs meet the federal Clean Water Act, requirements of ORS 468B, and related rules by:

- Developing water quality reference points and standards for Oregon's waters;
- Monitoring surface water quality with regular sampling of more than 50 rivers and streams in the 18 designated river basins found in Oregon (ambient monitoring);
- Conducting a statewide groundwater monitoring and assessment program to identify and characterize the quality of Oregon's groundwater resources (groundwater monitoring);
- Assessing water quality and prepare a list of impaired streams needing TMDLs as well as an integrated report (§305(b))
- Conducting water quality analysis and assigning load allocations to sources in impaired watersheds (TMDL)
- Regulating injection systems through a registration process and, when necessary, by issuing permits to protect groundwater (UIC);
- Providing technical assistance to public drinking water system to implement plans to protect drinking water (Drinking Water Protection);
- Maintaining a plan that describes how the state intends to manage non-point sources (NPS) to protect and restore water quality affected by non-point sources of pollution that include logging, mining, farming, grazing, urban stormwater, and recreational facilities.

- Offering low interest loans to public agencies to help fund improvements to water quality (SRF);
- Offering grants to help fund improvements to water quality from non-point sources (§319)
- Managing the Pacific Northwest Water Quality Data Exchange (PNWWQEx) to help provide a data repository for water quality data, which is both useful and usable (MSD);
- Administers pesticide collection programs when funding is available;
- Administers a toxics program;
- Approves and issues NPDES permits (Surface Water);
- Certifies federal actions for Water Quality Standards consistency (§401 WQ Certification);

DEQ's Role in the Water Quality Pesticide Management Plan:

- With OHA, lead the effort to establish water quality reference benchmarks or selected pesticides.
- Share knowledge, expertise and recommendations on pesticide toxicity and contamination issues and other ongoing DEQ water-related programs (PSPs, GWMAAs, etc.)
- Coordinate with other state agencies to develop and implement water quality monitoring activities.
- Coordinate implementation of the drinking water source water assessment and monitoring program with OHA.
- Develop and implement PSPs, which use monitoring data as a tool to encourage and assist pesticide users to implement voluntary management measures.
- Initiate regulatory actions when appropriate to reduce or mitigate the impact of pesticide use on the state's water resources, such as listing pesticides on 303(d) list, developing TMDLs, and taking enforcement actions for water quality standards violations.
- Maintain and track pesticide data using a water quality database for DEQ data and look for opportunities to establish a data repository.
- Provide technical assistance to local groups designing studies and collecting data in selected priority basins and watersheds.

Oregon Department of Forestry (ODF)

ODF is responsible for protecting, managing, and promoting stewardship of Oregon's forests to enhance environmental, economic, and community sustainability. The Oregon Department of Forestry administers the Forest Practices Act (ORS 527.610 to 527.770, 527.990, and 527.992) and the related forest practice rules, which regulate forest products harvesting and associated activities, including forest pesticide use.

The Oregon Forest Practices Act (FPA) sets policies, procedures, and some standards for forest practice regulation in Oregon. The FPA gives the Oregon Board of Forestry the exclusive authority to adopt further procedures and standards in the forest practice rules (OAR 629-600 through 629-665, and 629-670). The forest practice rules include the Chemical and Other Petroleum

Product Rules (OAR 629-620), which prescribe standards for natural resource protection when forest pesticides are used. The FPA and forest practice rules are designed to support economically efficient forest practices on forestland consistent with sound management of soil, air, water, fish and wildlife resources (ORS 527.630(1)). ODF administers the specific standards in the FPA, and all the standards and requirements in the forest practice rules.

The Oregon Board of Forestry designed the Chemical and Other Petroleum Product Rules (often referred to as “the Chemical Rules”) to mesh with regulations administered by other agencies, including those listed in the following. The total intended effect is that all of the regulations apply to a given forest pesticide application, and where there is any difference, the more stringent requirement applies.

- The forest practice rules include a requirement for forest pesticide users to comply with product labels. By agreement between the agencies, ODA typically takes primacy for incidents that may involve label violations, although ODF supports the investigations.
- ODA administers the state pesticide control law, including taking the lead in investigations of alleged violations of label requirements or alleged drift across property lines. Where the allegations may involve forest pesticide applications, ODF is a partner in the investigations.
- DEQ typically takes primary jurisdiction on requirements for spill reporting, control, and clean up, but ODF has some authority through the forest practice rules as well if spills result from forest operations.

The rules regulate the mixing and application of pesticides used in forestry operations. They also provide for buffer zones near waters of the state and require notification of public water system managers under certain circumstances. The rules are enforced through the penalty provisions of OAR 629-670.

ODF’s Role in the Water Quality Pesticide Management Plan:

- Address water quality issues by using their legal authority under state and federal laws.
- Provide expertise and recommendations on forest practices, pesticide use in the state’s forests, mitigation measures and Best Management Practices.
- Coordinate with pesticide users to implement voluntary management measures.
Defer to the Oregon Department of Agriculture on initiating regulatory actions related to pesticide product label violations to reduce or mitigate the impact of pesticide use on the state’s water resources.
- Coordinate with other state agencies to develop and implement water monitoring strategies and programs.

Oregon Health Authority (OHA)

The mission of the Oregon Health Authority is to help people and communities achieve optimum physical, mental and social well-being through partnerships, prevention and access to quality, affordable health care.. Ensuring safe water for Oregonians is a key function of the OHA Office of Environmental Public Health and activities are administered through programs in the Drinking Water section and the Research and Education Services section.

The Drinking Water Program administers and enforces drinking water quality standards for public water systems in the State of Oregon (Oregon Revised Statute 448). The program emphasizes prevention of contamination through source water protection, technical assistance to water systems, and training of water system operators.

OHA's Role in the Water Quality Pesticide Management Plan:

- Provide expertise in toxicology, human health risk assessments and public health policies for the protection of water resources.
- With DEQ, lead the effort to select water quality guidelines for evaluating pesticides.
- Facilitate participation of local health departments and water purveyors in local pesticide management plans.
- Coordinate with other state agencies to develop and implement water monitoring strategies and programs.
- Share data collected from source water assessments and drinking water monitoring programs.
- Interact with pesticide users to implement voluntary management measures.
- Initiate regulatory actions when appropriate to reduce or mitigate the impact of pesticide use on the state's water resources.

APPENDIX B

Oregon Pesticides of Interest: *potential to occur at concentrations approaching or exceeding a Federal, State, or Tribal human health or environmental reference point. Complete 2011 list. (+ indicates degradates/metabolites included)*

Active Ingredient	Active Ingredient
2,4-D	Isoxaflutole
Acetochlor	Lambda-cyhalothrin
Alachlor	Lindane
Aldicarb (+)	Linuron
Atrazine (+)	Malathion
Azinphos-methyl	Mesotrione
Azoxystrobin	Metalaxyl
Benfluralin	Metolachlor (+)
Bentazon	Metribuzin (+)
Bifenthrin	Metsulfuron methyl
Bromacil	MSMA (+)
Carbaryl	Myclobutanil
Carbofuran	Napropamide
Chlorothalonil	Norflurazone (+)
Chlorpyrifos	Oxyfluorfen
Clopyralid	PCP (Pentachlorophenol)
Copper-based pesticides	Pendimethalin
Cyfluthrin	Permethrin
Cypermethrin	Phenoxy Herbicides
Dacthal (DCPA)	Phosmet
DBCP	Picloram
Deltamethrin	Prochloraz
Diazanone	Prometon
Dicamba	Prometryn
Dicofol	Propargite
Dimethenamid	Propazine
Diuron	Propiconazole
Endosulfan (sulfate)	Propoxur
Esfenvalerate	Simazine (+)
Ethalfuralin	Sulfometuron
Ethoprop	Tebuthiuron
Fenbutatin oxide	Terbacil
Fipronil	Thiamethoxam
Flumetsulam	Tralkoxydim
Glyphosate	Triadimefon
Hexazinone (+)	Triallate
Imazamethabenz	Triclopyr
Imazapyr	Trifluralin
Imidacloprid	