



Waiving Phase II Monitoring Requirements

By Dennis Nelson and Kurt Putnam

THE 1986 amendments to the Safe Drinking Water Act (SDWA) require that during the three-year period starting January 1, 1993, all community¹ and nontransient noncommunity² water systems analyze their water for the Phase II synthetic organic contaminants (SOCs), including 18 regulated³ and 23 unregulated pesticides. The amendments require that *each* source be sampled in *each* of four consecutive quarters of a calendar year determined by the State. The costs of these analyses have been estimated to be as high as \$1,000 per sample (i.e. up to \$4,000 per source for the full year of monitoring). Full sampling will have to be performed *unless* it has been determined that the system is not vulnerable to contamination *and* a waiver has been granted by the State.

Conducting the vulnerability assessment is optional. Without the assessment, however, four quarters of monitoring for all SOC's will be required for each source. If the vulnerability assessment is conducted, the water system will be responsible for gathering the necessary information. The Oregon Health Division (OHD) will provide technical assistance and is developing a guidance document which spells out what data is required and where it can be obtained. OHD will review the data submitted by the system and determine the monitoring requirements. This article reviews the waiver application-monitoring requirement procedure.

THE U.S. Environmental Protection Agency (USEPA) has provided the criteria used to determine whether a waiver from monitoring can be granted; the State has the responsibility for establishing specific procedures. OHD has been developing the waiver application process since June 1991 with a committee of representatives from the Oregon Department of Agriculture; Water Resources Department; Department of Environmental Quality; Soil Conservation Department; OSU Extension, including county agents and faculty; and OSU Agricultural Chemistry Department. A draft of this document was discussed during the Phase II workshops in January 1992.

The committee had several objectives when designing the waiver application process:

- Focus on systems using groundwater, i.e., wells and springs.
- Use site specific information, directly related to the particular water source in question.
- Provide a defensible evaluation of aquifer vulnerability having use beyond Phase II, i.e. for future vulnerability assessments or in the Wellhead Protection Program.

- Base the procedure on available existing data so applications can be accomplished at the local level by the water supplier at reasonable cost.

Aquifer vulnerability is a function of both pesticide use and aquifer susceptibility. The USEPA guidelines define *use* as "...the application, storing, distributing, disposing, or transporting of..." a contaminant in the area. An aquifer is *susceptible* to contamination if the combination of the geology of the area and a contaminant's chemical properties create the opportunity for a contaminant used in the area to move from the surface to the aquifer.

The committee divided the waiver application into two parts, the first dealing with pesticide use, the second with the susceptibility of the aquifer to contamination. A water system's first step will be to inventory current crop patterns in a circular area around its wells and, using John W. Rinehold and James M. Witt, *Oregon Pesticide Use Estimates for 1987* (Corvallis: Oregon State University Extension Service), determine pesticide use as a function of crops grown. This publication

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Dennis Nelson, PhD, RG, is the groundwater coordinator and Kurt Putnam, RS, is a regional sanitarian for the Drinking Water Section.

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(EM8507) will be available after June 1, 1992, from Agricultural Communications at Oregon State University. Orders will not be accepted prior to June 1. Ordering information will be distributed by OHD to those systems that have expressed an interest in conducting the vulnerability assessment procedure (see below).

SYSTEM personnel will refine the preliminary list by contacting individuals such as licensed applicators and pesticide distributors/dealers who have knowledge of pesticide use associated with a particular activity or location such as maintenance of rights-of-way, agricultural practices, residential and industrial properties, and public and private forest lands.

The refined inventory will create a list of the regulated and unregulated pesticides that are now being or have been used in the area of a particular water source. Those which are *not* on the list are eligible for a reduction in monitoring and it is *not* necessary to evaluate aquifer susceptibility for *those* chemicals. Given the long-term persistence of some pesticides in the environment, the lack of historical data will not allow us to waive monitoring completely. All systems will have to complete at least one sample for all regulated and unregulated SOCs except in unusual cases (such as extremely isolated water sources, etc.). For those pesticides still on the inventory list, water systems will have the option of either monitoring during the *four* quarters discussed above or proceeding to the susceptibility determination.

The purpose of susceptibility analysis is to determine the probability or likelihood that a given contaminant will reach the aquifer. This phase of the application will determine whether the system will be required to perform full or reduced monitoring for each pesticide used in the area.

THE committee agreed that monitoring would have to be accomplished if a well report (well log) was not available for the system's well(s). Without a report, there is no basis for determining what aquifer the well taps, the depth of the seal, the depth of the well and consequently, aquifer susceptibility. The committee also identified factors important in determining the potential for movement of the contaminant to groundwater: history of nitrate or total coliform in the aquifer, well construction, geology, hydraulic surplus and chemical properties.

A record of problems of elevated nitrate or the presence of coliform bacteria *in the source* may imply that water from the surface is reaching the aquifer fairly directly. As a result, other contaminants, including pesticides, may also be transported. Such a surface connection indicates

a higher susceptibility to contamination and an increased level of monitoring will be required.

Full monitoring would also be required for those systems where the well report indicates a lack of protection from inflow of surface-derived water. Of concern is the case where the well penetrates highly permeable geologic materials such as sand and gravel and the seal does not extend into a confining or low-permeability unit such as a clay layer. Under such conditions, water percolating downward from the surface may find easy access to the aquifer.

The important geologic parameters are depth to the aquifer and the weighted hydraulic conductivity of the soil and vadose zone (area between the soil zone and the aquifer). Both variables will influence how long it takes water to reach the aquifer. The longer that time, the more chance the pesticide will be degraded by biologic activity, dilution or chemical reactions. Pertinent information can be derived from well reports, groundwater reports on the area and county soil surveys by the Soil Conservation Service.

SUSCEPTIBILITY of the aquifer also depends on whether there is a hydraulic surplus, excess water delivered to the surface that can percolate to the aquifer. The amount of water available for infiltration is dependent upon a number of factors: precipitation, irrigation (amount and method), evaporation, transpiration, runoff, surface character, etc. Quantification of the total effect is very difficult. The concept of hydraulic surplus has been utilized in Vogue, et al., *Guidance for Minimizing Movement of Pesticides to Groundwater* (unpublished manuscript: Corvallis, OR). This parameter is equal to rainfall plus irrigation minus evapotranspiration minus runoff. The Health Division is compiling sources of data for this information.

Geology and hydraulic surplus control the amount of water and length of time it takes to reach an aquifer. Whether that water will transport a given substance depends on the contaminant's chemical properties, how much organic matter occurs in the soil, how well the contaminant binds with it and how persistent is the contaminant. Data for determining these parameters are available from the USEPA and county soil surveys.

The level of monitoring will be determined through the use of a series of related matrices. A typical matrix, in this case for determining the *Traverse Potential*, or the likelihood of water traveling from the surface to the aquifer, is shown in the accompanying figure (pg. 6). This matrix uses the weighted hydraulic conductivity (Kw) and depth to the aquifer. The higher the traverse potential, the more susceptible the aquifer.

For example, for a given depth, wells in more permeable material such as sand and gravel ($K_w > 1000 \text{ gal/d/ft}^2$) have a higher traverse potential than wells in less permeable material such as silt ($K_w = 1 \text{ gal/d/ft}^2$). On the other hand, for a given type of aquifer material, shallow wells yield a higher traverse potential than deep wells, indicating a higher susceptibility.

The traverse potential is combined with hydraulic surplus to further evaluate the potential of the water to reach the aquifer. That result will be considered with the chemical characteristics to determine the extent of monitoring.

ATHOUGH the guidelines were designed so that water system staff would be able to accomplish most of the work, portions of the susceptibility analysis will have to be done by or under the guidance of a registered geologist. In particular, the weighted hydraulic conductivity discussed in the preceding paragraph will require interpretation of well logs or published literature and therefore requires geologic expertise. Expenses associated with retaining a geologic consultant will be minimized if the water system makes the effort to compile all the necessary data. In most cases, the data required for the susceptibility determination are already available. OHD is writing a guidance manual that will list specific sources of information or, in some cases, compile actual values to be used in the determination. The manual will spell out procedures in a step-by-step fashion so the water system will be better able to collect the data and understand how it will be utilized in the waiver decision process.

Given that the data to be used in the determination will by necessity be approximate, the committee did not believe the technique would be accurate enough to allow OHD to waive monitoring completely. As a result, all systems will have to accomplish at least one sampling during the first compliance period.

Monitoring will also have to be accomplished for *surface water* systems. Procedures for assessing their vulnerability have not yet been established nor is it necessary that they be at the same level as those for groundwater systems. The area in which pesticide use will be inventoried will be the entire drainage basin, defined by topography.

OHD views the Phase II waiver application process as a useful tool in an overall groundwater protection strategy. Although the costs associated with the vulnerability assessment may be nearly the same as those for a full round of initial monitoring, the long term benefits will be greater because reduced monitoring requirements continue to save money in the future.

The results of the vulnerability assessment will likely be usable in assessments required for contaminant monitoring in the future by compiling data that is specific to each system. Not only will systems gain a better understanding of their own water supplies, but OHD will have site specific data available to provide better technical assistance at both local and regional levels. The vulnerability assessment is an opportunity to increase our knowledge of the groundwater resource in the state as well as minimize the cost of monitoring.


Systems interested in pursuing the use and/or susceptibility waivers should request a copy of the guidance document by completing and mailing the form below.

¹A public water supply with at least 15 connections or that serves 25 or more year-round residents (e.g. cities, towns, mobile home parks and subdivisions).

²A public water supply serving 25 or more of the same people for more than six months out of the year (e.g. schools and work sites).

³See December, 1991, Special Edition of the **PIPELINE**.

I plan to apply for the waivers indicated below with respect to Phase II contaminants. Please send a copy of the *Guidance Document for Phase II Use and Susceptibility Waiver Application* to:

 _____

Name: _____

Address: _____

Phone: _____

Water System Name: _____

Identification Number: _____

Water source (circle all that apply): surface well spring

System classification: Community Nontransient noncommunity

My interests are as follows: Use waiver Susceptibility waiver Both

Mail to: Kurt Putnam, SOC waiver coordinator
 Drinking Water Section - FS
 Box 14450
 Portland OR 97214-0450

Phase II Rule Hearing in Eugene

Oregon Health Division, will hold a public hearing May 13 at 1:30p.m. on new administrative rules for the Phase II organic and inorganic contaminant regulations at Harris Hall (basement, south room) 125 E. 8th, Eugene. Copies of the proposed rules are available the Drinking Water Section-FS, PO Box 14450, Portland 97214-0450. Written comments will be accepted through May 20.

Options for SOC Monitoring

Below are the options available when monitoring for VOCs, PCBs and pesticides under Phase II. Completion of any of the three without a detection will result in compliance with the Phase II rule; each community and nontransient noncommunity system will have to do one option.

1. System decides not to conduct a vulnerability assessment.

a. Four quarters of initial monitoring for all the SOCs are required.

2. System conducts use assessment only, and applies for and receives use waiver.

a. For those SOCs identified in the use waiver as *not used*,

(1) Population served > or = 3,300: two quarters of initial monitoring.

(2) Population served < 3,300: one quarter of initial monitoring.

b. For those SOCs identified as *used*,

(1) Four quarters of initial monitoring are required.

3. System conducts use and susceptibility assessment, and

May 1: Notify OHD of intent to apply for a waiver (use coupon on page 3).

June 1: Receive copy of waiver application package from OHD.

Sep. 15: Last day to send completed waiver application to OHD.

Nov. 30: Notification of waiver decision from OHD³.

¹All dates except Sep. 15 are recommendations or estimates only.

²All other systems will monitor in 1994 or 1995.

³Applications will be processed in order of receipt. The sooner a system submits a completed application, the sooner it will be notified of its monitoring requirements.

By Dennis Nelson

applies for and receives use and susceptibility waivers.

a. For those SOCs identified in the use waiver as *not used*,

(1) Population served > or = 3,300: two quarters of initial monitoring.

(2) Population served < 3,300: one quarter of initial monitoring.

b. For those SOCs identified as *used*,

(1) Initial monitoring frequency for each contaminant as indicated by the susceptibility analysis (i.e. 1, 2, 3 or 4 samples for a given contaminant during the first year).

Important 1992 dates¹ in waiver application process for systems serving > 300 population².

New State Offices Open

Drinking Water Section has a new home. We moved over Presidents' Day weekend to the new State Office building, 800 NE Oregon St., Portland. We welcome you to see our facility when you're in town.

The best routes to the new State Office building are:

- From I-5 north or south, take the Broadway exit which actually puts you on Weidler St. Go east on Weidler (parallels Broadway and is one block south) to 7th or 9th (depending on construction). Turn south and go to Oregon St.
- From the east on I-84, take the Lloyd Blvd. (Lloyd Center) exit 1. Go west about six blocks. The State Office building is just west of the Bonneville Power Administration building (BPA has a curved facade facing I-84).

There is some metered parking on the west side of the building and some free (mostly one- and two-hour limit) parking on nearby streets.

Telephones			
Section Manager (Dave Leland)	731-4010	Eastern region (Gary Burnett)	276-8006
Monitoring/Compliance unit (Mary Alvey)	731-4381	Corvallis (John Potts)	757-4281
Field Services unit (Chris Hughes)	731-4317		
Addresses			
<i>(Correspondence, plan review and general matters- was PO Box 231)</i>	<i>(Water test results only-was PO Box 200)</i>	<i>(Tests of private wells for sale of property-was PO Box 6350)</i>	<i>(Physical location)</i>
Drinking Water Section	Drinking Water Section	Drinking Water Section	Drinking Water Section
Oregon Health Division	Oregon Health Division	Oregon Health Division	Room 611
P.O. Box 14450	P.O. Box 14350	P.O. Box 14560	800 NE Oregon St., # 21
Portland OR 97214-0450	Portland OR 97214-0350	Portland OR 97214-0560	Portland OR 97232

Measure 5 Reductions Affect Drinking Water Program

By Dave Leland, Drinking Water Section Manager

As many of you know, general fund reductions under Measure 5 are beginning to affect nearly all state programs. The drinking water program is no exception. Earlier this spring, the Governor directed state agencies to prepare and implement a plan to eliminate 4,000 positions by June 1993 a reduction of approximately 10%.

As part of this task, the Health Division was assigned a reduction target of 38 positions and directed to prepare a schedule to phase in these reductions between now and June 1993 in preparation for further reductions in 1993-95. The portion of this reduction assigned to the Drinking Water Program was 3 positions (1 manager and 2 classified) and represents a 10% reduction in the overall program staff level. The effective date of the drinking water program reductions is July 1992.

Because the reductions were directed to those functions supported by general funds, not federal funds or fee revenues, they affect state drinking water technical assistance functions rather than federal drinking water program activities. The program priorities document developed by program staff and the Drinking Water Advisory Committee (see April 1990 *PIPELINE*) was relied on heavily to identify specific program reductions. The reductions were therefore made in the Technical Services Unit and include unit management, cross connection control, training coordination and health hazard studies. Although these functions were generally identified as low or medium priority within the program plan, they are all highly successful and important public health programs in their own right. Their elimination represents a significant impact on protection of public health for Oregonians. The remaining functions in the Technical Services unit, groundwater protection and operator certification, will be transferred to the two remaining work units.

Cross connection control has generated the most concern from public water system operators and managers. While we will cease our role in coordinating the program, assisting in training, and in tracking and certifying device testers and inspectors, our requirements will remain on the books. Our field staff will continue to handle specific technical questions and provide assistance as time allows. We plan to present the 1993 legislature with a proposal to gain clearer statutory authority to certify testers and inspectors and to obtain authority to charge a fee to support these activities. This will allow us to restaff this important program in July

1993.

In the meantime, utilities will be expected to continue their local cross connection programs according to the rules, and we believe that formal training courses offered at the community college level (which are tuition supported) will continue. Local utilities may need to verify if their local testers have met course requirements. Fee proposals are likely to be unpopular in the next legislative session, so we are counting on industry support for our proposal to restart the cross connection program.

We are beginning to prepare our proposed budget for 1993-95. This is likely to be a very difficult process and we will continue to keep water suppliers and other interested parties informed on program impacts.

Mutual Aid May Save Money

In the January *PIPELINE*, the article on emergency response planning mentioned mutual aid agreements as an important component of ER plans.

Mutual aid is based on the idea of communities or systems agreeing to assist one another in time of need. They agree to share resources without giving up their individual identities. Some examples:

- sharing personnel such as certified operators to serve as backups during vacations or other absences; sharing maintenance specialists;
- agree to buy jointly materials in bulk to achieve economies of scale.
- develop a master resource sheet listing all available equipment and supplies that might be available for barter or rent.

Forming a mutual aid organization involves a number of steps and should involve elected officials, management personnel and water works staff.

1. Identify an individual willing to organize the network.
2. Identify and recruit key people and supporters.
3. Schedule the first meeting as informational with no major decisions expected and serving to identify the potential benefits of a mutual aid network. Keep minutes of the discussion to share with those who were invited but unable to attend. Identify a neutral facilitator to run the meeting.
4. The second meeting should affirm the collective interest in establishing a network and the scope of the group's efforts. This includes identifying institutional and legal constraints and developing strat-

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Training Calendar

Small Water System Training courses

Drinking Water Section, OHD
 Contact Claudia Stiff, 731-4317
Date County / other location
 June 2 Celilo Converter Station, The Dalles 9am-4pm
 June 4 Bend Pub. Works Complex 1375 NE Forbes 9am-4pm

July Douglas/Lane
 Aug Lincoln
 Sept Pendleton/Klamath Falls
 Oct Polk/Yamhill
 Nov Tillamook/Clatsop/Columbia

Backflow Device Tester's School

June 8-11 Clackamas Community College
 June 15-18 Clackamas Community College

Backflow Device Tester's Update

June 12 Clackamas Community College
 June 19 Clackamas Community College

Traverse Potential (From pg. 2)

(average groundwater velocity/travel time)

		Depth (ft) to aquifer					
		50	100	150	200	250	300
Kw	1000	10	10	10	9	9	8
	100	8	8	7	7	6	5
	10	5	4	4	3	3	2
	1	3	3	2	2	2	1
	0.1	2	2	1	1	1	1
	0.01	1	1	1	1	1	1

1 = low potential; 10 = high potential

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Please send requests for article topics or manuscripts of your articles to John Gram, editor (503 / 731-4010).

This issues contributors include: John Gram, Ron Hall, John Huffman, Dave Leland, Dennis Nelson and Kurt Putnam, Oregon Health Division.

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gies to overcome them. It will be important to keep the benefits in mind to avoid bogging down at this point.

- Subsequent meetings should focus on formalization of the group including election of officers, development of agreements and plans for future meetings.

Obviously some elements will be easier to implement. The benefits will determine the level of effort to be expended but virtually all systems will find some involvement worthwhile. Mutual aid agreements are a proven way of strengthening your system at minimum cost.

PIPELINE repairs:

Bill Keyser's and **Ron Gross'** names were misspelled in the January 1992 issue.