Source Water Assessment Report

City of Bandon, Oregon

PWS #4100074

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Prepared for
City of Bandon

Prepared by

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Executive Summary

The drinking water for the City of Bandon is supplied by intakes on Ferry and Geiger Creeks. This public water system serves approximately 2800 citizens. The intakes are located in the Ferry Creek Watershed in the Coquille River Sub-Basin. The geographic area providing water to Bandon's intake (the drinking water protection area) extends upstream approximately two miles in a southeasterly direction and encompasses a total area of 4 square miles. The elevation change from the upper edge of the watershed to the intake is approximately 400 feet. The City of Bandon's intake is located at approximately 75 feet as Geiger Creek flows into Ferry Creek.

An inventory of potential contamination sources was performed within Bandon's drinking water protection area. The primary intent of this inventory was to identify and locate significant potential sources of contaminants of concern. The inventory was conducted by reviewing applicable state and federal regulatory databases and land use maps, interviewing persons knowledgeable of the area, and conducting a windshield survey by driving through the drinking water protection area to field locate and verify as many of the potential contaminant source activities as possible. The primary contaminants of concern for surface water intakes are sediments/turbidity, microbiological, and nutrients. It is important to remember that the sites and areas identified are only potential sources of contamination to the drinking water, and water quality impacts are not likely to occur when contaminants are used and managed properly.

The delineated drinking water protection area is primarily dominated by forest and agricultural land uses with interspersed areas of residential use. A total of 27 potential contaminant sources were identified in the watershed. Of those, 18 are located in the sensitive areas. Potential contaminant sources that pose a higher to moderate relative risk to the drinking water supply include irrigated crops (cranberry bogs), the transportation corridors, public utility facilities, a managed forest area, a high density housing area using septic systems, a borrow pit, a historic spill, and a planned cranberry bog reservoir. The two potential contaminant sources with lower relative risk levels are associated with rural residential areas using septic systems.

The susceptibility analysis combines the results of the locations of the potential contaminant sources with the locations of the sensitive areas. Overlaying the locations of the moderate- to high-risk sources within the sensitive areas provides an indication of the areas that are highly susceptible to contamination. In the Bandon watershed, the results of the susceptibility "analysis" include the distribution of 16 identified high- to moderate-risk sources within the areas of soil with high runoff potential, and within the 1000' setback from the streams. The susceptibility analysis provides the community and the public water system with information on where the greatest risk occurs and where to focus resources for protection.

Introduction{tc "Background" \l 2}

In 1996, Congress amended the Safe Drinking Water Act, implemented some new requirements, and provided resources for state agencies to assist communities in protecting the sources of their public water supplies. The US Environmental Protection Agency (EPA) developed guidelines for implementing the new requirements to conduct "source water assessments" (EPA, 1997). In Oregon, the Oregon Health Division (OHD) and the Department of Environmental Quality (DEQ) are conducting the source water assessments. An assessment such as this one will be done for every public water system in Oregon regulated by the Safe Drinking Water Act. DEQ and OHD will each have specific tasks in accomplishing the assessments for a total of 2656 public water systems in Oregon. Of those 2656 public water systems, about 90% of these are groundwater systems drawing water from wells or springs, and 10% are surface water systems with intakes on streams, rivers, or lakes/reservoirs.

The assessments in Oregon include delineating the source area supplying the public water system, identifying areas "sensitive" to contamination, and conducting an inventory of potential contamination sources in the area. Using the results of the inventory and sensitive areas, the susceptibility of the public water system is determined. OHD will provide the delineation for all groundwater systems and the identification of the sensitive areas within their source area. DEQ will delineate and identify the sensitive areas within the watersheds for the surface water systems. DEQ will conduct all inventories of the potential contaminant sources inside the drinking water protection areas and this is then used to estimate the public water system's susceptibility to contamination.

Sources of information reviewed during this assessment included U.S. Geological Survey (U.S.G.S.) documents/websites, DEQ reports, EPA/DEQ databases, and other readily accessible reports. The reference list provides a few of the good sources of information used in the report. Time constraints do not allow research into all existing technical resources available for each system. As the assessment is performed, assistance from municipal water staff, state/federal land management officials, and community members will increase OHD and DEQ's abilities to characterize local hydrogeologic/hydrologic conditions, site-specific information, and ultimately increase the quality of the assessment. Where possible, DEQ staff has consulted local Natural Resource Conservation Service, county planning agencies, irrigation districts, and other natural resource officials.

Many watersheds in Oregon provide water used for public or "domestic" drinking water supplies, irrigation, industry, hydro power, fish hatcheries, and of course, natural in-stream fish rearing. Watersheds vary considerably in terms of overall health and susceptibility to contamination. Most surface water sources for drinking water are filtered and undergo treatment (disinfection) prior to delivery to the consumer. The ability to adequately (and cost-effectively) treat drinking water from a surface water source is directly related to the quality of the water at the intake. Surface water intakes for public water supplies are generally very susceptible to increases in coarse sediments. Treatment facilities for public water supplies are very susceptible to increases in fine sediments, nutrients and other organic and inorganic contaminants. Treatment facilities are also negatively impacted by changes in temperature.

Changes in surface water quality parameters can be caused by a variety of factors in any watershed. Detailed consideration of all the variables was beyond the scope of this assessment. The procedures for conducting these assessments were developed by a statewide advisory

committee (Source Water Assessment Plan, 1999). The value of preparing detailed procedures is in the ability to be consistent from one system to the next. There are also severe time constraints for the amount of time allowed to complete each public water system assessment. It is our intent to provide as much information about the watershed as our program resources allow.

Using the results of this assessment, the public water system and the local community can then move forward with voluntarily developing and implementing a *drinking water protection plan*. The requirements for water quality monitoring of public water systems in Oregon provide some degree of assurance of safe drinking water; however, all systems are vulnerable to potential contamination. One of the best ways to ensure safe drinking water and minimize future treatment costs is to develop a local plan designed to protect against potential contamination. Not only will this measure add a margin of safety, it will raise awareness in the local community of the risks of drinking water contamination, and provide information to them about how they can help protect the system. It is our hope that each community will use the assessment results as a basis for developing a drinking water protection plan.

Background {tc "Introduction to Delineation Process" \l 2}

Bandon is located in Coos County, Oregon about 18 miles south of Coos Bay on Highway 101. The drinking water for the City of Bandon is supplied by intakes on Ferry and Geiger Creeks. This public water system serves approximately 2800 citizens. The intakes are located in the Ferry Creek Watershed in the Coquille River Sub-Basin, Hydrologic Unit Code (HUC) #17100305. The watershed is within the physiographic province known as the Coast Range.

The City of Bandon's intake is located at an elevation of approximately 75 feet as Geiger Creek flows into Ferry Creek. The coordinates for the Ferry Creek intake are 43.11418 north latitude and 124.38123 west longitude. The coordinates for the Geiger Creek intake are 43.11359 north latitude and 124.3847 west longitude. DEQ obtained the coordinates using a Geographic Positioning System (GPS) in February 1999.

The study area for evaluating the extent of the Bandon's drinking water protection area (DWPA) includes US Geological Survey topographic maps for Bill Peak and Bandon at the 1:24,000 scale. The surface water intakes plot on the U.S. Geological Survey Bandon quadrangle topographic map. The geographic area providing water to Bandon's intake (the drinking water protection area) extends upstream approximately two miles in a southeasterly direction and encompasses a total area of 4 square miles. The elevation change from the upper edge of the watershed to the intake is approximately 400 feet.

The basement rocks in Bandon's drinking water protection area consist a thick sequence of bedded sandstone and siltstone containing minor conglomerates which are called the Roseburg formation (Baldwin et.al., 1973). Pillowed and brecciated (fragmented) basalts are abundant locally. The Roseburg formation is greater than 2,000 feet thick and generally has low permeability and limited potential for groundwater withdrawal (Beaulie and Hughes, 1975). The Roseburg formation is overlain by marine and stream terrace deposits which are elevated deposits of loosely compacted bedded sand and minor gravel with some local organic matter (Baldwin et.al., 1973). Groundwater production is low to moderate in the terrace deposits and hazards are generally

negligible but may include headland erosion, stream bank erosion, poor drainage, failure in deep cuts (Beaulie and Hughes, 1975).

The climate in the Coquille Sub-Basin area is characterized by moderate annual temperature and precipitation variations. Information on climate in the Bandon drinking water protection area is based on the National Oceanic and Atmospheric Administration's (NOAA) Bandon climate station, which is located at an elevation of 20 feet above mean sea level (Western Regional Climate Center). The average annual temperature recorded at the Bandon station is 52 degrees for the period of 1948 to 1999. The summers are dry and moderately warm to hot with temperature highs of approximately 65 to 75 degrees. Winters are cool and wet, with temperatures usually staying above freezing and very little snowfall. Average annual precipitation is about 60 inches, with over 70% of that occurring between November and March.

Delineation of the Protection Area

Methodology{tc "Introduction to Delineation Process" \l 2}

The delineation of the source area or the "drinking water protection area" is a fundamental aspect of the assessment of a public water system. For surface water systems such as Bandon's, the drinking water protection area delineation process begins by identifying the *watershed*. The watershed area is also called the *catchment basin* of a receiving water body. The outer boundary of this watershed is the drainage divide formed by the surrounding ridges and hills. The surface water delineation includes the entire watershed area upstream of the public water system intake structure. This watershed area provides "source" water to the surface water intake.

A map of the drinking water protection area provides the community with the knowledge of the geographic area providing the water to the intake. This is the area where contamination poses the greatest threat to the drinking water supply. Information about the drinking water protection area allows the community to develop management strategies that will have the most impact on protecting the source of the drinking water.

Results

DEQ has collected and reviewed data for the purpose of delineating the drinking water protection area for Bandon's intakes on Ferry and Geiger Creeks. The scope of work for this report included collecting information from the water system operator, researching written reports, and establishing a Geographic Information Systems (GIS) basemap of the delineated watershed. *The City of Bandon's drinking water protection area is shown in Figure 1.* Bandon's drinking water protection area extends upstream approximately two miles in a southeasterly direction and encompasses a total area of 4 square miles. The elevation change from the upper edge of the watershed to the intake is approximately 400 feet. The City of Bandon's intakes are located at an elevation of approximately 75 feet near where Geiger Creek flows into Ferry Creek.

Identification of Sensitive Areas

Methodology

After delineating the entire watershed, DEQ identified the "sensitive areas" within the watershed. *The objective in determining the sensitive areas for surface water sources is to produce reliable information to the community and public water system that is useful in developing and prioritizing protection strategies*. The list of the sensitive areas to be identified within drinking water watersheds was defined by the DEQ advisory committee as the procedures were developed (SWAP, 1999). The sensitive areas within a drinking water watershed includes both setbacks (land adjacent to stream) and other natural factors that increase the risk of contamination of the surface water. The result is an identification of a subset of the entire watershed. *The sensitive areas are those where potential contamination sources or land use activities, if present, have a greater potential to impact the water supply.*

In establishing sensitive areas in a watershed, there are several limiting factors to take into account. In using a Geographic Information System (GIS) to delineate the sensitive areas within the watershed, DEQ locates existing GIS layers and other natural resource agency data sets. Not all areas of the state have been mapped for the natural resource parameters of interest or at the level of detail ideal for this type of analysis. The availability of data at appropriate scales is also a potential limitation. The sensitive area mapping may be limited simply by the lack of readily available data, and conducting additional research is not possible within the time frame allowed to do this assessment. DEQ staff has sought to obtain the best available information for each water system as the source water assessment was performed.

There are four individual characteristics that determine the sensitivity of areas within the drinking water watersheds in the Source Water Assessment Plan (1999) procedures for Oregon water systems. A brief description of the sensitive area characteristics and the sources of the GIS data are included below.

Sensitive Area Setbacks

The first sensitive area is a setback using a consistent 1000' (about 300 meters) distance from the water body. The 1000' sensitive area setbacks are intended to identify those areas where there are higher risks of contamination by spills or other releases, simply due to their proximity to the water body. The sensitive area setbacks are identified as a minimum of 1000' from centerline of the intake stream and all perennial tributaries within the delineated drinking water watershed. The distance of 1000' was based on EPA national guidance for the distance to conduct the potential contamination source inventories adjacent to streams.

High Soil Erosion Potential

The soil erosion potential is determined by combining the effects of slope and the soil erodibility factor ("K-factor"). Slopes within a watershed are evaluated using the 1:24,000 SSURGO (Soil Survey Geographic Database) data sets from the *Natural Resources Conservation Service*. The slope for a map unit is a weighted average of the average slope. The soil erodibility factor is also available in the SSURGO database and quantifies the susceptibility of soil particles to detachment and movement by water including the effects of rainfall, runoff, and infiltration. The K-factor used is a weighted average of only the value for the surface layer of the map unit. In the watershed, only soils with "high" erodibility ratings were mapped as sensitive areas. Soils that classify as

"high" include soil with slopes greater than 30% and K-factors greater than 0.25. This rating system is based on the *Revised Universal Soil Loss Equation* from the USDA Agricultural Research Service as defined in the Washington's Standard Methodology for Conducting Watershed Analysis (Washington Forest Practices Board, 1993).

High Permeability Soils

Soils identified in the *U.S. Geological Survey* geologic map of Oregon GIS layer (1:500,000 scale) as Recent Alluvial Deposits (Qal) are mapped as sensitive areas due to the high potential for groundwater recharge adjacent to the stream. Alluvial deposits are typically very high permeability soils. These areas may be very vulnerable to rapid infiltration of contaminants to groundwater and subsequent discharge to a stream or lake/reservoir.

High Runoff Potential

The potential for high runoff rates was evaluated using the 1:24,000 SSURGO (Soil Survey Geographic Database) data sets from the *Natural Resources Conservation Service*. Class D soils, which are defined as soils with very slow infiltration rates were mapped as sensitive areas within the boundaries of the drinking water protection area. Map units are assigned to hydrologic groups based on their majority component. A Class D soil is typified as clayey, has a high water table, or an impervious layer occurs at a shallow depth. Soils with these characteristics would have the potential for rapid runoff and subsequent transport of sediments and possible contaminants to the surface water body supplying the public water system.

Additional Sensitive Areas

There may be other natural characteristics within a watershed that can be mapped as sensitive. Modifying the list of sensitive areas in this assessment can be done by the public water system or the community by identifying resources and procedures that are appropriate for the individual system. For example, the local community may choose to add "transient snow zones", high rainfall areas, and landslide/debris-flow hazards to the sensitive areas within their watershed. Due to time constraints, these additional areas will not be mapped by DEQ as part of this source water assessment, but can be added by the local community before developing a protection plan.

Transient snow zones are typically defined as areas above 1500 feet in the Oregon Coast Range, or above 2000 feet in the Cascades. In some watersheds, these areas may be subject to rapid snowmelt or rain-on-snow events which increase the likelihood of transport of sediments to the surface water bodies in the watershed. Areas of high rainfall or irrigation rates may increase the likelihood of transport of sediments and possible contaminants to the surface water body. These areas can be identified using average annual precipitation data from Oregon Climate Service (years 1961 through 1990) and irrigation/water rights data from Oregon Water Resources Department's water rights database. Mapping the high risk landslide and debris-flow areas can also be useful for evaluating sediment risks from natural hazards within a drinking water watershed. The Department of Forestry has recently completed GIS-based landslide and debris flow maps for western Oregon (Website address: http://www.odf.state.or.us/gis/debris.html).

The final watershed map for each public water system intake includes a composite of all sensitive areas identified by DEQ within the watershed. This composite or overlay will enable the communities and responsible agencies to focus future protection efforts in these sensitive areas.

Results

The sensitive areas within the City of Bandon's drinking water protection area are shown on Figure 2. These include the setbacks from the main stem and all perennial tributaries, and a few small areas of high runoff potential. Good data coverage was available for the Bandon watershed for each of the sensitive areas.

Inventory of Potential Contaminant Sources

Methodology

The primary intent of an inventory is to identify and locate significant potential sources of any of the contaminants of concern within the drinking water protection area. Significant potential sources of contamination can be defined as any facility or activity that stores, uses, or produces the contaminants of concern and has a sufficient likelihood of releasing such contaminants to the environment at levels that could contribute significantly to the concentration of these contaminants in the source waters of the public water supply. An inventory is a very valuable tool for the local community in that it:

- provides information on the locations of potential contaminant sources, especially those that present the greatest risks to the water supply,
- provides an effective means of educating the local public about potential problems,
- provides valuable awareness to those that own or operate facilities and land use activities in the drinking water protection area, and
- provides a reliable basis for developing a local protection plan to reduce the risks to the water supply.

Inventories are focused primarily on the potential sources of contaminants regulated under the federal Safe Drinking Water Act. This includes contaminants with a maximum contaminant level (MCL), contaminants regulated under the Surface Water Treatment Rule, and the microorganism Cryptosporidium. The inventory was designed to identify several categories of potential sources of contaminants including micro-organisms (i.e., viruses, Giardia lamblia, Cryptosporidium, and fecal bacteria); inorganic compounds (i.e., nitrates and metals); organic compounds (i.e., solvents, petroleum compounds and pesticides) and turbidity/sediments. Contaminants can reach a water body (groundwater, rivers, lakes, etc.) from activities occurring on the land surface or below it. Contaminant releases to water bodies can also occur on an area-wide basis or from a single point source.

When identifying potential risks to a public water supply, it is necessary to make "worst-case" assumptions. This is important because it is the POTENTIAL risk that we are attempting to determine through this procedure and it is simply not possible within our time constraints to conduct individual reviews or inspections at any of the facilities or land uses. The worst-case assumption that is made when considering potential risks to water bodies is that the facility or activity is not employing good management practices or pollution prevention. Under today's regulatory standards and environmental awareness, the majority of the identified activities and land uses employ "best management practices" (BMPs) in handling contaminants or preventing

water quality degradation from their operations. It is important to note that while this assessment will list all POTENTIAL risks, many of these do not present actual risks to the water system. Environmental contamination is not likely to occur when contaminants are handled and used properly, or when BMPs are employed. The day-to-day operating practices and environmental (contamination) awareness varies considerably from one facility or land use activity to another. In-depth analysis or research was not completed to assess each specific source's compliance status with local, state and/or federal programs or laws. Further, the inventory process did not include an attempt to identify unique contamination risks at individual sites such as facilities (permitted or not) that do not safely store potentially hazardous materials. After the assessment is completed, the next step is to conduct an "enhanced" inventory that will look at the site-specific practices. The potential sources listed in the assessment that employ BMPs (required through regulations OR voluntarily) can be removed from the list during the next step in the process of developing a voluntary drinking water protection plan.

Assumptions are also made about what potential contamination sources are included in the various types of land uses. For example, it is assumed that rural residences associated with farming operations have specific potential contamination sources such as fuel storage, chemical storage and mixing areas, and machinery repair shops. Again, any errors in these assumptions can be easily corrected as the community moves beyond the assessment to develop a protection plan.

Past, current, and possible future potential sources of contaminants were identified through a variety of methods and resources. In completing this inventory, DEQ used readily available information including review of DEQ, EPA, and other agencies' databases of currently listed sites, interviews with the public water system operator, and field observation as discussed below. The process for completing the inventory for Bandon's drinking water protection area included several steps, which are summarized as follows:

1. Collected relevant information as of October 14, 1999 from applicable state and federal regulatory databases including the following lists:
    - DEQ Environmental Cleanup Site Information System (ECSI) which includes the U.S. EPA National Priorities List (NPL) and the U.S. EPA Comprehensive Environmental Response, Compensation and Liability Information System (CERCLA) list;
    - DEQ leaking underground storage tank (LUST) list;
    - DEQ registered underground storage tank (UST) list;
    - DEQ Active Solid Waste Disposal Permits list;
    - DEQ Dry Cleaners list;
    - DEQ Site Information System (SIS) which includes Water Pollution Control Facility (WPCF) and National Pollutant Discharge Elimination System (NPDES) permitted facilities;
    - State Fire Marshall Hazardous Material Handlers (HAZMAT) site list (information on materials in a gas-form was not used since gaseous compounds rarely pose a threat to surface water or groundwater); and
    - DEQ Hazardous Waste Management Information System (HWIMSY) list which includes U.S. EPA Resource Conservation Recovery Act (RCRA) generators or notifiers and U.S. EPA RCRA Treatment, Storage, and Disposal Facility (TSDF) Permits.

    Because of the way various state and federal databases are set up, the specific location of listed sites is not always given or accurate within the database. DEQ verified the presence

and approximate location of potential contaminant sources and land uses within the drinking water protection area by consulting with local community members and/or by driving through the area (windshield survey) as discussed below in subsequent inventory steps.

2. Interviewed public water system officials, or someone they designated as knowledgeable of the area to identify potential sources that are not listed elsewhere in databases or on maps and to assist in locating potential sources listed in the state and federal databases.

3. Conducted a windshield survey by driving through the drinking water protection area to field locate and verify as many as possible of the potential contaminant source activities. We looked for potential contaminant sources within four general categories of land use: residential/municipal, commercial/industrial, agricultural/forest, and other land uses (see Table 1).

4. Assigned high-, medium-, or low-risk ratings to each potential contaminant source based on the Oregon Source Water Assessment Plan (1999). A summary of the types of potential contaminant sources and level of assigned risk is presented in Table 1 (Summary of Potential Contaminant Sources by Land Use). The "comments" section of Table 2 (Inventory Results-List of Potential Contaminant Sources) provides justification for any modifications to the risk rating that may have resulted from field observations that were different from what is typically expected for the specific facility. Relative risk ratings are considered an effective way for the water supply officials and community to prioritize management efforts for the drinking water protection area. When the local water supply officials and community "team" enhance the inventory for use in developing management options, further analysis may need to be conducted to more closely evaluate the actual level of risk.

5. Produced final summary of the inventoried sources and the GIS base map, which are presented in this report.

Results

For the purpose of discussing the results of the inventory within the delineated drinking water protection area, the source areas for both the Ferry Creek and Geiger Creek watersheds have been combined into one watershed. *The inventory results are summarized in Tables 1 and 2 and are shown on Figure 3.* The potential contaminant sources within each sub-watershed are identified by indicating Ferry or Geiger Creeks in Table 2. In general, land uses that are closest to the intake and those with the highest risk rating pose the greatest threat to your drinking water supply.

The delineated drinking water protection area is primarily dominated by forest and agricultural land uses with interspersed areas of residential use (see also Humphrey, 1996). A total of 27 potential contaminant sources were identified in the watershed. The sources considered to pose moderate to higher risks within the watershed were identified as follows:

Higher Risk:

Crops – irrigated (bogs)	Ref. # 1,2,7,12,16,17,18,19
Transmission Lines	Ref. # 13
Utility Stations	Ref. # 4,5
Transportation corridor	Ref. # 15

Mines/gravel pit	Ref. # 20
Moderate Risk:	
Crops – irrigated (bogs)	Ref. # 23,24
Managed forest -clearcut	Ref. # 9
Transportation corridor	Ref. # 10,25,26,27
Housing - high density	Ref. # 14
Other-historic spill	Ref. # 21
Upstream Reservoirs	Ref. # 22

The majority of the potential contaminant sources are irrigated crops (cranberry bogs), the transportation corridors (heavy use roads, potential herbicide use areas and stream crossings), and public utility facilities (transmission lines and substations). Each of these potential sources of contamination pose a higher to moderate relative risk to the drinking water supply. Other potential sources with relatively high or moderate risk within the drinking water protection area include a recent clearcut and replanted forested area, a high density housing area using septic systems, a borrow pit, a historic spill, and a planned cranberry bog reservoir. Additional detail for each of these sites is provided in Table 2.

Reference number 20 is considered a potential higher risk site even if it is actually just outside of the boundary of the drinking water protection area in Figure 2. This site is included due to the possibility of below ground communication between groundwater at the site, and surface waters within the watershed. While it is unknown if such an association between waters actually exists in this region, it was considered prudent to include this site due to the higher degree of potential risk associated with mining operations. (See Table 2 for a more detailed description of potential impacts). This site is also included because the boundary should be considered approximate, and this site may potentially impact water quality within the watershed. The two potential contaminant sources with lower relative risk levels are associated with rural residential areas using septic systems.

The presence of potential contaminant sources within Bandon's drinking water protection area provides a quick look at the potential sources of contaminants that could, if improperly managed, impact the water quality in the watershed. Even very small quantities of certain contaminants can significantly impact water bodies. It is important to remember the sites and areas identified in this section are only **potential** sources of contamination to the drinking water.

Susceptibility Analysis

Methodology

Susceptibility can be defined as the potential for contamination in the drinking water protection area to reach the intake on the surface water body being used by a public water system for drinking water purposes. Whether or not a particular drinking water source becomes contaminated depends on three major factors: 1) the occurrence of a facility or land use that releases contamination, 2) the location of the release, and 3) the hydrologic and/or soil characteristics in the watershed that allow the transport of the contaminants to the surface water body.

In conducting a susceptibility analysis the first step is identifying that part of the watershed that is most sensitive to contamination. This was accomplished after the delineation phase of this assessment. The second step consists of identifying and locating the potential contaminant sources in the drinking water protection area. Based on the type of facility and the nature of the chemicals they use, these sources represent a lower-, moderate-, or higher-relative risk to the surface water body. This step was accomplished in the inventory phase of the assessment.

The third step in the susceptibility analysis is to overlay the results of the inventory with the map of the sensitive areas. The results of the inventory are analyzed in terms of current, past, and future land uses; their time-of-travel relationship or proximity to the intake site; and their associated risk rating. In general, land uses that are closest to the intake and those with the highest risk rating pose the greatest threat to a drinking water supply. The presence and locations of the potential contamination sources within the sensitive areas will determine where the water system has the highest susceptibility to contamination. The susceptibility analysis cannot predict when or if contamination will actually occur, but it does recognize conditions that are highly favorable for contamination to occur. If a contaminant release to soils or water should occur in a sensitive area, it is very likely that contamination of the surface water body would occur if remedial actions are not undertaken.

When several high or moderate risk sources are located within the sensitive areas, the public water system may also be said to have a high overall susceptibility to contamination. If a public water system's drinking water source is determined to be of high susceptibility, it is recommended that the system identify those condition(s) that lead to the high susceptibility and take steps to protect the resource (e.g., reducing soil erosion, or working directly with facility operators to implement sound management practices, etc.). Water systems with a low susceptibility should consider all identified factors that could lead to higher susceptibility in the future and take action to prepare a strategy to protect the resource in the future.

Results

The results of the potential contamination source inventory are combined with the locations of the sensitive areas to determine the most susceptible areas within Bandon's drinking water watershed. The total number of sources within the sensitive areas are summarized as follows:

	Total Within Drinking Water Protection Area	Total Within Sensitive Areas	Higher- or Moderate-Risks Within Sensitive Areas
Potential Contamination Sources Identified	27	18	16

Overlaying the locations of the moderate- to high-risk sources with the sensitive areas provides an indication of the areas that are highly susceptible to contamination. The susceptibility analysis results are shown on Figure 3 (Source Water Assessment Results). *Where the moderate- to higher-risk sources fall within the sensitive areas are those areas most vulnerable to contamination.* In the Bandon watershed, it includes the distribution of the 16 identified sources within the areas of high runoff potential, or within the 1000' setback from the streams. In general, potential contaminant sources within the sensitive areas in the lower watershed pose greater risk than those in the higher areas of the watershed. The susceptibility analysis provides the water system with information on where the greatest risk occurs and where to focus resources for protection.

When all of the assessments are completed in Oregon, DEQ will provide a second type of susceptibility analysis for the surface water systems, an "inter-system susceptibility" on a statewide basis. DEQ will develop a summary report describing how the Bandon watershed compares with other drinking water watersheds in the state. To normalize the results of the assessments, the total number of potential contamination sources will not be used. The density of the moderate- to higher-risk sources within the drinking water protection area and within the sensitive areas will be calculated. This comparison will be based upon the number and distribution of the potential contamination sources in the watersheds that serve as drinking water resources. The purpose is not to rank individual systems, but to provide general groupings of overall risk relative to other Oregon public water systems. This will enable state agencies to develop priorities for staffing and funding more detailed assessments and protection measures.

Summary and Recommendations

This assessment provides a basis for focusing limited resources within the community to protect the drinking water source. The delineation provides the community with information regarding the location of the land area that directly supplies the surface water intake, i.e., the drinking water protection area. The sensitive areas are those where potential contamination sources or land use activities, if present, have the greater potential to impact the water supply. When the sensitive area information is combined with the potential contaminant source inventory, the highly vulnerable areas are identified (referred to as a susceptibility analysis). These should become high priority areas to be addressed first with educational information, technical assistance, and focused outreach to landowners to encourage voluntary cooperation in protecting the water quality in this watershed.

This assessment provides a basis for informed decision-making regarding community planning. The delineation, inventory and susceptibility analysis provides the community with a significant amount of information regarding where their drinking water comes from and an identification of some of the potential risks to the quality of that source. For example, knowing the location and status of the source area allows the community's planning authority to potentially make informed decisions regarding proposed land uses that are compatible with both the drinking water resource and the vision of community growth embraced by the community. Educating the community citizens about the susceptibility and risks to your system enables more public involvement in any future decisions about the public water system.

The results of this Source Water Assessment and the recommendations based on the results are summarized below.

♦ The drinking water for the City of Bandon is supplied by intakes on Ferry and Geiger Creeks. This public water system serves approximately 2800 citizens. The intakes are located in the Ferry Creek Watershed in the Coquille River Sub-Basin, Hydrologic Unit Code (HUC) #17100305. The watershed is within the physiographic province known as the Coast Range. The geographic area providing water to Bandon's intake (the drinking water protection area) extends upstream approximately two miles in a southeasterly direction and encompasses a total area of 4 square miles.

♦ Within the Bandon watershed, there are large areas identified as sensitive to contamination. Areas that are adjacent to the streams and areas where soils have high runoff should all receive special considerations for protection. These are some of the areas where the risk is greatest for existing **and future** potential sources of contamination impacting the water quality in the watershed. It is recommended that other natural conditions be considered and possibly added to the assessment results before proceeding with voluntary development of a drinking water protection plan.

♦ The susceptibility of the public drinking water system source depends on both the natural conditions in the watershed as well as the land uses and facilities operating in the watershed. The purpose of the susceptibility exercise is to identify those factors that may pose more of a risk than others within the community's drinking water protection area. It provides information with respect to facilities or land uses in the sensitive areas within the drinking water protection area that should be given greater priority in developing protection strategies. A review of the inventory

and the sensitive areas indicates that the Bandon public water system has at least 16 high and moderate-risk sources within the sensitive areas in the watershed. It is highly recommended that the community "enhance" or refine the delineation of the sensitive areas and the identification of the potential contamination sources through further research and local input.

♦ Due to the streamlined procedures for conducting the source water assessments, the results could potentially create a misperception that the "human activities" within the watersheds are higher risks than natural conditions or disturbances such as landslides and storm events. For example, it would be erroneous for communities to conclude that their source water was not at risk from natural conditions that produce sediments if there were no potential contamination sources identified within their watershed. It is recommended that the community take steps to ensure the natural conditions (both those identified in this assessment and any other additional areas identified by the community) within the watershed are considered when developing strategies for protection.

♦ Public water systems may be threatened by contamination already in the surface water. Many public water systems conduct routine tests for contamination in the raw water prior to treatment. It is highly recommended that such data be used to determine existing risks in the watershed. Collecting and analyzing this raw water data by DEQ or OHD has not been done and is beyond the scope of this assessment.

♦ This assessment provides a basis for dealing with future water quality work in the watershed. The delineation, inventory, and susceptibility analysis has been designed to serve as a strong foundation for further in-depth watershed assessments or water quality improvement efforts, such as Oregon's Total Maximum Daily Load (TMDL) plans.

♦ The primary intent of this source water assessment is to provide the background information for the community to use in developing a local Drinking Water Protection Plan. The City of Bandon and/or the public water system should assemble a team to assist in the development and implementation of a Drinking Water Protection Plan. Clean safe drinking water is fundamental to the viability of any community. Protecting the drinking water source is a wise and relatively inexpensive investment in the community's future. The next section will discuss this voluntary process.

Developing a Drinking Water Protection Plan

This Source Water Assessment (SWA) Report for your public water system is a compilation of the results of the delineation of the source area, identification of the sensitive areas, and an inventory of significant risks. The final product, the susceptibility analysis, provides the basis for prioritizing the areas in and around your community that need to be protected. As we discussed in the introduction, our hope is that the community will use the assessment as a basis for developing a "Drinking Water Protection Plan".

The process for developing a complete Drinking Water Protection Plan can be summarized as follows:

ASSESSMENT PHASE (Source Water Assessment Report performed by DEQ and OHD)

1. Delineate the area that serves as the source of the public water supply ("drinking water protection area" for groundwater wells or surface water intakes)
2. Inventory the potential risks or sources of contamination
3. Determine the areas most susceptible to contamination

PROTECTION PHASE (performed by community)

4. Assemble a local Drinking Water Protection Team
5. Enhance the Source Water Assessment
6. Develop a plan to protect the supply (reduce the risks of contamination)
7. Develop a contingency plan to address the potential loss of the system
8. Certify (optional) and implement the Drinking Water Protection Plan

As you know, the assessment phase work was funded by the federal Safe Drinking Water Act. The assessment is simply the first three steps of developing a protection plan for your public water supply. Developing a protection plan is voluntary.

Prior to moving into the protection phase, DEQ recommends the inventory presented in this document be reviewed in detail to clarify the presence, location, operational practices, actual risks, etc. of the identified facilities and land use activities. The SWA inventory should be regarded as a preliminary review of potential sources of contamination within the drinking water protection area. Resources within the community should be used to do an "enhanced inventory" to complete this preliminary list of potential sources of contamination.

It is also important to remember that not all of the inventoried activities will need to be addressed if you choose to develop a Drinking Water Protection Plan. When developing a protection plan, sources which pose little to no threat to your public water supply can be screened out. For example, if any of the land use activities are conducted in a manner that already significantly reduces the risk of a contamination release, the facility would not need to re-evaluate their practices based on drinking water protection "management". One of the goals of developing a Drinking Water Protection Plan based on the inventory results is to address those land use activities that do pose high or moderate risks to your public water supply.
The community should target these facilities with greater levels of education and technical assistance to minimize the risk of contamination.

Limited technical assistance is available through both DEQ and OHD for communities that choose to move beyond the assessments and voluntarily develop a Drinking Water Protection Plan. Using

the results of the assessment (and enhanced inventory), the local community can form a "Drinking Water Protection Team" of community members and develop a plan to reduce the risks of contamination from those sources.

Forming a local team to help with the development of a protection plan is very important. Oregon's drinking water protection approach relies upon the concept of "community-based protection", as are many other water quality programs. Community-based protection simply refers to the concept of allowing local control and decision-making to implement the water quality protection effort. Community-based protection is successful only with significant local citizen and stakeholder involvement.

The primary advantage of community-based protection is that it links community needs to environmental needs. Any successful protection program will need to be flexible enough to allow the community to adopt the "tools" or elements that are most appropriate for them. Allowing this local control in making the changes necessary for improving water quality will accomplish two key elements of restoration and protection. Community-based protection can draw on the knowledge and successful adaptive practices of the local area. Landowners generally know best how to achieve water resource restoration and protection as long as a thorough explanation of the problem is provided, the objectives are defined, and some free technical assistance is provided. Secondly, knowing they have more local control, citizens will also be more likely to participate in the program and more willing to assist with the educational and outreach effort which will make the plan successful. We recommend that the protection plan be developed so as to *minimize any burdens on individual property owners, but maximize the equity in responsibility for reducing the risks of future contamination.*

Drinking water protection involves developing protection strategies for groundwater or surface water sources of public water supplies. There are many similarities between this program and other water quality protection programs, and it is essential that water quality efforts are coordinated and linked in each geographic area as much as possible. DEQ is committed to linking the drinking water protection efforts to other habitat and water quality improvement efforts for fish in Oregon, as well as the ongoing work to address Clean Water Act 303(d) water-quality-limited streams. One of the primary means of providing technical assistance is to give your community the information and coordination necessary to create these links. Other agencies will also be involved in providing technical assistance as protection plans are developed. For example, on farmlands, the Oregon Department of Agriculture will provide assistance as provided for under Senate Bill 1010. In developing recommendations for protecting the drinking water source area, your community can maximize the use of existing programs in Oregon that offer free technical assistance. Examples of such programs include:

- pollution prevention technical assistance from the Department of Environmental Quality,
- sanitary survey assistance from the Oregon Health Division,
- household hazardous waste assistance from the Department of Environmental Quality,
- land use planning from the Department of Land Conservation and Development,
- agricultural water quality management plans Oregon Department of Agriculture,
- water conservation education from the Water Resources Department, or
- rural water quality outreach from the Oregon State University Extension Service.

Protecting the drinking water supply in a community can also be a very effective way to encourage all citizens to participate in an issue which directly affects everyone in that community.

This often leads to more public involvement in other significant local decisions concerning future livability issues (i.e., land use planning). In communities already developing and implementing Drinking Water Protection Plans, the process has served to bring many diverse interests together on a common goal and strengthened the local rural and urban relationships through communication and increased understanding. We must continue to do a better job in our outreach efforts to point out that we are all part of the existing water quality problems. The risks and sources of water quality problems are not only from industries, farmers, and managed forests, but every individual living, commuting and working in that area.

We encourage communities interested in developing Drinking Water Protection Plans to contact the DEQ or OHD resources listed below:

For technical assistance with the monitoring and operation of your public water system:

Oregon Health Division
Main Office - Portland Oregon
800 NE Oregon St., Room 611
PO Box 14450, Portland, OR 97293
(503) 731-4317
Fax (503) 731-4077

or:
Dennis Nelson, Groundwater Coordinator, (541) 726-2587
donelson@oregonvos.net
Oregon Health Division
Springfield Field Office
442 A Street, Springfield, OR 97477
Fax (541) 726-2596

For technical assistance with developing plans to protect your public water system:

Department of Environmental Quality
Water Quality Division
811 SW 6th Avenue
Portland, OR 97204-1390
(503) 229-5630 Fax (503) 229-6037
Toll Free 1-800-452-4011

Surface Water - Sheree Stewart, (503) 229-5413
stewart.sheree@deq.state.or.us

Groundwater - Julie Harvey, (503) 229-5664
harvey.julie@deq.state.or.us

References*

Baldwin E.M., et.al., 1973, Geology and Mineral Resources of Coos County, Oregon. Oregon Department of Geology and Mineral Industries, Bulletin #80. 82p.

Beaulie, J.D. and P.W. Hughes, 1975. Geology of Western Coos and Douglas Counties, Oregon. Oregon Department of Geology and Mineral Industries, Bulletin #87. 147p.

Environmental Protection Agency, 1997. State Source Water Assessment and Protection Programs Guidance, US EPA Office of Water, EPA816-R-97-009, August 1997. http://www.epa.gov/ogwdw/swp.html

Humphrey, Corrine, 1996. Small Watershed Analysis: The Ferry Creek Example. The Ferry Creek Watershed, Coos county Oregon, October 1996.

Natural Resource Conservation Service (NRCS). Soil Survey Geographic Database (SURGGO), National Cartography and Geospatial Center, Fort Worth, Texas. http://www.ftw.nrcs.usda.gov/ssurgo.html

Oregon Climate Service (OCS). College of Oceanic and Atmospheric Sciences, Oregon State University, Corvallis, Oregon. http://www.ocs.orst.edu/

Orr, Elizabeth L., William N. Orr, and Ewart M. Baldwin. 1992. Geology of Oregon, Kendall/Hunt Publishing Company, Dubuque, Iowa.

Source Water Assessment Plan: Implementation of the Safe Drinking Water Act 1996 Amendments. Sheree Stewart, Oregon Department of Environmental Quality, and Dennis Nelson, Oregon Health Division, February 1999 http://www.waterquality.deq.state.or.us/wq

Washington Forest Practices Board. 1993. Standard Methodology for Conducting Watershed Analysis, Version 2.0, October 1993

Western Regional Climate Center, Oregon Climate Summaries. http://www.wrcc.dri.edu/summary/climsmor.html

*Please note that there may be other sources of information for Ferry and Geiger Creeks and the Coquille Sub-Basin. Conducting an exhaustive search of all data and technical reports was beyond the scope of this Source Water Assessment Report.

Figures

Source Water Assessment Report
City of Bandon
PWS # 4100074

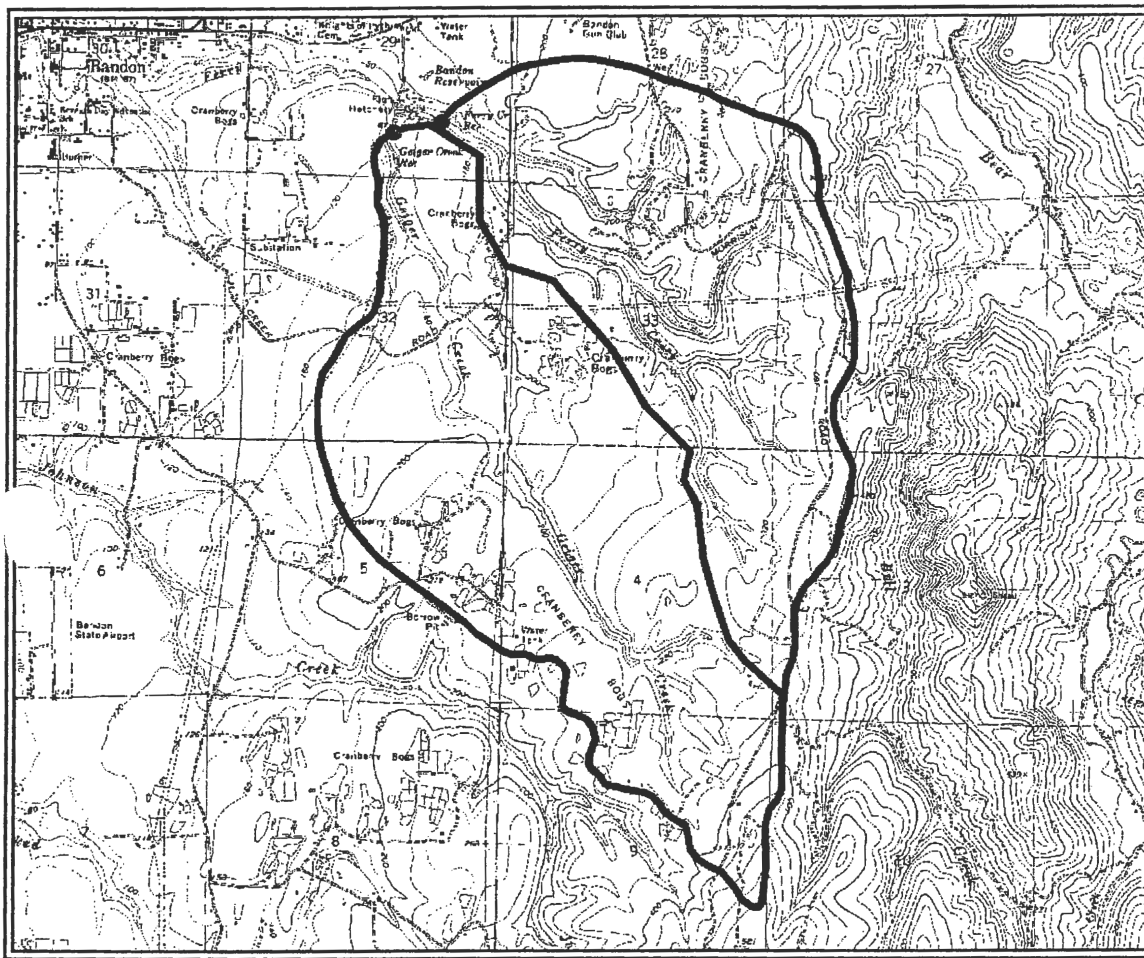

Figure 1: Bandon's Drinking Water Protection Area

PWS 4100074

- ● Drinking Water Intake - Surface Water
- Drinking Water Protection Area

Note on Base Map: 1:100,000 scale U.S. Geological Survey Digital Raster Graphics (DRGs) for Bill Peak (1971) and Bandon (1970) are displayed. DRGs are scanned images of topographic sheets. Where the DRGs join, seams and/or gaps may be visible. Between DRGs, variations in information displayed also may be seen.

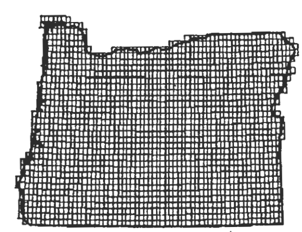

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Figure 2:
Sensitive Areas within Bandon's Drinking Water Protection Area

PWS 4100074

● Drinking Water Intake - Surface Water

Drinking Water Protection Area

Sources of Information:
High Soil Erodibility: Defined by slopes greater than 30 percent and K factor greater than .25. Soils derived from 1:24,000, USDA, NRCS, SSURGO preliminary data. Slope is in the SSURGO database Component Table. Slope displayed is a weighted average of the average slope for the map unit. K factor is contained in the SSURGO Layer Table. K factor displayed is a weighted average (of only the surface layer) for the map unit. This SSURGO data is preliminary.
High Runoff Potential: Hydrology Group D (very slow infiltration rates) from the SSURGO Component Table. These SSURGO data is preliminary.
High Permeability Soils: Alluvial deposits (Qal) from the U.S. Geological Survey Geologic Map of Oregon GIS layer.
Sensitive Area Setbacks Adjacent to Streams and Reservoirs: 1000 foot buffer from the centerline of perennial streams and the shoreline of any reservoir.

Note on Sensitive Areas: In determining the most sensitive areas within this Drinking Water Protection Area, DEQ used existing GIS layers and other natural resource agency data sets. Not all areas of the state have been mapped for the natural resource parameters of interest or at the level of detail ideal for this type of analysis. DEQ has sought to obtain the best available information for this composite.

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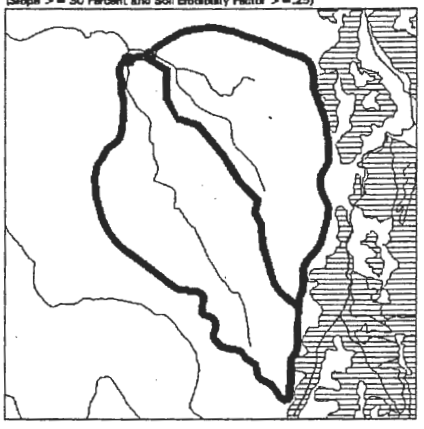
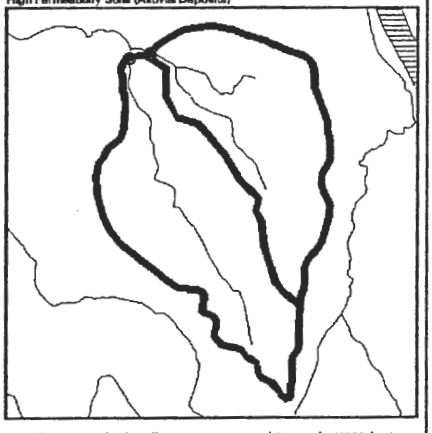
Sensitive Areas in Watershed

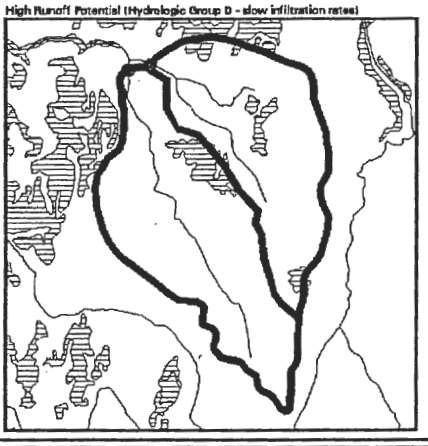
High Soil Erosion Potential
(Slope > = 30 Percent and Soil Erodibility Factor > = .25)



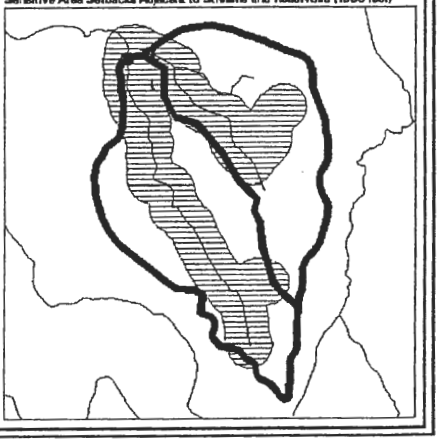
High Permeability Soils (Alluvial Deposits)



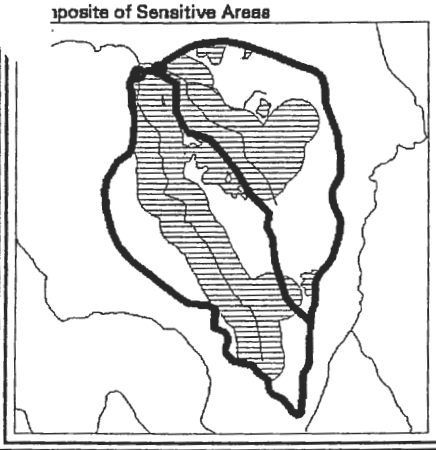
High Runoff Potential (Hydrologic Group D - slow infiltration rates)



Sensitive Area Setbacks Adjacent to Streams and Reservoirs (1000 feet)



ıposite of Sensitive Areas



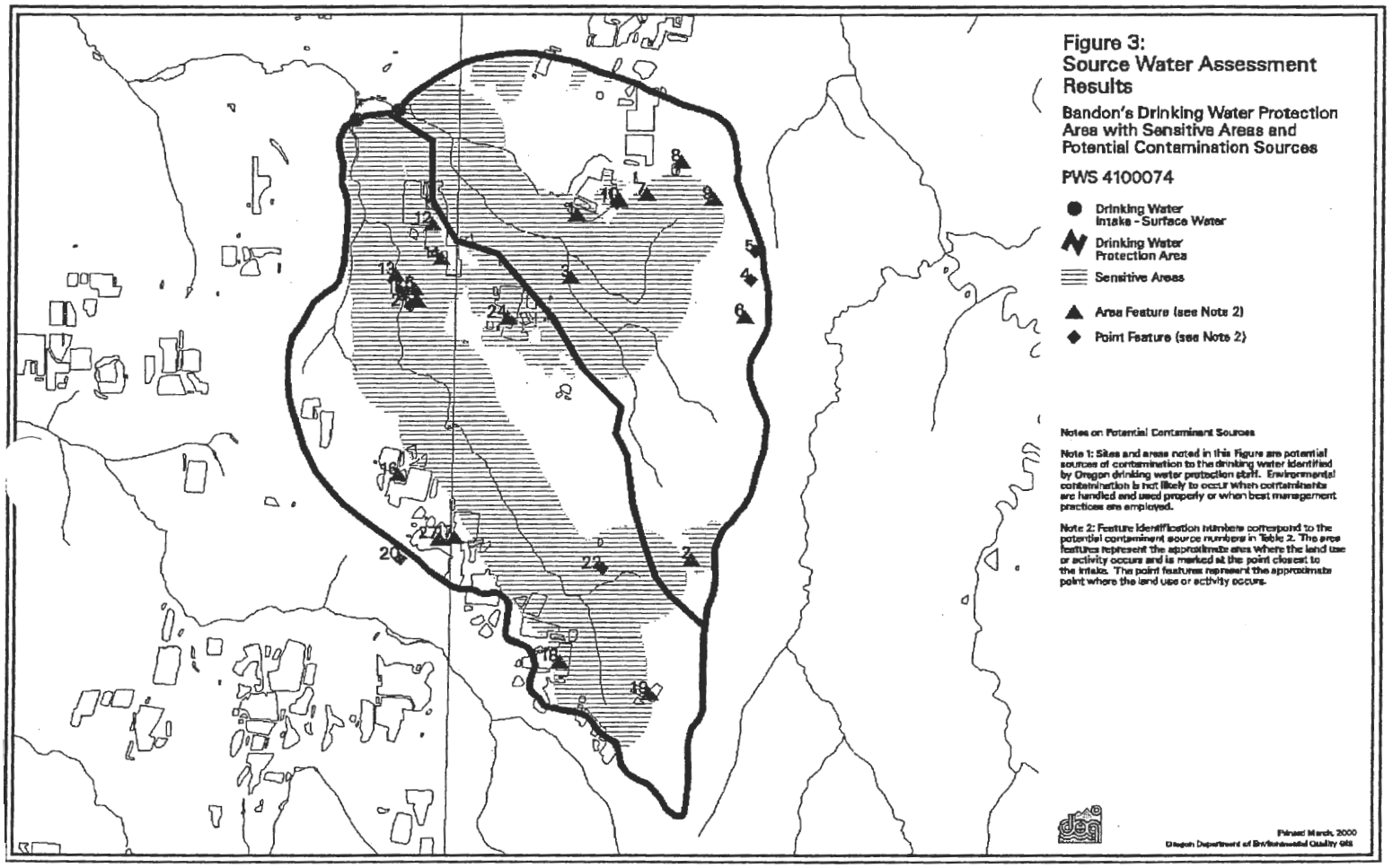


Figure 3:
Source Water Assessment Results
Bandon's Drinking Water Protection Area with Sensitive Areas and Potential Contamination Sources
PWS 4100074
Drinking Water Intake - Surface Water
Drinking Water Protection Area
Sensitive Areas
Area Feature (see Note 2)
Point Feature (see Note 2)
Notes on Potential Contaminant Sources
Note 1: Sites and areas noted in this Figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are handled and used properly or when best management practices are employed.
Note 2: Feature identification numbers correspond to the potential contaminant source numbers in Table 2. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.
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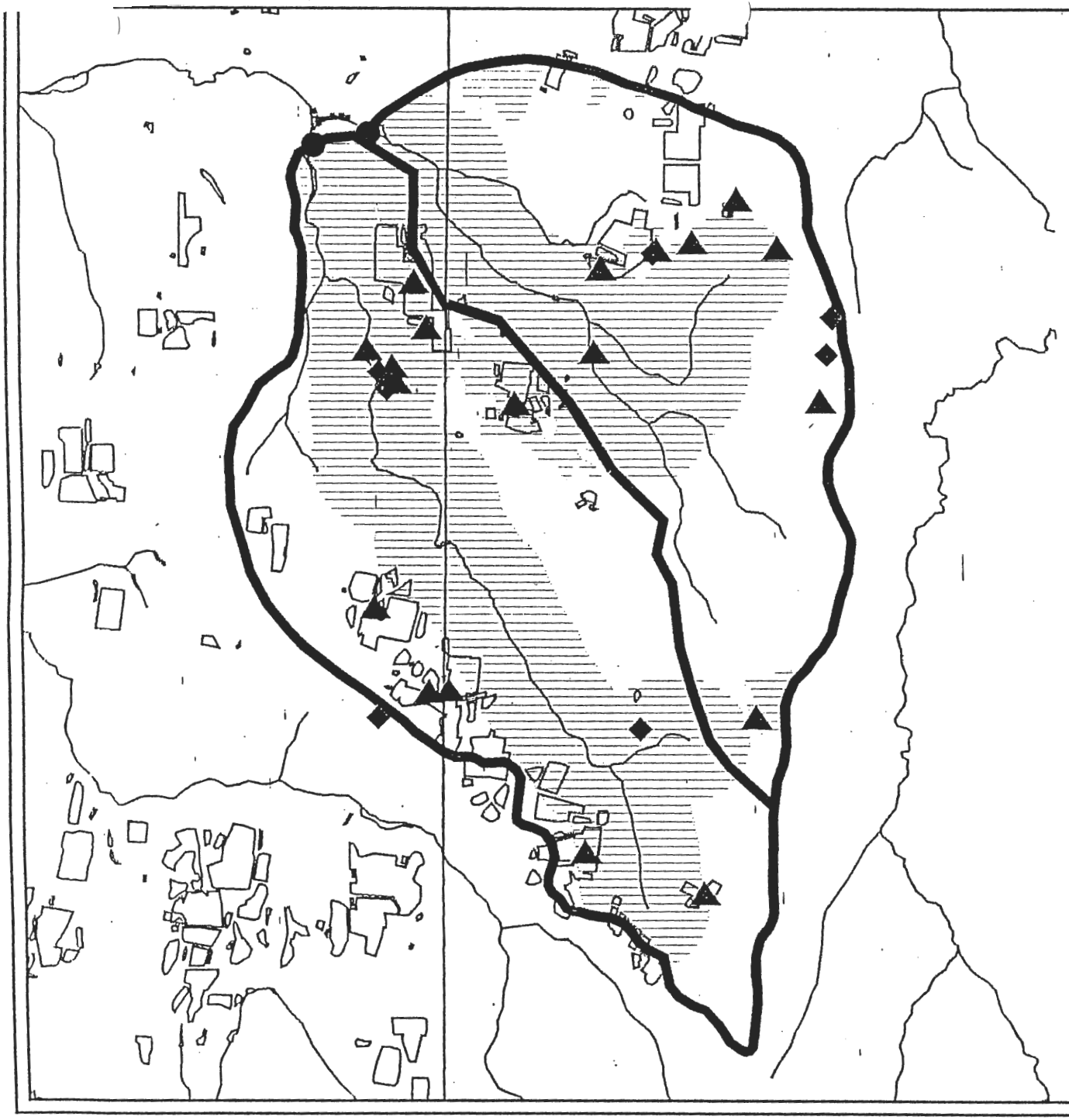

Source Water Assessment Results

Bandon's Drinking Water Protection Area with Sensitive Areas and Potential Contamination Sources

PWS 4100074

Drinking Water Protection Area

Drinking Water Intake - Surface Water

Sensitive Areas

Area Feature (see Note 2)

Point Feature (see Note 2)

Notes on Potential Contaminant Sources

Note 1: Sites and areas noted in this Figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are used and managed properly.

Note 2: Feature identification markers correspond to the potential contaminant source numbers in the SWA Report. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.

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Tables

Source Water Assessment Report
City of Bandon
PWS # 4100074
Inventory Results

Table 1. Summary of Potential Contaminant Sources by Land Use
Table 2. Inventory Results – List of Potential Contaminant Sources

Notes for Table 1 and Table 2

- Sites and areas identified in Tables 1 and 2 are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.
- Total number of sources listed in Table 1 in the DWPA may not add up to the total number of potential contaminant sources in Table 2 because more than one type of potential contaminant source may be present at any given facility.
- The data was collected by Elizabeth Esseks, DEQ's Western Region Office, on December 9, 1999.

Acronyms

AST - Aboveground Storage Tank
DEQ - Oregon Department of Environmental Quality
DRYCLEANER - DEQ's Drycleaner database
DWPA - Drinking Water Protection Area
ECSI - DEQ's Environmental Cleanup Site Information database
HWIMSY - DEQ's Hazardous Waste Information Management System database
LUST - DEQ's Leaking Underground Storage Tank database
NPDES - National Pollution Discharge Elimination System
PCS - Potential Contaminant Source
PWS - Public Water System
SFM - State Fire Marshall's database of hazardous materials
SIS - DEQ's Source Information System database (includes WPCF and NPDES permits)
SWMS - DEQ's Solid Waste Management System database
UST - DEQ's Underground Storage Tank database
UST - Underground Storage Tank
WPCF - Water Pollution Control Facility
WRD -Oregon Water Resources Division database for water rights information system

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE; BANDON CITY OF; PWS# 4100074

COMMERCIAL/INDUSTRIAL SOURCES		Relative Risk Ranking	Total in DWPA	RESIDENTIAL/MUNICIPAL SOURCES	Relative Risk Ranking	Total in DWPA
AUTOMOBILES	BODY SHOPS	MODERATE	0	AIRPORT - MAINTENANCE/FUELING AREA	MODERATE	0
	CAR WASHES	MODERATE	0	APARTMENTS AND CONDOMINIUMS	LOWER	0
	GAS STATIONS	MODERATE	0	CAMPGROUNDS/RV PARKS [1]	MODERATE	0
	REPAIR SHOPS	MODERATE	0	CEMETERIES - PRE-1945	LOWER	0
BOAT SERVICES/REPAIR/REFINISHING		HIGHER	0	DRINKING WATER TREATMENT PLANTS	MODERATE	0
CEMENT/CONCRETE PLANTS		MODERATE	0	FIRE STATION	LOWER	0
CHEMICAL/PETROLEUM PROCESSING/STORAGE		HIGHER	0	FIRE TRAINING FACILITIES	MODERATE	0
DRY CLEANERS		MODERATE	0	GOLF COURSES	MODERATE	0
ELECTRICAL/ELECTRONIC MANUFACTURING		MODERATE	0	HOUSING - HIGH DENSITY - > 1 HOUSE/0.5 ACRES	MODERATE	1
FLEET/TRUCKING/BUS TERMINALS		MODERATE	0	LANDFILL/DUMPS [1]	HIGHER	0
FOOD PROCESSING		MODERATE	0	LAWN CARE - HIGHLY MAINTAINED AREAS	MODERATE	0
FURNITURE/LUMBER/PARTS STORES		MODERATE	0	MOTOR POOLS	MODERATE	0
HOME MANUFACTURING		HIGHER	0	PARKS	MODERATE	0
JUNK/SCRAP/SALVAGE YARDS		HIGHER	0	RAILROAD YARDS/MAINTENANCE/FUELING AREAS	HIGHER	0
MACHINE SHOPS		HIGHER	0	SCHOOLS	MODERATE	0
MEDICAL/VET OFFICES [1]		LOWER	0	SEPTIC SYSTEMS - HIGH DENSITY - > 1/ACRE [1]	MODERATE	1
METAL PLATING/FINISHING/FABRICATION		HIGHER	0	SEWER LINES - CLOSE PROXIMITY TO PWS [1]	MODERATE	0
MINES/GRAVEL PITS		HIGHER	1	UTILITY STATIONS - MAINTENANCE TRANSFORMER STORAGE	HIGHER	2
OFFICE BUILDINGS/COMPLEXES		LOWER	0	WASTE TRANSFER/RECYCLING STATIONS [1]	HIGHER	0
PARKING LOTS/MALLS - > 50 SPACES		HIGHER	0	WASTEWATER TREATMENT PLANTS/COLLECTION STATIONS [1]	HIGHER	0
PHOTO PROCESSING/PRINTING		HIGHER	0	OTHERS (LIST)		
PLASTIC/SYNTHETICS PRODUCER		HIGHER	0			
RESEARCH LABORATORIES		HIGHER	0			
RV/MINI STORAGE		LOWER	0			
WOOD PRESERVING/TREATING		HIGHER	0			
WOOD/PULP/PAPER PROCESSING AND MILLS		HIGHER	0			
OTHERS (LIST)			0			

(Continued on p.2)

NOTES/KEY:

Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

[1] - Potential Source of Microbial Contamination

[2] - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation

TABLE 1. SUMMARY OF POTENTIAL CONTAMINANT SOURCES BY LAND USE; BANDON CITY OF; PWS# 4100074

AGRICULTURAL/FOREST SOURCES		Relative Risk Ranking	Total In DWPA
AUCTION LOTS[1]		HIGHER	0
BOARDING STABLES [1]		HIGHER	0
CONFINED ANIMAL FEEDING OPERATIONS (CAFOS) [1]		HIGHER	0
CROPS - IRRIGATED - BERRIES, HOPS, MINT, ORCHARDS, VINEYARDS/NURSERIES, GREEN HOUSES, VEGETABLES, ETC.		HIGHER[2]	10
CROPS - NONIRRIGATED - CHRISTMAS TREES, GRAINS, GRASS SEEDS, HAY, PASTURE		LOWER	0
FARM MACHINERY REPAIR		MODERATE	0
GRAZING ANIMALS - > 5 LARGE ANIMALS OR EQUIVALENT/ACRE [1]		HIGHER	0
LAGOONS/LIQUID WASTES [1]		HIGHER	0
LAND APPLICATION SITES [1]		HIGHER	0
MANAGED FOREST LANDS	BROADCAST FERTILIZED AREAS	MODERATE	0
	CLEARCUT HARVESTED - < 35 YRS.	HIGHER	1
	PARTIAL HARVESTED - <10 YRS.	HIGHER	0
	ROAD DENSITY - > 2 MI./SQ. MI.	HIGHER	0
PESTICIDE/FERTILIZER/PETROLEUM STORAGE, HANDLING, MIXING, & CLEANING AREAS		HIGHER	0
RECENT BURN AREAS - < 10 YRS.		HIGHER	0
OTHERS (LIST)			0

MISCELLANEOUS SOURCES		Relative Risk Ranking	Total In DWPA
ABOVE GROUND STORAGE TANKS		MODERATE	0
CHANNEL ALTERATIONS - HEAVY		HIGHER	0
COMBINED SEWER OUTFALLS [1]		HIGHER	0
STORMWATER OUTFALLS [1]		HIGHER	0
COMPOSTING FACILITIES [1]		HIGHER	0
HISTORIC GAS STATIONS		HIGHER	0
HISTORIC WASTE DUMPS/LANDFILLS [1]		HIGHER	0
HOMESTEADS - RURAL	MACHINE SHOPS	HIGHER	0
	SEPTIC SYSTEMS < 1/ACRE [1]	LOWER	2
INJECTION WELLS/DRYWELLS/SUMPS - CLASS V UICS [1]		MODERATE	0
KENNELS -> 20 PENS [1]		MODERATE	0
MILITARY INSTALLATIONS		HIGHER	0
RANDOM DUMPSITES		HIGHER	0
RIVER RECREATION - HEAVY USE [1]		MODERATE	0
SLUDGE DISPOSAL AREAS [1]		HIGHER	0
STORMWATER RETENTION BASINS [1]		HIGHER	0
TRANSMISSION LINES - RIGHT-OF-WAYS		HIGHER	2
TRANSPORTATION CORRIDORS	FREEWAYS/STATE HIGHWAYS	HIGHER	3
	RAILROADS	HIGHER	0
	HERBICIDE USE AREAS	HIGHER	3
	RIVER TRAFFIC - HEAVY	HIGHER	0
	STREAM CROSSING - PERENNIAL	HIGHER	2
UNDERGROUND STORAGE TANKS	CONFIRMED LEAKING TANKS - DEQ LIST	MODERATE	0
	DECOMMISSIONED - INACTIVE	LOWER	0
	NON-REGULATED TANKS - < 1,100 GALS	MODERATE	0
	NOT YET UPGRADED OR REGISTERED TANKS	MODERATE	0
	UPGRADED AND/OR REGISTERED - ACTIVE	LOWER	0
	STATUS UNKNOWN	MODERATE	0
UPSTREAM RESERVOIRS		MODERATE	1
WELLS/ABANDONED WELLS		MODERATE	0
LARGE CAPACITY SEPTIC SYSTEMS -CLASS V UIC (SERVES >20 PEOPLE) [1]		MODERATE	0
OTHERS (LIST)			
HISTORIC SPILL		MODERATE	1

NOTES/KEY:

Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

(1) - Potential Source of Microbial Contamination

(2) - Drip irrigated crops, such as vineyards and some vegetables, are considered lower risk than spray irrigation

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES; BANDON CITY OF; PWS# 4100074

REFERENCE NO. (SEE FIGURE 3)	PCS TYPE(S)	PCS NAME	APPROXIMATE LOCATION	CITY	DRINKING WATER SOURCE NAME	RELATIVE RISK LEVEL	METHOD FOR LISTING
1	CROPS - IRRIGATED/CRANBERRY BOGS	CRANBERRY BOGS	NORTHEAST OF CREEK AND SOUTHWEST OF MORRISON RD	BANDON	FERRY CREEK	HIGHER	FIELD OBSERVATION INTERVIEW
2	CROPS - IRRIGATED/CRANBERRY BOGS	CRANBERRY BOGS	SOUTH OF CREEK AND WEST OF MORRISON ROAD	BANDON	FERRY CREEK	HIGHER	FIELD OBSERVATION INTERVIEW
3	TRANSMISSION LINES - RIGHT OF WAYS	POWERLINES	CROSS WATERSHED EAST TO WEST	BANDON	FERRY CREEK	LOWER	FIELD OBSERVATION INTERVIEW
4	UTILITY STATIONS - SUBSTATION	SUBSTATION	JUST SOUTH OF POWERLINES AND WEST OF MORRISON RD	BANDON	FERRY CREEK	HIGHER	FIELD OBSERVATION INTERVIEW
5	UTILITY STATIONS - SUBSTATION	SUBSTATION	NORTH OF POWERLINES AND EAST OF MORRISON RD	BANDON	FERRY CREEK	HIGHER	FIELD OBSERVATION INTERVIEW
6	HOMESTEADS - RURAL - SEPTIC SYSTEMS < 1/ACRE	RURAL RESIDENTIAL HOUSING WEST OF MORRISON ROAD	SOUTH OF POWERLINES AND WEST OF MORRISON ROAD	BANDON	FERRY CREEK	LOWER	FIELD OBSERVATION INTERVIEW
7	CROPS - IRRIGATED/CRANBERRY BOGS	CRANBERRY BOGS	EAST OF CREEK AND NORTH AND EAST OF MORRISON ROAD AT 90 DEGREE BEND	BANDON	FERRY CREEK	HIGHER	FIELD OBSERVATION INTERVIEW
8	HOMESTEADS - RURAL - SEPTIC SYSTEMS < 1/ACRE	RURAL RESIDENTIAL HOUSING NORTH OF MORRISON ROAD	EAST OF CREEK AND NORTH OF HAIRPIN TURN IN MORRISON ROAD	BANDON	FERRY CREEK	LOWER	FIELD OBSERVATION INTERVIEW
9	MANAGED FOREST LAND - CLEARCUT HARVESTED - < 35 YEARS	FOREST LAND RECENTLY CLEARCUT AND REPLANTED	SOUTH OF HAIRPIN TURN IN MORRISON ROAD	BANDON	FERRY CREEK	MODERATE	FIELD OBSERVATION INTERVIEW
10	TRANSPORTATION CORRIDORS - FREEWAYS/STATE HIGHWAYS OR OTHER HEAVY USE ROADS / TRANSPORTATION CORRIDORS - HERBICIDE USE AREAS	MORRISON ROAD	RUNS APPROXIMATELY NORTH TO SOUTH ALONG EASTERN EDGE OF WATERSHED	BANDON	FERRY CREEK	MODERATE	FIELD OBSERVATION INTERVIEW
11	TRANSPORTATION CORRIDORS - STREAM CROSSING - PERENNIAL	MORRISON ROAD CROSSING FERRY CREEK	CROSSES NORTHERN MOST BRANCH OF CREEK WHERE ROAD RUNS NORTH TO SOUTH	BANDON	FERRY CREEK	LOWER	FIELD OBSERVATION INTERVIEW
12	CROPS - IRRIGATED/CRANBERRY BOGS	CRANBERRY BOGS	EAST OF CREEK AND NORTH OF BILL CREEK RD	BANDON	GEIGER CREEK	HIGHER	FIELD OBSERVATION INTERVIEW
13	TRANSMISSION LINES - RIGHT-OF-WAYS	POWERLINES	CROSS CREEK NORTH OF BILL CREEK RD	BANDON	GEIGER CREEK	HIGHER	FIELD OBSERVATION INTERVIEW
14	HOUSING - HIGH DENSITY- >1 HOUSE/0.5 ACRE / SEPTIC SYSTEMS - HIGH DENSITY - > 1/ACRE	POSSIBLE HIGH DENSITY HOUSING WITH HIGH DENSITY SEPTIC	EAST OF CREEK/INSIDE BEND OF BILL CREEK RD	BANDON	GEIGER CREEK	MODERATE	FIELD OBSERVATION INTERVIEW
15	TRANSPORTATION CORRIDORS - STREAM CROSSING - PERENNIAL	BILL CREEK RD CROSSING GEIGER CREEK	SOUTH OF POWERLINES CROSSING CREEK	BANDON	GEIGER CREEK	HIGHER	FIELD OBSERVATION INTERVIEW
16	CROPS - IRRIGATED/CRANBERRY BOGS	CRANBERRY BOGS	FIRST CLUSTER OF BOGS SOUTH OF BILL CREEK RD AND WEST OF CREEK	BANDON	GEIGER CREEK	HIGHER	FIELD OBSERVATION

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES; BANDON CITY OF; PWS# 4100074

REFERENCE NO. (SEE FIGURE 3)	POTENTIAL IMPACTS	DATABASE LISTINGS	COMMENTS
1	OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT DRINKING WATER. EXCESSIVE IRRIGATION MAY CAUSE TRANSPORT OF CONTAMINANTS OR SEDIMENTS TO GROUNDWATER/SURFACE WATER THROUGH RUNOFF. NOTE: *DRIP-IRRIGATED CROPS SUCH AS VINEYARDS AND SOME VEGETABLES, ARE CONSIDERED TO BE A LOW RISK.	NONE	NONE
2	OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT DRINKING WATER. EXCESSIVE IRRIGATION MAY CAUSE TRANSPORT OF CONTAMINANTS OR SEDIMENTS TO GROUNDWATER/SURFACE WATER THROUGH RUNOFF. NOTE: *DRIP-IRRIGATED CROPS SUCH AS VINEYARDS AND SOME VEGETABLES, ARE CONSIDERED TO BE A LOW RISK.	NONE	NONE
3	CONSTRUCTION AND CORRIDOR MAINTENANCE MAY CONTRIBUTE TO INCREASED EROSION AND TURBIDITY IN SURFACE WATER DRINKING WATER SUPPLYS. OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT DRINKING WATER SUPPLY.	NONE	NONE
4	SPILLS, LEAKS, OR IMPROPER HANDLING OF CHEMICALS AND OTHER MATERIALS INCLUDING PCBS DURING TRANSPORTATION, USE, STORAGE AND DISPOSAL MAY IMPACT THE DRINKING WATER SUPPLY.	NONE	NONE
5	SPILLS, LEAKS, OR IMPROPER HANDLING OF CHEMICALS AND OTHER MATERIALS INCLUDING PCBS DURING TRANSPORTATION, USE, STORAGE AND DISPOSAL MAY IMPACT THE DRINKING WATER SUPPLY.	NONE	NONE
6	IF NOT PROPERLY SITED, DESIGNED, INSTALLED, AND MAINTAINED, SEPTIC SYSTEMS CAN IMPACT DRINKING WATER. USE OF DRAIN CLEANERS AND DUMPING HOUSEHOLD HAZARDOUS WASTES CAN RESULT IN GROUNDWATER CONTAMINATION.	NONE	NONE
7	OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT DRINKING WATER. EXCESSIVE IRRIGATION MAY CAUSE TRANSPORT OF CONTAMINANTS OR SEDIMENTS TO GROUNDWATER/SURFACE WATER THROUGH RUNOFF. NOTE: *DRIP-IRRIGATED CROPS SUCH AS VINEYARDS AND SOME VEGETABLES, ARE' CONSIDERED TO BE A LOW RISK.	NONE	NONE
8	IF NOT PROPERLY SITED, DESIGNED, INSTALLED, AND MAINTAINED, SEPTIC SYSTEMS CAN IMPACT DRINKING WATER. USE OF DRAIN CLEANERS AND DUMPING HOUSEHOLD HAZARDOUS WASTES CAN RESULT IN GROUNDWATER CONTAMINATION.	NONE	NONE
9	CUTTING AND YARDING OF TREES MAY CONTRIBUTE TO INCREASED EROSION, RESULTING IN TURBIDITY AND CHEMICAL CHANGES IN DRINKING WATER SUPPLY. OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT DRINKING WATER SOURCE.	NONE	NONE
10	VEHICLE USAGE INCREASES THE RISKS FOR LEAKS OR SPILLS OF FUELS AND OTHER HAZARDOUS MATERIALS THAT MAY IMPACT DRINKING WATER. ROAD BUILDING, MAINTENANCE, AND USAGE MAY CONTRIBUTE TO INCREASED EROSION AND SLOPE FAILURE CAUSING TURBIDITY IN SURFACE WATER DRINKING WATER SOURCES. OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT THE DRINKING WATER SUPPLY. OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES MAY IMPACT DRINKING WATER SUPPLY.	NONE	FIELD RISK REDUCED TO MODERATE BECAUSE ROAD IS NOT HEAVILY USED
11	ROAD BUILDING, MAINTENANCE, AND USAGE MAY CONTRIBUTE TO EROSION AND SLOPE FAILURE CAUSING TURBIDITY IN DRINKING WATER SOURCE. VEHICLE USAGE INCREASES THE RISKS OF LEAKS OR SPILLS OF FUELS AND OTHER CHEMICALS IN HIGHLY SENSITIVE AREAS. OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES IN RIGHT-OF WAY MAY ALSO IMPACT DRINKING WATER SOURCE.	NONE	NONE
12	OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT DRINKING WATER. EXCESSIVE IRRIGATION MAY CAUSE TRANSPORT OF CONTAMINANTS OR SEDIMENTS TO GROUNDWATER/SURFACE WATER THROUGH RUNOFF. NOTE: *DRIP-IRRIGATED CROPS SUCH AS VINEYARDS AND SOME VEGETABLES, ARE CONSIDERED TO BE A LOW RISK.	NONE	NONE
13	CONSTRUCTION AND CORRIDOR MAINTENANCE MAY CONTRIBUTE TO INCREASED EROSION AND TURBIDITY IN SURFACE WATER DRINKING WATER SUPPLYS. OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT DRINKING WATER SUPPLY.	NONE	NONE
14	IMPROPER USE, STORAGE, AND DISPOSAL OF HOUSEHOLD CHEMICALS INCLUDING CLEANERS, VEHICLE MAINTENANCE PRODUCTS, POOL CHEMICALS, PESTICIDES AND FERTILIZERS MAY IMPACT THE DRINKING WATER SUPPLY. STORMWATER RUN-OFF OR INFILTRATION MAY CARRY CONTAMINANTS TO DRINKING WATER SUPPLY.	NONE	NONE
15	ROAD BUILDING, MAINTENANCE, AND USAGE MAY CONTRIBUTE TO EROSION AND SLOPE FAILURE CAUSING TURBIDITY IN DRINKING WATER SOURCE. VEHICLE USAGE INCREASES THE RISKS OF LEAKS OR SPILLS OF FUELS AND OTHER CHEMICALS IN HIGHLY SENSITIVE AREAS. OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES IN RIGHT-OF WAY MAY ALSO IMPACT DRINKING WATER SOURCE.	NONE	NONE
16	OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT DRINKING WATER. EXCESSIVE IRRIGATION MAY CAUSE TRANSPORT OF CONTAMINANTS OR SEDIMENTS TO GROUNDWATER/SURFACE WATER THROUGH RUNOFF. NOTE: *DRIP-IRRIGATED CROPS SUCH AS VINEYARDS AND SOME VEGETABLES, ARE CONSIDERED TO BE A LOW RISK.	NONE	NONE

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES; BANDON CITY OF; PWS# 4100074

REFERENCE NO. (SEE FIGURE 3)	PCS TYPE(S)	PCS NAME	APPROXIMATE LOCATION	CITY	DRINKING WATER SOURCE NAME	RELATIVE RISK LEVEL	METHOD FOR LISTING
17	CROPS - IRRIGATED/CRANBERRY BOGS	CRANBERRY BOGS	SECOND CLUSTER OF BOGS SOUTH OF BILL CREEK RD AND WEST OF CREEK	BANDON	GEIGER CREEK	HIGHER	FIELD OBSERVATION
18	CROPS - IRRIGATED/CRANBERRY BOGS	CRANBERRY BOGS	THIRD CLUSTER OF BOGS SOUTH OF BILL CREEK RD AND WEST OF CREEK	BANDON	GEIGER CREEK	HIGHER	FIELD OBSERVATION
19	CROPS - IRRIGATED/CRANBERRY BOGS	CRANBERRY BOGS	SET OF BOGS AT EXTREME SOUTHERN TIP OF CREEK	BANDON	GEIGER CREEK	HIGHER	FIELD OBSERVATION
20	MINES/GRAVEL PITS	BORROW PIT	JUST SOUTH OF CRANBERRY CLUSTER #6	BANDON	GEIGER CREEK	HIGHER	FIELD OBSERVATION
21	OTHER - HISTORIC SPILL	SITE OF BOG BUILDERS EXCAVATION EQUIPMENT INTO CREEK (1998)	JUST SOUTH OF BILL CREEK RD STREAM CROSSING	BANDON	GEIGER CREEK	MODERATE	FIELD OBSERVATION INTERVIEW
22	UPSTREAM RESERVOIRS/DAMS	PLANNED CRANBERRY BOG RESERVOIR	JUST NORTH OF UPPER BRANCH AT CREEK FORK	BANDON	GEIGER CREEK	MODERATE	FIELD OBSERVATION INTERVIEW
23	CROPS - IRRIGATED/CRANBERRY BOGS	CRANBERRY BOGS	JUST SOUTH OF BILL CREEK RD STREAM CROSSING	BANDON	GEIGER CREEK	MODERATE	INTERVIEW
24	CROPS - IRRIGATED/CRANBERRY BOGS	CRANBERRY BOGS	AT SOUTHEAST END OF BILL CREEK ROAD	BANDON	GEIGER CREEK	MODERATE	FIELD OBSERVATION INTERVIEW
25	TRANSPORTATION CORRIDORS - FREEWAYS/HIGHWAYS OR OTHER HEAVY USE ROADS	BILL CREEK ROAD	RUNS THROUGH UPPER WATERSHED EAST TO WEST	BANDON	GEIGER CREEK	MODERATE	FIELD OBSERVATION INTERVIEW
26	TRANSPORTATION CORRIDORS - HERBICIDE USE AREAS	BILL CREEK ROAD	RUNS THROUGH UPPER WATERSHED EAST TO WEST	BANDON	GEIGER CREEK	MODERATE	FIELD OBSERVATION INTERVIEW
27	TRANSPORTATION CORRIDORS - FREEWAYS/HIGHWAYS OR OTHER HEAVY USE ROADS / TRANSPORTATION CORRIDORS - HERBICIDE USE AREAS	WINDHURST ROAD	RUNS THROUGH LOWER WATERSHED AT WESTERN EDGE	BANDON	GEIGER CREEK	MODERATE	FIELD OBSERVATION INTERVIEW

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

TABLE 2. INVENTORY RESULTS - LIST OF POTENTIAL CONTAMINANT SOURCES; BANDON CITY OF; PWS# 4100074

REFERENCE NO. (SEE FIGURE 3)	POTENTIAL IMPACTS	DATABASE LISTINGS	COMMENTS
17	OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT DRINKING WATER. EXCESSIVE IRRIGATION MAY CAUSE TRANSPORT OF CONTAMINANTS OR SEDIMENTS TO GROUNDWATER/SURFACE WATER THROUGH RUNOFF. NOTE: *DRIP-IRRIGATED CROPS SUCH AS VINEYARDS AND SOME VEGETABLES, ARE CONSIDERED TO BE A LOW RISK.	NONE	NONE
18	OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT DRINKING WATER. EXCESSIVE IRRIGATION MAY CAUSE TRANSPORT OF CONTAMINANTS OR SEDIMENTS TO GROUNDWATER/SURFACE WATER THROUGH RUNOFF. NOTE: *DRIP-IRRIGATED CROPS SUCH AS VINEYARDS AND SOME VEGETABLES, ARE CONSIDERED TO BE A LOW RISK.	NONE	NONE
19	OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT DRINKING WATER. EXCESSIVE IRRIGATION MAY CAUSE TRANSPORT OF CONTAMINANTS OR SEDIMENTS TO GROUNDWATER/SURFACE WATER THROUGH RUNOFF. NOTE: *DRIP-IRRIGATED CROPS SUCH AS VINEYARDS AND SOME VEGETABLES, ARE CONSIDERED TO BE A LOW RISK.	NONE	NONE
20	SPILLS, LEAKS, OR IMPROPER HANDLING OF CHEMICALS AND WASTES GENERATED IN MINING OPERATIONS OR FROM HEAVY EQUIPMENT MAY IMPACT THE DRINKING WATER SUPPLY.	NONE	SITE IS LOCATED JUST OUTSIDE THE DWPA HOWEVER IT MAY IMPACT THE DWPA
21	THE IMPACTS OF THIS POTENTIAL CONTAMINANT SOURCE SHOULD BE ADDRESSED DURING THE ENHANCED INVENTORY.	NONE	PWS SHOULD VERIFY THAT CLEANUP IS COMPLETE
22	DURING MAJOR STORM EVENTS, RESERVOIRS MAY CONTRIBUTE TO PROLONGED TURBIDITY FOR DOWNSTREAM INTAKES FOR DRINKING WATER. CONSTRUCTION, FLUCTUATING WATER LEVELS, AND HEAVY WATERSIDE USE CAN INCREASE EROSION AND TURBIDITY IN RESERVOIR/DRINKING WATER SOURCE.	NONE	PWS SHOULD VERIFY WHETHER RESERVOIR IS ACTUALLY PUT INTO USE
23	OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT DRINKING WATER. EXCESSIVE IRRIGATION MAY CAUSE TRANSPORT OF CONTAMINANTS OR SEDIMENTS TO GROUNDWATER/SURFACE WATER THROUGH RUNOFF. NOTE: *DRIP-IRRIGATED CROPS SUCH AS VINEYARDS AND SOME VEGETABLES, ARE CONSIDERED TO BE A LOW RISK.	NONE	LOCATED WITH AERIAL PHOTOS/PWS SHOULD VERIFY LOCATION
24	OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT DRINKING WATER. EXCESSIVE IRRIGATION MAY CAUSE TRANSPORT OF CONTAMINANTS OR SEDIMENTS TO GROUNDWATER/SURFACE WATER THROUGH RUNOFF. NOTE: *DRIP-IRRIGATED CROPS SUCH AS VINEYARDS AND SOME VEGETABLES, ARE CONSIDERED TO BE A LOW RISK.	NONE	NONE
25	VEHICLE USAGE INCREASES THE RISKS FOR LEAKS OR SPILLS OF FUELS AND OTHER HAZARDOUS MATERIALS THAT MAY IMPACT DRINKING WATER. ROAD BUILDING, MAINTENANCE, AND USAGE MAY CONTRIBUTE TO INCREASED EROSION AND SLOPE FAILURE CAUSING TURBIDITY IN SURFACE WATER DRINKING WATER SOURCES. OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT THE DRINKING WATER SUPPLY.	NONE	FIELD RISK REDUCED TO MODERATE BECAUSE ROAD IS NOT HEAVILY USED
26	OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES MAY IMPACT DRINKING WATER SUPPLY.	NONE	NONE
27	VEHICLE USAGE INCREASES THE RISKS FOR LEAKS OR SPILLS OF FUELS AND OTHER HAZARDOUS MATERIALS THAT MAY IMPACT DRINKING WATER. ROAD BUILDING, MAINTENANCE, AND USAGE MAY CONTRIBUTE TO INCREASED EROSION AND SLOPE FAILURE CAUSING TURBIDITY IN SURFACE WATER DRINKING WATER SOURCES. OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES OR FERTILIZERS MAY IMPACT THE DRINKING WATER SUPPLY. OVER-APPLICATION OR IMPROPER HANDLING OF PESTICIDES MAY IMPACT DRINKING WATER SUPPLY.	NONE	FIELD RISK REDUCED TO MODERATE BECAUSE ROAD IS NOT HEAVILY USED

Note: Sites and areas identified in this Table are only potential sources of contamination to the drinking water. Environmental contamination is not likely to occur when contaminants are used and managed properly.

Attachment

Source Water Assessment Report
City of Bandon
PWS # 4100534

Attachment A. Source Water Assessment Summary Brochure

SOURCE WATER ASSESSMENT SUMMARY BROCHURE

CITY OF BANDON

PWS # 4100074

WHAT IS A SOURCE WATER ASSESSMENT?

The Source Water Assessment was recently completed by the Oregon Health Division and the Department of Environmental Quality to identify the surface areas (and/or subsurface areas) that supply water to the City of Bandon's public water system intake and inventory the potential contaminant sources that may impact the water supply.

WHY WAS IT COMPLETED?

The Source Water Assessment was completed to provide information so that the City of Bandon's public water supply operator, consumers and community citizens can develop strategies to protect the quality of the source of their drinking water, and to minimize future public expenditures for drinking water treatment. The assessment was prepared under the requirements and guidelines of the Federal Safe Drinking Water Act (SDWA).

WHAT AREAS ARE INCLUDED IN BANDON'S DRINKING WATER PROTECTION AREA?

The drinking water for the City of Bandon is supplied by intakes on Ferry and Geiger Creeks. This public water system serves approximately 2800 citizens. The intakes are located in the Ferry Creek Watershed in the Coquille River Sub-Basin. The geographic area providing water to Bandon's intake (the drinking water protection area) extends upstream approximately two miles in a southeasterly direction and encompasses a total area of 4 square miles. The elevation change from the upper edge of the watershed to the intake is approximately 400 feet. *The boundaries of the Drinking Water Protection Area are illustrated on the figure attached to this summary.*

WHAT ARE THE POTENTIAL SOURCES OF CONTAMINATION TO MOLALLA'S PUBLIC DRINKING WATER SUPPLY?

The purpose of an inventory is to identify and locate significant potential sources of contaminants of concern. An inventory of potential contamination sources was performed within Bandon's drinking water protection area. The delineated drinking water protection area is primarily dominated by forest and agricultural land uses with interspersed areas of residential use. A total of 27 potential contaminant sources were identified in the watershed.

WHAT ARE THE RISKS FOR OUR SYSTEM?

Of the potential contaminant sources identified in this assessment, 18 are located in the sensitive areas. In the Bandon watershed, the sensitive areas include soils with high runoff potential and those adjacent to the streams. Potential contaminant sources that pose a higher to moderate relative risk to the drinking water supply include irrigated crops (cranberry bogs), the transportation corridors, public utility facilities, a managed forest area, a high density housing area using septic systems, a borrow pit, a historic spill, and a planned cranberry bog reservoir. The information in this assessment provides a basis for prioritizing areas in and around your community that are most vulnerable to potential impacts and can be used by the Bandon community to develop a voluntary Drinking Water Protection Plan.

NEED MORE INFORMATION?

The City of Bandon's Source Water Assessment Report provides additional details on the methodology and results of this assessment. The full report is available for review at the Public Works office. Contact the City Public Works staff at:

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if you would like additional information on Bandon's Source Water Assessment results.

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City of Bandon
PWS # 4100534

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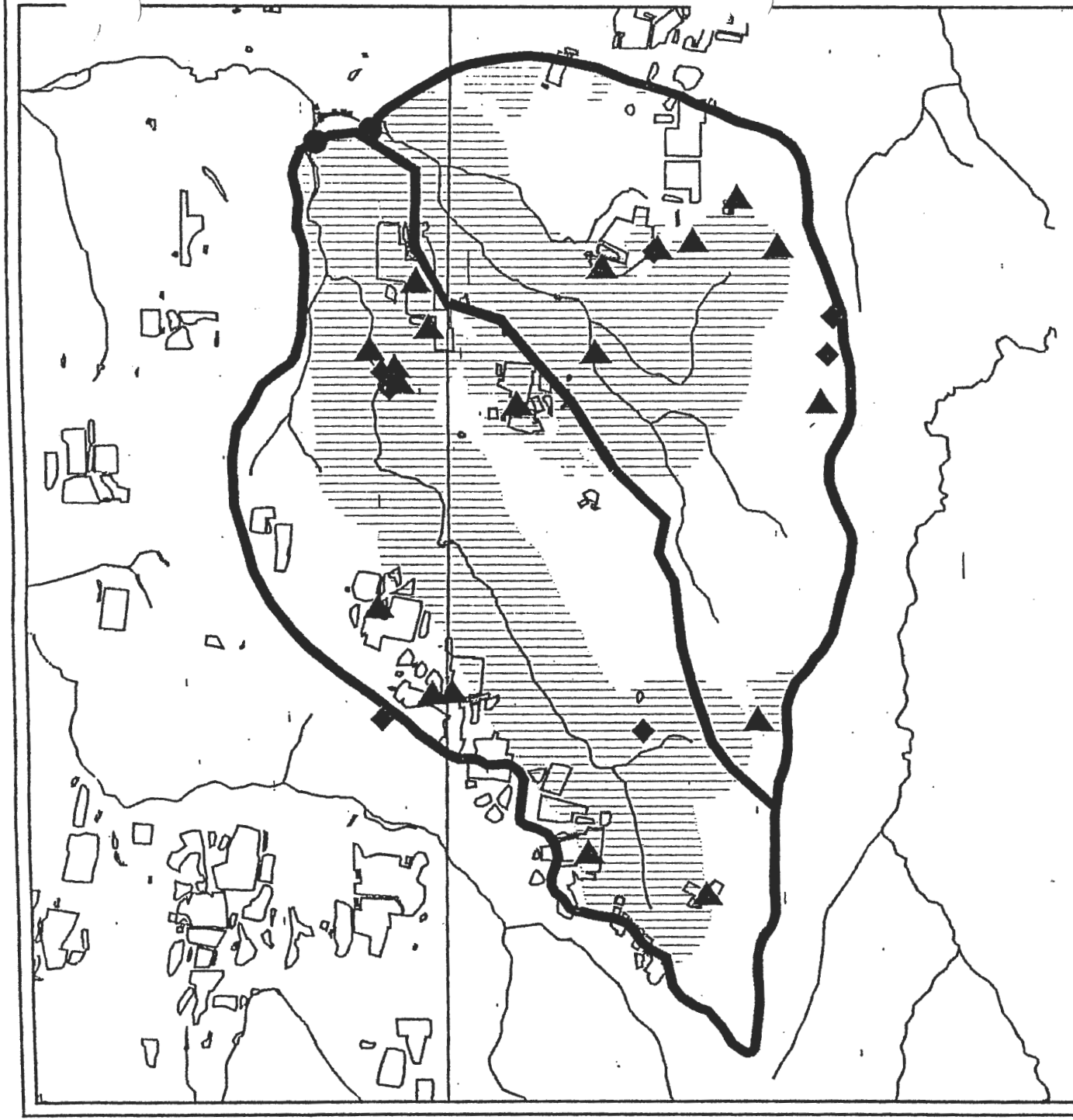

Source Water Assessment Results

Bandon's Drinking Water Protection Area with Sensitive Areas and Potential Contamination Sources

PWS 4100074

Drinking Water Protection Area

Drinking Water Intake - Surface Water

Sensitive Areas

Area Feature (see Note 2)

Point Feature (see Note 2)

Notes on Potential Contaminant Sources

Note 1: Sites and areas noted in this Figure are potential sources of contamination to the drinking water identified by Oregon drinking water protection staff. Environmental contamination is not likely to occur when contaminants are used and managed properly.

Note 2: Feature identification markers correspond to the potential contaminant source numbers in the SWA Report. The area features represent the approximate area where the land use or activity occurs and is marked at the point closest to the intake. The point features represent the approximate point where the land use or activity occurs.

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Oregon Department of Environmental Quality GIS