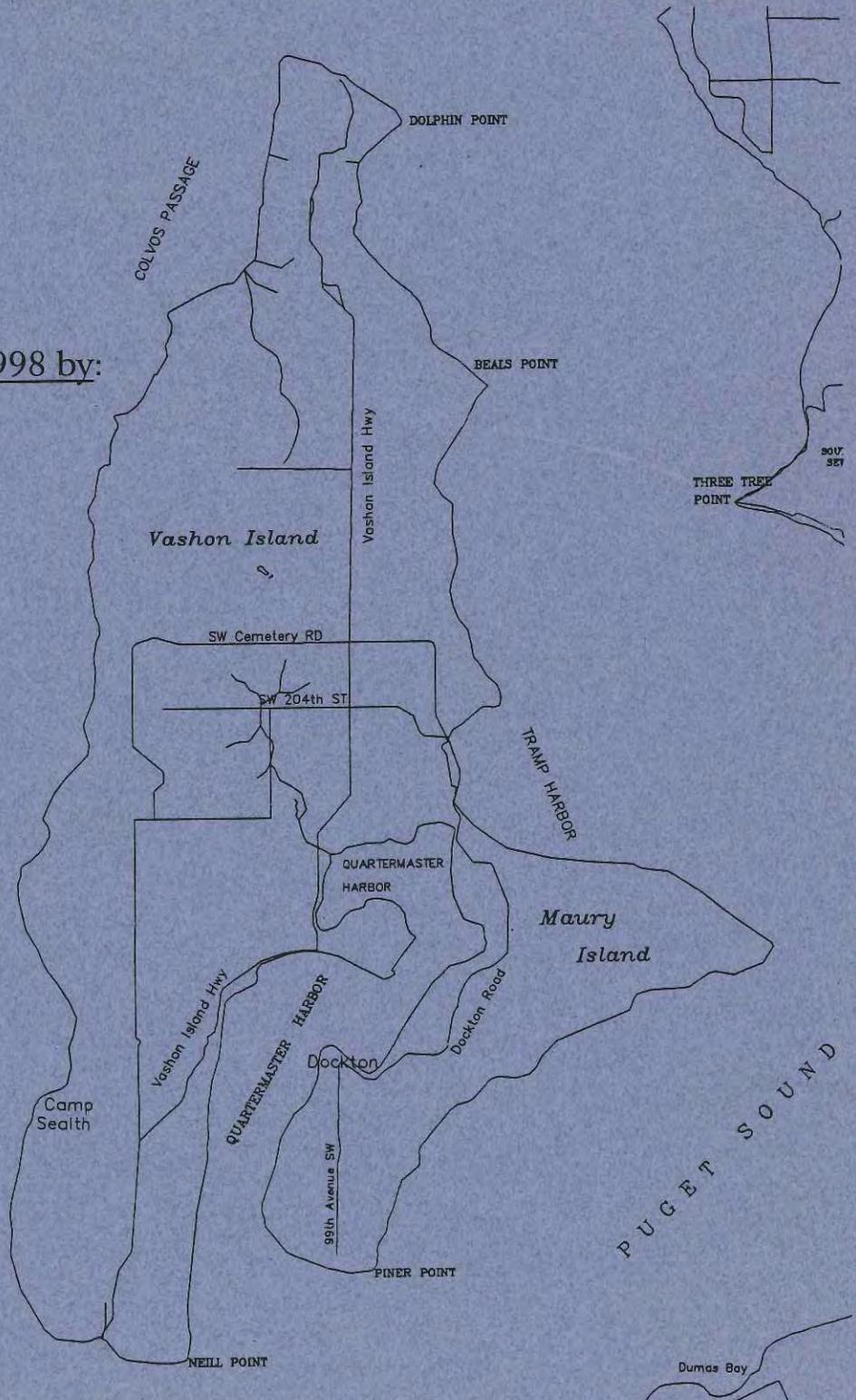


# Vashon-Maury Island Ground Water Management Plan

Final

Submitted December, 1998 by:  
Vashon - Maury Island  
Ground Water  
Advisory Committee



**Vashon-Maury Island  
Ground Water Management Plan:  
Management Strategies**

**December 1998  
Final**

Data and information contained in this document are current as of the period of project performance: 1989 - 1995.

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Ground Water Management Plan**

**December 1998**

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(Published Separately)

**Executive Summary**

**Vashon-Maury Island  
Ground Water Management Plan**

**December 1998**

## **Executive Summary**

### **Overview**

The Vashon-Maury Island Ground Water Management Area is a thirty seven square mile area located in the southern end of Puget Sound. The Island is bordered on the west by Colvos Passage from the Kitsap Peninsula, on the south by Dalco Passage from Tacoma, on the east by Puget Sound and King County, and on the north by Puget Sound. Low density residential development covers much of the Island with zoning of one home per five and ten acres. Higher density residential areas are concentrated in the Vashon Town Center, Vashon Heights, Burton, Dockton, and along parts of the shoreline. Multifamily, commercial and industrial uses are presently concentrated in the unincorporated town of Vashon and adjacent areas where sewer and other urban services are available.

The Vashon-Maury Island Ground Water Management Area was designated a Sole Source Aquifer by the United States Environmental Protection Agency in June, 1994 because Island ground and surface water provides all of the water needed for residential, commercial and agricultural needs. All water used on Vashon-Maury Island comes from precipitation that falls on the Island.

Seven Group A public water systems, ninety eight Group B public water systems, and an estimated 3,000 individual water systems rely on the Island's ground water. Approximately sixty nine percent of the Group A water systems and an estimated fifty to seventy five percent of Group B and individual wells draw water that is 25 feet or less below the surface of the ground.

The Vashon-Maury Island Ground Water Advisory Committee developed this Plan. They were appointed by the Department of Ecology and will be submitting the Plan to the State for certification. The Ground Water Advisory Committee met over a ten year period and consisted of representatives from many different groups that manage, develop, or rely on ground water in the area.

The Vashon-Maury Island Ground Water Management Plan contains a statement of purpose, introduction, recommended ground water management strategies, and a recommended implementation process. The supplement to the plan contains the area characterization, background for each issue addressed by the proposed management strategies, references, and appendices.

### **Ground Water Quality and Quantity Issues**

Ground water provides the Island's primary water supply. Drinking water in the Vashon-Maury Island Ground Water Management Area is provided by ground water sources and creeks that augment supply for some purveyors and individual systems. A two-part aquifer system (shallow and deep) was identified in 1983. Most of the Island wells withdraw water from the shallow aquifer. The deep aquifer is about 400 feet deep or

more. Water District Number 19's well draws from this deep aquifer. This simplified two aquifer system has now been defined in more detail to include four water bearing zones distributed throughout the Island. Although they are portrayed as separate units, the aquifer configuration is actually more complex and several of the water bearing zones are likely interconnected. Passage of water down through these zones allows potential contamination to travel from the susceptible near surface zones to successively deeper zones.

Wells that draw water from shallow aquifer zones are most vulnerable to contamination from land use activities. The vulnerability and susceptibility of shallow ground water is evident from the increased nitrate concentrations from 0.5 milligrams per liter (mg/l) in mid-1980's to 3.2 mg/l in 1994 occurring in the Burton Water Company well and from leachate derived contamination of both shallow and deep aquifers in the vicinity of the Vashon landfill. Because of the vulnerability of the shallow aquifer to contamination and the dependence of Island residents on shallow ground water for potable supply, the Vashon Ground Water Advisory Committee adopted the following two fundamental principles:

- On Vashon the quantity and quality of ground water is inextricably tied to the quantity and quality of surface water. Adequate protection of ground water requires protecting surface water supplies as well.
- Current Island residents have invested in drilling wells and obtaining water supplies. They should not be forced to drill deep wells, at a substantial cost, in order to continue using the same amount of water. It is not acceptable to allow the Island's population to increase to the point where current residents lose their existing water supplies due to contamination or overuse.

Water quality on Vashon-Maury Island is also threatened by seawater intrusion occurring along the coast. When ground water is pumped from aquifers that are in hydraulic continuity with Puget Sound, seawater may flow toward the well resulting in elevated levels of chloride. Wells with elevated chloride levels were identified in 1983 on the northern end of Vashon Island and the southeastern section of Maury Island. Wells monitored along the coastline in 1989 and 1990 as part of this Plan showed no evidence of seawater intrusion. However, a well with seawater intrusion in the northeast area (near Glen Acres) of Vashon was closed in 1993.

Extensive mapping of physically susceptible and recharge areas has been performed as part of this ground water planning process. The areas ranked as highly susceptible to ground water contamination indicate areas where the potential for contamination resulting from specific land management practices is high due to the permeability of the overlying soil, surficial geologic materials, and a shallow depth to ground water. Some management strategies identified in this Plan, as well as resource protection and land use policies in the King County Comprehensive Plan and Vashon-Maury Island Community

Plan, are applicable in these highly susceptible areas. Therefore, the Ground Water Advisory Committee adopted the following two fundamental principles:

- Enforcement of existing laws is essential to protect water resources. Adequate funding must be provided for enforcement.
- The 1986 Vashon Community Plan included many policies to protect water resources. The need for those policies has not changed. They should be fully implemented.

Land use activities affect both recharge and demand for water. Decrease in ground water recharge can be caused by development (by paving and building over high recharge areas and by loss of forested lands in areas with steep topography). In addition, continued suburbanization of Vashon-Maury Island will require greater volumes of ground water to be withdrawn from the aquifer system. Because the Island aquifer and surface water systems provide the only sources of water, and the maintenance of stable ground water levels could be affected by new development, management and land use strategies are proposed in this Plan to assist in preserving ground water quantity.

Vashon Island's population, development, and its related groundwater impacts have been increasing. The population has grown from 7,400 in 1970 to an estimated 10,200 in 1994. King County's population target for the Vashon rural area is an increase of only 720 to 1,200 persons (300 - 500 households) by 2012 for a total population between 10,930 and 11,400 persons. However, existing zoning would allow approximately 20,000 total residents. An analysis prepared when developing the Vashon Community Plan determined that the ground water available for consumption is approximately 930 acre-feet per year. It was estimated that this ground water supply could support an island population of between 10,900 to 13,200 people without significant impacts to surface or ground water resources. The technical analysis prepared for this Ground Water Management Plan estimates total ground water for the Island at 12,895 acre-feet per year, but made no attempt to estimate a maximum population that the Island's ground water resources could support. However, the authors of this higher estimate have stated that only a fraction of the water is available for consumption, this estimate of water does not necessarily support a higher population figure than that estimated in 1983, and that if too much water is withdrawn, the effects will be seen at the surface in the form of lower stream flows, lower water table, and increased potential for seawater intrusion. Therefore, they recommended that both the 1983 and the 1990 estimates of water availability should be taken together to form a set of boundaries for water resource management policy development. Interconnected water-bearing zones and other parameters such as rainfall and infiltration estimates account for the difference in estimated ground water resources.

### **Ground Water Management Plan Goals**

The underlying goal for the development of this Plan is to manage the ground water resources of King County to optimize current and long-term benefits for present and

future residents. To achieve this goal, a broad range of strategies are proposed in the plan. Eighteen specific goals intended to provide direction for programs that protect ground water quality and quantity are divided into three categories.

Goals Related to Both Ground Water Quantity and Quality: Four goals are proposed that would protect ground water resources by using special area designations, developing a data collection and management program, infiltrating storm water, increasing educational efforts for the citizens and local officials of the management area, and implementing land use measures.

Goals Related to Ground Water Quality: Water quality in the Vashon-Maury Island Ground Water Management Area is generally excellent. The emphasis of this proposed plan is on strategies and programs to protect existing water quality. Thirteen goals are proposed that address hazardous materials management, infrastructure (e.g., sewage treatment, underground storage tanks, and landfills), pesticides, and sand and gravel mining to prevent ground water contamination.

Goal Related to Ground Water Quantity: The overriding goal of the plan is to manage the quantity of ground water resources of Vashon-Maury Island for present and future residents. This goal is addressed through a combination of conservation, education, long term monitoring and data collection program and land use measures.

## **Recommendations**

The Vashon-Maury Island Ground Water Management Plan provides a description of the ground water resources, identifies potential threats to long term water quality and quantity, recommends management strategies for protection, and suggests funding methods for implementation. After careful study and deliberation about the possible and effective ground water protection measures, the Vashon-Maury Island Ground Water Advisory Committee adopted approximately 53 management strategies.

Management strategies that have been prioritized as “high” address the vulnerability of the Vashon-Maury Island aquifer system and it’s importance as primary supply of potable water. These strategies include:

- Applying land use controls to prevent overuse or contamination, including applying one residential unit per ten acre zoning in areas highly susceptible to contamination (consistent with the King County Comprehensive Plan R-205A);
- Incorporating an assessment of water quality impacts from specific land uses in a “Guidance for Environmental Reviewers,” especially in areas that are determined to be highly susceptible to ground water contamination, or in high recharge areas;
- Developing basic strategies that King County could implement to assist purveyors in their well head protection efforts;
- Implementing a seawater intrusion program;

- Monitoring trigger levels of certain parameters to help in assessing land use impacts on ground water;
- Assessing development's potential impact to recharge areas or infiltration potential during environmental review. Also, an analysis of aquifer capacity and associated surface water and ground water interaction should be performed, if water rights application is part of the development proposal;
- Requesting King County to enforce and implement adopted resource and land use policies applicable to Vashon-Maury Island; and,
- Adding to existing educational efforts for citizens and local governments.

### **Implementation**

The Vashon-Maury Island Ground Water Management Plan is intended to provide a framework to assist cooperation between regulatory agencies through implementation of the adopted management strategies. The management plan recommends forming a management committee for ground water protection activities in the planning area. The Representation on the Vashon-Maury Island Management Committee would consist of the King County Department of Natural Resources, a private citizen, water purveyor, and four members of the current Ground Water Advisory Committee.

The key task for implementing agencies is to develop programs, projects, budgets, and regulations consistent with this plan. Implementing agencies with the most responsibility include: King County Department of Natural Resources, Seattle-King County Department of Public Health, Water District Number 19, and the State Department of Ecology.

### **Funding**

A major source of long term funding must be developed to implement the ground water management plan. The Ground Water Advisory Committee recommends that the Metropolitan King County Council authorize a ballot measure to create an Aquifer Protection Area to provide funding for the implementation of the plan (Chapter 36.36 RCW). The ballot measure must specifically state the programs that would be implemented and time frame in which they would be completed. If voters approve the Aquifer Protection Area, the County can collect monthly ground water and septic system user fees. These funds must be used only for Vashon-Maury Island Ground Water Management Area activities. The Ground Water Advisory Committee has adopted the following two principles to guide the eventual implementation of the Aquifer Protection Area.

- When the local community chooses to tax itself to protect its water resources, the local community should set the priorities and manage the expenditure of those tax dollars, rather than turning the money over to a regional government that is not as accessible or as knowledgeable about local circumstances.

- When the local community chooses to tax itself to pay for additional protection of its water resources, the money raised should not be used to pay for governmental functions that are typically supported by general funds, such as the enactment of legislation, or that are already the responsibility of governmental bodies, such as the enforcement of existing laws.

In its review of the Management Plan, the Metropolitan King County Council has deferred creation of an Aquifer Protection Area until other funding options have been adequately considered.

The programs identified in this plan will have substantial public costs. The Ground Water Advisory Committee prioritized the programs into high, medium and low categories in part because of anticipated funding limitations. Based on preliminary estimates, implementing the high priority projects would cost approximately \$460,000; the medium priority \$27,000; and the low priority \$789,000.

**Acknowledgments**

**Vashon-Maury Island  
Ground Water Management Plan**

**December 1998**

## **Acknowledgments**

The Vashon-Maury Island Ground Water Advisory Committee was formed in 1988 and met regularly throughout the planning process. The Committee's role was to develop the plan according to the state regulations, and to provide their represented agency's perspective during the development. The input provided by the Committee was the foundation for the Plan.

This Plan has been produced by the Vashon-Maury Island Ground Water Advisory Committee, in conjunction with: the Seattle-King County Health Department; the King County Department of Natural Resources, Water and Land Resources Division; and the Department of Ecology. The King County Department of Development and Environmental Services, King County Council Staff, and the King Conservation District also contributed information or staff.

The Seattle-King County Health Department's Environmental Health Division initiated the ground water planning process. Under direction and support from Charles Kleeburg, then Chief of the Division, William J. Lasby committed to undertaking this complex and lengthy task. Mr. Lasby directed the development of the Plan from 1987 through 1995, and is recognized for his dedication and leadership. Also, the professional and volunteer staff of the Seattle-King County Health Department ground water program are recognized for their perseverance through the many unanticipated setbacks and demands of ground water program development.

The Plan was prepared with the assistance of the consulting team of Geraghty and Miller, Inc. with Ecochem Inc., URS, and Okanogan/Tacoma Pump and Drilling. The Ground Water Advisory Committee and King County staff would like to thank the numerous other organizations and citizens who contributed during the course of the development of this plan.

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\* Denotes alternate

**Statement of Purpose**

**Vashon-Maury Island  
Ground Water Management Plan**

**December 1998**

## Statement of Purpose

The people who live on Vashon Island have good reason to protect their ground water because:

- Vashon is a sole-source aquifer.
- The Vashon Community Plan states unequivocally that "all land use policies and regulations for Vashon shall reflect the overriding importance of the fact that the whole island is the recharge area for a sole-source aquifer. All of Vashon Island shall therefore be considered a ground water recharge area."
- Vashon's aquifer, the primary source of drinking water on the island, is a valuable resource that the current generation has a trust responsibility to preserve for posterity.
- Pollution of ground water is difficult and costly to arrest and almost impossible to reverse once it has begun.

For all those reasons, the Vashon Ground Water Advisory Committee decided at the outset that its goal is: *to manage the ground water resources of King County to optimize current and long-term benefits for present and future residents.* To achieve that goal we ask King County to: **adopt a non-degradation policy for Vashon.** The Ground Water Advisory Committee also set forth guiding principles for implementation of this Plan, which include:

1. On Vashon the quantity and quality of ground water is inextricably tied to the quantity and quality of surface water. Adequate protection of ground water requires protecting surface water supplies as well.
2. Current Island residents have invested in drilling wells and obtaining water supplies. They should not be forced to drill deep wells, at a substantial cost, in order to continue using the same amount of water. It is not acceptable to allow the Island's population to increase to the point where current residents lose their existing water supplies.
3. Use of ground water resources should not result in the loss of Island habitat. Withdrawal of water from the Island's aquifer should maintain sufficient base flows to support the streams and wetland ecology.
4. Enforcement of existing laws is essential to protect water resources. Adequate funding must be provided for enforcement.
5. The 1986 Vashon Community Plan included many policies to protect water resources. The need for those policies has not changed. They should be fully implemented.
6. When the local community chooses to tax itself to protect its water resources, the local community should set the priorities and manage the expenditure of those tax

dollars, rather than turning the money over to a regional government that is not as accessible, as responsive, or as knowledgeable about local circumstances.

7. When a local community chooses to tax itself to pay for additional protection of its water resources, the money raised should not be used to pay for governmental functions that are typically supported by general funds, such as the enactment of legislation, or that are already the responsibility of governmental bodies, such as the enforcement of existing laws.

Once a ground water source is contaminated, it may be lost forever and the cost of protecting ground water from contamination is considerably less than the cost of remedial action. Therefore, a major focus of the Ground Water Management Plan is on prevention with strategies that include:

- Educational programs in the schools;
- Educational placards displayed wherever herbicides, pesticides, motor oil, or any chemicals which may enter the surface or ground water (e.g., drain cleaners and laundry detergent) is sold;
- Educational material displayed in libraries and other public places; and,
- Land use measures to prevent overuse and contamination.

However, prevention will not totally protect the ground water resource. Therefore, an early warning system to alert the community and political institutions to any significant increase in pollution is needed. This early warning system must consist of both monitoring and a mechanism for quick response. The monitoring shall continue and build on the data accumulated under the original Vashon Ground Water Management grant. If it reveals that any significant pollution has reached a threshold level, the Management Committee will have six months to recommend action to the Metropolitan King County Council. Threshold levels for significant pollutants may include:

1. For any substance that is carcinogenic, mutagenic or teratogenic, and has not previously been detected in Vashon ground water: any detectable level that is confirmed by repeated (at least two samples at least two weeks apart) monitoring.
2. For any substance that is carcinogenic, mutagenic or teratogenic and has previously been detected at background levels: 10 percent of Washington state's ground water limit.
3. For any primary pollutant (a potential risk to public health, except fecal coliform) that has not previously been detected in Vashon ground water: any detectable level that is confirmed by repeated (at least two samples at least two weeks apart) monitoring.
4. For fecal coliform, the trigger is any detection that is not corrected by disinfection procedures.

5. For any primary pollutant that has previously been detected at background levels: 20 percent of Washington State's ground water limit.
6. For any secondary pollutant (primarily of aesthetic concern, but not the probable result of seawater intrusion): 50 percent of Washington state's ground water limit except where naturally occurring levels are higher.
7. For any secondary pollutant that is the probable result of seawater intrusion: 10 percent of Washington state's ground water limit.

### **Priority Assessment of Issues**

Evaluation and assessment of the Island's water resources led to a series of policy statements and recommendations for long-term planning and resource protection. The general priorities defined by the Ground Water Advisory Committee are discussed in Chapter 2, Management Strategies. The specific issues and recommendations are further prioritized based on criteria such as potential for ground water protection, community preferences, and funding mechanisms. The top priorities identified by the Ground Water Advisory Committee are:

- Establish the Ground Water Management Area as an aquifer protection area;
- Establish a data collection and management program for quality and quantity;
- Define trigger levels for indicator chemicals or contaminants;
- Establish a response mechanism for monitoring results that reach trigger levels defined in the Area Characterization;
- Provide public education to ensure the stewardship of the resource; and,
- Implement land use measures to prevent overuse and contamination.

At the request of the Metropolitan King County Council, the creation of an Aquifer Protection Area will be deferred until other options have been considered for appropriate funding sources.

**Chapter One**

**Introduction**

**Vashon-Maury Island  
Ground Water Management Plan**

**December 1998**

## **Introduction**

A Ground Water Management Plan for the Vashon-Maury Island Ground Water Management Area has been developed because (1) the ground water of the Island is a limited resource, vital to the future of the Island, the well being of its residents, and the vitality of our living natural resources; (2) ground water is not a separate body of water nor is it a separate environmental resource; (3) ground water needs to be protected and managed as a part of the entire hydrologic system, ecosystem, and economic system; and (4) the citizens and officials of King County are the stewards of the ground water resource, both for present and future generations. Therefore, it is essential that the ground water resource be protected from sources of contamination. Once a ground water source is contaminated, it may be lost forever and the cost of protecting ground water from contamination is considerably less than the cost of remedial action.

Today's generally good state of Island groundwater can be largely attributed to the 1986 *Vashon-Maury Island Community Plan*, which foresaw the importance of protecting our sole source aquifer a decade ago, brought public attention to the issue, and established appropriate land uses and policies. This Ground Water Management Plan requires continuation of the Vashon Plan policies, particularly in regard to land use, in order to withstand ever greater pressure on the resource in the upcoming decade and beyond.

Water quantity problems on the Island loom large. In the fall of 1994 four of seven major Island water purveyors were experiencing water shortages (Water District 19, Heights, Burton and Westside) as they have frequently in recent years. While there may be other options in the form of deeper wells or further stream flow reductions, they are not considered solutions because they could lead to unsustainable water use and ultimately be detrimental to the Island's ecology. While this Plan deals strictly with human use issues, there remains the major issue of leaving an adequate water supply to maintain the overall ecology of the Island. The Ground Water Advisory Committee does not regard water that is not consumed by humans to be wasted, but rather regard it as the lifeblood of the soils, vegetation, streams and wetlands that support an abundance of natural life which Islanders deem important.

### **1.1 Ground Water Management Program Purpose and Scope**

The purpose of the Washington State Department of Ecology's Ground Water Management Program is to foster the development and implementation of local ground water management plans. These plans represent a consensus on the most practical ground water protection measures to safeguard quality and ensure continued availability of this vital resource. The Vashon Ground Water Management Plan directs local and state agencies in developing regulations and programs to protect ground water.

The purpose of the Vashon-Maury Island Ground Water Management Plan is to provide a framework for cooperation between various agencies through implementation of the adopted ground water protection measures. It is also intended to serve as a guide to further focused research on the aquifers in addressing data and regulatory protection gaps.

## **1.2 Ground Water Management**

In response to growing concern in Washington State about ground water resources, the state legislature passed Substitute House Bill 232 in 1985 (Chapter 90.44.400 RCW *Regulation of Public Ground Waters*). This legislation directed the Department of Ecology to:

- Identify specific locations in need of ground water management programs,
- Establish a program to provide financial assistance to these locations, and
- Develop guidelines for the implementation of local ground water management strategies.

Ecology responded by adopting regulations defining a ground water management area as an area that encloses one or more aquifers, and which exhibits a justifiable concern for the quality and/or quantity of the ground water (*Ground Water Management Areas and Programs* Chapter 173-100 WAC).

Ecology's ground water program establishes protocols and guidelines for developing a local ground water management plan. A ground water management plan is designed to protect ground water quality and assure ground water quantity for current and future uses. The guidelines establish a process that allows for ground water issues, concerns, and opportunities from all interested groups and agencies to be incorporated into the planning process. The process is designed so that a ground water management plan can be initiated and developed on the local level while being supported by state legislation and regulations. The ground water management program process also provides local government with a method to achieve comprehensive ground water protection goals.

On June 9, 1986, King County petitioned Ecology to designate the Vashon-Maury Island Ground Water Management Area as a ground water management area. The petition document outlined a number of ground water protection problems facing the area, including:

- Potential contamination sources threaten ground water quality, or ground water is susceptible to contamination,
- Major aquifers have the potential for over use based on projected future demands, and
- Aquifers where an approved coordinated water system plan has identified a need for a Ground Water Management Plan.

Ecology designated the Vashon-Maury Island Ground Water Management Area on October 7, 1986 and approved the membership of the Ground Water Advisory Committee, consisting of a broad cross section of interests with representatives from many groups. Ecology selected the Seattle-King County Health Department to be the lead agency because it has jurisdiction throughout the Vashon Ground Water Management Area and has a regulatory role in water systems, on-site sewage systems, and other environmental health concerns. On January 1, 1996, the Metropolitan King County Council assigned responsibility for the ground water program to the Department of Natural Resources, Surface Water Management Division.

### **1.3 Management Plan Process Goals and Objectives**

The first step in developing a ground water management plan is to establish goals and objectives. The Ground Water Advisory Committee and the Seattle-King County Department of Public Health developed the following goal and objectives to help guide the process for development of the plans.

**Goal To manage the ground water resources of King County to optimize current and long-term benefits for present and future residents.**

#### **Objectives**

- Designate the Vashon-Maury Island Ground Water Management Area as a Ground Water Management Area, making it eligible for state grants designated for development of ground water management programs and plans.
- Develop a Ground Water Management Plan. This plan must:
  1. Be consistent with federal regulations, state ground water management laws and local ordinances.
  2. Include the public and local agencies participation in drafting, reviewing and modifying the plan.
  3. Include elements as described in WAC 173-100 *Ground Water Management Areas and Programs*. These include:
    - a) A public involvement plan to educate and inform the public about ground water and the Ground Water Management Plan process. The public will be informed of the need to protect the ground water resource from contamination and overuse and will provide support to the public and private actions required to protect the resource.
    - b) An area characterization section that includes mapping jurisdictional boundaries showing land and water use management authorities boundaries and goals; a description of the locale; the hydrogeology; the ground water quality; and the current ground water use and future needs.

- c) Identification and description of threats to ground water; stating goals and objectives related to these threats; and recommending strategies that solve or reduce these threats. Technical understanding of the ground water resource will be developed to assist decision-makers in formulating public policy.
  - d) An implementation process for the plan, which includes:
    - i. a work plan for each affected agency and jurisdiction,
    - ii. an effectiveness monitoring system, and
    - iii. a process for periodic review and revision.
- Obtain local approval and state certification of the plan, which will ensure implementation of the recommended ground water protection measures. Public agencies will work cooperatively to fulfill their responsibilities to protect the ground water resource. Local, state and regional land-use and water-use plans, policies and regulations will be enacted to protect the ground water resource.

#### **1.4 Plan Contents**

The proposed Vashon-Maury Island Ground Water Management Plan contains management strategies and a proposed implementation process. The supplement contains the area characterization. Each of these sections is briefly described below.

The “Recommended Ground Water Management Strategies” address the potential threats to ground water quality and quantity. The recommended management strategies are prefaced by adopted goals and a summary statement of the issues explored by the Ground Water Advisory Committee and followed by recommended management strategies. This section also contains a work plan for each management strategy, including identifying the responsible agencies and priority.

The “Recommended Implementation Process for the Ground Water Management Program” describes the preferred methods for funding and implementing the plan. It also contains tables showing the management strategies. The management strategies are listed in order, based on the Ground Water Advisory Committee priorities for funding and implementation. Another table lists the management strategy by responsible agency, in implementation order, with priority.

The Supplement to this Plan contains the area characterization and other background materials. The area characterization section describes the ground water management area’s hydrogeology and ground water quality, lists the governments and agencies that manage land and water use and describes their responsibilities, and characterizes historical land use activities that impact ground water quality and quantity.

The Supplement also contains the background material and discussion for each recommended ground water management strategy. The complete issue papers the Ground Water Advisory Committee used to make the recommendations, with unabridged

background information, are available upon request from the Ground Water Program in the Water and Land Resources Division.

### **1.5 Management Plan Team and Responsibilities**

Development of this plan was a coordinated effort between local and state government and citizen representatives on the Ground Water Advisory Committee. The following provides a brief explanation of the responsibilities of each group in developing the ground water management plan.

#### **Ground Water Advisory Committee**

The Vashon Ground Water Advisory Committee plays a critical role in developing a sound ground water management plan. The Ground Water Advisory Committee consists of a broad cross section of ground water interest groups, including local, state and federal government agencies, large and small businesses, environmental organizations and citizens. The Ground Water Advisory Committee is responsible for assuring that the Ground Water Management Plan is both technically and functionally sound. The committee will give final approval to the plan before it is submitted to Ecology for certification. The committee's specific duties include:

- Oversee the development of the Ground Water Management Plan;
- Review the work plan, schedule and budget developed by the lead agency;
- Assure that the plan is functional, and will not cause environmental or economic adversity;
- Verify that the plan is consistent with the state's regulations on ground water protection; and
- Formulate and implement a public involvement plan.

Ecology appointed the Ground Water Advisory Committee in cooperation with local governments and participated on the advisory committee. Ecology staff reviewed and approved interim plan products (e.g., Public Involvement Plan, Data Collection and Analysis Plan, Quality Assurance/Quality Control Plan, and the Data Management Plan), participated on the Ground Water Advisory Committee, and held a public hearing on the draft plan. In addition, Ecology will certify the final Ground Water Management Plan after all affected agencies have had an opportunity to concur with those provisions they are being asked to implement.

#### **Seattle-King County Health Department**

The Seattle-King County Health Department was responsible for coordinating the activities necessary to develop this proposed Ground Water Management Plan. As lead agency, this included preparing a work plan, coordinating data collection, scheduling

advisory committee meetings, developing the issue papers, drafting the plan based on committee direction, and obtaining concurrence from the affected agencies.

### **King County Department of Natural Resources**

The Metropolitan King County Council transferred the ground water management program from the Seattle-King County Health Department to the Surface Water Management Division as part of the County's reorganization plan. Transfer of the program occurred on January 1, 1996, which coincided with the Surface Water Management Division being placed in the new Department of Natural Resources. Subsequently, the Surface Water Management Division was renamed the Water and Land Resources Division and is the lead agency for the ground water management program.

### **Consultants**

This Ground Water Management Plan was developed jointly with Geraghty & Miller, Inc., Ecochem, Inc. and URS Consultants. The consulting team prepared portions of this document including the Data Collection and Analysis Plan; the Quality Assurance/Quality Control Plan; the Data Management Plan; collected stream flow measurements; trained the County staff and volunteers in data collection; oversaw drilling of the test well; conducted quality control of samples collected; and drafted the Area Characterization (published as a Supplement to this Plan).

## **1.6 Public Review, Adoption, and Implementation**

### **Public Review**

Upon completion of a draft plan Ecology held a public hearing for comment and review of the plan. This public hearing was held at the Vashon High School on December 14, 1995. Public comments from that hearing are included as an appendix to this document. The Ground Water Advisory Committee also held a public workshop at the Vashon Public Library on January 27, 1996. The lead agency collected public and agency comments during the three month period between December and March, 1996. Comments received during this period were analyzed by the Ground Water Advisory Committee and, where appropriate, included in the text of this document.

The Draft Vashon-Maury Island Ground Water Management Plan has been reviewed under the requirements of the State Environmental Policy Act. The Seattle-King County Health Department prepared an environmental checklist and published a Determination of Nonsignificance in November of 1995. No comments were received pertaining to the adequacy of the environmental review and the determination was sent to the Department of Ecology after the public comment period had closed.

## **Adoption**

Various drafts of this plan have been prepared, leading up to the present finalization. A Draft was published in March 1995 for concurrence review and comment by various affected agencies. Comments collected during the comment period (to March 1996) were incorporated into a final draft published in July 1996. This draft was submitted to the Metropolitan King County Council, and was assigned to the Law, Justice, and Human Services Committee, and hearings were held in July - October 1996 and August - September 1997. However, the plan was not passed, either for concurrence or non-concurrence, in either 1996 or 1997.

In 1998 there was a new effort to move the plan along. This time the plan was referred to two committees, the Utilities and Natural Resources Committee and the Growth Management Committee. Hearings were held in May and June of 1998, and the plan was approved, with conditions, for passage by the Council. On July 6, 1998, the County Council passed Motion 10493 that basically concurred with the plan, although with conditions. The motion, and a sample letter that was attached by Council to the motion, are included in Appendix B.

The Department of Natural Resources sent these concurrence materials to the Ground Water Advisory Committee (GWAC) on September 3rd with a cover letter. The GWAC met on October 20th to discuss the changes required by Council, and subsequently drafted a letter (dated November 18) to Louise Miller, Council Chair, with a cover letter to Laura Lowe at the Department of Ecology. All of these items are also included in Appendix B. The GWAC letter requested that the plan be forwarded to Ecology, and so it was revised according to Council's motion and submitted in December 1998.

## **Implementation**

Affected agencies and jurisdictions are responsible for implementing the plan following adoption by Ecology. The plan may be modified under the supervision of the Vashon-Maury Island Ground Water Management Committee. This committee will advise implementing agencies, oversee ground water management activities, review new issues, and consider new programs that emerged after the plan was adopted. It is the responsibility of the Management Committee to develop a process for how to incorporate new issues and programs.

**Chapter Two**  
**Management Strategies**

**Vashon-Maury Island**  
**Ground Water Management Plan**

**December 1998**

## **Recommended Management Strategies**

### **2.1 Introduction**

The Vashon-Maury Island Ground Water Management Plan contains management strategies to address the potential threats to ground water quality and quantity in the planning area. The Vashon-Maury Island Ground Water Advisory Committee identified topics or potential problems of concern and adopted management strategies for the following topics: special area designations to enhance ground water protection, storm water management, land use, seawater intrusion, education, hazardous materials management, underground storage tank management, on-site sewage disposal system use, pesticides and fertilizers, well construction and decommissioning and well owners' responsibilities, sewer pipes, solid waste landfills, burial of human remains, sand and gravel mining, and biosolids and effluent.

In developing the management strategies, the Vashon-Maury Island Ground Water Advisory Committee attempted to make maximum use of existing governmental programs and regulatory structures and was determined to build on existing efforts rather than developing new and potentially duplicative programs. The Committee preferred strategies that could be understood and supported by the citizens of Vashon-Maury Island. The Committee prioritized the management strategies because they recognized that the strategies would need to be implemented over several years.

The Vashon-Maury Island Ground Water Management Plan is intended to provide a framework to assist cooperation between various regulatory agencies and utilities through implementation of the adopted ground water protection measures. It is also intended to serve as a guide to further focused research on the aquifers to address data and regulatory protection gaps.

This chapter covers those issues that affect both ground water quality and quantity (Section 2.2); those that affect ground water quality only (Section 2.3); and those that affect ground water quantity only (Section 2.4). The sections first describe the goals for each issue, then specific issues with each topic are stated, and the adopted management strategy(ies).

### **2.2 Program Elements Related To Ground Water Quality And Quantity**

During the planning process, two significant legislative acts influenced the Ground Water Advisory Committee's recommendations. The first is the Growth Management Act, which was passed by the Washington legislature in 1990. This act requires local government to identify and protect areas that are critical for aquifer recharge. The Ground Water Advisory Committee responded by recommending some actions that are countywide in applicability rather than limited to the Ground Water Management Area.

This is in keeping with the directive of the Growth Management Act to local governments to cooperatively protect aquifer resources on a county or regional basis.

The second is wellhead protection requirements in the State Department of Health Wellhead Protection Program. The program requires public water system purveyors to delineate wellhead protection areas for each public water system and develop programs to protect ground water in those areas. The Ground Water Advisory Committee recognized the need for King County to be able to respond to recommendations in Wellhead Protection Plans for land use and other ground water protection strategies.

The Ground Water Advisory Committee identified six topics that affect ground water quantity and quality: special area designation, land use, seawater intrusion, data collection and management, storm water management, and education. This section includes a goal statement, issue summary and recommended management strategies for each of these topic areas.

### **2.2.1 Special Area Designations to Enhance Ground Water Protection**

Goal Statement: *To use available special area designations in conjunction with local regulations and policies to enhance ground water protection efforts in the Vashon-Maury Island Ground Water Management Area.*

A number of special federal, state, and local area designations may be used to enhance a ground water management program. Incorporating them may offer such benefits as a source of funds to implement ground water protection measures, enhanced eligibility for grant funds, or expanded review of development proposals. Increased public recognition of the value of an aquifer may be an important result of a special area designation. The special area designations discussed in this chapter are:

- Areas with a critical recharging effect on aquifers used for potable water per Chapter 36.70A RCW Growth Management;
- Wellhead Protection Areas per the 1986 amendments to the federal Safe Drinking Water Act;
- Environmentally Sensitive Areas per Chapter 197-11 WAC State Environmental Policy Act Rules;
- Special Protection Areas per Chapter 173-200 WAC Water Quality Standards for Ground Waters of the State of Washington;
- Sole-Source Aquifers per the federal Safe Drinking Water Act of 1974; and
- Aquifer Protection Areas per Chapter 36.36 RCW.

## **Areas with a Critical Recharging Effect on Aquifers Used for Potable Water per the Growth Management Act (RCW 36.70A)**

The Growth Management Act of 1990 requires all counties and cities in Washington to plan in order to manage growth. This act, much of which is codified in Chapter 36.70A RCW, requires that the largest and fastest growing counties conduct land use planning to achieve protection of critical areas.

The Growth Management Act also requires that the comprehensive plans contain land use controls to protect quality and quantity of ground water used for public water supplies (Chapter 36.70A.070(1) RCW). King County adopted the King County Comprehensive Plan, which contains several policies related to ground water protection to meet Growth Management Act requirements. These policies provide the basis and lay a foundation for incorporating ground water into overall natural resource management by King County. These policies include:

- NE -332 In unincorporated King County, areas identified as sole source aquifers or as areas with high susceptibility for ground water contamination where aquifers are used for potable water are designated as Critical Aquifer Recharge Areas as shown on the map, entitled Areas Highly Susceptible to Ground Water Contamination. Since this map focuses primarily on water quality issues, the County shall work in conjunction with cities and ground water purveyors as new information from ground water and wellhead protection studies adopted by the County or state agencies becomes available.
- NE-333 King County should protect the quality and quantity of ground water countywide by:
- a. Placing a priority on implementation of adopted Ground Water Management Plans;
  - b. Developing a process by which King County will review, and implement, as appropriate, adopted Wellhead Protection Programs in conjunction with cities and ground water purveyors; and
  - c. Developing, with affected jurisdictions, Best Management Practices for new development and for forestry, agriculture, and mining operations recommended in adopted Ground Water Management Plans and Wellhead Protection Programs as appropriate. The goals of these practices should be to promote aquifer recharge quality and to strive for no net reduction of recharge to ground water quantity.
  - d. Refining regulations as appropriate to protect critical aquifer recharge areas when information is evaluated and adopted by King County.
- NE-335 In making future zoning and land use decisions that are subject to environmental review, King County shall evaluate and monitor ground water policies, their implementation costs and the impacts upon the quantity and quality of ground water. The depletion or degradation of aquifers needed for

potable water supplies should be avoided or mitigated, and the need to plan and develop feasible and equivalent replacement sources to compensate for the potential loss of water supplies should be considered.

- NE-336 King County should protect groundwater in the Rural Area by:
- a. preferring land uses that retain a high ratio of permeable to impermeable surface area and that maintain or augment the infiltration capacity of the natural soils, and
  - b. Requiring standards for maximum vegetation clearing limits, impervious surface limits, and where appropriate, infiltration of surface water. These standards should be designed to provide appropriate exceptions consistent with Policy R-216.

### **The Wellhead Protection Program**

The 1986 amendments to the Safe Drinking Water Act established a Well Head Protection Program intended to safeguard ground waters used by public water supply wells. A Well Head Protection Area is defined in the Safe Drinking Water Act as "the surface and subsurface area around a well or wellfield supplying a public water system through which contaminants are reasonably likely to move toward and reach such water well or wellfield" (42 U.S.C.A. 300h-7(e)). Due to the nature of wellhead protection, much of the actual implementation efforts will be done by public water systems, local governments and by those agencies with source-specific jurisdictional responsibilities. Public water system purveyors are responsible for delineating the Well Head Protection Area and inventorying sources of contamination within the Well Head Protection Area. The effectiveness of these programs was largely predicated on the ability of the municipal well owner to directly regulate land use in all or a large portion of the zone of contribution. On Vashon, where public water system(s) do not control surrounding land use, the success of the Wellhead Protection Program will depend on the willingness of King County to impose necessary land use or other restrictions.

Considering the large number of public water systems in King County, responding to requests for and implementing individualized land use controls for each would be unworkable for King County. However, it should be possible to develop strategies under which King County could help implement Wellhead Protection Programs. Development of these strategies would benefit water systems required to prepare Wellhead Protection Programs. Such an approach is consistent with the state Wellhead Protection Program, which recommends a countywide approach to wellhead protection and the adopted policy in the King County Comprehensive Plan (NE-333).

### **Environmentally Sensitive Area Designation Under the State Environmental Protection Act**

The State Environmental Policy Act (SEPA) rules are implemented in unincorporated King County through the King County Code, "County Environmental Procedures" (Title

20.44). The Department of Development and Environmental Services is responsible for environmental review in relation to code requirements and for implementing SEPA compliance for private development proposals in King County. Municipalities within King County have either adopted the SEPA rules by reference or have developed their own regulations incorporating them. Municipalities conduct environmental review for projects occurring within incorporated boundaries.

In developing the SEPA rules, Ecology determined that some classes or types of activities, because of their size or nature, are not likely to represent a significant environmental impact and should, under ordinary circumstances, be exempt from SEPA requirements. This list of exempted types of activities is termed categorical exemptions. The categorical exemptions include some activities that could potentially represent a significant adverse environmental impact in areas of unusual ground water sensitivity.

Local governments have the authority to lower thresholds for requiring environmental review by designating certain portions of their land use jurisdiction as an Environmentally Sensitive Area. These areas are generally more vulnerable to the adverse effects of land and water-use activities. Designation would permit the Metropolitan King County Council to eliminate from environmental review specific categorical exemptions that may have an impact on ground water.

### **Special Protection Areas Established Under Washington Water Quality Standards for Ground Waters**

Ecology may designate Special Protection Areas to identify portions of the state with ground waters that require extraordinary consideration or increased protection because of one or more unique characteristics (Chapter 173-200-090 WAC). Ecology will consider the unique characteristics of a Special Protection Area when developing regulations, guidelines, and policies; when regulating activities; and when prioritizing department resources for ground water quality protection programs. Within Special Protection Areas, Ecology can choose to establish more stringent ground water quality criteria and contaminant enforcement limits. In addition, Ecology can impose special requirements for permits issued under authority of Ecology administered programs. Examples would be the State Waste Discharge Permit Program (Chapter 173-216 WAC) and permits for the withdrawal of ground water (water rights) issued pursuant to Chapter 90.44 RCW (Regulation of Public Ground Waters).

### **Sole Source Aquifer Designation under the Federal Safe Drinking Water Act**

The primary intent of the program is to prevent projects that receive federal financial assistance from contaminating aquifers representing the sole or principal source

of drinking water for an area. Projects that receive a portion, but not 100 percent, of their funding from the federal government are affected. The two Sole Source Aquifers in King County are Vashon Island and the lower Cedar River Valley. A Sole Source Aquifer

designation conveys a number of positive benefits, the most important of which is its public awareness value.

### **Aquifer Protection Areas Per Chapter 36.36 RCW**

The purpose of an Aquifer Protection Area is to establish a funding base for ground water protection, preservation, and rehabilitation programs. Aquifer Protection Areas are established through an election ballot issue requiring approval from a simple majority of voters within the proposed Aquifer Protection Area. If voters approve the Aquifer Protection Area, the county can collect modest water and septic system user fees. Fees may only be collected from users of water withdrawn from an aquifer as opposed to a surface water source.

**Issue 1 - General Protection of Aquifers:** Effective aquifer protection requires cooperation between land use jurisdictions because aquifers do not coincide with jurisdictional boundaries. General policies that provide guidance for land use decisions could be adopted by King County to provide a basic level of protection for aquifers. Environmental review should be standardized to include thorough consideration of a proposed development's impact on ground water. Ground water concern areas need to be defined and mapped.

**SA-1A Elimination of categorical exemptions to the State Environmental Policy Act:** King County, in conjunction with the Management Committee, will determine whether any categorical exemptions to the State Environmental Policy Act which are: installation of underground chemical storage tanks with a capacity of less than 10,000 gallons; construction of commercial buildings of less than 4,000 square feet and associated parking for up to 20 automobiles; construction of parking lots for up to 20 vehicles; construction of agricultural structures of under 10,000 square feet; and periodic use of Washington Department of Agriculture approved chemicals to maintain a utility or transportation right-of-way in its design condition (Chapter 197-11-800 WAC) should be eliminated in the most physically susceptible and recharge areas as mapped in the Vashon Ground Water Management Plan.

Who: King County King County Department of Natural Resources and the Management Committee  
Priority: High  
Time: 0.25 FTE  
Fund Source: Agency general funds

**SA-1B Designation of Environmentally Sensitive Areas:** King County will determine if any categorical exemptions should be eliminated and, if necessary, designate the Vashon-Maury Island Ground Water Management Area as an Environmentally Sensitive Area as authorized by the State Environmental Policy Act, so that categorical exemptions, as determined under SA-1A, may be eliminated.

Who: King County Department of Natural Resources  
Priority: Low  
Time: 0.25 FTE  
Fund Source: Agency general funds

**SA-1C Adoption of General Aquifer Protection Policies:** King County Department of Natural Resources and Office of Strategic Planning will prepare amendments to the King County Comprehensive Plan to include a policy that recognizes wellhead protection programs will provide direction for focusing intense aquifer protection efforts in those areas where the existing built environment presents very significant risks to public drinking water systems.

Who: King County Department of Natural Resources and Office of Budget and Strategic Planning  
Priority: Low  
Time: 0.125 FTE  
Fund Source: Agency general funds

**SA-1D Enhanced environmental review to protect aquifers:** King County Department of Natural Resources will develop guidance to assist environmental reviewers to: identify proposed development that may significantly impact ground water in aquifer recharge areas mapped by the Vashon Ground Water Management Plan; recognize and require adequate information to assess impacts upon ground water; and recognize and propose effective mitigation.

Who: King County Department of Natural Resources  
Priority: Low  
Time: 0.5 FTE  
Fund Source: Agency general funds

**SA - 1E Ground Water Concern Areas.** King County Department of Natural Resources, through an on-going process, will map areas where ground water is physically susceptible to contamination. These areas have been mapped according to the following criteria:

- Soil permeability - Soil units are defined by the Natural Resources Conservation Service in the *Soil Survey of the King County Area* (Soil Conservation Service 1973). The units are rated high, moderate, or low permeability according to the description in the Survey. (1/4 weight given to this criteria.)
- Geologic materials - United States Geological Survey maps provide information on surficial geology. High, moderate, or low permeability has been determined by professional judgment. (Full weight.)

- Depth to water - Drillers logs and previous investigations are used to determine depth to the uppermost water table. Existing water table elevation maps are used, if available. High (0-25 feet from surface), moderate (25-75 feet from surface), and low (greater than 75 feet from surface) contamination potentials are assigned. (Full weight.)

Areas receive overall ratings by use of an overlay map that incorporates ratings from the three physical parameters. A combined rating score is assigned to each portion of the mapped area. Determination of whether an area has a high, moderate, or low potential for recharge is based on the combined rating.

The ground water susceptibility maps produced for the Ground Water Management Plan and for the King County Comprehensive Plan were based on available information. Both the Ground Water Management Plan and the Comprehensive Plan specify that the maps will be refined as new information becomes available. Identification and protection of areas important to the quantity and quality of ground water is required by the Growth Management Act. King County expects to meet this requirement by starting with the maps currently produced, and adding new information as it becomes available. However, decisions that result in severe changes in the use of property should be deferred until detailed studies of the affected areas can be accomplished. New information may include precipitation data, land coverage and land use, for recharge and vulnerability estimation.

Who: King County Department of Natural Resources  
 Priority: Low  
 Cost: 0.25 FTE  
 Fund Source: Agency general funds would be used to disseminate mapped information. The Aquifer Protection Area Fund would support further revisions of the maps for Vashon-Maury Island.

**Issue 2 - Wellhead Protection:** Public water system purveyors are required to meet federal and state requirements to delineate and adopt measures to protect wellhead protection areas. Implementation of the Vashon Ground Water Management Plan will fulfill some wellhead protection needs. However, specific strategies to provide an increased level of protection to public water systems are required by the Washington State Department of Health. In order to accommodate the needs of the large system purveyors, King County needs to develop a way to assist wellhead protection in the unincorporated area.

**SA-2 Wellhead Protection:** King County Department of Natural Resources, in conjunction with the Management Committee, will develop strategies that King County could adopt to help purveyors implement Wellhead Protection Programs. King County would support water purveyors within the Vashon Ground Water Management Area who are applying for grants or other funding for the purpose of delineating Wellhead Protection Areas and developing and implementing protective strategies.

Who: King County Department of Natural Resources  
Priority: High  
Time: 0.5 FTE  
Fund Source: Agency general funds

**Issue 3 - Special Protection Areas:** Special Protection Areas designation enhances local ground water protection efforts by increasing the level of public concern about the aquifer and by providing additional protection when Ecology is regulating activities, developing regulations and prioritizing resources for ground water protection programs.

**SA-3 Designation of Special Protection Area:** King County Department of Natural Resources will prepare an application for Special Protection Area status for the Vashon Ground Water Management Area under *Water Quality Standards for Ground Waters of the State of Washington* (Chapter 173-200 WAC).

Who: King County Department of Natural Resources  
Priority: High  
Time: 0.125 FTE  
Fund Source: Aquifer Protection Area Fund

## **2.2.2 Land Use and Vashon-Maury Island Ground Water**

Land management practices should be avoided that can cause potential ground water contamination or overuse of the water supply thereby requiring Island residents to deepen existing wells, develop a new water system or connect to other existing water systems. Therefore, the Ground Water Advisory Committee adopted the following goal to guide development of land use management strategies:

*To preserve and protect the quality and quantity of ground water for present and future use by reducing or eliminating impacts from land use and associated population density and contamination sources.*

Seven Group A public water systems, ninety-eight Group B public water systems, and an estimated 3,000 individual water systems currently rely on the Island's groundwater to provide water to all Island residents and businesses. Since an estimated that fifty to seventy percent of the water systems draw from shallow ground water and surface water sources, it is imperative that land use policies be implemented to ensure that drinking water supplies will not be adversely affected. The King County Comprehensive Plan and Vashon Community Plan have policies, which, if implemented, would help protect the existing shallow aquifer and drinking water systems. Additional land use measures are proposed in this plan.

Replacing the Island's natural forest cover with impervious surface coverage reduces ground water recharge and base flow to streams. In general, population growth from new

development places new demands upon the ground water resources. Commercial development, such as in the Vashon Town Center, with its related roofs, parking lots and roads, significantly reduce rainfall infiltration. Where infiltration does occur, roadway runoff often introduces contaminants into the ground water. Rural development, with a lower percentage of impervious surface coverage, generally causes less site-specific rainfall infiltration reduction, but the cumulative impact of rural development can harm an island's aquifer. Residential low-density development can reduce recharge by 30 percent from previous forest cover. Rural pastures also reduce recharge, but their amount has not been estimated because hydrologic parameters have not been developed. (Hartley, David M., King County Surface Water Management, unpublished memo, August 29, 1995.) In addition, any reduction in the water supply to the till layer will reduce the recharge to regional ground water by as much as 17 percent in areas with 30 percent impervious surface and 70 percent lawn area (Wigmosta, *et. al.*, 1994). This is because the topsoil above the till layer that provides the sponge-like effect to keep the till constantly supplied with water would be removed.

Vashon Island's population, development, and its related groundwater impacts have been increasing. The population has grown from 7,400 in 1970 to an estimated 10,200 in 1994. King County's population target for the Vashon rural area is an increase of only 720 to 1,200 persons (300 - 500 households) by 2012 for a total population between 10,930 and 11,400 persons. However, existing zoning would allow approximately 20,000 total residents. An analysis prepared when developing the Vashon Community Plan determined that the ground water available for consumption is approximately 930 acre-feet per year. It was estimated that this ground water supply could support an island population of between 10,900 to 13,200 people without significant impacts to surface or ground water resources. The technical analysis prepared for this Ground Water Management Plan estimates total ground water for the Island at 12,895 acre-feet per year, but made no attempt to estimate a maximum population that the Island's ground water resources could support. However, the authors of this higher estimate have stated that only a fraction of the water is available for consumption, this estimate of water does not necessarily support a higher population figure than that estimated in 1983, and that if too much water is withdrawn, the effects will be seen at the surface in the form of lower stream flows, lower water table, and increased potential for seawater intrusion. Therefore, they recommended that both the 1983 and the 1990 estimates of water availability should be taken together to form a set of boundaries for water resource management policy development. Interconnected water-bearing zones and other parameters such as rainfall and infiltration estimates account for the difference in estimated ground water resources.

### **Land Use Management Strategies**

The Ground Water Management Committee recommends that, until a more definitive water budget is developed, the land use and ground water programs should rely on the 1983 water availability estimates. This would require resource and land use planners to be more conservative in their approach to growth on the Island. It would also require the

County to adopt a non-degradation policy for the Island's water resources, which is the intent of the management strategies contained in this plan. Since existing development will not likely be changed, the approach to protect ground water from existing and future impacts of development is to:

- Monitor the quality and quantity of ground water, and implement mitigation measures when unacceptable levels are reached,
- Predicate any future development upon knowledge about the quality and quantity of ground water and that development's potential impact on groundwater; and
- Prevent or limit development that would impact ground water, through the policies in the King County Comprehensive Plan, Vashon Community Plan, the King County Zoning Code and the measures recommended in this Plan.

### **Groundwater Monitoring**

Monitoring groundwater quality and quantity data will allow the Management Committee to advise the Metropolitan King County Council of any trends or exceedance of trigger points and to modify (advance or delay) implementation of other recommendations. The Management Committee will also determine mitigation procedures and recommend these to King County. The mitigation procedures might include:

- Establishing more restrictive standards for grading, topsoil placement, and/or enhancement, landscaping, native vegetation retention, impervious surface coverage and storm drain facilities. Land coverage on the developable areas of sites would not exceed set standards, unless geotechnical and subsurface aquifer studies show that there will be no additional impacts. Possible standards could include setting impervious surface limitation at 20%; and setting lawn areas coverage at 40%.
- Locating storm water infiltration facilities to replicate the natural system so that the top mantle of soil can accept the water from infiltration facilities;
- Using soil enhancement and other landscaping methods that are conducive to water infiltration;
- Preventing alteration of natural hydrologic features that would reduce their functional ability to preserve ground water quality and quantity;
- Conducting detailed technical analysis and subsurface exploration with appropriate geotechnical methods, water quality sampling and aquatic habitat analysis to ensure that the proposed storm drain systems will replace the existing undeveloped condition for the specific site geology;
- Specifying maintenance and operation provisions for existing natural drainage systems and on-site drainage facilities; and
- Developing a property owner's manual for every property owner in a well head protection area, or other definable area, that is experiencing adverse ground water quality and/or quantity impacts.

**LU-1 Land Use Impacts to Ground Water -- Ground Water Monitoring.** The King County Department of Natural Resources will monitor data, and report at least once a year to the Management Committee. The report will notify the Management Committee if the trigger levels are neared or exceeded, or if trends are noted. The Management Committee will also be notified if any monitored parameter shows a significant, sudden change. The trigger levels are:

- Trigger Level for Quality: 10% increase over baseline for any ground water standard, over two years;
- Trigger Level for Quantity: 10% decrease in water levels, over five - ten years, adjusted for precipitation; and,
- Trigger Level for Trend: half the Washington State limit or the result moves from zero to a quarter of the Washington State limit.

Who: King County Department of Natural Resources  
Priority: High  
Time: Part of the data collection and management program; an estimated 0.1 FTE to work with the Management Committee on analyzing trends.  
Fund Source: Aquifer Protection Area

**LU-2 Land Use Impacts to Ground Water -- Ground Water Monitoring.** The Management Committee will review the data and determine if action is needed. If needed, the Management Committee will:

- Advise the Metropolitan King County Council that development is impacting the ground water resources (based on the observed trends);
- Request King County to apply a moratorium on new dwelling unit construction as per King County Comprehensive Plan Policy R-107 of the King County Comprehensive Plan; and,
- Develop, with the King County Department of Natural Resources, mitigation measures to address the observed trends.

Who: Management Committee  
Priority: High  
Time: Estimated 0.1 FTE for committee staffing  
Fund Source: Aquifer Protection Area

### **King County Comprehensive Plan**

The Vashon Ground Water Advisory Committee discussed many types of land use controls that could be implemented by the County to help preserve the quality and quantity of drinking water for present and future residents. Several members strongly believe that there is a sound basis for including in this Ground Water Management Plan recommendations for amendments to the County's comprehensive plan that would

restrict subdivisions of land in areas highly susceptible to contamination and provide for a moratorium on building permits after Island population had reached 13,000 persons. Although such recommendations were not adopted by the Committee, they are representative of concerns expressed by Island residents in public hearings and workshops that future growth should be based on conservative estimates of available drinking water to prevent depleting and contaminating the resource.

The King County Comprehensive Plan contains the policies for land use development on the Island. The King County Comprehensive Plan designates Vashon as rural and supports low density residential development for most of the Island, and recognizes the significant influence land use development can have on the quality and quantity of ground water resources. The comprehensive plan states: "The Vashon community planning area, unlike the Rural Area as a whole, requires additional attention to plan for growth because its water supply is derived from a sole-source aquifer." The Plan reflects the objectives of the Vashon Community Plan, as noted on the following page, and contains three land use policies related specifically to Vashon-Maury Island, which include:

**R-107** King County should monitor the quantity and quality of the water supply for the Vashon Community Planning area, along with building permit and subdivision data, and reassess the Vashon Community Plan's allowable growth capacity, if warranted. If new information indicates an immediate and severe water shortage, the County should apply a complete moratorium on construction of new dwelling units while it updates the Vashon Community Plan and Area Zoning.

**R-205A** For Vashon-Maury Island, a residential density of one home per 10 acres:

- a. shall be maintained on existing areas as applied through area zoning to help protect community character and reduce adverse impacts on the island's infrastructure; and
- b. may be applied to areas identified as highly susceptible to ground water contamination or reduced recharge in a ground water management plan with which King County has concurred.

**NE-302** Development should occur in a manner that supports continued ecological and hydrological functioning of water resources. Development should not have a significant adverse impact on water quality or water quantity. On Vashon Island, development should maintain base flows, natural water levels fluctuations, ground water recharge in Critical Aquifer Recharge Areas and fish and wildlife habitat.

The Vashon Ground Water Advisory Committee recommends that these policies in the comprehensive plan need to be supplemented because: 1) the aquifer most residents draw water from is relatively shallow and is therefore very sensitive to impacts from land use development, 2) potable water resources are limited to those available on the Island,

3) the County's comprehensive plan recognizes that Island population growth is increasing at a rate faster than forecasted in the Vashon Community Plan, and 4) some of the County's regulations could effectively result in a doubling of allowable dwelling units. To avoid having to address an "immediate and severe water shortage" referred to in Policy R-107 the following management strategy is recommended:

**LU - 3 Land Use Impacts to Ground Water - King County Comprehensive Plan Policies.** King County Department of Natural Resources and the Office of Strategic Planning will propose amendments to the King County Comprehensive Plan to include the following policies related to growth and development on Vashon, for the Metropolitan King County Council's consideration:

- General -- Ground water based public water supplies should be protected by minimizing land-use impacts on ground water quality or quantity to preserve the supply of high quality drinking water for present and future populations.
- "Rounding Up" Policy -- On Vashon-Maury Island, King County shall not apply its policy of "rounding up," which allows the creation of new building lots that are three-quarters of the size allowed in a zone.
- Non-conforming Building Sites -- On Vashon-Maury Island, King County shall not allow the creation of multiple non-conforming building sites, such as allowing two non-conforming sites to be created when a road bisects one lot.
- Enforcement of Land Use Code -- King County shall allocate sufficient funds for effective enforcement of land use code provisions on Vashon-Maury Island, including the P-suffix requirements and the policies in the Vashon Community Plan.

Who: King County Office of Budget & Strategic Planning  
Priority: High  
Time: 0.125 FTE  
Fund Source: Agency general funds

### **Vashon Community Plan and Area Zoning**

The 1986 Vashon Community Plan and Area Zoning updated the 1981 Plan. During this update, the concern about limited ground water supplies was expressed. The *Vashon/Maury Island Water Resources Study* (Carr, 1983) served as the basis for the updated 1986 Vashon Plan. The 1986 Plan contained new and revised policies, development conditions, special recommendations, and zoning for the Island to reflect the 1983 information on the Island's groundwater.

The 1986 Vashon Community Plan's major objective for land use and zoning recommendation's was to accommodate the forecast population while still retaining the rural character of the Island and protecting the water resource. The recommendations for land use and public improvement decisions in the 1986 Vashon Community Plan are for a period of six to ten years. The Vashon Community Plan contains several policies that

would help prevent ground water depletion or degradation. However, emphasis should be placed on their implementation.

**LU - 4 Land Use Impacts to Ground Water - Vashon Community Plan Policies.** Implementation of the following policies of the Vashon Community Plan shall be fully funded, and the King County Zoning Code revised as necessary:

- V-3** All land-use polices and regulations for Vashon shall reflect the overriding importance of the fact that the whole Island is the recharge area for a sole-source aquifer. All of Vashon Island shall, therefore, be considered a ground water recharge area. Within the Island, based largely on soil types, there are areas of relatively high, medium, and low recharge potential. Areas of higher recharge potential should receive extra protection.
- SR 1** All development and maintenance of public lands and projects funded by community development block grants should be model examples of protection of the ground water resource, including, but not limited to, infiltration techniques, water-use conservation, and pollution abatement.
- SR 1** King County should review all short plat applications on Vashon Island for conformance with policies in this plan. Short Plats should be denied if they are inconsistent with this plan or conditions should be required to insure that short plats are consistent with policies in the community plan.
- V-57** To protect domestic water resources, high ground water recharge areas and watersheds should be maintained in residential or similarly non-intensive uses at low densities.
- V-61** Special consideration should be given to the impacts of new development on the Island's ground water resources. This should apply to major developments, development in high ground water recharge areas, or development near public water supplies.
- 6** High recharge area P-suffix conditions include the following:
- a. New commercial or industrial development that occurs in a high recharge area is limited to 60 percent impervious surface and must include natural or planted landscapes covering 40 percent of the land area.
  - b. Runoff discharge may not exceed pre-development levels as per King County Code 20.50.
  - c. Listed uses specified in the zoning code for General Commercial and Light manufacturing zones are excluded from high recharge areas. Examples are car washes, paint shops, boat builders, and kennels.
  - d. Listed unclassified uses specified in the zoning code are excluded from High Recharge Areas. Examples are landfills, incinerators, transfer stations, fairgrounds and airports.

Who: King County Department of Development and Environmental Services,  
Office of Strategic Planning, and Department of Natural Resources  
Priority: High  
Time: Estimated 0.1 FTE for evaluating current codes for compliance with the  
Vashon Community Plan policies  
Fund Source: Agency general funds

**LU - 5 Land Use Impacts to Ground Water - Area Zoning.** King County shall maintain zoning of one home per ten acres where it exists currently. King County shall expand the zoning of one home per ten acres to include those areas identified in this Plan as being highly physically susceptible to contamination or reduced recharge.

King County shall maintain zoning of a maximum density of one home per five acres where it exists currently. King County shall expand the zoning of one home per five acres where a higher density zone currently exists and the area has been identified in this Plan as being moderately physically susceptible to contamination or reduced recharge.

Who: King County Department of Development and Environmental Services,  
Code Development Section  
Priority: High  
Time: Estimated 0.1 FTE to initiate any zoning changes for the areas of high  
susceptibility  
Fund Source: Agency general funds

### **2.2.3 Seawater Intrusion**

The threat to ground water from seawater intrusion is a concern along Vashon's coast. When ground water is pumped from aquifers that are in hydraulic continuity with Puget Sound, seawater may flow toward the well resulting in elevated levels of chloride. Seawater intrusion can vary between regions, depending on geology, aquifer characteristics, topography, and the size of the recharge area. Occurrence of seawater intrusion may also vary seasonally due to fluctuations in rainfall and water use such as in the summer where low rainfall and higher groundwater use coincides. Also, elevated levels of chloride, between 10 mg/l and 100 mg/l, can result from on-site sewage systems, landfills, road salts, and sea spray. Ecology determined that chloride levels of 100 mg/l or more indicate seawater intrusion (Dion and Sumioka, 1984).

In response to concerns about seawater intrusion along Washington's coastlines, Ecology adopted the Seawater Intrusion Policy. The goal of the policy is to prevent seawater intrusion in areas where it has not occurred and to control seawater intrusion where the problem already exists. The Policy guides Ecology's administration and regulation of water rights in areas where risk of seawater intrusion exists. Ecology works with the Washington State Department of Health, local health and planning departments to implement the Policy. Risk of seawater intrusion is identified by reviewing lab analysis

for chloride for a new well, a test well, or a well within a one-half mile of a proposed well. Chloride concentrations from 25 to 100 mg/l indicate a low risk area. Chloride concentrations from 100 to 200 mg/l, or less than 100 mg/l with an increasing trend, indicate a medium risk area. Chloride concentrations of 200 mg/l or more, or levels between 100 and 200 mg/l with a rising trend, indicate a high risk area. Ecology may also use the indicated risk to condition or deny water right applications.

Island County and the Department of Ecology established the first Seawater Intrusion Program. The Island County Health Department evaluates existing and new wells and determines the relative risk of seawater intrusion. Based on the risk, the Island County Health Department may require monitoring, pump testing, limitations on number of connections, or may deny new system formation. The Draft Island County Ground Water Management Plan builds on the Island County Health Department's program by establishing classification criteria to further identify the risk of seawater intrusion from developing new wells or permitting additional withdrawals in the coastal zone. They developed a classification criteria matrix to generate a comparable value indicating the total of relative effects.

The *Vashon/Maury Island Water Resources Study* (Carr and Associates, 1983) identified wells on the northern end of Vashon Island and the south-eastern section of Maury Island with elevated chloride levels. Wells monitored along the coastline during 1989 and 1990 for this Plan showed no evidence of seawater intrusion. However, a Group B well with seawater intrusion in the northeast area (near Glen Acres) of Vashon was closed in 1993.

### **Seawater Intrusion Management Strategies**

Other parts of the Draft Vashon-Maury Island Ground Water Management Plan have three general management strategies related to seawater intrusion. Recommended management strategies LU-1 and LU-2 require the monitoring of wells for certain contaminants, and, if trigger levels are reached, the Management Committee would develop mitigation measures with King County Department of Natural Resources to address observed trends. The Data Collection and Management Program contains specific sampling and analysis activities related to seawater intrusion. The Ground Water Advisory Committee, during development of the Plan, stated its support of Ecology's Seawater Intrusion Policy.

However, the Ground Water Advisory Committee finds that seawater intrusion is of great importance on Vashon-Maury Island and requires more specific management strategies. The majority of the wells that are or could be drilled into the coastal zones would be for drinking water systems. These provide water for individual homes, or groups of homes as public water systems. The wells that would serve more than six homes would require a water right from Ecology. Review and approval of these drinking water systems, by Seattle-King County Health Department, the Washington State Department of Health, or review and approval of water right applications by Ecology, need to consider the potential

for causing or increasing seawater intrusion. Therefore, the following management strategies are recommended for adoption.

**SI - 1 Seawater Intrusion Criteria Development:** The King County Department of Natural Resources should develop a consistent and objective set of criteria to classify ground water impacts from developing new wells or permitting additional withdrawals in the coastal zone of Vashon-Maury Island to avoid increasing or causing seawater intrusion problems. The classification criteria developed for the Island County Ground Water Management Plan will provide a model. This criteria would assign a value to developing new wells or permitting additional withdrawals for: distance to seawater; static water level; pumping water level; geographic location; pumping rate; completion elevation; chloride concentration in area; infiltration potential at site and the number of existing wells in the area. These values would be multiplied by weighting factors and summed to generate an overall value, the total of relative effects. The classification criteria would be used by Ecology to evaluate water right applications and by the Seattle-King County Health Department and the Washington State Department of Health in reviewing drinking water systems.

Who: King County Department of Natural Resources  
Priority: High  
Time: 0.125 FTE  
Fund Source: Aquifer Protection Area funds

**SI - 2 Seawater Intrusion Program:** The Seattle-King County Health Department and the Washington State Department of Health should adopt a Seawater Intrusion Policy regarding drinking water wells in the coastal areas on Vashon-Maury Island. The Island County Health Department's policy may provide a model. The Policy should assign risk categories to existing non-expanding, existing expanding, and new water systems (individual and public). The Policy should require a variety of methods to assure that the relative risk of seawater intrusion for developing or maintaining an individual or public water system is addressed. These methods could include monitoring and reporting chloride and conductivity; reporting source meter readings; prohibiting new connections; requiring conservation methods; requiring individual meters; monitoring during phased development; or denial of development of a new water system. The Seattle-King County Health Department and the Washington State Department of Health would use the criteria developed under SI-1 as part of the seawater intrusion policy/program. The Seattle-King County Health Department and the Washington State Department of Health should adopt specific water well design and construction standards needed to implement the Seawater Intrusion Policy.

Who: Seattle-King County Health Department and the Washington State Department of Health  
Priority: High  
Time: 0.25 FTE  
Fund Source: Aquifer Protection Area funds

**SI - 3 Seawater Intrusion Special Protection Area:** The Ground Water Advisory Committee requests Ecology to designate the coastal zone or portions of the coastal zone as a Special Protection Area under Washington Ground Water Quality Standards (Chapter 173-200 WAC) and require that the ground water impact associated with developing new wells or permitting additional withdrawals in the coastal zone be classified and used as a criteria in determining new water right certification, to avoid increasing or causing seawater intrusion problems. Ecology would use the classification criteria developed under SI-1 as part of the review of any new water right application.

Who: Ecology  
Priority: High  
Time: To be determined  
Fund Source: Agency general funds

#### **2.2.4 Data Collection and Management Program**

Goal Statement: *To provide the necessary information to facilitate preservation of the quality and quantity of the Island's ground water. Effective long-term monitoring is the key to protecting and achieving optimum use of the Island's water resources.*

Long-term data collection of ground water quality and quantity, precipitation and stream flow on Vashon Island is necessary to monitor and protect the ground water resource from depletion and contamination. The focus of monitoring shall be on the earliest possible detection of ground water degradation and depletion in the most vulnerable recharge areas. The data collected needs to be entered into a database and analyzed to provide useful information for making resource management decisions. The recommended data collection program has estimated laboratory analysis costs of \$44,000 per year, plus a one-time estimated cost of \$50,000 to drill a new monitoring well. Data is collected and analyzed so that state and local agencies can:

- Determine water resource trends in ground water quality and quantity;
- Make informed decisions on such issues as land use and water rights;
- Plan for peak water use and population growth impacts;
- Conduct water programs such as well construction and decommissioning, operation and maintenance;
- Develop and refine a water resource model;
- Respond to data requests from water agencies and other interested parties; and,
- Respond to incidents such as water level declines.

**Issue 1 - Data Collection, Analysis and Management:** Ground water resource data on a long-term basis enables land and water use agencies to make informed decisions. Data collection and analysis to date has been used to develop a general characterization of

ground water hydrology on Vashon. Additional data collection and analysis is needed to refine characterization of the aquifer and to manage the resource.

**DCM - 1 Data Collection, Analysis and Management:** The King County Department of Natural Resources will develop and implement a data collection and management program that monitors water quality, water level, precipitation and stream discharge parameters. Where water level declines or ground water contamination is observed, convene the Ground Water Advisory Committee to determine a solution (per LU-1). The program would:

- Collect data needed according to the Vashon Data Collection List (see Appendix E: Recommended Data Collection Program);
- Continue data entry into the database, manages the data for quality control and applicability to analysis techniques, shares the data with other agencies and ensures data compatibility with other data collection efforts; and
- Analyze the data to better our understanding of ground water hydrology to estimate the available resource; assess the impacts of land use on the resource; and determine if a sophisticated numerical or computerized model is needed or would be useful.

**Who:** King County Department of Natural Resources, Ecology, utilities, well drillers, Management Committee, and volunteers

**Priority:** High

**Time:** 0.75 FTE for Department of Natural Resources staff

**Fund Source:** Aquifer Protection Area

### **2.2.5 Ground Water Quality and Quantity Issues Associated with Storm Water Management**

Goal Statement: *To promote storm water management practices that provide the greatest amount of recharge while protecting ground water quality.*

Past and present storm water management practices account for some ground water quantity and quality problems. Ground water quality may be affected if storm water containing contaminants is recharged intentionally or inadvertently. Also, precipitation is diverted to surface water when, under natural conditions, it would be recharged to ground water. As a result, the quantity of water recharged to ground water may be decreased. The Vashon Ground Water Management Committee adopted the following management strategies to address stormwater management issues. Education strategies related to stormwater management are found in the Education Program.

**Issue 1 - Assessment of Existing Storm Water Facilities:** Existing storm water management facilities (or the lack of facilities) in the most physically susceptible, high recharge, and wellhead protection areas may pose a risk to ground water quality and the population served by public water systems. Some facilities were constructed with little

concern for ground water quality. Of particular concern are dry wells used in commercial and industrial areas. Also, some areas have only ditches as storm water facilities. This situation may be found in areas with highly permeable soils that were developed prior to current regulations. Storm water enters ditches in these areas and rapidly infiltrates without benefit of treatment.

**ST-1 Assessment of Existing Storm Water Facilities:** King County should assess the adequacy of storm water facilities in the most physically susceptible, high recharge and wellhead protection areas to protect ground water quality and to give these areas high priority for water quality facility retrofit as warranted. Vashon-Maury Island is presently outside of the service area for the Water and Land Resources Division. The Division could accomplish this task only if the Island becomes a part of the service area. The Ground Water Advisory Committee supports expanding the service area for the Division onto the Island.

Who: King County Department of Natural Resources, Water and Land Resources Division  
Priority: Medium  
Time: To be determined, based on service area constraints of the Water and Land Resources Division  
Fund Source: Agency general funds

**Issue 2 - Roadside Soil:** Roadside soil can accumulate wastes which may be toxic to ground water from vehicles using these routes. This soil and debris are routinely accumulated and stockpiled in a pasture where the wastes may be leaching into the ground water.

**ST-2 Roadside Soil:** King County Department of Transportation, Road Services Division will evaluate the ground water in areas where roadside accumulations are stockpiled on Vashon.

Who: King County Department of Transportation, Road Services Division.  
Priority: Medium  
Time: Expected to be done with existing resources  
Fund Source: Agency general funds

**Issue 3 Coordination between Surface and Ground Water Planning Efforts.** Surface and ground water planning efforts should be effectively coordinated to make the best use of limited resources.

**ST-3 Coordination Between Surface and Ground Water Planning Efforts - Ecology Programs:** Ecology will assess surface and ground water quality planning programs to determine how they could be combined or coordinated in a way that is both scientifically justified and provides for greater efficiency.

Who: Ecology  
Priority: Low  
Time: 0.32 FTE  
Fund Source: Agency general funds

### **2.2.6 Ground Water Education Program**

Goal Statement: *To increase individual participation in protecting the ground water resource by educating citizens in the Vashon Ground Water Management Area about ground water, the threats to quantity and quality, and ways they can reduce those threats.*

Providing citizens on Vashon with information on the ground water resource and protection may be a particularly effective protection method. Understanding, caring, and commitment are needed to protect a finite basic resource which is impacted by a wide variety of activities. Although regulations may help, groups of informed citizens actively caring for their ground water under their own communities might be more effective. Providing technical assistance will not address all the concerns but will entice some community members to take individual action. Currently, a number of education programs focused on individual sources of contamination. However, no comprehensive ground water education program focuses on the following tasks:

- Help engender understanding and concern in order to protect the resource;
- Aid in developing resource protection messages that are consistent regardless of the specific education program;
- Coordinate with other resource protection programs that focus on a specific issue, such as solid waste, hazardous waste, surface water and storm water management;
- Develop specific education activities and materials for point and non-point sources of contamination that do not have their own individual programs;
- Support research on ground water resource; and
- Encourage and promote conservation.

A comprehensive program would coordinate existing environmental education programs to develop consistent messages about the ground water resource and ground water protection. This component would be done by briefing environmental educators about the Island's ground water system, and supporting joint programs. The program would respond to local ground water quality and quantity concerns that are not already covered by other programs. This program would provide assistance for local planning efforts and other ground water protection projects.

**Issue 1 - Existing Education:** Considerable effort is underway to educate the public regarding the prevention of non-point pollution, conservation, well construction and improper disposal of hazardous materials. Agencies or jurisdictions involved include King County (the Seattle-King County Health Department, Cooperative Extension, Department of Development and Environmental Services, Department of Natural

Resources, Water and Land Resources Division and Water Pollution Control Division (formerly Metro), Puget Sound Water Quality Authority, Ecology, King Conservation District, Natural Resources Conservation Service, schools and others. It is unknown if these existing educational materials contain ground water resource protection information.

**ED-1 Existing Education:** King County and other jurisdictions will jointly carry out a ground water education program which will review existing education activities and make use of these programs when applicable. The King County Department of Natural Resources will review applicable educational efforts underway to determine whether the protection of ground water is emphasized. The King County Department of Natural Resources will seek the cooperation of the parties involved to include ground water information and concerns in the educational programs. The specific elements of the program are:

- Existing educational program content will be reviewed for agreement with the Vashon Ground Water Management Plan policies and goals. The King County Department of Natural Resources will review the current educational programs of the Natural Resources Conservation Service, Cooperative Extension and others to ensure that the Vashon Ground Water Management Plan goals and policies are reflected;
- The Local Hazardous Waste Management Program in King County will coordinate with the Household Hazardous Waste Education Committee to include information about the risks to ground water associated with the disposal of household hazardous wastes to on-site sewage systems as part of their household hazardous waste educational activities;
- King County and water utilities will work with local nurseries, the Washington State University Cooperative Extension Service and the Conservation Districts to promote the availability of appropriate seed stocks, plants and materials to achieve xeriscaping (use of low-water use plants);
- The ground water education program will support conservation education efforts in the schools, and for the general public as described in the *Conservation Planning Requirements* (Washington Water Utilities Council, Department of Health, Department of Ecology, March 1994);
- Cooperative Extension and the King County Department of Natural Resources will prepare a brochure to educate residents about landscaping practices that promote aquifer recharge;
- The education program should include information on pesticides and fertilizer use, including the strategies in *Protecting Ground Water: A Strategy for Managing Agricultural Pesticides and Nutrients*, April, 1992 and the 1991 *Puget Sound Water Quality Authority Plan* (Household Hazardous Waste Program: Information and Education on Less-Toxic Alternatives for Household Products and Non-Point Source Pollution Program: Puget Sound Pest Management Information Program) to help insure that small farmers and homeowners receive more information about pesticide and fertilizer use;

- The Seattle-King County Health Department will coordinate measures to increase public awareness concerning the potential impacts of discharging household chemical products to an on-site sewage system. Such measures would be an extension of activities scheduled as part of the Local Hazardous Waste Management program;
- Educational programs concerning the effect of landscaping practices on aquifer recharge could be coupled with education on the impacts of pesticide and herbicide use on ground water quality. A discussion of proper disposal of household hazardous waste could be included. Landscaping tips should include a discussion of native vegetation and its role in facilitating infiltration of moisture. Educational efforts would complement and combine with the current efforts of the Seattle-King County Health Department, Cooperative Extension, and the Conservation District. This information could be disseminated through the Master Gardener and other programs of Cooperative Extension; and
- General public knowledge about the public health significance of the requirements for well construction, operation, maintenance, and decommissioning is lacking. The Vashon Ground Water Management Plan Education Program will coordinate with and support the Department of Ecology's well identification, well construction, proper well maintenance, contamination sources and well decommissioning projects. Informed well owners and other community members are probably more likely to comply with the well construction and decommissioning regulations. Methods of informing well owners might include distributing a questionnaire about wells to homes in the community, developing and distributing an educational brochure for homeowners, and supplementing the brochure with community educational programs. The questionnaire should be designed to ascertain the number of wells on each property, the construction methods used, and the number of wells that require decommissioning. The brochure should include recommended practices and legal requirements for well construction and decommissioning. It should also include the reasons why practices such as sealing the well are both advisable and required by law so that homeowners are knowledgeable before they make plans to construct or decommission a well.

**Issue 2 - New Educational Elements:** Several issues do not have any existing education program upon which to build. These have been identified through the Ground Water Advisory Committee consideration of ground water protection issues. These specific elements need to be adopted as part of the education program.

**ED-2 New Educational Elements:** King County will carry out a ground water education program which will develop specific education activities and materials for sources of contamination. The King County Department of Natural Resources will report to the Management Committee on the adequacy of existing educational programs to address ground water concerns. This report will include proposed changes as a result of review and discussions carried out in ED-1. The King County Department of Natural Resources will then develop a supplemental educational program to address deficiencies identified above, and present it to the Management Committee for review and adoption.

New educational programs will be developed and implemented according to the adopted Vashon Ground Water Advisory Committee actions below (this is a partial list, more elements are expected to be developed as the program progresses):

- Increase awareness concerning proper on-site sewage system operation and maintenance, including the risks associated with disposal of hazardous wastes in such systems. Amend the existing public information pamphlet concerning on-site sewage system maintenance and operation to provide instructions concerning proper household hazardous waste disposal practices;
- Educate homeowners and other owners of exempt underground storage tanks regarding tank abandonment requirements of the Uniform Fire Code;
- Include information about the relationship between solid waste disposal and the threat to ground water quality;
- Develop information brochures directed at builders/developers and homeowners with ideas on how to minimize surface water runoff increase due to property development.
- Presentations to appropriate banking and insurance company associations to inform them of the current regulating environment in regards to well owner responsibilities and the potential for contamination to the aquifers and the resulting expenses associated with clean-up.
- Sponsoring informational booths at local fairs; booth displays at local libraries or bank lobbies.
- The existing public information pamphlet concerning on-site sewage system maintenance and operation will be amended to provide instructions concerning proper household hazardous waste disposal practices prior to any scheduled reprinting.
- A committed and trained group of volunteers will expand the knowledge of protecting the ground water resource. These volunteers will function in a role similar to that established by the Cooperative Extension Service, Master Gardener and Land-Water Steward Volunteer Programs;
- Providing information about recycling and educating residents about reducing the waste stream may reduce the amount of solid and hazardous waste going into the landfills and the amount of hazardous products that people buy;
- Support schools or individual teachers with an interest in ground water protection. Such support could include providing education materials, or developing school skits;
- Working with neighborhood groups on neighborhood ground water protection efforts;
- Developing and installing interpretive signs, such as signs explaining Wellhead Protection Areas.
- Development of a video on water resources for cable television and distribution to local video outlets.

Who: King County Department of Natural Resources  
Priority: Medium  
Cost: 0.25 FTE  
Fund Source: Aquifer Protection Area

## **2.3 Programs To Protect Ground Water Quality**

The Ground Water Advisory Committee researched ten subject areas that potentially could affect ground water quality: hazardous materials management, underground storage tank management, on-site sewage treatment and disposal system use, use of pesticide and fertilizer, well construction and decommissioning, sewer pipes, solid waste landfills, burial of human remains, sand and gravel mining, and biosolids and sewage effluent. This section includes a goal statement, summary of the issues, and proposed management strategies for each subject area.

### **2.3.1 Hazardous Materials Management**

Goal Statement: *To ensure that ground water is not contaminated due to improper management, including disposal, of hazardous wastes.*

Industrial and commercial processes produce and use hazardous substances. Hazardous materials use is not, however, limited to industries and businesses. They are widely available and used by almost everyone. The impact of these substances on the environment, particularly ground water, is often determined by the management practices of the businesses and individuals that use them. The recommendations for Hazardous Materials Management are in the Unfinished Agenda section.

### **2.3.2 Underground Storage Tank Management**

Goal Statement: *To ensure that underground chemical and fuel storage tanks and piping systems are managed adequately to prevent contamination of ground water.*

Commercial underground petroleum and chemical storage tanks represent a significant potential threat to ground water quality in King County. Leakage from underground storage tanks and associated piping often occurs without detection and even relatively small amounts of certain compounds can have serious adverse impacts on ground water quality. Once released from an underground storage tank, some volatile organic compounds and petroleum products can rapidly migrate to ground water.

Ecology currently lists 28 commercial tanks in use on Vashon Island and it is estimated that an excess of 700 residential underground storage tanks are in use. Ecology is aware of seven sites in the Vashon-Maury Island Ground Water Management Area that have contaminated ground water. Six of these have completed remediation. Underground storage tanks are regulated by federal, state, and local governments. Private sector pressures from insurance and lending institutions also bring increasing pressure to bear upon owners and operators of underground storage tanks to install and maintain systems in a manner which reduces liability risks by avoiding spills.

Leaking underground home heating oil tanks may present a threat to ground water quality. Both federal and state regulations adopt a less aggressive approach to regulation of heating oil tanks, however, because of differences in the constituency and migration of fuel oils in the soil. Potential problems associated with home heating oil tanks include leakage from operating tanks and releases from improperly abandoned tanks containing residual product. Many of the existing home heating oil tanks within King County are likely to be bare steel tanks without protection from rusting and, as such, a large percentage may be leaking or will leak in the future.

**Issue 1 - Augment State Underground Storage Tanks Program:** The underground storage tank management program administered by Ecology does not have the resources to field check and monitor for compliance with regulations. As part of their Wellhead Protection Plans, purveyors are to identify potential threats to their wells, including underground storage tanks. The King County Comprehensive Plan policy NE-333 states that the County should review and implement, as appropriate, adopted Wellhead Protection Programs in conjunction ground water purveyors. Recommended Management Strategy SA-2 states that the Management Committee will develop strategies that King County could adopt to help implement Wellhead Protection Programs. These strategies should include ways to address underground storage tanks.

**UST-1 Wellhead Protection Strategies for Underground Storage Tanks.** The King County Department of Natural Resources, in conjunction with the Management Committee, will include the following in the strategies for wellhead protection. They would be implemented only if specifically requested by a water purveyor as part of their Wellhead Protection Plan.

- **1A Augment State Underground Storage Tanks Program - Designation as an ESA under Chapter 90.76 RCW:** King County Department of Natural Resources will prepare a petition to Ecology to designate the Vashon Ground Water Management Area as an Environmentally Sensitive Area under Chapter 90.76 RCW Underground Storage Tanks for the Metropolitan King County Council's consideration. An Environmentally Sensitive Area designation under the authority of Chapter 90.76 RCW is not the same as an Environmentally Sensitive Area designation under the State Environmental Policy Act (Chapter 197-11-908 WAC); although, a single area could be designated as an Environmentally Sensitive Area under both provisions of state law. Designation under RCW 90.76 affects only the construction and operation of underground storage tanks while designation under SEPA can affect a much broader range of land use activities.
- **1B Augment State Underground Storage Tanks Program:** King County Department of Natural Resources will prepare a program and related ordinances to enhance the current inspection of underground storage tank installation and removal in the Environmentally Sensitive Area to include the relevant requirements of Chapter

173-360 WAC - Underground Storage Tank Regulations for the Metropolitan King County Council's consideration.

- **1C Augment State Underground Storage Tanks Program:** Ecology and King County will ensure that underground storage tanks on Vashon Island are inspected to determine if they are leaking.
- **1D Disclosure and Secondary Containment:** The King County Department of Natural Resources will prepare an ordinance for the Metropolitan King County Council's consideration regarding underground tanks containing the following provisions: disclosure at the time of sale of any property in King County of the number, location, and legal status of existing underground fuel and chemical storage tanks; and require secondary containment for new tanks or have above ground installation.
- **1E Exempt Tanks:** The Department of Natural Resources will prepare an ordinance for the Metropolitan King County Council's consideration requiring secondary containment for underground chemical storage tanks as defined by Chapter 173-360-120 WAC and for heating oil tanks of all sizes and motor fuel tanks of 1,100 gallons or less.
- **1F Heating Oil Tanks - Abandonment and Maintenance:** The King County Department of Natural Resources will prepare an ordinance for the Metropolitan King County Council's consideration regarding underground home heating oil tanks containing the following provisions: proof from the Fire Marshal that the underground heating oil tank is abandoned in accordance with regulations prior to release of any permits associated with energy conversion (gas piping, electrical, etc.); and require underground heating oil tanks which are abandoned in place are filled with a material that precludes further storage of any chemical in the tank.

Who: King County Department of Natural Resources  
Priority: Low  
Cost: 0.25 FTE  
Fund Source: Aquifer Protection Area

**Issue 2 - New Tanks:** Underground storage tanks if not properly constructed, installed and maintained can cause degradation of Vashon's ground water resource.

**UST-2 New Tank Prohibition:** If approved by Ecology, King County will amend the King County Code to prohibit the installation of new underground fuel tanks in residential zones on Vashon Island.

Who: Department of Development and Environmental Services.

Priority: Low  
Cost: 0.125 FTE  
Fund Source: Agency general funds

### **2.3.3 On-Site Sewage Treatment and Disposal System Use**

Goal Statement: *To promote on-site sewage treatment and disposal practices that are effective in protecting ground water resources from possible adverse impacts.*

Ground water contamination associated with domestic on-site sewage system effluent can involve a number of contaminants including nitrate, bacteria, viruses, and trace organic chemical compounds. Nitrate is often considered the most significant contaminant associated with domestic wastewater since it is highly resistant to removal from treatment mechanisms present in the soil profile. Bacteria and viruses can be attenuated during migration through a few feet of fine to medium textured soils provided unsaturated flow conditions can be maintained. However, coarse textured, excessively permeable soils are ineffective in removing bacteria and viruses. Also, domestic effluent often contains volatile and semi-volatile organic compounds at very low levels. These organic chemicals are generally residues from household cleaning and paint products, and are known as household hazardous wastes. If on-site sewage systems are improperly designed or constructed, installed in inadequate soils, used at too high of a development density, or used to dispose of non-domestic wastewater, they can adversely impact surface and ground water quality as well as public health.

Vashon Island is a sole-source aquifer where all ground water on the island is either potential drinking water or base flow for streams. Also, Vashon Island is a rural area where on-site sewage disposal is the main method of sewage disposal, with the exception of the community sewerage system within the town of Vashon. The King County Comprehensive Plan and Vashon Community Plan state that Vashon is a rural area. The 1986 Vashon Community Plan policies relating to on-site wastewater and alternative sewage systems (V-44, V-46, V-47, V-48 and V-49) state that on-site waste disposal systems are considered as permanent solutions to wastewater disposal outside sewer local service areas.

In 1989 and 1990 the Seattle King County Health Department conducted a sanitary survey of seven coastal communities: Beulah Park, Cove, Bunker Trail, Spring Beach, Paradise Cove, Patten Palisades and Quartermaster Harbor to assess the status and operation of on-site sewage systems. As a result, the first four communities listed were declared "severe public health hazard areas" by the Washington State Department of Health pursuant to the Department of Ecology's Centennial Clean Water Fund grant criteria. In these four communities, no more than 25 percent of on-site sewage systems were functioning properly. More information concerning this study is available in the *Sewage Facilities Plan for the Severe Public Health Hazard Areas, Vashon Island*, Barrett Consulting Group, November 1993.

An extensive regulatory system is currently in place at the state and local level to prevent adverse public health and environmental impacts from the use of on-site sewage treatment and disposal systems. During the development of the Vashon Ground Water Management Plan, the Ground Water Advisory Committee identified the need to revise the state on-site regulations to meet the intent of the Water Quality Standards for Ground Water (Chapter 173-200 WAC). The state regulations were recently modified and implemented on January 1, 1995, strengthening the ground water protection provisions of applicable on-site sewage system regulations and standards. In addition to the regulatory programs, the King County Comprehensive Plan contains several policies about on-site systems:

**F-315** On-site wastewater treatment systems in the Rural Area and Natural Resource Lands should be designed, built, and operated as permanent methods of sewage disposal.

**F-316** King County should monitor on-site systems that have shown evidence of failure or potential for failure. The data should be used to correct existing problems and prevent future problems. King County should analyze public funding options for correcting on-site wastewater system failures that may include, where feasible and otherwise consistent with this Plan, conversion to community sewage system, or the installation of public sewers.

Improved design criteria in the revised regulations appear to have further reduced the threat to ground water quality posed by new individual residential on-site systems. Within the Vashon Ground Water Management Area, the 1989-90 Sanitary Survey concluded that existing high-density developments are served by conventional on-site sewage systems. To date, ground water quality problems associated with such developments have not been fully documented. Also, extensive ground water monitoring efforts to identify problems associated with on-site sewage systems have not been undertaken. The Vashon Ground Water Management Committee adopted the following management strategies to address on-site sewage treatment issues. Education strategies related to on-site sewage treatment are found in the Education Program.

**Issue 1 - Nitrate Concerns:** The designs of most on-site sewage treatment and disposal systems installed in Type 1 soils (coarse sands or coarser) prior to April 1987, the implementation date of King County Board of Health Title 13, did not incorporate enhanced treatment technology. These systems often support development densities that exceed one residential unit, or equivalent, per acre. The poor treatment efficiency of conventional on-site sewage systems installed in coarse textured soils suggests a potential for nitrate contamination of underlying ground water, especially in areas where the density of on-site sewage systems is relatively high. Nitrate concentrations may build up in the zone of contribution to public water systems to unacceptable levels resulting in irreversible loss of drinking water supplies.

**OS-1A Nitrate Concerns:** The King County Department of Natural Resources will include the following in the wellhead protection strategies: the Seattle-King County Health Department will work with land use authorities to require alternative methods of development and/or revised land use for those tracts less than an acre in size which are undeveloped in areas where nitrogen levels are found to be unacceptable (more than 5 mg/l); and the Seattle-King County Health Department will work with the Board of Health to require alternate methods of sewage disposal for those tracts less than an acre in size in areas where nitrogen levels are found to be unacceptable (more than 5 mg/l) or showing increased trends.

**OS-1B Nitrate Concerns:** King County Department of Natural Resources will consult with the Vashon Management Committee on action taken to resolve problems where on-site sewage disposal systems are determined to have a measurable effect on the aquifer from nitrogen levels.

Who: King County Department of Natural Resources, Management Committee.  
Priority: High  
Cost: 0.125 FTE  
Fund Source: Aquifer Protection Area

**Issue 2 - Household Hazardous Wastes:** Household hazardous wastes can enter ground water through the wastewater stream when residues from cleaning and paint products or quantities of unwanted chemical substances are disposed of in a sink or toilet connected to an on-site sewage system. When discharged to an on-site sewage system, household hazardous wastes may pass through the system and migrate to underlying ground water. While wastes from any single residence are not likely to have detectable impacts on underlying ground water, the cumulative effects of many residences may be significant. Many people are unaware that common household products often contain chemical compounds that can represent an environmental or even public health hazard if disposed in an on-site sewage system.

**OS-2 Household Hazardous Wastes:** The Local Hazardous Waste Program in King County will coordinate with the Household Hazardous Waste Education Committee to include information about the risks to ground water associated with the disposal of household hazardous wastes to on-site sewage systems when conducting household hazardous waste educational activities.

Who: Local Hazardous Waste Program in King County  
Priority: High  
Cost: To be determined  
Fund Source: Agency general funds

**Issue 3 - Operation and Maintenance:** Home and business owners may not be aware of the location and proper operation and maintenance of on-site sewage treatment and disposal systems.

**OS-3A Operation and Maintenance:** The Seattle-King County Health Department will prepare amendments to *Title 13 of the Code of the King County Board of Health* for King County Board of Health's consideration to require that the on-site sewage treatment and disposal system as-built plan be recorded with the property deed in order that it be transferred with the title at the time of property purchase. In addition, information concerning the relationship between on-site system maintenance and operation practices and ground water protection should be added to the standard as-built plan form.

Who: Seattle-King County Health Department, King County Board of Health  
Priority: High  
Time: 0.08 FTE  
Fund Source: Agency general funds

**OS-3B Operation and Maintenance:** The Seattle-King County Health Department will examine the feasibility of a county-wide on-site sewage system management program to determine its effectiveness in the protection of ground water.

Who: Seattle-King County Health Department.  
Priority: High  
Time: 0.5 FTE  
Fund Source: Agency general funds

#### **2.3.4 Pesticide and Fertilizer Use**

Goal Statement: *To prevent ground water contamination from the use of pesticide and fertilizer.*

Pesticides and fertilizers are used for the control of plant and animal pests and promotion of plant growth. Pesticides are a large and varied group of substances that are specifically designed to kill biological organisms including weeds, insects, and rodents. Fertilizer is used to promote plant growth. Pesticides and fertilizers are used for agriculture, home, forestry, and rights-of-way maintenance. Pesticides and fertilizer have the potential to contaminate ground water even when they are used according to the label instructions. The King County Comprehensive Plan policy NE-502 states that King County should actively encourage the use of environmentally safe methods of vegetation control and that herbicide use should be minimized. The Vashon Ground Water Management Committee adopted the following management strategies to address pesticide and fertilizer issues. Education strategies related to pesticide and fertilizer uses are found in the Education Program.

**Issue 1 - Pesticide and Fertilizer - Past Use:** Past use of pesticide and fertilizer may pose a threat to ground water quality.

**PF-1A Pesticide and Fertilizer - Past Use:** Include land uses that have the potential for pesticide and fertilizer use in the determination of vulnerable aquifer areas. See the strategy described in the "Special Protection Areas" paper.

**PF-1B Pesticide and Fertilizer - Past Use:** The King County Department of Natural Resources will monitor for specific pesticides and fertilizers in the physically susceptible areas, where they are expected to occur based upon past land use, in the Data Collection and Management Program.

Who: King County Department of Natural Resources  
Priority: Low  
Time: No additional costs, they are included as part of the Data Collection and Management Program  
Fund Source: Aquifer Protection Area

**Issue 2 - Pesticide and Fertilizer Use:** Use of pesticide and fertilizer may pose a threat to ground water quality.

**PF-2A Pesticide and Fertilizer Use:** King County will encourage and support the King Conservation District in development of Farm Plans using best management practices for any agricultural user of pesticide and fertilizer in the physically susceptible and recharge areas.

Who: King Conservation District  
Priority: Low  
Cost: \$94,900  
Fund Source: Agency general funds

**PF-2B Pesticide and Fertilizer Use:** King County Department of Natural Resources, in conjunction with the Management Committee, will evaluate the Cooperative Extension Pesticide Reduction Program for effectiveness in protecting ground water and applicability to the Vashon Ground Water Management Area.

Who: King County Department of Natural Resources  
Priority: Low  
Time: 0.125 FTE  
Fund Source: Agency general funds

**PF-2C Pesticide and Fertilizer Use:** King County Roads Services Division uses an Integrated Pest Management Program for roadside right-of-way maintenance. King County Department of Natural Resources, in conjunction with the Management Committee, will determine if maintenance practices by others for roads and utility rights-of-way in the Vashon Ground Water Management Area needs to be restricted to non-chemical methods.

Who: King County Department of Natural Resources  
Priority: Low  
Time: 0.125 FTE  
Fund Source: Agency general funds

### 2.3.5 Well Construction, Decommissioning and Well Owners' Responsibilities

Goal Statement: *To protect the quality of ground water in the county by ensuring that proper well construction and decommissioning procedures are followed.*

Wells provide a link between an aquifer and the earth's surface. Modern wells consist of a well casing that extends downward from the ground surface to the aquifer within a cylindrical bore hole. The Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 WAC) requires that the space between the casing and the wall of the borehole be sealed to prevent vertical movement of water along the outside of the casing. If this space is not adequately sealed, it may serve as a conduit by which contaminated surface or subsurface water may travel into an aquifer. Regulations also require that any well that is unusable, has been permanently discontinued, is in such disrepair that its continued use is impractical, or is an environmental, safety, or public health hazard, must be decommissioned.

The seven large public water systems (Group A) on Vashon are regulated by the Washington State Department of Health. Also, the numerous small water systems (Group B) and individual water systems are regulated by the Seattle-King County Health Department. The Vashon Ground Water Management Committee adopted the following management strategies to address well construction and decommissioning issues. Education strategies related to well construction and decommissioning are found in the Education Program.

**Issue 1 - State Program:** Existing regulations for well construction and decommissioning are not adequately enforced. Ecology does not receive enough funding to inspect more than a small percentage of wells during construction or decommissioning.

**WC-1A State Program:** Ecology, King County, and special purpose districts will pursue funding for the well construction and decommissioning program and pursue legislation, with input from affected parties. King County and special purpose districts should support the proposed legislation.

Who: Ecology, King County  
Priority: Low  
Cost: Ecology estimates \$70,000; 0.08 FTE for King County  
Fund Source: Agency general funds

**WC-1B State Program:** Seattle-King County Health Department and Ecology will develop a local health department program for implementation of the delegated portion of the well construction and decommissioning program in King County.

Who: Ecology and Seattle-King County Health Department  
Priority: Low  
Time: Seattle-King County Health Department: 0.5 FTE, Ecology: \$70,000/year  
Fund Source: Agency general funds

**Issue 2 - Well Identification:** Wells need to be identified so that Ecology may implement programs to protect the ground water resource. No method to systematically identify wells exists; wells that were drilled before 1973 were not required to submit well logs to Ecology; and there no agency is identifying wells that should be abandoned.

**WC-2A Well Identification:** King County Department of Natural Resources will prepare an ordinance for the Metropolitan King County Council's consideration which would require property sellers to disclose to buyers the existence of used or unused wells on the property. Ecology will prepare draft legislation to require sellers to disclose to buyers the existence of used or unused wells on the property.

Who: King County and Ecology  
Priority: Low  
Cost: 0.08 FTE for King County; Ecology estimates \$17,500 for Year 1 and \$35,000 for Year 2  
Fund Source: Agency general funds

**WC-2B Well Identification:** King County Department of Natural Resources will prepare an ordinance for the Metropolitan King County Council's consideration which would require that applicants establish the location and status of wells present on the property in question during environmental review, rezone and land use permit applications. King County will provide this information to Ecology.

Who: King County  
Priority: Low  
Cost: 0.08 FTE  
Fund Source: Agency general funds

### **2.3.6 Sewer Pipes**

Goal Statement: *To prevent the degradation of ground water which may be caused by wastewater leaking from gravity sewer pipes and side sewers, and to prevent the loss of water through infiltration to gravity sewer pipes and side sewers.*

The Vashon Sewer District has provided sewage collection and treatment for the town of Vashon since 1947. Presently about 330 customers comprise the Vashon Sewer District.

In 1955, the Vashon Sewer District installed its first gravity sewers. Currently, the Vashon sewage collection system consists of approximately 21,500 feet of gravity pipe and 10,000 feet of force main. Approximately 12,200 feet of gravity pipe is 8-inch diameter concrete pipe, 8,200 feet is 8-inch PVC pipe, and the remaining 1,100 feet is 8 inch asbestos cement. Concrete piping has cement mortar joints that usually leak soon after installation. In the mid 1960's, rubber gasket concrete pipe joints were developed and installed which allow some movement of the joint after installation without appreciable infiltration (*Vashon Sewer District Comprehensive Sewer Plan, June, 1992*).

Infiltration is defined as ground water entering sewer pipes through leaking joints or defects, both as runoff during storm events or as base flow from other sources. Inflow refers to direct flows of storm water into sewer pipes through hookups such as roof and footing drains. Because sources of infiltration and inflow (I and I) are not easily distinguished by sewer authorities, they are commonly considered under the single heading. Infiltration into sewer systems also represents potential export losses of ground water. Export loss means that ground water is transported out of the basin by the sanitary sewer reducing the total amount of available ground water.

In November 1989, Gary and Osborne completed a study of infiltration and inflow at the Vashon Sewage treatment plant. The study concluded that the sewer system experiences seasonal increases in flow due to infiltration and inflow related to the height of the ground water table and precipitation intensity. Gary and Osborne recommended rehabilitation work which would reduce 0.20 million gallons per day of inflow (*Vashon Sewer District Comprehensive Sewer Plan, June 1992*). The rate of infiltration was estimated to reach approximately 0.074 million gallons per day (51 gallons per minute). A physical survey, smoke testing and television inspection of much of the sewer system indicated that catch basins, open cleanouts, leaking joints, root intrusion, and leaking manholes were sources of infiltration and inflow.

If ground water infiltrates into sewer pipes during periods when the water table is high, then it is conceivable that wastewater is discharged into the ground when the water table is lowered. In 1991, the Vashon Sewer District while conducting investigations concluded that exfiltration may also be occurring. Excavations at a few selected locations support the exfiltration possibility by showing damp soil around the pipe in otherwise dry backfill. Although a limited number of tests along the pipe trench have not detected fecal coliform, further investigation may be warranted. Pipe repair is an important priority to protect the local ground water quality (*Vashon Sewer District Comprehensive Sewer Plan, June 1992*).

Numerous utility officials consider side sewers on private property more of a threat to ground water quality than the sewer mains themselves. For example, in a Kent study, in an older neighborhood, side sewers were determined to contribute 75 percent of the infiltration to Kent sewers. This was detected by the King County Water Pollution Control Division (formerly Metro) using a smoke test; Kent and Metro bore the cost of replacing these leaking side sewers.

**Issue 1 - Infiltration and Exfiltration:** Infiltration of ground water into gravity sewer pipes may be causing significant export losses of ground water from the Vashon Ground Water Management Area. Exfiltration of sewage from leaking sewer pipes may be causing contamination of ground water.

**SP-1A Infiltration and Exfiltration:** King County Department of Natural Resources will review and analyze existing studies and on going programs developed by the Vashon Sewer District to determine if infiltration and exfiltration are impacting ground water quality and quantity in the Vashon Ground Water Management Area and, analyze conclusions and determine appropriate follow up action, if any.

Who: King County Department of Natural Resources  
Priority: Low  
Time: 0.5 FTE  
Fund Source: Aquifer Protection Area

**SP-1B Infiltration:** The Management Committee will review the Vashon Sewer District Comprehensive Plan prior to any significant expansion of the sewer district area to determine the impacts on aquifer depletion.

Who: Management Committee  
Priority: Low  
Time: To be determined  
Fund Source: Aquifer Protection Area

**SP-1C Sewer Maintenance Programs:** The Vashon Management Committee encourages the Vashon Sewer District to continue or adopt a regularly scheduled leak detection and repair program, and a public education program related to side sewer maintenance.

Who: Vashon Sewer District  
Priority: Low  
Time: To be determined  
Fund Source: Agency general funds

**SP-1D Leakproof Piping:** The Vashon Ground Water Advisory Committee encourages King County to amend the King County Code 13.24 to require the following: new sewer piping installed in the most physically susceptible and recharge areas be leakproof; and existing leaking sewer pipes including side sewers will be replaced with leakproof piping in the most physically susceptible and recharge areas according to a schedule contained in the Sewer Utility Comprehensive Plans.

Who: King County, Office of Budget and Strategic Planning  
Priority: Low

Cost: 0.125 FTE  
Fund Source: Agency general funds

### **2.3.7 Solid Waste Landfills**

Goal Statement: *To eliminate or reduce the occurrence of ground water contamination by the operation of solid waste disposal facilities and if the Vashon landfill continues to be a source of contamination, then it should be closed and a transfer station provided.*

The ground water impact from landfills is from leachate production. Leachate is water or other liquid that has been contaminated by dissolved or suspended materials due to contact with solid waste or gases from the solid waste. Ground water that has been contaminated by leachate may affect public health. Ground water that is not currently being used for drinking water also needs to be protected from leachate contamination, as it may become a drinking water source in the future.

The Vashon landfill is located in west central Vashon Island. This site has been used since the early 1900's. The 9.3-acre refuse area is located on a 145-acre site. The old refuse area adjacent to the current refuse site has been capped. All wastes are accepted at the landfill except liquids, flammable materials, dangerous or hazardous wastes. King County Solid Waste Division expects to close the landfill in the year 2000. The Vashon Ground Water Management Committee recommended management strategies to address landfill issues are found in the Unfinished and Finished Agenda's of this Plan. Education strategies related to solid waste disposal are found in the Education Program.

### **2.3.8 Burial of Human Remains**

Goal Statement: *To prevent the degradation of ground water from embalming fluids, disintegrating metal caskets, decaying human remains and other materials associated with processing bodies for burial or cremation.*

Under certain hydrogeologic conditions, burial practices could have an affected on local ground water quality. One active cemetery is located on Vashon Island and one inactive cemetery on Maury Island. The Vashon Episcopal Church of the Holy Spirit also has a memorial garden columbarium used for earth burial of cremated remains. Nothing is known about the existing or potential effect of decomposing corpses and caskets on ground water on Vashon.

The Vashon Ground Water Advisory Committee concluded that ground water impacts from cemeteries was not a concern in the Vashon-Maury Island Ground Water Management Area. No further action is necessary at this time. However, the data collection and management plan may include monitoring near the cemetery.

### 2.3.9 Sand and Gravel Mining

Goal Statement: *To ensure that regulatory programs are adequate to prevent adverse effects upon ground water quality attributable to sand and gravel mining operations.*

Productive sand and gravel mines are often located over vulnerable aquifers. Mining activities in these areas can increase ground water vulnerability to contamination from both the extraction process and site reclamation. Four major commercial and a number of smaller sand and gravel extraction operations are located on the Island. The four major facilities, located on the south shore of Maury Island, operate throughout the year. The other sites, which operate intermittently, are located across the Island. The King County Comprehensive Plan contains these policies related to mining:

- RL-410** The periodic review process for Mining zoned sites and those sites operating in the Forest Production District and as legal nonconforming uses shall include sufficient public notice and comment opportunities. The purpose of the periodic review process is to provide opportunities for public review and comment on the internal resource facility's fulfillment of state and county regulations and implementation of industry-standard Best Management Practices, and for King County to modify, add or remove conditions to address new circumstances and/or unanticipated project-related impacts. The periodic review process is not intended to reexamine the appropriateness of the mineral resource use, or to consider expansion of operations beyond the scope of existing permitted operations since that review would be accomplished through the County's permitting process. The periodic review is intended to be part of King County's ongoing enforcement and inspections of mineral resource sites, and not to be part of the County's permitting process.
- RL-411** Conditions and mitigations for significant adverse environmental impacts associated with mining operations should be required especially in the following areas: Environmentally sensitive and critical areas, such as surface and ground water quality and quantity, wetlands, fisheries and wildlife habitats.
- R-412** King County should work with the state and federal governments to ensure that the proposals for underground mining, oil and gas extraction, and surface coal mining are reviewed with consideration of local land use and environmental requirements.
- R-413** King County should work with the State Department of Natural Resources to ensure that mining areas are reclaimed in a timely and appropriate manner. Where mining is completed in phases, reclamation also should be completed in phases as the resource is depleted.

**Issue 1 - Aquifer Impacts and Regulation:** Sand, gravel and rock quarry mining can cause changes in the site or include activities which increase the potential for contamination of important aquifers. Major changes have occurred at the state level regarding general permitting of sand, gravel, and rock quarry mining operations. Ecology require performance standards as part of the General Permit for all mines in King County.

All discharges from sand, gravel, and rock quarry mines must meet the Ground Water Quality Standards (Chapter 173-200 WAC) and the Surface Water Standards (Chapter 173-201A WAC). There may be changes as a result of oversight or problems of coordination between the General Permit process and local zoning or policies found in the King County Comprehensive Plan.

**SG-1 Aquifer Impacts and Regulation:** The environmental guidance document should include the following Best Management Practices for sand, gravel and rock quarries:

1. For sites with a planned excavation depth lower than the ground water table, a detailed hydrologic report should be filed. This may be a part of a complete Environmental Impact Statement or be an appendix to an environmental checklist.
2. When mining activities are to be located in designated wellhead protection areas, special protection areas, sensitive aquifer areas, or principal recharge zones an Environmental Impact Statement should be required.
3. Where possible, mining sites should utilize internal drainage, in order to support continued ground water recharge and minimize off-site discharges.
4. When ground water is exposed during the mining operation and the resulting impoundment is larger than 3 acres, ground water should be monitored for both water level (monthly) and water quality (quarterly to semi-annually) over the life of the operation. Water level and water quality monitoring should also be considered when depth to seasonal high water is reduced to 5 feet or less.
5. Associated activities such as concrete, asphalt or other batch processing plants shall not contaminate ground waters.
6. Truck and equipment wash runoff should be routed to an approved retention and treatment facility, equipped with an oil-water separator prior to its release to retention ponds.
7. Fuel (oils) storage and handling facilities should be located some distance from the main sediment and wash water retention facility. All such facilities should be equipped with approved containment, monitoring, and collection systems. Fuel storage should be aboveground. These sites should be lined and bermed with sufficient capacity to accommodate spills and leaks. Runoff from these surfaces should be routed to a retention pond that can be monitored and cleaned in the event of a spill.
8. All sites should maintain a fuels/hazardous waste management plan. This would be maintained by the operator and be available on the site at all times.
9. At closure of the site, after accidental spills, or at the request of the Washington State Department of Natural Resources/Ecology, all contaminated material will be removed and disposed of with approved methods and at approved disposal sites. This material will not be used as fill at the site.

10. In general, impoundments of greater than 3 acres should not be filled. These sites should be stabilized as lakes and ponds and the surrounding area revegetated to insure stability of the site. Future land-use decisions should reflect increased ground water vulnerability at the site. Individual sites may be filled if it can be demonstrated that sufficient inert material can be obtained to serve as fill. Impoundments of less than three acres should not be filled if there is doubt as to quality or supply of inert fill.
11. Excavation pits should not be used as landfill disposal sites for unclassified or non-inert wastes. In general municipal landfills are not an appropriate use of gravel sites located over semi-confined and unconfined ground waters.
12. Pits with standing water that are slated to be filled may use only approved inert earth materials (native fill/overburden) to fill the area up to the high water table. The remaining fill should meet the conditions described in 10 and 11.
13. Future land use should reflect the increased vulnerability of ground water at the site and the change in the water balance of the area.

Who: King County Department of Natural Resources  
Priority: Low  
Cost: 0.5 FTE  
Fund Source: General Agency funds

**Issue 2 - Environmental Review:** The environmental review process may not provide adequate technical review of siting issues during review of applications for rezones and unclassified use permits.

**SG-2 Environmental Review:** King County will fund adequate staff for the King County Department of Natural Resources to perform technical/hydrological reviews of projects undergoing environmental review regarding the protection of ground water.

Who: King County Department of Natural Resources  
Priority: Low  
Cost: 0.125 FTE  
fund Source: General Agency funds

**Issue 3 - Land Use of Inactive or Reclaimed Mines:** Subsequent land use of reclaimed sand and gravel mining sites should reflect the increased susceptibility of aquifers to contamination. Currently no formal requirement that this be given special consideration exists.

**SG-3 Land Use of Inactive or Reclaimed Mines.** King County Department of Natural Resources and the Office of Strategic Planning will propose an amendment to the King County Comprehensive Plan for the Metropolitan King County Council's consideration to include a policy which provides that land use of inactive or reclaimed sand, gravel and rock quarry mines be carefully evaluated in light of the increased susceptibility of aquifers to contamination due to mining activities.

Who: King County Office of Strategic Planning, in conjunction with the King County Department of Natural Resources  
Priority: Low  
Time: 0.25 FTE  
Fund Source: General agency funds

### **2.3.10 Biosolids and Sewage Effluent**

Goal Statement: *To provide assurance that groundwater will not be contaminated by biosolids or the reuse of wastewater effluent.*

Biosolids are the treated and primarily organic sewage solids generated from wastewater treatment plants. Biosolids may be utilized for various beneficial uses including compost and fertilizer production, agricultural and silvicultural land application, land reclamation, and the manufacture of various construction materials. In 1993, the Department of Ecology issued the draft *Biosolids Management Guidelines for Washington State*. The Seattle-King County Health Department currently enforces existing state regulations through Title 10 of the King County Board of Health. Also, the Seattle-King County Health Department requires permits for biosolids treatment facilities and land application sites. The permitting process includes review of biosolids quality, site specific project design and operations, inspections, and environmental monitoring.

The only biosolids currently generated on the island are from the sewage treatment process at the Vashon Sewer District Treatment plant. These wastes are currently transported off island for disposal. In the past, disposal was on the Island. The Ground Water Advisory Committee resolved that biosolids generated on the Island (although currently disposed of off the Island) should be disposed on the Island. When application for biosolids is made for site approval, the Seattle-King County Health Department will forward a copy of the permit application to the Management Committee.

Sewage effluent is liquid left after sewage has settled. This liquid may be untreated, or it may be further settled, filtered, and disinfected, depending on final use. Reuse of effluent is regulated by the State Water Pollution Control Act (Chapter 90.48 RCW) administered by Ecology and by the "Wastewater Reclamation and Reuse Interim Standards."

The Ground Water Advisory Committee determined that no action was needed on these issues, as the existing regulatory approach was sufficient for ground water protection.

### **2.4 Ground Water Quantity Program**

Goal Statement: *To manage the ground water resources of King County to optimize current and long-term benefits for present and future residents.*

Ground water quantity is important because ground water is used for drinking water, irrigation, industrial processes, and provides flow to streams that support fish and other

wildlife. Aquifers, and related surface water levels, are maintained by preserving recharge. The two main causes of ground water depletion are reducing recharge by increasing permeable surfaces and by overuse. Recharge occurs only through relatively undisturbed, permeable soils. Population growth, with its related construction of buildings and roads, causes an increase in impermeable surfaces and the demand for ground water.

The state of Washington has attempted to balance the needs of its citizens with maintaining the water resource. Ecology administers laws dealing with water appropriations and allocations. Allocations to new users must not conflict with existing use; however, the information needed to know when such a conflict may occur is lacking. Some areas of the state have experienced the effects of unwise use of aquifers, such as water level decline and seawater intrusion. Parties involved in water use are developing and using innovative techniques, such as conservation and artificial recharge, to decrease water use and increase water availability. Recent interest in maintaining surface water resources has spotlighted the interaction of ground water and surface water. Future ground water resource management must consider this interaction.

The *Ground Water Areas Management and Programs* (Chapter 173-100 WAC) contains guidelines on program content which were to be adapted to the particular needs of a ground water management plan. Included in the program content is a section on alternatives, which outlines various land and water use management strategies that address each of the ground water problems discussed in a problem definition section. It states that the alternative management strategies would address water conservation, conflicts with existing water rights and minimum instream flow requirements, programs to resolve such conflicts, and long-term policies and construction practices necessary to protect existing water rights and subsequent facilities installed in accordance with the Ground Water Management Plan program and/or other water right procedures. This Plan does not address these topics, except for conservation. Several new state programs, initiated since the WAC was written, provide programs to resolve conflicts with existing water rights and minimum instream flow requirements, and long-term policies and construction practices necessary to protect existing water rights and subsequent facilities (generally, under the Water Resources Forum from the Chelan Agreement). The Ground Water Advisory Committee found that an important step in addressing ground water quantity issues is to develop and implement a long-term monitoring and data collection program to provide decision makers with the necessary ground water information. Other important steps are conservation, education, and land use controls.

**Issue 1 - Aquifer Recharge Preservation.** One way to ensure continued recharge is through environmental review on individual developments. However, the current checklist for environmental review does not require a description of impacts to ground water recharge.

**WQ-1 Aquifer Recharge Preservation:** The Ground Water Advisory Committee requests that Ecology amend the environmental checklist to include impacts on the

quantity of aquifer recharge. Until the change by Ecology can be made, King County will consider impacts on the quantity of aquifer recharge during environmental checklist review.

Who: Ecology and King County Department of Development and Environmental Services  
Priority: Low  
Time: Ecology; \$7,000; DDES; to be determined  
Fund Source: General agency funds

**Issue 2 - Data Needs:** The many needs for a complete characterization of the aquifer resource including: by Ecology for water rights application analysis, surface water/ground water interaction determination, possible ground water reservation and other resource management concerns. To date, this has not been completed.

**WQ-2 Data Needs:** Design and implement a ground water data collection management program which would enable Ecology and others (such as purveyors, land use planners and public officials) who make land and water use decisions to make water resource decisions based on more complete information.

Who: King County Department of Natural Resources, in the Data Collection and Management Program  
Priority: High  
Time: See Data Collection and Management Program  
Fund Source: Aquifer Protection Area

**Issue 3 - Water Rights:** Water rights records do not necessarily accurately reflect actual pumpage rates and current use of the ground water resource.

**WQ-3 Water Rights:** Utilities will update their water right records and report to Ecology, as per the recommended program in the "Five Year Water Resource Data Management Plan."

Who: Water purveyors  
Priority: Low  
Time: To be determined  
Fund Source: General agency funds

**Issue 4 - Conservation:** Conservation has been shown to have a positive impact on ground water resources. Some conservation methods could be implemented to enhance current programs including landscaping methods. King County Board of Health regulations for small and individual water systems do not include conservation elements.

The intent of the Vashon-Maury Island Ground Water Management Program is to devise a conservation program that will reduce the need for further ground and surface water

appropriations. The Vashon Ground Water Management Committee adopted the following management strategies to address conservation issues. Education strategies related to conservation are found in the Education Program.

**WQ-4A Conservation:** The Seattle-King County Health Department will propose a revision to regulations for existing, new or expanded Group B Small Public Water Systems to cover water conservation goals and measures for consideration by the King County Board of Health and develop educational materials for new and existing individual well owners encouraging conservation measures.

Who: Seattle-King County Health Department, King County Board of Health.  
Priority: High  
Time: 0.10 FTE  
Fund Source: General agency funds

**WQ-4B Conservation:** All Group A water systems, and any water system with a King County right-of-way use permit, must include conservation measures and goals as set forth in the Vashon Coordinated Water Supply Plan, in their comprehensive water system plans.

Who: All water system purveyors, as required by the Washington State department of Health and King County  
Priority: High  
Time: Purveyors determine and fund  
Fund Source: General agency funds

**Issue 5 - Artificial Recharge:** Artificial recharge is a new technique that is being tried in this area. However, not enough is known about the feasibility for long-term artificial recharge.

**WQ-5 Artificial Recharge:** Water purveyors should investigate artificial recharge.

Who: Public water systems  
Priority: Low  
Time: To be determined  
Fund Source: General agency funds

**Issue 7 - Reservation:** Ground water reservation may be used to limit the amount of ground water withdrawn from a system.

**WQ-7 Reservation:** The Vashon-Maury Island Ground Water Advisory Committee encourages utilities to petition Ecology for water supply reservation of the ground water resource consistent with the King County Coordinated Water Supply plans, and the Growth Management projections for Vashon.

## 2.5 Unfinished Agenda

The Guidelines for Ground Water Management Area and Programs calls for concurrence on the recommended management strategies, and resolution of any non-concurrence issues by the Ground Water Advisory Committee. During review of the Draft Vashon-Maury Island Ground Water Management Plan, some management strategies were identified that the implementing agency could not commit resources or otherwise agree with at this time. The Department of Ecology's guidance for concurrence allows that unresolved issues may be placed onto an Unfinished Agenda section. These issues may not be critical to successful overall Plan implementation. However, Ecology retains the final determination on whether Unfinished Agenda items are critical.

### 2.5.1 Stormwater

**Roadway Runoff:** The State Highway Runoff Program provides for improved water quality and quantity controls for storm water runoff from new and existing state highways. The King County Surface Water Design Manual requires water quality and quantity controls for new roadways in King County. However, state and local programs may not address quality and quantity problems associated with existing roadways. Existing contamination problems may be identified via Basin Plans developed by King County Water and Land Resources Division via other processes to identify needed capital improvements. King County will then address the problems identified as funding allows.

**ST-1 Roadway Runoff:** The King County Department of Transportation, Roads Division will give highest priority to the most physically susceptible and recharge areas and Wellhead Protection Areas when identifying and correcting water quality problems associated with existing roadways and, develop a program to retrofit existing structures, which will require storm water quality and quantity controls comparable to new regulations when doing major renovation or widening of roads.

This management strategy is included in the Unfinished Agenda because the King County Department of Transportation, Roads Services Division, cannot concur due to the potential cost associated with action ST-6. Roads Services produces the six-year project list of which the yearly budget for road maintenance is based. The present prioritization process for the budget does not include the proposed factors. Staff, during the concurrence discussion, stated that consideration of location of a road (such as if it is in a sensitive area) could be considered for inclusion as a factor in future budget development.

**ST-2 Ground Water Quality Concerns - Long Term Impacts:** King County will sponsor research on the long term impacts of the infiltration of pretreated stormwater on ground water quality. This research will be supported by monitoring variables in areas where the facility is installed and operating.

This management strategy is included in the Unfinished Agenda because the King County Water and Land Resources Division cannot concur due to the cost associated with

the project. The 1996 budget for facility monitoring program was significantly cut and current monitoring efforts are focused on facility maintenance. The Center for Urban Water Resources may be able to coordinate a study with funding from different jurisdictions, of which the Division may be able to contribute to such a study. Typical costs of storm water facility evaluations are approximately \$20,000 - \$30,000 per facility.

### **2.5.2 Hazardous Materials**

**Hazardous Materials Management:** Businesses on Vashon-Maury Island may use hazardous materials, or generate hazardous waste. Due to the sole-source nature of the aquifer, hazardous waste should not be disposed on the Island.

**HM-1 Hazardous Waste Management:** The Ground Water Advisory Committee recommends that, as part of the Aquifer Protection Area activities, hazardous materials brought onto the Island by manufacturing facilities should be tracked to see that none of these materials are disposed of on the island.

This management strategy is included in the Unfinished Agenda because the establishing a program of this scope would be a huge task. Part of the complexity comes from the wording, where "hazardous materials by manufacturing facilities" would include gasoline. The Management Committee may reconsider this recommendation when establishing the Aquifer Protection Area.

**HM-2 Hazardous Waste Management:** King County will provide a hazardous materials collection facility at the landfill, and provide educational materials to island residents about the threat to the aquifer from misuse and improper disposal of hazardous materials. At a minimum, a cost-effective and non-fee based pickup site for waste oil and antifreeze will be established at the landfill.

This management strategy is included in the Unfinished Agenda because the Seattle-King County Health Department does not concur. The cost to operate such a facility could exceed \$1 million per year. Vashon currently contributes approximately \$8,500 per year to the County's hazardous waste program. The hazardous waste mobile once a year visit costs approximately \$70,000. The Wastemobile is funded from local hazardous waste management fees, not solid waste tonnage fees. The focus of the Local Hazardous Waste Management Program is education and reducing the hazardous waste stream, not increasing the number of collection facilities. In addition, the County collects hazardous waste only from households, not businesses due to legal and budgetary restrictions.

### **2.5.3 Solid Waste**

**Composting:** Vashon residents have no public facility available for disposal of yard wastes such as grass clippings other than disposal at the landfill. These wastes should be composted which would reduce the volume of solid waste for disposal.

**SW-1 Composting:** King County Solid Waste Division will provide a compost facility with liner at the landfill for use by Vashon residents.

This proposed management strategy is in the Unfinished Agenda because the Solid Waste Division has stated that a compost facility would not be cost effective and advised that yard waste, including grass clippings, would be collected from the year 2000 when the Vashon facility is closed and hauled off-island to existing compost facilities. Also, the Seattle King County Health Department advised that a compost facility has a high capital cost. For example, the Cedar Grove compost facility has spent \$6 million on their aeration system alone. These facilities need a lot of expensive equipment including aerators, grinders, movers, scrubs, in addition to a concrete pad, piping, etc. Compost cannot be just placed in a pile because of the fire hazard (may combust) and it would not meet the odor standards of the Puget Sound Air Pollution Control Authority.

#### **2.5.4 Water Quantity**

**Decline Limits:** Water level decline limits are set by Ecology and can be an effective tool for managing the resource. Ecology needs long-term information in order to set decline limits.

**WQ-1 Decline Limits:** Ecology shall review the information collected through the Data Collection and Management Program and recommendations shall be made to prevent further declines or restore pre-decline levels and to maintain safe sustainable yields. All jurisdictions shall then follow the appropriate mitigation actions as recommended by Ecology. Also, Ecology will consult with the Management Committee in setting water level decline limit "triggers."

Ecology cannot concur with WQ-8A prior to knowing the workload, costs, and probable outcomes, and is therefore placed in the Unfinished Agenda (Ecology, April 26, 1995).

#### **2.5.5 Aquifer Protection Area**

**Funding:** Metropolitan King County Council is investigating various funding alternatives for the Groundwater Management Program. The Ground Water Advisory Committee recommended the use of an Aquifer Protection Area.

The Ground Water Advisory Committee recommends that the Metropolitan King County Council designate the Vashon-Maury Island Ground Water Management Area as an Aquifer Protection Area to provide funding for the implementation of the Vashon Ground Water Management Plan (RCW Chapter 36.36). The purpose of an Aquifer Protection Area is to establish a funding base for ground water protection, preservation, and rehabilitation programs. Aquifer Protection Areas are established through an election ballot issue requiring approval from a simple majority of voters within the proposed Aquifer Protection Area. If voters approve the Aquifer Protection Area, the county can collect modest water and septic system user fees. Fees may only be collected from users

of water withdrawn from an aquifer, as opposed to a surface water source, and is not related to the amount of water used. The ballot measure must describe the specific use, and any changes in specific uses or the fee would require voter approval.

The Ground Water Advisory Committee has stated that the appropriation of Aquifer Protection Area funds should be guided by the following two principles:

1. When the local community chooses to tax itself to protect its water resources, the local community should set the priorities and manage the expenditure of those tax dollars, rather than turning the money over to a regional government that is not as accessible, as responsive, or as knowledgeable about local circumstances.
2. When a local community chooses to tax itself to pay for additional protection of its water resources, the money raised should not be used to pay for governmental functions that are typically supported by general funds, such as the enactment of legislation, or that are already the responsibility of governmental bodies, such as the enforcement of existing laws.

Creation and adoption of the Vashon-Maury Island Ground Water Management Area as an Aquifer Protection Area could ensure adequate long-term funding for implementing the Vashon Ground Water Management Plan. Community support would be demonstrated because the Aquifer Protection Area has to be approved by a majority of the people in the area. Also, an Aquifer Protection Area is consistent with Ecology's Ground Water Management Plan implementation ideas and what other counties have used.

The Ground Water Advisory Committee recognizes that the ballot measure must describe specific use of the funds, and any changes in specific uses or the fee would require voter approval. Fee collection is limited, in that the Aquifer Protection Area fees may only be collected from users of water withdrawn from an aquifer as opposed to a surface water source; the fee is not related to the amount of water used; and fees may be assessed on on-site sewage disposal only, not other sources of ground water contamination.

Since Council preferred to leave this issue unresolved until the alternatives are fully considered, this issue is included in the Unfinished Agenda.

## **2.6 Finished Agenda**

The Ground Water Advisory Committee started reviewing ground water issues in 1988 and adopted several recommended management strategies that have been accomplished, either partially or completely. The following recommended management strategies have been removed from the body of the plan for clarity and placed in this section. The Ground Water Advisory Committee wanted to retain those management strategies in the Plan that, during their review and adoption process, were considered important so that the review of critical issues is documented.

## 2.6.1 On-Site Sewage Systems

**OS-1 Nitrate Concerns.** The Seattle-King County Health Department should investigate apparent high-risk areas to determine the existence of impacts on ground water from on-site sewage systems.

This management strategy is included in the Finished Agenda because the Seattle-King County Health Department has completed an on-site sewage system survey of Vashon. Information from this study could be used to refine the wording of this action. Also, need to define what are “high risk areas.” This could be considered by the Management Committee in the future.

**OS-2 Operation and Maintenance:** The Seattle-King County Health Department will develop performance standards for on-site systems that minimize the risk of ground water contamination.

This management strategy is included in the Finished Agenda because performance standards are already in Title 13 (Jim Henriksen, Seattle-King County Health Department), that is based on the state regulations. The state regulations were revised to meet the state Ground Water Standards.

## 2.6.2 Solid Waste

**Issue 1 - Standards:** Standards can be improved to provide better ground water protection. The areas where changes may be made include: aquifer protection areas; and cell expansion in existing facilities. The Seattle-King County Health Department will prepare amendments to Title 10 to prohibit siting or expansion of landfills in the most physically susceptible and recharge areas for King County Board of Health's approval.

**SW-1 Standards:** Ecology's Minimum Functional Standards and the Seattle-King County Health Department (Title 10) will amend regulations to clearly state that cell expansion is subject to current standards, including location, for King County Board of Health's consideration.

This management strategy is included in the Finished Agenda because Ecology has adopted Chapter 173-351, and Seattle-King County Health Department is in the process of formally adopting WAC 173-351, which includes these provisions.

**Issue 2 - Site Analysis:** The present landfill site is perhaps not the best site for a landfill. Monitoring of the landfill by King County indicates that ground water quality has been impacted by leachate from the landfill. Although King County is taking steps to protect the ground water quality in the vicinity of the landfill, a better site on Vashon may be available for solid waste disposal.

**SW-2 Site Analysis:** King County Solid Waste Division will evaluate sites on Vashon before any expansion of the existing site is undertaken, to determine the best available site for a landfill.

This management strategy is included in the Finished Agenda because the landfill is to be closed in the Year 2000 and this action no longer applicable (King County Solid Waste). The Seattle-King County Health Department advised that the only identified abandoned landfill on Vashon is at the present site and monitoring will continue at least until the year 2030.

### **2.6.3 Sand and Gravel**

**Regulatory Modifications:** Sand, gravel, and rock quarry mining can cause changes in the site or include activities which increase the potential for contamination of important aquifers. Major changes have occurred at the state level regarding general permitting of sand, gravel, and rock quarry mining operations.

**SG-1 Regulatory Modifications:** King County should comply with the National Pollutant Discharge Elimination System permit program and Ecology's "General Permit" requirements.

This management strategy is included in the Finished Agenda because the General Permit has replaced the Best Management Practices. King County complies with NPDES and its General Permit requirements.

### **2.6.4 Water Quantity**

**Issue 1 - Policies and Ordinances:** Several policies and ordinances are proposed which may provide broad protection for aquifer recharge areas. There is an opportunity to influence which policies are adopted for ground water protection.

#### **WQ-1 Policies and Ordinances:**

1. King County will amend the King County Comprehensive Plan Policy E-337 to include aquifer recharge.
2. King County will consider adopting a clearing ordinance with guidelines for clearing on lands outside of sensitive areas and specific performance standards including phasing and seasonal clearing activities, retention requirements, and coverage. The ordinance should include the clarification of a clearing permit process.
3. King County will implement interim development standards whereby clearing is limited on subdivision, short subdivision, and new residential and commercial building projects to protect water quality, limit surface water runoff and erosion, and maintain wildlife habitat and visual buffers, until such time that a clearing ordinance is adopted.

This management strategy is included in the Finished Agenda because the King County Comprehensive Plan adopted in 1994 addresses ground water recharge in many policies, including: U-206, NE-302, NE-309, NE-333, NE-334, NE-335, NE-336 and R-216.

**WQ-2 Conservation:** King County will adopt the proposed landscaping ordinances to encourage conservation in new developments. Landscaping plans should incorporate native growth areas, use of plant species that are drought tolerant, water efficient irrigation technologies, soil amendments, and limitations on the amount of turf.

This management strategy is included in the Finished Agenda because King County adopted a landscaping ordinance in January 1994 that includes most of these elements.

**SA-1C Adoption of General Aquifer Protection Policies:** King County will adopt the following policies to protect ground water on Vashon Island by: a) preferring land uses that retain a high ratio of permeable to impermeable surface area and maintain or augment the infiltration capacity of the natural soils; and b) requiring standards for maximum vegetation clearing limits, impervious surface limits, maximizing topsoil retention and, where appropriate, infiltration of surface water.

The language in this proposed policy is the same as in the adopted Policy NE 336 of the King County Comprehensive Plan. Therefore, this action is placed in the Finished Agenda.

## **2.6.5 Stormwater**

**Issue 1 Runoff Versus Recharge.** The King County Surface Water Design Manual does not limit runoff volumes. Rather, the Manual requires that there be no increase in peak runoff rates. Potential ground water recharge is lost to runoff causing depletion of aquifers.

**ST - 1 Runoff Versus Recharge.** King County will amend/adopt surface water design manuals to require that runoff be infiltrated when site conditions permit except where potential ground water contamination cannot be prevented by pollution source controls and stormwater pretreatment. Extreme caution on recharge and infiltration is needed based on a site by site evaluation. We will strive to achieve a policy of no net reduction of recharge in any new development or redevelopment in the most physically susceptible areas.

Strategy ST-1 is in the Finished Agenda because King County Water and Land Resources Division has proposed a revised Design Manual that provides for infiltration, where appropriate and meets the State's design manual guidelines for encouraging infiltration.

**Issue 2 - Ground Water Quality Concerns:** Numerous studies have demonstrated that non-point source pollution is a major contributor to ground water degradation. Water quality controls and infiltration of storm water will increasingly be used to reduce

non-point source pollution effects upon both surface and ground water resources. Technology associated with these practices is in early stages and long-term effects on ground water quality are unknown. While water quality controls will improve the quality of the water discharged to the ground, the increasing emphasis on infiltration poses risks. Infiltration will be employed most often in areas with glacial and alluvial soils associated in the most physically susceptible and recharge areas. Regardless of how comprehensive new requirements may be, treatment systems will sometimes fail for a variety of reasons and they cannot be expected to function optimally at all times. Additionally, non-point source pollution that is not borne by storm water will infiltrate and reach ground water regardless of storm water management techniques.

**ST-2 Facility Requirements:** King County within the Vashon Ground Water Management Area will require that all types of stormwater facilities be designed to protect ground water.

This issue and management strategy is placed in the Finished Agenda because the King County Surface Water Design Manual requires that runoff be pretreated to a level of water quality equivalent to that of surface water.

**Issue 3 - Coordination between Surface and Ground Water Planning Efforts:** Surface and ground water planning efforts should be effectively coordinated to make the best use of limited resources.

**ST-3 Coordination Between Surface and Ground Water Planning Efforts - Puget Sound Water Quality Authority:** The Puget Sound Water Quality Authority recognizes that surface and ground water form a continuous and dynamic system which must be comprehensively protected. The Puget Sound Water Quality Management Plan should be revised to address all water quality issues in the Puget Sound drainage basin, including ground water.

This is in the Finished Agenda because the Puget Sound Water Quality Authority adopted the *Managing Nonpoint Pollution - An Action Plan Handbook for Puget Sound Watersheds*, in June 1993 and stated in their letter of February 27, 1996 that ground water is adequately protected by utilizing existing components of the Plan and through the Non-Point Source Pollution Program. The Puget Sound Plan also contains an education component which includes ground water and is being utilized by the Vashon School District.

#### **2.6.6 On-Site Sewage Systems**

**OS-2A Commercial Hazardous Materials:** The Seattle-King County Health Department should: inventory commercial, industrial, and institutional facilities served by on-site sewage treatment and disposal systems which potentially use, store, or dispose of hazardous materials; educate operators regarding hazardous materials management,

and; selectively monitor those facilities that appear to represent a significant risk to ground water quality.

**OS-2B Hazardous Materials:** The Seattle-King County Health Department will prepare amendments to *Title 13 of the Code of the King County Board of Health* to expressly prohibit the use of on-site sewage systems for disposal of any materials or substances other than domestic sewage as defined Chapter 246-272-010 WAC, for King County Board of Health consideration.

These strategies are in the Finished Agenda because the Seattle-King County Health Department implements the recommendations in OS-2A through the Local Hazardous Waste Management Program in King County. Title 13 is in the process of being amended this year to meet the State regulations and will include the requirements of OS-2B.

**Chapter Three**  
**Recommended Implementation Process**

**Vashon-Maury Island  
Ground Water Management Plan**

**December 1998**

## **Recommended Implementation Process for the Ground Water Management Program**

### **3.1 Introduction**

The ground water management planning process has been funded by Department of Ecology Centennial Clean Water Fund grants and contributions from King County. However, implementation of the Vashon Ground Water Management Plan depends upon long-term funding and appropriate assignment of responsibility. Executive and legislative branches of government and other public and private interests have important roles in the implementation of the Ground Water Management Plan to protect ground water quality and quantity. The recommended implementation process described in this chapter assigns roles and tasks and proposes a source of funding. Topics addressed include:

- Legislative Authority
- Funding
- Washington State Department of Ecology
- Ground Water Management Committee
- Ground Water Advisory Committee
- Lead Agency
- Implementation of the Plan
- Process for Evaluation and Revision of the Plan

Summary tables list actions to be taken during plan implementation. These tables also list priorities, who is responsible for implementation, cost, source of funds, and an approximate schedule for commencing and completing the work.

### **3.2 Legislative Authority**

Legislative authority of the Metropolitan King County Council and the Seattle-King County Board of Health are needed to ensure the Ground Water Management Plan and the necessary ordinances are implemented. The Ground Water Advisory Committee recommends that legislative authority for implementation of the Vashon Ground Water Management Plan be shared between the Metropolitan King County Council and the Seattle-King County Board of Health. Roles of each legislative authority are recommended below.

#### **Metropolitan King County Council**

The Metropolitan King County Council is legislative authority of the county. The Metropolitan King County Council exercises its legislative power by adoption and enactment of ordinances; by levying taxes, appropriating revenue and adopting budgets; and other powers as described in the King County Charter (King County Charter,

Sections 220 - 270). The Council ensures that the policies in the King County Comprehensive Plan are carried out through ordinances implementing the Plan. The role of the Council in implementing this plan would be:

- Adopt the Vashon Ground Water Management Plan after it has been certified by Ecology;
- Appoint members of the Ground Water Management Committee from nominees provided by entities represented;
- Adopt updates to the Vashon Ground Water Management Plan, upon recommendations from the Management Committee and concurrence by affected agencies;
- Allocate aquifer protection funds after approval by the Management Committee and concurrence from affected agencies; and
- Adopt ordinances necessary for the implementation of the Vashon Ground Water Management Plan (generally addressing such matters as land use, zoning, and regulations governing the activities of county agencies).

### **King County Board of Health**

The Seattle-King County Board of Health has powers concerning health and sanitary measures for the protection of the public health within the county, including: enacting rules and enforcement of regulations to preserve, promote, and improve public health, and establishing fee schedules for issuing or renewing permits. The role of the Board in implementing this plan would be to adopt ordinances necessary for the implementation of the Vashon Ground Water Management Plan generally addressing activities regulated by the Seattle-King County Health Department (e.g., on-site sewage disposal, small public and private drinking water systems, wellhead protection, solid waste disposal,).

### **Special Purpose Districts & Associations**

Other administrative bodies include the Board of Commissioners for Water District Number 19, various water associations, and the Vashon Sewer District. These boards set policies and rates for the provision of water within their service area and would be responsible for adopting measures as needed to implement the Vashon Ground Water Management Plan within their jurisdiction.

### **3.3 Funding**

King County is currently exploring approximately 6-8 long-term funding alternatives for the purpose of implementing a ground water management program. If a regional funding source cannot be identified, the Vashon-Maury Island Ground Water Management Committee should assess the feasibility of establishing an Aquifer Protection Area to provide funding for implementation of the Plan.

### **3.4 Washington Department of Ecology**

A certified Ground Water Management Plan is codified in the Washington Administrative Code and administered by Ecology. Ecology will rely on local government cooperation to implement the Plan, but it may assist the lead agency, if needed, to gain compliance with provisions of the adopted Plan.

### **3.5 Ground Water Management Committee**

The Ground Water Advisory Committee recommends the formation of a Ground Water Management Committee (Management Committee) that will coordinate ground water protection activities. The Management Committee will be advised by the Advisory Committee, at its discretion, for a period of three years after certification of the Vashon Ground Water Management Plan by Ecology. The Management Committee will carry out the following tasks:

- Allocation of Aquifer Protection Funds: review, amend as necessary, adopt, and recommend to the Metropolitan King County Council an annual allocation of aquifer protection funds based upon the Ground Water Management Plan.
- Monitor the implementation of the Ground Water Management Plans: review annual reports on implementation prepared by the lead agency; and determine whether implementation is adequate and whether changes are needed in priorities, monitoring, reporting etc., during the implementation period.
- Update the Vashon Ground Water Management Plan:
  1. Act as a forum to consider new or ongoing ground water protection issues of significance to all Ground Water Management Areas;
  2. Determine whether revisions are needed to the Vashon Ground Water Management Plan;
  3. Review, amend as necessary, adopt, and recommend for adoption by the Metropolitan King County Council, and the King County Board of Health, an updated Vashon Ground Water Management Plan three years after certification of the original Vashon Ground Water Management Plan by Ecology; and
  4. Determine appropriate response actions when trigger levels have been reached.
- Perform tasks as assigned in the Vashon Ground Water Management Plan, such as facilitating wellhead protection; determining categorical exemptions to environmental regulations that should be eliminated in sensitive aquifer areas; and developing guidance documents to assist environmental reviewers in King County.

The Management Committee should consist of a core committee of nine members constituted as follows: one representative of the Ground Water Advisory Committee, one representative of the County's Department of Natural Resources, one representative of

the Island's water purveyors, a representative of residential well users, one representative of the Vashon Chamber of Commerce, one representative of the Vashon-Maury Island Community Council, a representative of business owners, a representative of commercial agriculturists and a representative of a Vashon environmental organization. Members of the Management Committee would be appointed by motion by the Metropolitan King County Council with members serving staggered terms of three years.

This core committee should meet regularly to provide oversight to the implementation, to ensure that the budget process is performed in a fair and equitable manner, and to address the topics as assigned in the Vashon Ground Water Management Plan. Other members should be representative of those agencies required to implement the Plan. Individual members of the Management Committee will have the responsibility to coordinate internally with the entity represented.

Public Involvement: Interested public groups and individuals should be kept informed of the core committee work and implementation progress by inclusion on a notification list. Those on the list should receive core committee meeting agenda and minutes and routine updates on the Vashon Ground Water Management Plan progress. The core committee meetings should be open to the public, if they wish to attend. Also, if the core committee is aware of an agency or individual that has an interest in a topic under discussion, they should be invited to attend. Elected officials should also be included on the notification list. Elected officials may also have the opportunity to have presentations on the Vashon Ground Water Management Plan progress.

Dispute Resolution: There should be a process for dispute resolution. The first step in dispute resolution should be with the core committee. If the aggrieved party wishes, then the Dispute Resolution Group should meet with the party. The Dispute Resolution Group should consist of the chair of each of the core committees.

Bylaws: Decisions of the Management Committee will be by consensus whenever possible. Procedures for resolving lack of consensus should be adopted by the committee for inclusion in its bylaws. Management Committee bylaws should include a provision stating that Ground Water Advisory Committee recommendations will be carefully and promptly considered and followed by a written response.

The Management Committee may make use of subcommittees to accomplish some of its tasks due to its size. For example, a subcommittee might address the topic of hazardous materials transport through aquifer protection areas. Federal and State agencies will be asked to serve in a technical capacity, as appropriate, on the subcommittees.

Water purveyors relying on a ground water source may be asked to contribute to technical subcommittees formed to advise the Management Committee because the Vashon Ground Water Management Plan may fulfill many wellhead protection needs. Minimum wellhead protection strategies developed by the Management Committee will add to what is already contained in the Vashon Ground Water Management Plan. It is also expected

that individual purveyors will have system specific needs that they will want to include in their own wellhead protection programs.

### **3.6 Ground Water Advisory Committee**

The Ground Water Advisory Committee was established to develop the Vashon Ground Water Management Plan. After the Plan is certified by Ecology, the Committee's duties are completed (Chapter 173-100 WAC). However, successful implementation of the Vashon Ground Water Management Plan depends upon support by the affected agencies and the community.

The Ground Water Advisory Committee recommends that they continue to meet as needed. The role of the Committee would be to monitor implementation of the Vashon Ground Water Management Plan and to make recommendations to the Management Committee via its representatives. The Ground Water Advisory Committee would also review and comment upon the first Vashon Ground Water Management Plan update.

### **3.7 Lead Agency**

Implementation of the Vashon Ground Water Management Plan will require staff to perform day-to-day tasks. This staff needs to be familiar with the Vashon Ground Water Management Plan, data base management, area concerns, budget process, and be technically capable. This staff needs to provide administrative functions to the satisfaction of the Management Committee and the legislative authorities.

The Ground Water Advisory Committee recommends that the King County Department of Natural Resources serve as lead agency for the implementation of the Vashon Ground Water Management Plan. In fulfilling its role as lead agency, Department of Natural Resources will:

- Refine cost estimates of the Vashon Ground Water Management Plan in consultation with implementing governments and agencies and determine the amount of the aquifer protection fee;
- Prepare an annual proposed allocation of the aquifer protection fund based upon the adopted Vashon Ground Water Management Plan implementation plans for review and adoption by the Management Committee, affected agencies, and the Metropolitan King County Council;
- Ensure that funds are disbursed per the adopted allocation plan to implementing agencies;
- Provide staff support to the Management Committee and the Ground Water Advisory Committee;
- Monitor the implementation of the Vashon Ground Water Management Plan and bring issues to the attention of the Management Committee;

- Prepare annual implementation reports for the review of the Management Committee and Ground Water Advisory Committee;
- Implement elements of the Vashon Ground Water Management Plan as assigned to the lead agency by adopted implementation plans;
- Coordinate implementation of multi-jurisdictional program efforts such as data collection and sensitive aquifer area mapping;
- Coordinate with other King County planning processes and with federal, state, and local agencies regarding ground water protection;
- Coordinate the process for revision of the Vashon Ground Water Management Plan:
  1. Prepare draft update of the Vashon Ground Water Management Plan for review, amendment as necessary, and approval of the Management Committee;
  2. Hold public hearings;
  3. Submit draft updates of the Vashon Ground Water Management Plan to the Metropolitan King County Council and carry out the process of obtaining concurrence from affected governments and agencies.

### **3.8 Implementation of the Plan**

Ground Water Advisory Committee implementation priorities are listed in Tables One and Two. Prioritization enables the Committee to ensure that ground water protection is maximized in the near term. The schedule contained in the Implementation Plan provides a framework within which all governments and agencies can plan their Vashon Ground Water Management Plan implementation activities.

Each table lists, in relation to a specific action, its priority, who will be responsible for carrying it out, how much it will cost, what the source of funding will be, and approximately when it will be accomplished. Table One is organized by Committee-determined priority. Table Two is organized by the agency or government entity that will be responsible for implementing the action.

King County implementation efforts will be phased in over time and are dependent upon the availability of funding.

### **3.9 Process For Evaluation & Revision of the Plan**

A process for periodic evaluation and revision of the Vashon Ground Water Management Plan is established in order to ensure that the goals of the Vashon Ground Water Management Plan are achieved efficiently under changing conditions. The Management Committee, the Ground Water Advisory Committee, the Lead Agency, and agencies affected by the Vashon Ground Water Management Plan will be involved in the evaluation and revision of the Vashon Ground Water Management Plan. The first revision will be considered three years from the date of the Vashon Ground Water Management Plan certification by Ecology. Subsequent revisions will be considered on

five-year intervals unless the Management Committee determines that more frequent updates are needed.

The concurrence process will be initiated by the Lead Agency following adoption of revisions by the Management Committee. Public hearings will be held as required by law. The draft update will be submitted to the Metropolitan King County Council for review, amendment, and adoption when all affected governments and agencies have concurred.

Ground Water Management Plan updates at time intervals smaller than three years should be avoided due to the lengthy process of review, public hearings, concurrence, and adoption. Other mechanisms may be used to implement short-term changes either in substance or priority. For example, a grant could be sought to carry out a specific new task that the Management Committee feels is urgent but which is not included in the current Vashon Ground Water Management Plan. Alternatively, Vashon Ground Water Management Plan priorities could be changed in order to step up activity related to an issue that the Management Committee determines is more urgent than others.

The Lead Agency will assist the Management Committee in its evaluation of the Vashon Ground Water Management Plan by preparing annual implementation reports. These reports will cover such topics as:

- Progress in implementing plan elements in comparison with established priorities and schedule;
- Problems encountered in implementation of specific program elements;
- Proposed revisions or priority adjustments to address problems encountered in implementation; and
- Changes in federal, state, or local laws impacting the Vashon Ground Water Management Plan.

The Management Committee will use the reports as well as its own deliberations and the recommendations of the Ground Water Advisory Committee to determine whether and how Ground Water Management Plan should be modified when it is updated.

**Table 1**

**Management Strategies in Priority Order**

**Vashon-Maury Island  
Ground Water Management Plan**

**December 1998**

**TABLE 1**  
**Management Strategies by Priority**

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
1	DCM - 1 Data Collection, Analysis and Management	King County Department of Natural Resources	0.75	0.00	0.00	APA	
1	DCM - 1 Data Collection, Analysis and Management - Tagging	Ecology	TBD			APA	
1	DCM - 1 Data Collection, Analysis and Management - Tagging	Purveyors	TBD			APA	
1	DCM - 1 Data Collection, Analysis and Management - Tagging	Well Drillers	TBD			APA	
1	LU - 1 Ground Water Monitoring	King County Department of Natural Resources	0.10			APA	
1	LU - 2 Ground Water Monitoring	King County Department of Natural Resources	0.10				Agency funds
1	LU - 2 Ground Water Monitoring	Management Committee	TBD			APA	
1	LU - 3 KCCP Policies	King County Office of Budget & Strategic Planning	0.13				Agency funds
1	LU - 4 Vashon Community Plan Policies	King County DDES	0.10				Agency funds
1	LU - 5 Area Zoning	King County DDES	0.10				Agency funds

**TABLE 1**  
**Management Strategies by Priority**

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
1	OS - 1A, 1B Nitrate Concerns	King County Department of Natural Resources	0.13			APA	
1	OS - 1B Nitrate Concerns	Management Committee	TBD			APA	
1	OS - 2A Hazardous Materials Education - LHWMP	SKCHD	0.04			APA	
1	OS - 3A Operation and Maintenance	SKCHD	0.08				Agency
1	OS - 3B Operation and Maintenance	SKCHD	0.50				Agency
1	SA - 1A Elimination of categorical exemptions to SEPA	King County Department of Natural Resources	0.25				Agency
1	SA - 1A Elimination of categorical exemptions to SEPA	Management Committee	TBD			APA	
1	SA - 2 Wellhead Protection Strategies	King County Department of Natural Resources	0.50				General Agency Funds
1	SA - 3 Special Protection Area	King County Department of Natural Resources	0.13			APA	
1	SI - 1 Criteria Development	King County Department of Natural Resources	0.13				Agency funds
1	SI - 2 Seawater Intrusion Program	SKCHD	0.25				Agency funds

**TABLE 1**  
**Management Strategies by Priority**

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
1	SI - 2 Seawater Intrusion Program	WA Department of Health	TBD				Agency funds
1	SI - 3 Special Protection Area	Ecology	TBD				Agency funds
I	WQ - 2 Data Needs	King County Department of Natural Resources	0.00			APA	
I	WQ - 4A Conservation	SKCHD	0.10				General Agency Funds
1	WQ - 4B Conservation	Purveyors - Group A	TBD				Agency
2	ED - 1, 2 Education Program	King County Department of Natural Resources		0.25		APA	
2	ST - 1 Assessment of Existing Stormwater Facilities	King County Department of Natural Resources, WLR Division		TBD			Agency
2	ST - 2 Roadside Soil	King County King County Department of Transportation Road Services		No additional	No additional		General Agency Funds

**TABLE 1**  
**Management Strategies by Priority**

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
3	PF - 1A, 1B Pesticide and Fertilizer - Past Use	King County Department of Natural Resources			No additional cost, included in Data Collection Management Program		
3	PF - 2A Pesticide and Fertilizer Use	Conservation District			0.87		Agency
3	PF - 2B Pesticide and Fertilizer Use: Pesticide Reduction Program	King County Department of Natural Resources			0.13		Agency
3	PF - 2B Pesticide and Fertilizer Use: Pesticide Reduction Program	Management Committee			TBD	APA	
3	PF - 2C Pesticide and Fertilizer Use	King County Department of Natural Resources			0.13		Agency
3	SA - 1B Designation of Environmentally Sensitive Areas	King County Department of Natural Resources			0.25		Agency
3	SA - 1C Adoption of general aquifer protection policies	King County Department of Natural Resources			0.13		Agency

**TABLE 1**  
**Management Strategies by Priority**

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
3	SA - 1C Adoption of general aquifer protection policies	King County Office of Budget & Strategic Planning			0.13		Agency
3	SA - 1D Enhanced environmental review to protect aquifers	King County Department of Natural Resources			0.50		Agency
3	SA - 1E Define ground water recharge areas	King County Department of Natural Resources			0.25	APA	
3	SG - 1 Aquifer Impacts and Regulations	King County Department of Natural Resources			0.50		General Agency Funds
3	SG - 2 Environmental Review	King County Department of Natural Resources			0.13		General Agency funds
3	SG - 3 Land Use of Inactive or Reclaimed Mines: King County Comprehensive Plan	King County Department of Natural Resources			0.13		General Agency funds
3	SG - 3 Land Use of Inactive or Reclaimed Mines: King County Comprehensive Plan	King County Office of Budget & Strategic Planning			0.13		General Agency Funds
3	SP - 1A Sewer - Infiltration and Exfiltration	King County Department of Natural Resources			0.50	APA	
3	SP - 1B Infiltration	Management Committee			TBD	APA	

**TABLE 1**  
**Management Strategies by Priority**

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
3	SP - 1C Sewer Maintenance Programs	Vashon Sewer District			TBD		Agency
3	SP - 1D Leakproof Piping	King County Office of Budget & Strategic Planning			0.13		Agency
3	ST - 3 Coordination Between Surface and Ground Water Planning Efforts - Ecology	Ecology			0.32		General Agency Funds
3	UST - 1(A) Augment State UST Program Petition for ESAs UST - 1(B) Augment State UST Program - enhance current inspection UST - 1(C) Augment State UST Program - leak inspection UST - 1(D) Disclosure and Secondary Containment	King County Department of Natural Resources			0.25	APA	
3	UST - 1(E) Exempt Tanks UST - 1(F) Heating Oil Tanks	King County Department of Natural Resources			0.00	APA	
3	UST - 2 Prohibit new USTs on Vashon	King County DDES			0.13		General Agency Funds
3	WC - 1A State Program	Ecology			0.64		General Agency Funds

**TABLE 1**  
**Management Strategies by Priority**

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
3	WC - 1A State Program	King County			0.08		General Agency Funds
3	WC - 1B State Program	Ecology			0.64		General Agency Funds
3	WC - 1B State Program	SKCHD			0.50		Agency
3	WC - 2A Well Identification	Ecology			0.48		General Agency Funds
3	WC - 2A Well Identification	King County Department of Natural Resources			0.08		Agency
3	WC - 2B Well Identification	King County Department of Natural Resources			0.08		Agency
3	WQ - 1A Aquifer Recharge Preservation	Ecology			0.06		Agency
3	WQ - 1A Aquifer Recharge Preservation	King County DDES			0.13		Agency
3	WQ - 3 Water rights	Purveyors			TBD		General Agency Funds

**TABLE 1**  
**Management Strategies by Priority**

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
3	WQ - 5 Artificial recharge	Purveyors			TBD		General Agency Funds
3	WQ - 7 Reservation	GWAC encourages			TBD		Agency

**Table 2**

**Management Strategies in Implementing Agency Order**

**Vashon-Maury Island  
Ground Water Management Plan**

**December 1998**

Table 2  
Management Strategies by Implementing Agency

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
3	PF - 2A Pesticide and Fertilizer Use	Conservation District			0.87		Agency
		<b>Conservation District Total</b>	0.00	0.00	0.87		
1	DCM - 1 Data Collection, Analysis and Management - Tagging	Ecology	TBD			APA	
1	SI - 3 Special Protection Area	Ecology	TBD				Agency funds
3	ST - 3 Coordination Between Surface and Ground Water Planning Efforts - Ecology	Ecology			0.32		General Agency Funds
3	WC - 1A State Program	Ecology			0.64		General Agency Funds
3	WC - 1B State Program	Ecology			0.64		General Agency Funds
3	WC - 2A Well Identification	Ecology			0.48		General Agency Funds
3	WQ - 1A Aquifer Recharge Preservation	Ecology			0.06		Agency
		<b>Ecology Total</b>	0.00	0.00	2.16		
3	WQ - 7 Reservation	GWAC encourages			TBD		Agency
		<b>GWAC encourages Total</b>	0.00	0.00	0.00		

Table 2  
Management Strategies by Implementing Agency

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
3	WC - 1A State Program	King County			0.08		General Agency Funds
		<b>King County Total</b>	0.00	0.00	0.08		
1	LU - 4 Vashon Community Plan Policies	King County DDES	0.10				Agency funds
1	LU - 5 Area Zoning	King County DDES	0.10				Agency funds
3	UST - 2 Prohibit new USTs on Vashon	King County DDES			0.13		General Agency Funds
3	WQ - 1A Aquifer Recharge Preservation	King County DDES			0.13		Agency
		<b>King County DDES Total</b>	0.20	0.00	0.25		
1	DCM - 1 Data Collection, Analysis and Management	King County Department of Natural Resources	0.75			APA	
	DCM - 1 Data Collection, Analysis and Management - Lab and Equipment	King County Department of Natural Resources					
2	ED - 1, 2 Education Program	King County Department of Natural Resources		0.25		APA	

Table 2  
Management Strategies by Implementing Agency

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
1	LU - 1 Ground Water Monitoring	King County Department of Natural Resources	0.10			APA	
1	LU - 2 Ground Water Monitoring	King County Department of Natural Resources	0.10				Agency funds
3	PF - 1A, 1B Pesticide and Fertilizer - Past Use	King County Department of Natural Resources			No additional cost, included in Data Collection Management Program		
3	PF - 2B Pesticide and Fertilizer Use: Pesticide Reduction Program	King County Department of Natural Resources			0.13		Agency
3	PF - 2C Pesticide and Fertilizer Use	King County Department of Natural Resources			0.13		Agency
1	SA - 1A Elimination of categorical exemptions to SEPA	King County Department of Natural Resources	0.25				Agency

Table 2  
Management Strategies by Implementing Agency

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
3	SA - 1B Designation of Environmentally Sensitive Areas	King County Department of Natural Resources			0.25		Agency
3	SA - 1C Adoption of general aquifer protection policies	King County Department of Natural Resources			0.13		Agency
3	SA - 1D Enhanced environmental review to protect aquifers	King County Department of Natural Resources			0.50		Agency
3	SA - 1E Define ground water recharge areas	King County Department of Natural Resources			0.25	APA	
1	SA - 2 Wellhead Protection Strategies	King County Department of Natural Resources	0.50				General Agency Funds
1	SA - 3 Special Protection Area	King County Department of Natural Resources	0.13			APA	
3	SG - 1 Aquifer Impacts and Regulations	King County Department of Natural Resources			0.50		General Agency Funds
3	SG - 2 Environmental Review	King County Department of Natural Resources			0.13		General Agency funds

Table 2  
Management Strategies by Implementing Agency

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
3	SG - 3 Land Use of Inactive or Reclaimed Mines: King County Comprehensive Plan	King County Department of Natural Resources			0.13		General Agency funds
1	SI - 1 Criteria Development	King County Department of Natural Resources	0.13				Agency funds
3	SP - 1A Sewer - Infiltration and Exfiltration	King County Department of Natural Resources			0.50	APA	
3	UST - 1(A) Augment State UST Program - Petition for ESAs UST - 1(B) Augment State UST Program - enhance current inspection UST - 1(C) Augment State UST Program - leak inspection UST - 1(D) Disclosure and Secondary Containment	King County Department of Natural Resources			0.25	APA	
3	UST - 1(E) Exempt Tanks UST - 1(F) Heating Oil Tanks	King County Department of Natural Resources			0.00	APA	
3	WC - 2A Well Identification	King County Department of Natural Resources			0.08		Agency

**Table 2**  
**Management Strategies by Implementing Agency**

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
3	WC - 2B Well Identification	King County Department of Natural Resources			0.08		Agency
1	WQ - 2 Data Needs	King County Department of Natural Resources	See Data Collection Management Program			APA	
1	OS - 1A, 1B Nitrate Concerns	King County Department of Natural Resources	0.13			APA	
		<b>King County Department of Natural Resources Total</b>	2.08	0.25	3.03		
2	ST - 1 Assessment of Existing Stormwater Facilities	King County Department of Natural Resources, WLR Division		TBD			Agency
		<b>King County Department of Natural Resources, WLR Division Total</b>	0.00	0	0.00		
2	ST - 2 Roadside Soil	King County Department of Transportation Road Services		No additional			General Agency Funds

Table 2  
Management Strategies by Implementing Agency

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
		<b>King County Department of Transportation Road Services Total</b>	0.00	0.00	0.00		
1	LU - 3 KCCP Policies	King County Office of Budget & Strategic Planning	0.13				Agency funds
3	SG - 3 Land Use of Inactive or Reclaimed Mines: King County Comprehensive Plan	King County Office of Budget & Strategic Planning			0.13		General Agency Funds
3	SA - 1C Adoption of general aquifer protection policies	King County Office of Budget & Strategic Planning			0.13		Agency
3	SP - 1D Leakproof Piping	King County Office of Budget & Strategic Planning			0.13		Agency
		<b>King County Office of Budget &amp; Strategic Planning Total</b>	0.13	0.00	0.38		
1	LU - 2 Ground Water Monitoring	Management Committee	TBD			APA	
1	OS - 1B Nitrate Concerns	Management Committee	TBD			APA	
3	PF - 2B Pesticide and Fertilizer Use: Pesticide Reduction Program	Management Committee			TBD	APA	
1	SA - 1A Elimination of categorical exemptions to SEPA	Management Committee	TBD			APA	

Table 2  
Management Strategies by Implementing Agency

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
3	SP - 1B Infiltration	Management Committee			TBD	APA	
		<b>Management Committee Total</b>	0.00	0.00	0.00		
1	DCM - 1 Data Collection, Analysis and Management - Tagging	Purveyors	TBD			APA	
3	WQ - 3 Water rights	Purveyors			TBD		General Agency Funds
3	WQ - 5 Artificial recharge	Purveyors			TBD		General Agency Funds
		<b>Purveyors Total</b>	0.00	0.00	0.00		
1	WQ - 4B Conservation	Purveyors - Group A	TBD				Agency
		<b>Purveyors - Group A Total</b>	0.00	0.00	0.00		
1	OS - 2A Hazardous Materials Education LHWMP	SKCHD	0.04			APA	
1	OS - 3A Operation and Maintenance	SKCHD	0.08				Agency
1	OS - 3B Operation and Maintenance	SKCHD	0.50				Agency
1	SI - 2 Seawater Intrusion Program	SKCHD	0.25				Agency funds
3	WC - 1B State Program	SKCHD			0.50		Agency
1	WQ - 4A Conservation	SKCHD	0.10				General Agency Funds

Table 2  
Management Strategies by Implementing Agency

GWAC Priority	Management Strategy	Agent	Priority 1 FTE	Priority 2 FTE	Priority 3 FTE	Aquifer Protection Area	Other Source
		<b>SKCHD Total</b>	0.97	0.00	0.50		
3	SP - 1C Sewer Maintenance Programs	Vashon Sewer District			TBD		Agency
		<b>Vashon Sewer District Total</b>	0.00	0.00	0.00		
1	SI - 2 Seawater Intrusion Program	WA Department of Health	TBD				Agency funds
		<b>WA Department of Health Total</b>	0.00	0.00	0.00		
1	DCM - 1 Data Collection, Analysis and Management - Tagging	Well Drillers	TBD			APA	
		<b>Well Drillers Total</b>	0.00	0	0.00		
		<b>Grand Total</b>	3.37	0.25	7.27		

**Appendices**

**Appendix A: Public Comment**

**Appendix B: Letters of Concurrence or Comment**

**Appendix C: Guidelines for Development of Ground  
Water Management Areas and Programs**

**Appendix D: Management Strategy References**

**Appendix E: Recommended Data Collection and  
Analysis Program**

**Vashon-Maury Island  
Ground Water Management Plan**

**December 1998**

**Appendix A**  
**Public Comment**

**Vashon-Maury Island**  
**Ground Water Management Plan**

**December 1998**

# Appendix A

## Public Comment

### VASHON-MAURY ISLAND GROUND WATER MANAGEMENT PLAN PUBLIC HEARING COMMENTS - DECEMBER 14, 1995 - 8:45 P.M.

**The following comment was taped and transcribed by the Washington State Department of Ecology:**

David S. Vogel, 10608 SW Cedarhurst Road, Vashon Island, WA, 98070:

I think it's imperative that the nitrate concerns be addressed more carefully and more fully. There is no allocation for funding with regard to nitrate concerns. It's all to be determined, and it seems like a very costly proposition that should be done soon.

**Appendix B**

**Letters of Concurrence or Comment**

**Vashon-Maury Island  
Ground Water Management Plan**

**December 1998**

## APPENDIX B

### Letters of Concurrence or Comment

This Appendix contains letters of concurrence or comment letters on the draft of March 1995 and subsequent revisions through December 1998. The current draft includes changes based on these comments. Letters are included from:

- Washington State Department of Ecology
- Puget Sound Water Quality Authority
- King Conservation District
- Seattle-King County Health Department
- King County Department of Development and Environmental Services
- King County Department of Natural Resources, Water Pollution Control Division
- King County Department of Natural Resources, Surface Water Management Division (memo)
- King County Department of Natural Resources, Solid Waste Division
- King County Department of Transportation, Road Services Division
- Dockton Water Association, Mr. H. M Todd.
- Vashon-Maury Island Water Purveyors Association
- Mr. Robert Colombo
- Mr. And Mrs. R. A. Danielson
- Laurie Geissinger, GWAC member
- Donna Lee Klemka (former GWAC member) and Martin W. Baker
- P.J. Ritzhaupt
  
- Metropolitan King County Council, with response from Vashon-Maury Island Ground Water Advisory Committee



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

P.O. Box 47600 • Olympia, Washington 98504-7600  
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

May 3, 1996

Mark Isaacson  
Ground Water Management Plan Program  
Surface Water Management Division  
700 Fifth Avenue, Suite 2200  
Seattle, Washington 98104

Dear Mr. Isaacson:

Re: Concurrence on the Draft Vashon-Maury Island Ground Water  
Management Plan

I have reviewed the draft Vashon-Maury Island Ground Water Management Plan. The Department of Ecology concurs with the draft plan that was published in December, 1995.

I look forward to working with you to certify and complete the Vashon-Maury Island Ground Water Management Plan. I can be reached at 360/407-7255 if you have any questions.

Sincerely,

Laura H. Lowe  
Environmental Planner  
Shorelands and Water Resources Program

LL:ll

cc: Grant File





STATE OF WASHINGTON

PUGET SOUND WATER QUALITY AUTHORITY

PO Box 40900 • Olympia, Washington 98504-0900  
(360) 407-7300 • FAX (360) 407-7333

February 27, 1996

Mark Isaacson  
Groundwater Project Manager  
King County Dept. of Natural Resources  
Surface Water Management Division  
700 Fifth Ave., 22nd Floor  
Seattle, WA 98104-9830

Reference: Draft Vashon-Maury Island Groundwater Management Plan

Dear Mr. Isaacson,

We have completed our review of the Draft Vashon-Maury Island Ground Water Management Plan (GWMP). While we enthusiastically agree with the overall intent and direction of the plan to protect groundwater quality, and find that the GWMP adequately addresses issues of concern to water quality in Puget Sound, we do not concur with the need to revise the Puget Sound Water Quality Management Plan (Puget Sound Plan) to specifically include groundwater in order for the GWMP to be effective.

As the GWMP notes, existing ground and surface water planning regulations encourage coordinated efforts within and between local and state agencies and jurisdictions. The Departments of Ecology and Health, as well as King County have programs that address groundwater quality and quantity, and the watershed planning concept seeks to address all issues within watersheds as well. The Dept. of Ecology has the statutory mandate for groundwater, and the Authority's role is limited to directing public concerns to Ecology and supporting research and programs of other agencies, such as USGS, Ecology, and Health.

Utilizing existing components of the Puget Sound Plan can address the potential land use impacts mentioned in the GWMP that affect ground water supplies. The Stormwater and CSO program covers runoff, erosion control for new construction and redevelopment projects, water quality monitoring, and the use of Best Management Practices for source control. On-site sewage systems, pesticide and fertilizer use, timber harvesting and road



construction, and agricultural practices are covered within the Non-Point Source Pollution program, and the Non-Point rule (WAC 400-12). *Managing Non-Point Pollution: an action plan handbook for Puget Sound watersheds* specifically addresses groundwater as a pathway for migration of pollutants. Educational efforts are certainly an important component of protecting ground and surface water supplies. The existing Education and Public Involvement Program within the Puget Sound Plan has already been utilized by the Vashon Island School District through a Public Involvement and Education (PIE) grant to inform, educate and further public awareness of the relationship between ground water, surface water and the marine environment through school curriculum development, public forums, and public participation. Water quality monitoring and data collection are covered in several elements of the Puget Sound Plan as well.

The Authority believes that the planning process initiated by development of the Vashon-Maury Island Ground Water Management Plan should not be held up by a requirement to amend the Puget Sound Plan. We believe that implementation of the existing elements of the Plan will adequately address the concerns over land use and groundwater supplies noted in the GWMP.

We strongly support the efforts of the Vashon-Maury Island Groundwater Advisory Committee in their efforts to implement this Management Plan. Please contact me if you have any further questions or concerns.

Sincerely,



Nancy McKay  
Executive Director



**King Conservation District**

935 Powell Ave. SW - Renton, WA 98055 - (206) 226-4867 - FAX (206) 764-6677

March 6, 1996

Mark Isaacson  
Groundwater Project Manager  
King County Dept. of Natural Resources  
Surface Water Management Division  
700-Fifth Ave., 22nd Floor  
Seattle, WA 98104-9830

Dear Mr. Isaacson:

In reviewing the draft Vashon-Maury Island Groundwater Management Area Plan, we found a few instances where it is clear the authors do not fully understand the relationship of King County Conservation District and the Federal agency of the US Dept. of Agriculture - Natural Resources Conservation Service (NRCS) does all of its work through the Conservation District. King Conservation District has employees that are locally funded in addition to a few Federal employees. King Conservation District uses technical standards developed by NRCS whenever they are applicable. The Conservation District also has agreements with many other federal, state and local agencies for sharing of information and services.

As far as the plan itself is concerned King Conservation District does concur with the goals and objectives of the plan.

Specific actions listed for King Conservation District and by association, SCS or Soil Conservation Service are ED-1, PF-2A, PF-3B:

ED-1, elements 1 and 3. King Conservation District welcomes people and agencies for assistance.

PF-2A, Task 1,2. King Conservation District concurs with these tasks, but currently does not have sufficient funds from all sources to target areas specifically in this plan. It is estimated (roughly) that identification of farms in the susceptible areas and development of plans in those areas would cost from \$5,000-\$10,000 depending on actual numbers of farms in the area. Another note here is that we do have a relatively new program available to us from NRCS that will evaluate the susceptibility of ground water contamination from pesticides and herbicides in various soil mapping units. The Cooperative Extension programs may be based on the same information. Current funding is primarily from a county special assessment authorized by the King County Council through 1997.

PF3B, We welcome cooperative efforts listed for Soil Conservation Service.

In summary, King Conservation District concurs with the plan goals and objectives and also agrees to do the specific items mentioned subject to the availability of funding. We are willing to discuss and explore new funding sources to be able to carry out specific tasks.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jack Davis".

Jack Davis  
District Manager



**City of Seattle**  
Norman B. Rice, Mayor



**King County**  
Gary Locke, Executive

**Seattle-King County Department of Public Health**

Alonzo L. Plough, Ph.D., MPH, Director

March 26, 1996

Mark Isaakson, Manager Ground Water Project  
King County Surface Water Management Division  
Department of Natural Resources  
700 5th Avenue, Suite 2200  
Seattle, WA 98104

Re: **Vashon Ground Water Management Plan**

Dear Mark:

Thank you for the opportunity to review the draft Vashon-Maury Island Ground Water Management Plan. We have communicated to your staff proposed changes to the draft plan to reflect our position on the issues and policies in the plan. Paul Shallow has furnished us copies of the rewritten sections of the draft plan.

The Seattle-King County Health Department concurs with the plan as written except where specifically noted below in our comments. After the Metropolitan King County Council has reviewed and concurred with the plan, and the funding has been secured, we look forward to implementation of the tasks identified to our agency.

**Onsite Sewage Treatment and Disposal System Use**

Concurrence to actions in this section is based on removing reference to food waste in OS-2B, and deletion of OS-4C as provided in rewrite draft by Paul Shallow.

**Biosolids and Effluent**

Concurrence to actions in this section based on March 1995 rewrites as requested.

**Solid Waste**

Concurrence to actions in this section is based on March 1995 rewrites as requested with SW-1A amended to reflect adoption in Title 10 of Chapter 173-351 WAC by reference, and SW-1B and Issue 4 deleted as a plan actions. Additionally, we recommend the use of the ground water standards as an early warning threshold for reactivation of the GWAC for the reasons stated in earlier correspondence to you and request the following text changes.

Page 3- ~~12077~~ Paragraph 2, adding clarifying words to the text about the program.

Mark Isaakson  
March 26, 1996  
Page 2

The Code of the King County Board of Health, Title 10, "King County Solid Waste Regulations." ~~The Seattle-King County Board of Health has adopted~~ standards more stringent than the Minimum Functional Standards (WAC 173-304) as the local regulation for governing design, construction, operation, and closure of solid waste facilities other than municipal waste landfills in King County. The Seattle-King County Health Department presently enforces WAC 173-351 - "criteria for municipal solid waste landfills", which governs the design, construction, operation and closure of municipal waste landfills within King County. ~~The Seattle-King County Health Department, Environmental Health Division enforces Title 10. The Seattle-King County Health Department revised Title 10 during 1992. Among other changes, demolition disposal sites now must meet criteria for mixed waste landfills. The Seattle King County Health Department revised Title 10 in 1992 to require woodwaste landfills to have leachate control systems(liners), methane gas control systems, and ground water monitoring systems. Title 10 is considered more stringent than the minimum functional standards (WAC 173-304).~~

page 3-12577 Paragraph 5 Minor word edit in line 4 to drop the "of".  
~~This alternative is feasible because the Solid Waste Division is proceeding with this program. Funding for the Solid Waste division, program has been identified. Implementation would not require additional resources. However, a timely investigation of these sites this evaluation is requested to show the Solid Waste Division that this issue is of important to the Ground Water Advisory Committee and to ground water quality.~~

### **Hazardous Waste**

Concurrence to actions in this section is based on March 1995 rewrites of the policies OS-2A and OS-3A as requested and the deletion of proposed policies HM-1 and HM-2.

Additionally, we would like to see the following minor edits:

**Hm-1 Hazardous Waste Management:** (Page 3-65)

Note to GWAC: The Seattle .....Hazardous materials used by manufacturing...

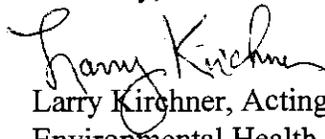
HM-2 Hazardous Waste Management: (Page 3-65)

Note: to GWAC: The Seattle.....The cost to operate such a facility could be as much as exceed \$1 million per year.

Mark Isaakson  
March 26, 1996  
Page 3

If you have any questions, please call Bill Lasby at 296-4795.

Sincerely,



Larry Kirchner, Acting Chief  
Environmental Health Division

BL:dm

cc: Greg Bishop, Acting Principal Environmental Health Specialist  
Dave Hickok, Acting Supervisor Solid Waste Program  
Jim Henriksen, Wastewater Program  
Bill Lasby, Drinking Water Program  
Wally Swofford, Chem/Physical Hazard Program  
Todd Yerkes, Local Hazardous Waste Management Program



King County  
Department of Development  
and Environmental Services  
3600 - 136th Place Southeast  
Bellevue, Washington 98006-1400

August 9, 1996

TO: Mark Issacson, Project Manager, Surface Water Management Division

FM: Robert S. Derrick, Director

RE: Vashon Maury Island Groundwater Management Plan

Thank you for including the majority of the revisions we requested to the November draft of the Vashon-Maury Island Groundwater Management Plan (GWMP). With resolution acceptable to the Department of the following outstanding issues, the Department of Development and Environmental Services (DDES) will be able to concur with the plan:

1. **Funding.** The tasks assigned to DDES are identified to be funded by "General Agency Funds". As discussed in our previous comments, DDES is a fee-supported agency and needs specific funding to conduct any work that does not generate fees. An acceptable funding source will have to be identified for the agency to complete the assigned tasks or they are unlikely to be completed. We again request that the tasks be funded through the Aquifer Protection Fund or some other specific source.
2. **SEPA Categorical Exemptions.** The plan's recommendation that SEPA categorical exemptions are considered for repeal is in direct conflict with the County's recent efforts to meet the requirements of the state's Regulatory Reform Act. DDES has completed an analytical review of the current categorical thresholds and application of SEPA mitigation to projects. Most of the projects above the thresholds had no additional mitigations identified - usually because the existing environmental protection measures were already codified. The conclusion was that thresholds be expanded; not exempted as the plan recommends. In light of the mandated 120 day permit time limits, the expectation that even smaller projects be subjected to SEPA review is unrealistic. The plan's focus should be on each jurisdiction's development of adequate regulation that precludes the need for individual SEPA review for many project types. This recommendation should be removed.
3. **Coordination with other GWMPs.** Most of the tasks that are identified for DDES are consistent across all of the GWMPs. DDES concurs with the level of effort and proposed schedule identified in the Redmond Bear Creek GWMP; not with this plan. Since the completion of tasks identified under this one plan will complete the majority of the tasks

Mark Issacson  
August 9, 1996  
Page 2

identified for DDES in the other plans, the funding of these tasks should be shared across all plans.

It is our understanding that some of these issues will not be resolved until after the King County Council has reviewed and concurred with the plan. We look forward to working with the Management Committee to resolve any outstanding issues and move forward with a successful implementation of the plan. After the Council has reviewed and concurred with the plan, the outstanding issues have been resolved, and the funding has been secured, we look forward to implementation of the tasks identified for our agency.

RSD:js

cc: Dan Chason, Chair, Ground Water Advisory Committee  
Doug Rushton, Washington State Department of Ecology  
Greg Kipp, Deputy Director, Department of Development and Environmental Services  
ATTN: Jerry Balcom, Supervisor, Code Development Section  
Mark Carey, Manager, Land Use Services Division  
Tom McDonald, Manager, Building Services Division



**King County  
Water Pollution Control Division**

Department of Natural Resources

821 Second Avenue  
Seattle, WA 98104-1598

March 14, 1996

Bill Lasby  
Drinking Water and Ground Water Programs  
Seattle-King County Department of Public Health  
Environmental Health Division  
Room 201 Smith Tower  
Seattle, WA 98104

Dear Mr. Lasby:

Thank you for the opportunity to comment on the Draft Ground Water Management Plan for the Vashon-Maury Island Ground Water Management Area. Overall the documents were easy to comprehend and conveyed information well. There were only a few comments on the plan as follows:

- Page 3 - 23 - Has the Vashon Town Plan been adopted? The text states that it will be adopted in December of 1995.
- Page 3 - 36 - "Metro" no longer exists. Reference to Metro should now be the King County Department of Natural Resources, Water Pollution Control Division.
- Page 3 - 133 - Paragraph 3 - There is a discussion of proposed regulations requiring a conservation element for ground water management plans. Has this proposed regulation been adopted? Is it possible to include what the requirements are for a conservation element? Also, could you include when the proposed regulations would be adopted?

If you have any questions or comments regarding these remarks, please feel free to contact me at (206) 684-1253 or Darlene Gaziano, Water Quality Planner at (206) 684-1147.

Sincerely,

A handwritten signature in cursive script, appearing to read "Elsie Hulsizer".

Elsie Hulsizer  
Acting Environmental Programs Manager  
King County Department of Natural Resources

cc: Jackie Reid, King County Department of Natural Resources  
Darlene Gaziano, King County Department of Natural Resources

April 1, 1996

TO: Paul Shallow  
FM: Lorin Reinelt *LR*  
RE: Vashon GWMP - Proposed language for ST-1

The following is the proposed language and title for a revised recommendation ST-1 in the Vashon GWMP. The recommendation is consistent with the current proposal in the 1996 draft Surface Water Design Manual. For subdivisions and commercial developments, infiltration is not required, but would likely be necessary on coarse soils in order to meet pre-development flow control requirements.

**ST-1: King County Surface Water Design Manual Infiltration Requirements**

The infiltration and water quality treatment design standards of the King County Surface Water Design Manual should encourage infiltration of stormwater after treatment in order to maintain aquifer recharge and protect groundwater quality. When infiltrating runoff from new development of pollution-generating impervious surfaces in the Vashon Groundwater Management Area, a sole-source aquifer area, stormwater treatment shall be required using one of the following options:

1. If soil infiltration rates are greater than 2.4 inches per hour, stormwater shall be treated prior to infiltration using a facility from the basic water quality menu in the Surface Water Design Manual, designed to remove 80 percent of total suspended solids and associated pollutants. Any one of the following facility options can be used to satisfy the basic water quality protection requirement: biofiltration swale, filter strip, wetpond, wetvault, constructed wetland, sand filter, or a new technology capable of 80 percent TSS removal.
2. If soil infiltration rates are between 2.4 and 9 inches per hour, soil treatment can be used to satisfy the treatment requirements if certain soil depths and characteristics are met in terms of cation exchange capacity, organic content, or grain size distribution.

Roof downspout dispersion or infiltration systems, consistent with lot size and soil type, should be required for new residential development.

cc: Louise Kulzer



**King County  
Solid Waste Division**

Department of Natural Resources  
Yesler Building  
400 Yesler Way, Room 600  
Seattle, WA 98104-2637  
(206) 296-6542

March 22, 1996

TO: Mark Isaacson, Project Manager, Surface Water Management Division

FM: Kevin Kiernan, Engineering Services Manager *KK*

RE: Vashon - Maury Island Ground Water Management Plan

Thank you for providing us the opportunity to review the Draft Groundwater Management and the Supplement Draft Area Characterization Plans for Vashon - Maury Island. This memorandum is organized to first comment on management strategies and then comment on the Supplement Draft Area Characterization.

We have reviewed section 3.3.7, Solid Waste Landfills, of the Draft Ground Water management Plan, and have the following comments:

**GOAL:**

Revise the second sentence to recognize King County's recent decision to close the Vashon Landfill in the year 2000 to replaced it with a transfer station that will become operational in the same year.

**ISSUES:**

- Amendments to Title 10 for landfills cell expansion (SW-1A and 1B)

You should consider revising the focus of SW - 1A and 1B amendments to Title 10 as a consequence of the impending closure of the Vashon Island Landfill and its replacement with a Transfer Station.

- Establishment of a Hazardous Waste Transfer Station(SW-2)

Mark Isaacson  
March 22, 1996  
Page 2

We do not agree with the rationale for recommending that King County establish a hazardous waste transfer station on the Island. It is true that King County does not accept hazardous and other dangerous wastes at any of our facilities, and our existing Waste Clearance and Screening Program is designed to minimize any accidental receipt of such wastes. King County does have an existing county-wide Hazardous Waste Collection and Disposal Program designed to collect and dispose hazardous wastes off-island.

Hazardous wastes are managed outside the solid waste disposal system. A mobile hazardous waste collection facility (Wastemobile) makes regularly scheduled stops on Vashon Island to collect paints, pesticides, cleaners, solvents, adhesives, and other hazardous materials. All wastes are removed from the site at the end of each collection day. Some materials are recycled, others are neutralized, and most harmful wastes are hauled to hazardous waste landfills or incinerators. The County continues to devote significant resources on public education through several publications and advertisements about this program. Was this program considered prior to the preparation of this draft report?

Hazardous waste management is coordinated through the local Hazardous Waste Management Plan. This plan is coordinated through the Seattle-King County Department of Public Health, the Water Pollution Control Division, the Solid Waste Division, the Suburban Cities Association, and the City of Seattle. The public process for this plan was recently completed, although if you act quickly, input may still be possible.

- Evaluation of sites for locating a new landfill (SW-3)

This recommendation has become unnecessary based on information discussed earlier.

- Provision of a Compost Facility (SW-4)

We do not believe that a separate Composting Facility will be viable or cost-effective at Vashon Island. This conclusion is based on pilot studies conducted in the past by the Division. Moreover, the proposed municipal solid waste transfer station, after it becomes operational in the year 2000, is scheduled to provide yard waste collection services. The collected yard waste, including grass clippings, will be hauled to existing off-island composting facilities.

- Investigation and Remediation of Abandoned Sites (SW-5)

We would appreciate the opportunity to provide input and comment on future determinations regarding this issue.

- Education Program (SW-6)

Mark Isaacson  
March 22, 1996  
Page 3

This section should acknowledge the significant progress the Division has made in educating its citizens about the Wastemobile Hazardous Waste Collection and Disposal service. King County already has a nationally recognized public information program on waste reduction and recycling. New educational elements should be modified to recognize the existence of this program.

We would like to be provided the opportunity to provide input and comment on future determinations with regard to the issues discussed above, and on the following:

- Designation of Environmentally Sensitive Areas (SA-1A)
- Elimination of Categorical Exemptions to SEPA (SA-1B)
- Adoption of General Aquifer Protection Policies (SA-1C)
- Enhanced environmental review to protect aquifers (SA-1D)
- Ground water recharge areas (SA-1E)
- Wellhead Protection (SA-2A)
- Designation of Special Protection Area (SA- 3)

We have also reviewed the Draft Vashon-Maury Island Ground Water Management Plan Supplement Area Characterization for landfills and have the following comments and suggestions:

Section 5.3.1 Description

Revise the fourth paragraph to read as follows: "...To comply ..a leachate collection and Pretreatment System“.

### Background

Revise this section to indicate that eight new groundwater monitoring wells were completed in 1995 around the Vashon Landfill (four shallow and four deep). Details on this project are provided in the "Draft Monitoring Well Construction and Hydrogeologic Report for Vashon Island Landfill, 1995" prepared for King County Solid Waste Division by CH2M Hill. King County began collecting samples from these wells in November 1995. This latest report provides supplemental hydrogeological information on the existing monitored groundwater zone (Units IIA and IIB), establishes an initial hydrogeologic Unit IIC monitoring network, and defines the deep hydrostratigraphic conditions beneath the landfill to approximately 350 feet below ground surface. A draft copy of this report will be provided to you upon written request.

### Deep Ground Water

Revise the third paragraph to indicate that King County has scheduled the construction of the second stage of an active landfill gas collection and treatment system to be completed by September 1996. The initial stage, completed in 1995, consisted of the installation of eight new landfill gas perimeter probes to monitor the performance of the stage II system. The latter system consists of an interior landfill gas collection, extraction, and treatment system.

### Future Plans

Revise the first paragraph to include the eight new groundwater wells and all related information.

Revise the second paragraph to indicate that the Consultant completed the Vashon Landfill Gas migration control study in 1993. Their recommended strategy for the control of landfill migration, which is being implemented as discussed above, is a three-stage plan. Stage I was completed in 1995. Stage II will be completed in 1996. Stage III if necessary will include the design and construction of a perimeter landfill gas control system at the site in 1998.

Revise the third paragraph to indicate that an evaluation of three site Conceptual Development Alternatives was completed in 1995. Details of this evaluation are in the "Vashon Island Landfill Conceptual Development Alternatives Report, 1995" prepared for King County Solid Waste Division by CH2M Hill. This study projects that the capacity in the existing developed landfill area will be exhausted in the first quarter of the year 2000, and recommended the closure of the landfill and its replacement with a transfer station. King County accepted this recommendation, and plans for the development of a transfer station in the year 2000 are proceeding on schedule.

Mark Isaacson  
March 22, 1996  
Page 5

Thank you for the opportunity to comment. If you have any questions, please contact me on extension 6-4419.

KK:VOO:mfn  
VOO18/ekcgwmp.doc

cc: Rodney G. Hansen, Manager, Solid Waste Division  
Jeff Gaisford, Acting Waste Reduction/Recycling Manager  
Shirley Jurgensen, Supervising Engineer  
Victor O. Okereke, Senior Engineer



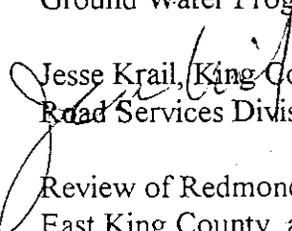
King County  
Road Services Division

Department of  
Transportation

Yealer Building  
400 Yealer Way MS 4Y  
Seattle, WA 98104-2637

March 19, 1996

TO: Paul Shallow, King County Department of Natural Resources  
Ground Water Program

FM:  Jesse Krail, King County Road Engineer, Department of Transportation,  
Road Services Division

RE: Review of Redmond - Bear Creek Valley, Issaquah Creek Valley,  
East King County, and Vashon Island Ground Water Management Plans

Thank you for the opportunity to review the referenced groundwater management plans. Department of Transportation, Road Services Division, Environmental Unit and Maintenance Operations Section staff have completed a review of the documents. The referenced groundwater management plans provide excellent guidance for protecting groundwater resources. However, we have the following comments about some of the plan policies:

Issaquah Creek Policy SA1A, Redmond Policy SA1A, and East King County SA1A

Road Services Division will want to be closely involved with any decisions made about revisions to existing SEPA exemptions. We perform a large quantity of SEPA exempt maintenance and upgrade work on King County bridges and roads, and this work is done on a tight timeline. Changes to exemptions for routine maintenance projects could significantly reduce our ability to service roads and bridges with a quick turn-around. This could result in unsafe conditions on our roadways. We request some acknowledgment and commitment within the management plans of the need for our Division's input to that decision-making process.

Issaquah Creek Policies ST-1 and ST-2A, Redmond Policies ST1A and ST2A,  
East King Policies ST-1A and ST-2A, and Vashon Policies ST-1 and ST-2B

Road Services Division will want to be closely involved in any effort to revise the Surface Water Design Manual. We request some acknowledgment and commitment within the management plans of the need for our division's input to that decision-making process.

Issaquah Policy ST-6, Redmond Policy ST 5A, East King Policy ST-6A, Vashon Policy ST-6

As noted in previous comments from Jon Cassidy, Road Services Maintenance Division, a six-year budget process is already in place to guide our capital expenditures. Changes or additions in project prioritization must take the existing planning process into consideration. From the groundwater protection aspect, we certainly agree in concept to giving high priority to physically susceptible areas when identifying retrofit opportunities.

However, there are other planning factors in road construction/retrofit that must be taken into account that may be of higher or equally high priority.

Vashon Policy WQ-1A

The Division wishes to assist in the development of the ordinance that establishes clearing guidelines and performance standards with retention requirements.

Vashon Policy WQ-9, Item 5

This policy calls for maintaining high ground water recharge areas in residential or non-intensive uses at low densities. Has there been consideration of how this policy will impact existing or proposed roads crossing through these areas? The plan should take this issue into account.

East King County Plan Environmental Checklist (Item 14 -Transportation)

This checklist item states that there will be no impacts to transportation. The checklist should be based on some analysis of the impacts to the Division's ability to provide transportation facilities based on the cost of proposed/anticipated retrofits. SEPA review is obviously not an appropriate vehicle for cost/benefit analysis, but impact of cost on ability to provide and maintain transportation facilities and resulting transportation system impacts is a legitimate avenue to pursue.

East King County plan Table 3.8.1, Implementation Priority

This table should include Division staff time and cost estimates based on our need to participate in further policy review and development.

Thank you again for the opportunity to comment on these plans. Please call Supervising Environmental Engineer Vicki Shapley at 296-6520 or Environmental Engineer Kathy Fendt at 296-8779 if you have any questions concerning our comments.

JK:kf

cc: Jon Cassidy, Supervising Engineer  
Lydia Reynolds, Manager, Project Support Services  
Vicki Shapley, Supervising Environmental Engineer  
Kathy Fendt, Environmental Engineer

Dockton Water Association  
9710 S.W. Windmill Street  
Vashon, Washington 98070

March 12, 1996

Mark Issacson  
Groundwater Project Manager  
King County Dept. of Natural Resources  
Surface Water Management Division  
700 Fifth Ave., 22nd Floor  
Seattle, WA 98104-9830

Dear Mr. Issacson:

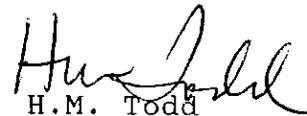
While my comments on the overall Vashon-Maury Island Ground Water Management Plan are included in the submittal by the Vashon-Maury Water Purveyors Association, the comments below cover errors specific to the Dockton Water Association. All comments address the supplement.

In table 2.6-3a, the total water rights for DWA is listed as 0.16 cfs. In reality this is the water right for only one of three sources, namely our Dockton Springs facility (Cert. # S1-23804C). We have an additional water right (Cert. # S1-20464C) for .03 cfs (16 acre ft./yr) for our Hake Springs facility and one for our Sandy Shores well facility (Cert. # unknown) for 100-128 gal/min. The latter right was originally registered to a Mr. Cleve Bard for the Sandy Shores Water Co.

On page 44, DWA is identified as one of three purveyors who have exceeded the maximum allowable withdrawal quantities. The annual allowable withdrawal quantity divided by what would be pumped at the maximum instantaneous rate for a year provides a factor of 30%. Applied to the well at 100 gpm, produces an allowable annual withdrawal of 15,768,000 gallons. When combined with the total allowable for the two spring sources (13,368,000 gallons), the total would be 29,136,000 gallons. We have never exceeded that amount of annual pumpage.

In table 2.6-4. Should you wish to update number of connections, the DWA total is now 317.

Sincerely,

  
H.M. Todd  
President

VASHON-MAURY ISLAND WATER PURVEYORS ASSN.

March 12, 1996

RECEIVED

MAR 14 1996

SURFACE WATER MANAGEMENT DIVISION  
OFFICE SUPPORT SERVICES

Mark Issacson  
Groundwater Project Manager  
King County Dept. of Natural Resources  
Surface Water Management Division  
700 Fifth Avenue, 22nd Floor  
Seattle, WA 98104-9830

Dear Mr. Issacson:

Enclosed are comments on the Vashon-Maury Island Ground Water Management Plan. The comments were cooperatively compiled by the members of the Association who have signed below.

The consensus of the participants was that the plan was overly ambitious and too costly. We do not believe that residents will vote positively on the formation of the proposed Aquifer Protection Area as defined in the plan. We recommend that you simplify the plan to the basic needs for aquifer protection with emphasis on costs.

As noted in the comments, we found that many of the tasks proposed to be charged to the APA were legislative mandates to the agencies involved and should be funded under the existing tax structure. Also, many others were common to other APAs or had County wide application but were proposed to be fully funded by the Vashon-Maury Island APA.

  
Larry Higley  
Heights Water Assn.

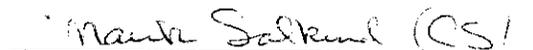
  
Mike Todd  
Dockton Water Assn.

  
Jim Garrison  
Burton Water Co.

  
Ben Binuya  
K.C. Water Dist. # 19

Singerely,  
  
Terry Jansen  
Westside Water Assn.

  
Doug Dolstad  
Island Water Management

  
Mark Salkind  
Beulah Park Water Assn.

  
Tom Baxter  
Maury Mutual Water Co.

COMMENTS ON  
VASHON-MAURY ISLAND  
GROUND WATER MANAGEMENT PLAN  
Vashon/Maury Island Water Purveyors Association

GENERAL

1. The plan describes many tasks (ordinance & regulation preparation; studies, education, etc.). which have County-wide application, but whose total cost is charged to the Vashon APA funds.
2. Some tasks are already the responsibility of State or County agencies in their basic mandated charter and should be funded by existing taxes; however, the costs of executing many of these tasks is charged to Vashon APA funds.  

Example: Ecology, due to a stated lack of funds, is delegating the oversight of well construction and abandonment to SKCHD. The cost of development of the SKCHD program and training of inspectors is proposed to be charged to Vashon APA funds.
3. The plan proposes to resolve a number of problems through enactment of ordinances, regulations and zoning; however, there is a lack of commitment to the enforcement of these new mandates or existing ones that affect ground water quality and quantity. New regulations, without provisions for enforcement, are not worth doing.
4. The funding estimate for the plan addresses the costs over a three year period with costs tagged to the initial implementation timeframe of each level of priority. It does not address the continuing annual costs for maintaining the initiatives set in place in the initial three years. Monitoring and sampling, for example, will be an ongoing and long term effort.
5. The GWAC is described as the policy making body for the GWMP, yet their policy statement as described in paragraph 3.5.2 is part of the unfinished agenda and has only reached the draft stage. It would appear that the plan was drafted without benefit of a firm policy from the responsible agency. The policy should be adopted in final form before adoption of GWMP. Further, in a meeting with the GWAC, members of that committee expressed concern that their inputs were not considered and that they had very little, if any, consultation on the content of the plan as drafted. There is reason to doubt that the County intends to allow any real policy power to the GWAC and only intends to use them as a buffer and to instill a false sense of local control of the GWMP.
6. The GWAC is given the responsibility to resolve any problems uncovered by the monitoring of water quality or quantity and are given six months to resolve each such issue. The GWAC has neither the resources or expertise to formulate solutions (most of which will be technical) to these problems. There appears to be no consideration of funding for GWAC activities. Solutions to problems will undoubtedly require the paid services of technical consultants as well as administrative expenses.
7. While a funding estimate has been provided, it apparently doesn't include all the costs "To be determined during concurrence" that occur in many of the paragraphs of the plan. Also costs are identified for the first three years only. It is obvious that some tasks are ongoing over many years, e.g. , Data Collection

and Analysis. The continuing costs should be identified.

8. Control of the proliferation of individual or small group wells has not been addressed. Outside of the considerations of conservation, each of these wells will be uncontrolled or poorly controlled point sources of contamination.
9. The use of incentives as opposed to new regulations should be explored as a more effective approach to contamination control. A surcharge or use tax could be applied to the purchase of such contaminants as pesticides to discourage their use. Tax incentives could be offered for low water usage landscaping, for example.

SPECIFIC TO NO. 1 & 2 PRIORITIES (Table 4.8.1)

Although reviewed, specific comments on Priority 3 issues are not addressed here since the issues are too numerous and the general comments can be applied to nearly all the proposed activities.

HM - 1      Hazardous Waste Management - Tracking.

Would appear to be a prudent plan. Responsibility of State Ecology and King County under the Hazardous Waste Management Act. Page 3-59 seems to acknowledge this cost responsibility, but Table 4.8.1 charges it all to Vashon APA funds. The table needs revision to match the text.

3.5.2      Non - Degradation Policy.

See General Comment 5.

OS - 1A&B      Nitrate Concerns

Acceptable as is. Will probably require sampling of water at each source prior to treatment. Currently one sample is taken after treatment from point in distribution system. Also, see general comment 6.

OS - 1C                      Nitrate Concerns

The investigation of high risk areas to ground water from on-site disposal would seem to be a current responsibility of SKCHD if high risk areas are defined as areas susceptible to failed septic systems. General comment 2 applies.

OS-2B      Hazardous Materials

An appropriate safeguard; however, per general comment 2, it should not be charged to APA funds.

OS-3A      Household Hazardous Waste

Acceptable as is.

OS-2A      Commercial Hazardous Waste



SA-2C Wellhead Protection

Currently, grants for wellhead protection are limited to political entities. Water District 19 is the only purveyor in this category. Private purveyors have entered into an interlocal agreement with District 19 to cooperate in a Wellhead Protection program for which District 19 will apply for a grant.

SA-2A Wellhead Protection

The tasks defined here are a part of the Wellhead Protection Program mandated by the State DOH on all Class A water systems. It is not specific to Vashon-Maury Islands and it is assumed that it is included in plan for reference.

WQ-4A Conservation

Landscaping ordinances would be difficult to enforce and would probably be resented as excessive government control. A better approach would be the use of incentives for use of landscaping that reduced water usage. The incentive could be reduced taxes in a similar vein as the Public Benefit Rating System.

WQ-4D Conservation

Acceptable as written. Assume this is for information only since it is already a requirement.

WQ-4C Conservation

Acceptable, except General Comment 1 applies.

WQ-4B Conservation

This may be impractical to enforce considering the number of Group B systems, some of which only serve two or three houses. Comments 1 & 2 apply.

UST- 1C Augment State Underground Storage Tank Program

It is not clear that this issue includes a test of buried tanks for leakage except during installation and removal. The larger issue would seem to be leakage from tanks that remain buried.

If the only issue is inspection during installation and removal, it would appear that having the Fire Marshal's office handle the total inspection process and provide a copy to SKCHD would be the most cost effective course. It wouldn't take much additional training to observe if a leak had occurred during tank removal.

DCM-1 Data Collection Analysis and Management

While this is the heart of the GWMP, it seems too elaborate and expensive. Much of the monitoring is already required of purveyors under state regulations and this data should be used for the DCM. The plan should be simplified to gather

and analyze only the basic data required for quality and quantity monitoring.

This is a task which will continue for many years. At \$261,000/yr., a less expensive approach is needed.

Many Education Program Elements  
Paragraphs

Education is a desirable component of the GWMP; however, \$230 per household over a three year period is overkill. Much of the education material is common to other APAs (See general comment 1.)

HM-1 Hazardous Waste Management

HM-2

See General Comment 2.

C-1 Burial of Human Remains

The first question is whether any action would be taken if so indicated by study. The public acceptance of digging up bodies and moving them someplace else could hardly be expected. Unless you have a plan and the political courage to carry it out, the study would be a waste of money. General comment 1 applies.

Mark Issaicson  
King County Surface Water Management Division  
700 fifth Avenue, Suite 2200  
Seattle, WA 98104

RECEIVED

January 30, 1996

FEB 01 1996

SURFACE WATER MANAGEMENT DIVISION  
OFFICE SUPPORT SERVICES

Subject: Vashon Groundwater Management Plan

In response to the invitation for public comment on the Vashon Groundwater Management Plan, I have the following contribution as a practicing environmental professional and land owner on Vashon.

1. From the meeting conducted Saturday, January 27, 1996 at the Vashon library, the committee and its members have evidently completed their task at hand and be congratulated for their work. They should also be quickly disbanded - ten years is to long for a citizen group to be together.
2. After ten years of study and hard work, putting the plan to the voters would be prudent, there is no plan "made in heaven." Regulations required to protect groundwater resources are "on the books" but they lack real time enforcement - the major hurdle that needs to be addressed by SWM and the Attorney General's office.
3. Proactive, full time enforcement could be achieved with privatization of a program with Vashon resident funds or as a position fully funded by the city government. From my working experience with the regulatory community, the County government and its departments clearly do not have the necessary resources for day-to-day enforcement issues other than those that are through citizen compliant and/or conflict.
4. The groundwater management program requires an individual to fulfill two areas of need - a lobbyist and a pragmatic environmental professional. The lobbyist is responsible for acting as a facilitator among the potential government agencies affected by this program and as an expeditor for island issues.
5. The environmental professional must have the necessary technical skills for the program's scientific objectives and have practical credentials for enforcement of the various regulations that pertain to protection (i.e., underground storage tanks, well head protection, septic and building regulations, etc.). This would include routine compliance and enforcement actions and the ability to collect and analyze the data required to meet the long term objectives of the program. This last effort is especially important as it is required to make rational and effective engineering-based decisions concerning the quality of our resource.

Thank you for your time. Please feel free to call me at (206) 633-6899 to discuss this letter.

Respectfully,



Robert Colombo  
P.O. Box 1734  
Vashon, WA 98070

RECEIVED

MAR 14 1996

SURFACE WATER MANAGEMENT DIVISION  
OFFICE SUPPORT SERVICES

Mr. Marc Isaacson  
Ground Water Program  
Dept. of Natural Resources  
700 5th. Ave.  
Suite 2200  
Seattle, WA. 98104

3/13/96

Dear Mr. Isaacson,

We are writing to you regarding the Vashon-Maury Island Ground Water Management Plan. As private well users, we may be affected by future determination of status of ground water. In respect to the carrying capacity, we would urge that any management plans take into consideration the renovation factor and be as conservative as possible.

We are concerned with the amount of growth that is taking place with seemingly no regard to water supply and effluent from increase in population.

Thank you for your consideration of this issue and we look forward to any response you have to this matter.

Sincerely,

Mr. and Mrs. R.A. Danielson  
PO Box 2007  
Vashon, WA. 98070

March 15, 1996

Mr. Mark Issacson  
King County Department of Natural Resources  
Groundwater Management Division  
700 5th Avenue, Suite 2200  
Seattle, WA 98104-9830

Dear Mr. Issacson:

I want to reiterate some concerns that have been expressed at recent meetings on the draft Vashon-Maury Island Ground Water Management Plan. I am hopeful we can find ways to strengthen the plan and build public confidence in it. I am committed to working with you toward that end.

1. Water Budget - The plan is lacking a water budget. Without this, it seems to me our community has no "benchmark" against which to evaluate the impact of changes in land use activity or zoning. As we are beginning to find out, we cannot be assured that it will be possible to take action to sufficiently protect high recharge areas without very clear parameters concerning water supply. We must make use of the best available information, and continue to do enough monitoring to improve upon our the existing knowledge. Without anything better, it seems as though the most practical alternative is to continue to rely the water budget developed by Carr and Associates in 1983.
2. Deep Aquifer - Our fundamental understanding of the deep aquifer is so lacking, and the costs and risks so great of relying on it, that for all practical purposes we need to focus more closely on the continued ability of the shallow aquifer to serve our needs. At least half of the residents of Vashon and Maury rely on (shallow aquifer) individual private wells, and are not part of larger systems. There have been some very expensive, non-productive attempts by public systems to obtain water from the deep aquifer. For private well users, future reliance on the deep aquifer is simply not an option. For others, it is bound to be far more speculative than perhaps we have conveyed in the draft plan. Our willingness to "relax" about more restrictive and substantive strategies to protect

groundwater rests largely on perceptions about the the deep aquifer. There is a false security and false economy in expecting future water needs to be met by drilling more deep aquifer wells, that is, not without wholesale changes in land use, that Vashon in all past planning efforts has consciously avoided. The bottom line is that our management strategies should be rigorous to offer us a sustainable future without relying so much on the deep aquifer.

3. Ground and Surface Water Interface - The relationship between ground and surface water is under-developed in the plan and its management strategies. In recent meetings, the reliance of both public supply systems and individual domestic system water users on surface waters has been highlighted, and I think our policies and management strategies must be more inclusive to gain public acceptance.

4. Saltwater Intrusion - The 1983 Carr report states: "Chemical analyses for this and prior studies show a definite indication of salt water intrusion on the Islands. This is evidenced by high concentrations of chloride and high specific conductance in a number of wells." Carr also reported on analyses of water from springs and stream sources showing higher chloride than the well sources. After including Carr's finding in a letter of July 9, 1993, I and several other committee members expressed continuing concern that perhaps this issue had not received enough attention in our plan. My understanding is that this resulted from some more favorable findings in different test results, from different wells. I continue to have concerns about this problem, as it seems to me the "early warning" light is already flashing - at least at some well sites. We need to address saltwater intrusion with higher priority.

5. Vegetative Cover - Insofar as vegetation removal can increase runoff and - all things considered - cause a net decrease in the volume of water reaching the aquifer, it seems our management strategies must be revised to deal more effectively with this issue. The rapid conversion (loss) of forest lands on Vashon-Maury Islands has a direct impact on the sustainability of our water supply, yet this is taking place with virtually no consideration of groundwater, not to mention other impacts.

6. Residential Density - Another issue that surfaced at recent meetings relates to overall density in residential zones which affect assumptions we make regarding future water quality and demand. There are apparently allowances resulting from changes to the Comprehensive Plan that allow for "accessory dwellings", or what amounts to an additional dwelling unit on each residential lot, and "rounding up", or an allowance to build on a lot that is less than the minimum size for that zone in some cases. There has also been concern expressed about an allowance for building on a lot created by a County roadway, even if the lot is undersized, based upon the existing zoning. We have an obligation to address these concerns, including but not limited to any significant changes brought about by revisions to the Comprehensive Plan. Integration of these planning efforts is vital to the protection of water resources.

Thank you for your help so far. I look forward to working with you to complete an effective Groundwater Management Plan.

Sincerely,

Laurie G. Geissinger  
13209 SW Reddings Beach Road  
Vashon, WA 98070  
(206) 463-5870 or 386-4585

11 March 1996

Marc Isaacson  
Groundwater Program  
King County Department of Natural Resources  
700 5th Avenue, Suite 2200  
Seattle, WA 98104

Dear Mr. Isaacson:

We have lived in the Reddings Beach Loop area of Vashon Island for nearly twenty years. Two wells on our 15 acres have been used for data collection for both the 1983 and the current ground water resource studies. We are familiar with both of these studies, and are committed to doing our part to preserve our ground water resource. We are committed from both an economic and a natural resource perspective. We know that the economic value of our home and surrounding land rests to a large extent on the potability of the water we draw from our well and on our continuing ability to draw our supply from it. We are also committed to preserving the natural resource base which has created and sustained the biodiversity which we all appreciate on our island.

The draft Vashon-Maury Island Ground Water Management Plan recognizes the two critical issues of quality and quantity of our groundwater resource, but falls short of addressing them adequately. In its draft form, the plan reads like a generic, county-wide document that does not address issues specific to our island, the nature of our existing utility service and the management constraints inherent in it, and the nature of the aquifers from which we get our water.

There are several relationships which we believe must be the focus of a ground water plan: 1) the relationship between the quality of ground water and the amount and character of effluent discharged from homes and businesses, 2) the relationship between types and density of development and water quality and availability, and 3) the relationship between surface and ground water. Each relationship must be developed fully, with management strategies designed to address specific threats to ground water quality and quantity.

Following are our recommendations for changes to the draft plan. First, we want to articulate some principles we believe must underly the plan if our island's ground water resource is to be protected. First, the management plan should be conservative in its assumptions and in the time frame allowed before a "trigger" occurs. This is especially important because of the years of lag time before the effect of an action actually shows up in the data being collected. The plan talks about an "early warning system" when, in fact, all we really have, de facto, is a late warning system.

Secondly, under some of the interactions described above, we are dealing solely with the language of utilities. Under others, however, discussion of land use sneaks in, whether we like it or not. This is simply a reflection of the unique nature of our island, the characteristics of its

water resources, and the way utilities are provided here -- on an island served by a sole source aquifer and a mixture of purveyors, private wells, septic systems and sewers, even land use becomes a utility issue.

Thirdly, the deep aquifer appears to be regarded as the "back-up" we have to the shallow aquifer from which many private well users currently draw their water. We believe this perspective is not only unrealistic, but downright wrong. As development which exceeds the water budget (the only one we have to go on, since the new study does not provide one) occurs, levels in existing wells may drop, and these may be "stranded" as they lose contact with the ever-dropping ground water level. This eliminates the economic value of the affected properties, forcing those private well users to dig costly wells into the deep aquifer. It is absolutely wrong that existing private well users of the shallow aquifer be forced to seek new water supplies and pay these costs.

Based on these underlying principles, we would like to have the following recommendations incorporated in the final plan:

1. Rewrite the Statement of Purpose and other appropriate portions of the plan to describe the dependence of 75% of island water systems on surface and shallow water and to describe the interdependence of surface and ground water on the island. This creates the awareness of the interaction of the two, and the need for addressing surface water quality in providing for the protection of ground and drinking water.
2. A trigger level for quantity must be defined in both purveyor areas and those in which private wells are used.
3. The renovation factor developed for this island should be used as the basis for developing management strategies.
4. Existing policies in the Vashon Community Plan should be enforced, including the P-suffix conditions. Additional conditions should be implemented, including disallowing accessory dwellings, the creation of a second parcel by a bisecting road, the application of the "rounding up" principle, and any other provisions of county regulations which provide for essentially a doubling of the density in a designated zone.
5. The time frame for the trigger mechanisms should be shortened, but still allow for the observation of a trend. A 5-year period, with a 5% drop may be reasonable.
6. Salt water intrusion (currently occurring along the shoreline of part of the island) needs to be addressed. Data collection has occurred at specific sites in previous studies, and this should be acknowledged, analyzed for use in developing management strategies, and should be continued.

We urge you to help us protect our property value by protecting the water supply we currently have. Please create management strategies in the ground water plan which will assure the protection of both the quantity and quality of our water resource which is used not only by purveyors, but also by private well users currently drawing water from the shallow aquifer. Our

ground water management plan should be based on the objective of protecting existing sources and existing quality. Otherwise, the county places a tremendous and costly burden on each property owner on this island. If our resource quality and quantity is not protected today, you force us to pay in the future for unwise and short-sighted resource planning. For those in government and the public who argue for private property rights, this plea must ring a bell -- a plea to help us maintain the value of our property by maintaining the existing resource base on which it (and our family) is dependent.

Thank you for considering our comments.

Sincerely,

Donna Lee Klemka  
Martin W. Baker  
23707 Landers Road SW  
Vashon Island, WA 98070

Mark Isaacson  
Groundwater Project Manager  
King Co. Dep. of Nat. Resources  
400 Yesler Way Room 700  
Seattle, Washington 98104

December 29, 1995  
9639 SW Eliska Lane  
Vashon Island  
Washington, 98070  
1-206-463-2433

I live on a small island which has been identified as a sole-source aquifer by the government. Groundwater is crucial to the future of Vashon Island... it's all we have. Over-population here will result in pumping water out faster than rainfall percolates down and our aquifers will be depleted. If we dump pollutants down the drain, spread herbicides/pesticides, or build too many houses in one spot our aquifers will be polluted. We started to protect our water back in 1986 with community involvement by writing a ground water protection and management plan. We want to preserve drinking water and natural streams systems - and do it in a way that permits key decisions to be made locally. Rhying up streams so someone can build more spec houses isn't part of our plan. We value preserving the island's natural systems and do not consider streams that support wild life to be a waste of water.

Because of State and County negligence and indifference, our Vashon ground water management plan has moved glacially thro county and state agencies. Finally we are at the public hearing and comment stage. I have lived on Vashon for 19 years and plan to stay. I favor a strong protection plan for our aquifers and natural stream watersheds. We already have minimum 5-10 acre zoning to protect aquifers from over-building; because of our plan, King Co. cuts our island roadsides vegetation rather than spraying chemicals which would pollute our aquifers. We oppose the paving over of natural island roadsides to prevent water runoff and encourage water soaking in down to the aquifer. We will continue to protect the quantity and quality of Vashon's only water source, our island aquifer. Once it becomes depleted or polluted, it cannot be fixed. There is no room for mismanagement and no time for more delay in implimenting a critical island -





**King County  
Water and Land Resources Division**

Department of Natural Resources

700 Fifth Avenue, Suite 2200

Seattle, WA 98104-5022

(206) 296-6519

(206) 296-0192 FAX

September 3, 1998

Dan Chasan  
Chair, Vashon - Maury Island Ground Water Advisory Committee  
17228 Westside Highway Southwest  
Vashon, WA 98070

Dear Mr. Chasan:

Enclosed please find a copy of Motion 10493, passed by the Metropolitan King County Council on July 6, 1998, regarding their concurrence with the Vashon - Maury Island Ground Water Management Plan.

As you know, County Council voted to require several changes in the Management Strategies document. Their recommendations, and the rationale for each, are listed in the enclosed concurrence letter that Council wrote (dated June 12 with the motion number "10493" stamped on each page). The concurrence letter states agreement with the goals and objectives of the groundwater program and specifies the revisions that are necessary for Council's concurrence with the plans. We will include both the motion and concurrence letter in Appendix B ("Letters of Concurrence or Comment") of the Management Plan.

We believe that the best course of action, for the sake of groundwater protection, is to make the changes required by Council, finalize the plans and submit them to Ecology for certification, and proceed to implementation. This cover letter, transmitting to you the motion and concurrence letter from Council, describes in detail the changes we will make to the document to accomplish these requirements. Please let us know at your earliest convenience if you agree with the approach and the proposed changes. I do not know whether it will be necessary (or even possible after such a long time) to call a meeting of the Ground Water Advisory Committee to ratify these changes. If you think that this is necessary, please call me (at 206-296-8323) and I will be glad to assist you in assembling the committee members.

These recommendations include:

Management Strategy LU-3 (Land Use Impacts to Ground Water, p. 2-14): the second and sixth bullets, relating to accessory dwelling units and vegetative removal, will be deleted from Management Strategy LU-3.

Management Strategy UST-2 (New Tank Prohibition, p. 2-28) the text of this strategy will be changed to the following (shown here with changes highlighted): "If approved by Ecology, King County will amend the King County Zoning Code to prohibit the installation of new underground fuel tanks in residential zones on Vashon Island."

Section 3.3 (Funding, p. 3-2) will be changed to the following: "King County is currently exploring approximately 6-8 long term funding alternatives for the purpose of implementing a ground water management program. If a regional funding source cannot be identified, the Vashon-Maury Island Ground Water Management Committee should assess the feasibility of establishing an Aquifer Protection Area to provide funding for implementation of the Plan." The original text, to authorize a ballot measure to establish an Aquifer Protection Area, will be moved into a new section in the Unfinished Agenda (Section 2.5) to become a new Section 2.5.5 "Aquifer Protection Area" (at the bottom of p. 2-48). The section will begin: "Metropolitan King County Council is investigating various funding alternatives for the Groundwater Management Program. The Ground Water Advisory Committee recommended the use of an Aquifer Protection Area." The section will conclude: "Since Council preferred to leave this issue unresolved until the alternatives are fully considered, this issue is included in the Unfinished Agenda."

Section 3.5 (Ground Water Management Committee, p. 3-4) will be changed to authorize a larger Management Committee. The first three sentences of the first paragraph (following "The Management Committee should consist of a core committee ") will be changed to "of nine members constituted as follows: one representative of the Ground Water Advisory Committee, one representative of the County's Department of Natural Resources, one representative of the Island's water purveyors, a representative of residential well users, one representative of the Vashon Chamber of Commerce, one representative of the Vashon-Maury Island Community Council, a representative of business owners, a representative of commercial agriculturists and a representative of a Vashon environmental organization. Members of the Management Committee would be appointed by motion by the Metropolitan King County Council with members serving staggered terms of three years."

Section 3.8 (Implementation of the Plan, p. 3-7) will be changed to include the following paragraph at the end of the section: "King County implementation efforts will be phased in over time and is dependent upon the availability of funding."

As the enclosed concurrence letter by County Council says, King County is pressing ahead to begin implementation of the groundwater program. We, at Department of Natural Resources, are developing approaches for the various management strategies included in the Management Plans. We are working on a long-term funding option which will allow us to expand our efforts in new directions and establish contacts with agencies and municipalities which may help this effort. We will, of course, be able to accomplish more when long-term funding is secured.

Dan Chasan  
September 3, 1998  
Page 3

Thank you for the dedication and diligence of the Vashon - Maury Island Ground Water Advisory Committee on this lengthy project. Please contact me at 206-296-8323 to discuss any questions you have about the above changes to the plans, and about what we can do to start the implementation phase of the groundwater program.

Sincerely,



Ken Johnson  
Groundwater Program Lead

KJ:pra26

Enclosures

cc: Distribution List

DISTRIBUTION LIST

Bill Tobin, Citizen at Large  
Bob James, DOH NW Drinking Water  
Bonnie Shride, League of Women Voters  
Bruce Monell, WA Department of Natural Resources  
Kathy Minsch, Puget Sound Water Action Team  
Donna Klemka, Citizen at Large  
Floyd Williams, K-2 Corporation  
Frank Jackson, Citizen at Large  
Jerry Balcom, Citizen at Large  
Jim Garrison, Burton Water Company  
Keith Oratz, KC Council Staff  
Ken Fulton, Water District #19  
Larry Higley, Citizen at Large  
Laura H. Lowe, WA Department of Ecology  
Laura Wishik, Citizen at Large  
Laurie Geissinger, Citizen at Large  
Lawrence Niece, L.H. Niece & Co.  
Luke Lukoskie, Island Spring Incorporated  
Rick Ames, Vashon Sewer District  
Susie Kalhorn, Citizen at Large

09/23/97

PETE VON REICHRATH  
JANE HAGUE  
LARRY PHILLIPS  
Greg Nickels

Introduced By:

sub 6/12/98 kn

Proposed No.:

97-594

1  
2

MOTION NO. 10493

3  
4  
5

A MOTION regarding concurrence with the recommendations contained in the Vashon-Maury Island Ground Water Management Plan.

6  
7  
8

WHEREAS, the Washington State Growth Management Act requires jurisdictions to designate critical areas, including areas with a critical recharging effect on aquifers used for potable water, RCW.36.70A.050, and

9  
10  
11

WHEREAS, Policy C-5 of the Countywide Planning Policies states that all jurisdictions that are included in ground water management plans shall support the development, adoption and implementation of the plans, Ordinance 11446, and

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14

WHEREAS, Policy NE-333 of the King County Comprehensive Plan states that King County should protect the quality and quantity of the ground water countywide by placing a priority on implementation of ground water management plans, and

15  
16  
17  
18

WHEREAS, the Washington State Department of Ecology has designated King County as the lead agency responsible for coordinating and undertaking the activities necessary for development of ground water management programs in the county, WAC 173-100-080, and

1           WHEREAS, a ground water advisory committee has been established for the  
2 Vashon-Maury Island ground water management area, and

3           WHEREAS, the ground water advisory committee contained representatives of  
4 local governments, special purpose districts, water associations, agricultural interests, well  
5 drilling firms, industry and environmental organizations, and

6           WHEREAS, the Vashon-Maury Island ground water advisory committee has  
7 overseen the development of the Vashon-Maury Island Ground Water Management Plan,  
8 and

9           WHEREAS, the oversight provided by the ground water advisory committee has  
10 included reviewing the work plan, schedule and budget for development of the plan,  
11 assuring that the proposed plan is technically and functionally sound and verifying that the  
12 proposed plan is consistent with Washington state laws and authorities of affected  
13 agencies, WAC 173-100-090, and

14           WHEREAS the Washington State Department of Ecology and the King  
15 Conservation District are required to implement some of the recommendations in the  
16 Vashon-Maury Island Ground Water Management Plan and have issued letters of  
17 concurrence, and

18           WHEREAS, following the King County council's review and comment on the  
19 plan's recommendations, the Vashon-Maury Island Ground Water Management Plan will  
20 be submitted to the Washington State Department of Ecology for certification in  
21 accordance with WAC 173-100-120, and

22           WHEREAS, following the Department of Ecology's certification of the Vashon-  
23 Maury Island Ground Water Management Plan, the metropolitan King County council will

1 be responsible for implementing those portions of the Plan which are within their  
2 jurisdictional authority to implement;

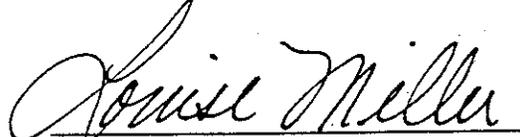
3 NOW, THEREFORE BE IT MOVED by the Council of King County:

4 The King County executive is hereby requested to transmit to the Vashon-Maury  
5 Island Ground Water Advisory Committee a letter, substantially in the form attached,  
6 identifying the county's findings and indicating areas of county concurrence and non-  
7 concurrence with recommendations contained in the Vashon-Maury Island Ground Water  
8 Management Plan. This letter should contain the following:

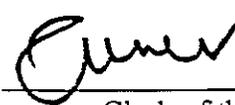
- 9 1. a clear statement of concurrence or nonconcurrence;
- 10 2. a statement of agreement with the goals and objectives of the ground water  
11 program; and
- 12 3. specific revisions necessary for county concurrence.

13 PASSED by a vote of 12 to 0 this 6<sup>th</sup> day of July  
14 1998.

15 KING COUNTY COUNCIL  
16 KING COUNTY, WASHINGTON

  
17  
18 Chair

19 ATTEST:

20   
21 Clerk of the Council

22 Attachments:  
23 Concurrence Letter

104934

June 12, 1998

Dan Chasan  
Chair, Vashon Ground Water Advisory Committee  
17228 Westside Highway SW  
Vashon, WA 98070

Dear Mr. Chasan:

King County generally agrees with the goals and objectives of the Vashon-Maury Island Ground Water Management Plan, yet makes a statement of nonconcurrence based on its finding of inconsistency between the recommendations contained in the Plan and the intent of chapter 90.44 RCW and other federal, state and local laws. The County recognizes the importance of the Plan's recommendations to preserve and protect ground water, a highly valued natural resource. The County's role in implementing the recommendations of this Plan reflects the County's responsibility as a resource manager, a land development regulator, and the permitting authority for the unincorporated areas of King County.

King County's statement of nonconcurrence is based on its finding of inconsistency between several recommendations included in the Plan and adopted county comprehensive planning policies and county laws. These recommendations must be modified as set forth below to achieve consistency and to allow county concurrence with the Draft Ground Water Management Plan. These recommendations include Management Strategy LU-3, Management Strategy UST-2, Section 3.3, Funding, Section 3.5, Ground Water Management Committee and Section 3.8, Plan Implementation. A summary of the basis for inconsistency and the changes necessary for King County concurrence follows.

King County does not concur with the recommendations of Management Strategy LU-3 (Land Use Impacts to Ground Water) relating to accessory dwelling units and vegetative removal. This finding of inconsistency is based upon the fact that:

1. prohibition of accessory dwelling units in single family zones is inconsistent with KCCP policies H-104, H-302 and H-603 - H-605;
2. pursuant to changes adopted by the State Legislature in 1997 to the Forest Practices Act, a Memorandum of Agreement (MOA) between King County and the State DNR is no longer necessary and is no longer being pursued by either party; and
3. the recommendation to adopt a MOA with DNR is inconsistent with KCCP policies RL-209 and RL-210.

King County can make a finding of consistency only if the recommendations relating to accessory dwelling units and vegetative removal are deleted from Management Strategy LU-3.

King County does not concur with the recommendation of Management Strategy UST-2 (New Tank Prohibition) as it is currently written. This finding of inconsistency is based upon the fact that:

1. King County has limited regulatory authority for underground storage tanks. King County can implement UST-2 if the State DOE approves designation of the Vashon-Maury Island Ground Water Management Area as an Environmentally Sensitive Area and approves the proposed prohibition of new underground tanks in residential zones;
2. it is inconsistent with Countywide Planning Policy ED-10; and
3. it is inconsistent with KCCP Policy ED-101

King County can make a finding of consistency only if Management Strategy UST-2 is modified to read as follows: "If approved by the State DOE, King County will amend the King County Code to prohibit the installation of new underground fuel tanks in residential zones, on Vashon Island."

King County does not concur with the recommendation in Section 3.3, for the Metropolitan King County Council to authorize a ballot measure to establish an Aquifer Protection Area. This finding of inconsistency is based upon the Council's adoption of Ordinance 12926 which required the King County Executive to provide a proposal for long term funding of King County's ground water program. King County's funding efforts will focus on identification of a long term funding source, and establishment of an Aquifer Protection Area will not be authorized until after these efforts have been exhausted.

King County can make a finding of consistency only if the text of Section 3.3 is amended as follows: "King County is currently exploring approximately 6-8 long term funding alternatives for the purpose of implementing a ground water management program. If a regional funding source cannot be identified, the Vashon-Maury Island Ground Water Management Committee should assess the feasibility of establishing an Aquifer Protection Area to provide funding for implementation of the Plan."

The Draft Plan currently proposes that the Management Committee should consist of a core committee of five to seven members including representatives from the Ground Water Advisory Committee, King County Department of Natural Resources, a water purveyor, and a private citizen. This core group would apparently be supplemented to ensure that there are at least four members from the Ground Water Advisory Committee.

While the aforementioned membership categories are essential to future success, the County would like to ensure that the Management Committee (and the implementation process) benefits from a broader range of views and expertise. Thus, the County does not concur with the recommendations contained in Section 3.5 of the Draft Plan. King County concurs with a larger Management Committee of nine members constituted as follows: one representative of the Ground Water Advisory Committee, one representative

of the County's Department of Natural Resources, one representative of the Island's water purveyors, a representative of residential well users, one representative of the Vashon Chamber of Commerce, one representative of the Vashon-Maury Island Community Council, a representative of business owners, a representative of commercial agriculturists and a representative of a Vashon environmental organization. Members of the Management Committee would be appointed by motion by the Metropolitan King County Council with members serving staggered terms of three years.

King County does not concur with the recommendations contained in Section 3.8 regarding implementation of the Plan. A finding of inconsistency is based upon existing obligations imposed by federal, state and local laws related to county revenues and expenditures. These limitations restrict the county from being able to fully commit to Plan implementation following certification.

King County can make a finding of consistency only if the text of Section 3.8 is amended to include the following statement: "King County implementation efforts will be phased in over time and is dependent upon the availability of funding.

King County places a high priority on implementing the specific management strategies relating to wellhead protection, development of best management practices, education, and mapping of critical aquifer recharge areas. During the initial phases of implementation, the County would start to undertake other activities such as coordinating and staffing the anticipated interjurisdictional ground water management committees; developing a data collection and management program to monitor ground water quality and quantity; and enhancing education programs to promote ground water protection.

Thank you for the dedication and diligence of the Vashon-Maury Island Ground Water Advisory Committee on this lengthy project. Please contact Mark Isaacson, Department of Natural Resources, Water and Land Resources Division, at 206-296-8369 to discuss starting the next steps in this effort.

Sincerely,

Ron Sims  
King County Executive

RECEIVED  
NOV 23 1998

17228 Westside Highway SW  
Vashon WA 98070  
November 18, 1998

KING COUNTY  
WATER & LAND RESOURCES DIVISION

Laura Lowe  
Washington Department of Ecology  
P.O. Box 47600  
Olympia WA 98504-7600

Dear Ms. Lowe:

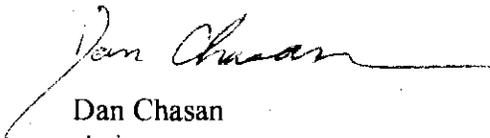
This is the Vashon-Maury Island Ground Water Advisory Committee's response to Metropolitan King County Council motion 10493 and the Council's attached non-concurrence letter seeking to modify the proposed Vashon-Maury Island Ground Water Management Plan. I have enclosed the Council's motion and letter.

As you know, WAC 173-100-120(2) says that "Statements of non-concurrence shall be resolved by the [Ground Water Advisory] committee."

By accepting most of King County's proposed changes and suggesting plan modifications in response to the remaining three, the GWAC has resolved the non-concurrence issues to its own satisfaction.

Now, under the terms of WAC 173-100-120(3), I am transmitting the plan along with the suggested modifications to the Department of Ecology. I hope the Department will certify the plan with the revisions proposed by King County and the GWAC. If Ecology is not willing to do that, I hope it will mediate the remaining disagreements so that we can move forward to protect Vashon's sole-source aquifer.

Very truly yours,



Dan Chasan  
chairman  
Vashon Groundwater Advisory Committee

November 18, 1998

From: Dan Chasan  
chairman  
Vashon Ground Water Advisory Committee  
17228 Westside Highway SW  
Vashon WA 98070

RECEIVED  
NOV 23 1998

To: Louise Miller  
chair  
Metropolitan King County Council  
King County Courthouse  
Seattle WA 98104

KING COUNTY  
WATER & LAND RESOURCES DIVISION

Re: Vashon-Maury Island Ground Water Management Plan

Dear Ms. Miller:

The Vashon -Maury Island Ground Water Advisory Committee cannot accept all the changes proposed in the non-concurrence letter attached to Council motion 10493. We expect King County to let Vashon residents choose their own representatives and protect their own resources. We expect King County to treat groundwater protection with the urgency it deserves. The letter states that because of "obligations imposed by federal, state and local laws related to county revenues and expenditures . . . King County can make a finding of consistency only if the text . . . is amended to include the following statement: 'King County implementation efforts will be phased in over time and is dependent upon the availability of funding.'" This is disingenuous at best.

"Inconsistency" is not the issue. Obviously, funding groundwater protection must not interfere with programs required by federal, state or local law. But the county does not spend money only on programs that are legally required. The issue is simply one of choice. We assume the county will choose to protect groundwater. Therefore, instead of the deliberately vague "phased in over time" and "dependent upon the availability of funding," the plan should state: "No later than April 15, 2000, King County will commit itself to funding all high-priority items in the Vashon-Maury Island Ground Water Management Plan by January 1, 2003."

The letter also states "King County does not concur with the recommendation . . . to authorize a ballot measure to establish an Aquifer Protection Area. . . . King County can make a finding of consistency only if the text . . . is amended as follows: 'King County is currently exploring approximately 6-8 long term funding alternatives for the purpose of implementing a ground water management program. If a regional funding source cannot be identified, the Vashon-Maury Island Ground Water Management Committee should assess the feasibility of establishing an Aquifer Protection Area to provide funding for implementation of the Plan.'" Again, the issue is not consistency but choice. We have not proposed an Aquifer Protection Area as a way to help King County escape its countywide

funding obligations. We have said that an Aquifer Protection Area should not pay for things County government is already obligated to do. But we do not have any confidence in King County's willingness to fund groundwater protection in an adequate or timely manner, and we believe Vashon may want to go beyond whatever program the County chooses to fund. Once an Aquifer Protection Area is established, its functions can, of course, expand or contract as the people of Vashon decide at the polls. We concede it may make sense to wait and see whether or not King County decides to fund groundwater protection in a timely manner. We do not think it is wise--and we think it shows an appalling contempt for the democratic process--to take an Aquifer Protection Area off the table indefinitely. An Aquifer Protection Area has been proposed as a way to let Vashon residents reach into their own pockets--if they choose--to do for themselves things the County will not otherwise do for them. Why not let Vashon residents do that? Is the County bureaucracy so fixated on uniformity that it can't stand the idea of Vashon doing something more? We ask the County to commit itself to an Aquifer Protection Area vote--if Vashon residents want one--by a date certain. The plan should state that "The citizens of Vashon may vote to form an Aquifer Protection Area for the purpose of financing any high priority item(s) to which King County has not committed funds and/or any supplemental public education or monitoring. After April 15, 2000, an Aquifer Protection Area will be placed on a general or special election ballot within six months if either the Vashon-Maury Island Community Council or the Vashon-Maury Island Ground Water Management Committee requests such a vote."

Finally, the letter proposes enlarging the management committee to nine members, representing certain organizations and categories, to be chosen by the Metropolitan King County Council. Our proposed plan calls for a smaller committee to be chosen by the Vashon-Maury Island Community Council. We do not object to enlarging the committee. We do object to the way in which the county wants it chosen. Vashon is, of course, an unincorporated area, but the county has accepted our Community Council as an advisory body. Now, Vashon is being told that the Community Council will not be allowed to focus or convey local preferences. Instead, the management committee will be chosen by a council 12 of whose 13 members do not represent Vashon at all. That is insulting. We ask that the categories be scrapped and the nine committee members be elected at large by the entire island. The plan should state: "The management committee shall consist of nine members elected at large for staggered terms of three years."

While these three areas of disagreement are significant--if they were not, we would not make an issue of them--they do not affect the basic programmatic thrust of the Vashon groundwater plan. Therefore, while the County and the GWAC work to resolve their remaining differences, we urge you to forward the plan to the state Department of Ecology with a note acknowledging those differences and a copy of this letter. We're sure that Ecology's review will take many months. We have already waited more than 12 years for a plan. Let's keep the process moving forward.

Thank you for your interest in groundwater.

Very truly yours,

Dan Chasan

**Appendix C**

**Guidelines for Development of Ground Water  
Management Areas and Programs**

**Vashon-Maury Island  
Ground Water Management Plan**

**December 1998**

**Chapter 173-100 WAC**  
**GROUND WATER MANAGEMENT AREAS AND PROGRAMS**

**WAC**

- 173-100-010 Purpose.
- 173-100-020 Authority.
- 173-100-030 Overview.
- 173-100-040 Definitions.
- 173-100-050 Probable ground water management areas.
- 173-100-060 General schedule.
- 173-100-070 Designation of ground water management areas for program planning purposes.
- 173-100-080 Lead agency responsibilities.
- 173-100-090 Ground water advisory committee.
- 173-100-100 Ground water management program content.
- 173-100-110 SEPA review.
- 173-100-120 Hearings and implementation.
- 173-100-130 Designation of ground water areas.
- 173-100-140 Intergovernmental agreements.
- 173-100-150 Appeals.
- 173-100-160 Regulation review.

**WAC 173-100-010 Purpose.**

The purpose of this chapter is to establish guidelines, criteria, and procedures for the designation of ground water management areas, subareas or zones and to set forth a process for the development of ground water management programs for such areas, subareas, or zones, in order to protect ground water quality, to assure ground water quantity, and to provide for efficient management of water resources for meeting future needs while recognizing existing water rights. The intent of this chapter is to forge a partnership between a diversity of local, state, tribal and federal interests in cooperatively protecting the state's ground water resources.

[Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-010, filed 12/20/85.]

**WAC 173-100-020 Authority.**

This chapter is promulgated by the department of ecology pursuant to RCW 90.44.400, 90.44.410, 90.44.420, 90.44.430 and 90.44.440.

[Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-020, filed 12/20/85.]

**WAC 173-100-030 Overview.**

This regulation establishes a process for the identification and designation of ground water management areas and for the development of comprehensive ground water management programs. From a general schedule of probable ground water management

areas, the department of ecology in cooperation with local government will designate specific ground water management areas, subareas, or depth zones within such areas and will appoint a lead agency to develop a ground water management program and an advisory committee to oversee the development of the program for each designated area. Following completion of the program and a public hearing to be held by the department of ecology, the program must be certified to be consistent with the intent of this chapter. The program will then be implemented through state regulations and local ordinances. The programs must thereafter be periodically reviewed.  
[Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-030, filed 12/20/85.]

**WAC 173-100-040 Definitions.**

For the purposes of this chapter the following definitions shall apply:

- (1) "Aquifer" means a geologic formation, group of formations or part of a formation capable of yielding a significant amount of ground water to wells or springs.
- (2) "Department" means the Washington state department of ecology.
- (3) "Ground water" means all waters that exist beneath the land surface or beneath the bed of any stream, lake or reservoir, or other body of surface water, whatever may be the geological formation or structure in which such water stands or flows, percolates or otherwise moves.
- (4) "Ground water advisory committee" means a committee appointed by the department to assist in the development of a ground water management program.
- (5) "Ground water area or subarea" means a geographic area designated pursuant to RCW 90.44.130.
- (6) "Ground water management area" means a specific geographic area or subarea designated pursuant to this chapter for which a ground water management program is required.
- (7) "Ground water management program" means a comprehensive program designed to protect ground water quality, to assure ground water quantity and to provide for efficient management of water resources while recognizing existing ground water rights and meeting future needs consistent with local and state objectives, policies and authorities within a designated ground water management area or subarea and developed pursuant to this chapter.
- (8) "Ground water management zone" means any depth or stratigraphic zone separately designated by the department in cooperation with local government for ground water management purposes within a ground water management area. Ground water management zones may consist of a specific geologic formation or formations or other reasonable bounds determined by the department consistent with the purposes of this chapter.
- (9) "Ground water right" means an authorization to use ground water established pursuant to chapter 90.44 RCW, state common or statutory law existing prior to the enactment of chapter 90.44 RCW, or federal law.
- (10) "Ground water user group" means an established association of holders of ground water rights located within a proposed or designated ground water management area.

(11) "Lead agency" means the agency appointed by the department to coordinate and undertake the activities necessary for the development of a ground water management program. Either the department or an agency of local government may be the lead agency.

(12) "Local government" means any county, city, town, or any other entity having its own incorporated government for local affairs including, but not limited to, a metropolitan municipal corporation, public utility district, water district, irrigation district, and/or sewer district.

(13) "Local government legislative authority" means the city or town council, board of county commissioners, special district commission, or that body assigned such duties by a city, county or district charter as enacting ordinances, passing resolutions, and appropriating funds for expenditure.

(14) "Probable ground water management area" means a specific geographic area identified by the department, in cooperation with other state agencies, local government and ground water user groups, as a candidate area for designation as a ground water management area pursuant to this chapter.

[Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-040, filed 12/20/85.]

**WAC 173-100-050 Probable ground water management areas.**

The department in cooperation with local government and ground water user groups shall identify probable ground water management areas.

(1) Probable ground water management areas may be proposed for identification at any time by the department upon its own motion or at the request of other state agencies, local government or ground water user groups.

(2) Probable ground water management area boundaries shall be delineated so as to enclose one or more distinct bodies of public ground water as nearly as known facts permit. Probable ground water management subareas shall be delineated so as to enclose all or any part of a distinct body of public ground water. Boundaries shall be based on hydrogeologic properties such as limits to lateral extent of aquifers, major perennial rivers, and regional ground water divides or as deemed appropriate by the department to most effectively accomplish the purposes of this chapter.

(3) The criteria to guide identification of probable ground water management areas shall include, but not be limited to, the following:

- (a) Geographic areas where ground water quality is threatened;
- (b) Aquifers that are declining due to restricted recharge or over-utilization;
- (c) Aquifers in which over-appropriation may have occurred and adjudication of water rights has not yet been completed;
- (d) Aquifers reserved or being considered for water supply reservation under chapter 90.54 RCW for future beneficial uses;
- (e) Aquifers identified as the primary source of supply for public water supply systems;

(f) Aquifers underlying a critical water supply service area where the coordinated water system plan established pursuant to chapter 70.116 RCW has identified a need for a ground water management program;

(g) Aquifers designated as sole source aquifers by the federal Environmental Protection Agency;

(h) Geographic areas where the ground water is susceptible to contamination or degradation resulting from land use activities;

(i) Aquifers threatened by seawater intrusion; or

(j) Aquifers from which major ground water withdrawals have been proposed or appear imminent.

(4) The state agency, local government or ground water user group requesting probable ground water management area identification shall provide sufficient information for the department to determine if the area should be so identified. The department and other affected state and local governments and user groups may cooperate in preparing the request for identification.

(a) The request for identification shall be presented in a concise, factual report form and shall consider the guidelines and criteria set forth in subsections (2) and (3) of this section as they relate to the proposed area. It shall also contain: (i) Supporting data as to the need for such identification; (ii) a general description of and rationale for the proposed ground water management area boundary; (iii) goals and objectives for the proposed ground water management area; (iv) an estimated cost of developing the ground water management program and potential funding sources; (v) recommendations for agencies, organizations and groups to be represented on the ground water management area advisory committee; and (vi) a recommendation for the lead agency, taking into consideration the responsibilities contained in WAC 173-100-080.

(b) The recommendation for lead agency shall first be submitted to the county or counties with jurisdiction for written concurrence. Such written concurrence shall be included with the information required in (a) of this subsection. If such concurrence cannot be obtained, the department shall attempt to mediate an agreement between the parties.

(c) The agency or ground water user group initiating the request for identification shall hold at least one public meeting for the purpose of receiving comments from the public, affected local, state and tribal agencies and ground water user groups.

(d) Upon completion, the request for identification shall be submitted to the department and other affected state and local agencies and ground water user groups for their review and comment. Comments shall be submitted to the department.

(5) If the department is proposing an area for identification, the department shall prepare a report containing the information in subsection (4)(a) of this section, hold a public meeting, and submit the report to affected state and local agencies and ground water user groups for their review and comment.

(6) Based upon review of the request for identification together with any comments received and a finding that the proposed area meets the guidelines and criteria of subsections (2) and (3) of this section, the department shall identify the proposed area as a probable ground water management area, establish the general planning boundaries and appoint a lead agency. When a probable ground water management area is included within only one county and that county indicates its desire to assume lead agency status, the department shall appoint the county as lead agency. The department shall notify

affected state and local agencies, ground water user groups, tribal governments and local news media of such identification.

[Statutory Authority: Chapters 43.27A and 90.44 RCW. 88-13-037 (Order 88-11), § 173-100-050, filed 6/9/88. Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-050, filed 12/20/85.]

**WAC 173-100-060 General schedule.**

The department shall establish a general schedule for the designation of specific ground water management areas. The general schedule shall guide the department in the designation of specific ground water management areas and in the allocation of the department's available water resources funding and staffing.

(1) The general schedule for designation of ground water management areas shall identify the relative priority of each of the probable ground water management areas. The relative priority of the probable ground water management areas shall be based upon:

(a) The availability of local or state agency resources to develop and implement a ground water management program;

(b) The significance, severity or urgency of the problems or potential problems described in the request for identification submitted for each area, with the highest priority given to areas where the water quality is imminently threatened;

(2) The department shall revise the general schedule as needed to comply with the intent of this chapter. After each revision the general schedule shall be published in the news media and the Washington State Register. A public hearing will be held in June of each year to receive public comment on the general schedule.

[Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-060, filed 12/20/85.]

**WAC 173-100-070 Designation of ground water management areas for program planning purposes.**

The department shall designate ground water management areas by order of the department in accordance with the general schedule. The department shall hold a public hearing within the county or counties containing the probable ground water management area prior to such designation. The order shall be issued to the lead agency as well as the agency or ground water user group originally requesting identification of the areas, with copies sent to other affected state agencies, local governments, tribal governments and those parties recommended for ground water advisory committee membership. Copies of the order shall be published by the department in newspapers of general circulation within the area. The order shall contain a general description of the planning boundary for the ground water management area and shall state that the department, in cooperation with the lead agency and local government, intends to appoint a ground water advisory committee to oversee the development of a ground water management program for the area.

[Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-070, filed 12/20/85.]

**WAC 173-100-080 Lead agency responsibilities.**

The lead agency shall be responsible for coordinating and undertaking the activities necessary for development of the ground water management program. These activities shall include collecting data and conducting studies related to hydrogeology, water quality, water use, land use, and population projections; scheduling and coordinating advisory committee meetings; presenting draft materials to the committee for review; responding to comments from the committee; coordinating SEPA review; executing inter-local agreements or other contracts; and other duties as may be necessary. The lead agency shall also prepare a work plan, schedule, and budget for the development of the program that shows the responsibilities and roles of each of the advisory committee members as agreed upon by the committee. Data collection, data analysis and other elements of the program development may be delegated by the lead agency to other advisory committee members.

[Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-080, filed 12/20/85.]

**WAC 173-100-090 Ground water advisory committee.**

(1) The ground water advisory committee shall be responsible for overseeing the development of the ground water management program; reviewing the work plan, schedule and budget for the development of the program; assuring that the program is technically and functionally sound; verifying that the program is consistent with this chapter and with the respective authorities of the affected agencies; and formulating and implementing a public involvement plan.

(2) The membership of each ground water advisory committee shall represent a broad spectrum of the public in order to ensure that the ground water is protected and utilized for the greatest benefit to the people of the state. The committee shall include, but not be limited to, representation from the following groups:

- (a) Local government legislative authorities within the designated area;
- (b) Planning agencies having jurisdiction within the designated area;
- (c) Health agencies having jurisdiction within the designated area;
- (d) Ground water user groups within the designated area, including domestic well owners;
- (e) The department;
- (f) Department of social and health services;
- (g) Other local, state, and federal agencies as determined to be appropriate by the department;
- (h) Tribal governments, where a ground water management program may affect tribal waters;
- (i) Public and special interest groups such as agricultural, well drilling, forestry, environmental, business and/or industrial groups within the area, as determined to be appropriate by the department.

(3) The department shall appoint, by letter, members and alternates to the ground water advisory committee after seeking nominations from the groups listed above. Members and alternates shall serve until the ground water management program for the

area is certified. The department may appoint replacement members or alternates upon request of the appointee or the ground water advisory committee.

(4) The lead agency shall hold the first meeting of the ground water advisory committee within sixty days of the appointment of the committee. Public notice shall be given for each meeting. The lead agency shall chair the first meeting, during which the advisory committee shall determine, by general agreement, rules for conducting business, including voting procedures, and the chairperson of the advisory committee.

[Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-090, filed 12/20/85.]

**WAC 173-100-100 Ground water management program content.**

The program for each ground water management area will be tailored to the specific conditions of the area. The following guidelines on program content are intended to serve as a general framework for the program, to be adapted to the particular needs of each area. Each program shall include, as appropriate, the following:

(1) An area characterization section comprised of:

(a) A delineation of the ground water area, subarea or depth zone boundaries and the rationale for those boundaries;

(b) A map showing the jurisdictional boundaries of all state, local, tribal, and federal governments within the ground water management area;

(c) Land and water use management authorities, policies, goals and responsibilities of state, local, tribal, and federal governments that may affect the area's ground water quality and quantity;

(d) A general description of the locale, including a brief description of the topography, geology, climate, population, land use, water use and water resources;

(e) A description of the area's hydrogeology, including the delineation of aquifers, aquitards, hydrogeologic cross-sections, porosity and horizontal and vertical permeability estimates, direction and quantity of ground water flow, water-table contour and potentiometric maps by aquifer, locations of wells, perennial streams and springs, the locations of aquifer recharge and discharge areas, and the distribution and quantity of natural and man-induced aquifer recharge and discharge;

(f) Characterization of the historical and existing ground water quality;

(g) Estimates of the historical and current rates of ground water use and purposes of such use within the area;

(h) Projections of ground water supply needs and rates of withdrawal based upon alternative population and land use projections;

(i) References including sources of data, methods and accuracy of measurements, quality control used in data collection and measurement programs, and documentation for and construction details of any computer models used.

(2) A problem definition section that discusses land and water use activities potentially affecting the ground water quality or quantity of the area. These activities may include but are not limited to:

- Commercial, municipal, and industrial discharges
- Underground or surface storage of harmful materials in containers susceptible to leakage

- Accidental spills
- Waste disposal, including liquid, solid, and hazardous waste
- Storm water disposal
- Mining activities
- Application and storage of roadway deicing chemicals
- Agricultural activities
- Artificial recharge of the aquifer by injection wells, seepage ponds, land spreading, or irrigation
- Aquifer over-utilization causing seawater intrusion, other contamination, water table declines or depletion of surface waters
- Improperly constructed or abandoned wells
- Confined animal feeding activities

The discussion should define the extent of the ground water problems caused or potentially caused by each activity, including effects which may extend across ground water management area boundaries, supported by as much documentation as possible. The section should analyze historical trends in water quality in terms of their likely causes, document declining water table levels and other water use conflicts, establish the relationship between water withdrawal distribution and rates and water level changes within each aquifer or zone, and predict the likelihood of future problems and conflicts if no action is taken. The discussion should also identify land and water use management policies that affect ground water quality and quantity in the area. Areas where insufficient data exists to define the nature and extent of existing or potential ground water problems shall be documented.

(3) A section identifying water quantity and quality goals and objectives for the area which (a) recognize existing and future uses of the aquifer, (b) are in accordance with water quality standards of the department, the department of social and health services, and the federal environmental protection agency, and (c) recognize annual variations in aquifer recharge and other significant hydrogeologic factors;

(4) An alternatives section outlining various land and water use management strategies for reaching the program's goals and objectives that address each of the ground water problems discussed in the problem definition section. If necessary, alternative data collection and analysis programs shall be defined to enable better characterization of the ground water and potential quality and quantity problems. Each of the alternative strategies shall be evaluated in terms of feasibility, effectiveness, cost, time and difficulty to implement, and degree of consistency with local comprehensive plans and water management programs such as the coordinated water system plan, the water supply reservation program, and others. The alternative management strategies shall address water conservation, conflicts with existing water rights and minimum instream flow requirements, programs to resolve such conflicts, and long-term policies and construction practices necessary to protect existing water rights and subsequent facilities installed in accordance with the ground water management area program and/or other water right procedures.

(5) A recommendations section containing those management strategies chosen from the alternatives section that are recommended for implementation. The rationale for choosing these strategies as opposed to the other alternatives identified shall be given;

(6) An implementation section comprised of:

(a) A detailed work plan for implementing each aspect of the ground water management strategies as presented in the recommendations section. For each recommended management action, the parties responsible for initiating the action and a schedule for implementation shall be identified. Where possible, the implementation plan should include specifically worded statements such as model ordinances, recommended governmental policy statements, interagency agreements, proposed legislative changes, and proposed amendments to local comprehensive plans, coordinated water system plans, basin management programs, and others as appropriate;

(b) A monitoring system for evaluating the effectiveness of the program;

(c) A process for the periodic review and revision of the ground water management program.

[Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-100, filed 12/20/85.]

#### **WAC 173-100-110 SEPA review.**

The proposed ground water management program shall be subject to review pursuant to the State Environmental Policy Act, chapter 43.21C RCW, as required under the applicable implementing regulations.

[Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-110, filed 12/20/85.]

#### **WAC 173-100-120 Hearings and implementation.**

(1) Upon completion of the ground water area management program, the department shall hold a public hearing within the designated ground water management area for the purpose of taking public testimony on the proposed program. Local governments are encouraged to hold joint hearings with the department to hear testimony on the proposed management program. Following the public hearing, the department and each affected local government shall prepare findings on the ground water management program within ninety days. This period may be extended by the department for an additional ninety days. The findings shall evaluate the program's technical soundness, economic feasibility, and consistency with the intent of this chapter and other federal, state and local laws. The findings shall identify any revisions necessary before the program can be certified and shall contain a statement of the agency's concurrence, indicating its intent to adopt implementing policies, ordinances and programs if required, or a statement of nonconcurrence with the program if such be the case.

(2) The lead agency will consolidate the findings and present them to the advisory committee. Statements of nonconcurrence shall be resolved by the committee and the program revised if necessary.

(3) The program shall then be submitted by the ground water advisory committee to the department which shall certify that the program is consistent with the intent of this chapter.

(4) Following such certification, state agencies and affected local governments shall adopt or amend regulations, ordinances, and/or programs for implementing those provisions of the ground water management program which are within their respective jurisdictional authorities.

(5) The department, the department of social and health services and affected local governments shall be guided by the adopted program when reviewing and considering approval of all studies, plans and facilities that may utilize or impact the implementation of the ground water management program.

[Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-120, filed 12/20/85.]

**WAC 173-100-130 Designation of ground water areas.**

The procedures provided in RCW 90.44.130 may be utilized by the department to designate ground water areas, subareas, or zones for the purposes described therein either in conjunction with the procedures of this chapter or independently thereof.

[Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-130, filed 12/20/85.]

**WAC 173-100-140 Intergovernmental agreements.**

In order to fully implement this chapter, the department may negotiate and enter into cooperative agreements with Indian tribal governments, adjacent states and Canadian governmental agencies when a ground water management area is contiguous with or affects lands under their jurisdiction. Such cooperative agreements shall not affect the jurisdiction over any civil or criminal matters that may be exercised by any party to such an agreement. Intergovernmental agreements shall further the purposes of this chapter, and shall serve to establish a framework for intergovernmental coordination, minimize duplication, and efficiently utilize program resources to protect ground water resources.

[Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-140, filed 12/20/85.]

**WAC 173-100-150 Appeals.**

All final written decisions of the department pertaining to designation of ground water management areas, certification of ground water management programs, permits, regulatory orders, and related decisions pursuant to this chapter shall be subject to review by the pollution control hearings board under chapter 43.21B RCW.

[Statutory Authority: RCW 90.44.400. 86-02-004 (Order DE 85-24), § 173-100-150, filed 12/20/85.]

**WAC 173-100-160 Regulation review.**

The department of ecology shall initiate a review of the rules established in this chapter whenever new information, changing conditions, or statutory modifications make it necessary to consider revisions.

[Statutory Authority: Chapters 43.27A and 90.44 RCW. 88-13-037 (Order 88-11), § 173-100-160, filed 6/9/88.]

**Appendix D**  
**Management Strategy References**

**Vashon-Maury Island  
Ground Water Management Plan**

**December 1998**

## APPENDIX D

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**Appendix E**

**Recommended Data Collection and Analysis Program**

**Vashon-Maury Island  
Ground Water Management Plan**

**December 1998**

## Appendix E

### Recommended Data Collection and Analysis Program

The following data program elements are based on recommendations from the consultant, as adopted by the Vashon Ground Water Advisory Committee.

#### WATER QUALITY

- A. The monitoring well network (twenty-one wells) used in the development of the Ground Water Management Plan should be expanded with continued implementation of the ground water quality monitoring program. Selection of additional wells should be based on the following:
1. Location within high physically susceptible areas and near coastal areas (to monitor specifically for seawater intrusion);
  2. Completed in the shallowest hydrostratigraphic zone (Zone 1) since this zone is most susceptible to contamination and can serve as an "early warning" to deeper zones;
  3. Spatial distribution within areas to be monitored; and
  4. Accessibility to monitoring personnel.
- B. The selected wells should continue to be monitored for the water quality parameters monitored in this study to build on the established database and confirm observed trends in concentrations. In addition, data from the wells should be compared to the trigger levels. Specifically, additional sampling should be conducted for wells in which increasing levels of contaminants (such as lead) were identified in this study. Wells near the shoreline should be closely monitored for indications of over pumping and associated seawater intrusion.
- C. As part of the monitoring program, a control area should be established for closely monitoring water quality and extrapolating the results to other areas of the Island. The control area should be established based on the following criteria:
1. Location within high physically susceptible area;
  2. Availability of sufficient monitoring points to monitor the shallowest hydrostratigraphic zone across the control area; and
  3. Knowledge of land use activities through wellhead protection studies, review of existing land use maps, and field surveys within the control area to establish cause and effect relationships.
- D. Continue to monitor the water quality of selected wells for potential impacts by point and non-point sources of contamination to provide long term trends in constituent levels. Specifically, continue to monitor the wells identified (including the wells associated with water purveyors) as having constituents above regulatory levels or increasing trends in concentrations of constituents.

- E. Continue to monitor water quality at the mouths of the major streams as an indicator of impacts from land use within the drainage basin. Streams monitored in this study (nine sites) should continue to be monitored since they represent the major drainage basins on the Island and have established access points. The streams should continue to be monitored for the water quality parameters monitored in this study to build on the established database and confirm observed trends in concentrations. Specifically, continue to monitor the creeks identified as having increasing trends in constituent concentrations, from the eight streams originally monitored. Continue to monitor contaminants in shellfish in areas identified as above regulatory levels.
- F. Vashon Landfill. Monitor the water quality data from wells at and around the Vashon landfill collected by the King County Solid Waste Division and the Seattle-King County Health Department to determine if ground water quality is being impacted by landfill contaminants, if the shallow and deep aquifers are interconnected, or connected to water producing zones for public supply. Provide this data to the King County Department of Natural Resources, for inclusion into the database.
- G. NIKE Battery Site. Confirm that ground water has not been impacted at the NIKE site by installing a monitoring well in the area of former paint and fuel storage areas.
- H. Biosolids. If biosolids are disposed on Vashon, evaluate the background water quality around the perimeter of the site for impact of applied biosolids.
- I. Agriculture. Conduct spot checking and long term monitoring of ground water in the vicinity of Island ranches for nitrate, especially at sites located in high recharge areas.
- J. Sand and Gravel. Monitor the Vashon Sand & Gravel well and plant settling pond for ground water quality. Assess land use activities in proximity to this operation.

## **WATER QUANTITY**

- A. Monitor water levels in the monitoring well network (twenty-five wells) to determine long term trends in water levels of the hydrostratigraphic zones. The long-term trends will aid in determining if ground water overdrafts are occurring, or the effects of drought periods on ground water levels. The well network established for this study should be augmented by additional wells (possibly up to twenty wells). Selection of additional wells should be based on the following:
  - 1. Location within high and low physically susceptible areas. Wells in high physically susceptible areas will be more sensitive to the effects of ground

- water recharge, wells in low physically susceptible areas will be more sensitive to ground water overdrafts;
2. Completed in the shallowest hydrostratigraphic zone (Zone 1) since this zone is most susceptible to recharge and overdrafts;
  3. Spatial distribution within areas to be monitored. Data should be collated to show where there are data gaps and to develop cross sections and ground water flow directions; and
  4. Accessibility to monitoring personnel.

The wells should continue to be monitored on either a monthly or quarterly basis. Pumping conditions (on or off and for how long) should be noted at the time of water level recording. Continued monitoring of the wells monitored in this study will build on the established database and observed trends in water levels.

- B. Monitor Island precipitation levels to determine long term trends specific to the Island. The monitoring should be conducted as follows:
  1. Install automatic rain gauge recorders at the locations monitored during this study (nine sites). These locations are representative of the major Island collection basins. The data collected will build on the database established during this study; and
  2. Establish schedule, funding, and personnel to enter data into the database and to collect periodic manual readings for cross-referencing the automatic recorders.
- C. As part of the monitoring program, a control area should be established for closely monitoring water quantity and extrapolating the results to other areas of the Island. The control area should be established based on the following criteria:
  1. Location within high physically susceptible area;
  2. Availability of sufficient monitoring wells to monitor the shallowest hydrostratigraphic zone across the control area; and
  3. Knowledge and/or control of land use activities (such as logging, ground water withdrawal rates) within the control area to establish cause and effect relationships.

The following monitoring activities should be conducted within the control area:

1. Install and monitor automatic rain gauges to record precipitation (the amount of water coming into the control area);
2. Install and monitor automatic stream gauges to record stream runoff (the amount of surface water leaving the control area through direct runoff and the amount of ground water leaving the control area through stream baseflow); and
3. Monitor water levels in selected monitoring wells to determine the effects of recharge and/or ground water withdrawals.

- D. Reactivate the U. S. Geological Survey stream gauging station located on Judd Creek to establish long term trends in stream flow and response to seasonal variations in precipitation.

#### ADDITIONAL ANALYSIS

- A. Ion balances should be constructed for each of the major hydrostratigraphic zones to determine the geochemical signature of each zone. The water within separate hydrostratigraphic zones often has a distinct signature defined by the distribution of ion concentrations. These signatures should be developed and monitored as indicators of contamination as follows:

1. Sample wells identified in this study as completed in each of the hydrostratigraphic zones and analyze for major anions and cations;
2. Construct a Stiff diagram by plotting the concentrations of detected anions and cations. The shape of the diagram will define the signature for the zone; and
3. Changes in the ion distribution should be used as indicators of contamination (such as seawater intrusions) and could be used to aid in establishing trigger mechanisms.

- B. The computerized database management system should be expanded in the following areas:

1. Integrate with the King County databases through the assessor's parcel numbering system;
2. Develop procedures for processing water use information;
3. Expand the data reporting capability to provide better access to the data that is stored in the systems;
4. Develop procedures to facilitate linkage between water utility data stored within PCSTORET with the physical data contained within the database management system;
5. Develop procedures for storing and manipulating stream flow and precipitation data; and
6. Ensure ongoing training and support is provided so that the database and the King County AutoCAD mapping system are effectively used.

Future database management efforts should include field verification of well information. Reporting procedures and funding mechanisms such as the aquifer protection funds user fees will need to be identified in order for long term data management to be successful.