Penrose Point / Mayo Cove
Water Quality Protection Plan

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INTRODUCTION

Puget Sound has long been a center of industrial and commercial development for the Paciffc Northwest. With the dramatic increases in population that the area has experienced in recent years, water quality has become one of our foremost concerns. Public health is threatened through water quality deterioration, and we stand to lose the beneficial use of the Sound's great resources. One of the more important fronts in the battle to protect water quality is nonpoint source pollution (NPS).

By definition, NPS is the cumulative effect of numerous, diverse and widely scattered sources of contamination, which may be non-threatening individually, but which together can amount to a substantial problem. This facet of water pollution is the most difficult to control because these sources can not be traced back to a single location or even to one group of polluters.

The most common elements of NPS pollution include: fecal wastes from pets and livestock and wild animals; failing or poorly functioning on-site sewage disposal systems

(septic systems); storm water from rural as well as urban and suburban areas; and waste discharges from recreational boats.

Since 1980, almost 40 percent of previously-approved commercial shellfish growing areas in Puget Sound have been closed or restricted due to nonpoint bacterial contamination. Recreational harvest is considered to constitute a health risk at 57 of 146 public beaches with shellfish stocks (39 percent), and another 35 beaches are considered to be threatened. The majority of risk is attributed to nonpoint source pollution.

As in much of the Puget Sound region, shellfish harvest is a part of the culture and history of Pierce County. Tribal subsistence and ceremonial harvest has occurred since the area was first inhabited. Commercial shellfish harvest has been an important part of the local economy for many years, and shellfish taken from the county's 16 recreational beaches and hundreds of private beaches for personal use have been a source of nourishment and enjoyment for residents and visitors alike.

By the 1980s, due to increased watershed development, bacterial nonpoint source pollution had limited the areas for safe recreational shellfish harvest in Pierce County to a few rural state and county parks. Most of these public shellfish harvest areas are located on either the somewhat remote Key Peninsula, or on islands in the western part of the county.

Penrose Point State Park is one of the few remaining public recreational shellfish harvest areas in Pierce County. It is the most frequently visited state park in the county and offers a wide range of recreational opportunities to visitors. Over 169,000 visitors enjoyed camping, picnicking, gathering shellfish, swimming, beachcombing, and boating at Penrose Park in 1989. The park has nearly two miles of rocky, sandy, and muddy shoreline habitat with a diverse assortment of sea life. The upland portion of the park has over 140 acres of forest growth with 83 campsites for the enjoyment of park visitors.

At the base of the Mayo Cove watershed, Penrose Point State Park is the recipient of problems caused by water quality deterioration anywhere in the watershed.

WATERSHED DESCRIPTION

The Penrose Point/Mayo Cove Watershed is located on the east side of the Key Peninsula in western Pierce County. The watershed boundary is defined by topographic ridges which direct all drainage toward Mayo Cove. The area of this small sub-watershed of the Key Peninsula Watershed is approximately 2.3 square miles (1500 acres). Its dimensions are 2.8 miles at the longest point by 1.1 miles at the widest.

The unincorporated rural community of Lakebay is located in the watershed, with most of the area's inhabitants living along the waterfront of Mayo Cove and Bay Lake or along major arterials. Bay Lake, the only lake in the watershed is relatively shallow, with a

surface area of 140 acres and a mean depth of 8 feet. It is fed largely through ground water, with a sole outlet at the north end. From this outlet, Mayo Creek flows approximately 0.37 miles to Mayo Cove. Soils in the watershed, as determined by U.S. Soil Conservation Service (SCS) maps, are varied. Only a small percentage readily absorb rainfall, resulting in potentially heavy runoff during rain events.

The watershed is mostly undeveloped forest land (65.7 percent) with other uses including: State Park (9 percent); Bay Lake (9.3 percent); upland residences with lots one acre or larger (7 percent); waterfront residences with lots under one acre (5 percent); agricultural (2 percent); noncommercial [hobby] farms (1 percent); and, commercial business (less than 1 percent).

The climate in the watershed in is temperate, with an average estimated rainfall of 50 inches. Temperatures during the sampling phases of this project ranged from 35 degrees to 70 degrees Fahrenheit.

VALUABLE RESOURCE A TA CROSSROADS

A division of the Washington State Department of Social and Health Services (now the Department of Health, DOH) found the first signs of bacterial contamination at Penrose Point Park in the summer of 1980. A survey of water and shellfish quality indicated a potential problem developing in the inner portions of Mayo Cove.

In the face of increasing development in the watershed, a plan was needed to direct and monitor future water and land use activities. The Washington State Department of Ecology (Ecology) successfully applied to the United States Environmental Protection Agency (EPA)'s National Estuary Program for a grant to fund a water quality project in the watershed. The goal of the project was to assess conditions and develop a comprehensive water quality protection program for the surface water and the shellfish resource within Mayo Cove.

Four objectives were specified to reach the project goal:

1. Determination of surface water and shellfish quality;
2. Mitigation efforts to correct known sources of contamination;
3. A public involvement program to heighten citizen awareness of potential water quality problems in the watershed; and,
4. Development of a management plan outlining policies, standards, and/or ordinances needed to address on-going protection of water quality in Mayo Cove.

The Tacoma-Pierce County Health Department (TPCHD) Water Resources Section was selected as the lead agency for the project, with assistance from DOH and oversight from Ecology and EPA. Sources of water pollution that were revealed during the study concerned five sites. In three instances stormwater problems were referred to the Pierce County Public Works Department for correction. In two instances poor animal-

keeping practices were referred to the local Conservation District, with one of those also being referred to Ecology's Agricultural Enforcement officer.

A sanitary survey of residences in the watershed was conducted by the Tacoma-Pierce County Health Department. Participation in the survey fell below expectations, but all tenants did receive informational materials. To assess the possible impacts of recreational use of the waters, a survey of boats using the park dock the adjacent Lakebay Marina and the moorages in the cove was conducted early in the project.

A citizen advisory group, the Mayo Cove Protection Committee (MCPC), was formed to provide input from a variety of business, boating, education, local government, and area resident viewpoints on water quality and the measures necessary to control water pollution. A public information program rounded out the project, and included participation in local events, a school contest and a local fair. Other Pierce County watershed management plans were reviewed for alternatives in land-use planning, and personnel from county planning and storm water control agencies were interviewed for advice about the most successful and cost effective NPS pollution abatement measures.

The Penrose Point/Mayo Cove Water Quality Management Plan includes sites recommended for immediate action, locations and frequencies for on-going monitoring, and proposed land-use guidelines for future development in the watershed. It is the result of many hours of field work data collection and analysis, public surveys and citizen input

RECOMMENDATIONS FOR WATER QUALITY PROTECTION

After a thorough evaluation of water and shellfish quality, a survey of current land uses and sewage disposal systems, and various meetings and events to increase public awareness and receive input on water quality issues, the need for planning for the future is apparent. Prompt action is recommended in the following areas:

1. Area Designation

The Penrose Point/Mayo Cove Watershed should be designated as a critical natural resource area under the Legislature's Growth Management Act of 1990. This designation would be consistent with Pierce County's sensitive area ordinance. The State Environmental Policy Act (SEPA) process will be activated and will provide area citizens and local-government agencies an opportunity to review and comment on most land use proposals in the watershed.

The watershed should further be included in a shellfish protection district, under Engrossed Substitute Senate Bill 6132. This will permit the development of funding options to local government for watershed protection projects and will facilitate funding from state water quality programs.

Citizens, with state and local agency support, should approach their elected representatives with a request for sensitive area status. State and local agencies can give guidance and technical support to the initiative.

2. On-Site Sewage Disposal Regulations

A Critical Area designation and incorporation of a shellfish protection district will permit the enforcement of special on-site sewage system (OSS) regulations. Better treatment of sewage effluent can be achieved by increasing the unsaturated soil depth required for installation of an OSS and/or requiring a higher level of treatment prior to disposal. In addition, increasing the minimum lot size required for installation of an OSS will provide area for reserve drainfields.

These measures will result in the protection of surface and ground waters and reduce the contamination that reaches the shellfish of Mayo Cove.

In addition to more protective on-site sewage disposal regulations, periodic sanitary surveys should be mandatory in sensitive areas. Policy makers should seek to establish a fund for low interest loans for septic system repair within the survey area. State Revolving Fund dollars are available for this purpose.

3. Land Use Regulations

Lot size requirements for any new subdivision of property in the watershed should be increased to preserve the rural values and minimize the impact of land development on water quality. The minimum lot size in the watershed should be two acres, regardless of soil type, slope or proximity to surface water. This size allows ample room for construction of buildings, a water supply (if necessary) and a sewage disposal system which features space for a reserve drainfield, and sufficient for areas to be left in natural cover.

Lowerdensity will give runoff more opportunity to infiltrate on the site and reduce the amount of contamination that is carried to Mayo Cove Natural vegetation buffers enhance on-site absorption of storm runoff, filter pollutants from runoff leaving the site and reduce the likelihood of erosion. Buffer areas of undisturbed natural vegetation should be left on the perimeter of developed property. Wider buffer areas should be left between any form of surface water or wetland and animal keeping areas, areas of clearing, grading, construction or other development activities. The width of buffers should be based on gradient, type of soils, and character of the vegetative cover, as well as intended land-use. A minimum of 50 feet is recommended in areas adjacent to surface waters, wetlands and drainage ditches.

Reducing site coverage reduces the quantity of runoff generated. A minimum of impervious surface (rooftops, sidewalks, paved driveways and parking lots) provides a maximum of on-site absorption area for storm water and reduces the volume and speed

of runoff from the site. The maximum amount of a site covered by impervious surfaces, should be as follows (by percentage of total lot size):

i) For single family residential sites: 20 percent;
ii) For commercial and multifamily residences where engineered storm water plans are submitted: 30 percent;
iii) Commercial and multifamily residences without engineered storm water plans: 20 percent.

4. Storm Water Control

Whereas storm water districts in other Puget Sound localities are source specific, shellfish district legislation provides for water quality protection from a broad array of sources. In areas where there are valuable shellfish harvesting resources, such as in Mayo Cove, shellfish protection district designations can facilitate the adoption of storm water control measures. Development creating impervious surfaces on a property should include a storm water disposal or control system. Single family residences require at minimum, a method of controlling roof drainage on-site. Any development with extensive amounts of impervious surfaces should have an engineered drainage facility; that facility with a large storage volume and slow release of the storm water from the facility.

The Pierce County Public Works Department needs to make water quality protection one of their highest priorities, especially in sensitive watersheds such as the Penrose Point/Mayo Cove Watershed. A county-wide stormwater quality improvement program must begin with the institution of simple, but effective water quality protection measures such as: grass-lined swales prior to discharge to surface or ground waters; check dams to slow the velocity of stormwater prior to discharge; and conservative design of holding and conveyance facilities with protection from large surges in stormwater volume. The three areas in the Penrose Point/Mayo Cove Watershed where stormwater was shown to be a significant contributor to water quality degradation need controls such as those listed above. Together with buffer areas, reduced development density, reduced site coverage, and conservative design of storm water systems, a county stormwater quality improvement plan will greatly reduce the quantity and improve the quality of storm runoff in the watershed.

5. Grading, Filling and Clearing

Disruptive activities such as site grading, filling and clearing can have a dramatic effect on water quality. These activities alter the capacity of the soil to absorb storm runoff, cause dramatic increases in siltation, fill in beneficial wetlands and open portals through which surface contamination can reach ground water. Seasonal timing of grading, filling and clearing can be critical. If these activities are conducted during times of moderate to high rainfall, the disturbed soil and lack of site vegetation can lead to heavy erosion and siltation of downstream surface waters.

All grading, filling and clearing in the Penrose Point/Mayo Cove Watershed should be conducted in accordance with the Pierce County Grading, Filling and Clearing Ordinance. All grading, filling and clearing should be restricted to the months of May through October, when rainfall is minimal. Any work done at the end of the season should utilize methods designed to protect exposed soils, i.e. mulches, rapidly growing ground cover, etc. In addition, those proposing site grading, filling and clearing adjacent to surface waters should be required to submit a site alteration plan to the appropriate agency and undergo review and comment in accordance with SEPA.

6. Agricultural Practices

Many agricultural activities cause water quality degradation. These include overgrazing by livestock, unrestricted livestock access to surface water, improper use of fertilizers and pesticides, and improper manure storage. In all of these situations, either a chemical product, eroded soil, and/or animal waste reach surface or ground water. Best Management Practices (BMPs) for agriculture have been established and shown to improve water quality in watersheds where they are used. Assistance programs exist to help operators of commercial and noncommercial farms alike to establish BMPs.

Conservation Districts assist with the development of farm plans, which outline BMPs that specifically apply to the site. The State Revolving Fund is available for small or no-interest loans to implement the farm plan.

It is recommended that all commercial farming operations in the Penrose Point/Mayo Cove Watershed be reviewed by Pierce County Conservation District (CD) personnel. The aim of the review should be to assist the operator with the formulation and implementation of a farm plan for water quality protection. Each noncommercial farm in the watershed should also be reviewed by CD personnel to determine whether BMPs are in place. A follow up and review of each commercial and noncommercial farm should be conducted at least every five years to ensure that farm plans are functioning and effective.

7. Recreational Boating

Wastes from recreational boats visiting Mayo Cove have been one of the greatest concerns of area citizens. Water and shellfish sampling events in the Penrose Project have indicated that Mayo Cove contains higher levels of fecal coliform bacteria when a large number of boats are present. A survey of boaters visiting Mayo Cove showed that the lack of facilities to dispose of wastes was one of their greatest concerns. The majority of respondents admitted they discharged sewage while in transit between destinations, but not at their destination.

The use of a portable pump-out facility or installation of a boat sewage pumpout station adjacent to the cove or a nearby cove is strongly recommended. A conveniently located, properly maintained sewage disposal facility would be supported by boaters and non-boaters alike. There are currently grant monies available to design and install

these facilities in locations where they will best protect water quality and benefit the public. The Washington State departments of Parks, Ecology, and Health, with the assistance of citizens and the local health department, must make a commitment to the installation of a sewage pump-out facility in Mayo Cove or nearby in the Key Peninsula area.

8. Monitoring of Water and Shellfish Quality

To evaluate the success of this plan in maintaining acceptable water and shellfish quality in Mayo Cove, a program of monitoring is necessary. At least two fresh water sampling events should be conducted in the wet season each year. Samples should be collected at the mouths of all of the tributaries and major storm drains flowing into Mayo Cove and at the problem sites identified in the Summary Report on Corrective and Enforcement Actions. One of these events should be conducted under heavy rainfall conditions.

Marine water samples should be collected concurrently with both fresh water sampling events and at least once during a warm summer weekend. In each event at least one sample should be collected from each of the project sites used in the 1989/90 EPA demonstration study. At least one shellfish sample should be collected concurrently with the summer marine water quality sampling event. The locations of these sample sites can be found in the technical reports of the Penrose Point/Mayo Cove Study.

Monitoring results should be made available to the public on an annual basis through the local branch of the Pierce County Library in Key Center, state and local parks, environmental and health agencies, and through the community's representatives on the Mayo Cove Protection Committee.

9. Public Involvement and Education

The most productive use of resources to protect water quality in Mayo Cove will be in public involvement and education. A small effort on the part of the many individuals who live, work or play in the watershed can have a much greater effect than a great deal of effort on the part of any government agency. It should be a major objective of health and resource agencies to provide technical and financial assistance and encouragement to citizen groups in protecting and preserving water and shellfish quality for future generations.

This process was begun during the course of the Penrose Point Project, with the formation of the Mayo Cove Protection Committee. In 1991 the possibility of creating a combined citizen/agency work group was discussed among MCPC members and resource and health agencies. Work on this effort continues at this time. It is this kind of work group that is needed, enlisting local citizens to work for water quality protection, to ensure that the area's elected representatives know that water quality is important to their constituents and to best utilize the resources of government agencies.

The successful formation of the Key Peninsula Water Quality Work Group should be a top priority of this water quality plan implementation process. Only through such cooperation will the more difficult and sensitive elements of this plan, the installation of a boat sewage pump-out station and the land use management recommendations, be accomplished.