The Chehalis/Grays Harbor Watershed Dissolved Oxygen, Temperature, and Fecal Coliform Bacteria TMDL

Detailed Implementation (Cleanup) Plan

November 2004
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Developed in collaboration with the
Chehalis Basin Partnership's Water Quality Committee

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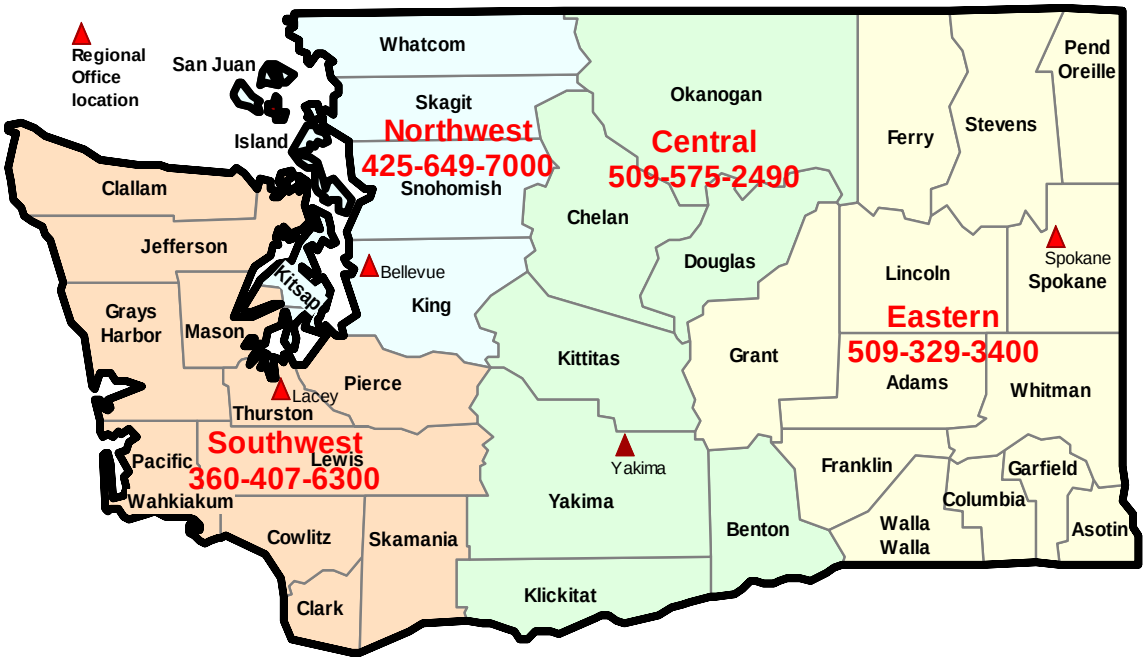

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Acronyms and Definitions

BMPs	Best Management Practices
BOD	Biological oxygen demand
CBP	Chehalis Basin Partnership for Watershed Planning
(The) Basin	Chehalis River/Grays Harbor Watershed Basin
CRP	Conservation Reserve Program
CREP	Conservation Reserve Enhancement Program
DFW	Washington Department of Fish and Wildlife
Ecology	Washington Department of Ecology
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
FC	Fecal coliform bacteria
DO	Dissolved oxygen
Load	A measure of the total amount of pollution carried by the water (*i.e.*, concentration x flow).
Loading capacity	The amount of pollution a water body can tolerate and remain healthy. (Meets state water quality standards)
mL	Milliliter
NRCS	Natural Resources Conservation Service
NTU	Nephelometric Turbidity Units
90th percentile	The concentration which includes 90% of measurements – 90% of water quality samples won't exceed this value.
10^{th} percentile exceedence	The concentration of pollutant that no more than 10% of samples may exceed.

O & M	Operations and Maintenance
Point of compliance	A water quality sampling location that is critical for showing that water cleanup goals have been achieved.
Waters of the state	"Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington" from RCW 90.48.020.
TMDL	Total Maximum Daily Load – the amount of pollution prescribed for each pollution source, plus an additional amount reserved for future growth, to assure that the cumulative loading from all sources will not exceed water quality standards.
TOC	Total organic carbons
Watershed	The area that drains into a given body of water.
WRIA	Water Resource Inventory Area, an administrative term applied to certain large watersheds.

Introduction

The federal Clean Water Act requires states to develop water cleanup plans (also known as Total Maximum Daily Loads or TMDLs) for impaired rivers, lakes, and streams. Impaired waters are those that don't meet Washington State water quality standards. In addition, the settlement agreement of a lawsuit on behalf of Northwest Environmental Defense Center requires the Washington State Department of Ecology to complete TMDLs by 2013, for all the impaired water bodies identified as of 1996. The Chehalis River and most of its tributaries are among more than 650 water bodies in Washington State that are included in that requirement. As part of an agreement on the implementation of section 303(d) of the federal Clean Water Act, Ecology must prepare a "Detailed Implementation Plan" (DIP) that describes a process for restoring and protecting water quality. The DIP includes a monitoring plan and a process for measuring success. This document is the DIP for 114 impaired river segments named in seven TMDLs in the Chehalis/Grays Harbor watershed. The TMDLs and their associated number of impaired segments are:

- Upper Chehalis Dissolved Oxygen TMDL, 1999 (26 segments)
- Upper Chehalis Temperature TMDL, 2000 (19 segments)
- Grays Harbor/Chehalis Fecal Coliform Bacteria TMDL, 2002 (23 segments)
- Upper Chehalis Fecal Coliform Bacteria TMDL, 2004 (17 segments)
- Upper Chehalis River Dry Season TMDL Study, 1994 (19 segments)
- Black River Wet Season Non-Point Source TMDL Study, 1994 (7 segments)
- Black River Dry Season TMDL Study, 1994 (3 segments)

Other documents related to the Chehalis TMDLs are available through the Washington State Department of Ecology web site at http://www.ecy.wa.gov/programs/wq/tmdl/index.html.

This plan is based on the technical assessments and decisions reported in the TMDL documents. The basic implementation concept for achieving pollution reductions in the Chehalis/Grays Harbor watershed is that existing programs and requirements, if fully funded and implemented, should result in meeting the TMDL targets. This document describes those existing programs and implementing organizations, establishes a schedule for implementation, and explains how monitoring of water quality and implementation activities will be used to track progress, as well as indicate when adaptive management procedures need to be employed. Significant programs and regulations currently available include:

- State and County On-Site Septic System Statutes, Rules, and Ordinances
- Dairy Nutrient Management Requirements, Technical Assistance, and Funding
- Non-Dairy Agriculture Technical Assistance and Funding
- Facility Wastewater Discharge Permitting Program (NPDES Permits and Regulation)
- Federal and State Clean Water Statutes and Rules for controlling pollution from facilities and nonpoint sources (*e.g.*, Federal Clean Water Act, State Water Pollution Control Act)

- Federal and State Financial Assistance Programs (*e.g.*, EQIP, CREP, CRP, FREP, 319, grants for non-point source pollution prevention, State Centennial Grants, State Revolving Fund Loan Program)
- State Fish and Forest Requirements (*i.e.*, State Forest Practices Act)
- Federal and State Stormwater Control Programs

The extent to which these programs are expected to help achieve successful implementation of this cleanup plan is summarized in the *Reasonable Assurances* section of this document.

Low dissolved oxygen, high temperatures, and bacterial contamination caused by a combination of pollution and natural factors have been measured in the basin. Water supplies, fish and wildlife habitat, and recreational uses of the water have been compromised as a result. Ecology began TMDL studies in the basin in 1990 in order to understand and begin formulating a response to the pollution concerns. The studies assessed water quality conditions, identified the sources and relative amounts of pollution being contributed to the impaired areas, determined loading capacities for oxygen demanding materials, fecal coliform bacteria, and temperature; and then recommended specific pollution reductions and some strategies to restore water quality to state standards. The TMDL reports provided wasteload allocations for facilities regulated by National Pollution Discharge Elimination System (NPDES) permits, and load allocations for particular stretches of the rivers and streams impaired by human related non-point source pollution.

Significant partnerships have evolved to focus on restoring and protecting water quality in the Chehalis Basin. Partners include citizens/landowners, Indian Tribes, businesses and agricultural commodity groups, local/federal/state government, natural resource management program personnel, and non-profit groups. One important product of those partnerships was the *Chehalis River Basin Action Plan for the Control of Nonpoint Source Pollution*—approved by the Department of Ecology in 1992. Also, a coordinating group called the Chehalis Basin Partnership (CBP) was recognized in 1998 as the planning unit to receive state funding to complete a Chehalis Basin Watershed Management Plan. That plan was completed in June 2004 and includes a section on water quality protection goals and strategies identified by the CBP. Because the usefulness of water supply is closely linked to water quality, previous TMDL "summary implementation strategy" reports (identified in the first paragraph above) called for detailed restoration planning to be conducted within the framework of the CBP watershed planning.

Purpose

This DIP for TMDLs in the Chehalis/Grays Harbor Watershed is intended to complement and build on the work described above. It fulfills a required next-step for describing a strategic approach to achieve the pollution reductions that were identified in the previous project phases. This DIP advances the TMDL technical studies, and the less detailed and conceptual cleanup approaches described in the earlier TMDL Summary Implementation Strategies. This DIP does not add to, or change wasteload or load allocations determined in the TMDLs approved by EPA. It is expected to meet Ecology's TMDL program responsibilities while addressing the water quality management interests of the CBP and others throughout the basin.

This DIP was developed in collaboration with the water quality committee of the CBP, and is available to the CBP for incorporating into their comprehensive watershed management plan. The authors also hope that this plan will help to coordinate the work of the many water stewardship programs in the Basin.

It should be acknowledged that since 1994 when the earlier water quality study reports were first published, there has been tremendous investment and effort made to reduce pollution from treatment plants and nonpoint sources alike. Many millions of dollars have been spent to not only plan, but also implement water cleanup measures. Cities and some industries in the Basin have improved their treatment plant facilities and processes. Agricultural BMPs and dairy management improvements are also evident in many parts of the Basin, and health department programs have helped reduce sewage inputs from failing septic systems and other facilities to the surface waters. Although water quality improvements have occurred in many areas of the basin, it could take decades for all parts of the Basin to achieve water quality standards for all parameters (*i.e.*, shade and implementation of additional elements of the Forest and Fish Agreement needed for long-term temperature improvements).

Overview

The Chehalis River Basin (Basin) lies between the Deschutes River Basin on the east and the Cowlitz River Basin on the south, the Willapa Hills on the west, and the Olympic Range on the north (Figure 1). The Basin includes parts of Lewis, Thurston, Cowlitz, Pacific, Grays Harbor, Mason, Jefferson, and Wahkiakum counties.

The Chehalis River Basin is the second largest river basin in the state of Washington. (The largest is the Columbia River Basin.) The total drainage area of the Chehalis River Basin is 2,660 square miles of which approximately 85 percent is forestlands. Approximately 257 square miles (164,000 acres) or 9.7 percent of the Basin is agricultural land. The Chehalis River system is largely rain-fed with precipitation levels which ranging from 45 inches per year in the Eastern Chehalis River valley to over 200 inches in the Olympic Mountains. Estimated average annual discharge of the entire basin is 11,208 cubic feet per second (cfs).

The four major population centers: Chehalis, Centralia, Aberdeen, and Hoquiam, depend on surface waters of the basin for the largest portion of their municipal and industrial supplies.

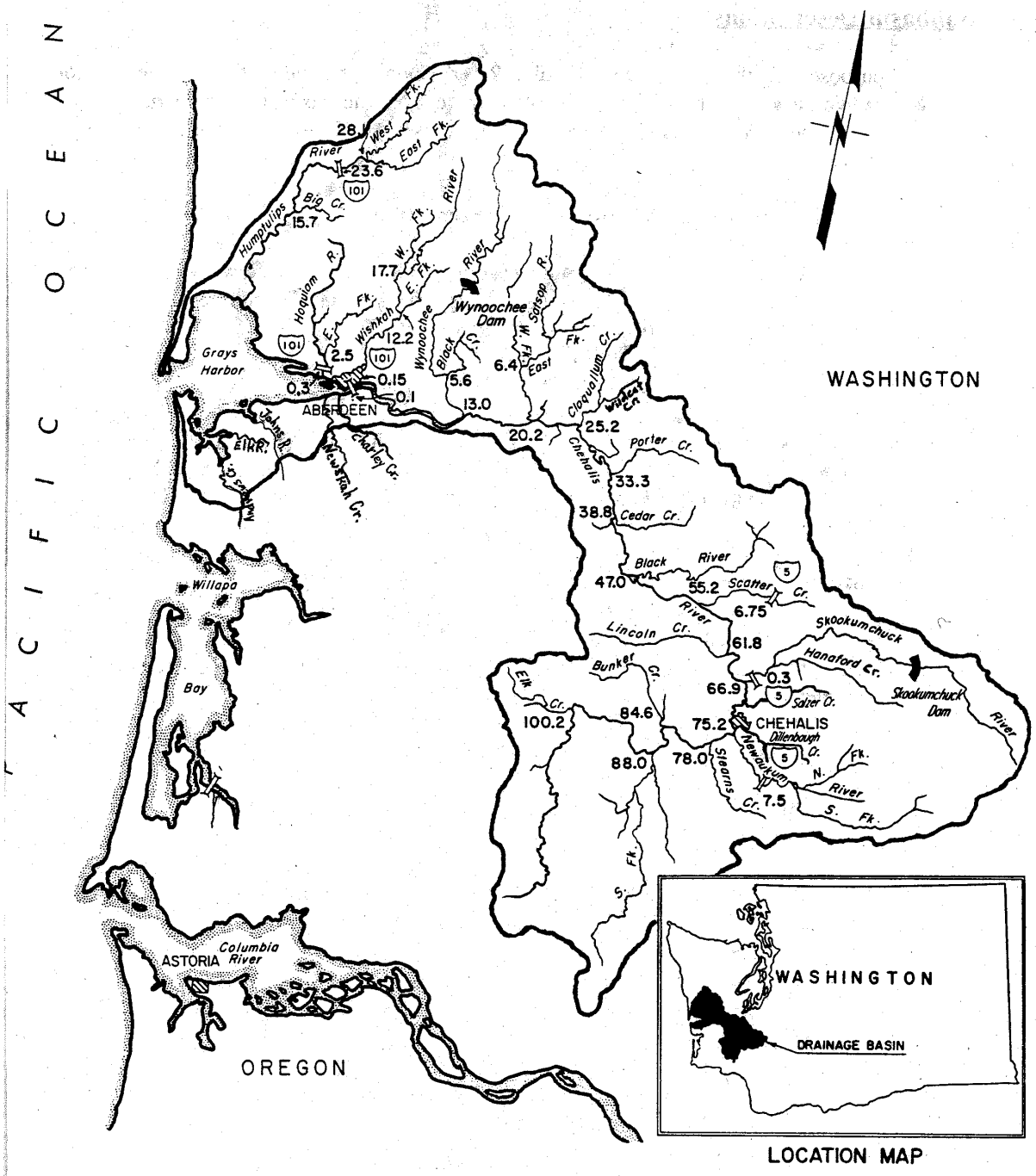
The principal industrial use of water is in the manufacturing of wood, pulp, and paper products. Aberdeen's industrial water system supplies most of this water from the Wynoochee River, with the remainder from Lake Aberdeen.

Land within the Basin is mostly forest cover with interspersed agricultural and residential areas. Forestlands, which constitute approximately 77 percent of the Upper Chehalis Basin (upstream of Porter) and 91 percent of the lower basin (downstream of Porter), are generally located on the upland areas with scattered amounts on bottomlands. Most forested acres are corporation-owned with the remainder being privately or government-owned (Capitol State Forest, Mt. Baker-Snoqualmie National Forest and Olympic National Forest). Intensive agriculture and irrigation occur mostly in the low-lying valleys along the Chehalis River and its tributaries. Commercial farms in the basin are following national trends of increased acreage and reduced numbers. Primary use of agricultural land is crop production (133,000 acres). Pasture comprises 1.8 percent, or 31,000 acres, of the Basin (USDA, 1975).

Although the Chehalis Basin has a high proportion of forestlands, development is concentrated in areas close to important Basin streams and rivers, and this can have adverse impacts on water quantity and water quality. Although only 11 percent of the basin, as a whole, is in agriculture, urban, or industrial uses, this figure climbs to 42 percent in those areas within one mile of the major Chehalis Basin Rivers. These streams are the Chehalis main stem, South Fork Chehalis, Newaukum, North Fork Newaukum, South Fork Newaukum, Skookumchuck, Black, and Satsop main stem. The developed segments of these water bodies account for almost half the length of the major rivers in the Basin.

The resident and anadromous fish resources are of national, local, and international economic significance. Sport, tribal, and commercial fishing are important to the economy of the Chehalis Basin.

Figure 1.



CHEHALIS RIVER BASIN
RIVER MILE INDEX

The Approach

This plan is meant to be a reasonable and realistic approach to achieving water quality standards within a realistic timeframe under challenging environmental, socio-political, and economic conditions. It is based largely on the belief that encouraging voluntary actions and implementing existing regulations is the best way to achieve lasting improvement in the Basin. While the plan calls for reductions of both point source and nonpoint source pollution, most of the pollution in the Chehalis Basin comes from nonpoint sources.

In general, this plan identifies and incorporates outreach and technical assistance to help landowners and citizens understand what causes pollution and how to prevent it. By many accounts, written within the "values" of the Chehalis Basin Partnership expressed in community meetings and personal conversations, people throughout the Basin generally agree that water quality is important to their quality of life. Water quality is also very important for protecting land and property values. Property on or adjoining polluted water is often stigmatized as being less desirable for purchase, and loan approvals usually require access to clean water as essential to protect both current and future use and value of the property. In areas affected by a TMDL, future land use (*i.e.*, expansion or new enterprise) is typically restricted to activities that assuredly won't add pollution to the affected water body. In essence, it becomes much more challenging for an area affected by polluted water to attract new ventures for economic growth.

Compared to previous conceptual cleanup plans known as Summary Implementation Strategies (SISs), this DIP is intended to serve as a more complete work plan to coordinate work efforts addressing dissolved oxygen, temperature, and bacteria impairments. It describes an expected path for continued progress. Features of this DIP include:

- A more complete description by the implementing parties of their intended cleanup activities and schedule.
- Interim water quality targets and schedules for use as performance measures in the ongoing assessment of progress towards water quality standards.
- Description of a plan to track implementation of actions as well as monitor water quality improvements so that cleanup activities can be modified when it is appropriate.
- A description of likely sources of funding or other non-monetary resources to use for current and new work to keep the water clean.

A voluntary approach must be more than general encouragement to take those actions which may improve water quality and to refrain from those that don't. To be effective, a voluntary approach should be active and should include at least the following general elements:

(1) Assemble and publicize information on those locations where water quality is good.

(2) Assess existing protections that these high quality waters have, and understand how and why they support high quality waters.

(3) Identify areas where existing protection programs are not likely to be effective.

(4) Identify voluntary mechanisms and incentives that can improve protection where needed.

(5) Obtain resources to implement voluntary approaches.

(6) Provide technical assistance.

(7) Publicize successful voluntary efforts and recognize successful individuals and institutions.

(8) Monitor to assess success.

(9) Apply adaptive management to make improvements where needed.

While every effort will be made to achieve voluntary compliance, this plan also acknowledges that enforcement of existing regulations will continue as an implementation tool. The Water Pollution Control Act (chapter 90.48 RCW) provides broad authority to issue permits and regulations, and prohibits all discharges to waters of the state. The act openly declares that it is the policy of the state to maintain the highest possible standards to ensure the purity of all waters of the state and to require the use of all known, available, and reasonable means to prevent and control water pollution. The act defines waters of the state and pollution and authorizes the Department of Ecology to control and prevent pollution, to make and enforce rules, including water quality standards. Ecology is charged with enforcing that law and will apply enforcement, if it becomes necessary to achieve the water quality goals of this plan. The act also designates Ecology as the state water pollution control agency for all the purposes of the federal Clean Water Act. Under this statute, Ecology is authorized to administer wastewater disposal permits and to require prior approval of plans and methods of operation of sewage or other disposal systems.

In simple terms, the general approach for TMDL implementation will be to:

- Provide technical assistance and help permitted facilities find financing to make needed changes that will help them meet permit limits required for water quality protection.
- Support the work of health department programs to help homeowners properly maintain their on-site septic systems—including local programs for education/outreach, financial assistance, or enforcement.
- Foster continued coordination among the farm service agencies, natural resource agencies, and agricultural landowners so that technical and financial assistance can continue to help expand implementation of BMPs for improving farm goals including water quality protection.
- Develop a coordinated monitoring program to track the implementation of activities and programs called for in the DIP.
- Assure that current data is available over the foreseeable future to show where water quality improvements have occurred and where our scarce cleanup resources should be focused next for the highest return-on-investment.

The approach is to complete and implement a realistic plan, monitor for success, and continuously adapt or refocus implementation where monitoring shows that changes are needed.

Implementation will be contingent on available funding and the ability of the implementing parties to incorporate and prioritize the plan activities into their current programs and budgets. In many cases permit requirements, compliance orders, and other legal agreements (*i.e.*, consent decrees) compel entities to secure funding and ensure implementation. Financial assistance opportunities described later in this DIP are available for implementing both point source and nonpoint source controls.

Pollution Sources and Corresponding Organizations

A. Pollution Categories

1) Agriculture, Permitted

Any livestock operation which meets the definition of a concentrated animal feeding operation (CAFO) in the federal Clean Water Act is required to operate under an NPDES Permit. A CAFO is an animal feeding operation (AFO) that either has a documented discharge to surface water or exceeds a specific number of animals. An AFO is a facility that confines animals in an area with no vegetation for at least 45 days in a 12-month period. In general, any dairy which confines over 700 animals will be a CAFO, and any dairy which is a documented source of pollution and meets the definition of a CAFO needs to apply for an NPDES dairy general permit. The statutory timeline provided for in RCW 90.64 applies to permitted dairies unless an administrative order specifies an earlier date. A beef AFO would need to have 1000 animals confined, or less than 1,000 animals and a discharge to be a CAFO. They would need to apply for an NPDES individual CAFO permit.

The 1998 Agricultural Compliance Memorandum of Agreement (MOA) of the Department of Ecology, Washington State Conservation Commission, and the Conservation Districts (CD) describes how the CDs and Ecology will interact in addressing agricultural pollution problems.

The MOA is scheduled to be updated, and should add the role of the state Department of Agriculture who took over responsibility for administering the state Dairy Nutrient Management Program on July 1, 2003. The Department of Ecology will maintain its role in administering water quality protection rules. When they signed the MOA in 1998, the CDs in the Chehalis Basin chose to operate at a compliance level of three (level 4 being the most assertive role).

CDs typically respond to dairy referrals on a high-priority basis. The agreement defines a consistent set of steps that coordinate Ecology's water pollution control responsibilities with the CDs programs that provide technical assistance programs to landowners and farm operators. The steps currently are:

a. Ecology receives an agricultural pollution complaint, then verifies whether the complaint is valid or not. If a pollution problem is verified, the farm is referred to the local CD for

assistance. If the problem is an immediate or substantial threat, Ecology is committed to require immediate corrective action that will stop the pollution discharge. Cleanup may be a part of Ecology's request (for example) if a toxic plume exits the site of discharge and presents continued substantial threat downstream.

b. Usually, the farmer, working with the CD, has up to six months to develop a farm plan and an additional 18 months to implement the plan.

c. If the farmer chooses not to work cooperatively with Ecology or the CD, Ecology will take appropriate action, which may include formal enforcement.

In some situations, Ecology may initiate the investigation/enforcement process rather than responding to a complaint. The response to dairies determined to be discharging wastes to surface waters (or waters of the state) will typically be a formal enforcement action, without first being referred to the local CD. A referral to the CD is most often appropriate for minor problems at agricultural operations, but it is typically not a timely or appropriate response for a direct discharge from a commercial dairy. This would typically be a situation where the environmental concern is heightened, such as when a high-volume discharge creates a significant risk to people or the environment, or perhaps if water quality violations are being addressed through a TMDL.

On July 1, 2003, the Washington State Department of Agriculture (WSDA) assumed the role for the enforcement of all dairy operations in the state. ESSB 5889 mandates this transfer from the Department of Ecology to Department of Agriculture. Ecology and WSDA are negotiating a Memorandum of Understanding (MOU) that will establish WSDA's administration of the current Dairy Nutrient Program and development of the larger federal Animal Feeding Operation (AFO) and Confined Animal Feeding Operation (CAFO) program under the Clean Water Act. Under this program, operations classified as either small, medium, or large CAFOs will require an NPDES permit. While WSDA seeks authority to issues these permits from EPA, Ecology will continue to issue and administer all necessary NPDES permits.

2) Agriculture, Non-Permitted

Any agricultural activity that is not required to operate under an NPDES permit is considered "non-permitted" as described below. These are typically farms involved in livestock or dairy production. The Chehalis Basin is home to approximately 36 non-permitted dairies, and many other commercial-sized poultry or beef cattle operations. Perhaps thousands of smaller "hobby-farm" livestock operations occur on small-acre plots.

Dairies:
Dairy farm "headquarters" typically include the home site, cattle housing and confinement areas, milking facilities, feed storage areas, equipment sheds, waste handling collections, and storage facilities. The average dairy milks about 250 cows and some maintain replacement stock.

Many dairy farms in the Chehalis Basin are located in flood plains or are adjacent to rivers or streams (surface water). Feed waste, silage leachate, milk-house drainage, and manure from animal confinement areas or manure storage facilities can be sources of polluted runoff from these dairy operations. The major water pollution concerns include bacterial pollution from

manure, and lower oxygen levels that result from the biological process of the organic waste runoff being decomposed in the receiving water.

Farm management systems are being designed and built to collect, handle, transfer, and store manure, feed waste, silage leachate, and milking center wastewater. Approved dairy plans call for collection of runoff from animal confinement areas (including outside lots and slabs) into waste storage facilities. Livestock watering and other activities for managing livestock must be controlled in ways that prevents the animals from polluting "waters of the state" (includes "lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington"-RCW 90.48.020).

The following practices may not be required but they can help to prevent pollution of water by dairy as well as non-dairy operations:

- Vegetated buffers provide habitat and help to reduce sediment, nutrient, bacteria, and organic matter inputs to watercourses.
- Pasture management should be emphasized to encourage good use of the land as a resource for forage production as well as a soil cover/stabilizer.

Class A dairies are regulated by Washington's Dairy Nutrient Management Act, RCW 90.64, and must have and implement a dairy nutrient management plan (DNMP). A DNMP describes how to manage nutrient-rich byproducts of dairy operations. In most cases, these byproducts will be applied to pasture and hay lands. When manure is applied to land, the DNMP must identify when growing plants are able to capture and use nutrients for plant growth. The DNMP also must identify times of year and weather conditions when land application of these byproducts could pollute surface or groundwater (and therefore should not be land-applied). Plans are approved by the Conservation Districts and all plans must have been approved by July 1, 2002. The final step of dairy farm planning is certification of the DNMP. This is a two-part process in which:

- The Conservation District certifies that the practices necessary to manage the byproduct nutrients from the dairy operation have been properly installed.
- The dairy producer certifies that he or she is managing the nutrients as the plan is designed and intended to be used.

All DNMPs were to be implemented by December 31, 2003. Most of the dairies in the Basin have developed a DNMP. Assuming that funds are requested by the Conservation Districts to fully implement their review and certification of plans, the statutory goals and deadlines will be met for active dairies.

Non-Dairy Commercial Livestock:
Commercial livestock operations are similar to dairies except that they don't include milking facilities and the animals tend to spend more time on pasture. These farms typically include fenced livestock pastures or feedlots.

Conservation practices recommended for livestock operations are meant to improve forage production, nutrient utilization, water quality, and fish and wildlife habitat. Appropriate implementation of BMPs will help prevent problems like erodible farm soils from weakened pasture or over-grazed or over-trodden areas. BMPs can prevent transport of these and other organic livestock waste to waters of the state. These materials are most susceptible to being transported to nearby surface waters during higher rainfall periods which often occur November through March of each year.

Water quality impacts can be reduced or eliminated by additional practices that include: collection and proper storage of manure during winter, improving plant cover by careful livestock grazing management, and appropriate revegetation of exposed soil surfaces, keeping clean water (*i.e.*, rainwater from roofs of buildings) separate from other surface water; and protecting (*i.e.*, armoring with appropriate materials for the site) heavy-use areas from the effects of livestock trampling.

Careful management of livestock traffic is crucial to reducing impacts to the land and associated runoff of pollutants. As with dairy operations, livestock watering and other activities for managing livestock must be controlled in ways that prevent the animals from polluting "waters of the state" (includes "lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington"-RCW 90.48.020).

Ecology conducted technical assistance visits of approximately 78 non-dairy livestock operations throughout the upper Chehalis Basin during 1998/99. The project closely examined the farms and identified a number of farming activities causing or likely to cause pollution. Most of the farms that had problems implemented pollution control practices voluntarily, while some were initially resistant and were referred to the conservation districts per the Compliance Memorandum of Agreement. Additional site visits were conducted in both the lower and upper Chehalis Basin since the original farm visits in 98/99. Water quality improvements in many parts of the Basin can be attributed to the pollution control work completed by the farmers/landowners involved in the site visits.

Farmers and agencies providing technical assistance must remain focused on careful farm management. According to the "Evaluation of BMPs in the Chehalis Basin" (Sargeant, 2001), farm pollution control practices must be properly maintained in order to remain effective at reducing pollution inputs to surface waters.

On July 1, 2003, the Washington State Department of Agriculture became the jurisdictional agency for permit enforcement, complaints, and other agricultural issues. The change of authority is due to legislation (ESSB 5889) that shifted the enforcement authority from the Department of Ecology to the Washington State Department of Agriculture for all Dairies and AFOs and CAFOs. While smaller operations may not necessarily require an NPDES or State Waste Discharge permit they will continue to be required to address water quality concerns through the CWA and Chapter 90.48 RCW. Initial complaint investigations will be made by WSDA. If it is determined that the operation is not a dairy, AFO or CAFO, the activity will be

forwarded to Ecology for action. WSDA and Ecology will work together to determine jurisdictional authority for all animal operations regardless of size.

3) On-Site Septics (OSS)

Residential septic systems are designed to use unsaturated soil beneath the drain field to remove bacteria from sewage and household wastewater. Soil compaction, clogging with solids, and system overload from too much water can all cause failures of a septic system.

These failures can contribute fecal coliform bacteria to receiving water. The county health departments have the specific requirement to: "Identify failing septic system tank drainfield systems in the normal manner and will use reasonable effort to determine new failures" (RCW 70.118.030). The "normal manner" implies the use of inspections in response to citizen or agency referrals. When water quality violations prompt a specific source identification response from Ecology or the conservation districts and agricultural operations are ruled out, a referral will be made to the health departments. The health department will then follow up with residential septic inspections.

The Department of Ecology has provided $200,000 to the Thurston County Health Department to disburse loans and grants to homeowners whose septic systems are in need of repair or replacement. Additional grants were provided to the health departments in Lewis, Thurston, and Grays Harbor Counties to conduct informational campaigns for the public about proper operation and maintenance needs of OSS. The health departments provide information on operation and maintenance to approximately one fifth of the residents in the county each year.

4) Wastewater Treatment Plants

Major bacteria pollution concern:
Human sewage is a significant source of fecal coliform bacteria. Treatment plants separate solids and liquids, and further disinfect wastewater using ultraviolet radiation, chlorine, or ozonation. Twelve municipal sewage plants which are regulated under the NPDES permit program are located in the Chehalis River Basin (cities of Pe Ell, Chehalis, Centralia, McCleary, Elma, Montesano, Cosmopolis, Aberdeen, Hoquiam, Ocean Shores, and Westport). Seven industrial facilities also have fecal coliform bacteria limits in their NPDES permits (Ocean Spray Cranberries, Grays Harbor Paper 001, Grays Harbor Paper 002, Weyerhaeuser Cosmopolis Pulp Mill 001, Weyerhaeuser Pulp Mill 002, Merinos Seafoods, and Washington Crab). The bacteria permit limits for all the facilities evaluated during the fecal coliform bacteria TMDL were found to be protective of water quality. Therefore the bacteria permit limits for the cities and industrial plants also serve as wasteload allocations for the TMDL. The cities and most of the industrial facilities have been able to substantially comply with their permit limits for fecal coliform bacteria discharges.

Biological oxygen demand (BOD) wastes, NH3 (ammonia), and thermal pollution concerns:
The Upper Chehalis temperature and dissolved oxygen TMDLs prescribe specific wasteload allocations for BOD, NH3 ammonia, and temperature for three treatment plants (West Farm Foods, city of Chehalis, and city of Centralia). Their discharges enter the Chehalis River in areas

that are documented to routinely exceed state water quality standards for temperature and dissolved oxygen during the summer critical (low-flow) period. Since the entire TMDL load for BOD, ammonia, and temperature has been allotted to natural sources (*i.e.*, not caused by activities of people), the TMDL wasteload allocations for the facilities is set at zero. Accordingly, the TMDL strategy is to assign permit limits for each existing discharger so that the cumulative loading from natural pollution and facility discharges will not exceed water quality standards in the river.

The city of Centralia completed a new treatment plant in the spring of 2004 which moved their discharge to a less-sensitive section of the river (*i.e.*, below the slow moving Centralia reach). New facility planning is also underway by the city of Chehalis. They plan to meet the new, more protective permit limits during the critical (low-flow) period by redirecting their discharge out of the river and applying it instead to a poplar tree plantation.

West Farm Foods are planning to comply with their future, more restrictive permit limits during the low-flow conditions by redirecting their discharge out of the river and applying it to cropland. They have already acquired land for application of their reclaimed wastewater.

Other cities are planning or have completed treatment plant upgrades that are expected to improve oxygen and reduce bacteria concentrations in the receiving waters. The following treatment plant activities occurred within the last five years (since completion of bacteria TMDL field study). Construction of a new plant at Pe Ell was due for completion in late 2003, which should significantly reduce bacteria loads to the Chehalis River. The city of Onalaska along the Skookumchuck River has a more efficient system and reserve capacity for growth. The city of Grand Mound recently built a new treatment plant. Flows from a decommissioned treatment lagoon at Maple Lane School now receive a higher level treatment at Grand Mound. The city of Elma recently built a new wastewater facility, which has reserve capacity and is a good system. Hoquiam is going to add ultraviolet disinfection to their wastewater plant to eliminate a chlorine discharge problem. It is a good system that performs well. Aberdeen is going through a major upgrade of their plant to improve operations and reliability of their plant. They have updated pump stations and have corrected many previous problems of inflow and infiltration that were believed to be contributing to pollution loading problems in the harbor. Westport's plant operations were found to be defective in fall 2003. The city is working aggressively to make plant improvements, to achieve their wastewater discharge limits, and protect Grays Harbor.

5) Forestry and Riparian Management Practices

Streamside forests provide shade and large woody debris in varying amounts depending upon stream order. They also provide food and habitat for stream communities of animals, fish, and insects as well as being useful in controlling nonpoint source pollution. Streamside forests remove excess nutrients, pesticides, and sediments from surface runoff and shallow groundwater by filtration through shrubs, grasses, rushes, sedges, and organic litter and by uptake of nutrients and chemicals by trees and plants for use in photosynthesis. Forests stabilize banks and slow down erosion and channel migration. Particulate matter, such as fruit, limbs, and leaves, are used as food for insects that are in turn food for fish. By shading streams with multi-story vegetation,

forests optimize light and temperature conditions for fish, aquatic plants, and animals. Additionally, shade helps raise levels of dissolved oxygen.

Low flows and stream morphology also affect temperature. Sediment and gravel transport create wider, shallower bodies of water that absorb more sunlight that cannot disperse the resulting increased heat. Low flows also create shallower water which is more vulnerable to increased thermal absorption.

Timber harvesting/road building/splash damming operations before Forest Practice Rules (1974) greatly affected stream function. Side-cast road construction methods were common in forest practices before 1974. Side cast construction methods resulted in mass wasting/debris flow events that delivered tons of coarse and fine sediment to stream networks. That type of road building generally occurred higher in the Basins where oversteepened hill slopes are most susceptible to mass wasting. Road densities that were needed to remove the historic large timber exceeded seven miles in some basins. High road density extends the stream network and greatly increases peak flow and run out timing. Higher flows increase the streams ability to erode and transport coarse and fine sediment. Subsequent low summer flows result, as lag time for runoff is greatly decreased.

Increased sediment loads are delivered from the higher tightly-confined upper reaches to lower-gradient valley floors where sediment loads drop out. Increased sediment loading to lower reaches cause rivers to become wider and shallower. As a result, solar input is more effective in causing water temperatures increases. As river systems build up (become shallower), from increased bed loading, flooding, bank erosion, and water quality, problems increase.

The Upper Chehalis Temperature TMDL prescribes load allocations for increased riparian shade along 13 stream reaches in the upper Chehalis watershed. For the South Fork Chehalis River, Newaukum River, and Black River, the amount of achievable shade alone is predicted to be insufficient to meet temperature standards. These stream sections are relatively wide and shallow with slow river flow velocity. These circumstances make them especially vulnerable to heating from direct sunlight. For these streams, targets for reduced width-to-depth ratios that will mitigate these conditions are established, in addition to the shade allocations to meet temperature standards. It is reasonable to assume that re-establishing riparian vegetation for shading will also restore functions, such as stream bank stabilization, and reduce sediment delivery. Thoughtful selection of plant materials and density will greatly increase shading effects. Although there is considerable documentation of water quality benefits associated with healthy riparian functions, there is insufficient information to predict how long it will take to achieve these targets. After sufficient time, monitoring of the processes and effects on channel depth will indicate if or when other more direct physical actions should be part of the corrective measures. Therefore, long-term monitoring will be necessary to show if the width-to-depth targets of the TMDL will be accomplished by managing the processes that affect stream channels.

Load allocations for nonpoint sources will be achieved through the involvement of private landowners, state and federal agencies, local government, Tribes, and private organizations. In addition to enacting recent rules protecting aquatic habitat and water quality in forest settings, state and federal governments are appropriating implementation funds, which improve the

likelihood that agencies and Tribes will be able to effectively implement the forest and fish requirements of the forest practices rules.

Strategies for water quality restoration in non-forested and non-agricultural land (*i.e.*, urban or other developed areas) can include removal of pollution sources and riparian planting enhancement. Recent restoration work by the Lewis Conservation District along China Creek in the city of Centralia is a successful example of that approach. Land use zoning, including possible designation of critical areas, may also be an effective administrative tool for restoring and protecting riparian and water quality conditions in certain areas.

6) Stormwater

Storm water can carry bacteria through cross-connections with sewer systems or through contact with nonpoint sources such as pet waste. Stormwater can also transport biochemical oxygen demand (BOD) materials that consume oxygen in surface waters.

Centralia and Chehalis Stormwater Controls
The Upper Chehalis River Dry Season Total Maximum Daily Load Study and the resulting TMDL submitted to EPA, contain some detailed site-specific examples of the impacts of storm water on water quality loading capacity estimates to the Centralia Reach of the Chehalis River. Sampling at one storm drain located at river mile 66.8 found high levels of pollutants during a light rain event on July 22, 1992: BOD5 was greater than 47 mg/L, TOC was over 100 mg/L, fecal coliform bacteria were detected at 28,000/100 mL, turbidity was 20 NTU and nutrients were relatively high (Appendix F, page F-10 and Table F3, page 4). The BOD5 level from this storm drain exceeded the observed and permitted concentrations discharged from the Centralia wastewater treatment facility near the Mellen Street bridge.

The TMDL study found that the Centralia Reach does not meet the water quality criteria for dissolved oxygen (a fish-critical water quality parameter) under critical conditions even with pollution loading reduced to background (natural) conditions. As a result, it recommended no loading above background conditions from any source, including stormwater runoff when river flows are less than 1,000 cfs. The TMDL study also recommended:

- Implementation of stormwater BMPs to control stormwater runoff during critical low-flow conditions less than 1,000 cfs.
- A stormwater permit for the cities of Centralia and Chehalis.
- Stormwater BMPs should meet the standards of the current accepted stormwater manual for Western Washington.
- Recognized WSDOT's commitment to use stormwater manual levels of treatment for I-5 to be implemented as it is widened.
- Stormwater BMPs for construction sites and new development in other areas of the Chehalis Basin, especially along the mainstem and in priority watersheds.

The bacteria TMDL prescribes load allocations for urban stormwater drains in Aberdeen, Cosmopolis, Hoquiam, and Westport. Storm water from other cities was not tested during the bacteria TMDL study, consequently this TMDL cleanup plan doesn't prescribe specific stormwater pollution allocations or controls for cities other than those mentioned above. However, several other cities in the Basin are either preparing or already implementing some stormwater controls, even though they are currently not required to do so.

Low-Impact Development

One long-term approach worth considering for stormwater pollution control in the Chehalis Basin is the application of Low Impact Development Strategies (LID). No jurisdiction in the Chehalis Basin currently has a low impact development (LID) ordinance. However, Thurston County is seriously considering one. Low impact development is ahead of the Chehalis Basin jurisdictions since very few have adopted and implemented stormwater management programs or stormwater utilities, or adopted the latest stormwater manual, *Stormwater Management Manual for Western Washington*.

Beyond the scope of this TMDL cleanup plan, emerging federal NPDES Stormwater (Phase II) requirements will eventually apply to cities with populations exceeding 10,000 residents as well as smaller cities where a TMDL prescribes specific stormwater pollution limits (*i.e.*, load or wasteload allocations). The Phase II Stormwater rules may also apply to county governments in the Basin. Phase II requires a review of stormwater activities for all cities with more than 10,000 residents. However, anyone may petition the Department of Ecology to review the stormwater protection activities of any government, and require special controls if necessary, regardless of the population density.

Lower Chehalis Stormwater Controls

A combination of local programs are expected to assure control of bacteria loading coming from urban stormwater drains in the four Grays Harbor area cities. Stormwater programs in the Grays Harbor area are developing at different speeds, largely depending upon funding availability. Continued water quality sampling will be needed at all the stormwater drain locations identified in the bacteria TMDL, to evaluate the extent of bacteria reductions achieved.

Cosmopolis

After the bacteria TMDL field study was completed in 1998, several failing septic systems in the Highland Addition were converted to the sanitary sewer system. In that development there are 84 homes, of which 54 have connected to the sanitary sewer system in the last two years. The city also adopted its own development standards, and the Puget Sound Stormwater Manual. The development standards require an additional 15 percent capacity for all stormwater retention/detention systems in the city. Cosmopolis is planning to evaluate stormwater pollution sources, especially in the Mill Creek drainage basin, and plans to coordinate with the city of Aberdeen to isolate pollution sources so that controls can be implemented more effectively.

Aberdeen

The city has adopted the Stormwater Management Manual for Western Washington, (August 2002). They have mapped their stormwater system and smoke tested it three times during 2000 and 2001. Smoke testing has identified several misconnections to the stormwater system which

have since been fixed. They believe their housekeeping (*i.e.*, street sweeping) is performing adequately, and they continue to invest in a vector waste (storm drain sump debris) collection and disposal system. Approximately 400 sources of inflow or infiltration to their stormwater system have also been eliminated. The Saginaw Slough area has been a historical source of stormwater pollution. Some sewer repairs have been completed although more work remains there. They estimate approximately $2 million has been invested in their stormwater program during the last three years. Aberdeen has a stormwater utility in place to provide ongoing revenues for their stormwater program.

Westport

Westport is continually trying to improve the city's drainage system through regular maintenance and improvements. Maintenance includes cleaning of the open ditch system through the removal of sediment, trash, and other debris. Westport also has made a commitment to educating those who reside around the city's drainage system. Recent improvements to the system include a new tide gate in the Marina District to prevent back-up of saltwater into the stormwater system. Westport is also planning to evaluate Winter Creek for pollutants identified in the Grays Harbor Fecal Coliform TMDL Sstudy. Winter Creek originates in a residential area of Grays Harbor County,south of the city limits. Additional water quality sampling will help identify the actual sources and strategies needed for control of Winter Creek pollution.

Hoquiam

The city has responsibilities to prevent discharge of pollutants via storm water at several outfalls identified during the fecal coliform bacteria TMDL field sampling. Department of Ecology staff has worked deliberately with Hoquiam and the other Harbor cities to help them apply for grant funding for addressing their stormwater management obligations. Hoquiam and the other cities said that they will apply for financial assistance and their next opportunity for Ecology funding is Fall 2004. The other Harbor cities provided the descriptions in this Plan for what they will undertake for stormwater TMDL corrective actions but Hoquiam has not described their intentions. Several years ago, however, Hoquiam did complete a Comprehensive Storm Water Management Plan. The Public Works Department said that they may implement some of those Plan recommendations when the city budget allows them to make it a priority.

7) Wildlife

The fecal coliform bacteria TMDL study did not individually quantify different possible sources of bacteria from wildlife. The study also did not give an allocation to wildlife. Bacterial loading from wildlife is considered part of the natural background source. If significant wildlife contributions are documented, further reductions may be required of human-related sources.

Regardless of the source, Washington water quality standards are based on total fecal coliform in the water. The limit is set to protect human health. If implementation activities fail to show adequate improvement in water quality, a source identification study based on genetic fingerprinting or antibiotic resistance may be warranted. During the initial stages of implementation, source identification will be approached by conducting water quality sampling segment by segment at appropriate river and stream locations.

Table 1. Potential Causes of DO, Temperature, and Bacteria Impairments

SOURCE	EXPLANATION
Agriculture	Animal waste pollution from improper grazing*, manure application or storage practices. Creates bacteria, DO (*high turbidity) and temperature (through erosion and deposition) problems.
On-Site Septic Systems (OSS)	Sewage treated by separation of solids and liquids in a septic tank and further filtration of liquids in a drainfield and underlying soils. Creates bacteria and possibly DO problems.
Permitted Treatment Plants	Facility upset or overwhelmed by influent flow, often during storm events. May create bacteria and possibly DO concerns.
Stormwater	Hobby farm and residential pet waste, illegal connections of sewers to storm drainage system. Can create bacteria and possibly DO concerns.
Forestry and Riparian Management Practices	Timber harvest operations have been known to alter riparian vegetation, negatively affecting functions of: shading, bank stabilization, sediment delivery, and groundwater recharge to the river. Can cause temperature, DO, and turbidity concerns.
Wildlife	Is considered a part of the background bacteria level, but has not been quantified.

B. Roles of Supporting Organizations

Participating organizations were invited to add a detailed description of their organizational responsibilities to this section. The following text was submitted by the respective organizations. The following agencies/organizations are cooperating on the implementation of the Chehalis/Grays Harbor watershed TMDLs, as indicated by the program descriptions which they submitted.

1) Confederated Tribes of the Chehalis Reservation

The Confederated Tribes of the Chehalis Reservation has an ongoing program to restore and protect riparian corridors. Under this program, the Tribe provides technical and financial assistance to landowners that are interested in protecting riparian zones on their property. The Tribe has often been successful working with landowners who are otherwise reluctant to work with "governmental agencies." In some cases, these landowners have become active proponents of riparian zone protection. Over a five-year period (1994-1998) the Chehalis Tribe has assisted with the installation of 20.6 miles of riparian fencing, resulting in the protection of 123 acres of riparian area. In addition, they have helped install six off-channel wetland/rearing habitats that provide another 40 to 50 acres of protected riparian areas.

The Chehalis Tribe also conducts water quality monitoring for an extensive network of monitoring sites, mostly in the upper Chehalis Basin. Ongoing availability of the data will be important for tracking effectiveness of water quality protection efforts.

2) Municipalities

The Upper Chehalis Temperature and Dissolved Oxygen TMDLs directly affect discharges from the cities of Chehalis and Centralia. According to a consent decree agreement with the cities, they have until 2008 to meet the full terms of the TMDLs. However, both cities are on track to implement changes before then.

Centralia is currently building a new treatment plant with a different discharge location that is below the critical "Centralia Reach" of the Chehalis. The new discharge point will be downstream of the area that was identified as needing more protection in the TMDL.

Chehalis is designing a new treatment facility and also plans to stop discharging to the Chehalis during low-flow conditions (when flows are less than 1000 cfs) as prescribed in the TMDL. The city has acquired land for growing poplar trees, and during low-flow conditions plans to irrigate the crop with their treated wastewater, as a beneficial "reclaimed use" of the water. For all other municipal treatment plants in the Basin, their NPDES Permit limits will serve as regulatory limits for water quality protection. The cities will be implementing BMPs for stormwater pollution control. The cities may adopt the Stormwater Management Manual for Western Washington (WA DOE, 2001), which lists a number of BMPs.

In addition, the cities of Aberdeen, Cosmopolis, Hoquiam, and Westport will continue to develop and implement comprehensive stormwater management programs in order to reduce bacteria levels identified in the Grays Harbor/Chehalis Fecal Coliform Bacteria TMDL.

The city of Cosmopolis has adopted, by ordinance, the Puget Sound Stormwater Manual. Hoquiam has completed a Comprehensive Surface Water Management Plan and is expected to implement many of their plan recommendations. The city of Aberdeen has adopted the 2001 Western Washington Stormwater Management Manual. Aberdeen has also conducted testing to locate possible illicit discharges to their stormwater system, made investments in an emerging program to reduce the loading from vector (storm drain sediments) wastes. They also plan to conduct water quality sampling to determine the effectiveness of their stormwater controls and in particularly suspect areas, identify possible pollution sources to drains identified during the bacteria TMDL study.

The cities of Cosmopolis, Hoquiam, and Westport plan to apply for water quality financial assistance in 2004 to conduct monitoring of priority drainages identified during the bacteria TMDL study. The data will help prioritize areas for response and inform selection of appropriate stormwater controls for the priority drainage areas. Funding will also support development of community information/outreach about problems and solutions in priority problem areas.

Features of the Puget Sound Stormwater Manual that are relevant to this cleanup plan include:

a) Local ordinances that could include things like:
    - low impact development strategies;
    - the use of best management practices (BMPs);
    - effective treatment appropriate for storm size and frequency;
    - protection of aquatic resources;
    - erosion and sediment control; and
    - enforcement.
b) An operation and maintenance program.
c) An approved stormwater management manual.
d) An education program.
e) Incorporation of stormwater controls in comprehensive land-use plans and intergovernmental coordination within shared watersheds.

All four Grays Harbor cities are working on revising their stormwater programs to reflect recommendations in the Stormwater Management Manual for Western Washington (WA Dept. of Ecology, 2001). The municipalities will have updated programs by 2008 that include:

- Incorporation of stormwater management into growth management planning.
- Stormwater controls for new development and redevelopment, including the requirement of specific BMPs and the adoption and use of Ecology's stormwater manual or an approved alternative.
- Review of site plans and regular inspection of construction sites to ensure that stormwater control measures are adequate and consistent with local requirements.
- Required maintenance of all permanent public and private stormwater facilities.
- Specific ordinances to prohibit dumping and illicit discharges, provide for enforcement, and encourage low-impact development.
- Additional analysis and prioritization of water quality problems, education of citizens and businesses to build awareness, and continued watershed planning.
- Development of local funding capacities.
- Monitoring of implementation, conditions, budget needs and resources, and environmental trends over time.

3) Permitted Industrial Facilities

This DIP does not create the need to change any industrial facility permit, except for the upcoming change to the West Farm Foods facility discharge permit discussed earlier. However, any plans for new or expanded facilities must demonstrate that the discharges will not cause a violation of water quality standards as prescribed within the TMDLs. TMDLs for dissolved oxygen and temperature in the upper Chehalis Basin restrict those pollutants during critical low-flow conditions to what is contributed naturally. In other words, water quality is already fully impacted (exceeds water quality standards) due to natural conditions, so no further loading from

human-related sources is allowed. A new or expanding facility might still be able to obtain a wasteload allocation by acquiring some of an existing allocation already assigned to a permitted facility in the TMDL area, as long as there is no net gain relative to the TMDL limits. This would create a pollution trading condition which would require additional modeling and a facilitator to design the trade, designate the parties, formulate agreements, and prove the ultimate maintenance of water quality standards. The costs of these efforts must be borne at the local level.

4) U.S. Natural Resource Conservation Service

U.S. Natural Resources Conservation Service (NRCS) provides the technical guidance in developing farm plans. These plans are critical components of good environmental practices by agricultural operations. The NRCS also administers financial assistance programs, in partnership with the conservation districts.

5) County Health Departments

The Health Departments administer an on-site septic system program that includes information, technical assistance, and regulatory oversight. This oversight includes:

- Site application review for new, repaired, or expanded septic systems.
- Permit issuance.
- Survey, construction, and operational inspections.
- Subdivision, boundary-line adjustment, and conditional use review.
- Complaint investigations.
- Enforcement of OSS ordinances and implementing state regulation WAC 246-272.
- Homeowner education.
- Financial assistance for repair of failing septic systems.
- Certification of septic system pumpers, installers, and operation specialists.

Grays Harbor County Environmental Health Division's On-site Sewage System Management Program

Since 1974, under Washington state public health laws, local departments and districts have regulated the siting, design, installation, repair, and replacement of on-site sewage systems. The state Department of Health (DOH) sets minimum standards for these functions and provides technical assistance to health departments. While the collective efforts of these programs have strengthened public health protection, an important focus has been missing: effective, long-term operation and maintenance of on-site sewage treatment systems. This may stem from the belief that on-site sewage systems were temporary, fail-safe, or self-maintaining. However, because the County Health Division now knows that properly maintained on-site systems can provide long-term service, they intend to place greater emphasis on comprehensive and effective monitoring programs to assure that systems are property operated and maintained. On September 20, 1999, Grays Harbor County Board of Commissioners adopted *Grays Harbor County Code, Title 8 Health and Safety, Chapter 8.16-On-site Sewage System* that established an operation and maintenance program for septic tank systems.

WAC 246-272-15501 requires that the owner of an on-site sewage system be responsible for properly operating and maintaining the system by:

- Determining the levels of solids and scum in the septic tank once every three years;
- Protecting the on-site system area and the reserve area from activities that could affect system performance; and
- Keeping the flow of sewage at or below the quantity and waste strength as specified in the approved design.

The local health officer is responsible for:

a) Providing operation and maintenance information to the on-site sewage system owner upon approval of any installation, repair, or alteration of a system.

b) Developing and implementing plans to:

    - Initiate periodic monitoring of each system no later than January 1, 2000, to assure that each system owner properly maintains and operates the on-site sewage system in accordance with this section and other applicable operation and maintenance requirements.
    - Provide relevant operation and maintenance information to system owners through effective means, routinely and upon request.
    - Assist in distributing educational material to on-site sewage system owners.
    - Require annual inspections of systems serving food service establishments (and may require pumping as needed).
    - Monitor the performance of all systems within areas of special concern. WAC 246-272-21501(3) requires that a person approved or designated by the local health officer shall inspect the system at least once every three years and submit written information pertaining to the results of the inspection to the health officer and property owner.

The Environmental Health Division of the Public Services Department has looked at a number of different alternatives to a monitoring program for Grays Harbor County, after reviewing the guidance handbook for monitoring programs developed by DOH and reviewing how other counties are approaching the monitoring requirements contained in the WAC. The Division feels that the following approach works for Grays Harbor County. While this approach does not, by any means, assure that all on-site systems will be inspected on a “periodic basis,” it does provide a framework that allows the county to inspect a large number of systems over the long term without additional resources.

To insure implementation of the above plan, the Environmental Health Division’s work program incorporated the following:

- Continue to perform loan certifications upon request.
- Continue to require existing system evaluations per Resolution 99.

- Continue to require septic system pumpers to provide a list of all properties to which they provide pumping service; (this information is entered into a database and used to detect problem areas).
- Continue to provide operation and maintenance information and material to on-site system owners.
- Continue to inspect food service on-site systems on an annual basis.

Areas of Special Concern
Grays Harbor County Health Department designated, per resolution 95-55, the Ocean Shores sanitary sewer area as an area of special concern on May 8, 1995, per WAC 246-272-21501. This resolution requires that every on-site sewage disposal system connect to the sanitary sewer within two years of its availability or meet the 1995 rules and regulations for on-site systems. The health officer or his representative shall determine if the system meets the 1995 rules. This resolution requires that the health officer develop and implement plans to monitor the performance of on-site systems within areas of special concern.

Areas of special concern within Grays Harbor County include the city of Ocean Shores, and the communities of Oyehut and Illahee.

Thurston County On-Site Sewage Program

On-site issues in WRIA 23 areas of Thurston County:
There are four locations of bacteria-impaired waters in WRIA management area 23 of Thurston County. They are in Scatter, Dempsey, Beaver, and Allen Creeks in the Black River sub-basin. It does not appear that on-site sewage systems are a significant surface water pollution source in these areas. Consequently, the Thurston County on-site program does not seem to be a significant tool for cleanup activity in these areas. If failing on-site septic systems are found, however, the Environmental Health Division (EHD) will make sure that they are promptly repaired.

EHD Program Activities
The EHD's on-site sewage system program performs many activities relating to the construction, repair, and operation of on-site sewage (septic tank) systems, including:

- Review of applications for new or expanded on-site sewage systems and sewage system repairs.
- Operation and maintenance program which requires renewable permits for complex systems such as sand filters, mounds, aerobic treatment units, community systems, and systems that serve food service establishments.
- On-site sewage system compliance (complaint investigation and resolution).
- Technical assistance for on-site system owners via the "Septic Help Line," public workshops, and other activities.

- Low interest loan program for the owners of failing systems with family incomes of $75,000 per year or less.
- Review of land use proposals (plats, etc.,) to assure that on-site sewage disposal needs can be satisfied.
- Evaluating existing systems as requested by property owners, usually as part of a real estate transaction.
- System surveys in areas of concern, typically funded by grants or special programs.

The permitting programs assure that new on-site systems meet the appropriate state and local standards before they are installed. Proposals for land use activities that will use on-site sewage systems are reviewed to assure that each lot or development that will use on-site systems can meet the appropriate standards.

Environmental Health issues renewable operational certificates for complex, community, and food service systems. Certificates are issued when these systems are installed, repaired, replaced, or evaluated as part of a loan certification (health letter) procedure. Using these criteria, approximately 10 percent of the on-site systems in Thurston County are required to have renewable operational certificates.

Operation and maintenance needs for other systems are addressed via a voluntary system. Recommended practices for operation and maintenance are given to the property owner when the system is installed, repaired, replaced, or evaluated for loan certification purposes. Other key elements in this program are the "Septic Help Line," and educational workshops.

Thurston County has the On-Site Sewage System Financial Assistance Program that gives State Revolving Fund loans to home owners for repair of failing on-site systems. Since the program started in 1991, they have repaired 53 systems. From 1998 through 2003, the average repair loan has been $12,330.

Thurston County EHD has an active compliance program that evaluates approximately 200 complaints per year. Complaints are evaluated within five days of receipt (within one working day for high priority cases), and steps are taken to assure that failing systems are promptly repaired.

Thurston County has participated in many special studies and sanitary survey efforts to evaluate the on-site sewages systems where they have been tied to public health water quality problems. Recent efforts include work in Henderson Inlet and Nisqually Reach in association with shellfish protection district activities. These efforts are usually funded by grants or other outside funding sources. Currently Environmental Health does not have funding for survey efforts in other parts of the county.

Lewis County Health Department Activities

Identify Sources
Phased Approach – focusing on high risk areas

- Identify areas of high density septic systems within the watershed.
- Within those areas – identify age of systems, develop soils limitations map, examine pumping records and failure rates (subject to funding).

Monitoring

- Target monitoring (of onsite system performance) to high risk areas (high density, poor soils, old systems, etc.) and high risk systems (commercial, high flow, and high waste strength) (subject to funding).
- Identify and track OSS failures and corrections within the Basin.
- Establish performance measures and monitor effectiveness of control measures.
- Continue cooperative efforts with Conversation District to seek funding for water quality monitoring efforts in the Basin.

Control measures

- Identify high strength/high flow onsite systems (commercial, food service establishments) within the high risk areas.
- Provide educational materials on system operation and maintenance for those businesses.
- Within the high risk areas identified above, conduct public outreach and technical assistance regarding construction and operation and maintenance of onsite sewage systems.
- Provide workshops for installers and designers in Lewis County to encourage creation of professional operation and maintenance firms.
- Work with community groups and agencies to identify and seek funding for onsite sewage repair programs.

Develop/conduct community education programs and broker financial assistance programs

- Prioritize local “pre-emptive” audience: public officials, banks/lenders, dealers of pre-manufactured homes, and the real estate industry.
- Prioritize system owners/neighborhoods according to monitoring program results.
- Hold educational meetings for communities in various priority subbasins of the Watershed.
- Coordinate grant assistance to operators of OSS, advise and advocate for local utility districts in order to develop financial and administrative support for effective local OSS protection programs.

6) County Public Works

County Public Works may act as the agent for special drainage and diking districts. Public Works can access funding from Ecology's competitive grant program to fund the establishment of riparian vegetation buffers or other possible pollution engineering controls.

7) Conservation Districts

Conservation districts are continually developing conservation plans on agricultural property throughout the Chehalis River Basin. For a farm plan to be approved by the Conservation District Board of Supervisors, it must identify all resource concerns, specify which alternative solutions the landowner has selected to address those concerns, project a schedule for implementation, and document the landowner's commitment to address all the identified concerns.

The conservation districts provide substantial technical and financial assistance to dairy operators and small farm landowners throughout the county.

Grays Harbor Conservation District (GHCD)
Since the completion of the Grays Harbor Fecal Coliform Total Maximum Daily Load Study in 1998, the GHCD and private watershed landowners have noted a number of management improvements aimed at reducing fecal coliform bacteria. Those improvements (*i.e.*, fencing projects) have resulted in verified water quality (fecal coliform) improvements. These areas are listed below:

Installation of riparian fencing to exclude livestock from waterways

- Humptulips River = 10,600 feet
- Satsop River = 65,320 feet
- Wishkah River = 1,850 feet
- Wynoochee River = 14,500 feet

Total riparian fencing installed = 92,270 feet

In 2002, the GHCD requested an additional area of eligibility for the Conservation Reserve Enhancement Program (CREP), which is a joint federal and state program to establish fully functioning riparian buffers along eligible waterways of the state. This is a cost-share program that allows for livestock exclusion fencing, alternative livestock watering, and riparian revegetation. The federal government also rents the enrolled buffer from the landowners for a period of 10 to 15 years.

In 2000, the GHCD started a new program concerning water quality monitoring, particularly for fecal coliform bacteria. This program was initiated in response to the TMDL, as a way to isolate and locate the fecal coliform loading sources. With almost two years of data on the Satsop, Humptulips, and Wynoochee Rivers, a better understanding of the problems has risen. To complement this program the GHCD dairy waste program has been collecting nitrate soil

samples on selected sites. The GHCD has also been active in the Chehalis Basin Partnership (a local watershed group) and is at present sitting on the steering/technical committee and the water quality committee.

A new area of concern that has risen because of the bacteria TMDL is potential impacts of bacteria on the commercial shellfish production. The GHCD is actively working with the growers to conduct additional fecal coliform testing at strategic locations to better understand the cumulative effect of the fecal loading to the estuary.

The GHCD is constantly looking for funding sources to assist local private landowners become better stewards of their land, through the use of best management practices (BMPs). With a strong focus on water quality, the future direction of the GHCD is taking shape.

Lewis County Conservation District (LCCD)

Approaches to restoring and protecting water quality
The Lewis County Conservation District is continually available to work with residents in an effort to restore and protect water quality. They provide technical and financial assistance during the process of meeting with stakeholders and determining what grant or program fits best on an individual basis.

The current opportunities offered are through Centennial Clean Water Fund Grants, Conservation Commission Grants, United States Fish and Wildlife Chehalis Fisheries Restoration Program, and the Conservation Reserve Enhancement Program (CREP). Those options generally have the ability to help fund development of conservation plans that detail alternatives for restoring and/or protecting natural resources once a landowner makes the commitment to request services from the CD.

LCCD has approved Dairy Nutrient Management Plans for all but one facility (nearing completion) in the Chehalis Basin and are now working to assist in implementing and certifying the operations. Currently, the Chehalis Basin has 30 dairies in operation in Lewis County and six have been certified as meeting all requirements of RCW 90.64.

In the CREP, there are 14 contracts in the Chehalis Basin totaling over 430 acres and just under 23 miles of riparian zones being re-established in the watershed. Two additional landowners in the Basin are contemplating signing up for the program. Enrollment will be open as long as state and federal funds exist to provide technical and financial assistance.

The District has worked with numerous property owners throughout the Basin in implementing livestock exclusion fencing projects, constructing rocked limited access livestock crossings and/or rocked limited access livestock watering sites. The majority of the cooperators either has planted trees and shrubs in the riparian zones themselves or has allowed the District to plant vegetation to create shade, filter sediment, utilize nutrients, help stabilize stream banks, and provide future food sources for aquatic inhabitants.

Thurston Conservation District (TCD)

Activities in the Chehalis Watershed
Since the completion of the Grays Harbor/Chehalis Total Maximum Daily Load Study in 1998, TCD and their cooperators have implemented many strategies aimed at improving water quality conditions (dissolved oxygen, temperature, and fecal coliform bacteria levels). These include:

- 6,400 ft of fencing (11 cooperators);
- 3 liquid manure tanks on three dairies (80,000 gal, 600,000 gal, and 9,000,000 gal);
- 3 dry stack storage facilities on three dairies (6,000 sq ft, 30,000 sq ft, and one now under construction);
- 1700 ft gutters (roof runoff control) – 2 dairies;
- 1150 underground outlet – 2 dairies, and;
- one catch basin for silage leachate (size unknown) on one dairy.

Revegetation and bank stabilization projects
TCD partnered with the Lewis and Grays Harbor CDs through the Chehalis Basin District Alliance to assist dairy owners and operators in the Upper Chehalis TMDL area to reduce nonpoint sources of pollution through one-to-one contact, and education and technical assistance to dairy operators. The Agricultural Nonpoint Reduction Project (Grant No. G9800263) enabled the Alliance to complete 29 farm plans, 7 dairy nutrient management plans, and 6 interim plans with an 80 percent implementation rate.

The Chehalis Basin District Alliance was again successful in securing a two-year grant in 2000 through the Department of Ecology (the Chehalis Basin Alliance Dairy Implementation project, Grant No. G0100033). The focus was to develop and implement dairy plans and provide assistance with nutrient management. Four new plans were developed and two existing plans were updated.

A grant project targeting poultry operations and poultry nutrient receiving grounds was completed in 2002. During the life of that project, nutrient management plans were developed for all the poultry operators (6) in the Thurston County area of the Chehalis Basin. In addition, plans were developed or technical assistance was provided for 12 landowners receiving manure for use on farms and/or garden space.

The TCD Washington Conservation Corps Crew has completed a number of projects in the Thurston County area of the Chehalis Basin since 1998. A summary of their work in the Chehalis watershed since December 2000 includes:

- Twenty-eight acres of riparian planting (seven cooperators-eleven acres on Dempsey Creek).
- Six culvert maintenance projects (four for county, two for private landowners).
- Two culvert replacements (one for private landowner-Dempsey Ck, one for Capitol Forest).

- One manure storage facility and 1700 feet of pipeline f(or a beef operation.
- Thirty-seven acres of riparian planting maintenance three sites/cooperators).
- 5850 feet of fence (three sites – 1900 ft on Wilson Dairy-Dempsey Creek).
- One bridge (for livestock access – which were previously walking through river).

In 2001, TCD again partnered their efforts to secure a Centennial Clean Water Fund grant, the Upper Chehalis Nonpoint Reduction project (Grant No. G0200365) aimed at improving water quality by working with landowners and operators of non-dairy agricultural farms to develop conservation plans and/or implement riparian restoration projects. Work began in late August, 2002. Three plans have been completed, with eight more scheduled for development nearing completion. Landowner cooperation was secured without the need for marketing the project. This is a clear indicator of the interest among landowners to do their part in reducing their impacts on water quality. Though implementation efforts are still in the infancy stages, TCD is excited about the participation they are receiving.

There are eight certified dairies in the Upper Chehalis section of Thurston County. Five were certified by June 2003. Certification indicates that the dairies have fully implemented their Dairy Nutrient Management Plans.

The Conservation Reserve Enhancement Program (CREP) began in Thurston County four years ago. Since that time contracts were arranged with three cooperating landowners, with one more potential project in the Chehalis watershed. CREP should expand further in the next couple of years. All of these sites will undergo extensive planting and maintenance projects. One site is on Scatter Creek. Another site is on the Black River.

Work started in 2003 on the "Nutrient Reduction/Riparian Assessment" project, a $328,000 grant. This grant addresses nutrient reduction efforts in the Chehalis watershed. However, the riparian assessment portion of the grant is targeted at the Deschutes watershed only. Technical assistance and soil testing will be provided to landowners in the Chehalis watershed. The District has obtained a manure spreader, which is available to landowners on a checkout basis. They must receive training from TCD on how to use and calibrate it, and then apply at the proper agronomic rates, based on the results of soils tests. The goal of the project is to serve 200 landowners total. Approximately 48 of those will lie in the Chehalis watershed.

Other projects in the Chehalis watershed currently being done are the Cozy Creek Enhancement/Restoration project, which will result in 1,500 feet of native plant revegetation, streambank stabilization, and barrier removals; and a 300 foot section of streambank along Beatty Creek will be stabilized and replanted with native vegetation after a barrier is removed.

The District recently developed and distributed a questionnaire to their cooperators. This tool will help evaluate the services that the District provides and will track how cooperators have changed their practices (behaviors) as a result of what they've learned or implemented with the assistance of the District. Modifications to the questionnaire will continue to ensure that monitoring results received are valuable and meet the needs of monitoring requirements.

TCD future activities/plans
Technical support and education will continue for owners of dairies and other livestock operations in the Chehalis watershed. TCD will continue to work with landowners who do not have livestock, as they utilize fertilizers and clear land much like those who farm. The goal is to expand services to more landowners over time.

The CREP program will hopefully expand further into the Upper Chehalis region of Thurston County, specifically along the Chehalis River, Scatter Creek, and Dempsey Creek.

TCD plans to continue their involvement and partnership with the Chehalis Basin District Alliance to help secure grant funding and work together in the watershed.

An additional grant project will allow TCD to expand their focus on nutrient management plans for poultry operations and nutrient receiving grounds. Most poultry operations in Thurston County are in the Chehalis watershed.

Over the past couple of years TCD has implemented a marketing plan about their available services. Each month they provide quarter-page newspaper ads and update their website with information on services we provide and water quality issues of interest to local landowners. TCD has also expanded its education efforts, which has resulted in more cooperators and increased interest. It is felt that with this kind of effort, more and more landowners will implement BMPs targeted at improving and maintaining water quality and will understand why they're doing it and why it's important.

TCD has not developed budgets or tangible plans for the upcoming years, beyond this general scope. However, it's anticipated that the TMDL Implementation Plan will provide additional leverage and justification to help secure future grant funding. TCD expects to continue work in the Chehalis watershed and have a positive impact on water quality, along with the cooperators they work with.

Mason Conservation District (MCD)
Although a very small part of the Chehalis Watershed resides within the boundaries of Mason County, the MCD has been very active in the watershed for the past ten years. The MCD has primary responsibility for agricultural practices within the county and utilizes a voluntary participation relationship with local landowners to improve agrarian practices and reduce the potential for nonpoint source pollution.

Beginning with a small grant secured from the US Fish and Wildlife Service back in 1993, the District has worked with landowners to design and implement BMPs, which reduce the potential for non-point source pollution from agricultural sites. While working with landowners on a voluntary basis the MCD provides technical assistance to landowners to develop farm plans, and suggest and design BMPs, such as livestock exclusion fencing, nutrient management, roof runoff diversion, rotational grazing, bridges, and alternative water sources. In some cases, the conservation district also has cost-share funds available to help landowners install BMPs, or for conservation easements.

Current funding sources, which allow the MCD to assist landowners in the Chehalis Watershed, include Centennial Clean Water Fund Grants, Conservation Commission Grants, United States Fish and Wildlife Service, Chehalis Fisheries Restoration Program, Conservation Reserve Enhancement Program (CREP), and Environmental Quality Incentive Program (EQIP).

The conservation district has prioritized their work in this watershed to emphasize the areas of concern, which include the protection and restoration of waterways, and providing technical support to insure that the Mason County agricultural community remains viable. The District has dedicated funds, which allowed them to work in the Chehalis Watershed until June 30, 2004.

8) Washington State and Private Owners of Forest Lands

The temperature TMDL provided the framework and targets for long term monitoring and implementation activities. However, it did not include the details for what to do or the mechanisms that will ensure that water quality improvements will occur. This section summarizes the strategy and elements that should ensure effective actions to meet the established targets as well as to maintain compliance with water quality standards for temperature.

In 1999, various state and federal agencies, counties, some tribes, and the timber industry agreed to act on the recommendations of the Forests and Fish Report (F&F) to address impacts on water quality and habitat for fish and six riparian-dependent amphibians, caused by forest harvesting activities. This agreement was contingent on the state adopting improved forest practice regulations, as well as funding and implementing a monitoring and adaptive management program to demonstrate the effectiveness of the new rules in protecting water quality and fisheries habitat. Landowners also agreed to share water quality information with the other parties to the agreement.

Emergency forest practice regulations were adopted by the Washington Forest Practices Board and became effective on March 20, 2000. These rules are representative of the F&F agreement. Permanent rules were adopted by the legislatively mandated deadline of June 30, 2001.

Negotiated “assurances” were provided to the timber industry under the agreement for supporting improved forest practice regulations. These assurances include:

1) Development of TMDLs for 303(d) listed water bodies affected primarily or solely by forest, practices may be delayed to the year 2009.

2) EPA and Ecology would not ask the Forest Practices Board to adopt any more stringent rules except through the adaptive management program set out in F&F.

3) The F&F adaptive management process will be used for adjusting forest practices, if necessary, to meet load allocations of TMDLs produced for streams in mixed use watersheds.

Initial development of this TMDL predates F&F and the allocations are necessary to address all the sources/causes of temperature problems in the Upper Chehalis River Basin. Therefore, Ecology has proceeded with TMDL completion. Load allocations are included in this TMDL for forestlands in the Upper Chehalis Basin in accordance with the section of F&F entitled “TMDLs produced prior to 2009 in mixed-use watersheds.” Also consistent with the F&F agreement,

implementation of the load allocations established in this TMDL for private and state forestlands will be accomplished via implementation of the revised forest practice regulations. The effectiveness of the F&F rules will be measured through the adaptive management process and monitoring of streams in the watershed. If shade levels are not approaching the TMDL load allocation by 2009, Ecology will suggest changes to the Forest Practices Board.

Therefore, DNR is encouraged to condition forest practices to prohibit any further reduction of stream shade and not to waive or modify any shade requirements for timber harvesting activities on these state and private lands. Ecology is committed to assisting DNR to identify those site specific situations where reduction of shade has the potential for or could cause material damage to public resources.

9) U.S. Fish and Wildlife Service (Service)

Through implementation of its restoration programs, the Service has cooperatively implemented restoration projects with numerous landowners throughout the Chehalis Basin. Landowner participation is voluntary, and the Service provides both financial and technical assistance. Typical restoration activities that affect parameters addressed within this DIP include: livestock fencing and off-channel watering, riparian planting, in-stream large wood placement, restoring wetland hydrology, and road decommissioning. Water quality-related outreach, education, and assessment projects are also supported. The Service typically funds between eight and ten projects annually throughout the Basin.

10) Chehalis Basin Fisheries Restoration Program

The Chehalis Basin Fisheries Restoration Program was initiated by congressional legislation (Public Law 101-452) and is coordinated by the U.S. Fish and Wildlife Service. The goal of the program is to optimize natural salmon and steelhead production while allowing the highest compatible level of hatchery production. The program provides funding and guidance to improve aquatic habitats throughout the Chehalis River Basin.

Under this program, Ecology implemented a six-year project to evaluate the effectiveness of best management practices and fisheries habitat restoration efforts. Numerous stream sites were monitored and evaluated under this grant. A number of interim project reports have been published which document the effectiveness of BMPs (Sargeant, 1996a&b, 1997, 1998a&b, Sargeant et al.,Chehalis Best Management Practices Evaluation Project-Final Report for Water Quality Sites, 2002).

In addition to monitoring the effectiveness of these activities, the program has provided grant funds to various cooperators for specific restoration activities (Table 17 from the Upper Chehalis Temperature TMDL).

11) State of Washington Department of Agriculture

The WSDA will administer the state Dairy program and the federal AFO/CAFO program. The development and enforcement of permits associated with livestock activities will be coordinated with development and implementation of the TMDL. Facilities under permit will be inspected on a routine basis to determine compliance with the permit including no discharges to surface or groundwater. In addition to these inspections associated with the livestock operations, WSDA is currently and will continue to monitor both surface and ground water for pesticide occurrences in other areas of the state. This monitoring is being conducted under the requirements of the Endangered Species Act (surface water), and as part of the federal and State Pesticide Management Plan (groundwater). Results of this monitoring will assist WSDA in determining what modifications to current pesticide management practices need to be implemented. At this time, the WSDA is not contemplating monitoring for the Chehalis but it may occur in the future.

12) State of Washington Department of Health

The Washington Department of Health (DOH) collects water samples monthly in Grays Harbor at established stations, and performs regular evaluations at various point sources in coordination with the Department of Ecology. DOH is responsible for ensuring that the standards of the National Shellfish Sanitation Program are met in all commercial and public recreational shellfish growing areas in Washington State. They also advise and work jointly with the Grays Harbor County Public Health and Social Services Department on shellfish closures, pollution concerns, and shoreline conditions that could affect water quality in shellfish production areas of Grays Harbor. They also oversee the local health programs administration of the state laws and regulations addressing proper septic system management, under WAC 246-272.

13) U.S. Environmental Protection Agency

The Environmental Protection Agency (EPA) is responsible for validating the Department of Ecology's implementation of the Chehalis TMDLs and enforcement of the Clean Water Act. EPA provides funding to states and tribes to implement the Clean Water Act. Some of the funding Ecology receives from EPA is the source for the competitive grants made each year. In cooperation with Ecology, EPA conducted field sampling in the upper Chehalis (WRIA 23) during 1997 to assess the status of ecological resources in the Basin and to examine the association between ecological conditions and natural and human influences. This project used indicator concepts and a statistical design developed by the Environmental Assessment and Monitoring Program to identify and draw samples from twenty-six second order streams. The results of this study are available in Ecological Conditions of the Upper Chehalis Basin Streams by Hayslip and Herger, 2001 (EPA-910-R-01-005). This study concluded that many of the sites examined exhibited good environmental conditions, including indicators representative of water quality and habitat. The project report contains summary data and site-specific data. It is available from EPA Region 10.

14) State of Washington Department of Ecology

Ecology has been delegated authority by the EPA to implement many aspects of the federal Clean Water Act. This includes the National Pollution Discharge Elimination System (NPDES) permitting and the Total Maximum Daily Load program. The Department of Ecology will continue to be the delegated authority by EPA to implement the federal Clean Water Act. However, by virtue of ESSB 5889, WSDA is seeking delegation by EPA of portions of the Clean Water Act that deal with the administrations of AFOs and CAFOs. It is expected that within a two year period WSDA will be delegated to issue NPDES permits to those facilities that they have jurisdiction over.

Ecology has inspectors in the Southwest Regional Office (SWRO) who implement RCW 90.48 (Water Pollution Control Act). The inspectors provide technical assistance, and enforcement if needed, for implementing RCW 90.48 and associated regulations. The SWRO also has at least two permit managers who are responsible for preparing and enforcing the permits for the sewer treatment plants and industrial facilities in the Basin. It is through NPDES permits, and inspection and enforcement programs that the waste load allocations (WLAs) of the TMDLs will be enforced. Ecology also helps local governments meet water quality goals through technical assistance and grants or loans, providing more than $49 million for area projects in the past five years.

Management Roles, Activities, and Schedules

Table 2: Management Roles, Activities, and Schedules

* Funding sources in bold type have been secured. Others are possible sources.
'319' - Funding program under the Federal Clean Water Act, Section 319
CCWF - Centennial Clean Water Fund (through Ecology – application during January and Feb.)
SRLP - Shellfish Reserve Septic Replacement Loan Program
FEMA - Federal Emergency Management Act
CREP - Conservation Reserve Enhancement Program
EQIP - Environmental Quality Incentives Program
USFWS - Chehalis Basin Fisheries Restoration Program
SRFB - Washington State Salmon Recovery Funding Board
FREP - Forestry Riparian Easement Program
St. LOAN - State Revolving Fund Loan Program (SRF)

Pollution Source	Responsible Agency	Action	Status/Schedule	Funding*
Agriculture	CD and NRCS	Farm planning and technical assistance on BMPs	Ongoing – priority on areas of concern	CCWF through 6/03 (will apply for additional funding)
		Install riparian livestock-exclusion fencing and plantings	Ongoing – priority on areas of concern	
		BMP workshops to reduce the amount of manure reaching waterways	Ongoing	CCWF
		Conservation Reserve Enhancement Program (riparian protection)	Ongoing – priority on areas of concern	CREP
		Environmental Quality Incentive Program	Ongoing – priority on areas of concern	EQIP

Table 2: continued

Pollution Source	Responsible Agency	Action	Status/Schedule	Funding*
Agriculture	Chehalis Basin Partnership	Facilitate partners' implementation of habitat and riparian enhancements. Coordinate basin-wide monitoring of activities and water quality	Annual award of grants	SRFB Water Quality Financial Assistance Program
	WA Dept. of Agriculture	Technical assistance and enforcement of Dairy Nutrient Management Act and Concentrated Animal Operations (CAFO) rules.	Tech. assistance as needed to reduce delivery of manure or other BOD materials to waterways. Enforcement when voluntary compliance has not been achievable.	WA Dept. of Agriculture Permit fees
	All stakeholders, Volunteer, Non-Profit Groups	Investigate manure management options. Plan and conduct comprehensive water quality monitoring	Ongoing potential approach to reduce sources and delivery of manure to waterways. Ongoing: locating sources of pollution and inform planning for water protection practices.	CCWF CCWF, 319 Grants, Private foundations
	Support Industries	Innovative technologies	Potential approach to reduce sources and delivery of manure to waterways.	CCWF
	WA Dept. of Ecology	Technical Assistance and Enforcement (agricultural non-point sources other than permitted livestock facilities regulated primarily by WA. State Dept. of Agriculture) Water Quality Monitoring	As needed to reduce sources of manure or other BOD materials to waterways, enforcement when voluntary compliance has not been achievable Monthly at several stations, other locations when necessary for compliance or regulation.	WA Dept. of Ecology U.S. EPA
Septic Systems	GH County Health	County-wide O&M Program	funding-dependent permit fees	CCWF St LOAN Program administered for use by households.
		Investigate commercial septage storage along waterways	By June 2004	User fees by Permittees
		Windshield survey to identify high-risk septic systems.	Done in high priority area by 8/20/04	User fees by Permittees
	GH County Health	Oversee septic repairs	Other areas of watershed Permit 50 repairs per year	 County , SLRP
	GH County Health	Evaluate existing systems	Evaluate 100 systems per year	County fees
		Complete system evaluations for loan reports.	Complete 50 loan reports per year using public education	User fees by Permittees
	GH County Health			

Table 2: continued

Pollution Source	Responsible Agency	Action	Status/Schedule	Funding*
Septic Systems	Lewis Co. Health	Identify high-risk sites, characterize failures, problem sources	Ongoing, at least through 10-yr. cycle	County budget CCWF, 319
	Lewis Co. Health	Monitor conditions, conduct technical assistance in high-risk septic locations Coordinate w/ Lewis Cons. District to follow-up on high-risk sites Collaborate w/CD on funding-requests to expand response capabilities	Ongoing, at least through 10-yr. cycle Ongoing, at least through 10-yr. cycle	County budget CCWF, 319 "" "" ""
	Lewis Co. Health	Develop/conduct community education, broker financial assistance to fix failing systems	Ongoing, at least through 10-yr. cycle	County budget, CCWF, 319, St LOAN
	Thurston Co. Health	Permit installation of new/expanded septic systems, oversee operations and maintenance program, and review land-use proposals to protect sensitive areas	Ongoing	Fee program, County budget
	Thurston Co. Health	Conduct technical assistance for system operators, provide education programs, investigate complaints, and conduct septic surveys in areas of high concern	Ongoing	Fee program, County budget, Special grants
	Thurston Co. Health	Broker financial assistance to fix failing systems.	Ongoing	St. LOAN
	Chehalis Tribe, WA. DOH	Survey of on-site septics on the reservation	Ongoing	Tribe, State DOH assistance
	Cities of Chehalis and Centralia	Adopt stormwater management manual and implement BMPs	2004/2005 and Beyond	State Revolving Fund (loans) CCWF
Stormwater Management	City of Hoquiam	Monitor stormwater for source i.d. and improvements	Beginning 2005 and Beyond	CCWF
	City of Westport	Monitor stormwater for pollution source i.d. and improvements, and coordinate w/ GH County on other on-site septic sources	Beginning 2005 and Beyond	CCWF
	City of Cosmopolis	Monitor stormwater for source i.d. and improvements, and coordinate w/GH County on other sources, connect ”6” homes per year to city sewer system	Ongoing Monitoring	CCWF SLRP

Table 2: continued

Pollution Source	Responsible Agency	Action	Status/Schedule	Funding*
Stormwater Management	City of Aberdeen	Monitor stormwater for source i.d. and improvements Expand vector waste program	Ongoing Monitoring 2004	City Stormwater Assessment
	State DNR	Implement Forest and Fish Act requirements with private landowners. Review road maintenance and abandonment plans	Ongoing	Legislative Mandate
	State DNR and Small Landowners	Implement Forest and Fish Act requirements with private landowners	Ongoing	FREP
	Chehalis Tribe	Conduct comprehensive water quality monitoring in dozens of places in upper basin	Ongoing	Tribal budget, 319, CCWF
Forestry and Riparian Management Practices	City of Chehalis	Build new treatment plant and meet other conditions of the DO TMDL consent decree.	By 2008 per DO TMDL consent decree.	SRF Loan, 319 Grants, User Utility Fees
	City of Chehalis	Plant poplar plantation for economic use of reclaimed wastewater during low-flow river conditions	Land developed, trees planted spring 2004. Irrigation system functional by 2008	SRF Loan, 319 Grants, User Utility Fees
Permitted Treatment Plants	City of Centralia	Build new treatment plant and meet other conditions of the DO TMDL consent decree	Completed April 2004	SRF Loan, User Utility Fees
	West Farm Foods	Implement wasteload allocation limits as set by DO TMDL and consent decree	Land acquired for installation of agricultural crop and wastewater application for irrigation. Full achievement of TMDL responsibilities by 2008	Company Budget

Performance Measures and Targets

This plan is based on a phased approach. It acknowledges that some time will be required to fully implement corrective strategies and sets practical timelines to assure that a responsible level of commitment is maintained towards cleanup. Phase One will address the obvious problems in the areas of concern. If monitoring data do not show improvements, or if interim goals set for progressive improvements in water quality are not achieved, implementation will advance into Phase Two. In Phase Two, cleanup actions will be considered on a watershed scale and a broader range of cleanup actions will be applied.

Cleanup Goals (Targets)

Tables below summarize the target geometric means and the load allocations stated in the TMDLs. The target geometric means should be met as soon as possible. Given progress observed to date, the current best estimate is that bacteria standards should be achieved by late 2005 in the lower Chehalis Basin (Table 3). That is consistent with the projection in the Grays Harbor/Chehalis Bacteria TMDL report. Annual goals for cleanup of bacteria in the upper Chehalis Basin are based on a six-year schedule for achieving water quality standards by 2010 (Table 4). That schedule is consistent with the projections described in the Upper Chehalis Bacteria TMDL submittal report. It will take longer to attain standards for dissolved oxygen and temperature.

As stated earlier, there should be some observed improvement in oxygen levels and lower bacteria levels as agricultural sources are reduced. Point source work is also expected to improve oxygen levels. The schedule for compliance with the dissolved oxygen and temperature wasteload allocations (permitted facilities in the upper Chehalis Basin) is 2008. Since achievement of the temperature standards is largely dependent on growing trees needed for significant increase of riparian shade that work will most likely take the longest to be completed. The temperature TMDL estimated that it could take 60-plus years for temperature standards to be achieved in the upper Chehalis Basin.

Measuring Progress toward Goals

Evaluation of water quality monitoring data and the progress of implementation activities will occur routinely. The Comprehensive Monitoring Plan being written by the Chehalis Basin Partnership will identify an appropriate frequency for progress reviews (*e.g.*, annually, every other year, or possibly at ten-plus years depending on the pollution parameter being evaluated). The review will be co-managed by the Department of Ecology and the CBP. The results of the review will be made available to the implementing organizations, as well as members of the Chehalis Basin Partnership. The purpose of the reviews is to keep implementing organizations focused on their commitments and for determining the need to apply adaptive management.

The reviews are intended to continually focus watershed protection work towards the most pressing problem areas. The active role of the CBP in the routine TMDL progress reviews helps meet a vital need, as expressed in the CBP's September 24 endorsement of this DIP. "The

Partnership expects to continue serving as a focal point for coordinating implementation of local elements of the DIP" (see Appendix A).

Target cleanup levels for each of the major tributaries are provided in the tables below.

Bacteria Targets

The yearly targets are based upon a decrease in the geometric mean over five to six years, with each annual target being a percentage of the previous year's target. This rate of decline was chosen because monitoring data in recent years have shown that the most rapid gains would be obtainable early in the process.

Table 3: Annual Water Quality Targets for Fecal Coliform Bacteria in the Lower Chehalis/Grays Harbor Basin

Date	Chehalis M Targets			Hump			Satsop		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
2-Jun-02	115	769	0	115	606	0	134	282	0
3-Sep-03	82	549	29	87	459	24	123	259	8
4-Sep-04	63	420	45	70	368	39	115	241	14
5-Sep-05	48	320	58	56	295	51	107	225	20
6-Mar-06	30	200	74	38	200	67	95	200	29
	Wishkah mo Targets			Wishkah upstr Targets			Hoquiam Targets		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
2-Jun-02	263	526	0	455	909	0	119	476	0
3-Sep-03	207	413	21	311	623	32	96	383	19
4-Sep-04	170	341	35	230	460	49	81	322	32
5-Sep-05	140	281	47	170	340	63	68	271	43
6-Mar-06	100	200	62	100	200	78	50	200	58
	W Hoquiam Targets			E Hoquiam Targets			Wynoochee Targets		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
2-Jun-02	92	317	0	116	233	0	83	200	0
3-Sep-03	82	283	11	112	224	4	83	200	0
4-Sep-04	75	258	19	109	217	7	83	200	0
5-Sep-05	68	235	26	105	211	9	83	200	0
6-Mar-06	58	200	37	100	200	14	83	200	0
	Elk River Targets			Johns River Targets			Central Prk Cr Targets		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
2-Jun-02	400	2000	0	149	408	0	533	3333	0
3-Sep-03	225	1125	44	125	341	16	264	1650	51
4-Sep-04	142	710	65	108	296	27	150	940	72
5-Sep-05	90	448	78	94	257	37	86	535	84
6-Mar-06	40	200	90	73	200	51	32	200	94
	Grass Cr Targets			Chenois Cr. Targets			Newskah Targets		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
2-Jun-02	61	606	0	54	317	0	96	278	0
3-Sep-03	46	459	24	48	283	11	88	256	8
4-Sep-04	37	368	39	44	258	19	83	240	14
5-Sep-05	29	295	51	40	235	26	77	224	19
6-Mar-06	20	200	67	34	200	37	69	200	28

Table 3: continued

Date	Charlie Cr			Andrews Cr			Elliot Slough		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
2-Jun-02	256	513	0	130	2000	0	137	274	0
3-Sep-03	203	405	21	73	1125	44	127	253	8
4-Sep-04	168	336	35	46	710	65	119	238	13
5-Sep-05	139	278	46	29	448	78	112	223	18
6-Mar-06	100	200	61	13	200	90	100	200	27

	Barlow Cr.			Grayland Dtch			Oleary Cr.		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
2-Jun-02	333	952	0	345	690	0	119	476	0
3-Sep-03	226	645	32	253	506	27	96	383	19
4-Sep-04	165	472	50	198	395	43	81	322	32
5-Sep-05	121	345	64	154	308	55	68	271	43
6-Mar-06	70	200	79	100	200	71	50	200	58

	Indian Cr.			Redman Sl.			Stafford Cr.		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
2-Jun-02	155	909	0	909	1818	0	341	690	0
3-Sep-03	106	623	32	524	1047	42	251	506	27
4-Sep-04	78	460	49	337	673	63	196	395	43
5-Sep-05	58	340	63	217	433	76	153	308	55
6-Mar-06	34	200	78	100	200	89	99	200	71

	Chapin Cr.			Campbell Cr			Westport Cr.		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
2-Jun-02	109	435	0	135	588	0	1250	2500	0
3-Sep-03	90	358	18	103	449	24	665	1330	47
4-Sep-04	77	307	29	83	362	38	401	802	68
5-Sep-05	66	262	40	67	292	50	242	484	81
6-Mar-06	50	200	54	46	200	66	100	200	92

	Dempsey Cr.			Urban Drains		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
2-Jun-02	123	426	0	750	10000	0
3-Sep-03	102	352	17	282	3761	62
4-Sep-04	88	303	29	129	1720	83
5-Sep-05	76	260	39	59	786	92
6-Mar-06	58	200	53	15	200	98

Table 4: Annual Water Quality Targets for Upper Chehalis Fecal Coliform Bacteria

Date	Porter			Independence Road			Prather		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
Dec-04	95	513	8	147	844	11	182	1138	20
Dec-05	81	439	21	116	664	30	145	907	36
Dec-06	70	375	32	91	523	45	107	670	53
Dec-07	59	320	43	71	411	57	79	495	65
Dec-08	51	274	51	56	323	66	58	366	75
Dec-09	43	234	58	44	254	73	43	270	81
Dec-10	37	200	64	35	200	79	32	200	86

Date	Centralia			Dryad			Beaver Creek		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
Dec-04	118	658	14	50	271	4	146	637	14
Dec-05	101	563	26	48	260	8	125	548	26
Dec-06	82	458	40	45	246	13	103	447	39
Dec-07	67	372	52	43	234	17	84	366	51
Dec-08	55	302	60	41	222	21	69	300	60
Dec-09	44	246	68	39	210	25	56	244	67
Dec-10	36	200	74	37	200	29	46	200	73

Date	Allen Creek Mouth			Dempsey Creek			Scatter Creek RM 8		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
Dec-04	105	397	8	360	2328	19	63	386	5
Dec-05	36	363	17	240	1546	46	57	346	15
Dec-06	85	322	26	160	1027	64	51	310	24
Dec-07	75	286	34	106	682	76	46	278	32
Dec-08	67	254	41	71	453	84	41	250	39
Dec-09	60	225	48	47	301	89	37	223	45
Dec-10	53	200	54	31	200	93	33	200	51

Date	Scatter Creek RM 19			Lincoln Creek RM 1.2			Lincoln Creek RM 8.8		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
Dec-04	111	326	12	173	1085	13	90	500	7
Dec-05	86	717	32	131	819	35	78	430	21
Dec-06	67	555	47	98	617	51	67	368	32
Dec-07	52	430	60	75	465	63	57	317	41
Dec-08	40	334	69	56	351	72	49	271	50
Dec-09	31	258	75	42	265	79	42	233	57
Dec-10	24	200	81	32	200	84	36	200	63

Table 4: continued

Date	Lincoln Creek RM 10			Skookumchuck Mouth			Salzer Creek Mouth		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
Dec-04	221	607	8	101	845	11	56	435	6
Dec-05	185	505	25	79	664	30	50	382	17
Dec-06	153	420	37	62	522	45	43	336	28
Dec-07	127	348	47	50	411	57	38	295	36
Dec-08	105	290	56	38	323	66	33	260	45
Dec-09	87	240	64	31	255	73	30	227	51
Dec-10	73	200	70	24	200	79	26	200	57
Date	**Dillenbaugh Mouth**			**Dillenbaugh RM 3.4**			**Berwick Creek Mouth**		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
Dec-04	111	1315	14	66	302	3	197	1315	14
Dec-05	81	960	37	62	282	4	144	960	37
Dec-06	60	702	54	58	263	16	106	702	55
Dec-07	43	512	67	54	245	21	77	512	67
Dec-08	32	375	76	50	230	27	56	375	75
Dec-09	23	273	82	47	214	31	41	273	82
Dec-10	17	200	87	44	200	36	30	200	87
Date	**Newaukum Mouth**			**Stearns Creek Mouth**			**Bunker Creek Mouth**		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
Dec-04	71	572	8	73	418	6	70	278	3
Dec-05	60	480	23	64	370	17	66	263	8
Dec-06	50	403	35	57	326	26	62	250	13
Dec-07	42	338	46	50	289	35	59	235	17
Dec-08	35	284	55	45	255	42	56	223	22
Dec-09	30	238	62	40	226	49	53	211	26
Dec-10	25	200	68	35	200	55	50	200	30
Date	**Deep Creek**			**South Fork Chehalis RM 4**			**Lake Creek Mouth**		
	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction	Geometric Mean	10% Exceed	% Reduction
Dec-04	115	1152	14	109	445	7	71	320	4
Dec-05	86	860	35	95	390	18	65	296	11
Dec-06	64	642	51	83	341	28	60	274	18
Dec-07	48	480	64	73	299	37	55	253	24
Dec-08	36	358	73	64	261	45	51	234	30
Dec-09	27	267	80	56	229	52	47	216	35
Dec-10	20	200	85	49	200	58	44	200	40

Table 4: continued

Date	Lost (Valley) Creek Mouth									
	Geometric Mean	10% Exceed	% Reduction							
Dec-04	52	435	6							
Dec-05	46	382	18							
Dec-06	40	337	28							
Dec-07	35	295	37							
Dec-08	31	260	44							
Dec-09	27	227	51							
Dec-10	24	200	57							

Dissolved Oxygen Targets

Load Allocations (LAs) are proposed for existing levels of nonpoint sources from Galvin Road to Porter. No LAs above background are proposed for nonpoint sources upstream of the Galvin Road Bridge and for future growth. The phased TMDL will allow the reassessment of the TMDL after implementation of nonpoint source controls. Tables from the Dissolved Oxygen TMDL submittal report are posted below to show allocations prescribed for ammonia (Table 5), and BOD (Table 6).

Table 5: Ammonia Allocation, TMDL, and Loading Capacity

RM				Allocation			Loading Cap	
	Code	Location	Bckg	WLA	LA	TMDL	Summ	Fall
	106.3	Chehalis River Headwaters	0.54		0.00			
	105.5	Pe Ell WTP		9.69				
	100.2	Elk Creek	0.19		0.00			
	106.3-97.9	Ground Water & Misc. Sources	5.94		0.00			
	97.9	CR @ Dryad				16.4	12.4	13.2
	88.0	South Fork Chehalis River	0.18		0.00			
	84.4	Bunker Creek	0.00		0.00			
	78.0	Stearns Creek	0.03		0.00			
	97.9-77.6	Ground Water & Misc. Sources	7.04		0.00			
	77.6	CR @.SR 603 Br nr Claquato				23.6	4.0	8.1
	75.2	Newaukum River	0.58		0.00			
	74.5	Dillenbaugh Creek	0.01		0.00			
	74.4	Darigold WTP (Existing)		0.00				
	74.3	Chehalis WTP (Existing)		0.00				
	69.2	Salzer Creek	0.00		0.00			
	77.6-67.5	Ground Water & Misc. Sources	4.67		0.00			
	67.5	CR @ Centralia (Mellen St Br)				28.9	3.8	7.8
	66.8	Centralia WTP (Existing)	.	54.33				
	66.9	Skookumchuck R nr mouth	1.23		0.00			
	66.8	Centralia WTP (Alternative)		0.00				
	66.8	Darigold WTP (Alternative)		0.00				
	66.8	Chehalis WTP (Alternative)		0.00				
	61.8	Lincoln Creek	0.01		0.17			
	67.5-59.9	Ground Water & Misc. Sources	0.17		0.00			

Table 5: continued

RM				Allocation			Lo	Cap.		
59.9	CR nr Grand Mnd (Prather) Rd)					84.8		36.0		58.9
58.2	Grand Mound WTP			161.54						
55.2	Scatter Creek		0.02		0.13					
51.5	Independence Creek		0.01		0.09					
47.0	Black River		0.81		6.78					
46.6	Sea Fresh Fish Co.			3.28						
44.9	Garrard Creek		0.05		0.22					
39.4	Rock Creek		0.04		0.00					
38.8	Cedar Creek		0.03		0.29					
59.9-33.8	Ground Water & Misc. Sources		1.25		7.44					
33.8	CR @ Porter (Porter Rd Br)					266.8		115.		166.1

Loading in pounds/day Ammonia as Nitrogen
Bck = background concentration

Table 6: CBOD Allocation, TMDL, and Loading Capacity

RM				Allocatio			Loading		Cap.
	Location		Bckg	WLA	LA	TMDL	Summ	Fall	
106.3	Chehalis River Headwaters		80.8		0.00				
105.5	Pe Ell WTP			48.5					
100.2	Elk Creek		28.3		0.00				
106.3-97.9	Ground Water & Misc. Sources		18.6		0.00				
97.9	CR @ Dryad					176	211		209
88.0	South Fork Chehalis River		27.1		0.00				
84.4	Bunker Creek		0.4		0.00				
78.0	Stearns Creek		4.1		0.00				
97.9-77.6	Ground Water & Misc. Sources		28.7		0.00				
77.6	CR @ SR 603 Br nr Claquato					236	165		116
75.2	Newaukum River		86.9		0.00				
74.5	Dillenbaugh Creek		1.2		0.00				
74.4	Darigold WTP (Existing)			0.0					
74.3	Chehalis WTP (Existing)			0.0					
69.2	Salzer Creek		1.8		0.00				
77.6-67.5	Ground Water & Misc. Sources		33.0		0.00				
67.5	Cr @ Centralia (Mellen St))Br)					359	338		98
66.8	Centralia WTP (Existing)			533.1					
66.9	Skookumchuck R nr mouth		184.2		0.00				
66.8	Centralia WTP (Alternative)			0.0					
66.8	Darigold WTP (Alternative)			0.0					
66.8	Chehalis WTP (Alternative)			0.0					
61.8	Lincoln Creek		2.0		3.00				
67.5-59.9	Ground Water & Misc. Sources		8.5		0.00				
59.9	CR nr Grand Mnd (Prather) Rd)					1090	1222		967
58.2	Grand Mound WTP			290.8					
55.2	Scatter Creek		2.9		3.00				
51.5	Independence Creek		0.8		1.20				
47.0	Black River		121.2		56.5				
46.6	Sea Fresh Fish Co.			121.2					

Table 6: continued

	RM				Allocatio				Lo	Cap.		
	44.9	Garrard Creek		7.3		10.7						
	39.4	Rock Creek		6.5		9.5						
	38.8	Cedar Creek		48.1		16.0						
	59.9-33.8	Ground Water & Misc. Sources		62.6		22.2						
	33.8	Cr @ Porter (Porter Rd Br)					1870			1778		1639

(loading in pounds/day as BOD 5)

Temperature Targets

Nonpoint source approaches:

For this TMDL, the relevant target for stream temperatures in the upper Chehalis Basin is 18 degrees centigrade. The target is based on State Surface Water Quality Standards in place at the time the temperature TMDL was approved by USEPA. As a nonpoint source measure however, effective stream shade was determined to be the most practical factor for influencing stream temperature improvements. Consequently, the temperature TMDL study established shade targets to measure over time (Table 7). Much of the area is influenced by forest practices rules for private and state forest lands. An especially relevant section of the Forest and Fish Rules is entitled "TMDLs Produced Prior to 2009 in Mixed-Use Watersheds." That section allows until 2009 for existing forest practices to demonstrate that they will be effective in achieving water quality standards. The effectiveness of the Forest and Fish Rules will be measured through the adaptive management process and monitoring of streams in the watershed. If shade is not approaching the TMDL load allocations by 2009, Ecology will suggest rule changes to the Forest Practices Board.

Table 7: Shade Targets for Upper Chehalis Basin Stream Reaches

Stream Reach		Percent Vegetative Shade	
	Load Allocation	Estimated Existing Shade	Additional Shade Needed
Chehalis ;river – Headquarters to Elk Creek	49%	53%	0%
Chehalis River – Elk Creek to Newaukum River	48	18%	30%
Chehalis River – Newaukum River to Skookumchuck R.	64%	22%	42%
Chehalis River – Skookumchuck R. to Scatter Creek	43%	16%	27%
Chehalis River – Scatter Creek to Town of Porter	44%	16%`	28%
South Fork Chehalis	74%	52%	22%
Newaukum River	78%	43%	35%
Dillenbaugh Creek	85%	64%	21%
Salzer Creek	81%	68%	13%
Skookumchuck R.	79%	59%	20%
Lincoln Creek	78%	59%	19%
Scatter Creek	81%	69%	12%
Black River	68%	37%	31%

The load allocations are based on two assumptions: 1) riparian vegetation will be protected and re-established as the result of management actions; and 2) water quality will be degraded no further by other influences. Although the bulk of the temperature TMDL analysis focused on riparian shade, the calibration of the model resulted in estimates of ground water inflow, stream and tributary flow, and channel morphology of the stream. Since the model was calibrated to predict conditions during the 1994 study, the implication of the assumptions is that existing influences on temperature other than shade must remain constant in order for the shade allocations to effectively control in-channel water temperatures. Since alterations of them would affect the assimilative capacity of the stream, existing groundwater inflow, stream flow, tributary flow, and channel morphology are considered part of the load allocation. Further degradation of these factors could affect the loading capacity of heat and may result in temperature standards not being met. In-stream flow levels at critical low flows must remain the same. Any additional water withdrawals must not be allowed during critical low flow periods. This includes any groundwater withdrawals with continuity to streams. Control measures need to be implemented to prevent further flow depletion.

Processes that affect channel morphology must at least be held constant for most streams. For the South Fork Chehalis River, the Newaukum River, and the Black River, the process affecting channel morphology must be improved to achieve stable channels with decreased width-to-depth ratios. The more significant factors affecting stream morphology that must be at least held constant are sediment delivery and watershed hydrology. Restoration activities that would reconnect or reestablish side channels, backwaters, and riverine wetlands would probably further improve channel water temperatures. Sediment delivery to the streams must be held constant or reduced. Excessive sediment loading to streams can raise temperatures. Surface erosion and sediment delivery from mass wasting must not increase.

Watershed hydrology must not be further changed. Activities that shift hydrographs from base flow to more surface storm flow will affect temperatures. Excessive storm flows can result in further stream bank erosion and will likely raise stream temperatures. Lower base flow in the summer seen in the hydrograph shift will also likely raise stream temperatures. Expansion of dikes and levies that could further alter stream hydrology should be curtailed. The load allocations described also apply to all tributary streams to the modeled reaches. The load allocations are based on the assumption that lateral temperatures and flows are held at current level. Lateral inflow represents all the smaller surface tributaries and ground water inflow to the segments that are not specifically modeled. These temperature and flows must not get worse. Activities that increase the temperature, reduce the flow, or impact the stream channel forming processes must be prevented in all tributaries of the watershed.

Point source facility approaches:
Specific wasteload allocations were established for three facilities (West Farm Foods, Chehalis, and Centralia treatment plants) to prevent any additional loading of BOD or NH3 to the upper Chehalis. The TMDL also prohibits additional loading from any other existing or future facility in the upper Basin because dissolved oxygen conditions fail state water quality standards due to natural conditions. A court-ordered consent decree allows the three facilities until 2008 to achieve their wasteload allocations, but they are on track to meet the schedule much sooner.

Effectiveness Monitoring Plan

There are four levels of monitoring needed, 1) systematic measurement of water quality conditions (ambient monitoring), 2) water quality sampling for source identification, 3) tracking of activity implementation, and 4) compliance monitoring. Each is used to evaluate the adequacy of implementation of control measures. Several entities conduct monitoring programs in the watershed. Together, these monitoring programs meet the following goals:

1. Ambient monitoring: What are the water quality conditions and trends over time?
2. Source identification: What is the true cause and source of the pollution?
3. Effectiveness monitoring: Activities and water quality are both monitored to learn whether the implementation measures are improving water quality.
4. Compliance monitoring: When have we reached the reductions required in the TMDL?

The Chehalis Basin Partnership was awarded grant funding to develop a comprehensive monitoring plan (CMP) to evaluate water quality and help focus protection efforts. No dedicated or ongoing funding has been identified yet for monitoring plan implementation. At the time of completion of this plan, the Partnership is pursuing grants to pay for a monitoring coordinator. *That function is very important to the success of an ongoing monitoring program*. There are so many entities doing monitoring at different times for different parameters and with different reporting techniques, that a person is needed to organize a process for coordinating that monitoring to make the data meaningful for the watershed overall.

The monitoring plan will include approaches for accomplishing the first three levels of monitoring. Annually (or other frequency as set by the CMP), the status of monitoring efforts and data will be compiled and summarized in a report. The first report will describe a plan for securing long-term funding to accomplish the monitoring.

The reports will be available to the watershed implementing parties and will particularly serve to continually focus watershed protection work on the most pressing problem areas.

1. Ambient Water Quality

At the end of each year (or other frequency) the geometric mean of the last 12 (monthly) samples is compared to the targets. When the record for a site is less than 12 samples, all the samples are used to calculate the geometric mean.

The locations which have been established for systematic water quality monitoring, are summarized below in Tables 8, 9, 10.

2. Source Identification

Where ambient water quality monitoring identifies persistent hot spots, an Ecology inspector can follow up with additional sampling to track the source. Any necessary referral will be made by Ecology to ensure that the pollution problem is addressed by the organization with the most direct authority.

3. Implementation Activity Effectiveness

Comprehensive monitoring must track actual activity implementation in order to show any correlation between implementation and water quality improvements. The purpose of this is described in more detail in the following section about Adaptive Management.

4. Compliance Monitoring

Determining when TMDL goals are achieved:
Ecology is responsible for determining the compliance status of water bodies following development and implementation of each TMDL. Compliance with a TMDL is determined by rigorous statistical analysis of water quality data to measure whether water quality standards have been achieved.

Monitoring may be conducted by Ecology or by other entities. The timing will depend on the pollution parameters addressed in the TMDL, the time when positive results should be identifiable, and the availability of resources.

Ecology will participate in analyzing monitoring data for quality assurance, and to evaluate progress towards compliance. This process will include consultations with the original TMDL modeler to determine critical parts of the implementation plan and to verify critical locations. These discussions must also include affected local people helping implement the comprehensive monitoring plan. These routine reviews will help allow informed decisions to be made about possible changes to the TMDL implementation plan, and will eventually allow Ecology to recommend that cleaned-up segments be de-listed from the TMDL implementation program.

Ecology will also be conducting five-year reviews on this and all completed TMDLs, to assure that water bodies stay in compliance.

An Integrated View of Monitoring Site Priorities

Purpose of an Integrated View:
Table 8 below is meant to help focus resources available for monitoring (and initial cleanup actions) towards the highest priority areas of the upper Chehalis Basin. Tables 9 and 10 on pages 53-55 below show the relative priority for improvement of each river segment in the lower Chehalis Basin. The results of water quality sampling guided by these tables will help support several of the monitoring objectives described above (*i.e.*, ambient monitoring, source identification, and achievement of required TMDL targets).

Each of the TMDL studies (for DO, temperature and fecal coliform bacteria) identified cleanup priorities for the respective river segments analyzed in each study. Each river segment was ranked according to the percent cleanup or improvement needed in order to achieve water quality standards for each pollutant separately. Table 8 was made to help show the *overall priority* for correcting the three pollutants collectively (*i.e.*, combination of bacteria reductions, dissolved oxygen increases, and shade increases) impairing each river location.

The table is not intended to be used as the sole criterion for choosing priorities, but it may be applied subjectively along with other important factors like: geographic constraints of a particular organization ready to proceed with work in a certain basin (county work within county lines), immediate availability of funding dedicated to an exclusive basin or project (Scatter Creek SRFB funding overlapping water cleanup priorities), opportunity to partner with a project sponsor focused on a special area of common interest. The tables are not meant to be prescriptive. Rather, they should be used as a guide. They should definitely be considered along with local judgment of where the best opportunities may be for monitoring, or perhaps cleanup depending on the objective for the choices being made at the time.

How to "read" Table 8:
Column 1 lists all waterbody segments that have been assigned a pollution reduction target by one or more of the TMDL studies. Many segments are identified as being impaired by more than one parameter.

Columns 2 through 4 summarize the river location priority-rankings for each pollutant. For instance, the dissolved oxygen column shows the relative priority of pollution reduction needed, for each waterbody segment originally assigned a pollution reduction target for dissolved oxygen. Twenty-two segments were prioritized according to their relative need for improvement. If two or more segments need the same relative degree of improvement for the same pollutant, those segments were assigned the same priority ranking. For example, the original dissolved oxygen TMDL found that Salzer Creek and the Middle Black River needed the same relative degree of dissolved oxygen improvement, so in the DO column of Table 8 both are shown as priority 1 sites. They received top priority for a combination of BOD and ammonia effects found in the DO TMDL study.

Column 5 labeled "Priority of All Pollutants Combined" assigns a relative priority ranking for cleanup of each river location, based on the significance of all pollutants combined.

The Table 8 rows for Beaver and Dillenbaugh Creeks stand out as potential priority locations, given the relatively higher degree of improvement needed for all three parameters combined. The Beaver Creek row for example, shows that among all the other river segments studied, Beaver Creek ranks a priority 2 (out of 22 segments) for dissolved oxygen improvement, priority 3 (among 13 locations ranked) for shade increases, and priority 9 (out of 22 segments ranked) for bacteria reduction.

Table 8 provides only a simple view of the combined significance of the cleanup needed at each site. The information is more qualitative than quantitative, although the number rankings were derived from a very quantitative and scientific data analysis in the TMDL studies.

Table 8: Upper Chehalis River Monitoring/Cleanup Site Priorities

Name of River or Water Body	River Mile Location	Follow-Up Priority				River Location Description
		Dissolved Oxygen (priority 1 thru 22) *Column 2	Temperature (priority 1 thru 13) *Column 3	Fecal Coliform Bacteria (priority 1 thru 22) *Column 4	Priority of All Pollutants Combined *Column 5	
Chehalis River	RM 106.3	13	1		7	CR @SR 6 Br. nr. PeEll
Elk Creek (mouth)	100.2	12	1		6.5	Elk Cr. @Elk Cr. Rd. Br.
Chehalis River at Dryad	101.7		1	1	1	
South Fork Chehalis River (mouth)	88.0	10	7**	9	8.7	At Boistfort Br.
Lake Creek (mouth)	SF Chehalis River RM 1.5			4	4	
Lost Valley Creek (mouth)	SF Chehalis River			8	8	
Bunker Creek (mouth)	84.4	14	1	2	5.7	Bunker Cr. @ Br. above mouth
Deep Creek	Bunker Creek RM 2.4			19	19	
Stearns Creek (mouth)	78.0	15	1	7	7.7	Stearns Cr. @ Twin Oaks Rd.
Chehalis River (mainstem)	97.9 to 77.6	16	1		8.5	CR @SR 603 Br. nr. Claquato
Newaukum River (mouth)	75.2	11	10***	12	11	
Dillenbaugh Creek (mouth)	74.5	19	6	21	15.4	At Labree Rd.
Dillenbaugh Creek (mainstem)	3.4			3	3	
Berwick Creek (mouth)				21	21	Berwick Cr. @Hamilton Rd.
Chehalis River (mainstem)	70.7	20	13		16.5	CR North of Airport
Salzer Creek (mouth)	69.2	22	13	8	14.4	Salzer Cr. @Airport Rd.
Chehalis River (mainstem)	70.1 to 68.1	21	13		17	CR below Midway meats
Chehalis River (mainstem)	77.6 to 66.5	18	10 (6-13)		14	CR below Centralia BL

Table 8: continued

Name of River or Water Body	River Mile Location	Follow-Up Priority				River Location Description
		Dissolved Oxygen (priority 1 thru 22) *Column 2	Temperature (priority 1 thru 13) *Column 3	Fecal Coliform Bacteria (priority 1 thru 22) *Column 4	Priority of All Pollutants Combined *Column 5	
Chehalis River (mainstem)	67.5 (Centralia)			15	15	CR @0.20 miles above Mellen St. Br
Chehalis River (mainstem)	74.5 to 66.5	17	13		15	CR below Chehalis WTP
Skookumchuck River (mouth)	66.9	9	13	16	12.7	
Lincoln Creek (mouth)	61.8	6	4		5	Lincoln Cr. @ Lincoln Cr. Rd.
Lincoln Creek	1.2			18	18	
Lincoln Creek	8.8			10	10	
Lincoln Creek	10.0			13	13	
Grand Mound	59.9		8	20	14	Prather Road
Chehalis River (mainstem)	54.7			16	16	Independence Road
Scatter Creek (mouth)	55.2	3	2		2.5	
Scatter Creek	8			5	5	
Scatter Creek	19			17	17	
Independence Creek (mouth)	51.5	5	9		7	Cr. @ 201st St.
Black River (mouth)	47.0	8	11		9.5	BR @Howanut Rd. Br.
Garrard Creek (mouth)	44.9	7	9		8	Ck @ Mattson Rd.
Rock Creek (mouth)	39.4	2	9		5.5	Cr. @ South Bank Rd.
Cedar Creek (mouth)	38.8	1	9		5.0	Cr. @ Elma-Gate Rd.
Chehalis River (mainstem)	39.5 to 33.8	4	9		6.5	CR 0.10 mile above South Bank Rd.
Chehalis River (mainstem at Porter)	33.8			11	11	Porter Rd. Br.
Upper Black River	Above RM 15.3	20	11		15.5	BR above Littlerock BL
Allen Creek (mouth)	Beaver Creek RM 2.6			6	6	
Dempsey Creek (mouth)	Black River RM 24.2			22	22	
Beaver Creek (mouth)	Black River RM 16.8	21	11	14	15.4	

Table 8: continued

Name of River or Water Body	River Mile Location	Follow-Up Priority				River Location Description
		Dissolved Oxygen (priority 1 thru 22) *Column 2	Temperature (priority 1 thru 13) *Column 3	Fecal Coliform Bacteria (priority 1 thru 22) *Column 4	Priority of All Pollutants Combined *Column 5	
Middle Black River	15.3 to 9.6	22	11		16.5	BR @ Rochester Sl (Steelhammer)
Mima Creek (mouth)	Black River RM 11.8	19	11		15	
Lower Black River	Below RM 9.6	18	11		14.5	BR just above Global Aqua
Black River System			11		11	Mouth of Black River

*Column 2 rankings derived from "Revised Upper Chehalis Dissolved Oxygen TMDL Report," March 2000, Pub. # 00-10-018

*Column 3 rankings derived from "Upper Chehalis Temperature TMDL Report," July 2001, Pub. # 99-52

*Column 4 rankings derived from "Upper Chehalis Fecal Coliform Bacteria TMDL Report," May 2004, Pub. # 04-10-041

*Column 5 rankings based on computing the average ranking for all the pollutants affecting the river segment location
**Width to depth ratio improvements also needed.
***Mainstem Chehalis River

Tables 9 and 10 below show monitoring location priorities for the lower basin fecal coliform bacteria concerns. The tables are organized differently according to two possibly different monitoring objectives. Table 9 shows sites in descending priority according to the percent pollution reduction needed to meet water quality standards. Table 10 prioritizes locations in descending order according to the total mass of the bacteria load that each location was contributing to pollution in Grays Harbor.

Table 9: Lower Chehalis River bacteria monitoring/cleanup site priorities listed in descending order of percent load reduction needed to meet water quality standards.

Tributaries to the Lower Chehalis River and Grays Harbor	Recommended % reduction to meet freshwater or marine standard	Percent of Total Load to Grays Harbor	Description of Suggested Monitoring Site Location**
Urban drains in Aberdeen, Cosmopolis, Westport, Hoquiam	98%	2.5%	See Grays Harbor TMDL Tech. Report, page 37
Unnamed Central Park creek	94%	1.2%	Central Park Dr. bridge near Fairway Park Dr.
Unnamed Westport creek	92%	0.09%	2nd and Sprague Streets
Elk R nr mouth (rollback to meet marine WQS) (see *** below)	90%	2.8%	Logging Rd. near mouth
Andrews Cr nr mouth (rollback to meet marine WQS)	90%	0.43%	Near DNR gate, logging Rd. footpath
Redman Slough	89%	0.13%	At mouth from shore
Barlow Creek	79%	0.33%	Plum St. bridge
Wishkah R above river mile 6	78%	--	Aberdeen Gardens Rd. bridge
Indian Creek	78%	0.28%	Hwy. 105 bridge nr. mouth
Mainstem Chehalis River between Porter and mouth of Satsop	74%	50.0%	Rd. Bridge @ So. Elma
Grayland Ditch	71%	0.32%	3 sites, see Grays Harbor TMDL tech. report, page 22
Stafford Creek	71%	0.13%	Hwy. 105 bridge nr. mouth
Grass Creek	67%	0.7%	Hwy. 105 bridge nr. mouth
O' Leary Creek	68%	0.28%	Hwy. 105 bridge nr. mouth
Humptulips R nr mouth (rollback to meet marine WQS)	67%	8.8%	Hwy. 109 bridge nr. mouth
Campbell Creek	66%	0.09%	Hwy. 105 bridge nr. mouth
Wishkah R near mouth (hypothetical class A)	62%	6.3%	Hwy. 12 bridge in Aberdeen
Charley Creek	61%	0.51%	Hwy. 105 bridge nr. mouth
Hoquiam R near mouth (hypothetical class A)	58%	5.4%	Riverside bridge in Hoquiam
Chapin Creek	54%	0.1%	Hwy. 105 bridge nr. mouth
Dempsey Creek	53%	0.05%	Plum St. bridge nr. mouth
Johns River near mouth	51%	2.4%	WDFW boat launch above Hwy. 105

Table 9: continued

Tributaries to the Lower Chehalis River and Grays Harbor	Recommended % reduction to meet freshwater or marine standard	Percent of Total Load to Grays Harbor	Description of Suggested Monitoring Site Location**
Chenois Creek	37%	0.66%	Hwy. 109 bridge nr. mouth
West Fork Hoquiam R above river mile 9.3 (Dekay Rd)	37%	--	Dekay Rd. bridge
Satsop River, 1 mile W. of Satsop	29%	7.9%	Old Hwy. 12 bridge,
Newskah Creek	28%	0.54%	Hwy. 105 bridge nr. mouth
Elliot Slough near Aberdeen	27%	0.33%	Nr. Mouth @ road bridge
East Fork Hoquiam River below Nisson	14%	--	F-line logging Rd. bridge
Wynoochee River near Montesano	0%	3.2%	Devonshire Rd. bridge
Other small tributaries	--	0.11	

** See Table 4 on Page 8 of the Grays Harbor/Chehalis Watershed Fecal Coliform Bacteria TMDL Tech. Report

***Elk Creek pollution caused by wildlife: intervention would be ineffective-not a priority site

Table 10: Lower Chehalis River bacteria monitoring/cleanup site priorities listed in descending order of percent load to Grays Harbor.

Tributaries to the Lower Chehalis River and Grays Harbor	Recommended % reduction to meet freshwater or marine standard	Percent of total load to Grays Harbor*
Mainstem Chehalis River between Porter and mouth of Satsop	74%	50.0%
Humptulips R nr mouth (rollback to meet marine WQS)	67%	8.8%
Satsop River	29%	7.9%
Wishkah R near mouth (hypothetical class A)	62%	6.3%
Wishkah R above river mile 6	78%	[--]
Hoquiam R near mouth (hypothetical class A)	58%	5.4%
West Fork Hoquiam R above river mile 9.3 (Dekay Rd)	37%	[--]
East Fork Hoquiam River	14%	[--]
Wynoochee River	0%	3.2%
Elk R nr mouth (rollback to meet marine WQS) {see *** below}	90%	2.8%
Urban drains in Aberdeen, Cosmopolis, Westport, Hoquiam	98%	2.5%
Johns River near mouth	51%	2.4%
Unnamed Central Park creek	94%	1.2%
Grass Creek	67%	0.7%
Chenois Creek	37%	0.66%
Newskah Creek	28%	0.54%
Charlie Creek	61%	0.51%
Andrews Cr nr mouth (rollback to meet marine WQS)	90%	0.43%
Elliot Slough	27%	0.33%
Barlow Creek	79%	0.33%
Grayland Ditch	71%	0.32%
Oleary Creek	68%	0.28%
Indian Creek	78%	0.28%
Redman Slough	89%	0.13%
Stafford Creek	71%	0.13%
Chapin Creek	54%	0.1%
Campbell Creek	66%	0.09%
Unnamed Westport creek	92%	0.09%
Dempsey Creek	53%	0.05%
Other small tributaries	--	0.11

* See Table 2 on page 4 of the Grays Harbor/Chehalis Watershed Fecal Coliform Bacteria TMDL. (columns with [--] are included in segment above)

** See Table 4 on page 8 of the Grays Harbor/Chehalis Watershed Fecal Coliform Bacteria TMDL

***Elk Creek pollution caused by wildlife: intervention would be ineffective-not a priority site

Enforcement

The Water Pollution Control Act (chapter 90.48 RCW) provides broad authority to issue permits and regulations, and prohibits all discharges to water. The act openly declares that it is the policy of the state to maintain the highest possible standards to ensure the purity of all waters of the state and to require the use of all known, available, and reasonable means to prevent and control water pollution. The act defines waters of the state and pollution and authorizes the Department of Ecology to control and prevent pollution, to make and enforce rules, including water quality standards. The act also designates the Department of Ecology as the state water pollution control agency for all the purposes of the federal Clean Water Act.

Adaptive Management

Adaptive Approach (plan, implement, monitor, adjust, continue monitoring):

The basic adaptive approach is described in the section entitled "The Approach." Ambient water quality monitoring, along with tracking of implementation activities, is expected to yield one of four possible outcomes, or water quality conditions, as shown in Table 11 below. When ambient water quality targets are not being met and implementation targets are being met (State IV), adaptive management is needed. The first response will be source identification monitoring, (Section VI.C). If tracking the source and applying existing implementation activities does not or is not expected to result in achieving targets, then further source identification will be conducted and appropriate control measures developed and implemented. Evaluation of water quality monitoring data, and status reports from each implementing organization about their activity implementation will be required annually with the goal of meeting water quality standards. The evaluation criteria and possible outcomes are summarized below in Table 11.

- State I: Both water quality and implementation goals are met, no change in scheduled activities is needed.
- State II: Ambient water quality goals are not being met, but implementation goals are being met; the immediate response will be to accelerate implementation activities. If accelerated implementation proves insufficient to meet water quality goals after three successive quarters, additional control measures will be developed and implemented.
- State III: Ambient water quality goals are being met, but implementation goals are not being met; implementation will be accelerated to meet implementation goals by the next quarter. This is consistent with the goal of meeting water quality standards as soon as possible.
- State IV: Neither ambient water quality nor implementation goals are being met; an accelerated implementation schedule or additional control measures will be required.

Table 11 - Water Quality Conditions and TMDL Implementation

	Water Quality Targets Met	Water Quality Targets Not Met
Implementation Schedule Met	State I - No Change Needed	State II – Accelerate implementation schedule and/or add additional control measures
Implementation Schedule Not Met	State III – Meet implementation schedule	State IV – Meet implementation schedule and/or add additional control measures

Reasonable Assurances

Many established programs described earlier are expected to advance restoration of water quality. Generally, this plan relies on existing programs for its success. However, as with most programs, they could be made more effective with stronger or broader level of implementation, and greater philosophical and financial support from local and other public officials. Ultimately, a greater understanding by citizens of how their actions affect water quality can translate into stronger commitment to personal choices that can restore and protect water quality. We must each understand the value of water to us individually to want to protect it.

The Chehalis Basin Partnership is a very capable organization with a broad spectrum of participation ready to coordinate the Watershed Management Plan that they recently completed. They are a proven organization advocating for protection of water quality, and supply, and have harnessed financial support for at least the last four years to plan and implement protection strategies. Their momentum is expected to provide continued leadership for coordinating, or serving as a clearinghouse for implementing many aspects of this cleanup plan. For instance, the CBP has been the local sponsor for implementation grants from the Chehalis Basin Fisheries Restoration Program, the Salmon Recovery Funding Board, the Watershed Planning Act, and the state Clean Water Financial Assistance Program. Under watershed planning, the CBP is tasked with establishing a procedure for controlling stream flow and they also chose to address water quality protection in their plan. Increasing flow during critical periods has the potential for decreasing temperature and improving oxygen saturation in the water. CBP is currently studying the possibilities for flow restoration in the Basin.

Most members of the advisory group that helped develop this DIP are members of the Chehalis Basin Partnership. It's important to note that many of those member organizations provided the descriptions for the implementation activities included in this plan. *Because the descriptions of*

the implementation activity commitments came directly from those responsible for implementation, there is a reasonable assurance of allegiance to the plan, to make it succeed. Appendix A includes a page from the CBP's Watershed Management Plan that summarizes the large breadth of CBP members and partners. Appendix A also includes a CBP letter that endorses this DIP and explains the CBP's commitment to support DIP implementation.

Implementation of Agricultural Practices:

The state Dairy Nutrient Management Act has been implemented almost completely in the Chehalis Basin. Continued stewardship by dairy operations, and monitoring the effectiveness of their operations and water quality will help ensure continued implementation of that very effective program.

The future success of agricultural water quality assistance programs for non-dairy farms is a concern. Local base funding is expected to continue for Conservation Districts, however, supplemental funding is required in order to implement more than a skeleton operation. Mason and Thurston Counties assess an annual landowner fee for supporting their CD technical assistance programs. Grays Harbor and Lewis CDs don't receive support from land tax assessments and rely almost completely on supplemental grant funding from outside sources to sustain their operation. Grays Harbor County CD is probably the most vulnerable to downsizing in the near future. At this time, they are expecting to rely solely on their base funding amount provided by the state Conservation Commission. Thus, their role in cleanup plan implementation may be minimal. This would be a major disappointment, given recent evidence that the work of the CD was effective in helping bring the Satsop and Humptulips Rivers into compliance with state water quality standards for fecal coliform bacteria. The District knew of livestock problems along the Satsop and Humptulips, and began helping landowners to fence out cattle as early as 1994. According to the CD's 2001/02 monitoring data, bacteria levels in the Satsop have dropped 75 percent below what the TMDL actually calls for. The Humptulips River was also reported as meeting the bacteria TMDL load allocation during the same time period, with an average concentration about 60% lower than the TMDL goal. The reductions can be attributed to lots of hard work by the landowners, the CD, and other farm service agencies.

The Washington State budget deficit has also reduced some of the traditional state financial assistance for agricultural non-point source water quality protection (*e.g.*, Centennial, and 319 Grants). Funding continues to be available through the State Revolving Fund Program, but the loan programs are much less applicable to the kind of non-point implementation described in this Plan.

Private funding is available from a long list of trusts and philanthropic organizations. There should be an ongoing and stepped-up review of those funding sources – for implementing strategies on agricultural as well as other lands. Maybe a person (volunteer or funded position) should be dedicated to conduct ongoing research of financial assistance opportunities, and write applications to secure more private funding. One clearinghouse and advisory service for environmental funding strategies is the Boise State University Environmental Finance Center (Center). The Chehalis Basin Partnership is currently consulting with the center to improve their ability to obtain more funding.

One hope for more financial support for agricultural landowners comes from the federal Environmental Quality Incentive Program (EQIP). The 2002 Farm Bill appropriated $60 million to EQIP nationally. The Chehalis Basin is part of the geographic area that was allotted $120,000 for 2003. The EQIP budget is expected to double in the next five years.

Forested Lands:

For state, county, municipal, and private forest landowners, all activities on forest lands are permitted by the Department of Natural Resources under the Forest Practice Rules and Regulations of the state of Washington. In 2000, major changes were adopted and approved in forest practices under the Forest and Fish legislation. These new and dramatically changed rules should provide major positive impacts to water quality by limiting and reducing timber harvesting activities in the following instances.

1) ***All*** headwater stream beginnings (initiation points) on every branch of a stream system within the Chehalis Basin must be protected by a 56' radius "leave area," creating much more shade and protection where stream water initially emerges from the ground.
2) ***All*** seeps and springs where water surfaces to the forest floor without a defined channel have at least a 50' "leave area" buffer on all sides.
3) ***Any*** junction where two small streams branch is protected by a 50' "leave area" buffer on all sides.
4) ***Fifty percent*** of the lineal distance of all small perennial headwater streams must be protected by a 50' "leave area" buffer on each side of the stream.
5) Buffers on all fish streams have been doubled from 50' in width to 100' in width on each side of the stream.
6) No timber harvesting is allowed on unstable slopes including bedrock hollow, convergent headwall, and inner gorge landforms.

In addition, many forest road construction, maintenance, and abandonment practices have been changed and instituted on all forest lands to protect shade along streams as well as reduce any sediment input by:

- disconnecting all ditch lines from live streams,
- increasing the size and frequency of culverts and relief ditch drainage,
- limiting the removal of timber at road crossings,
- requiring all existing roads be brought up to new standards or properly abandoned, and
- requiring additional buffer width for streams with adjacent forest roads.

The cumulative impact of all of these forest practice changes should result in improved water quality for the waters within the Chehalis Basin, since approximately 85% of the land base within the Basin is forest land, and these new practices represent major increased protection measures for all forest streams. The Forest Practices rules also call for monitoring and adaptive management, to modify prescriptions when necessary to meet water quality standards.

Non-Forested Lands:

For non-forested mixed-use land, several entities share an interest in seeing improvements in water quality, soil conservation, and habitat restoration. The conservation districts, in cooperation with local landowners, have conducted efforts in riparian management such as riparian fencing, riparian replanting, and fecal coliform water testing. The Conservation Reserve Enhancement Program (CREP) is one tool to help implement water quality protection practices. Among other benefits, CREP aims to increase bank stability and to restore and enhance habitat.

Stormwater Protection:

Ongoing commitment from the cities and counties will be necessary to get stormwater pollution in control. Of the cities affected by stormwater protection requirements, only Aberdeen has a utility assessment for helping finance their stormwater program. Other cities may wish to consider such an assessment.

All the cities with specific TMDL stormwater limits, except Hoquiam, have voluntarily committed to implementing stormwater improvements that will lead to meeting their TMDL pollution load allocations. (Hoquiam's Public Works Program has said that they intend to apply for financial assistance to do monitoring to better identify bacteria pollution sources.)

Beyond the voluntary approach, federal and state stormwater regulations can apply if necessary. The federal Phase II program provides for a review of stormwater programs, to determine their consistency with the federal Phase II stormwater requirements. This review is even more likely to be required where stormwater controls are required by a TMDL. The cities seem to understand that if they seriously commit now to stormwater controls required by the TMDL, and if a future Phase II program evaluation is required, they will hopefully be able to demonstrate their program consistency and avoid the full spectrum of the full permit requirements of Phase II.

Both Westport and Hoquiam have said that they want to collaborate with Grays Harbor County on identifying and addressing their respective stormwater pollution sources that may be part of the TMDL load allocations. The cities think that some of the bacteria pollution in their stormwater drains may actually be originating in the county (*i.e.*, outside the city limits and flowing into the city storm drains).

As described in the "Responsible Organizations" section above, the Grays Harbor area cities (affected by the Fecal Coliform Bacteria TMDL) are planning to apply for funding and conduct source identification monitoring so that they can make informed decisions about proper stormwater controls. Collaboration by Grays Harbor County will be important to the success of that work.

Success of On-Site Septic Programs:

At this point Grays Harbor and Thurston Counties have described how their OSS programs will benefit the TMDL implementation. The counties are restrained by recent economic downturns and are not planning to increase their OSS program capabilities in the immediate future. The Grays Harbor and Thurston Counties Health Departments have each developed a plan to respond to on-site-system failures, including, where appropriate, inspection of the systems. Health departments must also have a process to review their OSS program effectiveness, according to state statute and rules described earlier.

NPDES Permit Program:

Wasteload allocations (WLAs) for point source dischargers will be implemented by the Department of Ecology through its NPDES permitting authority. Permit maintenance and renewal schedules provide for ongoing monitoring of facility and discharge conditions to assure that water quality protections remain in place.

Funding Opportunities

Since 1998, the Department of Ecology has awarded $48.6 million dollars in loans and grants to cities and organizations for water quality protection in the Basin. Of this amount, almost $46 million has gone to cities and Lewis County for water quality protection in the upper Chehalis Basin, and $2.6 million for non-point source pollution management programs.

Potential funding sources for implementation of activities needed for water quality restoration and protection include:

State Shellfish Reserve Land Account Loan Program:
Revenues from the sale of oysters and leases from state-owned tideland in Grays Harbor and Pacific Counties are available to help finance the repair of on-site sewage systems that are contaminating shellfish growing areas. The account is administered by the Washington Department of Fish and Wildlife, which passes the septic system repair funding through to the Puget Sound Action Team for administration. The Loan Program was piloted in Pacific County during 2003 and revenues are expected to be available again next biennium in both Grays Harbor and Pacific counties.

Centennial/SRF/319:
These three funding sources are managed by Ecology through one combined application program. Funds are available to public entities as grants or low-interest loans. Grants require a 25 percent match. They may be used to provide education/outreach, technical assistance for specific water quality projects, or as seed money to establish various kinds of water quality related programs or program components. Grant funds may not be used for capital improvements to private property. However, riparian fencing, riparian revegetation, and alternative stock water are grant-eligible.

Low-interest loans are available to public entities for all the above uses, and have also been used as "pass-through" monies to provide low-interest loans to homeowners for septic system repair or agricultural best management practices, for instance. Loan money can be used for a wider range of improvements on private property.

Conservation Reserve Enhancement Program:
The Washington Conservation Reserve Enhancement Program is a joint effort between the state of Washington and the U.S. Department of Agriculture to restore fisheries habitat on private agricultural lands adjacent to depressed or critical-condition salmon streams. The streams in the Upper Chehalis River Basin have been approved for inclusion in this program. Landowners will contract with the federal Farm Services Agency to take land adjacent to these streams out of agricultural production and plant it with native trees. The trees must remain undisturbed for up to 15 years. In return, the landowner will receive an annual rental check. In addition to the payment, grant funds that cover nearly 90 percent of the cost of converting the agricultural land back to trees will be available to participating landowners.

The program began in January 1999 and is being coordinated by the Washington State Conservation Commission. Local conservation districts market the program to landowners, assist with the lease agreements, and help design the riparian restoration and protection practices. The program requires establishing a buffer that is dependent on the width, depth, and flood potential of the adjacent stream (NRCS Forest Riparian Buffer Standard 391).

In addition to developing recommendations for revegetation, other practices, such as livestock fencing and vegetation watering in dry periods, may also be included in the site plan.

Conservation Reserve Program (CRP):
A voluntary program that offers annual rental payments, incentive payments for certain activities, and cost-share assistance to establish approved cover on eligible cropland. Assistance is available in an amount equal to not more than 50 percent of the participant's costs in establishing approved practices; contract duration between 10-15 years. It is administered through the USDA NRCS.

Environmental Quality Incentives Program (EQIP):
This federally funded program is also managed by the local offices of the USDA NRCS.

- Provides technical assistance, cost share payments, and incentive payments to assist crop and livestock producers with environmental and conservation improvements on the farm.
- $600,000 for the five-county Olympic Peninsula area including Mason and Grays Harbor Counties during 2003/04.
- Seventy-five percent cost sharing but allows 90 percent if producer is a limited resource or beginning farmer or rancher.
- Contracts are one to ten years.

2514 Planning Unit for WRIAs 22 and 23:
Through this planning process, citizens and agencies are evaluating and making recommendations for protection of water supply, quality, and habitat. Funding is made available from time to time through the Washington legislature for different purposes, including some

funds for water quality-related projects. For example, the planning unit received $200,000 in 2003 to develop a comprehensive monitoring plan for the upper and lower basin, and to begin implementing it in the lower basin.

Flood Control Zone District:
Authorized by RCW 86.15, it may be possible, through use of the existing flood control zone district funds, to provide low-interest loans to watershed residents to repair or replace failing or poorly situated septic systems.

USDA:
Rural Housing Repair and Rehabilitation Loans are loans funded directly by the federal government. These loans are available to very low-income rural residents who own and occupy a dwelling in need of repairs. Funds are available for repairs to improve or modernize a home, or to remove health and safety hazards. This loan is a one percent loan that may be repaid over a twenty-year period.

To obtain a loan homeowner-occupants must be unable to obtain affordable credit elsewhere and must have very low incomes, defined as below 50 percent of the area median income. They must need to make repairs and improvements to make the dwelling more safe and sanitary or to remove health and safety hazards. Grants are only available to homeowners who are 62 years old or older and cannot repay a Section 504 loan.

Wetland Reserve Program (WRP):
A voluntary program to restore and protect wetlands on private property (including farmland that has become a wetland as a result of flooding). Landowners can receive financial incentives to enhance wetlands in exchange for retiring marginal agricultural land. Landowner limits future use of the land, but retains ownership, controls access, and may lease the land for undeveloped recreational activities and possibly other compatible uses.

Emergency Watershed Protection:
NRCS may purchase easements on floodplain lands and the right to conduct restoration activities, in exchange for limited future use by landowner.

Forestry Riparian Easement Program (FREP):
This voluntary program is administered through the DNR Small Forest Landowner Office. The easement program acknowledges the importance of small landowners and their contribution to protection of wildlife habitat. The intent of the program is to help small forest landowners keep their land in forests. The FREP partially compensates landowners for not cutting or removing qualifying timber under a 50-year easement. The landowner still owns the property and retains full access, but has "leased" the trees and their associated riparian function to the state. You may qualify for FREP if:

1. You own land as an individual or as part of a partnership, corporation, or other nongovernmental legal entity.
    - You own one parcel of more than 20 continuous acres, or

- You own a parcel of less than 20 acres as part of a total ownership of multiple parcels in Washington State that together total more than 80 acres.

2. You have timber next to a river, stream, lake, pond, or wetland that you plan to harvest in the near future.
3. Historically, you have not harvested an average of more than 2 million board feet of timber each year from all of your ownerships.
4. The state has access to the property by foot or vehicle.
5. There are no hazardous substances on the site.

USFWS Chehalis Basin Fisheries Restoration Program (CRFP):
The U.S. Fish and Wildlife Services' Chehalis Fisheries Restoration Program (CFRP) has funded $1.1 million dollars in habitat restoration projects since 1998. Through partnerships with private landowners, fisheries groups, nonprofit organizations; and local, tribal, and state agencies; the CFRP has implemented on-the-ground habitat restoration, watershed assessment, and public outreach projects. Some typical project types include: culvert replacement/removal, road decommissioning, riparian fencing and planting, water quality monitoring, stream habitat assessment, and newspaper inserts. Any individual or group that owns or manages land within the Chehalis/Grays Harbor Basin is eligible to receive funding.

Washington State Salmon Recovery Funding Board (SRFB):
This salmon recovery function was authorized by Chapter 77.85 RCW. The law entrusts voluntary "lead entities" consisting of counties, cities, and tribal governments to develop the projects necessary for restoring and protecting fish habitat within the Water Resource Inventory Areas (WRIAs). The Salmon Recovery Funding Board plays a leading role for making grants and loans to local lead entities for salmon habitat projects and activities. The Chehalis Basin Partnership designated Grays Harbor County to act as the Lead Entity for WRIAs 22 and 23.

Since 2001, the Chehalis Basin Partnership has facilitated four project lists for SRFB consideration. This first effort was successful; the SRFB has funded 22 salmon habitat projects and activities totaling $3.5 million in the two WRIAs.

Public Involvement

How the Public Was Involved in Plan Development

Several members of the fecal coliform bacteria TMDL public advisory group and the Chehalis Basin Partnership (CBP) recommended that the cleanup plan (DIP) should be developed within the framework of the CBP. The CBP formed a water quality committee to address issues related to the water quality element of their watershed plan, including this DIP.

It was decided that the most effective way to involve the affected people and produce something useful for the watershed plan was to write a single comprehensive plan to describe cleanup strategies for all three parameters basin-wide, instead of writing separate DIPs for the approved DO, Temperature and Bacteria TMDLs.

The plan was developed in collaboration with the Water Quality Committee (14 monthly meetings) and including discussions with affected groups throughout the Basin. Highlights of the public involvement activities include:

- Initial "TMDL 101" workshop in Grays Harbor County Commissioner's Hearing Room.
- "TMDL 102" workshop for the Water Quality Committee.
- Individual meetings with the cities of Westport, Hoquiam, Aberdeen, and Cosmopolis regarding their TMDL stormwater management responsibilities. Additional meetings occurred with Grays Harbor County officials and the Grays Harbor Council of Governments.
- Three meetings with the Grays Harbor County League of Women Voters to provide updates and receive input on DIP development.
- Separate meetings with the health departments of Lewis, Grays Harbor, and Thurston Counties.
- Consultation with the conservation districts from Grays Harbor, Lewis, Mason, and Thurston Counties.
- Numerous monthly briefings for the CBP regarding cleanup plan status and ongoing opportunity for participation.
- The DIP advisory group (Water Quality Committee of the CBP) and Ecology presented the DIP for endorsement by the CBP during their July and August 2004 meetings. A further recommendation made to the CBP was that the DIP should become a tool for implementing the water quality restoration/protection goals of the Partnership's Watershed Management Plan. The Monitoring Plan section of the DIP was recommended as a foundation for evaluating progress towards the TMDL as well as Watershed Plan goals for water quality protection.
- The CBP endorsed the DIP in a September 24 letter to the Department of Ecology.

Appendix A
Chehalis Basin Partnership Endorsement

Chehalis Basin Partnership Endorsement and Commitment to the DIP

The Chehalis Basin Partnership (CBP) provided the following correspondence about their commitment to the Detailed Implementation Plan. The CBP members and partners are named in the additional page excerpted from the CBP's April 2004 Watershed Management Plan (titled ACKNOWLEDGEMENTS).

Chehalis Basin Partnership
C/O Grays Harbor County
Department of Public Services
100 West Broadway Suite #31
Montesano, WA 98563
1.800.230.1638 - Lnapier@co.grays-harbor.wa.us

September 24, 2004

Mr. Dave Rountry
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775

Dear Mr. Rountry,

The Chehalis Basin Partnership today agreed to endorse the Detailed Implementation Plan that will guide implementation of actions needed to achieve the water quality protections identified in existing TMDLs approved for the Chehalis Basin. The Partnership directed me to express to you our appreciation for your efforts to ensure that the Detailed Implementation Plan reflects as accurately as possible how existing local programs can contribute to the desired outcome. Your work with the Partnership's Water Quality Committee and your willingness to make revisions to the Detailed Implementation Plan are appreciated and we commend you for your commitment to local involvement.

We recognize the benefits of the completed Detailed Implementation Plan and significance of local review and endorsement. This plan clearly describes the things that need to be accomplished locally to protect water quality. It clearly identifies what role state and local government and other local organizations can play in protecting local water resources. It can be used by these organizations to support requests for funding so that they have the resources to implement their plan elements.

In endorsing this Detailed Implementation Plan however, the Partnership also must recognize the reservations expressed by some of our members. It has been EP A's stated policy that if nonpoint sources of pollution that contribute to water quality impairment are not controlled, additional reductions will be made to NPDES permit limits for point sources. Because of this federal policy that ultimately holds point sources accountable for all sources of pollution, we feel it is important that adequate resources be made available to organizations responsible for implementing portions of the Detailed Implementation Plan and that enough time be provided for the plan to show results. There are also reservations that continual changes to the state Water Quality Standards will prevent us from ever actually achieving them no matter how much time,

Cities
Aberdeen
Bucoda
Centralia
Chehalis
Cosmopolis
Elma
Hoquiam
McCleary
Montesano
Napavine
Oakville
Ocean Shores
Pe Ell
Tenino
Westport

Counties
Grays Harbor County
Lewis County
Mason County
Thurston County

Tribes
Confederated Tribes
of the Chehalis
Quinault Indian Nation

Water Suppliers
Grays Harbor Water District #2
Boistfort Valley Water company

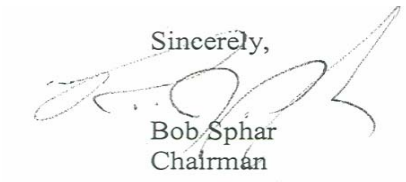
Port of Centralia
Department of Ecology
Chehalis Basin Fisheries
Task Force
Washington Farm Bureau
Weyerhaeuser

effort and money is spent. It must be understood that these types of concerns make it difficult for local government and citizens to reach agreement on how to support TMDLs.

It should also be clearly understood that the Chehalis Basin Partnership is endorsing THIS version of the Detailed Implementation Plan for Chehalis Basin TMDLs. If substantive revisions are made to this Detailed Implementation Plan as a result of new TMDLs, or changes to existing, TMDLs the Partnership can not be said to endorse those changes until it has had time to review them.

Finally, we hope that the process used to develop this Detailed Implementation Plan for Chehalis Basin TMDLs establishes a statewide standard for local participation in development and implementation of TMDLs.

The Partnership expects to continue serving as a focal point for coordinating implementation of local elements of the Detailed Implementation Plan. We also expect to continue to advocate for cost-effective protection of water quality, and will support efforts to obtain financial support so local governments and organizations can implement their commitments to water quality protection strategies that they described in the Detailed Implementation Plan.



Sincerely,

Bob Sphar
Chairman

ACKNOWLEDGMENTS

The development of the Chehalis Basin Watershed Management Plan was made possible by funding from the Washington State Legislature (ESHB 2514 and HB 1832).

The Chehalis Basin Partnership was the "planning unit" that developed the Chehalis Basin Watershed Management Plan. The Plan is the culmination of five years of diligent, collaborative work by elected officials, government staff, representatives of major interests and citizens from throughout the basin. The Partnership would like to acknowledge and express appreciation to the dedicated members of the planning unit and the committees (Steering/Technical, Water Quality, Citizen Advisory) that supported this effort for their time, creativity, and hard work.

Partnership members include the following:

Counties
Grays Harbor County
Lewis County
Mason County
Thurston County

Tribal Governments
Confederated Tribes of
the Chehalis Reservation

Water Districts
Boistfort Valley Water Co.
Grays Harbor Water District #2

Cities
Aberdeen
Centralia
Chehalis
Cosmopolis
Elma
Hoquiam
McCleary
Montesano
Napavine
Ocean Shores
Pe Ell
Westport

Port of Centralia

Citizen Representatives
Citizen - Grays Harbor County
Citizen – Lewis County
Citizen – Mason County
Citizen – Thurston County

Major Interests
Business Representative
Chehalis Basin Fisheries Task Force
Lewis County Farm Bureau
Weyerhaeuser

State Agencies
WA Department of Agriculture
WA Department of Ecology
WA Department of Fish and Wildlife
WA Department of Natural Resources

Committee Lists

Steering/Technical Committee:

Lonnie Crumley
Lee Daneker
Bob Fink
Jim Fleming
Jon Hare
Terra Hegy
Chanele Holbrook
Raman Iyer
Kahle Jennings
Lori Morris
John Mudge
John Sims
Craig Swanson
Chad Stussy
Mark Swartout
Ann Wick
Terry Willis
Ron Wisner

Citizens Advisory Committee:

Bill Barmettler
Jim Bottroff
Chris Cheney
Lori Cox
Neal Cox
Earl Emerson
Peter Heibert
Chanele Holbrook
Lyle Hojem
Mike Quigg
Margaret Rader-resigned

Water Quality Committee:

Bob Amrine
Randy Cox
Lee Daneker
Brady Engvall
Jim Fleming
Doug Fricke
Holly Fuller
Jon Hare
Terra Hegy
Chanele Holbrook
Samuel Iwenofu
Brian Peck
Harry Pickernell
Margaret Rader
J. Roach
Dave Rountry
Ron Schillinger
Dick Southworth
Chad Stussy
Craig Swanson
Mark Swartout
Ann Wick

Lee Napier	J. Roach	Raman Iyer	Terry Willis
Sue Patnude	Robert Schanz-resigned	Kahle Jennings	Patrick Wiltzius
Brian Peck	Gary Waltenburg	Mike Madsen	Ron Wisner
J. Roach	Terry Willis	Lori Morris	

Lee Napier of Grays Harbor County was the project manager for Plan development.

Triangle Associates, Inc. with TetraTech/KCM was the consultant team that facilitated the work of the Partnership and conducted technical studies and analyses to provide the Partnership with information for developing recommendations and making decisions.