


WASHINGTON STATE
DEPARTMENT OF
E C O L O G Y

Lower Skagit River Fecal Coliform Total Maximum Daily Load

Submittal Report

Water Cleanup Plan

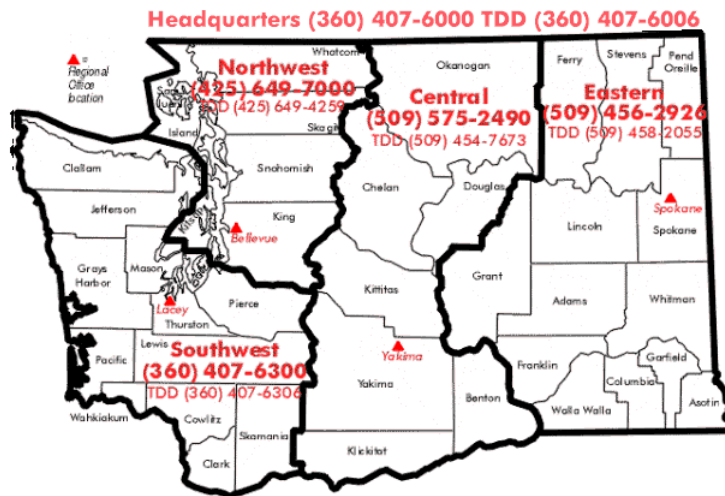
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Lower Skagit River Fecal Coliform Total Maximum Daily Load

Submittal Report Water Cleanup Plan

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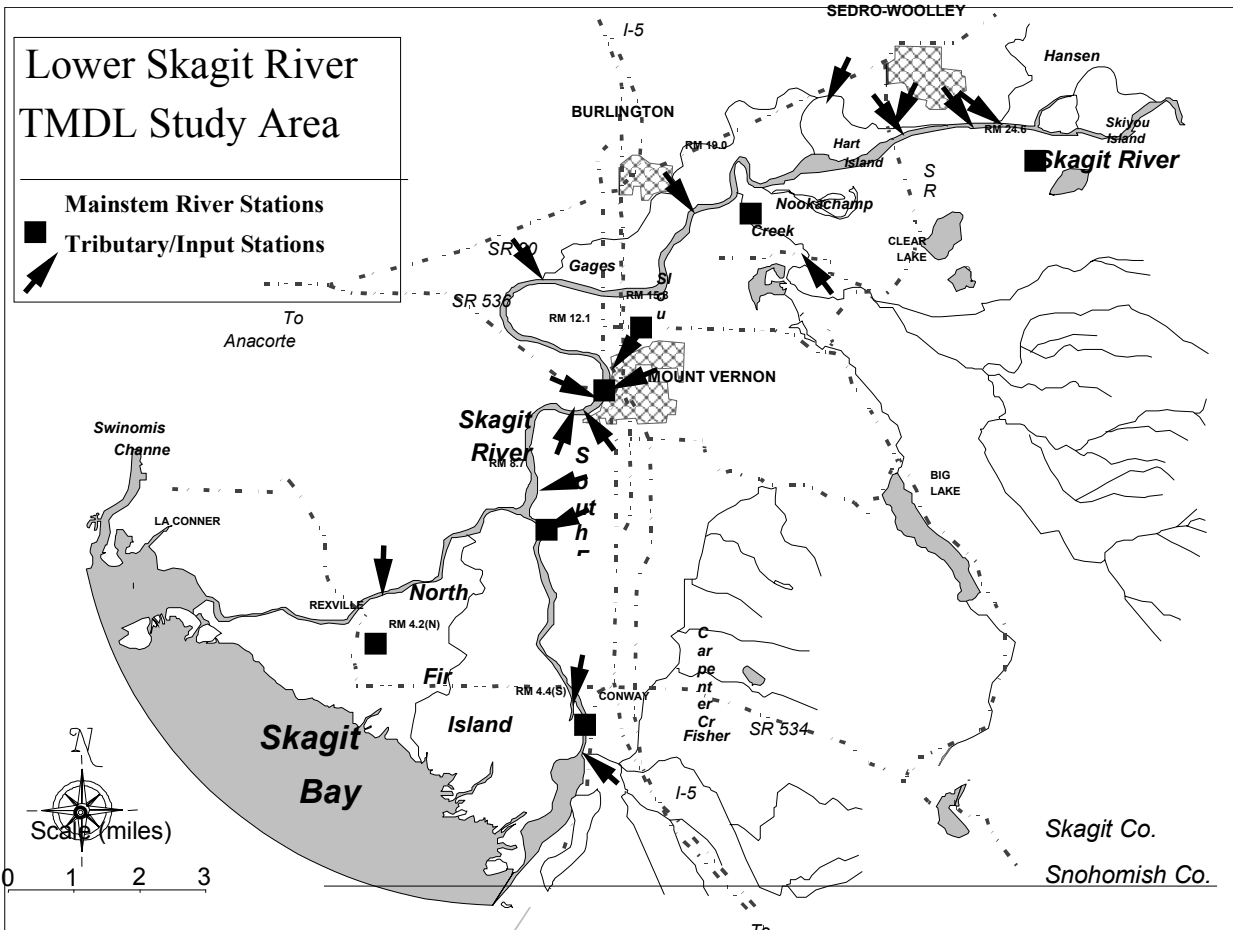
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Introduction

Section 303(d) of the federal Clean Water Act mandates that the state establish the Total Maximum Daily Load of pollutants for surface waters that do not meet standards after application of technology-based pollution controls. The U.S. Environmental Protection Agency (EPA) has promulgated new regulations (40 CFR 130) and developed guidance (EPA, 1991) for establishing TMDLs.

Under the Clean Water Act, every state has its own water quality standards designed to protect, restore, and preserve water quality. Water quality standards consist of designated uses, such as cold water biota and drinking water supply, and criteria, usually numeric criteria, to achieve those uses. When a lake, river or stream fails to meet water quality standards after application of required technology-based controls, the Clean Water Act requires that the state place the water body on a list of "impaired" water bodies and to prepare an analysis called a **Total Maximum Daily Load (TMDL)**.

The goal of a TMDL is to ensure the impaired water will attain water quality standards. A TMDL includes a written, quantitative assessment of water quality problems and of the pollutant sources that cause the problem. The TMDL determines the amount of a given pollutant that can be discharged to the water body and still meet water quality standards. The TMDL also determines the **loading capacity**, and allocates that loading capacity among the various sources. If the pollutant comes from a discrete source (referred to as a **point source**) such as an industrial facility's discharge pipe, that facility's share of the loading capacity is called a **Wasteload Allocation (WLA)**. If it comes from a diffuse source (referred to as a **nonpoint source**) such as farms or towns, that nonpoint share is called a **Load Allocation (LA)**.

The TMDL must also consider seasonal variations and include a **margin of safety** that takes into account lack of knowledge about the causes of the water quality problem or its loading capacity. The TMDL must also account for seasonal variability and address future growth. The sum of the individual allocations and the margin of safety must be equal to or less than the loading capacity.

The Lower Skagit River Fecal Coliform Total Maximum Daily Load, developed by the Washington State Department of Ecology (Ecology), is being established to address impairments to contact recreation in the Lower Skagit River Basin and help protect shellfish harvesting in Skagit Bay due to high fecal coliform levels. The geographic scope of this TMDL is the Main stem of the river, the North and South Fork Skagit River, and all the tributaries in the lower Skagit River basin to their headwaters. The upstream boundary of the lower Skagit River TMDL area is upstream of Sedro-Woolley and Hansen Creek, and just downstream of the western end of Skiyou Slough (Figure 1).

The five elements of a TMDL as required by federal statute and regulation are summarized below:

Loading Capacity: The loading capacity for fecal coliform bacteria in the Lower Skagit River is based on mass balances. These mass balances were developed with the load reductions needed to comply with the marine standards at the mouth of the river by meeting the marine standards target values at the downstream boundary of the study area and meeting freshwater quality standards at the mouths of all tributaries.

Wasteload Allocation: The wasteload allocations require that all NPDES permitted dischargers meet technology-based permit limitations and that combined sewer overflows are abated to meet goal of no more than one discharge per year on the average.

Load Allocations: The load allocations require that fecal coliform bacteria in the Skagit River upstream of Sedro-Woolley must meet target levels that are lower than Class AA water quality standards. Target values for this location that will protect the marine standards at the river's mouth are: 6 cfu/100 mL as a geometric mean, with no more than 10 percent of the samples used to calculate the mean exceeding 80 cfu/100 mL. The load allocations also require that Nookachamps, Carpenter, and Fisher Creeks must meet the Class A Water Quality Standards and that loading from the Rexville pump station (Drainage District 15) and the unidentified source upstream of Kulshan Creek must be significantly reduced below levels observed in 1995.

Margin of Safety: Several assumptions and critical conditions used in the modeling analysis of the Lower Skagit River Fecal Coliform TMDL provide an inherent margin of safety as required by the statute.

Seasonal Variation: Fecal coliform bacteria levels collected in the Skagit River do not show a pattern of seasonal variation. The TMDL will apply year-round.

Background

The Skagit River basin encompasses a total of 2,730 square miles in Washington and about 400 square miles in Canada. The main stem of the Skagit extends 35 miles in Canada and 127 miles in Washington. On average more than 15 million acre-feet of water cycles through the river basin annually. The Skagit River is regulated by three hydroelectric dams -- Gorge Dam at river mile (RM) 96.6, Diablo Dam at RM 101, and Ross Dam RM 105. The river originates in British Columbia, flows through Ross Lake, past the town of Sedro Woolley, through Burlington and Mount Vernon, divides into the North Fork and South Fork, and empties into the Puget Sound at Skagit Bay. The Skagit River provides hydroelectric power, drinking water, irrigation, fish and wildlife habitat, and extensive recreational opportunities.

The area covered by this TMDL - Lower Skagit River and its tributaries, and the North and South Fork Skagit River downstream to their mouths at Skagit Bay - is the lowland portion of the river downstream from the lower end of Skiyou Slough near Sedro-Woolley (Figure 1). This area drains about 200 square miles into Skagit Bay. The principal land uses in this area are agriculture, forestry and urban areas (Entranco, 1993). Much of the area is diked and drained, and several pump stations discharge water from the drainage districts into the Skagit River.

The flows of the Skagit River exhibit complex hydrology influenced by several sources. Summertime flows are maintained by groundwater inflow in the tributary drainages and by glacial outflow and snowmelt, which produce peak flows in early summer. Wintertime flows are dominated by the timing and amount of rainfall. The North and South Forks, and part of the mainstem are subject to a tidal influence extending about 15 miles upstream to near Mount Vernon. Mean daily flows gauged near Mount Vernon are highest in June and lowest in September. The mean annual flow is 16,710 cubic feet per second. The seven-day average low flow with a ten-year recurrence (7Q10) is 5030 cubic feet per second.

There are four permitted discharges to the Lower Skagit River with potential to affect fecal coliform levels: The city of Sedro-Woolley, the city of Burlington, the city of Mount Vernon, and Skagit County Sewer District # 2 (the Big Lake Facility). A number of potential nonpoint pollution sources also exist in the Lower Skagit River area.

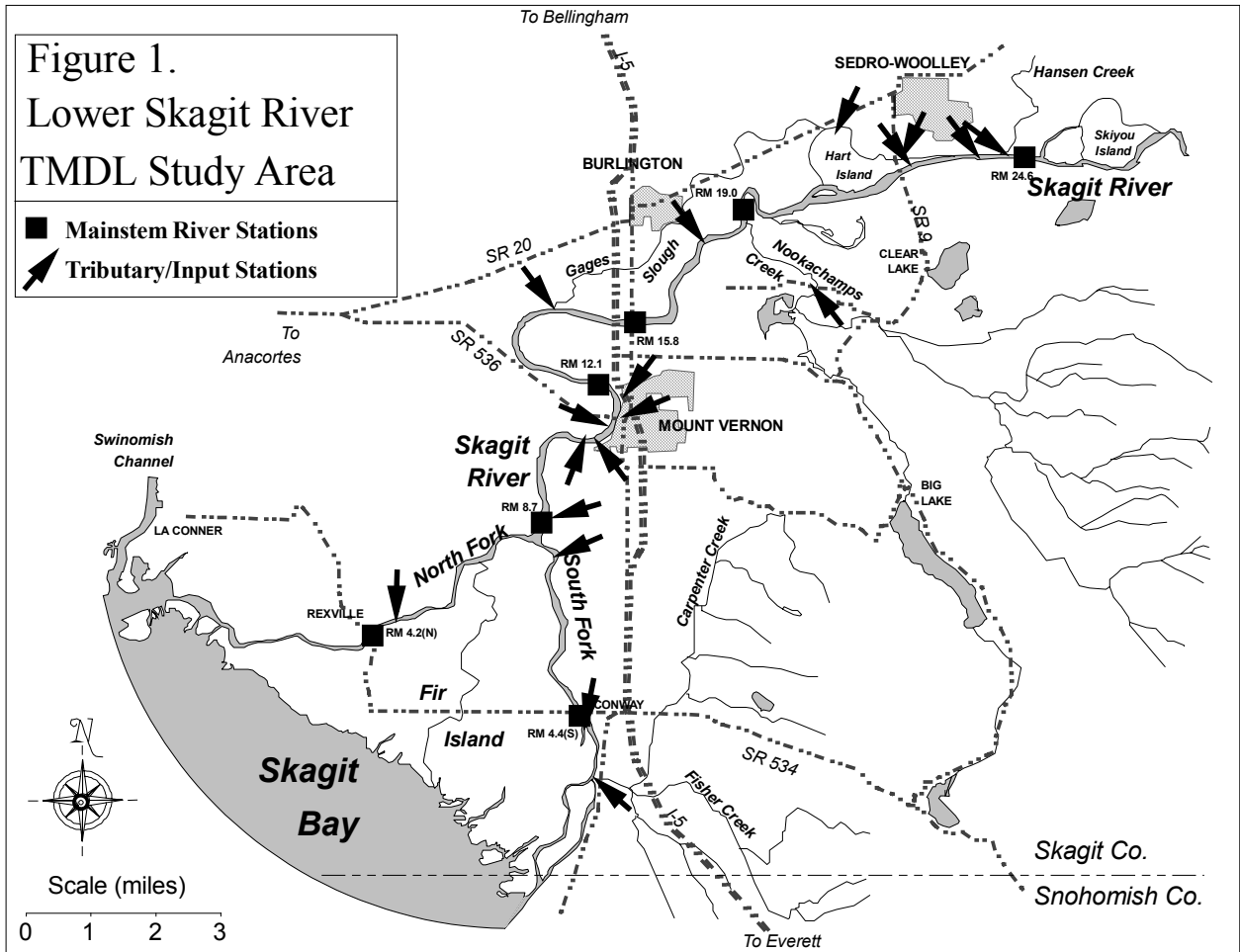
Nonpoint water pollution is most commonly generated by poor land use management, such as inadequate agricultural practices, failing on-site septic systems, or stormwater runoff within the Lower Skagit. Tributaries such as Nookachamps Creek that contain significant amounts of farmland and rural residences are especially susceptible to pollution from improper agricultural practices and failing on-site systems. The main stem of the river is also not immune to impacts from these non-point sources. Improper agricultural practices may add pollutants to the river through pump stations, tributary streams, and overland flow. The area contains over 50,000 acres are farmland with over 50 commercial dairy operations holding over 20,000 animals. The number of small non-commercial farms is also increasing. Many areas of the Lower Skagit basin have poor soils for siting on-site septic treatment systems, resulting in failing or inadequate septic systems that may also contribute pollutants to tributaries and the main stem. Urban stormwater reaches the river through the city of Mount Vernon combined sewer overflows. City, county, and drainage district pump stations and direct stormwater discharges also contribute

pollutants. Urban development is continually increasing in certain areas of the lower Skagit and impacts from stormwater runoff will need to be addressed. The lower Skagit River watershed is also rich in wildlife, such as wildfowl, elk, and beaver. Therefore, some proportion of fecal coliform bacteria may also originate from these natural sources.

A major water quality study of the Lower Skagit River was conducted by Entranco (1993). The study found that fecal coliform standards were exceeded in the North and South Forks, in the sloughs, and in the Nookachamps system. These data supported the addition of these waters to the Section 303(d) list. Because of the Entranco study and the new listings, Ecology conducted a TMDL technical study for the lower Skagit river (Pickett, 1996; 1997).

Figure 1.
Lower Skagit River
TMDL Study Area

- Mainstem River Stations
- ▲ Tributary/Input Stations



Applicable Criteria

Within the state of Washington, water quality standards are published pursuant to Chapter 90.48 of the Revised Code of Washington (RCW). Authority to adopt rules, regulations, and standards as necessary to protect the environment is vested with the Department of Ecology. Under the federal Clean Water Act, the EPA Regional Administrator must approve the water quality standards adopted by the state (Section 303(c)(3)). Through adoption of these water quality standards, Washington has designated certain characteristic uses to be protected and the criteria necessary to protect these uses [Washington Administrative Code (WAC), Chapter 173-201A]. These standards were last adopted in November 1997.

This TMDL is designed to address impairments of characteristic uses in Skagit River due to high fecal coliform levels. The TMDL also sets limits for fecal coliform to help protect characteristic uses in Skagit Bay. The characteristic uses designated for protection in the Lower Skagit River and Bay are as follows:

"Characteristic uses. Characteristic uses shall include, but not be limited to, the following:

(i) Water supply (domestic, industrial, agricultural).

(ii) Stock watering.

(iii) Fish and shellfish:

Salmonid migration, rearing, spawning, and harvesting.

Other fish migration, rearing, spawning, and harvesting.

Clam and mussel rearing, spawning, and harvesting.

Crayfish rearing, spawning, and harvesting.

(iv) Wildlife habitat.

(v) Recreation (primary contact recreation, sport fishing, boating, and aesthetic enjoyment).

(vi) Commerce and navigation."

[WAC 173-201A-030(1)&(2)]

The water quality standards describe criteria for the protection of characteristic uses. The Lower Skagit River and Bay are designated as Class A, excellent waters. The Skagit River upstream of the lower end of Skiyou Slough (at River Mile 25.6) is designated as Class AA, extraordinary water.

The water quality standards describe criteria for fecal coliform. Different criteria apply to fresh and marine water. Class A marine waters have been assigned fecal coliform criteria to protect the characteristic uses:

"fecal coliform organism levels shall both not exceed a geometric mean value of 14 colonies/100 mL, and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 43 colonies/100 ml."

[WAC 173-201A-030(1)(c)(i)(A)]

Class A freshwaters have been assigned fecal coliform criteria to protect the characteristic uses:

"fecal coliform organism levels shall both not exceed a geometric mean value of 100 colonies/100 mL, and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 200 colonies/100 ml."

[WAC 173-201A-030(1)(c)(i)(A)]

Class AA freshwaters have assigned fecal coliform criteria to protect the characteristic uses:

"fecal coliform organism levels shall both not exceed a geometric mean value of 50 colonies/100 mL, and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 100 colonies/100 ml."

[WAC 173-201A-030(1)(c)(i)(A)]

The water quality standards describe the averaging periods in the calculation of the geometric mean for the fecal coliform criteria:

"In determining compliance with the fecal coliform criteria in WAC 173-201A-030, averaging of data collected beyond a thirty-day period, ... shall not be permitted when such averaging would skew the data set as to mask noncompliance periods."

[WAC 173-201A-060(3)]

Different criteria apply to fresh and marine water. The water quality standards describe how to apply the different criteria in an estuary. The boundary between marine and freshwater standards occurs somewhere downstream of the bridges over the North and South Forks.

"In Brackish water of estuaries, where the fresh and marine water quality criteria differ within the same classification, the criteria shall be applied on the basis of vertically averaged salinity. The freshwater criteria shall be applied at any point where ninety-five percent of the vertically averaged daily maximum salinity values are less than or equal to one part per thousand. Marine criteria shall apply at all other locations; except that the marine water quality criteria shall apply ... for fecal coliform organisms when salinity is ten parts per thousand or greater."

[WAC 173-201-060(2)]

Water Quality and Resource Impairments

As a result of samples collected by Entranco (1993) that show fecal coliform criteria are exceeded, the Skagit River and several of its tributaries are included on The Washington 1998 Section 303(d) list. Most of these waters have been listed since 1994. Several portions of Skagit Bay are also listed for fecal coliform.

Table 1. Lower Skagit River Basin water bodies on the 1998 & 1996 303(d) list for fecal coliform.

96 WBID	98 WBID	1998 303(d) list	1996 303 (d) list
WA-03-1011	YA61IC	Carpenter Creek	Carpenter Creek
WA-03-1016	DY42MK	Gages Slough	Gages Slough
WA-03-1019	SV53RP	Hansen Creek	Hansen Creek
WA-03-1017	LZ60MT	Nookachamps Creek	Nookachamps Creek
WA-03-1010	QG78VP	Skagit River	Skagit River
WA-03-1012			Fisher Creek
WA-03-1018			Hart Slough/ Brickyard Ck.
WA-03-1015			Skagit River North Fork

Table 2. Location of Lower Skagit River Basin Segments on the 1998 & 1996 Section 303(d) List

Stream Name	Segment Location (Township-Range-Section or Latitude/Longitude)
Skagit River	33N-03E, 34N 03E, 34N 04E
Nookachamps Creek	34N-04E-03
Hansen Creek	35N-05E-30
Carpenter Creek	33N-04E-30
Skagit River North Fork	33N-03E
Gages Slough	34N-03E-12
Hart Slough/Brickyard Creek	35N-04E-22, 23 & 27
Fisher Creek	33N-04E-28 & 29

Fecal coliform bacteria levels collected in the Skagit River and its tributaries do not show a significant pattern of seasonal variation. Combined Sewer Outfall discharges before abatement were occurring all year round with any appreciable rainfall. Fecal coliform standard violations have been observed during both winter and summer periods, high flows and low flows and wet and dry weather conditions. There is a variety of conditions that produce fecal coliform bacteria levels that exceed standards, so there is no single “critical condition” that applies to this TMDL. Therefore, the TMDL applies all year round.

Data collected monthly by the Department of Ecology at Mount Vernon (Station 03A060) between January 1990 and December 1999 were compiled and descriptive statistics generated (Table 4). Monthly geometric means at this station for the last decade are all far below the criterion. The only month that exceeds the fecal coliform standard is December and that is caused by a single measurement beyond the 10 percentile criterion.

Table 3. Fecal Coliform Statistics of the Skagit River
from Data Collected between January 1990 to December 1999.

Month	Number of Samples	Geometric Mean (cfu/100mL)	Median (cfu/100mL)	Maximum (cfu/100mL)	Samples over the 200 cfu/100mL Criteria (%)
January	10	4	4	22	0
February	10	11	14	43	0
March	10	9	7	80	0
April	10	12	10	59	0
May	10	9	11	68	0
June	10	11	12	130	0
July	10	13	14	140	0
August	10	10	11	52	0
September	10	25	23	59	0
October	10	12	8	84	0
November	9	12	13	37	0
December	9	12	9	250	11%

Modeling Approach

To evaluate the effect of fecal coliform bacteria loading sources on the Lower Skagit River and Skagit Bay at the river's mouth, a steady-state mass-balance approach was used (Pickett, 1997). Steady-state means the model is not dynamically changing with time, and flows and loading are assumed to be at a constant level. Mass balance means that the data spreadsheets sum up all sources and subtracts losses from decay to get the outflows from the system. In addition all significant sources and outputs are estimated so that total inputs equal total outputs and losses.

- Marine standards target values for fecal coliform were determined, which represented the fecal coliform bacteria levels in the river that would meet marine standards when the mixture of river and bay water reached 10 ppt salinity.
- Methods were developed to predict runoff for ungauged tributaries using antecedent precipitation. The flow balance was evaluated for each survey with a computer spreadsheet program.
- Mass balances for fecal coliform bacteria were developed with a spreadsheet program.
- A first-order decay process was applied to bacteria in the river, and the decay rate was determined by the best fit to observed data. The mass balances were adjusted to account for the decay rate, unmeasured loading sources, and for dynamic effects during the surveys. The results of the adjusted mass balances were compared to the water quality standards.
- Mass balances were developed by reducing major loading sources until the fecal coliform bacteria levels in the river at the downstream boundaries (in the North and South Forks) met the marine standard target values.
- Mass balances were developed that met the marine standards target values and also had all tributaries meeting fresh water standards.

Loading Capacity Analysis

Identification of the loading capacity is an important step in developing TMDLs. The loading capacity provides a reference for calculating the amount of pollutant reduction needed to bring a water into compliance with water quality standards. By definition, a TMDL is the sum of the allocations. An allocation is defined as the portion of a receiving water's loading capacity that is assigned to a particular source. EPA defines the loading capacity as "the greatest amount of loading that a water can receive without violating water quality standards."

To estimate the loading capacity for fecal coliform bacteria in the Lower Skagit River, mass balances were developed with the load reductions needed to comply with the marine standards at the mouth of the river by meeting the marine standards target values at the downstream boundary of the study area. To develop these mass balances for meeting marine standards, the following load reductions were assessed:

- After point sources were set to be in compliance with permit limitations, loading was then increased to reflect projected growth for the year 2015 (Shervey, 1996).
- All combined sewer overflow (CSO) discharges were set to zero consistent with the Mount Vernon CSO reduction plan (City of Mount Vernon, 1994), except for two periods with the highest projected CSO discharges.
- Fecal coliform bacteria loading levels for selected tributary sources were reduced. Fecal coliform concentration in Nookachamps Creek and Carpenter/Fisher Creek were reduced to meet surface water quality criteria, and the other sources were reduced to the level necessary to meet the marine standards target values.

Margin of Safety

The statute requires that a margin of safety be identified to account for uncertainty when establishing a TMDL. The margin of safety can be explicit in the form of an allocation, or implicit in the use of conservative assumptions in the analysis. Several assumptions and critical conditions used in the modeling analysis of the Lower Skagit River Fecal Coliform TMDL provide an inherent margin of safety as required by the statute. These conservative assumptions and critical conditions are listed below:

- A conservative assumption was made by using regressions for predicting flows in ungauged tributaries that likely overestimate flow and therefore overestimate loading. Therefore loading reduction estimates will be protective.
- The cleanup of the tributaries and unknown sources will not stop when standards are met, so that it is likely that these sources will be significantly better than water quality standards or clean-up goals.
- The use of a 30-day averaging period rather than a longer period with the geometric mean and 10 percent criteria when evaluating the fecal coliform standards reduces the possibility of masking noncompliance periods.
- The long-term goal that all tributary sources meet Class A standards helps account for the possibility that some sources have been underestimated, and generates mass balances results at the downstream boundaries that are lower than the marine standards target values.
- Fecal coliform decay rates usually increase in marine waters, so bacteria levels at the mouth of the Skagit River are likely slightly lower than predicted in this analysis.

Seasonal Variation

Fecal coliform bacteria levels collected in the Skagit River and its tributaries do not show a significant pattern of seasonal variation. Fecal coliform standard violations have been observed during both winter and summer periods, high flows and low flows and wet and dry weather conditions.. The TMDL will apply year-round.

Wasteload and Load Allocations

The approach used to derive the loading capacity for fecal coliform bacteria in the Lower Skagit River also determines the allocation distribution. For management purposes, the allocations are described in terms of fecal coliform concentration, not in terms of a load. Federal regulations allow TMDLs to be expressed in "other appropriate measures" (40 CFR 130.2(i)). The sum of these allocations is equal to the loading capacity needed to meet the fresh water quality standards in the Skagit River and its North and South Forks, and marine water quality standards at the river's mouth. The specific numeric allocations for the Lower Skagit River Fecal Coliform TMDL are shown in Appendix E (Table 13 of Pickett, 1997) and are described in as follows:

Wasteload Allocations:

- All NPDES permitted dischargers meet technology-based permit limitations.
- CSOs are abated to meet goal of no more than one discharge per year.

Load Allocations:

- Fecal coliform bacteria in the Skagit River upstream of Sedro-Woolley must meet target levels that are lower than Class AA water quality standards. Target values for this location that will protect the marine standards at the river's mouth are: 6 cfu/100 mL as a geometric mean, with no more than 10% of the samples used to calculate the mean exceeding 80 cfu/100 mL.
- Nookachamps, Carpenter, and Fisher Creeks must meet Class A Water Quality Standards. All other tributaries in the lower Skagit basin must also meet designated water quality standards.
- Loading from the Rexville pump station (Drainage District 15) and the unidentified source upstream of Kulshan Creek must be significantly reduced (by 50 percent and 67 percent respectively).

Future Growth: Future growth of wastewater treatment plant loading has been factored into the wasteload allocations through the year 2015. Future growth, as it impacts nonpoint source loading, must comply with load allocations.

Summary Implementation Strategy

Overview

The strategy for implementing the Lower Skagit River TMDL will be guided by Washington's Water Quality Management Plan to Control Nonpoint Source Pollution (Ecology 1999). This plan was developed to include all nonpoint source pollution control efforts by federal, state, tribal, and local governments as well as volunteer programs carried out by the general public. The plan is a collaborative effort by a wide variety of entities. It identifies gaps in existing programs, sets a strategy for improving those programs, recommends timelines, and outlines methods for determining success. The plan meets federal mandates required by Section 319 of the Clean Water Act and Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990.

Cooperation of local agencies will be a key factor in the implementation of control strategies. Local agencies such as the Skagit Conservation District, and Skagit County Public Works and Skagit System Cooperative have shown an interest in working cooperatively on TMDL nonpoint issues. The Department of Ecology plans to make use of an existing Nonpoint Watershed Action Plan on Nookachamps Creek prepared under 400-12- WAC. Nookachamps Creek is the largest tributary in the Lower Skagit Basin. This document and the Nookachamps Implementation Review Committee report will also be used to assist with taking an inventory of existing implementation activities, and to assist with gaining an understanding of the degree of implementation and effectiveness of current and past activities. It is anticipated that watershed planning and implementation activities from Nookachamps can be applied to addressing nonpoint water quality issues in other sub-basins of the lower Skagit River. Ecology would like to build upon these existing efforts to refine existing programs, and find out where new implementation strategies are needed to address nonpoint issues that are not being adequately addressed by existing programs.

Ecology will also coordinate with and when possible facilitate joint projects and efforts with local watershed planning initiated under the HB 2514 watershed planning process and the Salmon Protection process.

Passage of the 1998 Dairy Nutrient Management Act significantly changed how water pollution from commercial dairy farms is addressed by the Department of Ecology. The law established a technical assistance inspection program for dairy farms to achieve compliance with water quality laws. The Act requires inspections for "in compliance" dairies every two years. For dairies that are not in compliance Ecology can use its full enforcement capabilities and can conduct multiple inspections to achieve water quality compliance.

Development of the Implementation Plan

The Detailed Implementation Plan (DIP) for the Lower Skagit River Fecal Coliform TMDL required under the Memorandum of Understanding between Ecology and U.S. EPA will be developed in conjunction with local watershed planning currently underway (see above).

Implementation Activities

The majority of management activities will be implemented by the local jurisdictions and landowners. There are several parties who will be involved with management of the TMDL. The items listed below provides a guideline for implementation, with the sources prioritized for action roughly as follows:

1. Combined sewer overflow abatement is the single most important action needed to improve Skagit River water quality and protect Skagit Bay from fecal coliform bacteria contamination. The city of Mount Vernon has entered into a consent order with the Department of Ecology to reduce combined sewer overflows to once per year by the year 2015. The first phase of the correction effort was constructed in 1998, and has reduced the overflows by about 90 percent. The city is using the new facilities to gather data for constructing the final control measures. Responsible Parties: city of Mount Vernon and Department of Ecology
2. Nookachamps Creek's Watershed Action Plan and related implementation activities should be reviewed to determine if they are adequate to ensure that the creek will comply with the water quality standards for fecal coliform. The plan should be revised, if necessary, and fully implemented. An implementation review committee has done an evaluation of the plan's implementation strategies. A report has been produced and it will be further used to refine future TMDL implementation activities. Responsible parties: Department of Ecology (overall oversight). Task evaluation and implementation: Department of Ecology, various local and state agencies identified within the action plan.
3. The unidentified source on the Skagit River upstream of Kulshan Creek should be investigated and, if appropriate, controls implemented to eliminate the source or bring it within applicable standards. An investigation to determine this pollution source is ongoing. Future sampling is needed to specifically determine current conditions. Responsible party: Department of Ecology in coordination with local agencies.
4. Carpenter and Fisher Creeks should have Watershed Plans developed and implemented so that the creeks attain water quality standards. The Department of Ecology through the 2514 watershed planning process and an Ecology sponsored monitoring/assessment project is working with local agencies to assist them with a watershed planning process in the basin. A study is to be initiated within the next fiscal year to address TMDL issues. Responsible Parties: Department of Ecology, Skagit Watershed Council, Skagit County Public Works, Skagit Conservation District and Skagit System Cooperative.
5. A Watershed Plan or equivalent should be developed for Drainage District 15, to improve fecal coliform bacteria levels in the discharge from the Rexville pump station. Since the time of the TMDL technical study inspections and implementation of best management practices
6. by the dairies in the district may have reduced fecal coliform levels. Potential water quality improvements will need to be confirmed by follow-up monitoring. Responsible parties: local

and state agencies to be determined within the Detailed Implementation Planning process.

7. Review of over 20 years of ambient data from the Skagit River at Mount Vernon suggests that the upstream target value of 80 cfu/100 mL is exceeded about 10 percent of the time, which is consistent with the results of this study. Conditions in the upper Skagit River basin should be investigated to determine the sources of these high fecal coliform values and whether human-caused nonpoint sources exist that require additional controls, so that upstream target values are met. Recently some of the farms above the study area have closed operations. The Department of Ecology has established a one-year duration ambient monitoring station for 1999-2000 above the study area to see if bacteria levels have dropped. Information should become available in the next fiscal year. Responsible Parties: Department of Ecology in coordination with local, state and federal agencies and Tribes who have jurisdictional roles in the upper Skagit Basin. Potential cooperative agencies include U.S. Forest Service and National Park Service, Seattle City Light, the Skagit Conservation District, and the state Department of Fish and Wildlife.
8. As resources allow, other tributaries and urban stormwater sources should be evaluated for nonpoint source controls with the long-term goal that these water bodies meet Class A water quality standards for fecal coliform bacteria. Responsible parties: Department of Ecology (lead agency) in coordination with Skagit Conservation District, County Health Department, Tribes and Skagit County.
9. Although the Britt Slough and Conway pump stations and the Gages Slough discharge met the water quality standards during this study; the sources should again be monitored for long-term compliance, and appropriate actions taken if they begin to exceed the standards. Responsible parties: Department of Ecology in coordination with Skagit Conservation District, Skagit County Health Department and Public Works, drainage and flood control districts.

The Department of Ecology assumes the role of facilitator and coordinator to ensure that the above organizations and activities move sequentially toward TMDL implementation. The high level of local interest in water quality portends excellent results.

Summary of Public Involvement Methods

Lower Skagit Water Quality Technical Study:

A public meeting was held on the technical Water Quality Study in February 1998. Ecology staff met with affected point source dischargers to discuss the TMDL. A Focus sheet on the water quality study was developed and mailed to affected and interested parties. A public comment period was conducted in early 1998.

Lower Skagit Fecal Coliform TMDL Submittal Report:

A Focus Sheet was developed and mailed out to interested and affected parties. A public meeting was held in March 2000 to gather comments on non-point water quality issues related to the TMDL. The meeting was advertised in local newspapers. A local agency meeting was conducted in March 2000 to present the TMDL process and gather input on the submittal report. A public comment period on the submittal report was conducted in March/April 2000. Public involvement will continue during the Detailed Implementation Planning (DIP) phase of the TMDL. This will include the use of a local agency committee of key potential implementers

in the development of the DIP. Public meetings and the development of public outreach materials. Review of drafts of the detailed implementation plan will be provided for local agencies, tribes, interest groups and the public.

Overall completed public involvement tasks are outlined in Appendix A.

Monitoring Strategy

EPA (1991) guidance calls for a monitoring plan for TMDLs where implementation will be phased in over time. The monitoring is conducted to provide assurance that the control measures achieve the expected load reductions. Long-term monitoring will be important to ensure compliance with the requirements of the Lower Skagit River Fecal Coliform TMDL.

Ecology conducts long-term monthly ambient monitoring in the Skagit River near Mount Vernon inside of the TMDL study area. This is a valuable long-term record, but additional monitoring is needed for TMDL assessment, because the ambient monitoring station is upstream of the critical locations in the river as well as many of the loading sources. One permanent monitoring station is maintained above the study area at Marblemount.. A permanent station is also located on the Samish River near the town of Burlington; this station provides WQ data from the same local area and has land use impacts similar to the Skagit River. The department deploys temporary monitoring stations at strategic locations for one-year period every five years. These stations can be used to assess long term trends in smaller water bodies.

For monitoring the effectiveness of the Lower Skagit River Fecal Coliform TMDL, Ecology will develop a monitoring plan. The following elements will be considered for inclusion in the Plan:

- Fecal coliform bacteria should be monitored year-round in the South Fork Skagit River at Conway and in the North Fork Skagit River near Rexville for compliance with the marine standards target values. Monitoring should be at least monthly, although monitoring that targets rainfall periods would probably be more effective for documenting the highest fecal coliform levels. Alternatively, a focused study with more intensive monitoring could be scheduled at a future date.
- Fecal coliform bacteria should be monitored in the Skagit River above Sedro-Woolley and in tributary streams and drainage areas downstream of agricultural operations as part of nonpoint control activities using appropriate best management practices assessment protocols and strategies.
- Long-term periodic monitoring of fecal coliform bacteria should be conducted in tributary streams and drainage areas that are meeting water quality standards to ensure their continued compliance with standards.
- Quality assurance plans should be developed for all monitoring that identify appropriate monitoring objectives, strategies, schedules, and resources. Monitoring can either be conducted by Ecology or by other interested parties such as tribal or local governments, watershed groups, or drainage districts.

Potential Funding Sources:

Department of Ecology: TMDL Implementation projects can potentially be funded through the Centennial Clean Water Fund, State Revolving Loan Fund Program and the Federal Section 319 Grant program. All three of these programs have the same annual application cycle that usually occurs in January and February. The Skagit Conservation District and Skagit County currently have a number of grants and loans that are oriented towards addressing fecal coliform water pollution issues.

TMDL related monitoring and assessment projects can be funded through the Department of Ecology's Environmental Assessment Program (EAP). Project proposals can be developed through regional Ecology staff. Proposals are evaluated annually in February. Ecology EAP staff develops project designs and are open to cooperation with local agencies on joint project efforts.

Local Conservation Districts have a number of federal cost share programs that private landowners are eligible for. An example of one of these programs is the Environmental Quality Incentive Program (EQIP). These programs can assist farmers/landowners with implementation of Best Management Practices that help minimize nonpoint water pollution.

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Appendix A

Outreach to Public and Affected Parties

Outreach to Public and Affected Parties

Contacts with the public about the Lower Skagit TMDL are listed below. Other informal contacts with individuals living in Skagit County preceded these official notices. During sampling and reconnaissance work in 1994 and 1995 Ecology personnel contacted WWTP staff, city officials, other government agencies, the Skagit Valley Herald and the Skagit Tribal Cooperative to gather information about monitoring and discharges. These contacts all involved explaining Ecology's work on the TMDL. Listed below are formal notices about the TMDL Study.

- Public advertisement of NPDES permit applications and the TMDL in the Skagit Valley Herald and The Herald (of Everett, November 23 & 30, 1997)
- Posting of information about the TMDL on the Washington Department of Ecology WEB site.
- Mailing of the Lower Skagit River Total Maximum Daily Load Data Summary (Ecology Report #96-345) or notice of its availability to a list of 90 to 100 individuals on January 22, 1997 including members of city and county government, tribes with interest in the area, environmental groups, and individual citizens who requested information.
- Mailing of the Lower Skagit River Total Maximum Daily Load Water Quality Study (Ecology Publication No. 97-326a) on October 6, 1997 to a list of 30 individuals who we expected would have interest in reviewing the TMDL modeling and other technical work. The mailing including members of city and county government, tribes with interest in the area, environmental groups, and individual citizens who requested information.
- Meet with affected dischargers (city representatives from Mount Vernon, Sedro Woolley, and Burlington on November 18, 1997. No representatives from Big Lake WWTP or Skagit County attended despite invitations from the Department.
- Mailing of a summary of the Lower Skagit River Total Maximum Daily Load Water Quality Study on November 21, 1997 as an Ecology Focus sheet entitled "The Lower Skagit River TMDL Public Hearing and Comment Period." (Ecology Publication No. 97-2046-WQ).
- Public advertisement of TMDL public hearing and comment period in the Skagit Valley Herald (December 29, 1997 issue) and The Herald (of Everett, December 30, 1997 issue).
- Public meeting at the Skagit Valley community College on January 21, 1998.
- Presentation to the Skagit County citizen volunteer group for implementation of local 400-12 nonpoint basin plans (audience of about 30 local citizens) on January 26, 1998.
- Extension of the public comment period from February 28, 1998 to April 30, 1998 at the request of the mayor of Mount Vernon. Notice mailed to mailing list of 90 to 100 people.
- Developed and completed mailing of February 2000 Focus Sheet entitled: Lower Skagit River Bacteria Water Clean up Plans. A mass local mailing of this focus sheet occurred on February 24, 2000. The purpose of this focus sheet was to advertise for a TMDL public meeting, advertise a public comment period, and educate citizens.

- Conducted a public comment period from February 23, 2000 to April 7, 2000 on the Lower Skagit Fecal Coliform TMDL Submittal Report.
- Posting of Focus Sheet and Draft Lower Skagit River Fecal Coliform TMDL Submittal Report on the Department of Ecology WEB site.
- Placement of Focus Sheet and Draft Lower Skagit River Fecal Coliform TMDL Submittal Report in local libraries for public review from February 23, 2000 to April 7, 2000. These documents were placed in the following Libraries: Anacortes, Burlington, Concrete, La Conner, Mount Vernon, and Sedro Woolley.
- Advertised for a TMDL public meeting in the following local newspapers: March 3, 2000, Skagit Valley Herald; early March, Agriculture Northwest (published monthly in the Herald) These two ads were displayed in 8 ½ by 4-inch advertisements. Legal notices were also posted on March 1, 2000 in the Anacortes American, Skagit Valley Argus, and the Courier Times.
- Conducted a public meeting in Mount Vernon at Public Utility District #1 of Skagit County on March 20, 2000.
- Sent out announcements to local agencies and regional state agencies to advertise for a local agency TMDL workshop.
- Conducted a local agency TMDL workshop in Mount Vernon at Public Utility District #1 of Skagit County on March 20, 2000.
- Distributed copies of the Draft Lower Skagit River Fecal Coliform TMDL Submittal Report, 1997 Lower Skagit TMDL Water Quality Study, and other TMDL education material at the March 20, 2000 public meeting and agency workshop.

Appendix B

Public Notice Materials

Public Notice Materials

- Public advertisement of TMDL public hearing and comment period in the Skagit Valley Herald (December 29, 1997 issue) and The Herald (of Everett, December 30, 1997 issue).
- November 1997 Focus Sheet entitled: Water Quality in Washington State The Lower Skagit River TMDL Public Hearing and Comment Period.
- February 2000 Focus Sheet entitled: Water Quality in Washington State Lower Skagit River Bacteria Water Cleanup Plans.
- March 3, 2000 advertisement in Skagit Valley Herald of March 20, 2000 public meeting and public comment period.
- March 1, 2000 advertisement in Skagit Valley /Burlington Argus of March 20, 2000 public meeting and public comment period.
- March 1, 2000 advertisement in Anacortes American of March 20, 2000 public meeting and public comment period
- March 1, 2000 advertisement in Sedro Woolley Courier Times of March 20, 2000 public Meeting and public comment period.
- March 31, 2000 Capitol Press newspaper article on TMDL's and March 20, 2000 Public Meeting.

Appendix C

Responses to comments received

Responses to comments received

The Lower Skagit Basin TMDL Local Agency Meeting Response Summary March 20, 2000

Comment: There was a discussion about potential fecal coliform sources from the upper Skagit basin. While the Lower Skagit TMDL study boundary is just upstream from Sedro Woolley, The discussion tended to focus on upstream from Rockport. The group was mainly concerned with natural background conditions.

Response: One of the proposed implementation activities in the Summary Implementation Strategy is to investigate fecal coliform sources in the upper Skagit basin. The TMDL technical study showed fecal coliform exceeded 80-cfu/100 ml 10% of the time. Ecology recognizes that natural conditions, such as sources from wildlife or wood debris may play a part in these values. Other potential pollution sources in the Upper Skagit as defined by the TMDL study (upstream of Sedro Woolley) are livestock waste and failing/leaking septic systems. Concrete has the only sewage treatment plant upstream of Sedro Woolley. Most other residences are on individual septic systems. Woodwaste may also be influencing these high fecal coliform counts. If resources are available, Ecology will consider monitoring large storm or flood events in the upper basin. The highest fecal coliform counts tend to come during these events.

Comment: What is the Status of the Concrete sewage treatment plant?

Response: The Concrete treatment plant has an approved facility-planning document. They have applied for grant/loan money for an upgrade to the plant. Ecology will make a decision this summer on whether Concrete will be awarded a grant/loan for the upgrade.

Comment: There was a concern about relaying on the existing WAC 400-12 nonpoint plans for implementation of nonpoint TMDL activities.

Response: Ecology intends to use existing past and ongoing planning and implementation efforts as a key component of the TMDL implementation strategies. We are fortunate to have a nonpoint water quality plan already done in the largest subbasin of the Lower Skagit (Nookachamps Creek). Ecology would like to build upon these existing efforts and refine existing programs, find out where new implementation strategies need to be developed to address nonpoint issues that are that are not being adequately addressed by existing programs.

Comment: Ecology needs to guide the focus of the TMDL implementation activities on the existing problems, and minimize more general blanket approaches to address nonpoint pollution sources. There is a need to pinpoint the problems more. An example of this is within the

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Nookachamps basin the focus should not be solely on dairies; other sources such failing septic systems need to be looked at too.

Response: As much possible Ecology wants to focus its efforts on finding the pollution sources and correcting them without unduly burdening individuals or agencies that are not causing the problem. This is a balancing act between conducting enough water quality monitoring to find the non-point sources and implementing pollution controls. Ecology and local agencies have

only so many resources for monitoring and eventually implementation activities must move forward based on the best available information.

Ecology will look at all the potential pollution sources in a basin and does not intend to target a particular source category unless monitoring and other information indicate that this is necessary to correct the problem.

Comment: Leaking and failing septic systems are a major problem in lower Skagit. Will the TMDL address the differences between pollution from failing septic systems and inherit contamination from growth?

Response: Skagit County has had an effective On-Site Septic (OSS) System program that has included education, surveys and a local loan fund program for fixing failing systems. This process is still the best way to identify failing OSS systems separate from other human fecal coliform sources that may be the result of urban /rural development.

Comment: A follow up to the above comment was a discussion about fecal coliform tracking.

Response: The tracking of fecal coliform sources to determine if a source is coming from humans or different animal species is being done in certain areas. Drayton Harbor in Blaine WA is the closest example. The genetic testing method used in Blaine may detect only the presence or absence of key organisms. It is also very expensive to conduct, due to the large number of samples necessary for statistical confidence in the results. Other less expensive options for separating human fecal coliform sources from other sources is to track chemical residues, such as caffeine, detergents and surfactants, or brighteners, which tend to show up in human sources such as septic systems.

Comment: There is a local government concern with balancing the workload generated by TMDL implementation with a reasonable implementation schedule. What will Ecology/EPA do if implementation strategies are not carried out by a local agency?

Response: Ecology intends to work with local agencies and groups throughout the development of the TMDL detailed implementation plan. A key part of developing the plan is working out a reasonable implementation schedule with all the designated agencies. Ecology will take into consideration such issues as workload in developing this schedule. If a local agency or group cannot meet their agreed upon implementation commitments, then Ecology is willing to work out reasonable timelines to try and accommodate the situation. If this does not work, one option that was recently used in a Case in Oregon is to not issue point source water quality permits to the non-cooperative agency. Ecology does not presently implement this policy but may consider it as a future option.

Comment: Can experience from other TMDL efforts be used to help with developing the Skagit TMDL?

Response: Ecology intends to take advantage of internal TMDL experience as much as possible in assisting with the Skagit TMDL. A formal process is not set up for this. The TMDL coordinator for the Skagit (David Pater) plans to take his own initiative in coordinating with colleagues who have dealt with similar TMDL issues. Ecology also needs to evaluate past TMDL reports that deal with issues similar to those being dealt within the Skagit basin.

Comment: What types of funding options does Ecology have available for doing additional water quality monitoring?

Response: Presently there are two funding options for doing additional TMDL monitoring. First is the Centennial grant fund program. Under the current evaluation system if a project is addressing an approved or developing TMDL, it will be awarded extra points. Another funding option is through an internal Department of Ecology process that determines project prioritization of 303D listed water bodies (TMDL list). This process requires local agency staff to work with Ecology staff to develop proposals that address TMDL monitoring needs.

Comment: More discussion about potential fecal coliform sources from natural background conditions in the Upper Skagit. Concerns were expressed that Ecology needs to pinpoint these sources as much as possible. Ecology should get migratory bird count information on the Lower Skagit from the Dept. of Fish and Wildlife. This information should be considered within the TMDL study as a potential Fecal Coliform source.

Response: There are many other potential fecal coliform sources between Sedro Woolley and Rockport mainly from agricultural activities and failing/leaking septic systems. Ecology needs to sort all of these sources out and then try estimating what contamination may be coming from natural background conditions (wildlife or wood debris). Ecology welcomes new information on other fecal coliform sources so we can get a more comprehensive picture of pollution sources in the basin.

Comment: How does the Lower Skagit TMDL related to Ecology's water resource planning efforts (2514)?

Response: Ecology TMDL staff interacts with Water Resource basin leads on a regular basis to see if there are areas or projects where we can work together. Present watershed efforts in the Skagit basin focus on in-stream flow issues. It is hoped that once the Skagit Watershed Council finishes with in-stream flow issues that they begin focusing on salmon habitat issues including water quality.

Comment: What determines the water quality stream classifications (i.e.: AA, A or B)? Is it possible to reclassify certain stream segments in Nookachamps Creek to AA to help improve water quality in the lower reaches of the basin? Streams in the upper part of the basin are less impacted than lower segments of the Creek.

Response: Beneficial uses of each water body are used in determining stream classification. Standards are also based on these designated protected uses. High quality double AA streams tend to be in the upper reaches of stream basins. There is a specific process for reclassifying Stream reaches. However, Ecology is moving towards "use-based" water quality standards that will eliminate the classification system. A review of the designated beneficial uses and how they contribute to improving overall water quality in the Nookachamps basin could be investigated as a part of the detailed implementation planning process.

Comment: There was a discussion on the role of the Growth Reserve and Margin of Safety.

Response: To be able to have a growth reserve within the pollution allocations of a TMDL, individual load and waste load allocations for point and nonpoint sources will need to be below the required TMDL or State water quality standard. This may be difficult to achieve in the case of nonpoint sources. This issue should be discussed further in the development of the detailed

implementation plan. The Margin of Safety is the buffer factor that accounts for the uncertainty about the relationships between pollutant loads and the quality of the receiving water. It must be a part of any TMDL pollution allocation.

Comment: There was a discussion about fecal coliform sampling and lab analysis techniques.

Response: In the lower Skagit River TMDL, Ecology used the Membrane Filter method for laboratory analysis of Fecal Coliform bacteria. The results from the MF method are more consistent than from the MPN method, so MF tends to work better for mass balance studies. Ecology took duplicate samples at all sites in this study. All samples were collected directly into the sample bottles.

Comment: How was the TMDL meeting advertised in the local newspapers?

Response: Ecology advertised the meeting with a large ad in the Skagit Valley Herald and monthly Agriculture Northwest publication. The meeting was also advertised in the weekly Sedro Woolley, Burlington and Anacortes papers.

Comment: Two possible pollution sources exist on Kulshan Creek and the north fork of the Skagit River near the Rexville pump station just downstream from where the river splits. Have Ecology Dairy inspectors investigated these areas?

Response: A potential source of pollution on the North Fork of the River may be a pipe located by the pump station on the North Fork. Further investigation of potential pollution sources on Kulshan Creek pointed to a drainage outfall at Ledger Lake which drains surrounding farmland. This source may be originating from a nearby dairy whose owners had problems managing their waste on other sites. Future sampling of this source is needed to determine current conditions. This information has been referred to the Ecology Dairy inspector.

Comment: Many dairy farms are now doing their own water quality sampling. The sampling for the TMDL study was done mainly in 1995. Will more recent water quality information be taken into consideration in the development of TMDL implementation strategies?

Response: A number of new programs have been initiated since 1995, including implementation of the Dairy Nutrient Management Act. These programs have hopefully led to water quality improvements in the basin. Ecology will take into consideration more recent monitoring data as long as it meets the agency's quality assurance monitoring standards. We realize that the 1995 data from the TMDL study may not reflect present water quality conditions in certain areas. Follow-up monitoring in key areas to evaluate implementation programs may be needed.

Comment: Can water bodies that document that they are meeting water quality standards be removed from the TMDL list?

Response: No formal process is in place removing water bodies from the 303d list outside of the TMDL process. However, if a local agency or group believes that they have sufficient water quality data to justify a stream de-listing this needs to be documented and sent to Ecology's 303d list keeper (Alison Beckett). Documentation should include a chronology of the monitoring findings a list of improvements or BMPs that lead to the water quality improvements and statement concerning the data QA/QC. This process is not the official Department of Ecology policy for 303d de-listing, but is a reasonable approach. Ecology is presently working with EPA

to develop a formal de-listing policy. Any proposed policy would have to go through public review.

Comment: Response to Skagit County Public Works Department April 20, 2000 comment letter: This letter is attached to the comment summary. The letter states: “The implementation plan mentions improvement of fecal coliform levels from the Rexville pump station. The source of the problem has been identified and reports have been sent to the Department.”

Response: The Department of Ecology does not have the referred to reports and there is no record of receiving them. Neither County Public Works staff or the County Health Department knows the content of these reports or their whereabouts. A follow up email from County Public Works to this comment discusses a manure lagoon failure that occurred just east of the pump station, The dairy in question has acquired several hundred additional acres in the last couple of years to allow for wider distribution of manure from the drainage system. Ecology files on this dairy have no record of a manure lagoon failure. This issue will need to be further investigated during the development of the Detailed Implementation Plan to fully determine if the problem has been corrected or if other actions need to be taken. The Implementation activity within the Summary Implementation Strategy referring to the Rexville Pump station will remain as stated in the draft submittal report.

Lower Skagit TMDL Responsiveness Summary
Public Meeting
March 20, 2000

Comment: Ecology/EPA settlement agreement, what are the key elements?

Response: Key components were outlined in an overhead to the group as follows:

- Establish a 15-year schedule to develop TMDLs from 1996 303D list.
- Increase public participation and tribal involvement
- Build on Ecology's five-year watershed approach.
- Build on existing nonpoint source programs for TMDL implementation
- Require Ecology to track and monitor listed waters and TMDLs
- EPA will "backstop" if Ecology does not complete TMDLs on the agreement schedule.

Comment: What is the role of EPA in the TMDL process?

Response: EPA Reviews and approves the TMDL submittal report. They participate as deemed necessary in the development of the TMDL. Recent negotiations between Ecology and EPA on how to coordinate on TMDLs should lead to EPA playing a more proactive role in individual TMDLs, especially the ones they designate as "high investment".

Comment: Is there some type of certification program that TMDL managers must go through?

Response: There is currently no formal certification program. Learning from experienced TMDL staff and attending select training is currently the way that new TMDL staff is brought up to speed with the program.

Comment: EPA has been very inflexible in their recent dealings with water quality violations on dairy farms. This has resulted in a number of fines being levied. Local dairy farmers are concerned that EPA will take the same approach with TMDLs. In comparison, facilities such as sewage treatment plants are given years to comply with the Clean Water Act.

Response: This is a reasonable concern. A few years ago Ecology was slow in developing TMDLs due to lack of resources, and EPA took direct control of several TMDLs. With the legislature now providing additional resources, it appears that EPA will leave TMDL development to Ecology. EPA staff has indicated a willingness to work with Ecology TMDL staff in the development process of a TMDL. They are looking to participate more in the process than they have in the past working up front rather than only reviewing documents in the later stages of the process. EPA staff attended the March 20, 2000 local agency meeting on the Lower Skagit TMDL.

Comment: Question concerning potential buffer requirements on Lake Creek in the upper Nookachamps Basin.

Response: At this time, this is more of a local issue. The particular Landowner's property is not zoned agriculture. This situation will probably apply more to a future temperature TMDL. In any case, other rules will govern buffer sizes, not the TMDLs.

Comment: Are there many examples of completed TMDLs or case studies that could be used to assist with TMDL work in the Lower Skagit?

Response: Many of the completed TMDLs have focused on point sources. There are a few nonpoint TMDLs of much smaller basins than the lower Skagit that Ecology staff could use to assist them with sub-basin scale work in the lower Skagit. Ecology staff intends to use existing TMDL information and experiences in the Lower Skagit basin, so that the TMDL is completed in an efficient and effective manner.

Comment: Ecology's five-year Water Quality Management Area (WQMA) process. There was a concern that individual WRIs are only being looked at every five years. Another concern was that Ecology would not be doing monitoring on the lower Skagit until the next WQMA scoping year (2003).

Response: The WQMA process was explained. Individual WRIs do not only get attention every five years. Ecology's Environmental Assessment Program (EAP) has an ambient monitoring program, and a certain amount of monitoring takes place every year in the Lower Skagit Basin. The EAP program also has annual funding allocated to TMDL oriented projects. Award determination is made through an internal Ecology process. A monitoring project on Fisher/Carpenter Creeks was allocated funding for this year to assist with the Lower Skagit TMDL effort.

Comment: Question about the role of volunteer monitoring and consideration of annual variation in water quality.

Response: Ecology intends to focus monitoring efforts and monitoring funding as effectively as possible for pinpointing water quality problems. Water quality data from local agencies and through volunteer efforts can be used by Ecology staff in the TMDL if the data and data collection methods meet Ecology's quality assurance standards. In Skagit County a number of volunteer monitoring efforts have been funded through centennial grants. Efforts like these are required to comply with Ecology standards and should be valid to use in TMDL efforts.

Comment: Will this monitoring information be used for enforcement?

Response: EAP monitoring information, whether ambient or for TMDL studies, is not intended to be used for enforcement purposes. However, this doesn't preclude the use of this information in enforcement actions. Traditionally site specific monitoring of egregious water quality violations is usually the situation where monitoring data is used for enforcement actions.

Comment: Explain how the state water quality standards determine water body typing?

Response: Beneficial uses of water bodies assist in determining designated water typing. State standards are also based on protected uses. Class AA streams tend to be located in the

headwaters of basin, which usually contain the less impacted environments. The process to determine the protected beneficial uses and the appropriate water body class to protect those uses is called a "Use Attainability Analysis".

Comment: What are the timelines for completing the lower Skagit TMDL?

Response: Ecology intends to submit the TMDL submittal report to EPA by the end of June 2000. Development of the detailed implementation plan cannot begin until EPA has approved the submittal report. Bringing the Lower Skagit Basin into compliance with TMDL and water quality standards will likely take many years because of the size of the basin.

Comment: Two possible pollution sources exist on Kulshan Creek and the north fork of the Skagit River near the Rexville pump station just downstream from where the river splits. Have Ecology Dairy inspectors investigated these areas?

Response: A potential source of pollution on the North Fork of the River may be a pipe located by the pump station on the North Fork. Further investigation of potential pollution sources on Kulshan Creek pointed to a drainage outfall at Ledger Lake which drains surrounding farmland. This source may be originating from a nearby dairy whose owners had problems managing their waste on other sites. Future sampling of this source is needed to determine current conditions. This information has been referred to the Ecology Dairy inspector.

Comment: Many dairy farms are now doing their own water quality sampling. The sampling for the TMDL study was done mainly in 1995. Will more recent water quality information be taken into consideration in the development of TMDL implementation strategies?

Response: A number a new programs have been initiated since 1995, including implementation of the Dairy Nutrient Management Act. These programs have hopefully led to water quality improvements in the basin. Ecology will take into consideration more recent monitoring data as long is as it meets the agency's quality assurance monitoring standards. We realize that the 1995 data from the TMDL may not reflect present water quality conditions in certain areas. Follow-up monitoring in key areas to evaluate implementation programs may be needed.

Comment: There was a discussion on degraded riparian habitats and value of the quality of riparian buffers. A second part of this discussion involved the value of buffers downstream from the lakes in the Nookachamps basin.

Response: While riparian buffers address elevated temperature issues directly, they are also important for providing a filtration buffer strip for reducing animal waste (fecal Coliform) from entering streams. Restored riparian zones will also help raise low streams flows over time and increase the stability of stream banks. In the Nookachamps basin, it's critical to have adequate riparian zones on stream reaches downstream from the lake outlets of McMurray and Big Lake. A good riparian zone is in place down stream from Lake McMurray, but a riparian zone is lacking downstream from Big Lake. The Skagit Conservation District has recently done some riparian planting in this area.

Comment: It is important to get water quality background level conditions for the TMDL study.

Response: Ecology will try and take background levels into consideration with the TMDL, however, this can be a difficult value to obtain when dealing with nonpoint sources. Valid monitoring data from local agencies, tribes, or other state agencies would help in dealing with this issue.

Comment: What should farmers be thinking of doing related to the Lower Skagit TMDL?

Response: Farmers should continue to cooperate with the Skagit Conservation District in working with present programs that implement on farm BMPs, develop farm plans, and restore and protect stream riparian zones. The TMDL Detailed Implementation Plan has yet to be developed so Ecology can not give farmers a clear answer in what specific activities they will be responsible for implementing. Farmers and other local groups will be able to participate in the development of TMDL implementation strategies beginning later this year and into 2001. Ecology wants to develop strategies that both bring the lower Skagit River into compliance with water quality standards, but also are generally accepted by the local community as the correct approaches.

Comment: What is Ecology's enforcement role in implementation TMDL clean up strategies?

Response: Enforcement is one of tools that Ecology uses to gain compliance. Working with local agencies such as the Conservation District or Skagit County and providing technical assistance are other ways that Ecology gains compliance with water quality laws and standards. There are a number of incentive programs through the Conservation District that can be used to gain compliance. When it is deemed necessary and appropriate enforcement is used to addresses difficult compliance situations.

Comment: What group will oversee the implementation of the detailed implementation plan strategies?

Response: Like the Nookachamps nonpoint water quality plan, a number of state and local agencies will be responsible for implementing particular strategies. The strategies and the responsible implementing agencies will be decided during the development of the detailed implementation plan. Ecology will ultimately be responsible for seeing that all implementation activities do occur.

Comment: Discussion on Carpenter and Fisher Creek Activities.

Response: County Public Works intends to take the lead on the watershed planning effort in these basins, Ecology, the Conservation District and the city of Mount Vernon will also be participating. Ecology's Environmental Assessment Program will also be conducting a flow and surface water monitoring study in the basin which will assist with the local planning effort.

Comment: How is it decided to work on a watershed planning effort?

Response: It is a cooperative decision process amongst local and sometimes state agencies. It is dependent on funding sources.

Comment: What agency will end up investigating the unknown pollution source on Kulshan Creek? Does Ecology assign the county or city to investigate pollution sources?

Response: In Kulshan Creek's case, Ecology will end up investigating the unknown pollution sources. Local Governmental agencies also do their own water quality investigations when deemed necessary.

Comment: What will Ecology do if a particular individual, group or agency does not want to cooperate with solving the water quality problem?

Response: Ecology's response to this would depend on the situation. If a situation involves an obvious water quality violation and an individual or group is uncooperative then some type of enforcement activity may be needed. If the situation involves a municipality or a major industrial discharger who is under a federal permitting process then one option is not to issue a water quality permit to the discharger, such as what occurred with a case in Oregon. Ecology presently does not follow this policy, but may consider it as an option in the future.

Responses to Comments Received (shown in italics)

1. Letter and attachments from Luis Fuste USGS Water Resources Division to Walt Enquist of the city of Mount Vernon dated April 22, 1998.

- 1.1. This set of papers derives 7Q10 flows for the lower Skagit River for different time periods and provides a history of dam construction in the upper river. The 7Q10 flow calculated for the period of 1953-1997 and 1982-1997 is 5030 CFS.

The original TMDL study used a value of 4730 CFS for the 7Q10 flow based on a period of 1941 to 1979. The flow regime has been regulated since the mid 1950's by the current dam configuration. The Department has changed the 7Q10 flow to 5030 CFS in response to this information.

2. Letter from the Honorable Skye Richendrfer, Mayor City of Mount Vernon to Gerald Shervey Washington State Department of Ecology on April 29, 1998.

- 2.1. The Department failed to provide notice and involve the City in development of waste load allocations (WLAs).

The Department has attempted to provide all interested parties with equal access to the TMDL process and deriving nonpoint load allocations and WLAs. The Department provided the WLAs to a wide range of parties at the time the Lower Skagit River Total Maximum Daily Load Water Quality Study (Pickett, 1997) was published.

- 2.2. Mount Vernon advocated basing WLAs on projected population instead of wastewater flows predicted in the approved comprehensive sewer plans for each affected municipality.

The City of Burlington has objected to this proposal (letter from Margaret Fleek dated February 13, 1998) noting that only population is directly forecasted by OFM and that other data must be taken into account to forecast wastewater treatment plant loadings. The Department agrees with the comment from Burlington.

The Department expects that comprehensive sewer plans include population projections contained in each entity's comprehensive plans and thus are based on approved GMA planning by both the County and individual cities. Comprehensive sewer plans refine growth projections to more accurately predict sewered population, commercial contributions, and industrial flows. These plans provide a more definitive projection of wastewater loading than simple population projections. The Department has increased the WLA for ammonia to Mount Vernon in response to the City's concern about growth and its efforts to reduce CSO discharge. The Department is anticipating withholding a reserve WLA for future growth.

As of January, 2000 the Department has recalculated WLAs using an updated, increased design flow for the Mount Vernon Sewage treatment plant based on influent loading

estimates provided by the City's engineering staff. This revision should satisfy Mount Vernon's concerns over the basis of WLAs

- 2.3. The Department should delay implementing the findings of the TMDL to allow additional investigation by the affected dischargers and Skagit County.

The Department has delayed the implementation of the TMDL and revised the findings as explained here.

3. Letter from the Honorable Skye Richendrfer, Mayor of Mount Vernon; the Honorable Roger Tjeerdsma, Mayor of Burlington; the Honorable Don Wally, Mayor of Sedro-Woolley; and the Honorable Robert Hart, chairman of the Board of Skagit County Commissioners to Gerald Shervey Washington State Department of Ecology on April 28, 1998.

- 3.1. The TMDL model predicted only a minor violation (0.2 mg/L below standards) of the State dissolved oxygen standard that would appear to have no practical impact on the use of the river or fish migration.

The TMDL and NPDES permits must be conditioned to meet the State water quality standards. The issue of impacting beneficial uses is considered when the state sets the standard, not for TMDLs, WLAs, and NPDES permits. This comment would be appropriate for the next time the State water quality standards regulation (WAC 173-201A) are revised.

- 3.2. The findings of the TMDL study will force major upgrades of the treatment facilities for the lower Skagit dischargers. The City and County should be afforded opportunity to verify the TMDL findings.

WLAs have been increased based on comments received. The Department has delayed implementation of the TMDL in permits and made adjustments to the model. The TMDL study and WLAs will set the basis for future treatment plant enhancements needed in response to growth, but the WLAs are sufficient for each plant to continue discharging with current treatment levels at least until 2015.

- 3.3. Revise the 7Q10 flow. *See 1.*

- 3.4. Provide the Permittees adequate time to assure themselves the TMDL model is correct. Allow a ten year compliance schedule for meeting the WLAs.

The merits and drawbacks of the Departments TMDL modeling can be debated endlessly. More detailed work seems superfluous considering the revised WLAs provide for growth in flows and loadings through the year 2015. The WLAs provided by the Department can be met with the level of treatment provided by each discharger now. The WLAs require removal of ammonia during treatment. Technology is currently available to meet this requirement, so new requirements can be incorporated into treatment system designs as growth in each city calls for WWTP upgrades. Revisions to the model based on comments and new data should render this comment moot.

- 3.5. The City and County will collaborate on meeting the requirements of the TMDL. *The Department has no comment.*

- 3.6. "In essence, we are requesting time to more completely evaluate the Skagit River..."

Revisions to the WLAs allow the affected dischargers to meet proposed permit limits with current technology and incorporate new requirements in future treatment system designs.

4. Copy of letter from Walt Enquist, Wastewater Utility Supervisor for Mount Vernon, to Sky Miller, Skagit County Surface Water Management dated March 16, 1998. *The Department has no comments to address from this letter.*
5. Letter from John Wiseman, City Engineer for Mount Vernon, to Gerald Shervey of Department of Ecology dated January 15, 1998.
 - 5.1. Estimate of BOD₅ loadings upstream of the Lower Skagit River area consists of only one data point. *To be exact, four measurements of BOD₅ were made at the upstream site. All four were below the level of detection. One measurement from an ultimate BOD analysis was used to estimate the BOD₅ value. Although that is a small amount of data to rely on, the value of that parameter is of minor significance compared to upstream ammonia values. The value is our best estimate.*
 - 5.2. Delay implementation of original WLAs. *The Department did this and revised the WLAs based on other comments.*
 - 5.3. Mount Vernon proposes that WLAs be provided based on population projections instead of comprehensive sewer plans. *See 2.2.*
 - 5.4. Provides a table of WLAs based on the Skagit County Comprehensive Plan and growth projections. *See 2.2*
 - 5.5. The major waste loading in the Skagit is coming from upstream of Sedro-Woolley Woolley. Upstream nonpoint loads should be reduced. *Loading from upstream is high because flows are high, but concentrations are very low. Little if any of that loading is controllable. The majority of loading from controllable sources that affects dissolved oxygen during the critical low flow season is from sewage treatment plants.*
 - 5.6. Reduce upstream loading from nonpoint sources. *See 5.5 above.*
 - 5.7. Skagit Bay needs to be studied to ascertain loading (*fecal coliform assumed*) from the periphery of the bay. *The Department of Ecology can consider funding this type of study in the future.*
6. Letter from Margaret Fleek to Department of Ecology (Attn: Gerald Shervey) dated February 13, 1998.

This letter disputes several items from the letter from John Wiseman to Gerald Shervey January 15, 1998. *See 2.2.*

7. Fax from Walt Enquist of the City of Mount Vernon to Gerald Shervey dated November 17, 1997.
 - 7.1. Discuss the regulatory status of the lower Skagit River in relation to the TMDL study.

The Department of Ecology initiated the TMDL study in response to data submitted by Skagit County that showed that lower Skagit failed to meet state dissolved oxygen standards. Ecology staff reviewed the data in greater detail as part of the preliminary work for the TMDL study, and concluded that the data accuracy was questionable. The Department is required to set water quality-based limits for discharges to state waters. The TMDL study fulfills this obligation. Ecology also has the discretionary capability to perform "preventative" TMDLs for potentially threatened waters. The recent rapid growth in the lower Skagit River basin and the potential for continued growth led Ecology to believe that a preventative TMDL was reasonable and timely.

- 7.2. How will the TMDL status affect the consent decree between the City of Mount Vernon and the Department of Ecology requires the City to reduce CSO discharges to an average of once per year (required by current state regulations)? If state standards were relaxed to match proposed federal standards of an average of 3-5 overflows per year would the City still be required to meet the standard of once per year?

The TMDL findings are consistent with the consent decree. If state standards for CSO discharge (a technology-based standard) were relaxed, the City would still be held to the requirement of averaging a single CSO episode per year. The TMDL has set a water-quality based limitation on the CSO discharges. The most stringent requirement takes precedent.

- 7.3. How was the load contribution upstream of the study area derived, specifically the ambient BOD₅ level?

See 5.1 for how the upstream BOD₅ level was developed. The alternative would have been to use an assumed value equal to one half of the detection level, which would have resulted in a higher estimated value than the one used. The upstream BOD₅ is insignificant compared to the upstream ammonia level. Upstream ammonia was determined from a statistical evaluation of ambient data. The Department has reduced its estimate of the upstream ammonia level to a range of 0.015 to 0.020 mg/L based on long term monitoring data, data supplied by the dischargers after the study, and omitting the data set from the highway 99 bridge at Mount Vernon. Compare model runs 14 and 16. The ammonia levels discharged from the Mount Vernon WWTP has more effect on the model results than the upstream ammonia levels.

- 7.4. Explain why the TMDL study identifies CSO abatement as most important action needed to improve Skagit River water quality and protect Skagit Bay from bacteria contamination.

Of the sources studied within the study area, reductions in CSO bacteria levels resulted in the largest reduction in bacteria levels in the Skagit River as compared to proportional reductions from other sources. In addition, fecal coliform is used as an indicator of pathogens from human beings in the river. Since the CSO discharge is of human origin, the discharge of CSO is more significant than bacteria measured from non-human fecal coliform bacteria sources such as manure application runoff.

Appendix D

Quality Assurance Project Plan

Appendix E

Technical Report

Bound Separately as Ecology Publication Number 97-326
"Lower Skagit River Total Maximum Daily Load Water Quality Study."

Appendix F

Nookachamps Watershed Nonpoint Action Plan
Executive Summary