Gibbons Creek Watershed
Fecal Coliform
Total Maximum Daily Load

Submittal Report

June 2000
Publication No. 00-10-039


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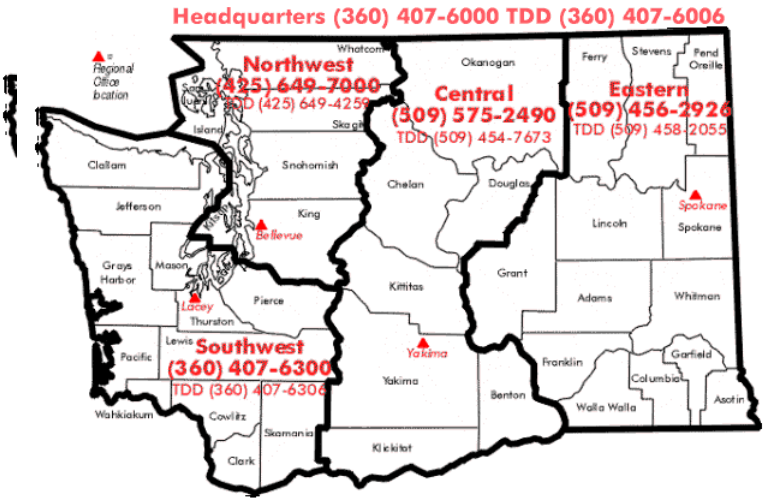

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Submittal Report

by
Rusty Post

Water Quality Program

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Introduction

The Washington State Department of Ecology (Ecology) has been delegated authority by the U.S. Environmental Protection Agency (EPA) to implement the federal Clean Water Act in Washington State. Under the Clean Water Act, each state has its own water quality standards designed to preserve, protect and restore water quality. When a lake, river or stream fails to meet water quality standards after application of required technology-based controls, Section 303(d) of the Clean Water Act requires that the state place the water body on a list of "impaired" water bodies, commonly known as the '303(d) list'. The Act also mandates that states establish Total Maximum Daily Loads (TMDLs) for surface waters that do not meet state water quality standards. The U.S. Environmental Protection Agency (EPA) has established regulations (40 CFR 130) and developed guidance (EPA, 1991) for setting TMDLs.

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 them. The TMDL determines the amount of a given pollutant that can be discharged to the water body and still meet standards, called the **loading capacity,** and allocates that load 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**. If it comes from diffuse sources (referred to as **nonpoint source**) such as stormwater runoff, that share is called a **load allocation**.

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

The Washington State Department of Ecology (Ecology) is establishing a Total Maximum Daily Load (TMDL) for Gibbons Creek watershed for fecal coliform bacteria. This TMDL will address potential impairments of beneficial uses in the watershed listed in the 1998 Section 303(d) list of impaired surface waters.

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 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 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 caused by fecal coliform bacteria. The characteristic uses designated for protection in the Gibbons Creek watershed streams 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)."

[WAC 173-201A-030(2)(b)]

The water quality standards describe criteria for fecal coliform for the protection of characteristic uses. Listed streams in the Gibbons Creek watershed are designated as Class A.

"General classifications applying to various surface water bodies not specifically classified under WAC 173-201A-130 or 173-201A-140 are as follows:...All other unclassified surface waters within the state are hereby classified Class A"

[WAC 173-201A-120(6)]

"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(2)(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)]

Background

Setting and Land Use

Gibbons Creek is located in eastern Clark County and flows into the Columbia River just east of the town of Washougal (Figure 1). In the upper watershed, the creek and its tributaries flow through relatively steep, incised valleys as the water travels down the northern slope of the Columbia River Gorge. The gradient lessens considerably as the creek reaches the floor of the valley, near the Evergreen Highway (Highway 14) crossing.

Prior to 1992, Gibbons Creek flowed westerly for the lower mile before discharging into the Columbia River. The lower creek channel was then modified, and now drains nearly due south from the highway crossing, through the Steigerwald Lake Wildlife Refuge, to the Columbia River. For most of this lower mile, the creek flows through an artificial, elevated channel before discharging into the Columbia River through a fish ladder structure. Because this portion of the channel is elevated (built on a dike), the surrounding land does not drain into Gibbons Creek, but instead drains into the old remnant channel. Therefore no land south of Highway 14, including the wildlife refuge and industrial park, contributes runoff into Gibbons Creek. Water quality in the remnant channel was the subject of a separate but concurrent investigation by Ecology (Erickson and Tooley, 1996).

Land use in the watershed consists largely of rural residential development with small farms, gardens, and/or animal-keeping operations along the slopes of the Columbia River Valley. The eastern fringe of the town of Washougal extends into the western portion of the watershed, including community subdivisions, schools, a gravel pit, and a golf course, all within the Campen Creek drainage area. New residential construction was occurring in the Campen Creek subbasin during the study period. Most of the study area is unincorporated with residences having on-site disposal systems (septic systems). There are no known point source dischargers within the Gibbons Creek basin.

Historical Water Quality Data

Prior to the 1996 TMDL Assessment, the only water quality data available were those measured by the Ecology Ambient Monitoring Program. These data were collected monthly from October 1991 to September 1992 at the Evergreen Highway crossing. Ehinger (1993) summarized findings as follows:

> "Fecal coliform counts were high with ten of the twelve samples exceeding 100 colonies/100 mL."

Ehinger's study found FC concentrations ranging from 37 to 910 colonies/100 mL (Table 1). The geometric mean of all measurements was 230 colonies/100 mL and 50 percent of the samples exceeded 200 colonies/100 mL; therefore, both parts of the water quality standard were violated. These data were the basis for Gibbons Creek's inclusion on the 303(d) list (Ecology, 1994).

Table 1. Fecal Coliform Concentrations Found in Gibbons Creek during October 1991 through September 1992 (Ehinger, 1993)

Year	Month	Fecal Coliform Concentration (# colonies/100 mL)
1991	October	450
	November	150
	December	37
1992	January	480
	February	140
	March	69
	April	360
	May	910
	June	730
	July	190
	August	140
	September	310
Geometric Mean:		**230**

The 1987 Water Quality Plan for Clark County (Intergovernmental Resource Center, 1987) states: "The water quality of Gibbons Creek is likely to be affected by septic system effluent in the upper reaches of the drainage basin, and agricultural runoff in the lower reaches." However, since that plan was written, additional residential development has taken place. Suspected sources of elevated FC levels include failing septic systems and agricultural run-off from small farms and animal-keeping operations.

1996 TMDL Assessment

The Washington State Department of Ecology conducted a fecal coliform total maximum daily load assessment of Gibbons Creek from September 1994 to January 1995. The intent was to establish a nonpoint source loading capacity for fecal coliform bacteria, recommend load allocations for control of sources throughout the basin, and identify specific problem areas for follow up action or continued study.

Two mainstem Gibbons Creek sites, two Campen Creek sites, and two unnamed tributaries to Gibbons Creek were sampled as described in Table 2 and shown in Figure 1. Three water quality surveys were conducted at the above six sites. The first survey was conducted in late summer on September 8, 1994. The second and third surveys were conducted during winter on November 9, 1994, and January 17, 1995.

Table 2. Description of Sampling Locations for Gibbons Creek Fecal Coliform Total Maximum Daily Load Study

Station ID	Description	Latitude	Longitude	Township	Range	Section
GC1	**Gibbons Creek** - below confluence with Campen Creek at Evergreen Highway crossing	45°34'29"	122°18'51"	1N	4E	16
GC2	**Campen Creek** - mouth, above confluence with Gibbons Creek	45°34'40"	122°18'52"	1N	4E	16
GC3	**Campen Creek** - upstream site at Bailey Road crossing	45°35'07"	122°19'32"	1N	4E	9
GC4	**Unnamed Tributary** #1 - mouth, above confluence with Gibbons Creek	45°35'00"	122°18'21"	1N	4E	10
GC5	**Unnamed Tributary** #2 - mouth, above confluence with Gibbons Creek	45°34'58"	122°17'55"	1N	4E	10
GC6	At confluence of Gibbons Creek and two unnamed tributaries (uppermost Gibbons Creek site)	45°34'43"	122°16'45"	1N	4E	11

Water Quality and Resource Impairments

As a result of measurements made that show criteria are exceeded, Gibbons Creek is included on Washington's 1998 Section 303(d) list (Table 3).

Table 3. Gibbons Creek Watershed 1998 Section 303(d) Listed Stream Segments

Stream Name	**Listed Parameter**	**Location (Township-Range-Section)**
Gibbons Creek	Fecal Coliform	T1N, R4E, SEC16

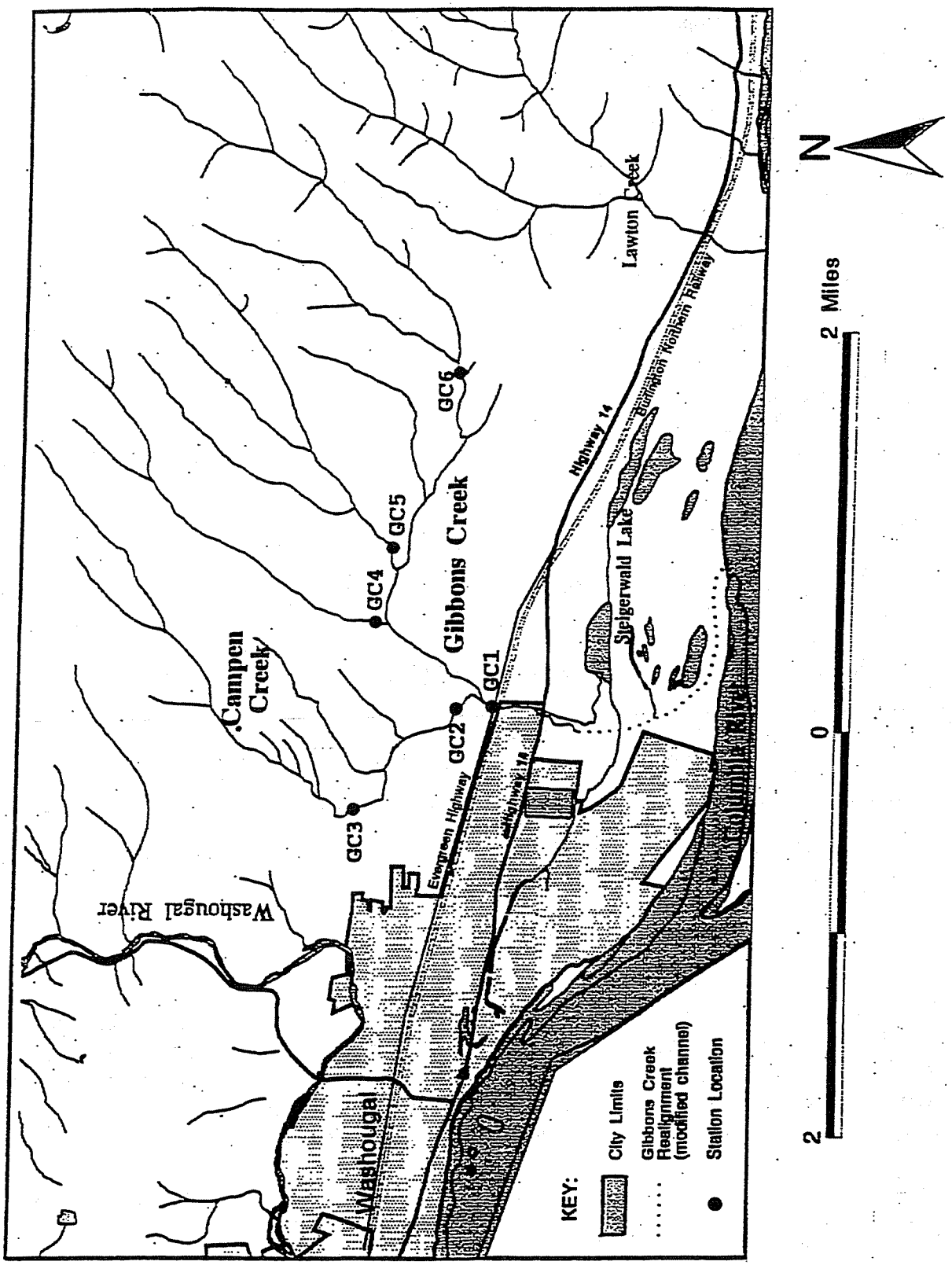
The streams of the watershed support anadromous fish runs of cut throat and rainbow trout, steelhead, and coho salmon (USFWS, 1996).

Conclusions and Recommendations

Both parts of the water quality criterion for FC were exceeded in Campen Creek, (1) the geometric mean of all samples at each site is not to exceed 100 colonies/100mL, and (2) no more than 10 percent of all samples may exceed 200 colonies/100 mL. The second part was exceeded throughout the Gibbons Creek watershed. Study results indicate that the primary FC loading problem is occurring throughout the basin in summer and also in Campen Creek year-round.

A phased TMDL is recommended for the Gibbons Creek watershed. It is recommended that a Load Allocation (LA) for FC be set for the mainstem Gibbons Creek at GC1 and Campen Creek at GC2 to meet the water quality criterion:

Figure 1. Location Map of Water Quality Sampling Sites (1996 TMDL Assessment)



Components of the TMDL

The five components of any TMDL as required by the Clean Water Act are defined as:

Loading Capacity: The greatest amount of loading that a water can receive without violating water quality standards. In the Gibbons Creek watershed, the loading capacity of fecal coliform bacteria has been established as the state water quality standard of 100col/100mL.

Wasteload Allocation: The portion of a receiving water's loading capacity that is allocated to an existing or future point source of pollution. The Gibbons Creek watershed has no permitted discharges, therefore the waste load allocation is set at zero.

Load Allocations: The portion of a receiving water's capacity that is attributed either to one of its existing or potential nonpoint sources of pollution or to natural background sources. The Gibbons Creek watershed load allocation for fecal coliform from all sources is equal to the loading capacity (as the state water quality standard). Reductions in fecal coliform needed to achieve the load allocation (capacity) range from 78 percent in the mainstem Gibbons Creek to 83 percent in Campen Creek, the primary tributary of Gibbons Creek.

Seasonal Variation: Water quality data collected in the Gibbons Creek watershed show a pattern of seasonal variation. Fecal coliform bacteria counts were variable, with higher counts throughout the basin in late summer months and consistently high FC levels in Campen Creek. This would be consistent with continuous and steady FC sources, independent of rainfall, such as failing septic tanks, or may represent a situation where FC sources have been depleted (washed off) by previous rainfall events.

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.

Loading Capacity

Identification of the loading capacity is an important step in developing TMDLs. EPA defines the loading capacity as "the greatest amount of loading that a water can receive without violating water quality standards." 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.

An analysis of FC loading into the mainstem of Gibbons Creek from Campen Creek and the other tributaries was conducted using the following expressions:

(1) $FC_Z = [(FC_{GC1} * Flow_{GC1}) - (FC_{GC2} * Flow_{GC2})]/Flow_Z$

where FC = fecal coliform concentration (colonies/100 mL),
Z represents Gibbons Creek above confluence with Campen Creek, and
$Flow_z$ was calculated as the difference of $Flow_{GC1}$ and $Flow_{GC2}$

(2) FC Loading (col/sec) = Flow (cfs) * FC (col/100 mL) * 284.7

where 284.7 is the conversion factor used for calculating FC loading (Kittrell, 1969)

The intent of this simplified analysis was to examine the relative contribution of FC loading into station GC1 and did not address the effect of bacterial decay, deposition and resuspension. It should be noted that FC samples in Campen Creek were collected approximately two hours apart during each survey and may not be representing the same set of conditions, especially during Survey 1 when sampling coincided with a rainfall event.

As shown in Table 4, the area draining into Campen Creek is contributing the greatest proportion of FC load to the watershed in relation to the other tributaries. FC relative load from Campen Creek during the study period ranged from 51 percent (Survey 2) to roughly 100 percent (Survey 3).

Table 4. Fecal Coliform Loading (col/sec) in Gibbons Creek (x 10,000)

Station ID	Survey 1	Survey 2	Survey 3
GC1	200	82	83
GC2	140	42	86
GC3	150	7.0	6.8
GC4	38	1.8	4.6
GC5	20	1.7	3.6
GC6	17	4.3	*
Z	56	40	-5.8

* = no flow data obtained
Z = station representing Gibbons Creek above the confluence with Campen Creek

The data show significant variation in the relationship between fecal coliform concentrations and flow. Fecal coliform levels are highly affected by the timing of sampling in relation to the

antecedent hydrograph and show "first flush" characteristics. Therefore, development of a single regression equation to predict fecal coliform concentration based on flow is not defensible with the limited data available.

Table 5. Fecal Coliform Geometric Means (#colonies/100 mL) Found in Gibbons Creek

STATION ID	Survey 1	Survey 2	Survey 3	ALL SURVEYS
GC1	2,000	82	50	200
GC2	5,600	180	210	590
GC3	4,900	45	23	170
GC4	1,100	12	16	60
GC5	980	10	12	49
GC6	990	25	4	46
ALL STATIONS	2,000	35	24	120

The loading capacity should be estimated for both parts of the fecal coliform criteria. However, the standards dictate that the geometric mean be computed from data collected within a 30-day period since longer averaging periods would skew the results to show noncompliance. The basis for state water quality standards comes from EPA (1976) criteria that require five samples over a 30-day period to compute the geometric mean. The limited data collected in the 1996 TMDL Assessment do not contain the minimum number of samples to defensibly compute a geometric mean. Therefore, the instantaneous measurements were assumed to represent the upper 10^{th} percentile of the averaging period for derivation of the loading capacity based on the higher fecal coliform criterion, 200 col/100mL, in order to provide an additional inherent margin of safety. The loading capacities were then derived within the range flows measured (high, medium, low) for each stream segment based on the peak instantaneous load approach.

Figure 2. Precipitation and Flow Data for Gibbons Creek

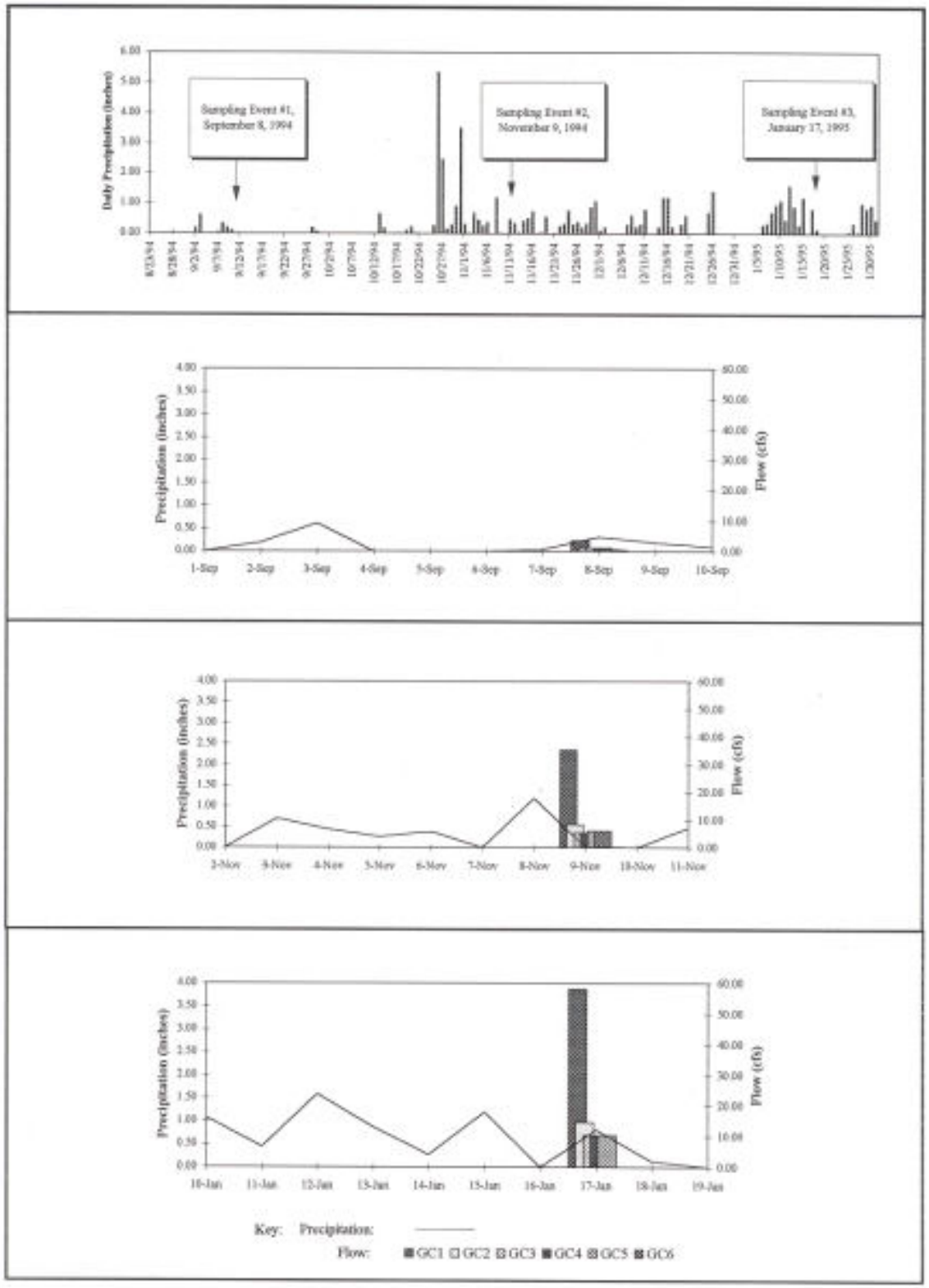


Table 6. Antecedent Precipitation (inches) and Streamflow (cfs) for Sampling Events

Survey Number	Date	Precipitation*	Station GC1	Station GC2	Station GC3	Station GC4	Station GC5	Station GC6
1	9/8/94	0.04	3.5	0.9	1.1	1.2	0.7	0.6
2	11/9/94	1.19	35	8.3	5.5	5.4	6.1	6.1
3	1/17/94	0.00	58	15	10	10	11	-

* Precipitation (inches) at City of Washougal Wastewater Treatment Plant in 24 hours preceding sampling date

\- No data obtained

Approximately 0.32 inch of rain fell on the first sampling date. Antecedent precipitation was 0.04 inches for the previous 24 hours, and averaged 0.12 inches/day in September preceding Survey 1. However, July and August were generally dry with total monthly rainfalls of 0.16 inches and 0.29 inches, respectively (city of Washougal Wastewater Treatment Plant, 1995).

Precipitation prior to Surveys 2 and 3 was generally rainy. As indicated in Table 6, the lowest flow rates were observed during the summer survey (September 8, 1994), while the highest flow rates were observed during the last winter survey (January 17, 1995).

The streamflows measured during the three surveys (3.5, 35, and 58 cfs for September, November, and December, respectively) were close to the historical mean monthly flows (3.9, 35, and 54 cfs). Therefore, the flow rates observed during the study period are likely representative of those respective months.

Load and Wasteload Allocations

Wasteload Allocations

Since there are no discharges in the Gibbons Creek watershed that are permitted by Ecology, the waste load allocation for all streams covered in this TMDL are zero.

Load Allocations

A phased approach is recommended for the Gibbons Creek TMDL, as is appropriate for basins with largely nonpoint source contributions. With a phased approach, load allocations (LAs) are defined, control measures are implemented, and the basin continues to be monitored to assess the effectiveness of the nonpoint source controls. If water quality targets are not met, additional nonpoint management techniques need to be implemented.

The study results indicate two general problems:

(1) high FC levels throughout the basin in the late summer, and
(2) consistently high FC levels in Campen Creek.

The CWA specifies that TMDLs can be expressed in terms of either mass per time (i.e., load), toxicity, **or other appropriate measure** (emphasis added) (40 CFR 130.2(i)). It is recommended that a Load Allocation for FC be set for the mainstem Gibbons Creek at GC1 and Campen Creek at GC2 to meet the water quality criterion:

- The geometric mean of all samples at each site is not to exceed 100 colonies/100 mL, and
- No more than 10 percent of all samples may exceed 200 colonies/100 mL.

For purposes of calculating the percent reduction of FC concentrations needed at GC1, data collected from the ambient monitoring program were pooled with data collected during the 1996 TMDL Assessment. The pooled data shows a significant seasonal pattern, with generally higher fecal coliform concentrations in the summer than the winter. The histogram in Figure 3 shows two distinctly different seasonal log-normal distributions of FC concentrations (Summer: April through October, and Winter: November through March). Although these seasons were selected based on fecal coliform concentrations, they are consistent with the streamflow pattern of Gibbons Creek, with relatively low average monthly streamflows in the summer months and high flows in the winter months.

Because of the seasonality of the data, percent reductions were calculated by season (Table 7). In the winter, essentially no reductions are necessary. In the summer, however, a 78 percent reduction in fecal coliform concentrations is needed to meet the TMDL load allocation. In Campen Creek, the first part of the water quality criterion was violated throughout the study period and there was insufficient data for determining seasonality. Therefore the percent reduction needed, 83 percent, was based on surveys from all dates (Table 7).

Table 7. Fecal Coliform Geometric Means and Recommended Percent Fecal Coliform Reductions for Gibbons Creek

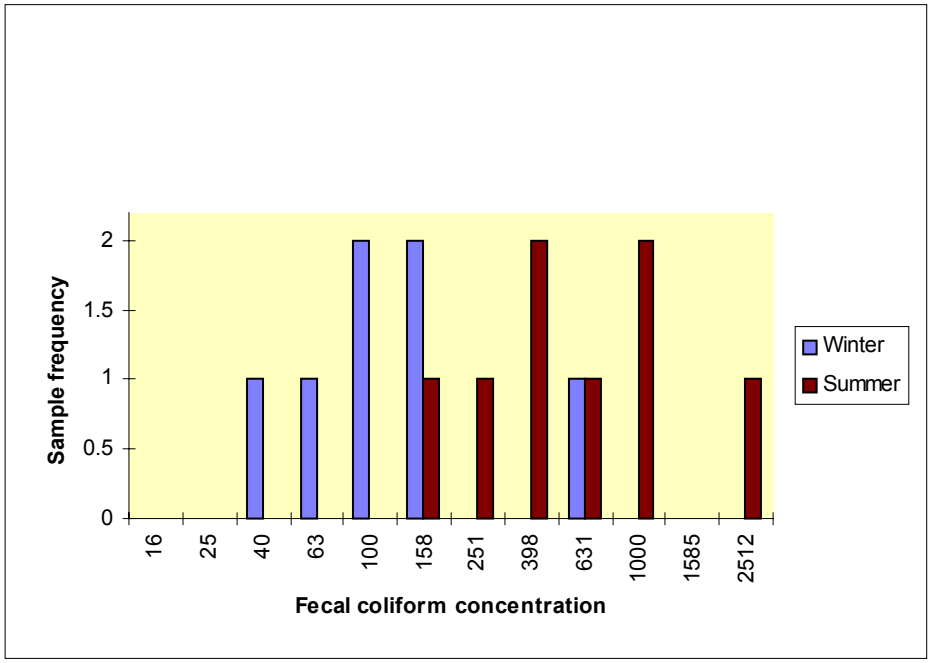
Station ID	Geometric Mean (#colonies/100 mL)			Load Allocation (#colonies/100 mL)	Percent Reduction Needed		
	summer	winter	year-round		summer	winter	year-round
GC1	453	101	-	100	78	1	-
GC2	-	-	590	100	-	-	83

The LAs proposed are intended to bring the water quality of Gibbons Creek into compliance with FC standards. However, it is not certain whether the LAs would be protective enough to meet the second criterion of the FC standard, especially in winter. Use of a phased TMDL approach will allow reconsideration of water quality management goals after evaluating the effectiveness of the LAs.

The existing pollutant loads are from nonpoint sources that must be assigned load allocations based on the loading capacity. As such, EPA guidance (1991) suggests a phased approach where the TMDL is monitored for effectiveness.

Seasonal Variation

Figure 3. Comparison of Winter and Summer Fecal Coliform Distributions in Gibbons Creek at GC1



Water quality data collected in the Gibbons Creek watershed show a pattern of seasonal variation. Fecal coliform bacteria counts were variable, with higher counts throughout the basin in late summer months and consistently high FC levels in Campen Creek. Highest FC concentrations were found during Survey 1, in late summer (Table 7). Station GC2 at Campen Creek consistently had the greatest FC concentrations in relation to other station locations. The much lower FC concentrations in November and January compared to September suggest that the diluting effect of higher streamflow is more than compensating for any additional rainfall washoff of FC sources. This would be consistent with continuous and steady FC sources, independent of rainfall, such as failing septic tanks, or may represent a situation where FC sources have been depleted (washed off) by previous rainfall events.

The pattern of FC loading along Campen Creek was different in the late summer than in the winter. In September, the upstream loading was roughly 100 percent of the downstream loading, whereas in November and January, the upstream loading was only 17 percent and 8 percent of the downstream loading, respectively. This indicates that the land draining to the reach between stations is contributing a proportionately larger share of FC in the winter than in the summer.

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.

EPA has developed a methodology for deriving fecal coliform TMDLs for areas with limited data (EPA, 1999). Using the most extreme fecal coliform loading measured is a conservative assumption that serves as an inherent margin of safety. The assumed instantaneous fecal coliform loads represent the upper 10^{th} percentile of data in a 30-day averaging period for comparison to the water quality standards.

Modeling Approach

A modeling approach was not used in the Gibbons Creek TMDL Assessment completed in 1996.

Summary Implementation Strategy

➢ Introduction

The purpose of this Summary Implementation Strategy (SIS) is to present the concept of how the waters covered in the Gibbons Creek Fecal Coliform Total Maximum Daily Load Assessment will achieve water quality standards over time. This SIS meets the requirements of a TMDL submittal for approval as outlined in the 1997 Memorandum of Agreement between the U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology). The SIS includes a description of the activities conducted to date and the process of how a Detailed Implementation Plan will be developed. The Gibbons Creek Water Cleanup Plan is an entirely non-point source TMDL.

➢ Overview

Gibbons Creek and its tributaries are located in eastern Clark County and flow into the Columbia River just east of the town of Washougal. In the upper watershed, the creek and its tributaries flow through relatively steep, incised valleys as the water travels down the northern slope of the Columbia River Valley. The gradient lessens considerably as the creek reaches the floor of the Columbia River Valley, near the Highway 14 crossing.

Land use in the watershed consists largely of rural residential development and small farms along the slopes of the Columbia River Valley. Many of the residences keep a small number of horses and/or cattle. The eastern fringe of the town of Washougal extends into the western portion of the watershed, including a school, golf course, and new residential development.

A technical study conducted by Ecology in 1994 and 1995 (Gibbons Creek Fecal Coliform Total Maximum Daily Load Assessment, April 1996), determined fecal coliform bacteria contamination of Gibbons Creek exceeded water quality standards. The study also revealed higher than normal levels of three other parameters: nutrients, turbidity and temperature. No additional activities, studies or monitoring have been conducted by Ecology since the TMDL Assessment released in 1996. Limited data on habitat and temperature is available from state and federal fish and wildlife agencies.

There are no permitted discharges (municipal, industrial or agricultural) of fecal coliform bacteria in the basin. Elevated bacteria counts can only be attributed to non-point sources. Elevated levels of nutrients, temperature and turbidity can only be attributed to non-point sources as well.

➢ Implementation Plan Development

Ecology initiated the TMDL or Water Cleanup Planning process for Gibbons Creek in February 2000 by holding an internal meeting to identify lead, support and technical staff within the agency, and committing to development of an implementation plan. Ecology hosted a series of four public meetings in March and April 2000, inviting individuals, organizations and agencies to help develop and implement a cleanup plan. Public participation resulted in the development of an outline of the Draft Water Cleanup Plan, which was released for a 30 day public comment period in April 2000. This outline and the comments received will guide development of the Detailed Implementation Plan scheduled for completion by October 2000. The Draft Water Cleanup Plan Outline and public comment Responsiveness Summary are attached for reference.

During the process of developing the outline of the Draft Water Cleanup Plan for fecal coliform bacteria, planning participants agreed to also address the other three parameters of concern (nutrients, turbidity and temperature) identified in the TMDL Assessment.

To address the four pollution parameters, the Plan Outline was divided into four main categories of activities that are the most likely sources of pollution: Farms, Septic Systems, Riparian/Streamside, and Construction/Landclearing. There is also a section on Monitoring that will track changes in water quality in the creek and assist in the identification of pollution sources. To address the four pollution types, each of the four categories is divided into five parts: Identify Sources, Identify Control Measures, Identify Resources, Identify Other Needs, and Timeline. The outline will serve as the basis for the Detailed Implementation Plan. Public Comment on the Draft Water Cleanup Plan Outline proposed modifying the existing group categories/names. Development of the Detailed Implementation Plan will reflect this subtle change in structure. It is expected that this change will lend itself to a simpler, more appropriate organizational structure better suited to planning and implementation of plan elements.

A significant consideration in development of this TMDL is that there are two other concurrent planning processes underway; Watershed Planning and Salmon Recovery. It is expected that this TMDL will likely result in an implementation plan that will function as the basis for the other two planning processes covering this basin. Coordinating this process with the other two should reduce duplication, build relationships, develop a wider understanding of the watershed, provide an example of planning and implementation, and increase the likelihood of funding and other support to or from the other planning groups. Also, it is important to note that the Gibbons Creek watershed is home to listed and proposed threatened and endangered species of fish as well as non-listed stocks. Water quality improvements resulting from TMDL implementation activities will also function as fish spawning, rearing and habitat improvements.

- **Involved Parties**

The following is a description of the key agencies and other groups that have regulatory authority, information, resources or other interests that will be included in the coordinated effort to develop and implement a Detailed Implementation Plan.

City of Washougal
US Fish and Wildlife
Clark Public Utilities
Washington Department of Fish and Wildlife
Clark Conservation District
Lower Columbia Fish Recovery Board
Washington State Department of Transportation
Local Citizens
Clark County
Southwest Washington Health District
Washington Department of Ecology
Natural Resources Conservation Service
Clark County Homebuilders Association
Local Media

- **Approaches to Meet Load Allocations**

The load allocation for this basin for fecal coliform bacteria has been defined as the state water quality standard of 100 colonies per 100mls. Although a load allocation has not been established for the other three parameters of concern in the basin, the state water quality standards will apply. The overall approach to meet these load allocations requires a combination of strategies with a wide array of non-point source controls and BMPs. To summarize the approach: identify pollution sources, identify control measures, identify available resources, identify other needs (funding, equipment, personnel, etc.) and set a timeline.

The first step is to identify potential sources, either by land-use type or by general location from monitoring results and other available information. The second step is to locate specific sources of pollution and contact the owners/operators. Voluntary source control through education and technical assistance is the preferred method for pollution reduction. Compliance and enforcement are available as a more formal process in controlling pollution sources, but are expected only in situations where education and technical assistance efforts fail to get pollution controls in place.

It is expected that public awareness and education programs will be a significant part of the Detailed Implementation Plan and will result in pollution reductions.

It should be noted that the sample data collected in 1994-5 as part of the TMDL Assessment, indicated watershed conditions and land uses at that time. Land use changes since that study period may have resulted in changes in pollution levels. Implementation of the Monitoring Plan should provide a more accurate picture of current water quality conditions in the basin. It is possible that the results garnered in the Monitoring Plan will alter the approach taken in the Detailed Implementation Plan. The current and proposed structure for this TMDL readily accommodates an adaptive management approach to attain water quality standards in the basin.

One essential element of the Detailed Implementation Plan will be defining Success Measures. The primary success measure will be fecal coliform bacteria reductions, but other measures will also be discussed and proposed for inclusion in the detailed implementation plan.

- **Implementation Activities**

Examples of activities related to the various pollution source types is outlined below and in the Draft Water Cleanup Plan Outline (see Appendix D).

If On-site Septic System (OSS) failures are identified through the maintenance and inspection program, the owners will be given technical assistance to get the repairs or replacements completed. The SWWHD will implement the provisions of their OSS program. Ecology and the SWWHD are currently negotiating a Memorandum of Agreement to prioritize the Gibbons Creek basin in the district's workload planning.

Agricultural sources identified as contributors to fecal coliform bacteria pollution will be referred to Clark Conservation District (CCD). The CCD, under the guidance of NRCS, will assist landowners in developing or modifying an existing farm plan to eliminate the potential to pollute. During the remainder of 2000, the CCD will continue to work with small farm owners to implement BMPs using the existing Ecology Centennial Grant for funding.

Clark Public Utilities has offered to assist with stream restoration measures and public education.

Clark County Public Works Department will continue to implement their stormwater program and assist with educational activities.

City of Washougal has committed to assist in identification of potential pollution sources and implementation of existing city ordinances. The city has also offered to assist with implementing some elements of the Monitoring Plan. The city will also assist with educational activities.

An education campaign/program will be developed. All participants in the TMDL planning process will be asked to assist in this key area. It is expected that educational activities will be coordinated with the volunteer monitoring program.

The Monitoring Plan will be initiated in June 2000. Monitoring will begin before the Detailed Implementation Plan is completed.

➢ Summary of Public Involvement

The initial public meeting introduced the participants to the TMDL Assessment and the water cleanup planning process. This was followed by two additional public meetings where planning participants identified more specific strategies, roles, needs, and timelines as proposed in the Draft Water Cleanup Plan Outline, which was released for public review and comment. One additional meeting was held to discuss and refine the approach to the Monitoring Plan. These meetings constitute the bulk of the public participation strategy entailed in development of this SIS and the Draft Water Cleanup Plan Outline. The Outline will serve as the basis for the Detailed Implementation Plan to be completed by October 2000.

Ecology will continue working with Clark County, city of Washougal, Port of Camas Washougal, US Fish and Wildlife, State Fish and Wildlife, Clark Public Utilities, Clark Conservation District, Southwest Washington Health District, the Lower Columbia River Fish Recovery Board, and many local organizations and individuals to develop the Detailed Implementation Plan, through a process of peer review and periodic stakeholder meetings. Stakeholders meetings will be used to keep planning and implementation participants appraised of the implementation activities and to reach consensus on appropriate implementation strategies, corrective actions and timelines. Local media coverage has been extremely helpful thus far and it is expected to continue. Three newspapers, two TV stations and one radio station are monitoring and covering the group's progress. A web site containing documents specific to this TMDL as well as general information is currently available.

Additional public involvement is essential to successful implementation of the Gibbons Creek Water Cleanup Plan.

➢ Monitoring Strategy

The Gibbons Creek Monitoring Plan is currently under development. The overall strategy and purpose of the plan was discussed and agreed to by the monitoring group in April 2000. The Monitoring Plan will be initiated in June of 2000, and will cover all four parameters of concern. The Monitoring Plan will address three primary goals: confirm existence of water quality pollution exceedences, help pinpoint potential sources of pollution, and provide long-term indicators of changes in water quality and the success or failure of pollution control measures.

The Monitoring Plan will be based on the Quality Assurance Project Plan established for Ecology's 1996 TMDL Assessment, but will include two additional monitoring stations, both in the Campen Creek basin. A reduced suite of sample parameters will reduce costs and keep the focus on the four parameters of concern.

Volunteer monitoring by local residents and school groups will supplement data generated by the Monitoring Plan, provide educational opportunities and involve the local population in measuring the effectiveness of pollution control measures.

Potential Funding Sources

The Centennial Clean Water Fund, Section 319, and State Revolving Fund grants are available to fund activities by jurisdictions to help implementation of the water cleanup plan. Non government organizations can apply to be funded by a 319 grant fund to provide additional assistance. Ecology will work with the stakeholders to prepare appropriate scopes of work, to implement this plan, and to assist with applying for grant opportunities as they arise. Ecology will be involved in monitoring by participating in sample collection and laboratory analysis.

Funding for specific projects or control measures that meet the guidelines for salmon recovery funding may be available through the Lower Columbia Fish Recovery Board.

Many elements of the implementation plan will be covered by minor adjustments of existing staff and resources and shifting priorities within various agencies and organizations. Some programs administered by local agencies, such as stormwater programs, are relatively new or are only recently being staffed and funded. Thus a good portion of the implementation can be funded within existing resources.

Acronyms and Abbreviations

BMP	Best Management Practice
CCD	Clark Conservation District
DNMP	Dairy Nutrient Management Plan
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
NPDES	National Pollution Discharge Elimination System
NRCS	National Resource Conservation Service
OSS	On-Site Sewage System (OSS)

References Cited

SASSI, 1993. 1992 Washington State Salmon and Steelhead Stock Inventory. Washington Department of Fisheries, Washington Department of Wildlife and Western Washington Treaty Indian Tribes. Olympia, WA.

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U.S. Environmental Protection Agency. 1987. The Enhanced Stream Water Quality Models QUAL2E and QUAL2E-UNCAS: Documentation and User Manual. EPA/600/3-87/007. Athens, GA.

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Appendix A

Public Participation Materials

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Focus

Gibbons Creek water cleanup planning update

Issue

Gibbons Creek, which is located in Clark County near Washougal, is facing water quality challenges. A study by the state Department of Ecology (Ecology) has found that water in the creek violates water quality standards for fecal coliform bacteria.

Fecal coliform is a major concern because it indicates that biological waste is entering the river. Common sources of fecal coliform include failing septic tanks and agricultural run-off.

Federal law requires cleanup of polluted waters

Federal law requires states to identify sources of pollution in waters that fall short of water quality standards, and to determine how much of each kind of pollution the waters can receive and still remain healthy. A set of pollutant allocations for that water body, based on sampling data, is called a Total Maximum Daily Load (TMDL), or water cleanup plan.

Ecology is in the process of developing a water cleanup plan for Gibbons Creek because it was listed, along with about 600 other polluted waters across Washington, for cleanup planning. After broad participation by local authorities and citizens, Ecology will submit the Gibbons Creek water cleanup plan to the U.S. Environmental Protection Agency (EPA).

Pollution problems may have many roots

There is no single source of pollution to Gibbons Creek. There are no industrial outfalls, or pipes, that discharge into the creek. Therefore, Ecology experts believe that "non-point" pollution is to blame for the basin's water quality dilemma.

"Non-point" pollution is caused by people and their activities. It is pollution that is not necessarily discharged through a pipe or an outfall (called "point-source" pollution). Non-point pollution is sometimes invisible. It can result from failing septic tanks, agricultural waste that gets into rivers; sediments that run off construction sites; stormwater that races to the creek from rooftops, driveways, roads, and fertilizer-laden lawns. It comes from people washing their cars in their driveways and from people dumping their paint buckets in ditches or in storm drains.

Non-point pollution is worsened because of the increase in houses and pavement, and the loss of stream-side trees and wetlands. Water that would normally go back into the ground or filter through vegetation, instead carries extensive pollution to the creek.

What happens because of poor water quality

Clean, cool water is important for people and for fish. A polluted creek can be a health threat to people who live near it and want to enjoy it. If left unchecked, it could even decrease property values. Fish may have trouble surviving and spawning. Federal Endangered Species Act listings

are sparking actions by local government to clean up waters such as Gibbons Creek and restore fish habitat, or face measures imposed by the federal government.

Cleaning up Gibbons Creek

Undoubtedly, it will take help from all who live in the Gibbons Creek watershed to clean up its waters for current and future generations.

Ecology's study -- the Gibbons Creek Fecal Coliform Total Maximum Daily Load Assessment -- recommends that additional work is needed to identify sources of elevated fecal coliform samples in the creek. The assessment recommends:

- An inventory of farm animals in the area;
- An assessment of animal waste systems and identification of farms that may be contributing to excess levels of fecal coliform runoff to the creek;
- A septic survey to identify failing septic tanks; and
- A land-use analysis of the entire basin to identify other potential sources of fecal coliform bacteria contamination.

How you can get involved

Ecology is working with local interests to develop a framework for improving water quality in the Gibbons Creek watershed. The first step is to address the fecal coliform bacteria pollution. Ecology wants to hear from people who live in the watershed to get public involvement in the development of the final cleanup plan.

Ecology's water quality report -- "Gibbons Creek Fecal Coliform Total Maximum Daily Load Assessment" -- is available at the Washougal City Hall at 1701 C Street, telephone 360-835-8501 and at the Vancouver Department of Ecology office at 2108 Grand Boulevard, telephone: 360-690-7171. It can also be found on Department of Ecology's website at http://www.wa.gov/ecology/biblio/96316.html

Public meeting

You are invited to a public meeting to discuss Gibbons Creek water cleanup planning. It will be from 6:30 - 8:30 p.m., Wednesday, March 15, at Jemtegaard Middle School, Commons Room, 35300 SE Evergreen Boulevard, Washougal.

For more information

For more information or to get on Ecology's mailing list to receive information about Gibbons Creek, contact Rusty Post, Department of Ecology, Vancouver Field Office, 2108 Grand Boulevard, Vancouver, WA 98661-4622; telephone: 360-690-4787; e-mail: rpos461@ecy.wa.gov

Meeting Agenda

Gibbons Creek water-cleanup planning meeting March 1, 2000

Time: 3:00 - 5:00 pm

Location: Camas Police Station

Agenda:

Welcome and Introduction:	Rusty Post
TMDLs - What are they?:	Ron McBride
TMDL Tecnical Report:	Karol Erickson
Gibbons Creek Implementation Strategy:	Rusty Post

A public meeting to discuss water-cleanup planning for Gibbons Creek will be held from 6:30–8:30 p.m. Wednesday, March 15, at Jemtegaard Middle School, Commons Room, 35300 S.E. Evergreen Blvd., in Washougal.

Ecology's study, the "Gibbons Creek Fecal Coliform Total Maximum Daily Load Assessment," is available at Washougal City Hall at 1701 C St. and at the Vancouver Department of Ecology office at 2108 Grand Blvd. The report is also posted at Ecology's Web site at http://www.wa.gov/ecology/biblio/96316.html

For more information about Gibbons Creek or the public meeting, contact Rusty Post, Department of Ecology, Vancouver Field Office, 2108 Grand Blvd., Vancouver, Wash., 98661-4622; telephone, 360-690-4787; e-mail, rpos461@ecy.wa.gov.

GIBBONS CREEK TMDL
WORKGROUP BREAKOUT
MARCH 15, 2000

Workgroup Breakout Session

- Five workgroups to address the pollution problems and develop a plan
    * Septic System Maintenance
    * Farms
    * Construction and land clearing
    * Riparian
    * Monitoring

- Workgroup coordinator (facilitate discussion, notes, report back)

- Objectives/Goals
    * Identify sources (or process to ID sources - who, when, where, how)
    * ID solutions or control measures (fix septic, cover manure, fence streams, reduce erosion, plant riparian zone, etc)
    * Identify resources (personnel, equipment, material, info, $)
    * ID other needs (information, data, etc.)
    * Timeline

Workgroup Reports (3 min. ea.)

Wrap-up

GIBBONS CREEK TMDL
PUBLIC MEETING AGENDA
MARCH 15, 2000

Welcome and Introduction (Rusty Post, Ecology)

General TMDL Process (Darrel Anderson, Ecology)

Technical Report (Rusty Post)

Gibbons Creek Water Cleanup Plan (Rusty Post)

Septic Maintenance Program (Ruel Emery, SWWHD)

Farm Plans - Waste Management (Lisa Bucy, Clark CD)

BREAK

Workgroup Breakout Session

Workgroup Reports

Wrap-up (Rusty Post)

Allen's P. C. B. Est. 1888

2373

Gibbons Creek clean-up discussed

By Dawn Feldhaus
Post-Record Staff

A study by the Department of Ecology reveals Gibbons Creek does not meet water quality standards for fecal coliform bacteria. Fecal coliform indicates biological waste is entering the creek from sources including failing septic tanks and agricultural run-off.

Gibbons Creek is one of more than 600 bodies of water in Washington that do not meet water quality standards.

The Department of Ecology is in the process of working with area residents and government leaders to develop a cleanup plan for Gibbons Creek.

An organizational meeting March 15 attracted more than 20 area residents and city and county government employees.

Those who attended were divided into five work groups to address the pollution problems and develop a plan. The workgroups addressed septic system maintenance, farms, construction and land clearing, riparian (land along the stream banks), and monitoring issues.

The groups were asked to identify sources of

See **Gibbons Creek,** ***page A3***

Gibbons Creek

Continued from page A1

pollution, as well as solutions or control measures, and resources of personnel, equipment, and funding.

Rusty Post, a water quality specialist for the Washington Department of Ecology, said the cleanup process will be easier if everyone works together.

"This is not a witch hunt," Post said. "This is not a time to point fingers or blame others. Everyone needs to take responsibility for their actions. It's not just the failing septic systems, the oil runoff, fertilizers, pesticides, storm water problems, or soapy car runoff from car washing. Everyone who lives in the basin is responsible.

"This is a process to address the water problem and figure out ways to solve it," Post said. "It will be easier if agencies and property owners cooperate."

"The Department of Ecology could write the cleanup plan ourselves, but it wouldn't represent the knowledge, information, interests, and concerns of area residents," he continued. "It needs to be their plan."

Post plans to compile comments from the March 15 meeting and send summary drafts to those who attended, "so the citizen workgroups can refine their ideas and fully develop a water quality plan."

Area residents will soon have another opportunity to present ideas and provide feedback regarding the cleanup of Gibbons Creek.

The Washington State Department of Ecology will hold a second meeting, Thursday, March 30, 6:30 p.m., in the community room at the Camas Police Department, 2100 N.E. Third Ave.

Post hopes more residents will show up at the next meeting. A water quality plan will be sent to all basin area residents in April during a 30-day public comment period.

2373

Post, Rusty

From: Howard, Sandy
Sent: Wednesday, March 29, 2000 9:32 AM
To: Mauermann, Sue; Berns, Pam; Blomstrom, Gale; Craig, Steve; Davies, Laurie; Duffy, Bob; Fisher, Chad; Hall, Linda; Harris, Mike; Heinitz, Eric; Jansen, David; Jennings, Kahle; Loranger, Thomas; McKay-Means, Keli; Mendez-Correa, Lorna; Nelson, Cynthia; Odum, Iloba; Saikewicz, Myron; Seiler, Kay; Wiatrak, Phil
Cc: Post, Rusty; Getchell, Mary
Subject: SWRO EcoClip, March 28

STATE SHARPENS FOCUS ON GIBBONS CREEK

Tuesday, March 28, 2000 By ERIK ROBINSON, Columbian staff writer

State officials say they're making progress on plans to clean up Gibbons Creek near Washougal, one of the first the first river stretches in Southwest Washington chosen such efforts under a state Department of Ecology program.

The agency will hold its second public meeting Thursday to work with local governments and citizens on a strategy to improve water quality in the creek, which violates standards for fecal coliform bacteria, a product of human or animal waste.

Ecology officials believe fecal coliform reaches the creek through "nonpoint" sources, meaning there is no specific place where pollution enters the water, such as a pipe from a sewer treatment plant or industrial site.

Although acknowledging that the department has not yet identified all of the pollution sources, Rusty Post with the agency's Water Quality Program said recently that the department was beginning to get a handle on where the main problems are.

The first meeting, held March 15 at Jemtegaard Middle School, set up work groups focusing on septic-system maintenance, farms, streamside runoff, construction and land clearing, and water monitoring.

The groups will identify sources of pollution, solutions or control measures, resources and funding sources. They also will develop a timeline.

One early step in the process will be for the Department of Ecology to conduct a study with an unwieldy name: the Gibbons Creek Fecal Coliform Total Maximum Daily Load Assessment. It's supposed to determine where pollution is occurring.

The assessment will take an inventory of farm animals in the area, assess animal waste systems used by property owners, survey septic systems to find those that are failing and analyze the entire basin to identify other potential sources of fecal coliform.

Ultimately, the department would adopt a cleanup plan called total maximum daily load. The TMDL establishes a maximum amount of pollution any waterway could take and still be healthy for fish, drinking, recreation, industries and other uses.

Sandy Howard, an agency spokeswoman, said state grants or loans might be made available to landowners willing to undertake streamside improvements projects, such as fencing or culverts.

Those whose land-use practices continue to cause pollution in the creek can be subject to fines of as much as $10,000 per day per violation.

Mary Getchell, public information officer for Ecology, said the agency rarely has to resort to penalties to get compliance.

"People absolutely value clean water," she said.

Gibbons Creek is one of about 600 water bodies across Washington that flunk standards set by the federal Clean

Water Act.

Ecology's study on Gibbons Creek is available at Washougal City Hall, 1701 C St., and at the agency's Vancouver office, 2108 Grand Blvd. It's also on the agency Web site at www.wa.gov/ecology/biblio/96316.html.

The Gibbons Creek cleanup planning meeting will be held from 6:30 to 8:30 p.m. Thursday in the conference room at the Camas police station, 2100 N.E. Third Ave.

Sandy Howard
Public Information Manager
Ecology Southwest Region
360-407-6239 -- pager: 360-786-3136
e-mail: srud461@ecy.wa.gov

Third Gibbons Creek water-cleanup meeting scheduled
By Dawn Feldhaus
Post-Record Staff

Area residents will soon have additional opportunities to comment on proposed plans to clean up Gibbons Creek. A draft implementation plan is expected to be completed and ready for public comment Friday, April 7.

The draft includes ideas submitted by Gibbons Creek area residents during public meetings March 15th and 30th.

A study by the Department of Ecology reveals Gibbons Creek does not meet water quality standards for fecal coliform bacteria. Fecal coliform indicates biological waste is entering the creek from sources including older septic systems and livestock. Additional problems at Gibbons Creek include high temperatures and muddiness.

Gibbons Creek is one of more than 600 bodies of water in Washington that do not meet water quality standards.

Several residents who live near Gibbons Creek have expressed concerns that water quality standards are based on samples taken in 1994 and 1995. Steve Roberts mentioned that a cattle farm located near the creek in the mid 1990's has since moved.

Steve Gibson, a member of the Washougal River Neighborhood Association, said there isn't an excessive number of livestock in the area around Gibbons Creek.

"It looks like more of a septic issue than a livestock issue," Gibson said.

Dave Howard, watershed coordinator of the water quality program for the Department of Ecology, was glad to see area residents involved in creating the cleanup plan.

"The people in this community are the essence of the process," Howard said, "not the officials from Olympia or Vancouver."

A third Gibbons Creek water-cleanup meeting is scheduled for Wednesday, April 5, at 6:30 p.m., in the Port of Camas-Washougal office meeting room, 24 South A St. Those in attendance will be asked to contribute ideas related to monitoring the creek cleanup.

The draft implementation plan will be available for viewing April 7 through May 7 at Washougal City Hall, the Department of Ecology office in Vancouver, and online at www.wa.gov/ecology/biblio/96316.html.

Comments about the plan will be accepted by phone at 690-4787 and 690-4796, as well as by fax at 690-7166. Comments can also be sent to the Department of Ecology office at 2108 Grand Blvd., Vancouver, 98661-4622 or e-mailed to Rusty Post at rpos461@ecy.wa.gov.

Remarks will be compiled and summarized, and comments on the final draft will be heard during a public meeting May 17.

GIBBONS CREEK CRUD

Streamlining the cleanup plan is important

Gibbons Creek has unacceptable levels of fecal coliform bacteria, which is a product of human or animal waste. It is also too muddy, too warm and too full of phosphates and nitrates.

The warmth and turbidity are likely caused by bank erosion, development and the lack of shade that results from clearing streamside trees. The increasing level of nutrients is most likely caused by things like detergents and fertilizers.

Feel like you need a shower just yet?

The creek flows into the Columbia River just east of the town of Washougal. And tonight from 6:30 to 8:30 in the conference room of the Camas police station at 2100 N.E. Third Ave., community members will work in groups to help draft plans that will eventually be combined into an implementation strategy for the creek's clean-up effort required by the state Department of Ecology.

Who would want to waste an evening discussing a stream's fecal matter and phosphate levels?

Possibly those who will be affected by the guidelines that are created to control the pollution. Some landowners will be expected, with the state's help, to undertake streamside improvements. Others may be required to test their septic systems. Some will have to keep livestock out of the creek and learn how to properly manage manure.

People are always more satisfied when involved in the solution process, not just the implementation of it.

— Elizabeth Hovde, for the editorial board

Nature AGENDA 2000

Thurs.
3/30/00
Columbian

WASHINGTON STATE DEPARTMENT OF ECOLOGY

News Release

FOR IMMEDIATE RELEASE – May 1, 2000
00-075

Contacts: **Sandy Howard, public information manager, 360-407-6239**

Ecology seeks public comment on Gibbons Creek water-cleanup plan

OLYMPIA – The state Department of Ecology (Ecology) is seeking public comment on a draft plan for cleaning up Gibbons Creek, near Washougal.

Local officials and residents helped develop the plan, which is aimed at improving water quality in the creek.

A public meeting to receive comments on the draft cleanup plan will be held at 6:30 p.m. on Wednesday, May 17, at the Camas Police Station Conference Room, 2100 N.E. Third Ave.

The draft plan is a general strategy that includes pinpointing sources of pollution as well as identifying pollution-control measures and resources for putting those measures in place.

The creek will be monitored to measure the effectiveness of the pollution controls.

Gibbons Creek does not meet water quality standards for fecal coliform bacteria, according to an Ecology study. Fecal coliform indicates that biological waste is entering the river from sources such as failing septic tanks and agricultural run-off. Gibbons is one of more than 600 water bodies across the state that does not meet water quality standards.

After incorporating public comments, a revised cleanup plan will be submitted to the U.S. Environmental Protection Agency in June for approval.

An implementation plan, containing more details, will be developed during the spring and summer this year. Department of Ecology officials encourage members of the public to participate in developing the implementation plan.

Copies of the draft cleanup plan are available at Washougal City Hall, located at 1701 C St., and at Ecology's Vancouver Field Office, at 2108 Grand Blvd. in Vancouver. The plan is also posted on Ecology's Web site at http://www.wa.gov/ecology/wq/tmdl/gibbonscreek.html.

Ecology's study, the "Gibbons Creek Fecal Coliform Total Maximum Daily Load Assessment," also is posted at Ecology's Web site at http://www.wa.gov/ecology/biblio/96316.html.

For more information about Gibbons Creek water cleanup planning or public meetings, contact Rusty Post, Department of Ecology, Vancouver Field Office, 2108 Grand Blvd., Vancouver, Wash., 98661-4622; telephone, 360-690-4787; fax, 360-690-7166; or e-mail, rpos461@ecy.wa.gov.

Ecology is also conducting water cleanup planning for Salmon Creek in Clark County.

# # #

May 30, 2000

Work continues on Gibbons Creek plan

By Dawn Feldhaus
Post-Record Staff

A summary implementation strategy to clean up Gibbons Creek will be submitted to the Environmental Protection Agency June 1.

A study by the Department of Ecology reveals Gibbons Creek does not meet water quality standards for fecal coliform bacteria. Fecal coliform indicates biological waste is entering the creek from sources including older septic systems and livestock. Additional problems at Gibbons Creek include high temperatures, muddiness, and high levels of nutrients.

Several residents who live near Gibbons Creek have expressed concerns that water quality standards are based on samples taken in 1994 and 1995.

A monitoring plan that has been discussed would involve the testing of water samples from several areas of the creek this year and next.

Rusty Post, water quality specialist with the Department of Ecology, said a single source of fecal coliform bacteria might never be pinpointed.

"But our monitoring may show drastic decreases in fecal coliform bacteria because everybody takes it upon themselves to be responsible for their septic systems, their livestock, the way that they clear the land on their property, making sure there is shading around the streams, and being really careful about how often they fertilize their lawns and the golf course," Post said.

"If everybody did that, but we never pinpointed a single source, we could see drastic reductions in all these parameters," Post added. "We could turn around and say 'yeah, we met the state water quality standards. There's no water quality problems here anymore, because everybody did what they needed to do at their place, and we never pinpoint a single source.' That's a possibility."

Post said, chances are, at least a handful of offenders will be identified.

"If we do identify a place that is a problem and they don't take any actions to correct it, and the discharge they're having does exceed state water quality standards, at some point we're going to have to draw a line in the sand and say, 'you must do this now," Post added.

Ralph Craig said there's a big difference between Campen Creek and Gibbons Creek.

"Campen Creek is a slow-moving creek with very little rapids," Craig said. "Gibbons Creek has a lot of moving water. Moving water that falls over rocks will clear itself in time, where a slow-moving stream with not much cover is just a moving septic tank."

Craig was among those who attended a May 17 meeting to comment on the draft cleanup plan.

Additional meetings to address the implementation of a monitoring plan are scheduled for June 6 and July 11 at 6:30 p.m. in the community room at the Camas Police Station, 2100 N.E. Third Avenue.

Additional information is available on the Department of Ecology's website at http://www.wa.gov/ecology/wq/tmdl/gibbonscreek.html.

Deputy sheriff gets criminal citation

As the result of an incident that occurred in Washougal, a Clark County Deputy Sheriff has received a criminal citation.

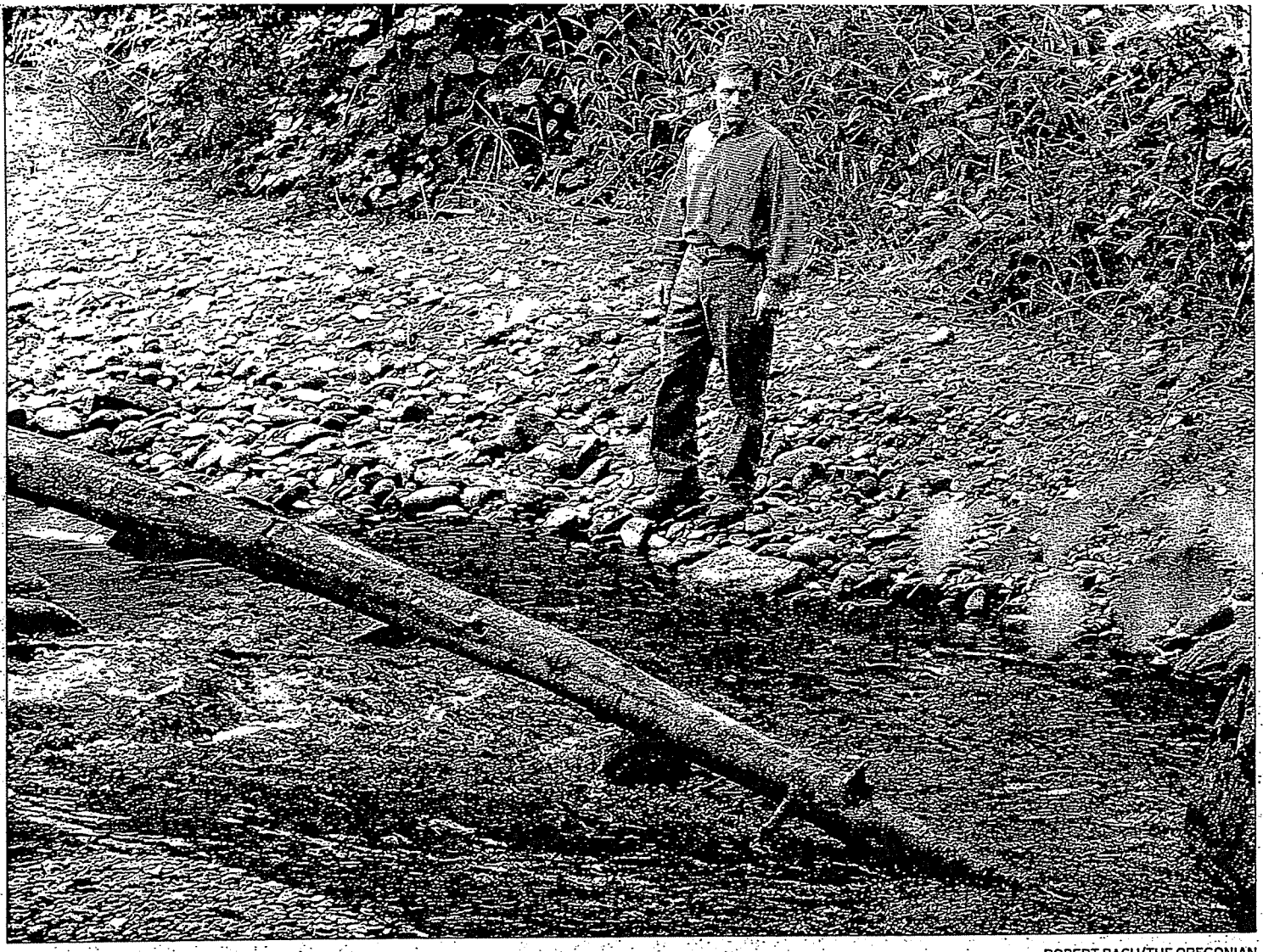
Deputy Robert Orr, 40, an eight-year veteran of the Clark County Sheriff's Office, has been charged with two misdemeanors including one count of contributing to the sexual delinquency of a minor and one count of sexual abuse in the third degree.

The charges are a result of a joint investigation by the Clark County Sheriff's Office Internal Affairs Unit, the Vancouver Police Department, and the Portland Police Bureau. Orr has been under investigation by the Internal Affairs Unit since Nov. 13, 1999, after the Washougal Police Department responded to Orr's home in response to a 911 call. No arrest was made during the course of the investigation, and the conduct was not sexual in nature.

Orr was immediately placed on paid administrative leave after this incident and remains on leave, according to the Clark County Sheriff's office.

During the course of their investigation, it was revealed that Orr had a relationship with a 17-year-old female. The investigation is ongoing, and will be completed soon and a decision made regarding any possible Sheriff's Office policy violations by Orr. If he is found to have violated department policy, the department may impose discipline up to, and including termination of Orr's employment.

Orr has served in various positions in the sheriff's office including patrol, the Drug Task Force, and most recently, as a School Resource Officer at Heritage High School. The victim in this case is not a student at Heritage High School.



ROBERT BACH/THE OREGONIAN

Rusty Post, a water-quality specialist for the state Department of Ecology, is working on a cleanup plan for Gibbons Creek, which drains the area north and east of Washougal. There is no one place along the creek to pinpoint the pollution source.

OREGONIAN 6-6-00

Polluted creek faces scattershot treatment

Urban runoff, inadequate livestock manure management and failing septic systems are blamed

By RICK BELLA
THE OREGONIAN

WASHOUGAL — Gibbons Creek is sick, and the state Department of Ecology is looking for a cure.

Tests show the creek, which drains the area north and east of Washougal, consistently violates federal water-quality standards for fecal coliform bacteria. It also has recorded legal but alarming levels of waterborne nutrients, cloudiness and temperature.

But unlike most troubled waters, where scientists can identify a "point source" for pollution, there is no one place along Gibbons Creek where you can point a finger.

In other words, the problem stems from a range of activities along the creek: urban runoff, inadequate livestock manure management and failing septic systems. To reverse the creek's fortunes, the Department of Ecology is proposing a scattershot approach designed to tighten up everywhere at once.

"We want all the agencies and all the landowners — really everybody — to cooperate and help us raise the water quality of Gibbons Creek," said Rusty Post, a Department of Ecology water-quality specialist. "It will take a coordinated effort."

PUBLIC MEETING

What: A public meeting to discuss a proposed cleanup plan for the Gibbons Creek watershed.
When: 6:30 p.m. Tuesday.
Where: Camas Police Department Community Room, 2100 N.E. Third Ave.
Host: Washington Department of Ecology.
Information: 360-690-4787.

Post has called a public meeting to discuss the plan.

Gibbons Creek is one of 636 waterways statewide that have been declared "threatened and impaired" for failing to meet federal water-quality standards. The state is under federal orders to design and carry out cleanup plans for the waterways.

According to Department of Ecology tests, Gibbons Creek has registered as much as nine times the legal limit of fecal coliform concentrations.

Copies of the proposed cleanup plan are available at Washougal City Hall, 1701 C St., and at the Department of Ecology's Vancouver Field Office, 2108 Grand Blvd., Vancouver.

The plan also is posted on the department's Web site at www.wa.gov/ecology/wq/tmdl/gibbonscreek.html.

Appendix B

Quality Assurance Project Plan

Gibbons Creek

Final Quality Assurance Project Plan

by
Karol Erickson
September 1994

Washington State Department of Ecology
Environmental Investigations and Laboratory Services Program
Watershed Assessments Section

Approvals:

Karol Erickson _____
Project Lead
Watershed Assessments Section

John Tooley _____
Ground Water Lead
Toxics Investigations Section

Will Kendra _____
Supervisor
Watershed Assessments Section

Bill Kammin _____
Ecology Lab Director
Manchester Laboratory

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Gibbons Creek Fecal Coliform Total Maximum Daily Load Study

1.0 Introduction

1.1 Setting

Gibbons Creek is located in eastern Clark County and flows into the Columbia River just east of the town of Washougal (Figure II-1). In the upper watershed, the creek and its tributaries flow through relatively steep, incised valleys as the water travels down the northern slope of the Columbia River Valley. The gradient lessens considerably as the creek reaches the floor of the Columbia River Valley, near the Highway 14 crossing.

The lower channel was recently modified; since 1992 the creek drains nearly due south from the highway crossing, through the Steigerwald Lake Wildlife Refuge, to the Columbia River (prior to 1992 it flowed westerly for the lower mile before discharging into the Columbia). For most of this lower mile, the creek flows through an artificial, elevated channel before discharging into the Columbia River through a fish ladder structure. Because this portion of the channel is elevated (built on a dike), the surrounding land does not drain into Gibbons Creek, but instead drains into the old remnant channel (see Part I for a description of this portion of the basin). Therefore no land south of Highway 14, including the wildlife refuge, industrial park, and agricultural areas described in Part I, contributes runoff into Gibbons Creek.

Land use in the watershed consists largely of rural residential development along the slopes of the Columbia River Valley. Many of these residences keep a small number of horses and/or cattle. The eastern fringe of the town of Washougal extends into the western portion of the watershed, including a school, golf course, and new residential development. The area covered by sewers, if any, has not yet been determined.

1.2 Beneficial Uses

Gibbons Creek is classified as Class A for water quality standards and therefore shall meet or exceed the requirements for all or substantially all of the following characteristic uses: domestic, industrial, and agricultural water supply; stock watering; salmonid and other fish migration, rearing, spawning, and harvesting; clam, oyster, and mussel rearing, spawning, and harvesting (Chapter 173-201A WAC).

2.0 Historical Data Review

2.1 Streamflow Data

The limited streamflow measurements available are summarized in Appendix B, Table B-1.

2.2 Water Quality Data

The only water quality data available are those measured by Ecology's Ambient Monitoring Program, consisting of monthly data from October 1991 to September 1992, collected at the highway crossing (Figure II-1). These data were summarized by Ehinger (1993); Appendix B includes his graphical comparisons of Gibbons Creek data to other ambient monitoring data collected for nearby stations. Gibbons Creek data were described by Ehinger as follows:

> "The maximum temperature recorded was approximately 16°C. Dissolved oxygen and pH were unremarkable. Fecal coliform counts were high with ten of the twelve samples exceeding 100 colonies/100 mL. Total suspended solids and turbidity were variable. Total phosphorus and soluble reactive phosphorus were somewhat higher than either the Lewis River or the Washougal River, but not particularly high on an absolute scale. Nitrate concentration exceeded 1.5 mg/L in November and was rather high all year. The high nitrate concentration and elevated total phosphorus concentration (in comparison with the Lewis and Washougal Rivers) may indicate a point or nonpoint source of nutrients to the stream. Ammonia concentration was unremarkable."

3.0 Problem Description

This project was initiated because Gibbons Creek is listed on Ecology's 1994 303(d) list, based on Ecology's Ambient Monitoring Program fecal coliform data (summarized below). Fecal coliform concentrations ranged from 37 to 910 colonies/100 mL with no apparent seasonal pattern.

Fecal coliform concentrations in Gibbons Creek (colonies/100 mL):

Yr.	1991			1992								
Mo.	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FC	450	150	37	480	140	69	360	910	730	190	140	310

The state water quality standards for Class A waters state that 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 (Chapter 173-201A WAC). The geometric mean of all measurements is 230 colonies/100 mL and 50 percent of the samples exceeded 200 colonies/100 mL; therefore both parts of the water quality standard were violated.

4.0 Project Objectives

1. Identify potential sources of fecal coliform pollution in the Gibbons Creek watershed.

2. Measure fecal coliform levels and other general chemistry parameters during dry and wet weather, including a storm event if possible, at six sites within the watershed.

3. Determine load allocations for fecal coliform for Gibbons Creek and Campen Creek (the main tributary to Gibbons Creek).

4. Recommend pollution control measures that will reduce fecal coliform levels to the identified load allocations.

5.0 Sources of Pollution

Based on a reconnaissance survey of land use in the watershed, possible sources of elevated fecal coliform levels are failing septic tanks and small animal-keeping operations. The 1987 Water Quality Plan for Clark County (Intergovernmental Resource Center, 1987) states: "The water quality of Gibbons Creek is likely to be affected by septic system effluent in the upper reaches of the drainage basin, and agricultural runoff in the lower reaches." Since that plan was written, additional residential development has taken place.

6.0 Study Design

6.1 Sample sites

Two Gibbons Creek sites, two Campen Creek sites, and two unnamed tributaries to Gibbons Creek will be sampled as shown in Figure II-1.

6.2 Water Quality Survey Schedule

Fecal coliform and other general chemistry parameters will be measured in Gibbons Creek during three surveys. The first is intended to represent dry weather, late summer conditions and is scheduled for September 8, 1994.

The second survey is intended to represent wet weather, winter conditions and is scheduled for December 7, 1994.

The third survey is intended to represent storm conditions. The date will be flexible to be able to respond to weather conditions. The following dates are "reserved" for possible storm event monitoring: November 1, 8, 15, 22, 29, December 13, January 4, 10, 17, 24, and 31.

6.3 Parameters

The main parameter of interest in this study is fecal coliform. In addition, several other general chemistry parameters will be measured to help characterize the water quality of the watershed: temperature, conductivity, pH, dissolved oxygen, total suspended solids, ammonia, nitrate+nitrite, total nitrogen, ortho-phosphate, total phosphate, chloride, and turbidity. The methods and detection limits/precision are the same as those listed in Part I, Table I-2.

Streamflow will be measured at each site during each survey. In addition, a capacitive probe and data logger will be installed near the Gibbons Creek highway crossing site to record flows over the time period of the study (August 26 to January 31).

7.0 Quality Control

Because this study is focused on fecal coliform, duplicate bacteria samples will be collected at each site. Duplicate samples will allow a better indication of data precision and reliability. In addition, duplicates of all other water quality parameters will be collected at one site (chosen at random) during each survey.

8.0 Data Reduction, Review, and Reporting

Data reduction, review, and reporting will follow the procedures outlined in the Manchester Laboratory Users Manual (Ecology, 1994).

9.0 Schedule, Budget, Project Organization

9.1 Schedule

Date	Milestone
September 8, 1994	Summer sampling event
December 7, 1994	Winter sampling event
November 1994 - Jan. 1995	Storm sampling event
January 31, 1995	Field data collection ends
June 30, 1995	Draft report submitted for internal review
August 15, 1995	Draft report submitted to client
September 15, 1995	Comments due back to EILS
October 15, 1995	Final report submitted to printing

9.2 Budget

The laboratory budget is shown in Appendix A, Table A-1.

9.3 Project Organization

The roles and responsibilities of project staff are shown below.

Karol Erickson, Principal Investigator, Watershed Assessments Section
- Designs, implements, and reports on project

Bill Backous, Section Supervisor, Water Quality Program, SWRO
- Client Section Supervisor

Nora Jewett, Basin Coordinator, SWRO
- Client Staff Contact, Regional Project Coordinator
- Reviews QAPP
- Coordinates implementation of recommendations

Bill Kammin, Ecology Manchester Laboratory Director
- Processes analytical samples
- Provides QA/QC data

Stew Lombard, Ecology Quality Assurance Officer, QA Section
- Reviews QAPP

David Giglio, Watershed Assessments Section
- Field assistant for the remaining sampling events

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Gibbons Creek Watershed

Figure II-1.

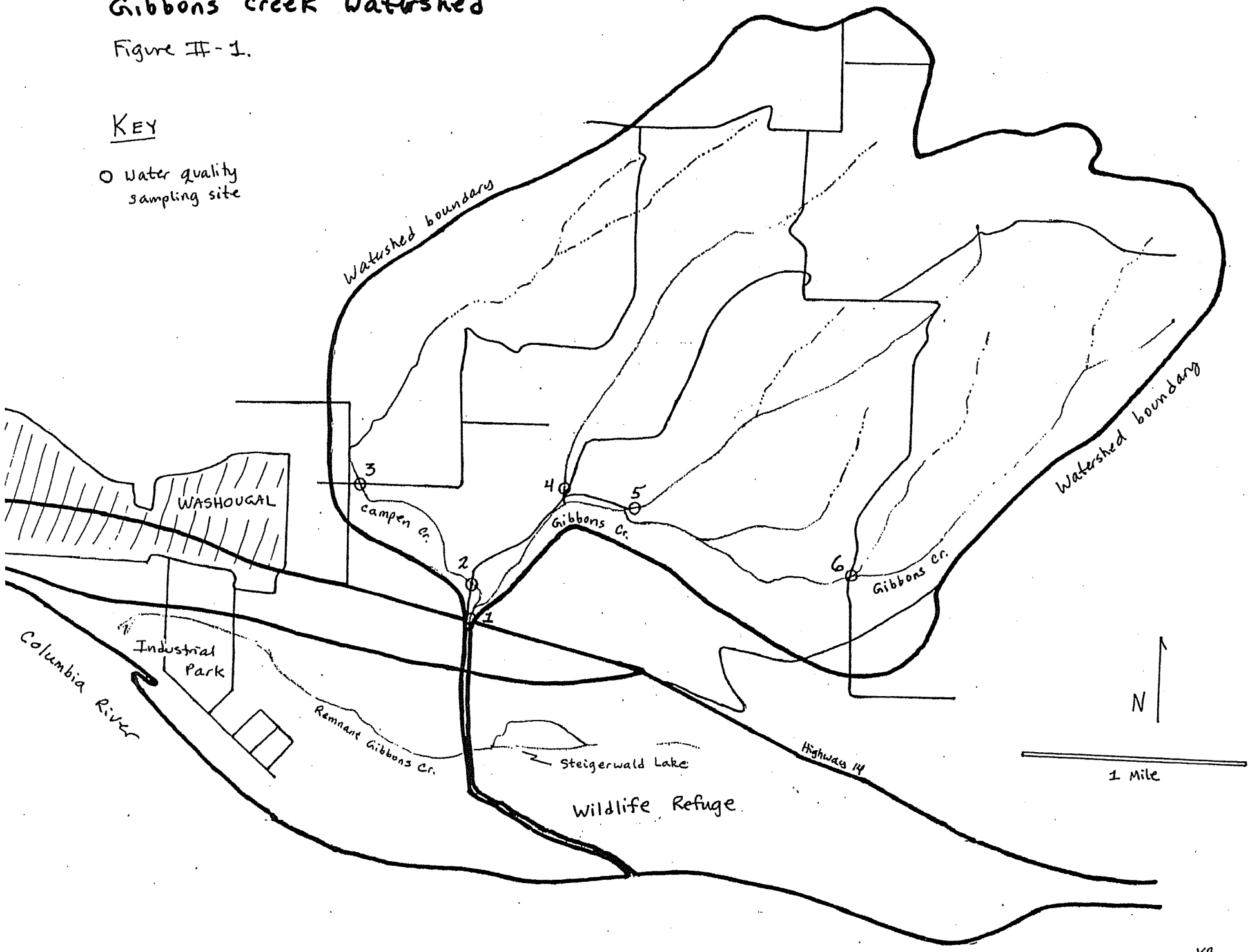

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Table A-1. Laboratory Budget for Gibbons Creek Project

PART I, RECEIVING WATER STUDY OF REMNANT GIBBONS CREEK CHANNEL						
	Cost per sample	Number of samples/ August	Total Cost/ August	Number of samples/ Nov+Dec	Total Cost/ Nov+Dec	Total Project Cost
General chemistry:						
Fecal Coliform	$28	6	$168	12	$336	
TSS	$14	6	$84	12	$168	
NH3	$16	6	$96	12	$192	
NO3/NO2	$16	6	$96	12	$192	
TPN	$23	6	$138	12	$276	
O-PO4	$16	6	$96	12	$192	
TP	$23	6	$138	12	$276	
Cl	$28	6	$168	12	$336	
Turb.	$10	6	$60	12	$120	
Hardness	$16	7	$112	14	$224	
TOC	$41	10	$410	14	$574	
BOD5	$61	6	$366	12	$732	
Oil and grease	$75	10	$750	12	$900	
Cyanide	$61	11	$671	12	$732	
Total - General Chemistry	$400		**$3,185**		**$4,914**	**$8,099**
Metals						
Priority pollutant metals - dissolved - low le	$550	6	$3,300	12	$6,600	
Priority pollutant metals - total rec. - low le	$900	7	$6,300	14	$12,600	
Hexavalent chromium	$53	3	$159	6	$318	
ICP Scan - SS	$240	1	$240	2	$480	
Sediment priority pollutant metals	$275	4	$1,100	0	$0	
Total - Metals	$1,468		**$11,099**		**$19,998**	**$31,097**
Organics						
BNAs-water	$430	6	$2,580	12	$5,160	
BNAs-sediment	$505	4	$2,020	0	$0	
Pesticides/PCBs - water	$340	6	$2,040	12	$4,080	
Pesticides/PCBs - Sediment	$440	4	$1,760	0	$0	
VOAs - water	$230	6	$1,380	12	$2,760	
VOAs - sediment	$250	4	$1,000	0	$0	
Total - Organics	$2,195		**$10,780**		**$12,000**	**$22,780**
Total, Part I						**$61,976**
PART II, GIBBONS CREEK TOTAL MAXIMUM DAILY LOAD STUDY						
Number of sampling events for each site and parameter:						
	Cost per sample					
In the field:						
Temp, pH, cond, DO, flow	N/A					
Lab:						
General chemistry:						
fecal coliform	$28	12	$336	24	$672	
TSS	$14	7	$98	14	$196	
NH3	$16	7	$112	14	$224	
NO3/NO2	$16	7	$112	14	$224	
TPN	$23	7	$161	14	$322	
O-PO4	$16	7	$112	14	$224	
TP	$23	7	$161	14	$322	
Cl	$28	7	$196	14	$392	
Turb.	$10	7	$70	14	$140	
Total, Part II	$174		$1,358		$2,716	**$4,074**
Total Parts I and II						**$66,050**

Table A-2. Laboratory Costs for Metals Sampling at Gibbons Creek, FY95

Number of samples:			
Water	Dissolved	Total Recov.	
Receiving water sites	4	4	
Effluent sites		1	
Replicate water site	1	1	
Matrix spike		1	
Filter Blank (dissolved only)	1		
Total	**6**	**7**	
Sediment			
Sediment sites		4	
(no replicate, blank, matrix spike)			
Total		**4**	
Laboratory Cost:			
Water	Cost per sample	Number of samples	Total Cost
Dissolved:			
Ag, Cd, Cr, Cu, Pb, Ni, Zn - ICP/MS ($60x7)	420		
Precleaned Nalgene 0.45 micron filters	30		
Precleaned Teflon Sample Bottles (2@$20/ea)	40		
Teflon Vials of 1:1 HNO3 for Preservation	10		
Preparation charge - low level waters	50		
Total	**550**	**6**	**3300**
Total Recoverable:			
All priority pollutant metals exc. Hg - ICP/MS ($60x12)	720		
Mercury - CVAF	50		
Precleaned Teflon Sample Bottles (1)	20		
Teflon Vials of 1:1 HNO3 for Preservation	10		
Preparation charge - low level waters	50		
Preparation for low level mercury	50		
Total	**900**	**7**	**6300**
Total without sediment			**9600**
Sediment			
Base price - standard method for priority pollutants	250		
Preparation charge - sediment	25		
Total - Sediment	**275**	**4**	**1100**
Total with sediment			**10700**

Appendix B

Table B-1

WATER FLOW MEASURMENTS (CFS) FOR GIBBONS CREEK
1987-1994

1987		1988		1989		1990		1991		1992		1993	
Date	Flow	Date	Flow	Date	Flow	Date	Flow	Date	Flow	Date	Flow	Date	Flow
03/17	36.2	01/19	27.7	01/10	97.7	01/11	56.2	10/21	4.2	01/30	36.2	01/20	52.2
04/06	11.2	03/25	35.5	02/28	31.8	02/21	81.1	11/05	53.8	02/24	55.2	03/18	31.6
04/23	12.0	04/21	28.8	03/17	53.1	03/21	12.8	11/13	12.9	04/27	14.4	04/21	24.1
05/13	6.9	05/02	33.3	04/06	36.1	04/18	16.1	11/27	63.3	07/21	3.6	06/09	20.8
08/05	2.2	05/25	10.8	05/18	10.4	06/14	33.9	12/02	56.2	09/04	4.3	06/29	11.6
08/14	3.7	06/02	18.1	07/14	6.4					11/23	21.1	08/17	3.3
09/21	1.6	06/17	9.8	08/04	9.7					12/09	22.5	09/13	3.9
12/17	8.7	08/03	5.4	09/19	2.5					12/10	125.8	10/13	2.5
		09/09	5.2	10/31	3.6					12/14	31.8	12/22	9.3
		09/21	5.9	12/05	66.1					12/17	22.9*		
		11/09	8.4	12/26	8.9								
		11/23	52.4										
		12/06	15.7										

*First reading after Gibbons Creek was diverted into the realigned channel, which occurred on 12/15/92.

1994		
Date	Flow	
	Diversion	Fish Ladder
02/02	9.4	9.6
03/30	8.1	
04/28	7.4	
05/17	5.7	
06/07		6.3
06/08	4.5	

c:\wp51\jim\gibbons.cfs

Source: USFS (1994)

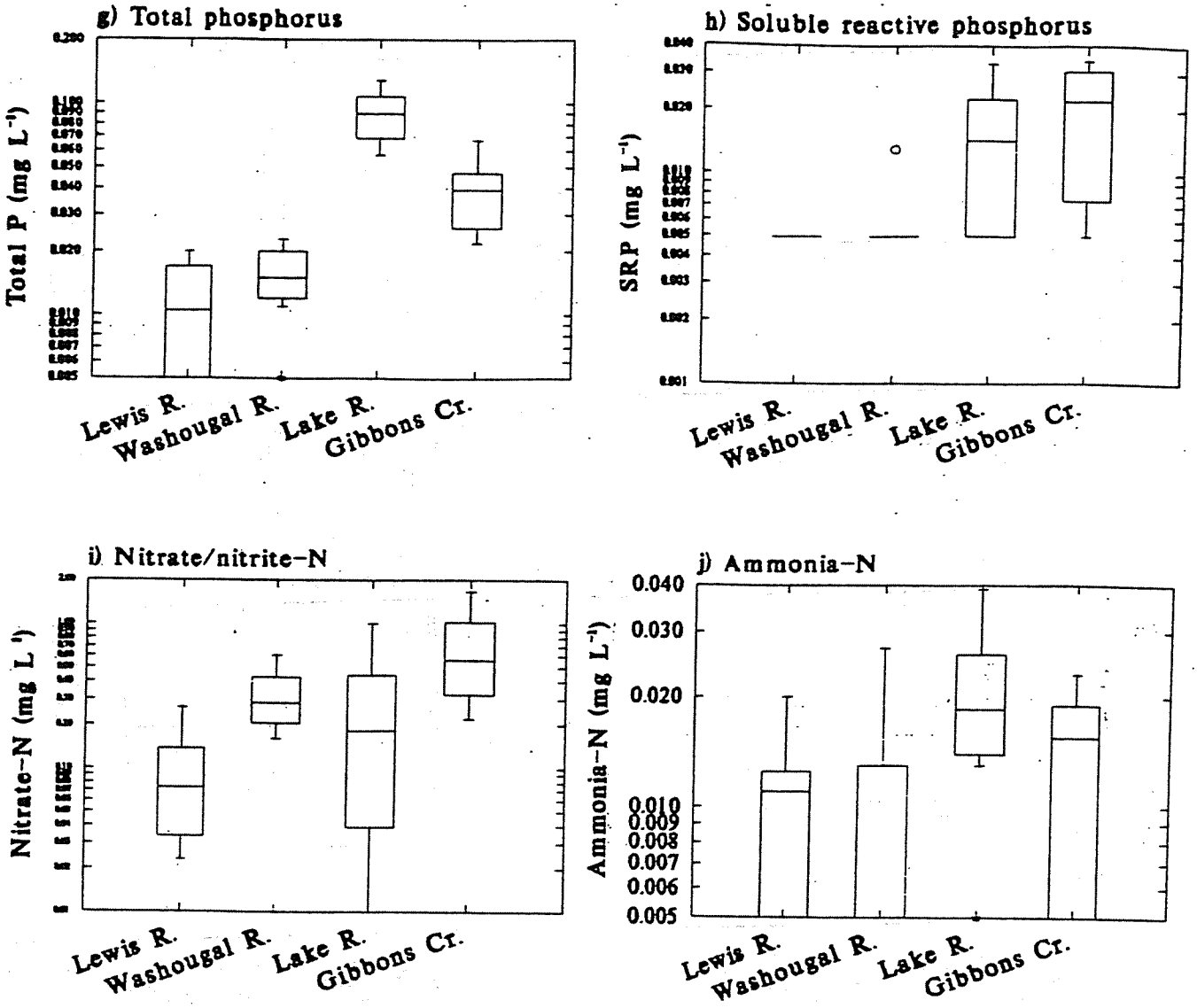

Figure 5 (cont.). Box plots of data collected in WY92 (Oct 91–Sept 92) at the four rotating stations in the Columbia Gorge basin. The Washougal River was sampled only during Oct 91–June 92.

From Ehinger (1993):

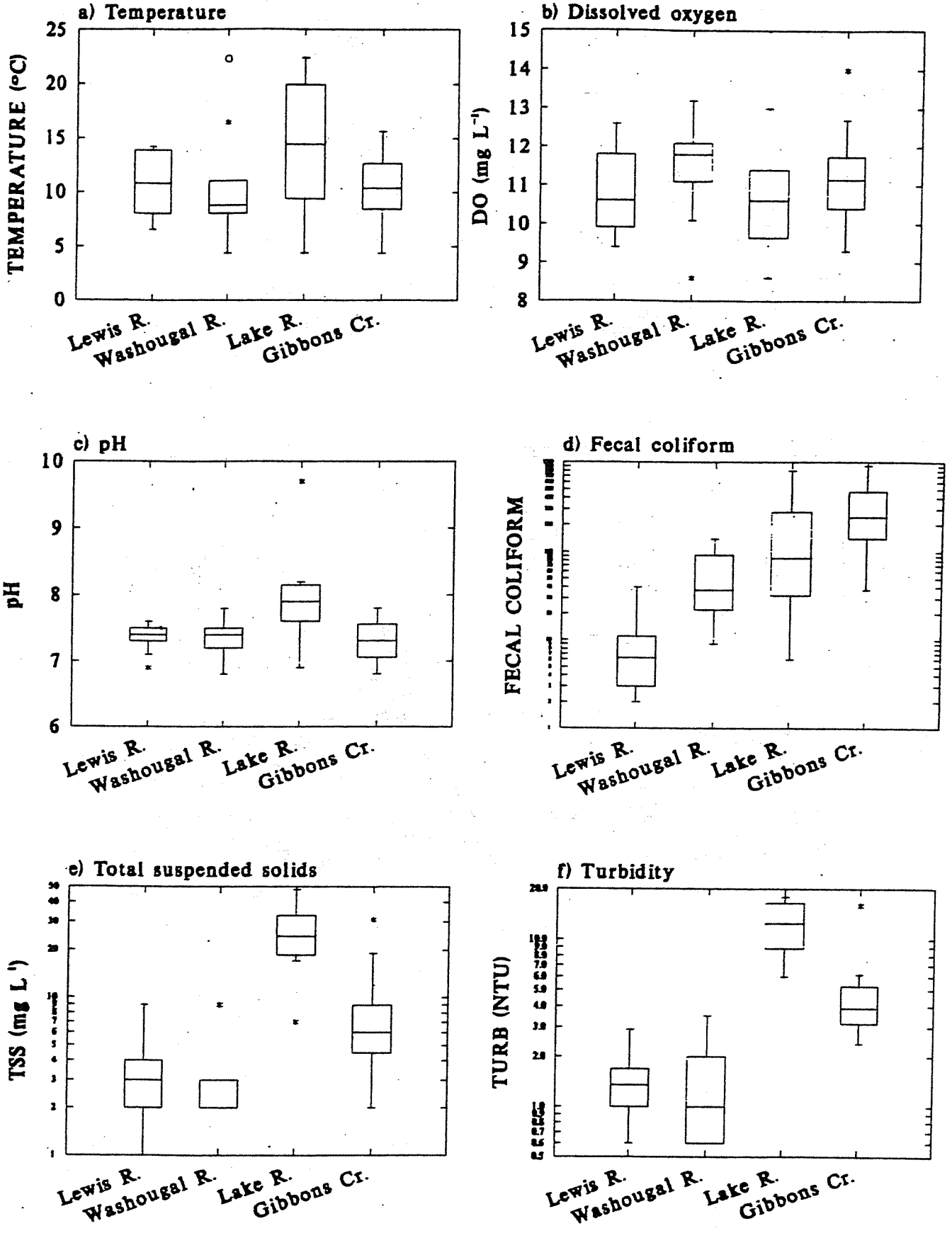

Figure 5. Box plots of data collected in WY92 (Oct 91–Sept 92) at the four rotating stations in the Columbia Gorge basin. The Washougal River was sampled only during Oct 91–June 92.

Appendix C

Technical Report

Gibbons Creek Fecal Coliform
Total Maximum Daily Load Assessment
April 1996
Publication No. 96-316
(Published Separately)

Appendix D

Draft Water Cleanup Plan Outline

GIBBONS CREEK TMDL
DRAFT WATER CLEANUP PLAN
OUTLINE
APRIL 2000

The Washington Department of Ecology wants to know

what you think about the attached plan

Gibbons Creek is one of over 600 waterbodies in Washington that fail to meet state water quality standards. Gibbons Creek does not meet the standards for fecal coliform bacteria. Accordingly, the Department of Ecology (Ecology) is required by the federal Clean Water Act to develop a Water Cleanup Plan also known as a Total Maximum Daily Load (TMDL).

The attached Draft Water Cleanup Plan, developed in conjunction with residents and interested parties in the Gibbons Creek basin, is being offered for public review and comment. After the close of the public comment period on May 12, 2000, we will carefully review and incorporate public comments and develop a responsiveness summary. We will then submit this Plan to the Environmental Protection Agency (EPA) as part of a package of documents known as the Summary Implementation Strategy (SIS). This Draft Water Cleanup Plan in the SIS is meant to serve as an indicator of the general direction to be taken to address pollution issues in the Gibbons Creek Basin. Ecology will be working with local agencies and residents to develop a more detailed implementation plan during the summer and fall of 2000.

A technical study conducted by Ecology in 1994 and 1995, determined fecal coliform bacteria contamination of Gibbons Creek exceeded water quality standards. It also revealed higher than normal levels of three other parameters: nutrients, turbidity and temperature. In addition to developing a water cleanup plan for fecal coliform bacteria, planning participants agreed to also address the other three parameters of concern. Since the four pollution parameters have different sources and control measures, the Plan is divided into four main acitivities or land uses that are the most likely sources of pollution: Farms, Septic Systems, Riparian/Streamside, and Construction/ Landclearing. There is also a section on Monitoring (required by EPA), which will track changes in water quality in the creek. To address the pollution sources, each of the land use activities is divided into five parts: Sources, Control Measures, Resources, Other Needs, and Timeline.

Please submit comments by May 12, to Rusty Post, Department of Ecology - Vancouver Field Office, 2108 Grand Boulevard, Vancouver, Washington 98661-4622, telephone (360) 690-4787. Comments may also be submitted by fax to (360) 690-7166 or by e-mail to rpos461@ecy.wa.gov. Additional information will be available in mid-April on Ecology's website at http://www.wa.gov/ecology/wq/tmdl/index..html

SECTION 1: FARMS

A. Identify Sources
1. Livestock Inventory
2. Animal Census
3. Commercial Operations

B. Identify Control Measures
1. Best Management Practices
    A) Fencing
    B) Manure Management
    C) Stormwater Management
    D) Stock Watering
2. Farm Plans
3. Education

C. Identify Resources
1. Grange
2. Conservation District
3. Cattleman's Association
4. Department of Agriculture
5. Clark Public Utilities
6. Local Farmers and Ranchers

D. Identify Other Needs
1. Funding (grants, loans, etc.)
2. Maps and Aerial Photos
3. Educational Materials, Technical Assistance

E. Timeline
1. Gather Information
2. Identify Potential Sources
3. Provide Information and Technical Assistance
4. Monitor Waterways

SECTION 2: SEPTIC SYSTEMS

A. Identify Sources
1. Phased Approach, Begin with Campen Creek Basin
2. Develop Complete and Accurate List of Septic Systems in Basin
3. Septic Maintenance Inspection Program (Statewide Requirement for Homeowners)
4. Use monitoring Results to Focus Efforts

B. Identify Control Measures
1. Provide List of Certified/Licensed Inspection Contractors
2. Provide List of Certified Pumpers and Repair Contractors
3. Provide Educational Materials
4. Require Repairs or Replacements if Necessary

C. Identify Resources
1. Lists of Contractors
2. Local Health Department Records
3. Clark County GIS

4. Local Resident Knowledge
5. State Health Department
6. Clark County Department of Community Services
7. USDA Rural Development

D. Identify Other Needs
1. More Detailed Information onNumber, Location and Condition of Systems
2. Funding
    a) Health District Inspection and Maintenance Program
    b) Grants and Loans for Maintenance and Repair

E. Timeline (Approximate)
1. Develop Preliminary List of Septic Systems
2. Develop More Detailed List of Septic Systems
3. Send Inspection Notice and Contractor Lists to System Owners

SECTION 3: RIPARIAN/STREAMSIDE

A. Identify Sources
1. Using Aerial Photos and Mapping
2. Consult State and US Fish and Wildlife Stream Survey Data
3. Focus on Residential Areas, Especially Campen Creek
4. Re-Survey Specific Areas

B. Identify Control Measures/Improve and Maintain Riparian Cover
1. Replanting With Native Vegetation
2. Fencing out Livestock
3. Education and Outreach
    a) Send Flyers to Local Residents
    b) Host Community Events (Invite Master Gardeners)
    c) Newspaper Coverage with Insert on Landscaping Ideas
    d) Involve Large Landowners and Small
    e) City Parks and Other Public Facilities Should Serve as Good Models
    f) Work With Developers Up Front

C. Identify Resources
1. Clark Conservation District and National Resource Conservation Service
2. Casey Center
    a) Master Gardeners
    b) Student Run Nursery of Native Plants
    c) Naturescaping Program
3. City of Washougal
4. Washougal Neighborhood Associations
5. Washougal Schools
6. Clark County

D. Identify Other Needs
1. Funding
2. Activity Coordinators

E. Timeline
1. Gather and Analyze Existing Information
2. Identify Scope of Problem
3. Identify Priority Areas

4. Begin Community Education and Outreach
5. Begin Restoration Activities

SECTION 4: CONSTRUCTION/LANDCLEARING

A. Identify Sources
1. Sediment From Clearing, Grading and New Construction
2. Removal of Vegetation
    a) Construction/Development
    b) Forest Practices
    c) Ditch Maintenance
    d) Farming
    e) Landscaping

B. Identify Control Measures
1. Compliance with Standards in State Stormwater Manual
2. Compliance with Clark County and City Washougal Stormwater Ordinances, Grading and Other Permits
3. Identify list of Best Management Practices (BMPs)
4. Provide Information During Permit Application Process
5. Enforce Existing Rules and Regulations

C. Identify Resources
1. State, County and Municipal Staff Familiar with Regulations and Ordinances
    a) Department of Ecology
    b) Clark County Development Review Services and Code Enforcement
    c) City of Washougal Development Review and Public Works
2. Best Management Practices (BMPs)
    a) State Stormwater Manual
    b) Clark County Homebuilders Association, Builder's Guide
    c) Environmental Consultants and Engineering Firms
3. Training and Education Seminars and Classes

D. Identify Other Needs
1. Available Education and Training Classes
2. Additional Technical Assistance and Enforcement

E. Timeline
1. Gather Available Data and Information
2. Identify Existing Sources and Problem Areas
3. Provide Information and Technical Assistance or Enforcement if Necessary
4. Develop System to Provide Information to Anyone Clearing Land
5. Monitor Water Quality

SECTION 5: MONITORING

A. Identify Existing Sources of Information
1. US Fish and Wildlife
2. State Department Of Ecology
3. State Department of Fish and Wildlife
4. Other Agencies, Organizations or Individuals

B. Develop a Monitoring Plan/Quality Assurance Project Plan (QAPP)
1. Problem Description
2. Project Objectives
3. Sources of Pollution

4. Study Design
    a) Sample Sites (Number and Location)
    b) Survey Schedule
    c) Parameters
        1) Fecal Coliform Bacteria
        2) Turbidity
        3) Nutrients
        4) Temperature
        5) Flow
        6) ph, Conductivity
    d) Quality Control
    e) Budget
    f) Project Organization

C. Identify Resources
1. Technial Staff to Develop Monitoring Plan/QAPP
2. Qualified Personnel to Collect and Analyze Samples
3. Existing Sampling and Monitoring Equipment
4. Available Funds for Sample Collection and Analysis

D. Identify Other Needs
1. Education and Outreach Program
2. Coordinate with Volunteer and/or School Monitoring Programs
3. Funding

E. Timeline
1. Review Existing Data
2. Develop Monitoring Plan/QAPP
3. Develop Budget
4. Begin Monitoring