WATER and AIR MONITORING and REPORTING SECTION
WATER, AIR and CLIMATE CHANGE BRANCH
MINISTRY OF ENVIRONMENT

Water Quality in British Columbia

Objectives Attainment in 2003

Prepared by:

Burke Phippen
BWP Consulting

November 2004

Canadian Cataloguing in Publication Data

Main entry under title:

Water quality in British Columbia : Objectives attainment in ... -- 2003 --

Annual.

Continues: The Attainment of ambient water quality objectives. ISNN 1194-515X

ISNN 1195-6550 = Water quality in British Columbia

1. Water quality - Standards - British Columbia - Periodicals. I. B.C. Environment. Water Management Branch.

TD227.B7W37 363.73’942’0218711 C93-092392-8

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

SUMMARY

The setting of water quality objectives in priority basins in British Columbia began in 1982. By the end of 2003, the Ministry of Environment (formerly the Ministry of Water, Land and Air Protection) had set water quality objectives in 51 areas or basins and updated them in two, both fresh and marine, throughout the Province. Annual monitoring to check the attainment of objectives started in 1987. This report presents the results of monitoring done to check the attainment of objectives in 23 basins in 2003.

The results are summarized in a series of tables. For all Ministry Regions the objectives were met 92.7 percent of the time in 2003. The findings in 2003 are slightly higher than the 2002 results (89.3%), and similar to previous years when attainment ranged from 95 percent in 1998 to 77 percent in 1997.

There was not 100 percent attainment because objectives are set in areas where water quality problems may occur. Monitoring results therefore reflect the state of water quality in areas affected by human activity rather than in the Province as a whole.

Variables for which objectives were sometimes not met in three or more basins in the 2003 sampling program included fecal coliforms, turbidity, suspended solids, total phosphorus and total copper.

ACKNOWLEDGEMENTS

The regional Environmental Protection staff carried out most of the monitoring, either directly or by using co-op students and contractors. The Environment Canada Pacific Environmental Science Centre and the PSC Analytical Laboratory analyzed the samples for most variables except for microbiological indicators measured by Cantest Labs and JR Labs, organic compounds by Axys Analytical Services, and biological communities measured by Fraser Environmental Services.

Additional data found in this report were also obtained from regional offices of B.C Ministry of Environment (formerly the Ministry of Water, Land and Air Protection), the federal Department of Fisheries and Oceans (DFO), Environment Canada, and the Greater Vancouver Regional District.

INTRODUCTION

In 1981, the Auditor General recommended that the Ministry develop a method of measuring its performance in safeguarding water quality. To fulfil this recommendation, the Ministry undertook the setting of water quality objectives for fresh and marine surface waters of British Columbia.

Water quality objectives are safe conditions or threshold levels of a substance that will protect the most sensitive water use of a specific body of water. They establish a reference against which the state of water quality at a specific site is checked, as recommended by the Auditor General. They are also used to prepare Waste Management Permits or Plans and to measure their effectiveness. Water quality objectives are thus a basic tool for use in maintaining a healthy aquatic environment.

We began work on water quality objectives in 1982. The Ministry has now published objectives on bodies of water in 51 areas or basins and updated them in two. In addition, objective-setting and updating is proceeding in a number of other basins. In each basin considered, we expected some type of water quality problem due to human activity. We set objectives for lakes, rivers, creeks, and marine areas covering all seven Environment Regions of the Ministry.

This report for 2003 is the fifteenth in a series of reports that began in 1986. Since 1987, the Ministry has been monitoring ambient water specifically to check the attainment of objectives. As a result, we have obtained an annual picture of how well objectives are being met since 1987. Each report is a condensation of monitoring data for use by managers of the water resource. It indicates where conditions are acceptable and provides a warning of where further evaluation may be needed to solve water quality problems. To keep this report to a reasonable length, we assume some reader familiarity with the detailed background reports on water quality objectives for each basin. Copies of these background reports may be obtained from the web site of the Water, Air and Climate Change Branch of the Ministry in Victoria (http://www.env.gov.bc.ca/wat/wq/index.html).

We usually choose the basins for setting water quality objectives on the basis of perceived water quality problems. Thus, results presented here indicate conditions in likely problem areas, but do not reflect the state of water quality in the Province as a whole. There are many bodies of water where water quality is relatively unaffected by humans and likely to remain so for the foreseeable future. Thus, reports in this series are a measure of the state of water quality in areas of British Columbia influenced by human activity.

To help the public and resource managers interpret the large amount of attainment data presented in this type of report, we developed a water quality index in 1995. This is a system of ranking which assigns a number and grade to a body of water to indicate its quality. The B.C. index is based on factors that measure the success of meeting water quality objectives. It thus compresses large quantities of data into a statement on the quality of water and its uses. A brochure describing this index is available from the Ministry, as is a more detailed report explaining how to calculate the index from the monitoring data on objectives attainment.

In 1995 the index was applied in 33 water basins plus five groundwater aquifers in the Province to produce a *B.C. Water Quality Status Report*. This report, the first of its kind, is intended to show the public in non-technical terms how suitable the water is, in specific areas, for a variety of uses. The *Status Report*, which is based on objectives attainment data collected between 1987 and 1993, was released in April 1996, and is available from the Ministry web site.

METHODS OF PRESENTING AND INTERPRETING THE DATA

Reports on Objectives

At the present time, the Ministry of Environment (formerly the Ministry of Water, Land and Air Protection) has completed 51 reports on water quality objectives. The complexity and size of the reports varies considerably, depending upon the body of water considered. These reports are distributed among the Environmental Regions of the Ministry as follows:

Vancouver Island	8
Skeena	5
Omineca-Peace	9
Cariboo	2
Southern Interior	14
Kootenay	5
Lower Mainland	8
Total	51

Work is in progress on a number of other water basins where objectives are either being set or updated.

Tables of Results

Tables 1 to 19 summarize the data collected in 2003, with a separate table for each of the water basins monitored. Due to funding limitations, fewer basins were monitored between 1995 and 2001 than had been previously monitored (see figure below); however, this trend has since reversed, with a gradual increase in the number of basins monitored province-wide. The level of monitoring effort for 2003 returned to about the same level as was used in the late 1980's when the program first began. It should be noted that the need for yearly monitoring in all water bodies is not practical or justified. For this reason, the Ministry has adopted a program of monitoring water bodies for three years following adoption of the water quality objectives. Thereafter, monitoring occurs about once in a five-year period except for exceptional water bodies.

In each table we list all the objectives that have been set, as they appear in the summary table of each report on objectives. We have updated a few of the objectives to reflect new

water quality guidelines and procedures. For example, we are now using chlorophyll *a* instead of periphyton biomass and total ammonia-N instead of un-ionized ammonia-N. The 90th percentile of 400/100 mL for fecal coliform values is used when high fecal coliform values were recorded at bathing beaches.

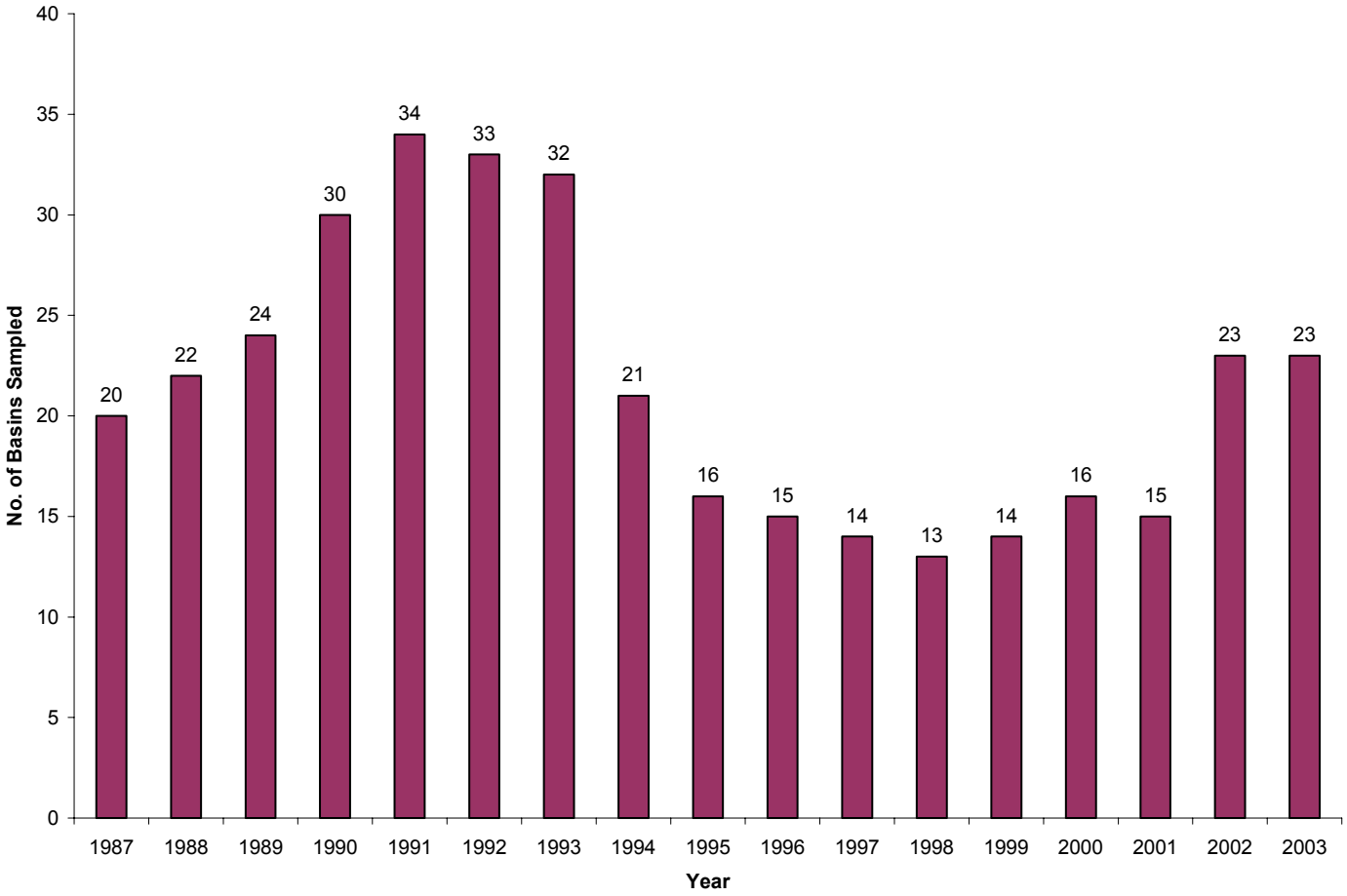


Figure 1. Summary of the number of basins sampled annually between 1987 and 2003.

Four different concluding statements are used in the data assessment: objective met, objective not met, indefinite result, and omitted 2003. We consider the objective to have been met if the monitoring result equaled or was within the objective limit. We report the result as indefinite if there were insufficient data to check the objective (a minimum of five samples collected within a 30-day period are necessary to calculate an average, median or ninetieth percentile value), the data were suspect, or the minimum detectable concentration

was too high. We report the objective as omitted if, for some reason, planned data collection did not take place or was excluded because of low priority, taking into account past results. These tables are the most important part of this report since they summarize where, when, and by how much objectives were met or exceeded in 2003.

Text

In the text section, we briefly explain the quality assurance program and its status in the 2003 monitoring year. We then give a provincial overview of the monitoring results. Finally, we describe briefly the tabulated data for each body of water, by Region, mentioning the highlights and sometimes drawing some general conclusions. At this stage, we avoid qualifying statements such as: "...the objectives were nearly met, slightly exceeded or probably met...". We consider these types of statements to be too speculative without the support of further evidence to explain them. Thus objectives not met by a wide margin are categorized equally with apparently borderline cases. Although a more detailed interpretation is desirable, this is not done here because it would require the presentation of much more data, beyond the scope of this attainment report.

For the same reason, we do not attempt to explain what may have caused the results or to comment on the effect of objectives not being met. Such assessments would entail consideration of river flows, effluent discharges, whether objectives are long-term or short-term, the degree to which objectives are exceeded, quality assurance, and other factors.

In addition to a brief description of the tabulated data, we present the 2003 water quality index and rank for the bodies of water in each basin - when there are sufficient data to do so. The calculation of the index and rank for 2003 helps highlight those variables that had a detrimental effect on water quality in a particular water body. The index formulation has been modified from the original index and now follows the index format endorsed by the Canadian Council of Ministers of the Environment (CCME).

The 2003 Attainment Report guides those involved in managing water quality by focusing on areas of concern where further assessment or inspection may be needed. Since

monitoring to check water quality objectives covers only a short time span, usually at most 30 days, we believe that any instance when objectives were not met could be significant and is worth a more detailed look. Further study could show whether objectives were not met because of natural phenomena or because there is a human cause to the problem.

Figures

A location map in Figure 2 shows the 51 basins where objectives have been set. Separate maps, Figures 3 to 22, illustrate the 19 water basins monitored in 2003 and show the sampling sites referred to in the tables.

Guide to Ranking Future Monitoring

Due to limited funds, we cannot monitor all basins where objectives have been set each year. We have therefore proposed the following scheme to rank monitoring:

- **1st priority**: any basin with less than three years of complete monitoring or any basin the Ministry considers provincially or internationally significant. Examples of significant basins are the Fraser River due to fisheries, the Okanagan Valley lakes due to recreation, the lower Columbia River due to trans-boundary effects, and Burrard Inlet due to a federal-provincial plan.

- **2nd priority**: any basin in which, after at least three years monitoring, a number of objectives are not regularly attained and there is either a local expression of concern or a plan for short-term action.

- **3rd priority**: any basin as for the 2nd priority above, but where there is no known concern or plan of action.

- **4th priority**: any basin in which, after at least three years monitoring, most objectives are either being met or the situation is fairly well documented with no change in status expected in the short term.

QUALITY ASSURANCE PROGRAM

Due to fiscal restraints, the Quality Assurance Program was suspended in 1996. Prior to this, the Quality Assurance Program ran over a five-year period from 1991 to 1995. This program described the accuracy and precision of the test results to assess the reliability of the results, and was specific to the variable and levels measured for objectives attainment. In its place the Ministry conducts a more general quality assurance program to ensure that contract laboratories are producing results that meet Ministry data quality standards. As well, regional offices incorporate some collection of replicate samples and submission of blanks as part of their normal sample collection activities.

PROVINCIAL OVERVIEW OF RESULTS

Presentation of Results

In the tables summarizing the monitoring data, there are four kinds of concluding statement. These are: objective met, objective not met, omitted 2003, and indefinite result.

To get an overview of performance for the Province, we totaled the number of occurrences of each conclusion for each water basin from the summary tables. In compiling these totals, we counted each instance of a maximum (or minimum) objective being met or not met plus all average and percentile values being met or not met.

Table 1 shows the results of this compilation in 2003. For each Region we give the sum of occurrences for each kind of conclusion and then total them for the whole Province. We also express the occurrences as a percent of the total of all occurrences, both by Region and for the Province as a whole.

Discussion of Results

Although the results apply to specific occurrences, we assume for this analysis that they are representative of the whole year. This simplification is a conservative approach to describing the state of water quality since we usually attempt to collect data during worst-case conditions.

Table 1 shows that the objectives were met 89% of the time in the Province as a whole in 2003. This result varied according to Region from 74% to 93%. Objectives were not met from between 1% and 23% of the time, with an overall average of 7%.

The occurrence of objectives omitted and indefinite results in 2003 averaged 1% and 3%, respectively. If we subtract these instances from the total, the objectives were met 93% of the time and objectives not met 7% of the time. By subtracting the instances of no results, we speculate that if all objectives had yielded results, then the above trend would continue. We can therefore generalize that, in the Province as a whole, the objectives were met about 93% of the time in 2003.

Factors which can affect the overall outcome include the frequency at which particular objectives in any region are monitored, the completeness of monitoring in a basin, and the inclusion or omission of water basins with either serious or minor water quality problems.

When comparing the data from past years, the relatively low numbers seen in the mid-1990's have reversed somewhat (as seen in the table below), with the exception of a slight dip in 2000. However, it is speculated that a downward trend could resume, because new basins with known problems will be added and, as monitoring costs increase, there will be a tendency to cease monitoring in areas where objectives are being met to free-up funding for areas that may have persistent water quality concerns.

If we wish to use objectives attainment data to describe the general state of water quality in developed areas, we will need to maintain monitoring in all areas where objectives have been set. If monitoring resources are scarce, we will need to concentrate on areas where the worst water quality problems occur. This will produce an increasingly negative general result, although we would expect the situation to improve in subsequent years as corrective action is taken. The goal, of course, is for water quality objectives to be met 100% of the time in all areas. Monitoring in future years, followed by corrective action where required, will show how close we can get to this ideal situation.

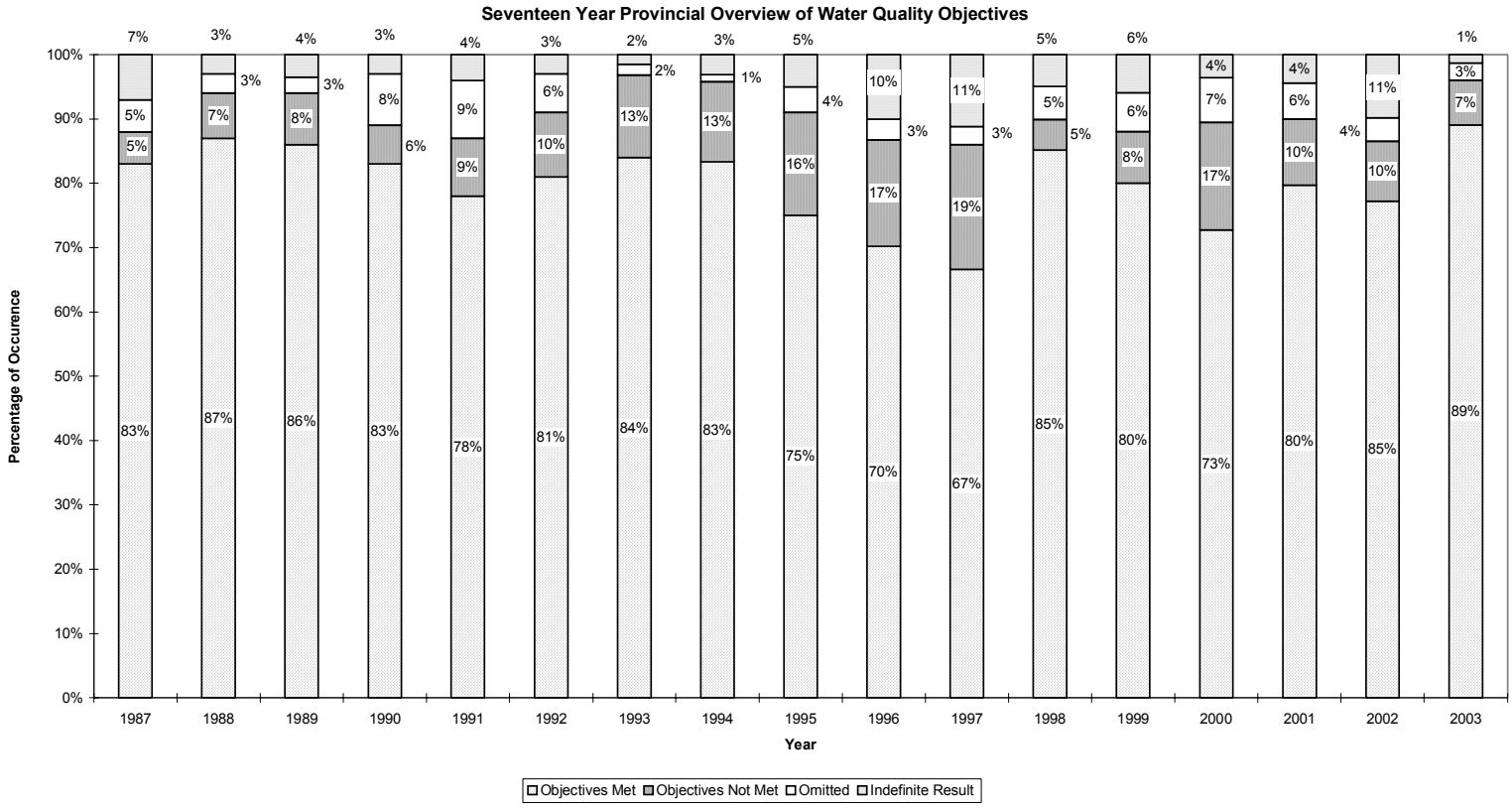
A comparison of objectives attainment (note: only attainment and exceedences were considered in calculations – data that was omitted or indefinite were not included).

	1987	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**
% of the Time Objectives Were Met	94%	93%	91%	93%	90%	89%	87%	87%	82%	81%
Number of Basins Sampled	20	22	24	30	34	33	32	21	16	15

	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
% of the Time Objectives Were Met	77%	95%	91%	81%	89%	89%	93%
Number of Basins Sampled	14	13	14	16	15	23	23

Sixteen-Year Water Quality Attainment Overview

This report marks the sixteenth year of the *Water Quality Objectives Attainment Report* series. Included below is a graph representing the findings from the past fifteen years of attainment reporting: this graph shows trends in each of the four concluding statements (objectives met, objectives not met, omitted, and indefinite results).



WATER QUALITY INDEX

The CCME (Canadian Council of Ministers of the Environment) water quality index has been calculated for the different water bodies. It should be noted that in prior years, the B.C. water quality index has been reported. We have now conformed our reporting to that developed within the CCME forum. It should be noted that the two can be compared but the CCME index is the reverse of the B.C. index. A B.C. value of 13 is approximately the same as a CCME index value of 87.

VANCOUVER ISLAND REGION

Cowichan-Koksilah Rivers

The Cowichan River is the most important river on Vancouver Island for recreational and commercial fisheries. The Koksilah River is a major tributary of the Cowichan River near its mouth. Possible sources of contamination include treated municipal sewage, agriculture, urban development, and effluents from a fish hatchery and abandoned metal mines.

Objectives were not checked from 1994 to 1997. Monitoring carried out from 1988 to 1993 gave fairly consistent results, with water quality ratings of fair for both rivers (Cowichan River index = 30 or CCME index of about 70; Koksilah River index = 36 or CCME index of about 74). It showed that objectives were not met for microbiological contaminants in both rivers and for algal growth in the lower part of the Cowichan River.

Table 2 lists results for 2003, and Figure 3 shows site locations. The CCME index values calculated for 2003 were 69 for the Cowichan River and 67 for the Koksilah River, both of which equate to ranks of Fair.

In 2003, objectives were met 95% of the time when sufficient data was collected to evaluate compliance. Fecal coliforms, *E. coli*, turbidity, and suspended solids did not meet objectives on occasion.

Middle Quinsam Lake, and Quinsam River Basin

Middle Quinsam Lake drains via the Quinsam River into the Campbell River just upstream from the Campbell River estuary (Figures 4, 5). The Middle Quinsam Lake sub-basin is a valuable habitat for trout and salmon, but could be impacted by an open-pit coal mine operating in the area. It was noted as having excellent water quality (index = 3 or CCME index of about 97) based on measurements between 1989 and 1993 while the Quinsam River had good water quality (index = 8 or CCME index of about 92). Figures 4 and 5 show site locations.

Table 3 shows results for 2003. The CCME index value calculated for Long Lake, Quinsam River and Middle Quinsam Lake were all equal to 100. This translates to a ranking of Excellent for all three waterbodies for 2003.

All water quality objectives that were monitored in the Quinsam basin in 2003 were met.

Oyster River

The Oyster River flows from the Forbidden Plateau area into the Strait of Georgia, south from Campbell River (Figure 6). The river and its tributaries are important habitat for several species of trout and salmon. The main threats to water quality are logging, agriculture, and mine exploration. We expect the latter to lead to active mining in the future, especially for coal.

Between 1990 and 1993, the objectives were usually always met, with a water quality rating of good (index = 16 or CCME index of about 84). Since the situation is stable, we did not monitor from 1994 to 1997. A few samples were collected between 1998 and 2001.

Table 4 shows results for 2003. The CCME index value calculated for the Oyster River was 88, for the Little Oyster River was 85 and for Woodhus Lake in 2003 was 93. This translates to a ranking of Good for all three waterbodies for 2003.

Water quality objectives that were occasionally not met in the Oyster River basin were fecal coliforms, turbidity, suspended solids, dissolved aluminum, total cadmium, and total chromium.

Elk and Beaver Lakes

Located near Victoria, these are the most important recreational fisheries lakes on southern Vancouver Island. Water-contact recreation is also very important in the lakes. Residential and agricultural development and the release of phosphorus from lake sediments are responsible for the present eutrophic state of the lakes.

Prior to this report, Elk and Beaver Lakes where monitored from 1993 to 1995. During the 1993 to 1995 study period, objectives for dissolved oxygen, chlorophyll-*a*, and the phytoplankton community were consistently not met, reflecting the eutrophic nature of the lakes. The water quality ratings were borderline, (index =54 or CCME index of about 46), for Elk Lake and poor, (index =72 or CCME index of about 28), for Beaver Lake.

Monitoring in the future will be a lower priority until action is taken to improve water quality conditions.

Tsolum River

The Tsolum River flows from Mount Washington to the Puntledge River at Comox on Georgia Strait (Figure 7). Acid-mine drainage from a closed copper mine in the headwaters creates high copper levels which are deleterious to fish. The river has the potential to support significant populations of salmonids.

Table 5 lists results for 2003. The Tsolum River had a CCME index value of 41 for 2003, which equates to a ranking of Poor.

Objectives for the Tsolum River were checked for the first time in 1994 in the river just downstream from the mine site. Since then**,** the objectives for dissolved copper were often not met.

Dissolved copper concentrations continued to exceed the maximum objective in 2003. Sampling frequencies were insufficient to determine if the mean copper objective was met (calculations for mean values require a minimum of five samples collected within a 30-day period).

We recommend continued objectives monitoring to track the progress of reclamation work at the mine.

Holland Creek and Stocking Lake

The Holland Creek and Stocking Lake watersheds, located near Ladysmith (Figure 8), are used mainly as a source of drinking water with some use for recreation and fisheries. Water quality objectives were prepared and approved recently as part of a watershed management plan for the area. Logging and road building are the main influences on water quality.

Monitoring to check the attainment of water quality objectives was carried out for the first time in 2002. The CCME WQI value for Stocking Lake was 53, while the value for Holland Creek was 58. These values translate to a ranking of Marginal for both water bodies. Table 6 summarizes water quality data.

Objectives were met 86% of the time in Holland Creek and Stocking Lake. Objectives that were occasionally not met included fecal coliforms in Holland Creek, total phosphorus in Stocking Lake, and turbidity, colour, and average total organic carbon in both Holland Creek and Stocking Lake.

Quatse Lake

Quatse Lake is located on the north-eastern end of Vancouver Island, approximately three kilometres north from Coal Harbour. In addition to a source of drinking water for Coal Harbour, Quatse Lake is also an important aquatic habitat for both fish and wildlife. A substantial portion of the watershed has been logged, which in turn has raised concerns that water quality may be affected.

Monitoring to check the attainment of water quality objectives has not yet been carried out, and is not planned in the immediate future.

SKEENA REGION

Bulkley River

The Bulkley River is a major tributary to the Skeena River. It is an important river for fisheries and has some drinking water use. The main influences on water quality are treated municipal effluent from Houston and Smithers, agriculture, urban runoff, and possible contamination in the headwaters from mining.

We have monitored the attainment of objectives from 1988 to 1992 and obtained consistent data, with a water quality rating of good, (index = 15 or CCME index of about 85). Given these results, we have not monitored the Bulkley River since 1992. We recommend monitoring to validate the rating should be carried out in 2004.

Kathlyn, Seymour, Round, and Tyhee Lakes

These four small lakes, in the Smithers area, are used for recreation, domestic water supply, and irrigation (Figure 9). The main influences on water quality are agriculture and residential development around the lakes.

Monitoring between 1987 and 1993 showed objectives for turbidity, colour, and phosphorus not being met due to the eutrophic nature of the lakes. No objectives monitoring took place between 1993 and 2001 Water quality was reported as fair for Kathlyn, (index = 34 or CCME index of about 66), and Tyhee, (index = 21 or CCME index of about 79), lakes in the 1996 water quality status report.

The CCME WQI values calculated for 2003 were 64 for Kathlyn Lake, 63 for Seymour Lake, 37 for Round Lake and 65 for Tyhee Lake. These values translate to rankings of Marginal, Marginal, Poor, and Marginal, respectively.

Table 7 summarizes the 2003 water quality data for these four lakes. Objectives as a whole were met 71% of the time in these lakes. Objectives that were not met included fecal coliforms, turbidity, total phosphorus and colour.

Lower Kitimat River and Arm

The river and arm are an important migration route for salmonids, and the water is also used for recreation and for industrial and municipal supplies. A kraft pulp mill and a municipal treatment plant discharge to the river and an aluminum smelter and methanol plant discharge at the head of the arm.

We recommend continued monitoring as the Ministry works with dischargers to upgrade effluent treatment facilities.

Lakelse Lake

Lakelse Lake drains into the Skeena River (Figure 10) and is important for salmon spawning and rearing and for recreation. It is also used as a domestic water supply. The only threats to water quality are septic tanks around the shoreline, agriculture, and logging in watersheds that drain into the lake.

The objectives were last checked in 1992 and all were met, with a water quality rating of good (index = 9 or CCME index of about 91). No monitoring was conducted between 1992 and 2001.

The CCME WQI for Lakelse Lake was 70 in 2003, which equates to a ranking of Fair. Table 8 summarizes the 2003 water quality data for Lakelse Lake. Objectives were met 89% of the time, with average and maximum turbidity and dissolved oxygen concentrations occasionally not meeting their objectives.

Yakoun River

The Yakoun River is on Graham Island in the Queen Charlotte Islands. It flows north from the Queen Charlotte Ranges into Masset Inlet. An open pit gold mine within the drainage has been proposed and water quality objectives have been set accordingly. The river has valuable fish resources, contributing all five species of salmon. It is also important for wildlife and recreation.

The development of the gold mine is in abeyance. We recommend monitoring to check the attainment of water quality objectives when the project proceeds.

OMINECA-PEACE REGION

Charlie Lake

Charlie Lake is used as a backup drinking water supply for the city of Fort St. John (the Peace River is the primary source) and for recreation. Agriculture, residential development around the lake, and nutrients from lake sediments are factors affecting water quality.

Monitoring from 1987 to 1993 showed the main problem to be high phosphorus levels causing eutrophic conditions, with a water quality rating of borderline (index = 46 or CCME index of about 64). Studies are underway to determine how to reduce nutrient input. The Charlie Lake Technical Advisory Committee is currently overseeing a watershed land-use/impact source survey to identify potential mitigation sites. Routine monitoring to check objectives should resume when corrective measures are undertaken.

Bullmoose Creek

Bullmoose Creek and its tributaries (West and South Bullmoose creeks) are important recreational fish habitat. The creeks are adjacent to an open pit coal mine.

The attainment of water quality objectives was documented by monitoring between 1987 and 1993 and there were no serious impacts, with a water quality ratings of fair for both Bullmoose Creek (index = 22 or CCME index of about 78), and West Bullmoose Creek (index = 23 or CCME index of about 77), and good for South Bullmoose Creek (index = 10 or CCME index of about 90). Further monitoring is a low priority at this time.

Nechako River

The Nechako River, a major tributary to the Fraser River at Prince George, has its flow controlled by dams for power generation for the Alcan aluminum smelting plant (Figure 11). The river is an important route for migrating salmon. Water quality can be affected by treated municipal sewage and diffuse sources such as forestry and agriculture. Water temperature is influenced by the flow of water released from the dams and by the manner in which it is released.

In past years, the fecal coliform objectives were met in the Nechako River except immediately downstream from Vanderhoof. The temperature objectives immediately downstream from Cheslatta Falls were often not met in the summer. We have obtained similar results since 1987. For the period, 1987 to 1993, water quality was considered as fair (index = 22 or CCME index of about 78). Temperature objectives might be met if a cold-water release structure, proposed for the Kenney Dam upstream from Cheslatta Falls, is installed. The attainment of the temperature objectives further downstream on the Nechako at Vanderhoof and upstream from the Stuart River has improved due to water temperature management by the Nechako Fisheries Conservation Program.

Table 9 shows water quality data for 2003. The Nechako River had a CCME index value of 65 for 2003, which equates to a ranking of Marginal.

Water quality objectives for the Nechako River were met 91% of the time that an assessment could be made. The only parameter for which data are available that failed to consistently meet its objective was temperature.

The Nechako Watershed Council and the Village of Vanderhoof have been advised of concerns associated with exceedence of coliform objectives downstream of Vanderhoof. Potential solutions include further treatment of the discharge or rerouting of the discharge to irrigation or wetlands to reduce nutrient concentrations. Alcan continues to monitor Nechako River water quality. Until action is taken by the Village of Vanderhoof it is not anticipated that water quality will change significantly, and therefore no further monitoring is recommended until that time or until 2007, whichever comes first.

Pine River

The Pine River, a tributary to the Peace River, supplies water to Chetwynd and supports significant sport fish populations. The water quality is considered to be mostly in a natural state with the major influence coming from forestry and from treated sewage from the Village of Chetwynd. On August 1, 2000 an oil pipeline ruptured, spilling almost 1 million litres of B.C. light crude oil to ground adjacent to the upper Pine River. Roughly half of this (or 500,000 litres) was believed to enter the Pine River. After an extensive cleanup, an estimated 80,000 L of in-river oil remained unaccounted for. This oil was likely dissolved in water, trapped in backwaters and deposited into and onto river sediment and river bottom substrates. Monitoring is ongoing, with continued spill response on an as-needed basis. Impact studies to determine potential short and long-term impacts from the spill are being reviewed by the Ministry at this time.

With regard to the other objectives currently in place for the Pine River, we presently consider monitoring to be a low priority for this basin and none was carried out after 1992. Past results show all objectives being met fairly consistently, with a water quality rating of good (index = 5 or CCME index of about 95). We recommend monitoring in 2004.

Pouce Coupe River and Dawson Creek

The Pouce Coupe River enters the Peace River inside the Alberta Border. Dawson Creek is its major tributary. The waters are impacted mainly by municipal discharges and agriculture.

The exact causes for objectives not being met need to be found. Water quality ratings were fair for the Pouce Coupe River (index = 33 or CCME index of about 67; period of record: 1987 to 1990), and borderline for Dawson Creek (index = 56 or CCME index of about 44; period of record: 1987 to 1989). Since objectives were consistently not met up to 1992, we will not resume monitoring to check their attainment until measures are taken to correct the problem. We recommend monitoring in 2004.

The City of Dawson Creek is monitoring both Dawson Creek and the Pouce Coupe River during spring freshet, as well as summer and winter low flows. We recommend that this work continue, and that data collected in the future be analyzed with respect to the existing water quality objectives for these water bodies.

Peace River

We have set objectives for the Peace River between the Bennett Dam and the B.C.-Alberta Border. The water is important for aquatic life and irrigation and can be affected by municipal discharges, forestry, agriculture, a gas plant, and a pulp mill built in 1988 after the objectives were set. We first checked the objectives in 1988. Water quality for the Peace River was judged as fair (index = 22 or CCME index of about 78), for the period of record from 1988 to 1993.

Objectives not met at times in 1994 included those for turbidity, suspended solids, temperature, and chromium. A limited amount of monitoring was conducted in 2003 at the joint Federal-Provincial monitoring site near Alces. The CCME WQI for the Peace River was 83 in 2003, which equates to a ranking of Good. Table 10 summarizes the 2003 water quality data for the Peace River, and Figure 12 shows site locations. The only objective not met 100% of the time when there was sufficient data to make a determination was total copper.

Considering Alberta's interest in the quality of the water crossing the provincial border, we recommend that objectives monitoring of the Peace River continue.

Upper Finlay River Sub-Basin

The Finlay River, located in the north east part of the Province, drains into the north end of Williston Lake. This river is broken into two sub-basins, the upper and the lower Finlay.

The drainage area of the upper Finlay sub-basin includes portions of the Skeena Mountains, Spatsizi Plateau, Omineca Mountains, and the Rocky Mountains. The upper Finlay was the

site of a gold and silver mine and mill (the Baker Mine), now closed. The upper Finlay system is an important aquatic habitat for sports fishery species such as Dolly Varden (*Salvelinus malma*), and Rainbow Trout (*Oncorhynchus mykiss*). In addition, other water uses include recreational uses and as a source of drinking water for the community of Ware. Objectives apply to Jock and Galen creeks, which eventually flow into the upper Finlay River.

The objectives were checked in 1987. The potential acid rock drainage situation at the Baker Mine is monitored annually in the spring and indicates that water quality in Galen Creek is acceptable. The Ministry will be negotiating a spring sampling program with the Baker Mine site owner. The large Kemess Mine, located in the Attichika Creek drainage above Thutade Lake, could potentially impact water quality, and monitoring of that site by the mining company is extensive. These data need to be added to the Ministry EMS database so that they can be used for reporting as appropriate. The need for monitoring in 2004 should reflect the data collected by the mines.

Lower Finlay River Sub-Basin

The lower Finlay sub-basin drains a portion of the Rocky Mountains, and the Finlay Range about 8000 km^2 in size. Even though the lower Finlay is an important fish habitat, other water use is minimal due to low development and population in the area. Water quality concerns stem from logging and potential mineral extraction in the region.

We recommend water quality monitoring in 2004 for one year. As development increases an assessment may show that monitoring is needed in the future.

Fraser River from the Source to Hope

This is the most important river in the Province in terms of fisheries values. Most of the contamination to the river between Moose Lake (the source of the river) and Hope is from pulp and paper mills and municipal treatment plants at Prince George and places downstream. Water quality objectives have been prepared to protect aquatic life, wildlife, irrigation, livestock watering, and drinking water supplies.

Table 11 lists 2003 water quality data, and Figure 13 shows site locations. A CCME index value was calculated for five sites on the Upper Fraser River in 2003: the Fraser River near Red Pass, the Fraser River near Hansard, the Fraser River near Prince George, the Fraser River near Quesnel and the Fraser River at Hope. Index values were 90 near Hope (a ranking of Good), 79 near Quesnel (a ranking of Fair), 100 near Prince George (a ranking of Excellent), 87 near Hansard (a ranking of Good) and 100 near Red Pass (a ranking of Excellent)..

Objectives were met in 95% of instances for the upper Fraser River. Parameters that did not consistently meet their objectives include fecal coliforms, dissolved oxygen and colour.

We recommend continued monitoring to check objectives in this section of the Fraser River, as well as increasing the sampling frequency for fecal coliforms and *E. coli* sufficiently to be able to evaluate objective compliance.

CARIBOO REGION

Williams Lake

Williams Lake drains to the Fraser River and is important for drinking water, recreation, and aquatic life (Figure 14). The water quality is affected by phosphorus that comes from lake sediments and traditional farming practices in the San Jose River drainage, the main inlet to the lake, and to a lesser extent from residential septic systems around the lake. For the period from 1987 to 1993, the water quality was rated as borderline (index = 55 or CCME index of about 45). However, cores of the lake bottom have recently been sampled, and preliminary findings indicate that Williams Lake has historically been more eutrophic (productive) than originally thought. Therefore, the algal blooms and other indicators of high phosphorus concentrations may be endemic rather than linked to anthropogenic activities. Pending the final results of this investigation, the water quality objectives for Williams Lake may be changed to reflect this new information.

Total dissolved phosphorus concentrations measured between 1987 and the present show annual fluctuations that reflect changes in the amount of annual runoff each year, with no clear increasing or decreasing trend. However, water clarity appears to be steadily improving, with increasing mean Secchi disk depths from 1977 to the present. Phosphorus concentrations and Secchi depths were the only parameters measured in both 2000 and 2001 for which objectives exist.

Table 12 lists water quality results and Figure 6 shows site locations. The CCME index value for Williams Lake in 2003 was 69, which equates to a ranking of Fair.

Water quality objectives not consistently met in Williams Lake include total phosphorus and average turbidity. Objectives were met 88% of the time.

There are continued concerns with land use in the Williams Lake basin, and ranchers have made numerous changes to reduce their impact. As such, they are generally in compliance with the Code of Agricultural Practice for Waste Management as specified in the

Agricultural Waste Control Regulation. The South Lakeside area is now connected to the Williams Lake sewer system, which should help maintain water quality. Further potential impacts from upstream land uses have to be minimized to maintain and improve water quality. We recommend continued monitoring of objectives to track the progress of corrective measures being undertaken in the watershed, and for the water quality objectives for Williams Lake to be updated to reflect new knowledge.

San Jose River

The San Jose River originates at Lac La Hache and is the main inlet to Williams Lake. It is used mainly for irrigation, livestock watering, and water storage. Ranching is the activity with the most influence on water quality.

The Ministry set only one objective for the San Jose River, namely the total annual loading of dissolved phosphorus entering Williams Lake. The Region has measured this loading since the 1970's.

The annual load was based on a calendar year. It was derived by adding daily stream flows in Borland Creek and the San Jose River just upstream, multiplying the total daily flow by the dissolved phosphorus daily concentrations measured in the San Jose downstream from Borland, plotting these daily loads against time, and measuring the area under the curve to obtain annual load. Sampling was suspended in 1997, and is not expected to continue until the objectives for Williams Lake have been updated.

SOUTHERN INTERIOR REGION

Bonaparte River

The Bonaparte River is a tributary to the Thompson River. It is an important trout habitat and is affected by agricultural operations and municipal discharges. Its main tributaries are Clinton Creek and Loon Creek.

The water quality objectives were last checked in 1994. Objectives not met at times included those for fecal coliforms, suspended solids, turbidity, chlorophyll-*a*, and the objective for dissolved oxygen in Loon Lake. The water quality rating for the time period 1987 to 1993 was Fair.

There are plans to improve water quality and correct problems. Routine monitoring to check attainment of objectives should resume in 2004 and after improvements are made.

Okanagan Valley Lakes

To date, objectives have only been set in the five main lakes for phosphorus, which is the major factor controlling the trophic state of the lakes (Figure 15). The lakes are highly valued for recreation, fisheries, and as a source of drinking and irrigation water. The major anthropogenic inputs of phosphorus are from treated municipal sewage and from diffuse sources that include septic tanks, agriculture, and forestry. However, the vast majority of phosphorus loading to the lakes is due to natural sources within the watershed (*e.g.* erosion). Phosphorus release from sediments also occurs in Wood Lake and Osoyoos Lake.

Table 13 lists results for 2003. CCME index rankings for Osoyoos and Wood lakes in 2003 were in the Poor range, with index values ranging from 10 in Wood Lake and 30 in Osoyoos Lake. Skaha, Kalamalka and Okanagan lakes were all rated as Excellent, with index values of 100. It should be noted that the rankings for any one year vary widely from year-to-year due to the influence of measuring only one variable.

Average spring turnover phosphorus objectives for the Okanagan Valley Lakes were met in 80% of instances where an assessment of data could be made. Objectives were consistently met in Okanagan, Kalamalka and Skaha lakes, consistently not met in Wood Lake, and occasionally met Osoyoos Lake.

Because there is only the single water quality objective for each lake (*i.e.*, spring overturn phosphorus), the index gives only a rough idea of the state of water quality. Better estimates will be provided when a few more pertinent objectives have been established and monitored.

Given the environmental and recreational importance of these lakes, we recommend continued monitoring of phosphorus at spring overturn, and the preparation of a more complete set of water quality objectives.

Similkameen River

The Similkameen River flows from Manning Park, east through the south Okanagan, then south across the U.S. border (Figure 16). It is important for fisheries, drinking water, and irrigation. Water quality could potentially be affected by mining and municipal discharges to ground and surface waters. We updated the water quality objectives in 1990 because of an increase in mining activity in the Hedley Creek area.

Monitoring between 1987 and 1993 has given consistent results with water quality ranked as good (index = 14 or CCME index of about 86), and was suspended in 1994 as low priority. The main problem has been with fecal coliforms, possibly from agricultural operations, which did not always meet the drinking water objective required for water that is treated by disinfection only. Limited data was collected in 1996 and 1997. All objectives were met in 1996, and all objectives except for total lead in Hedley Creek were met in 1997.

Table 14 lists results in 2003. CCME index rankings calculated for Hedley Creek and the Similkameen River for 2003 were 94 and 100, respectively. These values equate to ratings of Good and Excellent for the two systems, respectively.

Objectives were met in 99.7% of all instances where there were sufficient data to determine compliance. Objectives were consistently met in the Similkameen River , while in Hedley Creek, the only objective that was not met consistently was that for strong acid dissociable cyanide (SAD-CN) + thiocyanate.

Cahill Creek

Cahill Creek, its tributaries (Nickel Plate Mine Creek and Sunset Creek), and a parallel stream (Red Top Gulch Creek) enter the Similkameen River near Hedley (Figure 17). Fish from the Similkameen River use the creek near its mouth and the water is also used for irrigation. This watershed is the site of a gold mine and mill that began operating in 1987, and closed in 1996. Monitoring to check objectives began in 1987, with water quality for 1987 to 1993 being rated as good (index =13 or CCME index of about 87). Objectives not met in 2000 and 2001 included turbidity, sulphate and total arsenic. In 2003, water quality data collected by the permittee was analyzed for objectives attainment, resulting in almost daily measurements for some parameters. This gives a much clearer picture of what is happening in Cahill Creek and its tributaries over the entire year than we have been able to ascertain in the past.

Table 15 provides a summary of the 2003 data. CCME index ratings for each of the creeks in 2003 (and their respective rankings) are as follows: Cahill Creek: 86 (Good); Hedley Creek: 100 (Excellent); Nickel Plate Mine Creek: 53 (Marginal); Red Top Gulch Creek: 62 (Marginal); Sunset Creek: 100 (Excellent).

Monitoring by the permittee will continue in order to document improving trends in nitrate, cyanide and sulphate in various surface waters draining the mine site.

Bessette Creek

Bessette Creek, which flows into the Shuswap River, is formed by the confluence of Harris and Duteau creeks near the town of Lumby. Lawson Creek, and its tributary Spider Creek,

flow into Duteau Creek. These creeks provide spawning habitat for trout and four species of salmon. Activities that can affect water quality include a telephone pole treatment plant near Harris Creek, a wood-waste landfill along Lawson Creek, seasonal discharge of municipal sewage effluent to Bessette Creek, and agricultural operations in the area generally. Based on data from1990 to 1993, water quality was rated as fair for Bessette Creek (index = 33), Lawson Creek (index = 40 or CCME index of about 60), and Spider Creek (index = 40 or CCME index of about 60), but good in Harris Creek (index = 17 or CCME index of about 83).

Monitoring was suspended for 2003 but should resume in 2004.

Tributaries to Okanagan Lake near Westbank

We set objectives for Peachland, Trepanier, and Westbank creeks, which flow into Okanagan Lake in the Peachland-Westbank area. Peachland and Trepanier creeks support spawning populations of kokanee or trout, and all three creeks are used for irrigation and domestic water supplies. Effluent from a molybdenum mine (which closed in the early 1990's) had the potential to impact Peachland and Trepanier creeks, but seepage from this site is now captured and treated in order to meet the water quality objectives in Trepanier Creek. Westbank Creek is influenced by urban runoff and agricultural activities.

The objectives have been checked for three years with results showing generally good water quality, with water quality rating of Fair to Good. Further monitoring was considered a low priority and was discontinued in 1994.

Since that time, concerns have been raised about possible discharges from the closed Brenda Mines Operations. Hearings of the Environmental Appeal Board have resulted in the region re-assessing current objectives for Trepanier Creek. Monitoring should resume in 2004.

Tributaries to Okanagan Lake near Kelowna

Mission, Kelowna, and Brandt's creeks are tributaries to Okanagan Lake on its east shore near Kelowna. Mission and Kelowna creeks support salmonids and the water is also used for irrigation and domestic supply. Brandt's Creek is used mainly for irrigation. The creeks can be affected by urban storm-water runoff in their lower reaches and by logging or agriculture further upstream. Treated wastewater is discharged to Brandt's Creek.

The objectives were last checked in 1994. At that time, as in previous years, the objectives for bacteriological indicators (fecal coliforms, *E. coli*, and enterococci) were generally not met. Continued monitoring will depend on action taken in the future to control storm-water and other diffuse sources of contamination. Monitoring should resume in 2004.

Tributaries to Okanagan Lake near Vernon

Lower Vernon Creek and Deep Creek are tributaries to Okanagan Lake at its north end. The water is used for domestic and irrigation purposes and has some fisheries values, especially in lower Vernon Creek. Potential sources of contamination are urban storm-water runoff, a municipal sewage discharge, agricultural operations, and groundwater affected by spray irrigation of treated sewage.

Objectives were last checked in 1996, when objectives for suspended solids were not met in both creeks, and those for fecal coliforms and *E. coli* were not met on the Lower Vernon Creek. Monitoring should resume in 2004.

Hydraulic Creek

Hydraulic Creek flows into Okanagan Lake via Mission Creek about 10 km upstream from the lake. Hydraulic Creek is an important source of drinking water relying on disinfection only. The creek also supports a recreational fishery and is used for irrigation. Commercial logging in the watershed can affect these water uses.

Monitoring between 1991 and 1993 to check objectives showed that fecal coliform contamination was the main problem, with a water quality rating of fair (index =35 or CCME index of about 65). Monitoring was discontinued in 1994, as results were fairly predictable. Monitoring should resume in 2004.

Christina Lake

Christina Lake, located in south central B.C., drains into the Kettle River which joins the Columbia River in Washington State (Figure 18). The lake is important for recreation, domestic water supply and sport fish. The potential sources of contamination are residential development, agriculture, and logging.

Objectives were checked for the first time in 1994 and those not met included objectives for phytoplankton distribution, periphyton distribution, dissolved oxygen, and periphyton chlorophyll-*a*.

Table 16 shows 2003 attainment. The CCME index value for Christina Lake was 100 in 2003, which equates to a ranking of Excellent.

Objectives were met 100% of the time that attainment could be determined.

We recommend resuming sampling until objectives have been checked for at least one more year to obtain a reasonable database.

Thompson River

We set objectives in 1992 for the South Thompson which drains Little Shuswap Lake, the North Thompson which joins the South Thompson at Kamloops, Kamloops Lake, and the lower Thompson which is a major tributary to the Fraser River (Figure 19). This river system is very important for fish, especially salmon and trout. It is used extensively for recreation and is also a source of water for drinking, irrigation, and industrial use.

Between the North Thompson River and Kamloops Lake, the river receives treated effluents from a bleached kraft pulp mill and from the City of Kamloops. There are also diffuse discharges from agriculture and forestry. All these discharges can affect Kamloops Lake and the Thompson River downstream.

Table 17 lists results in 2003 and Figure 19 shows site locations. The CCME index value for the Lower Thompson was 71 (equivalent to a ranking of Fair), while the index value for Kamloops Lake was 100 (equivalent to a ranking of Excellent).

Objectives were met 97% of the time in the Thompson River system. The only objective not consistenly met was chlorophyll-*a* in the Lower Thompson River. Fecal coliform and *E. coli* concentrations were not measured at a sufficient interval to enable us to calculate ninetieth percentile values necessary to evaluate objectives compliance, but concentrations of both fecal coliforms and *E. coli* were generally low and would likely not exceed their respective objectives were sampling frequency to be increased.

We recommend continued monitoring to check Thompson River objectives.

Keremeos Creek

Water quality objectives were set for Keremeos Creek and its main tributaries (South Keremeos Creek, Cedar Creek and Olalla Creek) in 2000. Keremeos Creek provides important fish-rearing habitat, and is a source of water for domestic and irrigation use. A ski resort in the headwaters of Keremeos Creek, as well as agriculture, forestry and road maintenance operations, all influence the water quality of these creeks to varying degrees.

2003 represents the second year that objectives attainment was monitored for Keremeos Creek. Objectives that were occasionally not met in 2002 included fecal coliforms, turbidity and suspended solids. Table 18 lists results in 2003 and Figure 20 shows site locations. The CCME index value for Keremeos Creek was 86 (equivalent to a ranking of Good), the index value for Cedar Creek was 95 (equivalent to a ranking of Excellent) and the value for Olalla Creek was 95 (equivalent to a ranking of Excellent).

Objectives were met 94% of the time in the Keremeos Creek system. Objectives that were occasionally not met include fecal coliforms, turbidity and suspended solids.

We recommend continued monitoring to check Keremeos Creek objectives.

KOOTENAY REGION

Columbia and Windermere Lakes

These two lakes are important for fisheries, recreation, and as a source of drinking water. Residential development around the lakes is the main potential influence on water quality.

Attainment monitoring for water quality objectives was conducted in Columbia and Windermere lakes between 1987 and 1992. Since the objectives were met fairly consistently over this time period, with a water quality rating of good (index = 5 or CCME index of about 95 for Columbia Lake and 4 or CCME index of about 96 for Windermere Lake), attainment monitoring was discontinued in 1993.

A limited monitoring program was undertaken for Windermere Lake in 2002 and 2003 to determine if shoreline development was impacting water quality. There are presently eighteen water intakes drawing water from Windermere Lake. Three of these intakes were incorporated in the program. The study was designed to determine if the combination of heavy development on silt soils and the increased reliance on septic systems for domestic waste water disposal was affecting the productivity of the lake. Fecal coliforms were the only parameter measured for which objectives currently exist in Windermere Lake, as phosphorus and turbidity concentrations were not measured at the deep lake stations. Table 19 lists results of the 2003 monitoring program, and Figure 21 shows site locations.

The CCME index value for Windermere Lake was 100, equivalent to a ranking of Excellent, and the objectives for fecal coliforms (the only parameter assessed) were consistently met at all of the intakes.

Toby Creek and Upper Columbia River

Toby Creek enters the Upper Columbia River just downstream from Windermere Lake. Both watercourses are important for aquatic life and recreation. Potential sources of contamination in Toby Creek include indirect discharges of domestic sewage and by drainage from an abandoned mine. The Upper Columbia River receives an indirect discharge of treated sewage from Fairmont and Radium Hot Springs. In addition, Edgewater directly discharges treated sewage effluent into the Upper Columbia twice a year.

All objectives were generally met except occasional exceedences for fecal coliforms. We did not monitor after 1989 in Toby Creek and 1992 in the Upper Columbia River, as monitoring was considered a low priority at this time.

Limited monitoring was conducted in 2003 in both Toby Creek and the Upper Columbia River. The impact from the abandoned mine site on Toby Creek water quality was assessed to determine if the existing mine tailings were entering the creek and impacting water quality. Monitoring was also conducted in the Upper Columbia River in 2003 to assess whether treated sewage effluent was impacting water quality. Table 20 shows the results of the 2003 monitoring program, and Figure 22 shows site locations. In addition to water quality samples collected by MWLAP staff above and below the Mountain Minerals site and on the upper Columbia River, permittee sampling for the Panorama resort was also accessed and analyzed.

The CCME index value for Toby Creek was 62, equivalent to a ranking of Marginal, while the index value for the Upper Columbia River was 100, equivalent to a ranking of Excellent. Objectives that were occasionally not met included fecal coliforms, suspended solids, and total ammonia.

Columbia River from Keenleyside to Birchbank

The Columbia River is one of the major rivers in B.C. and Washington State. In B.C., this section of the river is important for aquatic life, sport fishing, recreation and, to a lesser

extent, as a drinking water supply. In the U.S., it supports a food fishery, major salmon runs, and irrigation and drinking water supplies. Between the Hugh Keenleyside Dam and Birchbank, the main influence is a kraft pulp mill that expanded production and upgraded its effluent treatment to secondary between 1991 and 1993. There are also small discharges of secondary-treated municipal effluent and urban runoff.

An objectives report for this section of the Columbia River was completed in 1992. Objectives were monitored over a period of three years. However, the monitoring program was significantly reduced in 1997 and was discontinued in 1998. Limited attainment monitoring was reintroduced in this section of the Columbia River in 2003. These results will be used to determine the frequency of further objectives monitoring in this area.

Water quality was rated as fair in the 1996 status report (index = 35 or CCME index of about 65), but appears to be improving based on data review from 1991 to 1993. Objectives not met in 2002 included dissolved oxygen and dioxins and furans in sediments. No samples were collected in 2003.

Columbia River from Birchbank to the International Border

The Columbia River is one of the major rivers in both B.C. and Washington State. In B.C., this section of the river is important for aquatic life, sport fishing, recreation and, to a lesser extent, as a drinking water supply. In the U.S., the Columbia River supports a food fishery, major salmon runs, and irrigation and drinking water supplies. Between Birchbank and the international border, the main influence is a metal smelter and refinery at Trail. There are also small discharges of secondary-treated municipal effluent and urban runoff.

A draft objectives report for this section of the Columbia River was completed in 1997 (MacDonald Environmental, 1997), and updated objectives were formalized in 2000; (MWLAP 2000). Attainment monitoring has been conducted annually in this section of the river since 1998. In 2003, attainment monitoring included water, sediment and fish tissue sampling at several sites between Birchbank and the international border and water sampling bi-weekly at Birchbank and weekly at Waneta.

Table 21 lists results for 2003, and Figure 23 shows site locations. The CCME index value for the lower Columbia River was 86 in 2003, which equates to a ranking of Good. The lower Columbia River was rated as Fair for the three years between 2000 and 2002.

Objectives were met 96% of the time in the lower Columbia River when there were sufficient data to assess attainment. Objectives that were occasionally not met included enterococcus, dissolved oxygen, total cadmium, total chromium, and total copper..

Considering the international significance of the river and its importance to aquatic life, continued monitoring to check the attainment of objectives is recommended.

Elk River

The Elk River and its main tributaries, the Fording River, Line Creek and Michel Creek, are located in the south-eastern part of the province. The Elk River is a tributary to Lake Koocanusa on the east side. We have set provisional objectives for suspended solids and substrate sedimentation to protect aquatic life against the potential effects of coal mining operations in the basin.

The objectives for suspended solids apply to base flow, or the non-freshet period, in the Elk River basin. They were generally met at all sites in 1993. Limited monitoring was conducted in 2003. The CCME WQI for the Elk River was 41 in 2003, which equates to a ranking of Poor. This low ranking is due to the fact that although there was only one exceedence, only one objective was assessed and therefore the percentage of objectives exceeded versus those measured was high. Table 22 summarizes the 2003 water quality data for the Elk River. Objectives for suspended solids were not met on one occasion. We recommend monitoring in 2004.

LOWER MAINLAND REGION

Fraser River from Hope to Kanaka Creek

We have set objectives for the Fraser River between Hope and Kanaka Creek, for tributaries entering from the south, and for all major water courses between the Fraser River and the International Border. The Fraser River is a major salmon migration route and the tributaries are important spawning areas. The major discharges to the Fraser River in this section are of treated municipal sewage.

Monitoring to check objectives was carried out in 1987, 1988, 1990, 1992, and 1993. The objectives were updated in 1998 and we recommend checking the revised objectives when they are finalized. Overall water quality was rated as good (index = 7 or CCME index of 93). We recommend monitoring in 2004.

Fraser River from Kanaka Creek to the Mouth

The river downstream from Kanaka Creek and the outer estuary (Figure 24) are very important for salmon migration and rearing. The water is used for irrigation and certain beaches are heavily used for recreation. Water quality can be affected by industry, treated sewage, and agriculture.

Water quality was rated as Good (index = 4 or CCME index of 96), in the Main Stem, Fair (index = 28 or CCME index of 72), in the Main Arm, and Fair (index = 18 or CCME index of 82), in the North Arm.

We have monitored to check objectives annually since 1987. Due to the provincial importance of this river and the threats to water quality that exist in this section, we recommend that such monitoring be continued annually. Updated objectives were released in 2000. A CCME WQI value was calculated for five portions of the Fraser River between Kanaka Creek and the mouth: the Main Arm (index value of 91, equivalent to Good); Main Stem (index value of 100, equivalent to Excellent); Middle Arm (index ranking of 71, equivalent to Fair); North Arm (index ranking of 91, equivalent to Good); and Sturgeon

Banks (ranking of 100, equivalent to Excellent). Table 23 summarizes the 2003 water quality data for the Fraser River between Kanaka Creek and the mouth. Objectives were met 98% of the time, with objectives for suspended solids and total copper occasionally not met. We recommend monitoring in 2004.

Boundary Bay

Boundary Bay sustains a crab and herring fishery and is important for recreation. The Little Campbell River, the Serpentine River, and the Nicomekl River are tributaries to Boundary Bay on the east side. They provide important habitat for trout and salmon and are used for irrigation. The main influences on water quality are from sewage pumping stations, storm-water, and septic tanks in Boundary Bay and from agriculture in the tributaries.

Objectives were checked from 1988 to 1993 giving consistent results, with a water quality rating of fair (index = 40 or CCME index of 60). Since the situation is stable and fairly well documented, further monitoring was considered a low priority except where required at bathing beaches for human health reasons. Sampling resumed in 1999, when four samples were collected at various sites and analyzed for a number of parameters. Three samples were also collected in 2000, and six samples were collected in 2002. No monitoring was conducted in 2003. Parameters which occasionally failed to meet their objectives in 2002 included dissolved oxygen and maximum and average nitrite levels.

Burrard Inlet

Burrard Inlet includes Port Moody Arm, Indian Arm, Vancouver Harbour, False Creek, and English Bay (Figure 25). The water is designated for aquatic life and wildlife in all areas and for primary-contact recreation in most areas, except in False Creek. There are several municipal and industrial discharges to Burrard Inlet that can affect water quality. These include primary-treated sewage, combined sewer overflows, storm-water, bulk-loading terminals, a sugar refinery, a sodium chlorate plant, a chlor-alkali plant, and oil depots. Water quality for the 1995 report was ranked as Fair in Port Moody Arm (index = 40 or CCME index of 60), Indian Arm (index = 18 or CCME index of 82), Second Narrows to Roche Point (index = 31 or CCME index of 69), First to Second Narrows (index = 42 or CCME index of 58), and outer Burrard Inlet (index = 20 or CCME index of 80), but Borderline in False Creek (index = 44 or CCME index of 56). Samples were last collected in 1996 and 1997, but analyzed only for fecal coliforms. Objectives for fecal coliforms were occasionally not met at Deep Cover, Cates Park and Brockton Point.

In the past, objectives have not been met for a number of other variables, including metals in sediments, phenol in water, and PCBs and PAHs in sediments. Approximately five samples were collected at various sites in the inlet in 2003.

Limited sampling for bacteriological indicators only was conducted in Burrard Inlet in 2003 by the GVRD, and Table 24 presents these results. CCME rankings for the individual sub-basins for 2000 were: Outer Burrard, an index value of 42 (equivalent to a ranking of Poor); 2nd Narrows to Roche Point, an index value of 100 (equivalent to a ranking of Excellent), and Port Moody and Indian Arms, both of which received a WQI value of 100 (equivalent to a ranking of Excellent).

Objectives for Burrard Inlet were in 99.6% of instances where there was sufficient data to make a determination in 2003. Fecal coliform concentrations occasionally did not meet their respective objectives. We recommend monitoring continue in Burrard Inlet in 2004, and the number of parameters increase so that a greater percentage of objectives are being assessed.

Burrard Inlet Tributaries

We have set objectives for the following three tributaries to Burrard Inlet: School House Brook (which discharges to Port Moody Arm and could be influenced by a chemical polymer plant); Lynn Creek (which discharges to Vancouver Harbour and could be affected by a municipal landfill); and the Capilano River (which discharges to outer Burrard Inlet and may also be affected by a municipal landfill). The main uses of these tributaries are recreation, aquatic life, and wildlife.

The water quality objectives were last checked in 1994. At that time, objectives were not met at times for phenols, water temperature, chromium, iron, zinc, and chlorophenols in water. Water quality was ranked as fair in School House Brook (index = 38 or CCME index of 62), good in Lynn Creek (index = 12 or CCME index of 88), and good in the Capilano River (index = 16 or CCME index of 84).

Although we have data for four years, we recommend resuming monitoring in 2004 because the past record is rather incomplete.

North Shore Lower Fraser Tributaries

Objectives have been set for the following four tributaries to the north shore of the lower Fraser River in the Lower Mainland: Kanaka Creek, the Pitt River, the Coquitlam River, and the Brunette River. All these streams, and their tributary streams and lakes, support salmon and trout fisheries to varying degrees. Most are important for recreation and some are sources of drinking water requiring treatment. Discharges that can affect water quality include storm-water, agricultural runoff, treated sewage, landfill leachates, wastewaters from gravel operations, and a wood preservation plant.

Monitoring from 1990 to 1993 gave fairly consistent results, and we consider future monitoring to be a relatively low priority until some of the water quality problems, caused mainly by non-point sources, are addressed. Water quality was ranked as fair in Kanaka Creek (index = 41 or CCME index of 59), good in the Pitt River (index = 16 or CCME

index of 84), and Pitt Lake (index = 4 or CCME index of 96), fair in the Alouette (index = 24 or CCME index of 76) and North Alouette (index = 22 or CCME index of 78) rivers, and excellent (index = 3 or CCME index of 97) in Alouette Lake. Coquitlam River water quality was ranked as fair (index = 34 or CCME index of 66), while the Brunette River was good (index = 14 or CCME index of 86). We recommend monitoring resume in 2004.

Pender Harbour

Pender Harbour, a small coastal inlet on the Sechelt Peninsula, is important for recreational boating and fishing. It also supports commercial fishing and some commercial shellfish harvesting. The main influences on water quality are from diffuse sources such as septic tanks, some agriculture, and sewage discharges from boats.

In 1994, the third year of monitoring, objectives were often not met for copper, lead, and zinc in both water and sediments and for iron in water. Objectives for tri-butyl tin in water and PAHs in sediments were also not met. These results were similar to those of past years. Since the situation is stable and reasonably well defined, monitoring is a lower priority in the immediate future. We recommend monitoring in 2004.

Sechelt Inlet

Sechelt Inlet is located on the mainland coast about 80 km northwest of Vancouver. It is important for fisheries, especially fish farming, and recreation and has potential for shellfish harvesting. Potential sources of contamination include residential development, marinas, logging and minor discharges from gravel washing, a fish hatchery, and mariculture.

Monitoring for the second time in 1994 showed that objectives for suspended solids, copper, lead, and zinc were not met at times, mostly near a dock in Porpoise Bay at the south end of the inlet.

We recommend continuing the program for at least one more year to obtain a reasonable database.

Table 1. Provincial Overview of Water Quality Objectives – 2003

	Number of Occurrences				
Region	**Objectives Met**	**Objectives Not Met**	**Indefinite Results**	**Omitted 2002**	**Totals**
Vancouver Island	1479	55	41	16	1591
	93.0%	3.5%	2.6%	1.0%	100.0%
Lower Mainland	884	10	86	74	1054
	83.9%	0.9%	8.2%	7.0%	100.0%
Southern Interior	8595	761	39	52	9447
	91.0%	8.1%	0.4%	0.6%	100.0%
Kootenays	1243	95	2	14	1354
	91.8%	7.0%	0.1%	1.0%	100.0%
Cariboo	30	4	0	4	38
	78.9%	10.5%	0.0%	10.5%	100.0%
Omineca - Peace	980	82	222	37	1321
	74.2%	6.2%	16.8%	2.8%	100.0%
Skeena	128	40	2	1	171
	74.9%	23.4%	1.2%	0.6%	100.0%
All Regions	**13339**	**1047**	**392**	**198**	**14976**
	89.1%	**7.0%**	**2.6%**	**1.3%**	**100.0%**
All Regions less occurrences with no result	**13339**	**1047**			**14386**
	92.7%	**7.3%**			**100.0%**

Table 2. Cowichan - Koksilah Rivers Water Quality Objectives – 2003

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Fecal Coliforms	Cowichan River:	Aug 10 - Nov 16	9	1 - 610 CFU/100 mL	
	E206108	Aug 10 - Sep 7	1	np = 374 CFU/100 mL	Objective not met
< 10 /100 mL	d/s Cowichan Lake	Oct 26 - Nov 16	1	np = 250 CFU/100 mL	Indef. Result (no 5-in-30)
90th percentile	0120808	Apr 15 - Nov 16	13	1 - 85 CFU/100 mL	
(np)	300m u/s L. Cowichan STP	Aug 5 - 24	1	np = 374 CFU/100 mL	Objective not met
		Oct 26 - Nov 16	1	np = 35 CFU/100 mL	Indef. Result (no 5-in-30)
	E206107	Aug 10 - Nov 16	13	1 - 200 CFU/100 mL	
	400m d/s L. Cowichan STP	Aug 10 - Sep 7	1	np = 184 CFU/100 mL	Objective not met
		Oct 26 - Nov 16	1	np = 154 CFU/100 mL	Indef. Result (no 5-in-30)
	0120802	Aug 10 - Nov 16	9	6 - 171 CFU/100 mL	
	u/s Highway 1	Aug 10 - Sep 7	1	np = 138 CFU/100 mL	Objective not met
		Oct 26 - Nov 16	1	np = 143 CFU/100 mL	Indef. Result (no 5-in-30)
	Koksilah River:	Aug 10 - Nov 16	9	1 - 65 CFU/100 mL	
	E207425	Aug 10 - Sep 7	1	np = 45 CFU/100 mL	Objective not met
	Pt. Renfrew Rd.	Oct 26 - Nov 16	1	np = 50 CFU/100 mL	Indef. Result (no 5-in-30)
	E206976	Aug 10 - Nov 16	9	7 - 80 CFU/100 mL	
	Koksilah Rd.	Aug 10 - Sep 7	1	np = 72 CFU/100 mL	Objective not met
		Oct 26 - Nov 16	1	np = 66 CFU/100 mL	Indef. Result (no 5-in-30)
	0123981	Jan 9 - Nov 18	22	< 1 - 950 CFU/100 mL	
	at Highway 1	Jan 9 - Feb 6, Aug 10 - Sep 8	2	np = 24 - 686 CFU/100 mL	Objective not met
		Oct 26 - Nov 16	1	np = 500 CFU/100 mL	Indef. Result (no 5-in-30)
	E207433	Aug 10 - Nov 16	9	15 - 650 CFU/100 mL	
	D/S Kelvin Creek	Aug 10 - Sep 7	1	np = 213 CFU/100 mL	Objective not met
		Oct 26 - Nov 16	1	np = 473 CFU/100 mL	Indef. Result (no 5-in-30)
E. coli	Cowichan River:	Aug 10 - Nov 16	9	1 - 670 CFU/100 mL	
	E206108	Aug 10 - Sep 7	1	np = 406 CFU/100 mL	Objective not met
< 10 /100 mL	d/s Cowichan Lake	Oct 26 - Nov 16	1	np = 211 CFU/100 mL	Indef. Result (no 5-in-30)
90th percentile	0120808	Aug 10 - Nov 16	9	2 - 68 CFU/100 mL	
(np)	300m u/s L. Cowichan STP	Aug 10 - Sep 7	1	np = 59 CFU/100 mL	Objective not met
		Oct 26 - Nov 16	1	np = 14 CFU/100 mL	Indef. Result (no 5-in-30)
	E206107	Aug 10 - Nov 16	9	3 - 116 CFU/100 mL	
	400m d/s L. Cowichan STP	Aug 10 - Sep 7	1	np = 19 CFU/100 mL	Objective not met
		Oct 26 - Nov 16	1	np = 89 CFU/100 mL	Indef. Result (no 5-in-30)
	0120802	Aug 10 - Nov 16	9	2 - 73 CFU/100 mL	
	u/s Highway 1	Aug 10 - Sep 7	1	np = 50 CFU/100 mL	Objective not met
		Oct 26 - Nov 16	1	np = 26 CFU/100 mL	Indef. Result (no 5-in-30)
	Koksilah River:	Aug 10 - Nov 16	9	1 - 16 CFU/100 mL	
	E207425	Aug 10 - Sep 7	1	np = 8 CFU/100 mL	Objective met
	Pt. Renfrew Rd.	Oct 26 - Nov 16	1	np = 16 CFU/100 mL	Indef. Result (no 5-in-30)
	E206976	Aug 10 - Nov 16	9	< 1 - 54 CFU/100 mL	
	Koksilah Rd.	Aug 10 - Sep 7	1	np = 34 CFU/100 mL	Objective not met
		Oct 26 - Nov 16	1	np = 46 CFU/100 mL	Indef. Result (no 5-in-30)
	0123981	Aug 10 - Nov 16	9	1 - 810 CFU/100 mL	
	at Highway 1	Aug 10 - Sep 7	1	np = 570 CFU/100 mL	Objective not met
		Oct 26 - Nov 16	1	np = 430 CFU/100 mL	Indef. Result (no 5-in-30)
	E207433	Aug 10 - Nov 16	9	5 - 520 CFU/100 mL	
	D/S Kelvin Creek	Aug 10 - Sep 7	1	np = 155 CFU/100 mL	Objective not met
		Oct 26 - Nov 16	1	np = 370 CFU/100 mL	Indef. Result (no 5-in-30)

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
E. coli	Cowichan River:	Aug 10 - Nov 16	9	< 1 - 33 CFU/100 mL	
< 385 /100 mL	E206106	Aug 10 - Sep 7	1	np = 29 CFU/100 mL	Objective met
90th percentile (np)	1 km d/s Duncan STP	Oct 26 - Nov 16	1	np = 30 CFU/100 mL	Indef. Result (no 5-in-30)
Enterococci					
< 3 /100 mL	Cowichan River	2003	0	no data collected	Omitted
90th percentile	Koksilah River				2003
(np)					
Turbidity	Cowichan River:	Aug 10 - Nov 16	10	0.62 - 2 NTU	Control Site
	E206108				
max increase:	d/s Cowichan Lake				
5 NTU	0120808	Aug 10 - Nov 16	10	0.54 - 5.18 NTU	
or 10%	300m u/s L. Cowichan STP				
			10	increase = 0 - 4.1 NTU	Objective met
	E206107	Aug 10 - Nov 16	10	0.4 - 3.25 NTU	
	400m d/s L. Cowichan STP				
			10	increase = 0 - 2.49 NTU	Objective met
	0120802	Aug 10 - Nov 16	10	0.45 - 118 NTU	
	u/s Highway 1	Aug 10 - Sep 7	5	increase = 0 - 0.13 NTU	Objective met
		Oct 19 - Nov 16	5	increase = 7.17 - 116 NTU	Objective not met
	E206106	Aug 11 - Dec 17	18	< 0.1 - 101 NTU	
	1 km d/s Duncan STP	Aug 11 - Nov 12	8	< 0.1 - 4.68 NTU	Objective met
		Oct 16 - Dec 17	10	5.93 - 101 NTU	Indefinite result (no control)
	Koksilah River:	Aug 10 - Nov 16	10	0.34 - < 12.1 NTU	Control Site
	E207425				
	Pt. Renfrew Rd.				
	E206976	Aug 10 - Nov 16	10	0.24 - < 7.35 NTU	
	Koksilah Rd.				
			10	increase = 0 - < 1.56 NTU	Objective met
	0123981	Jan 23 - Dec 17	30	< 0.1 - < 25 NTU	
	at Highway 1	Jan 23 - Dec 17	25	< 0.1 - < 4.13 NTU	Objective met
		Feb 6 - Oct 16	5	5.07 - < 25 NTU	Indefinite result (no control)
	E207433	Aug 10 - Nov 16	10	0.49 - < 9.9 CFU/100 mL	
	D/S Kelvin Creek	Aug 10 - Nov 16	9	increase = 0 - < 4.52 NTU	Objective met
		Aug 24	1	increase = 6.98 NTU	Objective not met
Suspended	Cowichan River:	Aug 10 - Nov 16	10	1 - 7 mg/L	Control Site
Solids	E206108				
max. increase	d/s Cowichan Lake				
10 mg/L	0120808	Aug 10 - Nov 16	10	< 1 - 6 mg/L	
or 10%	300m u/s L. Cowichan STP				
			8	increase = 0 - 3 mg/L	Objective met
	E206107	Aug 10 - Nov 16	10	< 1 - 5 mg/L	
	400m d/s L. Cowichan STP				
		Aug 10 - Nov 16	8	increase = 0 - 3 mg/L	Objective met
	0120802	Aug 10 - Nov 16	10	< 1 - 166 mg/L	
	u/s Highway 1	Aug 10 - Sep 7	5	increase = 0 - 8 mg/L	Objective met
		Oct 19 - Nov 16	5	increase = 11 - 163 mg/L	Objective not met

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Suspended Solids max. increase 10 mg/L or 10% (continued)	E206106 1 km d/s Duncan STP	Aug 11 - Nov 17	10	< 1 - 90 mg/L	
		Aug 18 - Nov 12	5	< 1 - 8 mg/L	Objective met
		Aug 11 - Nov 17	5	15 - 90 mg/L	Indefinite result (no control)
	Koksilah River: E207425 Pt. Renfrew Rd.	Aug 10 - Nov 16	10	< 1 - 12 mg/L	Control Site
	E206976 Koksilah Rd.	Aug 10 - Nov 16	10	< 1 - 41 mg/L	
		Aug 10 - Nov 16	9	increase = 0 - 2 mg/L	Objective met
		Oct 19	1	increase = 29 mg/L	Objective not met
	0123981 at Highway 1	Aug 10 - Nov 16	10	< 1 - 34 mg/L	
		Aug 10 - Nov 11	8	increase = 0 - 6 mg/L	Objective met
		Nov 16	1	increase = 25 mg/L	Objective not met
		Oct 20	1	34 mg/L	Indefinite result (no control)
	E207433 D/S Kelvin Creek	Aug 10 - Nov 16	10	1 - 16 mg/L	
		Aug 10 - Nov 16	10	increase = 0 - 10 mg/L	Objective met
Ammonia-N < 1.30 mg/L av 6.75 mg/L max at pH = 7.9 temp = 15 C	Cowichan River: E206108 d/s Cowichan Lake	Aug 10 - Nov 16	10	< 0.005 - 0.007 mg/L	Max obj. met
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = < 0.005 - 0.0054 mg/L	Av obj. met
	0120808 300m u/s L. Cowichan STP	Apr 15 - Nov 16	14	< 0.003 - < 0.006 mg/L	Max obj. met
		Aug 5 - 24, Oct 19 - Nov 16	2	av. = 0.0042 - 0.0052 mg/L	Av obj. met
	E206107 400m d/s L. Cowichan STP	Apr 15 - Nov 16	14	< 0.003 - 0.032 mg/L	Max obj. met
		Aug 5 - 24, Oct 19 - Nov 16	2	av. = 0.0056 - 0.01 mg/L	Av obj. met
	0120802 u/s Highway 1	Aug 10 - Nov 16	10	< 0.005 - 0.022 mg/L	Max obj. met
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = < 0.005 - 0.0106 mg/L	Av obj. met
	E206106 1 km d/s Duncan STP	Aug 10 - Nov 16	10	< 0.005 - < 0.078 mg/L	Max obj. met
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.0158 - 0.034 mg/L	Av obj. met
Chlorophyll-a 50 mg/m^2 max	Cowichan River	2003	0	no data collected	Omitted 2003
Total Cl_2 Res. 0.002 mg/L max	Cowichan River	2003	0	no data collected	Omitted 2003
Dissolved Oxygen 8.0 mg/L min Jun - Sep 11.2 mg/L min Oct - May	Cowichan River: E206106 1 km d/s Duncan STP	Jun 26 - Sep 25	3	9.0 - 12.0 mg/L	Objective met
	Koksilah River: 0123981 at Highway 1	Jun 26	1	8.8 mg/L	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Dissolved Cu	Cowichan River: E206108	Aug 10 - Nov 16	10	0.0003 - 0.0009 mg/L	Max obj. met
<0.002 mg/L av	d/s Cowichan Lake	Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00032 - 0.00068 mg/L	Av obj. met
0.004 mg/L max	0120808	Aug 10 - Nov 16	10	0.0002 - 0.0005 mg/L	Max obj. met
or	300m u/s L. Cowichan STP				
20% increase		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.0003 - 0.00038 mg/L	Av obj. met
	E206107	Aug 10 - Nov 16	10	0.0002 - 0.0006 mg/L	Max obj. met
	400m d/s L. Cowichan STP				
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00034 - 0.00043 mg/L	Av obj. met
	0120802	Aug 10 - Nov 16	10	0.0002 - 0.0016 mg/L	Max obj. met
	u/s Highway 1				
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00028 - 0.00074 mg/L	Av obj. met
	E206106	Aug 10 - Nov 16	10	0.0003 - 0.0012 mg/L	Max obj. met
	1 km d/s Duncan STP				
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00046 - 0.00064 mg/L	Av obj. met
	Koksilah River: E207425	Aug 10 - Nov 16	10	0.0003 - < 0.0009 mg/L	Max obj. met
	Pt. Renfrew Rd.	Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00036 - 0.00056 mg/L	Av obj. met
	E206976	Aug 10 - Nov 16	10	0.0004 - < 0.0017 mg/L	Max obj. met
	Koksilah Rd.				
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.0005 - 0.00096 mg/L	Av obj. met
	0123981	Aug 10 - Nov 16	10	0.0004 - 0.0019 mg/L	Max obj. met
	at Highway 1				
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00074 - 0.00114 mg/L	Av obj. met
	E207433	Aug 10 - Nov 16	10	0.0004 - < 0.0014 mg/L	Max obj. met
	D/S Kelvin Creek				
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00048 - 0.00094 mg/L	Av obj. met
Dissolved Pb	Cowichan River: E206108	Aug 10 - Nov 16	10	< 0.0001 - 0.0001 mg/L	Max obj. met
<0.003 mg/L av	d/s Cowichan Lake	Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.0001 mg/L	Av obj. met
0.008 mg/L max	0120808	Aug 10 - Nov 16	10	< 0.0001 - 0.0001 mg/L	Max obj. met
or	300m u/s L. Cowichan STP				
20% increase		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.0001 mg/L	Av obj. met
	E206107	Aug 10 - Nov 16	10	< 0.0001 - 0.0001 mg/L	Max obj. met
	400m d/s L. Cowichan STP				
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.0001 mg/L	Av obj. met
	0120802	Aug 10 - Nov 16	10	< 0.0002 - 0.0002 mg/L	Max obj. met
	u/s Highway 1				
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.0002 mg/L	Av obj. met
Dissolved Pb	E206106	Aug 10 - Nov 16	10	< 0.0001 - 0.0001 mg/L	Max obj. met
	1 km d/s Duncan STP				
<0.003 mg/L av		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.0001 mg/L	Av obj. met
0.008 mg/L max	Koksilah River: E207425	Aug 10 - Nov 16	10	< 0.0001 - 0.0001 mg/L	Max obj. met
or					
20% increase	Pt. Renfrew Rd.	Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.0001 mg/L	Av obj. met
	E206976	Aug 10 - Nov 16	10	< 0.0001 - 0.0001 mg/L	Max obj. met
	Koksilah Rd.				
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.0001 mg/L	Av obj. met

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Dissolved Pb	0123981 at Highway 1	Aug 10 - Nov 16	10	< 0.0001 - 0.0001 mg/L	Max obj. met
<0.003 mg/L av		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.0001 mg/L	Av obj. met
0.008 mg/L max	E207433 D/S Kelvin Creek	Aug 10 - Nov 16	10	< 0.0001 - 0.0001 mg/L	Max obj. met
or					
20% increase		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.0001 mg/L	Av obj. met
Dissolved Zn	Cowichan River: E206108	Aug 10 - Nov 16	10	< 0.0001 - < 0.0034 mg/L	Max obj. met
<0.030 mg/L av	d/s Cowichan Lake	Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00028 - 0.0016 mg/L	Av obj. met
0.180 mg/L max	0120808 300m u/s L. Cowichan STP	Aug 10 - Nov 16	10	< 0.0001 - 0.0005 mg/L	Max obj. met
or					
20% increase		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00022 - 0.0003 mg/L	Av obj. met
	E206107 400m d/s L. Cowichan STP	Aug 10 - Nov 16	10	< 0.0001 - 0.0006 mg/L	Max obj. met
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00028 mg/L	Av obj. met
	0120802 u/s Highway 1	Aug 10 - Nov 16	10	< 0.0001 - 0.0002 mg/L	Max obj. met
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00014 mg/L	Av obj. met
	E206106 1 km d/s Duncan STP	Aug 10 - Nov 16	10	< 0.0001 - 0.0004 mg/L	Max obj. met
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00018 - 0.00022 mg/L	Av obj. met
	Koksilah River: E207425	Aug 10 - Nov 16	10	< 0.0001 - 0.0005 mg/L	Max obj. met
	Pt. Renfrew Rd.	Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00026 - 0.0003 mg/L	Av obj. met
	E206976 Koksilah Rd.	Aug 10 - Nov 16	10	0.0001 - 0.0025 mg/L	Max obj. met
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.0003 - 0.00088 mg/L	Av obj. met
	0123981 at Highway 1	Aug 10 - Nov 16	10	0.0002 - 0.0014 mg/L	Max obj. met
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00042 - 0.00104 mg/L	Av obj. met
	E207433 D/S Kelvin Creek	Aug 10 - Nov 16	10	0.0002 - 0.001 mg/L	Max obj. met
		Aug 10 - Sep 7, Oct 19 - Nov 16	2	av. = 0.00046 - 0.0006 mg/L	Av obj. met
Cu-8 Quinolinolate	Cowichan River	2003	0	no data collected	Omitted 2003
0.0005 mg/L max					

Table 3. Middle Quinsam Lake Water Quality Objectives – 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total-P	Long Lake:	Aug 4 - Nov 16	10	< 0.002 - 0.021 mg/L	
< 0.007 mg/L av.	E219412				
(May - Sept.)	at outlet	Aug 4 - Sep 1	1	av. = 0.0048 mg/L	Objective met
Total-P	Middle Quinsam Lake:	Aug 4 - Nov 16	10	< 0.002 - 0.006 mg/L	
< 0.006 mg/L av.	0900504				
(May - Sept.)	at outlet	Aug 4 - Sep 1	1	av. = 0.0028 mg/L	Objective met
Chlorophyll-a	Quinsam River	2003	0	no data collected	Omitted
< 50 mg/m2					2003
Dissolved Oxygen	Long Lake	2003	0	no data collected	Omitted
3 mg/L min.	Quinsam Lake				2003
1m above seds.					
(May - Sept.)					
Turbidity	0900504	Aug 4 - Nov 16	10	0.26 - < 0.66 NTU	Max. obj. met
< 1.0 NTU av.	Middle Quinsam Lake				
5.0 NTU max.	Outlet	Aug 4 - Sep 1	1	av. = 0.31 NTU	Av. obj. met
Nitrate-N	Long Lake:	Aug 4 - Nov 16	10	< 0.024 - < 0.06 mg/L	Max. obj. met
< 40 mg/L av.	E219412				
200 mg/L max.	at outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = <0.034 - < 0.039 mg/L	Av. obj. met
	Middle Quinsam Lake:	Aug 4 - Nov 16	10	< 0.002 - < 0.917 mg/L	Max. obj. met
	0900504				
	at outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = <0.004 - < 0.020 mg/L	Av. obj. met
	Upper Quinsam River:	Aug 4 - Nov 16	10	< 0.003 - < 0.027 mg/L	Max. obj. met
	0126402				
	at Argonaut Road	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 0.012 - < 0.017 mg/L	Av. obj. met
Total Cobalt	Long Lake:	Aug 4 - Nov 16	10	< 0.000005 - 0.0001 mg/L	Objective met
	E219412				
0.05 mg/L max	at outlet				
	0900504	Aug 4 - Nov 16	10	< 0.000005 - 0.000005 mg/L	Objective met
	Middle Quinsam Lake				
	Outlet				
	Upper Quinsam River:	Aug 4 - Nov 16	10	< 0.000005 - 0.000005 mg/L	Objective met
	0126402				
	at Argonaut Road				
Total Manganese	0900504	Aug 4 - Nov 16	10	0.0054 - 0.0153 mg/L	Objective met
	Middle Quinsam Lake				
0.05 mg/L max	Outlet				

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Suspended Solids	Long Lake:	Aug 4 - Nov 16	10	< 1 - 2 mg/L	Max. obj. met
< 5 mg/L av.	E219412				
25 mg/L max.	at outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 1 - 1.2 mg/L	Av. obj. met
or 10 mg/L max. inc.	0900504	Aug 4 - Nov 16	10	all < 1 mg/L	Max. obj. met
	Middle Quinsam Lake				
	Outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 1 mg/L	Av. obj. met
	Upper Quinsam River:	Aug 4 - Nov 16	10	all < 1 mg/L	Max. obj. met
	0126402				
	at Argonaut Road	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 1 mg/L	Av. obj. met
Ammonia-N	Long Lake:	Aug 4 - Nov 16	10	< 0.005 - 0.009 mg/L	Max. obj. met
< 1.82 mg/L av.	E219412				
12.5 mg/L max.	at outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 0.005 - 0.006 mg/L	Av. obj. met
at pH = 7.5	0900504	Aug 4 - Nov 16	10	< 0.005 - 0.006 mg/L	Max. obj. met
temp. = 12 oC	Middle Quinsam Lake				
	Outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 0.005 - 0.0054 mg/L	Av. obj. met
	Upper Quinsam River:	Aug 4 - Nov 16	10	< 0.005 - 0.012 mg/L	Max. obj. met
	0126402				
	at Argonaut Road	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 0.005 - 0.0064 mg/L	Av. obj. met
Nitrite-N	Long Lake	2003	0	no data collected	Omitted
< 0.02 mg/L av.	Middle Quinsam Lake				2003
0.06 mg/L max.	Quinsam River				
pH	Long Lake:	Aug 4 - Nov 16	10	7.4 - 7.8	
	E219412	Aug 4 - Sep 1, Oct 19 - Nov 16	2	med = 7.6 - 7.7	Objective met
> 6.5 90th percentile	at outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	np = 7.6 - 7.8	Objective met
	0900504	Aug 4 - Nov 16	10	7.4 - 7.8	
(np)	Middle Quinsam Lake	Aug 4 - Sep 1, Oct 19 - Nov 16	2	med = 7.5 - 7.8	Objective met
	Outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	np = 7.56 - 7.8	Objective met
> 6.9 median	Upper Quinsam River:	Aug 4 - Nov 16	10	7.3 - 7.7	
(med.)	0126402	Aug 4 - Sep 1, Oct 19 - Nov 16	2	med = 7.4 - 7.6	Objective met
	at Argonaut Road	Aug 4 - Sep 1, Oct 19 - Nov 16	2	np = 7.56 - 7.7	Objective met
Dissolved Aluminum	Long Lake:	Aug 4 - Nov 16	10	0.0021 - 0.0233 mg/L	Max. obj. met
	E219412				
< 0.05 mg/L av	at outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = 0.0029 - 0.0186 mg/L	Av. obj. met
0.1 mg/L max.	0900504	Aug 4 - Nov 16	10	0.0082 - 0.0193 mg/L	Max. obj. met
	Middle Quinsam Lake				
	Outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = 0.0151 mg/L	Av. obj. met
	Upper Quinsam River:	Aug 4 - Nov 16	10	0.0131 - 0.028 mg/L	Max. obj. met
	0126402				
	at Argonaut Road	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = 0.0162 - 0.0240 mg/L	Av. obj. met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Arsenic < 0.05 mg/L max.	Long Lake: E219412 at outlet	Aug 4 - Nov 16	10	0.0004 - 0.0007 mg/L	Objective met
	0900504 Middle Quinsam Lake Outlet	Aug 4 - Nov 16	10	0.0001 - 0.0004 mg/L	Objective met
	Upper Quinsam River: 0126402 at Argonaut Road	Aug 4 - Nov 16	10	0.0001 - 0.0003 mg/L	Objective met
Total Cadmium < 0.0002 mg/L av. 0.0003 mg/L max.	Long Lake: E219412	Aug 4 - Nov 16	10	< 0.00001 - 0.00001 mg/L	Max. obj. met
	at outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 0.00001 - 0.00001 mg/L	Av. obj. met
	0900504 Middle Quinsam Lake	Aug 4 - Nov 16	10	< 0.00001 - 0.00001 mg/L	Max. obj. met
	Outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 0.00001 - 0.00001 mg/L	Av. obj. met
	Upper Quinsam River: 0126402	Aug 4 - Nov 16	10	< 0.00001 - 0.00001 mg/L	Max. obj. met
	at Argonaut Road	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 0.00001 - 0.00001 mg/L	Av. obj. met
Total Copper < 0.002 mg/L av.	Long Lake: E219412	Aug 4 - Nov 16	10	0.0003 - 0.0007 mg/L	
	at outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = 0.00048 - 0.0006 mg/L	Av. obj. met
	0900504 Middle Quinsam Lake	Aug 4 - Nov 16	10	0.0006 - 0.0011 mg/L	
	Outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = 0.00062 - 0.00074 mg/L	Av. obj. met
	Upper Quinsam River: 0126402	Aug 4 - Nov 16	10	0.0006 - 0.0009 mg/L	
	at Argonaut Road	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = 0.00066 - 0.0007 mg/L	Av. obj. met
Total Iron < 0.3 mg/L av.	Long Lake Middle Quinsam Lake Quinsam River	2003	0	no data collected	Omitted 2003
Total Lead <0.003 mg/L av. 0.005 mg/L max.	Long Lake: E219412	Aug 4 - Nov 16	10	< 0.00001 - 0.00001 mg/L	Max. obj. met
	at outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 0.00001 - 0.00001 mg/L	Av. obj. met
	0900504 Middle Quinsam Lake	Aug 4 - Nov 16	10	< 0.00001 - 0.00001 mg/L	Max. obj. met
	Outlet	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 0.00001 - 0.00001 mg/L	Av. obj. met
	Upper Quinsam River: 0126402	Aug 4 - Nov 16	10	< 0.00001 - 0.00001 mg/L	Max. obj. met
	at Argonaut Road	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 0.00001 - 0.00001 mg/L	Av. obj. met
Total Mercury 0.1 ug/L max.	Long Lake Middle Quinsam Lake Quinsam River	2003	0	no data collected	Omitted 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Nickel 0.025 mg/L max.	Long Lake: E219412 at outlet	Aug 4 - Nov 16	10	< 0.00005 - 0.0002 mg/L	Objective met
	0900504 Middle Quinsam Lake Outlet	Aug 4 - Nov 16	10	< 0.0001 - < 0.0005 mg/L	Objective met
	Upper Quinsam River: 0126402 at Argonaut Road	Aug 4 - Nov 16	10	< 0.0001 - 0.0002 mg/L	Objective met
Total Silver 0.0001 mg/L max.	Long Lake: E219412 at outlet	Aug 4 - Nov 16	10	all < 0.00002 mg/L	Objective met
	0900504 Middle Quinsam Lake Outlet	Aug 4 - Nov 16	10	all < 0.00002 mg/L	Objective met
	Upper Quinsam River: 0126402 at Argonaut Road	Aug 4 - Nov 16	10	all < 0.00002 mg/L	Objective met
Total Zinc 0.03 mg/L max.	Long Lake: E219412 at outlet	Aug 4 - Nov 16	10	0.0005 - 0.0014 mg/L	Objective met
	0900504 Middle Quinsam Lake Outlet	Aug 4 - Nov 16	10	< 0.0003 - 0.0015 mg/L	Objective met
	Upper Quinsam River: 0126402 at Argonaut Road	Aug 4 - Nov 16	10	0.0001 - 0.0011 mg/L	Objective met

Table 4. Oyster River Water Quality Objectives – 2003.

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Fecal Coliforms < 100 CFU /100 mL 90th percentile (np)	Oyster River 0125582 at Duncan Main	Aug 4 - Sep 1	5	1 - 200 CFU/100 mL	
			1	np = 126 CFU/100 mL	Objective not met
	0125580 at Highway	Aug 4 - Sep 1	5	1 - 20 CFU/100 mL	
			1	np = 17.2 CFU/100 mL	Objective met
Turbidity 5 NTU max	Oyster River 0125582 at Duncan Main	Aug 4 - Nov 16	9	0.13 - 1.13 NTU	Objective met
		Oct 19	1	13.7 NTU	Objective not met
Turbidity 7 NTU 90th percentile (np)	Oyster River: 125580 at Highway	Aug 4 - Sep 1	1	np = 0.29 NTU	Objective met
		Oct 19 - Nov 16	1	np = 16.0 NTU	Objective not met
Suspended Solids 12 mg/L max	Oyster River 0125582 at Duncan Main	Aug 4 - Nov 16	9	< 1 - 1 mg/L	Objective met
		Oct 19	1	25 mg/L	Objective not met
Suspended Solids 15 mg/L 90th percentile (np)	Oyster River: 125580 at Highway	Aug 4 - Sep 1	1	np = <1 mg/L	Objective met
		Oct 19 - Nov 16	1	np = 23.6 mg/L	Objective not met
Ammonia-N < 1.85 mg/L av 12.7 mg/L max at pH = 7.5 temp = 10 C	Oyster River 0125582 at Duncan Main	Aug 4 - Nov 16	10	< 0.005 - 0.025 mg/L	Max objective met
		Aug 4 - Sep 1, Oct 19 - Nov 16	2	av = 0.005 - 0.009 mg/L	Av. obj. met
	0125580 at Highway	Aug 4 - Nov 16	10	all < 0.005 mg/L	Max objective met
		Aug 4 - Sep 1, Oct 19 - Nov 16	2	av < 0.005 mg/L	Av. obj. met
	Little Oyster River: E207430	Aug 4 - Nov 16	10	< 0.005 - 0.035 mg/L	Max objective met
		Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = 0.0058 - 0.0188 mg/L	Av. obj. met
	Woodhus Creek: E207431	Oct 19 - Nov 16	5	all < 0.005 mg/L	Max objective met
		Oct 19 - Nov 16	1	av. < 0.005 mg/L	Av. obj. met
Nitrite - N < 0.02 mg/L av 0.06 mg/L max	Oyster River: Little Oyster River: Woodhus Creek:	2003	0	no data collected	Omitted 2003
Nitrate - N 10 mg/L max	Oyster River 0125582 at Duncan Main	Aug 4 - Nov 16	10	< 0.012 - < 0.087 mg/L	Objective met
	0125580 at Highway	Aug 4 - Nov 16	10	< 0.012 - 0.065 mg/L	Objective met
	Little Oyster River: E207430	Aug 4 - Nov 16	10	< 0.027 - < 0.348 mg/L	Objective met
	Woodhus Creek: E207431	Oct 19 - Nov 16	5	< 0.092 - < 0.191 mg/L	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
pH > 6.5 90th perc (np)	Oyster River: 125580	Aug 4 - Nov 16	10	7.2 - 7.7	Objective met
8.5 max	at Highway	Aug 4 - Sep 1, Oct 19 - Nov 16	2	np = 7.46 - 7.66	Objective met
pH 6.5 - 8.5	Oyster River 0125582 at Duncan Main	Aug 4 - Nov 16	10	7.2 - 7.6	Objective met
	Little Oyster River: E207430	Aug 4 - Nov 16	10	6.9 - 7.7	Objective met
	Woodhus Creek: E207431	Oct 19 - Nov 16	5	7.0 - 7.5	Objective met
Dissolved Al	Oyster River 0125582	Aug 4 - Nov 16	10	0.0063 - 0.0632 mg/L	Max objective met
<0.05 mg/L av	at Duncan Main	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av = 0.009 - 0.028 mg/L	Av. obj. met
0.1 mg/L max	0125580	Aug 4 - Nov 16	10	0.0062 - 0.0801 mg/L	Max objective met
	at Highway	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av = 0.0105 - 0.0363 mg/L	Av. obj. met
	Little Oyster River: E207430	Aug 4 - Nov 16 Oct 19 - Nov 11	6 4	0.0205 - 0.0958 mg/L 0.115 - 0.178 mg/L	Max objective met Max objective not met
		Oct 19 - Nov 16 Aug 4 - Sep 1	1 1	av. = 0.1288 av. = 0.0228 mg/L	Av. obj. not met Av. obj. met
	Woodhus Creek: E207431	Oct 26 - Nov 16 Oct 19	4 1	0.0332 - 0.0773 mg/L 0.149 mg/L	Max objective met
		Oct 19 - Nov 16	1	av. = 0.0755 mg/L	Av. obj. not met
Total As 0.05 mg/L max	Oyster River 0125582 at Duncan Main	Aug 4 - Nov 16	10	0.0001 - 0.0004 mg/L	Objective met
	0125580 at Highway	Aug 4 - Nov 16	10	0.0001 - 0.0004 mg/L	Objective met
	Little Oyster River: E207430	Aug 4 - Nov 16	10	0.0003 - 0.001 mg/L	Objective met
	Woodhus Creek: E207431	Oct 19 - Nov 16	5	< 0.0001 - 0.0003 mg/L	Objective met
Total Cd 0.2 ug/L max	Oyster River 0125582 at Duncan Main	Aug 4 - Nov 16	10	< 0.01 - 0.01 ug/L	Objective met
	0125580 at Highway	Aug 4 - Nov 16	10	< 0.01 - 0.01 ug/L	Objective met
	Little Oyster River: E207430	Aug 10 - Nov 11 Aug 4	9 1	< 0.01 - 0.01 ug/L 0.5 ug/L	Objective met Objective not met

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Total Cd 0.2 ug/L max	Woodhus Creek: E207431	Oct 19 - Nov 16	5	< 0.01 ug/L	Objective met
Total Cr 2 ug/L max	Oyster River 0125582 at Duncan Main	Aug 4 - Nov 16	10	< 0.2 - < 0.9 ug/L	Objective met
	0125580 at Highway	Aug 4 - Nov 16	10	< 0.2 - 0.9 ug/L	Objective met
	Little Oyster River: E207430	Aug 10 - Nov 16 Aug 4	9 1	< 0.2 - < 0.3 ug/L 4.1 ug/L	Objective met Objective not met
	Woodhus Creek: E207431	Oct 19 - Nov 16	5	< 0.2 - < 1.0 ug/L	Objective met
Total Co 50 ug/L max	Oyster River 0125582 at Duncan Main	Aug 4 - Nov 16	10	< 0.1 - 0.1 ug/L	Objective met
	0125580 at Highway	Aug 4 - Nov 16	10	< 0.1 - 0.1 ug/L	Objective met
	Little Oyster River: E207430	Aug 10 - Nov 16	10	< 0.1 - 0.3 ug/L	Objective met
	Woodhus Creek: E207431	Oct 19 - Nov 16	5	< 0.1 ug/L	Objective met
Total Cu < 3 ug/L av < 5 ug/L 90th perc. (np)	Oyster River 0125582 at Duncan Main	Aug 4 - Nov 16 Aug 4 - Sep 1, Oct 19 - Nov 16 Aug 4 - Sep 1, Oct 19 - Nov 16	10 2 2	0.5 - < 2.1 ug/L av. = 0.58 - < 0.96 ug/L np = 0.6 - < 1.58 ug/L	 Objective met Objective met
	0125580 at Highway	Aug 4 - Nov 16 Aug 4 - Sep 1, Oct 19 - Nov 16 Aug 4 - Sep 1, Oct 19 - Nov 16	10 2 2	0.6 - 4.1 ug/L av. = 1.0 - 1.6 ug/L np = 1.8 - 2.9 ug/L	 Objective met Objective met
Total Cu < 10 ug/L 90th perc. (np)	Little Oyster River: E207430	Aug 4 - Nov 16 Aug 4 - Sep 1, Oct 19 - Nov 16	10 2	1.3 - 3.2 ug/L np = 1.7 - < 3.1 ug/L	 Objective met
	Woodhus Creek: E207431	Oct 19 - Nov 16 Oct 19 - Nov 16	5 1	< 0.8 - < 1.5 ug/L np = < 1.3 ug/L	 Objective met
Total Fe < 0.3 mg/L 90th perc. (np)	Oyster River	2003	0	no data collected	Omitted 2003

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Total Pb < 3.5 ug/L av 5.4 ug/L max at hardness 11.8 mg/L	Little Oyster River: E207430	Aug 4 - Nov 16	10	< 0.1 - 0.1 ug/L	Max. objective met
		Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 0.1 - 0.1 ug/L	Objective met
	Oyster River 0125582 at Duncan Main	Aug 4 - Nov 16	10	< 0.1 ug/L	Max. objective met
		Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 0.1 ug/L	Av. objective met
	0125580 at Highway	Aug 4 - Nov 16	10	< 0.1 - 0.1 ug/L	Max. objective met
		Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = < 0.1 - 0.1 ug/L	Av. objective met
	Woodhus Creek: E207431	Oct 19 - Nov 16	5	< 0.1 ug/L	Max. objective met
		Oct 19 - Nov 16	1	av. = < 0.1 ug/L	Av. objective met
Total Pb 0.8 ug/g max in fish muscle	Oyster River Woodhus Creek Little Oyster River	2003	0	no data collected	Omitted 2003
Total Mn 0.05 mg/L max	Oyster River 0125582 at Duncan Main	Aug 4 - Nov 16	10	0.0004 - 0.0056 mg/L	Objective met
	0125580 at Highway	Aug 4 - Nov 16	10	0.0017 - 0.0221 mg/L	Objective met
	Woodhus Creek: E207431	Aug 4 - Nov 16	10	< 0.0029 - < 0.0075 mg/L	Objective met
Total Hg <0.02 ug/L av 0.1 ug/L max	Oyster River Woodhus Creek Little Oyster River	2003	0	no data collected	Omitted 2003
Total Hg 0.5 ug/g max in fish muscle	Oyster River Woodhus Creek Little Oyster River	2003	0	no data collected	Omitted 2003
Total Ni 0.025 mg/L max	Little Oyster River: E207430	Aug 4 - Nov 16	10	0.0001 - 0.0005 g/L	Objective met
	Oyster River 0125582 at Duncan Main	Aug 4 - Nov 16	10	< 0.0001 - 0.0003 mg/L	Objective met
	0125580 at Highway	Aug 4 - Nov 16	10	< 0.0001 - 0.0005 mg/L	Objective met
	Woodhus Creek: E207431	Oct 19 - Nov 16	5	0.0002 - 0.0004 mg/L	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Total Zn	Oyster River 0125582	Aug 4 - Nov 16	10	0.0001 - 0.0009 mg/L	Max objective met
<0.01 mg/L av	at Duncan Main	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av = 0.00022 - 0.00032 mg/L	Av objective met
0.03 mg/L max	0125580	Aug 4 - Nov 11	10	0.0001 - 0.0016 mg/L	Max objective met
	at Highway	Aug 4 - Sep 1, Oct 19 - Nov 16	2	av = 0.0005 - 0.0006 mg/L	Av objective met
	Little Oyster River: E207430	Aug 4 - Nov 16	10	0.0009 - 0.0018 mg/L	Max objective met
		Aug 4 - Sep 1, Oct 19 - Nov 16	2	av. = 0.0011 - 0.0014 mg/L	Av objective met
	Woodhus Creek: E207431	Oct 19 - Nov 16	5	0.0003 - 0.0023 mg/L	Max objective met
		Oct 19 - Nov 16	1	av. 0.00074 mg/L	Av objective met

Table 5. Tsolum River Water Quality Objectives - 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Copper < 0.007 mg/L av.	E207826 Tsolum River 500m d/s Murex Creek	Jan 21 - Oct 28 Jun 23 - Jun 25	8 2	0.00048 - 0.00941 mg/L 0.0111 - 0.0114 mg/L	Objective met Objective not met
0.011 mg/L max.		Jan 21 - Oct 28	1	av. = 0.00753 mg/L	Indefinite result (no 5-in-30)
% steelhead egg survival no difference between test & control (at 95% confidence)	Tsolum River	2002	0	no in situ bioassay data collected	Omitted 2002

Table 6. Holland Creek and Stocking Lake Water Quality Objectives - 2003.

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Fecal Coliform < 10 CFU/100 mL 90th percentile. (np)	Holland Creek: E216974 at Chicken Ladder Dam	Jan 15 - Dec 10	23	< 1 - 60 CFU/100 mL	
		Aug 21 - Sep 4, Sep 8 - 29, Nov 12 - Dec 10	3	np = 10.4 - 46.8 CFU/100 mL	Objective not met
	Stocking Lake: E206290 at Centre	Jan 15 - Dec 3	11	< 1 - 2 CFU/100 mL	
			1	np = 2 CFU/100 mL	Indef. Result (no 5-in-30)
Turbidity 1 NTU max	Holland Creek: E216974 at Chicken Ladder Dam	Jan 15 - Dec 3	8	0.12 - 0.43 NTU	Objective met
		Apr 9	1	1.05 NTU	Objective not met
	Stocking Lake: E206290 at Centre	Jan 15 - Dec 3	9	0.36 - 0.93 NTU	Objective met
		Feb 5	1	1.53 NTU	Objective not met
Colour 15 TCU max. or no increase if background > 15 TCU	Holland Creek: E216974 at Chicken Ladder Dam	Jan 15 - Nov 12	7	< 5 - 15 TCU	Objective met
		Apr 9 - Dec 3	2	20 TCU	Objective not met
	Stocking Lake: E206290 at Centre	Jan 15 - Dec 3	9	5 - 10 TCU	Objective met
		Jun 19	1	20 NTU	Objective not met
Total Organic Carbon ≤ 2 mg/L annual average	Holland Creek: E216974 at Chicken Ladder Dam	Jan 15 - Dec 3	9	1.9 - 3.4 mg/L	
			1	av. = 2.42 mg/L	Objective not met
	Stocking Lake: E206290 at Centre	Jan 15 - Dec 3	10	2.1 - 3.3 mg/L	
			1	av. = 2.62 mg/L	Objective not met
pH 6.5 - 8.5	Holland Creek: E216974 at Chicken Ladder Dam	Jan 15 - Dec 3	9	6.5 - 7.3	Objective met
	Stocking Lake: E206290 at Centre	Jan 15 - Dec 3	26	6.72 - 7.4	Objective met
Total Iron 0.3 mg/L max.	Stocking Lake	2003	0	no data collected	Omitted 2003
Chlorophyll *a* 0.0025 mg/L summer av.	Stocking Lake: E206290 at Centre	Feb 5	1	0.0015 mg/L	Indefinite result No summer samples
Total Phosphorus 0.001 mg/L av. at spring overturn	Stocking Lake: E206290 at Centre	Feb 5	2	0.004 - 0.007 mg/L	
			1	av. = 0.0055 mg/L	Objective not met

Table 7. Kathlyn, Seymour, Round and Tyhee Lakes Objectives – 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms	E207549 Kathlyn #2	Apr 7 - May 6	5	all < 2 CFU/100 mL	
Intakes: ≤ 10 /100 mL			1	np = < 2 CFU/100 mL	Objective met
90th percentile (np)	E207550 Kathlyn #3	Apr 7 - May 6	5	< 2 - 18 CFU/100 mL	
			1	np = 11.6 CFU/100 mL	Objective not met
Beaches: ≤ 200 /100 mL geometric mean (gm)	E207551 Kathlyn #4	Apr 7 - May 6	5	all < 2 CFU/100 mL	
≤ 400 /100 mL			1	np = < 2 CFU/100 mL	Objective met
90th percentile (np)	Seymour Lake: E207552 Seymour #1	Apr 7 - May 6	5	all < 2 CFU/100 mL	
			1	np = < 2 CFU/100 mL	Objective met
	E207553 Seymour #2	Apr 14 - May 12	5	< 1 - 4 CFU/100 mL	
			1	np = 3.2 CFU/100 mL	Objective met
	E207554 Seymour #3	Apr 7 - May 6	5	all < 2 CFU/100 mL	
			1	np = < 2 CFU/100 mL	Objective met
	Round Lake: E207558 Round #4	Apr 7 - May 6	5	all < 2 CFU/100 mL	
			1	np = < 2 CFU/100 mL	Objective met
	E249107 Round #5	Apr 14 - May 12	5	1 - < 2 CFU/100 mL	
			1	np = < 2 CFU/100 mL	Objective met
	Tyhee Lake: E207560 Tyhee #2	Apr 7 - May 6	5	all < 2 CFU/100 mL	
			1	np = < 2 CFU/100 mL	Objective met
	E207561 Tyhee #3	Apr 22	1	< 2 CFU/100 mL	
			1	np = < 2 CFU/100 mL	Indefinite result: No 5-in-30
	E207562 Tyhee #4	Apr 7 - May 6	5	all < 2 CFU/100 mL	
			1	np = < 2 CFU/100 mL	Objective met
Turbidity	E207549 Kathlyn #2	Apr 14 - May 6	3	0.81 - 2.59 NTU	Max obj met
≤ 5 NTU max			1	av = 1.52 NTU	Indefinite result: No 5-in-30
≤ 1 NTU av	E207550 Kathlyn #3	Apr 7 - May 6	5	0.9 - 2.09 NTU	Max obj met
			1	av = 1.5 NTU	Av obj not met
	E207551 Kathlyn #4	Apr 7 - May 6	5	0.54 - 2.26 NTU	Max obj met
			1	av = 1.19 NTU	Av obj not met
	Seymour Lake: E207552 Seymour #1	Apr 22 - May 6	3	4.07 - 4.98 NTU	Max obj met
		Apr 7 - Apr 14	2	6.25 - 6.98 NTU	Max obj not met
		Apr 22 - May 6	1	av = 5.3 NTU	Av obj not met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity ≤ 5 NTU max ≤ 1 NTU av	E207553 Seymour #2	Apr 14 - May 12	5	1.05 - 4.32 NTU	Max obj met
			1	av = 2.17 NTU	Av obj not met
	E207554 Seymour #3	Apr 7 - May 6	5	0.99 - 3.19 NTU	Max obj met
			1	av = 1.69 NTU	Av obj not met
	Round Lake: E207558 Round #4	Apr 7 - May 6	5	1.22 - 4.19 NTU	Max obj met
			1	av = 1.95 NTU	Av obj not met
	E249107 Round #5	Apr 22 - May 12	5	0.65 - 1.2 NTU	Max obj met
			1	av = 0.98 NTU	Av obj met
	Tyhee Lake: E207560 Tyhee #2	Apr 7 - May 6	5	0.55 - 1.78 NTU	Max obj met
			1	av = 1.01 NTU	Av obj not met
	E207562 Tyhee #4	Apr 7 - May 6	5	0.33 - 1.28 NTU	Max obj met
			1	av = 0.73 NTU	Av obj met
Total Phosphorus ≤ 0.029 mg/L av. Spring turnover	Kathlyn Lake E207550 Kathlyn #3	Apr 7	1	0.0018 mg/L	
			1	av = 0.018 mg/L	Objective met
	E207551 Kathlyn #4	Apr 7	1	0.0011 mg/L	
			1	av = 0.011 mg/L	Objective met
	Seymour Lake: E207552 Seymour #1	Apr 7	1	0.072 mg/L	
			1	av = 0.072 mg/L	Objective not met
	E207553 Seymour #2	Apr 14	1	0.04 mg/L	
			1	av = 0.04 mg/L	Objective not met
	E207554 Seymour #3	Apr 7	1	0.0017 mg/L	
			1	av = 0.017 mg/L	Objective met
	Round Lake: E207558 Round #4	Apr 7	1	0.067 mg/L	
			1	av = 0.067 mg/L	Objective not met
	Tyhee Lake: E207560 Tyhee #2	Apr 7	1	0.037 mg/L	
			1	av = 0.037 mg/L	Objective not met
	E207562 Tyhee #4	Apr 7	1	0.014 mg/L	
			1	av = 0.014 mg/L	Objective met
Colour ≤ 15 TCU max	E207549 Kathlyn #2	Apr 14 - May 6	2	10 TCU	Objective met
		Apr 22	1	20 TCU	Objective not met
	E207550 Kathlyn #3	Apr 7 - May 6	5	10 - 15 TCU	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Colour ≤ 15 TCU max	E207551 Kathlyn #4	Apr 7 - May 6 Apr 22 - Apr 29	3 2	10 - 15 TCU 20 TCU	Objective met Objective not met
	Seymour Lake: E207552 Seymour #1	Apr 7 - May 6	5	50 - 70 TCU	Objective not met
	E207553 Seymour #2	Apr 14 - May 12	5	20 - 50 TCU	Objective not met
	E207554 Seymour #3	Apr 7 - May 6	5	40 - 50 TCU	Objective not met
	Round Lake: E207558 Round #4	Apr 7 - May 6 Apr 22	4 1	all 15 TCU 30 TCU	Objective met Objective not met
	E249107 Round #5	Apr 22 - May 6 May 12	3 1	all 15 TCU 20 TCU	Objective met Objective not met
	Tyhee Lake: E207560 Tyhee #2	Apr 14 - May 6 Apr 7	4 1	5 - 15 TCU 20 TCU	Objective met Objective not met
	E207562 Tyhee #4	Apr 7 - May 6	5	all 10 TCU	Objective met

Table 8. Lakelse Lake Water Quality Objectives – 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms Intakes: ≤ 10 /100 mL	Lakelse Lake: E207583 Furlong Beach	2003	0	no data collected	Omitted 2003
90th percentile (np) Beaches: ≤ 200 /100 mL geometric mean (gm) ≤ 400 /100 mL	E207580 Lakelse Lake #1	Apr 8 - Sep 3	10	< 1 - 2 CFU/100 mL	
		Apr 8 - May 5, Aug 6 - Sep 3	2	np = 1.6 - 2 CFU/100 mL	Objective met
	E246120 Lakelse Lake #2	Apr 8 - Sep 3	10	< 1 - 3 CFU/100 mL	
		Apr 8 - May 5, Aug 6 - Sep 3	2	np = 2 - 2.2 CFU/100 mL	Objective met
90th percentile (np)	E251910 Lakelse Lake #5	Apr 15 - Sep 3	12	< 1 - 3 CFU/100 mL	
		Apr 15 - May 5, Aug 6 - Sep 3	2	np = 2 - 2.2 CFU/100 mL	Objective met
Turbidity ≤ 5 NTU max ≤ 1 NTU av	E207580 Lakelse Lake #1	Apr 8 - Sep 3	10	0.74 - 1.76 NTU	Objective met
		Apr 8 - May 5, Aug 6 - Sep 3	2	av = 1.11 - 1.15 NTU	Objective not met
	E246120 Lakelse Lake #2	Apr 8 - Sep 3	9	0.55 - 4.62 NTU	Objective met
		Apr 8	1	7.84 NTU	Objective not met
		Apr 8 - May 5	1	av = 2.71 NTU	Objective not met
		Aug 6 - Sep 3	1	av = 0.75 NTU	Objective met
	E251910 Lakelse Lake #5	Apr 8 - Sep 3	10	0.39 - 1.59 NTU	Objective met
		Apr 8 - May 5, Aug 6 - Sep 3	2	av = 0.55 - 0.97 NTU	Objective met
Total Phosphorus ≤ 0.01 mg/L av.	E206616 Deep Station	Feb 13 - Jul 7	13	0.005 - 0.01 mg/L	
			1	av = 0.0067 mg/L	Objective met
Chlorophyll a ≤ 0.003 mg/L av.	E206616 Deep Station	May 20 - Jul 7	16	0.001 - 0.0037 mg/L	
			1	av = 0.0026 mg/L	Objective met
Dissolved Oxygen ≥ 6 mg/L @ 5m above sediments	E206616 Deep Station	May 20 - Jul 20	2	8.7 - 13.0 mg/L	Objective met
		Sep 3	1	4.4 mg/L	Objective not met

Table 9. Nechako River Water Quality Objectives - 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform <100/100ml 90th perc. (np)	Nechako River E206583 at Prince George	Jan 6 - Jun 5	11	< 1 - 26 CFU/100 mL	No 5-in-30
			1	np = 18 CFU/100 mL	Indefinite result
	Federal/Provincial Site E206583 at Prince George	Jun 19 - Dec 8	14	< 1 - 5 CFU/100 mL	No 5-in-30
			1	np = 5 CFU/100 mL	Indefinite result
	Chilako River:	2003	0	no data collected	Omitted 2003
Fecal Coliforms <10/100ml 90th perc (np)	Stuart River:	2003	0	no data collected	Omitted 2003
Fecal Coliforms <200/100ml geometric mean (gm) <400/100ml 90 perc. (np)	Necoslie River:	2003	0	no data collected	Omitted 2003
Total Cl_2 Res. 0.002 mg/L max	Nechako & Stuart Rivers	2003	0	no data collected	Omitted 2003
Ammonia-N <2.05 mg/L av 14.1 mg/L max at pH = 7.5 temp = 1 °C	Nechako River	2003	0	no data collected	Omitted 2003
Ammonia-N <1.24 mg/L av 6.46 mg/L max at pH = 8.0 temp = 1 °C	Stuart River	2003	0	no data collected	Omitted 2003
Nitrite-N < 0.02 mg/L av 0.06 mg/l max	Nechako River	2003	0	no data collected	Omitted 2003
Chlorophyll - a < 50 mg/L av	Nechako River Stuart River	2003	0	no data collected	Omitted 2003
Chlorophyll - a < 100 mg/L av	Chilako River	2003	0	no data collected	Omitted 2003
Dissolved Oxygen 7.75 - 11.2 mg/L min depending on fish egg stage	Nechako River E206583 at Prince George	Jan 6 - Dec 8	19	9.2 - 14.0 mg/L	Objective met
pH 6.5 - 8.5	Nechako River E206583 at Prince George	Jan 20 - Dec 8	19	7.6 - 8.1	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Temperature	Nechako River:	Jan 1 - Dec 31	343	minus 2.0 - 19.8°C	
< 15 °C av	immediately d/s				
~ 100 m d/s	Cheslatta Falls*	Jun 9 - Sep 13	64	15.1 - 19.8°C	Objective not met
Cheslatta Falls	(DFO's Cheslatta Falls site)	Jan 1 - Dec 31	279	minus 2.0 - 15.0°C	Objective met
Temperature	Nechako River:	Jan 1 - Dec 31	364	0.7 - 21.4°C	
	at Vanderhoof				
< 20 °C Jul - Aug.	~40 km u/s Stuart R. confl.	Jul 1 - Aug 31	60.6	12.8 - 19.9°C	Objective met
< 18 °C Sep - Jun.	(DFO's Vanderhoof site)	Jul 9 - Aug 15	1.4	20.1 - 21.4°C	Objective not met
~ 100 m u/s		Jan 1 - Dec 31	298	0.7 - 18.0°C	Objective met
Stuart River		Jun 6 - Sep 3	3.9	18.1 - 20.2°C	Objective not met
Total Gas Pressure 109 % max	Nechako River	2003	0	no data collected	Omitted 2003

Table 10. Peace River Water Quality Objectives - 2003.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <100 /100 mL 90th percentile (np)	Peace River E206585 at Alces	Feb 12 - Jun 2	8	< 1 - 12 CFU/100 mL	No 5-in-30 day samples
			1	np. = 9.2 CFU/100 mL	Indefinite result
	Federal Provincial Site E206585 at Alces	Jun 25 - Dec 1	15	< 1 - 246 CFU/100 mL	No 5-in-30 day samples
			1	np. = 55.4 CFU/100 mL	Indefinite result
Turbidity 5 NTU or 10% max increase	E206585 at Alces	Feb 12 - Dec 15	22	0.67 - 1170 NTU	Indefinite result No control
Suspended solids 10 mg/L or 10% max increase	Peace River	2003	0	no data collected	Omitted 2003
Total chlorine residual 0.002 mg/L max	Peace River	2003	0	no data collected	Omitted 2003
Dissolved fluoride 1.0 mg/L max	Peace River	2003	0	no data collected	Omitted 2003
Chlorophyll-a 50 mg/m2 max	Peace River	2003	0	no data collected	Omitted 2003
Ammonia-N < 1.78 mg/L av 9.26 mg/L max at pH = 7.8 temp = 0 °C	Peace River	2003	0	no data collected	Omitted 2003
Nitrite - N < 0.04 mg/L av. 0.12 mg/L max. at chloride 2-4 mg/L	Peace River	2003	0	no data collected	Omitted 2003
Dissolved Oxygen 7.25 mg/L min	Peace River	2003	0	no data collected	Omitted 2003
pH 6.5 - 9.0 max change 0.5 pH units	E206585 at Alces	Feb 12 - Dec 15	19	7.8 - 8.2	Objective met
Total dissolved gas 110% saturation max	Peace River	2003	0	no data collected	Omitted 2003
Temperature max increase 1°C	E206585 at Alces	Feb 12 - Dec 15	23	0 - 16 °C	Indefinite result No control

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total copper 4 ug/L av. 11 ug/L max. at hardness 100 mg/L	E206585 at Alces	Feb 24 - Dec 15 Apr 21 - Jun 16 Jun 2 - Jun 30	18 2 1	0.3 - 8.83 ug/L 35.5 - 37.1 ug/L av. = 9.5 ug/L	Max obj. met Max obj. not met Av. Obj not met
Chlorinated phenols sum of tri, tetra and penta 0.2 ug/L	Peace River	2003	0	no data collected	Omitted 2003
Total lead 6 ug/L av. 82 ug/L max. at hardness 100 mg/L	E206585 at Alces	Feb 24 - Dec 15 Jun 2 - Jun 30	21 1	0.017 - 17.3 ug/L av. = 1.7 ug/L	Max obj. met Av. Obj met
Total nickel 65 ug/L max. at hardness 60 - 120 mg/L	E206585 at Alces	Feb 24 - Dec 15	21	0.02 - 46.7 ug/L	Max obj. met
Total zinc 30 ug/L max or 20% increase	E206585 at Alces	Jan 8 - Sep 30 Apr 21 - Jun 16	18 3	0.09 - 23.8 mg/L 33.7 - 143 mg/L	Objective met Indefinite result No control
Phenol 0.002 mg/L av.	Peace River	2003	0	no data collected	Omitted 2003
Un-ionized H_2S 0.002 mg/L max	Peace River	2003	0	no data collected	Omitted 2003
2,4-D Ester 0.004 mg/L	Peace River	2003	0	no data collected	Omitted 2003

Table 11. Fraser River (From the Source to Hope) Water Quality Objectives – 2003.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms	Fraser River Fed/Prov Site	Jun 24 - Dec 16	12	< 1 - 59 CFU/100 mL	
<100 /100 mL	at Red Pass	Jun 24 - Jul 22	1	np = 1.6 CFU/100 mL	Objective met
90th percentile	Fed/Prov Site	Jun 23 - Nov 12	11	< 1 - 21 CFU/100 mL	No 5-in-30
(np)	at Hansard				samples:
			1	np = 20 CFU/100 mL	Indefinite result
	E206182	Jan 8 - Mar 27	6	16 - 96 CFU/100 mL	No 5-in-30
	at Stoner				samples:
	(d/s Pr. Ge. mills)		1	np = 68 CFU/100 mL	Indefinite result
	0600011	Jan 8 - Dec 22	24	< 1 - 900 CFU/100 mL	No 5-in-30
	at Marguerite				samples:
	(d/s Quesnel)		1	np = 200 CFU/100 mL	Indefinite result
	E206581	Jan 14 - Dec 2	28	< 1 - 280 CFU/100 mL	
	at Hope				
		Jan 8 - Feb 25	1	np = 7.8 CFU/100 mL	Objective met
E. coli	E206182	Jan 8 - Mar 27	6	11 - 72 CFU/100 mL	No 5-in-30
<100/100 mL	at Stoner				samples:
90th percentile	(d/s Pr. Ge. mills)				
(np)			1	np = 52 CFU/100 mL	Indefinite result
Chlorine Residual	Fraser River	2003	0	no data collected	Omitted
< 2 ug/L av.					2003
Suspended Solids	Fraser River	2003	0	no data collected	Omitted
10 mg/L or 10%					2003
max increase					
Turbidity	Fraser River	Jan 7 - Dec 16	21	0.2 - 3.46 NTU	Objective met
1 - 5 NTU	Fed/Prov Site				
max increase	at Red Pass				
(control: 5 - 50 NTU)	Fed/Prov Site	Jul 8 - Nov 12	2	0.11 - 3.63 NTU	Objective met
	at Hansard	Apr 28 - Oct 27	12	6.02 - 172 NTU	Indefinite result
					(no control)
	0600011	Feb 18 - Dec 22	2	2.94 - 3.13 NTU	Objective met
	at Marguerite	Jan 23 - Dec 22	19	5.15 - 266 NTU	Indefinite result
	(d/s Quesnel)				(no control)
	E206581	Jan 2 - Dec 16	10	0.13 - 4.73 NTU	Objective met
	at Hope	Jan 28 - Nov 4	14	5.71 - 67.5 NTU	Indefinite result
					(no control)
Colour	Fraser River	Jan 7 - Dec 16	6	5 - 10 TCU	Objective met
	Fed/Prov Site	Jun 3 - Oct 28	10	5 - 10 TCU	Objective met
15 TCU max	at Red Pass				
Jun - Sep	Fed/Prov Site	Apr 28 - May 26, Oct 27	4	10 - 40 TCU	Objective met
75 TCU max	at Hansard	Jun 16 - Sep 15	7	5 - 10 TCU	Objective met
Oct - May		Jun 9	1	40 TCU	Objective not met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Colour 15 TCU max Jun - Sep 75 TCU max Oct - May	0600011 at Marguerite (d/s Quesnel)	Jan 23 - May 29, Oct 2 - Dec 22 Jun 11 - Sep 15 Jun 5 - Jun 17	12 7 2	10 - 50 TCU 5 - 15 TCU 20 - 60 TCU	Objective met Objective met Objective not met
	E206581 at Hope	Jan 2 - May 20, Oct 7 - Dec 16 Jun 3 - Jun 24 Jun 6 - Sep 23	17 2 5	5 - 30 TCU 20 TCU 5 - 15 TCU	Objective met Objective not met Objective met
Temperature 1 °C max increase	Fraser River Fed/Prov Site at Red Pass	Jan 7 - Dec 16	22	0.5 - 14.5 °C	Indefinite result No control
	Fed/Prov Site at Hansard	Apr 28 - Nov 12	15	1 - 17 °C	Indefinite result No control
	E206182 at Stoner (d/s Pr. Ge. mills)	Jan 21 - Feb 18	2	0.1 - 1.1 °C	Indefinite result No control
	0600011 at Marguerite (d/s Quesnel)	Jan 23 - Dec 22	20	-1 - 18 °C	Indefinite result No control
	E206581 at Hope	Jan 2 - Dec 16	24	2 - 16.5 °C	Indefinite result No control
Ammonia-N < 1.78 mg/L av 9.26 mg/L max at pH = 7.8 temp = 0 °C	Fraser River	2003	0	no data collected	Omitted 2003
Nitrite - N < 0.04 mg/L av. 0.12 mg/L max. at chloride 2-4 mg/L	Fraser River	2003	0	no data collected	Omitted 2003
Nitrate+Nitrite-N 10 mg/L max	Fraser River	2003	0	no data collected	Omitted 2003
Chlorophyll-a 50 mg/m2 max	Fraser River	2003	0	no data collected	Omitted 2003
pH 6.5 - 8.5	E206182 at Stoner (d/s Pr. Ge. mills)	Jan 21	1	8.22	Objective met
	0600011 at Marguerite (d/s Quesnel)	Jan 23 - Dec 22	20	7.6 - 8.1	Objective met
	E206581 at Hope	Jan 2 - Dec 16	24	7.6 - 8.0	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 8.0 mg/L min May to Oct 11.0 mg/L min Nov to Apr	Fed/Prov Site at Hansard	Apr 28 - Nov 12 May 12 - Oct 27	2 12	12 - 13.5 mg/L 9.4 - 13.1 mg/L	Objective met Objective met
	E206182 at Stoner (d/s Pr. Ge. mills)	Jan 21 - Feb 18	2	11.2 - 13 mg/L	Objective met
	0600011 at Marguerite (d/s Quesnel)	Jan 23 - Apr 28 Mar 3 - Apr 3 May 29 - Oct 2 Nov 12 - Dec 22	5 2 11 3	11.3 - 13.5 mg/L 10.6 mg/L 9.2 - 10.9 mg/L 9.9 - 10.2 mg/L	Objective met Objective not met Objective met Objective not met
	E206581 at Hope	Jan 2 - Apr 8, Nov 4 - Dec 16 May 6 - Oct 21	12 12	12.8 - 14.2 mg/L 9.6 - 11.8 mg/L	Objective met Objective met
Total Lead 0.8 ug/g max in fish muscle	Fraser River	2003	0	no data collected	Omitted 2003
Total PCBs 2.0 ug/g max in fish muscle 0.1 ug/g max in whole fish	Fraser River	2003	0	no data collected	Omitted 2003
Chlorophenols max. TCP's pH 7.8 2,3,4-: 0.1 ug/L 2,3,5-: 0.08 ug/L 2,3,6-: 0.32 ug/L 2,4,5-: 0.08 ug/L 2,4,6-: 0.5 ug/L 3,4,5-: 0.06 ug/L tot: 1.14 ug/L	Fraser River	2003	0	no data collected	Omitted 2003
max TTCPs pH 7.8: 2,3,4,5-: 0.2 ug/L 2,3,4,6-: 0.3 ug/L tot: 0.6 ug/L	Fraser River	2003	0	no data collected	Omitted 2003
max PCP pH 7.8: 0.1 ug/L	Fraser River	2003	0	no data collected	Omitted 2003
AOX no increase over control at 95% confidence	E206182 at Stoner (d/s Pr. Ge. mills)	Jan 21 - Feb 18	2	all < 0.1 mg/L	Indefinite result No control
	0600011 at Marguerite (d/s Quesnel)	Mar 17 - Dec 22	17	0.011 - < 0.1 mg/L	Indefinite result No control
	E206581 at Hope	Feb 25 - Dec 16	19	0.007 - < 0.1 mg/L	Indefinite result No control

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Resin Acids 12 ug/L max DHA 45 ug/L max total at pH 7.5	Fraser River	2003	0	no data collected	Omitted 2003
Dioxins and Furans in water 0.06 pg/L max TCDD-TEQ	Fraser River	2003	0	no data collected	Omitted 2003
Dioxins and Furans in sediments 0.25 pg/g max TCDD-TEQ	Fraser River	2003	0	no data collected	Omitted 2003
Dioxins and Furans in fish lipids 50 pg/g TCDD-TEQ	Fraser River	2003	0	no data collected	Omitted 2003

Table 12. Williams Lake Water Quality Objectives – 2003.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform < 200 /100 mL geometric mean (gm) < 400 /100 mL 90th percentile (np) at beaches	Williams Lake	2003	0	no data collected	Omitted 2003
Fecal Coliform < 10/100 mL 90th percentile at water intakes	Williams Lake	2003	0	no data collected	Omitted 2003
Turbidity < 1 NTU av 5 NTU max.	0603019 Williams Lake: at lake centre	Apr.16	5	2.37 - 2.75 NTU	Max obj. met
			1	av. = 2.5 mg/L	Objective not met
	0603022 Williams Lake: at deepest point	Apr.16	1	3.08 NTU	Max obj. met
			1	av. = 3.08 NTU	Objective not met
Total P < 0.020 mg/L av at spring overturn	0603019 Williams Lake: at lake centre	Apr.16	5	0.051 - 0.06 mg/L	
			1	av. = 0.056 mg/L	Objective not met
	0603022 Williams Lake: at deepest point	Apr.16	1	0.058 mg/L	
			1	av. = 0.058 mg/L	Objective not met
Chlorophyll-a < 5 ug/L av (May to Aug)	Williams Lake	2003	0	no data collected	Omitted 2003
Dissolved Oxygen 4.0 mg/L min 5 m above sed.	Williams Lake	2003	0	no data collected	Omitted 2003
Water Clarity 1.2 m min Secchi reading (May to August)	0603019 Williams Lake: at lake centre	May 15 - Oct 24	24	1.41 - 4.80 m	Objective met

Table 13. Okanagan Valley Lakes Water Quality Objectives – 2003.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total - P < 0.040 mg/L av. at spring overturn (short-term)	Wood Lake: 0500450 West of Vernon Creek	Feb 10	1 1 1	1 m: 0.05 mg/L 20 m: 0.052 mg/L av. = 0.051 mg/L	Objective not met
	0500848 Wood Lake Deep Basin	Feb 10	1 1 1 1	1 m: 0.05 mg/L 15 m: 0.049 mg/L 20 m: 0.049 mg/L av. = 0.0497 mg/L	Objective not met
Total - P < 0.008 mg/L av. at spring overturn	Kalamalka Lake: 0500246 at south end	Feb 10	1 1 1 1	1 m: 0.005 mg/L 15 m: 0.004 mg/L 20 m: 0.004 mg/L av. = 0.0043 mg/L	Objective met
	0500461 Kalamalka Lake South of Coldstream Creek	Feb 10	1 1 1 1	1 m: 0.006 mg/L 15 m: 0.007 mg/L 20 m: 0.006 mg/L av. = 0.0063 mg/L	Objective met
Total - P < 0.010 mg/L av at spring overturn	Okanagan Lake: 0500239 at Armstrong Arm	May 6 May 26	3 3 2	0.005 - 0.01 mg/L 0.005 - 0.009 mg/L av = 0.007 - 0.0077	Objective met
	0500238 Okanagan Lake at Vernon Arm at Vernon Arm	Feb 11	1 1 1 1	1 m: 0.005 mg/L 15 m: 0.006mg/L 20 m: 0.006 mg/L av. = 0.0057 mg/L	Objective met
	0500730 Okanagan Lake at north basin	May 6 May 26	3 3 2	0.007 - 0.008 mg/L 0.005 - 0.006 mg/L av = 0.0057 - 0.0073	Objective met
	0500236 Okanagan Lake at central basin	May 6	3 1	0.004 - 0.008 mg/L av = 0.0057 mg/L	Objective met
	0500729 Okanagan Lake at south basin	Mar 3	1 1 1	1 m: 0.005 mg/L 20 m: 0.007 mg/L av. = 0.006 mg/L	Objective met
	0500454 Okanagan Lake U/S Kelowna STP	Apr 1	3 1	1 m: 0.004 - 0.005 mg/L av. = 0.0047 mg/L	Objective met
	0500456 Okanagan Lake South Prairie C.	Feb 17	1 1 1	1 m: 0.008 mg/L 20 m: 0.006 mg/L av. = 0.007 mg/L	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total - P < 0.015 mg/L av at spring overturn	Skaha Lake:	Apr 21	1	0.003 - 0.007 mg/L	
	0500615	May 14	1	0.008 - 0.012 mg/L	
	Skaha Lake		2	av. = 0.005 - 0.009 mg/L	Objective met
	at center				
	0500453	Jan 30	1	1 m: 0.008 mg/L	
	Skaha Lake		1	20 m: 0.007 mg/L	
	W.Okanagan L. river mouth		1	av. = 0.0075 mg/L	Objective met
	0500846	Jan 30	1	1 m: 0.007 mg/L	
	Skaha Lake		1	20 m: 0.005 mg/L	
	south basin		1	av. = 0.006 mg/L	Objective met
	Osoyoos Lake:	Feb 6	1	1 m: 0.018 mg/L	
	0500249		1	15 m: 0.015 mg/L	
	at north basin		1	20 m: 0.020 mg/L	
			1	av. = 0.0178 mg/L	Objective not met
	0500728	Apr 21	1	0.005 - 0.008 mg/L	
	Osoyoos Lake	Jun 16	1	0.004 - 0.038 mg/L	
	opp. Monashee Co-op		1	av. = 0.0067 mg/L	Objective met
			1	av. = 0.016 mg/L	Objective not met

Table 14. Similkameen River and Hedley Creek Water Quality Objectives – 2003.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms < 10 /100 mL 90th percentile (np)	0500629 Similkameen River @ Princeton Hwy 3 Bridge	Jan 7 - May 27	11	< 1 - < 2 CFU/100 mL	
			1	np = < 2 CFU/100 mL	Indefinite result - no 5-in-30
	0500073 Similkameen River @ Chopka Rd. Bridge	Jan 7 - May 27	9	< 1 - 10 CFU/100 mL	
			1	np = < 2 CFU/100 mL	Indefinite result - no 5-in-30
E. coli < 10 /100 mL 90th percentile (np)	Similkameen River	2003	0	no data collected	Omitted 2003
Enterococci < 3 /100 mL 90th percentile	Similkameen River	2003	0	no data collected	Omitted 2003
Suspended Solids max. increase: 10 mg/L or 10%	E223873 Hedley Creek U/S Nickel Plate Diffuser	Jan 6 - Mar 31	15	< 0.1 - 3 mg/L	Control Site
	E223874 Hedley Creek 100 m D/S Nickel Plate Diffuser	Jan 6 - Mar 31	15	< 0.1 - 3 mg/L	
			15	increase = 0 - 0.5 mg/L	Objective met
Substrate Sedimentation: no increase in weight of particles < 3 mm dia.	Similkameen River	2003	0	no data collected	Omitted 2003
Turbidity max. increase: 1 - 5 NTU or 10%	0500629 Similkameen River @ Princeton Hwy 3 Bridge	Jan 21 - Dec 16	20	0.06 - 8.99 NTU	Control Site
	0500073 Similkameen River @ Chopka Rd. Bridge	Feb 4 - Dec 16	22	0.16 - 844 NTU	
		Feb 4 - Dec 16	14	increase = 0 - 4.81 NTU	Objective met
	E223873 Hedley Creek U/S Nickel Plate Diffuser	Jan 6 - Mar 31	15	< 0.1 - 0.9 NTU	Control Site
	E223874 Hedley Creek 100 m D/S Nickel Plate Diffuser	Jan 6 - Mar 31	15	0.4 - 1.1 NTU	
			15	increase = 0 - 0.4 NTU	Objective met
Total Cl2 Residue 0.002 mg/L max.	Similkameen River	2003	0	no data collected	Omitted 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
WAD-CN	0500629 Similkameen River	Jan 21 - Dec 16	20	< 0.0005 - 0.0005 mg/L	Max objective met
< 0.005 mg/L av	@ Princeton Hwy 3 Bridge	Jun 10 - Jul 8	1	av. = < 0.0005 mg/L	Objective met
0.010 mg/L max.	0500073 Similkameen River	Feb 4 - Dec 16	22	all < 0.0005 mg/L	Max objective met
	@ Chopka Rd. Bridge	Jun 10 - Jul 8, Sep 30 - Oct 28	2	av. = < 0.0005 mg/L	Objective met
	E223873 Hedley Creek	Jan 6 - Mar 31	15	all < 0.005 mg/L	Objective met
	U/S Nickel Plate Diffuser	Jan 6 - 27, Feb 3 - 24, Mar 3 - 31	3	av. = < 0.005 mg/L	Objective met
	E223874 Hedley Creek	Jan 6 - Mar 31	15	all < 0.005 mg/L	Objective met
	100 m D/S Nickel Plate Diffuser	Jan 6 - 27, Feb 3 - 24, Mar 3 - 31	3	av. = < 0.005 mg/L	Objective met
SAD-CN + SCN	E223873 Hedley Creek U/S Nickel Plate Diffuser	Jan 6 - Mar 31 Feb 3	14 1	< 0.018442 mg/L < 0.22904	Objective met Indefinite result
0.20 mg/L	E223874 Hedley Creek 100 m D/S Nickel Plate Diffuser	Jan 6 - Mar 31 Feb 3	14 1	0.022442 - 0.034442 mg/L 0.24604	Objective met Objective not met
Cyanate as CN 0.45 mg/L max.	Similkameen River	2003	0	no data collected	Omitted 2003
Total Arsenic 0.005 mg/L max. or 20% increase	E223873 Hedley Creek U/S Nickel Plate Diffuser	Jan 6 - Mar 31	15	0.0003 - < 0.0005 mg/L	Objective met
	E223874 Hedley Creek 100 m D/S Nickel Plate Diffuser	Jan 6 - Mar 31	15	0.0004 - 0.001 mg/L	Objective met
Chlorophyll-a < 50 mg/m2 av.	Similkameen River	2003	0	no data collected	Omitted 2003
Chlorophyll-a < 100 mg/m2 av.	Hedley Creek	2003	0	no data collected	Omitted 2003
Dissolved Oxygen 8 mg/L min. (July - March) 11 mg/L min. (April - June)	Similkameen River	2003	0	no data collected	Omitted 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH 6.5 - 8.5	0500629 Similkameen River @ Princeton Hwy 3 Bridge	Jan 21 - Dec 16	19	7.7 - 8.1	Objective met
	0500073 Similkameen River @ Chopka Rd. Bridge	Feb 4 - Dec 16	21	7.6 - 8.1	Objective met
	E223873 Hedley Creek U/S Nickel Plate Diffuser	Jan 6 - Mar 31	15	7.72 - 8.15	Objective met
	E223874 Hedley Creek 100 m D/S Nickel Plate Diffuser	Jan 6 - Mar 31	15	7.65 - 7.91	Objective met
Dissolved Aluminum < 0.05 mg/L av. 0.10 mg/L max. or 20% increase	Similkameen River	2003	0	no data collected	Omitted 2003
Total Chromium < 0.002 mg/L av. 0.02 mg/L max. or 20% increase	Similkameen River	2003	0	no data collected	Omitted 2003
Total Copper < 0.002 mg/L av. 0.003 mg/L max. or 20% inc. at hardness = 14	E223873 Hedley Creek U/S Nickel Plate Diffuser	Jan 6 - Mar 31 Jan 6 - 27, Feb 3 - 24, Mar 3 - 31	15 3	0.0005 - 0.002 mg/L av. = 0.00082 - 0.0014 mg/L	Max obj met Av obj met
	E223874 Hedley Creek 100 m D/S Nickel Plate Diffuser	Jan 6 - Mar 31 Jan 6 - 27, Feb 3 - 24, Mar 3 - 31	15 3	0.0008 - 0.002 mg/L av. = 0.00108 - 0.00132 mg/L	Max obj met Av obj met
Total Iron 0.3 mg/L max. or 20% increase	Similkameen River	2003	0	no data collected	Omitted 2003
Total Manganese 0.05 mg/L max. or 20% increase	Similkameen River	2003	0	no data collected	Omitted 2003
Total Lead 0.004 mg/L av. 0.030 mg/L max. or 20% inc. at hardness = 46	Similkameen River	2003	0	no data collected	Omitted 2003
Total Mercury < 0.02 ug/L av. 0.1 ug/L max.	Similkameen River	2003	0	no data collected	Omitted 2003
Total Molybdinum < 0.01 mg/L av. 0.05 mg/L max. (May - Sept.)	Similkameen River	2003	0	no data collected	Omitted 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Nickel 0.025 mg/L max. or 20% increase at hardness < 65	Similkameen River	2003	0	no data collected	Omitted 2003
Total Uranium < 0.01 mg/L av. 0.10 mg/L max. or 20% increase	Similkameen River	2003	0	no data collected	Omitted 2003
Total Zinc < 0.01 mg/L av. 0.03 mg/L max. or 20% increase	Similkameen River	2003	0	no data collected	Omitted 2003

Table 15. Cahill Creek Water Quality Objectives – 2003.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Suspended Solids 10 mg/L or 10% max. increase	E206637 at highway (Cahill #3)	Sep 9	1	438 mg/L	Indefinite result No Control
Suspended Solids 20 mg/L or 10% max. increase	Cahill Creek (Headwaters to Hwy) Nickel Plate Mine Creek Sunset Creek	2003	0	no data collected	Omitted 2003
Turbidity 5 NTU or 10% max. increase	Cahill Creek: E206635 U/S Sunset / Nickle Plate Mine Cks	Jan 6 - Dec 1	12	0.18 - 101 NTU	Control Site
	E206823 D/S confluence (Cahill #4)	Jan 6 - Dec 1	12	0.14 - 2.4 NTU	Objective met
	E249949 Cahill #4A	Jan 6 - Dec 1	12	0.2 - 3.4 NTU	Objective met
	E249950 Cahill #4B	Jan 6 - Dec 1	12	0.2 - 2.0 NTU	Objective met
	E250424 Cahill #4C	Jan 6 - Dec 1	12	0.2 - 1.8 NTU	Objective met
	E206824 D/S Tailings Ponds (Cahill #2)	Jan 6 - Dec 1	12	0.16 - 1.9 NTU	Objective met
	E206636 D/S Tailings Ponds (Cahill #2A)	Jan 6 - Dec 1	12	0.16 - 1.7 NTU	Objective met
	E206637 at highway (Cahill #3)	Jan 6 - Dec 1	12	0.14 - 3.6 NTU	Objective met
	Red Top Gulch Creek: E206638 Below Tailings Pond	Jan 6 - Dec 1	12	0.21 - 842 NTU	Control Site
	E215957 East Fork	May 5 - Jun 2	2	5.1 - 5.4 NTU	
			2	Increase = 0 - 0.4 NTU	Objective met
	E215956 West Fork	Jun 2 - Aug 11	3	3.1 - 7.7 NTU	Objective met
			2	Increase = 0 - 3.0 NTU	Objective met
Turbidity 10 NTU or 20% max. increase	Sunset Creek: E215954 U/S Canty Pit	Jan 6 - Dec 1	12	0.1 - 0.5 NTU	Control Site
	E250751 Lower SS	Jan 6 - Dec 1	12	0.19 - 0.2 NTU	Objective met
	E206634 U/S Cahill Creek	Jan 6 - Dec 1	12	0.1 - 1.1 NTU	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity 10 NTU or 20% max. increase	Nickel Plate Mine Creek: E206633 U/S Sunset Creek	Jan 6 - Dec 1	12	0.1 - 0.6 NTU	Objective met
Dissolved Solids 500 mg/L max.	Cahill Creek Red Top Gulch Nickel Plate Mine Creek Sunset Creek	2003	0	no data collected	Omitted 2003
Sulphate < 50 mg/L av. 150 mg/L max.	Cahill Creek: E206635	Jan 6 - Dec 1	8	5.4 - 14.0 mg/L	Max objective met
	U/S Sunset / Nickle Plate Mine Cks	Jan 7 - Dec 2	1	av = 10.4 mg/L	Indefinite result
	E206823 D/S confluence	Jan 1 - Dec 31	256	9 - 42.2 mg/L	Max obj. met
	(Cahill #4)	Jan 1 - Dec 31	51	av = 9 - 37.1 mg/L	Av. obj. met
	E249949	Jan 1 - Dec 31	259	13 - 147 mg/L	Max obj. met
	Cahill #4A	Jan 29 - Dec 18	34	av. = 14.9 - 49.5 mg/L	Av. obj. met
		Jan 1 - Dec 25	17	av = 50.9 - 116.0 mg/L	Av. obj. not met
	E249950	Jan 1 - Dec 31	259	14.3 - 110 mg/L	Max obj. met
	Cahill #4B	Mar 31 - Oct 30	13	av. = 16 - 48.6 mg/L	Av. obj. met
		Jan 1 - Dec 25	38	av = 50.4 - 98.4 mg/L	Av. obj. not met
	E250424	Jan 2 - Dec 31	254	14.4 - 148.5 mg/L	Max obj. met
	Cahill #4C	Jan 1 - Jan 3	2	151.6 - 155.3 mg/L	Max obj. not met
		Mar 31 - Oct 31	13	av. = 15.9 - 47.6 mg/L	Av. obj. met
		Jan 1 - Dec 30	38	av = 50.4 - 144.4 mg/L	Av. obj. not met
	E206824	Jan 13 - Dec 31	356	19.1 - 149.9 mg/L	Max obj. met
	D/S Tailings Ponds	Jan 1 - Jan 12	12	150.3 - 182.9 mg/L	Max obj. not met
	(Cahill #2)	Apr 14 - Oct 24	13	av. = 22.8 - 46.4 mg/L	Av. obj. met
		Jan 1 - Dec 28	60	av = 51.0 - 166.8 mg/L	Av. obj. not met
	E206636	Jan 15 - Dec 31	242	20.2 - 148.4 mg/L	Max obj. met
	D/S Tailings Ponds	Jan 1 - Mar 25	15	151.6 - 186.1 mg/L	Max obj. not met
	(Cahill #2A)	Apr 22 - Jun 2	4	av = 34.5 - 49.4 mg/L	Av. obj. met
		Jan 1 - Dec 29	47	av = 51.3 - 182.6 mg/L	Av. obj. not met
	E206637	Jan 23 - Dec 31	245	28.9 - 149.4 mg/L	Max obj. met
	at highway	Jan 1 - Jan 22	17	155.8 - 188.9 mg/L	Max obj. not met
		Apr 22 - Jun 2	3	av = 34.3 - 49.9 mg/L	Av. obj. met
	(Cahill #3)	Jan 1 - Dec 25	49	av = 51.5 - 181.9 mg/L	Av. obj. not met
	Red Top Gulch Creek: E206638	Jan 3 - Dec 26	49	197.8 - 214.4 mg/L	Max obj. not met
	Below Tailings Pond	Jan 3 - Dec 7	9	av = 198.4 - 206.0 mg/L	Av. obj. not met
	E215957 East Fork	Jun 2	1	601.9 mg/L	Max obj. not met
			1	av = 601.9 mg/L	Indefinite result
	E215956	Jun 2	1	128.8 mg/L	Max obj. met
	West Fork	Jul 7	1	816 mg/L	Max obj. not met
		Jun 2 - Jul 7	1	av = 472.4 mg/L	Indefinite result
	Nickel Plate Mine Creek: E206633	Jan 1 - Dec 31	261	498.3 - 636.32 mg/L	Max objective not met
	U/S Sunset Creek	Jan 1 - Dec 25	52	av = 505.6 - 623.0 mg/L	Av. obj. not met
WAD-CN < 0.005 mg/L av. 0.010 mg/L max.	Cahill Creek: E206637	Jan 6 - Dec 1	50	< 0.005 - 0.007 mg/L	Max obj. met
	at highway	Jan 6 - May 13	4	av = 0.0052 - 0.0066 mg/L	Av. obj. not met
	(Cahill #3)	May 10 - Dec 1	6	av = 0.005 mg/L	Av. obj. met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
SAD - CN + Thiocyanate as CN 0.20 mg/L max.	Cahill Creek: E206635 U/S Sunset / Nickle Plate Mine Cks	Jan 6 - Dec 1 May 5 Feb 3 - Nov 10	8 1 3	< 0.0095 - 0.0194 mg/L 0.3705 mg/L all < 0.229 mg/L	Objective met Objective not met Indefinite result
	E206823 D/S confluence (Cahill #4)	Jan 6 - Dec 29 May 5 Feb 3 - Nov 10	47 1 3	0.0184 - 0.0254 mg/L 0.235 mg/L all < 0.229 mg/L	Objective met Objective not met Indefinite result
	E249949 Cahill #4A	Jan 6 - Dec 1 Mar 11 - Nov 18 Jan 14 - Sep 3	50 9 3	< 0.0184 - 0.0314 mg/L 0.226 - 0.3297 mg/L all < 0.229 mg/L	Objective met Objective not met Indefinite result
	E249950 Cahill #4B	Jan 6 - Dec 1 Mar 11 - Nov 18 Jan 14 - Sep 23	50 9 3	< 0.0184 - 0.0314 mg/L 0.226 - 0.3735 mg/L all < 0.229 mg/L	Objective met Objective not met Indefinite result
	E250424 Cahill #4C	Jan 6 - Dec 1 Jan 14 - Nov 18 Feb 3 - Sep 23	51 10 2	< 0.0184 - 0.0274 mg/L 0.2262 - 0.3297 mg/L all < 0.229 mg/L	Objective met Objective not met Indefinite result
	E206824 D/S Tailings Ponds (Cahill #2)	Jan 6 - Dec 1 Jan 14 - Nov 18	51 12	< 0.0184 - 0.0274 mg/L 0.2268 - 0.3267 mg/L	Objective met Objective not met
SAD - CN + Thiocyanate as CN 0.20 mg/L max.	E206636 D/S Tailings Ponds (Cahill #2A)	Jan 6 - Dec 30 Feb 3 - Nov 10	47 4	< 0.0184 - 0.0274 mg/L 0.233 - 0.247 mg/L	Objective met Objective not met
	E206637 at highway (Cahill #3)	Jan 6 - Dec 30 Feb 3 - Nov 10	48 4	< 0.0184 - 0.0274 mg/L 0.23 - 0.239 mg/L	Objective met Objective not met
	Red Top Gulch Creek: E206638 Below Tailings Pond	Jan 6 - Dec 1 Feb 3 - Nov 10	8 4	< 0.0184 - 0.0214 mg/L 0.23 - 0.4661 mg/L	Objective met Objective not met
	E215957 East Fork	Jun 2 May 5	1 1	0.0234 mg/L 0.2433 mg/L	Objective met Objective not met
	E215956 West Fork	Jun 2 - Aug 11	3	1.7882 - 11.4848 mg/L	Objective not met
Cyanates as CN 0.45 mg/L max.	E206637 at highway (Cahill #3)	Jan 6 - Dec 30	53	0.005 - 0.015 mg/L	Objective met
Total Arsenic 0.05 mg/L max.	Cahill Creek: E206635 U/S Sunset / Nickle Plate Mine Cks	Jun 2 - Dec 1	5	0.0007 - 0.0017 mg/L	Objective met
	E206823 D/S confluence (Cahill #4)	Jan 6 - Dec 1	12	0.0123 - 0.0264 mg/L	Objective met
	E249949 Cahill #4A	Jan 6 - Dec 30	21	0.0131 - 0.0288 mg/L	Objective met
	E249950 Cahill #4B	Jan 6 - Dec 30	21	0.0135 - 0.026 mg/L	Objective met
	E250424 Cahill #4C	Jan 6 - Dec 30	21	0.0134 - 0.0242 mg/L	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Arsenic 0.05 mg/L max.	E206824 D/S Tailings Ponds (Cahill #2)	Jan 6 - Dec 30	22	0.01 - 0.03 mg/L	Objective met
	E206636 D/S Tailings Ponds (Cahill #2A)	Jan 6 - Dec 30	53	0.01 - 0.02 mg/L	Objective met
	E206637 at highway (Cahill #3)	Jan 6 - Dec 30	57	0.01 - 0.02 mg/L	Objective met
	Hedley Creek: E223873 U/S Nickel Plate Diffuser	Jan 6 - Dec 29	56	0.0002 - 0.0008 mg/L	Objective met
	E223874 100 m D/S Nickel Plate Diffuser	Jan 6 - Dec 29	56	0.0002 - 0.001 mg/L	Objective met
	Red Top Gulch Creek: E206638 Below Tailings Pond	Jan 6 - Dec 1	12	0.0077 - 0.048 mg/L	Objective met
Total Arsenic 0.5 mg/L max.	Nickel Plate Mine Creek	2003	0	no data collected	Omitted 2003
Ammonia-N < 1.11 mg/L av. 5.78 mg/L max. at pH = 8.0 temp. = 12 °C	Cahill Creek: E206637 at highway (Cahill #3)	Jan 6 - Dec 30	99	< 0.005 - 0.03 mg/L	Max. obj. met
		Jan 6 - Dec 2	19	av. = 0.009 - 0.014 mg/L	Av obj met
Nitrite-N < 0.02 mg/L av. 0.06 mg/L max.	Cahill Creek: E206637 at highway (Cahill #3)	Jan 1 - Dec 31	261	all < 0.03 mg/L	Max. obj. met
		Jan 1 - Dec 30	52	av. = < 0.03 mg/L	Av. Obj. met
Nitrite-N < 1 mg/L max	Cahill Creek: E206635 U/S Sunset / Nickle Plate Mine Cks	Jan 6 - Dec 1	12	all < 0.03 mg/L	Objective met
	E206823 D/S confluence (Cahill #4)	Jan 1 - Dec 31	255	all < 0.03 mg/L	Objective met
	E249949 Cahill #4A	Jan 1 - Dec 31	271	< 0.001 - 0.032 mg/L	Objective met
	E249950 Cahill #4B	Jan 1 - Dec 31	271	< 0.001 - 0.03 mg/L	Objective met
	E250424 Cahill #4C	Jan 1 - Dec 31	268	< 0.001 - 0.03 mg/L	Objective met
	E206824 D/S Tailings Ponds (Cahill #2)	Jan 1 - Dec 31	380	< 0.001 - 0.03 mg/L	Objective met
	E206636 D/S Tailings Ponds (Cahill #2A)	Jan 1 - Dec 31	257	all < 0.03 mg/L	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrite-N < 1 mg/L max	Red Top Gulch Creek: E206638 Below Tailings Pond	Jan 3 - Dec 26	48	all < 0.03 mg/L	Objective met
	E215957 East Fork	Jun 2	1	0.15 mg/L	Objective met
	E215956 West Fork	Jun 2 - Jul 7	2	< 0.03 - 0.188 mg/L	Objective met
Nitrite-N < 10 mg/L max	Nickel Plate Mine Creek: E206633 U/S Sunset Creek	Jan 1 - Dec 31	261	< 0.03 - < 0.3 mg/L	Objective met
Nitrate-N < 10 mg/L max.	Cahill Creek: E206635 U/S Sunset / Nickle Plate Mine Cks	Jan 6 - Dec 1	12	< 0.005 - 0.2 mg/L	Objective met
	E206823 D/S confluence (Cahill #4)	Jan 1 - Dec 31	260	0.053 - 0.73 mg/L	Objective met
	E249949 Cahill #4A	Jan 1 - Dec 31	271	0.28 - 6.65 mg/L	Objective met
	E249950 Cahill #4B	Jan 1 - Dec 31	271	0.45 - 4.76 mg/L	Objective met
	E250424 Cahill #4C	Jan 1 - Dec 31	268	0.45 - 4.6 mg/L	Objective met
	E206824 D/S Tailings Ponds (Cahill #2)	Jan 1 - Dec 31	380	0.52 - 5.01 mg/L	Objective met
	E206636 D/S Tailings Ponds (Cahill #2A)	Jan 1 - Dec 31	261	0.57 - 4.61 mg/L	Objective met
	E206637 at highway (Cahill #3)	Jan 1 - Dec 31	266	0.57 - 4.2 mg/L	Objective met
	Red Top Gulch Creek: E206638 Below Tailings Pond	Jan 3 - Dec 26	53	5.5 - 7.6 mg/L	Objective met
Nitrate-N < 10 mg/L max.	E215957 East Fork	May 5 - Jun 2	2	0.91 - 2.43 mg/L	Objective met
	E215956 West Fork	Jun 2 - Aug 11	3	0.15 - 1.269 mg/L	Objective met
Nitrate-N < 100 mg/L max	Nickel Plate Mine Creek: E206633 U/S Sunset Creek	Jan 1 - Dec 31	265	26.35 - 44.07 mg/L	Objective met
Total Aluminum 0.30 mg/L max. or 20% increase at pH > 7	Cahill Creek	2003	0	no data collected	Omitted 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cadmium 0.0002 mg/L	Cahill Creek Highway Crossing to Similkameen	2003	0	no data collected	Omitted 2003
Total Cadmium 0.005 mg/L	Cahill Creek: Headwaters to Highway crossing Red Top Gulch Creek: Headwaters to Highway crossing	2003	0	no data collected	Omitted 2003
Total Cadmium 0.02 mg/L	Nickel Plate Mine Creek	2003	0	no data collected	Omitted 2003
Total Copper < 0.005 mg/L av. 0.007 mg/L max. or 20% max. increase	Cahill Creek: E206637 at highway (Cahill #3)	Jan 6 - Dec 1 Jan 6 - Dec 1	12 1	0.001 - 0.0031 mg/L av. = 0.002 mg/L	Max obj met Indefinite result
Total Copper < 0.2 mg/L max	Cahill Creek: E206635 U/S Sunset / Nickle Plate Mine Cks	Jun 2 - Dec 1	5	0.002 - 0.0028 mg/L	Objective met
	E206823 D/S confluence (Cahill #4)	Jan 6 - Dec 1	12	< 0.001 - 0.003 mg/L	Objective met
	E249949 Cahill #4A	Jan 6 - Dec 1	12	0.001 - 0.003 mg/L	Objective met
	E249950 Cahill #4B	Jan 6 - Dec 1	12	<0.001 - 0.0027 mg/L	Objective met
	E250424 Cahill #4C	Jan 6 - Dec 1	12	<0.001 - 0.0028 mg/L	Objective met
	E206824 D/S Tailings Ponds (Cahill #2)	Jan 6 - Dec 1	12	0.001 - 0.004 mg/L	Objective met
	E206636 D/S Tailings Ponds (Cahill #2A)	Jan 6 - Dec 1	8	0.0016 - 0.003 mg/L	Objective met
	Red Top Gulch Creek: E206638 Below Tailings Pond	Feb 3 - Nov 10	4	< 0.001 - 0.04 mg/L	Objective met
Total Copper < 0.2 mg/L max	Nickel Plate Mine Creek	2003	0	no data collected	Omitted 2003
Dissolved Iron 0.3 mg/L max.	Cahill Creek: E206637 at highway	Jan 6 - Dec 23	51	< 0.01 - 0.08 mg/L	Objective met
Total Lead < 0.005 mg/L av. 0.015 mg/L max. at 20% increase	Cahill Creek Red Top Gulch Nickel Plate Mine Creek Sunset Creek	2003	0	no data collected	Omitted 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Lead < 0.05 mg/L max	Cahill Creek: Headwaters to Highway crossing Red Top Gulch Creek: Headwaters to Highway crossing	2003	0	no data collected	Omitted 2003
Total Lead < 0.1 mg/L max	Nickel Plate Mine Creek:	2003	0	no data collected	Omitted 2003
Total Mercury 0.1 ug/L max.	Cahill Creek: Highway Crossing to Similkameen Red Top Gulch Creek: Highway Crossing to Similkameen	2003	0	no data collected	Omitted 2003
Total Mercury 1 ug/L max.	Cahill Creek: Headwaters to Highway crossing Red Top Gulch Creek: Headwaters to Highway crossing	2003	0	no data collected	Omitted 2003
Total Mercury 3 ug/L max.	Nickel Plate Mine Creek	2003	0	no data collected	Omitted 2003
Total Mercury 0.5 ug/g max. wet weight in fish	Cahill Creek: Highway Crossing to Similkameen Red Top Gulch Creek: Highway Crossing to Similkameen	2003	0	no data collected	Omitted 2003
Total Molybdenum 0.01 mg/L av. (May - Sept.) 0.05 mg/L max.	Cahill Creek: E206637 at highway (Cahill #3)	2003	0	no data collected	Omitted 2003
Total Molybdenum 0.01 mg/L av. 0.05 mg/L max.	Nickel Plate Mine Creek	2003	0	no data collected	Omitted 2003
Total Selenium 0.001 mg/L max. or 20% max. increase	Cahill Creek: E206637 at highway (Cahill #3)	2003	0	no data collected	Omitted 2003
Total Selenium 0.01 mg/L max.	Cahill Creek: Highway Crossing to Similkameen Red Top Gulch Creek: Highway Crossing to Similkameen	2003	0	no data collected	Omitted 2003
Total Selenium 0.05 mg/L max.	Nickel Plate Mine Creek	2003	0	no data collected	Omitted 2003
Total Silver 0.0001 mg/L max. or 20% max. increase	Cahill Creek: E206637 at highway (Cahill #3)	2003	0	no data collected	Omitted 2003
Total Silver 0.05 mg/L max.	Cahill Creek: Highway Crossing to Similkameen Red Top Gulch Creek: Highway Crossing to Similkameen Nickel Plate Mine Creek	2003	0	no data collected	Omitted 2003
Total Zinc 0.05 mg/L max.	Cahill Creek: E206637 at highway (Cahill #3)	2003	0	no data collected	Omitted 2003

Table 16. Christina Lake Water Quality Objectives – 2003.

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Zooplankton > 10% for any of the rotifers (ro objective) *Kellicottia* *Conochilus* > 10% for any of the crustaceans (cr objective) *Bosmina* *Epishura* *Diacyclops*	Christina Lake	2003	0	no data collected	Omitted 2003
Dissolved Oxygen 8 mg/L at any depth	Christina Lake	2003	0	no data collected	Omitted 2003
Turbidity ≤ 1 NTU seasonal av 5 NTU max	Christina Lake	2003	0	no data collected	Omitted 2003
Secchi Depth 3 m min seasonal av > 10 m	0200078 Christina Lake at Christina	Sep 30	1	13.0 m	Objective met
			1	av = 13.0 m	Objective met
	E215758 north basin deep center	Sep 30	1	13.2 m	Objective met
			1	av = 13.2 m	Objective met
Total Phosphorus < 0.007 mg/L av at spring overturn	0200078 Christina Lake at Christina	Mar 31	2	0.005 - 0.006 mg/L	
			1	av = 0.0055 g/L	Objective met
	E215758 north basin deep center	Mar 31	2	0.004 - 0.007 mg/L	
			1	av = 0.0055 mg/L	Objective met
Total Nitrogen ≤ 0.200 mg/L av at spring overturn	0200078 Christina Lake at Christina	Mar 31	2	0.09 - 0.10 mg/L	
			1	av = 0.095 mg/L	Objective met
	E215758 north basin deep center	Mar 31	2	0.07 - 0.11 mg/L	
			1	av = 0.09 mg/L	Objective met
Chlorophyll - *a* ≤ 0.0025 mg/L seasonal av.	0200078 Christina Lake at Christina	Mar 31 - Sep 30	3	0.0007 - 0.011 mg/L	
			1	av = 0.0009 mg/L	Objective met
	E215758 north basin deep center	Mar 31	2	0.0008 - 0.0011 mg/L	
			1	av = 0.00095 mg/L	Objective met
Periphyton Chlorophyll - *a* 10 mg/m^2 seasonal av.	Christina Lake	2003	0	no data collected	Omitted 2003

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Fecal Coliforms ≤ 10/100 mL 90th perc. (np) over 30 days	Christina Lake	2003	0	no data collected	Omitted 2003

Table 17. Thompson River Water Quality Objectives – 2003.

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Fecal Coliform	0600135 South Thompson River	Jan 21 - Dec 22	4	2 - 6 CFU/100 mL	No 5-in-30 samples
	Kamloops d/s Peterson Cr.		1	np = 5.4 CFU/100 mL	Indefinite result
< 10 CFU/100 mL 90th percentile. (np)	0600164 North Thompson River	Jan 21 - Dec 22	4	< 1 - 1 CFU/100 mL	No 5-in-30 samples
	at Kamloops u/s Paul Cr.		1	np = 1 CFU/100 mL	Indefinite result
	E218768 Kamloops Lake	Jan 21 - Dec 10	6	< 1 - 18 CFU/100 mL	No 5-in-30 samples
	near outlet		1	np = 9.5 CFU/100 mL	Indefinite result
	0600004 Lower Thompson	Jan 21 - Dec 22	4	all < 1 CFU/100 mL	No 5-in-30 samples
	at Savona		1	np = < 1 CFU/100 mL	Indefinite result
	0600163 Lower Thompson	Jan 21 - Dec 22	4	< 1 - 2 CFU/100 mL	No 5-in-30 samples
	d/s Walhachin		1	np = 1.7 CFU/100 mL	Indefinite result
	0600005 Lower Thompson	Jan 21 - Dec 22	4	< 1 - 10 CFU/100 mL	No 5-in-30 samples
	at Spences Bridge		1	np = 7.3 CFU/100 mL	Indefinite result
	E206586 Lower Thompson	Jan 14 - May 27	8	< 1 - 4 CFU/100 mL	No 5-in-30 samples
	at Spences Br. d/s Nicola R.		1	np = 2.6 CFU/100 mL	Indefinite result
E. coli	0600135 South Thompson River	Jan 21 - Dec 22	4	< 1 - 4 CFU/100 mL	No 5-in-30 samples
< 200/100 mL geometric mean (gm)	Kamloops d/s Peterson Cr.		1	np = 3.4 CFU/100 mL	Indefinite result
	0600164 North Thompson River	Jan 21 - Dec 22	4	all < 1 CFU/100 mL	No 5-in-30 samples
	at Kamloops u/s Paul Cr.		1	np = < 1 CFU/100 mL	Indefinite result
	E218768 Kamloops Lake	Jan 21 - Dec 10	6	< 1 - 12 CFU/100 mL	No 5-in-30 samples
	near outlet		1	np = 6.5 CFU/100 mL	Indefinite result
	0600004 Lower Thompson	Jan 21 - Dec 22	4	< 1 - 2 CFU/100 mL	No 5-in-30 samples
	at Savona		1	np = 1.7 CFU/100 mL	Indefinite result
	0600163 Lower Thompson	Jan 21 - Dec 22	4	< 1 - 2 CFU/100 mL	No 5-in-30 samples
	d/s Walhachin		1	np = 1.7 CFU/100 mL	Indefinite result
	0600005 Lower Thompson	Jan 21 - Dec 22	4	< 1 - 5 CFU/100 mL	No 5-in-30 samples
	at Spences Bridge		1	np = 3.8 CFU/100 mL	Indefinite result

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Colour 15 TCU max. or 5 TCU increase over average of N + S Thompson Rivers	E218768 Kamloops Lake near outlet	Jan 21 - Dec 10	4	5 - 10 TCU	Objective met
	0600163 Lower Thompson d/s Walhachin	Oct 29	1	< 5 TCU	Objective met
	0600005 Lower Thompson at Spences Bridge	Oct 29	1	< 5 TCU	Objective met
	E206586 Lower Thompson at Spences Br. d/s Nicola R.	Jan 14 - Dec 17 May 27, Oct 21	19 2	5 - 10 TCU 20 - 30 TCU	Objective met Indefinite result - no control
Chlorophyll - *a* < 50 mg/m^2	Thompson River at Savona	Jan 23 Feb 18 Mar 26 Apr 24 Jan 23 - Apr 24 Mar 26	5 5 5 5 3 1	0 - 0.97 mg/m^2 15.63 - 47.97 mg/m^2 73.30 - 223.97 mg/m^2 all 0 mg/m^2 av. = 0 - 31.30 mg/m^2 av. = 131.97 mg/m^2	 Objective met Objective not met
	Thompson River at Walhachin	Jan 23 Feb 18 Mar 26 Apr 24 Jan 23 - Apr 24	5 5 5 5 4	0 - 9.52 mg/m^2 0 - 80.86 mg/m^2 21.74 - 28.86 mg/m^2 0.74 - 30.30 mg/m^2 av. = 0.30 - 23.74 mg/m^2	 Objective met
Dioxins & Furans 0.2 pg/L max. TEQ-TCDD	Thompson River Kamloops Lake	2003	0	no data collected	Omitted 2003
Dioxins & Furans 1.0 pg/g max. TEQ-TCDD wet weight in fish	Thompson River Kamloops Lake	2003	0	no data collected	Omitted 2003
Dioxins & Furans 0.7 pg/g max. TEQ-TCDD dry weight in seds.	Thompson River Kamloops Lake	2003	0	no data collected	Omitted 2003
Resin Acids 12 µg/L DHA max. 45 µg/L total max. at pH = 7.5	Thompson River Kamloops Lake	2003	0	no data collected	Omitted 2003

Table 18. Keremeos Creek Water Quality Objectives – 2003.

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Fecal Coliforms < 10 /100 mL 90th percentile (np)	Keremeos Creek: E221386 at Gunbarrel Intake	May 14 - Jun 11	5	all < 1 CFU/100 mL	
			1	np < 1 CFU/100 mL	Objective met
	Cedar Creek: E221525 at Highway 3A	Mar 27 - Jun 11	10	< 1 - 22 CFU/100 mL	
		Mar 27 - Apr 24	1	np = 17.2 CFU/100 mL	Objective not met
		May 14 - Jun 11	1	np = 1.6 CFU/100 mL	Objective met
	Olalla Creek: E221526 at Olalla	Mar 27 - Jun 11	10	< 1 - 22 CFU/100 mL	
		Mar 27 - Apr 24	1	np = 19.6 CFU/100 mL	Objective not met
		May 14 - Jun 11	1	np = 5.6 CFU/100 mL	Objective met
Fecal Coliforms < 100 /100 mL 90th percentile (np)	Keremeos Creek: E221390 Base of Triple Chair	May 14 - Jun 11	5	< 1 - 1 CFU/100 mL	
			1	np = 1 CFU/100 mL	Objective met
	E221339 at Highway 3A	Mar 27 - Jun 11	10	< 1 - 20 CFU/100 mL	
		Mar 27 - Apr 24, May 14 - Jul 11	2	np = 10.4 - 18.8 CFU/100 mL	Objective met
	E221340 U/S Olalla Creek	Mar 27 - Apr 24	5	8 - 240 CFU/100 mL	
		Mar 27 - Apr 24	1	np = 200 CFU/100 mL	Objective not met
	E221341 at Keremeos	Mar 27 - Jun 11	9	< 1 - 460 CFU/100 mL	
		Mar 27 - Apr 24	1	np = 320 CFU/100 mL	Objective not met
	0500757 at Mouth	Mar 27 - Jun 11	10	1 - 270 CFU/100 mL	
		Mar 27 - Apr 24, May 14 - Jul 11	2	np = 141 - 206 CFU/100 mL	Objective not met
Suspended Solids 10 mg/L during clear flow (Jul 1 - Mar 31)	Keremeos Creek at Gunbarrel Intake	2003	0	no data collected	Omitted 2003
Suspended Solids max. increase 10 mg/L in 24 hours or 5 mg/L in 30 days during clear flow (Jul 1 - Mar 31)	Keremeos Creek E221339 at Highway 3A	Mar 27	1	1 mg/L	Objective met
	E221340 U/S Olalla Creek	Mar 27	1	1 mg/L	Objective met
	E221341 at Keremeos	Mar 27	1	2 mg/L	Objective met
	0500757 at Mouth	Mar 27	1	1 mg/L	Objective met
	Cedar Creek: E221525 at Highway 3A	Mar 27	1	1 mg/L	Objective met
	Olalla Creek: E221526 at Olalla	Mar 27	1	1 mg/L	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Suspended Solids max. increase 10 mg/L or 10% during turbid flow (Apr 1 - Jun 30)	Keremeos Creek: E221386 at Gunbarrel Intake	May 28 - Jun 11	3	< 4 mg/L	Objective met
	E221384 U/S Apex Parking Lot	May 28 - Jun 11	3	inc = 16 - 93 mg/L	Objective not met
	E221413 North Fork U/S West Fork	May 28 - Jun 11	3	inc = 0 - 7 mg/L	Objective met
	E221387 U/S Apex STP	May 28 - Jun 4 Jun 11	2 1	inc = 28 - 82 mg/L inc = 9 mg/L	Objective not met Objective met
	E221390 Base of Triple Chair	May 28 - Jun 4 Jun 11	2 1	inc = 13 - 56 mg/L inc = 5 mg/L	Objective not met Objective met
	E221389 at Dividend Road	Jun 4 Jun 11	1 1	increase = 12 mg/L increase = 6 mg/L	Objective not met Objective met
	E221339 at Highway 3A	Apr 2 - Jun 11 May 28 Apr 2 - Jun 11	8 1 7	1 - 15 mg/L increase = 11 mg/L increase = 0 - 2 mg/L	 Objective not met Objective met
	E221340 U/S Olalla Creek	Apr 2 - Apr 24	4	1 - 10 mg/L	Objective met
	E221341 at Keremeos	Apr 2 - Jun 11 Apr 2 - Jun 4 Apr 24 May 28 - Jun 11	7 4 1 2	1 - 32 mg/L inc = 0 - 7 mg/L 13 mg/L inc = 12 - 28 mg/L	 Objective met Indefinite result - no control Objective not met
	0500757 at Mouth	Apr 2 - Jun 11 May 28 Jun 11 - Jun 25	7 1 3	< 4 - 37 mg/L increase = 33 mg/L increase = 0 - 8 mg/L	 Objective not met Objective met
Suspended Solids max. increase 5 mg/L or 10% during turbid flow (Apr 1 - Jun 30)	Cedar Creek: E221525 at Highway 3A	Apr 2 - Jun 11	7	< 1 - 4 mg/L	Objective met
	Olalla Creek: E221526 at Olalla	Apr 2 - Jun 11 May 28	6 1	< 1 - 4 mg/L 13 mg/L	Objective met Indefinite result - no control
Turbidity max 5 NTU av. 2.5 NTU during clear flow	Keremeos Creek: E221386 at Gunbarrel Intake	May 28 - Jun 11	3 1	0.54 - 1.26 NTU av. = 0.86 NTU	Max objective met Indefinite result

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Turbidity 8 NTU increase over 24 hours or 2 NTU increase over 30 days during clear flow (July 1 - March 31)	Keremeos Creek E221339 at Highway 3A	Mar 27	1	0.16 NTU	Objective met
	E221340 U/S Olalla Creek	Mar 27	1	0.76 NTU	Objective met
	E221341 at Keremeos	Mar 27	1	0.58 NTU	Objective met
	0500757 at Mouth	Mar 27	1	0.39 NTU	Objective met
Turbidity 1 NTU increase when background < 5 NTU during clear flow (July 1 - March 31)	Cedar Creek: E221525 at Highway 3A	Mar 27	1	0.11 NTU	Objective met
	Olalla Creek: E221526 at Olalla	Mar 27	1	0.20 NTU	Objective met
Turbidity max. increase 5 NTU or 10% during turbid flow (Apr 1 - Jun 30)	Keremeos Creek: E221386 at Gunbarrel Intake	May 28 - Jun 11	3	0.54 - 1.26 NTU	Max objective met
	E221384	May 28 - Jun 4 Jun 11	2 1	24.2 - 25.9 NTU 2.87 NTU	Objective not met Objective met
	E221413 North Fork U/S West Fork	May 28 - Jun 11	3	0.32 - 1.3 NTU	Objective met
	E221387	May 28 - Jun 4 Jun 11	2 1	7.49 - 16.3 NTU 1.07 NTU	Objective not met Objective met
	E221390 Base of Triple Chair	May 28 Jun 4 - Jun 11	1 2	15.5 NTU 1.34 - 3.86 NTU	Objective not met Objective met
	E221389 at Dividend Road	Jun 4 - Jun 11	2	0.81 - 4.22 NTU	Objective met
	E221339 at Highway 3A	Apr 2 - Jun 11	7	0.23 - 2.44 NTU	Objective met
	E221340 U/S Olalla Creek	Apr 2 - Apr 24	4	0.63 - 3.27 NTU	Objective met
	E221341 at Keremeos	Apr 2 - Jun 11 May 28	6 1	0.51 - 3.42 NTU inc = 6.43 NTU	Objective met Objective not met
	0500757 at Mouth	Apr 2 - Jun 11 May 28	6 1	0.31 - 3.59 NTU inc = 8.24 NTU	Objective met Objective not met

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Turbidity max. increase 5 NTU or 10% during turbid flow (Apr 1 - Jun 30)	Cedar Creek: E221525 at Highway 3A	Apr 2 - Jun 11	7	0.16 - 0.11 NTU	Objective met
	Olalla Creek: E221526 at Olalla	Apr 2 - Jun 11	7	0.18 - 1.66 NTU	Objective met
Ammonia-N < 1.30 mg/L av 6.75 mg/L max at pH = 7.9 temp = 15 C	Keremeos Creek: E221339 at Highway 3A	Mar 27 - Apr 24	5	< 0.005 - 0.009 mg/L	Max. obj. met
			1	av. = 0.006 mg/L	Av. obj. met
	E221340 U/S Olalla Creek	Mar 27 - Apr 24	5	< 0.005 - 0.008	Max. obj. met
			1	av. = 0.006 mg/L	Av. obj. met
	E221341 at Keremeos	Mar 27 - Apr 24	5	< 0.005 - 0.019 mg/L	Max. obj. met
			1	av. = 0.008 mg/L	Av. obj. met
	0500757 at Mouth	Mar 27 - Apr 24	5	< 0.005 - 0.009 mg/L	Max. obj. met
			1	av. = 0.006 mg/L	Av. obj. met
	Cedar Creek: E221525 at Highway 3A	Mar 27 - Apr 24	5	< 0.005 - 0.01 mg/L	Max. obj. met
			1	av. = 0.006 mg/L	Av. obj. met
	Olalla Creek: E221526 at Olalla	Mar 27 - Apr 24	5	< 0.005 - 0.008	Max. obj. met
			1	av. = 0.006 mg/L	Av. obj. met
Nitrite-N < 0.02 mg/L av 0.06 mg/L max at Chloride < 2 mg/L	Keremeos Creek: E221386 at Gunbarrel Intake	May 28	1	< 0.002 mg/L	Max. obj. met
			1	av. = < 0.002 mg/L	Indefinite result
	E221339 at Highway 3A	Mar 27 - Jun 11 Mar 27 - Apr 24	8	< 0.002 - 0.031 mg/L	Max. obj. met
			1	av. = 0.0026 mg/L	Av. obj. met
	E221340 U/S Olalla Creek	Mar 27 - Apr 24	5	0.002 - 0.006 mg/L	Max. obj. met
			1	av. = 0.004 mg/L	Av. obj. met
	E221341 at Keremeos	Mar 23 - Sep 23 Mar 27 - Apr 24	10	0.001 - 0.005 mg/L	Max. obj. met
			1	av. = 0.003 mg/L	Av. Obj. met
	0500757 at Mouth	Mar 27 - Jun 11 Mar 27 - Apr 24	8	0.002 - 0.009 mg/L	Max. obj. met
			1	av. = 0.0056 mg/L	Av. obj. met
	Cedar Creek: E221525 at Highway 3A	Mar 27 - Jun 11 Mar 27 - Apr 24	8	0.002 - 0.003 mg/L	Max. obj. met
			1	av. = 0.0022 mg/L	Av. obj. met
	Olalla Creek: E221526 at Olalla	Mar 27 - Jun 11 Mar 27 - Apr 24	8	0.002 - 0.005 mg/L	Max. obj. met
			1	av. = 0.0026 mg/L	Av. obj. met

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Nitrate + Nitrite-N 10 mg/L max	Keremeos Creek: E221386 at Gunbarrel Intake	May 28 - Jun 11	3	0.002 - 0.032 mg/L	Objective met
	E221384 U/S Apex Parking Lot	Jun 4 - Jun 11	2	0.013 - 0.026 mg/L	Objective met
	E221413 North Fork U/S West Fork	Jun 4 - Jun 11	2	0.02 - 0.024 mg/L	Objective met
	E221387 U/S Apex STP	Jun 4 - Jun 11	2	0.022 - 0.028 mg/L	Objective met
	E221390 Base of Triple Chair	May 28 - Jun 11	3	0.105 - 0.135 mg/L	Objective met
	E221389 at Dividend Road	Jun 11	1	0.095 mg/L	Objective met
	E221339 at Highway 3A	Mar 27 - Jun 11	8	0.03 - 0.12 mg/L	Objective met
	E221340 U/S Olalla Creek	Mar 27 - Apr 24	5	0.226 - 0.376 mg/L	Objective met
	E221341 at Keremeos	Mar 27 - Sep 23	10	0.021 - 0.275 mg/L	Objective met
	0500757 at Mouth	Mar 27 - Jun 11	8	0.011 - 0.224 mg/L	Objective met
Nitrate + Nitrite-N 10 mg/L max	Cedar Creek: E221525 at Highway 3A	Mar 27 - Jun 11	8	< 0.002 - 0.05 mg/L	Objective met
	Olalla Creek: E221526 at Olalla	Mar 27 - Jun 11	8	< 0.002 - 0.007 mg/L	Objective met
pH 6.5 - 8.5	Keremeos Creek: E221339 at Highway 3A	Mar 27 - Apr 24	5	All 8.1	Objective met
	E221340 U/S Olalla Creek	Mar 27 - Apr 24	5	8.1 - 8.2	Objective met
	E221341 at Keremeos	Mar 27 - Apr 24	5	8.2 - 8.3	Objective met
	0500757 at Mouth	Mar 27 - Apr 24	5	8.2 - 8.4	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
pH 6.5 - 8.5	Cedar Creek: E221525 at Highway 3A	Mar 27 - Apr 24	5	8.1 - 8.2	Objective met
	Olalla Creek: E221526 at Olalla	Mar 27 - Apr 24	5	All 8.2	Objective met
Dissolved Oxygen 8.0 mg/L min 11.0 mg/L min when salmonid embryos and larvae present	Keremeos Creek: E221339 at Highway 3A	Apr 16 - Jun 4	3	9.2 - 11.8 mg/L	Objective met
	E221340 U/S Olalla Creek	Apr 16 - Apr 24	2	10.4 - 11.0 mg/L	Objective met
	E221341 at Keremeos	Apr 16 - Jun 4	3	9.2 - 11.4 mg/L	Objective met
	0500757 at Mouth	Apr 16 - Jun 4	3	9.4 - 10.6 mg/L	Objective met
	Cedar Creek: E221525 at Highway 3A	Apr 16 - Jun 4	3	9.9 - 12.6 mg/L	Objective met
	Olalla Creek: E221526 at Olalla	Apr 16 - Jun 4	3	9.8 - 12.6 mg/L	Objective met
Chlorophyll-a 50 mg/m^2 max	Keremeos Creek Cedar Creek Olalla Creek	2003	0	no data collected	Omitted 2003
Dissolved Solids 500 mg/L max	Keremeos Creek: E221339 at Highway 3A	Mar 27 - Apr 24	5	146 - 192 mg/L	Objective met
	E221340 U/S Olalla Creek	Mar 27 - Apr 24	5	186 - 280 mg/L	Objective met
	E221341 at Keremeos	Mar 27 - Apr 24	5	170 - 244 mg/L	Objective met
	0500757 at Mouth	Mar 27 - Apr 24	5	188 - 254 mg/L	Objective met
	Cedar Creek: E221525 at Highway 3A	Mar 27 - Apr 24	5	124 - 176 mg/L	Objective met
	Olalla Creek: E221526 at Olalla	Mar 27 - Apr 24	5	146 - 194 mg/L	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT SITE	DATE	n	VALUE	CONCLUSION
Dissolved Chloride 100 mg/L max.	Keremeos Creek: E221339 at Highway 3A	Mar 27 - Apr 24	5	9.9 - 10.3 mg/L	Objective met
	E221340 U/S Olalla Creek	Mar 27 - Apr 24	5	9.4 - 11.4 mg/L	Objective met
	E221341 at Keremeos	Mar 27 - Apr 24	5	7.7 - 9.3 mg/L	Objective met
	0500757 at Mouth	Mar 27 - Apr 24	5	7.6 - 9.3 mg/L	Objective met
Temperature max 17°C weekly av.	Keremeos Creek: E221386 at Gunbarrel Intake	May 28 - Jun 11	3	2.4 - 4.8°C	Objective met
	E221384 U/S Apex Parking Lot	May 28 - Jun 11	3	3.4 - 7.4°C	Objective met
	E221413 North Fork U/S West Fork	May 28 - Jun 11	3	4.0 - 7.4°C	Objective met
	E221387 U/S Apex STP	Jun 4 - Jun 11	2	6.6 - 7.7°C	Objective met
	E221390 Base of Triple Chair	May 28 - Jun 11	3	5.6 - 9.1°C	Objective met
	E221389 at Dividend Road	Jun 4 - Jun 11	2	6.9 - 8.5°C	Objective met
	E221339 at Highway 3A	Mar 27 - Jun 11	7	6.2 - 9.0°C	Objective met
	E221340 U/S Olalla Creek	Mar 27 - Apr 24	5	7.0 - 9.8°C	Objective met
	E221341 at Keremeos	Mar 27 - Jun 11	7	5.4 - 11.0°C	Objective met
	0500757 at Mouth	Mar 27 - Jun 11	7	5.4 - 11.0°C	Objective met

Table 19. Columbia and Windermere Lakes Water Quality Objectives – 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform near water intakes < 10/100 mL 90th percentile (np)	Windermere Lake:	Jan 7 - Feb 5	10	all < 1 CFU/100 mL	
		Apr 22 - May 22	10	< 1 - < 2 CFU/100 mL	
	Windermere Intake		4	np = < 1 - < 2 CFU/100 mL	Objective met
	E207048	Jan 2 - May 22	19	< 1 - < 2 CFU/100 mL	
	Parr Utilities Water Intake		3	np = < 1 - < 2 CFU/100 mL	Objective met
	E207049	Jan 7 - May 22	22	< 1 - 2 CFU/100 mL	
	Timber Ridge Water Intake		4	np = < 1 - 2 CFU/00 mL	Objective met
Fecal Coliform at bathing beaches < 400/100 mL 90th percentile (np) < 200/100 mL geometric mean (gm)	Columbia Lake Windermere Lake	2003	0	no data collected	Omitted 2003
Turbidity < 1 NTU average < 5 NTU maximum	Columbia Lake Windermere Lake	2003	0	no data collected	Omitted 2003
Total Phosphorus < 0.008 mg/L average Columbia Lake < 0.010 mg/L average Windermere Lake	Columbia Lake Windermere Lake	2003	0	no data collected	Omitted 2003

Table 20. Toby Creek and Upper Columbia River Water Quality Objectives - 2003.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform < 10/100 mL 90th percentile (np)	Toby Creek: 0200333 above Panorama STP	Feb 27 - Mar 25 Aug 26 - Sep 23 Dec 2 - Dec 30	5 5 5	< 1 CFU/100 mL 3 - 15 CFU/100 mL < 1 - 1 CFU/100 mL	
			2 1	np = < 1 - 1 CFU/100 mL np = 12.6 CFU/100 mL	Objective met Objective not met
Toby Creek Columbia River (Toby Creek to Radium Hot Springs)	E247080 SE Panorama STP	Feb 27 - Mar 25 Aug 26 - Sep 16	5 5	< 1 CFU/100 mL < 1 - 25 CFU/100 mL	
			1 1	np = < 1 CFU/100 mL np = 22.6 CFU/100 mL	Objective met Objective not met
	E247081 2km D/S Panorama STP	Feb 27 - Mar 25 Aug 26 - Sep 23 Dec 2 - Dec 30	5 5 5	< 1 CFU/100 mL < 1 - 17 CFU/100 mL < 1 - 1 CFU/100 mL	
			2 1	np = < 1 - 1 CFU/100 mL np = 15.4 CFU/100 mL	Objective met Objective not met
	Columbia River: E207118 D/S Fairmont Hot Springs	Jan 7 - Feb 5 Apr 22 - May 20	5 5 2	< 1 CFU/100 mL < 1 - 12 CFU/100 mL np = < 1 - 8 CFU/100 mL	 Objective met
	Columbia River: 0200232 U/S Radium Hot Springs STP	Jan 8 - Feb 5 Apr 22 - May 20	5 5 2	< 1 - 3 CFU/100 mL < 1 - < 2 CFU/100 mL np = < 2 - 2.6 CFU/100 mL	 Objective met
Fecal Coliform < 400/100 mL 90th percentile (np) < 200/100 mL geometric mean (gm)	Columbia River: E207529 U/S Edgewater STP	Jan 7 - Feb 5 Apr 22 - May 20	5 5 2	< 1 - 1 CFU/100 mL < 1 - < 2 CFU/100 mL np = < 1 - < 2 CFU/100 mL	 Objective met
	E207530 D/S Edgewater STP	Jan 7 - Feb 5 Apr 22 - May 20	5 5 1 1	< 1 - 110 CFU/100 mL < 1 - 8 CFU/100 mL np = 5.6 CFU/100 mL np = 66.4 CFU/100 mL	 Objective met Objective not met
Turbidity 5 NTU or 10% max increase	Toby Creek	2003	0	no data collected	Omitted 2003
Suspended Solids 10 mg/L max increase	Toby Creek: E206171 U/S Mountain Minerals	Jan 8	1	< 4 mg/L	Control
	E206170 D/S Mountain Minerals	Jan 8	1	< 4 mg/L	Objective met
	0200333 above Panorama STP	Jan 2 - Dec 30	18	< 1 - 24 mg/L	Control
	E247080 SE Panorama STP	Jan 2 - Dec 30 Jan 2 - Dec 30 Sep 9	18 16 1	< 0.5 - 36 mg/L increase = 0 - 10 mg/L increase = 15 mg/L	 Objective met Objective not met
	E247081 2km D/S Panorama STP	Jan 2 - Dec 30 Jan 2 - Dec 30 Sep 9	18 16 1	< 0.5 - 34 mg/L increase = 0 - 8 mg/L increase = 13 mg/L	 Objective met Objective not met
Periphyton Growth 25% max increase	Toby Creek	2003	0	no data collected	Omitted 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Ammonia	Toby Creek: E206171	Jan 25 - May 20	9	< 0.005 - 0.008 mg/L	Max obj. met
0.007 mg/L avg	U/S Mountain Minerals	Apr 23 - May 20	1	av = 0.006 mg/L	Av obj. met
0.030 mg/L max	E206170 D/S Mountain Minerals	Jan 25 - May 20	9	< 0.005 - 0.008 mg/L	Max obj. met
		Apr 23 - May 20	1	av = 0.006 mg/L	Av obj. met
	0200333 above Panorama STP	Mar 6 - Dec 22	4	< 0.001 - 0.029 mg/L	Max obj. met
		Jan 2 - Dec 30	14	0.04 - 0.287 mg/L	Max obj. not met
		Feb 27 - Mar 25, Aug 26 - Sep 23, Dec 2 - Dec 30	3	av = 0.057 - 0.185 mg/L	Av obj. not met
	E247080 SE Panorama STP	Jan 2 - Dec 22	5	< 0.001 - 0.026 mg/L	Max obj. met
		Feb 27 - Dec 30	13	0.036 - 0.29 mg/L	Max obj. not met
		Feb 27 - Mar 25, Aug 26 - Sep 16	2	av = 0.038 - 0.201 mg/L	Av obj. not met
	E247081 2km D/S Panorama STP	Mar 6 - Dec 22	4	0.001 - 0.029 mg/L	Max obj. met
		Jan 2 - Dec 30	14	0.049 - 0.277 mg/L	Max obj. not met
		Feb 27 - Mar 25, Aug 26 - Sep 23, Dec 2 - Dec 30	3	av = 0.046 - 0.177 mg/L	Av obj. not met
Total Nitrite	Toby Creek: E206171	Jan 15 - May 20	9	< 0.002 - 0.006 mg/L	Max obj. met
0.020 mg/L avg	U/S Mountain Minerals	Apr 23 - May 20	1	av = 0.003 mg/L	Av obj. met
0.060 mg/L max	E206170 D/S Mountain Minerals	Jan 25 - May 20	9	< 0.002 - 0.005 mg/L	Max obj. met
		Apr 23 - May 20	1	av = 0.003 mg/L	Av obj. met
	0200333 above Panorama STP	Jan 2 - Dec 30	18	all 0.01 mg/L	Max obj. met
		Feb 27 - Mar 25, Aug 26 - Sep 23, Dec 2 - Dec 30	3	av = 0.01 mg/L	Av obj. met
	E247080 SE Panorama STP	Jan 2 - Dec 22	18	all 0.01 mg/L	Max obj. met
		Feb 27 - Mar 25, Aug 26 - Sep 16	2	av = 0.01 mg/L	Av obj. met
	E247081 2km D/S Panorama STP	Jan 2 - Dec 30	18	all 0.01 mg/L	Max obj. met
		Feb 27 - Mar 25, Aug 26 - Sep 23, Dec 2 - Dec 30	3	av = 0.01 mg/L	Av obj. met
Total Lead	Toby Creek: E206171	Jan 8 - May 20	10	0.00004 - 0.0036 mg/L	Max obj. met
0.005 mg/L max at hardness < 95 mg/L 0.010 mg/L max at hardness > 95 mg/L	U/S Mountain Minerals				
	E206170 D/S Mountain Minerals	Jan 8 - May 20	9	0.00008 - 0.00131 mg/L	Max obj. met
Total Barium	Toby Creek: E206171	Jan 8 - May 20	10	0.0318 - 0.187 mg/L	Max obj. met
1.0 mg/L max	U/S Mountain Minerals				
	E206170 D/S Mountain Minerals	Jan 8 - May 20	9	0.0362 - 0.0858 mg/L	Max obj. met
Total Cadmium	Toby Creek: E206171	Jan 8 - May 20	10	< 0.00001 - 0.00042 mg/L	Max obj. met
0.0002 mg/L max	U/S Mountain Minerals				
	E206170 D/S Mountain Minerals	Jan 8 - May 20	9	< 0.00001 - 0.0002 mg/L	Max obj. met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Zinc 0.05 mg/L max	Toby Creek: E206171 U/S Mountain Minerals	Jan 8 - May 20	10	< 0.0001 - 0.0063 mg/L	Max obj. met
	E206170 D/S Mountain Minerals	Jan 8 - May 20	9	0.0005 - 0.0068 mg/L	Max obj. met
Dissolved Copper 0.002 mg/L max	Toby Creek: E206171 U/S Mountain Minerals	Jan 8 - May 20	9	< 0.00005 - 0.0007 mg/L	Max obj. met
	E206170 D/S Mountain Minerals	Jan 8 - May 20	9	< 0.00005 - 0.00053 mg/L	Max obj. met

Table 21. Columbia River (Birchbank to International Border) Water Quality Objectives - 2003.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform < 100/100 mL 90th percentile (np)	Columbia River: 0200003 at Birchbank	Feb 4 - Mar 4	5	< 2 - 2 CFU/100 mL	
		Apr 14 - May 13	5	< 2 - 2 CFU/100 mL	
		Jun 18 - Jul 15	5	< 1 - 5 CFU/100 mL	
		Oct 7 - Nov 3	5	< 1 - 4 CFU/100 mL	
		Nov 12 - Dec 4	5	< 1 - 13 CFU/100 mL	
			5	np = 2 - 9 CFU/100 mL	Objective met
	E223893 100 m D/S RDKB STP outfall	Feb 4 - Mar 4	5	< 1 - 24 CFU/100 mL	
		Apr 14 - May 13	5	< 1 - 100 CFU/100 mL	
		Nov 12 - Dec 4	5	4 - 27 CFU/100 mL	
			3	np = 25 - 82 CFU/100 mL	Objective met
	0200559 at Waneta	Feb 4 - Mar 4	5	< 1 - 10 CFU/100 mL	
		Apr 14 - May 13	5	< 1 - 12 CFU/100 mL	
		Jun 18 - Jul 15	5	< 1 - 13 CFU/100 mL	
		Jul 21 - Aug 20	5	< 1 - 21 CFU/100 mL	
		Aug 25 - Sep 22	5	< 1 - 80 CFU/100 mL	
		Oct 27 - Nov 24	5	1 - 13 CFU/100 mL	
		Nov 12 - Dec 4	5	1 - 9 CFU/100 mL	
			7	np = 7 - 58 CFU/100 mL	Objective met
Enterococcus sp. < 25 /100mL 90th percentile (np)	Columbia River: 0200003 at Birchbank	Feb 4 - Mar 4	5	< 1 - 55 CFU/100 mL	
		Apr 14 - May 13	5	< 2 - 2 CFU/100 mL	
		Nov 12 - Dec 4	5	< 1 - 2 CFU/100 mL	
			2	np = 1 - 2 CFU /100 mL	Objective met
			1	np = 33.4 CFU/100 mL	Objective not met
	E223893 100 m D/S RDKB STP outfall	Feb 4 - Mar 4	5	4 - 35 CFU/100 mL	
		Apr 14 - May 13	5	< 2 - 18 CFU/100 mL	
		Nov 12 - Dec 4	5	< 2 - 4 CFU/100 mL	
			2	np = 4 - 14 CFU /100 mL	Objective met
			1	np = 33 CFU /100 mL	Objective not met
	0200559 at Waneta	Feb 4 - Mar 4	5	< 1 - 3 CFU/100 mL	
		Apr 14 - May 13	5	1 - < 2 CFU/100 mL	
		Nov 12 - Dec 4	5	< 1 - 2 CFU/100 mL	
			3	np = 2 - 3 CFU/100 mL	Objective met
E. coli < 100 /100mL 90th percentile (np)	Columbia River: 0200003 at Birchbank	Feb 4 - Mar 4	5	< 1 - 1 CFU/100 mL	
		Apr 14 - May 13	5	< 2 - 2 CFU/100 mL	
		Nov 12 - Dec 4	5	< 1 - 2 CFU/100 mL	
			2	np = 1 - 2 CFU /100 mL	Objective met
	E223893 100 m D/S RDKB STP outfall	Feb 4 - Mar 4	5	< 1 - 17 CFU/100 mL	
		Apr 14 - May 13	5	< 1 - 8 CFU/100 mL	
		Nov 12 - Dec 4	5	4 - 26 CFU/100 mL	
			3	np = 6 - 24 CFU /100 mL	Objective met
	0200559 at Waneta	Feb 4 - Mar 4	5	< 1 - 7 CFU/100 mL	
		Apr 14 - May 13	5	< 1 - 4 CFU/100 mL	
		Nov 12 - Dec 4	5	< 1 - 5 CFU/100 mL	
			3	np = 3 - 5 CFU/100 mL	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia	Columbia River:	Feb 4 - Mar 4	5	< 0.005 - 0.026 mg/L	Max objective met
	0200003	Apr 14 - May 13	5	< 0.005 - 0.012 mg/L	Max objective met
30-day average	at Birchbank	Nov 12 - Dec 4	5	< 0.005 - 0.020 mg/L	Max objective met
1.13 mg/L			3	av = 0.007 - 0.010 mg/L	Av. objective met
at 10ºC and pH 8.0	E223892	Feb 4 - Mar 4	5	0.016 - 0.273 mg/L	Max objective met
	at Stoney	Apr 14 - May 13	5	< 0.005 - 0.041 mg/L	Max objective met
5.86 mg/L max.		Nov 12 - Dec 4	5	0.006 - 0.037 mg/L	Max objective met
at 10ºC and pH 8.0			3	av. = 0.018 - 0.076 mg/L	Av. objective met
	0200558	Feb 4 - Mar 4	5	0.052 - 0.090 mg/L	Max objective met
	New Trail Bridge	Apr 14 - May 13	5	0.022 - 0.070 mg/L	Max objective met
		Nov 12 - Dec 4	5	0.009 - 0.023 mg/L	Max objective met
			3	av. = 0.015 - 0.072 mg/L	Av. objective met
	E216137	Feb 4 - Mar 4	5	0.017 - 0.174 mg/L	Max objective met
	Old Trail Bridge	Apr 14 - May 13	5	0.009 - 0.034 mg/L	Max objective met
		Nov 12 - Dec 4	5	< 0.005 - 0.012 mg/L	Max objective met
			3	av. = 0.008 - 0.052 mg/L	Av. objective met
	E223893	Feb 4 - Mar 4	5	0.015 - 0.100 mg/L	Max objective met
	100 m D/S RDKB	Apr 14 - May 13	5	0.008 - 0.026 mg/L	Max objective met
	STP outfall	Nov 12 - Dec 4	5	0.013 - 0.107 mg/L	Max objective met
			3	av = 0.018 - 0.043 mg/L	Av. objective met
	0200559	Feb 4 - Mar 4	5	0.018 - 0.044 mg/L	Max objective met
	at Waneta	Apr 14 - May 13	5	< 0.005 - 0.040 mg/L	Max objective met
		Nov 12 - Dec 4	5	0.005 - 0.037 mg/L	Max objective met
			3	av = 0.015 - 0.033 mg/L	Av. objective met
pH	Columbia River:	Jan 6 - Dec 29	42	6.9 - 8.1	Objective met
	0200003				
6.5 - 8.5	at Birchbank				
	E223892	Feb 4 - Dec 4	15	7.7 - 8.0	Objective met
	D/S Stoney Creek				
	0200558	Feb 4 - Dec 4	15	7.7 - 8.0	Objective met
	New Trail Bridge				
	E216137	Feb 4 - Dec 4	15	7.7 - 8.0	Objective met
	Old Trail Bridge				
	E223893	Feb 4 - Dec 4	15	7.7 - 8.0	Objective met
	100 m D/S RDKB STP outfall				
	0200559	Jan 6 - Dec 29	65	7.0 - 8.1	Objective met
	at Waneta				

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen May to October 5 mg/L min. 8 mg/L ave November to April 9 mg/L min 11 mg/L ave	Columbia River: 0200003	Feb 4 - Mar 4	8	10.0 - 10.1 mg/L	Min obj. met
		Apr 14 - May 13	4	9.2 - 12.3 mg/L	Min obj. met
		Apr 23	1	6.6 mg/L	Min obj. not met
		Nov 12 - Dec 4	4	9.3 - 10.1 mg/L	Min obj. met
	at Birchbank		3	av = 9.7 - 10.0 mg/L	Av. obj not met
	E223892 D/S Stoney Creek	Feb 4 - Mar 4	5	10.0 - 10.7 mg/L	Min obj. met
		Apr 14 - May 13	4	9.3 - 12.8 mg/L	Min obj. met
		Apr 23	1	6.6 mg/L	Min obj. not met
		Nov 12 - Dec 4	4	9.7 - 11.4 mg/L	Min obj. met
			3	av = 10.3 - 10.6 mg/L	Av. obj not met
	0200558 New Trail Bridge	Feb 4 - Mar 4	5	10.1 - 10.4 mg/L	Min obj. met
		Apr 14 - May 13	4	9.4 - 12.8 mg/L	Min obj. met
		Apr 23	1	6.7 mg/L	Min obj. not met
		Nov 12 - Dec 4	4	9.7 - 11.6 mg/L	Min obj. met
			3	av = 10.3 - 10.6 mg/L	Av. obj not met
	E216137 Old Trail Bridge	Feb 4 - Mar 4	5	10.1 - 10.6 mg/L	Min obj. met
		Apr 14 - May 13	5	9.3 - 12.9 mg/L	Min obj. met
		Nov 12 - Dec 4	5	9.8 - 11.1 mg/L	Min obj. met
			2	av. = 10.4 - 10.5 mg/L	Av. obj not met
			1	av. = 11.4 mg/L	Ave. obj met
	E223893 100 m D/S RDKB STP outfall	Feb 4 - Mar 4	5	10.3 - 10.9 mg/L	Min obj. met
		Apr 14 - May 13	5	8.3 - 12.8 mg/L	Min obj. met
		Nov 12 - Dec 4	5	10.1 - 11.6 mg/L	Min obj. met
			2	av. = 10.5 - 10.7 mg/L	Av. obj not met
			1	av. = 11.2 mg/L	Ave. obj met
	0200559 at Waneta	Feb 4 - Mar 4	5	10.3 - 10.5 mg/L	Min obj. met
		Apr 14 - May 13	5	9.1 - 12.2 mg/L	Min obj. met
		Nov 12 - Dec 4	5	10.0 - 10.4 mg/L	Min obj. met
			3	av. = 10.1 - 10.8 mg/L	Av. obj not met
Dissolved Gas 110% max.	Columbia River: 0200003 at Birchbank	Feb 4 - Dec 4	15	100 - 108 %	Max obj. met
	0200559 at Waneta	Feb 4 - Dec 4	14	101 - 105 %	Max obj. met
Total As 0.005 mg/L av.	Columbia River: 0200003 at Birchbank	Feb 4 - Mar 4	5	0.0001 - 0.0002 mg/L	
		Apr 14 - May 13	5	0.0002 - 0.0003 mg/L	
		Jun 18 - Jul 15	5	0.0002 - 0.00026 mg/L	
		Nov 12 - Dec 4	5	< 0.0001 - 0.0003 mg/L	
			4	av. = 0.0001 – 0.0002 mg/L	Av. obj. met
	E223892 D/S Stoney Creek	Feb 4 - Mar 4	5	0.0003 - 0.0006 mg/L	
		Apr 14 - May 13	5	0.0002 - 0.0006 mg/L	
		Nov 12 - Dec 4	5	< 0.0001 - 0.0002 mg/L	
			3	av. = 0.0002 – 0.0005 mg/L	Av. obj. met
	0200558 New Trail Bridge	Feb 4 - Mar 4	5	0.0004 - 0.0005 mg/L	
		Apr 14 - May 13	5	0.0004 - 0.0008 mg/L	
		Nov 12 - Dec 4	5	0.0001 - 0.0005 mg/L	
			3	av. = 0.0002 – 0.0006 mg/L	Av. obj. met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total As 0.005 mg/L av.	E216137 Old Trail Bridge	Feb 4 - Mar 4	5	0.0002 - 0.0003 mg/L	
		Apr 14 - May 13	5	0.0001 - 0.0006 mg/L	
		Nov 12 - Dec 4	5	0.0001 - 0.0003 mg/L	
			3	av. = 0.0002 – 0.0004 mg/L	Av. obj. met
	E223893 100 m D/S RDKB STP outfall	Feb 4 - Mar 4	5	0.0002 - 0.0003 mg/L	
		Apr 14 - May 13	5	0.0002 - 0.0003 mg/L	
		Nov 12 - Dec 4	5	< 0.0001 - 0.0003 mg/L	
			3	av. = 0.0002 – 0.0003 mg/L	Av. obj. met
	0200559 at Waneta	Feb 4 - Mar 4	5	0.0002 - 0.0003 mg/L	
		Apr 8 - May 7	5	0.0003 - 0.00035 mg/L	
		Apr 14 - May 13	5	0.0003 - 0.0004 mg/L	
		May 13 - Jun 2	5	0.00032 - 0.00038 mg/L	
		Jun 11 - Jul 7	5	0.00026 - 0.00032 mg/L	
		Sep 3 - Sep 30	5	0.00015 - 0.00024 mg/L	
		Oct 7 - Nov 3	5	0.00018 - 0.00023 mg/L	
		Nov 12 - Dec 10	5	0.00016 - 0.00026 mg/L	
		Nov 18 - Dec 16	5	< 0.0001 - 0.0004 mg/L	
			9	av. = 0.00019 – 0.00035 mg/L	Av. obj. met
Total Cd 0.05 ug/L av.	Columbia River: 0200003 at Birchbank	Feb 4 - Mar 4	5	< 0.01 - 0.12 ug/L	
		Apr 14 - May 13	5	0.01 - 0.04 ug/L	
		Jun 18 - Jul 15	5	0.015 - 0.025 ug/L	
		Nov 12 - Dec 4	5	< 0.01 - 0.02 ug/L	
			3	av. = 0.01 - 0.02 ug/L	Av. obj. met
			1	av. = 0.05 ug/L	Av. obj not met
	E223892 D/S Stoney Creek	Feb 4 - Mar 4	5	< 0.01 - 0.23 ug/L	
		Apr 14 - May 13	5	0.01 - 0.25 ug/L	
		Nov 12 - Dec 4	5	0.01 - 0.04 ug/L	
			1	av. = 0.03 ug/L	Av. obj. met
			2	av. = 0.08 - 0.09 ug/L	Av. obj not met
	0200558 New Trail Bridge	Feb 4 - Mar 4	5	0.17 - 0.23 ug/L	
		Apr 14 - May 13	5	0.04 - 0.24 ug/L	
		Nov 12 - Dec 4	5	0.04 - 0.13 ug/L	
			3	av. = 0.06 – 0.20 ug/L	Av. obj not met
	E216137 Old Trail Bridge	Feb 4 - Mar 4	5	< 0.01 - 0.1 ug/L	
		Apr 14 - May 13	5	0.02 - 0.16 ug/L	
		Nov 12 - Dec 4	5	0.01 - 0.04 ug/L	
			2	av. = 0.03 - 0.048 ug/L	Av. obj. met
			1	av. = 0.07 ug/L	Av. obj not met
	E223893 100 m D/S RDKB STP outfall	Feb 4 - Mar 4	5	< 0.01 - 0.11 ug/L	
		Apr 14 - May 13	5	0.03 - 0.08 ug/L	
		Nov 12 - Dec 4	5	0.02 - 0.03 mg/L	
			1	av. = 0.03 ug/L	Av. obj. met
			2	av. = 0.05 - 0.06 ug/L	Av. obj not met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cd	0200559 at Waneta	Feb 4 - Mar 4	5	< 0.01 - 0.25 ug/L	
		Apr 8 - May 7	5	0.038 - 0.05 ug/L	
0.05 ug/L av.		Apr 14 - May 13	5	0.04 - 0.19 ug/L	
		May 13 - Jun 2	5	0.038 - 0.099 ug/L	
		Jun 11 - Jul 7	5	0.028 - 0.041 ug/L	
		Sep 3 - Sep 30	5	0.022 - 0.047 ug/L	
		Oct 7 - Nov 3	5	0.018 - 0.055 ug/L	
		Nov 12 - Dec 10	5	0.018 - 0.124 ug/L	
		Nov 12 - Dec 4	5	0.02 - 0.04 ug/L	
			7	av. = 0.022 - 0.047 ug/L	Av. obj. met
			2	av. = 0.055 - 0.072 ug/L	Av. obj not met
Total Cr 1 ug/L av.	Columbia River: 0200003 at Birchbank	Feb 4 - Mar 4	5	all < 0.2 ug/L	
		Apr 14 - May 13	5	all < 0.2 ug/L	
		Jun 18 - Jul 15	5	0.081 - 0.120 ug/L	
		Nov 12 - Dec 4	5	0.4 - 2.8 ug/L	
			3	av. = 0.09 - < 0.2 ug/L	Av. obj. met
			1	av. = 1.4 ug/L	Av. obj not met
	E223892 D/S Stoney Creek	Feb 4 - Mar 4	5	all < 0.2 ug/L	
		Apr 14 - May 13	5	all < 0.2 ug/L	
		Nov 12 - Dec 4	5	< 0.2 - 2.9 ug/L	
			2	av. = < 0.2 ug/L	Av. obj. met
			1	av. = 1.44 ug/L	Av. obj not met
	0200558 New Trail Bridge	Feb 4 - Mar 4	5	all < 0.2 ug/L	
		Apr 14 - May 13	5	all < 0.2 ug/L	
		Nov 12 - Dec 4	5	< 0.2 - 2.9 ug/L	
			2	av. = < 0.2 ug/L	Av. obj. met
			1	av. = 1.44 ug/L	Av. obj not met
	E216137 Old Trail Bridge	Feb 4 - Mar 4	5	all < 0.2 ug/L	
		Apr 14 - May 13	5	all < 0.2 ug/L	
		Nov 12 - Dec 4	5	0.3 - 2.8 ug/L	
			2	av. = < 0.2 ug/L	Av. obj. met
			1	av. = 1.44 ug/L	Av. obj not met
	E223893 100 m D/S RDKB STP outfall	Feb 4 - Mar 4	5	all < 0.2 ug/L	
		Apr 14 - May 13	5	all < 0.2 ug/L	
		Nov 12 - Dec 4	5	< 0.2 - 2.8 ug/L	
			2	av. = < 0.2 ug/L	Av. obj. met
			1	av. = 1.48 ug/L	Av. obj not met
	0200559 at Waneta	Feb 4 - Mar 4	5	all < 0.2 ug/L	
		Apr 8 - May 7	5	0.060 - 0.244 ug/L	
		Apr 14 - May 13	5	all < 0.2 ug/L	
		May 13 - Jun 2	5	0.120 - 0.303 ug/L	
		Jun 11 - Jul 7	5	0.086 - 0.186 ug/L	
		Sep 3 - Sep 30	5	0.059 - 0.093 ug/L	
		Oct 7 - Nov 3	5	0.053 - 0.061 ug/L	
		Nov 12 - Dec 10	5	0.055 - 0.071 ug/L	
		Nov 12 - Dec 4	5	< 0.2 - 3.1 ug/L	
			8	av. = 0.056 - 0.206 ug/L	Av. obj. met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
			1	av. = 1.42 ug/L	Av. obj not met
Total Cu 7.17 ug/L max 2 ug/L av.	Columbia River: 0200003 at Birchbank	Feb 4 - Mar 4	5	0.26 - 0.73 ug/L	Max. obj. met
		Apr 14 - May 13	5	0.33 - 0.85 ug/L	Max. obj. met
		Jun 18 - Jul 15	5	0.35 - 0.41 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	0.44 - 0.75 ug/L	Max. obj. met
			4	av. = 0.37 - 0.56 ug/L	Av. obj. met
	E223892 D/S Stoney Creek	Feb 4 - Mar 4	5	0.22 - 0.51 ug/L	Max. obj. met
		Apr 14 - May 13	5	0.38 - 0.57 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	0.48 - 0.64 ug/L	Max. obj. met
			3	av. = 0.34 - 0.57 ug/L	Av. obj. met
	0200558 New Trail Bridge	Feb 4 - Mar 4	5	0.22 - 0.76 ug/L	Max. obj. met
		Apr 14 - May 13	5	0.40 - 0.69 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	0.46 - 0.79 ug/L	Max. obj. met
			3	av. = 0.42 - 0.64 ug/L	Av. obj. met
	E216137 Old Trail Bridge	Feb 4 - Mar 4	5	0.23 - 0.42 ug/L	Max. obj. met
		Apr 14 - May 13	5	0.40 - 0.77 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	0.43 - 0.65 ug/L	Max. obj. met
			3	av. = 0.31 - 0.60 ug/L	Av. obj. met
	E223893 100 m D/S RDKB STP outfall	Feb 4 - Mar 4	5	0.33 - 0.67 ug/L	Max. obj. met
		Apr 14 - May 13	5	0.51 - 0.80 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	0.55 - 1.48 ug/L	Max. obj. met
			3	av. = 0.50 - 0.88 ug/L	Av. obj. met
	0200559 at Waneta	Feb 4 - Mar 4	5	0.31 - 0.66 ug/L	Max. obj. met
		Apr 8 - May 7	5	0.49 - 0.75 ug/L	Max. obj. met
		Apr 14 - May 13	5	0.60 - 1.13 ug/L	Max. obj. met
		May 13 - Jun 2	5	0.66 - 1.35 ug/L	Max. obj. met
		Jun 11 - Jul 7	5	0.47 - 1.26 ug/L	Max. obj. met
		Sep 3 - Sep 30	5	0.41 - 0.91 ug/L	Max. obj. met
		Oct 7 - Nov 3	5	0.25 - 0.46 ug/L	Max. obj. met
		Nov 12 - Dec 10	5	0.39 - 0.54 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	0.61 - 1.12 ug/L	Max. obj. met
			9	av. = 0.39 - 0.95 ug/L	Av. obj. met
Total Pb 37.9 ug/L max 4.8 ug/L av.	Columbia River: 0200003 at Birchbank	Feb 4 - Mar 4	5	0.06 - 0.17 ug/L	Max. obj. met
		Apr 14 - May 13	5	0.05 - 1.37 ug/L	Max. obj. met
		Jun 18 - Jul 15	5	0.112 - 0.224 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	0.04 - 0.61 ug/L	Max. obj. met
			4	av. = 0.09 - 0.40 ug/L	Av. obj. met
	E223892 D/S Stoney Creek	Feb 4 - Mar 4	5	0.12 - 0.38 ug/L	Max. obj. met
		Apr 14 - May 13	5	0.08 - 0.52 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	0.07 - 0.19 ug/L	Max. obj. met
			3	av. = 0.12 - 0.27 ug/L	Av. obj. met
	0200558 New Trail Bridge	Feb 4 - Mar 4	5	0.24 - 1.01 ug/L	Max. obj. met
		Apr 14 - May 13	5	0.18 - 0.82 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	0.11 - 1.99 ug/L	Max. obj. met
			3	av. = 0.46 - 0.75 ug/L	Av. obj. met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Pb 37.9 ug/L max 4.8 ug/L av.	E216137 Old Trail Bridge	Feb 4 - Mar 4	5	0.08 - 4.3 ug/L	Max. obj. met
		Apr 14 - May 13	5	0.13 - 0.81 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	0.06 - 1.85 ug/L	Max. obj. met
			3	av. = 0.37 - 1.02 ug/L	Av. obj. met
	E223893 100 m D/S RDKB STP outfall	Feb 4 - Mar 4	5	0.13 - 0.42 ug/L	Max. obj. met
		Apr 14 - May 13	5	0.16 - 0.55 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	0.08 - 0.27 ug/L	Max. obj. met
			3	av. = 0.18 - 0.36 ug/L	Av. obj. met
	0200559 at Waneta	Feb 4 - Mar 4	5	0.10 - 0.41 ug/L	Max. obj. met
		Apr 8 - May 7	5	0.206 - 0.317 ug/L	Max. obj. met
		Apr 14 - May 13	5	0.19 - 0.74 ug/L	Max. obj. met
		May 13 - Jun 2	5	0.298 - 2.30 ug/L	Max. obj. met
		Jun 11 - Jul 7	5	0.179 - 0.416 ug/L	Max. obj. met
		Sep 3 - Sep 30	5	0.150 - 0.353 ug/L	Max. obj. met
		Oct 7 - Nov 3	5	0.129 - 0.183 ug/L	Max. obj. met
		Nov 12 - Dec 10	5	0.095 - 0.429 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	0.09 - 0.45 ug/L	Max. obj. met
			9	av. = 0.171 - 1.860 ug/L	Av. obj. met
Total Tl 0.8 ug/L av.	Columbia River: 0200003 at Birchbank	Feb 4 - Mar 4	5	< 0.002 - 0.002 ug/L	
		Apr 14 - May 13	5	< 0.002 - 0.004 ug/L	
		Jun 18 - Jul 15	5	0.003 - 0.004 ug/L	
		Nov 12 - Dec 4	5	< 0.002 - 0.005 ug/L	
			4	av. = 0.002 - 0.003 ug/L	Av. obj. met
	E223892 D/S Stoney Creek	Feb 4 - Mar 4	5	< 0.002 - 0.013 ug/L	
		Apr 14 - May 13	5	< 0.002 - 0.003 ug/L	
		Nov 12 - Dec 4	5	< 0.002 - 0.005 ug/L	
			3	av. = 0.002 - 0.005 ug/L	Av. obj. met
	0200558 New Trail Bridge	Feb 4 - Mar 4	5	0.124 - 0.317 ug/L	
		Apr 14 - May 13	5	< 0.002 - 0.207 ug/L	
		Nov 12 - Dec 4	5	0.019 - 0.221 ug/L	
			3	av. = 0.067 - 0.236 ug/L	Av. obj. met
	E216137 Old Trail Bridge	Feb 4 - Mar 4	5	0.017 - 0.087 ug/L	
		Apr 14 - May 13	5	0.017 - 0.092 ug/L	
		Nov 12 - Dec 4	5	0.004 - 0.025 ug/L	
			3	av. = 0.010 - 0.051 ug/L	Av. obj. met
	E223893 100 m D/S RDKB STP outfall	Feb 4 - Mar 4	5	< 0.002 - 0.036 ug/L	
		Apr 14 - May 13	5	0.018 - 0.035 ug/L	
		Nov 12 - Dec 4	5	0.002 - 0.010 ug/L	
			3	av. = 0.006 - 0.025 ug/L	Av. obj. met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Tl 0.8 ug/L av.	0200559 at Waneta	Feb 4 - Mar 4	5	0.013 - 0.039 ug/L	
		Apr 8 - May 7	5	0.016 - 0.021 ug/L	
		Apr 14 - May 13	5	0.017 - 0.044 ug/L	
		May 13 - Jun 2	5	0.009 - 0.025 ug/L	
		Jun 11 - Jul 7	5	0.004 - 0.016 ug/L	
		Sep 3 - Sep 30	5	0.014 - 0.039 ug/L	
		Oct 7 - Nov 3	5	0.001 - 0.037 ug/L	
		Nov 12 - Dec 10	5	0.009 - 0.017 ug/L	
		Nov 12 - Dec 4	5	0.003 - 0.016 ug/L	
			9	av. = 0.010 - 0.029 ug/L	Av. obj. met
Total Zn 33 ug/L max 7.5 ug/L av.	Columbia River: 0200003 at Birchbank	Feb 4 - Mar 4	5	0.9 - 5.0 ug/L	Max. obj. met
		Apr 14 - May 13	5	1.4 - 5.4 ug/L	Max. obj. met
		Jun 18 - Jul 15	5	1.09 - 2.30 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	0.8 - 2.0 ug/L	Max. obj. met
			4	av. = 1.4 - 2.9 ug/L	Av. obj. met
	E223892 D/S Stoney Creek	Feb 4 - Mar 4	5	4.7 - 6.4 ug/L	Max. obj. met
		Apr 14 - May 13	5	2.2 - 8.6 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	2.0 - 3.6 ug/L	Max. obj. met
			3	av. = 3.0 - 5.8 ug/L	Av. obj. met
	0200558 New Trail Bridge	Feb 4 - Mar 4	5	6.7 - 16.8 ug/L	Max. obj. met
		Apr 14 - May 13	5	3.5 - 10.0 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	3.7 - 6.7 ug/L	Max. obj. met
			2	av. = 4.9 - 6.5 ug/L	Av. obj. met
			1	av. = 9.9 ug/L	Av. obj. not met
	E216137 Old Trail Bridge	Feb 4 - Mar 4	5	2.7 - 4.7 ug/L	Max. obj. met
		Apr 14 - May 13	5	2.6 - 7.5 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	1.8 - 3.4 ug/L	Max. obj. met
			3	av. = 2.7 - 5.1 ug/L	Av. obj. met
	E223893 100 m D/S RDKB STP outfall	Feb 4 - Mar 4	5	2.5 - 6.4 ug/L	Max. obj. met
		Apr 14 - May 13	5	2.5 - 5.7 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	2.3 - 4.1 ug/L	Max. obj. met
			3	av. = 3.3 - 4.6 ug/L	Av. obj. met
	0200559 at Waneta	Feb 4 - Mar 4	5	0.9 - 6.5 ug/L	Max. obj. met
		Apr 8 - May 7	5	3.35 - 4.56 ug/L	Max. obj. met
		Apr 14 - May 13	5	3.5 - 11.4 ug/L	Max. obj. met
		May 13 - Jun 2	5	3.44 - 7.97 ug/L	Max. obj. met
		Jun 11 - Jul 7	5	2.52 - 4.32 ug/L	Max. obj. met
		Sep 3 - Sep 30	5	1.60 - 2.96 ug/L	Max. obj. met
		Oct 7 - Nov 3	5	1.48 - 2.09 ug/L	Max. obj. met
		Nov 12 - Dec 10	5	0.75 - 3.05 ug/L	Max. obj. met
		Nov 12 - Dec 4	5	2.7 - 9.3 ug/L	Max. obj. met
			9	av. = 1.77 - 6.1 ug/L	Av. obj. met
Total As 5.7 µg/g dry weight max in sediments	Columbia River	2003	0	no data collected	Omitted 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cd 0.6 µg/g dry weight max in sediments	Columbia River	2003	0	no data collected	Omitted 2003
Total Cr 36.4 µg/g dry weight max in sediments	Columbia River	2003	0	no data collected	Omitted 2003
Total Cu 35.1 µg/g dry weight max in sediments	Columbia River	2003	0	no data collected	Omitted 2003
Total Pb 33.4 µg/g dry weight max in sediments	Columbia River	2003	0	no data collected	Omitted 2003
Total Hg 0.16 µg/g dry weight max in sediments	Columbia River	2003	0	no data collected	Omitted 2003
Total Zn 120 µg/g dry weight max in sediments	Columbia River	2003	0	no data collected	Omitted 2003
Total As 471 µg/kg wet weight max in fish					
Total Cd 900 µg/kg wet weight max in fish					
Total Cr 940 µg/kg wet weight max in fish					
Total Pb 160 µg/kg wet weight max in fish					

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Hg 100 µg/kg wet weight max in fish					
Dioxins & Furans 0.85 pg/g PCDD and PCDF TEQ max. in sediments (dry weight)	Columbia River	2003	0	no data collected	Omitted 2003
Dioxins & Furans 0.71 pg/g PCDD and PCDF TEQ max. in fish (wet weight)					

Table 22. Elk River Water Quality Objectives - 2003.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Suspended Solids	Elk River 0200102	Jan 19 - Apr 7, Oct 21	7	< 4 - 67 mg/L	Max objective met
< 25 mg/L av	D/S Sparwood		1	av. = 13 mg/L	Indefinite result - no 5-in-30
80 mg/L max Sept - mid April	0200016 near Elko	Jan 19 - Apr 7, Nov 11	16	< 4 - 15 mg/L	Max objective met
		Oct 21	1	82 mg/L	Max objective not met
			1	av. = 5.6 mg/L	Indefinite result - no 5-in-30
Substrate Sediment no increase in particulates < 3 mm Sept - mid April	Elk River	2002	0	no data collected	Omitted 2003

Table 23. Fraser River (Kanaka Creek to the Mouth) Water Quality Objectives - 2003.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms	Main Stem:	Feb 13 - Mar 14	5	2 - 34 CFU/100 mL	
	E207603		1	gm = 10.4 CFU/100 mL	Indefinite result
< 200 CFU /100 mL	100m D/S Kent STP				(not Apr - Oct)
geometric mean		Feb 14 - Mar 14	5	9 - 110 CFU/100 mL	
(gm)	E207602				
	100m D/S James STP		1	gm = 35.2 CFU/100 mL	Indefinite result
April - October		Feb 13 - Mar 13	5	110 - 570 CFU/100 mL	
	300005				
	Near Patullo Railroad Bridge		1	gm = 206.1 CFU/100 mL	Indefinite result
		Feb 11 - Mar 11	5	10 - 47 CFU/100 mL	
	MacMillan Island		1	gm = 22.4 CFU/100 mL	Indefinite result
		Feb 11 - Mar 11	5	20 - 32 CFU/100 mL	
	Barnston Island		1	gm = 23.0 CFU/100 mL	Indefinite result
		Feb 11 - Mar 11	5	20 - 40 CFU/100 mL	
	U/S Sapperton Bar		1	gm = 25.1 CFU/100 mL	Indefinite result
	North Arm	Feb 13 - Mar 13	5	29 - 420 CFU/100 mL	
	300002				
	at Oak Street Bridge		1	gm = 154.4 CFU/100 mL	Indefinite result
		Feb 12 - Mar 12	5	227 - 585 CFU/100 mL	
	Near Boundary Road		1	gm = 364.1 CFU/100 mL	Indefinite result
		Feb 12 - Mar 12	5	50 - 1744 CFU/100 mL	
	Near McDonald Slough		1	gm = 276.7 CFU/100 mL	Indefinite result
	Main Arm	Feb 13 - Mar 13	5	100 - 1200 CFU/100 mL	
	301311				
	D/S Annacis Outfall		1	gm = 423.9 CFU/100 mL	Indefinite result
		Feb 13 - Mar 13	5	55 - 230 CFU/100 mL	
	E207407				
	D/S Lulu STP		1	gm = 125.7 CFU/100 mL	Indefinite result
		Feb 11 - Mar 11	5	47 - 223 CFU/100 mL	
	Tilbury Island		1	gm = 114.6 CFU/100 mL	Indefinite result
		Feb 11 - Mar 11	5	244 - 577 CFU/100 mL	
	Near Ewen Slough		1	gm = 374.5 CFU/100 mL	Indefinite result
	Sturgeon Banks	Feb 13 - Mar 13	5	6 - 58 CFU/100 mL	
	Between Iona Jetty and				
	Main Arm Jetty		1	gm = 16.4 CFU/100 mL	Indefinite result
	GVRD Iona Beach	Mar 11 - Dec 3	39	20 - 500 MPN/100 mL	
	Station 15	Apr 2 - Sep 24	6	gm = 20 - 57 MPN/100 mL	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms	GVRD Iona Beach	Mar 11 - Dec 3	39	20 - 800 MPN/100 mL	
< 200 CFU /100 mL geometric mean (gm)	Station 16	Apr 2 - Sep 24	6	gm = 20 - 44 MPN/100 mL	Objective met
	GVRD Iona Beach	Mar 11 - Dec 3	39	20 - 230 MPN/100 mL	
	Station 17	Apr 2 - Sep 24	6	gm = 20 - 43 MPN/100 mL	Objective met
April - October	Roberts Banks E249990	Feb 13 - Mar 5	4	< 1 - 8 CFU/100 mL	
	South of Main Arm		1	gm = 2.4 CFU/100 mL	Indefinite result
Enterococci	Main Stem: E207603	Feb 13 - Mar 14	5	< 1 - 8 CFU/100 mL	
< 20 CFU /100 mL geometric mean (gm)	100m D/S Kent STP		1	gm = 2.8 CFU/100 mL	Indefinite result
	E207602	Feb 14 - Mar 14	5	2 - 69 CFU/100 mL	
	100m D/S James STP		1	gm = 19.2 CFU/100 mL	Indefinite result
April - October	300005	Feb 13 - Mar 13	5	37 - 140 CFU/100 mL	
	Near Patullo Railroad Bridge		1	gm = 74.2 CFU/100 mL	Indefinite result
	North Arm 300002	Feb 13 - Mar 13	5	16 - 110 CFU/100 mL	
	at Oak Street Bridge		1	gm = 35.8 CFU/100 mL	Indefinite result
	Main Arm 301311	Feb 13 - Mar 13	5	48 - 610 CFU/100 mL	
	D/S Annacis Outfall		1	gm = 179.9 CFU/100 mL	Indefinite result
	E207407	Feb 13 - Mar 13	5	23 - 140 CFU/100 mL	
	D/S Lulu STP		1	gm = 45.8 CFU/100 mL	Indefinite result
	Sturgeon Banks Between Iona Jetty and	Feb 13 - Mar 13	5	7 - 830 CFU/100 mL	
	Main Arm Jetty		1	gm = 38.4 CFU/100 mL	Indefinite result
	Roberts Banks E249990	Feb 13 - Mar 5	4	2 - 240 CFU/100 mL	
	South of Main Arm		1	gm = 26.3 CFU/100 mL	Indefinite result
Escherichia coli	Main Stem: E207603	Feb 13 - Mar 14	5	< 1 - 17 CFU/100 mL	
< 77 CFU /100 mL geometric mean (gm)	100m D/S Kent STP		1	gm = 5.5 CFU/100 mL	Indefinite result
	E207602	Feb 14 - Mar 14	5	3 - 72 CFU/100 mL	
	100m D/S James STP		1	gm = 15.6 CFU/100 mL	Indefinite result
April - October	300005	Feb 13 - Mar 13	5	10 - 240 CFU/100 mL	
	Near Patullo Railroad Bridge		1	gm = 35.7 CFU/100 mL	Indefinite result
	MacMillan Island	Feb 11 - Mar 11	5	20 - 32 CFU/100 mL	
			1	gm = 24.0 CFU/100 mL	Indefinite result
	Barnston Island	Feb 11 - Mar 11	5	20 - 32 CFU/100 mL	
			1	gm = 23.0 CFU/100 mL	Indefinite result

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Escherichia coli		Feb 11 - Mar 11	5	20 - 40 CFU/100 mL	
< 77 CFU /100 mL	U/S Sapperton Bar		1	gm = 23.0 CFU/100 mL	Indefinite result
geometric mean (gm)	North Arm 300002	Feb 13 - Mar 13	5	3 - 240 CFU/100 mL	
	at Oak Street Bridge		1	gm = 33.7 CFU/100 mL	Indefinite result
April - October		Feb 12 - Mar 12	5	157 - 585 CFU/100 mL	
	Near Boundary Road		1	gm = 234.0 CFU/100 mL	Indefinite result
		Feb 12 - Mar 12	5	32 - 1744 CFU/100 mL	
	Near McDonald Slough		1	gm = 196.5 CFU/100 mL	Indefinite result
	Main Arm 301311	Feb 13 - Mar 13	5	23 - 260 CFU/100 mL	
	D/S Annacis Outfall		1	gm = 101.5 CFU/100 mL	Indefinite result
Escherichia coli		Feb 13 - Mar 13	5	12 - 150 CFU/100 mL	
< 77 CFU /100 mL	E207407 D/S Lulu STP		1	gm = 40.7 CFU/100 mL	Indefinite result
geometric mean (gm)		Feb 11 - Mar 11	5	32 - 169 CFU/100 mL	
	Tilbury Island		1	gm = 86.5 CFU/100 mL	Indefinite result
April - October		Feb 11 - Mar 11	5	89 - 386 CFU/100 mL	
	Near Ewen Slough		1	gm = 187.0 CFU/100 mL	Indefinite result
	Sturgeon Banks Between Iona Jetty and	Feb 13 - Mar 13	5	1 - 10 CFU/100 mL	
	Main Arm Jetty		1	gm = 3.8 CFU/100 mL	Indefinite result
	Roberts Banks E249990	Feb 13 - Mar 5	4	< 1 - 4 CFU/100 mL	
	South of Main Arm		1	gm = 1.4 CFU/100 mL	Indefinite result
Pseudomonas aeruginosa	Main Stem:	Feb 13 - Mar 6	4	< 1 - 2 CFU/100 mL	
< 10 CFU /100 mL	100m D/S Kent STP		1	gm = 1.2 CFU/100 mL	Indefinite result
geometric mean (gm)		Feb 14 - Mar 6	4	1 - 7 CFU/100 mL	
	100m D/S James STP		1	gm = 1.7 CFU/100 mL	Indefinite result
April - October		Feb 13 - Mar 13	5	15 - 50 CFU/100 mL	
	Near Patullo Railroad Bridge		1	gm = 27.4 CFU/100 mL	Indefinite result
	North Arm	Feb 13 - Mar 13	5	3 - 54 CFU/100 mL	
	at Oak Street Bridge		1	gm = 10.3 CFU/100 mL	Indefinite result
	Main Arm	Feb 13 - Mar 13	5	1 - 28 CFU/100 mL	
	D/S Annacis Outfall		1	gm = 8.1 CFU/100 mL	Indefinite result
		Feb 13 - Mar 13	5	1 - 40 CFU/100 mL	
	D/S Lulu STP		1	gm = 5.0 CFU/100 mL	Indefinite result

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Pseudomonas aeruginosa	Sturgeon Banks	Feb 13 - Mar 13	5	< 1 - 26 CFU/100 mL	
	Between Iona Jetty and				
< 10 CFU /100 mL	Main Arm Jetty		1	gm = 1.9 CFU/100 mL	Indefinite result
geometric mean (gm)	Roberts Banks	Feb 13 - Mar 5	4	< 1 - 340 CFU/100 mL	
April - October	South of Main Arm		1	gm = 4.3 CFU/100 mL	Indefinite result
Suspended Solids	Main Stem:	Feb 11 - Mar 11	5	3 - 5 mg/L	Control Site
max. increase:	MacMillan Island				
		Feb 11 - Mar 11	5	< 3 - 5 mg/L	
10 mg/L or 10 %	Barnston Island		5	inc. = 0 - 2 mg/L	Objective met
		Feb 11 - Mar 11	5	6 - 12 mg/L	Control site for North Arm, Main Arm
	U/S Sapperton Bar		5	inc. = 1 - 9 mg/L	Objective met
		Feb 13 - Feb 26	3	4 - 7 mg/L	Objective met
	Near Patullo Railroad Bridge				
	North Arm:	Feb 12 - Mar 12	5	7 - 12 mg/L	
	Near Boundary Road		5	inc. = 0 - 3 mg/L	Objective met
Suspended Solids		Feb 13 - Mar 13	3	6 - 9 mg/L	Objective met
		Feb 20	1	inc = 5 mg/L	Objective met
max. increase:	at Oak Street Bridge				
		Feb 12 - Mar 12	5	8 - 28 mg/L	
		Mar 6 - 12	2	inc = 2 - 3 mg/L	Objective met
10 mg/L or 10 %	Near McDonald Slough	Feb 12 - 26	3	inc = 16 - 21 mg/L	Objective not met
	Main Arm	Feb 13 - 20	2	6 - 8 mg/L	Objective met
	D/S Annacis Outfall				
		Feb 11 - Mar 11	5	8 - 16 mg/L	
	Tilbury Island		5	inc. = 0 - 7 mg/L	Objective met
		Feb 11 - Mar 11	5	10 - 31 mg/L	
		Feb 11 - Mar 11	4	inc = 4 - 7 mg/L	Objective met
	Near Ewen Slough	Feb 19	1	inc = 19 mg/L	Objective not met
Ammonia-N	Main Stem:	Feb 13 - 26	3	0.003 - 0.005 mg/L	Max objective met
1.85 mg/L av	100m D/S Kent STP		1	av = 0.004 mg/L	Indefinite result
17.6 mg/L max. at		Feb 14 - 26	3	0.009 - 0.015 mg/L	Max objective met
pH = 7.2	100m D/S James STP		1	av = 0.011 mg/L	Indefinite result
temp = 10°C		Feb 13 - 27	3	0.051 - 0.082 mg/L	Max objective met
	Near Patullo Railroad Bridge		1	av = 0.070 mg/L	Indefinite result
		Feb 11 - Mar 11	5	0.015 - 0.023 mg/L	Max objective met
	MacMillan Island		1	av = 0.020 mg/L	Average objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N 1.85 mg/L av 17.6 mg/L max. at pH = 7.2 temp = 10°C		Feb 11 - Mar 11	5	0.018 - 0.026 mg/L	Max objective met
	Barnston Island		1	av = 0.022 mg/L	Average objective met
		Feb 11 - Mar 11	5	0.013 - 0.023 mg/L	Max objective met
	U/S Sapperton Bar		1	av = 0.018 mg/L	Average objective met
	North Arm	Feb 13 - Feb 20	2	0.018 - 0.06 mg/L	Max objective met
	at Oak Street Bridge		1	av = 0.039 mg/L	Indefinite result
		Feb 12 - Mar 12	5	0.028 - 0.095 mg/L	Max objective met
	Near Boundary Road		1	av = 0.064 mg/L	Average objective met
		Feb 12 - Mar 12	5	0.067 - 0.078 mg/L	Max objective met
	Near McDonald Slough		1	av = 0.071 mg/L	Average objective met
	Main Arm	Feb 13 - Feb 20	2	0.17 - 1.26 mg/L	Max objective met
	D/S Annacis Outfall		1	av = 0.715 mg/L	Indefinite result
		Feb 14 - Feb 20	2	0.069 - 0.104 mg/L	Max objective met
	D/S Lulu STP		1	av = 0.087 mg/L	Indefinite result
		Feb 11 - Mar 11	5	0.021 - 0.069 mg/L	Max objective met
	Tilbury Island		1	av = 0.041 mg/L	Average objective met
		Feb 11 - Mar 11	5	0.107 - 0.146 mg/L	Max objective met
	Near Ewen Slough		1	av = 0.128 mg/L	Average objective met
Nitrite - N 0.02 mg/L av 0.06 mg/L max. at chloride < 2 mg/L	Main Stem:	Feb 13 - Feb 26	3	0.003 - 0.005 mg/L	Max objective met
	100m D/S Kent STP		1	av = 0.004 mg/L	Indefinite result
		Feb 14 - Feb 26	3	0.009 - 0.015 mg/L	Max objective met
	100m D/S James STP		1	av = 0.011 mg/L	Indefinite result
		Feb 13 - Feb 27	3	0.004 - 0.006 mg/L	Max objective met
	Near Patullo Railroad Bridge		1	av = 0.005 mg/L	Indefinite result
		Feb 11 - Mar 11	5	0.001 - 0.004 mg/L	Max objective met
	MacMillan Island		1	av = 0.003 mg/L	Average objective met
		Feb 11 - Mar 11	5	0.001 - 0.005 mg/L	Max objective met
	Barnston Island		1	av = 0.004 mg/L	Average objective met
		Feb 11 - Mar 11	5	0.002 - 0.005 mg/L	Max objective met
	U/S Sapperton Bar		1	av = 0.003 mg/L	Average objective met
	North Arm	Feb 13 - Feb 20	2	0.002 - 0.006 mg/L	Objective met
	at Oak Street Bridge		1	av = 0.004 mg/L	Indefinite result

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrite - N 0.02 mg/L av 0.06 mg/L max. at chloride < 2 mg/L		Feb 12 - Mar 12	5	0.001 - 0.004 mg/L	Max objective met
	Near Boundary Road		1	av = 0.003 mg/L	Average objective met
		Feb 12 - Mar 12	5	0.004 - 0.006 mg/L	Max objective met
	Near McDonald Slough		1	av = 0.005 mg/L	Average objective met
	Main Arm	Feb 13 - Feb 20	2	0.005 - 0.006 mg/L	Max objective met
	D/S Annacis Outfall		1	av = 0.0055 mg/L	Indefinite result
		Feb 14 - Feb 20	2	0.004 - 0.006 mg/L	Max objective met
	D/S Lulu STP		1	av = 0.005 mg/L	Indefinite result
		Feb 11 - Mar 11	5	0.004 - 0.005 mg/L	Max objective met
	Tilbury Island		1	av = 0.004 mg/L	Average objective met
		Feb 11 - Mar 11	5	0.004 - 0.005 mg/L	Max objective met
	Near Ewen Slough		1	av = 0.004 mg/L	Average objective met
Dissolved Oxygen May-October: 5 mg/L inst. min. 30-d mean > 8.0 mg/L or 80% saturation (whichever is higher) November - April: 9 mg/L inst. min. 30-d mean > 11.0 mg/L	Main Stem Main Arm North Arm Middle Arm	2003	0	no data collected	Omitted 2003
Dissolved Oxygen 5 mg/L inst. min. 30-d mean > 8.0 mg/L or 80% saturation (whichever is higher)	Sturgeon Bank Roberts Bank	2003	0	no data collected	Omitted 2003
pH 6.5 - 8.5	Main Stem: 100m D/S Kent STP	Feb 13 - Feb 26	3	all 7.9	Objective met
	100m D/S James STP	Feb 14 - Feb 26	3	7.8 - 7.9	Objective met
	Near Patullo Railroad Bridge	Feb 13 - Feb 27	3	7.7 - 7.8	Objective met
	MacMillan Island	Feb 11 - Mar 11	5	7.38 - 7.60	Objective met
	Barnston Island	Feb 11 - Mar 11	5	7.31 - 7.60	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
pH 6.5 - 8.5	U/S Sapperton Bar	Feb 11 - Mar 11	5	7.23 - 7.66	Objective met
	North Arm at Oak Street Bridge	Feb 13 - Feb 20	2	all 7.7	Objective met
	Near Boundary Road	Feb 12 - Mar 12	5	7.25 - 7.84	Objective met
	Near McDonald Slough	Feb 12 - Mar 12	5	7.20 - 7.55	Objective met
	Main Arm D/S Annacis Outfall	Feb 13 - Feb 20	2	all 7.7	Objective met
	D/S Lulu STP	Feb 14 - Feb 20	2	7.6 - 7.7	Objective met
	Tilbury Island	Feb 11 - Mar 11	5	7.35 - 7.94	Objective met
	Near Ewen Slough	Feb 11 - Mar 11	5	7.21 - 7.56	Objective met
Total Cu <0.004 mg/L av 0.006 mg/L max. at hardness > 35 or 20% increase	Main Stem: 100m D/S Kent STP	Feb 13 - Feb 26	3 1	0.00062 - 0.00151 mg/L av = 0.00106 mg/L	Max objective met Indefinite result
	100m D/S James STP	Feb 14 - Feb 26	3 1	0.00069 - 0.00172 mg/L av = 0.00132 mg/L	Max objective met Indefinite result
	Near Patullo Railroad Bridge	Feb 13 - Feb 27	3 1	0.0174 - 0.00252 mg/L av = 0.00204 mg/L	Objective met Indefinite result
	MacMillan Island	Feb 11 - Mar 11	5 1	0.0006 - 0.0009 mg/L av = 0.0007 mg/L	Max objective met Average objective met
	Barnston Island	Feb 11 - Mar 11	5 1	0.0006 - 0.001 mg/L av = 0.0009 mg/L	Max objective met Average objective met
Total Cu <0.004 mg/L av 0.006 mg/L max. at hardness > 35 or 20% increase	U/S Sapperton Bar	Feb 11 - Mar 11	5 1	0.0007 - 0.0015 mg/L av = 0.0011 mg/L	Max objective met Average objective met
	North Arm at Oak Street Bridge	Feb 13 Feb 20	1 1 1	0.0017 mg/L 0.00735 mg/L av = 0.00453 mg/L	Max objective met Max objective not met Indefinite result
	Near Boundary Road	Feb 12 - Mar 12	5 1	0.0012 - 0.0015 mg/L av = 0.0014 mg/L	Max objective met Average objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cu		Feb 12 - Mar 12	5	0.0011 - 0.0034 mg/L	Max objective met
<0.004 mg/L av	Near McDonald Slough		1	av = 0.0021 mg/L	Average objective met
0.006 mg/L max.	Middle Arm	Feb 20	1	0.0019 mg/L	Max objective met
at		Feb 13	1	0.025 mg/L	Max objective not met
hardness > 35	at Dinsmore Bridge		1	av = 0.0135 mg/L	Indefinite result
or	Main Arm	Feb 20	1	0.0002 mg/L	Max objective met
20% increase		Feb 13	1	0.00626 mg/L	Max objective not met
	D/S Annacis Outfall		1	av = 0.00323 mg/L	Indefinite result
		Feb 20	1	0.0002 mg/L	Max objective met
		Feb 13	1	0.00979 mg/L	Max objective not met
	D/S Lulu STP		1	av = 0.005 mg/L	Indefinite result
		Feb 11 - Mar 11	5	0.0007 - 0.0015 mg/L	Max objective met
	Tilbury Island		1	av = 0.0011 mg/L	Average objective met
		Feb 11 - Mar 11	5	0.0008 - 0.0019 mg/L	Max objective met
	Near Ewen Slough		1	av = 0.0015 mg/L	Average objective met
Total Pb	Main Stem:	Feb 13 - Feb 26	3	0.00006 - 0.00044 mg/L	Max objective met
< 0.003 mg/L av	100m D/S Kent STP		1	av = 0.00021 mg/L	Indefinite result
0.010 mg/L max.		Feb 14 - Feb 26	3	0.00009 - 0.00016 mg/L	Max objective met
	100m D/S James STP		1	av = 0.00013 mg/L	Indefinite result
		Feb 13 - Feb 27	3	0.00027 - 0.0005 mg/L	Max objective met
	Near Patullo Railroad Bridge		1	av = 0.00038 mg/L	Indefinite result
		Feb 11 - Mar 11	5	0.00006 - 0.00010 mg/L	Max objective met
	MacMillan Island		1	av = 0.00008 mg/L	Average objective met
		Feb 11 - Mar 11	5	0.00008 - 0.00013 mg/L	Max objective met
	Barnston Island		1	av = 0.00010 mg/L	Average objective met
		Feb 11 - Mar 11	5	0.00010 - 0.00028 mg/L	Max objective met
	U/S Sapperton Bar		1	av = 0.00016 mg/L	Average objective met
	North Arm	Feb 13 - Feb 20	2	0.0004 - < 0.001 mg/L	Max objective met
	at Oak Street Bridge		1	av < 0.0007 mg/L	Indefinite result
		Feb 12 - Mar 12	5	0.0002 - 0.00071 mg/L	Max objective met
	Near Boundary Road		1	av = 0.00034 mg/L	Average objective met
		Feb 12 - Mar 12	5	0.0003 - 0.0007 mg/L	Max objective met
	Near McDonald Slough		1	av = 0.0005 mg/L	Average objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Pb	Middle Arm	Feb 13 - Feb 20	2	0.0003 - 0.0004 mg/L	Max objective met
< 0.003 mg/L av	at Dinsmore Bridge		1	av = 0.00035 mg/L	Indefinite result
0.010 mg/L max.	Main Arm	Feb 13 - Feb 20	2	< 0.0001 - 0.0009 mg/L	Max objective met
	D/S Annacis Outfall		1	av < 0.00054 mg/L	Indefinite result
		Feb 13 - Feb 20	2	0.0001 - 0.00031 mg/L	Max objective met
	D/S Lulu STP		1	av = 0.00021 mg/L	Indefinite result
		Feb 11 - Mar 11	5	0.00009 - 0.00019 mg/L	Max objective met
	Tilbury Island		1	av = 0.00014 mg/L	Average objective met
		Feb 11 - Mar 11	5	0.0001 - 0.0005 mg/L	Max objective met
	Near Ewen Slough		1	av = 0.0003 mg/L	Average objective met
Total Mn	Main Stem:	Feb 11 - Mar 11	5	0.012 - 0.019 mg/L	Objective met
0.1 mg/L max	MacMillan Island				
		Feb 11 - Mar 11	5	0.011 - 0.016 mg/L	Objective met
	Barnston Island				
		Feb 11 - Mar 11	5	0.011 - 0.017 mg/L	Objective met
	U/S Sapperton Bar				
	North Arm:	Feb 12 - Mar 12	5	0.016 - 0.021 mg/L	Objective met
	Near Boundary Road				
		Feb 12 - Mar 12	5	0.008 - 0.030 mg/L	Objective met
	Near McDonald Slough				
	Main Arm	Feb 11 - Mar 11	5	0.012 - 0.018 mg/L	Objective met
	Tilbury Island				
		Feb 11 - Mar 11	5	0.005 - 0.035 mg/L	Objective met
	Near Ewen Slough				
Total Zn	Main Stem:	Feb 13 - Feb 26	3	0.0002 - 0.0075 mg/L	Max objective met
< 0.050 mg/L av.	100m D/S Kent STP		1	av = 0.00028 mg/L	Indefinite result
0.100 mg/L max.		Feb 14 - Feb 26	3	0.0007 - 0.0017 mg/L	Max objective met
	100m D/S James STP		1	av = 0.0010 mg/L	Indefinite result
		Feb 13 - Feb 27	3	0.0017 - 0.0035 mg/L	Max objective met
	Near Patullo Railroad Bridge		1	av = 0.0029 mg/L	Indefinite result
		Feb 11 - Mar 11	5	0.0005 - 0.020 mg/L	Max objective met
	MacMillan Island		1	av = 0.0047 mg/L	Average objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Zn		Feb 11 - Mar 11	5	0.0009 - 0.003 mg/L	Max objective met
< 0.050 mg/L av.	Barnston Island		1	av = 0.0014 mg/L	Average objective met
0.100 mg/L max.		Feb 11 - Mar 11	5	0.0007 - 0.0076 mg/L	Max objective met
	U/S Sapperton Bar		1	av = 0.0028 mg/L	Average objective met
Total Zn	North Arm	Feb 13 - Feb 20	2	0.003 - < 0.01 mg/L	Max objective met
< 0.050 mg/L av.	at Oak Street Bridge		1	av < 0.0065 mg/L	Indefinite result
0.100 mg/L max.		Feb 12 - Mar 12	5	< 0.0005 - 0.0058 mg/L	Max objective met
	Near Boundary Road		1	av = 0.0028 mg/L	Average objective met
		Feb 12 - Mar 12	5	0.003 - 0.007 mg/L	Max objective met
	Near McDonald Slough		1	av = 0.0048 mg/L	Average objective met
	Middle Arm	Feb 13 - Feb 20	2	0.0041 - 0.006 mg/L	Max objective met
	at Dinsmore Bridge		1	av = 0.0051 mg/L	Indefinite result
	Main Arm	Feb 13 - Feb 20	2	< 0.001 - 0.0126 mg/L	Max objective met
	D/S Annacis Outfall		1	av < 0.0068 mg/L	Indefinite result
		Feb 13 - Feb 20	2	< 0.001 - 0.0024 mg/L	Max objective met
	D/S Lulu STP		1	av = 0.0017 mg/L	Indefinite result
		Feb 11 - Mar 11	5	0.0009 - 0.0027 mg/L	Max objective met
	Tilbury Island		1	av = 0.0016 mg/L	Average objective met
		Feb 11 - Mar 11	5	0.001 - 0.010 mg/L	Max objective met
	Near Ewen Slough		1	av = 0.004 mg/L	Average objective met
Chlorophenols (tri + tetra + penta-CP)	North Arm	Feb 13 - Feb 20	2	< 0.0011 mg/L	Indefinite result
in water	at Oak Street Bridge				
0.0002 mg/L max.	Middle Arm	Feb 13 - Feb 20	2	< 0.0011 mg/L	Indefinite result
	at Dinsmore Bridge				
Chlorophenols (tri + tetra + penta - CP) in sediments 0.01 ug/g max. av of replicates (dry weight)	Main Stem Main Arm North Arm Middle Arm Sturgeon Bank Roberts Bank	2003	0	no data collected	Omitted 2003
Chlorophenols (tri + tetra + penta-CP) in fish 0.10 ug/g max. (wet weight)	Main Stem Main Arm North Arm	2003	0	no data collected	Omitted 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
PCBs in sediments < 0.03 ug/g max. av of replicates (dry weight)	Main Stem Main Arm North Arm Middle Arm	2003	0	no data collected	Omitted 2003
PCBs in fish 0.50 ug/g max. (wet weight)	Main Stem Main Arm North Arm Middle Arm	2003	0	no data collected	Omitted 2003
Dioxins and Furans in sediments 2,3,7,8-T4CDD TEQs	Main Stem Main Arm North Arm Middle Arm	2003	0	no data collected	Omitted 2003
Furans in fish 2,3,7,8-T4CDD TEQs < 50 pg TEQ/g wet weight in fish muscle or egg tissue	Main Stem North Arm Middle Arm Main Arm	2003	0	no data collected	Omitted 2003
PAHs acridine in sediment < 1 ug/g max. av of replicates (dry weight)	Main Stem North Arm Middle Arm Main Arm	2003	0	no data collected	Omitted 2003
PAHs acenaphthene in sediment < 0.15 ug/g max. av of replicates (dry weight)	Main Stem North Arm Middle Arm Main Arm	2003	0	no data collected	Omitted 2003
PAHs acenaphthylene in sediment < 0.66 ug/g max. av of replicates (dry weight) (September - April)	Main Stem North Arm Middle Arm Main Arm	2003	0	no data collected	Omitted 2003
PAHs benzo(a)anthracene in sediment < 0.06 ug/g max. av of replicates (dry weight)	Main Stem North Arm Middle Arm Main Arm	2003	0	no data collected	Omitted 2003

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
PAHs benzo(a)pyrene in sediment < 0.06 ug/g max. av of replicates (dry weight)	Main Stem North Arm Middle Arm Main Arm	2003	0	no data collected	Omitted 2003
PAHs benzo(a)pyrene in fish < 1 ug/kg max. av of replicates (wet weight)	Main Stem North Arm Middle Arm Main Arm	2003	0	no data collected	Omitted 2003
PAHs chrysene in sediment < 0.2 ug/g max. av of replicates (dry weight)	Main Stem North Arm Middle Arm Main Arm	2003	0	no data collected	Omitted 2003
PAHs dibenzo(a,h)anthracene in sediment < 0.005 ug/g max. av of replicates (dry weight)	Main Stem North Arm Middle Arm Main Arm	2003	0	no data collected	Omitted 2003
PAHs fluoranthene in sediment < 2 ug/g max. av of replicates (dry weight)	Main Stem North Arm Middle Arm Main Arm	2003	0	no data collected	Omitted 2003
PAHs fluorene in sediment < 0.2 ug/g max. av of replicates (dry weight)	Main Stem North Arm Middle Arm Main Arm	2003	0	no data collected	Omitted 2003
PAHs naphthalene in sediment < 0.01 ug/g max. av of replicates (dry weight)	Main Stem North Arm Middle Arm Main Arm	2003	0	no data collected	Omitted 2003
PAHs phenanthrene in sediment < 0.0867 ug/g max. av of replicates (dry weight) (September - April)	Main Stem North Arm Middle Arm Main Arm	2003	0	no data collected	Omitted 2003

Table 24. Burrard Inlet Water Quality Objectives – 2003.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms	Outer Burrard Inlet	Jan 7 - Dec 29	77	20 - 3000 MPN/100 mL	
	English Bay Beach				
< 200 /100 mL	GVRD Station 303	Apr 1 - Oct 16	11	gm = 20 - 85 MPN/100 mL	Objective met
geometric mean	English Bay Beach	Jan 7 - Dec 29	77	20 - 230 MPN/100 mL	
(gm)					
	GVRD Station 305	Apr 1 - Oct 16	11	gm = 20 - 31 MPN/100 mL	Objective met
Apr - Oct	Jericho Beach	Jan 9 - Dec 19	72	20 - 300 MPN/100 mL	
	GVRD Station 601	Apr 2 - Oct 23	11	gm = 23 - 54 MPN/100 mL	Objective met
	Jericho Beach	Jan 9 - Dec 19	72	20 - 800 MPN/100 mL	
	GVRD Station 602	Apr 2 - Oct 23	11	gm = 20 - 66 MPN/100 mL	Objective met
	Jericho Beach	Jan 9 - Dec 19	72	20 - 3000 MPN/100 mL	
	Station 603	Apr 2 - Oct 23	11	gm = 20 - 93 MPN/100 mL	Objective met
	Jericho Beach	Jan 9 - Dec 19	71	20 - 1700 MPN/100 mL	
		Jun 17 - Jul 3	1	gm = 213 MPN/100 mL	Objective not met
	GVRD Station 647	Apr 8 - Oct 30	10	gm = 20 - 159 MPN/100 mL	Objective met
	Kits Beach	Jan 9 - Dec 19	72	20 - 500 MPN/100 mL	
	GVRD Station 501	Apr 2 - Oct 23	11	gm = 20 - 43 MPN/100 mL	Objective met
	Kits Beach	Jan 9 - Dec 19	72	20 - 2400 MPN/100 mL	
	GVRD Station 502	Apr 2 - Oct 23	11	gm = 20 - 111 MPN/100 mL	Objective met
	Kits Beach	Jan 9 - Dec 19	72	20 - 2400 MPN/100 mL	
	GVRD Station 503	Apr 2 - Oct 23	11	gm = 20 - 181 MPN/100 mL	Objective met
	Kits Beach	Jan 9 - Dec 19	72	20 - 2400 MPN/100 mL	
	GVRD Station 542	Apr 2 - Oct 23	11	gm = 23 - 82 MPN/100 mL	Objective met
	Kits Point	Jan 9 - Dec 19	70	20 - 800 MPN/100 mL	
	GVRD Station 511	Apr 2 - Oct 23	11	gm = 26 - 121 MPN/100 mL	Objective met
	Locarno Beach	Jan 9 - Dec 19	73	16000 MPN/100 mL	
		Sep 26 - Oct 21	1	gm = 404 MPN/100 mL	Objective not met
	GVRD Station 701	Apr 2 - Sep 24	10	gm = 20 - 68 MPN/100 mL	Objective met
	Locarno Beach	Jan 9 - Dec 19	73	20 - 3000 MPN/100 mL	
	GVRD Station 703	Apr 2 - Sep 24	11	gm = 23 - 85 MPN/100 mL	Objective met
	Locarno Beach	Jan 9 - Dec 19	73	20 - 16000 MPN/100 mL	
	GVRD Station 704	Apr 2 - Oct 21	11	gm = 20 - 88 MPN/100 mL	Objective met
	Second Beach	Jan 7 - Dec 29	77	20 - 500 MPN/100 mL	
	GVRD Station 704	Apr 1 - Oct 16	11	gm = 23 - 90 MPN/100 mL	Objective met

	Second Beach	Jan 7 - Dec 29	77	20 - 500 MPN/100 mL	
	GVRD Station 202	Apr 1 - Oct 16	11	gm = 20 - 81 MPN/100 mL	Objective met
	Spanish Banks	Jan 9 - Dec 19	72	20 - 500 MPN/100 mL	
		Sep 30 - Oct 23	1	gm = 218 MPN/100 mL	
	GVRD Station 801	Apr 2 - Sep 26	10	gm = 20 - 43 MPN/100 mL	Objective met
	Spanish Banks	Jan 9 - Dec 19	72	20 - 800 MPN/100 mL	
	GVRD Station 804	Apr 2 - Oct 23	11	gm = 23 - 62 MPN/100 mL	Objective met
	Spanish Banks	Jan 28 - Dec 19	70	20 - 500 MPN/100 mL	
	GVRD Station 812	Apr 2 - Oct 23	11	gm = 20 - 62 MPN/100 mL	Objective met
Fecal Coliforms	Sunset Beach	Jan 7 - Dec 29	77	20 - 16000 MPN/100 mL	
< 200 /100 mL	Station 401	Apr 1 - Oct 16	11	gm = 20 - 60 MPN/100 mL	Objective met
geometric mean	Sunset Beach	Jan 7 - Dec 29	77	20 - 800 MPN/100 mL	
(gm)	GVRD Station 402	Apr 1 - Oct 16	11	gm = 23 - 101 MPN/100 mL	Objective met
Apr - Oct	Sunset Beach	Jan 7 - Dec 29	77	20 - 5000 MPN/100 mL	
	GVRD Station 403	Apr 1 - Oct 16	11	gm = 26 - 187 MPN/100 mL	Objective met
	Sunset Beach	Jan 7 - Dec 29	64	20 - 5000 MPN/100 mL	
	GVRD Station 404	Apr 30 - Oct 1	9	gm = 23 - 117 MPN/100 mL	Objective met
	Third Beach	Jan 7 - Dec 29	80	20 - 800 MPN/100 mL	
	GVRD Station 100	Apr 1 - Oct 28	12	gm = 23 - 117 MPN/100 mL	Objective met
	Third Beach	Jan 7 - Dec 29	80	20 - 500 MPN/100 mL	
	GVRD Station 101	Apr 1 - Oct 28	12	gm = 26 - 68 MPN/100 mL	Objective met
	Third Beach	Jan 7 - Dec 29	80	20 - 300 MPN/100 mL	
	GVRD Station 102	Apr 1 - Oct 28	12	gm = 20 - 120 MPN/100 mL	Objective met
	Ambleside Beach	Jan 10 - Dec 4	75	20 - 800 MPN/100 mL	
	GVRD Station 14	Apr 1 - Oct 22	12	gm = 23 - 80 MPN/100 mL	Objective met
	Ambleside Beach	Jan 10 - Dec 4	75	20 - 2400 MPN/100 mL	
	GVRD Station 16	Apr 1 - Oct 22	12	gm = 20 - 188 MPN/100 mL	Objective met
	Ambleside Beach	Jan 10 - Dec 4	75	20 - 900 MPN/100 mL	
	GVRD Station 19	Apr 1 - Oct 22	12	gm = 20 - 123 MPN/100 mL	Objective met
	Cypress to Dund.	Jan 10 - Dec 4	74	20 - 3000 MPN/100 mL	
	GVRD Station 7	Apr 1 - Oct 22	12	gm = 20 - 120 MPN/100 mL	Objective met
	Cypress to Dund.	Jan 10 - Dec 4	74	20 - 1300 MPN/100 mL	
	GVRD Station 8	Apr 1 - Oct 22	12	gm = 20 - 129 MPN/100 mL	Objective met
	Eagle Harbour	Jan 10 - Dec 4	76	20 - 2400 MPN/100 mL	

	GVRD Station 22	Apr 1 - Oct 1	11	gm = 20 - 153 MPN/100 mL	Objective met
	Eagle Harbour	Jan 10 - Dec 4	75	20 - 2400 MPN/100 mL	
	GVRD Station 25	Apr 1 - Oct 7	11	gm = 23 - 185 MPN/100 mL	Objective met
	Whytecliff Park	Jan 21 - Dec 4	72	20 - 220 MPN/100 mL	
	GVRD Station 21	Apr 1 - Oct 1	11	gm = 20 - 45 MPN/100 mL	Objective met
	Whytecliff Park	Jan 21 - Dec 4	73	20 - 500 MPN/100 mL	
	GVRD Station 24	Apr 1 - Oct 1	11	gm = 20 - 51 MPN/100 mL	Objective met
	2nd Narrows - Roche Pt.	Mar 7 - Dec 29	74	< 20 - 400 MPN/100 mL	
	Cates Park GVRD Station 30	Apr 1 - Oct 16	12	geomean = 20 - 48 MPN/100 mL	Objective met
	Cates Park	Jan 10 - Dec 29	79	20 - 1300 MPN/100 mL	
	GVRD Station 36	Apr 1 - Oct 16	12	geomean = 20 - 98 MPN/100 mL	Objective met
Fecal Coliforms	Port Moody Arm	Jan 17 - Dec 3	45	20 - 1300 MPN/100 mL	
	Barnet Marine				
< 200 /100 mL	GVRD Station 1	Apr 1 - Oct 17	7	gm = 23 - 75 MPN/100 mL	Objective met
geometric mean	Barnet Marine	Jan 17 - Dec 3	45	20 - 1100 MPN/100 mL	
(gm)	GVRD Station 2	Apr 1 - Oct 17	7	gm = 20 - 112 MPN/100 mL	Objective met
Apr - Oct	Indian Arm	Jan 10 - Dec 29	76	20 - 1700 MPN/100 mL	
	Deep Cove				
	GVRD Station 35	Apr 1 - Oct 1	11	geomean = 20 - 121 MPN/100 mL	Objective met
	Deep Cove	Jan 10 - Dec 29	76	20 - 800 MPN/100 mL	
	GVRD Station 37	Apr 1 - Oct 1	11	geomean = 20 - 85 MPN/100 mL	Objective met
	Deep Cove	Jan 10 - Dec 29	76	20 - 5000 MPN/100 mL	
	GVRD Station 39	Apr 1 - Oct 1	11	gm = 20 - 75 MPN/100 mL	Objective met
Enterococci	False Creek:	Aug 28 - Sep 8	2	1 - 19 CFU / 100 mL	
<200 /100 mL	E207815				
geometric mean	False Creek West End		1	gm = 4 CFU / 100 mL	Indefinite result
(gm)	E207814	Aug 28 - Sep 8	2	17 - 20 CFU / 100 mL	
Apr - Oct	False Creek East End				
			1	gm = 18 CFU / 100 mL	Indefinite result
	1st-2nd Narrows:	Aug 28 - Sep 8	2	5 - 9 CFU / 100 mL	
	E207813				
	Coal Harbour		1	gm = 7 CFU / 100 mL	Indefinite result
Suspended	Indian Arm				
Solids	Port Moody Arm	2003	0	no data collected	Omitted
	2nd Narrows-Roche Pt.				2003
10 mg/L	1st-2nd Narrows				
max. increase	Outer Burrard				
	False Creek				
Turbidity	Port Moody Arm				

5 NTU max. increase geometric mean	2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	2003	0	no data collected	Omitted 2003
Cl2-Produced Oxidants 3 ug/L av	Port Moody Arm 2nd Narrows-Roche Pt.	2003	0	no data collected	Omitted 2003
Ammonia-N <1.0 mg/L av 2.5 mg/L max.	Indian Arm Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	2003	0	no data collected	Omitted 2003
Dissolved Oxygen 6.5 mg/L min.	Indian Arm Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	2003	0	no data collected	Omitted 2003
WAD - CN 0.001 mg/L max	Port Moody Arm	2003	0	no data collected	Omitted 2003
H2S 0.002 mg/L max	Port Moody Arm 1st-2nd Narrows	2003	0	no data collected	Omitted 2003
pH 6.5 - 8.5	2nd Narrows-Roche Pt.	2003	0	no data collected	Omitted 2003
Total As 0.010 mg/L max	1st-2nd Narrows 2nd Narrows - Roche Pt.	2003	0	no data collected	Omitted 2003
Total As <20 ug/g max. in sediment (long term)	1st-2nd Narrows 2nd Narrows - Roche Pt.	2003	0	no data collected	Omitted 2003
Total Ba 0.5 mg/L max.	2nd Narrows - Roche Pt.	2003	0	no data collected	Omitted 2003
Total Cd <0.009 mg/L av 0.043 mg/L max. in water	1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody: Indian Arm:	2003	0	no data collected	Omitted 2003
Total Cd <1.0 ug/g max. in sediment	1st-2nd Narrows 2nd Narrows - Roche Pt.	2003	0	no data collected	Omitted 2003
Total Cd < 9 ug/g av < 43 ug/g max.	Indian Arm:	2003	0	no data collected	Omitted 2003

in sediment					
Total Cr <0.050 mg/L max. in water	False Creek: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
Total Cr < 60 ug/g max. in sediment (long term)	1st-2nd Narrows 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
Total Cu <0.002 mg/L av 0.003 mg/L max. in water	Outer Burrard: False Creek: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody: Indian Arm:	2003	0	no data collected	Omitted 2003
Total Cu < 100 ug/g max. in sediment (long term)	1st-2nd Narrows 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
Total Pb < 0.002 mg/L av. 0.140 mg/L max. in water	Outer Burrard: False Creek: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody: Indian Arm:	2003	0	no data collected	Omitted 2003
Total Pb 0.8 µg/g max. (wet weight) in fish	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody: Indian Arm:	2003	0	no data collected	Omitted 2003
Total Pb < 30 ug/g max. in sediment (long term)	1st-2nd Narrows 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
Total Hg 0.02 µg/L av. 2.0 µg/L max. in water	2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	2003	0	no data collected	Omitted 2003
Total Hg 0.5 µg/g max. wet weight in fish	1st-2nd Narrows 2nd Narrows - Roche Pt. Indian Arm:	2003	0	no data collected	Omitted 2003
Total Hg 0.15 µg/g max. dry weight in sediment	1st-2nd Narrows	2003	0	no data collected	Omitted 2003

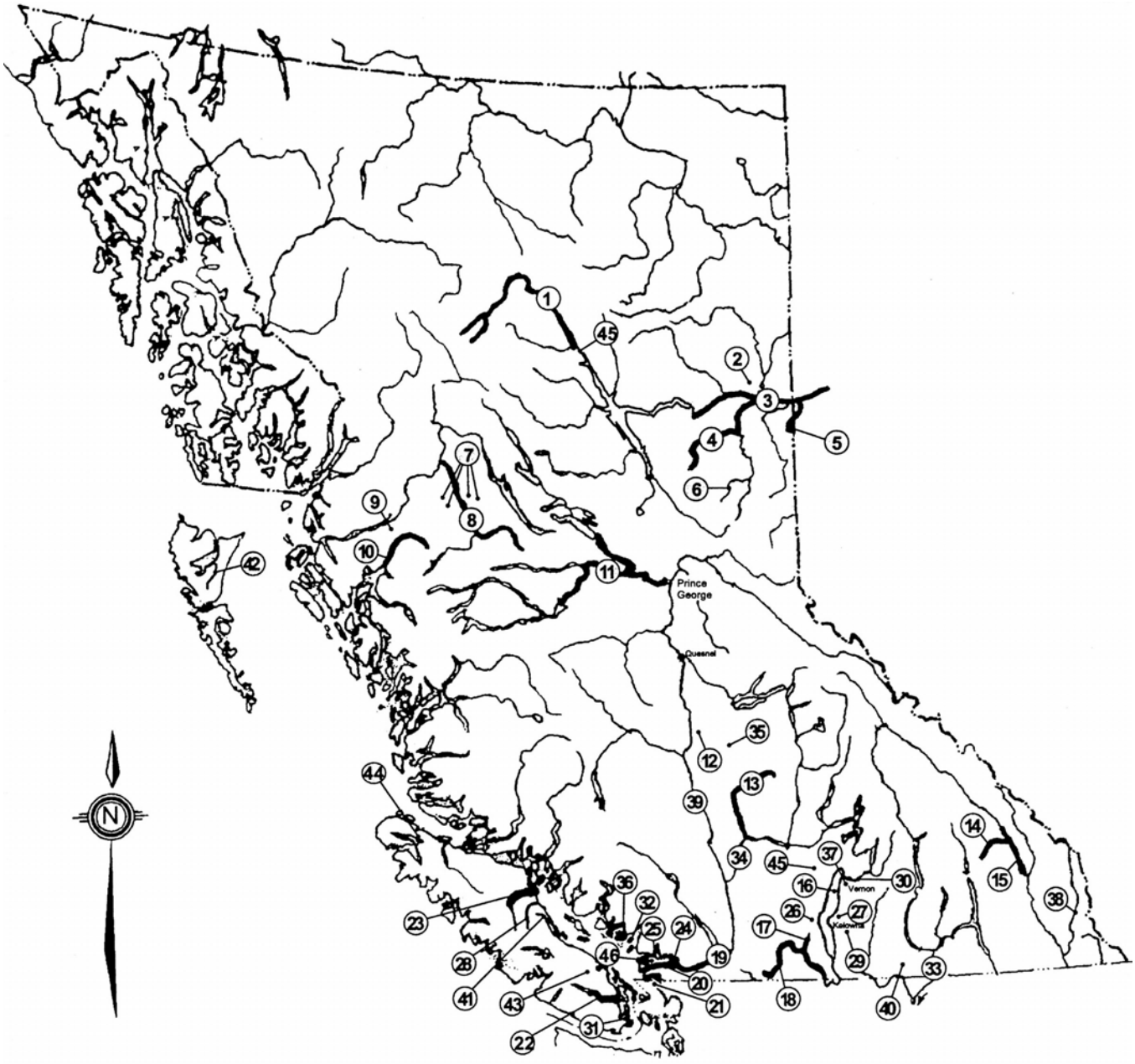
Total Ni < 0.008 mg/L av. 0.075 mg/L max. in water	False Creek: 1st-2nd Narrows: 2nd Narrows - Roche Pt.	2003	0	no data collected	Omitted 2003
Total Ni < 45 ug/g max. in sediment	1st-2nd Narrows 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
Total Zn < 0.086 mg/L av. 0.095 mg/L max. in water	Outer Burrard: False Creek: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody: Indian Arm:	2003	0	no data collected	Omitted 2003
Total Zn < 150 ug/g max. in sediment (long-term)	1st-2nd Narrows 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
Chlorophenols (tri + tetra + penta - CP) 0.2 µg/L max. in water	1st-2nd Narrows	2003	0	no data collected	Omitted 2003
Chlorophenols (tri + tetra + penta - CP) in sediments 0.01 ug/g max. av of replicates (dry weight)	1st-2nd Narrows	2003	0	no data collected	Omitted 2003
Chlorophenols (tri+ tetra+ penta) in fish 0.10 ug/g max. (wet weight)	1st to 2nd Narrows	2003	0	no data collected	Omitted 2003
PCBs in sediments < 0.03 ug/g max. (dry weight)	1st-2nd Narrows 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
PCBs in fish 0.1 ug/g max. (wet weight)	Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	2003	0	no data collected	Omitted 2003
Tributyl tin in sediment 0.03 ug/g max.	Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows	2003	0	no data collected	Omitted 2003

(dry weight)	Outer Burrard False Creek				
Tributyl tin in fish 0.5 ug/g max. (wet weight)	Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	2003	0	no data collected	Omitted 2003
Phenols 1 µg/L max. in water	Port Moody Arm 2nd Narrows-Roche Pt.	2003	0	no data collected	Omitted 2003
Styrene 0.05 mg/L max. in water	Port Moody Arm	2003	0	no data collected	Omitted 2003
PAHs acenaphthene in sediment < 0.05 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
PAHs acenaphthylene in sediment < 0.06 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
PAHs anthracene in sediment < 0.1 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
PAHs benzo(a)anthracene in sediment < 0.13 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
PAHs benzo(a)pyrene in sediment < 0.16 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
PAHs benzo-fluoranthenes in sediment	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt.	2003	0	no data collected	Omitted 2003

< 0.32 ug/g max. (dry weight) (long-term)	Port Moody:				
PAHs benzo(g,h,i)perylene in sediment < 0.07 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
PAHs chrysene in sediment < 0.14 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
PAHs dibenzo(a,h)anthracene in sediment < 0.06 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
PAHs fluoranthene in sediment < 0.17 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
PAHs fluorene in sediment < 0.05 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
PAHs indeno(1,2,3- c,d)pyrene in sediment < 0.06 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
PAHs naphthalene in sediment < 0.2 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
PAHs phenanthrene in sediment < 0.15 ug/g max.	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003

(dry weight) (long-term)					
PAHs pyrene in sediment < 0.26 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
Total LPAH (naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene) in sediment < 0.5 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003
Total HPAH (fluoranthene pyrnen, benxo(a)anthracene, chrysene, benzo-fluoranthenes, benzo(a)pyrene, indeno(1,2,3- c,d)pyrene dibenzo(a,h)anthracene benzo(g,h,i)perylene) in sediment < 1.2 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2003	0	no data collected	Omitted 2003

Figure 2. Map of British Columbia showing locations of watersheds with water quality objectives.



1. Upper Finlay River
2. Charlie Lake
3. Peace River
4. Pine River
5. Pouce Coupe River
6. Bullmoose Creek
7. Kathlyn, Seymour, Round, and Tyhee Lakes
8. Bulkley River
9. Lakelse Lake
10. Lower Kitimat River and Arm
11. Nechako River
12. Williams Lake
13. Bonaparte River
14. Toby Creek
15. Columbia and Windermere Lakes
16. Okanagan Valley Lakes
17. Cahill Creek
18. Similkameen River
19. Fraser River (Hope to Kanaka)
20. Fraser River (Kanaka to Mouth)
21. Boundary Bay
22. Cowichan-Koksilah Rivers
23. Quinsam River
24. Lower Fraser River Tributaries
25. Burrard Inlet
26. Okanagan Tribs., Westbank
27. Okanagan Tribs., Kelowna
28. Oyster River
29. Hydraulic Creek
30. Bessette Creek
31. Elk and Beaver Lakes
32. Pender Harbour
33. Columbia River (to Birchbank)
34. Thompson River
35. San José River
36. Sechelt Inlet
37. Okanagan Tribs. Vernon
38. Elk River
39. Fraser River (Prince George to Hope)
40. Christina Lake
41. Tsolum River
42. Yakoun River
43. Holland Cr & Stocking Lk
44. Quatse Lake
45. Lower Finlay River
46. Burrard Inlet Trib.

Figure 3 Cowichan - Koksilah Rivers

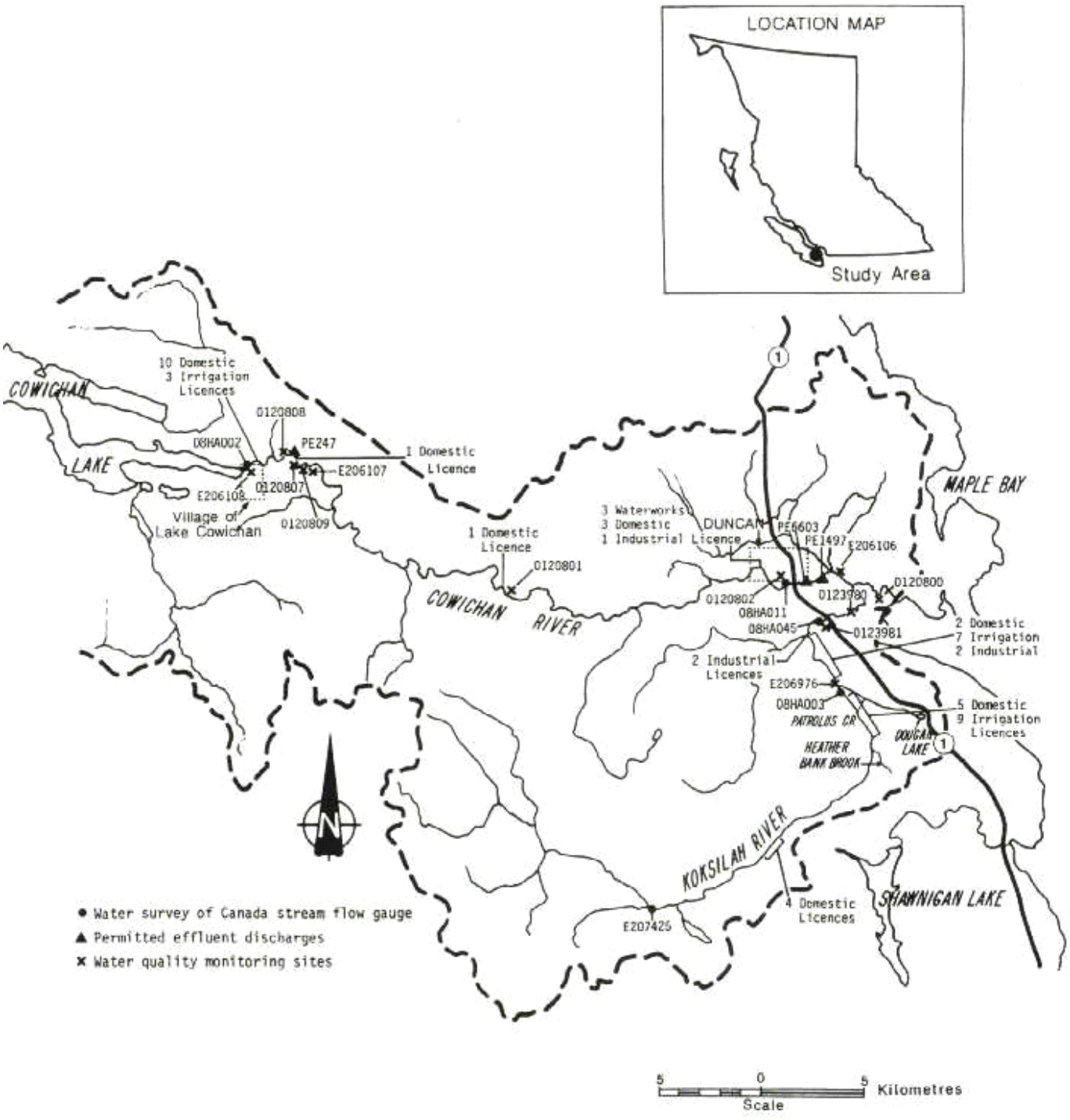


Figure 4. Quinsam River

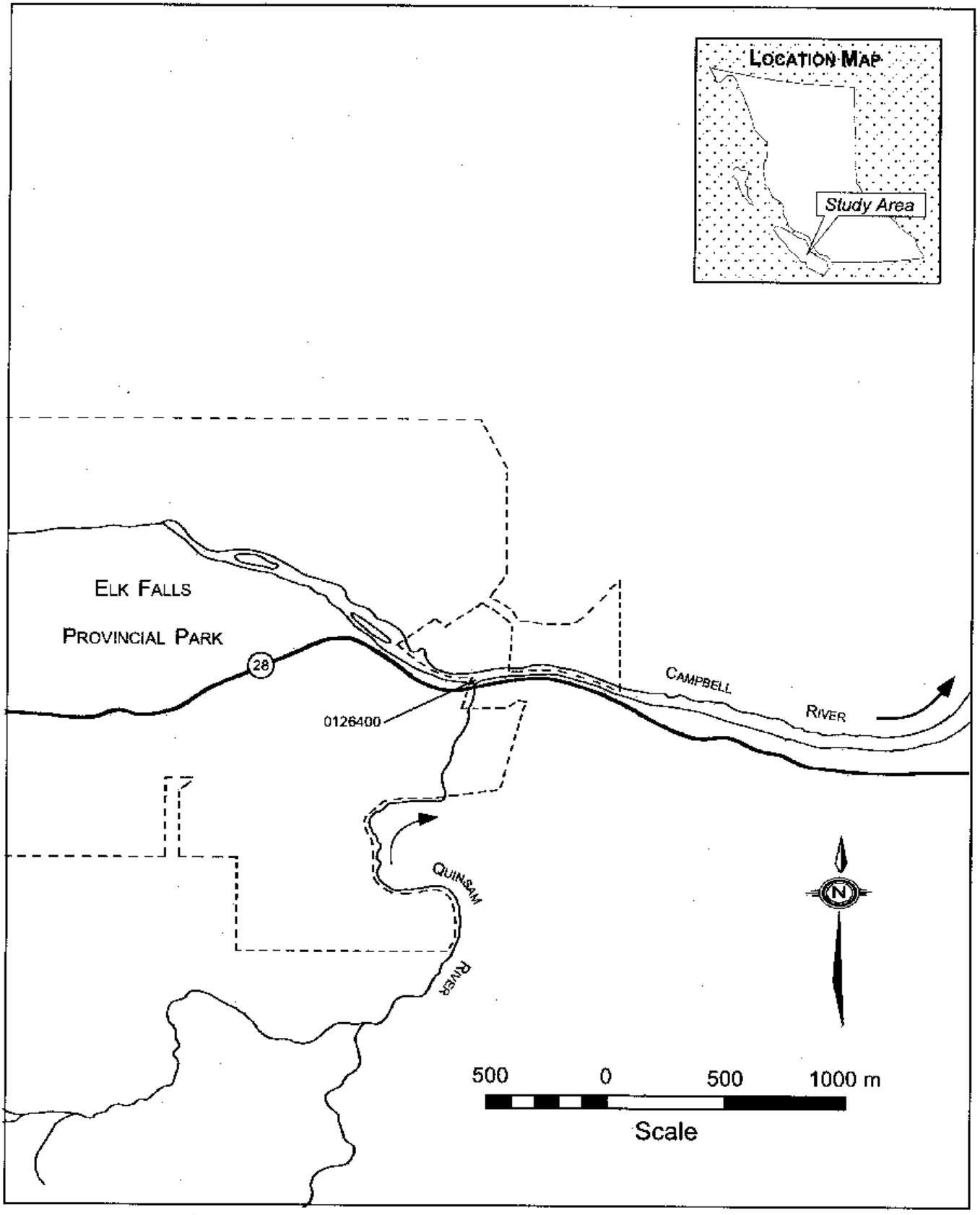


Figure 5. Middle Quinsam Lake.

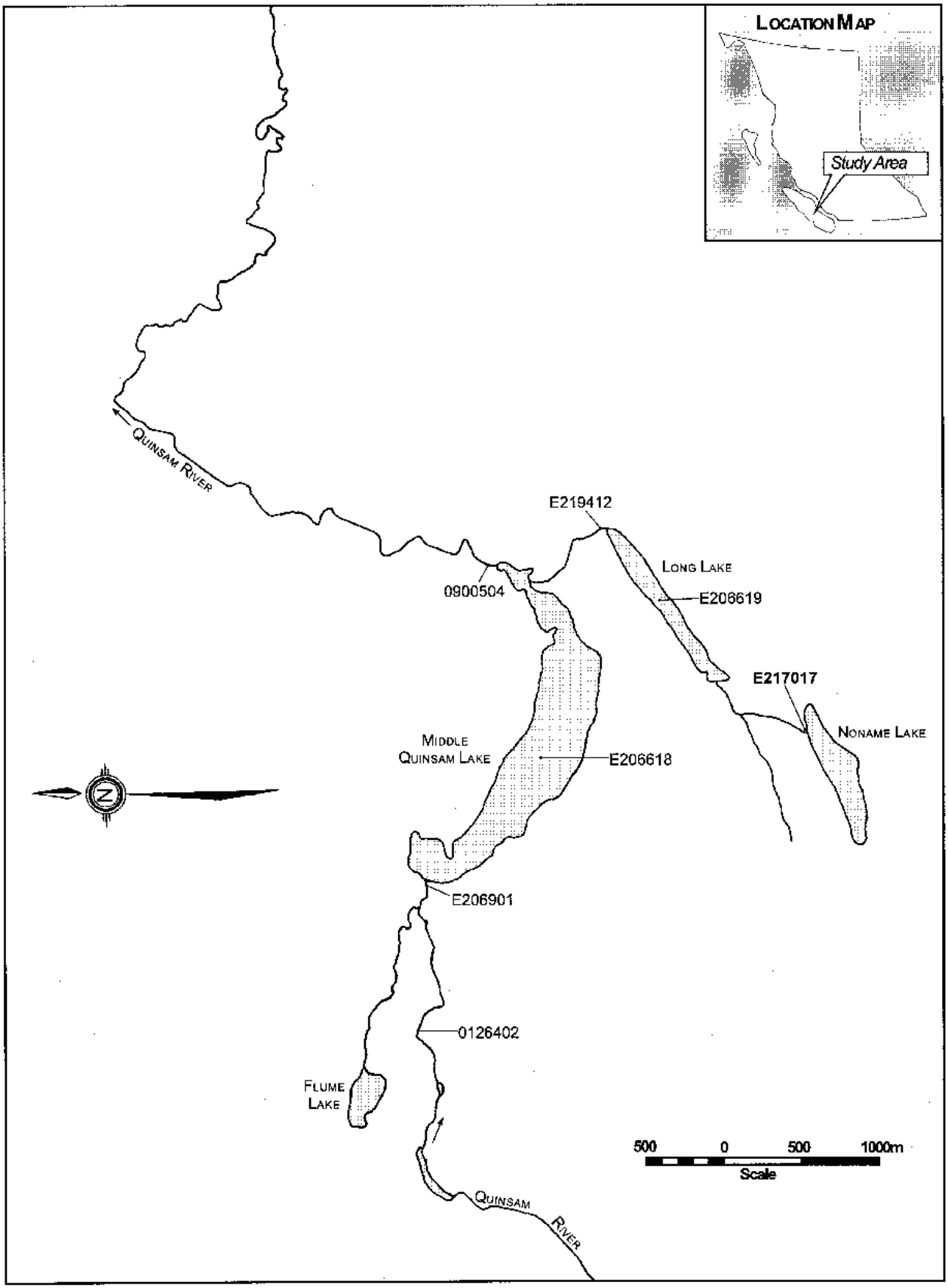


Figure 6. Oyster River Basin.

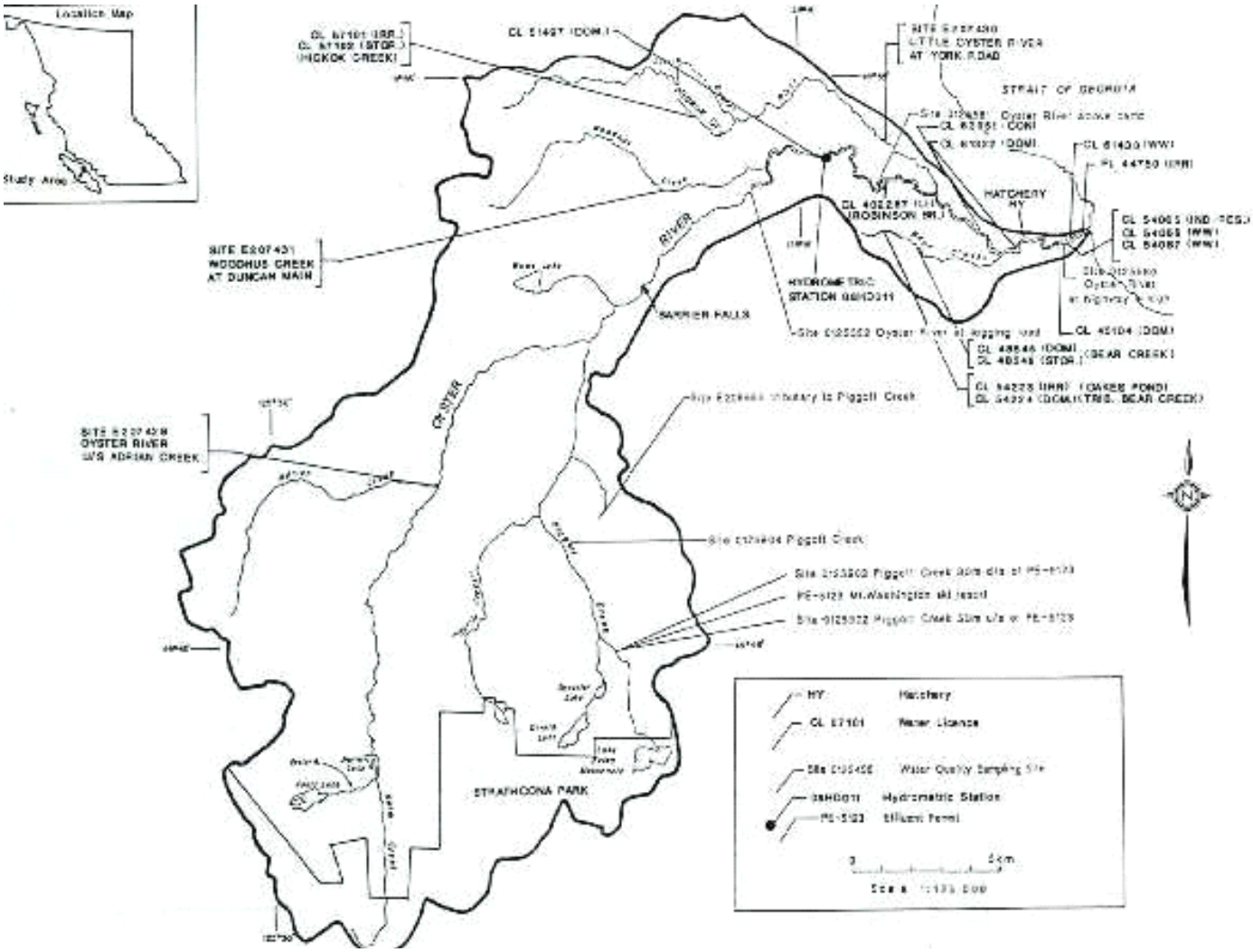


Figure 7. Tsolum River

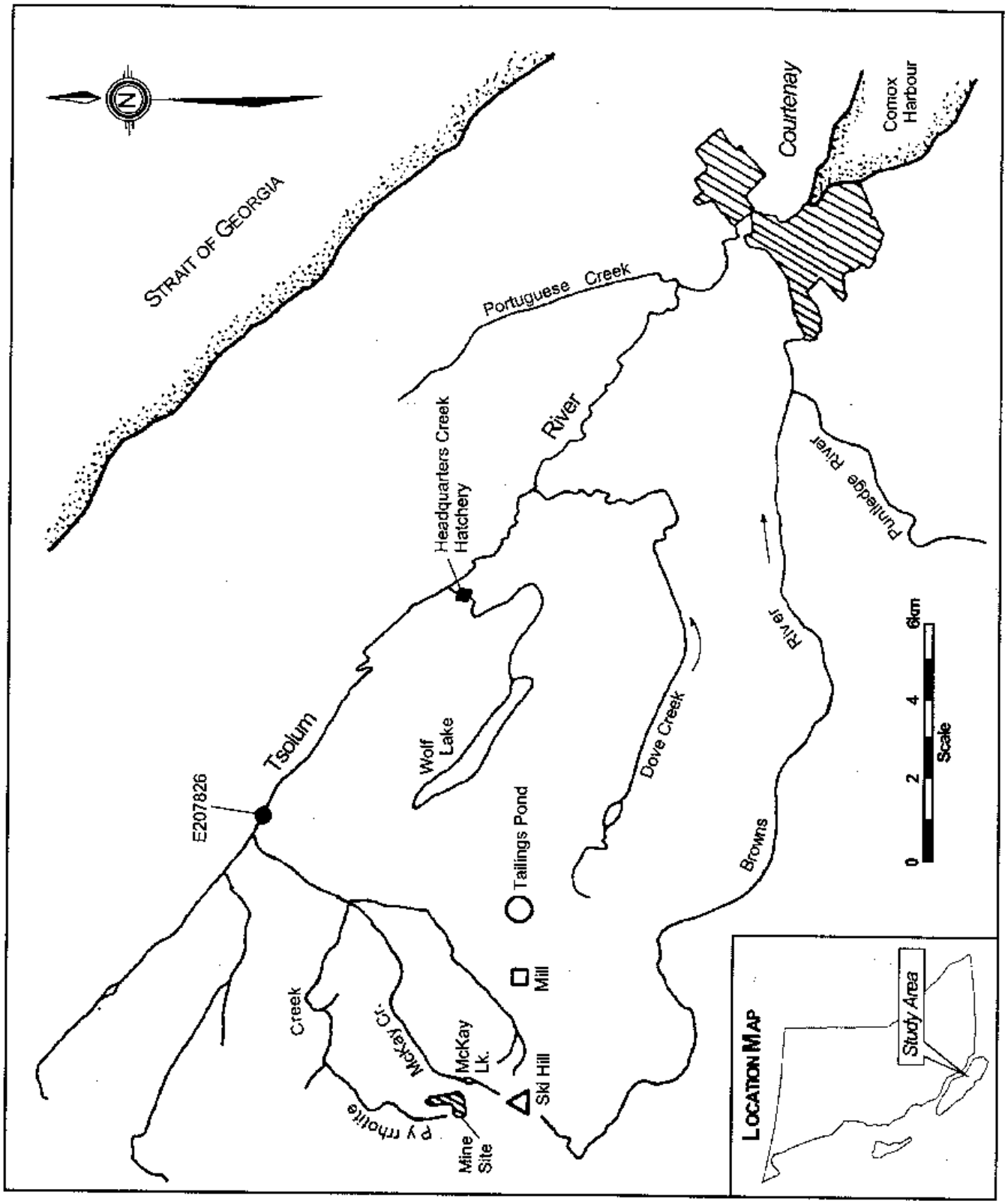


Figure 8. Holland Creek and Stocking Lake

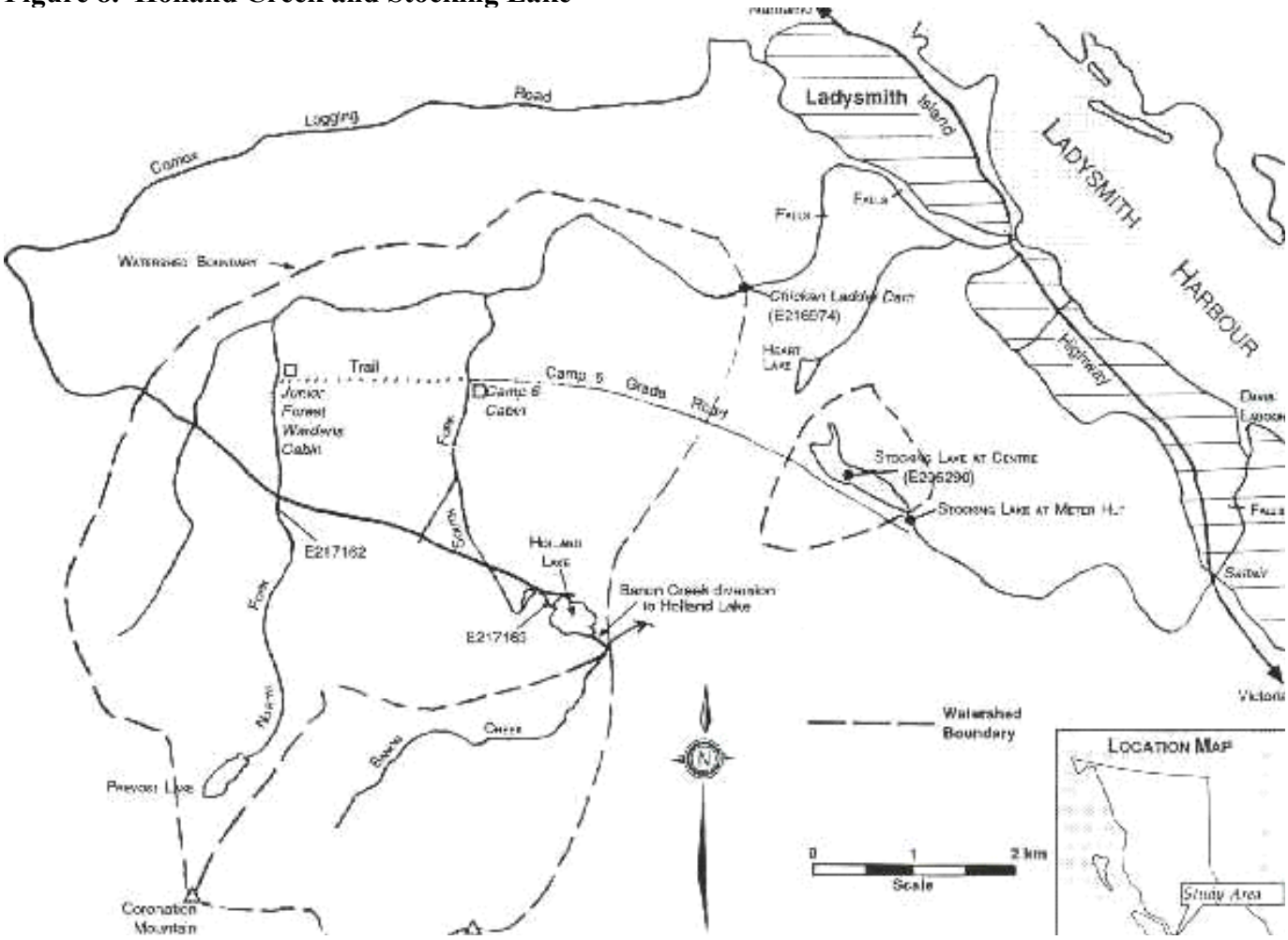


Figure 9. Kathlyn, Seymour, Round and Tyhee Lakes

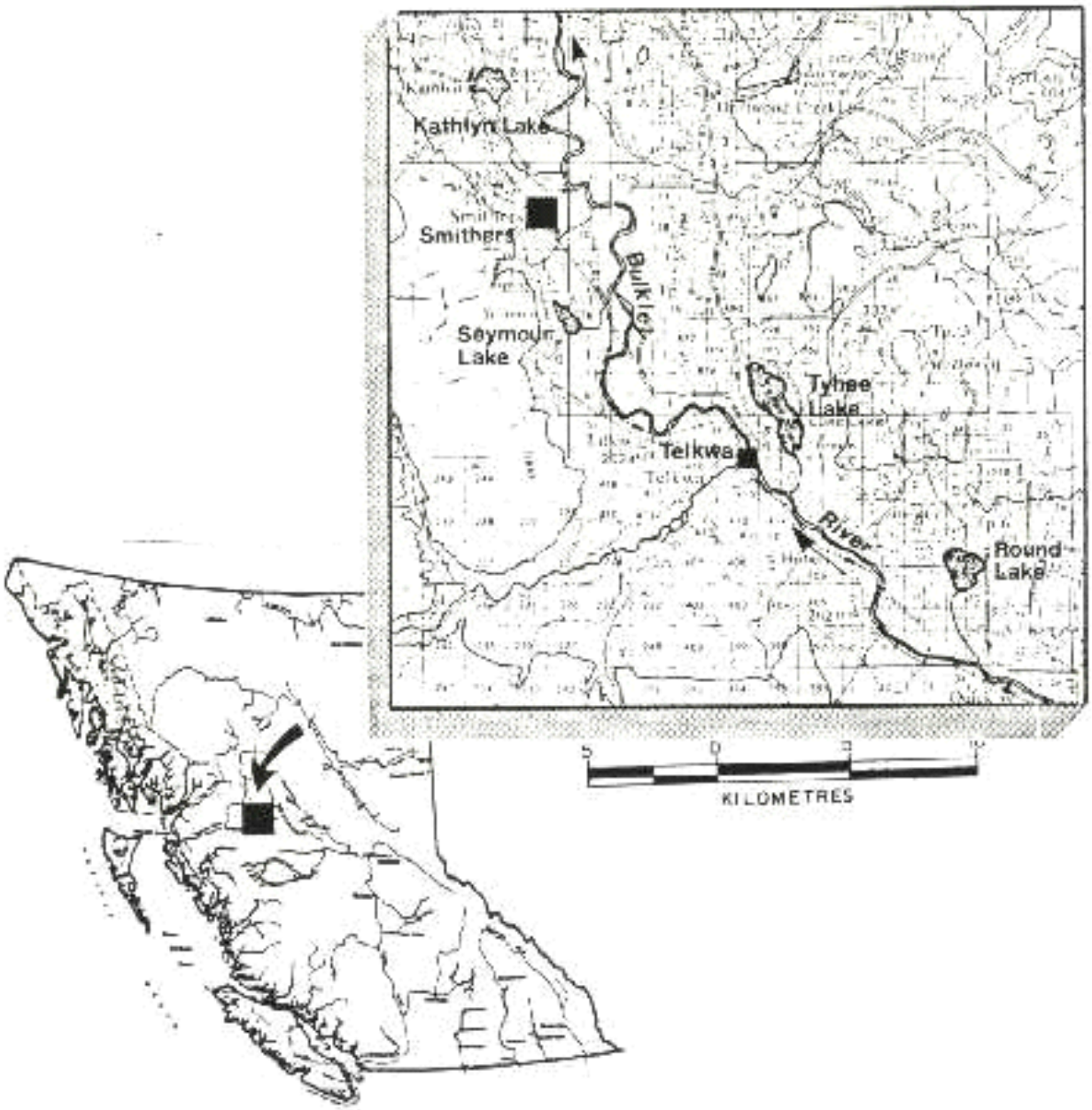


Figure 10. Lakelse Lake.

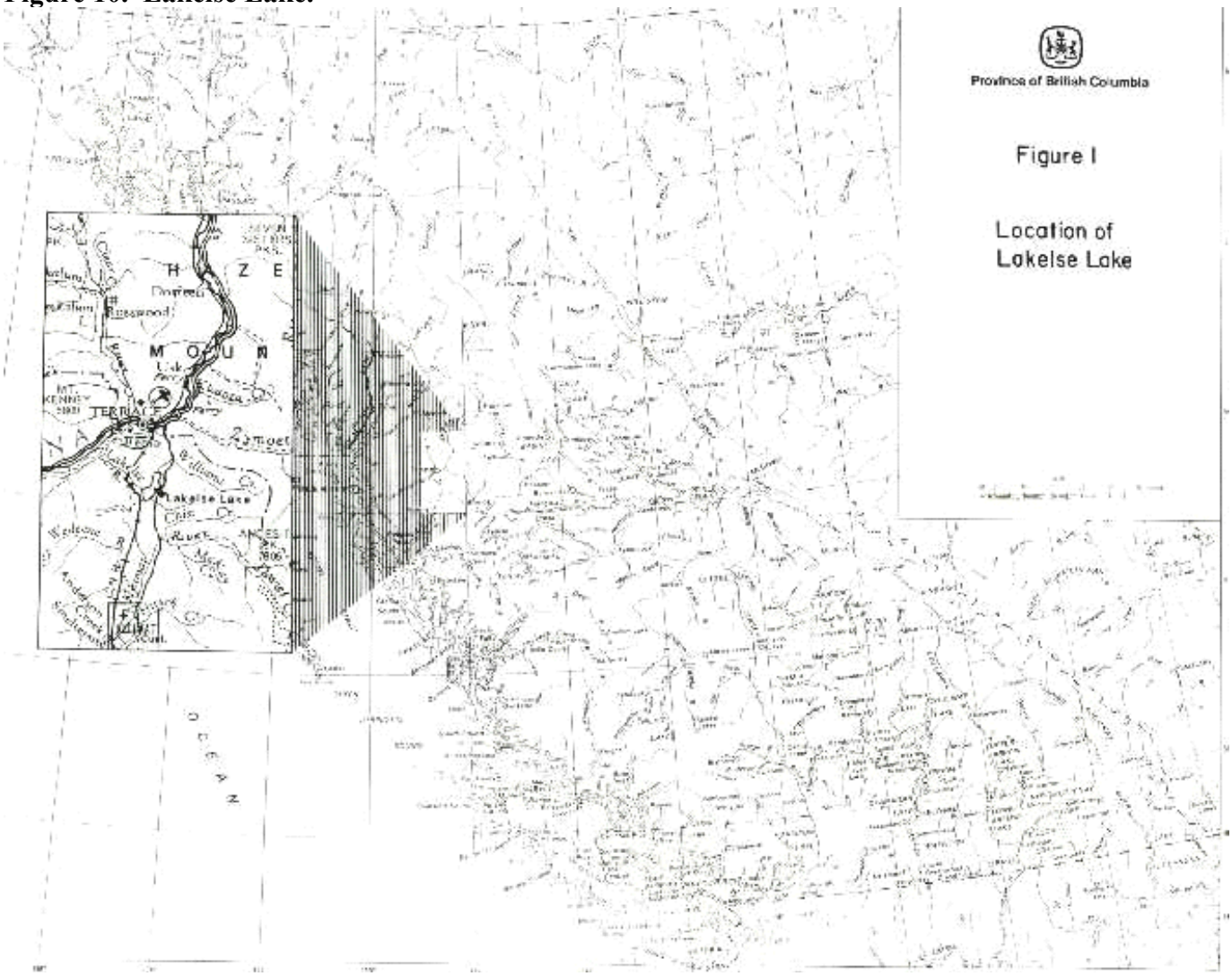


Figure 11. Nechako River

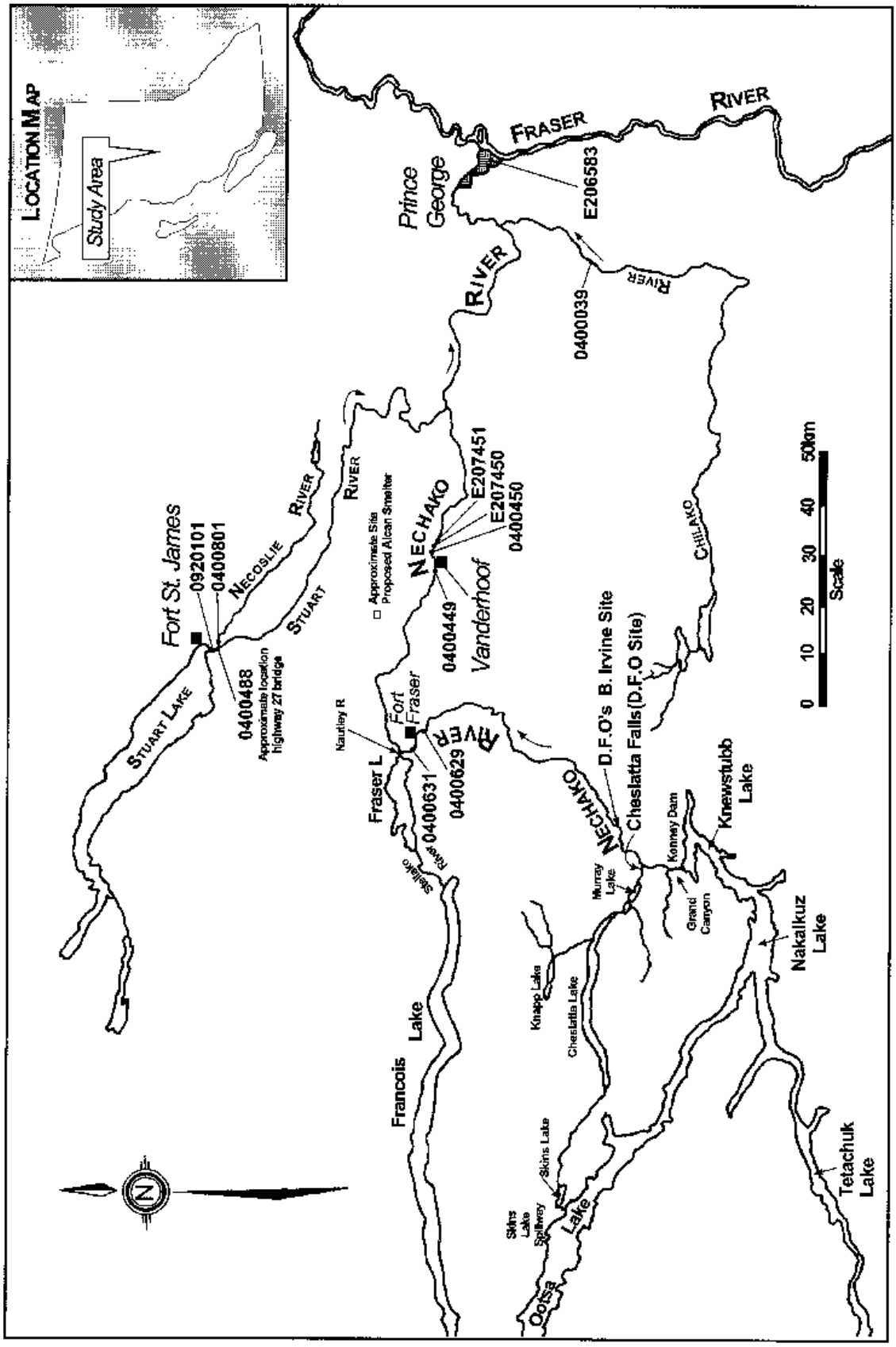
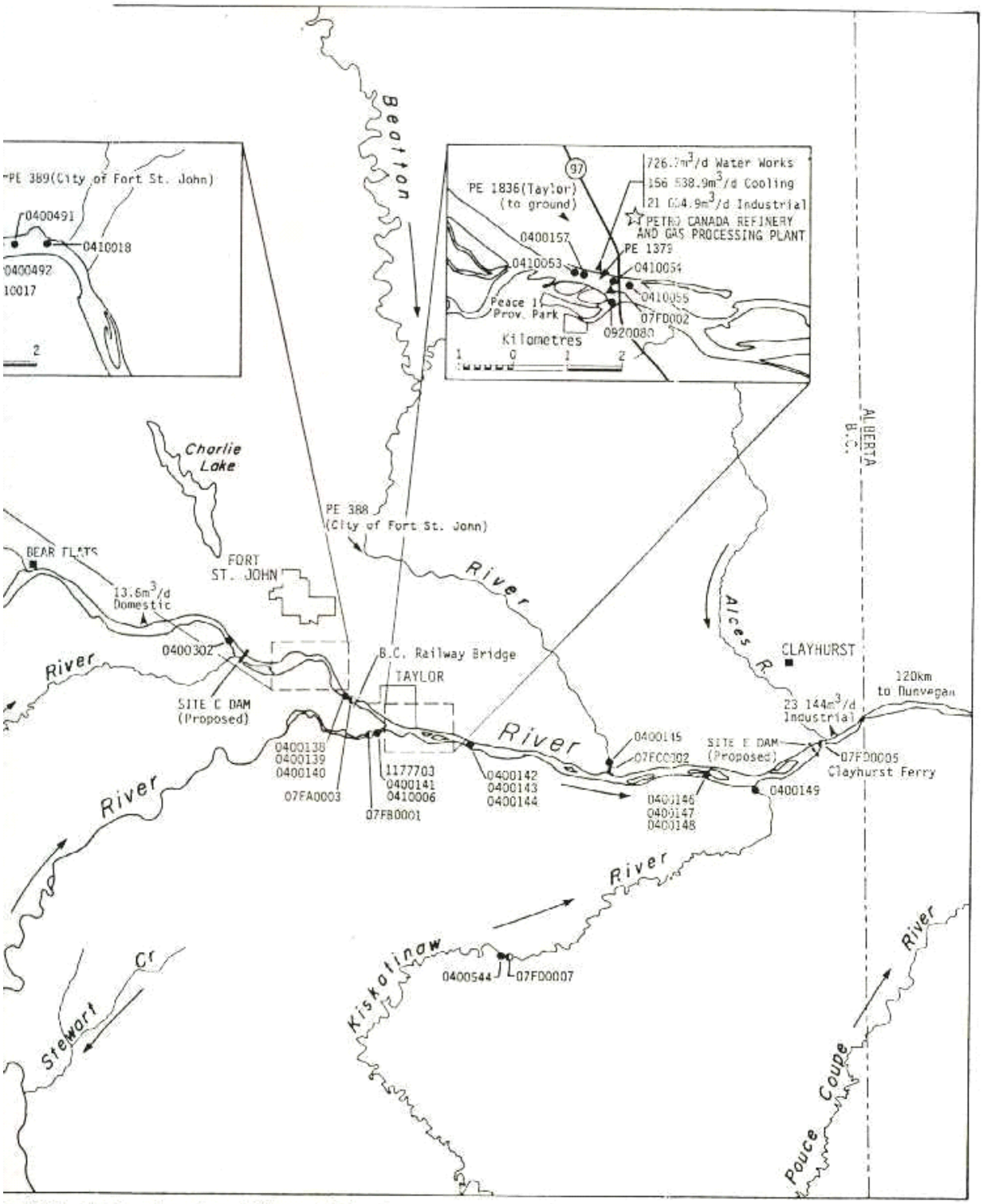


Figure 12. Peace River



er Sub-basin showing Effluent Discharges,
er Sites, and Water Withdrawals.

Figure 13. Upper Fraser River

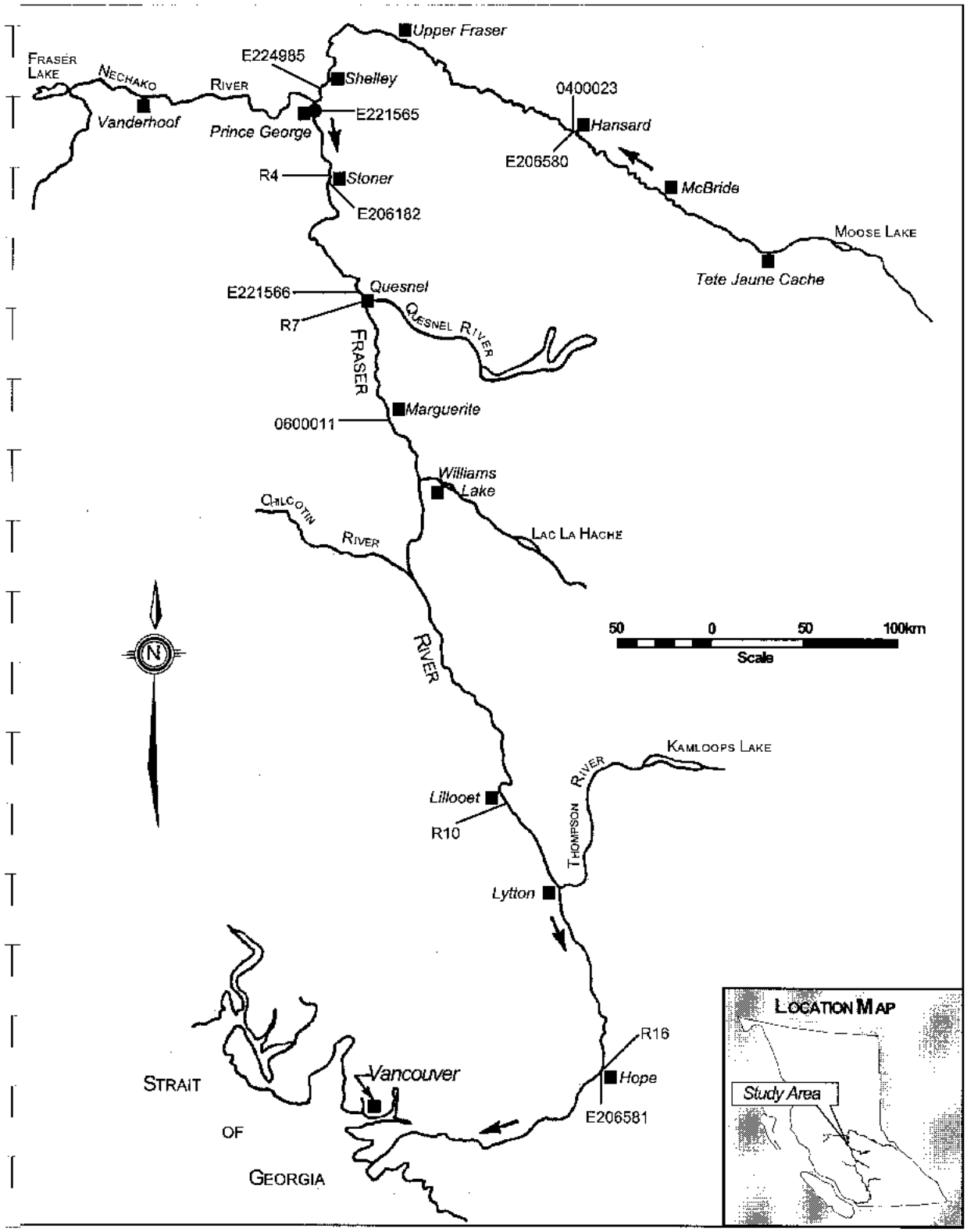


Figure 14. Williams Lake

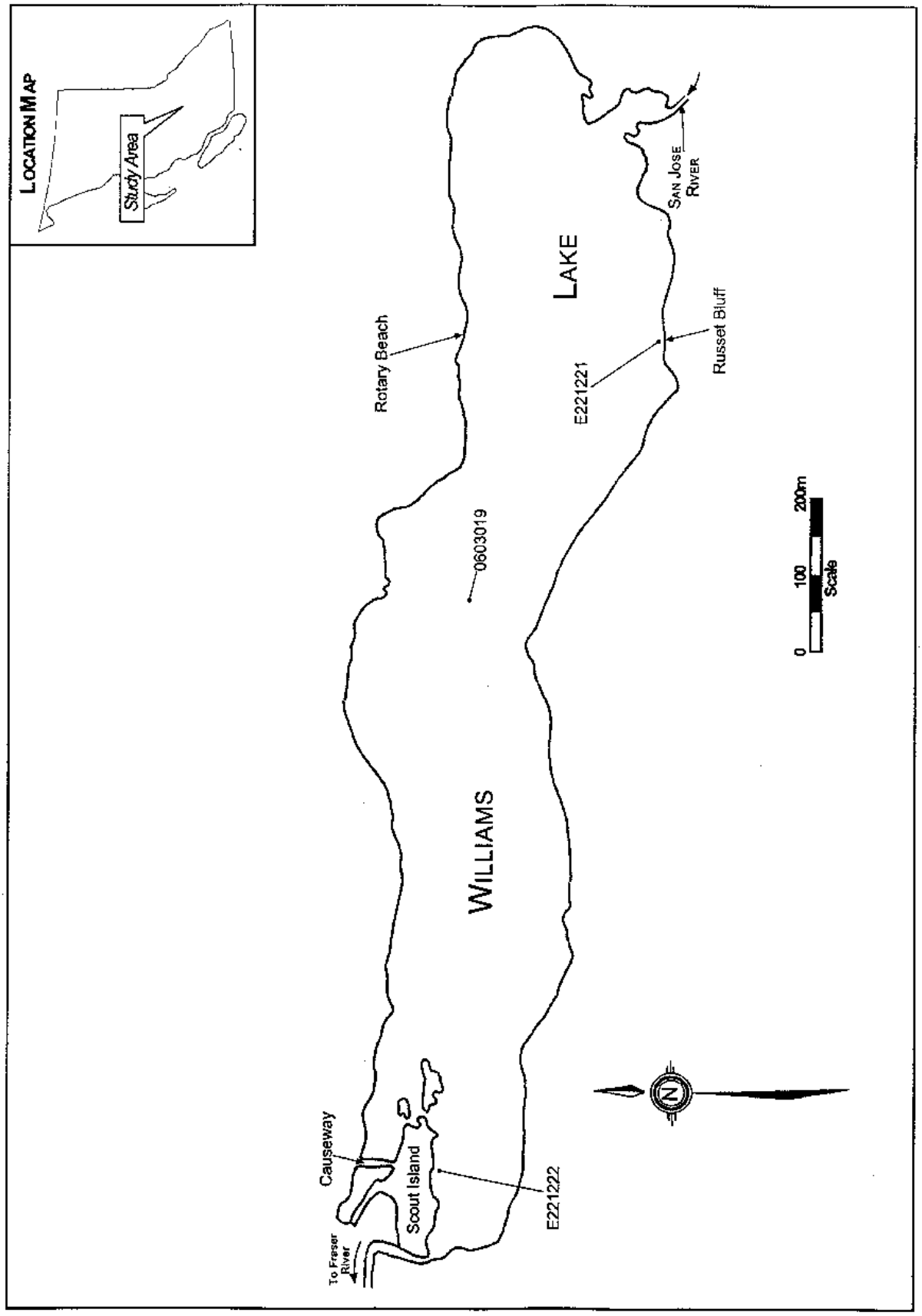


Figure 15. Okanagan Valley Lakes.

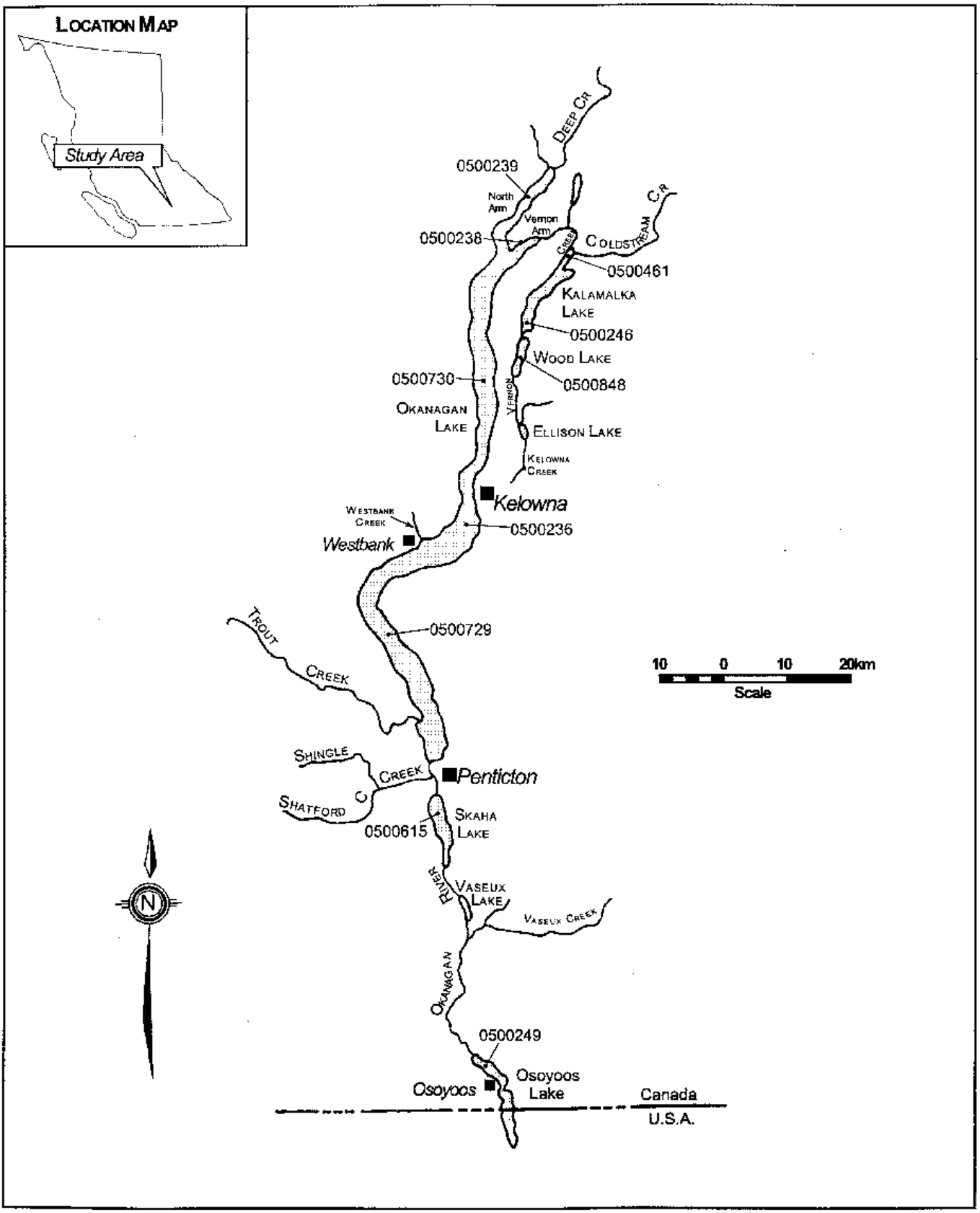


Figure 16. Similkameen River.

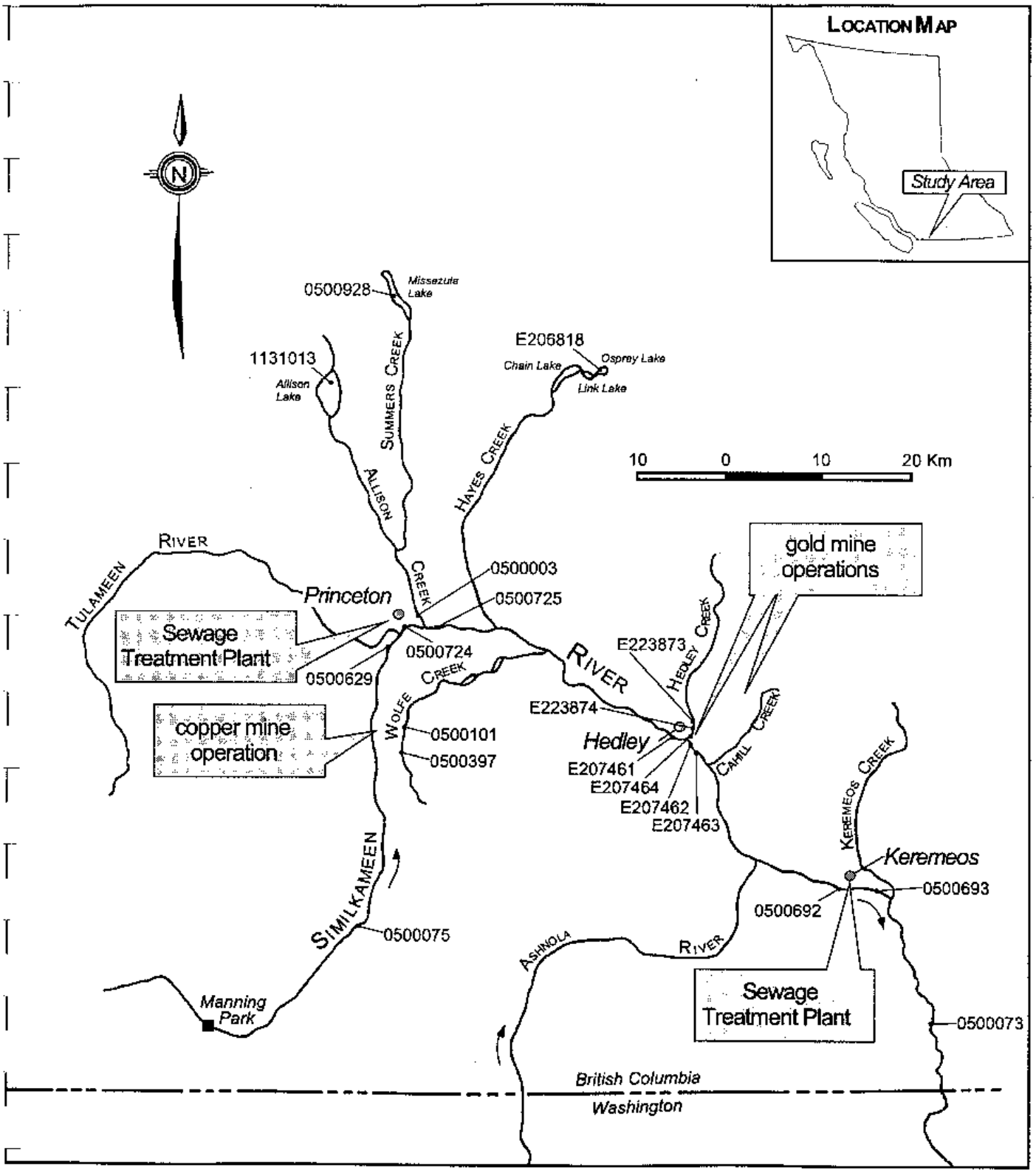


Figure 17. Cahill Creek.

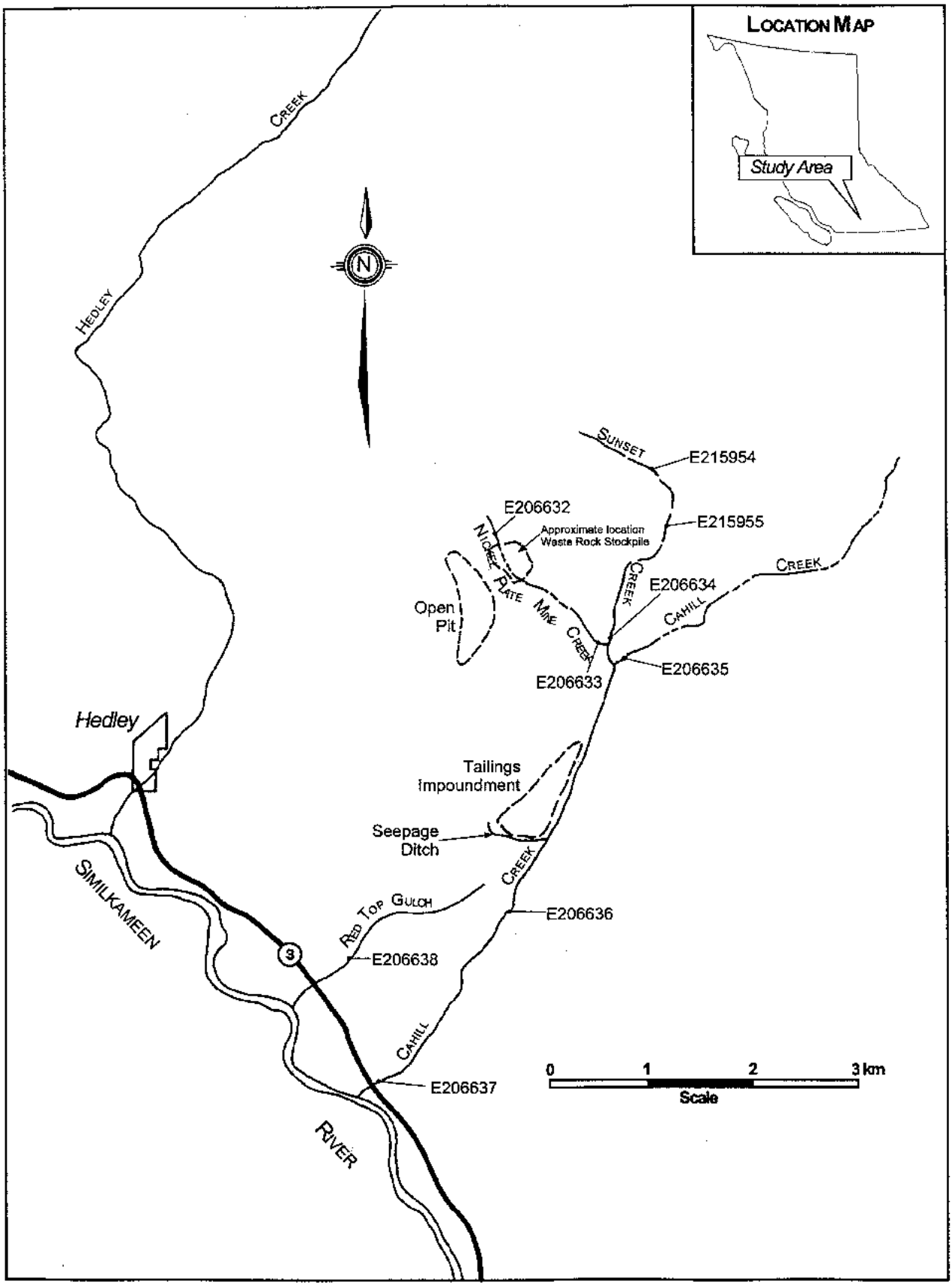


Figure 18. Christina Lake

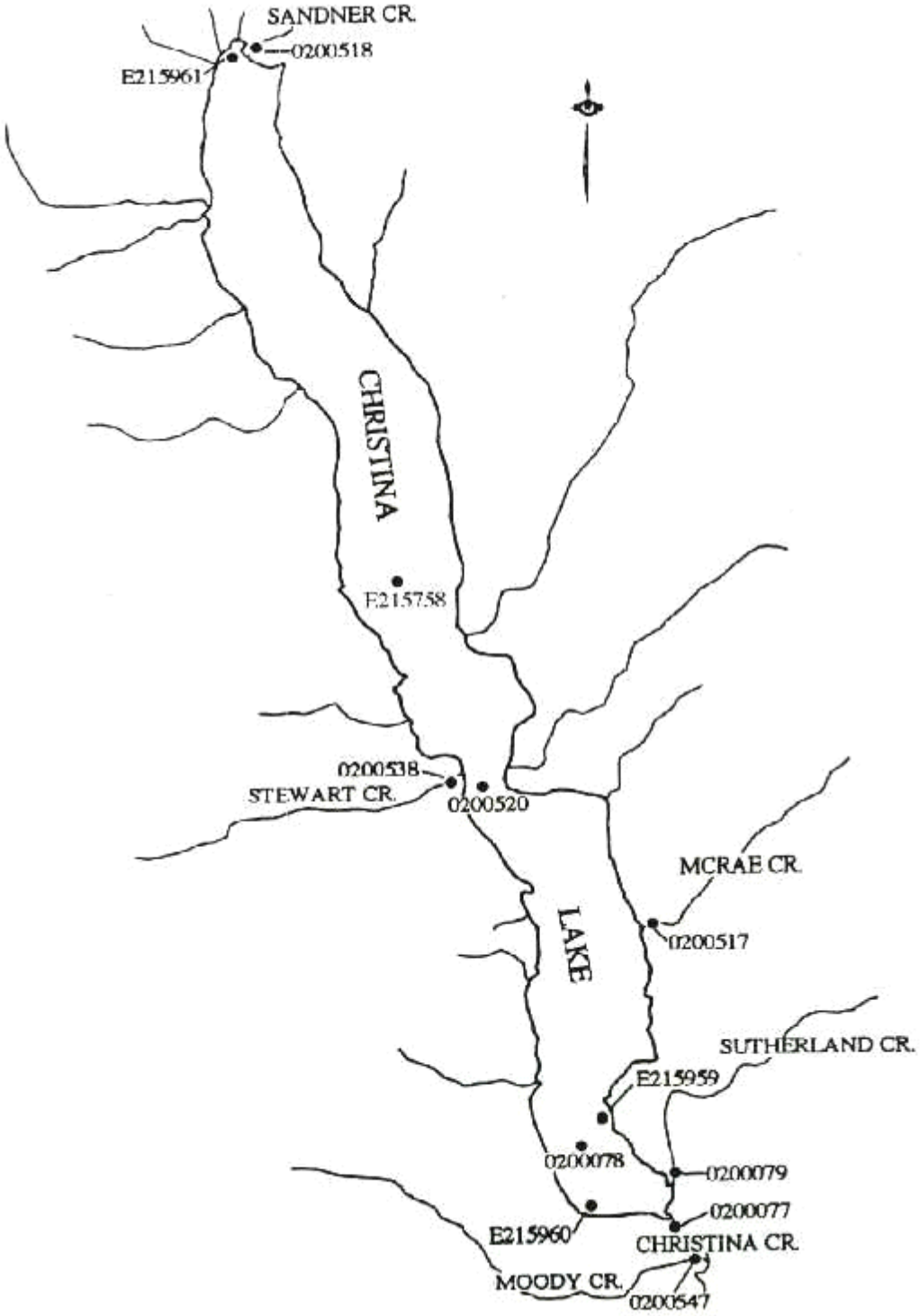


Figure 19. Thompson River.

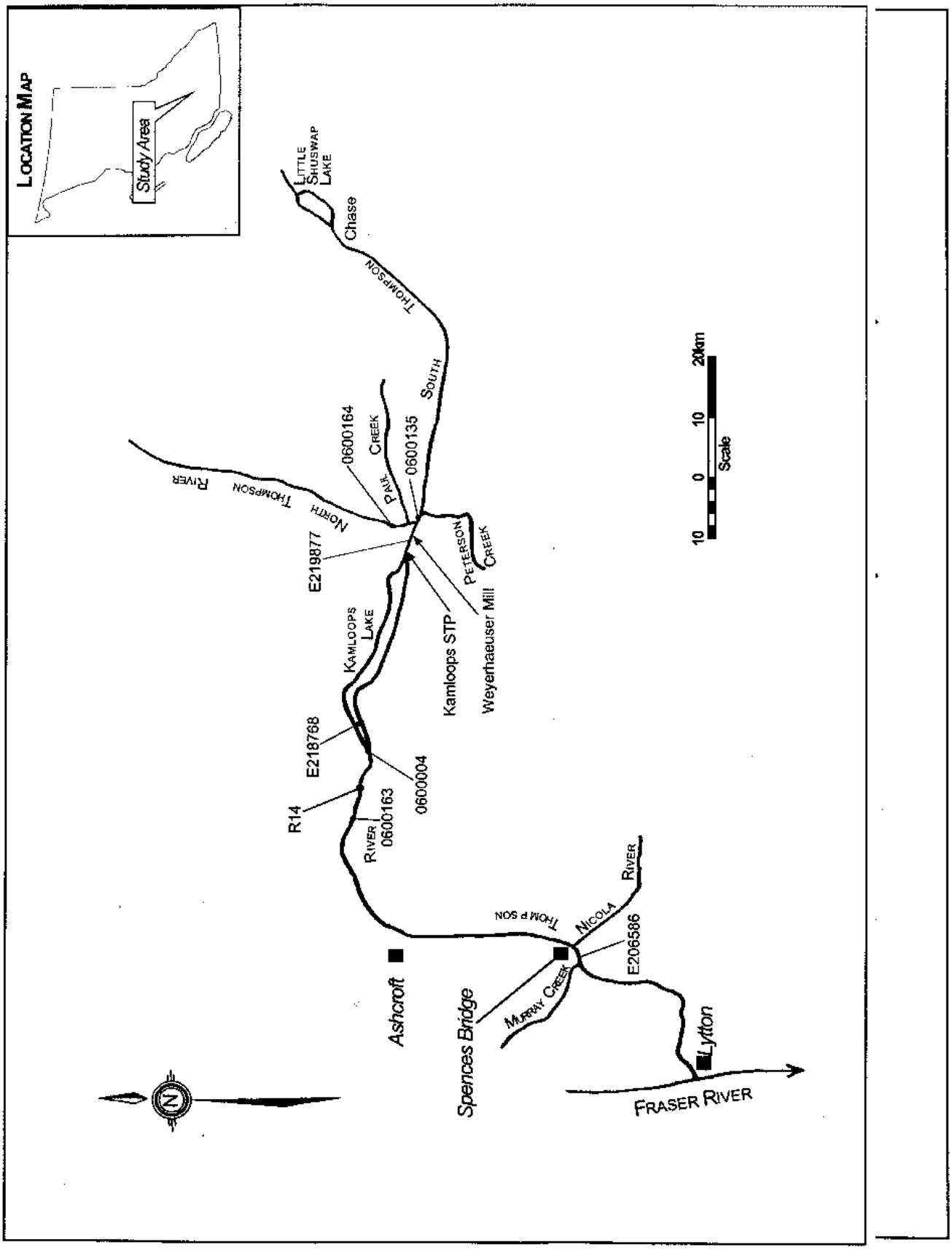


Figure 20. Keremeos Creek.

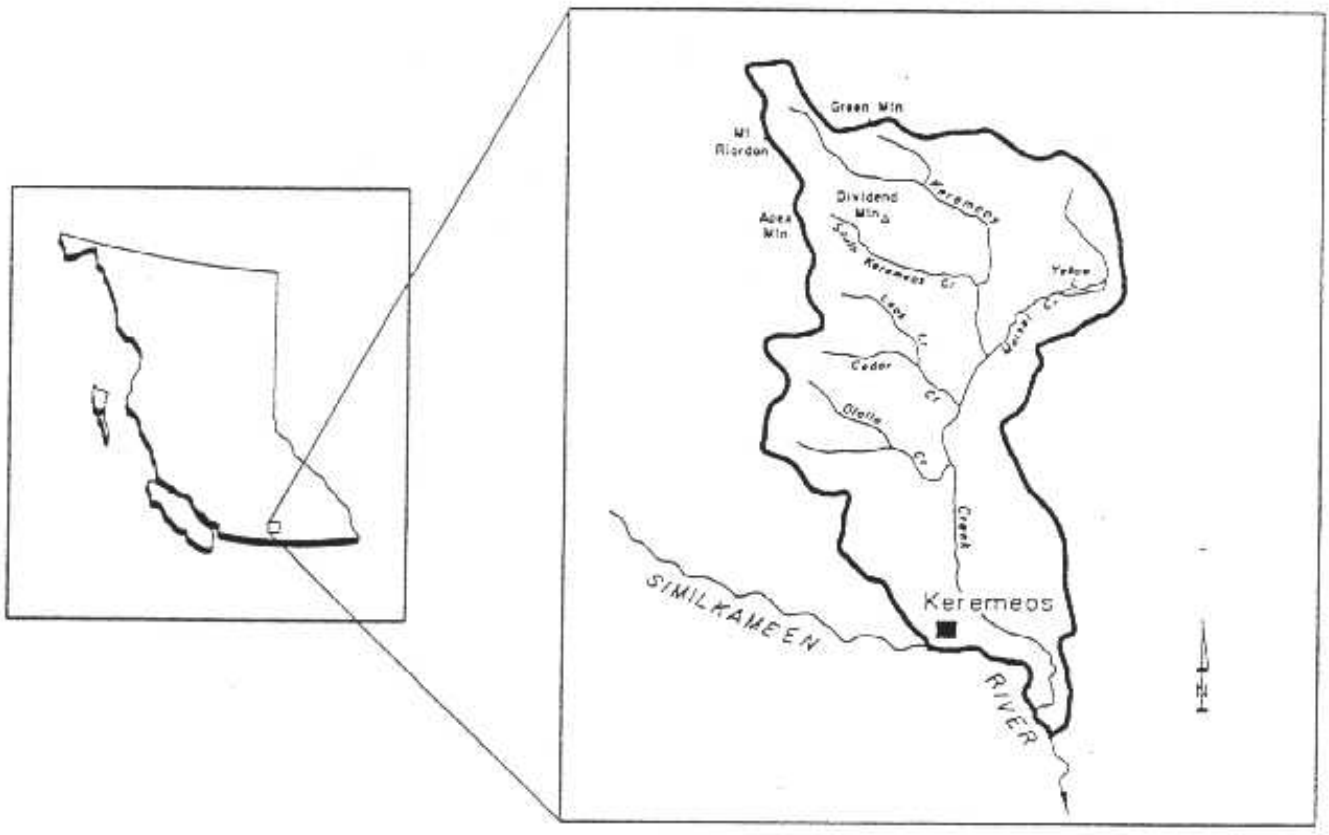


Figure 21. Columbia and Windermere Lakes

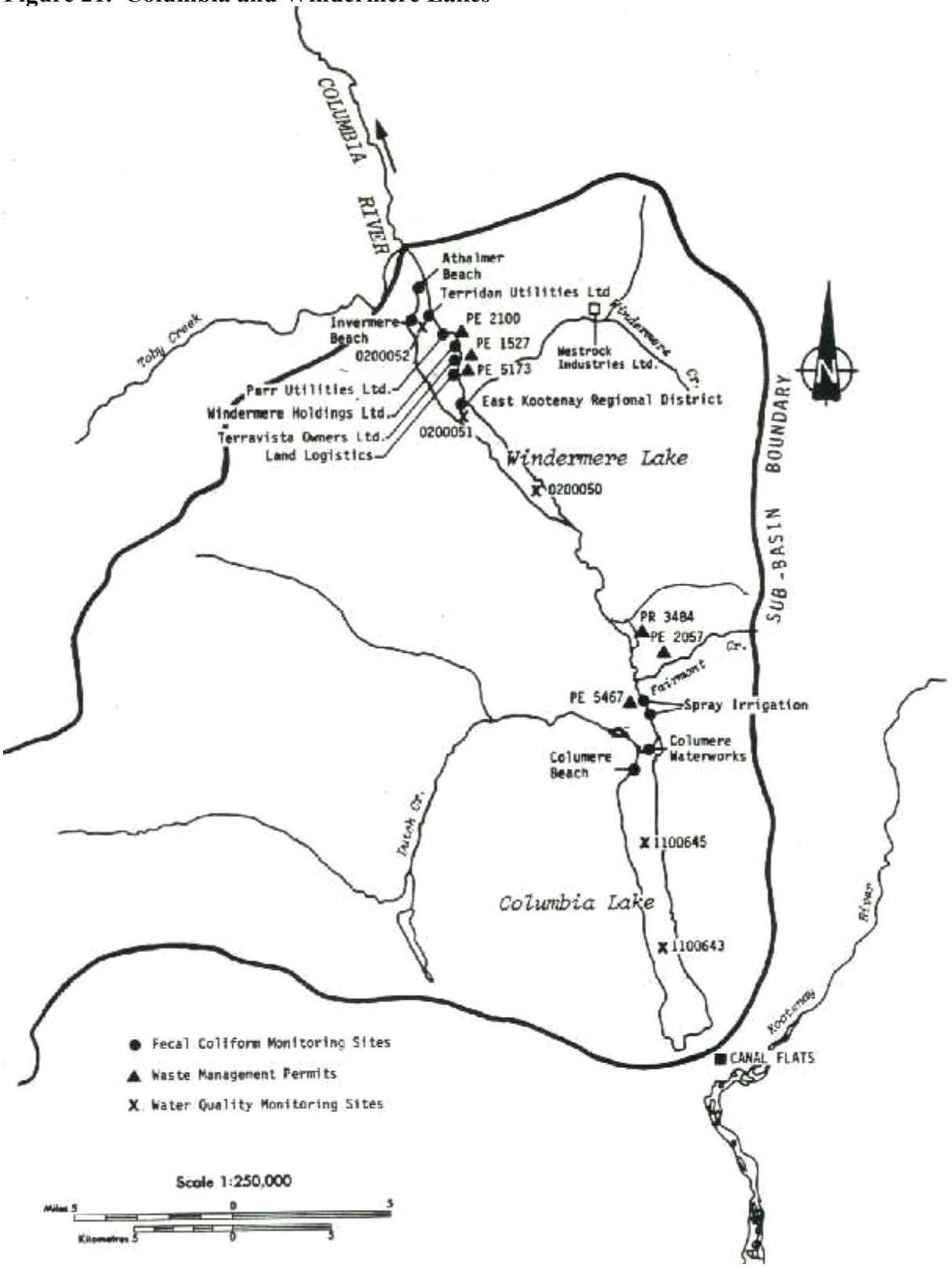


Figure 22. Toby Creek and Upper Columbia River.

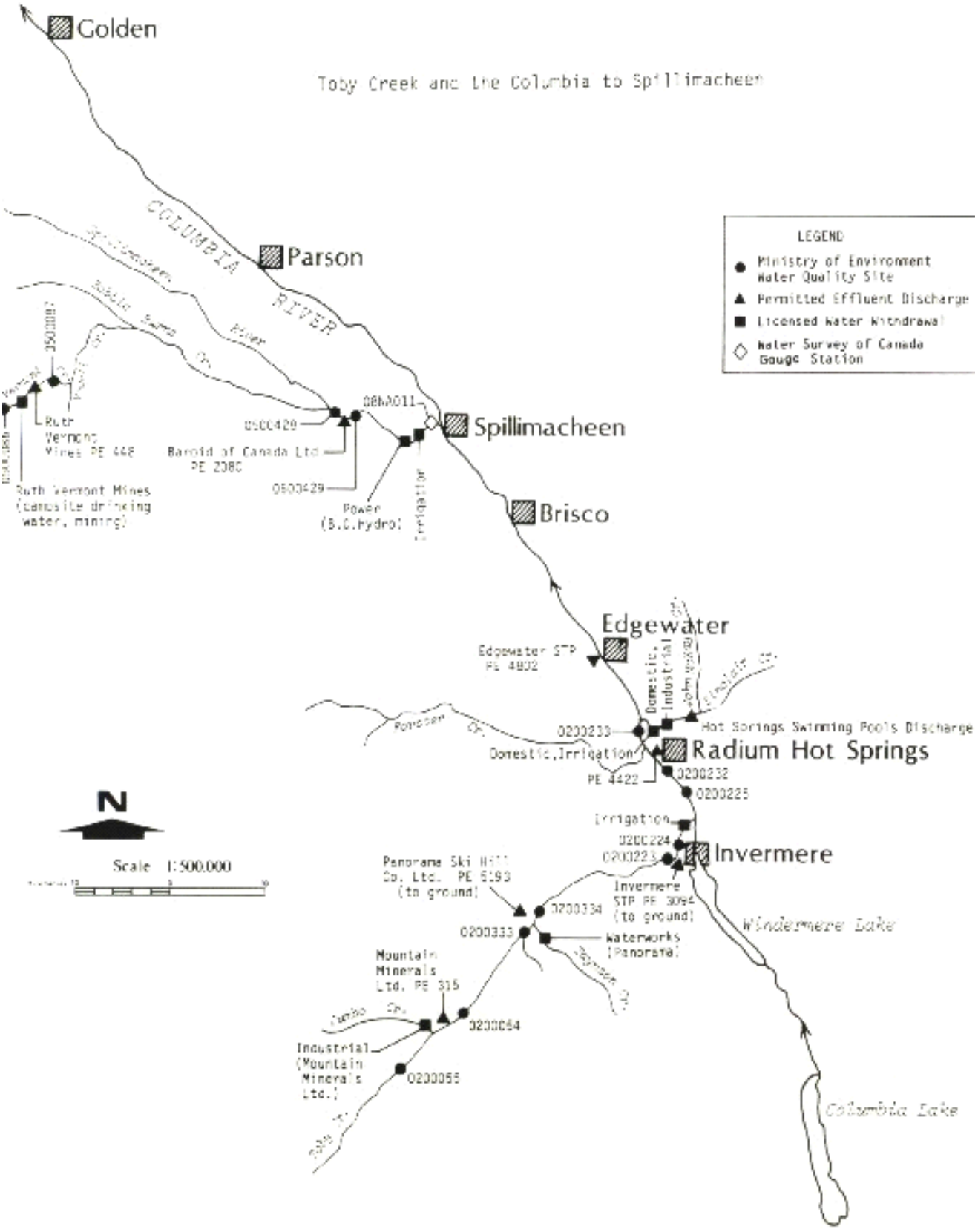


Figure 23. Columbia River from Birchbank to the International Border.

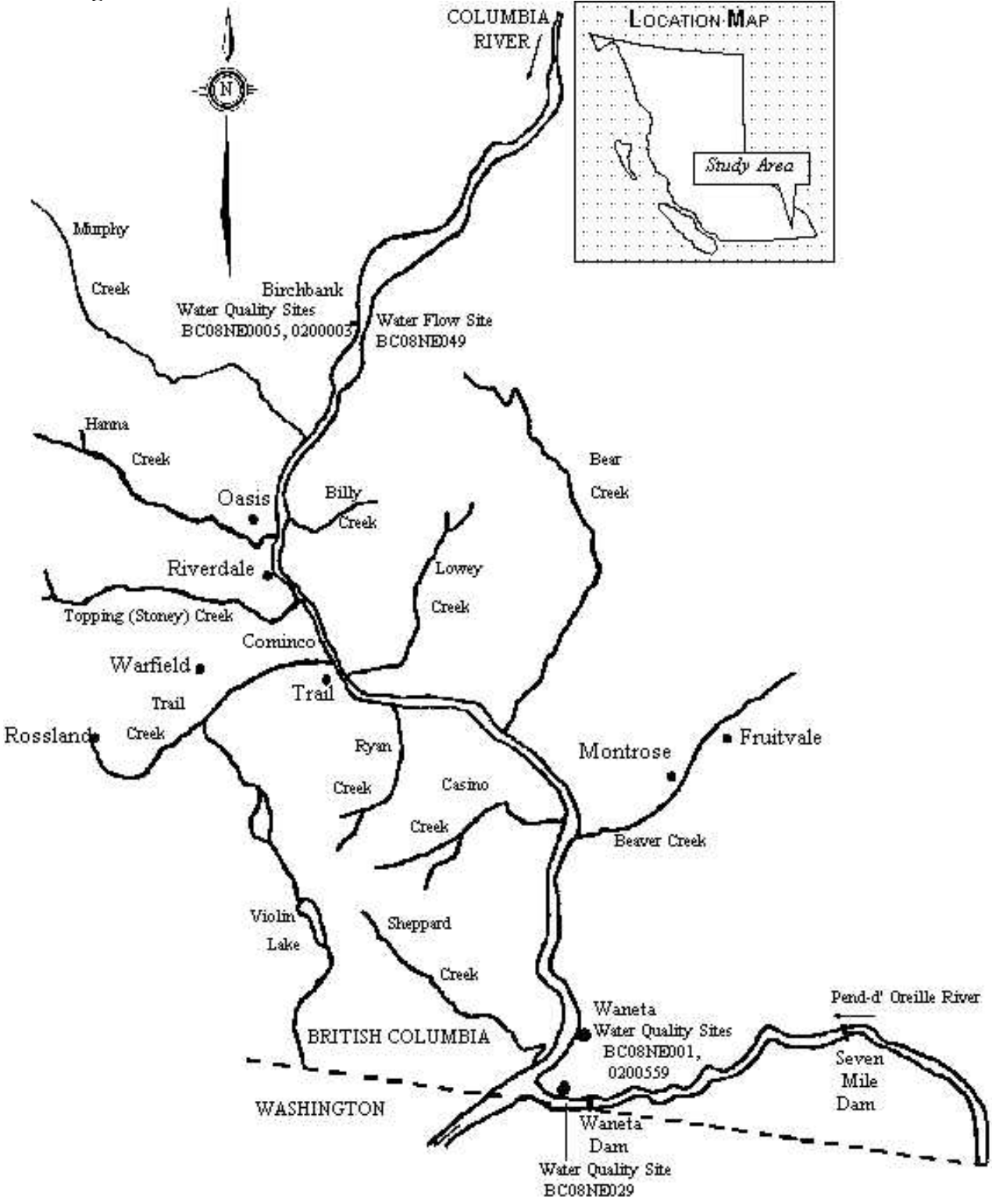


Figure 24. Fraser River - Kanaka Creek to the Mouth.

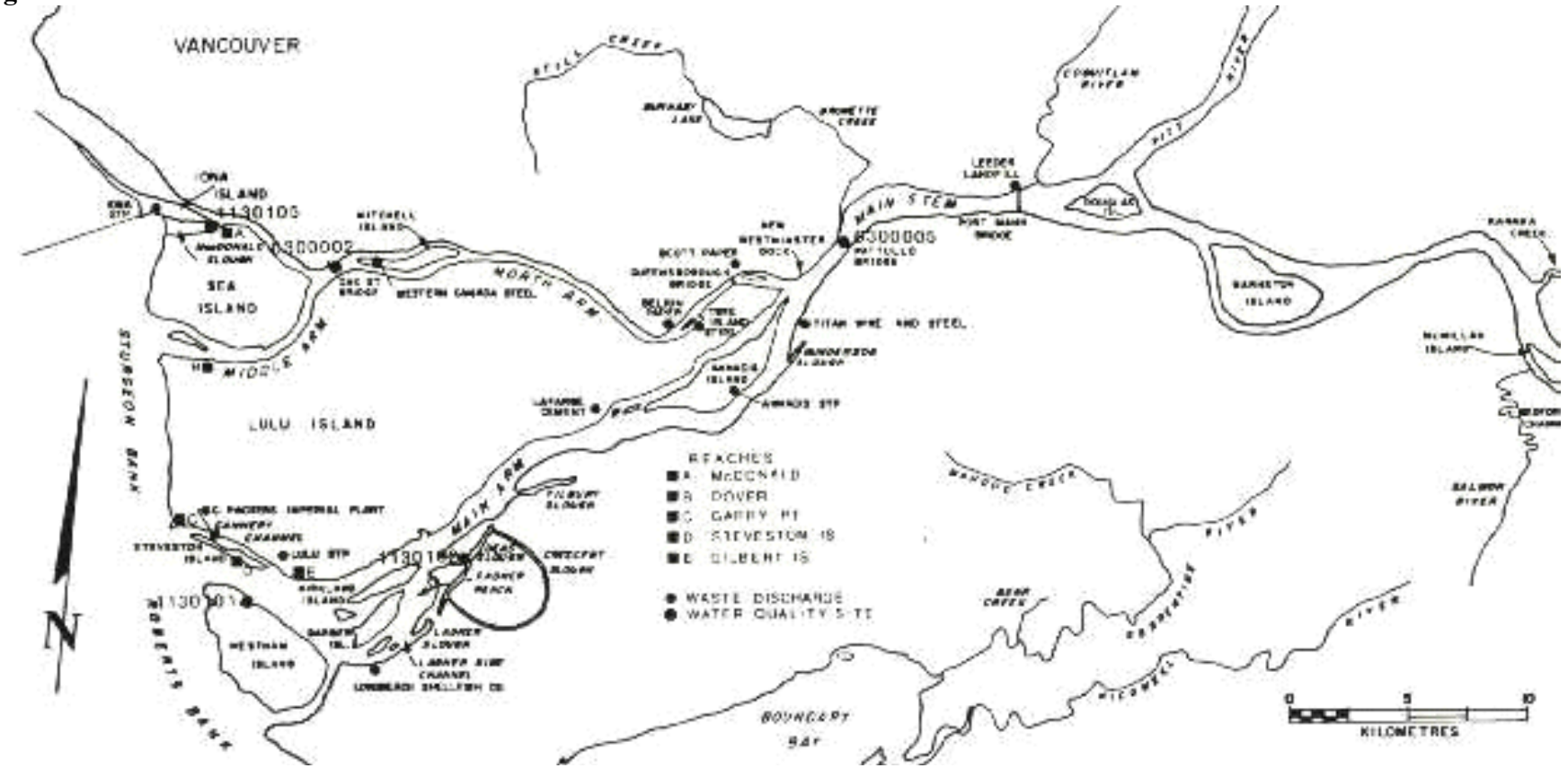


Figure 25. Burrard Inlet.