WATER and AIR MONITORING and REPORTING SECTION

ENVIRONMENTAL QUALITY BRANCH

MINISTRY OF ENVIRONMENT

Water Quality in British Columbia

Objectives Attainment in 2005

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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 2005, the Ministry of Environment 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 2005.

The results are summarized in a series of tables. For all Ministry Regions the objectives were met 92.6 percent of the time in 2005. The findings in 2005 are slightly higher than the 2004 results (90.8%), 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 2005 sampling program included fecal coliforms, *E. coli*, *Enterococci*, turbidity, dissolved oxygen, 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 Maxxam Analytical Laboratory analyzed the samples for most variables except for microbiological indicators measured by 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, Environment Canada, and the Greater Vancouver Regional District (GVRD).

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 2005 is the seventeenth 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 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 2 to 24 summarize the data collected in 2005, 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 1 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 2005 was 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.

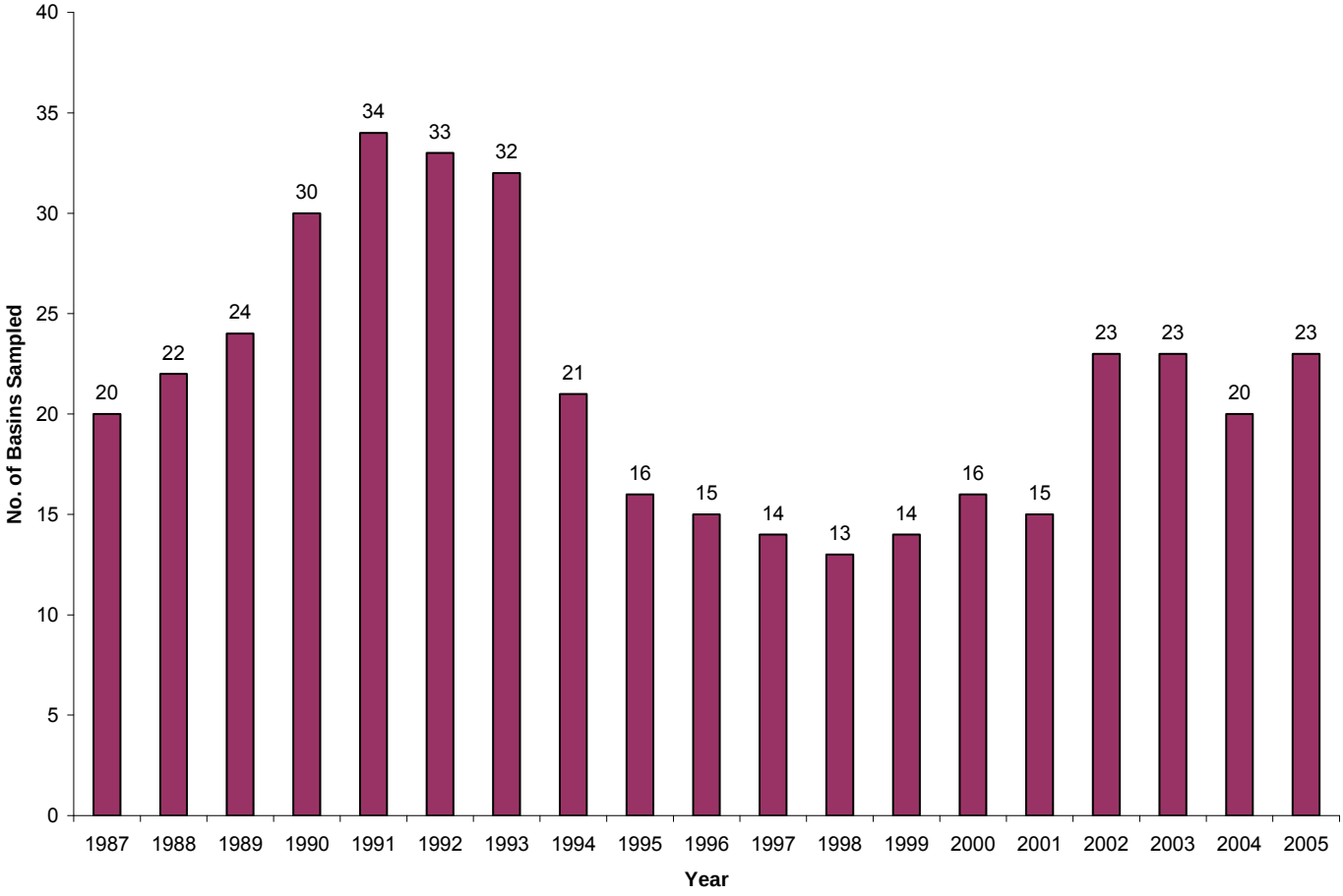


Figure 1. Summary of the number of basins sampled annually between 1987 and 2005.

Four different concluding statements are used in the data assessment: objective met, objective not met, indefinite result, and omitted 2005. 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,

geometric mean 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 2005.

Text

In the text section, we briefly explain the quality assurance program and its status in the 2005 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 2005 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 2005 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 2005 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 25, illustrate the 23 water basins monitored in 2005 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, and the lower Columbia River due to trans-boundary effects.

- **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 2005, 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 (p. 48) shows the results of this compilation in 2005. 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 88.1% of the time in the Province as a whole in 2005. Objectives were not met from between 6.7% and 12.3% of the time, with an overall average of 7.0%. The occurrence of objectives omitted and indefinite results in 2005 averaged 1.5% and 3.4%, respectively. If we subtract these instances from the total, the objectives were met 92.6% of the time and objectives not met 7.4% 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 2005.

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.

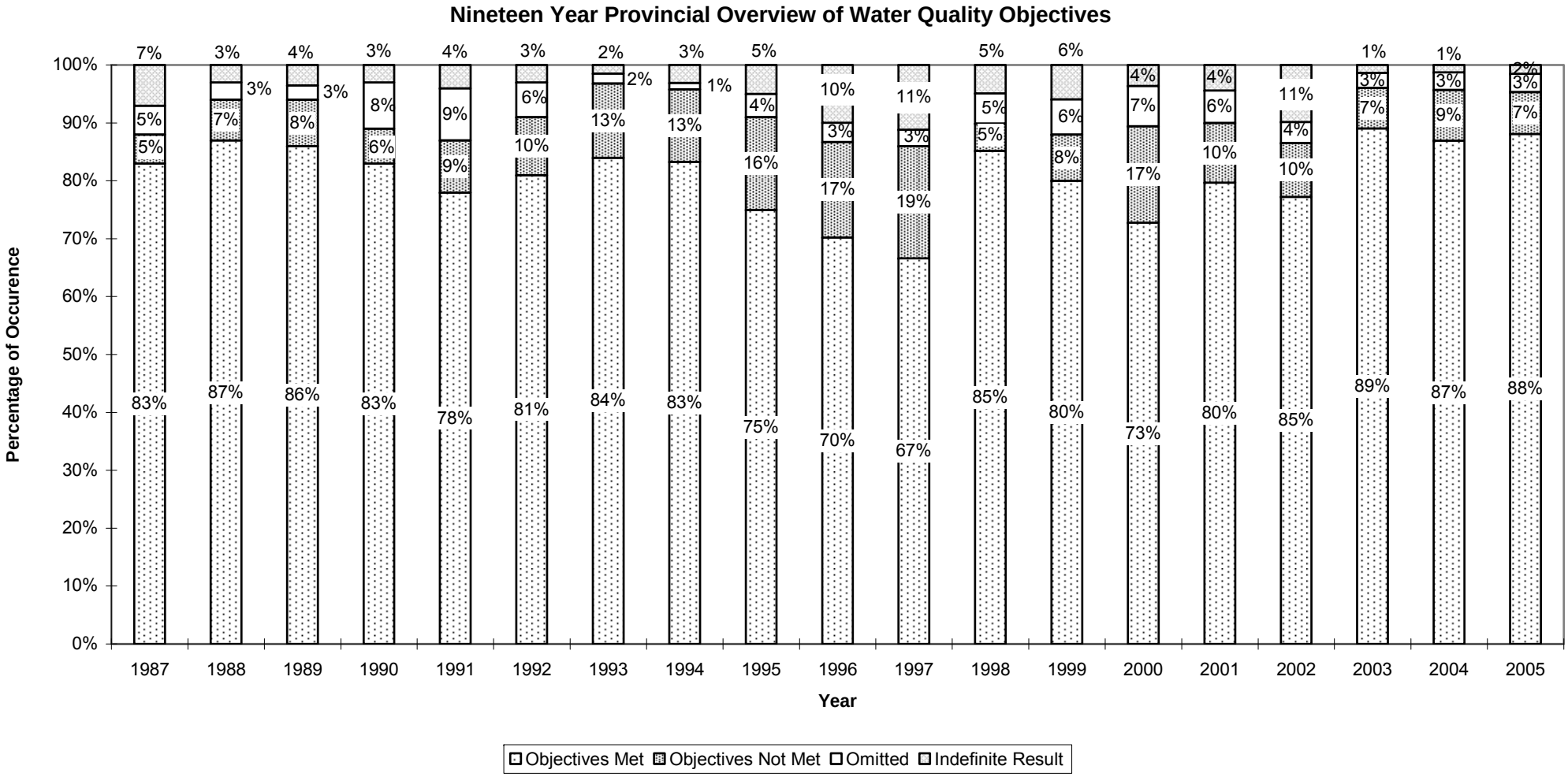
A comparison of objectives attainment (note: only attainment and exceedences were considered in calculations – data that was omitted or indefinite were not included).

	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**	**2004**	**2005**
% of the Time Objectives Were Met	77%	95%	91%	81%	89%	89%	93%	91%	93%
Number of Basins Sampled	14	13	14	16	15	23	23	20	23

Eighteen-Year Water Quality Attainment Overview

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


Nineteen Year Provincial Overview of Water Quality Objectives
Percentage of Occurence
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005
Year
7% 3% 4% 3% 4% 3% 2% 3% 5% 10% 11% 5% 6% 4% 4% 11% 1% 1% 2%
5% 3% 3% 8% 9% 6% 2% 1% 4% 3% 3% 5% 6% 7% 6% 4% 3% 3% 3%
5% 7% 8% 6% 9% 10% 13% 13% 16% 17% 19% 5% 8% 17% 10% 10% 7% 9% 7%
83% 87% 86% 83% 78% 81% 84% 83% 75% 70% 67% 85% 80% 73% 80% 85% 89% 87% 88%
Objectives Met
Objectives Not Met
Omitted
Indefinite Result

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 64). 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 (page 49) lists results for 2005, and Figure 3 (page 122) shows site locations. The CCME index values calculated for 2005 were 91 for the Cowichan River and 83 for the Koksilah River, which equate to ranks of Good for both watersheds. These values were relatively unchanged from 2004, when the values were 92 and 79, respectively.

In 2005, objectives were met 87% of the time when sufficient data was collected to evaluate compliance. Fecal coliforms in the Koksilah River and dissolved oxygen in both the Cowichan and Koksilah rivers did not meet objectives on occasion.

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 were 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.

Holland Creek and Stocking Lake

The Holland Creek and Stocking Lake watersheds, located near Ladysmith (see Figure 4) 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 87, while the value for Holland Creek was 68. These values translate to a ranking of Good and Fair, respectively.

In 2005, two water samples were collected from Stocking Lake, and no samples were collected from Holland Creek (Table 3). Based on these limited data, a WQI value of 50 was calculated, which equates to a rating of Marginal. Objectives for turbidity, pH, total organic carbon and spring-overturn phosphorus were not met.

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. 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).

In 2004, the CCME index value calculated for Long Lake, Quinsam River and Middle Quinsam Lake were all equal to 100, equivalent to a ranking of Excellent. No samples were collected from these sites in 2005.

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. No monitoring took place in 2005.

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.

Tsolum River

The Tsolum River flows from Mount Washington to the Puntledge River at Comox on Georgia Strait (Figure 6). 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 4 lists results for 2005. The Tsolum River had a CCME index value of 71 for 2005, which equates to a ranking of Fair.

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 exceeded the maximum objective in two of 23 samples collected in 2005, considerably better than the seven of 23 samples that exceeded objectives in 2004.

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

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 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 be carried out in 2006.

Kathlyn, Seymour, Round, and Tyhee Lakes

These four small lakes, in the Smithers area, are used for recreation, domestic water supply, and irrigation (Figure 7). 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 2004 were 88 for Kathlyn Lake, 64 for Seymour Lake, 54 for Round Lake and 100 for Tyhee Lake. These values translate to rankings of Good, Marginal, Marginal, and Excellent, respectively. Very limited monitoring was conducted in 2005, and WQI values were not calculated.

Table 5 summarizes the 2005 water quality data for these four lakes. Total spring overturn phosphorus was the only objective measured in each lake, and the objective was met in all lakes except for Round Lake.

Lakelse Lake

Lakelse Lake drains into the Skeena River (Figure 8) 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.

Only one objective was assessed in 2005, on one occasion, and no WQI value was calculated. Table 6 summarizes the 2005 water quality data for Lakelse Lake.

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.

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

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.

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.

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 7 lists 2005 water quality data, and Figure 9 shows site locations. A CCME index value was calculated for four sites on the Upper Fraser River in 2005: the Fraser River near Red Pass, the Fraser River near Hansard, the Fraser River near Quesnel and the Fraser River at Hope. Index values were 100 near Red Pass and Hansard (a ranking of Excellent), 90 near Quesnel (a ranking of Good), and 81 near Hope (a ranking of Good).

Objectives were met in 97% of instances for the upper Fraser River. Parameters that did not consistently meet their objectives were 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* to five samples within a 30-day period to be able to evaluate objective compliance.

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 10). 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, fecal coliform objectives were met in the Nechako River except immediately downstream from Vanderhoof. 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 considerably over recent years due to water temperature management by the Nechako Fisheries Conservation Program.

Table 8 shows water quality data for 2005. The Nechako River had a CCME index value of 79 for 2005, which equates to a ranking of Fair.

Water quality objectives for the Nechako River were met 88% of the time that an assessment could be made. Objectives that were not met included dissolved oxygen and water 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 2008, whichever comes first.

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 2005 at the joint Federal-Provincial monitoring site near Alces. The CCME WQI for the Peace River was 87 in 2005, which equates to a ranking of Good. Table 9 summarizes the 2005 water quality data for the Peace River, and Figure 11 shows site locations. Objectives that were not met 100% of the time when there was sufficient data to make a determination were total copper and total zinc.

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

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 2006.

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 2006.

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.

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 2006 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 2005 for one year. As development increases an assessment may show that monitoring is needed in the future.

CARIBOO REGION

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.

Williams Lake

Williams Lake drains to the Fraser River and is important for drinking water, recreation, and aquatic life (Figure 12). 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. Turbidity, phosphorus concentrations and Secchi depths are the only parameters measured in the last few years for which objectives exist.

Table 10 lists water quality results and Figure 12 shows site locations. The CCME index value for Williams Lake in 2005 was 40, which equates to a ranking of Poor.

Water quality objectives not consistently met in Williams Lake include total phosphorus and average turbidity. Objectives were met 87% 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.

SOUTHERN INTERIOR REGION

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 2006.

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 2006 and after improvements are made.

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 13). 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). Since 2002, water quality data collected by the permittee has 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 11 provides a summary of the 2005 data. CCME index ratings for each of the creeks in 2005 (and their respective rankings) are as follows: Cahill Creek: 94 (Good); Nickel Plate Mine Creek: 58 (Marginal); Red Top Gulch Creek: 42 (Poor); and Sunset Creek: 71 (Fair). Objectives that were not met consistently included average and maximum sulphate concentrations, strong acid dissociable cyanide (SAD-CN) + thiocyanate, turbidity, total copper and total nitrate. Rankings in 2005 were similar to those seen in 2004 for both Cahill Creek and Nickel Plate Mine Creek, but decreased considerably in Red Top Gulch Creek and Sunset Creek (from Marginal to Poor, and from Excellent to Fair, respectively). Decreases in rankings are not likely due to a deterioration of water quality in the creeks, but rather an increase in the number of parameters measured.

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.

Christina Lake

Christina Lake, located in south central B.C., drains into the Kettle River which joins the Columbia River in Washington State (Figure 14). 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 12 shows 2005 attainment. The CCME index value for Christina Lake was 90 in 2005, which equates to a ranking of Good.

Objectives were met 99% of the time that attainment could be determined. One of 47 measurements of dissolved oxygen concentrations did not meet the guideline.

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

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 2006.

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.

Monitoring was not conducted in 2005. In 2003 objectives that were occasionally not met include fecal coliforms, turbidity and suspended solids.

We recommend continued monitoring to check Keremeos Creek objectives.

Okanagan Valley Lakes

To date, objectives have only been set in the five main lakes (Wood, Skaha, Kalamalka, Okanagan, and Osoyoos) 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 2005. CCME index rankings for all of the lakes were 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 all of the Okanagan Valley Lakes were consistently met. This was the first year since 1998-99 when the phosphorus objective was met in either Osoyoos or Wood lakes.

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.

Tributaries to Okanagan Lake near Kelowna

Mission, Kelowna, and Brandt's creeks are tributaries to Okanagan Lake on its east shore near Kelowna (Figure 16). 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.

Results of water quality objectives monitoring in both Mission and Kelowna creeks in 2005 are summarized in Table 14. The CCME index value calculated for Mission Creek was 75, which equates to a ranking of Fair, while the index for Kelowna Creek was 53, which equates to a ranking of Marginal.

Objectives were met in 91% of all instances where there were sufficient data to determine compliance. Objectives not met on all occasions were all of the bacteriological indicators (fecal coliforms, *E. coli* and *Enterococci*), and total zinc.

Tributaries to Okanagan Lake near Vernon

Lower Vernon Creek and Deep Creek are tributaries to Okanagan Lake at its north end (Figure 17). 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.

Table 15 summarizes water quality data collected in Vernon Creek and Deep Creek in 2005. The CCME index value for Vernon Creek was 60 (Marginal), while the value for Deep Creek was 58 (also Marginal). Objectives were met 83% of the time that samples were collected. Objectives not met include all of the bacteriological indicators (fecal coliforms, *E. coli* and *Enterococci*), as well as dissolved oxygen levels. We recommend that monitoring continue in 2006.

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 (Figure 18). 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.

Water quality data for Peachland, Trepanier and Westbank creeks are summarized in Table 16. CCME WQI values were 87 (Good) for Peachland Creek, 100 (Excellent) for Trepanier Creek and 45 (Poor) for Westbank Creek. Water quality appears to be worse in Westbank Creek because objectives for bacteriological indicators (fecal coliforms, *E. coli* and *Enterococci*) have been established and were measured in 2005, and these objectives do not apply to Peachland or Trepanier creeks. We recommend monitoring continue in all three creeks in 2006.

Similkameen River

The Similkameen River flows from Manning Park, east through the south Okanagan, then south across the U.S. border (Figure 19). 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 17 lists results in 2005. CCME index rankings calculated for Hedley Creek and the Similkameen River for 2005 were 76 and 90, respectively, which equate to rankings of Fair and Good, respectively.

Objectives were met in 97% of all instances where there were sufficient data to determine compliance. Objectives that were not met consistently included fecal coliforms in the Similkameen River, and turbidity, weak-acid dissociable cyanide (WAD-CN), strong acid dissociable cyanide (SAD-CN) + thiocyanate, pH, total copper, total iron and total manganese in Hedley Creek. We recommend that monitoring continue in these watersheds in 2006.

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 20). 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 18 lists results in 2005 and Figure 20 shows site locations. The CCME index value for both the Lower Thompson and Kamloops Lake was 100, equivalent to a ranking of Excellent.

Objectives were met 100% of the time in the Thompson River system when sampling frequencies were sufficient to determine objectives compliance. True colour in both the Lower Thompson and Kamloops Lake and chlorophyll-*a* in the Lower Thompson were the only parameters measured with sufficient frequency to determine guideline compliance.

We recommend continued monitoring to check Thompson River 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, along with two public beaches. 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 impacting water quality within the lake. Objectives were not monitored in 2005.

We recommend that monitoring resume in Windermere Lake in 2006.

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 conducted in this section of the Columbia River in 2002. 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 2005.

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 2005, attainment monitoring included water and fish tissue sampling at several sites between Birchbank and the international border.

Table 19 lists results for 2005, and Figure 21 shows site locations. The CCME index value for the lower Columbia River was 93 in 2005, which equates to a ranking of Good. The lower Columbia River was rated as Fair for the three years between 2000 and 2002, Good in 2003 and Fair in 2004.

Objectives were met 94% of the time in the lower Columbia River when there were sufficient data to assess attainment. Objectives that were occasionally not met included fecal coliforms and total mercury in fish tissue.

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. Limited monitoring was conducted in 2005 (Table 20). The CCME WQI for the Elk River was 73 in 2005, which equates to a ranking of Fair.

Objectives were met on 95% of occasions when there was suffiencient data to determine guideline compliance. The objective for the maximum allowable increase in suspended solids was not met on one occasion.

We recommend continued monitoring in 2006.

Toby Creek and Upper Columbia River

Toby Creek enters the Upper Columbia River just downstream from Windermere Lake (Figure 22). 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 2005 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 2005 to assess whether treated sewage effluent was impacting water quality. Table 21 shows the results of the 2005 monitoring program, and Figure 22 shows site locations.

The CCME index value for Toby Creek was 49, 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 in Toby Creek included total ammonia and total nitrite.

Objectives were met 89% of the time in Toby Creek and 100% of the time in the Upper Columbia River when sampling frequencies were sufficient to determine objectives compliance.

LOWER MAINLAND REGION

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 or 2004. Parameters which occasionally failed to meet their objectives in 2002 included dissolved oxygen and maximum and average nitrite levels.

The Greater Vancouver Regional District (GVRD) collects water samples at bathing beaches throughout the greater Vancouver area, including Centenial Beach, Crescent Beach and White Rock beach, to ensure that primary-contact recreation is not threatened by elevated fecal coliform counts. Table 22 summarizes the results of this sampling, and Figure 23 shows site locations. The CCME index for Boundary Bay was 71 (Fair) based on the results of the coliform sampling. Objectives were met 98% of the time when there was sufficient data to make a determination of guideline compliance.

We recommend continued monitoring in Boundary Bay in 2006, and recommend that the monitoring program expand to include a greater number of parameters and a better representation of sites within the Boundary Bay area.

Burrard Inlet

Burrard Inlet includes Port Moody Arm, Indian Arm, Vancouver Harbour, False Creek, and English Bay. 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. No water samples were collected in 2004.

As part of their Liquid Waste Management Plan, the GVRD collects water and sediment samples throughout Burrard Inlet. We have summarized the data collected in 2005 in Table 23. Figure 24 shows the individual sub-basins within Burrard Inlet. The CCME index for the various sub-basins (and their respective rankings) are as follows: Outer Burrard Inlet WQI 65 (Marginal); First Narrows to Second Narrows WQI 83 (Good); Second Narrows to Roche Point WQI 42 (Poor); Indian Arm WQI 40 (Poor); and Port Moody Arm WQI 41 (Poor). Objectives that were occasionally not met included fecal coliforms in water, total chromium in sediments, total copper in sediments, total lead in sediments, total mercury in sediments and total nickel in sediments. On average, objectives were met 91% of the time.

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 2006 because the past record is rather incomplete.

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 2005.

Fraser River from Kanaka Creek to the Mouth

The river downstream from Kanaka Creek and the outer estuary (Figure 25) 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 few water samples were collected in 2005 by the GVRD as part of their Fraser River Ambient Monitoring Program, and the results are summarized in Table 24. A CCME WQI value was calculated for four portions of the Fraser River between Kanaka Creek and the mouth: the Main Arm (index value of 82, equivalent to Good); Main Stem (index value of 84, equivalent to Good); North Arm (index ranking of 86, equivalent to Good); and Sturgeon Banks (ranking of 100, equivalent to Excellent). Objectives were met 93% of the time, with objectives for suspended solids, dissolved oxygen, total copper and total manganese occasionally not met. We recommend increased monitoring in 2006.

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 2006.

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 2006.

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 – 2005

	Number of Occurrences				
Region	**Objectives Met**	**Objectives Not Met**	**Indefinite Results**	**Omitted 2005**	**Totals**
Vancouver Island	87	15	6	14	122
	71.3%	12.3%	4.9%	11.5%	100.0%
Lower Mainland	660	58	36	82	836
	78.9%	6.9%	4.3%	9.8%	100.0%
Southern Interior	9,638	735	171	52	10,596
	91.0%	6.9%	1.6%	0.5%	100.0%
Kootenays	568	45	26	15	654
	86.9%	6.9%	4.0%	2.3%	100.0%
Cariboo	59	9	1	4	73
	80.8%	12.3%	1.4%	5.5%	100.0%
Omineca - Peace	8	75.04	207	33	1,115
	71.7%	6.7%	18.6%	3.0%	100.0%
Skeena	4	1	3	5	13
	30.8%	7.7%	23.1%	38.5%	100.0%
All Regions	**11,816**	**938**	**450**	**205**	**13,409**
	88.1%	**7.0%**	**3.4%**	**1.5%**	**100.0%**
All Regions less occurrences with no result	**11,816**	**938**			**12,754**
	92.6%	**7.4%**			**100.0%**

Table 2. Cowichan - Koksilah Rivers Water Quality Objectives – 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms	Koksilah River:	Jan 5 - Dec 14	28	< 1 - 1500 CFU/100 mL	
< 10 /100 mL	0123981	Jan 20 - Feb 24	1	np. = 36.8 CFU/100 mL	Objective not met
90th percentile	at Highway 1	Aug 24 - Sep 28	1	np. = 50.8 CFU/100 mL	Objective not met
(np)					
E. coli					
< 10 /100 mL	Cowichan River	2005	0	no data collected	Omitted
90th percentile	Koksilah River				2005
(np)					
E. coli	Cowichan River:				
< 385 /100 mL	D/S from highway	2005	0	no data collected	Omitted
90th percentile (np)					2005
Enterococci					
< 3 /100 mL	Cowichan River	2005	0	no data collected	Omitted
90th percentile	Koksilah River				2005
(np)					
Turbidity	Cowichan River:	Jan 5 - Dec 14	23	0.6 - 4.9 NTU	Objective met
	E206106				
max increase:	1 km d/s Duncan STP	Jan 20 - Feb 10	4	6.85 - 44.6 NTU	Indef. result (no control)
5 NTU	Koksilah River:	Jan 5 - Dec 14	27	0.5 - 3.78 NTU	Objective met
or 10%	0123981				
	at Highway 1	Jan 20	1	11.9 NTU	Indef. result (no control)
Suspended					
Solids	Cowichan River	2005	0	no data collected	Omitted
max. increase	Koksilah River				2005
10 mg/L					
or 10%					
Ammonia-N					
< 1.30 mg/L av	Cowichan River	2005	0	no data collected	Omitted
6.75 mg/L max					2005
at					
pH = 7.9					
temp = 15 C					
Chlorophyll-a					
	Cowichan River	2005	0	no data collected	Omitted
50 mg/m2 max					2005
Total Cl2 Res.	Cowichan River	2005	0	no data collected	Omitted
					2005
0.002 mg/L max					
Dissolved	Cowichan River:	Jun 23 - Sep 8	8	8 - 11 mg/L	Objective met
Oxygen	E206106	Dec 14	1	13 mg/L	Objective met
8.0 mg/L min	1 km d/s Duncan STP	Oct 20 - Dec 1	4	9.6 - 11 mg/L	Objective not met
Jun - Sep	Koksilah River:	Nov 16 - Dec 14	2	12 - 13 mg/L	Objective met
11.2 mg/L min	0123981				
Oct - May	at Highway 1	Oct 20 - Dec 1	3	8.4 - 11 mg/L	Objective not met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Cu <0.002 mg/L av 0.004 mg/L max or 20% increase	Cowichan River Koksilah River	2005	0	no data collected	Omitted 2005
Dissolved Pb <0.003 mg/L av 0.008 mg/L max or 20% increase	Cowichan River Koksilah River	2005	0	no data collected	Omitted 2005
Dissolved Zn <0.030 mg/L av 0.180 mg/L max or 20% increase	Cowichan River Koksilah River	2005	0	no data collected	Omitted 2005
Cu-8 Quinolinolate 0.0005 mg/L max	Cowichan River	2005	0	no data collected	Omitted 2005

Table 3. Holland Creek and Stocking Lake Water Quality Objectives - 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform < 10 CFU/100 mL 90th percentile. (np)	Holland Creek Stocking Lake	2005	0	no data collected	Omitted 2005
Turbidity 1 NTU max	Stocking Lake: E206290 at Centre	Mar 15 Mar 15	1 1	0.3 NTU 1.5 NTU	Objective met Objective not met
Colour 15 TCU max. or no increase if background > 15 TCU	Stocking Lake: E206290 at Centre	Mar 15	2	both < 5 TCU	Objective met
Total Organic Carbon ≤ 2 mg/L annual average	Stocking Lake: E206290 at Centre	Mar 15	2 1	2.2 mg/L av. = 2.2 mg/L	 Objective not met
pH 6.5 - 8.5	Stocking Lake: E206290 at Centre	Mar 15 Mar 15	1 1	av. = 5.5 6.5	Objective not met Objective met
Total Iron 0.3 mg/L max.	Stocking Lake	2005	0	no data collected	Omitted 2005
Chlorophyll a 0.0025 mg/L summer av.	Stocking Lake E206290 at Centre	Mar 15	1	0.0009 mg/L	Objective met
Total Phosphorus 0.001 mg/L av. at spring overturn	Stocking Lake E206290 at Centre	Mar 15	2 1	0.003 - 0.007 mg/L av. = 0.005 mg/L	 Objective not met

Table 4. Tsolum River Water Quality Objectives – 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Copper < 0.007 mg/L av.	E207826 Tsolum River 500m d/s Murex Creek	Jan 26 - Dec 13	21	0.0022 - 0.0085 mg/L	Objective met
		Apr 25	2	0.0131 - 0.0132 mg/L	Objective not met
0.011 mg/L max.			1	av. = 0.0054 mg/L	Indefinite result (no 5-in-30)
% steelhead egg survival no difference between test & control (at 95% confidence)	Tsolum River	2005	0	no in situ bioassay data collected	Omitted 2005

Table 5. Kathlyn, Seymour, Round and Tyhee Lakes Objectives – 2005

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms Intakes: ≤ 10 /100 mL 90th percentile (np) Beaches: ≤ 200 /100 mL geometric mean (gm) ≤ 400 /100 mL 90th percentile (np)	Kathlyn Lake Seymour Lake Round Lake Tyhee Lake	2005	0	no data collected	Omitted 2005
Turbidity ≤ 5 NTU max ≤ 1 NTU av	Kathlyn Lake Seymour Lake Round Lake Tyhee Lake	2005	0	no data collected	Omitted 2005
Total Phosphorus ≤ 0.029 mg/L av. Spring turnover	Kathlyn Lake: 1131007	Apr 18	3	0.01 - 0.016 mg/L	
	Deep Station		1	av. = 0.013 mg/L	Av. obj met
	Seymour Lake: 1131010	Apr 28	3	0.017 - 0.028 mg/L	
	Deep Station		1	av. = 0.021 mg/L	Av. obj met
	Round Lake: 1131008	Apr 25	3	0.027 - 0.151 mg/L	
	Deep Station		1	av. = 0.07 mg/L	Av. obj not met
	Tyhee Lake: E216924	Apr 18	4	0.016 - 0.042 mg/L	
	Deep Station		1	av. = 0.024 mg/L	Av. obj met
Colour ≤ 15 TCU max	Kathlyn Lake Seymour Lake Round Lake Tyhee Lake	2005	0	no data collected	Omitted 2005

Table 6. Lakelse Lake Water Quality Objectives – 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms Intakes: ≤ 10 /100 mL 90th percentile (np) Beaches: ≤ 200 /100 mL geometric mean (gm) ≤ 400 /100 mL 90th percentile (np)	Lakelse Lake E207580 NW Water Intake	Mar 22	1 1	< 1 CFU/100 mL np = < 1 CFU/100 mL	 Indefinite result No 5-in-30 day samples
Turbidity ≤ 5 NTU max ≤ 1 NTU av	Lakelse Lake: E207580 NW Water Intake	Mar 22	1 1	2.5 NTU av = 2.5 NTU	Max. objective met Indefinite result No 5-in-30 day samples
Total Phosphorus ≤ 0.01 mg/L av.	Lakelse Lake: E207580 NW Water Intake	Mar 22	1 1	< 0.001 mg/L av = < 0.001 mg/L	 Indefinite result No 5-in-30 day samples
Chlorophyll a ≤ 0.003 mg/L av.	Lakelse Lake	2005	0	no data collected	Omitted 2005
Dissolved Oxygen ≥ 6 mg/L @ 5m above sediments	Lakelse Lake	2005	0	no data collected	Omitted 2005

Table 7. Fraser River (From the Source to Hope) Water Quality Objectives – 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms	Fraser River	Jan 11 - Nov 8	22	all < 1 CFU/100 mL	No 5-in-30
	E236796				samples:
<100 /100 mL	at Red Passs		1	np. = 1 CFU/100 mL	Indefinite result
90th percentile	E206182	Apr 21 - May 3	2	< 1 - 4500 CFU/100 mL	No 5-in-30
(np)	at Stoner				samples:
	(d/s Pr. Ge. mills)		1	np = 80.6 CFU/100 mL	Indefinite result
	0600011	Feb 24 - Dec 19	21	< 1 - 2100 CFU/100 mL	No 5-in-30
	at Marguerite				samples:
	(d/s Quesnel)		1	np. = 490 CFU/100 mL	Indefinite result
	E206581	Jan 5 - Dec 7	21	< 1 - 300 CFU/100 mL	No 5-in-30
	at Hope				samples:
			1	np. = 300 CFU/100 mL	Indefinite result
E. coli	Fraser River	Apr 21 - May 3	2	5 - 20 CFU/100 mL	No 5-in-30
<100/100 mL	E206182				samples:
90th percentile	at Stoner				
(np)	(d/s Pr. Ge. mills)		1	np. = 18.5 CFU/100 mL	Indefinite result
Chlorine Residual	Fraser River	2005	0	no data collected	Omitted
< 2 ug/L av.					2005
Suspended Solids	Fraser River	2005	0	no data collected	Omitted
10 mg/L or 10%					2005
max increase					
Turbidity	Fraser River	Jan 11 - Nov 8	23	0.3 - 3.3 NTU	Objective met
1 - 5 NTU	E236796				
max increase	at Red Passs				
(control: 5 - 50 NTU)	E206580	Nov 28	1	3.5 NTU	Objective met
	at Hansard	Apr 19 - Nov 21	7	8.7 - 48.7 NTU	Indefinite result
					(no control)
	0600011	Feb 24 - Dec 19	24	6.3 - 129 NTU	Indefinite result
	at Marguerite				(no control)
	(d/s Quesnel)				
	E206581	Dec 7	1	3.1 NTU	Objective met
	at Hope	Jan 5 - Nov 9	23	5.23 - 145 NTU	Indefinite result
					(no control)
Colour	Fraser River	Apr 19 - Jul 11, Oct 5 - Nov 28	8	5 - 15 CFU/100 mL	Objective met
	E236796	Sep 19	1	5 TCU	Objective met
15 TCU max	at Red Pass				
Jun - Sep	E206580	Apr 12 - May 25, Oct 12 - Nov 22	8	< 5 - 40 TCU	Objective met
75 TCU max	at Hansard	Jun 7 - Sep 27	8	< 5 - 10 TCU	Objective met
Oct - May					
	0600011	Feb 24 - Dec 19	14	5 - 30 TCU	Objective met
	at Marguerite				
	(d/s Quesnel)	Jun 7 - Sep 28	10	< 5 - 15 TCU	Objective met
	E206581	Jan 5 - Dec 7	14	5 - 40 NTU	Objective met
	at Hope	Jun 8 - Sep 21	8	< 5 - 5 NTU	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
		Jun 21	1	30 NTU	Objective not met
Temperature 1 °C max increase	Fraser River E236796 at Red Pass	Jan 11 - Nov 8	22	0 - 14 °C	Indefinite result No control
	E206580 at Hansard	Apr 19 - Nov 28	8	0.1 - 11 °C	Indefinite result No control
	0600011 at Marguerite (d/s Quesnel)	Feb 24 - Dec 19	22	-1 - 17 °C	Indefinite result No control
	E206581 at Hope	Jan 5 - Dec 7	23	0 - 18 °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	2005	0	no data collected	Omitted 2005
Nitrite - N < 0.04 mg/L av. 0.12 mg/L max. at chloride 2-4 mg/L	Fraser River	2005	0	no data collected	Omitted 2005
Nitrate+Nitrite-N 10 mg/L max	E206581 at Hope	Sep 21	1	0.033 mg/L	Max obj met
Chlorophyll-a 50 mg/m2 max	Fraser River	2005	0	no data collected	Omitted 2005
pH 6.5 - 8.5	Fraser River E236796 at Red Pass	Jan 11 - Nov 8	23	6.9 - 7.9	Objective met
	E206580 at Hansard	Apr 19 - Nov 28	8	7.3 - 8.1	Objective met
	0600011 at Marguerite (d/s Quesnel)	Feb 24 - Dec 19	24	7.2 - 8.1	Objective met
	E206581 at Hope	Jan 5 - Dec 7	23	7.0 - 8.1	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen	Fraser River	Aug 30 - Oct 25	5	8.4 - 10 mg/L	Objective met
	E236796	Nov 8	1	11 mg/L	Objective met
	at Red Pass				
8.0 mg/L min	E206580	July 11 - Oct 31	5	9 - 11 mg/L	Objective met
May to Oct	at Hansard	Apr 19, Nov 21 - Nov 28	3	11 - 13 mg/L	Objective met
11.0 mg/L min	0600011	Oct 26 - Dec 19	5	11 - 13 mg/L	Objective met
Nov to Apr	at Marguerite	Feb 24 - Mar 31	5	9.9 - 10 mg/L	Objective not met
	(d/s Quesnel)	May 10 - Oct 26	13	8.6 - 13 mg/L	Objective met
	E206581	Jan 5 - Dec 7	11	11 - 14.8 mg/L	Objective met
	at Hope	Apr 27	1	9.8 mg/L	Objective not met
		May 25 - Oct 19	11	9.8 - 11 mg/L	Objective met
Total Lead	Fraser River	2005	0	no data collected	Omitted 2005
0.8 ug/g max in fish muscle					
Total PCBs 2.0 ug/g max in fish muscle 0.1 ug/g max in whole fish	Fraser River	2005	0	no data collected	Omitted 2005
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	2005	0	no data collected	Omitted 2005
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	2005	0	no data collected	Omitted 2005
max PCP pH 7.8: 0.1 ug/L	Fraser River	2005	0	no data collected	Omitted 2005
AOX	Fraser River	Oct 31 - Nov 28	2	< 20 - 510 µg/L	Indefinite result
	Fed/Prov Site				No control
no increase	at Hansard				
over control	0600011	July 6 - July 20	2	< 50 µg/L	Indefinite result
at 95% confidence	at Marguerite				No control
	(d/s Quesnel)				
	E206581	Jan 5 - Oct 19	22	< 20 - 720 µg/L	Indefinite result
	at Hope				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	2005	0	no data collected	Omitted 2005
Dioxins and Furans in water 0.06 pg/L max TCDD-TEQ	Fraser River	2005	0	no data collected	Omitted 2005
Dioxins and Furans in sediments 0.25 pg/g max TCDD-TEQ	Fraser River	2005	0	no data collected	Omitted 2005
Dioxins and Furans in fish lipids 50 pg/g TCDD-TEQ	Fraser River	2005	0	no data collected	Omitted 2005

Table 8. Nechako River Water Quality Objectives – 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform <100/100ml 90th perc. (np)	Federal/Provincial Site E206583 at Prince George	Jan 11 - Dec 20	24	< 1 - 72 CFU/100 mL	No 5-in-30
			1	np. = 29.1 CFU/100 mL	Indefinite result
Fecal Coliforms <10/100ml 90th perc (np)	Stuart River:	2005	0	no data collected	Omitted 2005
Fecal Coliforms <200/100ml geometric mean (gm) <400/100ml 90 perc. (np)	Necoslie River:	2005	0	no data collected	Omitted 2005
Total Cl2 Res. 0.002 mg/L max	Nechako & Stuart Rivers	2005	0	no data collected	Omitted 2005
Ammonia-N <2.05 mg/L av 14.1 mg/L max at pH = 7.5 temp = 1 °C	Nechako River Stuart River Chilako River	2005	0	no data collected	Omitted 2005
Nitrite-N < 0.02 mg/L av 0.06 mg/l max	Nechako River Stuart River Chilako River	2005	0	no data collected	Omitted 2005
Chlorophyll - a < 50 mg/L av	Nechako River Stuart River	2005	0	no data collected	Omitted 2005
Chlorophyll - a < 100 mg/L av	Chilako River	2005	0	no data collected	Omitted 2005
Dissolved Oxygen 7.75 - 11.2 mg/L min depending on fish egg stage (11.2 mg/L from Oct to Dec and May to Jun 15)	Nechako River E206583 at Prince George	Jan 11 - Apr 20, Jun 28 - Sep 22 Oct 3 - Dec 20 May 4 - Jun 14, Oct 17	14 5 5	8.5 - 13.2 mg/L 12.0 - 15.0 mg/L 8.8 - 11.0 mg/L	Objective met Objective met Objective not met
pH 6.5 - 8.5	Nechako River E206583 at Prince George	Jan 11 - Dec 20	24	7.0 - 8.0	Objective met
Temperature < 15 °C av ~ 100 m d/s Cheslatta Falls	Nechako River: immediately d/s Cheslatta Falls* (DFO's Cheslatta Falls site)	May 23 - Dec 31 Jun 18 - Sep 17 May 23 - Dec 31	211 55 156	0.76° - 18.1°C 15.1 - 18.1°C 0.76° - 15.0°C	 Objective not met Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Temperature	Nechako River: at Vanderhoof	May 23 - Dec 31	222	0.6°C - 19.9°C	
< 20 °C Jul - Aug.	~40 km u/s Stuart R. confl.	Jul 1 - Aug 31	62	14.4°C - 19.9°C	Objective met
< 18 °C Sep - Jun.	(DFO's Vanderhoof site)	May 23 - Jun 30,			
~ 100 m u/s		Sept 1 - Dec 31	160	0.6° - 18°C	Objective met
Stuart River		Jun 8 - Jun 30	0.04	18.1°C	Objective not met
Total Gas Pressure 109 % max	Nechako River	2005	0	no data collected	Omitted 2005

Table 9. Peace River Water Quality Objectives - 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms <100 /100 mL 90th percentile (np)	Peace River E206585 at Alces	Jan 4 - Dec 19	25	< 1 - 300 CFU/100 mL	No 5-in-30 day samples
			1	np. = 53.2 CFU/100 mL	Indefinite result
Turbidity 5 NTU or 10% max increase	Peace River E206585 at Alces	Jan 4 - Dec 6 Mar 8 - Dec 19	12 15	1.7 - 4.5 NTU 5.7 - 513 NTU	Objective met Indefinite result No control
Suspended solids 10 mg/L or 10% max increase	Peace River	2005	0	no data collected	Omitted 2005
Total chlorine residual 0.002 mg/L max	Peace River	2005	0	no data collected	Omitted 2005
Dissolved fluoride 1.0 mg/L max	Peace River	2005	0	no data collected	Omitted 2005
Chlorophyll-a 50 mg/m2 max	Peace River	2005	0	no data collected	Omitted 2005
Ammonia-N < 1.78 mg/L av 9.26 mg/L max at pH = 7.8 temp = 0 °C	Peace River	2005	0	no data collected	Omitted 2005
Nitrite - N < 0.04 mg/L av. 0.12 mg/L max. at chloride 2-4 mg/L	Peace River	2005	0	no data collected	Omitted 2005
Dissolved Oxygen 7.25 mg/L min	Peace River	Aug 23 - Dec 19	7	9.0 - 13.0 mg/L	Objective met
pH 6.5 - 9.0 max change 0.5 pH units	Peace River E206585 at Alces	Jan 4 - Dec 19	27	7.7 - 8.2	Objective met
Total dissolved gas 110% saturation max	Peace River	2005	0	no data collected	Omitted 2005
Temperature max increase 1°C	Peace River E206585 at Alces	Jan 4 - Dec 19	27	< -0.9 - 13°C	Indefinite result No control

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total copper 4 µg/L av. 11 µg/L max. at hardness 100 mg/L	Peace River E206585 at Alces	Jan 4 - Dec 19 Apr 12 - Jun 7	24 4 1	0.72 - 4.47 µg/L 12.1 - 24.8 µg/L av. = 3.7 µg/L	Max obj. met Max obj. not met Indefinite result No 5-in-30 day samples
Total lead 6 µg/L av. 82 µg/L max. at hardness 100 mg/L	Peace River E206585 at Alces	Jan 4 - Dec 19	28 1	0.071 - 12.7 µg/L av. = 1.6 µg/L	Max obj. met Indefinite result No 5-in-30 day samples
Total nickel 65 µg/L max. at hardness 60 - 120 mg/L	Peace River E206585 at Alces	Jan 4 - Dec 19	28	0.81 - 34 µg/L	Max obj. met
Total zinc 30 µg/L max or 20% increase	Peace River E206585 at Alces	Jan 4 - Dec 19 Apr 12 - Jun 7	24 4 1	0.94 - 17.8 µg/L 55.8 - 108 µg/L av. = 14.2 µg/L	Max obj. met Max obj. not met Indefinite result No control
Chlorinated phenols sum of tri, tetra and penta 0.2 µg/L	Peace River	2005	0	no data collected	Omitted 2005
Phenol 0.002 mg/L av.	Peace River	2005	0	no data collected	Omitted 2005
Un-ionized H2S 0.002 mg/L max	Peace River	2005	0	no data collected	Omitted 2005
2,4-D Ester 0.004 mg/L	Peace River	2005	0	no data collected	Omitted 2005

Table 10. Williams Lake Water Quality Objectives – 2005.

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	2005	0	no data collected	Omitted 2005
Fecal Coliform < 10/100 mL 90th percentile at water intakes	Williams Lake	2005	0	no data collected	Omitted 2005
Turbidity < 1 NTU av 5 NTU max.	0603019 Williams Lake: at lake centre	Apr 11 - Oct 17 Oct 17	31 1 6	0.9 - 4 NTU 6 NTU av. = 1.5 - 4.3 NTU	Max obj. met Max obj not met Av obj not met
	0603022 Williams Lake: at deepest point	Apr 11 - May 9	2 1	1.9 - 2.5 mg/L av. = 2.2 NTU	Max obj. met Indefinite result - no 5-in-30
Total P < 0.020 mg/L av at spring overturn	0603019 Williams Lake: at lake centre	Apr 11	6 1	0.056 - 0.063 mg/L av. = 0.060 mg/L	 Objective not met
	0603022 Williams Lake: at deepest point	Apr 11	1 1	0.059 mg/L av. = 0.059 mg/L	 Objective not met
Chlorophyll-a < 5 ug/L av (May to Aug)	Williams Lake	2005	0	no data collected	Omitted 2005
Dissolved Oxygen 4.0 mg/L min 5 m above sed.	Williams Lake	2005	0	no data collected	Omitted 2005
Water Clarity 1.2 m min Secchi reading (May to August)	0603019 Williams Lake: at lake centre	May 1 - Aug 29	18	daily av. = 1.6 - 3.02 m	Objective met

Table 11. Cahill Creek Water Quality Objectives – 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Suspended Solids 10 mg/L or 10% max. increase	E206637 at highway (Cahill #3)	Sept 22	1	< 3 mg/L	Objective met
Suspended Solids 20 mg/L or 10% max. increase	Cahill Creek: E206635 U/S Sunset / Nickle Plate Mine Cks	Sept 22	1	< 3 mg/L	Objective met
	E206823 D/S confluence (Cahill #4)	Sept 22	1	< 3 mg/L	Objective met
	E249949 Cahill #4A	Sept 22	1	< 3 mg/L	Objective met
	E249950 Cahill #4B	Sept 22	1	< 3 mg/L	Objective met
	E250424 Cahill #4C	Sept 22	1	< 3 mg/L	Objective met
	E206824 D/S Tailings Ponds (Cahill #2)	Sept 22	1	< 3 mg/L	Objective met
	E206636 D/S Tailings Ponds (Cahill #2A)	Sept 22	1	< 3 mg/L	Objective met
	E206637 at highway (Cahill #3)	Sept 22	1	< 3 mg/L	Objective met
	Sunset Creek: E206634 U/S Cahill Creek	Sept 22	1	< 3 mg/L	Objective met
	Nickel Plate Mine Creek: E206633 U/S Sunset Creek	Sept 22	1	< 3 mg/L	Objective met
Turbidity 5 NTU or 10% max. increase	Cahill Creek: E206635 U/S Sunset / Nickle Plate Mine Cks	Jan 3 - Dec 5	12	0.49 NTU - 2.41 NTU	Control Site
	E206823 D/S confluence (Cahill #4)	Jan 3 - Dec 5	12	0.48 NTU - 3.41 NTU	
			12	increase = 0 - 1.22 NTU	Objective met
	E249949 Cahill #4A	Jan 3 - Dec 5	12	0.6 NTU - 3.24 NTU	
			12	increase = 0 - 1.34 NTU	Objective met
	E249950 Cahill #4B	Jan 3 - Dec 5	12	0.61 NTU - 2.44 NTU	
			12	increase = 0 - 1.19 NTU	Objective met
	E250424 Cahill #4C	Jan 3 - Dec 5	12	0.73 NTU - 2.58 NTU	
			12	increase = 0 - 0.71 NTU	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Turbidity (con't) 5 NTU or 10% max. increase	E206824 D/S Tailings Ponds (Cahill #2)	Jan 3 - Dec 5	12	0.41 NTU - 2.71 NTU	
			12	increase = 0 - 1.07 NTU	Objective met
	E206636 D/S Tailings Ponds (Cahill #2A)	Jan 3 - Dec 5	12	0.76 NTU - 2.31 NTU	
			12	increase = 0 - 1.17 NTU	Objective met
	E206637 at highway (Cahill #3)	Jan 3 - Dec 5	12	0.96 NTU - 3.56 NTU	
			12	increase = 0 - 1.86 NTU	Objective met
	Red Top Gulch Creek: E206638 Below Tailings Pond	Jan 3 - Dec 5	12	0.53 NTU - 1.72 NTU	Control Site
	E215957 East Fork	Apr 4 - July 4	4	1.86 NTU - 8.57 NTU	
			3	increase = 0.82 - 2.72 NTU	Objective met
			1	increase = 7.58 NTU	Objective not met
	E215956 West Fork	Jan 3 - Jun 6	6	1.06 NTU - 4.43 NTU	
			6	increase = 0.02 - 3.29 NTU	Objective met
Turbidity 10 NTU or 20% max. increase	Sunset Creek: E215954 U/S Canty Pit	Jan 3 - Dec 5	12	0.24 NTU - 1.82 NTU	Control Site
	E250751 Lower SS	Jan 3 - Dec 5	12	0.48 NTU - 2.18 NTU	
			12	increase = 0 - 1.64 NTU	Objective met
	E206634 U/S Cahill Creek	Jan 3 - Dec 5	12	0.31 NTU - 7.94 NTU	
			11	increase = 0 - 1.39 NTU	Objective met
			1	increase = 7.38 NTU	Objective not met
	Nickel Plate Mine Creek: E206633 U/S Sunset Creek	Jan 3 - Dec 5	12	0.37 NTU - 1.15 NTU	Objective met
Dissolved Solids 500 mg/L max.	Cahill Creek Red Top Gulch Nickel Plate Mine Creek Sunset Creek	2005	0	no data collected	Omitted 2005
Sulphate < 50 mg/L av. 150 mg/L max.	Cahill Creek: E206635 U/S Sunset / Nickle Plate Mine Cks	Jan 3 - Dec 5	13	4.76 mg/L - 12.62 mg/L	Max obj met
			1	av = 8.1 mg/L	Indef.result (no 5-in-30)
	E206823 D/S confluence (Cahill #4)	Jan 3 - Dec 30	265	8.33 mg/L - 45.2 mg/L	Max obj met
		Jan 3 - Dec 30	53	av. = 9.6 - 32.9 mg/L	Av obj met
	E249949 Cahill #4A	Jan 3 - Dec 30	265	23.2 mg/L - 111.9 mg/L	Max obj met
		Mar 4 - Dec 30	20	av. = 26.7 - 49.8 mg/L	Av obj met
		Jan 3 - Sep 12	33	av. = 52 - 99.9 mg/L	Av obj not met
	E249950 Cahill #4B	Jan 3 - Dec 30	265	28.4 mg/L - 113 mg/L	Max obj met
		Jan 24 - Dec 23	19	av. = 31.8 - 48.7 mg/L	Av obj met
		Jan 3 - Dec 30	34	av. = 50.3 - 92.4 mg/L	Av obj not met
	E250424 Cahill #4C	Jan 3 - Dec 30	265	27.8 mg/L - 95.6 mg/L	Max obj met
		Jan 24 - Dec 23	19	av. = 30.9 - 47.9 mg/L	Av obj met
		Jan 3 - Dec 30	34	av. = 50.1 - 86.7 mg/L	Av obj not met
	E206824 D/S Tailings Ponds (Cahill #2)	Jan 1 - Dec 26	370	29.9 mg/L - 82.5 mg/L	Max obj met
		Jan 24 - Jun 20	9	av. = 31.9 - 50 mg/L	Av obj met
		Jan 13 - Dec 27	65	av. = 52.2 - 108 mg/L	Av obj not met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Sulphate (con't) < 50 mg/L av. 150 mg/L max.	E206636	Jan 3 - Dec 30	265	35.8 mg/L - 135.4 mg/L	Max obj met
	D/S Tailings Ponds	Apr 22 - Jun 15	3	av. = 41.2 - 49 mg/L	Av obj met
	(Cahill #2A)	Jan 3 - Dec 30	50	av. = 50.1 - 120.7 mg/L	Av obj not met
	E206637	Jan 4 - Dec 30	264	35.7 mg/L - 130.2 mg/L	Max obj met
	at highway	Apr 25 - May 5	2	av. = 38.4 - 45.1 mg/L	Av obj met
	(Cahill #3)	Jan 4 - Dec 26	50	av. = 52.3 - 116 mg/L	Av obj not met
	Red Top Gulch Creek: E206638	Jan 3 - Dec 30	51	278.8 mg/L - 332.4 mg/L	Max obj not met
	Below Tailings Pond	Jan 3 - Dec 23	10	av. = 285.3 - 328.1 mg/L	Av obj not met
	E215957 East Fork	Apr 4 - Jul 4	4	162.2 mg/L - 323.6 mg/L	Max obj not met
			1	av = 237.8mg/L	Indefinite result
	E215956 West Fork	Feb 7 - Aug 1	6	1052.2 mg/L - 1330 mg/L	Max obj not met
			1	av = 1226.3 mg/L	Indefinite result
	Nickel Plate Mine Creek: E206633	Jan 3 - Dec 30	265	470.8 mg/L - 630.2 mg/L	Max obj not met
	U/S Sunset Creek	Jan 3 - Dec 30	53	av. = 481.3 - 619.2 mg/L	Av obj not met
WAD-CN < 0.005 mg/L av. 0.010 mg/L max.	Cahill Creek: E206637	Jan 11 - Dec 27	52	0.003 - 0.008 mg/L	Max obj met
	at highway	Jan 11 - Dec 13	10	av. = 0.004 - 0.005 mg/L	Av obj met
SAD - CN + Thiocyanate as CN 0.20 mg/L max.	Cahill Creek: E206635	Jan 3 - Dec 5	7	0.0184 mg/L - 0.0887 mg/L	Max obj met
	U/S Sunset / Nickle Plate Mine Cks	Feb 7 - Nov 7	6	< 0.229 mg/L	Indefinite result
	E206823	Jan 3 - Dec 26	49	0.0174 mg/L - 0.0314 mg/L	Max obj met
	D/S confluence				
	(Cahill #4)	Feb 7 - Nov 7	6	< 0.229 mg/L	Indefinite result
	E249949 Cahill #4A	Jan 3 - Dec 27	51	0.0164 mg/L - 0.0274 mg/L	Max obj met
		Feb 7 - Nov 7	6	< 0.229 mg/L	Indefinite result
	E249950 Cahill #4B	Jan 3 - Dec 27	48	0.0164 mg/L - 0.0254 mg/L	Max obj met
		Feb 7 - Nov 7	6	< 0.229 mg/L	Indefinite result
	E250424 Cahill #4C	Jan 3 - Dec 27	50	0.0174 mg/L - 0.0244 mg/L	Max obj met
		Feb 7 - Nov 7	6	< 0.229 mg/L	Indefinite result
	E206824	Jan 3 - Dec 27	52	0.0174 mg/L - 0.0224 mg/L	Max obj met
	D/S Tailings Ponds				
	(Cahill #2)	Feb 7 - Nov 7	6	< 0.229 mg/L	Indefinite result
	E206636	Jan 3 - Dec 27	51	0.0174 mg/L - 0.0232 mg/L	Max obj met
	D/S Tailings Ponds				
	(Cahill #2A)	Feb 7 - Nov 7	6	< 0.229 mg/L	Indefinite result
	E206637	Jan 11 - Dec 27	52	0.0184 mg/L - 0.0237 mg/L	Max obj met
	at highway				
	(Cahill #3)	Feb 7 - Nov 7	6	< 0.229 mg/L	Indefinite result
	Red Top Gulch Creek: E206638	Jan 3 - Dec 5	7	0.0184 mg/L - 0.0184 mg/L	Max obj met
	Below Tailings Pond	Feb 7 - Nov 7	5	< 0.229 mg/L	Indefinite result

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
SAD - CN + (con't) Thiocyanate as CN 0.20 mg/L max.	E215957 East Fork	Apr 4 - Jul 4	3	0.0364 - 0.0464 mg/L	Max obj met
		May 2	1	0.4384 mg/L	Max obj not met
	E215956 West Fork	Feb 7 - Aug 1	6	7.8671 mg/L - 18.8139 mg/L	Max obj not met
Cyanates as CN 0.45 mg/L max.	Cahill Creek	2005	0	no data collected	Omitted 2005
Total Arsenic 0.05 mg/L max.	Cahill Creek: E206635 U/S Sunset / Nickle Plate Mine Cks	Jan 3 - Dec 5	8	< 0.0005 - 0.0011 mg/L	Objective met
	E206823 D/S confluence (Cahill #4)	Jan 3 - Dec 5	15	0.013 - 0.0295 mg/L	Objective met
	E249949 Cahill #4A	Jan 3 - Dec 27	55	0.0122 - 0.0267 mg/L	Objective met
	E249950 Cahill #4B	Jan 3 - Dec 27	57	0.0113 - 0.023 mg/L	Objective met
	E250424 Cahill #4C	Jan 3 - Dec 27	57	0.0121 - 0.026 mg/L	Objective met
	E206824 D/S Tailings Ponds (Cahill #2)	Jan 3 - Dec 27	57	0.0117 - 0.0213 mg/L	Objective met
Total Arsenic 0.05 mg/L max.	E206636 D/S Tailings Ponds (Cahill #2A)	Jan 3 - Dec 27	52	0.0109 - 0.0185 mg/L	Objective met
	E206637 at highway (Cahill #3)	Jan 11 - Dec 27	56	0.0108 - 0.0181 mg/L	Objective met
	Red Top Gulch Creek: E206638 Below Tailings Pond	Jan 3 - Dec 5	12	0.0075 - 0.02 mg/L	Objective met
Total Arsenic 0.5 mg/L max.	Nickel Plate Mine Creek	Sept 22	1	0.0139 mg/L	Objective met
Ammonia-N < 1.11 mg/L av.	Cahill Creek: E206637	Jan 11 - Dec 27	55	0.005 mg/L - 0.035 mg/L	Max obj met
5.78 mg/L max. at pH = 8.0 temp. = 12 ºC	at highway (Cahill #3)	Jan 11 - Dec 27	11	0.009 mg/L - 0.0152 mg/L	Av obj met
Nitrite-N < 0.02 mg/L av.	Cahill Creek: E206637	Jan 4 - Dec 30	259	0.0011 mg/L - < 0.03 mg/L	Max obj met
0.06 mg/L max.	at highway	Jan 10 - Dec 26	51	< 0.0242 mg/L - < 0.03 mg/L	Indefinite result

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrite-N < 1 mg/L max	Cahill Creek: E206635 U/S Sunset / Nickle Plate Mine Cks	Jan 3 - Dec 5	8	< 0.001 mg/L - < 0.03 mg/L	Objective met
	E206823 D/S confluence (Cahill #4)	Jan 3 - Dec 30	260	< 0.001 - < 0.03 mg/L	Objective met
	E249949 Cahill #4A	Jan 3 - Dec 30	265	< 0.001 - < 0.03 mg/L	Objective met
	E249950 Cahill #4B	Jan 3 - Dec 30	265	< 0.001 - < 0.03 mg/L	Objective met
	E250424 Cahill #4C	Jan 3 - Dec 30	265	< 0.001 - < 0.03 mg/L	Objective met
	E206824 D/S Tailings Ponds (Cahill #2)	Jan 1 - Dec 31	370	0.0013 mg/L - < 0.03 mg/L	Objective met
	E206636 D/S Tailings Ponds (Cahill #2A)	Jan 3 - Dec 30	260	< 0.001 - < 0.03 mg/L	Objective met
	Red Top Gulch Creek: E206638 Below Tailings Pond	Jan 3 - Dec 30	46	< 0.03 mg/L - < 0.3 mg/L	Objective met
	E215957 East Fork	Apr 4 - Jul 4	3	all < 0.3 mg/L	Objective met
	E215956 West Fork	Apr 4 - Jul 4	3	all < 0.3 mg/L	Objective met
Nitrite-N < 10 mg/L max	Nickel Plate Mine Creek: E206633 U/S Sunset Creek	Jan 3 - Dec 30	260	0.0151 mg/L - < 0.3 mg/L	Objective met
	Cahill Creek: E206635 U/S Sunset / Nickle Plate Mine Cks	Jan 3 - Dec 5	13	< 0.005 mg/L - 0.121 mg/L	Objective met
	E206823 D/S confluence (Cahill #4)	Jan 3 - Dec 30	265	0.04 mg/L - 0.376 mg/L	Objective met
	E249949 Cahill #4A	Jan 3 - Dec 30	265	0.121 mg/L - 3.141 mg/L	Objective met
	E249950 Cahill #4B	Jan 3 - Dec 30	265	0.397 mg/L - 3.277 mg/L	Objective met
	E250424 Cahill #4C	Jan 3 - Dec 30	265	0.35 mg/L - 2.675 mg/L	Objective met
	E206824 D/S Tailings Ponds (Cahill #2)	Jan 1 - Dec 31	370	0.516 mg/L - 2.54 mg/L	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrite-N (con't) < 10 mg/L max	E206636 D/S Tailings Ponds (Cahill #2A)	Jan 3 - Dec 30	265	0.676 mg/L - 2.337 mg/L	Objective met
	E206637 at highway (Cahill #3)	Jan 4 - Dec 30	264	0.582 mg/L - 2.199 mg/L	Objective met
	Red Top Gulch Creek: E206638 Below Tailings Pond	Jan 3 - Dec 30 Jan 21	50 1	7.406 mg/L - 9.14 mg/L 10.599 mg/L	Objective met Objective not met
Nitrate-N < 10 mg/L max.	E215957 East Fork	Apr 4 - Jul 4	4	0.37 mg/L - 8.787 mg/L	Objective met
	E215956 West Fork	Feb 7 - Aug 1	6	0.242 mg/L - 1.88 mg/L	Objective met
Nitrate-N < 100 mg/L max	Nickel Plate Mine Creek: E206633 U/S Sunset Creek	Jan 3 - Dec 30	265	13.46 mg/L - 21.895 mg/L	Objective met
Total Aluminum 0.30 mg/L max. or 20% increase at pH > 7	Cahill Creek	2005	0	no data collected	Omitted 2005
Total Cadmium 0.0002 mg/L	Cahill Creek Highway Crossing to Similkameen	2005	0	no data collected	Omitted 2005
Total Cadmium 0.005 mg/L	Cahill Creek: Headwaters to Highway crossing Red Top Gulch Creek: Headwaters to Highway crossing	2005	0	no data collected	Omitted 2005
Total Cadmium 0.02 mg/L	Nickel Plate Mine Creek	2005	0	no data collected	Omitted 2005
Total Copper < 0.005 mg/L av. 0.007 mg/L max. or 20% max. increase	Cahill Creek: E206637 at highway (Cahill #3)	Feb 7 - Dec 5 Oct 3 Jan 12 - Dec 6	12 1 1	< 0.001 mg/L - 0.0064 mg/L 0.01 mg/L av. = 0.003 mg/L	Max obj met Max obj not met Indefinite result
Total Copper < 0.2 mg/L max	Cahill Creek: E206635 U/S Sunset / Nickle Plate Mine Cks	Jan 3 - Dec 5	8	< 0.001 mg/L - 0.01 mg/L	Objective met
	E206823 D/S confluence (Cahill #4)	Jan 3 - Dec 5	13	< 0.001 mg/L - 0.01 mg/L	Objective met
	E249949 Cahill #4A	Jan 3 - Dec 5	13	< 0.001 mg/L - < 0.01 mg/L	Objective met
	E249950 Cahill #4B	Jan 3 - Dec 5	13	< 0.001 mg/L - 0.01 mg/L	Objective met
	E250424 Cahill #4C	Jan 3 - Dec 5	13	< 0.001 mg/L - < 0.01 mg/L	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Copper (con't) < 0.2 mg/L max	E206824 D/S Tailings Ponds (Cahill #2)	Jan 3 - Dec 5	13	< 0.001 mg/L - 0.01 mg/L	Objective met
	E206636 D/S Tailings Ponds (Cahill #2A)	Jan 3 - Dec 5	8	0.0011 mg/L - 0.01 mg/L	Objective met
	Red Top Gulch Creek: E206638 Below Tailings Pond	Feb 7 - Nov 7	5	< 0.001 mg/L - < 0.005 mg/L	Objective met
	Nickel Plate Mine Creek	Sept 22	1	< 0.005 mg/L	Objective met
Dissolved Iron 0.3 mg/L max.	Cahill Creek: E206635 U/S Sunset / Nickle Plate Mine Cks	Jan 3 - Dec 5	8	0.025 mg/L - 0.1 mg/L	Objective met
	E206823 D/S confluence (Cahill #4)	Jan 3 - Dec 27	58	0.001 mg/L - 0.11 mg/L	Objective met
	E249949 Cahill #4A	Jan 3 - Nov 7	12	0.02 mg/L - < 0.1 mg/L	Objective met
	E249950 Cahill #4B	Jan 3 - Dec 27	57	0.001 mg/L - < 0.1 mg/L	Objective met
	E250424 Cahill #4C	Jan 3 - Dec 27	57	0.001 mg/L - < 0.1 mg/L	Objective met
	E206824 D/S Tailings Ponds (Cahill #2)	Jan 3 - Dec 27	57	0.001 mg/L - < 0.1 mg/L	Objective met
	E206636 D/S Tailings Ponds (Cahill #2A)	Jan 3 - Dec 27	52	0.0008 mg/L - 0.04 mg/L	Objective met
	Nickel Plate Mine Creek	Sept 22	1	< 0.03 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	2005	0	no data collected	Omitted 2005
Total Lead < 0.05 mg/L max	Cahill Creek: Headwaters to Highway crossing Red Top Gulch Creek: Headwaters to Highway crossing	2005	0	no data collected	Omitted 2005
Total Lead < 0.1 mg/L max	Nickel Plate Mine Creek:	2005	0	no data collected	Omitted 2005
Total Mercury 0.1 ug/L max.	Cahill Creek: Highway Crossing to Similkameen Red Top Gulch Creek: Highway Crossing to Similkameen	2005	0	no data collected	Omitted 2005

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Mercury 1 ug/L max.	Cahill Creek: Headwaters to Highway crossing Red Top Gulch Creek: Headwaters to Highway crossing	2005	0	no data collected	Omitted 2005
Total Mercury 3 ug/L max.	Nickel Plate Mine Creek	2005	0	no data collected	Omitted 2005
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	2005	0	no data collected	Omitted 2005
Total Molybdenum 0.01 mg/L av. (May - Sept.) 0.05 mg/L max.	Cahill Creek: E206637 at highway (Cahill #3)	2005	0	no data collected	Omitted 2005
Total Molybdenum 0.01 mg/L av. 0.05 mg/L max.	Nickel Plate Mine Creek	2005	0	no data collected	Omitted 2005
Total Selenium 0.001 mg/L max. or 20% max. increase	Cahill Creek: E206637 at highway (Cahill #3)	2005	0	no data collected	Omitted 2005
Total Selenium 0.01 mg/L max.	Cahill Creek: Highway Crossing to Similkameen Red Top Gulch Creek: Highway Crossing to Similkameen	2005	0	no data collected	Omitted 2005
Total Selenium 0.05 mg/L max.	Nickel Plate Mine Creek	2005	0	no data collected	Omitted 2005
Total Silver 0.0001 mg/L max. or 20% max. increase	Cahill Creek: E206637 at highway (Cahill #3)	2005	0	no data collected	Omitted 2005
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	2005	0	no data collected	Omitted 2005
Total Zinc 0.05 mg/L max.	Cahill Creek: E206637 at highway (Cahill #3)	2005	0	no data collected	Omitted 2005

Table 12. Christina Lake Water Quality Objectives – 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Zooplankton > 10% for any of the rotifers (ro objective) *Kellicottia* *Conochilus* > 10% for any of the crustaceans (cr objective) *Bosmina* *Epishura* *Diacyclops*	Christina Lake	2005	0	no data collected	Omitted 2005
Dissolved Oxygen 8 mg/L at any depth	Christina Lake: 0200078 Christina Lake at Christina	Apr 13	12	10.8 - 11.8 mg/L	Objective met
	E215758 north basin deep center	Apr 13 - Oct 13	34	8.4 - 12.3 mg/L	Objective met
		Oct 13 (44 m)	1	6.8 mg/L	Objective not met
Turbidity ≤ 1 NTU seasonal av 5 NTU max	Christina Lake	2005	0	no data collected	Omitted 2005
Secchi Depth 3 m min seasonal av > 10 m	0200078 Christina Lake at Christina	Apr 13 - Oct 9	8	8.25 - 12.45 m	Objective met
			1	av = 10.8 m	Objective met
	E215758 north basin deep center	Apr 13 - Oct 9	7	10.2 - 13.2 mg/L	Objective met
			1	av = 12.3 m	Objective met
Total Phosphorus < 0.007 mg/L av at spring overturn	0200078 Christina Lake at Christina	Apr 13	2	< 0.002 mg/L	
			1	av = < 0.002 mg/L	Objective met
	E215758 north basin deep center	Apr 13	2	0.002 mg/L	
			1	av = 0.002 mg/L	Objective met
Total Nitrogen ≤ 0.200 mg/L av at spring overturn	0200078 Christina Lake at Christina	Apr 13	2	0.1 mg/L	
			1	av = 0.1 mg/L	Objective met
	E215758 north basin deep center	Apr 13	2	0.11 mg/L	
			1	av = 0.11 mg/L	Objective met
Chlorophyll - *a* ≤ 0.0025 mg/L seasonal av.	0200078 Christina Lake at Christina	Apr 13 - Sep 28	2	< 0.0005 - 0.0023 mg/L	
			1	av = 0.0014 mg/L	Objective met
	E215758 north basin deep center	Apr 13 - Sep 28	2	< 0.0005 - 0.0022 mg/L	
			1	av = 0.0014 mg/L	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Periphyton Chlorophyll - *a* 10 mg/m^2 seasonal av.	Christina Lake	2005	0	no data collected	Omitted 2005
Fecal Coliforms ≤ 10/100 mL 90th perc. (np) over 30 days	Christina Lake	2005	0	no data collected	Omitted 2005

Table 13. Okanagan Valley Lakes Water Quality Objectives – 2005.

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	Mar 14	2	0.035 - 0.04 mg/L	
			1	av. = 0.038 mg/L	Objective met
	0500848 Wood Lake Deep Basin	Mar 14	2	0.038 - 0.041 mg/L	
			1	av. = 0.0395 mg/L	Objective met
Total - P < 0.008 mg/L av. at spring overturn	Kalamalka Lake: 0500246 at south end	Feb 15	2	< 0.002 - 0.003 mg/L	
			1	av. = 0.003 mg/L	Objective met
	0500461 Kalamalka Lake South of Coldstream Creek	Feb 15	2	0.002 - 0.003 mg/L	
			1	av. = 0.003 mg/L	Objective met
	0500847 Kalamalka Lake South of Coldstream Creek	Feb 15	3	0.002 - 0.004 mg/L	
			1	av. = 0.003 mg/L	Objective met
Total - P < 0.010 mg/L av at spring overturn	Okanagan Lake: 0500239 at Armstrong Arm	May 3	3	0.004 - 0.006 mg/L	
			1	av. = 0.005 mg/L	Objective met
	0500730 Okanagan Lake at north basin	Feb 9	3	0.003 - 0.005 mg/L	
			1	av. = 0.004 mg/L	Objective met
	0500236 Okanagan Lake at central basin	Feb 9	3	0.004 - 0.011 mg/L	
			1	av. = 0.007 mg/L	Objective met
	0500454 Okanagan Lake U/S Kelowna STP	Feb 10	3	0.004 - 0.006 mg/L	
			1	av. = 0.005 mg/L	Objective met
Total - P < 0.015 mg/L av at spring overturn	Skaha Lake: 0500615 Skaha Lake at centre	Feb 14	2	0.002 - 0.004 mg/L	
			1	av. = 0.003 mg/L	Objective met
	0500453 Skaha Lake W.Okanagan L. river mouth	Feb 14	3	0.003 - 0.004 mg/L	
			1	av. = 0.003 mg/L	Objective met
	0500846 Skaha Lake south basin	Feb 14	2	0.003 - 0.004 mg/L	
			1	av. = 0.004 mg/L	Objective met
	Osoyoos Lake: 0500249 at north basin	Mar 10	2	0.006 - 0.006 mg/L	
			1	av. = 0.006 mg/L	Objective met
	0500728 Osoyoos Lake opp. Monashee Co-op	Mar 10	3	0.005 - 0.007 mg/L	
			1	av. = 0.006 mg/L	Objective met

Table 14. Okanagan Tributaries near Kelowna Water Quality Objectives - 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform	0500046	Apr 26 - Dec 20	16	10 - 300 CFU/100 mL	
≤ 100/100mL	Mission Creek	Apr 26 - May 25	1	np. = 130.4 CFU/100 mL	Objective not met
90th percentile	at Lakeshore Road	Aug 15 - Sep 13	1	np. = 142 CFU/100 mL	Objective not met
	0500039	Apr 26 - Aug 22	10	250 - 2300 CFU/100 mL	
	Kelowna Creek	Apr 26 - May 24	1	np. = 968 CFU/100 mL	Objective not met
	at Abbott Street	Jul 28 - Aug 22	1	np. = 2220 CFU/100 mL	Objective not met
E. coli	0500046	Apr 26 - Dec 20	16	7 - 300 CFU/100 mL	
≤ 100/100 mL	Mission Creek	Apr 26 - May 25	1	np. = 120 CFU/100 mL	Objective not met
90th percentile	at Lakeshore Road	Aug 15 - Sep 13	1	np. = 120 CFU/100 mL	Objective not met
(np)	0500039	Apr 26 - Aug 22	10	180 - 2000 CFU/100 mL	
	Kelowna Creek	Apr 26 - May 24	1	np. = 818 CFU/100 mL	Objective not met
	at Abbott Street	Jul 28 - Aug 22	1	np. = 1680 CFU/100 mL	Objective not met
Enterococci	0500046	Apr 26 - Dec 20	16	3 - 330 CFU/100 mL	
≤ 25/100 mL	Mission Creek	Apr 26 - May 25	1	np. = 125.2 CFU/100 mL	Objective not met
90th percentile (np)	at Lakeshore Road	Aug 15 - Sep 13	1	np. = 217.2 CFU/100 mL	Objective not met
	0500039	Apr 26 - Aug 22	10	500 - 5200 CFU/100 mL	
	Kelowna Creek	Apr 26 - May 24	1	np. = 3960 CFU/100 mL	Objective not met
	at Abbott Street	Jul 28 - Aug 22	1	np. = 1760 CFU/100 mL	Objective not met
Ammonia-N	0500046	Jan 19 - Dec 20	18	< 0.005 - 0.026 mg/L	Objective met
< 0.762 mg/L av.	Mission Creek	Apr 26 - May 25	1	av. = 0.007 mg/L	Objective met
5.60 mg/L max.	at Lakeshore Road	Aug 15 - Sep 13	1	av. = 0.007 mg/L	Objective met
at	0500039	Apr 26 - Aug 22	10	< 0.005 - 0.033 mg/L	Objective met
pH = 8	Kelowna Creek	Apr 26 - May 24	1	av. = 0.021 mg/L	Objective met
temp = 20°C	at Abbott Street	Jul 28 - Aug 22	1	av. = 0.013 mg/L	Objective met
Nitrite-N	0500046 Mission Creek	Jan 19 - Feb 22	3	< 0.002 - 0.003 mg/L	Objective met
< 0.06 mg/L av.	at Lakeshore Road		1	av. = 0.002 mg/L	Indefinite result
0.18 mg/L max	0500039	Apr 26 - Aug 22	10	0.006 - 0.011 mg/L	Objective met
	Kelowna Creek	Apr 26 - May 24	1	av. = 0.008 mg/L	Objective met
	at Abbott Street	Jul 28 - Aug 22	1	av. = 0.008 mg/L	Objective met
Nitrate + Nitrite - N	0500046 Mission Creek	Jan 19 - Dec 20	18	0.018 - 0.505 mg/L	Objective met
10 mg/L max.	at Lakeshore Road				
	0500039 Kelowna Creek at Abbott Street	Apr 26 - Aug 22	10	0.264 - 2.41 mg/L	Objective met
Chlorophyll-a	Kelowna Creek	2005	0	no data collected	Omitted
< 100 mg/m2 av.	Mission Creek				2005
(average based on six reps)					

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen	0500046	May 2 - Sep 26	10	10 - 14 mg/L	Objective met
8.0 mg/L min.	Mission Creek				
(May - Oct.)	at Lakeshore Road	Nov 29 - Dec 20	2	14 mg/L	Objective met
11.0 mg/L	0500039	May 4 - Aug 22	8	8.4 - 15 mg/L	Objective met
(Nov. - Apr.)	Kelowna Creek				
	at Abbott Street				
pH	0500039	Apr 26 - Aug 22	10	7.5 - 8.3 mg/L	Objective met
	Kelowna Creek				
6.5 - 9.0	at Abbott Street				
Dissolved Aluminum	Kelowna Creek	2005	0	no data collected	Omitted
0.1 mg/L or 10%	Mission Creek				2005
max. increase					
Total Copper	0500039	Apr 26 - Aug 22	10	0.0001 - 0.007 mg/L	Max obj met
0.018 mg/L max	Kelowna Creek	Apr 26 - May 24	1	av. = 0.003 mg/L	Av obj met
0.007 mg/L av	at Abbott Street	Jul 28 - Aug 22	1	av. = 0.001 mg/L	Av obj met
at hardness = 170 mg/L					
Total Zinc	0500039	May 4 - Aug 22	9	0.0007 - 0.0077 mg/L	Objective met
0.03 mg/L or 20%	Kelowna Creek	Apr 26	1	0.031 mg/L	Objective not met
max. increase	at Abbott Street				
Total Lead	0500039	May 4 - Aug 22	9	0.0001 - 0.0009 mg/L	Max obj met
0.01 mg/L max	Kelowna Creek	Apr 26	1	< 0.03 mg/L	Indefinite result
0.004 mg/L av	at Abbott Street	Jul 28 - Aug 22	1	av. = 0.0002 mg/L	Av obj met
at hardness = 20 mg/L					

Table 15. Okanagan Tributaries near Vernon Water Quality Objectives - 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform	0500020	Apr 27 - Aug 23	10	45 - 300 CFU/100 mL	
≤ 100/100mL	Deep Creek	Apr 27 - May 25	1	np. = 276 CFU/100 mL	Objective not met
90th percentile	near mouth	Jul 28 - Aug 23	1	np. = 160 CFU/100 mL	Objective not met
(np)	0500091	Apr 27 - Aug 23	10	120 - 970 CFU/100 mL	
	Vernon Creek	Apr 27 - May 25	1	np. = 686 CFU/100 mL	Objective not met
	at Okanagan Lake	Jul 28 - Aug 23	1	np. = 646 CFU/100 mL	Objective not met
E. coli	0500020	Apr 27 - Aug 23	10	26 - 250 CFU/100 mL	
≤ 100/100 mL	Deep Creek	Apr 27 - May 25	1	np. = 230 CFU/100 mL	Objective not met
90th percentile	near mouth	Jul 28 - Aug 23	1	np. = 156 CFU/100 mL	Objective not met
(np)	0500091	Apr 27 - Aug 23	10	31 - 920 CFU/100 mL	
	Vernon Creek	Apr 27 - May 25	1	np. = 616 CFU/100 mL	Objective not met
	at Okanagan Lake	Jul 28 - Aug 23	1	np. = 504 CFU/100 mL	Objective not met
Enterococci	0500020	Apr 27 - Aug 23	10	24 - 990 CFU/100 mL	
≤ 25/100 mL	Deep Creek	Apr 27 - May 25	1	np. = 746 CFU/100 mL	Objective not met
90th percentile (np)	near mouth	Jul 28 - Aug 23	1	np. = 260 CFU/100 mL	Objective not met
	0500091	Apr 27 - Aug 23	10	24 - 2000 CFU/100 mL	
	Vernon Creek	Apr 27 - May 25	1	np. = 1238 CFU/100 mL	Objective not met
	at Okanagan Lake	Jul 28 - Aug 23	1	np. = 482 CFU/100 mL	Objective not met
Total Suspended Solids	0500020	Apr 27 - May 25	5	31 mg/L - 59.6 mg/L	Indefinite result
max increase	Deep Creek				(no control)
10 mg/L or 10%	near mouth	Jul 28 - Aug 23	5	< 1 mg/L - 6 mg/L	Objective met
	0500091	Apr 27 - Aug 23	7	13 - 47.4 mg/L	Indefinite result
	Vernon Creek				(no control)
	at Okanagan Lake	Jul 28 - Aug 8	3	4 mg/L - 7 mg/L	Objective met
Turbidity	0500020	Apr 27 - May 25	6	17 - 45 NTU	Indefinite result
max increase	Deep Creek				(no control)
5 NTU or 10%	near mouth	Jul 28 - Aug 23	8	0.6 - 2.5 NTU	Objective met
	0500091	Apr 27 - Aug 23	14	6.7 - 30 NTU	Indefinite result
	Vernon Creek				(no control)
	at Okanagan Lake	Jul 28 - Aug 8	5	0.4 - 4 NTU	Objective met
Ammonia-N	0500020	Apr 27 - Aug 23	10	0.016 - 0.253 mg/L	Max obj met
< 0.762 mg/L av.	Deep Creek	Apr 27 - May 25	1	av. = 0.121 mg/L	Av obj met
5.60 mg/L max.	near mouth	Jul 28 - Aug 23	1	av. = 0.036 mg/L	Av obj met
at	0500091	Apr 27 - Aug 23	10	< 0.005 - 0.029 mg/L	Max obj met
pH = 8	Vernon Creek	Apr 27 - May 25	1	av. = 0.015 mg/L	Av obj met
temp = 20 oC	at Okanagan Lake	Jul 28 - Aug 23	1	av. = 0.009 mg/L	Av obj met
Nitrite-N	Deep Creek	2005	0	no data collected	Omitted
	Vernon Creek				2005
< 0.06 mg/L av.					
0.18 mg/L max					

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Nitrate + Nitrite - N 10 mg/L max.	0500020 Deep Creek near mouth	Apr 27 - Aug 23	10	0.065 - 0.353 mg/L	Max obj met
	0500091 Vernon Creek at Okanagan Lake	Apr 27 - Aug 23	10	0.188 - 0.708 mg/L	Max obj met
Chlorophyll-a < 100 mg/m2 av. (average based on six reps)	Deep Creek Vernon Creek	2005	0	no data collected	Omitted 2005
Dissolved Oxygen 8.0 mg/L min. (May - Oct.)	0500020 Deep Creek near mouth	May 11 - Aug 23 May 4	7 1	3.8 - 7.1 mg/L 8.8 mg/L	Min obj not met Min obj met
11.0 mg/L (Nov. - Apr.)	0500091 Vernon Creek at Okanagan Lake	May 4 - Aug 23	8	9.1 - 15 mg/L	Min obj met
pH 6.5 - 9.0	0500020 Deep Creek near mouth	May 17 - Aug 23	7	8 - 8.3 pH units	Objective met
	0500091 Vernon Creek at Okanagan Lake	Apr 27 - Aug 23	10	8.1 - 8.4 pH units	Objective met

Table 16. Okanagan Tributaries near Westbank Water Quality Objectives - 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Dissolved Solids 500 mg/L max	Peachland Creek Trepanier Creek	2005	0	no data collected	Omitted 2005
Total Sodium 45.97[(0.0499Ca+0.0823Mg)/2]1/2 mg/L max May to September 270 mg/L max	0500056 Peachland Creek at the mouth	July 27	1	5.62 mg/L	Objective not met (guideline 2.2 mg/L max at Ca 40.7 mg/L and Mg 5.27 mg/L)
pH 6.5 - 9.0	Peachland Creek	Apr 25 - Aug 22	11	7.9 - 8.3 pH units	Objective met
pH 6.5 - 8.5	Trepanier Creek	Apr 25 - Aug 22	11	7.1 - 8.3 pH units	Objective met
Dissolved Aluminum 0.1 mg/L max 0.05 mg/L ave	Peachland Creek Trepanier Creek Westbank Creek	2005	0	no data collected	Omitted 2005
Total Molybdenum 0.05 mg/L max 0.01 mg/L ave (May-Sept)	0500056 Peachland Creek at the mouth	Apr 25 - Aug 22 Jul 27 - Aug 22	13 1	0.0077 - 0.0159 mg/L av. = 0.0147 mg/L	Max obj met Av obj not met
	0500078 Trepanier Creek at Hwy 97	Apr 25 - Aug 22 Jul 27 - Aug 22	11 1	0.0035 - 0.0072 mg/L av. = 0.0055 mg/L	Max obj met Av obj met
Total Copper 0.002 mg/L ave 0.007 mg/L max at hardness < 50 mg/L	0500056 Peachland Creek at the mouth	Apr 25 - Aug 22 Apr 25 - May 24 Jul 27 - Aug 22	13 1 1	0.0007 - < 0.005 mg/L av. = 0.0019 mg/L av. = 0.0018 mg/L	Max obj met Av obj met Av obj met
	0500096 Westbank Creek at the mouth	Apr 25 - Aug 22 Apr 25 - May 24 Jul 27 - Aug 22	10 1 1	0.0003 - 0.0037 mg/L av. = 0.0019 mg/L av. = 0.0013 mg/L	Max obj met Av obj met Av obj met
Periphyton chlorophyll-a < 100 mg/m2 av. (average based on six reps)	Peachland Creek	2005	0	no data collected	Omitted 2005
Nitrite-N < 0.02 mg/L av. 0.06 mg/L max.	Peachland Creek	2005	0	no data collected	Omitted 2005
Nitrite-N < 0.04 mg/L av. 0.12 mg/L av. when chloride 2-4 mg/L	Westbank Creek	2005	0	no data collected	Omitted 2005
Nitrate-N 10 mg/L max	0500056 Peachland Creek at the mouth	Jun 26 - July 15	2	0.532 - 0.603 mg/L	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N	0500056	Apr 25 - Aug 22	11	< 0.005 - 0.007 mg/L	Max obj met
< 0.762 mg/L av.	Peachland Creek	Apr 25 - May 24	1	av. = 0.006 mg/L	Av obj met
5.60 mg/L max.	at the mouth	Jul 27 - Aug 22	1	av. = < 0.005 mg/L	Av obj met
at	0500096	Apr 25 - Aug 22	10	< 0.005 - 0.036 mg/L	Max obj met
pH = 8	Westbank Creek	Apr 25 - May 24	1	av. = 0.011 mg/L	Av obj met
temp = 20 oC	at the mouth	Jul 27 - Aug 22	1	av. = 0.005 mg/L	Av obj met
Total Iron	Westbank Creek	2005	0	no data collected	Omitted
0.3 mg/L max					2005
(long-term)					
Total Zinc	0500096	Apr 25 - Aug 22	10	0.0023 - 0.0151 mg/L	Objective met
0.03 mg/L max	Westbank Creek				
(long-term)	at the mouth				
Fecal coliforms	0500096	Apr 25 - Aug 22	10	550 - 2800 CFU/200 mL	
< 200/100 mL	Westbank Creek	Apr 25 - May 24	1	gm. = 1266 CFU/100 mL	Objective not met
geometric mean (gm)	at the mouth	Jul 27 - Aug 22	1	gm. = 1491 CFU/100 mL	Objective not met
E. coli	0500096	Apr 25 - Aug 22	10	250 - 2600 CFU/100 mL	
< 77/100 mL	Westbank Creek	Apr 25 - May 24	1	gm. = 571 CFU/100 mL	Objective not met
geometric mean (gm)	at the mouth	Jul 27 - Aug 22	1	gm. = 1134 CFU/100 mL	Objective not met
Enterococci	0500096	Apr 25 - Aug 22	10	220 - 2100 CFU/100 mL	
< 20/100 mL	Westbank Creek	Apr 25 - May 24	1	gm. = 678 CFU/100 mL	Objective not met
geometric mean (gm)	at the mouth	Jul 27 - Aug 22	1	gm. = 1113 CFU/100 mL	Objective not met
Pseudomonas	Westbank Creek	2005	0	no data collected	Omitted
< 2/100 mL					2005
75th percentile					
Residual chlorine	Westbank Creek	2005	0	no data collected	Omitted
					2005
0.002 mg/L max					
Suspended solids	Westbank Creek	2005	0	no data collected	Omitted
10 mg/L or					2005
10% max increase					
Turbidity	0500096	Apr 25 - Aug 22	17	12.5 - 120 NTU	Indefinite result
1 NTU increase when	Westbank Creek				(no control)
background < 5 NTU	at the mouth				
5 NTU or 10% max					
increase when background					
> 5 NTU					
Substrate sedimentation	Westbank Creek	2005	0	no data collected	Omitted
no increase in weight					2005
particulate matter <3mm					
in diameter (95th %ile)					

Table 17. Similkameen River and Hedley Creek Water Quality Objectives – 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms	0500629	Jan 4 - Dec 20	28	< 1 - 10 CFU/100 mL	
< 10 /100 mL	Similkameen River				
90th percentile	@ Princeton Hwy 3 Bridge	Apr 26 - May 24	1	np. = 8 CFU/100 mL	Objective met
(np)	0500073	Feb 1 - Dec 6	25	< 1 - 60 CFU/100 mL	
	Similkameen River				
	@ Chopka Rd. Bridge	Apr 26 - May 24	1	np. = 57 CFU/100 mL	Objective not met
E. coli	Similkameen River	2005	0	no data collected	Omitted
< 10 /100 mL					2005
90th percentile					
(np)					
Enterococci	Similkameen River	2005	0	no data collected	Omitted
< 3 /100 mL					2005
90th percentile					
Suspended Solids	E223873	Jan 3 - Dec 26	58	< 0.1 - 39.4 mg/L	Control Site
max. increase:	Hedley Creek				
10 mg/L or 10%	U/S Nickel Plate Diffuser				
	E223874	Jan 3 - Dec 26	58	< 0.1 - 43 mg/L	
	Hedley Creek				
	100 m D/S Nickel Plate Diffuser	Jan 5 - Dec 27	58	increase = 0 - 3.6 mg/L	Objective met
Substrate	Similkameen River	2005	0	no data collected	Omitted
Sedimentation:					2005
no increase in					
weight of					
particles					
< 3 mm dia.					
Turbidity	0500629	Jan 4 - Dec 20	27	0.4 - 17.4 NTU	Control Site
1 NTU max increase	Similkameen River				
(U/S < 5 NTU)	@ Princeton Hwy 3 Bridge				
5 NTU or 10%	0500073	Feb 1 - Dec 6	25	0.2 - 17.1 NTU	
max increase	Similkameen River				
(U/S > 5 NTU)	@ Chopka Rd. Bridge	Mar 1 - Dec 6	20	increase = 0 - 0.5 NTU	Objective met
	E223873	Jan 3 - Dec 26	57	0.21 - 16.1 NTU	Control Site
	Hedley Creek				
	U/S Nickel Plate Diffuser				
	E223874	Jan 3 - Dec 26	57	0.27 - 19.7 mg/L	
	Hedley Creek	Jan 3 - Dec 26	53	increase = 0 - 3.6 NTU	Objective met
	100 m D/S Nickel Plate Diffuser	Jan 24 - Dec 5	4	increase = 1.01 - 1.89 NTU	Objective not met
Total Cl2 Residue	Similkameen River	2005	0	no data collected	Omitted
0.002 mg/L max.					2005
WAD-CN	0500629	Jan 4 - Dec 20	28	< 0.0005 - 0.0017 mg/L	Max obj met
	Similkameen River				
< 0.005 mg/L av	@ Princeton Hwy 3 Bridge	Apr 26 - May 24	1	av. = < 0.0005 mg/L	Av obj met
0.010 mg/L max.	0500073	Feb 1 - Dec 6	25	< 0.0005 - 0.0005 mg/L	Max obj met
	Similkameen River				
	@ Chopka Rd. Bridge	Apr 26 - May 24	1	av. = < 0.0005 mg/L	Av obj met
WAD-CN	E223873	Jan 3 - Dec 26	58	all < 0.005 mg/L	Max obj met
(con't)	Hedley Creek				
< 0.005 mg/L av	U/S Nickel Plate Diffuser	Jan 3 - Dec 5	11	av. = < 0.005 mg/L	Av obj met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
WAD-CN	E223874	Jan 3 - Dec 26	58	< 0.005 - 0.007 mg/L	Max obj met
< 0.005 mg/L av	Hedley Creek	Jun 13 - Jul 11	1	av. = 0.0054 mg/L	Av obj not met
0.010 mg/L max.	100 m D/S Nickel Plate Diffuser	Jan 3 - Dec 5	10	av. = < 0.005 mg/L	Av obj met
SAD-CN + SCN	E223873	Jan 3 - Dec 26	52	0.0164 - 0.0324 mg/L	Objective met
	Hedley Creek	May 2	1	0.2296 mg/L	Objective not met
	U/S Nickel Plate Diffuser	Feb 7 - Sept 7	5	< 0.225 - < 0.229 mg/L	Indefinite result
0.20 mg/L	E223874	Jan 3 - Dec 26	52	< 0.0184 - 0.0414 mg/L	Objective met
	Hedley Creek				
	100 m D/S Nickel Plate Diffuser	Feb 7 - Nov 7	6	0.2294 - 0.2346 mg/L	Objective not met
Cyanate as CN	Similkameen River	2005	0	no data collected	Omitted
0.45 mg/L max.					2005
Total Arsenic	E223873	Jan 3 - Dec 26	56	0.0003 - 0.0009 mg/L	Objective met
0.005 mg/L max.	Hedley Creek				
or	U/S Nickel Plate Diffuser				
20% increase	E223874	Jan 3 - Dec 26	56	0.0002 - 0.0006 mg/L	Objective met
	Hedley Creek				
	100 m D/S Nickel Plate Diffuser				
Chlorophyll-a	Similkameen River	2005	0	no data collected	Omitted
< 50 mg/m2 av.					2005
Chlorophyll-a	Hedley Creek	2005	0	no data collected	Omitted
< 100 mg/m2 av.					2005
Dissolved Oxygen	0500629	Sep 13 - Dec 20	7	9.2 - 13 mg/L	Min obj met
8 mg/L min.	Similkameen River				
(July - March)	@ Princeton Hwy 3 Bridge				
11 mg/L min.	0500073	Sep 13 - Dec 6	7	8.6 - 12 mg/L	Min obj met
(April - June)	Similkameen River				
	@ Chopka Rd. Bridge				
pH	0500629	Jan 4 - Dec 20	27	7 - 8.1 pH units	Objective met
	Similkameen River				
6.5 - 8.5	@ Princeton Hwy 3 Bridge				
	0500073	Feb 1 - Dec 6	25	7.3 - 8.1 pH units	Objective met
	Similkameen River				
	@ Chopka Rd. Bridge				
	E223873	Jan 3 - Dec 26	57	7.41 - 8.43 pH units	Objective met
	Hedley Creek				
	U/S Nickel Plate Diffuser	Sept 22	1	6.47 pH units	Objective not met
	E223874	Jan 3 - Dec 26	58	6.92 - 8.07 pH units	Objective met
	Hedley Creek				
	100 m D/S Nickel Plate Diffuser				
Dissolved Aluminum	E223873	Sep 22	1	0.007 mg/L	Max obj met
< 0.05 mg/L av.	Hedley Creek				
0.10 mg/L max.	U/S Nickel Plate Diffuser				
or 20% increase	E223874	Sep 22	1	0.0074 mg/L	Max obj met
	Hedley Creek				
	100 m D/S Nickel Plate Diffuser				
Total Chromium					
< 0.002 mg/L av.	Similkameen River	2005	0	no data collected	Omitted
0.02 mg/L max.	Hedley Creek				2005
or 20% increase					

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Copper	E223873	Jan 3 - Dec 26	54	< 0.0002 - < 0.003 mg/L	Max obj met
	Hedley Creek	Jan 17 - Oct 3	4	0.0031 - 0.006 mg/L	Max obj not met
< 0.002 mg/L av.	U/S Nickel Plate Diffuser	Jan 3 - Dec 5	11	av. = 0.0006 - 0.0019 mg/L	Av obj met
0.003 mg/L max.	E223874	Jan 3 - Dec 26	54	< 0.0002 - 0.003 mg/L	Max obj met
or 20% inc.	Hedley Creek	Apr 25 - Oct 3	4	0.0033 - 0.006 mg/L	Max obj not met
at hardness = 14	100 m D/S Nickel Plate Diffuser	Jan 3 - Dec 5	10	av. = 0.0008 - 0.0016 mg/L	Av obj met
		Sept 12 - Oct 3	1	av = 0.0024 mg/L	Av obj not met
Total Iron	Federal Site	Feb 15 - Dec 6	21	0.0204 - 0.292 mg/L	Objective met
0.3 mg/L max.	Similkameen River				
or 20% increase	at Princeton	Feb 1 - May 16	5	0.331 mg/L - 3.5 mg/L	Objective not met
	Federal Site	Jan 4 - Dec 20	27	0.0173 - 0.247 mg/L	Objective met
	Similkameen River				
	at International Border	Apr 26	1	1.06 mg/L	Objective not met
Total Manganese	Federal Site	Jan 4 - Dec 20	28	0.00107 - 0.0333 mg/L	Objective met
0.05 mg/L max.	Similkameen River				
or 20% increase	at Princeton				
	Federal Site	Feb 1 - Dec 6	25	0.00328 - 0.0249 mg/L	Objective met
	Similkameen River				
	at International Border	Apr 26	1	0.113 mg/L	Objective not met
Total Lead	Federal Site	Jan 4 - Dec 20	28	0.005 - 0.973 µg/L	Max obj met
	Similkameen River				
4 µg/L av.	at Princeton	Apr 26 - May 24	1	av. = 0.2552 µg/L	Av obj met
30 µg/L max.	Federal Site	Feb 1 - Dec 6	26	0.005 - 1.49 µg/L	Max obj met
or 20% inc.	Similkameen River				
at hardness = 46	at International Border	Apr 26 - May 24	1	av. = 0.4294 µg/L	Av obj met
Total Mercury	Hedley Creek				2005
< 0.02 ug/L av.					
0.1 ug/L max.					
Total Molybdinum	Federal Site	May 3 - Sep 27	13	0.658 - 1.67 µg/L	Max obj met
< 10 µg/L max.	Similkameen River				
5 µg/L av.	at Princeton	Apr 26 - May 24	1	av. = 0.6908 µg/L	Av obj met
(May - Sept.)	Federal Site	May 3 - Sep 27	14	0.884 - 2.37 µg/L	Max obj met
	Similkameen River				
	at International Border	Apr 26 - May 24	1	av. = 0.901 µg/L	Av obj met
Total Nickel	Federal Site	Jan 4 - Dec 20	28	0.02 - 1.12 µg/L	Objective met
25 µg/L max.	Similkameen River				
or 20% increase	at Princeton				
at hardness < 65	Federal Site	Feb 1 - Dec 6	26	0.06 - 4.21 µg/L	Objective met
	Similkameen River				
	at International Border				
Total Uranium	Similkameen River	2005	0	no data collected	Omitted
< 0.01 mg/L av.	Hedley Creek				2005
0.10 mg/L max.					
or 20% increase					
Total Zinc	Federal Site	Jan 4 - Dec 20	28	0.09 - 4.56 µg/L	Max obj met
< 10 µg/L av.	Similkameen River				
30 µg/L max.	at Princeton	Apr 26 - May 24	1	av. = 1.45 µg/L	Av obj met
or 20% increase	Federal Site	Feb 1 - Dec 6	26	0.05 - 14.1 µg/L	Max obj met
	Similkameen River				
	at International Border	Apr 26 - May 24	1	av. = 4.0 µg/L	Av obj met

Table 18. Thompson River Water Quality Objectives – 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform	0600135 South Thompson River	Feb 1 - Dec 5	5	< 1 - 5 CFU/100 mL	No 5-in-30 samples
	Kamloops d/s Peterson Cr.		1	np = 4.2 CFU/100 mL	Indefinite result
< 10 CFU/100 mL 90th percentile. (np)	0600164 North Thompson River	Feb 1 - Dec 5	5	< 1 - 4 CFU/100 mL	No 5-in-30 samples
	at Kamloops u/s Paul Cr.		1	np. = 2.8 CFU/100 mL	Indefinite result
	E218768 Kamloops Lake	Mar 2 - Dec 8	6	< 1 - 2 CFU/100 mL	No 5-in-30 samples
	near outlet		1	np. = 1.5 CFU/100 mL	Indefinite result
	E206586 Lower Thompson	Jan 4 - Dec 20	25	< 1 - 84 CFU/100 mL	No 5-in-30 samples
	at Spences Br. d/s Nicola R.		1	np. = 6.0 CFU/100 mL	Indefinite result
E. coli	0600135 South Thompson River	Feb 1 - Dec 5	5	< 1 - 7 CFU/100 mL	No 5-in-30 samples
< 200/100 mL geometric mean (gm)	Kamloops d/s Peterson Cr.		1	np = 5 CFU/100 mL	Indefinite result
	0600164 North Thompson River	Feb 1 - Dec 5	5	< 1 - 2 CFU/100 mL	No 5-in-30 samples
	at Kamloops u/s Paul Cr.		1	np = 2 CFU/100 mL	Indefinite result
	E218768 Kamloops Lake	Mar 2 - Dec 8	6	< 1 - 4 CFU/100 mL	No 5-in-30 samples
	near outlet		1	np. = 2.5 CFU/100 mL	Indefinite result
Colour 15 TCU max. or	E218768 Kamloops Lake near outlet	Mar 2	1	5 TCU	Objective met
5 TCU increase over average of N + S Thompson Rivers	E206586 Lower Thompson at Spences Br. d/s Nicola R.	Jan 4 - Dec 20	25	< 5 - 10 CFU/100 mL	Objective met
Chlorophyll - a < 50 mg/m2	Thompson River at Savona	Feb 17	5	4.56 - 41.5 mg/m2	
		Mar 9	5	19.6 - 28.6 mg/m2	
		Oct 4	5	2.2 - 35.9 mg/m2	
			3	av. = 17.6 - 26.4 mg/m2	Objective met
	Thompson River at Walhachin	Feb 17	5	7.46 - 13.5 mg/m2	
		Mar 9	5	13.7 - 28.3 mg/m2	
		Oct 4	5	3.8 - 16.7 mg/m2	
			3	av. = 9.0 - 20.7 mg/m2	Objective met
	Thompson River	Oct 4	6	8.9 - 32.5 mg/m2	
	at Ashcroft		1	av. = 18.0 mg/m2	Objective met
	Thompson River	Oct 4	6	7.5 - 13.9 mg/m2	
	at Martel		1	av. = 9.1 mg/m2	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Chlorophyll - a (con't)	Thompson River	Oct 4	6	5.6 - 7.9 mg/m2	
< 50 mg/m2	at Spences Bridge		1	av. = 7.0 mg/m2	Objective met
Dioxins & Furans 0.2 pg/L max. TEQ-TCDD	Thompson River Kamloops Lake	2005	0	no data collected	Omitted 2005
Dioxins & Furans 1.0 pg/g max. TEQ-TCDD wet weight in fish	Thompson River Kamloops Lake	2005	0	no data collected	Omitted 2005
Dioxins & Furans 0.7 pg/g max. TEQ-TCDD dry weight in seds.	Thompson River Kamloops Lake	2005	0	no data collected	Omitted 2005
Resin Acids 12 µg/L DHA max. 45 µg/L total max. at pH = 7.5	Thompson River Kamloops Lake	2005	0	no data collected	Omitted 2005

Table 19. Columbia River (Birchbank to International Border) Water Quality Objectives - 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform	Columbia River:	Jan 25 - Feb 28	5	< 1 - 2 CFU/100 mL	
< 100/100 mL	0200003	Apr 25 - May 11	5	1 - 16 CFU/100 mL	
90th percentile	at Birchbank				
(np)			2	np. = 1.6 - 14 CFU/100 mL	Objective met
	E223893	Apr 25 - May 11	5	4 - 25 CFU/100 mL	
	100 m D/S RDKB				
	STP outfall		1	np. = 22.2 CFU/100 mL	Objective met
	0200559	Jan 25 - Feb 22	5	1 - 8 CFU/100 mL	
		Mar 1 - Mar 29	5	< 1 - 6 CFU/100 mL	
	at Waneta	Apr 5 - May 2	5	< 1 - 180 CFU/100 mL	
		Apr 25 - May 11	5	< 1 - 9 CFU/100 mL	
		May 10 - Jun 7	5	2 - 20 CFU/100 mL	
		Aug 16 - Sep 12	5	1 - 290 CFU/100 mL	
		Sep 20 - Oct 18	5	2 - 51 CFU/100 mL	
		Nov 23 - Dec 19	5	2 - 4 CFU/100 mL	
			6	np. = 3.6 - 50.6 CFU/100 mL	Objective met
			2	np = 146.8 - 208.8 CFU/100 mL	Objective not met
Enterococcus sp.	Columbia River:	Apr 25 - May 11	5	< 1 - 1 CFU/100 mL	
< 25 /100mL	0200003				
90th percentile (np)	at Birchbank		1	np = 1 CFU/100 mL	Objective met
	E223893	Apr 25 - May 11	5	< 1 - 18 CFU/100 mL	
	100 m D/S RDKB				
	STP outfall		1	np = 13.6 CFU/100 mL	Objective met
	0200559	Apr 25 - May 11	5	< 1 - 4 CFU/100 mL	
	at Waneta				
			1	np = 3.6 CFU/100 mL	Objective met
E. coli	Columbia River:	Apr 25 - May 11	5	< 1 - 4 CFU/100 mL	
< 100 /100mL	0200003				
90th percentile	at Birchbank		1	np = 3.2 CFU/100 mL	Objective met
(np)	E223893	Apr 25 - May 11	5	< 1 - 5 CFU/100 mL	
	100 m D/S RDKB				
	STP outfall		1	np = 4.2 CFU/100 mL	Objective met
	0200559	Apr 25 - May 11	5	1 - 5 CFU/100 mL	
	at Waneta				
			1	np = 5 CFU/100 mL	Objective met
Ammonia	Columbia River:	Apr 25 - May 11	5	< 0.005 - 0.007 mg/L	Max obj. met
	0200003				
30-day average	at Birchbank		1	av. = 0.006 mg/L	Av. obj. met
1.13 mg/L	E223892	Apr 25 - May 11	5	< 0.005 - 0.011 mg/L	Max obj. met
at 10ºC and pH 8.0	D/S Stoney Creek				
			1	av. = 0.006 mg/L	Av. obj. met
5.86 mg/L max.	0200558	Apr 25 - May 11	5	< 0.005 - 0.021 mg/L	Max obj. met
at 10ºC and pH 8.0	New Trail Bridge				
			1	av. = 0.014 mg/L	Av. obj. met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia (con't) 30-day average 1.13 mg/L at 10ºC and pH 8.0	E216137 Old Trail Bridge	Apr 25 - May 11	5	< 0.005 - 0.017 mg/L	Max obj. met
			1	av. = 0.008 mg/L	Av. obj. met
	E223893 100 m D/S RDKB STP outfall	Apr 25 - May 11	5	< 0.005 - 0.03 mg/L	Max obj. met
			1	av. = 0.015 mg/L	Av. obj. met
5.86 mg/L max. at 10ºC and pH 8.0	0200559 at Waneta	Apr 25 - May 11	5	< 0.005 - 0.011 mg/L	Max obj. met
			1	av. = 0.007 mg/L	Av. obj. met
pH 6.5 - 8.5	Columbia River: 0200003 at Birchbank	Jan 5 - Dec 14	36	6.9 - 8	Objective met
	E223892 D/S Stoney Creek	Apr 25 - May 11	10	7.4 - 7.9	Objective met
	0200558 New Trail Bridge	Apr 25 - May 11	10	7.6 - 8	Objective met
	E216137 Old Trail Bridge	Apr 25 - May 11	10	7.4 - 8	Objective met
	E223893 100 m D/S RDKB STP outfall	Apr 25 - May 11	10	7.5 - 8	Objective met
	0200559 at Waneta	Jan 5 - Dec 19	56	6.8 - 7.9	Objective met
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 at Birchbank	Apr 25 - May 11	5	11 - 13 mg/L	Min. obj. met
			1	av. = 12 mg/L	Av. obj. met
	E223892 D/S Stoney Creek	Apr 25 - May 11	5	11 - 13 mg/L	Min. obj. met
			1	av. = 12 mg/L	Av. obj. met
	0200558 New Trail Bridge	Apr 25 - May 11	5	11 - 13 mg/L	Min. obj. met
			1	av. = 12 mg/L	Av. obj. met
	E216137 Old Trail Bridge	Apr 25 - May 11	5	11 - 12 mg/L	Min. obj. met
			1	av. = 11.8 mg/L	Av. obj. met
	E223893 100 m D/S RDKB STP outfall	Apr 25 - May 11	5	11 - 13 mg/L	Min. obj. met
			1	av. = 11.8 mg/L	Av. obj. met
	0200559 at Waneta	Apr 25 - May 11	5	11 - 13 mg/L	Min. obj. met
			1	av. = 12 mg/L	Av. obj. met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Gas 110% max.	Columbia River: 0200003 at Birchbank	Apr 25 - May 11	5	104 - 110 %	Max obj. met
	0200559 at Waneta	Apr 25 - May 11	5	103 - 107 %	Max obj. met
Total As 5 µg/L av.	Columbia River: 0200003 at Birchbank	Apr 25 - May 11	5	0.1 - 0.2 µg/L	
			1	av. = 0.2 µg/L	Av. obj. met
	E223892 D/S Stoney Creek	Apr 25 - May 11	5	0.2 - 0.5 µg/L	
			1	av. = 0.4 µg/L	Av. obj. met
	0200558 New Trail Bridge	Apr 25 - May 11	5	0.2 - 0.4 µg/L	
			1	av. = 0.3 µg/L	Av. obj. met
	E216137 Old Trail Bridge	Apr 25 - May 11	5	0.2 - 0.3 µg/L	
			1	av. = 0.2 µg/L	Av. obj. met
	E223893 100 m D/S RDKB STP outfall	Apr 25 - May 11	5	0.2 - 0.3 µg/L	
			1	av. = 0.2 µg/L	Av. obj. met
	0200559 at Waneta	Apr 25 - May 11	5	0.2 - 0.3 µg/L	
			1	av. = 0.2 µg/L	Av. obj. met
Total Cd 0.05 µg/L av.	Columbia River: 0200003 at Birchbank	Apr 25 - May 11	5	0.01 - 0.03 µg/L	
			1	av. = 0.01 µg/L	Av. obj. met
	E223892 D/S Stoney Creek	Apr 25 - May 11	5	0.02 - 0.06 µg/L	
			1	0.04 µg/L	Av. obj. met
	0200558 New Trail Bridge	Apr 25 - May 11	5	0.02 - 0.09 µg/L	
			1	0.04 µg/L	Av. obj. met
	E216137 Old Trail Bridge	Apr 25 - May 11	5	0.01 - 0.04 µg/L	
			1	0.03 µg/L	Av. obj. met
	E223893 100 m D/S RDKB STP outfall	Apr 25 - May 11	5	0.01 - 0.05 µg/L	
			1	0.03 µg/L	Av. obj. met
	0200559 at Waneta	Apr 25 - May 11	5	0.01 - 0.05 µg/L	
			1	0.03 µg/L	Av. obj. met
Total Cr 1 µg/L av.	Columbia River: 0200003 at Birchbank	Apr 25 - May 11	5	all < 0.2 µg/L	
			1	av. < 0.2 µg/L	Av. obj. met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cr (con't) 1 µg/L av.	E223892 D/S Stoney Creek	Apr 25 - May 2	5	< 0.2 - 0.2 µg/L	
			1	av. = 0.2 µg/L	Av. obj. met
	0200558 New Trail Bridge	Apr 25 - May 11	5	0.02 - 0.09 µg/L	
			1	0.04 µg/L	Av. obj. met
	E216137 Old Trail Bridge	Apr 25 - May 2	5	< 0.2 - 0.2 µg/L	
			1	av. = 0.2 µg/L	Av. obj. met
	E223893 100 m D/S RDKB STP outfall	Apr 25 - May 11	5	all < 0.2 µg/L	
			1	av. < 0.2 µg/L	Av. obj. met
	0200559 at Waneta	Apr 25 - May 11	5	all < 0.2 µg/L	
			1	av. < 0.2 µg/L	Av. obj. met
Total Cu 7.17 µg/L max 2 µg/L av.	Columbia River: 0200003 at Birchbank	Apr 25 - May 11	5	0.3 - 0.4 µg/L	Max. obj. met
			1	av. = 0.38 µg/L	Av. obj. met
	E223892 D/S Stoney Creek	Apr 25 - May 11	5	0.3 - 0.6 µg/L	Max. obj. met
			1	av. = 0.42 µg/L	Av. obj. met
	0200558 New Trail Bridge	Apr 25 - May 11	5	0.3 - 0.9 µg/L	Max. obj. met
			1	av. = 0.48 µg/L	Av. obj. met
	E216137 Old Trail Bridge	Apr 25 - May 2	5	0.3 - 0.4 µg/L	Max. obj. met
			1	av. = 0.32 µg/L	Av. obj. met
	E223893 100 m D/S RDKB STP outfall	Apr 25 - May 11	5	0.3 - 0.5 µg/L	Max. obj. met
			1	av. = 0.38 µg/L	Av. obj. met
	0200559 at Waneta	Apr 25 - May 11	5	0.3 - 0.6 µg/L	Max. obj. met
			1	av. = 0.42 µg/L	Av. obj. met
Total Pb 37.9 µg/L max 4.8 µg/L av.	Columbia River: 0200003 at Birchbank	Apr 25 - May 11	5	0.02 - 0.1 µg/L	Max. obj. met
			1	av. = 0.06 µg/L	Av. obj. met
	E223892 D/S Stoney Creek	Apr 25 - May 11	5	0.02 - 0.94 µg/L	Max. obj. met
			1	av. = 0.36 µg/L	Av. obj. met
	0200558 New Trail Bridge	Apr 25 - May 11	5	0.02 - 0.3 µg/L	Max. obj. met
			1	av. = 0.15 µg/L	Av. obj. met
	E216137 Old Trail Bridge	Apr 25 - May 11	5	0.02 - 0.16 µg/L	Max. obj. met
			1	av. = 0.09 µg/L	Av. obj. met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Pb (con't) 37.9 µg/L max 4.8 µg/L av.	E223893 100 m D/S RDKB STP outfall	Apr 25 - May 11	5	0.02 - 0.16 µg/L	Max. obj. met
			1	av. = 0.1 µg/L	Av. obj. met
	0200559 at Waneta	Apr 25 - May 11	5	0.03 - 0.19 µg/L	Max. obj. met
			1	av. = 0.09 µg/L	Av. obj. met
Total Tl 0.8 µg/L av.	Columbia River: 0200003 at Birchbank	Apr 25 - May 11	5	< 0.002 - 0.097 µg/L	
			1	av. = 0.031 µg/L	Av. obj. met
	E223892 D/S Stoney Creek	Apr 25 - May 11	5	< 0.002 - 0.004 µg/L	
			1	av. = 0.003 µg/L	Av. obj. met
	0200558 New Trail Bridge	Apr 25 - May 11	5	0.066 - 0.869 µg/L	
			1	av. = 0.276 µg/L	Av. obj. met
	E216137 Old Trail Bridge	Apr 25 - May 11	5	0.026 - 0.182 µg/L	
			1	av. = 0.081 µg/L	Av. obj. met
	E223893 100 m D/S RDKB STP outfall	Apr 25 - May 11	5	0.019 - 0.089 µg/L	
			1	av. = 0.048 µg/L	Av. obj. met
	0200559 at Waneta	Apr 25 - May 11	5	< 0.002 - 0.082 µg/L	
			1	av. = 0.045 µg/L	Av. obj. met
Total Zn 33 µg/L max 7.5 µg/L av.	Columbia River: 0200003 at Birchbank	Apr 25 - May 11	5	< 0.1 - 2 µg/L	Max. obj. met
			1	av. = 1.0 µg/L	Av. obj. met
	E223892 D/S Stoney Creek	Apr 25 - May 11	5	1.2 - 4.1 µg/L	Max. obj. met
			1	av. = 2.5 µg/L	Av. obj. met
	0200558 New Trail Bridge	Apr 25 - May 11	5	0.5 - 2.8 µg/L	Max. obj. met
			1	av. = 1.5 µg/L	Av. obj. met
	E216137 Old Trail Bridge	Apr 25 - May 11	5	0.3 - 1.7 µg/L	Max. obj. met
			1	av. = 1.0 µg/L	Av. obj. met
	E223893 100 m D/S RDKB STP outfall	Apr 25 - May 11	5	0.3 - 1.6 µg/L	Max. obj. met
			1	av. = 1.1 µg/L	Av. obj. met
	0200559 at Waneta	Apr 25 - May 11	5	0.4 - 2 µg/L	Max. obj. met
			1	av. = 1.2 µg/L	Av. obj. met
Total As 5.7 µg/g dry weight max in sediments	Columbia River	2005	0	no data collected	Omitted 2005

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cd 0.6 µg/g dry weight max in sediments	Columbia River	2005	0	no data collected	Omitted 2005
Total Cr 36.4 µg/g dry weight max in sediments	Columbia River	2005	0	no data collected	Omitted 2005
Total Cu 35.1 µg/g dry weight max in sediments	Columbia River	2005	0	no data collected	Omitted 2005
Total Pb 33.4 µg/g dry weight max in sediments	Columbia River	2005	0	no data collected	Omitted 2005
Total Hg 0.16 µg/g dry weight max in sediments	Columbia River	2005	0	no data collected	Omitted 2005
Total Zn 120 µg/g dry weight max in sediments	Columbia River	2005	0	no data collected	Omitted 2005
Total As 0.471 mg/kg wet weight max in fish	Genelle to Birchbank	Oct 26 - Oct 29	12	< 0.01 - 0.13 mg/kg	Objective met
	Beaver Creek to Pend d'Oreille	Oct 26 - Oct 29	12	< 0.01 - 0.19 mg/kg	Objective met
Total Cd 0.900 mg/kg wet weight max in fish	Genelle to Birchbank	Oct 26 - Oct 29	12	all < 0.01 mg/kg	Objective met
	Beaver Creek to Pend d'Oreille	Oct 26 - Oct 29	12	< 0.01mg/kg - 0.03 mg/kg	Objective met
Total Cr 0.940 mg/kg wet weight max in fish	Genelle to Birchbank	Oct 26 - Oct 29 Oct 26 - Oct 29	2 10	1 mg/kg < 1 mg/kg	Indefnite result (detection limit exceeds objective) Indefinite result
	Beaver Creek to Pend d'Oreille	Oct 26 - Oct 29	12	all < 1 mg/kg	Indefinite result

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Pb 0.160 mg/kg wet weight max in fish	Genelle to Birchbank	Oct 26 - Oct 29	12	< 0.01 - 0.02 mg/kg	Objective met
	Beaver Creek to Pend d'Oreille	Oct 26 - Oct 29	12	all < 0.01 mg/kg	Objective met
Total Hg 0.100 mg/kg wet weight max in fish	Genelle to Birchbank	Oct 26 - Oct 29	12	0.14 - 0.56 mg/kg	Objective not met
	Beaver Creek to Pend d'Oreille	Oct 26 - Oct 29	12	0.18 - 0.67 mg/kg	Objective not met
Dioxins & Furans 0.85 pg/g PCDD and PCDF TEQ max. in sediments (dry weight)	Columbia River	2005	0	no data collected	Omitted 2005
Dioxins & Furans 0.71 pg/g PCDD and PCDF TEQ max. in fish (wet weight)	Columbia River	2005	0	no data collected	Omitted 2005

Table 20. Elk River Water Quality Objectives - 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Suspended Solids	Elk River 0200102	Jan 24 - Apr 3 Sept 7 - Nov 29	10	< 1 - 71 mg/L	Max objective met
< 25 mg/L av	D/S Sparwood		1	av. = 8.3 mg/L	Indefinite result - no 5-in-30
80 mg/L max Sept - mid April	0200016 near Elko	Jan 26 - Apr 4, Feb 7 - Apr 3, Sep 7 - Nov 29	1 9	132 mg/L < 1 - 7 mg/L	Max objective not met Max objective met
			1	av. = 15.5 mg/L	Indefinite result - no 5-in-30
Substrate Sediment no increase in particulates < 3 mm Sept - mid April	Elk River	2005	0	no data collected	Omitted 2005

Table 21. Toby Creek and Upper Columbia River Water Quality Objectives - 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform	Toby Creek:	Feb 28 - Dec 27	14	< 1 - 2 CFU/100 mL	
< 10/100 mL	0200333	Feb 28 - Mar 29	1	np. = < 1 CFU/100 mL	Objective met
90th percentile	above Panorama STP	Sep 26 - Oct 24	1	np. = 1 CFU/100 mL	Objective met
(np)	E247080	Feb 28 - Dec 27	14	< 1 - 1 CFU/100 mL	
Toby Creek	SE Panorama STP	Feb 28 - Mar 29	1	np. = < 1 CFU/100 mL	Objective met
Columbia River		Sep 26 - Oct 24	1	np. = 1 CFU/100 mL	Objective met
(Toby Creek to	E247081	Feb 28 - Dec 27	14	< 1 - 2 CFU/100 mL	
Radium Hot Springs)	2km D/S Panorama STP	Feb 28 - Mar 29	1	np. = < 1 CFU/100 mL	Objective met
		Sep 26 - Oct 24	1	np. = 1.6 CFU/100 mL	Objective met
Fecal Coliform	Columbia River:	Sep 13 - Dec 5	8	< 1 - 6 CFU/100 mL	
< 400/100 mL	E207529	Sep 13 - Oct 11	1	np. = 4.8 CFU/100 mL	Objective met
90th percentile	U/S Edgewater STP	Sep 13 - Oct 11	1	geomean = 1.1 CFU/100 mL	Objective met
(np)	E207530	Sep 13 - Dec 5	8	< 1 - 9 CFU/100 mL	
< 200/100 mL	D/S Edgewater STP				
geometric mean		Sep 13 - Oct 11	1	np = 8.2 CFU/100 mL	Objective met
(gm)		Sep 13 - Oct 11	1	geomean = 2.3 CFU/100 mL	Objective met
Turbidity					
5 NTU or 10%	Toby Creek	2005	0	no data collected	Omitted
max increase					2005
Suspended	Toby Creek	Feb 28 - Dec 27	14	< 1 - 11 mg/L	Control
Solids	0200333				
10 mg/L	above Panorama STP				
max increase	E247080	Feb 28 - Dec 27	14	< 1 - 13 mg/L	
	SE Panorama STP				
			14	increase = 0 - 2 mg/L	Objective met
	E247081	Feb 28 - Dec 27	14	< 1 - 10 mg/L	
	2km D/S Panorama STP				
			14	increase = 0 mg/L	Objective met
Periphyton Growth					
	Toby Creek	2005	0	no data collected	Omitted
25% max increase					2005
Total Ammonia	Toby Creek:	Mar 7 - Dec 27	11	< 0.001 - 0.026 mg/L	Max obj met
0.007 mg/L avg	0200333	Feb 28 - Apr 5	3	0.037 - 0.042 mg/L	Max obj. not met
0.030 mg/L max	above Panorama STP	Feb 28 - Mar 29	1	av. = 0.028 mg/L	Av obj. not met
		Sep 26 - Oct 24	1	av. = 0.005 mg/L	Av obj met
	E247080	Mar 22 - Dec 27	10	< 0.001 - 0.025 mg/L	Max obj met
	SE Panorama STP	Feb 28 - Apr 5	4	0.040 - 0.050 mg/L	Max obj. not met
		Feb 29 - Mar 29	1	av = 0.034 mg/L	Av obj. not met
		Sep 26 - Oct 24	1	av. = 0.004 mg/L	Av obj met
	E247081	Mar 7 - Dec 20	9	< 0.001 - 0.023 mg/L	Max obj met
	2km D/S Panorama STP	Feb 28 - Dec 27	5	0.032 - 8.2 mg/L	Max obj. not met
		Feb 29 - Mar 29	1	av = 0.035 mg/L	Av obj. not met
		Sep 26 - Oct 24	1	av. = 1.645 mg/L	Av. obj. not met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Nitrite	Toby Creek:	Feb 28 - Dec 27	14	< 0.01 - 0.01 mg/L	Max obj met
	0200333	Feb 28 - Mar 29	1	av. = 0.01 mg/L	Av obj met
	above Panorama STP	Sep 26 - Oct 24	1	av. = 0.01 mg/L	Av obj met
0.020 mg/L avg	E247080	Feb 28 - Dec 27	14	< 0.01 - 0.01 mg/L	Max obj met
0.060 mg/L max	SE Panorama STP	Feb 28 - Mar 29	1	av. = 0.01 mg/L	Av obj met
		Sep 26 - Oct 24	1	av. = 0.01 mg/L	Av obj met
	E247081	Mar 7 - Dec 20	13	< 0.01 - 0.01 mg/L	Max obj met
	2km D/S Panorama STP	Sept 26	1	0.48 mg/L	Max obj. not met
		Feb 28 - Mar 29	1	av. = 0.01 mg/L	Av obj met
		Sep 26 - Oct 24	1	av. = 0.10 mg/L	Av obj. not met
Total Lead 0.005 mg/L max at hardness < 95 mg/L 0.010 mg/L max at hardness > 95 mg/L	Toby Creek	2005	0	no data collected	Omitted 2005
Total Barium 1.0 mg/L max	Toby Creek	2005	0	no data collected	Omitted 2005
Total Cadmium 0.0002 mg/L max	Toby Creek	2005	0	no data collected	Omitted 2005
Total Zinc 0.05 mg/L max	Toby Creek	2005	0	no data collected	Omitted 2005
Dissolved Copper 0.002 mg/L max	Toby Creek	2005	0	no data collected	Omitted 2005

Table 22. Boundary Bay Water Quality Objectives - 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliform < 1000 / 100 mL geometric mean (gm) < 4000 / 100 mL max April - October	Mahood Creek Serpentine River Latimer Creek Hyland Creek Nicomekl River Anderson Creek Murray Creek	2005	0	no data collected	Omitted 2005
Fecal Coliform < 200 / 100 mL geometric mean (gm) < 400 / 100 mL 90th perc. (np) April - October	Boundary Bay	Apr 13 - Sep 30	45	< 20 - 490 MPN/100 mL	
		Apr 13 - Sep 30	6	gm = 20.0 - 61.6 MPN/100 mL	Objective met
	Centenial Beach	Apr 13 - Sep 30	6	np = 20.0 - 321.2 MPN/100 mL	Objective met
		Apr 07 - Sep 09	75	< 20 - 230 MPN/100 mL	
		Apr 07 - Sep 09	5	gm = 21.9 - 38.1 MPN/100 mL	Objective met
	Crescent Beach	Apr 07 - Sep 09	5	np = 20.0 - 150.0 MPN/100 mL	Objective met
		Apr 07 - Sep 09	25	< 20 - 790 MPN/100 mL	
		Apr 07 - Sep 09	5	gm = 23.5 - 88.2 MPN/100 mL	Objective met
		Apr 07 - Sep 09	4	np = 35.0 - 78.0 MPN/100 mL	Objective met
	Crescent Beach North	Jul 6 - Aug 5	1	np = 526.0 MPN/100 mL	Objective not met
		Apr 07 - Sep 09	100	< 20 - 1300 MPN/100 mL	
		Apr 07 - Sep 09	5	gm = 37.9 - 74.3 MPN/100 mL	Objective met
	White Rock	Apr 07 - Sep 09	5	np = 112. - 346. MPN/100 mL	Objective met
Suspended Solids max increase: 10 mg/L or 10%	Mahood Creek Serpentine River Latimer Creek Hyland Creek Nicomekl River Anderson Creek Murray Creek Little Campbell River	2005	0	no data collected	Omitted 2005
Substrate Sedimentation no increase in weight of particles <3 mm dia	Mahood Creek Serpentine River Nicomekl River Anderson Creek Murray Creek Latimer Creek Hyland Creek Little Campbell River	2005	0	no data collected	Omitted 2005
Turbidity max increase: 5 NTU or 10%	Mahood Creek Serpentine River Nicomekl River Anderson Creek Murray Creek Latimer Creek Hyland Creek Little Campbell River	2005	0	no data collected	Omitted 2005

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Ammonia-N <0.76 mg/L av 5.6 mg/L max at pH = 8.0 temp = 20 C	Mahood Creek Serpentine River Nicomekl River Anderson Creek Murray Creek Latimer Creek Hyland Creek Little Campbell River	2005	0	no data collected	Omitted 2005
Nitrite - N < 0.02 mg/L av 0.06 mg/L max	Mahood Creek Serpentine River Nicomekl River Anderson Creek Murray Creek Latimer Creek Hyland Creek Little Campbell River	2005	0	no data collected	Omitted 2005
Chlorophyll-a 50 mg/m2 av	Mahood Creek Serpentine River Nicomekl River Anderson Creek Murray Creek Latimer Creek Hyland Creek Little Campbell River	2005	0	no data collected	Omitted 2005
Dissolved Oxygen 8 mg/L min Jun - Oct 11 mg/L min when salmonid eggs, larvae or alevin present	Mahood Creek Latimer Creek Anderson Creek Hyland Creek Murray Creek	2005	0	no data collected	Omitted 2005
Dissolved Oxygen 6 mg/L min 11 mg/L min when salmonid eggs, larvae or alevin present	Serpentine River Nicomekl River Little Campbell River	2005	0	no data collected	Omitted 2005
pH 6.5 - 8.5 or 0.2 max increase	Mahood Creek Serpentine River Nicomekl River Anderson Creek Murray Creek Latimer Creek Hyland Creek Little Campbell River	2005	0	no data collected	Omitted 2005

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Lead < 0.005 mg/L av 0.010 mg/L max	Nicomekl River	2005	0	no data collected	Omitted 2005
PCBs 0.001 ug/L max in water	Serpentine River Mahood Creek Latimer Creek Hyland Creek	2005	0	no data collected	Omitted 2005
PCBs <0.1-0.5 ug/g wet weight in fish	Serpentine River Mahood Creek Latimer Creek Hyland Creek	2005	0	no data collected	Omitted 2005
PCBs <0.03 ug/g dry weight in sediments	Serpentine River Mahood Creek Latimer Creek Hyland Creek	2005	0	no data collected	Omitted 2005

Table 23. Burrard Inlet Water Quality Objectives - 2005.

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms	Outer Burrard Inlet	Apr 14 - Sep 28	90	< 20 - 330 MPN/100 mL	
	English Bay				
< 200 /100 mL	Third Beach	Apr 14 - Sep 28	6	gm = 21.1 - 41.3 MPN/100 mL	Objective met
geometric mean	English Bay	Apr 14 - Sep 28	60	< 20 - 330 MPN/100 mL	
(gm)					
	Second Beach	Apr 14 - Sep 28	6	gm = 20.0 - 46.5 MPN/100 mL	Objective met
Apr - Oct	English Bay	Apr 14 - Sep 28	90	< 20 - 790 MPN/100 mL	
	English Bay Beach	Apr 14 - Sep 28	6	gm = 21.1 - 56.0 MPN/100 mL	Objective met
	English Bay	Apr 14 - Oct 06	165	< 20 - 9200 MPN/100 mL	
	Sunset Beach		11	gm = 27.2 - 175.0 MPN/100 mL	Objective met
	English Bay	Apr 12 - Oct 05	90	< 20 - 790 MPN/100 mL	
	Kitsilano Beach		6	gm = 23.5 - 53.8 MPN/100 mL	Objective met
	English Bay	Apr 12 - Oct 05	30	< 20 - 490 MPN/100 mL	
	Kitsilano Beach 511		6	gm = 41.2 - 82.6 MPN/100 mL	Objective met
	English Bay	Apr 12 - Oct 05	90	< 20 - 490 MPN/100 mL	
	Jericho Beach		6	gm = 25.1 - 68.7 MPN/100 mL	Objective met
	English Bay	Apr 12 - Oct 05	90	< 20 - 1100 MPN/100 mL	
	Locarno Beach		6	gm = 31.8 - 69.9 MPN/100 mL	Objective met
	English Bay	Apr 12 - Oct 05	89	< 20 - 9200 MPN/100 mL	
	Spanish Banks		6	gm = 20.0 - 41.2 MPN/100 mL	Objective met
	Wreck Beach	Apr 12 - Sep 07	50	< 20 - 490 MPN/100 mL	
	Foreshore East		5	gm = 32.1 - 70.4 MPN/100 mL	Objective met
	Wreck Beach	Apr 12 - Sep 07	50	< 20 - 490 MPN/100 mL	
	Acadia		5	gm = 26.2 - 78.4 MPN/100 mL	Objective met
	Wreck Beach	Apr 12 - Sep 07	50	< 20 - 1700 MPN/100 mL	
	Trail 4		5	gm = 21.7 - 59.9 MPN/100 mL	Objective met
	Wreck Beach	Apr 12 - Sep 07	100	< 20 - 230 MPN/100 mL	
	Breakwater, Trail 6		5	gm = 20.0 - 34.2 MPN/100 mL	Objective met
	Wreck Beach	Apr 12 - Sep 13	50	< 20 - 1100 MPN/100 mL	
	Trail 7		5	gm = 44.6 - 84.4 MPN/100 mL	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms	Ambleside Beach	Apr 05 - Sep 22	90	< 20 - 16000 MPN/100 mL	
< 200 /100 mL			6	gm = 26.5 - 186.2 MPN/100 mL	Objective met
geometric mean (gm)	Dundarave	Apr 05 - Sep 22	60	< 20 - 1700 MPN/100 mL	
			6	gm = 23.2 - 73.6 MPN/100 mL	Objective met
Apr - Oct	Eagle Harbour	Apr 05 - Sep 26	110	< 20 - 5400 MPN/100 mL	
			9	gm = 28.9 - 164.6 MPN/100 mL	Objective met
		Jun 2 - Jul 8	2	gm = 224.9 - 238.5 MPN/100 mL	Objective not met
	Whytecliff Park	Apr 05 - Oct 06	70	< 20 - 2400 MPN/100 mL	
			7	gm = 20.0 - 149.2 MPN/100 mL	Objective met
	Lions Gate Study	Mar 28	1	170 MPN/100 mL	
	Site 1		1	gm = 170 MPN/100 mL	Indefinite result
	Lions Gate Study	Mar 28	1	49 MPN/100 mL	
	Site 2		1	gm = 49 MPN/100 mL	Indefinite result
	Lions Gate Study	Mar 29	1	230 MPN/100 mL	
	Site 3		1	gm = 230 MPN/100 mL	Indefinite result
	Lions Gate Study	Mar 31	1	310 MPN/100 mL	
	Site 4		1	gm = 310 MPN/100 mL	Indefinite result
	Lions Gate Study	Apr 1	1	490 MPN/100 mL	
	Site 5		1	gm = 490 MPN/100 mL	Indefinite result
	Lions Gate Study	Mar 29	1	17 MPN/100 mL	
	Site 10		1	gm = 17 MPN/100 mL	Indefinite result
	Lions Gate Study	Mar 31	1	21 MPN/100 mL	
	Site 11		1	gm = 21 MPN/100 mL	Indefinite result
	Lions Gate Study	Mar 28	1	170 MPN/100 mL	
	Site 12		1	gm = 170 MPN/100 mL	Indefinite result
	Lions Gate Study	Mar 29	1	130 MPN/100 mL	
	Site 13		1	gm = 130 MPN/100 mL	Indefinite result
	Lions Gate Study	Mar 31	1	49 MPN/100 mL	
	Site 18		1	gm = 49 MPN/100 mL	Indefinite result
	Lions Gate Study	Mar 31	1	5 MPN/100 mL	
	Site 19		1	gm = 5 MPN/100 mL	Indefinite result

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Fecal Coliforms	Lions Gate Study	Mar 30	1	130 MPN/100 mL	
< 200 /100 mL	Site 21		1	gm = 130 MPN/100 mL	Indefinite result
geometric mean (gm)	Lions Gate Study	Mar 30	1	230 MPN/100 mL	
	Site 22		1	gm = 230 MPN/100 mL	Indefinite result
Apr - Oct	Lions Gate Study	Apr 1	1	230 MPN/100 mL	
	Site 27		1	gm = 230 MPN/100 mL	Indefinite result
	Lions Gate Study	Mar 29	1	110 MPN/100 mL	
	Site 32		1	gm = 110 MPN/100 mL	Indefinite result
	Lions Gate Study	Mar 28	1	7 MPN/100 mL	
	Site 45		1	gm = 7 MPN/100 mL	Indefinite result
	1st Narrows - 2nd Narrows	Apr 14 - Sep 28	90	< 20 - 790 MPN/100 mL	
	Brockton Point		6	gm = 26.7 - 53.6 MPN/100 mL	Objective met
	1st Narrows - 2nd Narrows	Mar 30	1	230 MPN/100 mL	
	Lions Gate Study				
	Site 6		1	gm = 230 MPN/100 mL	Indefinite result
	Lions Gate Study	Mar 30	1	490 MPN/100 mL	
	Site 7		1	gm = 490 MPN/100 mL	Indefinite result
	Lions Gate Study	Mar 30	1	490 MPN/100 mL	
	Site 8		1	gm = 490 MPN/100 mL	Indefinite result
	2nd Narrows - Roche Pt.	Apr 05 - Oct 26	80	< 20 - 9200 MPN/100 mL	
		Apr 05 - Oct 26	7	gm = 24.9 - 107.0 MPN/100 mL	Objective met
	Cates Park	Jun 16 - Jul 12	1	gm = 230.1 MPN/100 mL	Objective not met
	Port Moody Arm	Apr 14 - Sep 19	90	< 20 - 16000 MPN/100 mL	
		Apr 14 - Sep 19	7	gm = 23.5 - 88.4 MPN/100 mL	Objective met
	Barnet Marine	Jun 27 - Jul 25	2	gm = 407.1 - 473.2 MPN/100 mL	Objective not met
	Port Moody Arm	Apr 14 - Sep 19	30	< 20 - 2400 MPN/100 mL	
	Orchard Park		6	gm = 30.9 - 131.6 MPN/100 mL	Objective met
	Indian Arm	Apr 15 - Sep 19	59	< 20 - 490 MPN/100 mL	
	Belcara				
	Bedwell Bay		6	gm = 20.0 - 50.8 MPN/100 mL	Objective met
	Belcara	Apr 15 - Sep 14	60	< 20 - 1700 MPN/100 mL	
	Belcara Park		6	gm = 20.0 - 40.9 MPN/100 mL	Objective met
	Indian Arm	Apr 05 - Sep 28	135	< 20 - 16000 MPN/100 mL	
		Apr 05 - Sep 28	8	25.1 - 182.8 MPN/100 mL	Objective met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
	Deep Cove	May 25 - Jun 6	1	gm = 1564.1 MPN/100 mL	Objective not met
Enterococci <200 /100 mL geometric mean (gm) Apr - Oct	Indian Arm Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	2005	0	no data collected	Omitted 2005
Suspended Solids 10 mg/L max. increase	Indian Arm Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	2005	0	no data collected	Omitted 2005
Turbidity 5 NTU max. increase geometric mean	Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	2005	0	no data collected	Omitted 2005
Cl2-Produced Oxidants 3 ug/L av	Port Moody Arm 2nd Narrows-Roche Pt.	2005	0	no data collected	Omitted 2005
Ammonia-N <1.0 mg/L av 2.5 mg/L max.	1st Narrows - 2nd Narrows Lions Gate Study Site 6	Mar 30	1 1	0.0133 mg/L av = 0.0133 mg/L	Max obj met Indefinite result
	Lions Gate Study Site 7	Mar 30	1 1	0.0153 mg/L av = 0.0153 mg/L	Max obj met Indefinite result
	Lions Gate Study Site 8	Mar 30	1 1	0.0133 mg/L av = 0.0133 mg/L	Max obj met Indefinite result
Dissolved Oxygen 6.5 mg/L min.	Outer Burrard Inlet Lions Gate Study Site 1	Mar 28	1	7.59 mg/L	Min obj met
	Lions Gate Study Site 2	Mar 28	1	7.36 mg/L	Min obj met
	Lions Gate Study Site 3	Mar 29	1	7.02 mg/L	Min obj met
	Lions Gate Study Site 4	Mar 31	1	6.72 mg/L	Min obj met
	Lions Gate Study Site 5	Apr 1	1	6.75 mg/L	Min obj met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Dissolved Oxygen 6.5 mg/L min.	Lions Gate Study Site 10	Mar 29	1	7.33 mg/L	Min obj met
	Lions Gate Study Site 11	Mar 31	1	6.53 mg/L	Min obj met
	Lions Gate Study Site 12	Mar 28	1	7.63 mg/L	Min obj met
	Lions Gate Study Site 13	Mar 29	1	7.20 mg/L	Min obj met
	Lions Gate Study Site 18	Mar 31	1	6.89 mg/L	Min obj met
	Lions Gate Study Site 19	Mar 31	1	6.59 mg/L	Min obj met
	Lions Gate Study Site 21	Mar 30	1	7.06 mg/L	Min obj met
	Lions Gate Study Site 22	Mar 30	1	7.15 mg/L	Min obj met
	Lions Gate Study Site 27	Apr 1	1	6.40 mg/L	Min obj met
	Lions Gate Study Site 32	Mar 29	1	7.21 mg/L	Min obj met
	Lions Gate Study Site 45	Mar 28	1	7.61 mg/L	Min obj met
	1st Narrows - 2nd Narrows Lions Gate Study Site 6	Mar 30	1	6.98 mg/L	Min obj met
	Lions Gate Study Site 7	Mar 30	1	7.06 mg/L	Min obj met
	Lions Gate Study Site 8	Mar 30	1	7.22 mg/L	Min obj met
WAD - CN 0.001 mg/L max	Port Moody Arm	2005	0	no data collected	Omitted 2005

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
H2S 0.002 mg/L max	Port Moody Arm 1st-2nd Narrows	2005	0	no data collected	Omitted 2005
pH 6.5 - 8.5	2nd Narrows-Roche Pt.	2005	0	no data collected	Omitted 2005
Total As 0.010 mg/L max	1st-2nd Narrows 2nd Narrows - Roche Pt.	2005	0	no data collected	Omitted 2005
Total As <20 µg/g max. in sediment (long term)	Outer Burrard Inlet Lions Gate Study Site 1	Mar 28	1	8.37 µg/g	Max obj met
	Lions Gate Study Site 2	Mar 28	1	7.50 µg/g	Max obj met
	Lions Gate Study Site 3	Mar 29	1	6.49 µg/g	Max obj met
	Lions Gate Study Site 4	Mar 31	1	7.91 µg/g	Max obj met
	Lions Gate Study Site 5	Apr 1	1	6.60 µg/g	Max obj met
	Lions Gate Study Site 10	Mar 29	1	7.53 µg/g	Max obj met
	Lions Gate Study Site 11	Mar 31	1	8.41 µg/g	Max obj met
	Lions Gate Study Site 12	Mar 28	1	7.78 µg/g	Max obj met
	Lions Gate Study Site 13	Mar 29	1	7.07 µg/g	Max obj met
	Lions Gate Study Site 18	Mar 31	1	5.61 µg/g	Max obj met
	Lions Gate Study Site 19	Mar 31	1	8.45 µg/g	Max obj met
	Lions Gate Study Site 21	Mar 30	1	6.90 µg/g	Max obj met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total As <20 µg/g max. in sediment (long term)	Lions Gate Study Site 22	Mar 30	1	4.92 µg/g	Max obj met
	Lions Gate Study Site 27	Apr 1	1	7.72 µg/g	Max obj met
	Lions Gate Study Site 32	Mar 29	1	7.93 µg/g	Max obj met
	Lions Gate Study Site 45	Mar 28	1	7.80 µg/g	Max obj met
	1st Narrows - 2nd Narrows Lions Gate Study Site 6	Mar 30	1	7.33 µg/g	Max obj met
	Lions Gate Study Site 7	Mar 30	1	8.28 µg/g	Max obj met
	Lions Gate Study Site 8	Mar 30	1	3.92 µg/g	Max obj met
Total Ba 0.5 mg/L max.	2nd Narrows - Roche Pt.	2005	0	no data collected	Omitted 2005
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:	2005	0	no data collected	Omitted 2005
Total Cd <1.0 ug/g max. in sediment	Outer Burrard Inlet Lions Gate Study Site 1	Mar 28	1	0.352 µg/g	Max obj met
	Lions Gate Study Site 2	Mar 28	1	0.149 µg/g	Max obj met
	Lions Gate Study Site 3	Mar 29	1	0.136 µg/g	Max obj met
	Lions Gate Study Site 4	Mar 31	1	0.170 µg/g	Max obj met
	Lions Gate Study Site 5	Apr 1	1	0.126 µg/g	Max obj met
	Lions Gate Study Site 10	Mar 29	1	0.192 µg/g	Max obj met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cd <1.0 ug/g max. in sediment	Lions Gate Study Site 11	Mar 31	1	0.204 µg/g	Max obj met
	Lions Gate Study Site 12	Mar 28	1	0.122 µg/g	Max obj met
	Lions Gate Study Site 13	Mar 29	1	0.158 µg/g	Max obj met
	Lions Gate Study Site 18	Mar 31	1	0.115 µg/g	Max obj met
	Lions Gate Study Site 19	Mar 31	1	0.237 µg/g	Max obj met
	Lions Gate Study Site 21	Mar 30	1	0.363 µg/g	Max obj met
	Lions Gate Study Site 22	Mar 30	1	0.144 µg/g	Max obj met
	Lions Gate Study Site 27	Apr 1	1	0.184 µg/g	Max obj met
	Lions Gate Study Site 32	Mar 29	1	0.139 µg/g	Max obj met
	Lions Gate Study Site 45	Mar 28	1	0.086 µg/g	Max obj met
	1st Narrows - 2nd Narrows Lions Gate Study Site 6	Mar 30	1	0.408 µg/g	Max obj met
	Lions Gate Study Site 7	Mar 30	1	0.418 µg/g	Max obj met
	Lions Gate Study Site 8	Mar 30	1	0.176 µg/g	Max obj met
Total Cd < 9 ug/g av < 43 ug/g max. in sediment	Indian Arm:	2005	0	no data collected	Omitted 2005
Total Cr <0.050 mg/L max. in water	False Creek: 2nd Narrows - Roche Pt. Port Moody:	2005	0	no data collected	Omitted 2005

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cr < 60 ug/g max. in sediment (long term)	Outer Burrard Inlet Lions Gate Study Site 1	Mar 28	1	53.8 µg/g	Max obj met
	Lions Gate Study Site 2	Mar 28	1	60.0 µg/g	Max obj met
	Lions Gate Study Site 3	Mar 29	1	60.5 µg/g	Max obj not met
	Lions Gate Study Site 4	Mar 31	1	57.6 µg/g	Max obj met
	Lions Gate Study Site 5	Apr 1	1	53.1 µg/g	Max obj met
	Lions Gate Study Site 10	Mar 29	1	49.2 µg/g	Max obj met
	Lions Gate Study Site 11	Mar 31	1	50.2 µg/g	Max obj met
	Lions Gate Study Site 12	Mar 28	1	59.6 µg/g	Max obj met
	Lions Gate Study Site 13	Mar 29	1	55.0 µg/g	Max obj met
	Lions Gate Study Site 18	Mar 31	1	51.7 µg/g	Max obj met
	Lions Gate Study Site 19	Mar 31	1	53.1 µg/g	Max obj met
	Lions Gate Study Site 21	Mar 30	1	43.0 µg/g	Max obj met
	Lions Gate Study Site 22	Mar 30	1	23.9 µg/g	Max obj met
	Lions Gate Study Site 27	Apr 1	1	58.2 µg/g	Max obj met
	Lions Gate Study Site 32	Mar 29	1	51.5 µg/g	Max obj met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cr < 60 ug/g max. in sediment (long term)	Lions Gate Study Site 45	Mar 28	1	49.8 µg/g	Max obj met
	1st Narrows - 2nd Narrows Lions Gate Study Site 6	Mar 30	1	47.7 µg/g	Max obj met
	Lions Gate Study Site 7	Mar 30	1	37.7 µg/g	Max obj met
	Lions Gate Study Site 8	Mar 30	1	17.7 µg/g	Max obj met
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:	2005	0	no data collected	Omitted 2005
Total Cu < 100 ug/g max. in sediment (long term)	Outer Burrard Inlet Lions Gate Study Site 1	Mar 28	1	144 µg/g	Max obj not met
	Lions Gate Study Site 2	Mar 28	1	82.5 µg/g	Max obj met
	Lions Gate Study Site 3	Mar 29	1	63.1 µg/g	Max obj met
	Lions Gate Study Site 4	Mar 31	1	51.2 µg/g	Max obj met
	Lions Gate Study Site 5	Apr 1	1	49.0 µg/g	Max obj met
	Lions Gate Study Site 10	Mar 29	1	83.4 µg/g	Max obj met
	Lions Gate Study Site 11	Mar 31	1	96.5 µg/g	Max obj met
	Lions Gate Study Site 12	Mar 28	1	124 µg/g	Max obj not met
	Lions Gate Study Site 13	Mar 29	1	66.7 µg/g	Max obj met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Cu < 100 ug/g max. in sediment (long term)	Lions Gate Study Site 18	Mar 31	1	41.5 µg/g	Max obj met
	Lions Gate Study Site 19	Mar 31	1	146 µg/g	Max obj not met
	Lions Gate Study Site 21	Mar 30	1	216 µg/g	Max obj not met
	Lions Gate Study Site 22	Mar 30	1	46.3 µg/g	Max obj met
	Lions Gate Study Site 27	Apr 1	1	129 µg/g	Max obj not met
	Lions Gate Study Site 32	Mar 29	1	49.1 µg/g	Max obj met
	Lions Gate Study Site 45	Mar 28	1	90.4 µg/g	Max obj met
	1st Narrows - 2nd Narrows Lions Gate Study Site 6	Mar 30	1	106 µg/g	Max obj not met
	Lions Gate Study Site 7	Mar 30	1	119 µg/g	Max obj not met
	Lions Gate Study Site 8	Mar 30	1	56.2 µg/g	Max obj met
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:	2005	0	no data collected	Omitted 2005
Total Pb 0.8 µg/g max. (wet weight) in fish	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody: Indian Arm:	2005	0	no data collected	Omitted 2005
Total Pb < 30 ug/g max. in sediment (long term)	Outer Burrard Inlet Lions Gate Study Site 1	Mar 28	1	33.7 µg/g	Max obj not met
	Lions Gate Study	Mar 28	1	23.2 µg/g	Max obj met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
	Site 2				
Total Pb < 30 ug/g max. in sediment (long term)	Lions Gate Study Site 3	Mar 29	1	20.9 µg/g	Max obj met
	Lions Gate Study Site 4	Mar 31	1	17.2 µg/g	Max obj met
	Lions Gate Study Site 5	Apr 1	1	14.0 µg/g	Max obj met
	Lions Gate Study Site 10	Mar 29	1	24.0 µg/g	Max obj met
	Lions Gate Study Site 11	Mar 31	1	18.7 µg/g	Max obj met
	Lions Gate Study Site 12	Mar 28	1	28.2 µg/g	Max obj met
	Lions Gate Study Site 13	Mar 29	1	20.1 µg/g	Max obj met
	Lions Gate Study Site 18	Mar 31	1	10.9 µg/g	Max obj met
	Lions Gate Study Site 19	Mar 31	1	27.3 µg/g	Max obj met
	Lions Gate Study Site 21	Mar 30	1	35.3 µg/g	Max obj not met
	Lions Gate Study Site 22	Mar 30	1	12.8 µg/g	Max obj met
	Lions Gate Study Site 27	Apr 1	1	21.9 µg/g	Max obj met
	Lions Gate Study Site 32	Mar 29	1	18.9 µg/g	Max obj met
	Lions Gate Study Site 45	Mar 28	1	28.0 µg/g	Max obj met
	1st Narrows - 2nd Narrows Lions Gate Study Site 6	Mar 30	1	30.2 µg/g	Max obj not met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Pb < 30 ug/g max. in sediment (long term)	Lions Gate Study Site 7	Mar 30	1	26.8 µg/g	Max obj met
	Lions Gate Study Site 8	Mar 30	1	11.9 µg/g	Max obj met
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	2005	0	no data collected	Omitted 2005
Total Hg 0.5 µg/g max. wet weight in fish	1st-2nd Narrows 2nd Narrows - Roche Pt. Indian Arm:	2005	0	no data collected	Omitted 2005
Total Hg 0.15 µg/g max. dry weight in sediment	Outer Burrard Inlet Lions Gate Study Site 1	Mar 28	1	0.161 µg/g	Max obj not met
	Lions Gate Study Site 2	Mar 28	1	0.134 µg/g	Max obj met
	Lions Gate Study Site 3	Mar 29	1	0.125 µg/g	Max obj met
	Lions Gate Study Site 4	Mar 31	1	0.125 µg/g	Max obj met
	Lions Gate Study Site 5	Apr 1	1	0.0997 µg/g	Max obj met
	Lions Gate Study Site 10	Mar 29	1	0.178 µg/g	Max obj not met
	Lions Gate Study Site 11	Mar 31	1	0.153 µg/g	Max obj not met
	Lions Gate Study Site 12	Mar 28	1	0.171 µg/g	Max obj not met
	Lions Gate Study Site 13	Mar 29	1	0.151 µg/g	Max obj not met
	Lions Gate Study Site 18	Mar 31	1	0.0842 µg/g	Max obj met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Hg 0.15 µg/g max. dry weight in sediment	Lions Gate Study Site 19	Mar 31	1	0.172 µg/g	Max obj not met
	Lions Gate Study Site 21	Mar 30	1	0.226 µg/g	Max obj not met
	Lions Gate Study Site 22	Mar 30	1	0.0568 µg/g	Max obj met
	Lions Gate Study Site 27	Apr 1	1	0.169 µg/g	Max obj not met
	Lions Gate Study Site 32	Mar 29	1	0.141 µg/g	Max obj met
	Lions Gate Study Site 45	Mar 28	1	0.202 µg/g	Max obj not met
	1st Narrows - 2nd Narrows Lions Gate Study Site 6	Mar 30	1	0.143 µg/g	Max obj met
	Lions Gate Study Site 7	Mar 30	1	0.173 µg/g	Max obj not met
	Lions Gate Study Site 8	Mar 30	1	0.0505 µg/g	Max obj met
Total Ni < 0.008 mg/L av. 0.075 mg/L max. in water	False Creek: 1st-2nd Narrows: 2nd Narrows - Roche Pt.	2005	0	no data collected	Omitted 2005
Total Ni < 45 ug/g max. in sediment	Outer Burrard Inlet Lions Gate Study Site 1	Mar 28	1	42.3 µg/g	Max obj met
	Lions Gate Study Site 2	Mar 28	1	45.4 µg/g	Max obj not met
	Lions Gate Study Site 3	Mar 29	1	46.3 µg/g	Max obj not met
	Lions Gate Study Site 4	Mar 31	1	46.8 µg/g	Max obj not met
	Lions Gate Study Site 5	Apr 1	1	43.1 µg/g	Max obj met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Ni < 45 ug/g max. in sediment	Lions Gate Study Site 10	Mar 29	1	37.8 µg/g	Max obj met
	Lions Gate Study Site 11	Mar 31	1	40.4 µg/g	Max obj met
	Lions Gate Study Site 12	Mar 28	1	45.9 µg/g	Max obj not met
	Lions Gate Study Site 13	Mar 29	1	41.1 µg/g	Max obj met
	Lions Gate Study Site 18	Mar 31	1	41.8 µg/g	Max obj met
	Lions Gate Study Site 19	Mar 31	1	43.7 µg/g	Max obj met
	Lions Gate Study Site 21	Mar 30	1	31.6 µg/g	Max obj met
	Lions Gate Study Site 22	Mar 30	1	12.7 µg/g	Max obj met
	Lions Gate Study Site 27	Apr 1	1	45.5 µg/g	Max obj not met
	Lions Gate Study Site 32	Mar 29	1	44.9 µg/g	Max obj met
	Lions Gate Study Site 45	Mar 28	1	37.7 µg/g	Max obj met
	1st Narrows - 2nd Narrows Lions Gate Study Site 6	Mar 30	1	37.6 µg/g	Max obj met
	Lions Gate Study Site 7	Mar 30	1	26.4 µg/g	Max obj met
	Lions Gate Study Site 8	Mar 30	1	8.1 µg/g	Max obj met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
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:	2005	0	no data collected	Omitted 2005
Total Zn < 150 ug/g max. in sediment (long-term)	Outer Burrard Inlet Lions Gate Study Site 1	Mar 28	1	140 µg/g	Max obj met
	Lions Gate Study Site 2	Mar 28	1	111 µg/g	Max obj met
	Lions Gate Study Site 3	Mar 29	1	105 µg/g	Max obj met
	Lions Gate Study Site 4	Mar 31	1	99.4 µg/g	Max obj met
	Lions Gate Study Site 5	Apr 1	1	90.2 µg/g	Max obj met
	Lions Gate Study Site 10	Mar 29	1	102 µg/g	Max obj met
	Lions Gate Study Site 11	Mar 31	1	103 µg/g	Max obj met
	Lions Gate Study Site 12	Mar 28	1	124 µg/g	Max obj met
	Lions Gate Study Site 13	Mar 29	1	97.2 µg/g	Max obj met
	Lions Gate Study Site 18	Mar 31	1	83.0 µg/g	Max obj met
	Lions Gate Study Site 19	Mar 31	1	120 µg/g	Max obj met
	Lions Gate Study Site 21	Mar 30	1	121 µg/g	Max obj met
	Lions Gate Study Site 22	Mar 30	1	52.7 µg/g	Max obj met

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Total Zn < 150 ug/g max. in sediment (long-term)	Lions Gate Study Site 27	Apr 1	1	116 µg/g	Max obj met
	Lions Gate Study Site 32	Mar 29	1	99.2 µg/g	Max obj met
	Lions Gate Study Site 45	Mar 28	1	107 µg/g	Max obj met
	1st Narrows - 2nd Narrows Lions Gate Study Site 6	Mar 30	1	127 µg/g	Max obj met
	Lions Gate Study Site 7	Mar 30	1	111 µg/g	Max obj met
	Lions Gate Study Site 8	Mar 30	1	42.7 µg/g	Max obj met
Chlorophenols (tri + tetra + penta - CP) 0.2 µg/L max. in water	1st-2nd Narrows	2005	0	no data collected	Omitted 2005
Chlorophenols (tri + tetra + penta - CP) in sediments 0.01 ug/g max. av of replicates (dry weight)	1st-2nd Narrows	2005	0	no data collected	Omitted 2005
Chlorophenols (tri+ tetra+ penta) in fish 0.10 ug/g max. (wet weight)	1st to 2nd Narrows	2005	0	no data collected	Omitted 2005
PCBs in sediments < 0.03 ug/g max. (dry weight)	1st-2nd Narrows 2nd Narrows - Roche Pt. Port Moody:	2005	0	no data collected	Omitted 2005
PCBs in fish 0.1 ug/g max. (wet weight)	Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	2005	0	no data collected	Omitted 2005

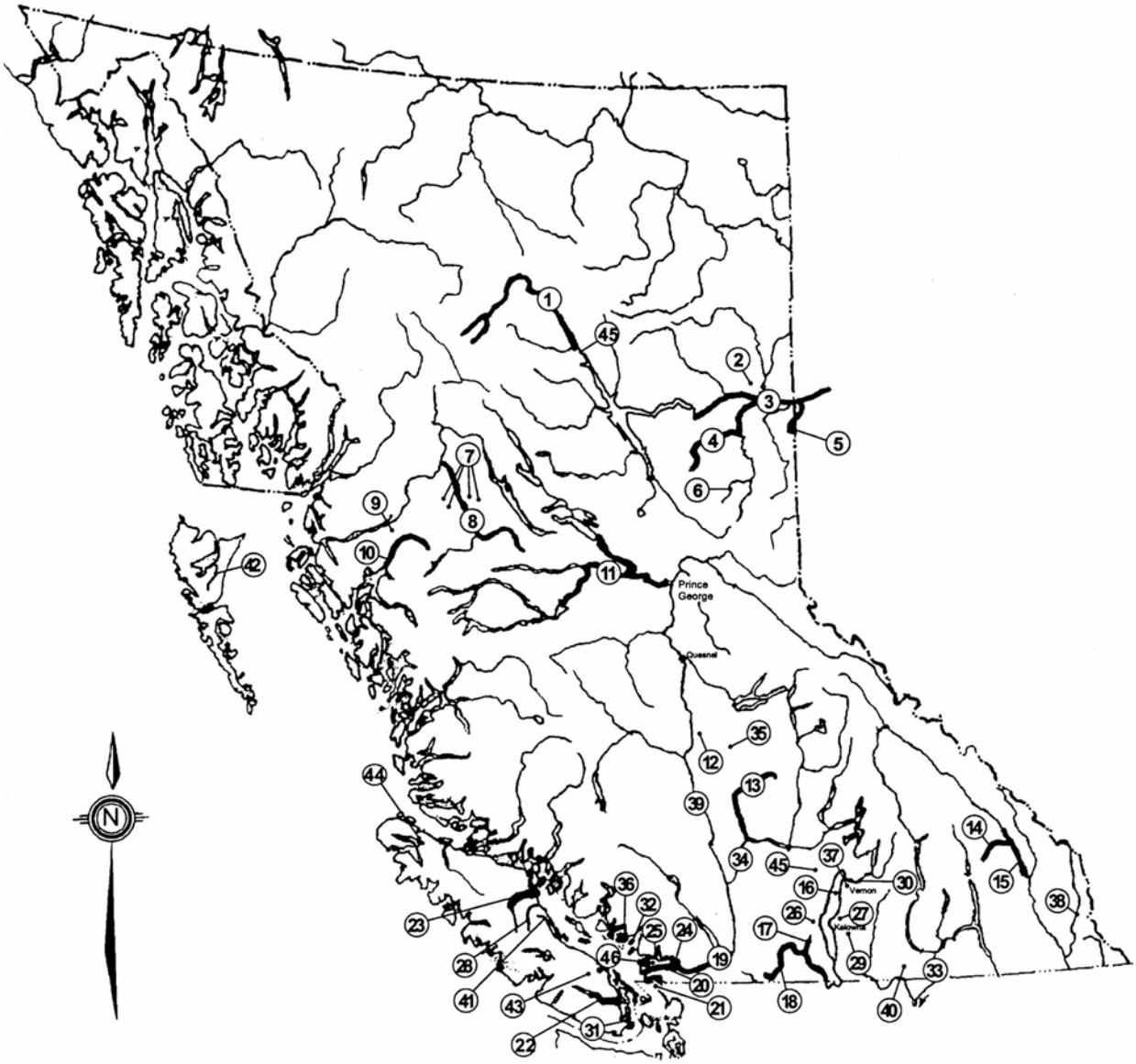
VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
Tributyl tin in sediment 0.03 ug/g max. (dry weight)	Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	2005	0	no data collected	Omitted 2005
Tributyl tin in fish 0.5 ug/g max. (wet weight)	Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	2005	0	no data collected	Omitted 2005
Phenols 1 µg/L max. in water	Port Moody Arm 2nd Narrows-Roche Pt.	2005	0	no data collected	Omitted 2005
Styrene 0.05 mg/L max. in water	Port Moody Arm	2005	0	no data collected	Omitted 2005
PAHs acenaphthene in sediment < 0.05 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2005	0	no data collected	Omitted 2005
PAHs acenaphthylene in sediment < 0.06 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2005	0	no data collected	Omitted 2005
PAHs anthracene in sediment < 0.1 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2005	0	no data collected	Omitted 2005
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:	2005	0	no data collected	Omitted 2005

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
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:	2005	0	no data collected	Omitted 2005
PAHs benzo-fluoranthenes in sediment < 0.32 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2005	0	no data collected	Omitted 2005
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:	2005	0	no data collected	Omitted 2005
PAHs chrysene in sediment < 0.14 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2005	0	no data collected	Omitted 2005
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:	2005	0	no data collected	Omitted 2005
PAHs fluoranthene in sediment < 0.17 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2005	0	no data collected	Omitted 2005
PAHs fluorene in sediment < 0.05 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2005	0	no data collected	Omitted 2005

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
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:	2005	0	no data collected	Omitted 2005
PAHs naphthalene in sediment < 0.2 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2005	0	no data collected	Omitted 2005
PAHs phenanthrene in sediment < 0.15 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2005	0	no data collected	Omitted 2005
PAHs pyrene in sediment < 0.26 ug/g max. (dry weight) (long-term)	Outer Burrard: 1st-2nd Narrows: 2nd Narrows - Roche Pt. Port Moody:	2005	0	no data collected	Omitted 2005
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:	2005	0	no data collected	Omitted 2005

VARIABLE & OBJECTIVE	MEASUREMENT				CONCLUSION
	SITE	DATE	n	VALUE	
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:	2005	0	no data collected	Omitted 2005

Table 24. Fraser River (Kanaka Creek to the Mouth) Water Quality Objectives - 2005.



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

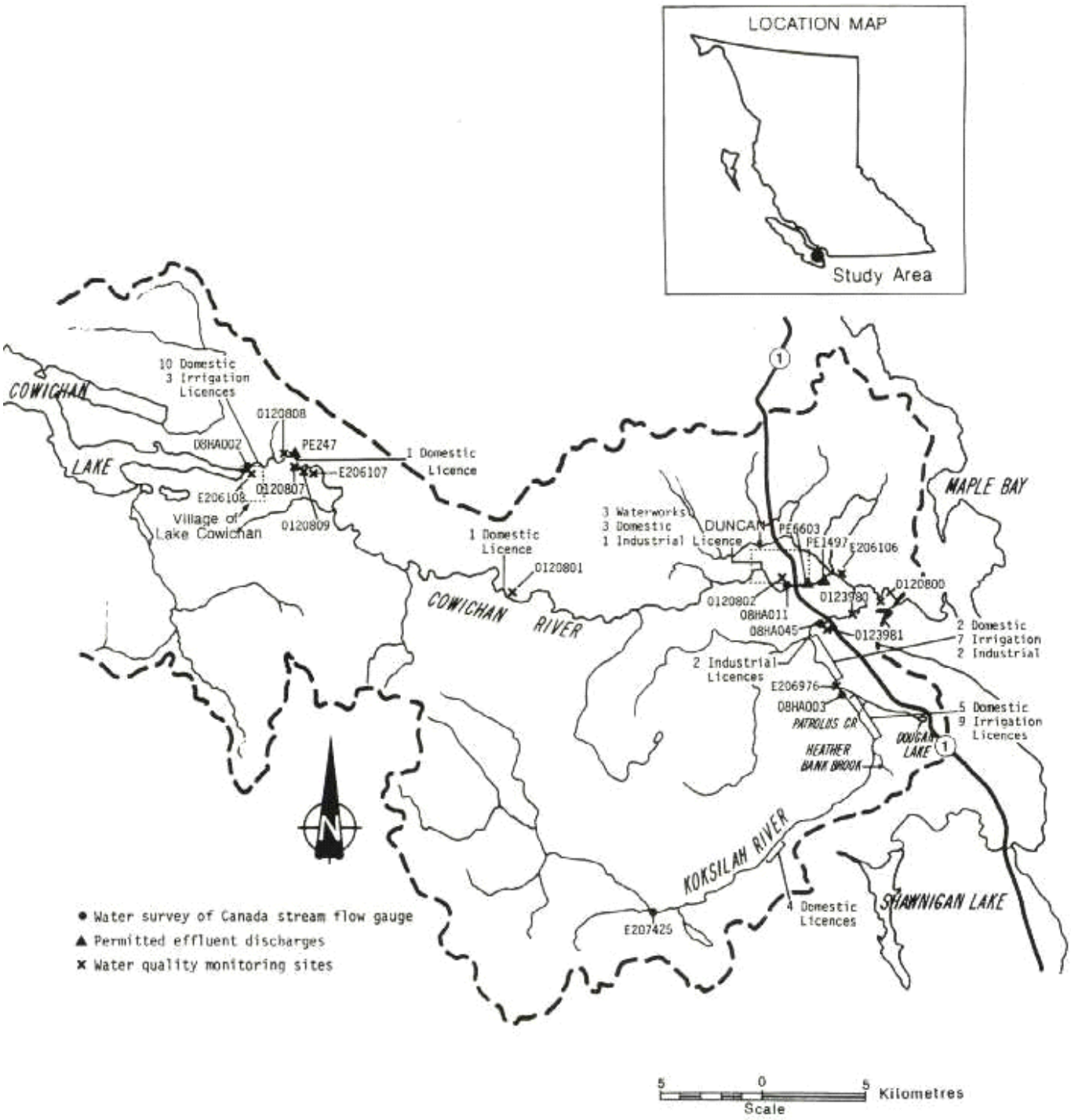


Figure 3 Cowichan - Koksilah Rivers

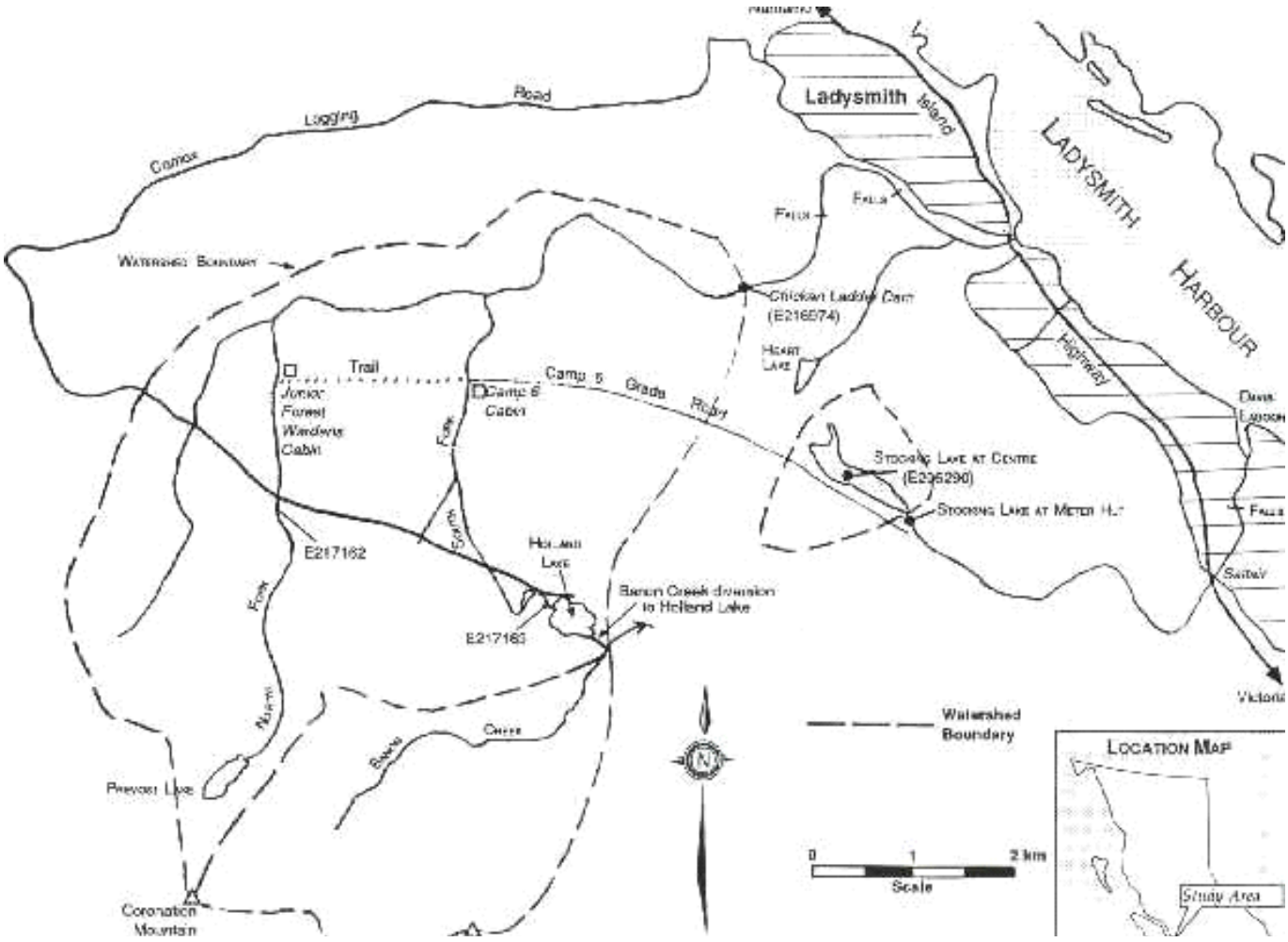


Figure 4. Holland Creek and Stocking Lake

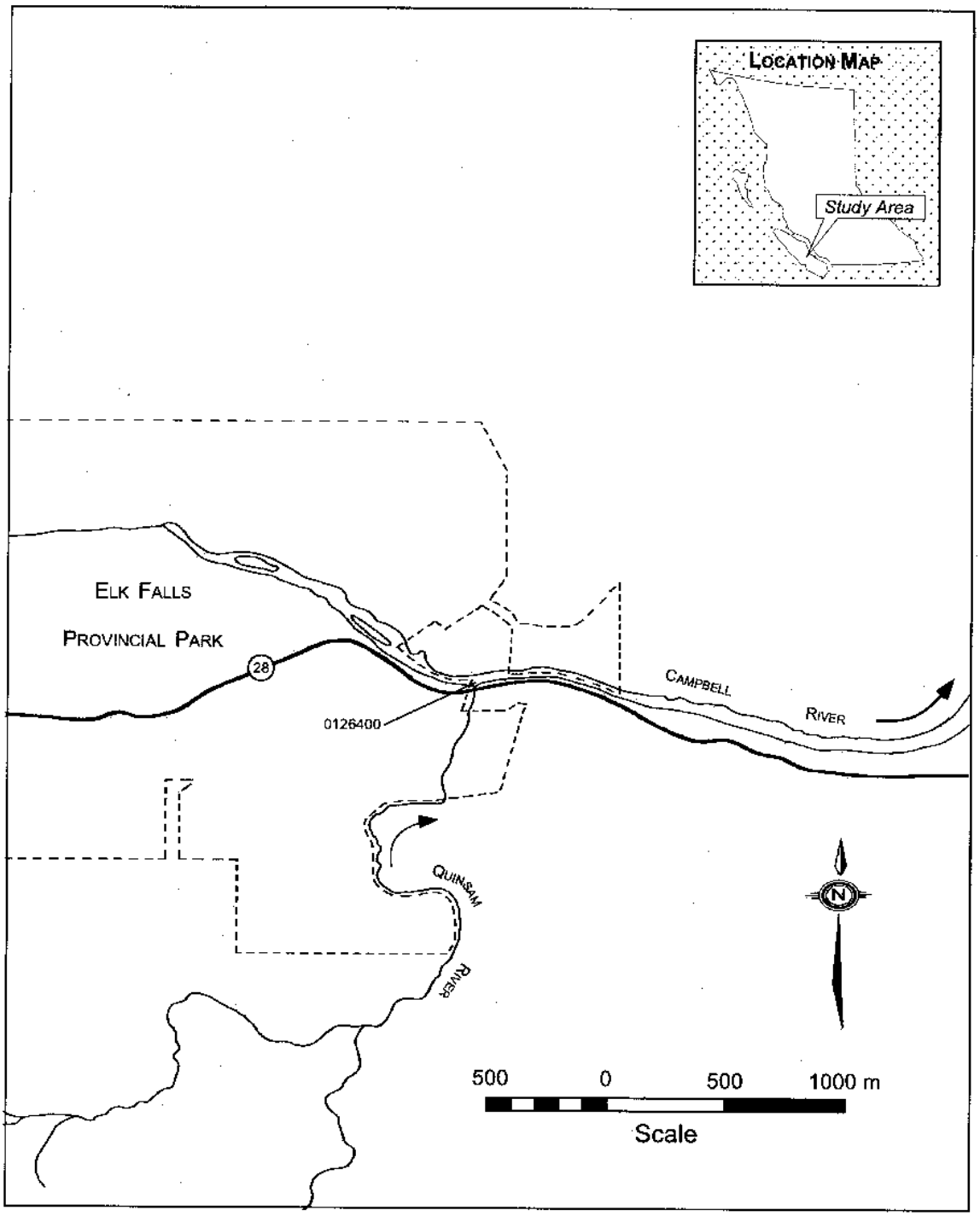


Figure 5. Quinsam River

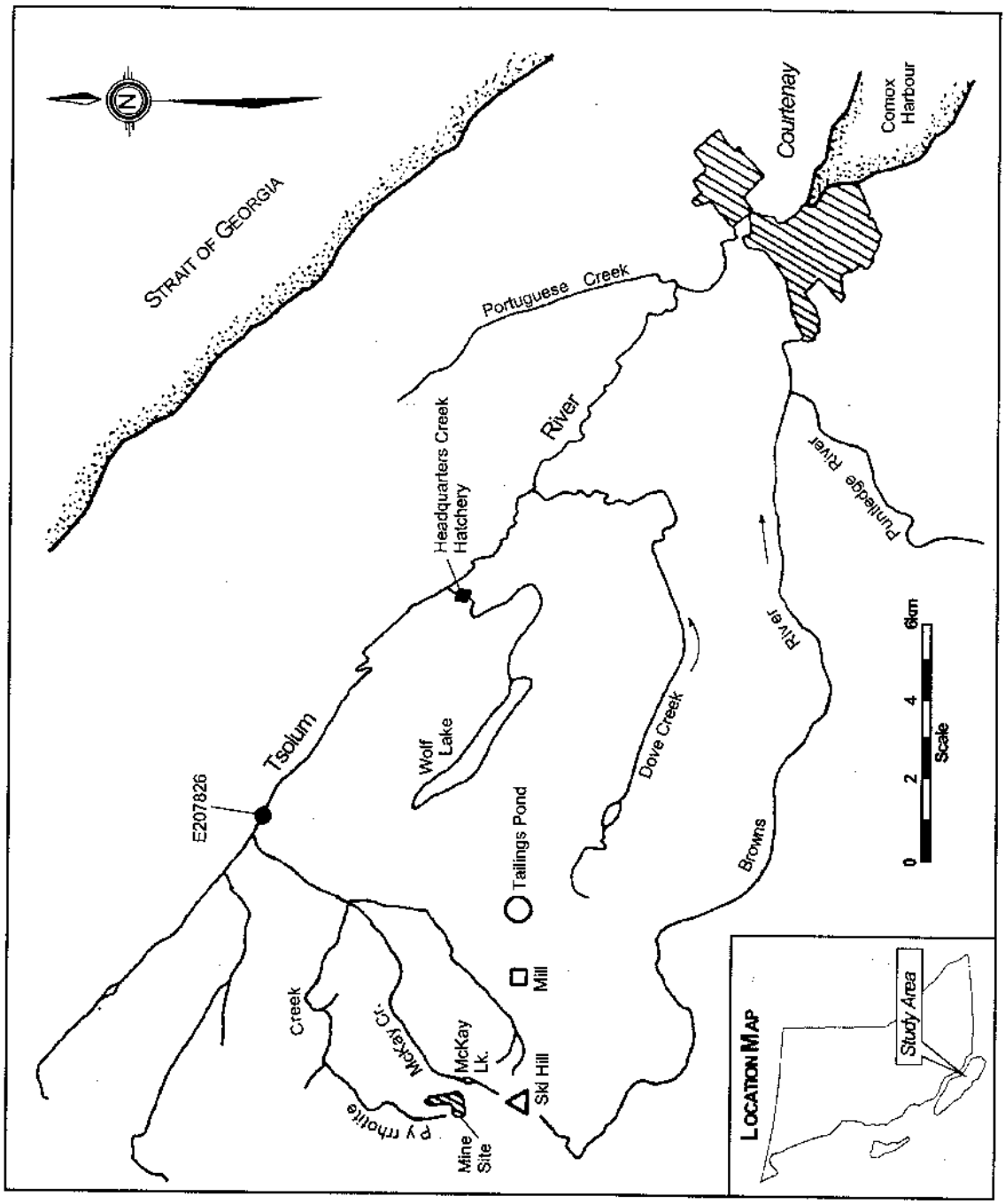


Figure 6. Tsolum River

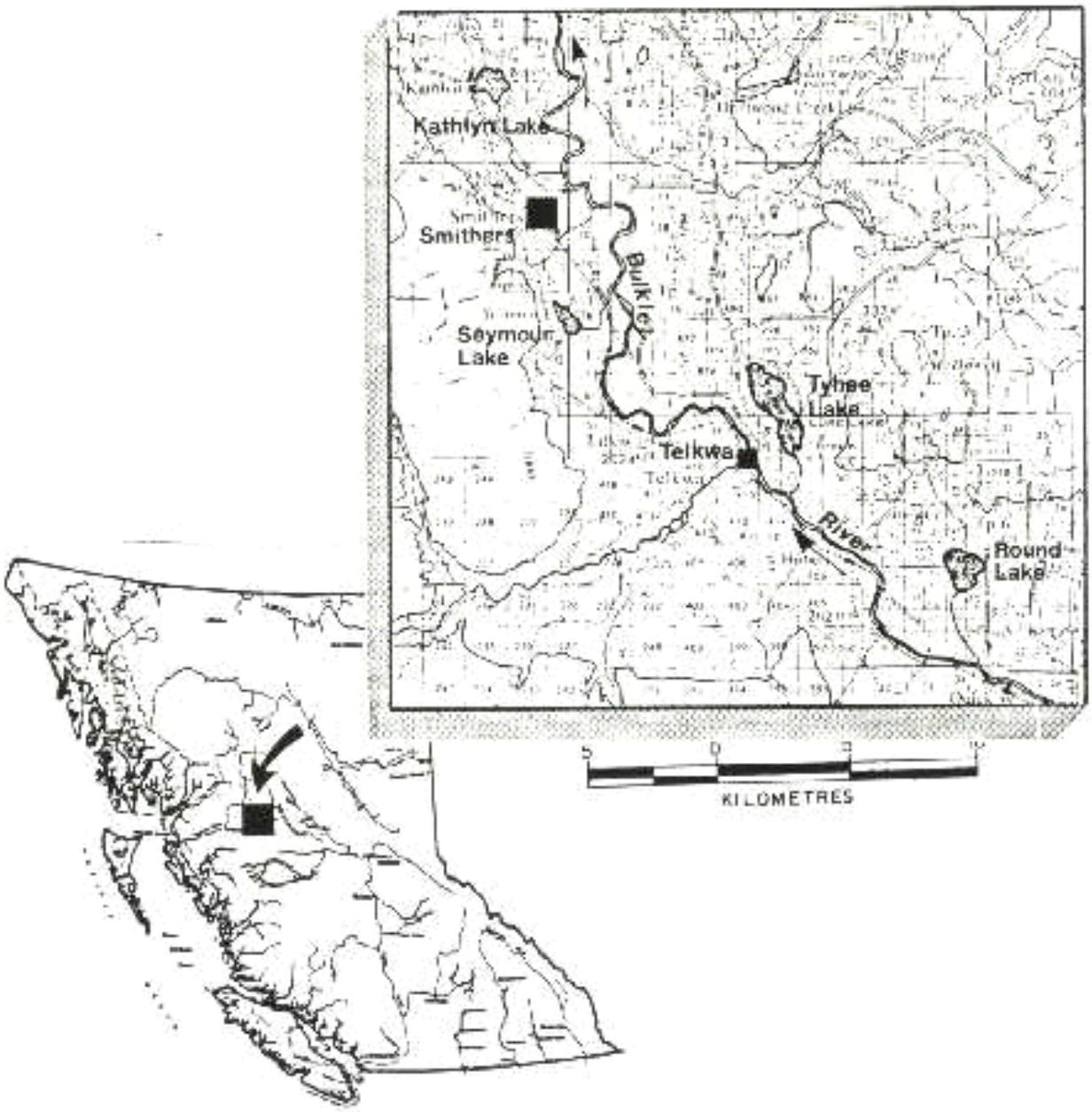


Figure 7. Kathlyn, Seymour, Round and Tyhee Lakes

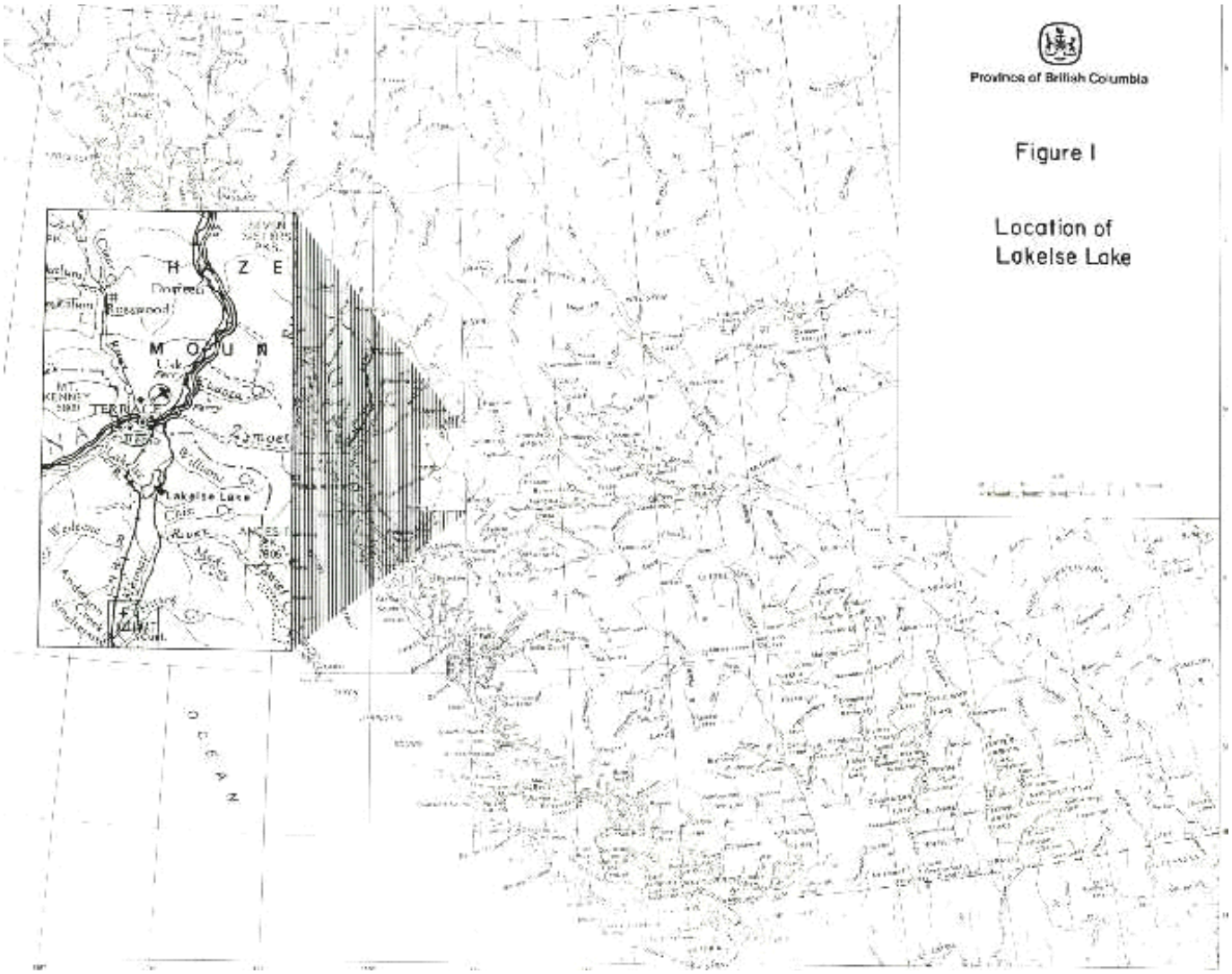


Figure 8. Lakelse Lake.

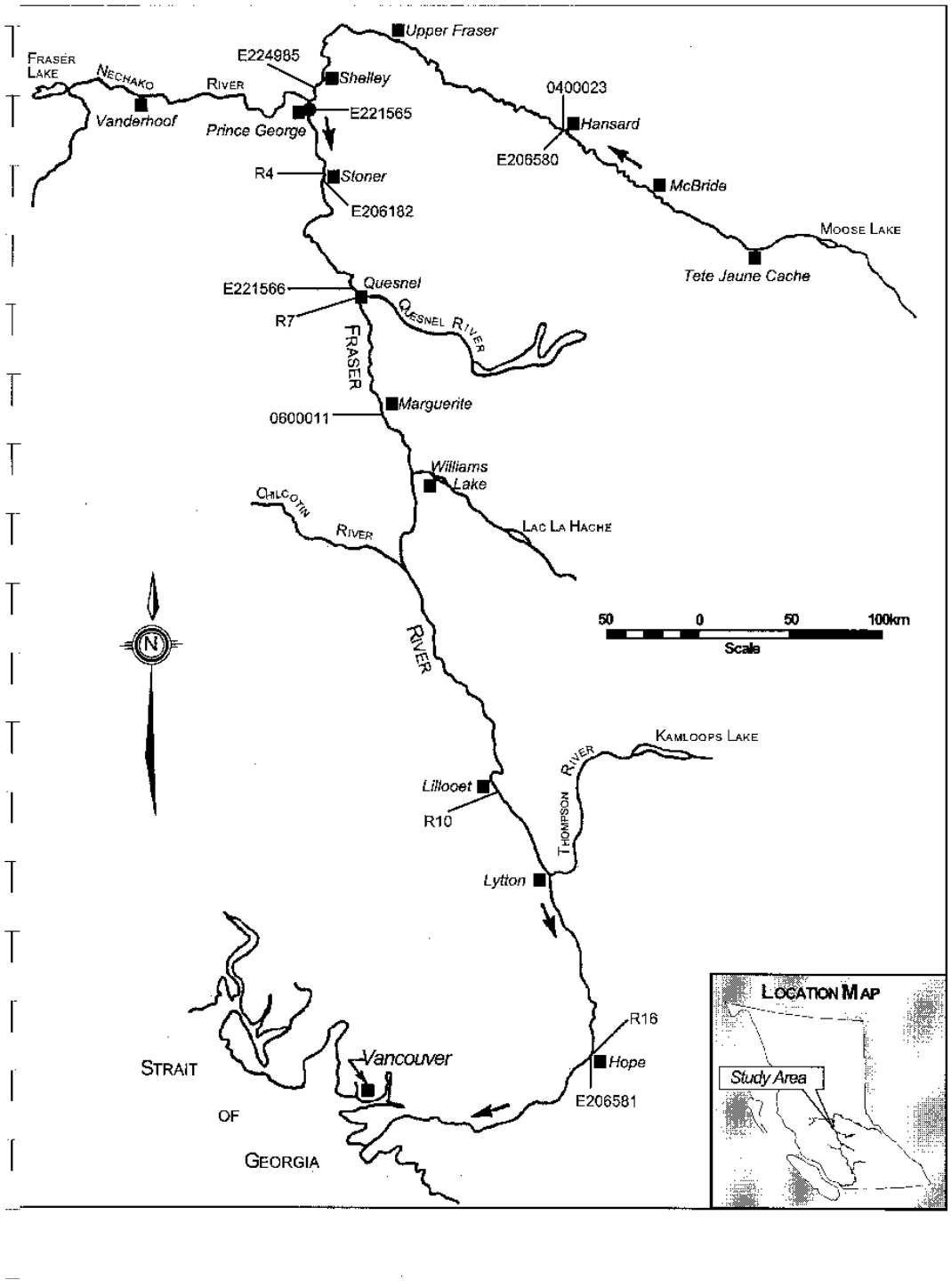


Figure 9. Fraser River (From the Source to Hope)

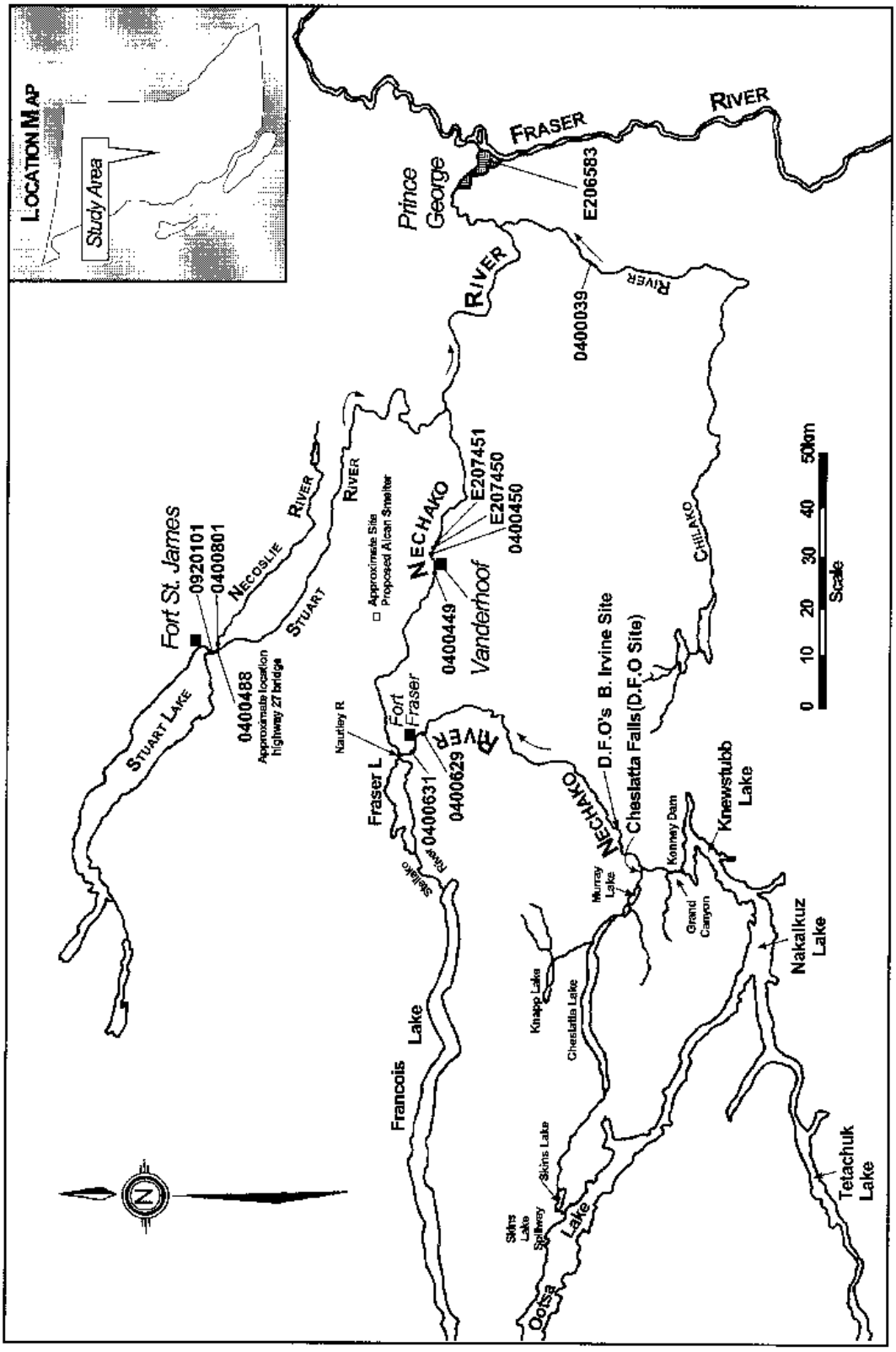
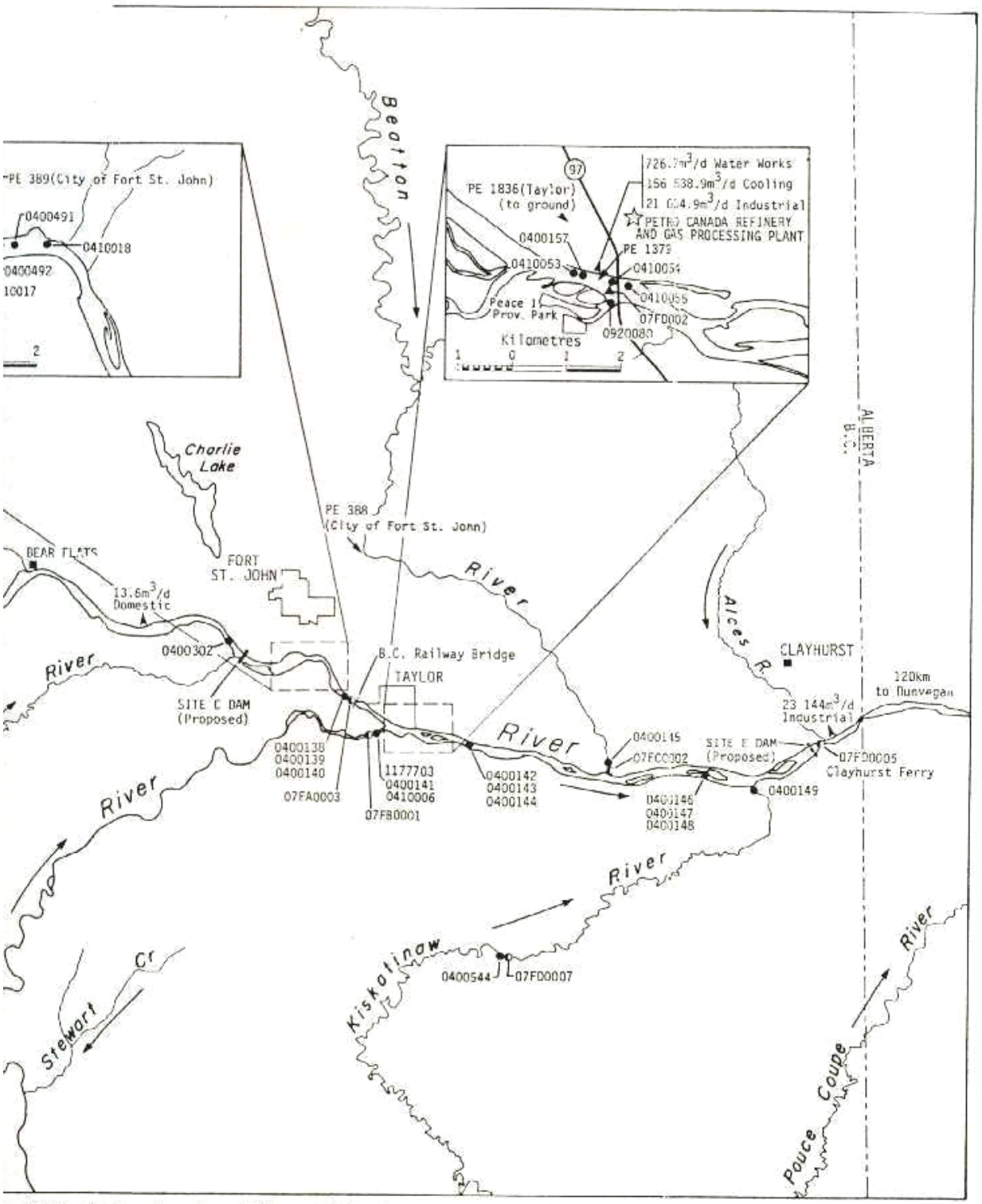


Figure 10. Nechako River



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

Figure 11. Peace River

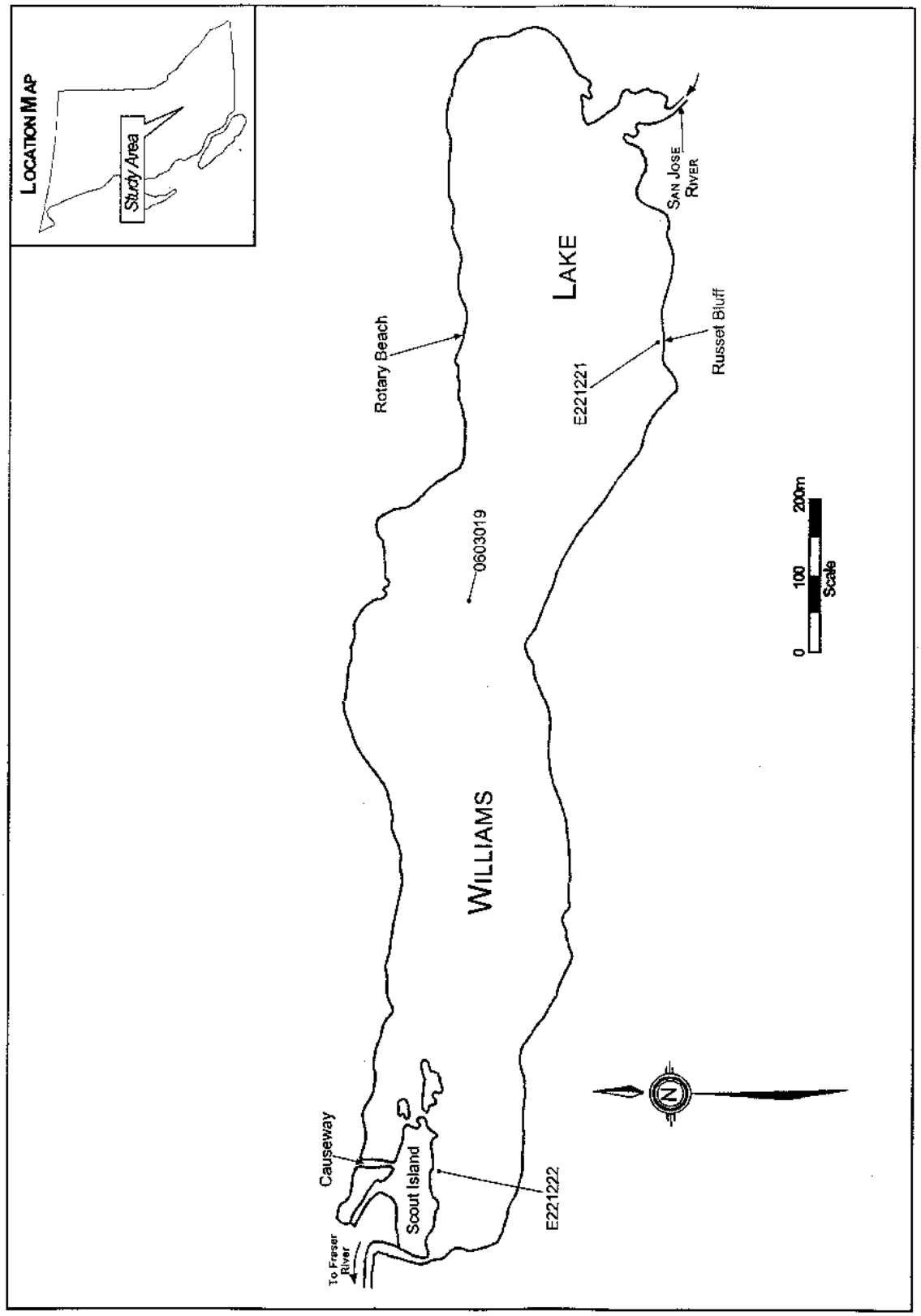


Figure 12. Williams Lake

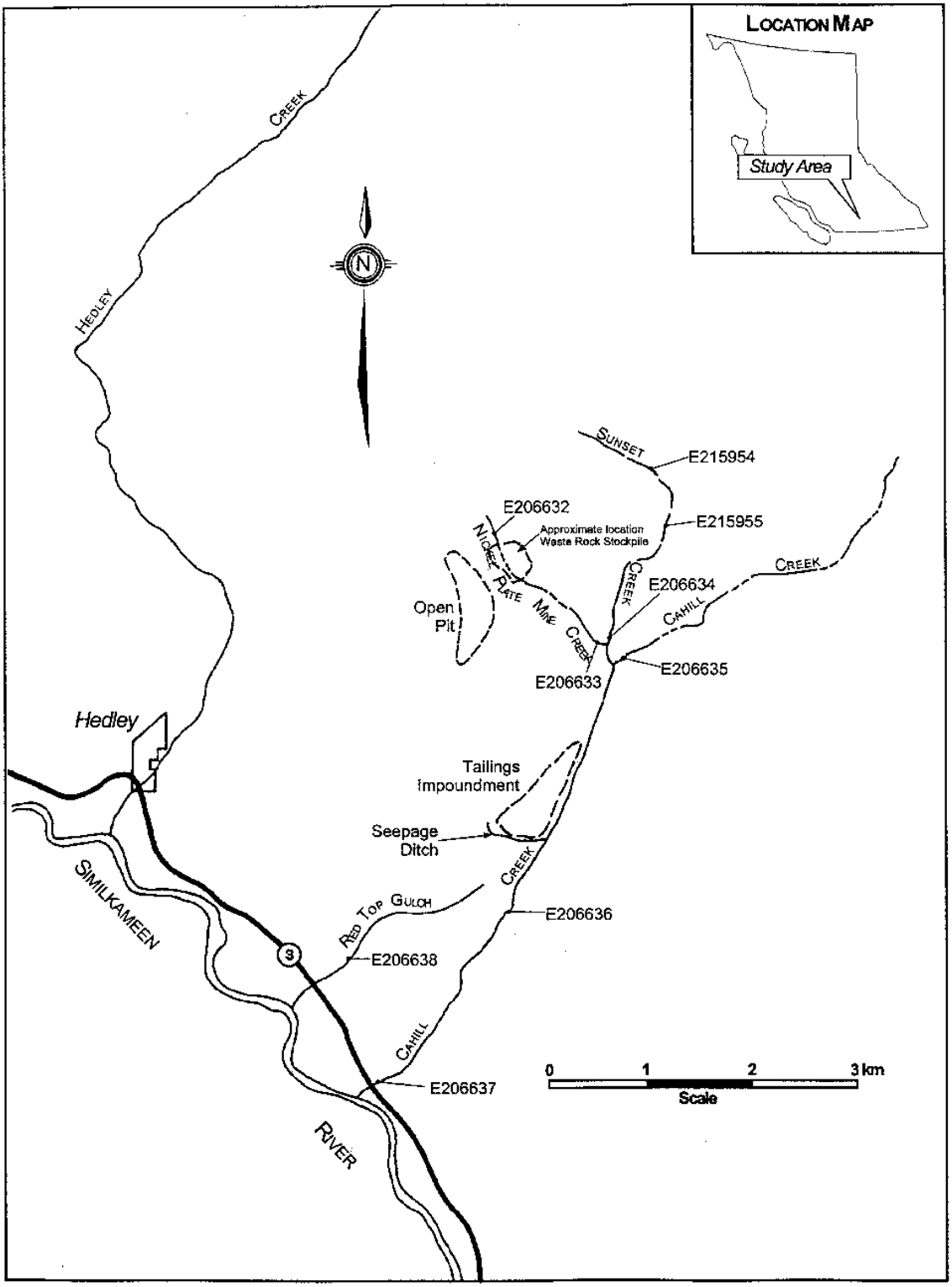


Figure 13. Cahill Creek.

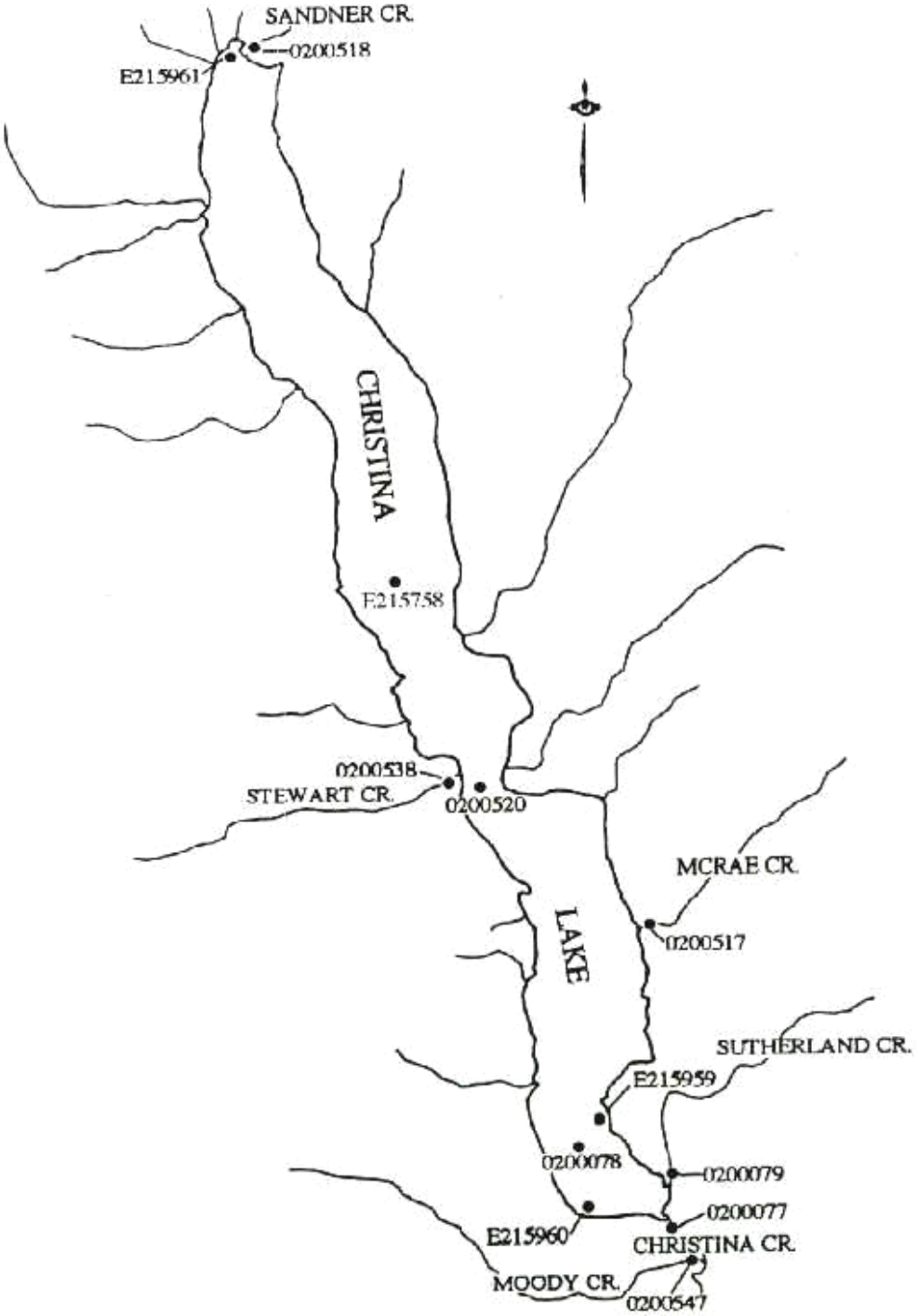


Figure 14. Christina Lake

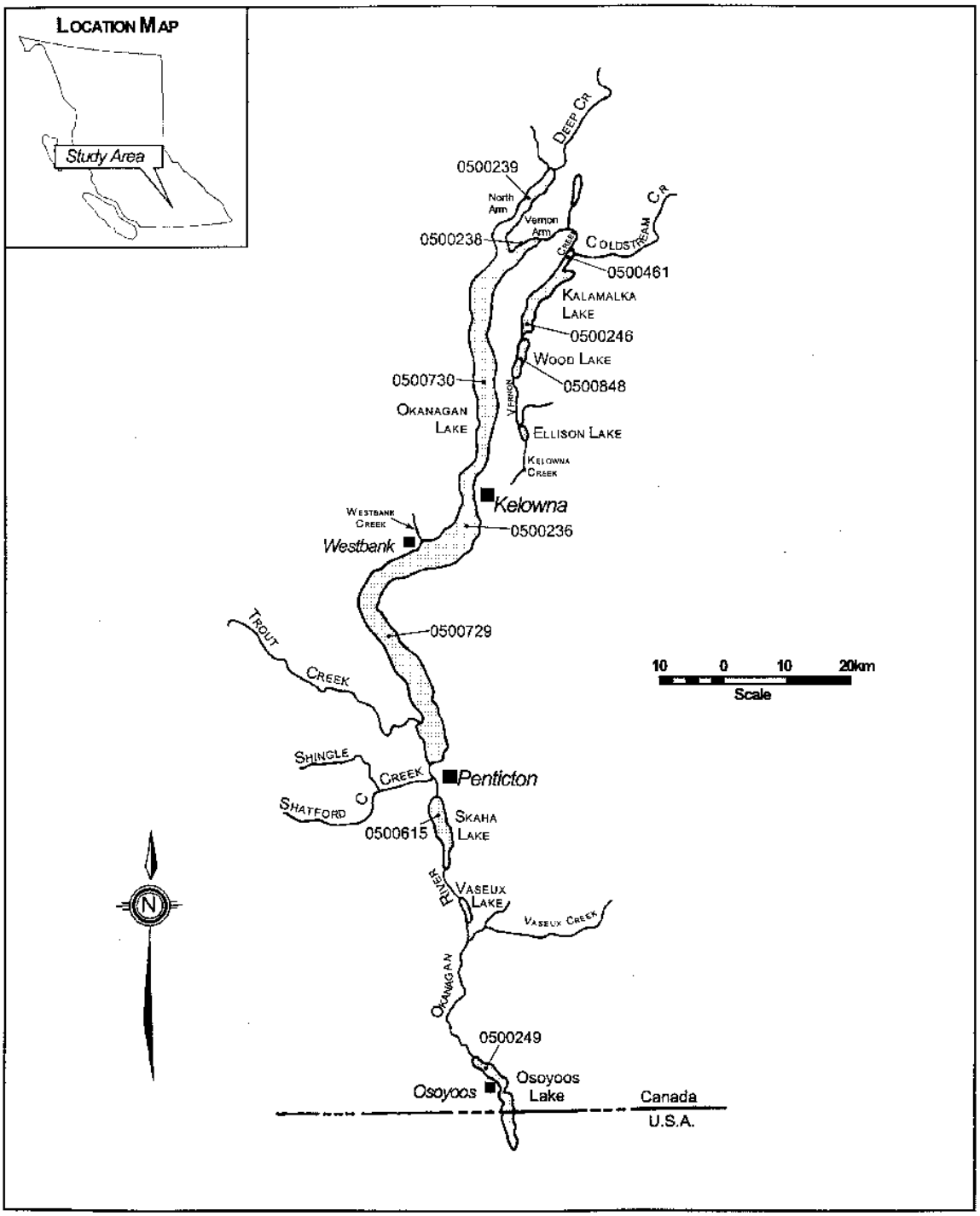


Figure 15. Okanagan Valley Lakes.

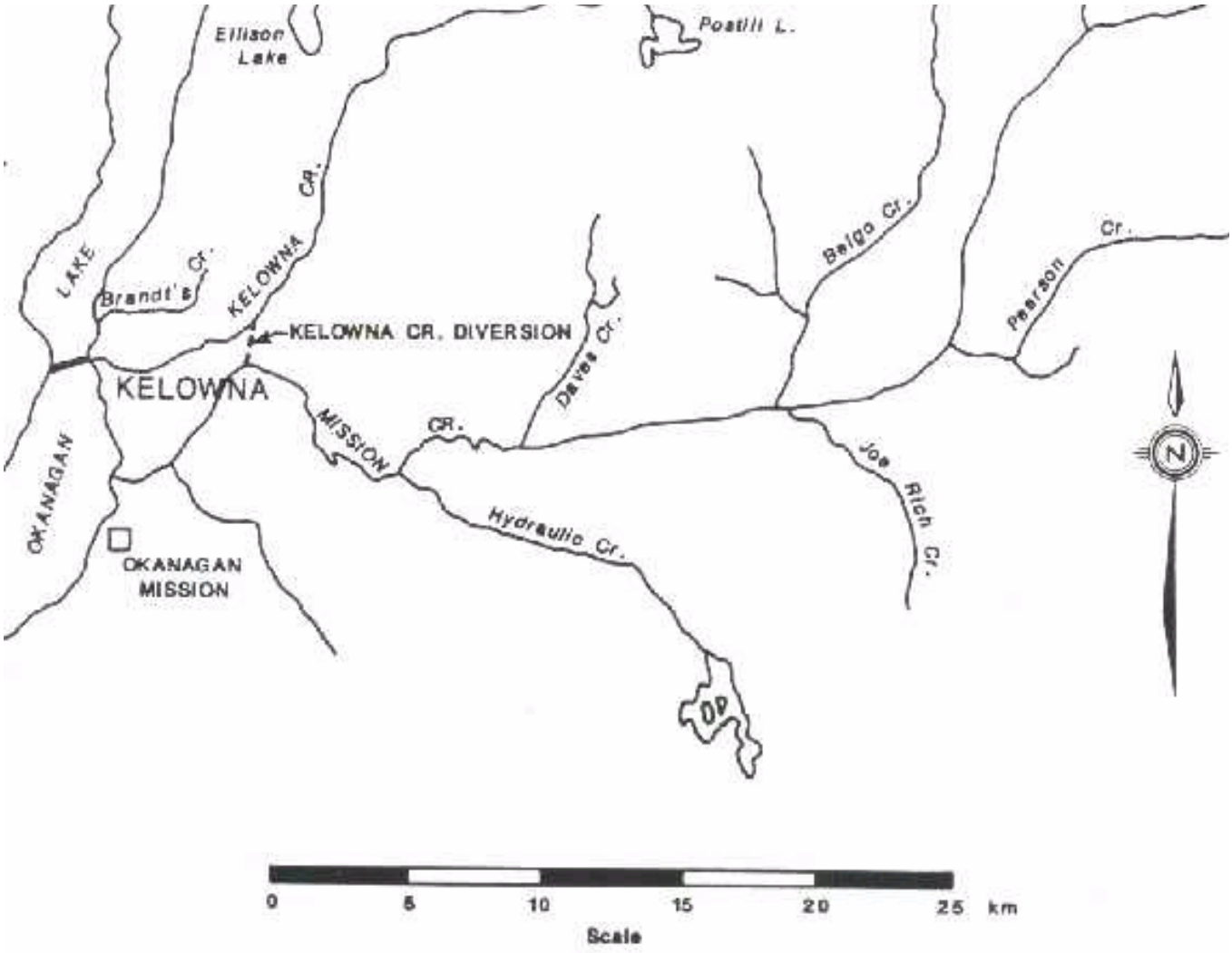


Figure 16. Okanagan Tributaries Near Kelowna.

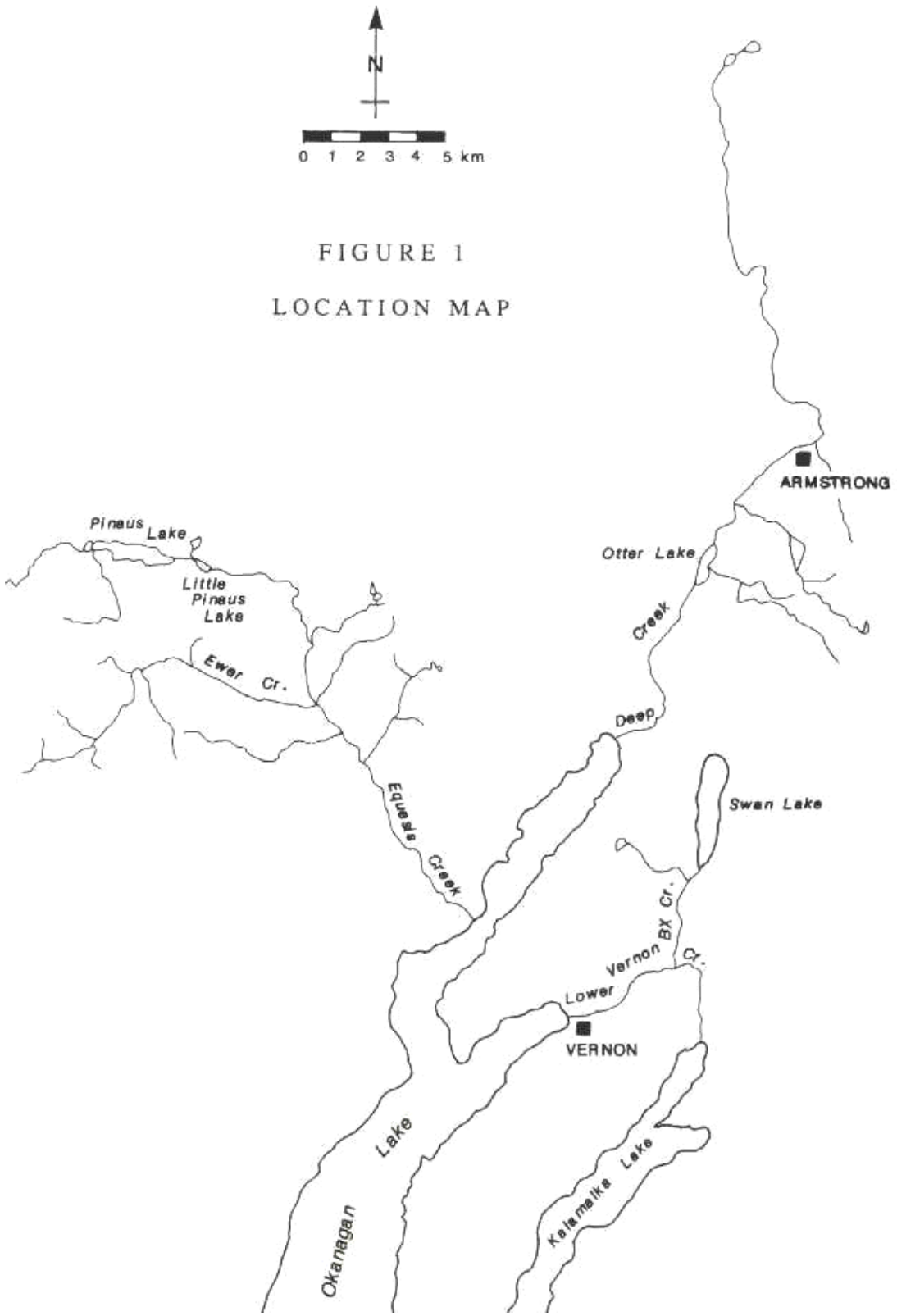


Figure 17. Okanagan Tributaries Near Vernon.

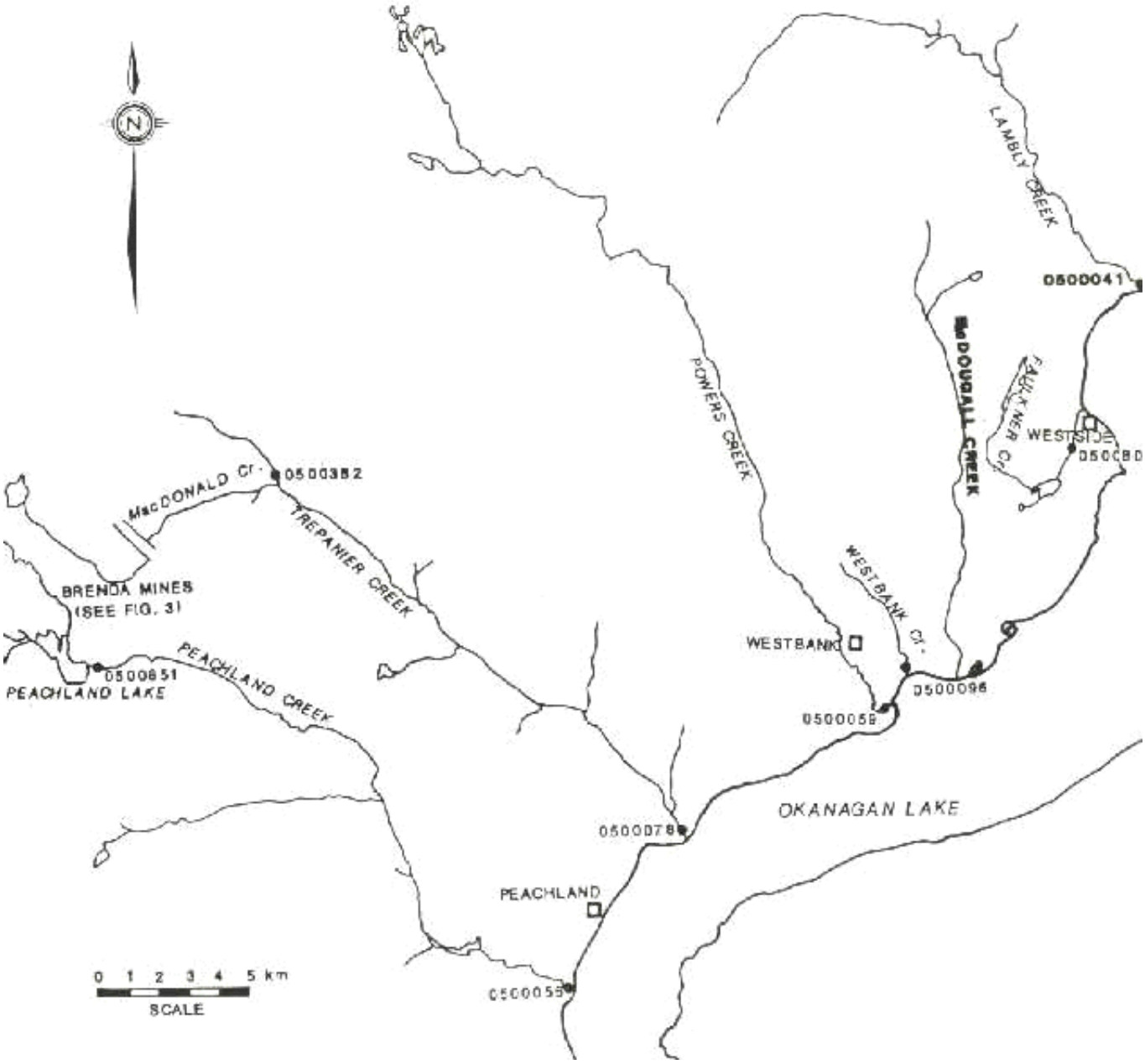


Figure 18. Okanagan Tributaries near Westbank.

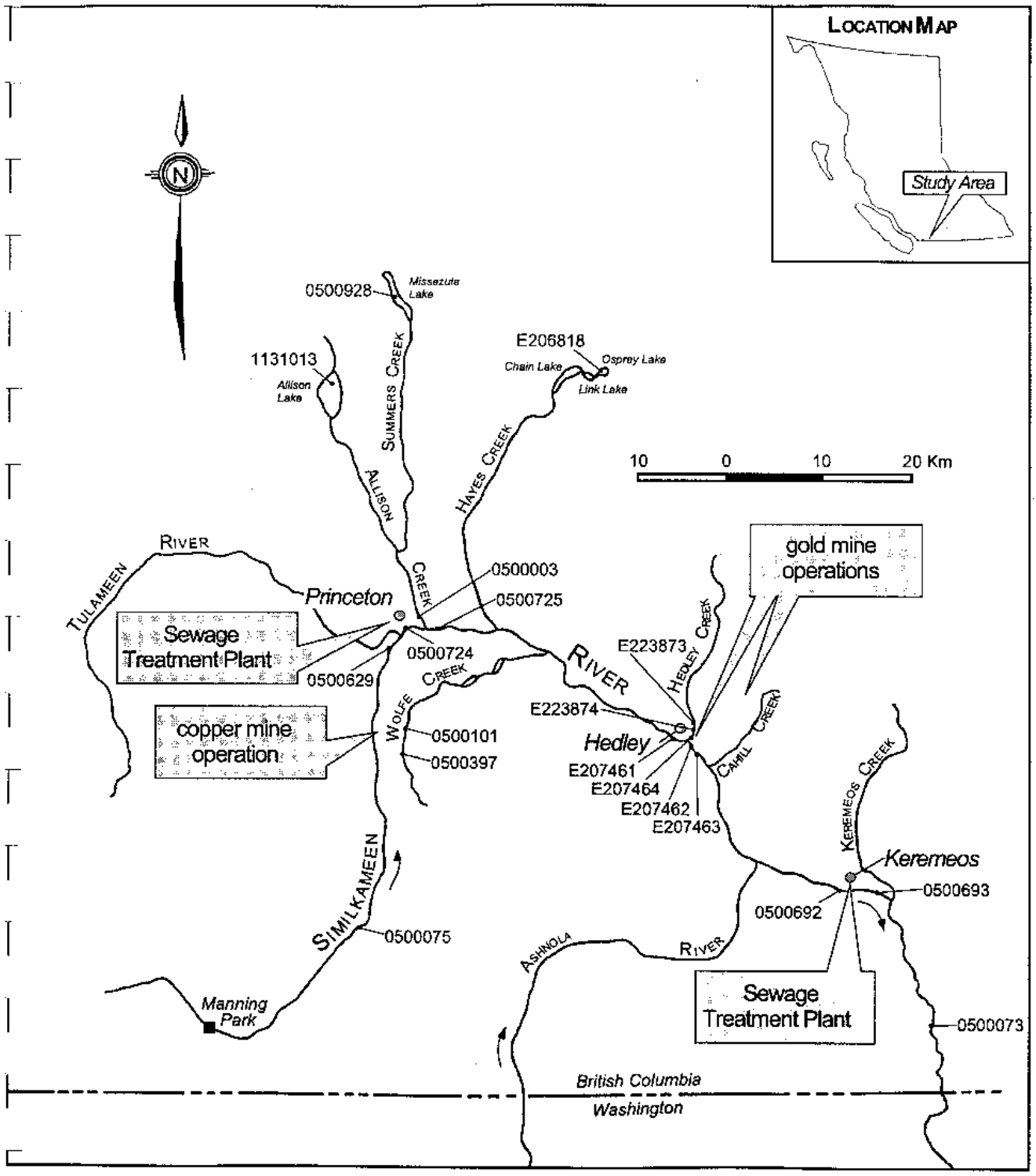


Figure 19. Similkameen River.

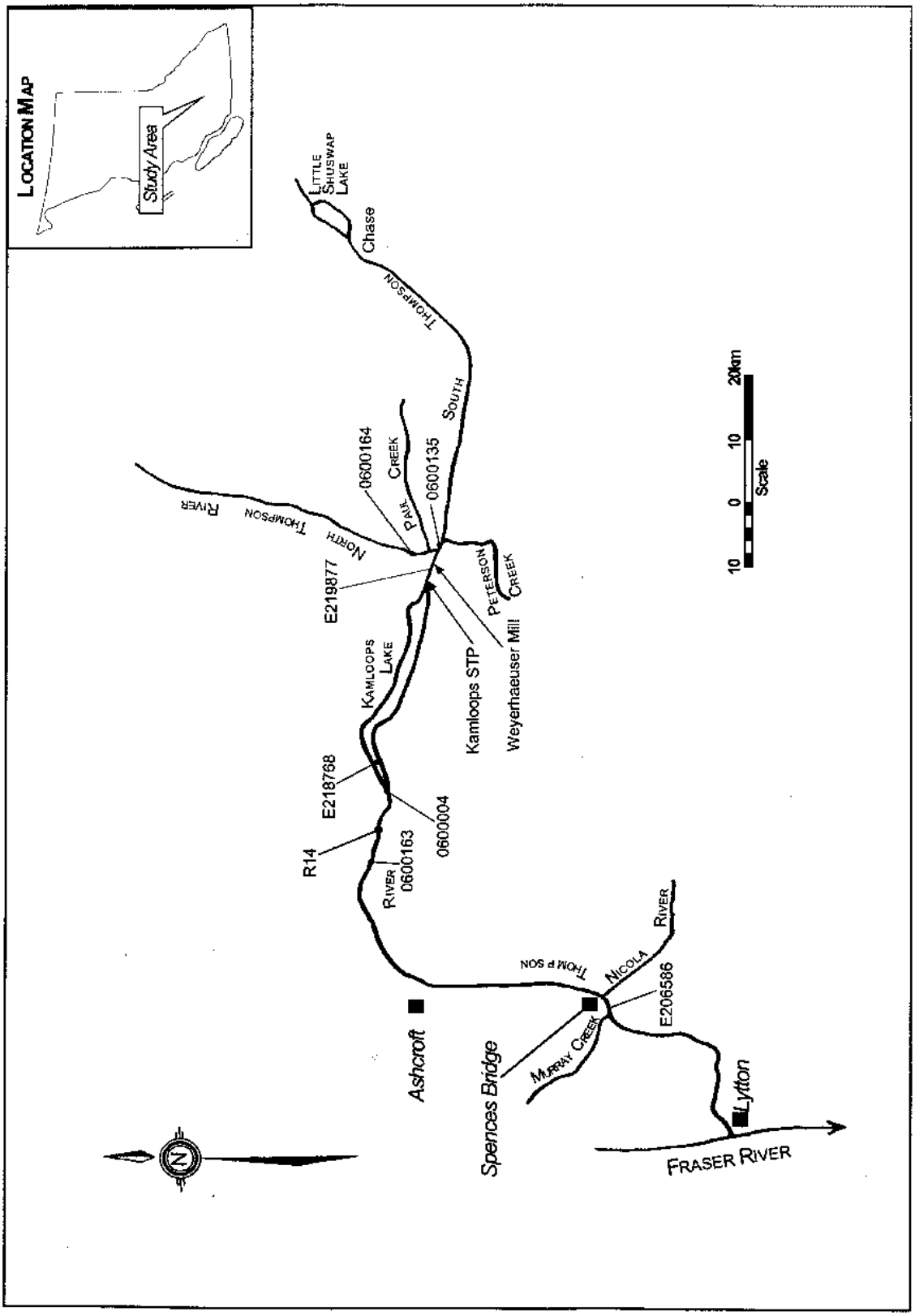


Figure 20. Thompson River.

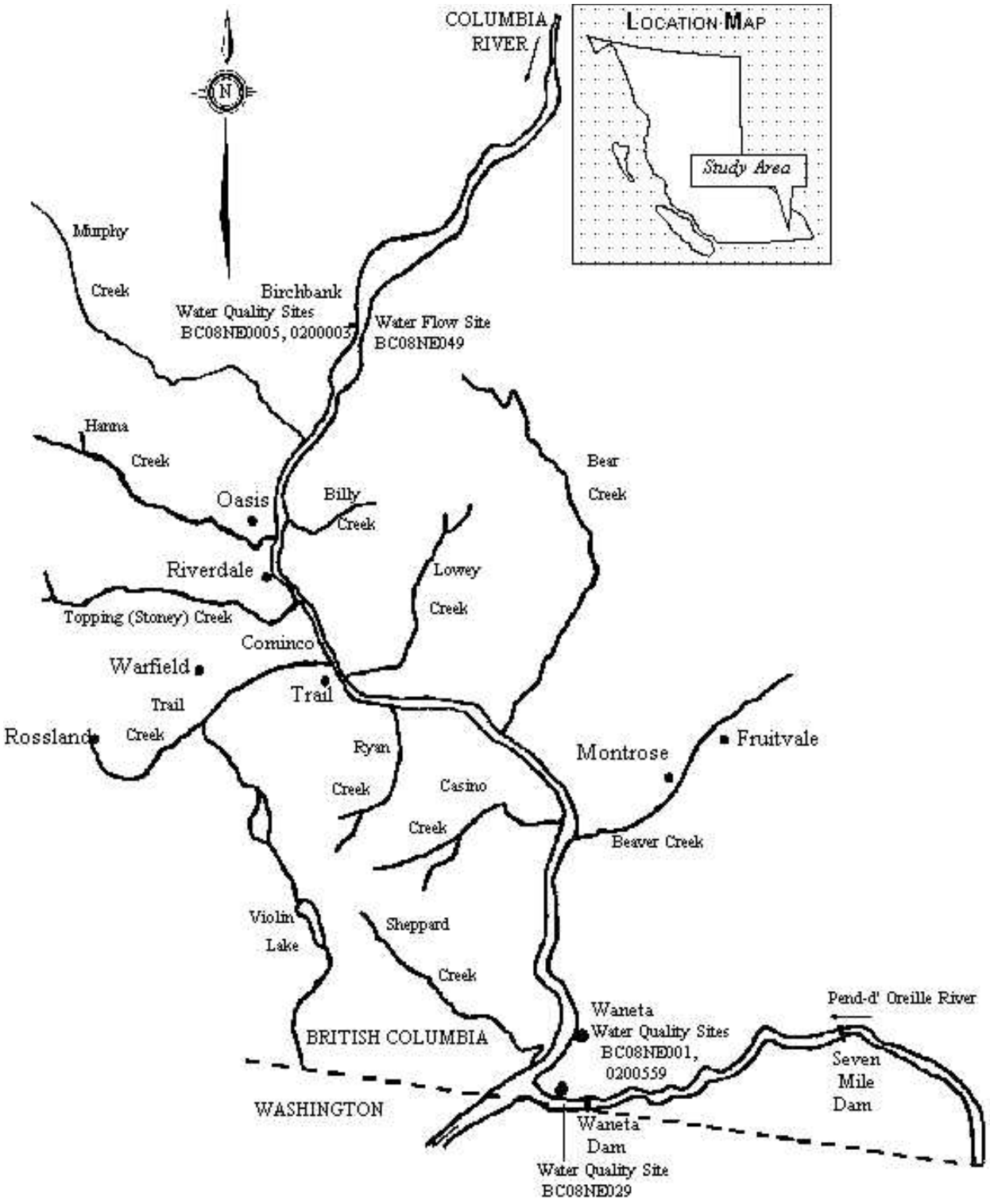


Figure 21. Columbia River from Birchbank to the International Border.

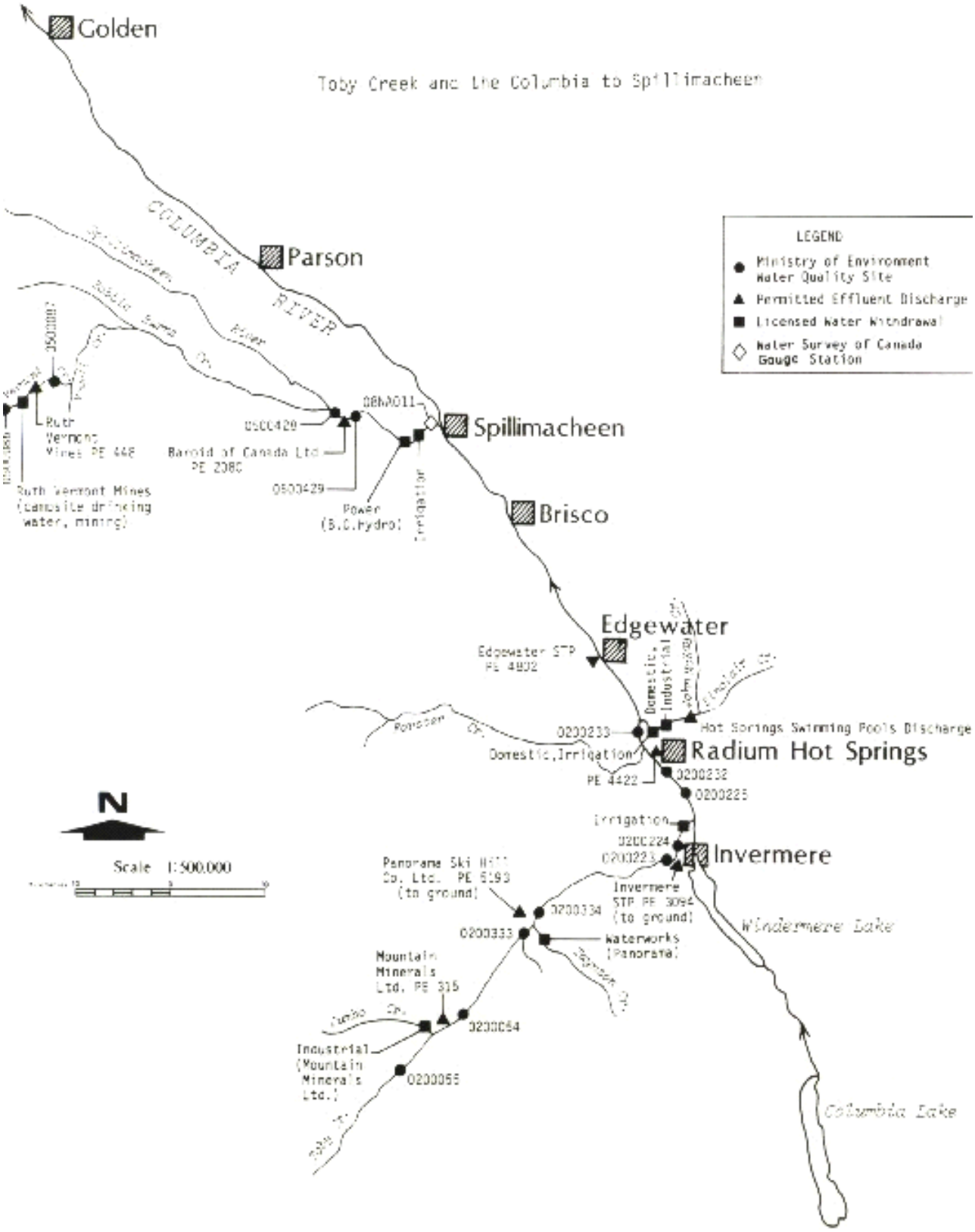


Figure 22. Toby Creek and Upper Columbia River.

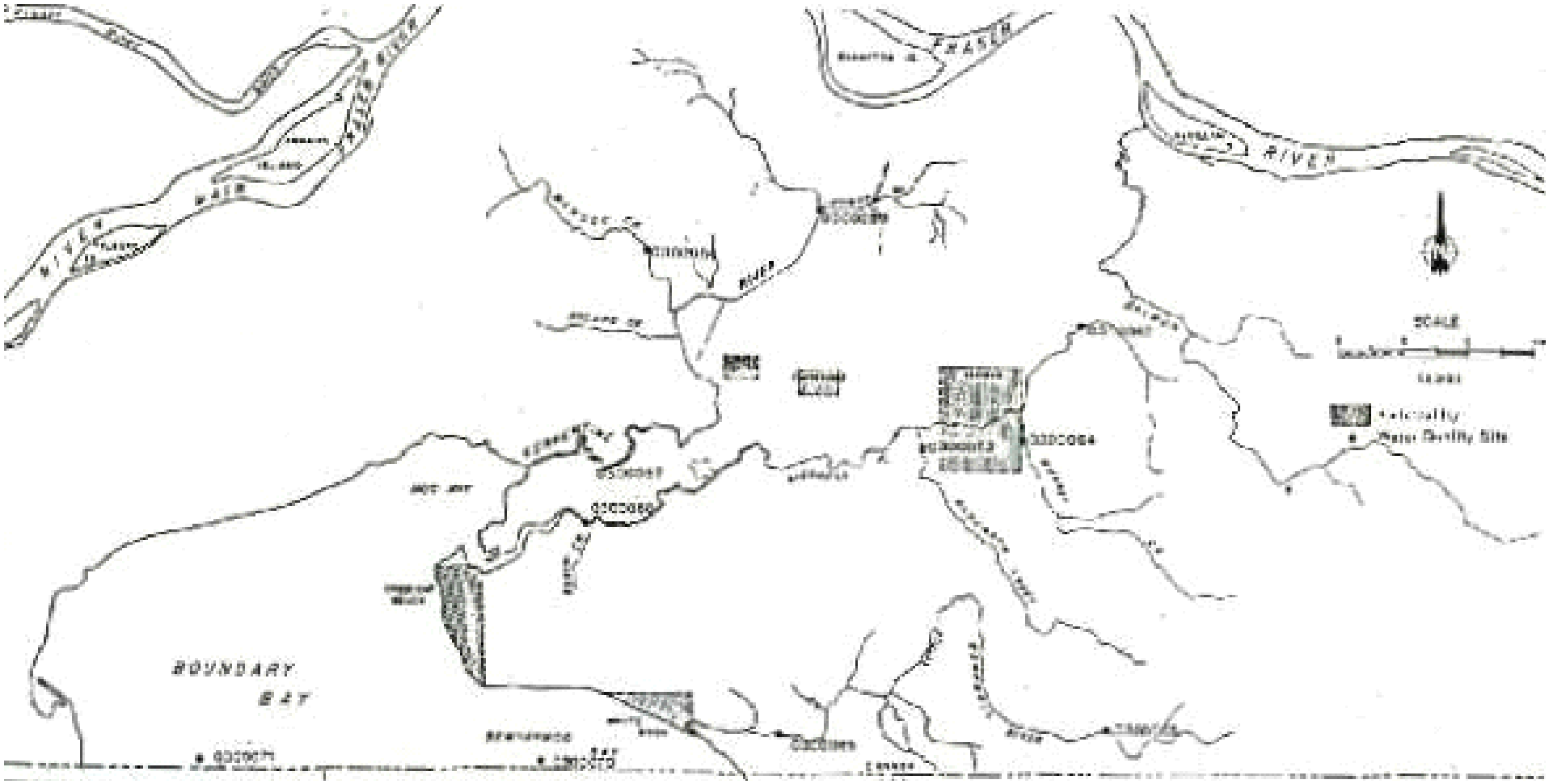


Figure 23 Boundary Bay.

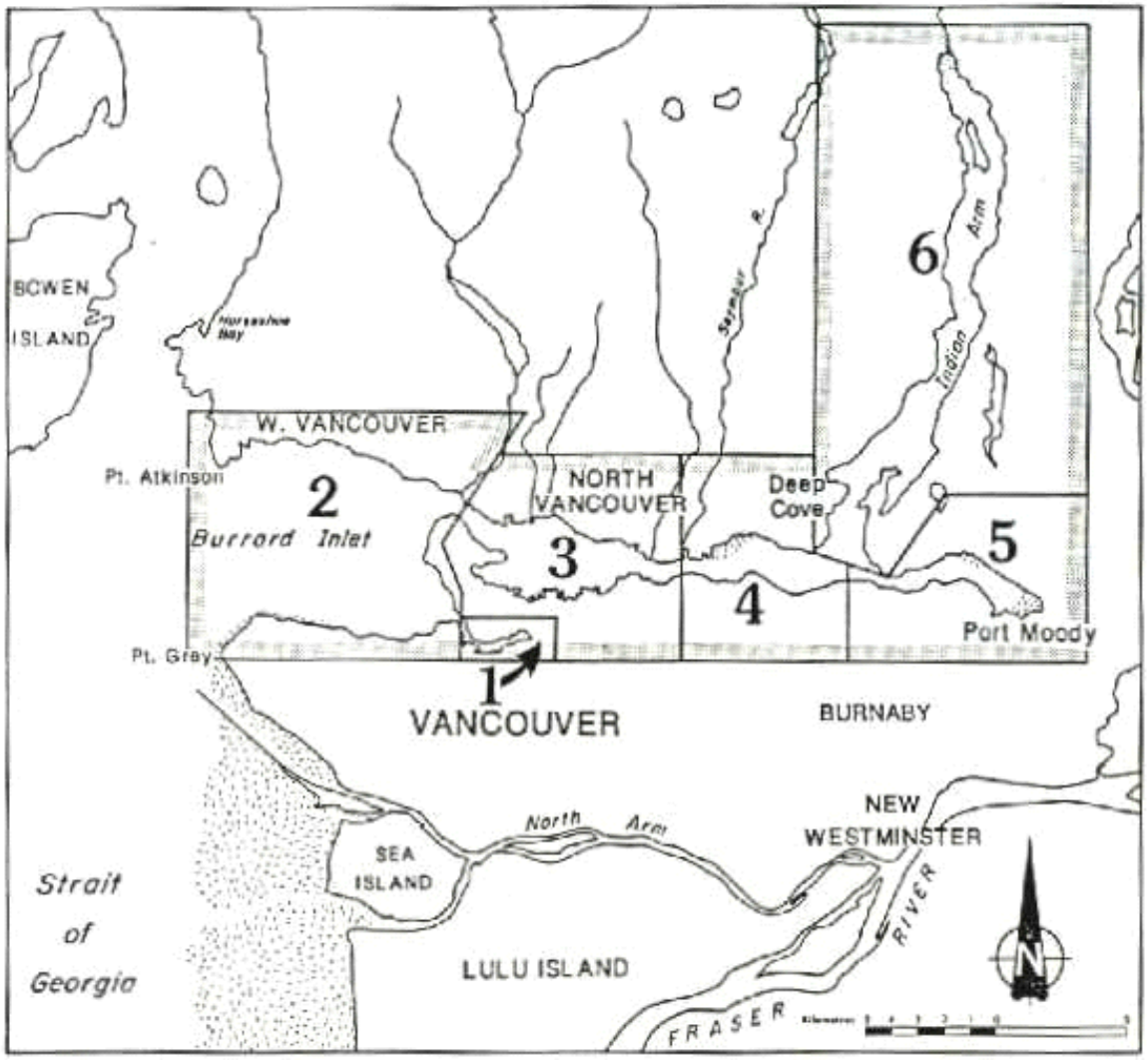


Figure 2. Sub-Basins in the Burrard Inlet Study Area

Legend
1 False Creek
2 Outer Burrard Inlet
3 First Narrows to Second Narrows (Vancouver Harbour)
4 Second Narrows to Roche Point
5 Port Moody Arm
6 Indian Arm

Figure 24. Burrard Inlet Sub-basins.

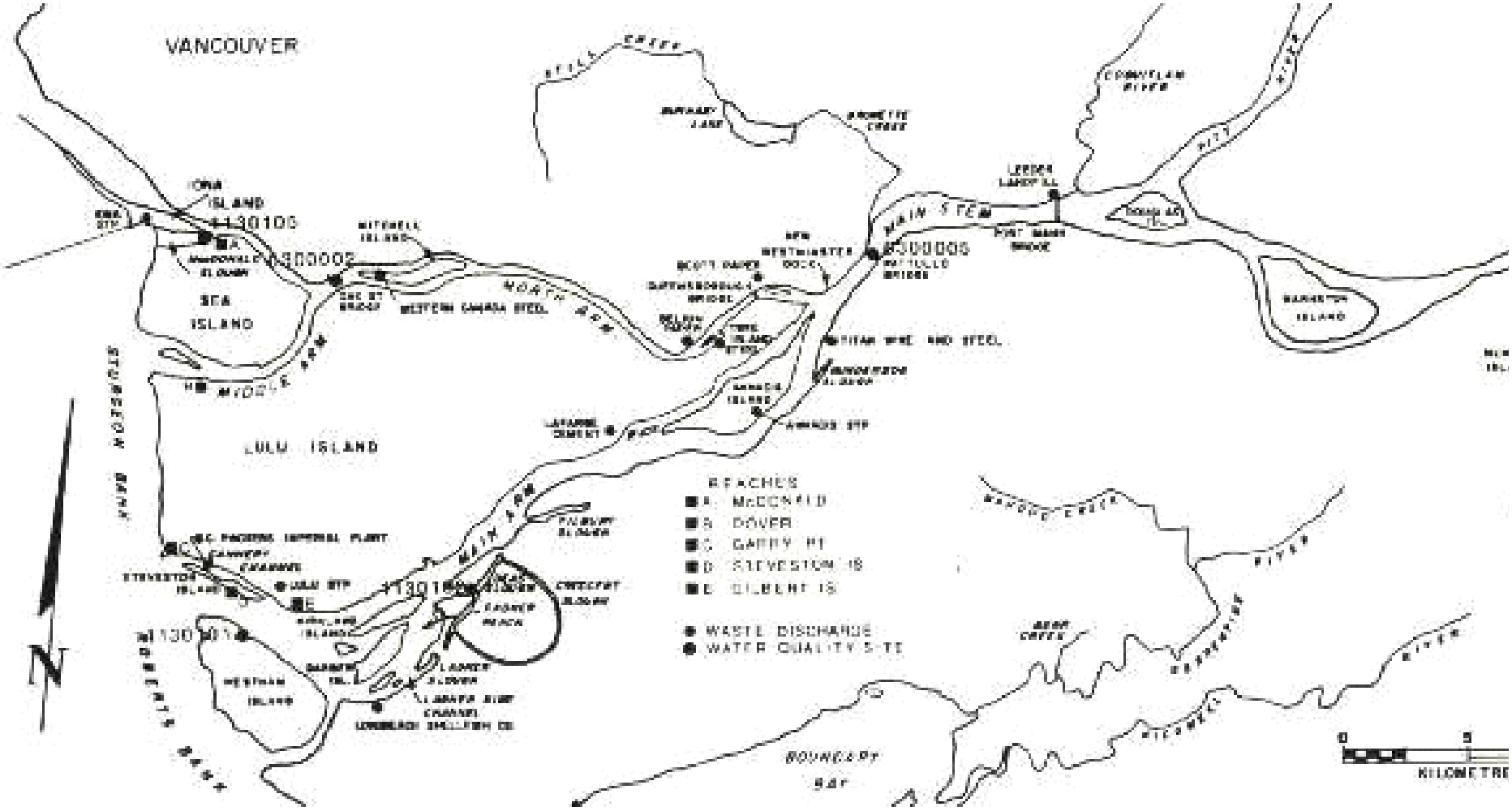


Figure 25. Fraser River - Kanaka Creek to the Mouth.