Errata sheet for Report: Water Quality in B.C. - Objectives Attainment in 1995

The following corrections are required for Bessette Creek:

page 75, in Table 12 under total chlorophenols in sediments, change the values at site E210219 in Harris Creek to be the same as at site E209072 and the conclusion to read "Objective met"

.1

page 30, under Bessette Creek, third paragraph, omit from the list of objectives not met at times the statement "chlorophenols in sediments from Harris Creek" and add it to the list of objectives met.

WATER QUALITY SECTION WATER MANAGEMENT BRANCH MINISTRY OF ENVIRONMENT, LANDS AND PARKS

Water Quality in British Columbia

Objectives Attainment in 1995

January, 1997

Canadian Cataloguing in Publication Data

Main entry under title:

Water quality in British Columbia : Objectives attainment in ... -- 1995 -

Annual.

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

ISNN 1195-6550 = Water quality in British Columbia

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

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

SUMMARY

The setting of water quality objectives in priority basins in British Columbia began in 1982. By the end of 1995, the Ministry had set water quality objectives in 43 bodies of water, 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 in 1995 to check the attainment of objectives in 16 basins, a reduced program compared to previous years.

The results are summarized in a series of tables. For all Ministry Regions the objectives were met 83 percent of the time. This is slightly less than last year's 87 percent and also less than most previous years when attainment ranged from 94 percent in 1987 to 87 percent in 1993. There is not 100 percent compliance 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 1995 included fecal coliforms, *E. coli*, suspended solids, chlorophyll-*a* (a measure of algal growth in lakes and streams), total phosphorus in lakes, and dissolved oxygen. The objective for dioxins and furans in fish to protect fish from chronic toxic effects was also not met at times in three basins, although the criterion for human consumption was always met and there is no restriction on eating fish from rivers and lakes.

The Ministry recently developed a water quality index to help interpret objectives attainment data. The index reduces the water quality information, as tabulated in this report, to a simple category or rank describing the state of water quality in a body of water. The index is applied to the 1995 data to rank some of the water bodies in this report. It was also applied to water bodies in 33 basins to produce the B.C. Water Quality Status Report. This report gives the public information on the suitability of specific bodies of water for a variety of uses, based on objectives monitoring from 1987 to 1993.

ACKNOWLEDGEMENTS

The regional staff of Environmental Protection carried out most of the monitoring, either directly or by using co-op students and contractors. Zenon Environmental Laboratories analyzed the samples for most variables except for microbiological indicators measured by J.R. Laboratories and biological communities measured by Fraser Environmental Services.

Information was also obtained from regional offices of B.C Environment, from the federal Department of Fisheries and Oceans, from RL & L Environmental Services on behalf of B.C. Hydro, from Hatfield Consultants Ltd., from Celgar Pulp Company, and from the Greater Vancouver Regional District.

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INTRODUCTION

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

Water quality objectives are safe conditions or threshold levels of a substance which 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. They 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 43 areas or basins and updated them in one. 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 1995 is the tenth in a series of annual reports which 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 Water Management Branch of the Ministry in Victoria.

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 recently developed a water quality index. 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 which 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.

The index has been applied in 33 water basins plus 5 groundwater aquifers in the Province to produce a B.C. Water Quality Status Report. This report, the first of its kind, is a user-friendly document intended to show the public 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 July, 1996, and is available from the Ministry.

METHODS OF PRESENTING AND INTERPRETING THE DATA

Reports on Objectives

At the present time, the Ministry of Environment has completed 43 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	6
Skeena	5
Omineca-Peace	8
Cariboo	2
Southern Interior	11
Kootenay	3
Lower Mainland	8
Total	43

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

Tables of Results

We have summarized the data collected in 1995 in Tables 2 to 17, with a separate table for each of the 16 water basins monitored. Because of funding limitations, fewer basins were monitored than in previous years.

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 criteria 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 MPN/100 mL for fecal coliform values is used when high fecal coliform values are recorded at bathing beaches. In some cases, such as Kitimat Arm, we have added some generalized water quality

criteria to allow for the fact that threats to water quality have changed or are better understood since publication of the objectives reports.

Five different concluding statements are used: objective met, objective not met, indefinite result, objective not checked, and omitted 1995. We consider the objective to have been met if the monitoring result equalled or was within the objective limit. We report the result as indefinite if there were insufficient data to check the objective, the data were suspect, or the minimum detectable concentration was too high. We report the objective as not checked if, for some reason, planned data collection did not take place. We report the objective as omitted if the plan was to not monitor 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 in 1995.

Text

In the next section, the text presents the results of our 1995 quality assurance program to test the accuracy and precision of laboratory data. 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 them 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 apparent borderline cases. Although a more detailed interpretation is desirable, this is not done here because it would require the presentation of much more data which is 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 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 1995 helps highlight those variables which had a detrimental effect on water quality in a particular water body.

The 1995 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 1 shows the 43 basins where objectives have been set. Separate maps, Figures 2 to 17, illustrate the 16 water basins monitored in 1995 and show the sampling sites referred to in the tables. Each figure number corresponds to the table of the same number.

Guide to Ranking Future Monitoring

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

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

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

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

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

QUALITY ASSURANCE PROGRAM

Introduction

This is the fifth year of our quality assurance program which describes the accuracy and precision of test results. Details on procedures and results are in a draft report available from the Water Management Branch (Quality Assurance / Quality Control for the 1995 Water Quality Objectives Program - December, 1995).

We present here results from testing 9 general variables plus 17 metals in water. In addition we tested 11 metals in marine sediments and 14 PAHs in river estuary sediments. We chose the variables based on important objectives most frequently exceeded as well as on availability of reference materials. For example, we could not include fecal coliforms due to the lack of standard references.

In an ideal situation one would aim to measure the accuracy and precision of the total monitoring process. This would include sample collection, handling in the field, shipping, storage, and laboratory analysis. In 1995, we measured the accuracy and precision of the laboratory analyses with some work on combined field plus laboratory precision. The results apply to the June to August operating period of the laboratory when most ambient sampling occurs.

Procedure

For general variables, we obtained standard reference solutions from an established laboratory which had certified the levels. Similar standard reference solutions were obtained for the metals. Marine sediments tested contained certified levels of metals and estuarine sediments tested were spiked with PAHs.

Where possible, we chose concentrations for these references that were usually close to the maximum criterion level to protect aquatic life for each substance. Results thus indicate the confidence one may have in laboratory data at levels where sensitive objectives are set. However, these levels were sometimes near or below laboratory detection limits and therefore could produce poor accuracy and precision.

We submitted all reference samples to the analyzing laboratory as if they were environmental samples. All variables were analyzed in their unfiltered or total state.

General variables in fresh water

The National Water Research Institute prepared 20 identical samples, each 500 mL, with certified values for 9 variables. These were pH, colour, specific conductance, turbidity, hardness, fluoride, ammonia, nitrate plus nitrite, and sulphate.

The samples were sent for analysis to Zenon Environmental Laboratories of Vancouver which was the laboratory generally used for objectives work. The samples were submitted five at a time in four separate batches between late June and early August for a total of 20 samples.

Metals in fresh water

The National Water Research Institute prepared 20 identical samples, each 100 mL, with certified values for elements and metals, 17 of which are reported on here. These are aluminum, arsenic, barium, calcium, cadmium, chromium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, nickel, selenium, sodium, and zinc.

We submitted these samples to Zenon in four batches of five from June to August for a total of 20 samples.

Zenon analyzed for arsenic, cadmium, lead, and selenium using a low-level atomic absorption method. For the other metals, Zenon used a metals package with ICP emission spectroscopy which gives higher minimum detection levels then the low-level method.

Metals in marine sediments

The National Research Council (NRC) provided two reference sediment materials with certified metal concentrations. One was from the Gulf of St. Lawrence and one from Esquimalt Harbour. The Esquimalt Harbour sediment had generally much higher metal levels. The 11 elements of interest in each were arsenic, cadmium, cobalt, chromium, copper, lead, manganese, mercury, molybdenum, nickel, and zinc.

The freeze-dried sediment powders received from NRC were transferred to Zenon sample

containers. Samples were sent to Zenon, five at a time for each reference, in four batches between July and August. We submitted a total of 20 samples of each reference.

PAHs in estuarine sediments

The National Research Council (NRC) provided sediment collected from a Nova Scotia estuary and spiked with PAHs after processing. There were eight high molecular weight and five low molecular weight PAHs at given concentrations.

The reference values were not certified but represented the average of several measurements. We submitted a total of 20 samples to Zenon in four batches, each batch containing five samples.

Results

We calculated the accuracy and the precision of the laboratory measurements. The accuracy (also called bias or percent recovery) is a measure of how the analytical result differs from the true value. It is expressed as a percent by dividing the analytical result by the true concentration of the reference solution or material. The precision is a measure of the repeatability of the analysis. It is also expressed as a percent by dividing the standard deviation of the analytical results by their mean.

We present the mean result obtained by Zenon for all 20 samples submitted at a given value or concentration together with the equivalent reference concentration or value. We also show the average accuracy and precision of Zenon's results. We consider that acceptable limits for the average accuracy and precision are those provided for the reference material.

General variables in fresh water

pН

Zenon's mean pH was 7 compared to the reference pH of 7.15. Zenon's accuracy of 96% and its precision of 2.4% were both within acceptable limits.

Colour

Zenon's mean colour value was 5 TCU compared to the reference colour level of 6.9 TCU. Zenon's accuracy was 72% which is within acceptable limits. The precision was 0% since all Zenon's measurements were at the detection limit.

Specific conductance

Zenon's specific conductance value was 47 μ S/cm compared to the reference level of 53.3 μ S/cm. Zenon's accuracy was 89% and its precision was 5%. Although they were outside the acceptable range given for the reference, they were still within reasonable limits.

Turbidity

Zenon's mean turbidity was 0.18 NTU compared to the reference level of 0.19 NTU. The accuracy of 95% was high although the precision of 76% was not as good. However, the values were close to Zenon's minimum detection level of 0.1 NTU and below levels of environmental significance.

Hardness

Zenon's mean hardness value was 12 mg/L compared to the reference value of 21.27 mg/L. The accuracy of 58% was poor although the precision of 6.2% was reasonable.

Fluoride

The reference concentration for fluoride of 0.051 mg/L was below Zenon's minimum detection level of 0.1 mg/L We could therefore not calculate accuracy or precision, although all Zenon's values were reported correctly as below detection. The reference concentration was also below values considered toxic to aquatic life.

Ammonia nitrogen

Zenon's mean concentration was 0.043 mg/L compared to the reference value of 0.023 mg/L. As one would expect, Zenon's accuracy of 186% was outside the acceptable range although the precision of 27% was good. The reference concentration was low and below values considered toxic to aquatic life.

Nitrate + nitrite nitrogen

Zenon's mean concentration was 0.10 mg/L compared to the reference value of 0.085 mg/L. Zenon's accuracy of 118% and precision of 22% were reasonable, although these were very low concentrations for general water quality.

Sulphate

Zenon's mean concentration was 8.07 mg/L compared to the reference value of 8.38 mg/L. Zenon's accuracy of 96% was good but its precision of 57% was poor. The poor precision came from a batch of five samples giving a result below the detection level of 1 mg/L.

Metals and elements in fresh water

Aluminum

Zenon's mean concentration was 0.065 mg/L compared to the reference value of 0.067 mg/L. Zenon's accuracy of 103% was acceptable and the precision of 18% close to acceptable. Both improved once an outlier (0.11 mg/L) was removed from the data set. There were six results reported as below detection caused by Zenon's minimum detection level of 0.06 mg/L being close to the reference value.

Arsenic

Zenon's mean concentration was 0.0020 mg/L compared to the reference value of 0.0021 mg/L. Zenon's accuracy of 97% was good but its precision of 38% fell outside acceptable limits. One value out of the 20 results was below the detection level of 0.005 mg/L.

Barium

Zenon's mean concentration was 0.0071 mg/L compared to the reference value of 0.0086 mg/L. Zenon's accuracy of 83% and precision of 7.8% were within acceptable limits.

Calcium

Zenon's mean concentration was 3.59 mg/L compared to the reference value of 5.79 mg/L. Zenon's accuracy of 62% and precision of 6.1% were outside acceptable limits as one might expect with such low results, although the precision was reasonable. The results were also consistent with those obtained for hardness.

Cadmium

Zenon's mean concentration was 0.0009 mg/L compared to the reference value of 0.001 mg/L. Zenon's accuracy of 92% and precision of 22% were within acceptable limits. The reference concentration was relatively high, being about five times above levels considered toxic to aquatic life.

Chromium

Zenon's mean concentration was 0.0026 mg/L compared to the reference value of 0.0027 mg/L. Zenon's accuracy of 94% was well within acceptable limits and its precision of 27% was only slightly outside. There were eight results reported as below detection caused by Zenon's minimum detection level of 0.002 mg/L being close to the reference value.

Cobalt

Zenon's mean concentration of 0.0043 mg/L was equal to the reference value of 0.0043 mg/L. This result was due to Zenon's minimum detection level of 0.004 mg/L being virtually equal to the reference concentration. Fourteen of the 20 measurements were, in fact, reported as below detection.

Copper

Zenon's mean concentration was 0.033 mg/L compared to the reference value of 0.0355 mg/L. Zenon's accuracy of 94% was within acceptable limits while its precision of 15% was reasonable although outside the limits. Precision improved with removal of an outlier recorded at 0.053 mg/L. The copper levels involved were about ten times higher than the lowest levels considered toxic to aquatic life.

Iron

The reference concentration for iron of 0.0267 mg/L was below Zenon's minimum detection level of 0.05 mg/L. We could therefore not calculate accuracy or precision, although all Zenon's values were reported correctly as below detection. The reference concentration was also below values considered toxic to aquatic life.

Lead

Zenon's mean concentration was 0.0067 mg/L compared to the reference value of 0.0048 mg/L. Zenon's accuracy of 138% was within acceptable limits while its precision of 29% was slightly outside. One measurement out of the 20 was below Zenon's minimum detection level of 0.003 mg/L.

Magnesium

Zenon's mean concentration was 0.82 mg/L compared to the reference value of 1.62 mg/L. Zenon's accuracy of 50% and precision of 7.9% were outside acceptable limits as one might expect with such low results, although the precision was reasonable. The results were also consistent with those obtained for calcium and hardness.

Manganese

Zenon's mean concentration was 0.0025 mg/L compared to the reference value of 0.0027 mg/L. Zenon's accuracy of 91% was within acceptable limits while its precision of 47% was outside the limits. Removal of an outlier (0.007 mg/L) improved the precision but reduced the accuracy somewhat. There were three results reported as below detection, caused by Zenon's minimum detection level of 0.002 mg/L being close to the reference value. The reference concentration was well below values that could affect drinking water or aquatic life.

Molybdenum

The reference concentration for molybdenum of 0.0023 mg/L was below Zenon's minimum detection level of 0.004 mg/L. We could therefore not calculate accuracy or precision, although three of Zenon's values out of 20 were reported as above detection (up to 0.009 mg/L). The reference concentration was also below values that could affect irrigation waters or aquatic life.

Nickel

The reference concentration for nickel of 0.0027 mg/L was below Zenon's minimum detection level of 0.01 mg/L. We could therefore not calculate accuracy or precision, although all Zenon's values were reported correctly as below detection. The reference concentration was also below values considered toxic to aquatic life.

Selenium

Zenon's mean concentration was 0.0051 mg/L compared to the reference value of 0.0041 mg/L. Zenon's accuracy of 125% was within acceptable limits but the precision of 138% was well outside. Removal of an outlier (0.0347 mg/L) improved the precision to a reasonable level of 36% although it is still outside the acceptable range. Selenium levels above 0.001 mg/L may be toxic to aquatic life.

Sodium

Zenon's mean concentration was 1.8 mg/L compared to the reference value of 1.00 mg/L. Zenon's accuracy of 182% and precision of 18% were outside acceptable limits. Removal of an outlier (3.1 mg/L) improved accuracy only marginally but improved the precision to within the acceptable range.

Zinc

Zenon's mean concentration was 0.032 mg/L compared to the reference value of 0.022 mg/L. Zenon's accuracy of 145% and precision of 26% were outside acceptable limits. Removal of an outlier (0.06 mg/L) improved these results to only a limited extent. The concentrations involved were around the minimum values that are toxic to aquatic life.

Metals and elements in marine sediments

Arsenic

Zenon's mean concentrations were 18.6 µg/g and 85.6 µg/g compared to the reference values of 11.1

 μ g/g and 211 μ g/g. Zenon's accuracy went from 168% at the low level to 41% at the high level. The precision went from 56% to 18%. In both cases, accuracy and precision were outside acceptable limits. There were 8 values out of 20 reported below detection at the lower concentration which was close to Zenon's minimum detection level of 10 μ g/g. While the low level would not be toxic to aquatic life, the higher level would be toxic.

Cadmium

Zenon's mean concentration was 2.4 μ g/g compared to the reference value of 2.38 μ g/g. Zenon's accuracy of 99% and precision of 40% were good even though 5 of the 20 measurements were reported as below the minimum detection level of 1 μ g/g. The reference concentration was at the low end of the scale for toxicity to aquatic life.

Cobalt

Zenon's mean concentrations were 10.3 μ g/g and 11.7 μ g/g compared to the reference values of 11.4 μ g/g and 17.5 μ g/g. Zenon's accuracy was 90% at the low level and 71% at the high level. The precision went from 4.3% to 6.8%. The accuracy and precision were acceptable at the low level but not at the higher level, an unexpected result. Because Zenon's minimum detection level was 10 μ g/g, there were 8 measurements out of 20 reported as below detection at the low level.

Chromium

Zenon's mean concentrations were 41.0 μ g/g and 44.6 μ g/g compared to the reference values of 123 μ g/g and 113 μ g/g. Zenon's accuracy was 33% at the low level and 39% at the high level. The precision went from 34% to 28%. Accuracy and precision were well outside acceptable limits in both cases. The reference concentrations, which were well above Zenon's minimum detection level of 1 μ g/g, were in the range that can be toxic to aquatic life.

Copper

Zenon's mean concentrations were 14.8 μ g/g and 385.4 μ g/g compared to the reference values of 18.5 μ g/g and 452 μ g/g. Zenon's accuracy was 80% at the low level and 85% at the high level. The precision went from 3.7% to 4.1%. Accuracy was outside the acceptable range while precision was reasonable. The reference concentrations, which were well above Zenon's minimum detection level of 1 μ g/g, ranged from non-toxic to toxic to aquatic life.

Lead

Zenon's mean concentrations were 18.1 μ g/g and 299 μ g/g compared to the reference values of 22.7 μ g/g and 404 μ g/g. Zenon's accuracy was 80% at the low level and 74% at the high level. The

precision went from 9.8% to 4.7%. Accuracy and precision were outside the acceptable range in both cases. The reference concentrations, which were above Zenon's minimum detection level of 10 μ g/g, ranged from slightly toxic to very toxic to aquatic life.

Manganese

Zenon's mean concentrations were 191 μ g/g and 266 μ g/g compared to the reference values of 229 μ g/g and 470 μ g/g. Zenon's accuracy was 83% at the low level and 57% at the high level. The precision went from 5.4% to 5.7%. Accuracy and precision were outside the acceptable range in both cases. The reference concentrations were well above Zenon's minimum detection level of 1 μ g/g.

Mercury

Zenon analyzed only 15 samples at one concentration. The result was a mean of 4.16 μ g/g compared to the reference of 4.57 μ g/g. The accuracy was 91% and the precision was 8.3%. These were reasonable although outside the acceptable range for the reference. The reference concentration, which was well above Zenon's minimum detection level of 0.05 μ g/g, would be toxic to aquatic life.

Molybdenum

Zenon's mean concentration was 5.0 μ g/g compared to the reference value of 12.3 μ g/g. The accuracy of 40% and precision of 14% were well outside acceptable limits, although the reference concentration was above Zenon's detection level of 1 μ g/g.

Nickel

Zenon's mean concentrations were 48.5 μ g/g and 33.2 μ g/g compared to the reference values of 55.3 μ g/g and 44.1 μ g/g. Zenon's accuracy was 88% at the low level and 75% at the high level. The precision went from 4.9% to 5.1%. Accuracy and precision were close to, although outside, the acceptable range. The reference concentrations were well above Zenon's minimum detection level of 5 μ g/g.

Zinc

Zenon's mean concentrations were 103 μ g/g and 546 μ g/g compared to the reference values of 119 μ g/g and 824 μ g/g. Zenon's accuracy was 86% at the low level and 66% at the high level. The precision went from 5.0% to 5.5%. Accuracy was poor, being well outside the acceptable range. The precision was reasonable. The reference concentrations, which were well above Zenon's minimum detection level of 1 μ g/g, ranged from slightly toxic to very toxic to aquatic life.

PAHs in estuarine sediments

Results are presented below for 5 low molecular weight compounds followed by 8 high molecular weight compounds. The minimum detection level for each of these compounds was $0.001 \ \mu g/g$ which was well below any of the reference concentrations. All reference concentrations would be considered toxic to aquatic life except that of benzo(a)pyrene which was just below the criterion level. In all cases, Zenon's average result was less than the reference level and the accuracy and precision were well outside the acceptable range.

Acenaphthene

Zenon's mean concentration was 0.015 μ g/g compared to the reference value of 0.59 μ g/g. The accuracy was 25% and the precision 37%.

Anthracene

Zenon's mean concentration was $0.011 \,\mu\text{g/g}$ compared to the reference value of $0.02 \,\mu\text{g/g}$. The accuracy was 55% and the precision 38%.

Fluorene

Zenon's mean concentration was 0.061 μ g/g compared to the reference value of 0.55 μ g/g. The accuracy was 11% and the precision 36%.

Naphthalene

Zenon's mean concentration was 0.30 μ g/g compared to the reference value of 1.70 μ g/g. The accuracy was 17% and the precision of 37%.

Phenanthrene

Zenon's mean concentration was $0.50 \ \mu g/g$ compared to the reference value of $1.05 \ \mu g/g$. The accuracy was 48% and the precision 33%.

Benz(a)anthracene

Zenon's mean concentration was $0.074 \ \mu g/g$ compared to the reference value of $0.5 \ \mu g/g$. The accuracy was 15% and the precision 27%.

Dibenz(a,h)anthracene

Zenon's mean concentration was 0.49 μ g/g compared to the reference value of 0.60 μ g/g. The accuracy was 82% and the precision 27%.

Chrysene

Zenon's mean concentration was 0.59 μ g/g compared to the reference value of 1.10 μ g/g. The accuracy was 53% and the precision 20%.

Benzo(g,h,i)perylene

Zenon's mean concentration was 0.56 μ g/g compared to the reference value of 0.69 μ g/g. The accuracy was 81% and the precision 22%.

Pyrene

Zenon's mean concentration was 0.58 μ g/g compared to the reference value of 2.4 μ g/g. The accuracy was 24% and the precision 24%.

Benzo(a)pyrene

Zenon's mean concentration was 0.039 μ g/g compared to the reference value of 0.15 μ g/g. The accuracy was 26% and the precision 18%.

Indeno(1,2,3-c,d)pyrene

Zenon's mean concentration was 0.52 μ g/g compared to the reference value of 0.8 μ g/g. The accuracy was 65% and the precision 32%.

Fluoranthene

Zenon's mean concentration was $0.75 \,\mu\text{g/g}$ compared to the reference value of $1.35 \,\mu\text{g/g}$. The accuracy was 55% and the precision 26%.

PROVINCIAL OVERVIEW OF RESULTS

Presentation of Results

In the tables summarizing the monitoring data, there are five kinds of concluding statement. These are: objective met, objective not met, objective not checked, omitted 1995, and indefinite result.

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

Table 1 shows the results of this compilation. 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 75% of the time in the Province as a whole in 1995. This result varied according to Region from 2% to 85%. Objectives were not met from between 2% to 53% of the time, with an overall average of 16%.

The occurrence of objectives not checked, omitted 1995, or indefinite results averaged 3%, 1%, and 5%, respectively. If we subtract these relatively minor instances of no result from the total, then the number of instances (or percent of time) that objectives were met overall becomes 83% and the number not met 17%.

We can therefore state that, in the Province as a whole, the objectives were met about 83% of the time in 1995. This is an approximate general statement at the best of times, but is especially so for 1995 because of the reduced monitoring that year. 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.

The overall result for objectives met in 1995 was lower than in 1994 when it was 87% and also lower than results for previous years. The objectives were met 94% of the time in 1987, 93% in 1988, 92% in 1989, 93% in 1990, 90% in 1991, 89% in 1992, and 87% in 1993. The data show a downward trend. As the monitoring program is repeated in future years the trend could continue. This is 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 consistently by a wide margin.

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, as is likely, monitoring resources are scarce, we will need to concentrate on areas where the worst water quality problems occur. This will produce a more 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.

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 in 1995 and 1994. Monitoring carried out from 1988 to 1993 gave fairly consistent results. 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. Monitoring to check objectives attainment should be resumed after these problems have been addressed.

Middle Quinsam Lake

Middle Quinsam Lake drains via the Quinsam River into the Campbell River near its 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.

Measurements between 1989 and 1993 showed that objectives were generally met at all times. There was no monitoring to check objectives in 1994 and 1995. Further monitoring is not a priority in the immediate future unless there are changes at the mine or new developments in the watershed.

Oyster River

The Oyster River flows from the Forbidden Plateau area into the Strait of Georgia, south of Campbell River. 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. Since the situation is stable, we did not monitor in 1994 and 1995 and no further work to check objectives is planned at this time

unless development occurs in the watershed.

Elk and Beaver Lakes

Table 2 lists results and Figure 2 shows site locations.

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.

This is the third year we monitored to check the attainment of objectives. As in previous years, objectives for dissolved oxygen, chlorophyll-a, and the phytoplankton community were not met, reflecting the eutrophic nature of the lakes. The water quality index gave ratings of fair (index = 38) for Elk Lake and poor (index = 87) for Beaver Lake in 1995. These ratings were due to many of the objectives not being met, especially those for algae growth. Monitoring in the future will be a lower priority until action is taken to improve water quality conditions.

Tsolum River

Table 3 lists results and Figure 3 shows site locations.

The Tsolum River flows from Mount Washington to the Puntledge River at Comox on Georgia Strait. 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.

Objectives for the Tsolum River were issued recently and their attainment was checked for the first time in 1994 in the river just downstream from the mine site. As in 1994, the objective for dissolved copper was often not met in 1995 indicating a continued threat to fish. The objective for percent steelhead survival will not be checked until water quality conditions improve substantially. The water quality index gave a rating of borderline (index = 46) due to high levels of dissolved copper.

We recommend continued objectives monitoring to track progress of reclamation work in the mine area as it occurs.

WATER MANAGEMENT BRANCH - MINISTRY OF ENVIRONMENT, LANDS AND PARKS

Holland Creek and Stocking Lake

The Holland Creek and Stocking Lake watersheds, located near Ladysmith, 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 roadbuilding are the main influences on water quality.

Monitoring to check the attainment of water quality objectives has not yet been carried out.

SKEENA REGION

Bulkley River

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

We have monitored the attainment of objectives since 1988 and obtained consistent data. Given these results, we consider objectives checking to be a relatively low priority at this time and have not monitored since 1992.

Kathlyn, Seymour, Round, and Tyhee Lakes

Table 4 lists results and Figure 4 shows site locations.

These four small lakes, in the Smithers area, are used for recreation, domestic water supply, and irrigation. 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. Routine monitoring to check objectives ended after 1993 while plans to rehabilitate lake water quality were being prepared. Monitoring in 1995 was limited to checking the phosphorus objective in Kathlyn and Tyhee lakes and results were similar to those of the past. There were insufficient data to rate the water quality of the lakes in 1995 using the index. Once corrective action starts, more complete monitoring for objectives attainment should resume to document progress.

Lower Kitimat River and Arm

Table 5 lists results and Figure 5 shows site locations.

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 ammonia plant discharge at the head of the arm. The existing water quality objectives are being updated.

The only monitoring carried out in 1995 was the measurement of dioxins and furans in sediments. Results show that criteria to protect aquatic life were met in the river but were not met in the harbour area. In 1994, when more complete monitoring was done, objectives and criteria not met in the harbour included the objectives for cyanide, fluoride, and iron and the criteria for PAHs in sediments. Monitoring in 1995 was too incomplete to calculate a water quality index.

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

Lakelse Lake

Lakelse Lake drains into the Skeena River 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. We have not monitored since then as we presently consider such monitoring to be a low priority.

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 on hold. We recommend monitoring to check the attainment of water quality objectives when the project proceeds.

OMINECA-PEACE REGION

Charlie Lake

Charlie Lake is used as a drinking water supply 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. Studies are underway to determine how to reduce nutrient input. Routine monitoring to check objectives should resume when corrective measures are undertaken.

Bullmoose Creek

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

The attainment of water quality objectives was documented by monitoring between 1987 and 1993 and there were no serious impacts. Further monitoring is a low priority at this time.

Nechako River

Table 6 lists results and Figure 6 shows site locations.

The Nechako River, a major tributary to the Fraser River at Prince George, has its flow controlled by dams for power generation. 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 1995, the fecal coliform objective was met in the Nechako River except immediately downstream from Vanderhoof, as has been the case in the past. The temperature objectives immediately downstream from Cheslatta Falls and at Vanderhoof were often not met in the summer. We have obtained similar results since 1987. Temperature objectives will presumably be met when a coldwater release structure, planned for the Kenney Dam upstream from Cheslatta Falls, is installed.

Objectives which were met included those for ammonia, nitrite, dissolved oxygen, and pH. The water quality index gave a rating of fair (index - 36) for the Nechako River in 1995, due mainly to high coliform levels downstream from Vanderhoof. Given the importance of the river, we recommend continued monitoring to check objectives.

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.

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.

Pouce Coupe River and Dawson Creek

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

The exact causes for objectives not being met need to be found. 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.

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.

There was no monitoring in 1995 to check objectives. Objectives not met at times in 1994 included those for turbidity, suspended solids, temperature, and chromium.

Considering Alberta's interest in the quality of the water crossing the provincial border, we

recommend that monitoring of the Peace River be resumed.

Upper Finlay River

The Finlay River, located in the north east part of the Province, drains into the north end of Williston Lake. The area of the upper Finlay was the site of a gold and silver mine and mill, now closed. Objectives apply to Jock and Galen creeks which eventually flow into the upper Finlay River.

The objectives were checked in 1987. Since the area is remote and the operation is closed, no further monitoring has been carried out. Future monitoring or new objectives may be needed if development re-occurs in the area.

Fraser River from the Source to Hope

Table 7 lists results and Figure 7 shows site locations.

This is the most important river in the Province for fisheries. 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.

The objectives were checked in the winter of 1995. The objective for fecal coliforms was not met at Prince George and Quesnel, a result partly confirmed by *E. coli* measurements. Other objectives not met at times included those for suspended solids, turbidity, dissolved oxygen (although no values were below 10 mg/L), and AOX. The objective for dioxins and furans to protect aquatic life against chronic effects was not met in one out of 17 fish sampled in late summer. However, the less stringent criterion for human consumption was always met and there are no restrictions on eating fish from the river.

Objectives that were met included those for colour, temperature, ammonia, nitrite, nitrate, pH, chlorophenols, and resin acids. Certain objectives remain to be checked, such as those for chlorine residual, chlorophyll-a, lead in fish, PCBs in fish, and dioxins and furans in water and sediments. The water quality index gave a rating of fair (index = 29), due mainly to the objective for AOX not being met. This objective requires no increase in AOX over background values above the pulp mills. We recommend continued monitoring to check objectives in this section of the Fraser River.
CARIBOO REGION

Williams Lake

Table 8 lists results and Figure 8 shows site locations.

Williams Lake drains to the Fraser River and is important for drinking water, recreation, and aquatic life. The water quality is affected by phosphorus which 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.

Objectives not met in 1995 included those for turbidity, total phosphorus at spring overturn, chlorophyll-a, and dissolved oxygen. These results reflect the current eutrophic state of the lake. The water quality index rated the quality of the lake as borderline (index = 53) in 1995 due to a high phosphorus level at spring overturn and several objectives not being met. We recommend continued monitoring of objectives to track the progress of corrective measures being undertaken in the watershed.

San Jose River

Table 9 lists results and Figure 9 shows site locations.

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 seventies. The objective was met in 1995.

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.

SOUTHERN INTERIOR REGION

Bonaparte River

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

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

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

Okanagan Valley Lakes

Table 10 lists results and Figure 10 shows site locations.

To date, objectives have only been set in the five main lakes for phosphorus, which is the major factor controlling the trophic state of the lakes. The lakes are highly valued for recreation, fisheries, and as a source of drinking and irrigation water. The major inputs of phosphorus are from treated municipal sewage and from diffuse sources that include septic tanks, agriculture, and forestry. Phosphorus release from sediments also occurs in Wood Lake and Osoyoos Lake.

The short-term phosphorus objective was met in Wood Lake, as it has been since 1990. This is an improving trend compared to results obtained in 1987, 1988, and 1989 when the objective was not met. The phosphorus objective for Kalamalka Lake was met at the south and north ends as it has been most years except 1993 and 1994. The objective for Okanagan Lake was met except in Armstrong Arm as has been the case in the past. The objective was met in Skaha Lake, as it was for the first time in 1991 and also in 1992, indicating an improving trend. It was also met in Osoyoos Lake for the second year in a row indicating the start of another improving trend.

In 1995, the water quality index gave a rating of excellent (index = 0) for all the lakes except

Okanagan Lake for which the rating was good (index = 15). Because there is only the single phosphorus objective for each lake, 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 set and checked. Given the environmental importance of these lakes, we recommend continued monitoring of phosphorus at spring overturn.

Similkameen River

The Similkameen River flows from Manning Park, east through the south Okanagan, then south across the U.S. border. It is important for fisheries, drinking water, and irrigation. Water quality can be affected by mining and municipal discharges. 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 and was suspended in 1994 as a low priority. The main problem has been with fecal coliforms, possibly from agricultural operations, which did not always meet the drinking water objective requiring disinfection only.

Cahill Creek

Table 11 lists results and Figure 11 shows site locations.

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. 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 which began operating in 1987. Monitoring to check objectives began the same year.

Objectives not met at times in 1995 included those for dissolved solids, sulphate, nitrite, total aluminum, and dissolved iron.

Among objectives met were those for suspended solids, turbidity, cyanide (in weak-acid dissociable and cyanate forms), arsenic, nitrate, pH, selenium, and a number of heavy metals (cadmium, copper, lead, molybdenum, silver, and zinc).

In 1995, the water quality index gave a ranking of good (index = 9) for Cahill Creek, excellent (index = 0) for Sunset Creek, fair (index = 22) for Nickel Plate Mine Creek, and good (index = 14)

for Red Top Gulch Creek. The major influences on these rankings were occurrences of high dissolved solids and sulphate values. We recommend continuing routine monitoring to check objectives while work proceeds to improve the mine operation.

Bessette Creek

Table 12 lists results and Figure 12 shows site locations.

Bessette Creek, which flows into the Shuswap River, is formed by the joining 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 woodwaste landfill along Duteau Creek, and agricultural operations generally.

Objectives not met at times in 1995 included those for microbiological indicators generally (fecal coliforms, *E. coli*,), dissolved and suspended solids and dissolved oxygen in Spider Creek, and chlorophenols in sediments from Harris Creek. Objectives met included those for turbidity, ammonia, nitrite, nitrate, chlorophyll-*a*, colour, pH, and resin acids.

In 1995, the water quality index ranked Bessette Creek (index = 31), Lawson Creek (index = 30), Spider Creek (index = 43), and Harris Creek (index = 23) as fair. These results were due mainly to some high chlorophenol levels in sediments from Harris Creek and high coliform levels in the other creeks. Continued monitoring is recommended as measures to improve water quality are carried out.

Tributaries to Okanagan Lake near Westbank

We set objectives for Peachland, Trepanier, and Westbank creeks which flow into Okanagan Lake in the Peachland-Westbank area. Peachland and Trepanier creeks support spawning populations of kokanee or trout, and all three creeks are used for irrigation and domestic water supplies. Peachland and Trepanier creeks can be affected by seepage from a molybdenum mine which closed recently. Westbank Creek is now influenced by urban runoff and agriculture.

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

Tributaries to Okanagan Lake near Kelowna

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

The objectives were last checked in 1994. Then, as in previous years, the objectives for bacteriological indicators (fecal coliforms, *E. coli*, and enterococci) were generally not met. Continued monitoring will depend on action taken in the future to control stormwater and other diffuse sources of contamination.

Tributaries to Okanagan Lake near Vernon

Table 13 lists results and Figure 13 shows site locations.

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

In 1995, our third year of monitoring to check objectives, those not met at times were objectives for fecal coliform, *E. coli*, suspended solids, and dissolved oxygen. Among the objectives met were those for turbidity, ammonia, nitrite, nitrate, chlorophyll-*a*, and pH.

The water quality index rated Lower Vernon Creek (index = 24) and Deep Creek (index = 31) as fair in 1995, due mainly to high fecal coliform levels. Further monitoring of these creeks should be considered as measures to improve water quality are carried out.

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 recreational fish 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. Monitoring was discontinued in 1994 as results were fairly predictable.

Thompson River

Table 14 lists results and Figure 14 shows site locations.

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. 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 the 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.

Objectives not met in 1995 included those for chlorophyll-*a* and, in some instances, for dioxins and furans in fish. The dioxin and furan levels in water were calculated from pulp mill effluent levels assuming complete mixing of effluent with the lower Thompson River and the objective was met. Although the dioxin and furan objective to protect aquatic life against chronic effects was not met in three fish, the less stringent criterion for human consumption was always met and there is no restriction on eating fish from the river.

The water quality index gave a ranking of fair (index = 35) for the lower Thompson in 1995, due largely to growth of attached algae. We recommend continued monitoring to check Thompson River objectives.

Christina Lake

Christina Lake, located in south central B.C., drains into the Kettle River which joins the Columbia River in Washington State. 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 not checked in 1995. 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*.

We recommend resuming sampling until objectives have been checked for at least two more years to obtain a reasonable data base.

KOOTENAY REGION

Columbia and Windermere Lakes

The 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.

We monitored to check objectives between 1987 and 1992. Since the objectives have been met fairly consistently, we discontinued monitoring in 1993.

Toby Creek and Upper Columbia River

Toby Creek enters the Upper Columbia River just downstream from Windermere Lake. Both streams are important for aquatic life and recreation. Toby Creek can be affected by indirect discharges of domestic sewage and by drainage from an abandoned mine. The Upper Columbia River receives an indirect discharge of treated sewage from Radium Hot Springs.

All objectives have generally been met except, on occasion, those for fecal coliforms. We did not monitor after 1989 in Toby Creek and 1992 in the Upper Columbia River. We consider future monitoring a low priority at this time.

Columbia River from Keenleyside to Birchbank

Table 15 lists results and Figure 15 shows site locations.

The Columbia River is one of the major rivers in British Columbia and in Washington State further downstream. 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 which recently expanded production and upgraded its effluent treatment to secondary. There are also small discharges of secondary-treated municipal effluent and urban runoff.

Objectives not met at times in 1995 were those for dissolved oxygen (although the minimum was

not below 7 mg/L), organic carbon in sediments, dissolved gases, and dioxins and furans in fish and sediments. Although the dioxin and furan objective to protect aquatic life against chronic effects was not met in several fish, the less stringent criterion for human consumption was always met and there is no restriction on eating fish from the river.

Objectives met in 1995 included those for pH, colour, suspended solids, turbidity, fecal coliforms, *E. coli*, pulp mill toxicity in the river, chlorophenols, resin acids, chlorinated resin acids, and periphyton chlorophyll-*a*.

The water quality index gave a rating of fair (index = 35) in 1995. This result is based on about one third of the objectives not being met on average about one third of the time. Considering the international significance of the river and its importance to aquatic life, continued monitoring to check the attainment of objectives is recommended.

Elk River

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

The objectives for suspended solids apply to base flow, or the non-freshet period, in the Elk River basin. They were generally met at all sites in 1993. Further monitoring to check these objectives was considered a low priority.

LOWER MAINLAND REGION

Fraser River from Hope to Kanaka Creek

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

Monitoring to check objectives was carried out in 1987,1988, 1990, 1992, and 1993. The objectives are being updated and we recommend checking the revised objectives when they are finalized.

Fraser River from Kanaka Creek to the Mouth

Table 16 lists results and Figure 16 shows site locations.

The river downstream from Kanaka Creek and the outer estuary 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.

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. We plan to publish updated objectives in 1996.

Among objectives not met at times in 1995 were those for fecal coliforms in the Main Arm and dissolved oxygen in the bottom of sloughs (although the minimum was not less than 5 mg/L).

Objectives met included those for fecal coliforms at all bathing beaches, suspended solids, ammonia, dissolved oxygen in the main reaches of the river, pH, metals (copper, lead, and zinc), chlorophenols in water, sediments, and fish, and PCBs in sediments and fish.

In 1995, the water quality index gave a ranking of fair (index = 23) for the Main Arm, good (index = 10) for the North Arm, and excellent (index = 0) for the Main Stem, the Middle Arm, and

Tsawwassen Beach. The major influence was high levels of fecal coliforms in the Main Arm and a few low dissolved oxygen values in the North Arm sloughs. While these results indicate an improvement in water quality compared to previous years, we cannot be certain they are truly representative because monitoring was incomplete.

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, stormwater, and septic tanks in Boundary Bay and from agriculture in the tributaries.

Objectives were checked from 1988 to 1993 giving consistent results. 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.

Burrard Inlet

Table 17 lists results and Figure 17 shows site locations.

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 which can affect water quality. These include primary-treated sewage, combined sewer overflows, stormwater, bulk-loading terminals, a sugar refinery, a sodium chlorate plant, a chlor-alkali plant, and oil depots.

In 1995, the only objective checked was the one for fecal coliforms at bathing beaches. This objective was not met at times at Deep Cove, Cates Park, Brockton Point, and Ambleside. There were insufficient data to calculate a water quality index.

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. Considering the importance of Burrard Inlet and the number of instances that objectives have not been met, we recommend

continued monitoring to check all objectives.

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 not checked in 1995. In 1994, objectives were not met at times for phenols, temperature, chromium, iron, zinc, and chlorophenols in water.

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

North Shore Lower Fraser Tributaries

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

Objectives were not checked in 1995 or 1994. 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.

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. Objectives were not checked in 1995. 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 tributyl 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.

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.

Objectives were not checked in 1995. 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 data base.

R.J. Rocchini, P. Eng. Water Quality Section Water Management Branch

NUMBER OF OCCURRENCES INDEFINITE TOTALS OBJECTIVES OBJECTIVES OMITTED REGION OBJECTIVES RESULT MET NOT MET NOT 1995 CHECKED 49 0 22 26 0 1 Vancouver Island 2% 0% 100% 45% 53% 0% 78 2 6 49 21 0 Skeena 63% 27% 0% 100% 2% 8% 13 2 75 1603 1220 293 Omineca 100% 76% 18% 1% .0% 5% Peace 27 2 1 0 18 6 Cariboo 100% 67% 22% 4% 0% 7% 1088 41 Southern 921 94 9 23 2% 4% 100% Interior 85% 8% 1% 352 3 0 1 1223 867 Kootenay 29% 0% 0% 0% 100% 71% 647 17 91 1 113 869 Lower Mainland 13% 100% 74% 2% 11% 0% 4937 3697 794 166 48 232 All Regions 3% 5% 100% 75% 16% 1% 794 4761 All Regions 3967 less occurrences 100% with no result 83% 17%

PROVINCIAL OVERVIEW OF WATER QUALITY OBJECTIVES - 1995

& DATE VALUE OBJECTIVE SITE n Temperature Elk Lake 1100844 Jun 29 - Sep 28 4 9.5 - 14.4 °C Objective at 7 to 9 m met 15°C max at centre (start of hypolimnion) in hypolimnion Beaver Lake Obj. not met Jun. 29 16.2 °C at 5 m E207470 1 1 13.2 °C at 6 m Obj. met at centre 17.6 °C at 5 m Jul. 27 1 Obj. not met Aug. 30 1 17.8 °C at 5 m Obj. not met 15.0 °C at 6 m Obj. met 1 Obj. not met Sep. 28 1 17.8 °C at 5 m 15.0 °C at 6 m Obj. met **Dissolved Oxygen** Elk Lake 3 < 2 - 2.2 mg/L Objective 1100844 Jun 29 - Aug 30 5 mg/L min at centre at 9 m not met 1 m above sediment Beaver Lake May - August Objective E207470 Jun 29 - Aug 30 3 1 - 4 mg/L not met at 5 to 6 m at centre Elk Lake Chlorophyll-a Jun 29 - Sep 28 16 < 0.5 - 4.2 ug/L Objective 1100844 duplicates at 0,2,4,6 m met 1.5 - 2.5 ug/L at centre av = 2.2 ug/Lav of duplicates at 0,2,4,6 m Beaver Lake Objective May - August E207470 Jun 29 - Sep 28 12 2.3 - 19.9 ug/L at centre duplicates at 0,2,4 m not met av = 9.6 ug/L Elk Lake Water Clarity 1100844 Jun 29 - Sep 28 4 4.6 - 5.5 m Objective met at centre 1.9 m min Secchi disc reading Beaver Lake 3.8 m Obj. met E207470 Jun. 29 1 Jul 27 - Sep 28 Obj. not met at centre 3 1.1 - 1.7 m Elk Lake Phytoplankton Obj. not met 1100844 Jun. 29 1 53.5 % Cyanophytes Community

Jul. 27

Aug. 30

Sep. 28

Jun. 29

Jul. 27

Aug. 30

Sep. 28

at centre

Beaver Lake

E207470

at centre

< 50 % Cyanophytes

(cells/mL at surface)

May - August

1

1

1

1

1

1

1

6.3 % Cyanophytes

24.9 % cyanophytes

68.3 % Cyanophytes

83.4 % Cyanophytes

37.3 % Cyanophytes

81.7 % cyanophytes

42.9 % Cyanophytes

ELK AND BEAVER LAKES WATER QUALITY OBJECTIVES - 1995

MEASUREMENT

CONCLUSION

Obj. met

Obj. met

Obj. not met

Obj. not met

Obj. met

Obj. not met

Obj. met

VARIABLE

41

TSOLUM RIVER WATER QUALITY OBJECTIVES - 1995

VARIABLE	<u> </u>	CONCLUSION			
OBJECTIVE	SITE	DATE	n	VALUE	-
Dissolved	Tsolum River:				
Copper	E207826	Apr 19 - May 31	- 5	0.006 - 0.043 mg/L	Average
	500m d/s Murex Creek		_	av = 0.028 mg/L	not met
< 0.007 mg/L av 0.011 mg/L max		Apr 19, May 3	2	0.006 - 0.009 mg/L	Max obj. met
		May 17 - May 31	3	0.041 - 0.043 mg/L	Max not met
		Jun 21 - Nov 8	4	0.013 - 0.037 mg/L	Max not met
		Sep 29 - Nov 1	3	0.006 - 0.010 mg/L	Max obj. met
% steelhead egg survival no difference	Tsolum River	1995	0	no in situ bioassay data collected	Omitted 1995
between test & control (at 95% confidence)					

KATHLYN, SEYMOUR, ROUND & TYHEE LAKES WATER QUALITY OBJECTIVES - 1995

VARIABLE		CONCLUSION			
&					
OBJECTIVE	SITE	DATE	n	VALUE	
Fecal	Kathiyn Lake	1995	0	no data collected	Omitted 1995
Coliforms	Seymour Lake				
001101110.	Bound Lake				
< 10/100 ml	Types Lake				
	I yriee Lake				
our perc. (np)					
al					
water intakes					
000/100 ml					
< 200/100 mL]		
geometric mean					
(gm)					
< 400/100 mL					
90th perc. (np)		· · · · · · · · · · · · · · · · · · ·			
at beaches					
Turbidity	Kathlyn Lake	1995	0	no data collected	Omitted 1995
	Seymour Lake				
< 1 NTU av	Round Lake				
5 NTU max	Tyhee Lake				
Total P	Kathlyn Lake	May. 9	1	0.0 m: 0.012 mg/L	Objective
	1131007		1	2.5 m: 0.021 mg/L	not met
< 0.015 mg/L av	North Basin		1	5.0 m: 0.018 mg/L	
at spring			[1]	7.5 m: 0.019 mg/L	
overturn			1	10.0 m: 0.047 mg/L	
				av = 0.023 mg/L	
	Tyhee Lake	May. 8	1	0.0 m: 0.008 mg/L	Objective
	1131009		1	2.5 m: 0.026 mg/L	not met
	North Basin	· ·	1	5.0 m: 0.026 mg/L	
			1	7.5 m: 0.025 mg/L	
			1	10.0 m: 0.030 mg/L	· ·
				12.5 m: 0.034 mg/L	
			1	15.0 m: 0.037 mg/L	
				$17.5 \text{ m} \cdot 0.040 \text{ mg/l}$	
				20.0 m; 0.399 mg/l	
				2010 m 01000 mg/2	
				av from 2.5 to 7.5 m	
			ľ.	0.031 mg/l	
	E216924	May 7		2.5 m: 0.027 mc/l	Ohiective
	South Basin	ividy. /		5.0 m; 0.030 mg/l	not met
	Sodin Basin			7.5 m: 0.029 mg/l	normer
				10.0 m; 0.029 mg/l	
				10.0 m. 0.029 mg/L	
				12.5 m; 0.031 mg/L	
				13.0 m: 0.033 mg/L	
				17.5 m: 0.039 mg/L	
				20.0 m: 0.044 mg/L	
				22.5 m: 0.056 mg/L	
			1	24.0 m: 0.181 mg/L	
				av from 2.5 to 22.5 m:	
				0.035 mg/L	
	Round Lake	1995	0	no data collected	Omitted 1995
	·				

KATHLYN, SEYMOUR, ROUND & TYHEE LAKES WATER QUALITY OBJECTIVES - 1995

VARIABLE &		CONCLUSION			
OBJECTIVE	SITE	DATE	n	VALUE	-
Colour	Kathlyn Lake Seymour Lake	1995	0	no data collected	Omitted 1995
15 TCU max near	Round Lake Tyhee Lake				
water intakes					

LOWER KITIMAT RIVER AND ARM WATER QUALITY OBJECTIVES - 1995

VARIABLE	MEASUREMENT			CONCLUSION	
	SITE				-
Eecal Coliforms	Kitimat Biver	1995		no data collected	Ohiective
< 200/100 ml	raunat niver	1990	Ĭ	no data conected	not checked
< 200/100 mL					HOL CHECKED
(cm)					
(gill)	Kitimat Arm	1005		no data colloctod	Objectives
recar Collionnis	Killmat Allin	1995		no uala collecteo	objectives
< 14/100 IIIL					HUL CHECKED
(mod)					
(mea)					
10/100 ml	, , , , , , , , , , , , , , , , , , ,				
< 43/100 mL					
90th percentile					
(np)		1005			
Suspended	Kitimat River	. 1995	0	no data collected	Objective
Solids				,	not checked
max. increase '					
10 mg/L					
or 10%				0	
Turbidity	Kitimat River	1995	0	no data collected	Objective
max. increase:					not checked
5 NTU					
or 10%					· · · · · · · · · · · · · · · · · · ·
WAD Cyanide	Kitimat Harbour & Arm	1995	0	no data collected	Objective
					not checked
0.001 mg/L max.					
Fluoride	Kitimat Harbour & Arm	1995	0	no data collected	Objective
					not checked
1.5 mg/L max					
H2S	Kitimat River	1995	0	no data collected	Objective
					not checked
0.002 mg/L max.					
Chlorophyll - a	Kitimat River	1995	0	no data collected	Objective
					not checked
50 mg/m2 av					
Ammonia-N	Kitimat River	1995	0	no data collected	Objectives
< 1.8 mg/L av					not checked
14.0 mg/L max					
(pH = 7.4					
temp = 13 °C)					
Ammonia-N	Kitimat Arm	1995	0	no data collected	Objectives
< 2.4 mg/L av					not checked
11.0 mg/L max					
(pH = 7.8			· ·		
temp = 15 °C	<i>x</i>			1.	
sal. = 30 n/kn					
Nitrite-N	Kitimat Biver	1995	0	no data collected	Objectives
11010011					not checked
< 0.020 mg/L av		·			
< 0.020 mg/L av					
Dissolved	Kitimat Biyor	1005		no data collected	Objectivo
Dissolved		1995		no dala conecieu	not obecked
Oxygen					not checked

.

LOWER KITIMAT RIVER AND ARM WATER QUALITY OBJECTIVES - 1995

VARIABLE	MEASUREMENT				CONCLUSION
		DATE			-
OBJECTIVE	Sile Vitimat Divor	1005			Objective
рп	Riumat River	1992	0	no dala collected	Objective
65.00					not checked
Total Al	Kitimat Harbour & Arm	1005		no data collected	Objective
TOIATAI	Killmat Halbour & Allin.	1995		no dala conected	not checked
20% max increase					not checked
Z0% max increase	Kitimat Harbour & Arm	1005		no data collected	Objectives
< 0.012 mg/L av	Rithat Halbour & Ann	1999	ĬĬ		not checked
0.038 mg/L may					not checked
Total Cu	Kitimat Harbour & Arm	1995		no data collected	Objectives
< 0.002 mg/l av	Killmar Halbour & Alm	1000	Ĭ		not checked
0.003 mg/L max					not onconcia
or					
20% increase					
Total Fe	Kitimat Harbour & Arm	1995	0	no data collected	Objective
					not checked
0.3 mg/L max					
Total Pb	Kitimat Harbour & Arm	1995	0	no data collected	Objectives
< 0.009 mg/L av					not checked
0.22 mg/L max					
or					
20% increase					
Colour	Kitimat River	1995	0	no data collected	Criterion
(criterion)					not checked
15 TCU max					
Toxicity	Kitimat River	1995	0	no data collected	Objective
% mill effluent					not checked
in river					
< 0.05 of the					
96-h LC50				and the second	
PAHs in water	Kitimat Harbour & Arm	1995	0	no data collected	Criteria
(max criteria)					not checked
naphtha 1 ug/L		1			
acenaphe 6 ug/L					
fluorene 12 ug/L					
chrysene 0.1 ug/L					
bz-a-py 0.01 ug/L			_		
L-PAH in sediments	Kitimat River	1995	0	no data collected	Criteria
(max criteria)	Kitimat Harbour & Arm				not checked
naphtha 0.2 ug/g					
acenphyl 0.06 ug/g					
acenapne 0.05 ug/g					
fluorene 0.05 ug/g					
phenant 0.15 ug/g					
aninrac 0.10 ug/g					
total U.5 Ug/g					1

LOWER KITIMAT RIVER AND ARM WATER QUALITY OBJECTIVES - 1995

VARIABLE			CONCLUSION		
&				-	
OBJECTIVE	SITE	DATE	n	VALUE	
H-PAH in sediments	Kitimat River	1995	0	no data collected	Criteria
(max criteria)	Kitimat Harbour & Arm				not checked
fluorant 0.17 ug/g					
pyrene 0.26 ug/g					
bz-a-an 0.13 ug/g				ļ	
chrysene 0.14 ug/g					
bz-bk-fl 0.32 ug/g					
bz-a-py 0.16 ug/g					
ind-pyr 0.06 ug/g					
dibz-an 0.06 ug/g					
bz-pery 0.07 ug/g					
total 1.2 ug/g					
Dioxins and Furans	Kitimat River:				
(criterion)	E207569	Feb. 8	1	0.07 pg/g TCDD-TEQ	Criterion met
	u/s Eurocan				
< 0.25pg/g TCDD-TEQ					
av in sediment	E207570	Feb. 8	1	0.19 pg/g TCDD-TEQ	Criterion met
	d/s Eurocan				
	Kitimat Harbour & Arm				
	0400510	Feb. 8	1	3.5 pg/g TCDD-TEQ	Criterion
	Ocelot Dock, N end				not met
	E218985	Feb. 8	1	5.4 pg/g TCDD-TEQ	Criterion
	Scow Grid				not met
	E218983	Feb. 8	1	4.88 pg/g TCDD-TEQ	Criterion
	Yacht Basin North	· ·			not met

VARIABLE		CONCLUSION			
	QITE	DATE		VALUE	
Fecal Coliforms	Nechako River: 0400629 200 m u/s Fort Fraser	Feb 9 - Mar 7	5	0 - 4/100 mL	Objective met
90th perc. (np)	0400631 200 m d/s Fort Fraser	Feb 9 - Mar 7	5	0 - 6/100 mL	Objective met
	0400449 u/s Vanderhoof	Feb 7 - Mar 8	5	2 - 300/100 mL np = 150/100 mL	Objective not met
	0400450 100 d/s Vanderhoof	Feb 7 - Mar 8	5	9000 - 19000/100 mL np = 15000/100 mL	Objective not met
• • • •	E207450 0.5 km d/s Vanderhoof	Feb 7 - Mar 8	5	10 - 61/100 mL np = 45/100 mL	Objective met
	E207451 2 km d/s Vanderhoof	Feb 7 - Mar 8	10	24 - 80/100 mL np = 77/100 mL	Objective met
=	Chilako River	1995	0	no data collected	Objective not checked
Fecal Coliforms	Stuart River: 0400488 E bank at Highway 27	Feb 8 - Mar 6	5	0 - 167/100 mL np = 95/100 mL	Objective not met
90th perc (np)	0920101 W bank at Highway 27	Feb 8 - Mar 6	5	all = 0/100 mL	Objective met
Fecal Coliforms <200/100ml geometric mean (gm) <400/100ml	Necoslie River: 0400801 d/s Fort St James 20 m u/s Highway 27	Feb 8 - Mar 6	5	2 - 6/100 mL	Objectives met
Total Cl2 Res. 0.002 mg/L max	Nechako & Stuart Rivers	1995	0	no data collected	Omitted 1995
Ammonia-N <2.05 mg/L av 14.1 mg/L max at	Nechako River: 0400629 200 m u/s Fort Fraser	Feb 9 - Mar 7	5	<0.005 - 0.009 mg/L	Objectives met
pH = 7.5 temp = 1 °C	0400631 200 m d/s Fort Fraser	Feb 9 - Mar 7	5	all < 0.005 mg/L	Objectives met
	0400449 u/s Vanderhoof	Feb 7 - Mar 8	5	ali < 0.005 mg/L	Objectives met
	0400450 100 m d/s Vanderhoof	Feb 7 - Mar 8	5	0.391 - 0.970 av = 0.723 mg/L	Objectives met

VARIABLE	· · · · · · · · · · · · · · · · · · ·	CONCLUSION			
&			-		
OBJECTIVE	SITE	DATE	n	VALUE	
Ammonia-N	Neckako River: E207450	Feb 7 - Mar 8	5	<0.005 - 0.005 mg/L av = 0.005 mg/L	Objectives met
<2.05 mg/L av	0.5 km d/s Vanderhoof				
14.1 mg/L max	E207451	Feb 7 - Mar 8	10	<0.005 - 0.017 mg/L	Objectives
at	2 km d/s Vanderhoof			av = 0.016 mg/L	met
pH = 7.5					
temp = 1 °C	·		11		
Ammonia-N	Stuart River:				
	0400488	Feb 8 - Mar 6	5	0.070 - 0.165 mg/L	Objectives
<1.24 mg/L av	E bank at Highway 27			av = 0.119 mg/L	met
6.46 mg/L max	0000101	Fab 0 Mar 0	+	0.005 0.000	Ohiostiuss
at	0920101	Feb 8 - Mar 6	5	<0.005 - 0.006 mg/L	Objectives
pH = 8.0	W bank at Highway 27	,		av = 0.005 mg/L	met
temp = 1 °C			<u></u>		
	Chilako River:	Tab. 14		-0 005 mg/l	May objective met
	0400039	Feb. 14		<0.005 mg/L	wax objective met
	~30 km from mouth				AV not checked
Nitrito N	Nachaka Rivar:	······	++		
Nititle-N	0400629	Feb 9 - Mar 7	5	<0.001 - 0.002 mg/l	Ohiectives
< 0.02 mg/l av	200 m u/s Fort Fraser		J	<0.001 0.002 mg/L	met
0.06 mg/l max	200 m 0/31 0/11 1000				
	0400631	Feb 9 - Mar 7	5	<0.001 - 0.002 mg/L	Objectives
	200 m d/s Fort Fraser		ĭ	101001 01001 11.g. L	met
	0400449	Feb 7 - Mar 8	5	<0.001 - 0.002 mg/L	Objectives
	u/s Vanderhoof				met
1 F	0400450	Feb 7 - Mar 8	5	all < 0.005 mg/L	Objectives
	100 m d/s Vanderhoof				met
I F	E207450	Feb 7 - Mar 8	5	<0.001 - 0.002 mg/L	Objectives
	0.5 km d/s Vanderhoof				met
	Stuart River:				
	0400488	Feb 8 - Mar 6	5	<0.001 - 0.004 mg/L	Objectives
	E bank at Highway 27				met
	0000101	E-h 0 Mar 0	+ _ +	0.001 0.001 mm/	Objectives
		Feb 8 - Mar 6	5	<0.001 - 0.001 mg/L	Objectives
	W Dank at Highway 27				Inter
	Ohilaka Diver		++		
		Eab 14		0.002 mg/l	Max obi mot
	0400039 20 km from mouth	FED. 14	'	0.003 mg/L	Av not checked
	~30 km from mouth				AV HOL CHECKED
Chlorophyll	Nechako Biyer	1995		no data collected	Objective
Chiorophyn - a	Necharo River	1990	ľ	no data conected	not checked
	Stuart Pivor	1005		no data collected	Objective
< ou ing/L av	Stuart River	1990		no dala collected	not checked
Chlorophyll - a	Chilako River	1995		no data collected	Objective
< 100 mg/Lav	Of marko Puver	1880	Ĭ	no dala bonotica	not checked
< Too mg/L av					

VARIABLE		CONCLUSION			
	SITE	DATE		VALUE	
Dissolved Oxygen	Nechako Biyer:		+-''-+	VALUE	
Dissolved Oxygen	0400629	Feb 8 - Mar 7	5	11.6 - 12.0 mg/l	Objective
775 - 11 2 mg/l	200 m u/s Fort Fraser		ĭ	11.0 - 12.0 mg/E	met
7.75 - 11.2 mg/L	200 11 0/3 1 0/11 10361	· ·		· · · · ·	mer
depending on fish egg	0400631	Feb 9 - Mar 7	- 5	117-120 mg/l	Objective
stage	200 m d/s Fort Fraser		Ĭ	in india	met
siage	200 11 0/3 1 0/11 12361				mot
	0400449	Feb 7 - Mar 8	5	11 1 - 11 7 mg/l	Objective
	u/s Vanderboof		Ĭ	11.7 11.7 mg/L	met
					inot
	0400450	Feb 7 - Mar 8	5	10.8 - 11.4 mg/l	Objective
•	100 m d/s Vanderboof	r ob r mar o	Ĭ	10.0 11.1 mg/L	met
					mor
	E207450	Feb 7 - Mar 8	5	11.1 - 11.6 ma/L	Objective
	0.5 km d/s Vanderboof			· · · · · · · · · · · · · · · · · · ·	met
					inot
	E207451	Feb 7 - Mar 8	5	11.1 - 11.8 mg/L	Objective
	2 km d/s Vanderboof				met
	Chilako Biyer:		++		
	0400039	Eeb 14		9.8 mg/l	Objective
	~30 km from mouth	1 60.14	1 1	3.0 mg/L	met
			+		iner
	Stuart River:	Tab 0 Mar 6	E	105 11 4 mal	Objective
	0400488	red 2 - Mar 6	l S	10.5 - 11.4 mg/c	Objective
· · · · ·	E bank at Highway 27	Eab 0 Mar C		10.4 11.9 mg/	Objective
	0920101	reb 8 - Mar b	5	10.4 - 11.8 mg/L	Objective
	W bank at Highway 27				met
pn	Nechako River	Esh O Max 7		75 70	Obioativa
05.05	0400629	reb 9 - Mar 7	P	7.5 - 7.8	Objective
6.5 - 8.5	200 m u/s Fon Fraser				met
	0400621	Eab 0 Mar 7		70 76	Objective
		Feb 9 - Mar 7	э	1.2 - 1.0	Objective
	200 m/d/s Font Fraser				met
	0100110	Eab 7 Mar 9	+	71 76	Objective
	0400449	red / - Maro	5	7.1 - 7.0	Objective
	u/s vandernoor				met
	0400450	Eab 7 Mar 9		70 70	Objective
		red / - Maro	0	7.2 - 7.9	Objective
	100 m d/s vandemoor				met
	E007450	Eab 7 Mar 9		60 75	Objective
-	E207430	red / - Maro	, °	0.9 - 7.5	Objective
	0.5 km d/s vandemoon				met
	E207451	Eob 7 - Mar 8	10	69-75	Objective
	2 km d/s Vanderboof	reb / - Mai o	. 10	0.9 - 7.5	met
	2 km u/s vandemoor				inet .
	Otiveral Diversi		+		
		Eab 0 March	_	75 70	Objective
		rep 8 - Mar 6	р	1.5 - 1.9	Objective
	E bank at Highway 27				met
	0000101	Esh C March		70 70	Objective
	U920101	repo-Maro	· 5	/.b = /.ň	
	w bank at Highway 27		1	0	met
					L

VARIABLE	[MEASUREMENT			CONCLUSION
&					
OBJECTIVE	SITE	DATE	n	VALUE	
рН	Chilako River				
	0400039	Feb. 14	1	8.1	Objective
6.5 - 8.5	~30 km from mouth				met
Temperature	Nechako River:			·	
	immediately d/s	Jan 1 - Jun 19	170	0.4 - 15 ° C	Objective
< 15 °C av	Chesiatta Falls				met
~ 100 m d/s	(DFO's Cheslatta Falls site)	Jun 20 - Aug 25	167	15.1 - 18.5 ° C	Objective
Cheslatta Falls					not met
	10 km d/s Cheslatta Falls	Jan 1 - Jun 19	170	0.1 - 14.9 ° C	Objective
	(DFO's B. Irvine site)	·			met
		June 20 - Sep 17	90	15.1 - 18.4 ° C	Objective
					not met
		Sep 18 - Dec 30	100	0.1 - 14.7 ° C	Objective
					, met
Temperature	Nechako River:				
	at Vanderhoof	May 3 - Jun 26	43	6.6 - 17.9 ° C	Objective
< 20 °C Jul - Aug.	~40 km u/s Stuart R. confl.			10.0.00.00	met
< 18 °C Sep - Jun.	(DFO's Vanderhoot site)	May 24,30,31,	16	18.2 - 20.9 ° C	Objective
~ 100 m u/s		Jun 2-7, 20-22,			not met
Stuart River		Jun 27-30		10.0 10.0 0	Ohiostius
		Jul 1 - Aug 31	01	13.8 - 19.2 - 0	Objective
		hul C	+	00.1.9.0	Objective
		Jul. 6		20.1 * 0	Objective
Total Gas	Noobaka River		+		not met
Proceuro	0400631	Ech Q - Ech 21	2	00.8 - 100.%	Objective
Flessule	200 m d/s Fort Fraser	1603-16021	-	33.0 - 100 /8	objective
100 % max	200 11 0/31 011 1 1 36				mer
103 /011104	F207451	Feb 7 - Mar 8	3	96 - 100 %	Ohiective
	2 km d/s Vanderboof	1 60 / - Widt O		00 - 100 /8	met
I					

FRASER RIVER (FROM THE SOURCE TO HOPE) WATER QUALITY OBJECTIVES - 1995

VARIABLE			CONCLUSION		
	OITE	DATE	_	VALUE	
OBJECTIVE Eccel Coliforma	SILE Eroopt Biyort	DATE		VALUE	
recai Comornis		Eeb 20 - Mar 20	5	0 - 20/100 ml	Objective
-100/100 ml	0400023	red 20 - Iviai 20	5	0 = 20/100 mL	mot
<100/100 mL		·		np = 10/100 mE	met
90th percentile	(u/s F1. Ge.)	Ech 27 Mar 20	6	0 - 90/100 ml	Objective
(np)	EZZ 1909	Feb 27 - Wal 20	°	0 = 30/100 mL	Objective
	di Pr. Ge. CINA bildge			hp = 55/100 hr L	met
	Epocted	Eab 20 Mar 20		20 400/100 ml	Objective
	E206182	red 20 - Wal 20	5	20 - 400/100 mL	objective
			-	hp = 370/100 hL	notmet
		Eab 00 Mar 00	6	51 05/100 ml	Objective
	E221566	Feb 22 - Mar 22	2	51 - 95/100 mL	Objective
	at Longbar u/s Quesnei			np = 80/100 mL	mei
	0600011	Feb 15 - Mar 15	6	17 - 1000/100 mL	Objective
	at Marguerite d/s Quesnel			np = 530/100 mL	not met
	E206581	Mar 6 - Mar 22	4	4 - 43/100 mL	Indefinite
	at Hope				result
E. coli	Fraser River:				Objective
	0400023	Feb 20 - Mar 20	5	0 - 2/100 mL	met
<100/100 mL	at Hansard			np = 1/100 mL	
90th percentile	(u/s Pr. Ge.)			•	
(np)	E221565	Feb 27 - Mar 20	6	0 - 2/100 mL	Objective
V T /	at Pr. Ge. CNR bridge	4		np = 1/100 mL	met
	(d/s Pr. Ge. mills)				
	E206182	Feb 20 - Mar 20	5	30 - 300/100 mL	Objective
	at Stoner			np = 280/100 mL	not met
	(d/s Pr. Ge. mills)				
	E221566	Feb 22 - Mar 28	3	22 - 56/100 mL	Indefinite
	at Longbar u/s Quesnel				result
	0600011	Feb 22 - Mar 8	3	10 - 12/100 mL	Indefinite
	at Marguerite d/s Quesnel				result
	-				
Chlorine Residual	Fraser River	1995	0	no data collected	Objective
< 2ug/L av					not checked
Suspended Solids	Fraser River:				
	0400023	Feb 20 - Mar 20	5	< 4 - 9/100 mL	Control site 1
10 mg/L or 10%	at Hansard	· · · ·			
max increase	(u/s Pr. Ge.)				
	E221565	Mar 13 - Mar 20	2	5 - 12/mg/L	Objective
	at Pr. Ge. CNR bridge			max inc. $= 3 \text{ mg/L}$	met
	(d/s Pr. Ge. mills)			Ū.	
	E206182	Feb 20 - Mar 20	5	< 4 - 13 mg/L	Objective
	at Stoner			max inc. = 6 mg/L	met
	(d/s Pr. Ge. mills)				
	E221566	Mar 15 - Mar 22	2	43 - 332 ma/L	Control site 2
	at Longbar u/s Quesnel				
	0600011	Jan 5 - Feb 15	4	< 4 - 8 ma/L	Obj. met
	at Marguerite d/s Quesnel	Mar 1,8, Apr 11, Nov 26	4	< 4 - 8 mg/L	Obj. met
		Mar. 15	1	78 mg/L, inc = 35 mg/L.	Obj. not met
		Mar. 22	1	186 mg/L, inc. = 0 mg/L	Obj. met

FRASER RIVER (FROM THE SOURCE TO HOPE) WATER QUALITY OBJECTIVES - 1995

VARIABLE &		CONCLUSION			
OBJECTIVE	SITE	DATE	n	VALUE	
Turbidity	Fraser Biver:		+		
raibidity	0400023	Feb 20 - Mar 20	5	11.59 NTU	Control site 1
1 - 5 NTU	at Hansard	1 60 20 - 10121 20	ĬĬ	1.1 - 0.5 11 0	Control Site 1
max ingrases	(u/o Pr. Go.)				
(control: 5 - 50 NTU)	(u/s F1. Ge.)	Mor 19	╉╦╋	2.0 NITH inc. 1.0 NITH	Ohi nat mat
(control: 5 - 50 NTO)	EZZ 1505	Iviar. 15	1	3.2 NTO, Inc 1.3 NTO	Obj. not met
	(d/a Dr. Co. millo)	Max 00	+		Ohi mat
	(d/s Pr. Ge. mills)	Mar. 20	+ $+$ $+$	4.3 NTU, Inc. = 0 NTU	Obj. met
	E200182	Feb 20 - Mar 20	4	1.9 - 3.1 NIU	Objective
	at Stoner	No. 10	╉╌╌╋	max Inc. = 1.0 NTO	met
	(d/s Pr. Ge. mills)	Mar. 13	'	5.2 NIU	Objective
	5001500	14	+	Inc. = 3.3 NTU	not met
	E221566	Mar 15 - Mar 22	2	62 - 76 NTU	Control site 2
	at Longbar u/s Quesnel		+		
	0600011	Mar 15 - Mar 22	2	31 - 45 NTU	Objective
	at Marguerite d/s Quesnel			max inc. = 0 NTU	met
Colour	Fraser River:		1 1		
	0400023	Feb 20 - Mar 20	5	< 5 - 14 SWU	Objective
15 TCU max	at Hansard				met
Jun - Sep	(u/s Pr. Ge.)				
	E221565	Mar 13 - Mar 20	2	27 - 32 SWU	Objective
75 TCU max	at Pr. Ge. CNR bridge				met
Oct - May	(d/s Pr. Ge. mills)				
	E206182	Feb 20 - Mar 20	5	26 39 SWU	Objective
	at Stoner		1 1		met
	(d/s Pr. Ge. mills)		-		
	E221566	Mar 15 - Mar 22	2	10 - 28 SWU	Objective
	at Longbar u/s Quesnel				met
· · · ·					
	0600011	Jan 5 - May 24	9	16 - 51 TAC	Obj. met
	at Marguerite d/s Quesnel	Jun 7 - Sep 26	8	4 - 13 TAC	Obj. met
		Oct 9 - Dec 19	6	6 - 24 TAC	Obj. met
	E206581	Mar 6 - Mar 29	5	14 - 26 SWU	Objective
	at Hope				met
Temperature	Fraser River:				
	0400023	Feb 20 - Mar 20	5	0°C	Control site 1
1 °C	at Hansard			at sampling depth 0.5 m	
max increase	(u/s Pr. Ge.)				
	E221565	Mar 13 - Mar 20	2	0°C	Objective
	at Pr. Ge. CNB bridge			at sampling depth 0.5 m	met
	(d/s Pr. Ge. mills)				
	E206182	Feb 20 - Mar 20	5	0 °C	Objective
	at Stoner			at sampling depth 0.5 m	met
	(d/s Pr Ge mille)			at outputing doput of offi	
	E221560	Mar 15 - Mar 99	1 2	0.0	Control etta 2
			^	at sampling denth 0.5 m	Control Site 2
	at Longbar u/s Quesnel			at sampling depth 0.5 m	
	0600011	Eab 02 Mar 00			Objective
	ot Marguarite d/a Ouconst	100 22 - Widi 22	l °	o C	Objective
	at margueine d/s Quesnei			ar samhund achar ara m	

FRASER RIVER (FROM THE SOURCE TO HOPE) WATER QUALITY OBJECTIVES - 1995

VARIABLE		CONCLUSION			
	SITE	DATE		VALLE	
	Erasor Biver:	DATE		VALUE	
Ammonia-N	0400022	Eeb 20 - Mar 20	5	< 0.005 - 0.005 mg/l	Objectives
< 1.79 mg/(L.0)/	at Hansard		l v l	< 0.003 - 0.003 mg/L	met
< 1.70 mg/L av					inec
9.20 mg/L max	(U/S F1. GE.)	Mor 12 Mar 20		< 0.005 - 0.012 mg/l	Max objective
at at	E221505	Ivial 13 - Ivial 20	2	< 0.003 - 0.012 mg/L	met
pri = 7.8	di Pr. Ge. CNR bridge				met
temp = 0 °C	(d/s Pr. Ge. mills)	5-1:00 Max 00	++	- 0.00E _ 0.022 mg/l	Öhipativas
	E206182	Feb 20 - Mar 20	^o	< 0.005 - 0.032 mg/L	Objectives
	at Stoner				met
·	(d/s Pr. Ge. mills)	Mar 45 Mar 00	+	0.000 0.000 mg/l	May abjective
	E221566	Mar 15 - Mar 22	2	0.023 - 0.029 mg/L	wax objective
	at Longbar u/s Quesnel				met
			++	0.007 0.000	Obligations
	0600011	Feb 22 - Mar 22	5	< 0.005 - 0.029 mg/L	Objectives
	at Marguerite d/s Quesnel		+		met
	· ·	Jan 5 - Feb 15	4	0.006 - 0.041 mg/L	Max obj. met
		Mar 27 - Dec 19	16	< 0.005 - 0.010 mg/L	Max obj. met
	E206581	Mar 6 - Mar 29	5	< 0.005 - 0.013 mg/L	Objectives
	at Hope				met
Nitrite-N	Fraser River:				
	0400023	Feb 20 - Mar 20	5	all < 0.005 mg/L	Objectives
< 0.04 mg/L av	at Hansard				met
0.12 mg/L max	(u/s Pr. Ge.)				
at	E221565	Mar 13 - Mar 20	2	< 0.005 - 0.007 mg/L	Max objective
chioride 2-4 mg/L	at Pr. Ge. CNR bridge				met
	(d/s Pr. Ge. mills)				
	E206182	Feb 20 - Mar 20	5	all < 0.005 mg/L	Objectives
	at Stoner		1 1		met
	(d/s Pr. Ge. mills)				
	E221566	Mar 15 - Mar 22	2	< 0.005 - 0.005 mg/L	Max objective
	at Longbar u/s Quesnel				met
	0600011	Feb 22 - Mar 22	5	all < 0.005 mg/L	Objectives
· · · ·	at Marguerite d/s Quesnel				met
n.	E206581	Mar 6 - Mar 29	5	< 0.005 - 0.008 mg/L	Objectives
	at Hope			-	met
Nitrate+Nitrite-N	Fraser River:				
	0400023	Feb 20 - Mar 20	5	0.10 - 0.14 mg/L	Objective
10 mg/L max	at Hansard				met
	(u/s Pr. Ge.)				
`	E221565	Mar 13 - Mar 20	2	0.11 - 0.15 ma/L	Objective
	at Pr. Ge. CNR bridge				met
	(d/s Pr. Ge. mills)				
	E206182	Feb 20 - Mar 20	5	0.07 - 0.11 ma/L	Objective
	at Stoper				met
1	(d/s Pr Ge mills)				
	F221566	Mar 15 - Mar 22	2	0.09 - 0.11 mg/l	Objective
	at Longbar u/s Quesnel			0.00 0.11 119/2	met
	at congota the decorrer				
	T C C C C C C C C C C C C C C C C C C C				

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FRASER RIVER (FROM THE SOURCE TO HOPE) WATER QUALITY OBJECTIVES - 1995

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VARIABLE		MEASUREMENT	-		CONCLUSION
&					
OBJECTIVE	SITE	DATE	n	VALUE	
Nitrate+Nitrite-N	Fraser River:				
	0600011	Feb 22 - Mar 22	5	0.10 - 0.12 mg/L	Objective
10 mg/L max	at Marguerite d/s Quesnel				met
	· · ·				
	E206581	Mar 6 - Mar 29	5	0.08 - 0.11 mg/L	Objective
	at Hope				met
		ومروابة الألافية التواعد ومعتكما مواحد والفصوصات			
Chlorophyli-a	Fraser River	1995	0	no data collected	Objective
					not checked
50 mg/m2 max	·				
рН	Fraser River:				
	0400023	Feb 20 - Mar 20	5	7.6 - 7.9	Objective
6.5 - 8.5	at Hansard				met
	(u/s Pr. Ge.)				
	E221565	Mar 13 - Mar 20	2	7.7 - 7.8	Objective
	at Pr. Ge. CNR bridge				met
	(d/s Pr. Ge. mills)				
	E206182	Feb 20 - Mar 20	5	7.4 - 7.9	Objective
	at Stoner				met
	(d/s Pr. Ge. mills)				
	E221566	Mar 15 - Mar 22	2	7.5 - 7.8	Objective
	at Longbar u/s Quesnel				met
	0600011	Feb 22 - Mar 22	5	6.9 - 7.8	Objective
	at Marguerite d/s Quesnel				mét
· · · · ·	E206581	Mar 6 - Mar 29	5	7.7 - 8.0	Objective
	at Hope				met
Dissolved Oxygen	Fraser River:	Feb 27 - Mar 20	4	12.4 - 12.8 mg/L	Objective
	0400023			C C	met
8.0 ma/L min	at Hansard	Feb. 20	1	10.8 mg/L	Objective
May to Oct	(u/s Pr. Ge.)			Ũ	not met
	E221565	Feb 20 - Mar 20	5	11.6 - 12.9 mg/L	Objective
11.0 ma/L min	at Pr. Ge. CNR bridge			· · · · ·	met
Nov to Apr	(d/s Pr. Ge. mills)				
	E206182	Feb 27 - Mar 20	4	12.6 - 13.7 mg/L	Objective
	at Stoner			Ū	met
	(d/s Pr. Ge. milis)	Feb. 20	11	10.8 mg/L	Objective
	(,				not met
	E221566	Feb 22 - Mar 22	4	13.0 - 13.4 mg/L	Objective
	at Longbar u/s Quesnel				met
	0600011	Feb 22 - Mar 22	4	12.8 - 13.2 mg/	Objective
	at Marguerite d/s Quespel	and in the take			met
Total Lead	Fraser River	1995	0	no data collected	Objective
0.8 μα/α max			Ĭ		not checked
in fish muscle					
Total PCRe	Fraser Biver	1995		no data collected	Objectives
2 0 un/n may	i rasci ruvei	1000	Ĭ		not checked
in fich mucolo	1				
					İ
in whole fich					
In whole tish			1.1		

FRASER RIVER (FROM THE SOURCE TO HOPE) WATER QUALITY OBJECTIVES - 1995

VARIABLE		CONCLUSION			
	SITE	DATE		VALLIE	
Chlorophenols	Eraser Biver	DATE	5	2.3.4-TCP < 0.1 µg/	Objective met
may TCPs nH 7.8	0400023	Eeb 20 - Mar 20	5	2.3.5-TCP < 0.1 µg/L	Indefinite result
2.3.4-: 0.1.ug/l	at Hansard	1 65 20 - Mai 20	5	2.3.6-TCP < 0.1 ug/l	Objective met
2,3,4 0.1 ug/L			5	2.45 -TCP < 0.1 ug/l	Indefinite result
2,3,5°. 0.00 ug/L	(u/311. de.)		5	2,4,6 TCP < 0.1 ug/	Objective met
2,3,5-: 0.32 ug/L			5	3.45 -TCP < 0.1 ug/L	Indefinite result
2,4,5 0.00 ug/L			5	tot TCP < 0.1 $\mu q/l$	Objective met
2,4,6 0.5 ug/L			5	2345 TTCP < 0.1 up/	Objective met
5,4,5 0.00 ug/L			5	2346 TTCP < 0.1 ug/l	Objective met
101. 1.14 Ug/L			5	tot TTCP < 0.1 µg/l	Objective met
			5		Objective met
max TTCPs pH 7.8:	5001505	Mar 10 Mar 00			Objective met
2,3,4,5-: 0.2 Ug/L	E221565	Mar 13 - Mar 20	2	2,3,4-TCP < 0.1 ug/L	Objective met
2,3,4,6-: 0.3 ug/L	at Pr. Ge. CNR bridge		2	2,3,5-TCP < 0.1 ug/L	Objective met
tot: 0.6 ug/L	(d/s Pr. Ge. mills)		2	2,3,6-TCP < 0.1 ug/L	Objective met
			2	2,4,5-1CP < 0.1 ug/L	Indefinite result
max PCP pH 7.8:			2	2,4,6-1CP < 0.1 ug/L	Objective met
0.1 ug/L			2	3,4,5-TCP < 0.1 ug/L.	Indefinite result
			2	tot TCP < 0.1 ug/L	Objective met
			2	2,3,4,5-TTCP < 0.1 ug/L	Objective met
			2	2,3,4,6 -TTCP <0.1 ug/L	Objective met
·			2	tot TTCP < 0.1 ug/L	Objective met
			2	PCP < 0.1 ug/L	Objective met
	E206182	Feb 20 - Mar 20	5	2,3,4-TCP < 0.1 ug/L	Objective met
	at Stoner		5	2,3,5-TCP < 0.1 ug/L	Indefinite result
-	(d/s Pr. Ge. mills)		5	2,3,6-TCP < 0.1 ug/L	Objective met
			5	2,4,5-TCP < 0.1 ug/L	Indefinite result
			5	2,4,6-TCP < 0.1 ug/L	Objective met
			5	3,4,5-TCP < 0.1 ug/L	Indefinite result
			5	tot TCP < 0.1 ug/L	Objective met
			5	2,3,4,5-TTCP < 0.1 ug/L	Objective met
			5	2,3,4,6 -TTCP <0.1 ug/L	Objective met
			5	tot TTCP < 0.1 ug/L	Objective met
			5	PCP < 0.1 ug/L	Objective met
	E221566	Mar 15 - Mar 22	2	2,3,4-TCP < 0.1 ug/L	Objective met
	at Longbar u/s Quesnel		2	2,3,5-TCP < 0.1 ug/L	Indefinite result
н	_		2	2,3,6-TCP < 0.1 ug/L	Objective met
			2	2,4,5-TCP < 0.1 ug/L	Indefinite result
			2	2,4,6-TCP < 0.1 ug/L	Objective met
			2	3,4,5-TCP < 0.1 ug/L	Indefinite result
			2	tot TCP < 0.1 ug/L	Objective met
	5		2	2.3.4.5-TTCP < 0.1 ug/L	Objective met
			2	2.3.4.6 -TTCP <0.1 ug/L	Objective met
			2	tot TTCP < 0.1 ug/L	Objective met
			2	PCP < 0.1 ug/L	Objective met
	0600011	Feb 22 - Mar 22	5	2.3.4-TCP < 0.1 ug/L	Objective met
	at Marguerite d/s Quesnel		5	2.3.5-TCP < 0.1 µg/L	Indefinite result
			5	2.3.6-TCP < 0.1 µg/l	Objective met
			5	$245-TCP < 0.1 \mu \sigma/l$	Indefinite result
			5	246-TCP < 0.1 ug/l	Objective met
			5	2, -7, 0 = 101 < 0.1 ug/c	Indefinite recuit
			5	0, -1, 0 - 1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1 < 0, -1	Objectivo met
			5	10110F < 0.1 ug/L	Objective met

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FRASER RIVER (FROM THE SOURCE TO HOPE) WATER QUALITY OBJECTIVES - 1995

VARIABLE	· · · · · · · · · · · · · · · · · · ·	CONCLUSION			
&					
OBJECTIVE	SHE	DATE	n -	VALUE	Objective met
Chlorophenois	Fraser River:	Fab 00 Mar 00	5	2,3,4,5-11CP < 0.1 ug/L	Objective met
max TCPs pH 7.8:	0600011	Feb 22 - Mar 22	5	2,3,4,6-11CP <0.1 ug/L	Objective met
2,3,4-: 0.1 ug/L	at Marguente d/s Quesnei		5		Objective met
2,3,5-: 0.08 ug/L	Factoria		5	PCP < 0.1 ug/L	Objective met
2,3,6-: 0.32 ug/L	E206581	Mar 6 - Mar 29	5	2,3,4-TCP < 0.1 Ug/L	Objective met
2,4,5-: 0.08 ug/L	at Hope	,	5	2,3,5-TCP < 0.1 ug/L	
2,4,6-: 0.5 ug/L			5	2,3,6-TCP < 0.1 ug/L	Objective met
3,4,5-: 0.06 ug/L			5	2,4,5-TCP < 0.1 ug/L	Indefinite result
tot: 1.14 ug/L			5	2,4,6-TCP < 0.1 ug/L	Objective met
	-		5	3,4,5-TCP < 0.1 ug/L	Indefinite result
max TTCPs pH 7.8:			5	tot TCP < 0.1 ug/L	Objective met
2,3,4,5-: 0.2 ug/L			5	2,3,4,5-TTCP < 0.1 ug/L	Objective met
2,3,4,6-: 0.3 ug/L			5	2,3,4,6 -TTCP <0.1 ug/L	Objective met
tot: 0.6 ug/L			5	tot TTCP < 0.1 ug/L	Objective met
			5	PCP < 0.1 ug/L	Objective met
max PCP pH 7.8:					
0.1 ug/L					
AOX	Fraser River:				
	0400023	Feb 20 - Mar 20	5	all < 0.01 mg/L	Control site 1
no increase	at Hansard			•	
over control	(u/s Pr. Ge.)				
at 95% confidence	E221565	Mar 13 - Mar 20	2	0.05 - 0.07 mg/L	Objective
	at Pr. Ge. CNR bridge			inc. = 400 - 600 %	not met
	(d/s Pr. Ge. mills)				
	E206182	Feb 20 - Mar 20	5	0.04 - 0.11 mg/L	Objective
	at Stoner			inc. = 300 - 1000 %	not met
	(d/s Pr. Ge. mills)				
	E221566	Mar 15 - Mar 22	2	0.03 - 0.04 mg/L	Control site 2
	at Longbar u/s Quesnel				
	0600011	Mar 15 - Mar 22	2	0.03 - 0.05 mg/L	Objective
	at Marguerite d/s Quesnel			inc. = 0 - 25 %	met
Resin Acids	Fraser River:				
	0400023	Feb 20 - Mar 20	5	DHA: all < 1 ug/L	Objectives
12 ug/L max DHA	at Hansard			total: ali < 7 ug/L	met
45 ug/L max total	(u/s Pr. Ge.)				
at pH 7.5	E221565	Mar 13 - Mar 20	2	DHA: < 1 -1 ug/L	Objectives
	at Pr. Ge. CNR bridge			total: < 7 - 7 ug/L	met
	(d/s Pr. Ge. mills)				
	E206182	Feb 20 - Mar 20	5	DHA: <1 - 3 ug/L	Objectives
	at Stoner		1 1	total: < 7 - 5 ug/L	met
	(d/s Pr. Ge. mills)				
	E221566	Mar 15 - Mar 22	2	DHA: <1 - 1 ug/L	Objectives
	at Longbar u/s Quesnel			total: < 7 - 1 ug/L	met
	-				
	0600011	Feb 22 - Mar 22	5	DHA: < 1 - 11 ug/L	Objectives
	at Marguerite d/s Quesnel			total: < 7 - 43 ug/L	met
	-				
	E206581	Mar 6 - Mar 29	5	DHA: all < 1 ug/L	Objectives
	at Hope			total: all < 7 ug/L	met
	•			-	

FRASER RIVER (FROM THE SOURCE TO HOPE) WATER QUALITY OBJECTIVES - 1995

VARIABLE		MEASUREMENT					
OBJECTIVE	SITE	DATE	n	VALUE			
Dioxins and Furans in water 0.06 pg/L max TCDD-TEQ	Fraser River	1995	0	no data collected	Objective not checked		
Dioxins and Furans in sediments 0.25 pg/g max TCDD-TEQ	Fraser River	1995	0	no data collected	Objective not checked		
Dioxins and Furans in fish lipids 50 pg/g TCDD-TEQ	Fraser River: R4 at Stoner	Sep. 7	6	0 - 17 pg/g TCDD-TEQ in lipid of mountain whitefish muscle	Objective met		
	R7 below Quesnel	Sep. 10	7	4.2 - 26.1 pg/g TCDD-TEQ in lipid of mountain whitefish muscle	Objective met		
			1	527 pg/g TCDD-TEQ in lipid of mountain whitefish muscle	objective not met		
	R10 below Lillooet	Sep. 10	2	5.2 - 5.5 pg/g TCDD-TEQ in lipid of mountain whitefish muscle	Objective met		
	R16 above Hope	Oct. 11	2	24.1 - 24.6 pg/g TCDD-TEQ in lipid of mountain whitefish muscle	Objective met		

WILLIAMS LAKE WATER QUALITY OBJECTIVES - 1995

VARIABLE		CONCLUSION			
&		r	· · · · · ·		
OBJECTIVE	SITE	DATE	n	VALUE	
Fecal Coliform	Williams Lake:				
< 200/100 mL	E221221	Jun 8 - Aug 31	4	5 - 25/100 mL	Indefinite
geometric mean	Scout Island Beach				results
(gm)				,	
< 400/100 mL					
90th percentile					
(np)					
at beaches					
Fecal Coliform	Williams Lake	1995	0.	no data collected	Objective
< 10/100 mL	water intake sites				not checked
90th percentile					
at water intakes					
Turbidity	Williams Lake:	Apr. 11	5	0.5-18 m: 1.5 - 3.0 NTU	Max obj. met
	0603019				
< 1 NTU av	at lake centre	Aug 3 - Aug 26	5	0 m: 1.8 - 3.2 NTU	Av not met
5 NTU max.		· · · · · · · · · · · · · · · · · · ·			Max. obj. met
		Sep. 5		0 m: 1.5 N I U	Max obj. met
Total P	Williams Lake:				
	0603019	Apr. 11	1	0.5 m : 0.082 mg/L	Objective
< 0.020 mg/L av	at lake centre		1	5 m : 0.086 mg/L	not met
at spring			1	10 m : 0.086 mg/L	
overturn			1	18 m : 0.076 mg/L	
				av = 0.083 mg/L	
Chlorophyll-a	Williams Lake:				
	0603019	May 13 - Aug 9	4	5.1 - 12.4 ug/L	Objective
< 5 ug/L av	at lake centre			av = 7.5 ug/L	not met
(May to Aug)					
Dissolved Oxygen	Williams Lake:				
	0603019	May 13 - Jun 12	2	14.5 m: 5.3 - 5.8 mg/L	Objective
4.0 mg/L min	at lake centre				met
5 m above sed.		Aug 9 - Oct 1	3	14.5 m: 0.5 - 1.3 mg/L	Objective
					not met
Water Clarity	Williams Lake:				
	0603019	May 13 - Aug 9	4	2.0 - 4.2 m	Objective
1.2 m min	at lake centre				met
Secchi reading	,				
(May to August)					
			1		1

SAN JOSE RIVER WATER QUALITY OBJECTIVE - 1995

VARIABLE	· · · · · · · · · · · · · · · · · · ·	CONCLUSION			
	SITE	DATE	n	VALUE	
Dissolved P	San Jose River:				Objective
	08MC040	Jan 15 - Nov 21	41	0.144 - 1.91 m3/s	met
2500 kg/year	(near 0600317)			river flow	
	u/s Borland Creek				
max. loading at the					
inlet to Williams Lk	Borland Creek:				
	08MC039	Jan 15 - Nov 21	41	0.006 - 0.078 m3/s	
	(near 0600105)			creek flow	
	at the mouth				
	San Jose Biver		+		
	0600316	Jan 15 - Nov 21	41	0.022 - 0.631 mg/l	
	d/s Borland Creek			dissolved P	
				0.699 - 13.568 kg/day	
				dissolved P	
				total = 1293 kg/year	
				dissolved P	

OKANAGAN VALLEY LAKES WATER QUALITY OBJECTIVES - 1995

VARIABLE		MEASUREMENT				
OBJECTIVE	SITE	DATE	l n l	VALUE	-	
Total-P	Wood Lake:					
	0500848	Feb. 23	11	1 m: 0.068 ma/L	Objective	
< 0.040 mg/L av	lake centre			15 m: 0.031 mg/L	met	
at spring				20 m: 0.019 mg/L		
overturn				30 m: 0.019 mg/L		
(short-term)				av = 0.034 mg/l		
(blioit toilit)				av = 0.00 + mg2		
Total-P	Kalamalka Lake:	Apr. 24		1 m: <0.003 mg/l		
	0500246		3	20 m: <0.003-0.005 mg/l	Objective	
< 0.008 mg/l av	south end		Ť	av = 0.003 mg/l	met	
< 0.000 mg/2 uv				av = 0.000 mg/L	inot i	
overturn	0500461	Apr. 24		1 m: 0.007 mg/L	1	
	north end			20 m: <0.003 mg/L	Objective	
				av = 0.005 mg/l	met	
				uv = 0.000 mg/L	mor	
Total-P	Okanagan Lake:					
	0500239	Apr. 11	1	1 m: 0.009 ma/L		
< 0.010 mg/L av	Armstrong Arm		4	20 m: 0.008-0.018 mg/L	Objective	
at spring	, and a set of the set			av = 0.013 mg/L	not met	
overturn						
	0500238	Mar. 14		1 m: 0.007 mg/l	Objective	
	Vernon Arm			15 m: 0.003 mg/l	met	
				20 m < 0.003 mg/l		
				20 m < 0.003 mg/L		
				av = 0.004 mg/L		
. · · · ·	0500730	Mar. 14	1	1 m: 0.013 ma/L	Objective	
	north basin		3	15 m: <0.003-0.004 mg/L	met	
				20 m; <0 003 mg/l		
				av = 0.005 mg/L		
	0500236	Feb. 22	1	15 m: <0.003 mg/L	Objective	
	central basin			20 m: 0.009 mg/L	met	
				av = 0.006 mg/L		
ľ	. 0500729	Mar. 12	5	0 m: <0.003-0.004 mg/L	Objective	
	south basin		4	1 m: all <0.003 mg/L	met	
			1	15 m: 0.004 mg/L		
			1	20 m: <0.003 mg/L		
	i i i i i i i i i i i i i i i i i i i			av = 0.003 mg/L		
				C C		
Total-P	Skaha Lake:	Mar.3	1	1m: <0.003 mg/L	Objective	
	0500615		1	15 m: 0.004 mg/L	met	
< 0.015 mg/L av	at centre			20 m: 0.007 mg/L		
at spring				av = 0.005 mg/L		
overturn				•		
F	Osoyoos Lake:	Feb. 28	1	0 m: 0.005 mg/L		
	0500249		2	1 m; all = 0.009 ma/L	Objective	
	north end			15 m: 0.007 ma/L	met	
				av = 0.007 mg/L		

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CAHILL CREEK AND TRIBUTARIES WATER QUALITY OBJECTIVES - 1995

VARIABLE		CONCLUSION			
&			·······		
OBJECTIVE	SITE	DATE	n	VALUE	
Suspended Solids	Cahill Creek: E206636 d/s tailings	Jan 24 - Aug 8	6	< 4 - 21 mg/L	Control site
max. increase	E206637 at highway	Jan 24 - Aug 8	6	< 4 - 19 mg/L increase = 0 - 6 mg/L	Objective met
	Red Top Gulch: E206638 at Highway	Jan 24 - Aug 8	6	all < 4 mg/L	Objective met
Susp. Solids 20 mg/L or 10% max. increase	Cahill Creek: E206635 u/s confluence	Jan. 25	1	< 4 mg/L	Control site
	E206636 d/s tailings	Jan 24 - Aug 1	5	< 4 - 8 mg/L	Objective met
		Aug. 8	1	21 mg/L	Indefinite result
	Nickel Plate Mine Creek: E206633 d/s pit	Jan. 24	1	< 4 mg/L	Objective met
	Sunset Creek: E206634 u/s confluence	Jan. 24	1	< 4 mg/L	Objective met
Turbidity 5 NTU or 10% max_increase	Cahill Creek: E206635 u/s confluence	Jan 25 - Aug 8	6	0.2 - 3.4 NTU	Control site
	E206636 d/s tailings	Jan 24 - Aug 8	6	0.2 - 4.4 NTU increase = 0 - 1.0 NTU	Objective met
•	E206637 at highway	Jan 24 - Aug 8	6	0.2 - 4.1 NTU increase = 0.1 - 1.0 NTU	Objective met
	Red Top Gulch: E206638 at highway	Jan 24 - Aug 8	6	0.1 - 0.7 NTU	Objective met
Turbidity 10 NTU or 20% max. increase	Sunset Creek: E215954 u/s Canty Pit	Jul. 10 - Aug. 8	5	0.2 - 1.6 NTU	Control site
	E215955 d/s Canty Pit	Jul. 10 - Aug. 8	5	0.4 - 1.8 NTU increase = 0 - 1.0 NTU	Objective met
	E206634 u/s confluence	Jan. 24	1	0.8 NTU	Objective met
	Nickel Plate Mine Creek: E206633 d/s pit	Jan 24 Aug 8	6	< 0.1 - 0.5 NTU	Objective met

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CAHILL CREEK AND TRIBUTARIES WATER QUALITY OBJECTIVES - 1995

VARIABLE	MEASUREMENT				CONCLUSION
	SITE	DATE	T n T	VALUE	-
Dissolved Solids	Cabill Creek:				
Dissolved Solids	E206635	lan 25	1	76 mg/l	Objective
	E200035	Jan. 25		70 mg/E	objective
	d/s confidence				met
	Faaaaa	lan 04	+++	150	Objective
	E206636	Jan. 24		156 mg/L	Objective
500 mg/L max	d/s tailings				met
	E206637	Jan. 24	1	156 mg/L	Objective
	at highway			·	met
		I			
	Red Top Gulch:				
	E206638	Jan. 24	1	576 mg/L	Objective
	at highway			-	not met
	Nickel Plate Mine Creek:		++		
	Tooccoo	lon 04		1120 mg/l	Objective
	E206633	Jan. 24		1130 mg/L	Objective
	d/s pit				not met
Sulphate	Cahill Creek:				
	E206635	Jul. 10 - Aug. 8	5	< 1.0 - 12.0 mg/L	Objectives
< 50 mg/L av	u/s confluence			av = 7.1 mg/L	met
150 mg/L max.					
		Jan. 25	1	11.5 mg/L	Max obj. met
	E206636	Jul 10 - Aug 8	5	27.8 - 59.6 mg/L	Objectives
	d/s tailings			av = 37.3 mg/L	met
		Jan 24, Sep 19	2	19.9, 71.1 mg/L	Max obj. met
	E206637	Jul 10 - Aug 8	5	30.4 - 52.6 mg/L	Objectives
	at highway	5		av = 40.5 mg/L	met
			++		
		Jan 24, Nov 19	2	25.8, 72.6 mg/L	Max obi, met
	Red Top Gulph:		+-+		
	Red Top Guich.	hut to Aur B		101 106 mg/	Max obj mot
	E206638	Jul. 10 - Aug. 8	^o	121 - 128 mg/L	Max. obj. met
	at highway			av = 125 mg/L	AV. not met
		1		100	May abi mat
	a de la constante de la consta	Jan. 24		136 mg/L	Max obj. met
	Nickel Plate Mine Creek:	Jul 10 - Aug 8	5	175 - 384 mg/L	Objectives
	E206633			av = 332 mg/L	not met
	d/s pit				
		Jan 24, Nov 1	2	262 - 404 mg/L	Max not met
WAD-CN	Cahill Creek:				
	E206635	Jul. 10 - Aug. 8	5	all < 0.001 mg/L	Objectives
< 0.005 mg/L av	u/s confluence			-	met
0.010 mg/L max					
0.010 119 2 110	E206636	Jul 10 - Aug 8	5	all < 0.001 mg/L	Objectives
	d/s tailings		ľ	u	met
	a s tainigs				
	E206637	Jul 10 - Aug 8	5	all < 0.001 mg/l	Objectives
	et highwoy	Jul. 10 - Aug. 0			met
	at ngnway				in ot
			╺┾╼╍┿		
	Red Top Gulch:				
	E206638	Jul. 10 - Aug. 8	5	all < 0.001 mg/L	Objectives
	at highway				met
					1

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VARIABLE		CONCLUSION			
	SITE	DATE	T n T	VALUE	1
	Cabill Creek:	DAIL	- `` -	Thiocyanate:	
Thiopyopato as	E206635	Jul 10 - Aug 8	5	all < 0.025 mg/l	Indefinite
Thiocyanate as		Jul. 10 - Aug. 0		(SAD-CN not checked)	rosult
CN	u/s connuence			(SAD-CIVITOL CHECKED)	result
0.90 mg/L may	E206636	Jul 10 - Aug 8	5	Thiocyanate:	Indefinite
0.20 mg/L max	d/e tailings	0ui: 10 //ug. 0	Ĭ	all < 0.025 mg/l	result
	d/s tailings			(SAD-CN not checked)	roodit
	E206627	lul 10 - Aug 8	- 5	Thiocyanate:	Indefinite
	at highway	Jul. 10 - Aug. 0	U U	all < 0.025 mg/l	result
	at highway			(SAD-CN not checked)	result
			++		
	Red Top Guich:			Thiocyanate:	Indofinito
	E206638	Jul. 10 - Aug. 8	5	all < 0.025 mg/L	Indefinite
	at Highway			(SAD-CN hot checked)	result
0	Cabill Creak				
Cyanates as CN	Canill Creek:	Jul 25 Aug 9		$a \ < 0.05 mg/l$	Objective
0.45 mg/l may	E200037	Jul. 25 - Aug. 6		aii < 0.05 mg/c	met
0.45 mg/L max	at nighway	Jul 10 Jul 19	1	2 < 0.50 mg/	Indefinite
		Jui 10 - Jui 10	2	all < 0.50 mg/L	result
			++		result
	Red Top Guich:			all < 0.05 mg/l	Objective
	E206638	Jul. 25 - Aug. 8	2	ali < 0.05 mg/∟	Objective
	at Highway			0.50 5.00	met
		Jui 10 - Aug 1	3	< 0.50 - < 5.00 mg/L	indennite
	Ochill Ore elu			· · · · · · · · · · · · · · · · · · ·	resuit
I OTAL AS	Carilli Creek.			$a \ < 0.01 mg/l$	Objective
0.05 mg/l mov		Jul. 10 - Aug. 6	5	air < 0.04 mg/L	mot
0.05 mg/L max.	u/s confluence				mer
	E206636	Jul 10 - Aug 8	5	< 0.04 - 0.04 mg/l	Objective
	d/s tailings	Jul 10 - Aug 0	Ĭ	< 0.04 ° 0.04 mg/L	met
	u/s tailings				
	F206637	Jul 10 - Aug 8	5	all < 0.0005 mg/l	Objective
	at highway		Ĭ		met
	armgmay				
	Red Top Guleb:		+ +		1
	Facess	hul 10 Aug 9	5	all < 0.0005 mg/l	Objective
	E200030	Jul. 10 - Aug. 6		all < 0.0000 Mg/2	objective
	at nighway				iner
Totol Ac	Nickel Plate Mine Crock:				
0 5 mg/l mov	E206622	hul 10 - Aug 8	5	< 0.04 - 0.06 mg	Objective
0.5 mg/L max	d/s pit		Ĭ	< 0.54 ° 0.60 mg	met
Ammonia-N	Cabill Creek:		++		
Ammonia-N	E206637	Jan 24		< 0.005 mg/l	Max obi met
< 1.11 mg/L ov	at highway		1 1	C 01000 mg/L	Av not chkd
$\leq 1.11 \text{ mg/L av}$	at highway				/ to not onita.
5.75 mg/L max	Ded Ten Outshi		++		+
at		100.04		< 0.005 mg/l	Max ohi mot
pH = 8.0		Jan. 24		< 0.005 mg/L	Av not oblid
temp = 12 °C	at nignway		+_+	ou - 0.007 //	Av not crika.
Nitrite-N	Canill Greek:	Jul 10 - Aug 8		av = 0.027 mg/L	May obj met
	E206637	Jui 10 - Aug 8	4	< 0.005 - 0.026 mg/L	Max obj. met
< 0.02 mg/L av	at nighway	Jul. 18		0.086 mg/L	Max not met
0.06 mg/L max		Jan 24, Sep 19		0.015, < 0.005 mg/L	mot
			- I I		11101

VARIABLE		CONCLUSION			
	SITE	DATE		VALUE	
OBJECTIVE Nitrito N	SITE Red Tep Culebi		<u> </u>	<0.005 - 0.022 mg/l	Objectives
Nitrite-IN		Jul 10 - Aug o	5	<0.005 - 0.023 mg/L	Objectives
< 0.02 mg/l av	E200030			av = 0.013 mg/L	niet
< 0.02 mg/L av	at highway	lan 24		0.007 mg/l	Max obi met
0.00 mg/L max	Cabill Crook:	Jan. 24	+ '+	0.007 mg/2	Wax obj. met
Nutitie-IN	E206625	lan 25		0.010 mg/l	Max obi met
1 mg/ mgy		Jan. 20	1'1	0.010 mg/c	Av not chkd
r mg/∟ max	u/s comuence				AV HOL CHKU.
	E006626	ian 24 Son 19	+	0.027 < 0.005 mg/l	Max obi mot
		Jali 24, Sep, 19	2	0.027, < 0.003 mg/L	wax obj. met
	u/s tailings				
Nitrito N	Niekel Plate Mine Creek				· · · · · · · · · · · · · · · · · · ·
Nume-in	Fooeso	Ion 24 Nov 1		0.049, 0.007 mg/i	Max obi mot
10 mg/1 mov	. E200033	Jall 24, NOV 1	-	0.049, 0.007 mg/E	Max obj. met
10 mg/L max	u/s pit				
Niitroto N	Cobill Crook:				
Nitrate-IN				-0.00 0.06 mg/l	Objective
10	E206635	Jan 25 - Aun 8	l o	<0.02 - 0.06 mg/L	Objective
10 mg/L max	u/s confluence				met
	5000000	1 04 - 0 40	+	0.05 0.50	Ohiostius
	E206636	Jan 24 - Sep 19		2.05 - 9.53 mg/L	Objective
	d/s tailings				met
			+	0.05 0.00	Oblection
	E206637	Jan 24 - Sep 19	1	2.35 - 9.02 mg/L	Objective
·	at highway				met
			_		
	Red Top Gulch:	·			
· ·	E206638	Jan 24 - Aug 8	6	5.57 - 6.07 mg/L	Objective
· · · ·	at highway				met
Nitrate-N	Nickel Plate Mine Creek				
	E206633	Jan 24 - Nov 1	7	59.0 - 95.6 mg/∟	Objective
100 mg/L max	d/s pit	•			met
рН	Cahill Creek:				
	E206635	Jan 25 - Aug 8	6	6.8 - 7.5	Objective
6.5 - 8.5	u/s confluence				met
	E206636	Jan 24 - Aug 8	6	7.6 - 7.9	Objective
	d/s tailings				met
			_		
	E206637	Jan 24 - Aug 8	6	7.5 - 7.8	Objective
	at highway				met
	Red Top_Gulch:				
	E206638	Jan 24 - Aug 8	6	8.0 - 8.2	Objective
	at highway			L	met
	Nickel Plate Mine Creek:				
	E206633	Jan 24 - Nov 1	7	7.8 - 8.1	Objective
	d/s pit				met
Total Al	Cahill Creek:				
0.30 mg/L max	E206635	Jul. 10 - Aug. 8	5	0.08 - 0.18 mg/L	Control site
or 20% increase	u/s confluence				
at pH > 7					

VARIABLE		CONCLUSION			
&					
OBJECTIVE	SITE	DATE	n	VALUE	Obiostivo
Total Al	Cahill Creek:	Jul 10 - Aug 1	4	0.18 - 0.24 mg/L	Objective
0.30 mg/L max	E206637		+ +	2.42	Objective
or 20% increase	at highway	Aug. 8	11	0.43 mg/L	Objective
at pH > 7			++	increase = 139%	not met
Total Al	Red Top Gulch:				Ohiootius
0.30 mg/L max	E206638	Jul. 10 - Aug. 8	5	0.05 - 0.14 mg/L	Objective
at pH > 7	at highway				met
	0.1110.11		+-+	· · · · · · · · · · · · · · · · · · ·	
	Cahill Creek:				Ohiostiya
Total Cd	E206637	Jul. 10 - Aug. 8	5	all < 0.0001 mg/L	Objective
	at highway				met
0.0002 mg/L max					
· ·	Red Top Gulch:				
	E206638	Jul. 10 - Aug. 8	5	all < 0.0001 mg/L	Objective
	at highway				met
Total Cd	Cahill Creek:				
	E206635	Jul. 10 - Aug. 8	5	all < 0.002 mg/L	Objective
0.005 mg/L	u/s Confluence				met
			_		
	E206636	Jul 10 - Aug 8	5	all < 0.002 mg/L	Objective
	d/s tailings				met -
	•		_		
Total Cd	Nickel Plate Mine Creek:				
	E206633	Jul. 10 - Aug. 8	5	all < 0.002 mg/L	Objective
0.02 mg/L max	d/s pit				met
			_		
Total Cu	Cahill Creek:				
	E206637	Jul. 10 - Aug. 8	5	<0.002 - 0.003 mg/L	Objectives
< 0.005 mg/L av	at highway			av = 0.002 mg/L	met
0.007 mg/L max					
or			1 1		
20% max. increase					
Total Cu	Red Top Gulch:				
	E206638	Jul. 10 - Aug. 8	5	all < 0.002 mg/L	Objectives
< 0.005 mg/L av	at highway				met
0.007 mg/L max					
Total Cu	Cahill Creek:				
	E206635	Jul. 10 - Aug. 8	5	< 0.002 - 0.003 mg/L	Objective
0.2 mg/L max	u/s confluence				met
					Chile atting
	E206636	Jul 10 - Aug 8	5	< 0.002 - 0.003 mg/L	Objective
	d/s tailings	· · · · · · · · · · · · · · · · · · ·			met
	Altabat Disks Affred Organi				
Total Cu	Nickel Plate Mine Creek:				Objective
	E206633	Jui 10 - Aug 8	l °	< 0.002 - 0.006 mg/L	Objective
.0.3 mg/L max	a/s pit				met
Disselius d Es	Oshill Oresin				
Dissolved Fe		kildo Ave 4	_	0.07 0.00	Objective
	E206635	Jui 10 - Aug. 4	5	0.07 - 0.22 mg/L	Objective
0.3 mg/L max	u/s connuence				met
1					1

VARIABLE		CONCLUSION			
	SITE	DATE		VALUE	-
DBJECTIVE		DATE		VALUE	
	E206636	Jul 10 - Aug 1	4	0.09 - 0.17 mg/L	Objective met
olo ing z max		Aug. 8	1	0.41 mg/L	Objective not met
	E206637 at highway	Jul 10 - Aug 1	4	0.16 - 0.26 mg/L	Objective met
		Aug. 8	1	0.45 mg/L	Objective not met
	Red Top Gulch: E206638 at highway	Jul. 10 - Aug. 8	5	ali < 0.05 mg/L	Objective met
	Nickel Plate Mine Creek: E206633 d/s pit	Jul. 10 - Aug. 8	5	ali < 0.05 mg/L	Objective met
Total Pb < 0.005 mg/L av 0.015 mg/L max	Cahill Creek: E206637 at highway	Jul. 10 - Aug. 8	5	all < 0.003 mg/L	Objectives met
or 20% increase					
Total Pb < 0.005 mg/L av	Red Top Gulch: E206638 at highway	Jul. 10 - Aug. 8	5	alí < 0.003 mg/L	Objectives met
Total Pb 0.05 mg/L max	Cahill Creek: E206635 u/s confluence	Jul. 10 - Aug. 8	5	ali < 0.03 mg/L	Objective met
	E206636 d/s tailings	Jul 10 - Aug 8	5	all < 0.03 mg/L	Objective met
Total Pb 0.1 mg/L max	Nickel Plate Mine Creek: E206633 d/s pit	Jul. 10 - Aug. 8	5	all < 0.03 mg/L	Objective met
Total Hg 0.1 ug/L max	Cahill Creek at hwy Red Top Gulch at hwy	1995	0	no data collected	Omitted 1995
Total Hg 1 ug/L max	Cahill Creek u/s hwy Red Top Gulch Ck u/s hwy	1995	0	no data collected	Omitted 1995
Total Hg 3 ug/L	Nickel Plate Mine Creek	1995	0	no data collected	Omitted 1995
Total Hg in fish muscle 0.5 ug/g max wet wt	Cahill Creek at hwy Red Top Gulch at hwy	1995	0	no data collected	Omitted 1995
Total Mo 0.01 mg/L av 0.05 mg/L max (May - Sep)	Red Top Gulch: E206638 at highway	Jan. 24	1	< 0.004 mg/L (dissolved Mo)	Indefinite result

& OBJECTIVE SITE DATE n VALUE Total Mo Cahill Creek:	Control site Objectives met
OBJECTIVE SITE DATE N VALUE Total Mo Cahill Creek: Jul 10 - Aug 8 5 all < 0.004 mg/L	Control site Objectives met
I otal Mo Canil Creek: E206635 Jul 10 - Aug 8 5 all < 0.004 mg/L < 0.01 mg/L av	Control site Objectives met
E206635 Jul 10 - Aug 8 5 all < 0.004 mg/L < 0.01 mg/L av	Objectives met
< 0.01 mg/L av u/s confluence 0.05 mg/L max u/s confluence or E206636 Jul 10 - Aug 8 5 all < 0.004 mg/L	site Objectives met
0.05 mg/L max or E206636 Jul 10 - Aug 8 5 all < 0.004 mg/L	Objectives met
or E206636 Jul 10 - Aug 8 5 all < 0.004 mg/L	Objectives met
	met
20% max. increase d/s tailings	Indefinite
(May - Sep)	Indefinite
E206637 Jan. 24 1 < 0.004 mg/L	in lucininte
at highway (dissolved Mo)	result
Total Mo Nickel Plate Mine Creek:	
E206633 Jul. 10 - Aug. 8 5 ali < 0.004 mg/L	Objective
	met
0.00 mg/E max	mot
Total Se Cabill Creek	
FOR $C = C = C = C = C = C = C = C = C = C $	Objective
	Objective
1 ug/L max at nignway	met
or 20% max inc.	
Total Se Hed Top Guich:	Ohiostina
E206638 Jul. 10 - Aug. 8 5 all < 0.5 ug/L	Objective
1 ug/L max at highway	met
Total Se Cahill Creek:	
10 ug/L max E206635 Jul. 10 - Aug. 8 5 all < 0.5 ug/L	Objective
u/s confluence	met
E206636 Jul. 10 - Aug. 8 5 ali < 0.5 ug/L	Objective
d/s tailings	met
Total Se Nickel Plate Mine Creek:	
50 ug/L max E206633 Jul. 10 - Aug. 8 5 all < 0.5 ug/L	Objective
d/s pit	met
Total Ag Cahill Creek:	
F206635 Jul 10 - Aug 8 5 all < 0.03 mg/L	Control
	site
	- Circo
$\frac{1}{2000 \text{ may increase}} = \frac{1}{10000000000000000000000000000000000$	Objective
	objective
u/s contidence	Indefinite
at highway Jul. 25 r Jul. 25 r Jul. 25 r	rocult
	result
Red Top Gulch:	
E206638 Jul 10 - Aug 8 5 all < 0.0001 mg/L.	Objective
at highway	met
Total Ag Cahill Creek:	
E206635 Jul. 10 - Aug. 8 5 ali < 0.03 mg/L	Objective
0.05 mg/L max u/s Confluence	met
or	
20% max. increase E206636 Jul 10 - Aug 8 5 all < 0.03 mg/L	Objective
d/s tailings	met
Nickel Plate Mine Creek:	
F206633	Objective
d/s pit	met

VARIABLE		CONCLUSION			
OBJECTIVE	SITE	DATE	n	VALUE	
Total Zn 0.05 mg/L max	Cahili Creek: E206635 u/s confluence	Jul. 10 - Aug. 8	5	all < 0.01 mg/L	Objective met
	E206636 d/s tailings	Jul. 10 - Aug. 8	5	< 0.01 - 0.02 mg/L	Objective met
	E206637 at highway	Jul. 10 - Aug. 8	5	all < 0.01 mg/L	Objective met
	Red Top Gulch: E206638 at highway	Jul. 10 - Aug. 8	5	all < 0.01 mg/L	Objective met
	Nickel Plate Mine Creek: E206633 d/s pit	Jul. 10 - Aug. 8	5	all < 0.01 mg/L	Objective met

TABLE 12

VARIABLE		CONCLUSION			
&					
OBJECTIVE	SITE	DATE	n	VALUE	
Fecal	Bessette Creek:	Jul 6 - Aug 2	5	160 - 570/100 mL	
Coliforms	0500293			np = 500/100 mL	np not met
	u/s Lumby	Jul 6 - Jul 20	3	160 - 200/100 mL	Max obj. met
<100/100 mL		Jul 25 - Aug 2	2	430 - 570/100 mi.	Max not met
90th perc.					
(np)	0500294	Jul 6 - Aug 2	5	90 - 700/100 mL	
	d/s Lumby STP			np = 610/100 mL	np not met
200/100 mL max		Jul 6 - Jul 20	3	90 - 170/100 mL	Max obj. met
	•	Jul 25 - Aug 2	2	530 - 700/100 mL	Max not met
	Lawson Creek:	T			
	0500645	Jul 6 - Aug 2	5	250 - 3300/100 mL	Objectives
	u/s Riverside mill			np = 1900/100 mL	not met
	0500646	Jul 6 - Aug 2	5	400 - 3200/100 mL	Objectives
	d/s Riverside mill			np = 2100/100 mL	not met
	Spider Creek:				1
	0500643	Jul 6 - Aug 2	-5	300 - 4100/100 mL	Objectives
	u/s Riverside Mill			np = 3400/100 mL	not met
	0500644	Jul 6 - Aug 2	5	36 - 1500/100 mL	
	near mouth			np = 870/100 mL	np not met
		Jul 6 - Aug 2	3	36 - 100/100 mL	Max obj. met
	-	Jul 12 - Jul 25	2	240 - 1500/100 mL	Max not met
E. coli	Bessette Creek:	Jul 6 - Aug 2	5	10 - 360/100 mL	
	0500293			np = 230/100 mL	np not met
<100/100 mL	u/s Lumby	Jul 6 - Aug 2	4	10 - 100/100 mL	Max obj. met
90th perc.		Jul. 25	1.1	360/100 mL	Max not met
(np)					
	0500294	Jul 6 - Aug 2	5	8 - 100/100 mL	Objectives
200/100 mL max	d/s Lumby STP			np = 95/100 mL	met
	2				
	Lawson Creek:	Jul 6 - Aug 2	5	5 - 540/100 mL	
	0500645	j =		np = 330/100 mL	np not met
	u/s Riverside mill	Jul 6 - Aug 2	4	5 - 130/100 mL	Max obi, met
		Jul. 25	1	540/100 mL	Max not met
	•				
	0500646	Jul 6 - Aug 2	5	6 - 500/100 mL	
	d/s Riverside mill			np = 310/100 mL	np not met
		Jul 6 - Aug 2	4	6 - 120/100 mL	Max obj. met
		Jul. 12	1	500/100 mL	Max not met
	Spider Creek:	Jul 6 - Aua 2	5	40 - 2600/100 mL	I
	0500643			np = 1450/100 mL	np not met
	u/s Biverside Mill	Jul 6 - Jul 26	3	40 - 200/100 mL	Max obi, met
		Jul 20 - Aug 2	2	300 - 2600/100 mL	Max not met
	0500644	Jul 6 - Aua 2	5	7 - 580/100 mL	
	near mouth			np = 370/100 mL	np not met
		Jul 6 - Aug 2	4	7 - 160/100 mL	Max obi. met
		Jul. 25		580/100 mL	Max not met
Enterococci	Bessette Creek				
<25/100 mL	Lawson Creek	1995	0	no data collected	Omitted
90th percentile	Spider Creek				1995
50/100 mL max					

BESSETTE CREEK WATER QUALITY OBJECTIVES - 1995

VARIABLE	MEASUREMENT				CONCLUSION
	SITE	DATE			1
Dissolved	Lawson Creek:	DAIL		VALUE	
Solids	0500645	.lul 6lul 26	4	368 - 400 mg/l	Control site
Condo	u/s Biverside mill			000 400 mg/L	Control Site
500 mg/l max	0500646	Jul 6 - Jul 26	4	410 - 450 mg/l	Objective
or	d/s Biverside mill	001 0 001 20		410 - 400 mg/E	mot
20% increase					mer
20 /0 11010000	Spider Creek				
	OFODG47		_	976 466 mail	Control site
	USUU843	Jui 6 - Aug 2	5	376 - 466 Mg/L	Control site
	u/s niverside Mill				
	0500644	Jul 6	1 1	500 mg/l	Obi met
	near mouth	. hul 12 hul 26		502 • 750 mg/l	Obi not mat
	neur mouth			(increase - 22 - 80%)	Obj. Hot met
Suspended	Bessette Creek				
Solids	0500293	Jul 6 - Aug 2	5	all < 4 mg/l	Control
Condo			Ĭ	un < + mg/L	site
10 mg/ or 10%	the Londy				
maximum increase	0500294	Jul 6 - Aug 2	5	all < 4 mg/L	Objective
	d/s Lumby STP				met
	Lawson Creek:		<u>†</u>		
	0500645	Jul 6 Jul 26	4	< 4 - 21 mg/L	Control
	u/s Biverside mill				site
	0500646	Jul 6 - Jul 26	4	5 - 13 ma/L	Objective
	d/s Riverside mill			max. inc. = 6 mg/L	met
	Spider Creek:				
	0500643	Jul 6 - Aug 2	5	7 - 17 mg/L	Control
	u/s Riverside Mill				site
· ·					
	0500644	Jul 6 - Jul 26	3	10 - 19 mg/L	Objective
	near mouth			max. inc. = 2 mg/L	mei
		Jul. 20	1	25 mg/L	Objective
				max inc. = 18 mg/L	not met
	Harris Creek:				
	E209072	Jul 6 - Aug 2	5	all < 4 mg/L	Control
	u/s Bell Pole				site
	E210219	Jul 6 - Aug 2	5	< 4 - 4 mg/L	Objective
	at Bell Pole				met
0.1	Descette Occuli		+		
Substrate	Bessette Creek	1005		no data callactad	Omitted 1005
Sedimentation	Lawson Creek	1995		no data collected	Omitted 1995
no increase in	Spider Creek				
weight of particles	патть Стеек				
<3 mm diameter	Bessette Crook:			·····	
rubidity	Desselle Uleek.	Jul 6 - Aug 2	5		Control
5 NTI or 10%	u/s Lumhy	0010 - Aug 2			sito
max increase	als comby				Olto

.

VARIABLE		CONCLUSION			
& 00.5070/5	OITE	DATE			-
OBJECTIVE	SHE	DATE		VALUE	
rubidity	Bessette Creek				
5 NTU or 10%	0500294	Jul 6 - Aug 2	5	0.4 - 1.1 NTU	Objective
max increase	d/s Lumby STP	our o y lug 2	Ŭ		met
	Lawson Creek:		+ +		
	0500645	Jul 6 - Jul 26	4	0.3 - 3.0 NTU	Control site
	u/s Riverside mill				
		1			
	0500646	Jul 6 - Jul 26	4	0.3 - 2.3 NTU	Objective
	d/s Riverside mill				met
l í	Spider Creek:				
	0500643	Jul 6 - Aug 2	5	0.6 - 3.7 NTU	Control
	u/s Riverside Mill				site
			+ +		
	0500644	Jul 6 - Jul 26	4	0.9 - 5.4 NTU	Objective
	near mouth			max. Inc. = 1.7 NTU	met
	Llauria Ora ale	<u> </u>	+-+		
	Harris Creek:				Control
	E207072	Jui 6 - Aug 2	° I	0.3 - 0.7 NTO	control
	u/s bell Pole				Sile
	F210219	Jul 6 - Aug 2	5	0.3 - 1.0 NTU	Objective
	at Bell Pole	our of ridg 2	Ŭ		met
Ammonia-N	Bessette Creek				
	Lawson Creek	1995	0	no data collected	Omitted 1995
< 1.66mg/L av	Spider Creek		ÍÍ		
12.2 mg/L max					
at	Harris Creek				
pH = 7.5	E209072	Jul 6 - Aug 2	5	< 0.005 - 0.006 mg/L	Objectives
temp = 16 °C	u/s Beli Pole				met
	E210219	Jul 6 - Aug 2	. 5	all < 0.005 mg/L	Objectives
	at Bell Pole				met
Nitrito-N	Bessette Creek:				
initite-in	0500293	Jul 6 - Aug 2	5	< 0.005 - 0.011 mg/l	Ohiectives
< 0.04 mg/Lay		our o - Aug 2	ĭ	< 0.000 - 0.011 high	met
0.12 mg/L max	alo Edinby				
<u> </u>	0500294	Jul 6 - Aug 2	5	< 0.005 - 0.009 mg/L	Objectives
av Cl = 2 - 4 mg/L	d/s Lumby STP	, č			met
	-				
Nitrite-N	Lawson Creek:				
	0500645	Jul 6 - Jul 26	4	0.011 - 0.026 mg/L	Max obj. met
< 0.20 mg/L av	u/s Riverside mill			•	av not checked
0.60 mg/L max					
	0500646	Jul 6 - Jul 26	4	< 0.005 - 0.032 mg/L	Max obj. met
av Cl > 10 mg/L	d/s Riverside mill				,
1 I		1			1

VARIABLE		CONCLUSION			
&					
OBJECTIVE	SITE	DATE	n	VALUE	1
Nitrite-N	Spider Creek:				
< 0.20 mg/L av	0500644	Jul 6 - Jul 26	4	< 0.005 - 0.007 mg/L	Max obj. met
0.60 mg/L max	near mouth				av not checked
av Cl > 10 mg/L					
Nitrite-N	Spider Creek:				·
	0500643	Jul 6 - Aug 2	5	< 0.005 - 0.013 mg/L	Objectives
< 0.02 mg/L av	u/s Riverside Mill				met
0.06 mg/L max					
	Harris Creek:		TT		
av Cl < 2 mg/L	E209072	Jul 6 - Aug 2	5	all < 0.005 mg/L	Objectives
	u/s Bell Pole	, i i i i i i i i i i i i i i i i i i i		5	met
	E210219	Jul 6 - Aug 2	5	all < 0.005 mg/L	Objectives
	at Bell Pole				met
Nitrate-N	Bessette Creek:				
	0500293	Jul 6 - Aua 2	5	< 0.02 - 0.04 ma/L	Objective
10 mg/L max	u/s Lumby				met
	0500294	Jul 6 - Aug 2	5	< 0.02 - 0.10 ma/L	Objective
	d/s Lumby STP			,	met
· ·					
	l awson Creek:		- 1		
	0500645	Jul 6 Jul 26	4	0.68 - 0.86 mg/l	Objective
	u/s Riverside mill			0.00 - 0.00 mg/E	met
					in or
	0500646	Jul 6 - Jul 26	4	0.57 - 0.66 mg/l	Ohiective
	d/s Riverside mill			0.01 0.00 mg 2	met
	Spider Creek:				
	0500643	Jul 6 - Aug 2	5	all < 0.02 mg/l	Objective
	u/s Biverside Mill	dui o riug 1	Ŭ		met
					inde
	0500644	Jul 6 - Jul 26	4	all < 0.02 mg/l	Objective
	near mouth				met
					initia
	Harris Creek:				1
	E207072	Jul 6 - Aug 2	5	all < 0.02 mg/l	Objective
	u/s Bell Pole		Ŭ		met
	u/S Den r die				i inct
	E210219	Jul 6 - Aug 2	5	ali < 0.02 mg/l	Objective
	at Bell Pole	Build - Hug 2			met
Chiorophvll-a	Bessette Creek:		++		
	0500294	Aua. 2	6	7.9 - 63.8 ma/m2	Objective
100 mg/m2 max	d/s Lumby STP			av = 36 mg/m2	met
	,				
	Harris Creek:		++		1
	E210219	Aug 2	6	16.8 - 33.9 ma/m2	Objective
	at Bell Pole		Ĭ	$av = 28 m n/m^2$	met
1. State 1.		1			

VARIABLE	<u></u>	CONCLUSION			
	OITE	DATE		VALUE	-
Chlorophyllea	SIIE Lawson Creek	1995		no data collected	Omitted 1995
Chicrophyn-a	Spider Creek	1000	Ĭ		
100 mg/m2 max					·
Colour	Lawson Creek:				
	0500645	Jul 6 - Jul 26	4	5 - 20 TCU	Control site
15 TCU max.	u/s Riverside mill				
or					
20% increase	0500646	Jul 6 - Jul 26	4	5 - 20 TCU	Objective
	d/s Riverside mill			(no inc. over obj.)	met
	Spider Creek:				
	0500643	Jul 6 - Aug 2	5	all = 5 TCU	Control site
	u/s Riverside mill				
				5 40 700	Ohlastius
	0500644	Jul 6 - Jul 26	4	5 - 10 ICU	Objective
	near mouth				mer
Temperature	Duteau Creek	1995		no data collected	Omitted 1995
1°C max increase	Duleau Oreek	1000		no dala bolicolog	
TO Max. morease				•	
рН	Bessette Creek:			······································	
	0500293	Jul 6 - Aug 2	4	7.5 - 7.7	Objective
6.5 - 8.5	u/s Lumby	_			met
or 0.2	-				
max. increase	0500294	Jul 6 - Aug 2	4	7.3 - 7.8	Objective
at pH > 8.5	d/s Lumby STP				met
	0				
рн	Lawson Creek:			77.00	Objective
65.95	USUU645	Jul 6 - Jul 26	4	7.7 - 0.0	met
0.5 - 0.5	u/s niverside min				inec
-	0500646	Jul 6 - Jul 26	4	7.5 - 7.8	Objective
	d/s Riverside mill				met
	Spider Creek:				
	0500643	Jul 6 - Aug 2	5	8.0 - 8.2	Objective
	u/s Riverside Mill				met
	0500644	Jul 6 - Jul 26	4	7.0 - 7.4	Objective
	near mouth				met
					4
	Harris Creek:			70 75	Objective
	E209072	Jul 6 - Aug 2	5	7.3 - 7.5	Objective
-		lul 6 Aug 2		71.75	Objective
	ez 10219	Jul 6 - Aug 2	5	7.1-7.5	mot
	at bell Fole				iner iner
Dissolved	Bessette Creek:				
Oxygen	0500293	Jul 6 - Aug 2	5	10.2 - 10.8 mg/L	Objective
	u/s Lumby	Ŭ		-	met
8 - 11 mg/L min	0500294	Jul 6 - Aug 2	5	10.0 - 10.8 mg/L	Objective
	d/s Lumby STP				met

VARIABLE		CONCLUSION			
&					
OBJECTIVE	SITE	DATE	n	VALUE	
Dissolved	Lawson Creek:				
Oxygen	0500645	Jul 6 - Aug 2	5	9.6 - 10.3 mg/L	Objective
	u/s Riverside mill				met
8 - 11 mg/L min					
	0500646	Jul 6 - Aug 2	5	8.0 - 9.6 mg/L	Objective
	d/s Riverside mill	-			met
	Spider Creek:				
		lup 27 Jul 25	5	88 - 110 mg/l	Objective
		Jun. 27 - Jul. 25	5	8.8 - 11.0 mg/L	Objective
					met
					Objective
	0500644	Jul 12 - Jul 20	2	8.6 - 9.0 mg/L	Objective met
	near mouth	Jul 6 - Aug 2	3	5.6 - 7.9 mg/L	Obj. not met
	Harris Creek:				
	E209072	Jul 6 - Aug 2	5	10.0 - 10.8 mg/L	Objective
	u/s Bell Poie				met
	E210219	Jul 6 - Aug 2	5	10.2 - 10.8 mg/L	Objective
	at Bell Pole	, i i i i i i i i i i i i i i i i i i i		-	met
Resin Acids	Lawson Creek:				
	0500645	Jul 6 - Jul 26	4	DHA: all < 0.001 mg/L	Objectives
DHA	u/s Biverside mill			Total: all < 0.007 mg/L	met
0.012 mg/l max				Totali all Coloor Hight	
0.012 mg/L max.	0500646	hul 6 - Jul 26		DHA: < 0.001 - 0.001 mg/l	Ohiectives
	d/o Biyoroido mill	001 0 - 001 20	"	Total: all < 0.007 mg/l	met
0.045 mg/L max	d/s Riverside Itilii			10tal. all < 0.007 mg/L	met
at $pH = 7.5$					
	Spider Creek:				
	0500644	Jul 6 - Jul 26	4	DHA: all < 0.001 mg/L	Objectives
	near mouth			Total: all < 0.007 mg/L	met
	Harris Creek:	1995	0	no data collected	Omitted 1995
Total	Harris Creek				
Chlorophenols	E209072	Aug. 2	3	TCP: 0.0025 ug/g av	Objective
in sediments	u/s Bell Pole	(3 reps)		TTCP: 0.0025 ug/g av	met
				PCP: < 0.005 ug/g av	
0 005 µg/g max	E210219	Jul. 26	1	TCP: 0.08 ug/g	Objective
dry weight	at Bell Pole			TTCP: 0.01 µg/g	not met
(av of 2 rope)					
Total	Harris Creek:	1995	0	no data collected	Omitted 1995
Chlorophonolo	Tanis Oreek.	1000	ľ	no dala concelea	
Chiorophenois					
in fish:					
0.1 ug/g max					
wet weight		1007			Obioativo
Mono-CP	Harris Creek	1995	0	no data collected	Objective
					not checked
0.5 ug/L max					
Di-CP	Harris Creek	1995	0	no data collected	Objective
					not checked
0.1.ug/l max	1	1			

VARIABLE &		MEASUREMENT				
OBJECTIVE	SITE	DATE	n	VALUE		
Tri-CP	Harris Creek E209072	Jul 6 - Aug 2	5	all < 0.1 ug/L	Objective	
0.05 ug/L max	u/s Bell Pole			total & for for each isomer	met	
	E210219 at Bell Pole	Jun 27 - Jul 25	5	all < 0.1 ug/L total & for for each isomer	Objective met	
Tetra-CP 0.1 ug/L max	Harris Creek E209072 u/s Bell Pole	Jun 27 - Jul 25	5	all < 0.1 ug/L total & for for each isomer	Objective met	
	E210219 at Bell Pole	Jun 27 - Jul 25	5	all < 0.1 ug/L total & for for each isomer	Objective met	
Penta-CP	Harris Creek E209072	Jun 27 - Jul 25	5	all < 0.1 ug/L	Objective	
0.05 ug/L max	u/s Bell Pole				met	
	E210219 at Bell Pole	Jun 27 - Jul 25	5	all < 0.1 ug/L	Objective met	

TRIBUTARIES TO OKANAGAN LAKE NEAR VERNON WATER QUALITY OBJECTIVES - 1995

A DATE N VALUE Pecal CollECTIVE Lower Vernon Creek: 650089 Jul 6 - Aug 3 5 14 - 130 / 100 mL mp = 90/100 mL Objective met <100/100 mL 90m percentile (mp) 0500091 Jul 5 - Aug 3 5 450 - 3700/100 mL mp = 2100/100 mL Objective met 0600259 Jul 5 - Aug 3 5 450 - 3700/100 mL mp = 2100/100 mL Objective met 0600259 Jul 5 - Aug 3 5 400 - 2300/100 mL mp = 2000/100 mL Objective mot met 0600220 Jul 5 - Aug 3 5 400 - 2300/100 mL mp = 2000/100 mL Objective mot met 0500020 Jul 6 - Aug 3 5 290 - 780/100 mL mp = 650/100 mL Objective mot met 0500020 Jul 6 - Aug 3 5 290 - 780/100 mL mp = 650/100 mL Objective mot met 0500020 Jul 6 - Aug 3 5 < 1 - 74/100 mL mp = 650/100 mL Objective mot met 0500021 Jul 6 - Aug 3 5 < 1 - 7500/100 mL mp = 80/100 mL Objective mot met 0500021 Jul 6 - Aug 3 5 < 1 - 160/100 mL mp = 100/100 mL Objective mot met 0500021 Jul 6 - A	VARIABLE		MEASUREMENT			CONCLUSION
Objective Galforms Lower Vermon Creek: 0 6500089 Date n VALUE Objective np = 90/100 mL Objective met <100/100 mL 90th persentile (np) 0550091 Okanagan Lake inlet Jul 5 - Aug 3 5 14 - 130 / 100 mL np = 90/100 mL Objective met 0500091 (np) Okanagan Lake inlet Jul 5 - Aug 3 5 450 - 3700/100 mL mp = 200/100 mL Objective not met 0500021 (rp) Daep Creek: 0500020 (rb Amstrong STP Jul 5 - Aug 3 5 400 - 160000/100 mL np = 200/100 mL Objective not met 0500020 (rp) Jul 6 - Aug 3 5 290 - 780/100 mL np = 650/100 mL Objective not met 100/100 nL 900 percentile (np) Lower Vermon Creek: 0500029 Jul 6 - Aug 3 5 <1 - 74/100 mL np = 650/100 mL Objective met 2100/100 nL 900 percentile (np) 0500089 Jul 6 - Aug 3 5 <1 - 74/100 mL np = 85/100 mL Objective met 2500020 (np) Jul 6 - Aug 3 5 <1 - 160/100 nL np = 85/100 mL Objective met 26500261 (np) Jul 6 - Aug 3 5 <1 - 100/100 nL np = 60/100 mL Objective met 26500202 (Nanagan Lake inlet Jul 6 - Aug 3	&					-
Fecal Coliforms Lower Verino Lifeet: biologenetic (np) Juli 6 - Aug 3 5 14 - 130 / 100 mL np = 90/100 mL Objective met 90h percentile (np) 0500091 (kanagan Lake inlet Juli 5 - Aug 3 5 450 - 3700 / 100 mL np = 2100 / 100 mL Objective not met Deep Creek: 0500258 u/s Armstrong STP Juli 5 - Aug 3 5 450 - 3700 / 100 mL np > 100 / 100 mL Objective not met E20165 d/s Armstrong STP Juli 5 - Aug 3 5 400 - 2300 / 100 mL Objective not met 0500020 0kanagan Lake inlet Juli 6 - Aug 3 5 290 - 780 / 100 mL Objective not met 10 - 1000000 mL 0500020 0kanagan Lake inlet Juli 6 - Aug 3 5 x-1 - 74 / 100 mL Objective mp = 650 / 100 mL 90h percentile (np) ILower Vernon Creek: 0500089 kalamatka Lake outlet Juli 6 - Aug 3 5 x-1 - 74 / 100 mL Objective met 0500020 0kanagan Lake inlet Juli 6 - Aug 3 5 x-1 - 7500 / 100 mL Objective met 200 / 0 kanagan Lake inlet Juli 6 - Aug 3 5 x-1 - 7500 / 100 mL Objective met 2050020 (kanagan Lake inlet Juli 6 - Aug 3 5 x-1 - 100 / 100 mL Object	OBJECTIVE	SITE	DATE	n	VALUE	
Collidities Kalamaka Lake outlet Jul 5 - Aug 3 5 1 4 - 13/100 mL p = 90/100 mL met Objective met 90h percentile (np) 0500091 Okanagan Lake inlet Jul 5 - Aug 3 5 450 - 3700/100 mL mp = 2010/100 mL met Objective not met Deep Creek: 0500228 u/s Amstrong Jul 5 - Aug 3 5 400 - 2300/100 mL mp = 2000/100 mL Objective not met Deep Creek: 0500200 Okanagan Lake inlet Jul 5 - Aug 3 5 200 - 2300/100 mL mp = 2000/100 mL Objective not met 0.050020 Okanagan Lake inlet Jul 6 - Aug 3 5 290 - 780/100 mL mp = 650/100 mL Objective not met 0.050080 Jul 6 - Aug 3 5 290 - 780/100 mL met Objective met 0.050080 Jul 6 - Aug 3 5 <1 - 74/100 mL mp = 44/100 mL Objective met 0.050081 (np) Jul 6 - Aug 3 5 <1 - 74/00 mL mp = 85/100 mL Objective met 0.0500820 (np) Jul 6 - Aug 3 5 <1 - 160/100 mL mp = 60/100 mL Objective met 0.0500200 (0kanagan Lake inlet Jul 6 - Aug 3 5 <1 - 100/100 mL mp = 60/100 mL Objective met 0.0500200 (0kanagan Lake inlet Jul	Fecal	Lower Vernon Creek:			14 120 /100 ml	Objective
<100/100 mL 90th percentile (np) 0.430,138,40,000 mL 0kanagan Lake inlet Jul 5 - Aug 3 5 450 - 3700/100 mL np = 2100/100 mL Objective not met Deep Creek: 0500255 u/s Armstrong Jul 5 - Aug 3 4 100 - 160000/100 mL np > 100/100 mL Objective not met E220165 d/s Armstrong GTP Jul 5 - Aug 3 5 400 - 2300/100 mL np = 2000/100 mL Objective not met E220165 d/s Armstrong GTP Jul 6 - Aug 3 5 290 - 780/100 mL np = 650/100 mL Objective not met 0500020 Okanagan Lake inlet Jul 6 - Aug 3 5 <1 - 74/100 mL not met Objective met 0500020 Okanagan Lake inlet Jul 6 - Aug 3 5 <1 - 74/100 mL not met Objective met 00100 mL 90th percentle (np) 0500028 Jul 6 - Aug 3 5 <1 - 74/100 mL not met Objective met 00500020 Okanagan Lake inlet Jul 6 - Aug 3 5 <1 - 160/100 mL not met Objective met 0050020 Okanagan Lake inlet Jul 6 - Aug 3 5 <1 - 200/100 mL not met Objective met 0050020 Okanagan Lake inlet Jul 2 - Aug 3 5 <1 - 200/100 mL not met Objective met 25/100 mL 000 pe	Comorms	Kalamatka Laka autlat	Julio - Aug 3	l °	14 - 130 / 100 mL	Objective
Stortonin. 0500091 Jul 5 - Aug 3 5 450 - 3700/100 mL Objective not met 90h percentile (np) Deep Creek: 0500258 Jul 5 - Aug 3 4 100 - 160000/100 mL Objective not met 90h percentile 0500258 Jul 5 - Aug 3 5 4400 - 2300/100 mL Objective not met 0500200 Jul 5 - Aug 3 5 400 - 2300/100 mL Objective not met 0500200 Okanagan Lake inlet Jul 6 - Aug 3 5 290 - 780/100 mL Objective not met 0500200 Okanagan Lake inlet Jul 6 - Aug 3 5 290 - 780/100 mL Objective not met 0500209 Jul 6 - Aug 3 5 290 - 780/100 mL Objective met 0500209 Jul 6 - Aug 3 5 <1 - 74/100 mL	<100/100 ml	Raiamaika Lake ouliet			hp = 90/100 mL	met
Sour percentine (np) Okanagan Lake intet Sub 5 - Aug 3 Sub 5 - Aug 3 Sub 5 - Aug 3 Control inc np = 2100/100 mL Objective not met Deep Creek: 05002258 WS Armstrong Jul 5 - Aug 3 4 100 - 160000/100 mL Objective not met E220165 d/e Armstrong STP Jul 6 - Aug 3 5 400 - 2300/100 mL Objective not met 0500200 Okanagan Lake inlet Jul 6 - Aug 3 5 290 - 780/100 mL Objective not met E. coll Lower Vernon Creek: 0500029 Jul 6 - Aug 3 5 <1 - 74/100 mL	<100/100 mL	0500081	lul 5 - Åug 3	5	450 - 3700/100 ml	Objective
(i,b) Orkinigen Lake inter International (international (internationa	(pp)	Okanagan Lake inlet	our 5 - Aug 5		430 - 3700/100 mL	pot met
Deep Creek: 0500258 w/s Amstrong Jul 5 - Aug 3 4 100 - 16000/100 mL np > 100/100 mL Objective not met E220165 d/e Amstrong STP Jul 5 - Aug 3 5 400 - 2300/100 mL np = 2000/100 mL Objective not met 0500020 Okanagan Lake inlet Jul 6 - Aug 3 5 290 - 780/100 mL Objective not met 00/100 mL 90h percentie (np) Lower Vernon Creek: 0500029 Kalamaka Lake outlet Jul 6 - Aug 3 5 <1 - 74/100 mL	(1)	Okanagan Lake met	·		np = 2100/100 m2	normer
Juil 5 - Aug 3 4 100 - 160000/100 mL np > 100/100 mL Objective not met E220165 d/s Amstrong STP Juil 5 - Aug 3 5 400 - 2300/100 mL np = 2000/100 mL Objective not met 0500220 Okanagan Lake inlet Juil 6 - Aug 3 5 290 - 780/100 mL np = 650/100 mL Objective not met Lower Vernon Creek: 0500099 kalamalka Lake outlet Juil 6 - Aug 3 5 <1 - 74/100 mL np = 45/100 mL Objective met 00th percentile (np) Deep Creek: 0500291 Okanagan Lake inlet Juil 6 - Aug 3 5 <1 - 7500/100 mL np = 45/100 mL Objective met 0500280 u/s Amstrong Juil 6 - Aug 3 5 <1 - 160/100 mL np = 85/100 mL Objective met Deep Creek: 0500280 u/s Amstrong Juil 6 - Aug 3 5 <1 - 100/100 mL np > 100/100 mL Objective not met Esterococci Lower Vernon Creek Deep Creek Juil 2 - Aug 3 5 <1 - 200/100 mL np = 60/100 mL Objective not met 0500020 Okanagan Lake inlet Juil 2 - Aug 3 5 <1 - 200/100 mL np = 110/100 mL Objective not met Suspended Solids maximum increase Lower Vernon Creek Deep Creek Juil 6 - Aug 3 5 <4 - 9 mg/L		Deep Creek:		++		
u/s Armstrong Lan ang np > 100/100 mL not met E220165 d/s Armstrong STP Jul 5 - Aug 3 5 400 - 2300/100 mL np = 2000/100 mL Objective not met 0500020 Okanagan Lake inlet Jul 6 - Aug 3 5 290 - 780/100 mL np = 650/100 mL Objective not met e. coli Lower Vernon Creek: 0500059 Kalamalka Lake outlet Jul 6 - Aug 3 5 <1 - 74/100 mL np = 44/100 mL Objective net 90th percentile (np) Obso0091 Okanagan Lake inlet Jul 6 - Aug 3 5 <1 - 7500/100 mL np = 85/100 mL Objective met 0500258 u/s Armstrong Jul 6 - Aug 3 5 <1 - 100/100 mL np = 60/100 mL Objective met 0500258 u/s Armstrong STP Jul 6 - Aug 3 5 <1 - 100/100 mL np = 60/100 mL Objective met 0500020 Okanagan Lake inlet Jul 2 - Aug 3 5 <1 - 100/100 mL np = 60/100 mL Objective not met 25/100 mL 090th perc. (np) Lower Vernon Creek Deep Creek Jul 2 - Aug 3 5 <1 - 100/100 mL np = 110/100 mL Objective not met 90th perc. (np) Lower Vernon Creek Deep Creek 1995 0 no data collected Omitted 1995		0500258	Jul 5 - Aug 3	4	100 - 160000/100 mL	Objective
E220165 Jul 5 - Aug 3 5 400 - 2300/100 mL Objective not met 0500020 0kanagan Lake inlet Jul 6 - Aug 3 5 290 - 780/100 mL Objective not met E. coli Lower Vernon Creek: 0500089 Jul 6 - Aug 3 5 290 - 780/100 mL Objective not met o01/100 mL 90th percentile (np) Lower Vernon Creek: 0500291 Jul 6 - Aug 3 5 <1 - 74/100 mL		u/s Armstrong			np > 100/100 mL	not met
E220165 d/s Armstrong STP Jul 5 - Aug 3 5 400 - 2300/100 mL np = 2000/100 mL Objective not met 0500020 Okanagan Lake inlet Jul 6 - Aug 3 5 290 - 780/100 mL mp = 650/100 mL Objective not met <100/100 mL 90th percentile (np) Lower Vernon Creek: 0500091 Okanagan Lake inlet Jul 6 - Aug 3 5 <1 - 74/100 mL mp = 44/100 mL Objective not met 2000 20 (np) Malamalka Lake outlet Jul 6 - Aug 3 5 <1 - 74/100 mL met Objective met 2000 20 (np) Okanagan Lake inlet Jul 6 - Aug 3 5 <1 - 7500/100 mL met Objective met 0500258 u/s Armstrong Jul 6 - Aug 3 4 <1 - 7500/100 mL met Objective met 0500200 Okanagan Lake inlet Jul 6 - Aug 3 5 <1 - 100/100 mL met Objective not met 25/100 mL 0kanagan Lake inlet Jul 2 - Aug 3 5 <1 - 200/100 mL met Objective not met 25/100 mL 90th perc. (np) Lower Vernon Creek: Deep Creek 1995 0 no data collected Omitted 1995 Suspended Solids 10 mg/L or 10% maximum increase Lower Vernon Creek: 0500091 Jul 6 - Aug 2 4 11 - 13 mg/L max. inc					··•	
d/s Armstrong STP n p = 2000/100 mL not met 0500020 Jul 6 - Aug 3 5 290 - 780/100 mL Objective not met E. coli Lower Vernon Creek: 0500089 Jul 6 - Aug 3 5 <1 - 74/100 mL		E220165	Jul 5 - Aug 3	5	400 - 2300/100 mL	Objective
$ \begin{array}{ c c c c c } \hline		d/s Armstrong STP			np = 2000/100 mL	not met
0500020 Okanagan Lake inlet Jul 6 - Aug 3 5 290 - 780/100 mL np = 650/100 mL Objective not met E. coli Lower Vernon Creek: 0500089 Jul 6 - Aug 3 5 <1 - 74/100 mL np = 44/100 mL Objective met 90th percentile (np) 0500091 Jul 6 - Aug 3 5 <1 - 160/100 mL met Objective met 050020 0500091 Jul 6 - Aug 3 5 <1 - 160/100 mL np = 85/100 mL Objective met 050020 0kanagan Lake inlet Jul 6 - Aug 3 5 <1 - 7500/100 mL np = 85/100 mL Objective met 050020 Jul 6 - Aug 3 5 <1 - 100/100 mL np = 60/100 mL Objective met 050020 Jul 2 - Aug 3 5 <1 - 100/100 mL np = 60/100 mL Objective met 25/100 mL 90th perc. (np) Lower Vernon Creek Deep Creek Jul 2 - Aug 3 5 <1 - 200/100 mL not met Objective met Suspended Solids 10 mg/L or 10% maximum increase Lower Vernon Creek: 0500089 Jul 6 - Aug 3 5 <4 - 9 mg/L						
Okanagan Lake inlet no met E. coli Lower Vernon Creek: 0500089 Jul 6 - Aug 3 5 <1 - 74/100 mL np = 44/100 mL Objective met 90th percentile (np) 0500091 Jul 6 - Aug 3 5 <1 - 160/100 mL np = 44/100 mL Objective met 0500091 Jul 6 - Aug 3 5 <1 - 160/100 mL np = 85/100 mL Objective met 0500258 Jul 6 - Aug 3 4 <1 - 7500/100 mL np = 85/100 mL Objective met 1 Deep Creek: 0500258 Jul 6 - Aug 3 5 <1 - 100/100 mL not met Objective met 1 E220165 Jul 6 - Aug 3 5 <1 - 100/100 mL np = 60/100 mL Objective not met 0 0500020 Jul 2 - Aug 3 5 <1 - 200/100 mL np = 110/100 mL Objective not met 0 0500020 Jul 2 - Aug 3 5 <1 - 200/100 mL not met Objective not met 25/100 mL 90th perc. (np) Lower Vernon Creek Deep Creek 1995 0 no data collected Omitted 1995 Suspended Solids 10 mg/L or 10% maximum increase Lower Vernon Creek: 0500091 Jul 6 - Aug 2 4 11 - 13 mg/L max. inc = 9 mg/L Objective met max. inc = 9 mg/L 0 Jul 2 - Aug 2 1 15 mg/L Objective met max. inc = 9 mg/L Objective met max. inc = 9 mg/L		0500020	Jul 6 - Aug 3	5	290 - 780/100 mL	Objective
E. coli Lower Vernon Creek: 0500089 Jul 6 - Aug 3 5 .<1 - 74/100 mL np = 44/100 mL Objective met 90th percentile (np) 0500091 Jul 6 - Aug 3 5 <1 - 750/100 mL		Okanagan Lake inlet			np = 650/100 mL	not met
E. coli 4100/100 mL 90th percentile (np) Matamatka Lake outlet (np) Matamatka Lake outlet Deep Creek: 0500091 Okanagan Lake inlet Deep Creek: 0500258 U/S Armstrong STP Deep Creek: 0500200 Jul 6 - Aug 3 Jul 6 - Aug 2 Jul 6 - Aug 4 Jul - Jul				++		
-100/100 mL 90th percentile (np) Kalamalka Lake outlet Jul 6 - Aug 3 5 <1 - 1/2/100 mL mp = 44/100 mL Delective met 0500091 (np) 0kanagan Lake inlet Jul 6 - Aug 3 5 <1 - 160/100 mL mp = 85/100 mL Objective met Deep Creek: 0500258 u/s Armstrong Jul 6 - Aug 3 4 <1 - 7500/100 mL mp = 85/100 mL Objective met E220165 d/s Armstrong STP Jul 6 - Aug 3 5 <1 - 100/100 mL mp = 60/100 mL Objective met 0500020 Okanagan Lake inlet Jul 2 - Aug 3 5 <1 - 200/100 mL mp = 110/100 mL Objective met 25/100 mL 90th perc. (np) Lower Vernon Creek Deep Creek 1995 0 no data collected Omitted 1995 300 perc. (np) Lower Vernon Creek: 0500089 Jul 6 - Aug 3 5 <4 - 9 mg/L	E. coli	Lower Vernon Creek:			1 74/400 ml	Ohiostius
Clour burner Retaining a Lake oblief Imp = 44/100 mL Objective met 90th percentile (np) 0500091 Okanagan Lake inlet Jul 6 - Aug 3 5 <1 - 160/100 mL	100/100 ml		Jul 6 - Aug 3	5	.< 1 - 74/100 mL	Objective
Sour percention (np)0500091 Okanagan Lake inletJul 6 - Aug 35<1 - 160/100 mL np = 85/100 mLObjective metDeep Creek: 0500258 u/s ArmstrongJul 6 - Aug 34<1 - 7500/100 mL np > 100/100 mLObjective not metE220165 d/s Armstrong STPJul 6 - Aug 35<1 - 100/100 mL not metObjective net0500020 Okanagan Lake inletJul 2 - Aug 35<1 - 200/100 mL np = 60/100 mLObjective netEnterococci source Okanagan Lake inletLower Vernon Creek Deep Creek19950no data collectedOmitted 1995Suspended Solids maximum increaseLower Vernon Creek: 0500091 Okanagan Lake inletJul 6 - Aug 35<4 - 9 mg/L	<100/100 mL	Kalamaika Lake outlet			hp = 44/100 mL	met
(iii) Okanagan Lake inlet Objective Deep Creek: 0500258 u/s Armstrong Jul 6 - Aug 3 4 <1 - 7500/100 mL np > 100/100 mL Objective not met E220165 d/s Armstrong STP Jul 6 - Aug 3 5 <1 - 100/100 mL np = 60/100 mL Objective met 0500020 Okanagan Lake inlet Jul 2 - Aug 3 5 <1 - 200/100 mL np = 110/100 mL Objective met Enterococci Lower Vernon Creek Deep Creek 1995 0 no data collected Omitted 1995 Suspended Solids Lower Vernon Creek: 0500089 10 mg/L or 10% maximum increase Jul 6 - Aug 3 5 <4 - 9 mg/L	(nn)	0500091	lul 6 - Aug 3	5	< 1 - 160/100 ml	Ohiective
Deep Creek: 0500258 u/s ArmstrongJul 6 - Aug 34<1 - 7500/100 mL np > 100/100 mLObjective not metE220165 d/s Armstrong STPJul 6 - Aug 35<1 - 100/100 mL np = 60/100 mLObjective met0500020 Okanagan Lake inletJul 2 - Aug 35<1 - 200/100 mL np = 60/100 mLObjective metEnterococci <25/100 mL 90th perc. (np)Lower Vernon Creek Deep Creek19950no data collectedOmitted 1995Suspended Solids maximum increaseLower Vernon Creek: 0500091 Okanagan Lake inletJul 6 - Aug 35<4 - 9 mg/L	((1))	Okanagan Lake inlet	Jul 0 - Aug 3		= 85/100 m	met
Deep Creek: 0500258 u/s ArmstrongJul 6 - Aug 34<1 - 7500/100 mL np > 100/100 mLObjective not metE220165 d/s Armstrong STPJul 6 - Aug 35<1 - 100/100 mL		Okanagan Lake iniet			np = 00/100 m2	
Display in the second		Deep Creek:		+ +		
u/s Armstrongnp > 100/100 mLnot metE220165 d/s Armstrong STPJul 6 - Aug 35< 1 - 100/100 mL		0500258	Jul 6 - Aug 3	4	< 1 - 7500/100 mL	Objective
E220165 d/s Armstrong STPJul 6 - Aug 35<1 - 100/100 mL np = 60/100 mLObjective met0500020 Okanagan Lake inletJul 2 - Aug 35<1 - 200/100 mL np = 110/100 mLObjective metEnterococci Lower Vernon Creek Deep Creek19950no data collectedOmitted 1995Suspended Solids maximum increaseLower Vernon Creek: 0500091 Okanagan Lake inletJul 6 - Aug 35<4 - 9 mg/L		u/s Armstrong			np > 100/100 mL	not met
E220165 d/s Armstrong STPJul 6 - Aug 35< 1 - 100/100 mL np = 60/100 mLObjective met0500020 Okanagan Lake inletJul 2 - Aug 35< 1 - 200/100 mL np = 110/100 mLObjective not metEnterococciLower Vernon Creek Deep Creek19950no data collectedOmitted 1995Suspended Solids 10 mg/L or 10% maximum increaseLower Vernon Creek: 0500091 Okanagan Lake inletJul 6 - Aug 35< 4 - 9 mg/L						
d/s Armstrong STP np = 60/100 mL met 0500020 Jul 2 - Aug 3 5 < 1 - 200/100 mL		E220165	Jul 6 - Aug 3	5	< 1 - 100/100 mL	Objective
0500020 Okanagan Lake inletJul 2 - Aug 35<1 - 200/100 mL np = 110/100 mLObjective not metEnterococciLower Vernon Creek Deep Creek19950no data collectedOmitted 199590th perc. (nb)Deep Creek19950no data collectedOmitted 1995Suspended Solids 10 mg/L or 10% maximum increaseLower Vernon Creek: 0500091Jul 6 - Aug 35<4 - 9 mg/L		d/s Armstrong STP			np = 60/100 mL	met
Image: Second				+		
Okanagan Lake inlet np = 110/100 mL not met Enterococci Lower Vernon Creek 1995 0 no data collected Omitted 1995 <		0500020	Jul 2 - Aug 3	5	< 1 - 200/100 mL	Objective
Enterococci Lower Vernon Creek 1995 0 no data collected Omitted 1995 30th perc. (np) Deep Creek Jul 6 - Aug 3 5 < 4 - 9 mg/L		Okanagan Lake inlet			np = 110/100 mL	not met
Enterococci Lower Vernion Creek 1995 0 Indicat conected Office of the conected 90th perc. (np) Deep Creek Jul 6 - Aug 3 5 <4 - 9 mg/L	Enternoncei		1005	+	no data collected	Omitted 1005
<.25/100 mL	Enterococci	Deep Creek	1995		no data conected	Omitted 1995
90th perc. (np) Lower Vernon Creek: Jul 6 - Aug 3 5 < 4 - 9 mg/L Control site 10 mg/L or 10% maximum increase Kalamalka Lake outlet Jul 6 - Aug 2 4 11 - 13 mg/L Objective met 0500091 Jul 6 - Aug 2 4 11 - 13 mg/L Objective met Jul 20 1 15 mg/L Objective met	< 25/100 ml	Deep Oreek				
Suspended Solids Lower Vernon Creek: 0500089 Jul 6 - Aug 3 5 < 4 - 9 mg/L Control site 10 mg/L or 10% maximum increase Kalamalka Lake outlet Jul 6 - Aug 3 5 < 4 - 9 mg/L	90th perc. (np)					
10 mg/L or 10% maximum increase 0500089 Kalamalka Lake outlet Jul 6 - Aug 3 5 < 4 - 9 mg/L Control site 0500091 Okanagan Lake inlet Jul 6 - Aug 2 4 11 - 13 mg/L max. inc = 9 mg/L Objective met max. inc = 9 mg/L Jul. 20 1 15 mg/L increase = 11 mg/L Objective not met	Suspended Solids	Lower Vernon Creek:				
10 mg/L or 10% maximum increase Kalamalka Lake outlet site 0500091 Okanagan Lake inlet Jul 6 - Aug 2 4 11 - 13 mg/L max. inc = 9 mg/L Objective met max. inc = 9 mg/L Jul. 20 1 15 mg/L increase = 11 mg/L Objective not met		0500089	Jul 6 - Aug 3	5	< 4 - 9 mg/L	Control
maximum increase 0500091 Jul 6 - Aug 2 4 11 - 13 mg/L Objective met Okanagan Lake inlet Jul. 20 1 15 mg/L Objective increase = 11 mg/L Objective increase	10 mg/L or 10%	Kalamalka Lake outlet				site
0500091 Jul 6 - Aug 2 4 11 - 13 mg/L Objective met Okanagan Lake inlet Jul. 20 1 15 mg/L Objective Jul. 20 1 15 mg/L Objective	maximum increase					
Okanagan Lake inlet max. inc = 9 mg/L Jul. 20 1 15 mg/L Objective increase = 11 mg/L not met 1		0500091	Jul 6 - Aug 2	4	11 - 13 mg/L	Objective met
Jul. 20 1 15 mg/L Objective		Okanagan Lake inlet			max. inc = 9 mg/L	
increase = 11 mg/L not met		· · · ·	Jul. 20		15 mg/L	Objective
	· · ·			<u> </u>	increase = 11 mg/L	not met
		Deep Creek:				Control
0500258 Jul 6 - Aug 3 5 < 4 - 129 mg/L Control		0500258	Jul 6 - Aug 3	5	< 4 - 129 mg/L	Control
U/s Amistrony Site E220165 Iul 6 - Aug 2 4 6 - 11 mg/l Objective met		u/S Armstrong			6 - 11 ma/l	Objective met
d/s Armstrong STP		d/s Armstrong STP	Jul 0 - Aug 3	*	max. inc. = 7 mo/i	Objective met
Jul. 27 1 15 mg/L Objective		We Amstong OT	Jul. 27	+	15 ma/L	Objective
increase = 11 mg/L not met					increase = 11 mg/L	not met

TRIBUTARIES TO OKANAGAN LAKE NEAR VERNON WATER QUALITY OBJECTIVES - 1995

VARIABLE		MEASUREMENT	•	<u></u>	CONCLUSION
&	0.177	5.177			4
OBJECTIVE	SITE Dear Oregely	DATE	n	VALUE	
Suspended Solids	Deep Сгеек:			E E mail	Objective
10 mg/L or 109/	Okanagan Laka inlat	Jul 6 - Aug 3	Ð	5 - 6 mg/L	Objective
10 mg/L or 10%	Okanagan Lake met				met
Turbidity	Lower Vernon Creek:		-++-		······
raibidity	0500089	Jul 6 - Aug 3	5	0.2 - 1.2 NTU	Control
5 NTU or 10%	Kalamalka Lake outlet				site
maximum increase					
	0500091	Jul 6 - Aug 3	-5	1.5 - 4.5 NTU	Objective
	Okanagan Lake inlet				met
	_				
	Deep Creek:	•			
	0500258	Jul 6 - Aug 3	5	2.0 - 5.3 NTU	Control
	u/s Armstrong			· · · · · · · · · · · · · · · · · · ·	site
	E220165	Jul 6 - Aug 3	5	1.2 - 6.0 NTU	Objective
	d/s Armstrong STP			max. inc. = 3.6 NTU	met
			_		
	0500020	Jul 6 - Aug 3	5	0.4 - 3.1 NTU	Objective
	Okanagan Lake inlet				met
Ammonio M	Lower Vernen Creek				
Ammonia-N	Lower vernor creek.		5	< 0.005 - 0.007 mg/l	Objectives
< 0.762 mg/l av	Kalamatka Lako outlot	Jul 6 - Aug 3		< 0.005 - 0.007 mg/L	Objectives
5.60 mg/L max	Nalamaika Lake Outlet			av = 0.000 mg/L	iner
at	0500091	Jul 6 - Aug 3	5	< 0.005 - 0.011 mg/	Objectives
pH = 8	Okanagan Lake inlet	our o mag o	Ŭ	av = 0.006 mg/L	met
temp = 20 °C				ut = 0.000 mg =	
	Deep Creek:		+-+		
	0500258	Jul 6 - Aua 8	5	< 0.005 - 0.101 ma/L	Objectives
	u/s Armstrong			av = 0.025 mg/L	met
	, and g				
	E220165	Jul 6 - Aug 3	5	< 0.005 - 0.041 mg/L	Objectives
	d/s Armstrong STP			av = 0.016 mg/L	met
	0500020	Jul 6 - Aug 3	5	< 0.005 - 0.016 mg/L	Objectives
	Okanagan Lake inlet			av = 0.007 mg/L	met
			_	المرابقة مع المرابقة	
Nitrite-N	Lower Vernon Creek:				
0.00	0500089	Jul 6 - Aug 8	5	< 0.005 - 0.007 mg/L	Objectives
< 0.06 mg/L av	Kalamaika Lake outlet			av = 0.005 mg/L	met
0.18 mg/L max	Deep Creek:	· · · · · · ·		· · · · · · · · · · · · · · · · · · ·	
at	0500020	Jul 6 - Aug 3	5	< 0.005 - 0.006 mg/L	Objectives
av CI = 4 - 6 mg/L	Okanagan Lake Inlet		·	av = 0.005 mg/L	met
INITICE-IN	Lower vernon Creek:	hile - Aug 2		0.011 - 0.015	Objectives
< 0.20 mg/L av	Okanagan Lake inlet	Jul 6 - Aug 3	5	av - 0.012 mg/L	met
0.20 mg/L av	Doop Crock				
0.00 mg/L max	0500259	Jul 6 - Aug 2	5	< 0.005 - 0.018 mg/l	Objectivos
		our o - Aug o		< 0.000 - 0.010 mg/L	mot
av 0. > 10 mg/L	F220165	Jul 6 - Aug 3	5	< 0.005 - 0.011 mg/l	Ohiectives
	d/s Armstrong STP	our o - Aug o	ĭ	av = 0.006 mg/l	met
	a standardig str			ut – 0.000 mg u	

TRIBUTARIES TO OKANAGAN LAKE NEAR VERNON WATER QUALITY OBJECTIVES - 1995

VARIABLE		MEASUREMENT	,		CONCLUSION
OBJECTIVE	SITE	DATE	Inl	VALUE	1
Nitrate + Nitrite-N	Lower Vernon Creek:				
	0500089	Jul 6 - Aug 3	5	< 0.02 - 0.12 mg/L	Objective
10 mg/L max	Kalamalka Lake outlet				met
	0500091	Jul 6 - Aug 3	5	0.43 - 0.50 mg/L	Objective
	Okanagan Lake inlet				- met
	Deep Oreelu				
	Deep Creek:	hule Aug 2		0.22 - 0.78 mg/l	Objective
	USUU258	Jul 6 - Aug 3	5	0.23 - 0.78 mg/L	objective
	u/s Amstrong				mer
	E220165	Jul 6 - Aug 3	5	< 0.02 - 0.25 ma/L	Objective
	d/s Armstrong STP			0	met
	, , , , , , , , , , , , , , , , , , ,				
	0500020	Jul 6 - Aug 3	5	< 0.02 - 0.14 mg/L	Objective
	Okanagan Lake inlet				met
Chiorophyll-a	Lower Vernon Creek:			7.1 - 122 mg/m2	
	0500089	Jul. 27	1	av = 32.1 mg/m2	Objective met
< 100 mg/m2 av	Kalamalka Lake outlet			(avg. of 6 reps)	1
(average based	Deep Creek:			112 - 233 mg/m2	
on six reps)	0500020	Jul. 27	1	av = 173 mg/m2	Objective met
	Okanagan Lake inlet			(avg. of 6 reps)	
рн	Deep Creek:			70 77	Objective
65.00	USUU256	Jul 6 - Aug o		1.2 - 1.1	met
0.5 - 9.0	E220165	Jul 6 - Aug 3	5	7.6-7.8	Objective
	d/s Armstrong STP	our o riug o			met
	g				
	0500020	Jul 6 - Aug 3	5	7.8 - 8.0	Objective
	Okanagan Lake inlet				met
Dissolved Oxygen	Lower Vernon Creek:				
	0500089	Jul 6 - Aug 8	5	8.4 - 1 0.4 mg/L	Objective
8.0 mg/L min.	Kalamalka Lake outlet				met
May - Oct	0500001	hul C Aum C		0.0.0.10.6 mg/	Objective
11.0 mg/ min	Okonogon Laka inist	Jul 6 - Aug 3	1	9.2 0 10.6 Mg/L	objective
Nov - Apr	Okanagan Lake Iniet		1 1		inec
Nov Apr.	Deep Creek:				
	0500258	Jul 6 - Aua 8	5	6.0 - 7.8 ma/L	Objective
	u/s Armstrong				not met
	E220165	Jul 6 - Aug 3	4	8.8 - 12.2 mg/L	Objective met
	d/s Armstrong STP	Jul. 27	1	6.6 mg/L	Obj. not met
	0500020	Jul 6 - Aug 3	3	8.2 - 8.6 mg/L	Objective met
	Okanagan Lake inlet	Jul 13 - Jul 20	2	6.4 - 6.7 mg/L	Obj. not met
1			1 - A		

TABLE 14

VARIABLE &	· · · · · · · · · · · · · · · · · · ·	CONCLUSION			
OBJECTIVE	SITE	DATE	n	VALUE	-
Fecal Coliforms < 10/100 mL	South Thompson: 0600135 Kamloops d/s Peterson C.	Jan 24 - Nov 7	12	0 - 150/100 mL	Indefinite result
90th perc. (np)	North Thompson: 0600164 Kamloops u/s Paul Creek	Jan 24 - Dec 13	4	0 - 1/100 mL	Indefinite result
	Kamloops Lake E218768 near outlet	Dec. 13	1	< 1/100 mL	Indefinite result
	Lower Thompson: 0600004 at Savona	Apr 25 - Dec 13	2	ali < 1/100 mL	Indefinite result
	0600163 d/s Walhachin	Apr 25 - Dec 13	2	all < 1/100 mL	Indefinite result
	E206586 Spences Br. d/s Nicola R.	Apr 25 - Dec 13	2	1 - 11/100 mL	Indefinite result
<i>E. coli</i> < 200/100 mL geometric mean	South Thompson: 0600135 Kamloops d/s Peterson C.	Jan 24 - Nov 7	12	0 - 12/100 mL	Indefinite result
(gm)	North Thompson: 0600164 Kamloops u/s Paul Creek	Jan 24 - Dec 13	4	0 - 1/100 mL	Indefinite result
	Kamloops Lake E218768 near outlet	Dec. 13	1	< 1/100 mL	Indefinite result
	Lower Thompson: 0600004 at Savona	Apr 25 - Dec 13	2	all < 1/100 mL	Indefinite result
	0600163 d/s Walhachin	Apr 25 - Dec 13	2	all < 1/100 mL	Indefinite result
	E206586 Spences Br. d/s Nicola R.	Apr 25 - Dec 13	2	all = 1/100 mL	Indefinite result

VARIABLE		CONCLUSION			
OBJECTIVE	SITE	DATE		VAL 1 IE	1
Colour 15 TCU max or	Kamloops Lake: E218768 near outlet	Dec. 13	1	5 TCU	Objective met
5 TCU increase over average of N + S Thompson rivers	Lower Thompson: 0600004 at Savona	Mar 1 - Dec 13	4	< 5 - 10 TCU	Objective met
	0600163 d/s Walhachin	Jan 24 - Dec 13	4	< 5 - 5 TCU	Objective met
	E206586 Spences Br. d/s Nicola R.	Apr 25 - Dec 13	2	< 5 - 5 TCU	Objective met
Chlorophyll-a	Lower Thompson: 0600004 at Sayona	Jan. 19	5	218 - 332 mg/m2 av = 268 mp/m2	Objective not met
< 30 mg/mz	atoavona	Feb. 14	5	239 - 324 mg/m2 av = 280 mg/m2	Objective not met
		Mar. 13	5	80.4 - 314 mg/m2 av = 226 mg/m2	Objective not met
		Apr. 11	5	44.8 - 225 mg/m2 av = 126 mg/m2	Objective not met
		Oct. 31	5	17.9 - 77.8 mg/m2 av = 39.8 mg/m2	Objective mēt
		Nov. 23	5	av = 128 mg/m2	not met
	0600163	Jec. 19	5	av = 280 mg/m2	not met
	d/s Walhachin	Feb 14	5	av = 204 mg/m2	not met
		Nor 12	5	av = 87.2 mg/m2	not met
		Mar. 13	5	av = 76.4 mg/m2	not met
		Apr. 11	5	av = 141 mg/m2	not met
		Oct. 31	5	63.2 - 130 mg/m2 av = 91.0 mg/m2	Objective not met
		Nov. 23	5	68.0 - 124 mg/m2 av = 101 mg/m2	Objective not met
		Dec. 19	5	79.4 - 370 mg/m2 av = 210 mg/m2	Objective not met

VARIABLE		MEASUREMENT			CONCLUSION
	OITE	DATE			
OBJECTIVE	SILE	DATE	<u>n</u>	VALUE	
Dioxins and Furans	Lower Inompson	1		-#luantious] 0.070 no/	Ohioatius
in water	d/s weyernaeuser mill	Jan. 18	1	emuent level = 2.872 pg/L	Objective
				TEQ-TODD	met
0.2 pg/L max					
TEQ-TCDD				dilution = 95:1	
				0.030 pg/L TEQ-TCDD	
		Apr. 19	1	effluent level = 1.351 pg/L	Objective
				TEQ-TCDD	met
				dilution = 238:1	
				calculated river level.	
				0.006 pg/L TEO-TCDD	
		P Iul.	1	effluent level - 2 670 pg/l	Ohiective
				TEQ-TCDD	met
				dilution = 954.1	
				calculated river level:	
				0.003 pg/L TEQ-TCDD	
		Oct. 9	1	effluent level = 2.976 pg/L	Objective
				TEQ-TCDD	met
				dilution = 225:1	
				calculated river level:	
				0.013 pg/L TEQ-TCDD	
Dioxins and Furans	Lower Thompson:				
in fish muscle	R14	Sep.19	5	0.10 - 0.62 pg/g TCDD-TEQ	Objective
	above Walhachin			in muscle of mountain	met
1.0 pg/g max	(Hatfield Consultants site)			whitefish	
TEQ-TCDD			3	1.7 - 4.1 pg/g TCDD-TEQ	Objective
wet weight				in muscle of mountain	not met
				whitefish	·
Dioxins and Furans	Lower Thompson	1995	0	no data collected	Objective not
in sediments	Kamloops Lake				checked
0.7 pg/g max			, ·		
TEQ-TCDD					
dry weight					

VARIABLE		CONCLUSION			
		DATE	T		-
OBJECTIVE	SITE	DATE	<u></u>	VALUE	
Resin Acids	Kamloops Lake:				
	E218768	Dec. 13	1	< 1 ug/L DHA	Objectives
12 ug/L DHA max	near outlet			< 7 ug/L total	met
45 ug/L total max					
at	Lower Thompson:		T		
pH = 7.5	0600004	Jan 24 - Dec 13	5	all < 1 ug/L DHA	Objectives
	at Savona			all < 7 ug/L total	met
	0600163	Jan 24 - Dec 13	5	all < 1 ug/L DHA	Objectives
	d/s Walhachin			ali < 7 ug/L total	met
	· · · · · · · · · · · · · · · · · · ·				
	E206586	Apr. 25	1	< 1 ug/L DHA	Objectives
	Spences Br. d/s Nicola R.			< 7 ug/L total	met
· · · · · · · · · · · · · · · · · · ·	1	· · · · · · · · · · · · · · · · · · ·	1		1

TABLE 15

VARIABLE		MEASUREMENT			CONCLUSION
	SITE		l n	VALUE	-
Dissolved	SiTE Columbia Biyor:	DATE	''	VALUE	
Dissolved				10.0 - 10.8 mg/l	Obi met
Oxygen		Jul 5 - Jul 20		10.0 - 10.8 mg/L	Obj. met
	3 km u/s Ceigar			7.0	Ohi net met
10 mg/L min		Jun. 29	1	7.3 mg/L	Obj. not met
	E213039	Jul 12 - Jul 19	2	10.1 - 10.6 mg/L	Obj. met
	400 m d/s Celgar		_		
	south bank	Jun 29, Jul 5,26	3	7.3 - 9.2 mg/L	Obj. not met
	0200200	Jul. 12	1	11.2 mg/L	Obj. met
	400 m u/s Kootenay				
		Jun 29 - Jul 26	4	8.9 - 9.8 mg/L	Obj. not met
	0200003	Jul. 5,26	2	10.2 - 10.6 mg/L	Obj. met
	at Birchbank				
		Jun 29 Jul 12 19	3	82-96 mg/l	Obi, not met
		001120,001 12,10	Ĭ	0.2 0.0 mg 2	
nLl	Columbia Pivor:				
рп		due 09 Jul 06		76 77	Objective
	0200183	Jun 28 - Jul 26	4	7.6-7.7	Objective
6.5 - 8.5	3 km u/s Celgar				met
	E213039	Jun 28 - Jul 26	4	7.5 - 7.7	Objective
	400 m d/s Celgar				met
	south bank		_		
	0200200	Jun 28 - Jul 26	4	7.5 - 7.7	Objective
	400 m u/s Kootenay				met
	0200003	Apr. 26 - Jul 26	5	7.5 - 7.7	Objective
	at Birchbank				met
	· · · · · · · · · · · · · · · · · · ·				
Colour	Columbia Biver:				
Concur	0200183	Jun 28 - Jul 26	5	<5 - 5 TCU	Objective
15 TCU may	3 km u/s Celgar				met
101001110	o kin u/o Oolgan				
	E212020	lun 28 - Jul 26	5	<5 - 5 TC11	Objective
		501126 - 50126		20-3100	mot
	400 m d/s Ceigar	1			met
	south bank				
	0200200	Jun 28 - Jul 26	5	<5 - 5 TCU	Objective
	400 m u/s Kootenay	·			met
	-				
	0200003	Jun 28 - Jul 26	5	<5 - 5 TCU	Objective
	at Birchbank				met
Suspended	Columbia River:				
Solids	0200183	Jun 28 - Jul 26	5	all < 4 mg/L	Control site
	3 km u/s Celgar			, i i i i i i i i i i i i i i i i i i i	
10 mg/	F213039	Jun 28 - Jul 26	5	all < 4 mg/l	Objective
max increase	400 m d/s Celgar		Ŭ		met
max increase	south bank			· · · ·	inici
	south bank	hun 00 - 1-1-00	+		Objective
	0200200	Jun 28 - Jul 26	5	a i < 4 mg/∟	Objective
	400 m u/s Kootenay				met
	0200003	Jan 3 - Dec 18	31	< 4 - 5 mg/L	Objective
	at Birchbank				met

VARIABLE		CONCLUSION			
	SITE	DATE		VALUE	
Turbidity	Columbia Rivori	DATE	+ " +	VALUE	
ruibidity	0200182	lun 28 - Jul 26	5		Control cito
	2 km u/o Colgar	Juli 20 - Jul 20		0.2 - 0.7 1410	Control site
	Skill U/S Celgai	lun 00 lul 00	++		Objective
max increase	E213039	Jun 28 - Jul 26	⁵	0.2 - 0.8 NTU	Objective
	400 m d/s Ceigar			max increase = 0.2 NTO	met
	south bank		+		
	0200200	Jun 28 - Jul 26	5	0.1 - 0.6 NTU	Objective
	400 m u/s Kootenay			max increase = 0.2 NTU	met
	0200003	Jun 28 - Jul 26	5	0.2 - 0.6 NTU	Objective
	at Birchbank			max increase = 0.3 NTU	met
Sediment TOC	Columbia River:	· · · ·			
	0200183	Aug. 29	1	6.1-0.8 = 5.3 mg/g TOC	Control site
no increase	3 km u/s Celgar				
u/s to d/s at					
95% confidence	E213039	Aug. 29	1	8.5-0.7 = 7.8 mg/g TOC	Objective
	400 m d/s Celgar			% increase = 47%	not met
	south bank				
	0200200	Aug. 29	1	8.0-0.8 = 7.2 mg/g TOC	Objective
	400 m u/s Kootenay	, i i i i i i i i i i i i i i i i i i i		% increase = 36%	not met
					1
	0200003	Aug. 29	11	7.4-0.5 = 6.9 mg/g TOC	Objective
	at Birchbank			% increase = 30%	not met
				/o indicado - 00 /o	normor
Dissolved Gas	Columbia Biver:		++		
Discontra dao	at Hugh Keelevside	Jan 1 - Dec 31	343	95 5 - 109 9 %	Objective
110% max	u/e dam	Jan 1 - Dec of	040	(9) = deily av)	Objective
110% max				(% = daily av)	inet
	(B.C. Hydro site)	lon t. Mou t.t.	100	077 100 0 %	
	at Robson	Jan I - May 14	123	97.7 = 100.3 %	
	~ 3.5 km d/s Ceigar	May 15 - May 17	3	110.3 - 113.9 %	Obj. not met
	(B.C. Hydro site)	May 18 - Jun 24	48	105.3 109.9 %	Obj. met
		Jun 25 - Sep 20	88	110.5 - 141.1 %	Obj. not met
		Sep. 21		109.6%	Obj. met
		Sep. 22	1	110.2%	Obj. not met
		Sep 23 - Sep 26	3	109.3 - 109.7 %	Obj. met
		Sep 27 - Sep 28	2	110.5 - 111.2 %	Obj. not met
		Sep 29 - Oct 16	18	106.0 - 110.0 %	Obj. met
		Oct. 17	1	111.4%	Obj. not met
	· · · · · · · · · · · · · · · · · · ·	Oct 18 - Oct 24	7	107.8 - 109.3 %	Obj. met
		Nov 5 - Dec 27	50	114.1 - 138.3 %	Obj. not met
		Dec 28 - Dec 31	4	103.7 - 105.7 %	Obj. met
				(% = daily av)	l
	at Birchbank	Jan 1 - May 9	129	98.5 - 109.6 %	Obj. met
	(B.C. Hydro site)	May 10 - Sep 15	119	110.6 - 126.6 %	Obj. not met
		Sep. 16	1	108.6%	Obj. met
		Sep 17 - Sep 19	3	118.5 - 118.7 %	Obi, not met
		Sep 20 - Oct 25	36	102.4 - 108.6 %	Obi, met
		Oct 26 - Dec 27	63	110.4 - 122.7 %	Ohi not met
		Dec 28 - Dec 20	5		Obi mot
		Dec 20 - Dec 23		110 20/	Obj. met
	1	Dec. 30			
		Dec. 31	1'		Uuj. met
1	1		1	(% = ually av)	1

VARIABLE		MEASUREMENT			CONCLUSION
& 00 15070 (5	OITE	DATE		VALUE	
OBJECTIVE	SILE Columbia Diversi	DATE	<u> </u>	VALUE	
Fecal	Columbia River:	hum 00 that 00		1 0/100 ml	Objective
Contorms	0200183	Jun 28 - Jul 26	э	< 1 - 2/100 mL	Objective
100/100	3 km u/s Ceigar				met
< 100/100 mL	F010000	hun 00		. 1. 1/100 ml	Ohiostius
90th perc.		Jun 28 - Jul 26	2	< 1 - 1/100 mL	Objective
(np)	400 m d/s Ceigar				met
	South Dank		+	1.0(100	Oblastics
	0200200	Jun 28 - Jul 26	5	< 1 - 3/100 mL	Objective
	400 m u/s Kootenay				met
1	2222222			1 2/102	Ohissting
	0200003	Jun 28 - Jul 26	1	< 1 - 2/100 mL	Objective
	at Birchbank	· · · · ·			met
E. Coli	Columbia River:				
	0200183	Jun 28 - Jul 26	5	< 1 - 1/100 mL	Objective
< 100/100 mL	3 km u/s Celgar				met
90th perc.					
(np)	E213039	Jun 28 - Jul 26	5	< 1 - 1/100 mL	Objective
	400 m d/s Celgar				met
	south bank				·
	0200200	Jun 28 - Jul 26	5	.< 1 - 1/100 mL	Objective
	400 m u/s Kootenay				met
	0200003	Jul 5 - Jul 26	4	< 1 - 1/100 mL	Indefinite
	at Birchbank				result
Toxicity	Columbia River	monthly tests on	12	96-hLC50 = 100%	Objective met
	. at Celgar	rainbow trout		(no fish mortalities)	
% mill effluent					
in river:					
< 0.05 of the					
96-h LC50					
Chlorophenols	Columbia River				
	0200183	Jul. 5	1	tri: <0.05 ug/L any isomer	Objective met
< 0.05 ug/L tri	3 km u/s Celgar				
< 0.10 ug/L tetra			1	tetra: <0.05 ug/g any isomer	Objective met
< 0.05 ug/L penta					
			1	penta: <0.05 ug/L	Objective met
· · · ·	E213039	Jul. 5	1	tri: <0.05 ug/L any isomer	Objective met
	400 m d/s Celgar				
	south bank		11	tetra: <0.05 ug/g any isomer	Objective met
				00 1	
			1	penta: <0.05 ug/L	Objective met
	0200200	Jul. 5	1	tri: <0.05 ug/L anv isomer	Objective met
	400 m u/s Kootenav				
· · ·			1	tetra: <0.05 ug/g any isomer	Objective met
			· ·	louidi toloo ugʻgʻuliy isoliloi	
			1	nenta: ∠0.05 µa/i	Objective met
	0200003	Jul 5	1	tri: <0.05 µg/L anv isomer	Objective met
	at Birchbank	Juli J		In South any isomer	Objective met
			1	tetra: <0.05 µg/g any isomor	Objective met
			'	totra. Soloo ugrg arry laoinei	Objective met
4			1	penta: <0.05 ug/L	Objective met

VARIABLE		CONCLUSION			
	0175	DATE			4
Disuina & Europo	Columbia Divoru	DATE		VALUE	
Dioxins & Furans 1pg/g TCDD TEQ max in fish	Columbia River: Between Keenleyside and Birchbank	Nov. 28	7	1.005 - 11.887 pg/g TCDD TEQ (mountain whitefish)	Objective not met
(wet weight)			3	0.020 - 0.870 pg/g TCDD TEQ (mountain whitefish)	Objective met
Dioxins & Furans 0.2 pg/L TCDD TEQ max in water	Columbia River	1995	0	no data collected	Objective not checked
Dioxins & Furans 0.7 pg/g TCDD TEQ	Columbia River: 0200183 3 km u/s Celgar	Aug. 29	1	0.038 pg/g TCDD TEQ	Objective met
max in seds	E213039 400 m d/s Celgar south bank	Aug. 29	1	2.130 pg/g TCDD TEQ	Objective not met
	0200200 400 m u/s Kootenay	Aug. 29	1	0.381 pg/g TCDD TEQ	Objective met
	0200003 at Birchbank	Aug. 29	1	0.020 pg/g TCDD TEQ	Objective met
Resin Acids 12 ug/L max DHA 45 ug/L max total	Columbia River: 0200183 3 km u/s Celgar	Jul. 19	1	DHA < 1 ug/L total < 7 ug/L	Objectives met
at pH = 7.6	E213039 400 m d/s Celgar south bank	Jul. 19	1	DHA < 1 ug/L total < 7 ug/L	Objectives met
	0200200 400 m u/s Kootenay	Jul. 19	1	DHA < 1 ug/L total < 7 ug/L	Objectives met
	0200003 at Birchbank	Jul. 19	1	DHA < 1 ug/L total < 7 ug/L	Objectives met
Chlorinated Resin Acids 6 ug/L max of mono CI-DHA & di CL-DHA	Columbia River.	1995	0	no data collected	Objectives not checked
Chiorophyli-a < 50 mg/m2 av	Columbia River: 0200183 3 km u/s Celgar	Aug. 15	6	0.5 - 1.3 mg/m2 av – 1.0 mg/m2	Objective met
	0200200 400 m u/s Kootenay	Aug. 15	6	< 0.3 - 0.5 mg/m2 av = 0.4 mg/m2	Objective met
	0200003 at Birchbank	Aug. 15	6	< 0.3 - 2.5 mg/m2 av = 1.2 mg/m2	Objective met

TABLE 16

VARIABLE		CONCLUSION			
	SITE	DATE		VALUE	4
Fecal	Main Stem	1995	0	no data collected	Objectives
Contonna	Main Arm:				HOLCHECKEU
< 1000/100 mL	GVRD 1	Apr 20 - Oct 17	4	20 - 1100/100 mL	Max. obj. met
geometric mean	u/s Annacis				gm not checked
(gm)	0)(00.0	hum 0 Oct 17	+	00 0000/100	Mary ist much
4000/100 ml	GVRD 2		3	20 - 2300/100 mL	Max obj. met
max	urs Annacis	Apr. 20	· · ·	8000/100 mil	wiax not met
	GVRD 3	June 8 - Oct 17	3	80 - 3000/100 mL	Max obj. met
April - October	12 km d/s Annacis	Apr. 20		,30000/100 mL	Max not met
	GVRD 4	Jun 8 - Aug 22	2	80 - 2300/100 mL	Max. obj. met
	d/s Lulu	Apr 20 - Oct 17	2	11000 - 17000/100 mL	Max. not met
	GVRD 5	Jun 8 - Aug 22	2	40 - 140/100 mL	Max. obj. met
	d/s Steveston	Apr 20 - Oct 17	2	5000 - 11000/100 mL	Max. not met
	North Arm	1995	0	no data collected	Objectives
	Middle Arm				not checked
Fecal Coliforms	Iona Beach				
000/100	every 1.5 km along jetty	Jun 5 - Jul 5	6	gm < 22/100 mL	Objective met
< 200/100 mL	east to west	Jul 13 - Aug 16	6	gm < 22/100 mL	Objective met
(am)	GVBD 6	Jun 5 - Jul 5	6	am < 25/100 m	Objective met
(9)		Jul 13 - Aug 16	6	gm < 20/100 mL	Objective met
June - August		the E half	<u> </u>	01// 00	Objective
at beaches	GVRD 8		6	gm < 31/100 mL	Objective met
		Jul 13 - Aug 10	Ů	gin < 22/100 mL	Objective met
	GVRD 10	Jun 5 - Jul 5	6	gm < 27/100 mL	Objective met
		Jul 13 - Aug 16	6	gm < 22/100 mL	Objective met
	GVRD 12	Jun 5 - Jul 5	6	gm < 25/100 mL	Objective met
		Jul 13 - Aug 16	6	gm < 20/100 mL	Objective met
	GVRD 14	Jun 5 - Jul 5	6	am < 32/100 mL	Objectivo met
		Jul 13 - Aug 16	6	gm < 30/100 mL	Objective met
	Tsawwassen Beach:]
	GVRD 1	Jun 30 - Aug 18	5	gm < 49/100 mL	Objective met
	Causeway-north, 0 km				
	GVRD 2	Jun 30 - Aug 18	5	gm < 35/100 mL	Objective met
	Causeway-north, 2 km				
	GVRD 3	Jun 30 - Aug 18	5	gm < 20/100 mL	Objective met
	Causeway-north, 3 km				
	Sturgeon Bank	1995		no data collected	Ohiective
	Roberts Bank		Ĭ		not checked

OBJECTIVE SITE DATE n VALUE Supponded Solids North Arm E207808 Mar 2 - Mar 30 5 <4 - 18 mg/L Control site max increase: 10 mg/L or 10 % 0300002 Mar 2 - Mar 30 5 7 - 24 mg/L Objective max inc. = 7 mg/L Objective met Middle Arm E207601 Mar 2 - Mar 23 4 13 - 68 mg/L Control site Middle Arm E207600 Mar 2 - Mar 23 4 11 - 21 mg/L Objective met Middle Arm E207600 Mar 2 - Mar 23 4 11 - 21 mg/L Objective met Ammonia-N Main Arm: 0.002 mg/L max, at GVRD 1,2,3,4,8,5 Feb 21 - Dec 5 6 all < 0.05 mg/L Max. obj. met 1.83 mg/L av 9.6 mg/L max, at Mar Arm: 0.301308 Mar 2 - Mar 30 5 <0.01 - 0.05 mg/L Max. obj. met 1.83 mg/L av 9.6 mg/L av 9.6 Jang/L av 9.6 Jang/L av Mar Arm: 0.301308 Mar 2 - Mar 30 5 <0.005 - 0.027 mg/L av = 0.144 mg/L Objectives met GVRD 1 Mar 2 - Mar 30 5 0.005 - 0.027 mg/L av = 0.013 mg/L Max obj. met 18 mg/L av 9 Anacis	VARIABLE		MEASUREMEN	Г		CONCLUSION
Superiod Date In Under In Under Superiod Name EX07388 Mar 2 - Mar 30 5 < 4 - 18 mg/L		SITE	DATE	Inl	VALUE	
Solide max. increase: 10 mgL or 10 % E207398 (u/s Sout Paper) Mer 2 · Mar 30 5 < 4 - 18 mg/L Control site 00 mgL or 10 % 030000/2 Oak Street Bridge Mar 2 · Mar 30 5 7 · 24 mg/L max. inc. = 7 mg/L Objective met Middle Arm E207601 100 m d/s North Arm Discore Bridge Mar 2 · Mar 23 4 13 - 68 mg/L Control site Middle Arm E207600 at Disnore Bridge Mar 2 · Mar 23 4 11 - 21 mg/L max. inc. = 7 mg/L Objective met Total CI2 Res. 0.002 mg/L max. Main Arm: QVRD 1,2,3,4,8 5 Feb 21 · Dec 5 6 all < 0.05 mg/L	Suspended	North Arm	DAIL	+		
usis Sooti Paper unit at mathe o	Solids	F207398	Mar 2 - Mar 30	5	< 4 - 18 mg/L	Control site
max. increase: 10 <th10< th=""> 10 10</th10<>	Condo	u/s Scott Paner	mar 2 mar oo	Ŭ	() ionigiz	Control one
10 mg/L or 10 % 0300002 Oak Street Bridge Mar 2 Mar 30 5 7 - 24 mg/L max. inc. = 7 mg/L Objective met Middle Arm E207601 Mar 2 - Mar 23 4 13 - 68 mg/L Control site 100 mg/L or 10 % Middle Arm E207601 Mar 2 - Mar 23 4 13 - 68 mg/L Control site 000 mg/L or 10 % North Arm E207600 Mar 2 - Mar 23 4 11 - 21 mg/L max increase = 0 Objective met Total CI2 Res. 0.002 mg/L aw Main Arm: GVRD 1 Feb 21 - Dec 5 6 all < 0.05 mg/L	max increase:					
Damping Link of display="block block	10 mg/l or 10 %	0300002	Mar 2 Mar 30	5	7 - 24 mg/l	Ohiective
Middle Am E207601 Mar 2 · Mar 23 4 13 - 68 mg/L Control site 100 m d/s North Am E207600 Mar 2 · Mar 23 4 11 - 21 mg/L max Increase = 0 Objective met Total Ci2 Res. 0.002 mg/L max. Main Am: GVRD 1,2,3,4,8.5 Feb 21 · Dec 5 6 all < 0.05 mg/L	ro mg/2 of ro vo	Oak Street Bridge			max, inc. = 7 mg/L	met
Middle Arm E207601 Mar 2 · Mar 23 4 13 · 68 mg/L Control site 100 m d/s North Arm E207600 Mar 2 · Mar 23 4 11 · 21 mg/L max increase = 0 Objective met Total Ci2 Res. 0.002 mg/L max. Main Arm: GVRD 1.2,3,4,8.5 Feb 21 · Dec 5 6 all < 0.05 mg/L		Call Chieff Linge				
Middle Arm E207601 100 m (4) North Arm Mar 2 - Mar 23 4 13 - 68 mg/L Control site Total Ci2 Res. 0.002 mg/L max. GVRD 1,2,3,4,8,5 Feb 21 - Dec 5 6 all < 0.05 mg/L						
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E207600 at Diramore Bridge Mar 2 - Mar 23 Main Arm: GVRD 1,2,3,4,8,5 Mar 2 - Mar 23 Feb 21 - Dec 5 4 feb 21 - Dec 5 11 - 21 mg/L max increase = 0 Objective met max increase = 0 Armonia-N 1.83 mg/L av 9.5 mg/L at pH = 7.7 temp = 12°C Main Arm: GVRD 1 u/s Annacis Feb 21 - Dec 5 6 <0.01 - 0.05 mg/L av = 0.144 mg/L Max. obj. met 0301308 at pH = 7.7 temp = 12°C Mar Annacis Mar 2 - Mar 30 5 <0.005 - 0.538 mg/L av = 0.144 mg/L Objectives met 0301311 d/s Annacis Mar 2 - Mar 30 5 <0.005 - 0.027 mg/L av = 0.013 mg/L Objectives met GVRD 1 d/s Annacis Feb 21 - Dec 5 6 0.01 - 0.06 mg/L av = 0.013 mg/L Objectives met GVRD 2 d/s Annacis Feb 21 - Dec 5 6 0.04 - 0.12 mg/L av = 0.013 mg/L Max obj. met E105892 u/s Lulu STP Mar 2 - Mar 30 5 0.022 - 0.047 mg/L av = 0.038 mg/L Objectives met GVRD 4 d/s Lulu Feb 21 - Dec 5 6 0.04 - 0.12 mg/L Max obj. met GVRD 5 d/s Lulu STP Feb 21 - Dec 5 6 0.04 - 0.14 mg/L Max obj. met GVRD 5 d/s Lulu STP Feb 21 - Dec 5 6 0.04 - 0.14 mg/L Max		100 m d/s North Arm			3	
at Dismore Bridge max increase = 0 Total Cl2 Res. 0.002 mg/L max. Main Arm: GVRD 1,2,3,4,8.5 Feb 21 - Dec 5 6 all < 0.05 mg/L		E207600	Mar 2 - Mar 23	4	11 - 21 mg/L	Objective met
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Total Ci2 Res. Main Arm: GVRD 1,2,3,4,8.5 Feb 21 - Dec 5 6 all < 0.05 mg/L Indefinitie result Ammonia-N Main Arm: GVRD 1 Feb 21 - Dec 5 6 <0.01 - 0.05 mg/L		Ŭ				
0.002 mg/L max. GVRD 1,2,3,4,8 5 Feb 21 - Dec 5 6 all < 0.05 mg/L result Ammonia-N 1.83 mg/L av at pH = 7.7 temp = 12°C Main Arm: GVRD 1 Feb 21 - Dec 5 6 <0.01 - 0.05 mg/L	Total Cl2 Res.	Main Arm:			· · · · · · · · · · · · · · · · · · ·	Indefinite
Ammonia-N Main Am:: GVRD 1 Feb 21 - Dec 5 6 <0.01 - 0.05 mg/L Max. obj. met 1.83 mg/L av 9.5 mg/L max at pH = 7.7 temp = 12°C 0301308 Mar 2 - Mar 30 5 <0.005 - 0.538 mg/L av = 0.144 mg/L Objectives met QVRD 2 0301311 Mar 2 - Mar 30 5 <0.005 - 0.538 mg/L av = 0.144 mg/L Objectives met GVRD 2 0301311 Mar 2 - Mar 30 5 <0.005 - 0.027 mg/L av = 0.013 mg/L Objectives met GVRD 2 Feb 21 - Dec 5 6 0.01 - 0.06 mg/L Max obj. met GVRD 3 Feb 21 - Dec 5 6 0.04 - 0.12 mg/L Max obj. met 12 km d/s Annacis Feb 21 - Dec 5 6 0.033 - 0.059 mg/L Objectives met E105892 Mar 2 - Mar 30 5 0.033 - 0.059 mg/L Objectives met E207407 Mar 2 - Mar 30 5 0.022 - 0.047 mg/L Objectives met GVRD 4 Feb 21 - Dec 5 6 0.04 - 0.14 mg/L Max obj. met GVRD 5 Feb 21 - Dec 5 6 0.06 - 0.10 mg/L Max obj. met GVRD 5 Feb 21 - Dec 5 </td <td>0.002 mg/L max.</td> <td>GVRD 1,2,3,4,& 5</td> <td>Feb 21 - Dec 5</td> <td>6</td> <td>all < 0.05 mg/L</td> <td>result</td>	0.002 mg/L max.	GVRD 1,2,3,4,& 5	Feb 21 - Dec 5	6	all < 0.05 mg/L	result
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u/s Lulu STPMar 2 - Mar 305a v = 0.043 mg/LmetE207407 d/s Lulu STPMar 2 - Mar 3050.022 - 0.047 mg/L a v = 0.038 mg/LObjectives metGVRD 4 d/s LuluFeb 21 - Dec 560.04 - 0.14 mg/LMax obj. metGVRD 5 d/s StevestonFeb 21 - Dec 560.06 - 0.10 mg/LMax obj. metNorth Arm19950no data collectedObjectives not checkedMiddle Arm: E207601 100m d/s North ArmMar 2 - Mar 3050.05 - 0.014 mg/L a v = 0.011 mg/LObjectives met		E105892	Mar 2 - Mar 30	5	0.033 - 0.059 mg/L	Objectives
E207407 d/s Lulu STPMar 2 - Mar 3050.022 - 0.047 mg/L av = 0.038 mg/LObjectives metGVRD 4 d/s LuluFeb 21 - Dec 560.04 - 0.14 mg/LMax obj. metGVRD 5 d/s StevestonFeb 21 - Dec 560.06 - 0.10 mg/LMax obj. metMax obj. met19950no data collectedObjectives not checkedMiddle Arm: E207601 100m d/s North ArmMar 2 - Mar 3050.05 - 0.014 mg/L av = 0.011 mg/LObjectives met		u/s Lulu STP			av = 0.043 mg/L	met
E207407 d/s Lulu STPMar 2 - Mar 3050.022 - 0.047 mg/L av = 0.038 mg/LObjectives metGVRD 4 d/s LuluFeb 21 - Dec 560.04 - 0.14 mg/LMax obj. metGVRD 5 d/s StevestonFeb 21 - Dec 560.06 - 0.10 mg/LMax obj. metMax obj. met19950no data collectedObjectives not checkedMiddle Arm: E207601 100m d/s North ArmMar 2 - Mar 3050.05 - 0.014 mg/L av = 0.011 mg/LObjectives met						
d/s Lulu STPav = 0.038 mg/LmetGVRD 4 d/s LuluFeb 21 - Dec 560.04 - 0.14 mg/LMax obj. metGVRD 5 d/s StevestonFeb 21 - Dec 560.06 - 0.10 mg/LMax obj. metNorth Arm19950no data collectedObjectives not checkedMiddle Arm: E207601 100m d/s North ArmMar 2 - Mar 3050.05 - 0.014 mg/L av = 0.011 mg/LObjectives met		E207407	Mar 2 - Mar 30	5	0.022 - 0.047 mg/L	Objectives
GVRD 4 d/s LuluFeb 21 - Dec 560.04 - 0.14 mg/LMax obj. metGVRD 5 d/s StevestonFeb 21 - Dec 560.06 - 0.10 mg/LMax obj. metNorth Arm19950no data collectedObjectives not checkedMiddle Arm: E207601 100m d/s North ArmMar 2 - Mar 3050.05 - 0.014 mg/L av = 0.011 mg/LObjectives met		d/s Lulu STP			av = 0.038 mg/L	met
GVRD 4 d/s LuluFeb 21 - Dec 560.04 - 0.14 mg/LMax obj. metGVRD 5 d/s StevestonFeb 21 - Dec 560.06 - 0.10 mg/LMax obj. metNorth Arm19950no data collectedObjectives not checkedMiddle Arm: E207601 100m d/s North ArmMar 2 - Mar 3050.05 - 0.014 mg/L av = 0.011 mg/LObjectives met						
d/s LuluFeb 21 - Dec 560.06 - 0.10 mg/LMax obj. metGVRD 5 d/s StevestonFeb 21 - Dec 560.06 - 0.10 mg/LMax obj. metNorth Arm19950no data collectedObjectives not checkedMiddle Arm: E207601 100m d/s North ArmMar 2 - Mar 3050.05 - 0.014 mg/L av = 0.011 mg/LObjectives met		GVRD 4	Feb 21 - Dec 5	6	0.04 - 0.14 mg/L	Max obj. met
GVRD 5 d/s StevestonFeb 21 - Dec 560.06 - 0.10 mg/LMax obj. metNorth Arm19950no data collectedObjectives not checkedMiddle Arm: E207601 100m d/s North ArmMar 2 - Mar 3050.05 - 0.014 mg/L av = 0.011 mg/LObjectives met		d/s Lulu				
GVRD 5 d/s StevestonPeb 21 - Dec 560.06 - 0.10 mg/LMax obj. metNorth Arm19950no data collectedObjectives not checkedMiddle Arm: E207601 100m d/s North ArmMar 2 - Mar 3050.05 - 0.014 mg/L av = 0.011 mg/LObjectives met			Fab 01 Dag 5	+	0.06 0.10 mg/	Max abi mat
Ors Stevestor19950no data collectedObjectives not checkedNorth Arm19950no data collectedObjectives not checkedMiddle Arm: E207601 100m d/s North ArmMar 2 - Mar 3050.05 - 0.014 mg/L av = 0.011 mg/LObjectives met		GVRD 5	Feb 21 - Dec 5	N N	0.08 - 0.10 mg/L	wax obj. met
North Arm19950no data collectedObjectives not checkedMiddle Arm: E207601 100m d/s North ArmMar 2 - Mar 3050.05 - 0.014 mg/L av = 0.011 mg/LObjectives met		U/S SIEVESION				
Middle Arm: E207601 Mar 2 - Mar 30 5 0.05 - 0.014 mg/L Objectives 100m d/s North Arm Mar 2 - Mar 30 5 0.05 - 0.014 mg/L Objectives		North Arm	1005		no data collected	Objectives
Middle Arm: Mar 2 - Mar 30 5 0.05 - 0.014 mg/L Objectives 100m d/s North Arm met met		NOTH ATT	1990		no dala conected	not checked
Middle Arm: Kit Compared and C						
E207601 Mar 2 - Mar 30 5 0.05 - 0.014 mg/L Objectives 100m d/s North Arm av = 0.011 mg/L met		Middle Arm [,]		++		Ì
100m d/s North Arm av = 0.011 mg/L met		F207601	Mar 2 - Mar 30	5	0.05 - 0.014 ma/l.	Objectives
		100m d/s North Arm			av = 0.011 mg/L	met
					a. e.e.i i iigia	

VARIABLE		CONCLUSION			
	SITE	DATE	TnT	VALUE	
Ammonia-N	Middle Arm:	DATE	+ " +	THEOL	
Aminonia-N	F207600	Mar 2 - Mar 30	5	< 0.005 - 0.025 mg/L	Objectives
1 82 mg/l av	at Dinsmore Bridge	Mar E Mar 00	ľ	av = 0.017 mg/l	met
0.5 mg/L av	at Dillishore Dhuge			av = 0.017 mg/2	
9.5 mg/t max	Churgeon Book	1005		no data colected	Objectives
	Sulgeon Bank	1995		no dala colected	not checked
pH = 7.7	Roberts Bank				not checked
temp = 12° C	Main Ciami		+-+		
Dissoived	Main Stem:	Mor 9 Mor 90	5	110-126 mg/	Objective met
Oxygen	E206965	Mar 2 - Mar 30	5	11.0 - 12.0 mg/L	Objective met
	Barnston Island	Marco Marcoo	<u> </u>	10.0 110.0	Objective met
7.75 mg/L min	0300005	Mar 2 - Mar 30	5	10.9 - 12.6 mg/L	Objective met
	Pattullo Bridge				
	Main Arm:				
	Gunderson Slough	Feb. 10	19	0-5.5 m: 8.0 - 11.6 mg/L	Objective met
	E216045	Mar. 31	15	0-4.3 m: 8.5 - 10.0 mg/L	Objective met
	•				
	GVRD 1				
	u/s Annacis	Feb 21 - Dec 5	6	9.7 - 12.9 mg/L	Objective met
	0301308	Mar 2 - Mar 30	5	10.8 - 12.6 mg/L	Objective met
	u/s Annacis				
	0301311	Mar 2 - Mar 30	5	10.7 - 12.4 mg/L	Objective met
	d/s Annacis				
					-
	GVRD 2				
	d/s Annacis	Feb 21 - Dec 5	6	9.7 - 12.6 mg/L	Objective met
		1			
	Deas Slough	Feb. 11	16	0-4.6 m: 9.9 - 12.9 mg/L	Objective met
	E216044		1	4.9 m: 7.0 mg/L	Objective not met
		Mar. 31	18	0-5.2 m: 9.4 - 10.7 mg/L	Objective met
	GVRD 3				
	12 km d/s Annacis	Feb 21 - Dec 5	6	9.3 - 12.6 mg/L	Objective met
	Ladner Slough	Feb. 11	16	0-4.6 m: 8.9 - 12.3 mg/L	Objective met
	E216043	Mar. 31	16	0-4.6 m: 7.8 - 10.9 mg/L	Objective met
			11	4.9 m: 5.0 mg/L	Objective not met
	E105892	Mar 2 - Mar 30	5	10.8 - 12.5 mg/L	Objective met
	100 m u/s Lulu				· · ·
	E207407	Mar 2 - Mar 30	5	10.9 - 12.4 mg/L	Objective met
	100 m d/s Lulu			-	
	GVRD 4				
	d/s Lulu	Feb 21 - Dec 5	6	9.2 - 12.5 mg/L	Objective met
				-	
	GVRD 5				
	d/s Steveston	Feb 21 - Dec 5	5	9.3 - 12.3 mg/L	Objective met
				2	

VARIABLE		CONCLUSION			
		DATE)(A) LIE	
OBJECTIVE	SILE	DATE		VALUE	
Dissolved Oxygen	North Arm: E207398 u/s Scott Paper	Mar 2 - Mar 30	5	10.8 - 12.6 mg/L	Objective met
7.75 ma/L min	Tree Island Slough	Feb. 10	15	0-4.3 m: 8.0 - 12.9 mg/L	Objective met
, and any second	E216038	Mar. 30	12	0-3.4 m: 8.4 - 10.5 mg/L	Objective met
			1	3.7 m: 7.6 mg/L	Objective not met
	E207397 d/s Belkin	Mar 2 - Mar 30	5	10.9 - 12.6 mg/L	Objective met
	E207401 d/s Mitchell Island	Mar 2 - Mar 30	5	10.9 - 12.0 mg/L	Objective met
	0300002 Oak Street Bridge	Mar 2 - Mar 30	5	10.9 - 12.0 mg/L	Objective met
	Eburne Slough	Feb. 10	15	0-4.3 m: 8.1 - 11.8 mg/L	Objective met
	E216039	Mar. 30	10	0-2.7 m: 9.0 - 10.0 mg/L	Objective met
			1	3.0 m: 5.8 mg/L	Objective not met
	MacDonald Slough	Feb. 10	19	0-5.5 m: 7.9 - 10.9 mg/L	Objective met
	F216037		1	5.8 m: 6.5 mg/L	Objective not met
		Mar. 30	15	0-4.3 m: 8.3 - 10.1 mg/L	Objective met
	Middle Arms		+		
	E207601 100 m d/s North Arm	Mar 2 - Mar 30	5	10.9 - 12.0 mg/L	Objective met
	E207600 at Dinsmore Bridge	Mar 2 - Mar 30	5	11.0 - 11.9 mg/L	Objective met
Dissolved	Sturgeon Bank	1995	0	no data collected	Objective
Oxygen	Boberts Bank				not checked
Chygon	rioborto Daria				
9.0 mg/l min				κ.	
9.0 mg/L mm	Main Stem:				
6.5 - 8.5	E206965 Barnston Island	Mar 2 - Mar 30	5	7.35 - 7.75	Objective met
	0300005 d/s Pattullo Bridge	Mar 2 - Mar 30	5	7.25 - 7.65	Objective met
	Main Arm: GVRD 1 u/s Annacis	Feb 21 - Dec 5	6	6.7 - 7.7	Objective met
	0301308 u/s Annacis	Mar 2 - Mar 30	5	7.3 - 8.0	Objective met
	0301311 d/s Annacis	Mar 2 - Mar 30	5	7.5 - 8.0	Objective met
	GVRD 2 d/s Annacis	Feb 21 - Dec 5	6	6.6 - 7.9	Objective met

VARIABLE		CONCLUSION			
	SITE	DATE		VALUE	
nH	Main Arm:	DATE	+"+	VALUE	· · · · · · · · · · · · · · · · · · ·
pri	GVBD 3				
65-85	12 km d/s Annacis	Feb 21 - Dec 5	6	66-78	Objective met
0.0 - 0.0		10021 0000	ľ	0.0 - 1.0	
	E105892	Mar 2 - Mar 30	5	7.3 - 7.8	Objective met
	100m u/s Lulu				,
	E207407	Mar 2 - Mar 30	5	6.9 - 7.8	Objective met
	100m d/s Lulu				
		·			
	GVRD 4			· ·	
	d/s Lulu	Feb 21 - Dec 5	6	6.8 - 7.8	Objective met
	GVRD 5				
	d/s Steveston	Feb 21 - Dec 5	6	6.9 - 7.8	Objective met
	North Arm:				
	E207398	Mar 2 - Mar 30	5	7.25 - 7.65	Objective met
	u/s Scott Paper				
	E207207	Mar Q Mar 20		7.05 7.65	Objective met
	d/o Polikin Ponorhoord	iviar 2 - iviar 30) S	7.35 - 7.65	Objective met
	us beixin raperboard				
	0300002	Mar 2 - Mar 30	5	7 20 - 7 50	Objective met
	Oak Street Bridge			1.20 1.00	
	ean en our en ago				
	Middle Arm:		1-1		
	E207601	Mar 2 - Mar 30	5	7.3 - 7.8	Objective met
	100 m d/s North Arm				,
	E207600	Mar 2 - Mar 30	5	7.3 - 7.7	Objective met
	at Dinsmore Bridge				
Total Cu	Main Arm:			· · · ·	
	GVRD 1	Feb 21 - Dec 5	6	all < 0.001 mg/L	Control
~<0.004 mg/L av	u/s Annacis			(Dissolved Cu)	Site
0.006 mg/L max					
at	0301308	Mar 2 - Mar 30	5	< 0.002 - 0.008 mg/L	Control
nardness > 35	u/s Annacis			av < 0.004 mg/L	Site
	0201211	Mar 2 Mar 20		(Total Cu)	
20% increase	d/c Appacie	Ivial 2 - Ivial 30	5	< 0.002 - 0.005 mg/L	Objectives
	d/s Annadis			(Total Cu)	objectives
				(1012100)	met
	GVRD 2		++		
	d/s Annacis	Feb 21 - Dec 5	6	<0.001 - 0.001 ma/L	Indefinite
				(Dissolved Cu)	result
	GVRD 3				
	12 km d/s Annacis	Feb 21 - Dec 5	6	<0.001 - 0.001 mg/L	Indefinite
				(Dissolved Cu)	result

VARIABLE		CONCLUSION			
	OITE	DATE		VALUE	
Total Cit	Main Arm:	DATE		VALUE	
Total Ou	E105892	Mar 2 - Mar 30	5	< 0.002 - 0.002 mg/l	Objectives
<0.004 mg/L av	100 m u/s Lulu		Ŭ	< 0.002 - 0.002 mg/L	met
0.004 mg/L av	100 m 0/3 Luiu			(Total Cu)	met
o.ooo mg/c max	E207407	Mar 2 - Mar 30	5	<0.002 - 0.002 mg/l	Objectives
hardness > 35	100 m d/s Lulu	mare maroo	Ŭ	av < 0.002 mg/l	met
or				(Total Cu)	mot
20% increase	GVBD 4				
	d/s Lulu	Feb 21 - Dec 15	6	<0.001 - 0.001 mg/L	Indefinite
			Ű	(Dissolved Cu)	result
				(
	GVRD 5			n an	
	d/s Steveston	Feb 21 - Dec 5	6	<0.001 - 0.001 mg/L	Indefinite
				(Dissolved Cu)	result
	North Arm	1995	0	no data collected	Objectives
					not checked
	Middle Arm:	ang manang m Manang manang m	TT		
	E207601	Mar 2 - Mar 30	5	< 0.002 - 0.005 mg/L	Objectives
	100 m d/s North Arm			av < 0.003 mg/L	met
				(Total Cu)	
	E207600	Mar 2 - Mar 30	5	< 0.002 - 0.003 mg/L	Objectives
	at Dinsmore Bridge			av < 0.002 mg/L	met
	-			(Total Cu)	
Total Pb	Main Arm:				
	GVRD 1	Feb 21 - Dec 5	6	all < 0.001 mg/L	Indefinite
< 0.003 mg/L av	u/s Annacis			(Dissolved Pb)	result
0.010 mg/L max					
	0301308	Mar 2 - Mar 30	5	all < 0.003 mg/L	Objectives
	u/s Annacis			(Total Pb)	met
	0001011	Mar 0. Mar 00		all	Obiestives
	0301311	Mar 2 - Mar 30	5	all < 0.003 mg/L	Objectives
	d/s Annacis		1	(Total Pb)	met
	GVPD 2		-++		
	d/a Appagia	Fob 21 - Doo 5	6	2 < 0.001 mg/l	Indefinite
	u/S Annacis	Feb 21 - Dec 5	Ů	(Dissolved Pb)	regult
			1		reaut
	GVBD 3	Feb 21 - Dec 5	6	all < 0.001 mg/L	Indefinite
	12 km d/s Annacis			(Dissolved Pb)	result
		,		3	
	E105892	Mar 2 - Mar 30	5	all < 0.003 mg/L	Objectives
	100 m u/s Lulu			(Total Pb)	met
	E207407	Mar 2 - Mar 30	5	all < 0.003 mg/L	Objectives
	100 m d/s Lulu			(Total Pb)	met
· · · · · · · · · · · · · · · · · · ·	GVRD 4				
	d/s Lulu	Feb 21 - Dec 5	6	all < 0.001 mg/L	Indefinite
				(Dissolved Pb)	result

VARIABLE		CONCLUSION			
OBJECTIVE	SITE	DATE	Inl	VALUE	1
Total Pb	Main Arm:	0.112			
	GVRD 5	Feb 21 - Dec 5	6	ali < 0.001 mg/L	Indefinite
< 0.003 mg/L av	d/s Steveston			(Dissolved Pb)	result
0.010 mg/L max					
	North Arm	1995	0	no data collected	Objectives
					not checked
· · ·				1	
	Middle Arm:				
	E207601	Mar 2 - Mar 30	5	< 0.003 - 0.003 mg/L	Objectives
	100m d/s North Arm			av < 0.003 mg/L	met
				(Total Pb)	
	E207600	Mar 2 - Mar 30	5	all < 0.003 mg/L	Objectives
	at Dinsmore Bridge			(Total Pb)	met
Total Zn	Main Arm :	Feb 21 - Dec 5	6	< 0.001 - 0.001 mg/L	Indefinite
	GVRD 1	•		(Dissolved Zn)	result
< 0.050 mg/L av.	u/s Annacis				
0.100 mg/L max.	0301308	Mar 2 - Mar 30	5	< 0.01 - 0.05 mg/L	Objectives
	u/s Annacis			av = 0.02 mg/L	met
				(Total Zn)	
	0301311	Mar 2 - Mar30	5	< 0.01 - 0.04 mg/L	Objectives
	d/s Annacis			av < 0.02 mg/L	met
				(Total Zn)	
	GVRD 2	Feb 21 - Dec 5	6	all < 0.001 mg/L	Indefinite
	d/s Annacis			(Dissolved Zn)	result
	CVPD 2	Fab 21 Das F		- 0.001 0.000 mall	Indefinite
	12 km d/a Annacia	Fed 21 - Dec 5	Ö	< 0.001 - 0.002 mg/L (Dissolved Zn)	Indefinite
	12 KIII WS AIIIIAUS			(DISSOIVED ZII)	resuit
	F105892	Mar 2 - Mar 30	5	< 0.01 - 0.07 mg/l	Objectives
	100 m u/s Lulu		Ĭ	av < 0.02 mg/l	met
				(Total Zn)	
	E207407	Mar 2 - Mar 30	5	<0.01 - 0.01 mg/L	Objectives
	100 m d/s Lulu			av < 0.01 mg/L	met
				(Total Zn)	
	GVRD 4	Feb 21 - Dec 5	6	< 0.001 - 0.002 mg/L	Indefinite
	d/s Lulu			(Dissolved Zn)	result
	GVRD 5	Feb 21 - Dec 5	5	< 0.001 - 0.001 mg/L	Indefinite
	d/s Steveston			(Dissolved Zn)	result
	North Arm	1995	0	no data collected	Objectives
					not checked
	Middle Arm:				
	E207601	Mar 2 - Mar 30	5	< 0.01 - 0.04 mg/L	Objectives
	100m d/s North Arm			av < 0.02 mg/L	met
				(Total Zn)	
	E207600	Mar 2 - Mar 30	5	<0.01 - 0.03 mg/L	Objectives
· · · ·	at Dinsmore Bridge			av < 0.02 mg/L	met
				(Total Zn)	

VARIABLE		MEASUREMEN	Т		CONCLUSION
	SITE	DATE	In	VALLIE	
Chlorophenols	Main Stem:	DATE	- <u> ''-</u>		
(tri + tetra	E206965	Mar. 30	1	all tri, tetra & penta - CP	Objective
+ penta -CP)	Barnston Island			<0.0001 mg/L	met
in water				, , , , , , , , , , , , , , , , , , ,	
0.0002 mg/L max	Main Arm	1995	0	no data collected	Objective
					not checked
	North Arm:				
	E207397	Mar 2 - Mar 30	5	all tri, tetra & penta - CP	Objective
	d/s Belkin			<0.0001 mg/L	met
	E207401	Mar 2 - Mar 30	5	all tri, tetra & penta - CP	Objective
	d/s Mitchell Island			< 0.0001 mg/L	met
	Middle Arm:				
	E207600	Mar 2 - Mar 30	5	all tri, tera, & penta - CP	Objective
	at Dinsmore Bridge			<0.0001 mg/L	met
Chlorophenols	Main Stem:				
(tri + tetra	E206965	Mar. 28	3	all < 0.005 ug/g	Objective
+ penta - CP)	Barnston Island			for tri, tetra & penta - CP	met
in sediments					
0.01	Main Arm	1995	0	no data collected	Objective
0.01 ug/g max					not checked
av or replicates	North Arms	Mor 20	2	0.006 0.000 ug/g popto	Objective
(ary weight)	E207207	Mar. 30	3	0.008 - 0.009 ug/g perita	Objective
	d/s Belkin Paperboard			av = 0.007 ug/g penta - 01	iner
	u/s Deikin raperboard			all < 0.005 µg/g	
				for tri & tetra - CP	
	Middle Arm:				
	E207600	Mar. 29	3	0.005 - 0.006 ug/g penta	Objective
1	at Dinsmore Bridge			av = 0.005 ug/g penta - CP	met
				all < 0.005 ug/g	
				for tri & tetra - CP	
	Sturgeon Bank:				
	E216048	Mar. 30	3	all = 0.006 ug/g penta - CP	Objective
	d/s MacDonald Slough				met
				all < 0.005 ug/g	
				for tri & tetra - CP	
	Roberts Bank	1995	0	no data collected	Objective
					not checked
Oblemation					
	Main Stem:	Mar 29		(3 separate composites of	Ohiective
	E200900 Barnston Island	IVIA1. 20		6 10 & 18 starry flounders)	met
in fieh	Damstoff Islanu			all < 0.005 µg/g	
0.10 ug/g max.				for each homologue	
(wet weight)					

VARIABLE		CONCLUSION			
	SITE	DATE		VALUE	
Chlorophenols	Main Arm			VALUE	
(Tri + Tetra	E206970	Mar. 27	5	(5 samples from separate	Objective
+ Penta)	Ewen Slough			starry flounders)	met
in fish				all < 0.005 ug/g	
0.10 ug/g max.	1			for each homologue	
(wet weight)				-	
	North Arm				
	E216037	Mar. 29	5	(4 samples from separate	Objective
	in MacDonald Slough			starry flounders + 1	met
				composite of 2)	
				all < 0.005 ug/g	
				for each homologue	
	Middle Arm				
	E207600	Mar. 29	5	(5 samples from separate	Objective
	Dinsmore Bridge			starry flounders)	met
				all < 0.005 ug/g	
	·			for each homologue	
PCBs	Main Stem				
in sediments	E206965	Mar. 28	3	all < 0.02 ug/g	Objective
	Barnston Island				met
< 0.03 ug/g max					
	Main Arm	1995	0	no data collected	Objectives
av of replicates					not checked
(dry weight)					
	North Arm:				
	E207397	Mar. 30	3	all < 0.02 ug/g	Objective
					met
	Middle Arm:				
	E207600	Mar. 29	3	all < 0.02 µg/g	Objective
	at Dinsmore Bridge				met
PCBs	Main Stem:				
in fish	E206965	Mar. 28	3	(3 separate composites of	Objective
0.50 ug/g max	Barnston Island			6,10,& 18 starry flounders)	met
(wet weight)				all < 0.1 ug/g	
	Main Arm:				
	E206970	Mar. 27	5	(5 samples from separate	Objective
	Ewen Slough			starry flounders)	met
÷				aii < 0.1 ug/g	
	North Arm				
	E216037	Mar. 29	5	(4 samples from separate	Objective
	in MacDonald Slough			starry flounders + 1	met
				composite of 2)	
				all < 0.1 ug/g	
	Middle Arm				
	E207600	Mar. 29	. 5	(5 samples from separate	Objective
	Dinsmore Bridge			starry nounders)	met
	; I		1 1	an < 0.1 ug/g	

TABLE 17

BURRARD INLET WATER QUALITY OBJECTIVES - 1995

VARIABLE		CONCLUSION			
OBJECTIVE	SITE	DATE	n	VALUE	-
Fecal Coliforms	Port Moody Arm:				
	GVRD 1	May 19 - Jun 23	5	< 20 - 230/100 mL	Objective met
< 200/100 mL	Barnett Pk. E of pier			gm < 33/100 mL	
geometric mean		Jul 14 - Aug 25	5	< 20 - 40/100 mL	Objective met
(gm)				gm < 26/100 mL	
	GVRD 2	May 5 - Jun 9	5	< 20 - 130/100 mL	Objective met
May - Oct	Barnett Pk. Sandy Beach			gm < 42/100 mL	
		Jul 14 - Aug 25	5	< 20 - 210/100 mL	Objective met
				gm = 53/100 mL	
	Indian Arm:				
	GVRD 35	May 2 - May 31	11	< 20 - 1300/100 mL	Objective met
	Deep Cove Beach N			gm = 173/100 mL	
		Aug 15 - Sep 15	10	20 - 1100/100 mL	Objective met
	·	·		gm = 169/100 mL	
	GVRD 39	May 2 - May 30	10	< 20 - 2400/100 mL	Objective
	Deep Cove Beach S			gm.= 212/100 mL	not met
		Jun 12 - Jul 12	10	< 20 - 500/100 mL	Objective met
				gm = 95/100 mL	
	2nd Narrows-Roche Pt.:				
	GVRD 36	May 11 - Jun 12	6	< 20 - 130/100 mL	Objective met
	Cates Park Beach			gm < 34/100 mL	
	N	Aug 15 - Sep 15	5	< 20 - 170/100 mL	Objective met
			_	gm = 59/100 mL	
	GVRD 29	Jul 12 - Aug 11	5	20 - 3000/100 mL	Objective met
	Cates Park boat ramp			gm = 173/100 mL	
		Sep 18 - Oct 19	5	40 - 1700/100 mL	Objective
				gm = 328/100 mL	not met
	1st-2nd Narrows:				
	GVRD 5	Jun 13 - Jul 17	5	40 - 9000/100 mL	Objective
	1 km W Brockton Pt.			gm = 950/100 mL	not met
		Sep 25 Oct 24	5	20 - 1700/100 mL	Objective met
			_	gm = 150/100 mL	
	GVRD 1	Jun 5 - Jul 10	5	140 - 3000/100 mL	Objective
	1.5 km W Brockton Pt.			gm = 511/100 mL	not met
		Aug 3 - Sep 5	6	70 - 3000/100 mL	Objective
				gm = 404/100 mL	not met
	Outer Burrard:				
	GVRD 14	May 29 - Jun 26	6	< 20 - 2400/100 mL	Objective met
	Ambleside Beach			gm = 120/100 mL	
		Sep 27 - Oct 27	9	130 - 3000/100 mL	Objective
				gm = 367/100 mL	not met
	GVRD 304	May 2 - Jun 1	10	< 20 - 1300/100 mL	Objective met
	3rd Beach			gm < 45/100 mL	
		Jun 29 - Aug 1	11	< 20 - 300/100 mL	Objective met
				gm < 40/100 mL	

BURRARD INLET WATER QUALITY OBJECTIVES - 1995

VARIABLE		MEASUREMENT			CONCLUSION
&					
OBJECTIVE	SITE	DATE	n	VALUE	
Fecal Coliforms	Outer Burrard:				
	GVRD 200	May 2 - Jun 10	10	< 20 - 300/100 mL	Objective met
< 200/100 mL	2nd Beach			gm < 37/100 mL	
geometric mean		Aug 14 - Sep 14	10	< 20 - 300/100 mL	Objective met
(gm)				gm < 32/100 mL	
	GVRD 101	May 9 - Jun 8	10	< 20 - 300/100 mL	Objective met
May - Oct	English Bay Beach			gm < 28/100 mL	
		Aug 14 - Sep 14	10	< 20 - 110/100 mL	Objective met
				gm < 35/100 mL	
	GVRD 703	Jun 26 - Jul 26	9	< 20 - 500/100 mL	Objective met
	Locarno Beach			gm < 63/100 mL	
		Oct 3 - Oct 30	6	20 - 300/100 mL	Objective met
				gm = 132/100 mL	
	False Creek:				
	GVRD 16	Jun 12 - Jul 10	5	40 - 800/100 mL	Objective met
	at the mouth			gm = 148/100 mL	
		Aug 8 - Sep 8	5	< 20 - 170/100 mL	Objective met
			_	gm = 35/100 mL	
Enterococci	Burrard Inlet	1995	0	no data collected	Omitted 1995
<200/100 mL					
geometric mean					
(gm)					
May - Oct	Dort Moody Arm	1005		no data collected	Objective
Suspended	Port Woody Ann 2nd Narrowe Banha Pt	1995	0	no dala collected	Objective not chocked
Solius	2nd Narrows-Roche Ft.				not checked
10 mg/l	Outor Burrard				
max increase	False Creek				
Max. morease	I dise ofeen				
Turbidity	Port Moody Arm	1995	0	no data collected	Objective
(dibidity	2nd Narrows-Boche Pt.	1000	ľ	no dala concerca	not checked
5 NTU	1st-2nd Narrows				
max. increase	Outer Burrard				
	False Creek				
Cl2-Produced	Port Moody Arm	1995	0	no data collected	Objective
Oxidants	2nd Narrows-Roche Pt.				not checked
3 ug/L av					
Ammonia-N	Port Moody Arm	1995	0	no data collected	Objective
	2nd Narrows-Roche Pt.				not checked
<1.0 mg/L av	1st-2nd Narrows				
2.5 mg/L max.	False Creek				
BURRARD INLET WATER QUALITY OBJECTIVES - 1995

VARIABLE	· · · · · · · · · · · · · · · · · · ·	CONCLUSION			
OBJECTIVE	SITE	DATE		VALUE	- ·
Dissolved Oxygen	Indian Arm Port Moody Arm 2nd Narrows-Roche Pt.	1995	0	no data collected	Objective not checked
6.5 mg/L min.	1st-2nd Narrows Outer Burrard False Creek				
WAD - CN 0.001 mg/L max	Port Moody Arm	1995	0	no data collected	Objective not checked
H2S 0.002 mg/L max	Port Moody Arm 1st-2nd Narrows	1995	0	no data collected	Objective not checked
рН 6.5 - 8.5	2nd Narrows-Roche Pt.	1995	0	no data collected	Objective not checked
Total As 0.010 mg/L max	2nd Narrows-Roche Pt. 1st-2nd Narrows	1995	0	no data collected	Objective not checked
Total As <20 ug/g av in sediment (long term)	Port Moody Arm 1st-2nd Narrows Outer Burrard False Creek	1995	0	no data collected	Objective not checked
Total Ba	2nd Narrows-Roche Pt.	1995	0	no data collected	Objective not checked
Total Cd <0.009 mg/L av 0.043 mg/L max.	Indian Arm Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows False Creek	1995	0	no data collected	Objective not checked
Total Cd <1.0 ug/g av. in sediment (long term)	Port Moody Arm 1st-2nd Narrows Outer Burrard False Creek	1995	0	no data collected	Objective not checked
Total Cr 0.050 mg/L max	Port Moody Arm 2nd Narrows-Roche Pt. False Creek	1995		no data collected	Objective not checked

BURRARD INLET WATER QUALITY OBJECTIVES - 1995

VARIABLE		CONCLUSION			
	SITE	DATE		VALUE	
Total Cr	Port Moody Arm 1st-2nd Narrows	1995	0	no data collected	Objective not checked
<60 ug/g av in sediment (long term)	Outer Burrard False Creek				
Total Cu <2 ug/L av. 3 ug/L max. (long term)	Indian Arm Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	1995	0	no data collected	Objective not checked
Total Cu <100 ug/g av in sediment	Port Moody Arm	1995	0	no data collected	Objective not checked
Total Cu <100 ug/g av in sediment (long term)	1st-2nd Narrows Outer Burrard False Creek	1995	0	no data collected	Objective not checked
Total Fe 0.3 mg/L max (long term)	Port Moody Arm False Creek	1995	0	no data collected	Objective not checked
Total Fe	Indian Arm 1st-2nd Narrows Outer Burrard	1995	0	no data collected	Objective not checked
Total Pb < 2 ug/L av (long term) 140 ug/L max	Indian Arm Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	1995	0	no data collected	Objective not checked
Total Pb <30 ug/g av in sediment (long term)	Port Moody Arm 1st-2nd Narrows Outer Burrard False Creek	1995	0	no data collected	Objective not checked
Total Pb 0.8 ug/g max wet weight in fish tissue	Indian Arm Port Moody Arm 2nd Narrows-Roche Pt. 1st-2nd Narrows Outer Burrard False Creek	1995	0	no data collected	Objective not checked

BURRARD INLET WATER QUALITY OBJECTIVES - 1995

VARIABLE		CONCLUSION			
&		-			
OBJECTIVE	SITE	DATE	n	VALUE	
Total Hg	2nd Narrows-Roche Pt	1995	0	no data collected	Objective
<0.02 ug/L av	1st-2nd Narrows				 not checked
2.0 ug/L max	False Creek		_		
Total Hg	Port Moody Arm	1995	0	no data collected	Objective
<0.15 ug/g av	2nd Narrows-Roche Pt				not checked
Sediment					
Total Hg	1st-2nd Narrows	1995	0	no data collected	Objective
<0.15 ug/g av	Outer Burrard				not checked
Sed. (long-term)	False Creek				
Total Hg	2nd Narrows-Roche Pt.	1995	0	no data collected	Objective
`	1st-2nd Narrows				not checked
0.5 ug/g max	Outer Burrard				
wet weight	False Creek				
in fish tissue					
Total Ni	2nd Narrows-Roche Pt.	1995	0	no data collected	Objective
	1st-2nd Narrows				not checked
< 8 ug/L av.	False Creek				
75 ug/L max.					
Total Ni	Port Moody Arm	1995	0	no data collected	Objective
	2nd Narrows-Roche Pt.				not checked
< 45 ug/g av	1st-2nd Narrows				
in sediment	Outer Burrard				
	False Creek				
Total Zn	Indian Arm	1995	0	no data collected	Objective
	Port Moody Arm				not checked
< 86 ug/L av	2nd Narrows-Roche Pt.				
95 ug/L max	1st-2nd Narrows				
	Outer Burrard	м			
	False Creek				
Total Zn	Port Moody Arm	1995	0	no data collected	Objective
	1st-2nd Narrows				not checked
< 150 ug/g av	Outer Burrard				
in sediment	False Creek				
(long term)					
Chlorophenols	1st-2nd Narrows	1995	0	no data collected	Objective
(tri + tetra					not checked
+ nenta)					
Chlorophenols	1st-2nd Narrows	1995	0	no data collected	Objective
			Ĭ		not checked
-0 1 ug/g may					
in codimont					
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BURRARD INLET WATER QUALITY OBJECTIVES - 1995

VARIABLE		CONCLUSION			
OBJECTIVE	SITE	DATE	Ini	VALUE	•
Chlorophenols	1st-2nd Narrows	1995	0	no data coilected	Objective
(tri + tetra					not checked
+ penta)					
0.1 ug/g max					
wet weight in fish					
PCBs	Port Moody Arm	1995	0	no data collected	Objective
	2nd Narrows-Roche Pt.				not checked
<0.03 ug/g av	1st-2nd Narrows				
in sediment	Outer Burrard				
	False Creek				
PCBs	Port Moody Arm	1995	0	no data collected	Objective
0.5 ug/g max	2nd Narrows-Roche Pt.				not checked
wet weight	1st-2nd Narrows				
in fish tissue	Outer Burrard				
	False Creek				
TBT	. 1st-2nd Narrows	1995	0	no data collected	Objective
	False Creek:				not checked
10 ng/L					
Ethylene	1st-2nd Narrows	1995	0	no data collected	Objective
Dichloride					not checked
< 0.2 mg/L av					
2.0 mg/L max					
Phenols	Port Moody Arm	1995	0	no data collected	Objective
	2nd Narrows-Roche Pt.				not checked
1 ug/L max					
Styrene	Port Moody Arm:	1995	0	no data collected	Objective
	E207698				not checked
50 ug/L max					
L-PAH	Port Moody Arm	1995	0	no data collected	Objective
in sediment	2nd Narrows-Roche Pt.				not checked
(max)	Outer Burrard				
	False Creek:				
naphthy 0.20 ug/g					
acenphyl 0.06 ug/g					
acenaphe 0.05 ug/g					
fluor 0.05 ug/g					
phenant 0.15 ug/g					
anthrac 0.10 ug/g					
total 0.5 ug/g					

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VARIABLE		CONCLUSION			
&					
OBJECTIVE	SITE	DATE	n	VALUE	
H-PAH	Port Moody Arm	1995	0	no data collected	Objective
in sediment	2nd Narrows-Roche Pt.				not checked
(max)	Outer Burrard				
	False Creek:				· · · · · · · · · · · · · · · · · · ·
fluorant 0.17 ug/g					
pyrene 0.26 ug/g					
bz-a-an 0.13 ug/g					
chrysene 0.14 ug/g					· · ·
bz-a-fl 0.32 ug/g	· ·				
bz-a-py 0.16 ug/g		· · ·			
ind-pyr 0.06 ug/g					
dibz-an 0.06 ug/g					
bz-pery 0.07 ug/g					
total 1.2 ug/g					

BURRARD INLET WATER QUALITY OBJECTIVES - 1995





FIGURE 2: ELK AND BEAVER LAKES





FIGURE 4: KATHLYN, SEYMOUR, ROUND AND TYPEE LAKES



FIGURE 5: LOWER KITIMAT RIVER AND KITIMAT ARM





FIGURE 6: NECHAKO RIVER

FIGURE 7: FRASER RIVER FROM SOURCE TO HOPE







FIGURE 10: OKANAGAN VALLEY LAKES



FIGURE 11: CAHILL CREEK



FIGURE 12: $\stackrel{115}{\text{Bessette Creek}}$



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FIGURE 13: TRIBUTARIES TO OKANAGAN LAKE NEAR VERNON















FIGURE 17: BURRARD INLET