

ANALYSES OF ELUTRIATES, NATIVE WATER, AND BOTTOM MATERIAL IN SELECTED RIVERS AND ESTUARIES IN WESTERN OREGON AND WASHINGTON

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U.S. GEOLOGICAL SURVEY
OPEN FILE REPORT 82-922

Prepared in cooperation with the
U.S. ARMY CORP OF ENGINEERS



Portland, Oregon
1983

U.S. DEPARTMENT OF THE INTERIOR

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CONTENTS

	Page
Abstract-----	1
Introduction-----	1
Approach and methodology-----	4
Field procedures-----	5
Laboratory procedures-----	7
Summary of results-----	11
Quality-assurance program-----	11
Selected references-----	14
Data tables-----	16

ILLUSTRATIONS

	Page
Figure 1. Map showing locations of the 15 Oregon and Washington project areas-----	3
2. Diagram showing sampling equipment used for the collection of bottom materials-----	6
3. Photograph showing elutriation sample prior to mixing-----	8
4. Photograph showing tripod and cassette filtration units used for filtering dissolved inorganic constituents-----	10
5. Photograph showing pressurized stainless-steel filtration unit used for filtering dissolved organic constituents-----	10
6. Graph showing salinity and conductance ranges for marine, estuarine, euryhaline, and fresh classifications-----	15
7-21. Maps showing sampling sites for the following projects:	
7. Baker Bay, Wash.-----	24
8. Columbia River near Chinook, Wash., and Area D, Oregon-----	34
9. Columbia River near Tansy Point, Oreg.-----	43
10. Skipanon and Columbia Rivers near Warrenton, Oreg.-----	51
11. Astoria boat slips and Youngs Bay, Oreg.-----	59
12. Columbia River and Skamokawa Creek, Wash.-----	68
13. Clatskanie River, Oreg.-----	77
14. Columbia and Cowlitz Rivers at Longview, Wash.-----	85
15. North and South Forks Toutle River, Wash., near retention structures-----	94
16. Lake River, Wash.-----	102
17. Columbia River at powerhouse under construction at Bonneville Dam, Wash.-----	107
18. Tillamook Bay near Garibaldi, Oreg.-----	114
19. Yaquina River, Oreg.-----	122
20. Umpqua River, Oreg.-----	131
21. Coos River, Oreg.-----	140

TABLES

		Page
	Conversion factors-----	x
Table	1. Names and site designations of the 15 project areas in Oregon and Washington-----	2
	2. Detection limits of chemical analyses and precision data expressed in terms of relative deviation for low, medium, and high analytical concentration ranges-----	16
	3. Chemical determinations of trace metals in distilled-deionized dilution water and initial concentrations of U. S. Environmental Protection Agency standard solution concentrations-----	17
	4. Chemical determinations of trace metals in four varying standard concentrates by the U.S. Geological Survey Central Laboratory-----	18
	5. Chemical determinations of dissolved cyanide in standard concentrates by the U.S. Army Corps of Engineers (COE) Northwest Division Materials Laboratory-----	19
	6. Chemical determinations of dissolved phenol in standard concentrates by the U.S. Army Corps of Engineers Northwest Division Materials Laboratory-----	19
	7. Chemical determinations of trace metals in standard concentrates diluted with filtered ocean water-----	20
	8. Chemical determinations of trace metals in standard concentrates diluted with filtered river water-----	20
	9. Chemical determinations of duplicate ocean water samples for dissolved metals, nutrients, and phenols made by the U.S. Geological Survey Laboratory and the U.S. Army Corps of Engineers Laboratory-----	21
	10. Chemical determinations of duplicate river water samples for dissolved metals, nutrients, and phenols made by the U.S. Geological Survey Laboratory and the U.S. Army Corps of Engineers Northwest Division Materials Laboratory-----	22
	11. Chemical determinations of duplicate elutriate water samples for dissolved metals, nutrients, and phenols made by the U.S. Geological Survey Laboratory and the U.S. Army Corps of Engineers Northwest Division Materials Laboratory-----	23

TABLES--Continued

	Page
12a-12f. Baker Bay, Wash., project:	
12a. Location of sampling sites-----	25
12b. Dissolved chemicals in native water and elutriates-----	26
12c. Additional dissolved chemicals in native water and elutriates-----	28
12d. Dissolved insecticides and herbicides in native water and elutriates-----	29
12e. Total recoverable chemicals in bottom material-----	32
12f. Total recoverable insecticides and herbicides in bottom material-----	33
13a-13f. Chinook, Wash., and Area D, Oregon, project:	
13a. Location of sampling sites-----	35
13b. Dissolved chemicals in native water and elutriates-----	36
13c. Additional dissolved chemicals in native water and elutriates-----	38
13d. Dissolved insecticides and herbicides in native water and elutriates-----	39
13e. Total recoverable chemicals in bottom material-----	41
13f. Total recoverable insecticides and herbicides in bottom material-----	42
14a-14f. Tansy Point, Oreg. project:	
14a. Location of sampling sites-----	44
14b. Dissolved chemicals in native water and elutriates-----	45
14c. Additional dissolved chemicals in native water and elutriates-----	46
14d. Dissolved insecticides and herbicides in native water and elutriates-----	47
14e. Total recoverable chemicals in bottom material-----	49
14f. Total recoverable insecticides and herbicides in bottom material-----	50
15a-15f. Skipanon and Columbia Rivers, Oreg., project:	
15a. Location of sampling sites-----	52
15b. Dissolved chemicals in native water and elutriates-----	53
15c. Additional dissolved chemicals in native water and elutriates-----	54
15d. Dissolved insecticides and herbicides in native water and elutriates-----	55
15e. Total recoverable chemicals in bottom material-----	57
15f. Total recoverable insecticides and herbicides in bottom material-----	58

TABLES--Continued

	Page
16a-16f. Astoria and Youngs Bay, Oreg., project:	
16a. Location of sampling sites-----	60
16b. Dissolved chemicals in native water and elutriates-----	61
16c. Additional dissolved chemicals in native water and elutriates-----	63
16d. Dissolved insecticides and herbicides in native water and elutriates-----	64
16e. Total recoverable chemicals in bottom material-----	66
16f. Total recoverable insecticides and herbicides in bottom material-----	67
17a-17f. Columbia River and Skamokawa Creek, Wash., project:	
17a. Location of sampling sites-----	69
17b. Dissolved chemicals in native water and elutriates-----	70
17c. Additional dissolved chemicals in native water and elutriates-----	72
17d. Dissolved insecticides and herbicides in native water and elutriates-----	73
17e. Total recoverable chemicals in bottom material-----	75
17f. Total recoverable insecticides and herbicides in bottom material-----	76
18a-18f. Clatskanie River, Oreg., project:	
18a. Location of sampling sites-----	78
18b. Dissolved chemicals in native water and elutriates-----	79
18c. Additional dissolved chemicals in native water and elutriates-----	80
18d. Dissolved insecticides and herbicides in native water and elutriates-----	81
18e. Total recoverable chemicals in bottom material-----	83
18f. Total recoverable insecticides and herbicides in bottom material-----	84
19a-19f. Columbia and Cowlitz Rivers, Wash., project:	
19a. Location of sampling sites-----	86
19b. Dissolved chemicals in native water and elutriates-----	87
19c. Additional dissolved chemicals in native water and elutriates-----	89
19d. Dissolved insecticides and herbicides in native water and elutriates-----	90
19e. Total recoverable chemicals in bottom material-----	92
19f. Total recoverable insecticides and herbicides in bottom material-----	93

TABLES--Continued

	Page
20a-20f. North and South Forks Toutle River, Wash., near retention structures project:	
20a. Location of sampling sites-----	95
20b. Dissolved chemicals in native water and elutriates-----	96
20c. Additional dissolved chemicals in native water and elutriates-----	97
20d. Dissolved insecticides and herbicides in native water and elutriates-----	98
20e. Total recoverable chemicals in bottom material-----	100
20f. Total recoverable insecticides and herbicides in bottom material-----	101
21a-21d. Lake River, Wash., project:	
21a. Location of sampling sites-----	103
21b. Dissolved chemicals in native water and elutriates-----	104
21c. Additional dissolved chemicals in native water and elutriates-----	105
21d. Dissolved insecticides and herbicides in native water and elutriates-----	106
22a-22e. Columbia River at the powerhouse under construction at Bonneville Dam, Wash., project:	
22a. Location of sampling sites-----	108
22b. Dissolved chemicals in native water and elutriates-----	109
22c. Dissolved insecticides and herbicides in native water and elutriates-----	110
22d. Total recoverable chemicals in bottom material-----	112
22e. Total recoverable insecticides and herbicides in bottom material-----	113
23a-23f. Tillamook Bay near Garibaldi, Oreg., project:	
23a. Location of sampling sites-----	115
23b. Dissolved chemicals in native water and elutriates-----	116
23c. Additional dissolved chemicals in native water and elutriates-----	117
23d. Dissolved insecticides and herbicides in native water and elutriates-----	118
23e. Total recoverable chemicals in bottom material-----	120
23f. Total recoverable insecticides and herbicides in bottom material-----	121

TABLES--Continued

	Page
24a-24f. Yaquina River, Oreg., project:	
24a. Location of sampling sites-----	123
24b. Dissolved chemicals in native water and elutriates-----	124
24c. Additional dissolved chemicals in native water and elutriates-----	126
24d. Dissolved insecticides and herbicides in native water and elutriates-----	127
24e. Total recoverable chemicals in bottom material-----	129
24f. Total recoverable insecticides and herbicides in bottom material-----	130
25a-25f. Umpqua River, Oreg., project:	
25a. Location of sampling sites-----	132
25b. Dissolved chemicals in native water and elutriates-----	133
25c. Additional dissolved chemicals in native water and elutriates-----	135
25d. Dissolved insecticides and herbicides in native water and elutriates-----	136
25e. Total recoverable chemicals in bottom material-----	138
25f. Total recoverable insecticides and herbicides in bottom material-----	139
26a-26f. Coos River, Oreg., project:	
26a. Location of sampling sites-----	141
26b. Dissolved chemicals in native water and elutriates-----	142
26c. Additional dissolved chemicals in native water and elutriates-----	143
26d. Dissolved insecticides and herbicides in native water and elutriates-----	144
26e. Total recoverable chemicals in bottom material-----	146
26f. Total recoverable insecticides and herbicides in bottom material-----	147

CONVERSION FACTORS

The following factors may be used to convert English units to the International System of Units (SI).

To convert from	To	Multiply by
inch (in.)	millimeter (mm)	25.40
foot (ft)	meter (m)	0.3048
mile (mi)	kilometer (km)	1.609
square foot (ft ²)	square meter (m ²)	0.09290
cubic foot (ft ³)	cubic meter (m ³)	0.02832
quart (qt)	liter (L)	0.9464
gallon (gal)	liter (L)	3.785
pound (lb)	kilogram (kg)	0.4536
degree Fahrenheit (°F)	degree Celsius (°C)	<u>1/</u>

$$\underline{1/} \text{ Temp } ^\circ\text{C} = (\text{temp } ^\circ\text{F} - 32) / 1.8$$

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ABSTRACT

The U.S. Geological Survey, in cooperation with the U.S. Army Corps of Engineers, collected native water and bottom-material samples and processed elutriate samples between May and December 1980. The primary purpose of the study was to provide reconnaissance data to determine short-term water-quality conditions associated with dredging operations in rivers and estuaries. The data were collected from selected rivers and estuaries as far south as the Coos River in western Oregon, as far north as Baker Bay in southwestern Washington, and as far inland as Bonneville Dam on the Columbia River.

In an elutriation test, bottom material from a dredging site is mixed with native water and the filtrate is analyzed. Results of chemical analyses of elutriates, native water, and bottom material for selected metals, nutrients, and organic compounds are presented. Elutriate-test results showed variability in concentrations of dissolved chemicals as follows: in micrograms per liter ($\mu\text{g/L}$), manganese ranged from 0 to 10,000, iron from 10 to 4,300, zinc from 1 to 90, and phenols from 0 to 420; in milligrams per liter (mg/L), ammonia as nitrogen ranged from 0.03 to 46 and organic carbon from 0.5 to 46.

INTRODUCTION

The U.S. Geological Survey, in cooperation with the U.S. Army Corps of Engineers, participated in an elutriation study from May to December 1980. Elutriation is the process by which bottom materials from a dredged site are mixed with native water (water collected from either the dredging or disposal site) and the filtrate is analyzed. The elutriate test is designed to indicate the various processes that occur when bottom materials are dredged and transported as a mixture of bottom materials and water.

The purpose of this report is to describe field and laboratory procedures and to present reconnaissance data on elutriates, native water, and bottom material. Data were collected for selected rivers and estuaries as far south as the Coos River in western Oregon, as far north as Baker Bay in southwestern Washington, and as far inland as Bonneville Dam on the Columbia River. Elutriation data for the Columbia and Cowlitz Rivers prior to and after the May 18, 1980, eruption of Mount St. Helens are also included.

Samples of water and bottom material were collected by the Corps of Engineers and the Geological Survey. River and ocean waters, elutriates, and bottom-material samples were processed for chemical analysis by the Geological Survey in Portland, Oreg., and sent to the Geological Survey Central Laboratory in Arvada, Colo. Selected elutriate constituents were analyzed by the Corps of Engineers Northwest Division Materials Laboratory in Troutdale, Oreg. Sampling sites were selected by the Corps of Engineers and were designated as either dredging or disposal sites. Both established and newly defined disposal sites were sampled. For this study, native water was collected from either dredging or disposal sites. Table 1 and figure 1 show the locations of the 15 Oregon and Washington project areas.

Table 1.--Names and site designations of the 15 project areas in Oregon and Washington

Site design- nation	Project name
A	Baker Bay, Wash.
B	Chinook, Wash., and Area D, Oreg.
C	Tansy Point, Oreg.
D	Skipanon and Columbia Rivers, Oreg.
E	Astoria and Youngs Bay, Oreg.
F	Skamokawa Creek, Wash.
G	Clatskanie River, Oreg.
H	Cowlitz River, Wash.
I	North and South Fork Toutle Rivers, Wash.
J	Lake River, Wash.
K	Bonneville Dam, Wash.
L	Garibaldi, Oreg.
M	Yaquina River, Oreg.
N	Umpqua River, Oreg.
O	Coos Bay, Oreg.

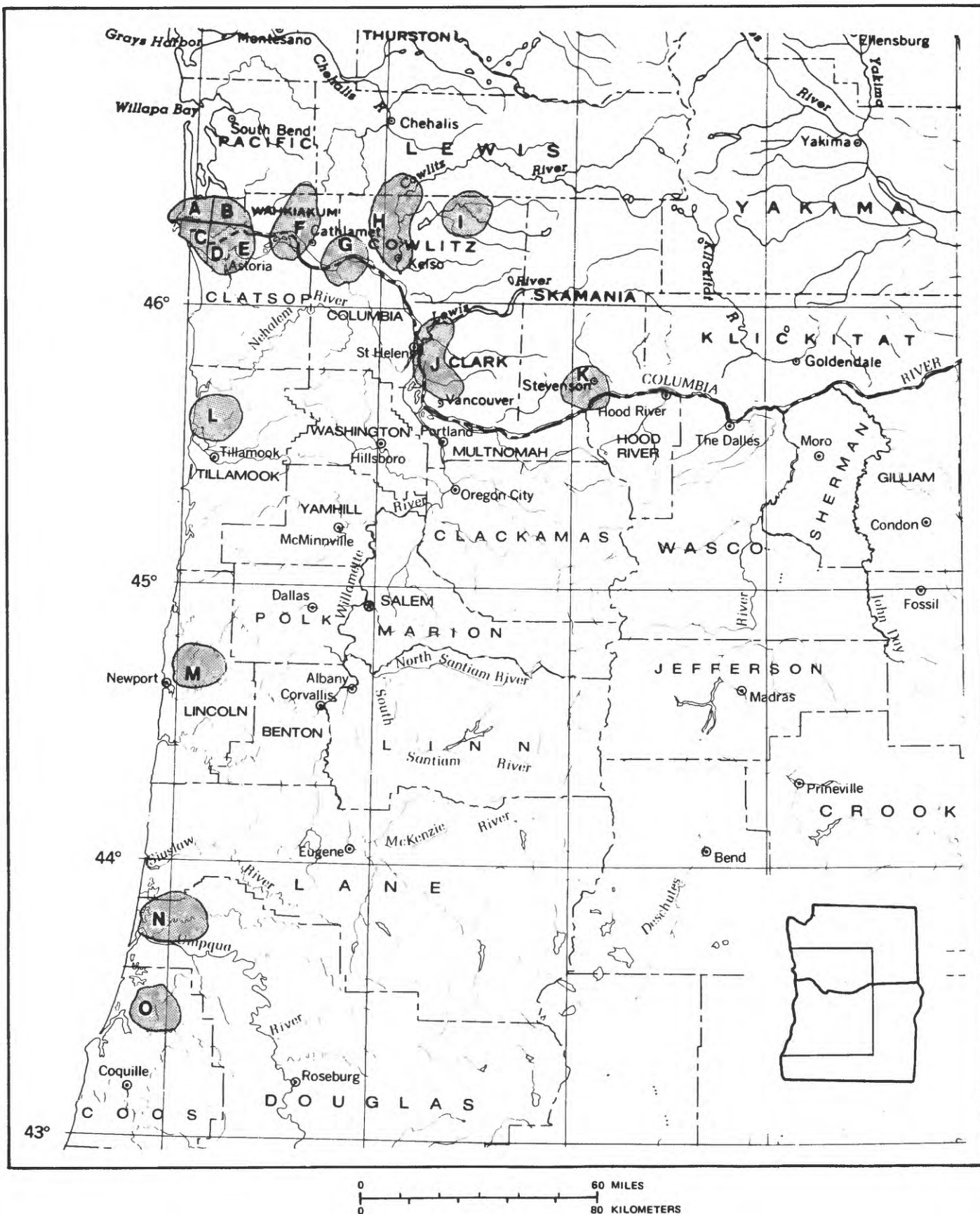


Figure 1. – Map showing locations of the 15 Oregon and Washington project areas.

APPROACH AND METHODOLOGY

As defined by the U.S. Environmental Protection Agency/Corps of Engineers Technical Committee on Criteria for Dredged and Fill Material (Plumb, 1981), "The elutriate test is a simplified simulation of the dredging and disposal process wherein predetermined amounts of dredging site water and sediment are mixed together to approximate a dredged-material slurry. The elutriate is the supernatant resulting from the vigorous 30-min shaking of one part sediment from the dredging site with four parts water (vol/vol) collected from the dredging site followed by 1-hour settling time and appropriate centrifugation and 0.45 μ m filtration."

For proper interpretation of the elutriation-test results the following items should be considered (Lee and Plumb, 1974):

1. Increase or decrease in chemical concentrations as a result of suspending bottom material from a dredging site with native water from a dredging or disposal site.
2. Background chemical concentrations of disposal-site water as compared to chemical concentrations of the elutriate. Where chemical concentrations exceed 1.5 times the background disposal-site concentrations, special conditions apply to disposal of dredged material. The 1.5 factor does not necessarily represent an increase in chemical concentration that would be harmful to the environment; rather, it indicates that chemical release could occur and that consideration of its impact on the environment is advisable.
3. Factors affecting the elutriation test include (a) solid-to-liquid ratio; (b) length of time bottom material is in contact with native water; (c) pH and dissolved-oxygen changes during the mixing process; (d) method and duration of the mixing process; and (e) atmospheric exposure of bottom material prior to the elutriate test, allowing premature redox reactions to occur.
4. The elutriation test is designed to detect potential water-column problems, but does not indicate toxicity to benthic organisms.

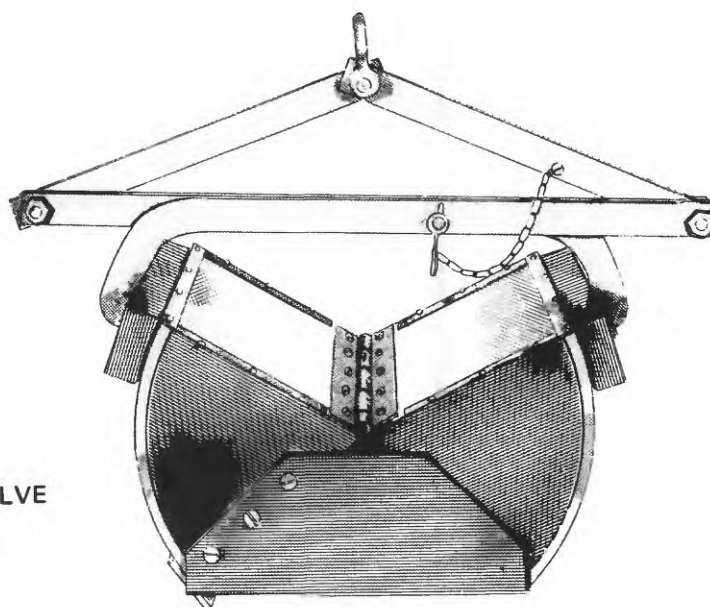
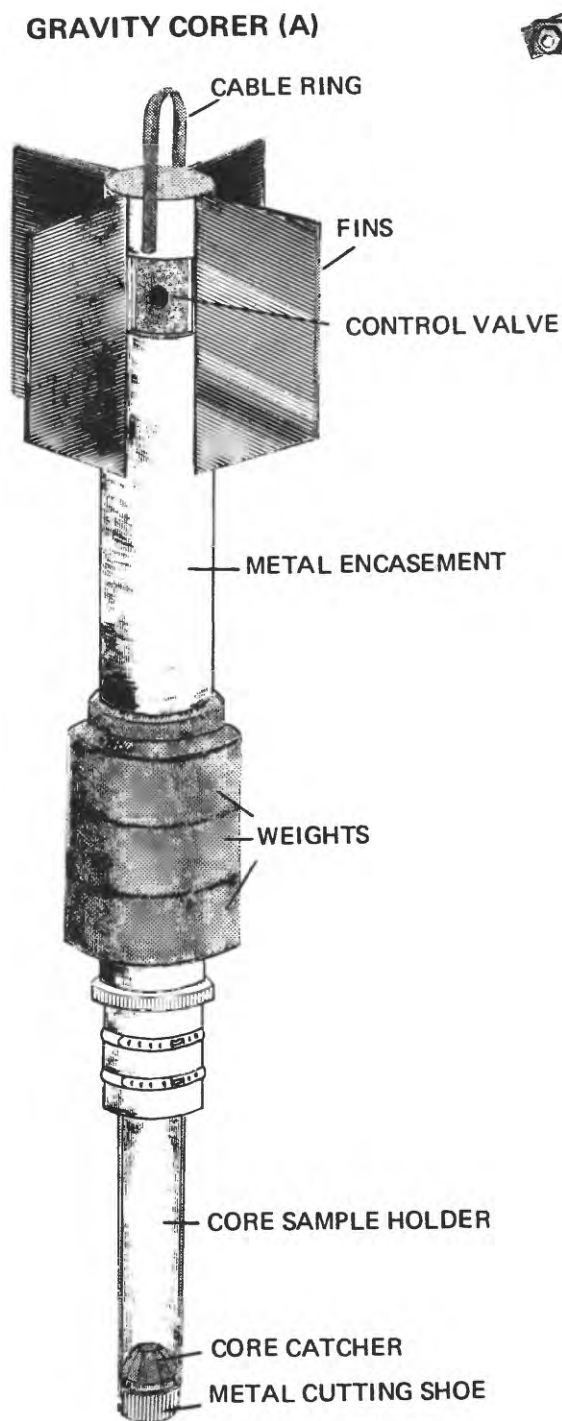
According to M. O. Fretwell (U.S. Geological Survey, written commun., 1981), the following is also important in the interpretation of elutriation-test results: Knowledge that bottom-material analysis (as determined in this study) is a soft-digestion procedure for determining total recoverable chemical constituents and is an attempt to simulate bioavailability. Soft digestion involves two steps: (1) preliminary destruction and removal of all organic matter using a 30-percent hydrogen peroxide solution; and (2) dissolution of all sorbed metals and other minor elements, using a 0.3 molar hot hydrochloric acid solution. This method involves dissolution of all readily available acid-soluble bottom-material components without appreciably attacking the internal matrix of the sediment. The soft-digestion process accounts for only readily soluble chemical constituents.

Data and other information for each project include (1) a map showing the sampling-site locations (figs. 7-21); (2) a table listing site names, sampling dates, and locations by latitude and longitude (tables 12a through 26a); and (3) tables listing results of chemical analyses, including metals, nutrients, organic compounds, and sample code (tables 12b-f through 26b-f). Sample code is used to identify native water and elutriation samples under a classification scheme of marine, estuarine, euryhaline, and fresh, with salinity and specific conductance boundaries indicated in figure 6. For purposes of this report marine samples are considered as estuarine.

Retrieval of chemical data by either USGS's WATSTORE (a Water Data STorage and Retrieval System) or EPA's STORET (STorage and RETrieval System) can be made by using a 15-digit station identification number consisting of latitude and longitude, followed by a 2-digit sequence number. The sequence number indicates the type of chemical data to be retrieved from a particular latitude and longitude. The sequence numbers are as follows: 00 for elutriates with river water, 01 for elutriates with ocean water, 02 for bottom material, and 05 for native (river and ocean) water.

FIELD PROCEDURES

Bottom material was collected in several ways, using equipment appropriate for sampling conditions. Two sampling devices, the gravity corer and the Ponar grab sampler (fig. 2A-B), were operated with a boom winch, and a third, the Ellard sampler (fig. 2C), was attached to and pulled behind the sampling boat. Under ideal current and weather conditions, the 220-pound gravity corer was used. The depth of sediment penetration that the gravity corer was able to attain ranged from 0.5 to 5.0 ft. Sediment penetration was dependent on three factors: (1) fall velocity on impact, (2) compaction of bottom material, and (3) bottom-material grain size. The Ponar grab sampler, designed to remove a 0.5-square-foot surface sample, was used when conditions did not permit use of the gravity corer. The Ellard sampler was used during periods of violent wave action, when the other samplers could not be used. The Ellard sampler is a stainless-steel cylindrical vessel closed at one end, and is designed to collect a 0.25-cubic-foot surface sample when pulled by the sampling boat.



PONAR GRAB SAMPLER (B)

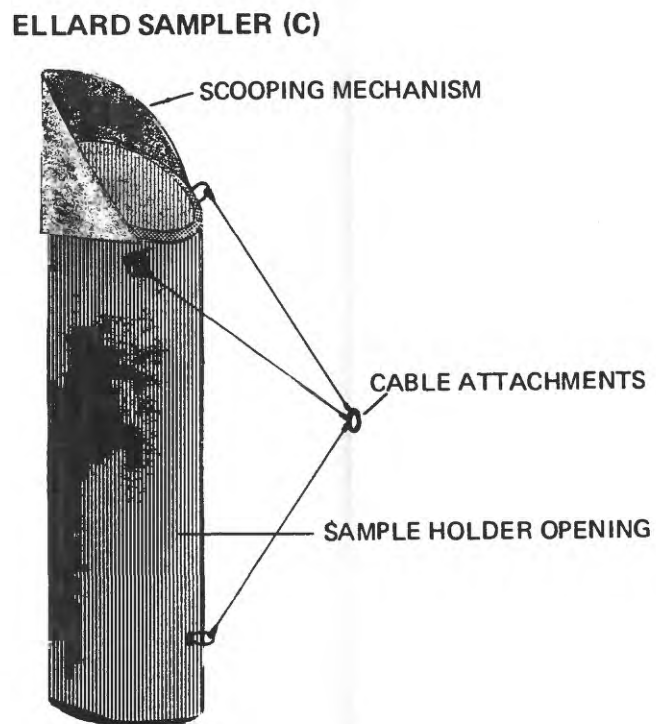


Figure 2. — Sampling equipment utilized for collection of bottom materials. (A), Gravity Corer Assembly; (B), Ponar Grab Sampler; (C), Ellard Sampler. (Adapted from U.S. Army Corps of Engineers, 1980b.)

Bottom samples collected using the gravity corer were automatically encased in clean (prerinsed with acid and distilled water), removable transparent butyrate-acetate cylinders (2-5/8 in. diameter by 24 in. length). Volume of sample collected at a single sampling point was dependent on the number of analyses desired. Minimum sample volume required filling approximately half the plastic cylinder. Sand-sized materials were difficult to collect using the gravity corer and therefore required multiple samplings.

Samples collected with the Ellard sampler were scooped by hand into the same type of plastic cylinder as used by the gravity corer. Protective gloves were used to prevent sample contamination. When using the Ponar grab sampler, the material was scooped by hand into a clean, acid-rinsed stainless-steel pan and then transferred to a cylinder of the same type as used by the gravity corer. The samples were iced in the field and refrigerated at 4°C in the Geological Survey laboratory until the elutriation test was made. The time between sample collection and running the elutriation test was generally 1 to 2 weeks.

Native-water samples were collected using a 4-liter Van Dorn water sampler and placed into 5-gallon collapsible polyethylene containers rinsed with 10-percent hydrochloric acid and distilled water. Native water was a mixture of water collected from three points in the water column: (1) near the surface, (2) at mid-depth, and (3) near the bottom. Native-water samples were iced in the field and refrigerated at 4°C in the Geological Survey laboratory until processed.

LABORATORY PROCEDURES

Native-water and elutriate samples were analyzed for selected dissolved constituents; bottom-material samples were analyzed for selected total recoverable constituents. The elutriation process involved a 30-minute continuous mixing of bottom material with native water (volumetric sediment-to-water ratio of 1:4) in a 5-gallon glass carboy. The elutriate mixture was agitated with a mechanical mixer attached to a stainless-steel shaft and propellor (fig. 3). The rotational speed of the mechanical mixer was set to between 750 and 7,500 r/min (revolutions per minute), depending on the volume of elutriate material being mixed.

Upon completion of mixing, the resultant mixture was allowed to remain quiescent for 1 hour, after which time the supernatant was withdrawn and filtered for analysis of dissolved constituents. For most elutriate samples, a 1-hour quiescent time produced a mixture that could be filtered immediately. About 10 percent of the samples required filtering times ranging from 2 to 5 hours (as compared to about 15 minutes for the other samples), making filtration difficult and time consuming. In most cases, centrifugation (at 1,000 r/min) of these turbid samples resulted in negligible separation.

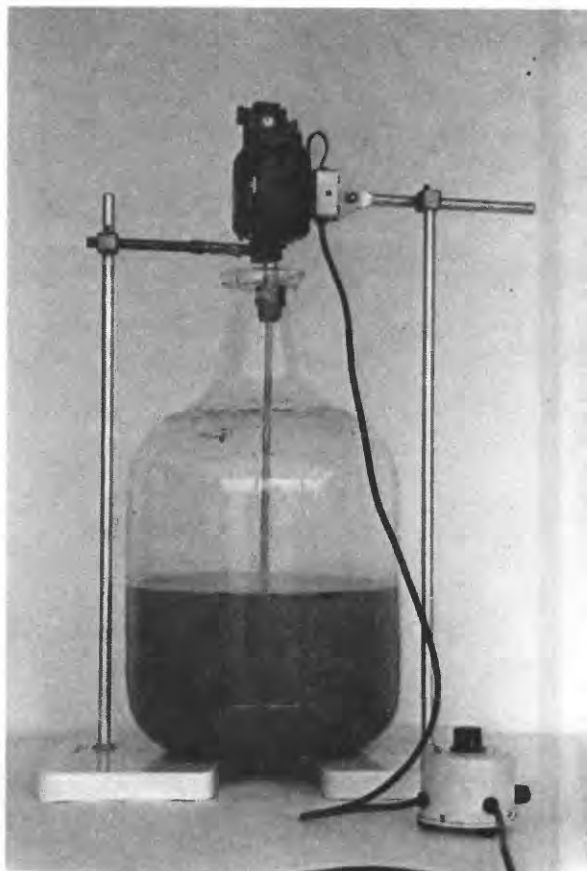


Figure 3. — Elutriation sample prior to mixing.

A peristaltic pump, connected with silicone tubing to a hollow J-shaped glass tube (11 in. long by 3/16 in. inner diameter), was used to withdraw the unfiltered elutriate sample. The J-shaped end of the glass tube was submerged in the elutriate sample; the supernatant was then withdrawn, allowing for minimal resuspension of the settled materials.

Two filtration methods were used for processing the dissolved constituents:

1. The inorganic dissolved constituents (trace metals, nutrients, cyanide, and major ions) were filtered through a 0.45- μ m pore-size filter (low water extractable and consisting of mixed cellulose acetate and cellulose nitrate) contained in a tripod or cassette filter-type holder (fig. 4). The two filter holders differ in the number of filters that can be loaded into each unit. The tripod unit contains a single 0.17-square-foot filter, and the cassette unit contains a variable number of filters resulting in a filter area ranging from 0.5 to 50 ft. If after the 1-hour quiescent period, the elutriate supernatant appeared to be less turbid, the tripod unit was used; if the same degree of turbidity remained, the cassette unit was used.
2. The dissolved organic constituents (organic carbon, phenols, insecticides, and herbicides) were passed through a fiberglass filter having a nominal pore-size of 10 μ m. These filters were pretreated by rinsing with pesticide-free grade hexane, air dried, and stored in aluminum foil after being baked in an oven at 350^o F overnight. The fiberglass filter was supported by Teflon screens set in a stainless-steel tripod assembly (fig. 5). The filter assembly was attached to a 5-liter stainless-steel tank containing the unfiltered elutriate. Pressurized nitrogen gas ("water-pumped" grade) was used to supply the external pressure necessary to force the unfiltered elutriate out of the 5-liter tank through the Teflon tubing into the filter assembly.

Representative subsamples of bottom materials, which were analyzed for total recoverable constituents, were removed from the plastic cylinders and placed into a quart-size glass container that had been baked overnight at 350^o F. Samples were refrigerated at 4^o C until shipped in ice to the Geological Survey Central Laboratory in Arvada, Colo., for chemical analysis.

All native-water, elutriate, and bottom-material samples were analyzed as follows:

1. Dissolved trace metals, nitrogen, major ions, and all total recoverable constituents were analyzed by the Geological Survey, using methods described by Skougstad and others (1979).

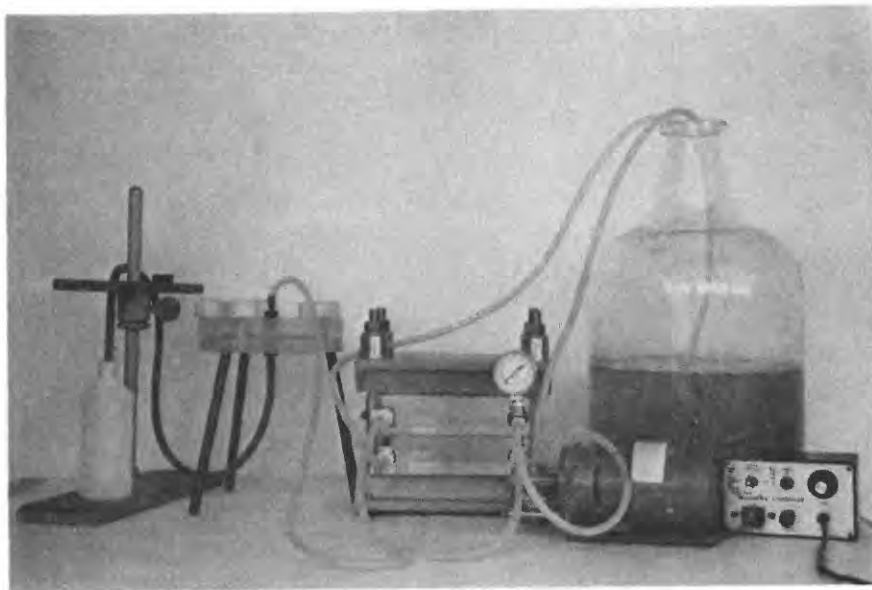


Figure 4. — Tripod and cassette filtration units used for filtering dissolved inorganic constituents.

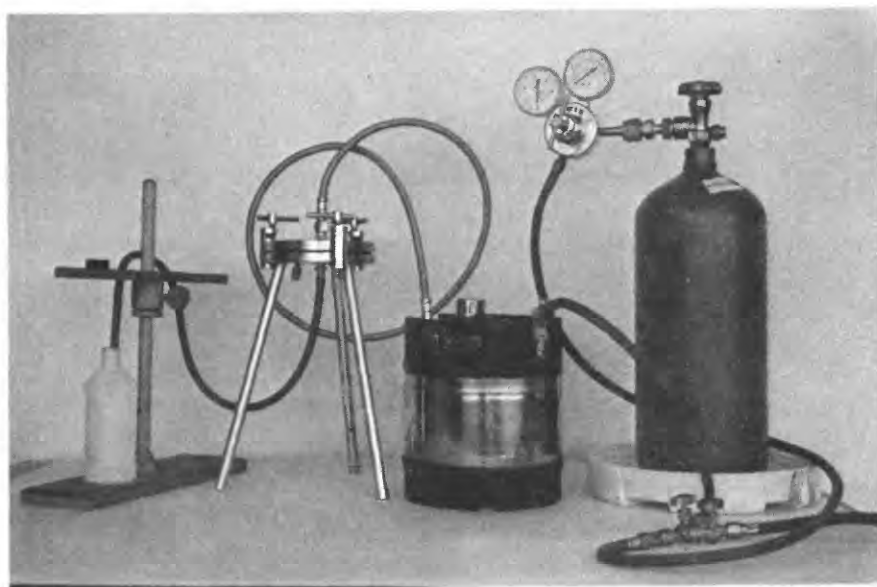


Figure 5. — Pressurized stainless steel filtration used for filtering dissolved organic constituents.

2. Dissolved cyanide, phosphorus, orthophosphate, and phenols were analyzed by the Corps of Engineers, using methods described in "Standard Methods for the Examination of Water and Wastewater" (American Public Health Association and others, 1975).
3. Dissolved organics, including insecticides and herbicides, were analyzed by the Geological Survey, using methods described by Goerlitz and Brown (1972).

Immediately following filtration of selected samples, specific conductance and pH were measured at the Geological Survey Portland laboratory, using methods described by Skougstad and others (1979).

SUMMARY OF RESULTS

Elutriate-test results showed variability in concentrations of dissolved chemicals as follows: in micrograms per liter ($\mu\text{g/L}$), manganese ranged from 0 to 10,000, iron from 10 to 4,300, zinc from 1 to 90, and phenols from 0 to 420; in milligrams per liter (mg/L), ammonia as nitrogen ranged from 0.03 to 46 and organic carbon from 0.5 to 46.

QUALITY-ASSURANCE PROGRAM

An essential part of this data-collection and analysis involved establishing a quality-assurance program. The quality-assurance data can aid in evaluating the accuracy and precision of native water and elutriation analyses for varying chemical concentrations. The two cooperating laboratories in the quality-assurance program were the U.S. Geological Survey Central Laboratory in Arvada, Colo., and the U.S. Army Corps of Engineers Northwest Division Materials Laboratory in Troutdale, Oreg. All chemical analyses listed in tables 2-11 were made using methods referenced in the section titled "Laboratory Procedures." Lower detection limits for constituents determined in the study that are not covered in this section are shown by the figure following the less-than sign (<) in the data tables. The following example shows mercury, which in some instances is reported as $<0.1 \mu\text{g/L}$; reporting with a less-than sign indicates a laboratory detection level to the nearest $0.1 \mu\text{g/L}$.

Three types of samples were used for the quality-assurance program, as follows:

1. Blind samples - Samples having known chemical concentrations were used to determine accuracy of analyses.
2. Standard addition samples - Standard solutions having known chemical concentrations were added to native-water samples and were used to determine that no interference exists that would affect the analytical results for the constituents of concern.
3. Replicate samples - Two separate samples having identical chemical concentrations were used to determine precision of analyses.

The Oregon District of the U.S. Geological Survey received standard solutions provided by the U.S. Environmental Protection Agency (EPA) and Environmental Resource Associates (ERA). These standard solutions, having concentrations ranging from below detection limits to alert limits, were obtained for trace metals, cyanide, and phenols. Quality assurance samples were submitted to the cooperating laboratories with routine elutriation samples.

Table 2 lists the detection limits of chemical analyses, the range of concentrations for which there are precision data available (analytical concentration range), and relative deviation of the analytical concentration range including number of participating laboratories and mean chemical concentrations. Data presented in table 2 should only be used as a guide to indicate the variability in precision and should be consulted prior to any interpretation of the data. Precision values for dissolved trace metals and nitrogen are the result of multiple-laboratory analyses of natural waters. Precision values for these constituents within any one laboratory could be expected to be better than between multiple laboratories. Precision values represent the relative standard deviation (coefficient of variation) for a particular set of determinations, where each value corresponds to a low, medium, or high analytical concentration range.

In reporting results of laboratory analyses for blind samples, standard addition samples, and replicate samples (tables 4 through 11), precision values were not shown. In many cases, use of precision values can infer the degree of confidence which may be derived from a given analytical method. It is essential that precision values be used when evaluating laboratory results of quality control standards and standard solution concentrations. The following example shows the application of precision values (table 2) in the analysis of standard solution concentration-C for lead: In table 4, the laboratory reported a lead concentration of 4 $\mu\text{g/L}$; however, table 2 indicates a precision level of +38 percent, resulting in a range of 2.0 to 6.0 $\mu\text{g/L}$.

Analyses of distilled deionized water (used for dilution of EPA and ERA standard solution concentrations) are subject to the detection limits and precision levels shown in table 2. Requests for rerun analyses of quality-assurance samples were selected based on comparing the laboratory value to the corresponding known concentration. Reruns were not requested for analyses of distilled water because the laboratory values reported were reasonable.

Table 3 shows initial EPA standard solution concentrations and U.S. Geological Survey Laboratory analyses of DDDW (distilled deionized dilution water). Results of laboratory analyses preceded by the symbol "<" indicate that if the constituent is present in the sample, it exists below the detection limit shown in table 2. These data are required to calculate SC (standard concentrates); the term standard concentrate is the concentration resulting from the mixing of DDDW or native dilution water with EPA or ERA standard solution concentrations. In many instances, SC's are reported as a range; the range results from the reporting of a dilution water analyses as "<". In instances when DDDW or native dilution water are reported as "<" the detection limit, the minimum SC value of the range results from assuming a contribution of 0 $\mu\text{g/L}$ to the SC; the maximum SC value of the range results from assuming a contribution equal to the detection limit (table 2).

Blind Samples

Tables 4, 5, and 6 show analytical results of solutions having known chemical concentrations. Table 4 shows chemical determinations of selected dissolved trace metals made by the U.S. Geological Survey Laboratory; tables 5 and 6 show analytical analyses of cyanide and phenols, respectively, made by the U.S. Army Corps of Engineers Northwest Division Materials Laboratory.

The standard concentrates shown in table 4 are dilutions of the EPA standard solution concentrations shown in table 3 using distilled deionized dilution water:

1. SC-B, SC-C, and SC-D are all 1:100 dilutions of EPA standard solution concentrations B, C, and D, respectively (see table 3).
2. SC-A is a 1:100 dilution of SC-D.

Standard Addition Samples

Standard addition samples were submitted to determine if interfering substances exist in filtered native water, affecting the analytical results. Tables 7 and 8 show analytical results of adding one part EPA standard solution concentrations to 100 parts of filtered native water. Determinations for selected dissolved trace metals were made by the U.S. Geological Survey Laboratory.

Replicate Samples

Duplicate samples were split at the Portland Laboratory and sent to appropriate laboratories to determine precision of the various determinations. Tables 9, 10, and 11 show analyses of duplicate samples analyzed by the cooperating laboratories. Duplicate samples of ocean, river, and elutriate water were analyzed for selected dissolved trace metals and nitrogen by the U. S. Geological Survey Laboratory and for cyanide, orthophosphate, phenols, and total phosphorus by the U. S. Army Corps of Engineers Laboratory. In general, these splits verified the multiple laboratory precision data shown in table 2.

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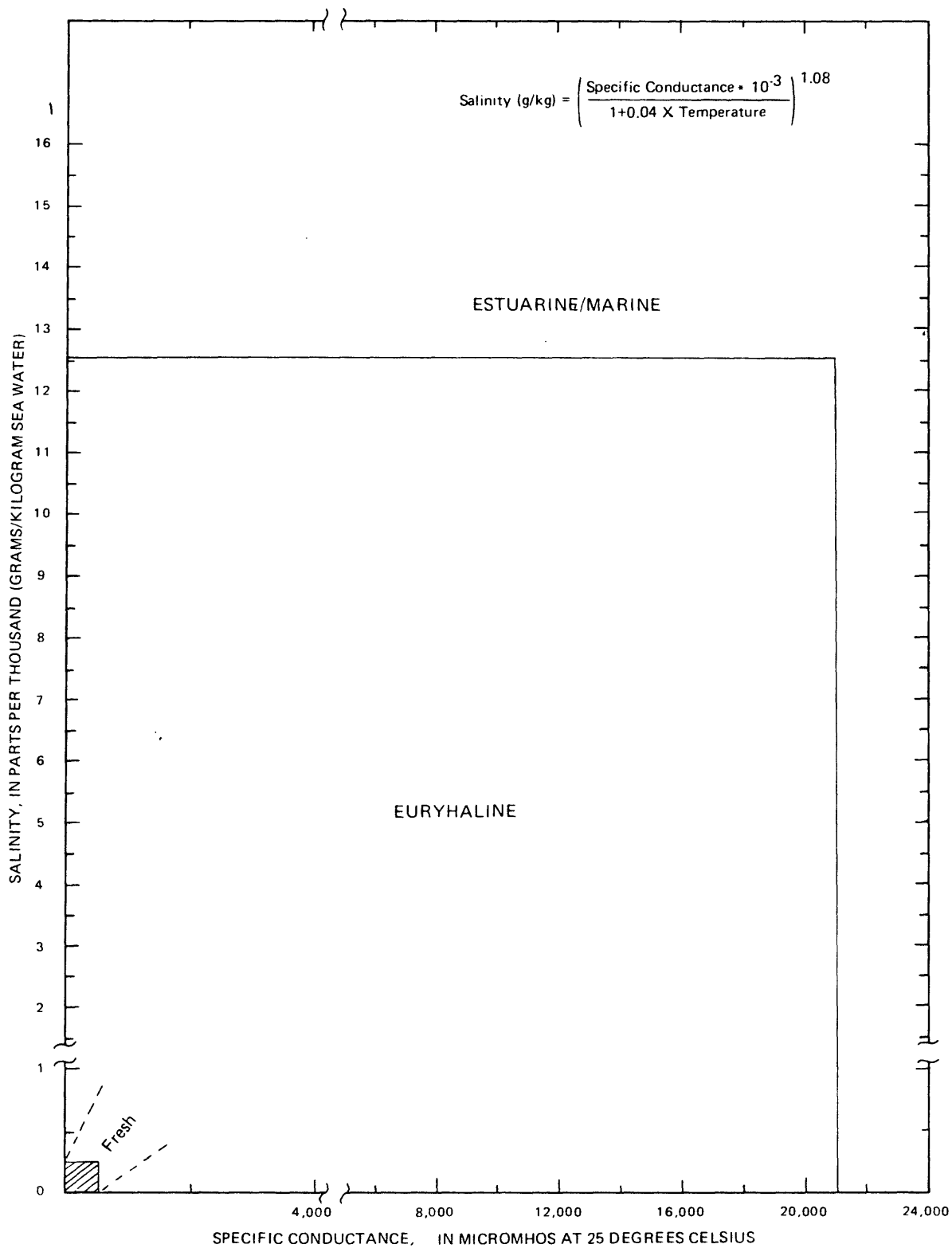


Figure 6. – Graph showing salinity and conductance ranges for marine, estuarine, euryhaline, and fresh classifications.

Table 2.--Detection limits of chemical analyses and precision data expressed in terms of relative deviation for low, medium, and high analytical concentration ranges

[All concentrations are in the dissolved state and are reported in units of micrograms per liter, except where indicated. NA=data not available]

Chemicals	Detection limit	Analytical ^{1/} concentration range	Relative deviation for the following analytical concentration ranges								
			low			medium			high		
			number of labs	mean concentration (percent)	relative standard deviation (percent)	number of labs	mean concentration (percent)	relative standard deviation (percent)	number of labs	mean concentration (percent)	relative standard deviation (percent)
U. S. Geological Survey Laboratory ^{2/}											
Arsenic	1	N.A.	1	5.0	10	1	10.4	10	1	13.8	4
Barium	100	100-800	16	162	38	N.A.	N.A.	N.A.	10	800	16
Beryllium	10	10-60	N.A.	N.A.	N.A.	4	27	19	5	38	12
Cadmium	1 ^{2/}	2-16	6	2.5	2.2	6	10.2	17	N.A.	N.A.	N.A.
Chromium	1	8-25	3	8	25	N.A.	N.A.	N.A.	12	23	82
Copper	1	N.A.	5	25	23	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Iron	10	80-1000	17	100	31	13	445	49	N.A.	N.A.	N.A.
Lead	1	4-50	7	4	38	N.A.	N.A.	N.A.	7	45.6	10
Manganese	10	40-300	23	70	20	N.A.	N.A.	N.A.	34	256	9
Mercury	.1	N.A.	1	.72	11	1	2.17	5	1	7.51	4
Nickel	1 ^{3/}	3-25	8	5.9	37	4	12.2	31	13	23.2	23
Zinc	10 ^{2/}	35-450	35	41	35	23	253	14	27	437	7
Nitrogen, NH ₄ as N	.01	N.A.	2	.22	17	2	1.53	6	N.A.	N.A.	N.A.
Nitrogen, NH ₄ + organic as N	.1	N.A.	2	0.38	18	2	3.32	6	N.A.	N.A.	N.A.
U. S. Army Corps of Engineers Laboratory ^{4/}											
Cyanide ^{5/}	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Ortho-phosphate as P	10	10-6000	3	100	9.1	3	600	4.0	3	7000	5.2
Total phosphorus as P ^{6/}	10	10-6000	3	100	9.1	3	600	4.0	3	7000	5.2
Phenols ^{6/}	1	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

^{1/} The analytical concentration range represents the range of chemical concentrations on which precision data has been determined.

^{2/} Skougstad and others (1979).

^{3/} The detection limits for zinc and cadmium are .2 and .01 respectively, where specific conductance is <20000 umhos.

^{4/} Standard methods (1976).

^{5/} Overall precision for cyanide/colorimetric method used in this study (.5-4 µg/L cyanide) range from 0.09 to 0.49 µg/L cyanide.

^{6/} Precision data for phenols are not available; phenol values are based on C₆H₅OH, and can be regarded only as an approximation representing the minimum phenol concentration.

Table 3.--Chemical determinations of trace metals in distilled-deionized dilution water and initial concentrations of U. S. Environmental Protection Agency standard solution concentrations

[All concentrations are reported in units of micrograms per liter]

Chemicals	Distilled deionized dilution water	EPA Standard Solution Concentrations B	C	D
Arsenic	<1	2.6×10^3	1.09×10^4	1.54×10^4
Beryllium	<10	1.6×10^3	7.8×10^3	3.98×10^4
Cadmium	<1	5.2×10^2	2.3×10^3	7.3×10^3
Chromium	2	1.6×10^3	1.54×10^4	2.09×10^4
Copper	<1	1.6×10^3	7.2×10^3	1.02×10^4
Iron	<10	2.6×10^3	4.17×10^4	6.78×10^4
Lead	<1	2.2×10^3	2.98×10^3	3.52×10^4
Manganese	<10	2.6×10^3	4.5×10^3	3.97×10^4
Mercury	<.1	8.0×10^1	4.5×10^2	9.4×10^2
Zinc	<10	1.1×10^3	3.0×10^3	1.74×10^4

^{1/} Analysis by the U. S. Geological Survey Laboratory.

Table 5.--Chemical determinations of dissolved cyanide in standard concentrates by the U. S. Army Corps of Engineers (COE) Northwest Division Materials Laboratory

[Units are micrograms per liter]

Standard concentrates of cyanide	Corps of Engineers laboratory
3.6	2
7.1	5
14.2	10

Table 6.--Chemical determinations of dissolved phenol in standard concentrates by the U. S. Army Corps of Engineers Northwest Division Materials Laboratory

[Units are micrograms per liter]

Standard concentrates of phenols	Corps of Engineers laboratory
0	<1 ^{1/}
28	37
112	110
280	230

^{1/} Analyses of distilled-deionized dilution water for phenols were made by the U. S. Army Corps of Engineers Northwest Division Materials Laboratory.

Table 7.--Chemical determinations of trace metals in standard concentrates diluted with filtered ocean water

[Units are micrograms per liter; * =chemical contribution of filtered ocean water exceeds 20 percent of standard concentrate; sample site and date=site no. 1, table 24]

Chemicals	Native ocean ^{1/} water	EPA standard solution concentrations	Standard concentrate	USGS laboratory results ^{1/}
Arsenic	1	2.2×10^3	23	26
Barium	<100 ^{1/}	1.42×10^4	*142-242	200
Cadmium	1	2.9×10^2	*4	6
Lead	2	2.2×10^3	24	26
Mercury	<.1	1.4×10^2	1.4-1.5	1.5

^{1/} The original ocean water analysis for barium was deleted by the Central Laboratory, the value used in this table was derived from two ocean water analysis of similar location and date.

Table 8.--Chemical determinations of trace metals in standard concentrates diluted with filtered river water

[Units are micrograms per liter; sample site and date=site no. 14, table 24]

Chemicals	Native river water	EPA standard solution concentrations	standard concentrate	USGS laboratory results ^{1/}
Arsenic	<1	2.2×10^3	22-23	26
Barium	<100	1.42×10^4	142-242	300
Cadmium	0.11 ^{1/}	2.9×10^2	3.1	4.5 ^{1/}
Lead	<1	2.2×10^3	22-23	22
Mercury	<.1	1.4×10^2	1.4-1.5	1.3

^{1/} A more sensitive method of analysis was used as indicated in table 2.

Table 9.--Chemical determinations of duplicate ocean water samples for dissolved metals, nutrients, and phenols made by the U. S. Geological Survey Laboratory and the U. S. Corps of Engineers Northwest Division Materials Laboratory

[Units are micrograms per liter except as indicated; -- = analysis not made; DD= determination deleted; ND=analyzed for and not detected; sample site and data=site no. 1, table 24]

Chemicals	U.S.G.S. laboratory results		C.O.E. laboratory results	
Carbon, total organic ^{1/}	5.0(mg/L)	6.4(mg/L)	--	--
Chromium	DD	DD	--	--
Copper	6	2	--	--
Iron	120	100	--	--
Manganese	30	30	--	--
Nickel	3	<1	--	--
Zinc	11 ^{2/}	24 ^{2/}	--	--
Nitrogen, NH ₄ as N	.15	.10	--	--
Nitrogen, NH ₄ + organic	.5	.4	--	--
Phenols	--	--	ND	ND
Cyanide	--	--	1	1
Ortho-phosphate	--	--	20(mg/L)	10(mg/L)
Total phosphorus	--	--	30(mg/L)	30(mg/L)

^{1/} Analyses of total organic carbon were made on sample passed through a fiberglass filter having a nominal pore-size of 10 um.

^{2/} A more sensitive method of analysis was used as indicated in table 2.

Table 10.--Chemical determinations of duplicate river water samples for dissolved metals, nutrients, and phenols made by the U. S. Geological Survey Laboratory and the U. S. Army Corps of Engineers Northwest Division Materials Laboratory

[Units are micrograms per liter except as indicated; -- =analysis not made; DD= determination deleted; ND=analyzed for and not detected; sample site and data=site no. 14, table 24]

Chemicals	U.S.G.S. laboratory		C.O.E. laboratory	
	results		results	
Carbon, total organic ^{1/}	2.2	4.5	--	--
Chromium	DD	DD	--	--
Copper	1	3	--	--
Iron	40	20	--	--
Manganese	20	20	--	--
Nickel	6	2	--	--
Zinc	5.8 ^{2/}	3.3 ^{2/}	--	--
Nitrogen, NH ₄ as N	.18	.06	--	--
Nitrogen, NH ₄ + organic	.5	.5	--	--
Phenols	--	--	ND	ND
Cyanide	--	--	1	1
Ortho-phosphate	--	--	30	20
Total phosphorus	--	--	50	30

^{1/} Analyses of total organic carbon were made on sample passed through a fiberglass filter having a nominal pore-size of 10 um.

^{2/} A more sensitive method of analysis was used as indicated in table 2.

Table 11.--Chemical determinations of duplicate elutriate water samples for dissolved metals, nutrients, and phenols made by the U. S. Geological Survey Laboratory and the U. S. Army Corps of Engineers Northwest Division Materials Laboratory

[Units are micrograms per liter except as indicated; -- =analysis not made; DD= determination deleted; ND=analyzed for and not detected; sample site and data=site no. 13, table 24]

Chemicals	U.S.G.S. laboratory results		C.O.E. laboratory results	
Carbon, total organic ^{1/}	1.9	1.8	--	--
Cadmium	.21 ^{2/}	.19 ^{2/}	--	--
Chromium	<1	<1	--	--
Copper	2	<1	--	--
Iron	100	110	--	--
Lead	<1	<1	--	--
Manganese	3400	3400	--	--
Mercury	<.1	<.1	--	--
Zinc	2.8 ^{2/}	2.1 ^{2/}	--	--
Nitrogen, NH ₄ as N	.83	.85	--	--
Ortho-phosphate	--	--	30	20
Phenol	--	--	ND	ND

^{1/} Analyses of total organic carbon were made on sample passed through a fiberglass filter having a nominal pore-size of 10 um.

^{2/} A more sensitive method of analysis was used as indicated in table 2.

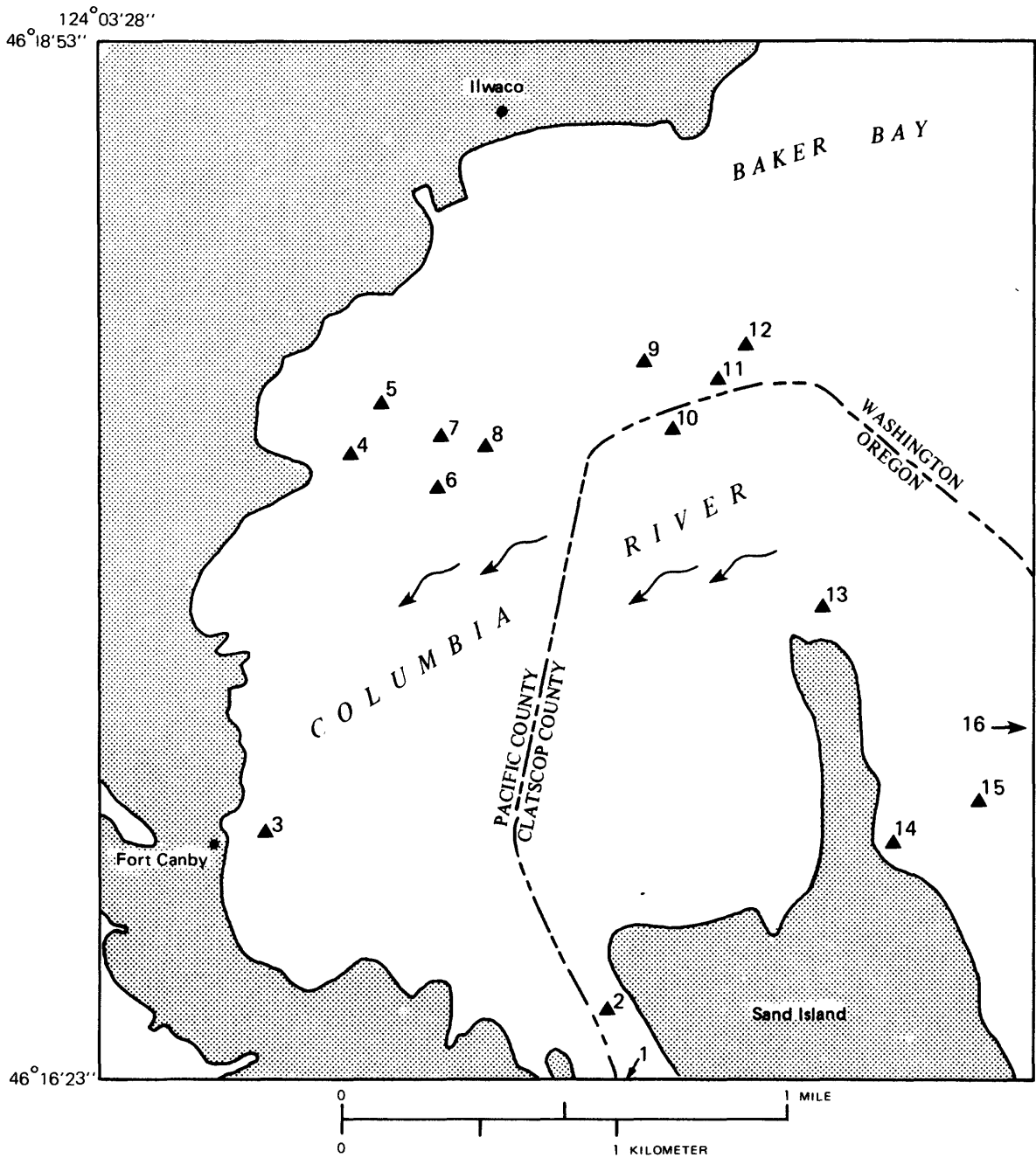


Figure 7. — Map of sampling sites for the Baker Bay, Washington project.

Table 12a.--Location of sampling sites, Baker Bay, Wash., project

Site no.	Site designation	Collection date	Site location		Remarks
			Latitude	Longitude	
1	Pacific Ocean	07-24-80	46°13'27"	124°06'32"	Same as site 1 in figure 10 and table 15.
2	Baker Bay	07-23-80	46°16'45"	124°01'59"	
3	do.	do.	46°17'07"	124°02'58"	
4	do.	do.	46°17'51"	124°02'43"	
5	do.	do.	46°17'57"	124°02'36"	
6	do.	do.	46°17'46"	124°02'29"	
7	do.	do.	46°17'52"	124°02'27"	
8	do.	do.	46°17'50"	124°02'20"	
9	do.	do.	46°18'00"	124°01'55"	
10	do.	07-25-80	46°17'53"	124°01'48"	
11	do.	07-23-80	46°17'57"	124°01'41"	
12	do.	do.	46°18'03"	124°01'37"	
13	do.	do.	46°17'32"	124°01'23"	
14	do.	07-25-80	46°17'05"	124°01'13"	
15	do.	do.	46°17'09"	124°00'57"	
16	Columbia River, Tongue Point	07-24-80	46°12'52"	123°45'12"	Same as site 3 in figure 11 and table 16.

TABLE 12B.--BAKER BAY, WASHINGTON, PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BN=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	D A T E	C A D M I U M (U G / L A S C D)	C H R O M I U M (U G / L A S C R)	C O P P E R (U G / L A S C U)	I R O N (U G / L A S F E)	L E A D (U G / L A S P B)	M A N G A N E S E (U G / L A S M N)	M E R C U R Y (U G / L A S H G)	Z I N C (U G / L A S Z N)	C A R B O N, O R G A N I C (M G / L A S C)	N I T R O G E N, A M M O N I A (M G / L A S N)
1		PACIFIC OCEAN	NE1 07/24/80	<1	<1	--	200	4	60	0.1	50	2.7	<.01
10		BAKER BAY	NH3 07/25/80	<1	<1	2	90	2	20	<.01	20	2.5	<.01
15		BAKER BAY	NE4 07/25/80	<1	<1	4	80	3	40	0.1	40	2.5	<.01
16		COLUMBIA RIVER	NH2 07/24/80	1/ 0.04	<1	3	20	2	10	<.01	<10	3.4	<.01
2		BAKER BAY	EH2 07/23/80	<1	<1	<1	10	<1	40	<.01	20	3.5	0.11
3		BAKER BAY	EH2 07/23/80	<1	1	1	30	<1	20	0.2	10	20.0	1.4
3		BAKER BAY	EE1 07/23/80	<1	<1	<1	160	2	480	0.2	40	13.0	1.5
4		BAKER BAY	EH2 07/23/80	<1	<1	2	30	1	40	0.2	10	14.0	0.72
4		BAKER BAY	EE1 07/23/80	<1	<1	<1	160	2	630	0.2	40	7.8	.98
5		BAKER BAY	EH2 07/23/80	<1	<1	<1	20	5	10	0.2	10	11.0	1.3
6		BAKER BAY	EH2 07/23/80	<1	<1	3	50	<1	160	<.01	40	23.0	1.4
6		BAKER BAY	EE1 07/23/80	<1	<1	1	150	3	2100	0.1	30	15.0	1.5
7		BAKER BAY	EH2 07/23/80	<1	<1	<1	110	<1	150	<.01	10	13.0	7.4
8		BAKER BAY	EH2 07/23/80	<1	<1	4	60	3	80	0.3	40	35.0	1.4
8		BAKER BAY	EE1 07/23/80	1	<1	<1	170	3	1100	0.1	40	20.0	1.5
9		BAKER BAY	EH2 07/23/80	<1	<1	1	30	3	10	0.2	10	12.0	0.91
11		BAKER BAY	EH2 07/23/80	<1	<1	3	50	1	10	<.01	10	22.0	1.3
12		BAKER BAY	EH2 07/23/80	<1	<1	1	20	1	10	0.2	10	12.0	0.7
12		BAKER BAY	EE1 07/23/80	<1	<1	<1	180	2	90	<.01	40	5.0	0.89
13		BAKER BAY	EH2 07/23/80	<1	<1	1	10	<1	40	<.01	10	8.6	1.3
14		BAKER BAY	EH2 07/25/80	<1	1	6	290	2	70	<.01	10	24.0	0.04
14		BAKER BAY	EE1 07/25/80	<1	<1	1	160	1	320	<.01	40	8.8	0.36

1/ CADMIUM ANALYSIS FOR SITE NUMBER 16 HAS A LOWER DETECTION LIMIT OF .01 UG/L.

TABLE 12B.--BAKER BAY, WASHINGTON, PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES--CONTINUED

S I T E NO.	C O D E	SITE DESCRIPTION	PHOSPHORUS		PHENOLS (UG/L)
			ORTHOPHOSPHATE (UG/L AS P)		
1	PACIFIC OCEAN	NE1	43		9
10		NH3	35		8
15		NE4	47		5
16		NH2	36		3
2	BAKER BAY	EH2	35		48
3		EH2	38		27
3		EE1	50		37
4		EH2	27		34
4	BAKER BAY	EE1	32		11
5		EH2	85		150
6		EH2	28		380
6		EE1	<10		420
7	BAKER BAY	EH2	72		34
8		EH2	30		320
8		EE1	<10		280
9		EH2	28		100
11	BAKER BAY	EH2	210		14
12		EH2	47		31
12		EE1	37		33
13		EH2	141		9
14	BAKER BAY	EH2	22		38
14		EE1	35		8

TABLE 12C.--BAKER BAY, WASHINGTON, PROJECT

ADDITIONAL DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE-NATIVE ESTUARINE WATER, NH-NATIVE EURYHALINE WATER, NF-NATIVE FRESH WATER, EF-ELUTRIATE WITH ESTUARINE WATER, EH- ELUTRIATE WITH EURYHALINE WATER, EF-ELUTRIATE WITH FRESH WATER, BM-BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

NO.	SITE	DESCRIPTION	DATE	ARSENIC (UG/L AS AS)	BARIUM (UG/L AS BA)	BERYL- LIUM (UG/L AS BE)	1/ CYANIDE (UG/L AS CN)	NICKEL (UG/L AS NI)	NITRO- GEN, AM- MONIA + ORGANIC (MG/L AS N)	PH	SPE- CIFIC- CON- DUCT- ANCE (MICRO- MHOS/CM)	PHOS- PHORUS, (UG/L AS P)
1	PACIFIC OCEAN	NE1	07/24/80	1	<100	10	0	2	0.3	8.0	42100	58
10	BAKER BAY	NH3	07/25/80	1	<100	10	0	1	0.4	8.0	14500	55
15	BAKER BAY	NE4	07/25/80	1	<100	10	0	3	0.6	8.0	21200	53
16	COLUMBIA RIVER	NH2	07/24/80	1	<100	--	0	4	0.4	7.9	1650	37
4	BAKER BAY	EH2	07/23/80	2	<100	<10	1	2	1.5	--	3030	147
4	BAKER BAY	EE1	07/23/80	2	400	10	0	7	1.8	7.8	38000	118
6	BAKER BAY	EE1	07/23/80	3	400	10	--	3	27.0	8.0	37700	--
8	BAKER BAY	EH2	07/23/80	3	<100	--	--	1	5.0	8.5	3980	115

1/
-- LOWER DETECTION LIMIT FOR CYANIDE IS NOT AVAILABLE.

TABLE 12D.--BAKER BAY, WASHINGTON, PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURHALINE WATER, NP=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH=ELUTRIATE WITH EURHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES '---' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

SITE NO.	SITE DESCRIPTION	C O D E	DATE	ALDRIN (UG/L)	ANE-TRYNE (UG/L)	ATRA-TONE (UG/L)	ATRA-ZINE (UG/L)	CHLOR-DANE (UG/L)	CYAN-AZINE (UG/L)	CYPRA-ZINE (UG/L)	DDD (UG/L)	DDE (UG/L)	DDT (UG/L)	DI-ELDRIN (UG/L)	ENDO-SULFAN (UG/L)
1	PACIFIC OCEAN	NE1	07/24/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
10	BAKER BAY	NH3	07/25/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
15	BAKER BAY	NE4	07/25/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
16	COLUMBIA RIVER	NH2	07/24/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
4	BAKER BAY	EH2	07/23/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
4	BAKER BAY	EE1	07/23/80	<.01	<.1	<.1	<.1	--	<.1	<.1	--	--	--	--	--
6	BAKER BAY	EE1	07/23/80	--	<.1	<.1	<.1	--	<.1	<.1	--	--	--	--	--
8	BAKER BAY	EH2	07/23/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
SITE NO.	SITE DESCRIPTION	C O D E	ENDRIN (UG/L)	HEPTA-CHLOR (UG/L)	HEPTA-CHLOR EPOXIDE (UG/L)	LINDANE (UG/L)	METH-OXY-CHLOR (UG/L)	MIREX (UG/L)	PCB (UG/L)	NAPH-THA-LENES, POLY-CHLOR. (UG/L)	PER-THANE (UG/L)	PROME-TONE (UG/L)	PROME-TRYNE (UG/L)	PRO-PAZINE (UG/L)	
1	PACIFIC OCEAN	NE1	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1
10	BAKER BAY	NH3	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1
15	BAKER BAY	NE4	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1
16	COLUMBIA RIVER	NH2	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1
4	BAKER BAY	EH2	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1
4	BAKER BAY	EE1	--	--	--	--	--	--	--	--	--	--	<.1	<.1	<.1
6	BAKER BAY	EE1	--	--	--	--	--	--	--	--	--	--	<.1	<.1	<.1
8	BAKER BAY	EH2	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1

TABLE 12D.--BAKER BAY, WASHINGTON, PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES--CONTINUED										
S I T E N O.	C O D E	S I T E D E S C R I P T I O N	SILVEX (UG/L)	SIMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)
1		PACIFIC OCEAN	NE1	<.01	<.1	<.01	<.1	<.01	<.01	<.01
10		BAKER BAY	NH3	--	<.1	<.01	<.1	--	--	--
15		BAKER BAY	NE4	--	<.1	<.01	<.1	--	--	--
16		COLUMBIA RIVER	NH2	--	<.1	<.01	<.1	--	--	--
4		BAKER BAY	EH2	<.01	<.1	<.01	<.1	<.01	<.01	<.01
4		BAKER BAY	EE1	<.01	<.1	<.01	<.1	<.01	<.01	<.01
6		BAKER BAY	EE1	<.01	<.1	<.01	<.1	<.01	<.01	<.01
8		BAKER BAY	EH2	<.01	<.1	<.01	<.1	<.01	--	0.01

TABLE 12D.--BAKER BAY, WASHINGTON, PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES--CONTINUED

C I T E NO.	S I T E D E DESCRIPTION	C O D E	SILVEX (UG/L)	SIMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)
1	PACIFIC OCEAN	NE1	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01
10	BAKER BAY	NH3	--	<.1	<.01	<.1	<1	--	--	--
15	BAKER BAY	NE4	--	<.1	<.01	<.1	<1	--	--	--
16	COLUMBIA RIVER	NH2	--	<.1	<.01	<.1	<1	--	--	--
4	BAKER BAY	EH2	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01
4	BAKER BAY	EE1	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01
6	BAKER BAY	EE1	<.01	<.1	<.01	<.1	--	<.01	<.01	<.01
8	BAKER BAY	EH2	<.01	<.1	<.01	<.1	<1	<.01	--	0.01

TABLE 12E.--BAKER BAY, WASHINGTON, PROJECT

TOTAL RECOVERABLE CHEMICALS IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURIHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH=ELUTRIATE WITH EURIHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '-' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	ARSENIC (UG/G)	BARIUM (UG/G)	BERYL- LIUM (UG/G)	CADMIUM (UG/G)	CHRO- MIUM (UG/G)	COPPER (UG/G)	CYANIDE (UG/G)	IRON (UG/G)	LEAD (UG/G)	MANGA- NESE (UG/G)	MERCURY (UG/G)
8	BM	BAKER BAY	07/23/80	10	38	<1	2	24	43	<0.5	17000	40	280	0.26
6	BM	BAKER BAY	07/23/80	9	400	1	2	15	37	<0.5	22000	30	230	0.17
4	BM	BAKER BAY	07/23/80	4	20	<1	1	7	17	<0.5	6900	20	130	0.06
14	BM	BAKER BAY	07/25/80	2	<2.5	<1	<1	5	5	<0.5	3100	10	52	0.01
12	BM	BAKER BAY	07/23/80	2	<2.5	<1	<1	5	5	<0.5	4000	10	54	0.01

S I T E NO.	C O D E	SITE DESCRIPTION	NICKEL (UG/G)	ZINC (UG/G)	CARBON, INOR- GANIC (G/KG)	CARBON, INORG + ORGANIC (G/KG)	NITRO- GEN,NH4 (MG/KG AS N)	NITRO- GEN,NH4 + ORG. (MG/KG AS N)	PHOS- PHORUS (MG/KG)
8	BM	BAKER BAY	30	190	0.3	20	130	980	1200
6	BM	BAKER BAY	10	160	0.0	18	150	1500	990
4	BM	BAKER BAY	10	52	0.3	7	5	190	530
14	BM	BAKER BAY	10	19	--	1	5	56	520
12	BM	BAKER BAY	10	21	0.1	1	3	130	410

TABLE 12F.--BAKER BAY, WASHINGTON, PROJECT

TOTAL RECOVERABLE INSECTICIDES AND HERBICIDES IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	INSECTICIDES AND HERBICIDES													
				ALDRIN (UG/KG)	CHLOR- DANE (UG/KG)	DDD (UG/KG)	DDE (UG/KG)	DDT (UG/KG)	ELDRI (UG/KG)	ENDO- SULFAN (UG/KG)	ENDRIN (UG/KG)	HEPTA- CHLOR (UG/KG)	HEPTA- CHLOR EPOXIDE (UG/KG)	LINDANE (UG/KG)			
8	BAKER BAY	BM	07/23/80	1.5	2	0.4	3.5	0.1	0.1	<.1	<.1	<.1	<.1	<.1			
6	BAKER BAY	BM	07/23/80	--	2	0.3	2.3	0.1	0.1	<.1	<.1	0.2	<.1	<.1			
4	BAKER BAY	BM	07/23/80	<.1	<.1	0.6	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1			
14	BAKER BAY	BM	07/25/80	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1			
12	BAKER BAY	BM	07/23/80	<.1	<.1	0.2	0.1	0.5	<.1	<.1	<.1	<.1	<.1	<.1			

S I T E NO.	C O D E	SITE DESCRIPTION	HERBICIDES									
			METH- OXY- CHLOR (UG/KG)	MIREX (UG/KG)	PCB (UG/KG)	PCN (UG/KG)	PER- THANE (UG/KG)	SILVEX (UG/KG)	TOXA- PHENE (UG/KG)	2,4-D (UG/KG)	2,4,5-T (UG/KG)	2,4-DP (UG/KG)
8	BAKER BAY	BM	<.1	<.1	30	--	<.1	<.1	<.1	<.1	<.1	<.1
6	BAKER BAY	BM	<.1	<.1	10	--	<.1	<.1	<.1	<.1	<.1	<.1
4	BAKER BAY	BM	<.1	<.1	3	--	<.1	<.1	<.1	<.1	<.1	<.1
14	BAKER BAY	BM	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
12	BAKER BAY	BM	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1

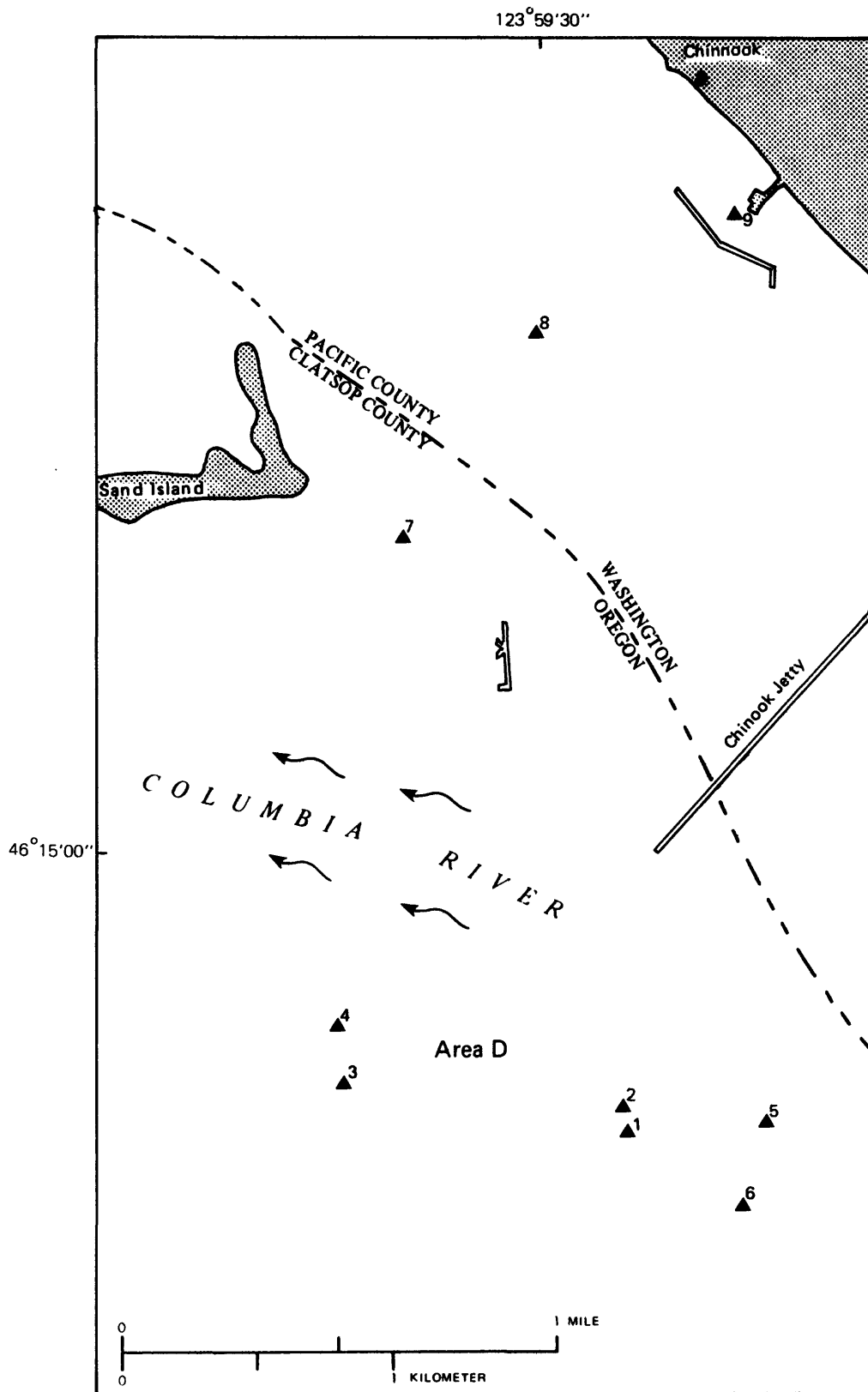


Figure 8. — Map of sampling sites for the Columbia River near Chinook, WA, and Area D, Oregon.

Table 13a.--Location of sampling sites, Columbia River near Chinook, Wash., and Area D, Oregon, project

Site no.	Site designation	Collection date	Site location		Remarks
			Latitude	Longitude	
1	Columbia River, Area D	08-19-80	46°14'30"	123°57'24"	Same as site 1 in figure 9 and table 14.
2	do.	do.	46°14'32"	123°57'25"	
3	do.	do.	46°14'34"	123°58'05"	
4	do.	do.	46°14'41"	123°58'03"	
5	do.	do.	46°14'29"	123°56'50"	
6	do.	do.	46°14'19"	123°56'54"	Chinook sites located southwest of Chinook, Wash.
7	Chinook River	08-20-80	46°15'38"	123°57'54"	
8	do.	do.	46°15'58"	123°57'24"	
9	do.	do.	46°16'15"	123°56'53"	

TABLE 13B.--CHINOOK, WASHINGTON AND AREA D, OREGON, PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURIHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURIHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '---' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	CADMIUM (UG/L AS CD)	CHROMIUM (UG/L AS CR)	COPPER (UG/L AS CU)	IRON (UG/L AS FE)	LEAD (UG/L AS PB)	MANGANESE (UG/L AS MN)	MERCURY (UG/L AS HG)	ZINC (UG/L AS ZN)	CARBON, ORGANIC (MG/L AS C)	NITROGEN, AMMONIA (MG/L AS N)
1		COLUMBIA AREA D	NE1 08/19/80	1	1	2	80	1	20	0.2	20	4.0	0.09
2		COLUMBIA AREA D	EE1 08/19/80	2	<1	1	60	1	170	0.1	30	4.0	1.6
3		COLUMBIA AREA D	EE1 08/19/80	3	<1	1	70	1	1500	0.2	30	2.8	2.2
4		COLUMBIA AREA D	EE1 08/19/80	1	<1	1	80	1	260	0.1	70	3.5	1.2
5		COLUMBIA AREA D	EE1 08/19/80	1	<1	1	50	<1	30	<0.1	20	2.3	0.14
6		COLUMBIA AREA D	EE1 08/19/80	1	<1	1	50	<1	20	<0.1	20	2.5	0.07
7		CHINOOK	EE1 08/20/80	<1	<1	<1	50	<1	1300	0.1	23	7.7	6.3
8		CHINOOK	EE1 08/20/80	1	<1	1	130	<1	2300	0.1	20	18.0	--
9		CHINOOK	EE1 08/20/80	2	<1	8	110	1	1000	0.7	90	11.0	3.5

TABLE 13B.--CHINOOK, WASHINGTON AND AREA D, OREGON, PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELutriATES--CONTINUED

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	P H O S P H O R U S		P H E N O L S	
			O R T H O P H O S P H A T (U G /L A S P)		(U G /L)	
1	COLUMBIA AREA D	NE1	60	5		
2	COLUMBIA AREA D	EE1	35	42		
3	COLUMBIA AREA D	EE1	34	14		
4	COLUMBIA AREA D	EE1	72	7		
5	COLUMBIA AREA D	EE1	62	6		
6	COLUMBIA AREA D	EE1	53	7		
7	CHINOOK	EE1	37	7		
8	CHINOOK	EE1	37	230		
9	CHINOOK	EE1	47	180		

TABLE 13C.--CHINOOK, WASHINGTON AND AREA D, OREGON, PROJECT

ADDITIONAL DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NP=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E	C O D E	SITE	DESCRIPTION	DATE	ARSENIC (UG/L AS AS)	BARIUM (UG/L AS BA)	BERYL- LIUM (UG/L AS BE)	CYANIDE (UG/L AS CN)	NICKEL (UG/L AS NI)	NITRO- GEN,AM- MONIA + ORGANIC (MG/L AS N)	PH	SPE- CIFIC- CON- DUCT- ANCE (MICRO- MHOS/CM)	PHOS- PHORUS, (UG/L AS P)
1	NE1	COLUMBIA AREA D		08/19/80	1	<100	10	2	3	0.5	7.8	21100	87
5	EE1	COLUMBIA AREA D		08/19/80	1	500	10	1	11	0.5	7.7	19500	78
9	EE1	CHINOOK		08/20/80	4	--	<10	3	5	36	7.8	19500	85

TABLE 13L.--CHINOOK, WASHINGTON AND AREA D, OREGON, PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH=ELUTRIATE WITH EUPHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTON MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '---' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

SITE NO.	SITE DESCRIPTION	C O D E	DATE	ALDRIN (UG/L)	HEPTA- CHLOR EPOXIDE (UG/L)	LINDANE (UG/L)	METH- OXY- CHLOR (UG/L)	MIREX (UG/L)	POB (UG/L)	NAPH- THA- LENES, POLY- CHLOR. (UG/L)	PER- THANE (UG/L)	PRONE- TONE (UG/L)	PRONE- THYNE (UG/L)	PRO- PAZINE (UG/L)
1	COLUMBIA AREA D	NE1	08/19/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01
5	COLUMBIA AREA D	EE1	08/19/80	<.01	--	<.1	<.1	--	--	<.01	<.01	<.01	<.01	<.01
9	CHINOOK	EE1	08/20/80	<.01	--	<.1	<.1	--	--	<.01	<.01	<.01	<.01	<.01
1	COLUMBIA AREA D	NE1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01
5	COLUMBIA AREA D	EE1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	--
9	CHINOOK	EE1	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	<.01	--

TABLE 13D.--CHINOOK, WASHINGTON AND AREA D, OREGON, PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUVIATES--CONTINUED

S I T E NO.	SITE DESCRIPTION	C O D E	SILVEX (UG/L)	SIMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)
1	COLUMBIA AREA D	NE1	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01
5	COLUMBIA AREA D	EE1	<.01	<.1	--	<.1	<1	<.01	--	<.01
9	CHINOOK	EE1	0.01	<.1	--	<.1	<1	<.01	--	0.03

TABLE 13E.--CHINOOK, WASHINGTON AND AREA D, OREGON, PROJECT

TOTAL RECOVERABLE CHEMICALS IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE-NATIVE ESTUARINE WATER, NH-NATIVE EURHALINE WATER, NP-NATIVE FRESH WATER, EE-ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BN-BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	ARSENIC (UG/G)	BARIUM (UG/G)	BERYL- LIUM (UG/G)	CADMIUM (UG/G)	CHRO- MIUM (UG/G)	COPPER (UG/G)	CYANIDE (UG/G)	IRON (UG/G)	LEAD (UG/G)	MANGA- NESE (UG/G)	MERCURY (UG/G)
8	CHINOOK	BM	08/20/80	10	40	<1	8	18	44	<0.5	17000	30	420	0.07
5	COLUMBIA AREA D	BM	08/19/80	3	20	<1	2	4	4	1	4700	10	150	0.01

S I T E NO.	C O D E	SITE DESCRIPTION	NICKEL (UG/G)	ZINC (UG/G)	CARBON, INOR- GANIC (G/KG)	CARBON, INORG + ORGANIC (G/KG)	NITRO- GEN, NH4 (KG/KG) AS N	NITRO- GEN, NH4 + ORG. (KG/KG) AS N	PHOS- PHORUS (KG/KG)
8	CHINOOK	BM	20	135	1.4	28	150	2003	970
5	COLUMBIA AREA D	BM	10	22	3.3	--	2	73	480

TABLE 13F.--CHINOOK, WASHINGTON AND AREA D, OREGON, PROJECT

TOTAL RECOVERABLE INSECTICIDES AND HERBICIDES IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTON MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE										
				ALDRIN (UG/KG)	CHLOR- DANE (UG/KG)	DDD (UG/KG)	DDE (UG/KG)	DDT (UG/KG)	DI- ELDRIN (UG/KG)	ENDO- SULFAN (UG/KG)	ENDRIN (UG/KG)	HEPTA- CHLOR (UG/KG)	HEPTA- CHLOR EPOXIDE (UG/KG)
3	CHINOOK	BM	08/20/80	<.1	4	5.9	5.6	<.1	0.4	<.1	<.1	<.1	0.4
5	COLUMBIA AREA D	BM	08/19/80	<.1	<1	0.1	<.1	<.1	<.1	--	<.1	<.1	<.1
S I T E NO.	C O D E	SITE DESCRIPTION											
			METH- OXY- CHLOR (UG/KG)	MIREX (UG/KG)	PCB (UG/KG)	PCN (UG/KG)	PER- THANE (UG/KG)	SILVEX (UG/KG)	TOXA- PHENE (UG/KG)	2,4-D (UG/KG)	2,4,5-T (UG/KG)	2,4-DP (UG/KG)	
8	CHINOOK	BM	<.1	<.1	15	--	<1	<.1	<1	<.1	<.1	<.1	
5	COLUMBIA AREA D	BM	<.1	--	<1	<1	--	<.1	<1	<.1	<.1	<.1	

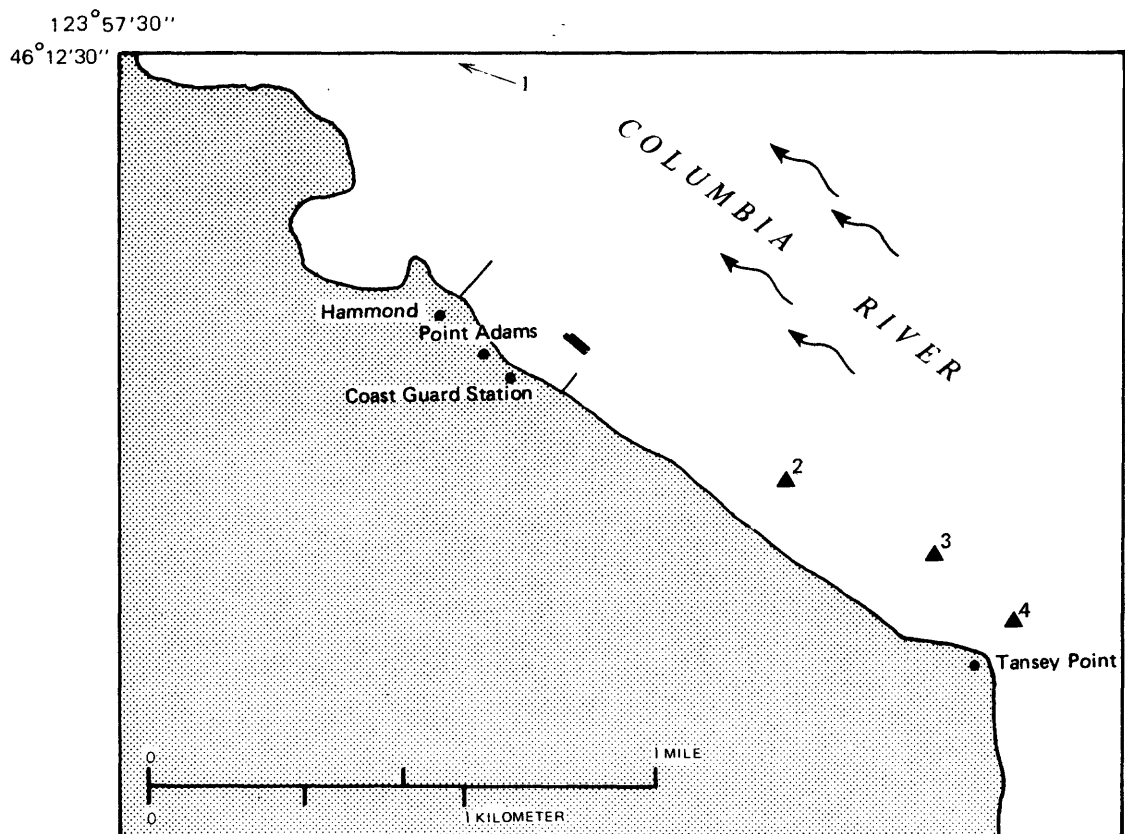


Figure 9. – Map of sampling sites for the Columbia River near Tansey Point, OR, project.

Table 14a.--Location of sampling sites, Columbia River near
Tansy Point, Oreg., project

Site no.	Site designation	Collec- tion date	Site location		Remarks
			Latitude	Longitude	
1	Columbia River, Area D	08-19-80	46°14'30"	123°57'24"	Same as site 1 in figure 8 and table 13.
2	Columbia River, Tansy Point	do.	46°11'46"	123°55'51"	
3	do.	do.	46°11'37"	123°55'30"	
4	do.	do.	46°11'32"	123°55'17"	

TABLE 14C.--TANSY POINT, OREGON, PROJECT

ADDITIONAL DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BN=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '---' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

NO.	SITE	DESCRIPTION	DATE	ARSENIC (UG/L AS AS)	BARIUM (UG/L AS BA)	BERYL- LIUM (UG/L AS BE)	CYANIDE (UG/L AS CH)	NICKEL (UG/L AS NI)	NITRO- GEN, AM- MONIA + ORGANIC (MG/L AS N)	PH	SPE- CIFIC- CON- DUCT- ANCE (MICRO- MHOS/CM)	PHOS- PHORUS, (UG/L AS P)
1	COLUMBIA RIVER	NE1	08/19/80	1	<100	10	2	3	0.5	7.8	21100	87
4	COLUMBIA RIVER	EE1	08/19/80	1	<100	10	1	6	1.2	7.9	19500	62

TABLE 14D.--TANSY POINT, OREGON, PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '---' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	SITE DESCRIPTION	DATE	ALDRIN (UG/L)	AME- TRYNE (UG/L)	ATRA- TONE (UG/L)	ATRA- ZINE (UG/L)	CHLOR- DANE (UG/L)	CYAN- AZINE (UG/L)	CYPRA- ZINE (UG/L)	DDD (UG/L)	DDE (UG/L)	DDT (UG/L)	DI- ELDRIN (UG/L)	ENDO- SULFAN (UG/L)
1	COLUMBIA RIVER	NE1	08/19/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
4	COLUMBIA RIVER	EE1	08/19/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01

S I T E N O.	C O D E	SITE DESCRIPTION	DATE	HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR (UG/L)	METH- OXY- CHLOR (UG/L)	MIREX (UG/L)	PCB (UG/L)	PER- THANE (UG/L)	PROME- TONE (UG/L)	PROME- TRYNE (UG/L)	PRO- PAL (UG/L)
1	COLUMBIA RIVER	NE1	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1
4	COLUMBIA RIVER	EE1	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1

TABLE 14D.--TANSY POINT, OREGON, PROJECT

SITE NO.	SITE DESCRIPTION	C Q D E	DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES--CONTINUED							
			SILVEX (UG/L)	SIMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)
1	COLUMBIA RIVER	NE1	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01
4	COLUMBIA RIVER	EE1	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01

TABLE 14E.--TANSY POINT, OREGON, PROJECT

TOTAL RECOVERABLE CHEMICALS IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '---' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

SITE NO.	SITE DESCRIPTION	DATE	ARSENIC (UG/G)	BARIUM (UG/G)	BERYL- LIUM (UG/G)	CADMIUM (UG/G)	CHRO- MIUM (UG/G)	COPPER (UG/G)	CYANIDE (UG/G)	IRON (UG/G)	LEAD (UG/G)	MANGA- NESE (UG/G)	MERCURY (UG/G)
4	COLUMBIA RIVER	BM 08/19/80	3	30	<1	2	6	5	<0.5	4500	10	87	0.02
SITE NO.	DESCRIPTION	DATE	ARSENIC (UG/G)	BARIUM (UG/G)	BERYL- LIUM (UG/G)	CADMIUM (UG/G)	CHRO- MIUM (UG/G)	COPPER (UG/G)	CYANIDE (UG/G)	IRON (UG/G)	LEAD (UG/G)	MANGA- NESE (UG/G)	MERCURY (UG/G)
4	COLUMBIA RIVER	BM	3	30	<1	2	6	5	<0.5	4500	10	87	0.02
4	COLUMBIA RIVER	BM	3	30	<1	2	6	5	<0.5	4500	10	87	0.02

1/ LOWER DETECTION LIMIT FOR INORGANIC CARBON IS NOT AVAILABLE.

TABLE 14F.--TANSY POINT, OREGON, PROJECT

TOTAL RECOVERABLE INSECTICIDES AND HERBICIDES IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH=ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

SITE NO.	SITE DESCRIPTION	DATE	ALDRIN		CHLOR-DANE		DDD	DDE	DDT	DI-ELDRIN	ENDO-SULFAN	HEPTA-CHLOR		HEPTA-CHLOR EPOXIDE	
			(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)						(UG/KG)	(UG/KG)	(UG/KG)	
4	COLUMBIA RIVER	BM 08/19/80	<.1	<.1	<.1	<.1	2.5	0.7	1.0	<.1	--	<.1	<.1	<.1	<.1
SITE NO.	SITE DESCRIPTION	C O D E	METH-OXY-CHLOR (UG/KG)	WIREX (UG/KG)	PCB (UG/KG)	PCN (UG/KG)	PER-THANE (UG/KG)	SILVEX (UG/KG)	TOXA-PHENE (UG/KG)	2,4-D (UG/KG)	2,4,5-T (UG/KG)	2,4-DP (UG/KG)			
4	COLUMBIA RIVER	BM	<.1	--	<.1	--	--	<.1	<.1	<.1	--	--			

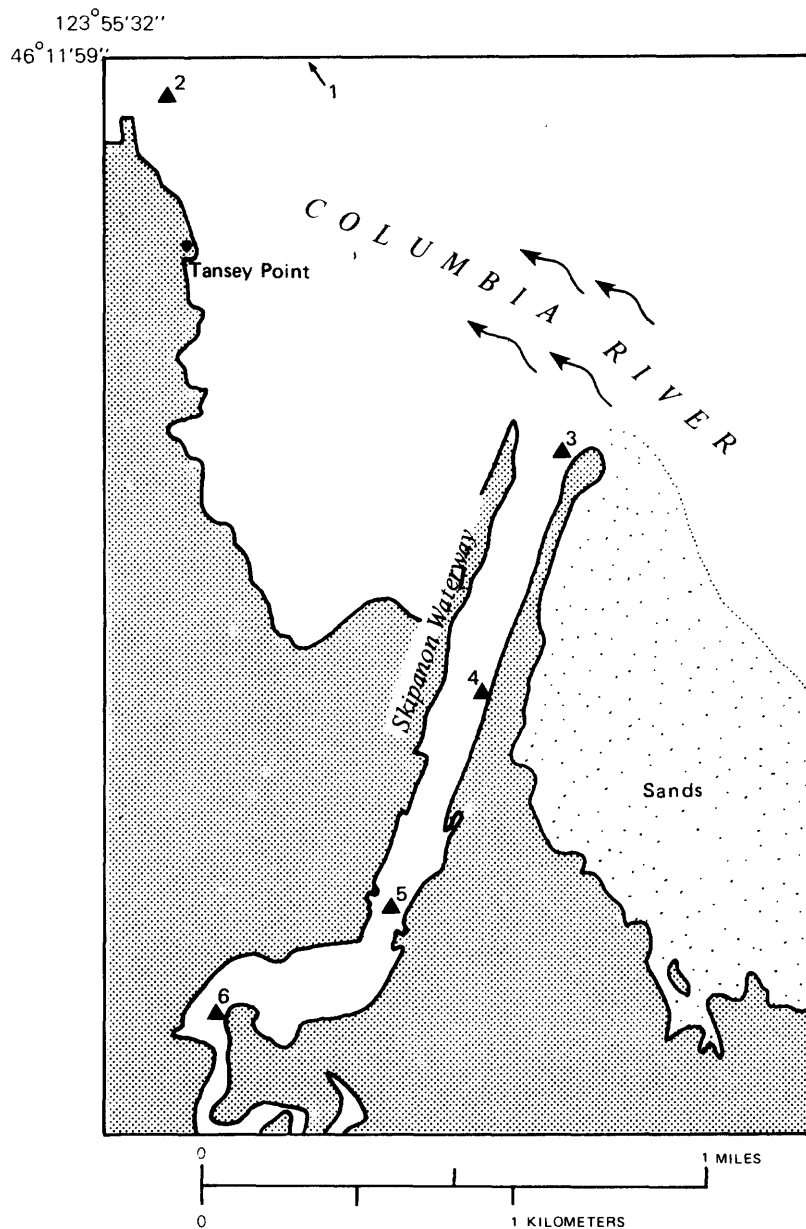


Figure 10. — Map of sampling sites for the Skipanon and Columbia River near Warrenton, OR, project.

Table 15a.--Location of sampling sites, Skipanon and Columbia Rivers near Warrenton, Oreg., project

Site no.	Site designation	Collection date	Site location		Remarks
			Latitude	Longitude	
1	Pacific Ocean	07-24-80	43°13'27"	124°06'32"	Same as site 1 in figure 7 and table 12.
2	Tansy Point	07-25-80	46°11'29"	123°55'15"	
3	Skipanon RM 0.5	07-22-80	46°11'00"	123°54'23"	
4	Skipanon RM 1.0	do.	46°10'35"	123°54'35"	
5	Skipanon RM 1.5	do.	46°10'11"	123°54'46"	
6	Skipanon RM 2.0	do.	46°09'59"	123°55'11"	

TABLE 15B.--SKIPANON AND COLUMBIA RIVERS, OREGON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BN=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

SITE NO.	SITE DESCRIPTION	DATE	CADMIUM (UG/L AS CD)	CHROMIUM (UG/L AS CR)	COPPER (UG/L AS CU)	IRON (UG/L AS FE)	LEAD (UG/L AS PB)	MANGANESE (UG/L AS MN)	MERCURY (UG/L AS HG)	ZINC (UG/L AS ZN)	CARBON, ORGANIC (MG/L AS C)	NITROGEN, AMMONIA (MG/L AS N)
1	PACIFIC OCEAN	NE2 07/24/80	<1	<1	--	--	4	60	0.1	50	2.7	<.01
2	TANSEY POINT	NH1 07/25/80	<1	<1	2	30	1	20	<0.1	20	2.7	<.01
3	SKIPANON RM 0.5	EH1 07/22/80	<1	<1	<1	20	<1	660	0.6	10	35.0	15
3	SKIPANON RM 0.5	EE2 07/22/80	<1	1	3	630	<1	7200	0.1	40	18.0	0.2
4	SKIPANON RM 1.0	EH1 07/22/80	<1	<1	1	30	<1	450	0.1	10	17.0	9.6
5	SKIPANON RM 1.5	EH1 07/22/80	<1	1	<1	190	<1	550	<0.1	10	26.0	19
6	SKIPANON RM 2.0	EH1 07/22/80	<1	<1	19	70	<1	50	0.6	10	22.0	3.7
6	SKIPANON RM 2.0	EE2 07/22/80	<1	<1	1	170	<1	710	0.1	30	8.9	6.7
S			S		C							
I			I		O							
T			T		D							
E			E		E							
NO.			NO.	SITE DESCRIPTION		PHOSPHORUS ORTHOPHOSPHATE (UG/L AS P)	PHENOLS (UG/L)					
1	PACIFIC OCEAN	NE2	43	9								
2	TANSEY POINT	NH1	30	8								
3	SKIPANON RM 0.5	EH1	22	210								
3	SKIPANON RM 0.5	EE2	<10	180								
4	SKIPANON RM 1.0	EH1	36	240								
5	SKIPANON RM 1.5	EH1	50	330								
6	SKIPANON RM 2.0	EH1	28	--								
6	SKIPANON RM 2.0	EE2	28	<1								

S
I
T
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N
O.

C
O
D
E

SITE
DESCRIPTION

DATE

PHOSPHORUS
ORTHOPHOSPHATE
(UG/L
AS P)

PHENOLS
(UG/L)

1	NE2	PACIFIC OCEAN	43	9
2	NH1	TANSEY POINT	30	8
3	EH1	SKIPANON RM 0.5	22	210
3	EE2	SKIPANON RM 0.5	<10	180
4	EH1	SKIPANON RM 1.0	36	240
5	EH1	SKIPANON RM 1.5	50	330
6	EH1	SKIPANON RM 2.0	28	--
6	EE2	SKIPANON RM 2.0	28	<1

TABLE 15C.---SKIPANON AND COLUMBIA RIVERS, OREGON PROJECT

ADDITIONAL DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E	C O D E	SITE	DESCRIPTION	DATE	ARSENIC	BARIUM	BERYL- LIUM	1/ CYANIDE	NICKEL	NITRO- GEN,AM- MONIA + ORGANIC	PH	SPE- CIFIC- CON- DUCT- ANCE (MICRO- MHOS/CM)	PHOS- PHORUS, (UG/L AS P)
					(UG/L AS AS)	(UG/L AS BA)	(UG/L AS BE)	(UG/L AS CH)	(UG/L AS NI)	(MG/L AS N)	(UNITS)		
1		PACIFIC OCEAN	NE2	07/24/80	1	<100	10	0	2	0.3	8.0	42100	58
2		TANSEY POINT	NH1	07/25/80	1	<100	10	0	<1	1.6	7.8	7850	58
6		SKIPANON RM 2.0	EH1	07/22/80	3	<100	10	--	<1	4.8	8.1	3700	152
		SKIPANON RM 2.0	EE2	07/22/80	2	400	10	--	<1	6.7	7.6	43200	62

1/ LOWER DETECTION LIMIT FOR CYANIDE IS NOT AVAILABLE.

TABLE 15D.--SKIPANON AND COLUMBIA RIVERS, OREGON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BN=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	D A T E	A L D R I N (U G /L)	A M E T R Y N E (U G /L)	A T R A T O N E (U G /L)	A T R A Z I N E (U G /L)	C H L O R D A N E (U G /L)	C Y A N A Z I N E (U G /L)	C Y P R A Z I N E (U G /L)	D D D (U G /L)	D D E (U G /L)	D D T (U G /L)	D I - E L D R I N (U G /L)	E N D O - S U L F A N (U G /L)
1	NE2	PACIFIC OCEAN	07/24/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
2	NH1	TANSEY POINT	07/25/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
6	EH1	SKIPANON RM 2.0	07/22/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
6	EE2	SKIPANON RM 2.0	07/22/80	<.01	--	--	--	<.1	--	--	<.01	<.01	<.01	<.01	<.01

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	E N D R I N (U G /L)	H E P T A - C H L O R (U G /L)	H E P T A - C H L O R E P O X I D E (U G /L)	L I N D A N E (U G /L)	M E T H O X Y - C H L O R (U G /L)	M I R E X (U G /L)	P C B (U G /L)	P E R - T H A N E (U G /L)	P R O M E - T O N E (U G /L)	P R O M E - T R Y N E (U G /L)	P R O - P A Z I N E (U G /L)
1	NE2	PACIFIC OCEAN	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1
2	NH1	TANSEY POINT	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1
6	EH1	SKIPANON RM 2.0	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1

TABLE 15D.--SKIPANON AND COLUMBIA RIVERS, OREGON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES--CONTINUED

S I T E NO.	SITE DESCRIPTION	C O D	SILVEX (UG/L)	SIMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)
1	PACIFIC OCEAN	NE2	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01
2	TANSEY POINT	NH1	--	<.1	<.01	<.1	<1	--	--	--
6	SKIPANON RM 2.0	EH1	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01

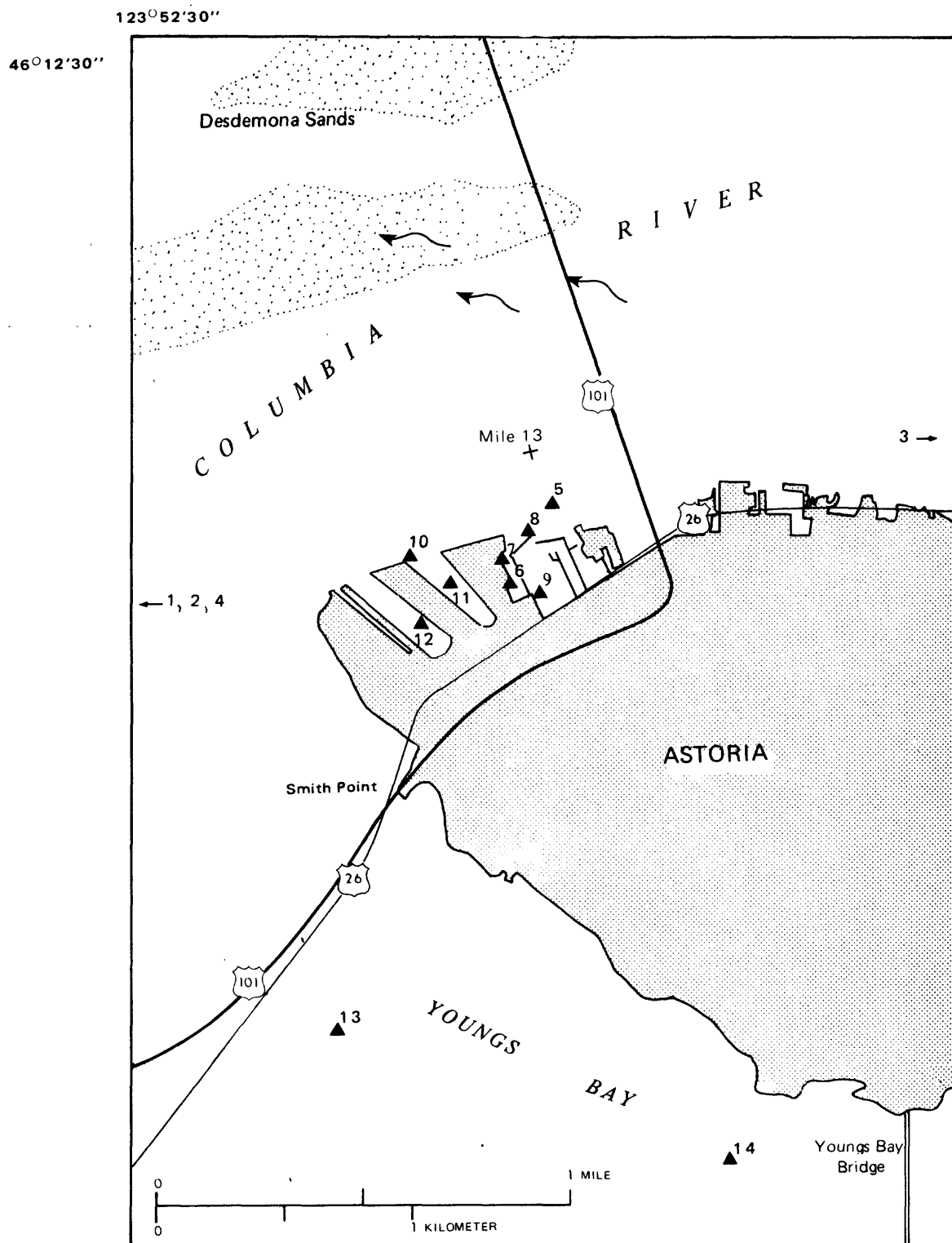


Figure 11. — Map of sampling sites for the Astoria boat slips and Youngs Bay, OR, project.

Table 16a.--Location of sampling sites, Astoria boat slips and Youngs Bay,
Oreg., project

Site no.	Site designation	Collec- tion date	Site location		Remarks
			Latitude	Longitude	
1	Columbia River, Area D	12-02-80	46°14'30"	123°57'25"	
2	Pacific Ocean	do.	46°13'37"	124°04'27"	
3	Columbia River, Tongue Point	07-24-80	46°12'52"	123°45'12"	Same as site 16 in figure 7 and table 12.
4	Pacific Ocean	do.	46°13'27"	124°06'32"	Same as site 1 in figure 7 and table 12.
5	Astoria boat basin	12-02-80	46°11'32"	123°51'12"	
6	do.	do.	46°11'21"	123°51'20"	
7	do.	do.	46°11'24"	123°51'21"	
8	do.	do.	46°11'28"	123°51'16"	
9	do.	do.	46°11'20"	123°51'14"	
10	do.	do.	46°11'27"	123°51'10"	
11	do.	07-25-80	46°11'22"	123°51'31"	
12	do.	do.	46°11'17"	123°51'35"	
13	Youngs Bay RM 1.5	07-22-80	46°10'26"	123°51'51"	
14	Youngs Bay RM 2.5	do.	46°10'07"	123°50'44"	

TABLE 16B.--ASTORIA AND YOUNGS BAY, OREGON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	SITE DESCRIPTION	C O D E	DATE	CADMIUM (UG/L AS CD)	CHROMIUM (UG/L AS CR)	COPPER (UG/L AS CU)	IRON (UG/L AS FE)	LEAD (UG/L AS PB)	MANGANESE (UG/L AS MN)	MERCURY (UG/L AS HG)	ZINC (UG/L AS ZN)	CARBON, ORGANIC (MG/L AS C)	NITROGEN, AMMONIA (MG/L AS N)
1	COLUMBIA RIVER	NE1	12/02/80	<1	4	<1	140	<1	30	0.1	30	3.2	0.03
2	PACIFIC OCEAN	NE2	12/02/80	3	<1	6	160	4	40	<0.1	50	2.7	0.05
3	COLUMBIA RIVER	NH3	07/24/80	1/ 0.04	<1	3	20	2	10	<0.1	<10	3.4	<0.1
4	PACIFIC OCEAN	NE4	07/24/80	<1	<1	--	--	4	60	0.1	50	2.7	<0.1
5	ASTOR. BOAT BASIN	EE1	12/02/80	<1	<1	1	160	<1	920	<0.1	30	5.0	4.7
6	ASTOR. BOAT BASIN	EE1	12/02/80	<1	<1	2	2700	<1	5700	0.1	40	5.6	33
7	ASTOR. BOAT BASIN	EE1	12/02/80	<1	<1	7	2400	<1	9300	<0.1	50	13.0	33
7	ASTOR. BOAT BASIN	EE2	12/02/80	<1	<1	1	4300	<1	10000	0.1	50	9.6	44
8	ASTOR. BOAT BASIN	EE1	12/03/80	<1	<1	8	210	<1	1500	0.1	30	6.0	29
8	ASTOR. BOAT BASIN	EE2	12/03/80	<1	<1	<1	200	<1	6200	0.2	50	5.5	16
9	ASTOR. BOAT BASIN	EE1	12/02/80	<1	<1	<1	560	<1	3800	<0.1	50	12.0	46
10	ASTOR. BOAT BASIN	EE1	12/02/80	<1	<1	<1	480	<1	5600	<0.1	50	4.4	23
11	ASTOR. BOAT BASIN	EH3	07/25/80	1	<1	6	50	<1	1200	0.1	40	24.0	8
12	ASTOR. BOAT BASIN	EH3	07/25/80	1	<1	1	30	1	130	0.2	30	31.0	8.2
13	YOUNGS BAY RM 1.5	EH3	07/22/80	<1	<1	2	10	<1	10	<0.1	20	13.0	7.6
14	YOUNGS BAY RM 2.5	EH3	07/22/80	<1	<1	2	20	<1	10	0.2	10	19.0	7.1
14	YOUNGS BAY RM 2.5	EE4	07/22/80	<1	<1	2	140	<1	230	<0.1	30	8.8	1.6

1/
-- CADMIUM ANALYSIS FOR SITE NUMBER 3 HAS A LOWER DETECTION LIMIT OF .01 UG/L.

TABLE 16B.--ASTORIA AND YOUNGS BAY, OREGON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES--CONTINUED

S I T E NO.	C O D E	SITE DESCRIPTION	PHOSPHORUS		PHENOLS (UG/L)
			ORTHOPHOSPHATE (UG/L AS P)		
1		COLUMBIA RIVER NE1	53		6
2		PACIFIC OCEAN NE2	48		9
3		COLUMBIA RIVER NH3	36		3
4		PACIFIC OCEAN NE4	43		9
5		ASTOR. BOAT BASIN EE1	32		120
6		ASTOR. BOAT BASIN EE1	35		84
7		ASTOR. BOAT BASIN EE1	38		110
7		ASTOR. BOAT BASIN EE2	60		140
8		ASTOR. BOAT BASIN EE1	27		30
8		ASTOR. BOAT BASIN EE2	32		98
9		ASTOR. BOAT BASIN EE1	32		160
10		ASTOR. BOAT BASIN EE1	19		28
11		ASTOR. BOAT BASIN EH3	35		120
12		ASTOR. BOAT BASIN EH3	143		170
13		YOUNGS BAY RM 1.5 EH3	28		31
14		YOUNGS BAY RM 2.5 EH3	38		37
14		YOUNGS BAY RM 2.5 EE4	23		--

TABLE 16C.--ASTORIA AND YOUNGS BAY, OREGON PROJECT

ADDITIONAL DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NP=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E	C O D E	SITE	DESCRIPTION	DATE	ARSENIC (UG/L AS AS)	BARIUM (UG/L AS BA)	BERYL- LIUM (UG/L AS BE)	1/ CYANIDE (UG/L AS CN)	NICKEL (UG/L AS NI)	NITRO- GEN,AM- MONIA + ORGANIC (MG/L AS N)	PH	SPE- CIFIC- CON- DUCT- ANCE (MICRO- MHOS/CM)	PHOS- PHORUS, (UG/L AS P)
1	COLUMBIA RIVER	NE1	12/02/80	1	<100	<10	<10	1	3	0.9	8.1	42900	60
2	PACIFIC OCEAN	NE2	12/02/80	1	<100	<10	<10	1	3	0.9	8.2	47200	60
3	COLUMBIA RIVER	NH3	07/24/80	1	<100	--	--	0	4	0.4	7.9	1650	37
4	PACIFIC OCEAN	NE4	07/24/80	1	<100	10	10	0	2	0.3	8.0	42100	58
7	ASTOR. BOAT BASIN	EE1	12/02/80	2	1500	20	20	3	4	--	7.0	39300	68
7	ASTOR. BOAT BASIN	EE2	12/02/80	2	1100	20	20	3	4	--	7.0	41600	11
14	YOUNGS BAY RM 2.5	EH4	07/22/80	2	<100	10	10	--	<1	7.3	8.7	2520	56
14	YOUNGS BAY RM 2.5	EE4	07/22/80	2	1300	20	20	--	1	15.0	7.9	30400	56

1/
-- LOWER DETECTION LIMIT FOR CYANIDE IS NOT AVAILABLE.

TABLE 16D.--ASTORIA AND YOUNGS BAY, OREGON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURHYALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURHYALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '---' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	ALDRIN (UG/L)	AME- TRYNE (UG/L)	ATRA- TONE (UG/L)	ATRA- ZINE (UG/L)	CHLOR- DANE (UG/L)	CYAN- AZINE (UG/L)	CYPRA- ZINE (UG/L)	DDD (UG/L)	DDE (UG/L)	DDT (UG/L)	DI- ELDRIN (UG/L)	ENDO- SULFAN (UG/L)
1	C	COLUMBIA RIVER	NE1 12/02/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
2	O	PACIFIC OCEAN	NE2 12/02/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
3	D	COLUMBIA RIVER	NH3 07/24/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
4	E	PACIFIC OCEAN	NE4 07/24/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
7	C	ASTOR. BOAT BASIN	EE1 12/02/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
7	O	ASTOR. BOAT BASIN	EE2 12/02/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
14	D	YOUNGS BAY RM 2.5	EH3 07/22/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
14	E	YOUNGS BAY RM 2.5	EE4 07/22/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
S I T E NO.	C O D E	SITE DESCRIPTION	ENDRIN (UG/L)	HEPTA- CHLOR (UG/L)	HEPTA- CHLOR EPOXIDE (UG/L)	LINDANE (UG/L)	METH- OXY- CHLOR (UG/L)	MIREX (UG/L)	PCB (UG/L)	POLY- CHLOR. (UG/L)	PER- THANE (UG/L)	PRONE- TONE (UG/L)	PRONE- TRYNE (UG/L)	PRO- PAZINE (UG/L)	
1	C	COLUMBIA RIVER	NE1 <.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1
2	O	PACIFIC OCEAN	NE2 <.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1
3	D	COLUMBIA RIVER	NH3 <.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1
4	E	PACIFIC OCEAN	NE4 <.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1
7	C	ASTOR. BOAT BASIN	EE1 <.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1
7	O	ASTOR. BOAT BASIN	EE2 <.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1
14	D	YOUNGS BAY RM 2.5	EH3 <.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1
14	E	YOUNGS BAY RM 2.5	EE4 <.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1

TABLE 16D.--ASTORIA AND YOUNGS BAY, OREGON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES--CONTINUED

S I T E NO.	C O D E	SITE DESCRIPTION	SILVEX (UG/L)	SIMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)
1		COLUMBIA RIVER	NE1	<.01	<.01	<.1	<1	<.01	<.01	<.01
2		PACIFIC OCEAN	NE2	<.01	<.01	<.1	<1	<.01	<.01	<.01
3		COLUMBIA RIVER	NH3	--	<.01	<.1	<1	--	--	--
4		PACIFIC OCEAN	NE4	<.01	<.01	<.1	<1	<.01	<.01	<.01
7		ASTOR. BOAT BASIN	EE1	<.01	<.01	<.1	<1	<.01	<.01	<.01
7		ASTOR. BOAT BASIN	EE2	<.01	<.01	<.1	<1	<.01	<.01	<.01
14		YOUNGS BAY RM 2.5	EH3	<.01	<.01	<.1	<1	<.01	<.01	<.01
14		YOUNGS BAY RM 2.5	EE4	<.01	<.01	<.1	<1	<.01	<.01	<.01

TABLE 16E.--ASTORIA AND YOUNGS BAY, OREGON PROJECT

TOTAL RECOVERABLE CHEMICALS IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURIHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURIHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BN=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '---' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	ARSENIC (UG/G)	BARIUM (UG/G)	BERYL- LIUM (UG/G)	CADMIUM (UG/G)	CHRO- MIUM (UG/G)	COPPER (UG/G)	CYANIDE (UG/G)	IRON (UG/G)	LEAD (UG/G)	MANGA- NESE (UG/G)	MERCURY (UG/G)
7	ASTOR. BOAT BASIN BM		12/02/80	7	40	1	5	14	31	<0.5	11000	10	190	0.09
14	YOUNGS BAY RM 2.5 BM		07/22/80	10	40	<1	4	8	180	<0.5	11000	10	140	0.03

S I T E NO.	C O D E	SITE DESCRIPTION	NICKEL (UG/G)	ZINC (UG/G)	CARBON, INOR- GANIC (G/KG)	CARBON, INORG + ORGANIC (G/KG)	NITRO- GEN,NH4 (MG/KG) AS N	NITRO- GEN,NH4 + ORG. (MG/KG) AS N	PHOS- PHORUS (MG/KG)
7	ASTOR. BOAT BASIN BM		20	110	0.3	16	150	1300	800
14	YOUNGS BAY RM 2.5 BM		20	35	0.6	13	122	760	480

TABLE 16F.--ASTORIA AND YOUNGS BAY, OREGON PROJECT

TOTAL RECOVERABLE INSECTICIDES AND HERBICIDES IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BN=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	SITE DESCRIPTION	DATE										
				ALDRIN (UG/KG)	CHLOR- DANE (UG/KG)	DDD (UG/KG)	DDE (UG/KG)	DDT (UG/KG)	DI- ELDRIN (UG/KG)	ENDO- SULFAN (UG/KG)	ENDRIN (UG/KG)	HEPTA- CHLOR (UG/KG)	HEPTA- CHLOR EPOXIDE (UG/KG)
7	ASTOR.	BOAT BASIN BM	12/02/80	<.1	<1	<.1	2.9	<.1	0.1	<.1	<.1	<.1	<.1
14	YOUNGS	BAY RM 2.5 BM	07/22/80	<.1	<1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
S I T E N O.	C O D E	SITE DESCRIPTION											
				METH- OXY- CHLOR (UG/KG)	MIREX (UG/KG)	PCB (UG/KG)	PCN (UG/KG)	PER- THANE (UG/KG)	SILVEX (UG/KG)	TOXA- PHENE (UG/KG)	2,4-D (UG/KG)	2,4,5-T (UG/KG)	2,4-DP (UG/KG)
7	ASTOR.	BOAT BASIN BM		<.1	<.1	11	--	<1	<.1	<1	<.1	--	<.1
14	YOUNGS	BAY RM 2.5 BM		<.1	<.1	<1	<1	<1	<.1	<1	<.1	<.1	<.1

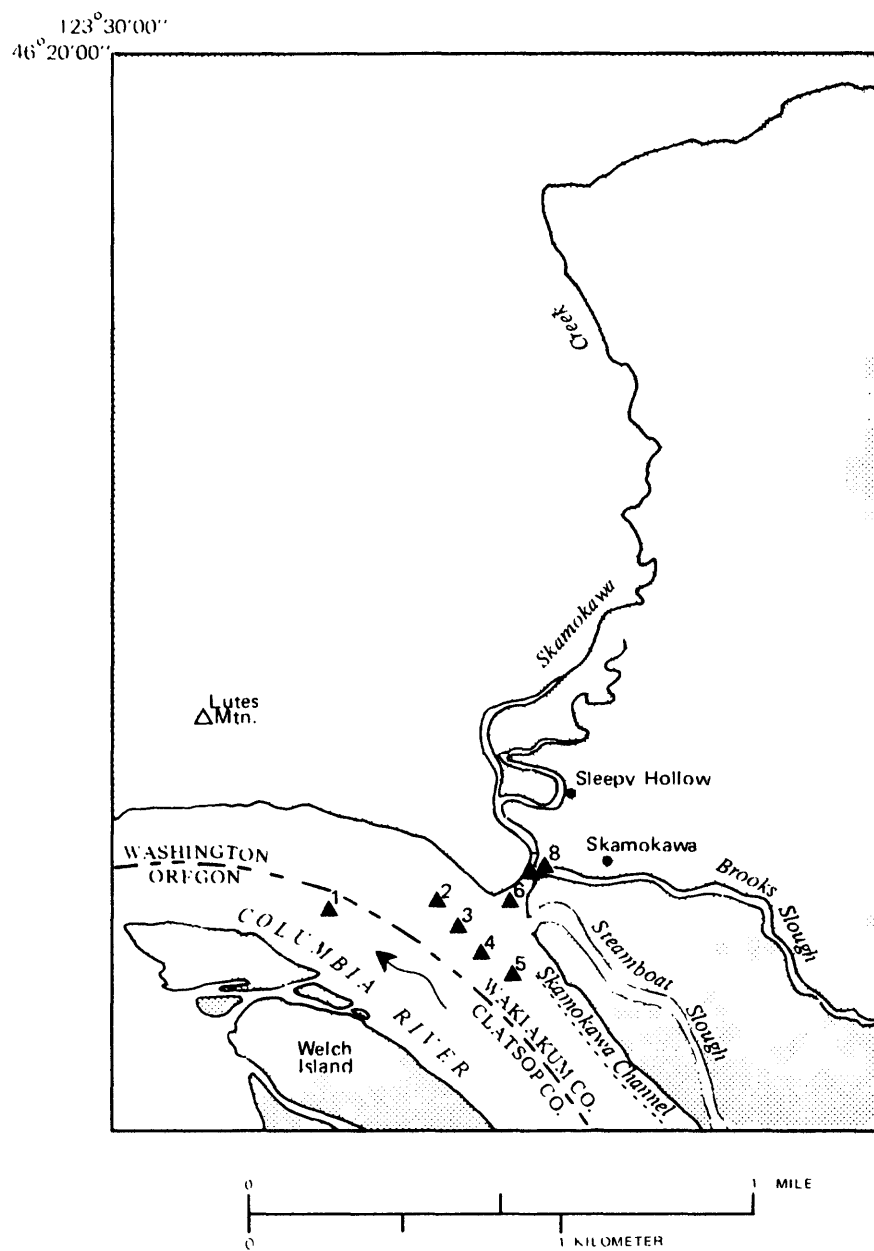


Figure 12. — Map of sampling sites for the Columbia River and Skamokawa Creek, WA, project.

Table 17a.--Location of sampling sites, Columbia River and Skamokawa Creek,
Oreg., project

Site no.	Site designation		Collec- tion date	Site location		Remarks
				Latitude	Longitude	
1	Columbia RM	32.7	05-14-80	46°16'01"	123°28'57"	In-water disposal site.
2	do.	32.8	05-18-80	46°15'49"	123°27'20"	Do.
3	do.	33.2	05-15-80	46°16'00"	123°27'54"	
4	do.	33.3	do.	46°15'53"	123°27'44"	
5	do.	33.5	do.	46°15'44"	123°27'32"	
6	Skamokawa RM	0.05	05-14-80	46°16'01"	123°27'24"	
7	do.	0.12	do.	46°16'08"	123°27'18"	
8	do.	0.15	do.	46°16'09"	123°27'13"	

TABLE 17B.--COLUMBIA RIVER AND SKAMOKAWA CREEK, WASHINGTON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NF=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	SITE DESCRIPTION	DATE	1/ CADMIUM (UG/L AS CD)		CHROMIUM (UG/L AS CH)		COPPER (UG/L AS CU)		IRON (UG/L AS FE)		LEAD (UG/L AS PB)		MANGANESE (UG/L AS MN)		MERCURY (UG/L AS HG)		2/ ZINC (UG/L AS ZN)		CARBON, ORGANIC (MG/L AS C)		NITROGEN, AMMONIA (MG/L AS N)	
1	COLUMBIA RM	32.7	NF1 05/14/80	0.09	<1	<1	<1	<1	<1	19	28	30	<0.1	9.0	2.4	0.04							
1	COLUMBIA RM	32.7	EF1 05/14/80	1.00	<1	<1	<1	1	80	1	<10	<10	<0.1	37.0	4.1	0.1							
2	COLUMBIA RM	32.8	EF1 05/15/80	0.29	1	1	1	2	70	2	<10	<10	<0.1	45.0	3.3	0.03							
3	COLUMBIA RM	33.2	EF1 05/15/80	0.14	<1	<1	<1	2	70	<1	10	10	<0.1	6.5	3.1	0.03							
4	COLUMBIA RM	33.3	EF1 05/15/80	0.07	<1	<1	<1	2	80	2	10	10	<0.1	7.8	3.0	0.15							
5	COLUMBIA RM	33.5	EF1 05/15/80	0.06	<1	<1	<1	<1	70	1	<10	<10	<0.1	6.8	3.1	0.08							
6	SKAMOKAWA RM	0.05	EF1 05/14/80	0.25	1	1	1	4	110	2	10	10	<0.1	68.0	3.6	0.03							
7	SKAMOKAWA RM	0.12	EF1 05/14/80	0.13	24	24	24	2	50	2	820	820	<0.1	15.0	6.4	0.47							
8	SKAMOKAWA RM	0.15	EF1 05/14/80	0.23	<1	<1	<1	1	30	2	670	670	<0.1	11.0	3.5	0.77							

1/
2/

CHEMICAL ANALYSES FOR CADMIUM HAVE A LOWER DETECTION LIMIT OF .01 UG/L.

CHEMICAL ANALYSES FOR ZINC HAVE A LOWER DETECTION LIMIT OF .2 UG/L.

TABLE 17B.--COLUMBIA RIVER AND SKAMOKAWA CREEK, WASHINGTON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES--CONTINUED

SITE E NO.	C O D E	SITE DESCRIPTION	PHOSPHORUS		PHENOLS (UG/L)
			ORTHOPHOSPHATE (UG/L AS P)	AS P)	
1	COLUMBIA RM	32.7 NF1	12	4	
1	COLUMBIA RM	32.7 EF1	26	52	
2	COLUMBIA RM	32.8 EF1	16	7	
3	COLUMBIA RM	33.2 EF1	34	210	
4	COLUMBIA RM	33.3 EF1	<10	14	
5	COLUMBIA RM	33.5 EF1	12	9	
6	SKAMOKAWA RM	0.05 EF1	<10	31	
7	SKAMOKAWA RM	0.12 EF1	<10	210	
8	SKAMOKAWA RM	0.15 EF1	<10	180	

TABLE 17C.--COLUMBIA RIVER AND SKANOKAWA CREEK, WASHINGTON PROJECT

ADDITIONAL DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL.. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E	C O D E	SITE	DATE	ARSENIC	BARIUM	BERYL- LIUM	CYANIDE	NICKEL	NITRO- GEN,AM- MONIA + ORGANIC	PH	SPE- CIFIC- CON- DUCT- ANCE	PHOS- PHORUS,
				(UG/L AS AS)	(UG/L AS BA)	(UG/L AS BE)	(UG/L AS CN)	(UG/L AS NI)	(MG/L AS N)	(UNITS) MHOS/CM)	(UG/L AS P)	
NO.	DESCRIPTION											
1	COLUMBIA RM 32.7	NF1	05/14/80	1	<100	<10	4	<1	1.8	7.8	143	47
1	COLUMBIA RM 32.7	EF1	05/14/80	1	<100	<10	3	7	3.4	7.6	142	58
5	COLUMBIA RM 33.5	EF1	05/15/80	--	--	--	--	--	--	7.8	109	--
	SKANOKAWA RM 0.15	EF1	05/14/80	2	<100	<10	3	<1	1.3	--	--	22

TABLE 17D.--COLUMBIA RIVER AND SKAMOKAWA CREEK, WASHINGTON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURIHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURIHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '---' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	D A T E	A L D R I N (UG/L)	A M E - T R Y N E (UG/L)	A T R A - T O N E (UG/L)	A T R A - Z I N E (UG/L)	C H L O R - D A N E (UG/L)	C Y A N - A Z I N E (UG/L)	C Y P R A - Z I N E (UG/L)	D D D (UG/L)	D D E (UG/L)	D D T (UG/L)	D I - E L D R I N (UG/L)	E N D O - S U L F A N (UG/L)
1	C	COLUMBIA RM 32.7	NF1 05/14/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
1	C	COLUMBIA RM 32.7	EF1 05/14/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
8	C	SKAMOKAWA RM 0.15	EF1 05/14/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	D A T E	H E P T A - C H L O R E P O X I D E (UG/L)	H E P T A - C H L O R (UG/L)	M I R E X (UG/L)	P C B (UG/L)	M E T H - O X Y - C H L O R (UG/L)	P O L Y - C H L O R (UG/L)	P E R - T H A N E (UG/L)	P R O M E - T O N E (UG/L)	P R O M E - T R Y N E (UG/L)	P R O - P A Z I N E (UG/L)
1	C	COLUMBIA RM 32.7	NF1	<.01	<.01	<.01	<.1	<.01	<.1	<.1	<.1	<.1	<.1
1	C	COLUMBIA RM 32.7	EF1	<.01	<.01	<.01	<.1	<.01	<.1	<.1	<.1	<.1	<.1
8	C	SKAMOKAWA RM 0.15	EF1	<.01	<.01	<.01	<.1	<.01	<.1	<.1	<.1	<.1	<.1

TABLE 17D.--COLUMBIA RIVER AND SKANOKAWA CREEK, WASHINGTON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES--CONTINUED

SITE NO.	SITE DESCRIPTION	C O D E	SILVEX (UG/L)	SIMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)
1	COLUMBIA RM 32.7	NF1	0.01	<.1	<.01	<.1	<1	0.01	<.01	0.01
1	COLUMBIA RM 32.7	EF1	0.01	<.1	<.01	<.1	<1	0.01	<.01	0.01
8	SKANOKAWA RM 0.15	EF1	0.01	<.1	<.01	<.1	<1	0.05	<.01	0.01

TABLE 17E.--COLUMBIA RIVER AND SKAMOKAWA CREEK, WASHINGTON PROJECT

TOTAL RECOVERABLE CHEMICALS IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NAIVE ESTUARINE WATER, NH=NAIVE EURYHALINE WATER, NP=NAIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BN=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	ARSENIC (UG/G)	BARIUM (UG/G)	BERYL- LIUM (UG/G)	CADMIUM (UG/G)	CHRO- MIUM (UG/G)	COPPER (UG/G)	CYANIDE (UG/G)	IRON (UG/G)	LEAD (UG/G)	MANGA- NESE (UG/G)	MERCURY (UG/G)
1	COLUMBIA RM 32.7 BM	05/15/80	4	30	<1	1	2	5900	10	<0.5	5900	10	150	<.01
8	SKAMOKAWA RM 0.15 BM	05/15/80	9	80	1	1	10	22	21000	1	21000	10	400	0.03

S I T E NO.	C O D E	SITE DESCRIPTION	NICKEL (UG/G)	ZINC (UG/G)	CARBON, INOR- GANIC (G/KG)	CARBON, INORG + ORGANIC (G/KG)	NITRO- GEN, NH4 (MG/KG) AS N	NITRO- GEN, NH4 + ORG. (MG/KG) AS N	PHOS- PHORUS (MG/KG)
1	COLUMBIA RM 32.7 BM	10	25	0.00	1	18	85	400	
8	SKAMOKAWA RM 0.15 BM	30	60	0.10	133	12	320	560	

TABLE 17F.--COLUMBIA RIVER AND SKAMOKAWA CREEK, WASHINGTON PROJECT

TOTAL RECOVERABLE INSECTICIDES AND HERBICIDES IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NAIVE ESTUARINE WATER, NH=NAIVE EURYHALINE WATER, NF=NAIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTON MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALISES HAS NOT BEEN MADE.]

SITE NO.	C O D E	SITE DESCRIPTION	DATE	ALDRIN	CHLOR-DANE	DDD	DDE	DDT	DI-ELDRIN	ENDO-SULFAN	ENDRIN	HEPTA-CHLOR	HEPTA-CHLOR EPOXIDE
				(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)
1	C	COLUMBIA RM 32.7 BM	05/15/80	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
8	O	SKAMOKAWA RM 0.15 BM	05/15/80	0.1	<.1	0.3	0.3	0.1	<.1	<.1	<.1	<.1	<.1
SITE NO.	C O D E	SITE DESCRIPTION		METH-OXY-CHLOR	MIREX	PCB	PCN	PER-THANE	SILVEX	TOXA-PHENE	2,4-D	2,4,5-T	2,4-DP
				(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)
1	C	COLUMBIA RM 32.7 BM		<.1	<.1	<.1	--	<.1	<.1	<.1	<.1	<.1	<.1
8	O	SKAMOKAWA RM 0.15 BM		<.1	<.1	3	--	<.1	<.1	<.1	<.1	<.1	<.1

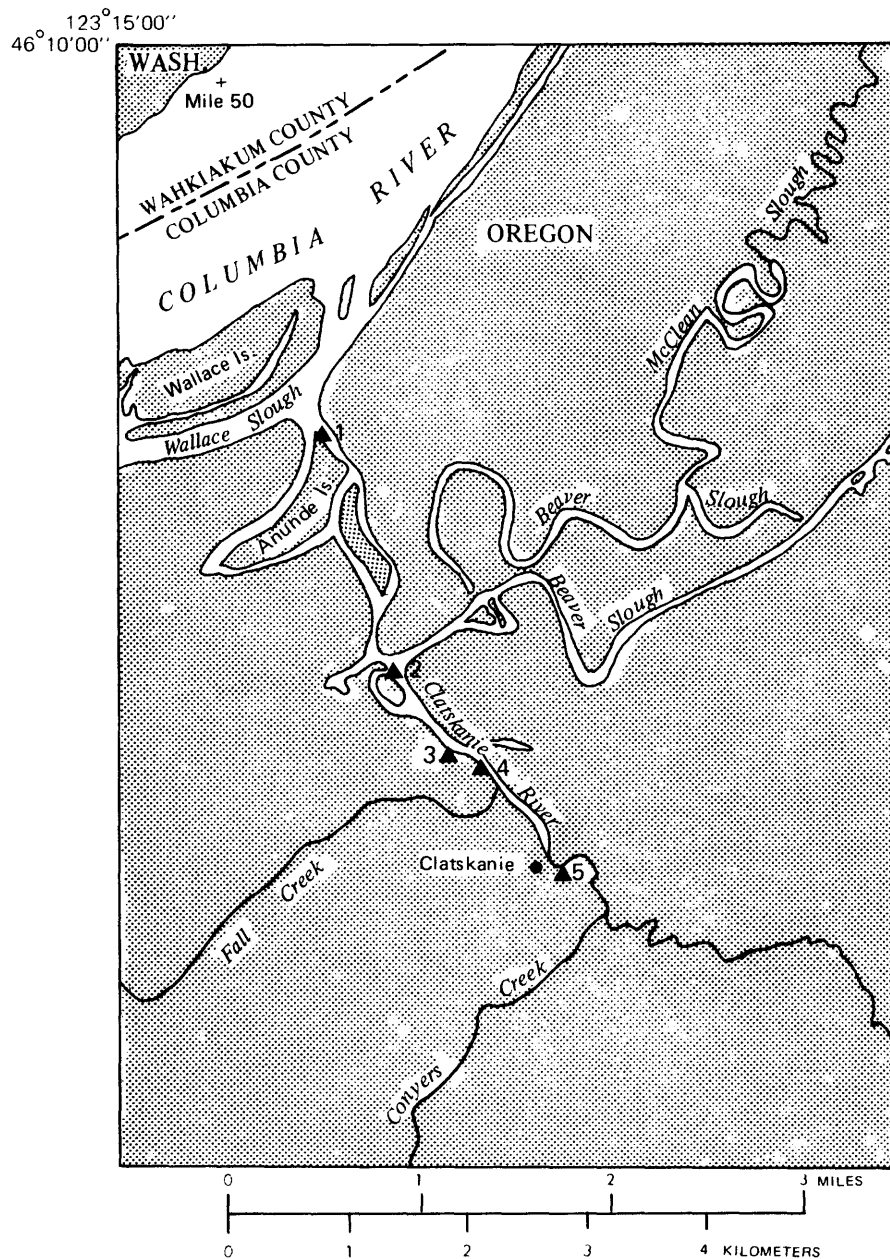


Figure 13. — Map of sampling sites for the Clatskanie River, OR, project.

Table 18a.--Location of sampling sites, Clatskanie River, Oreg., project

Site no.	Site designation	Collec- tion date	Site location		Remarks
			Latitude	Longitude	
1	Beaver Slough RM 0.18	11-20-80	46°08'16"	123°13'41"	
2	Clatskanie RM 0.0	do.	46°07'15"	123°13'13"	
3	do.	do.	46°06'51"	123°12'53"	
4	do.	do.	46°06'50"	123°12'42"	
5	do.	do.	46°06'21"	123°12'10"	

TABLE 1B.--CLATSKANIE RIVER, OREGON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE BURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH BURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, EN=BOTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	SITE DESCRIPTION	DATE	CADMIUM (UG/L AS CD)	CHROMIUM (UG/L AS CR)	COPPER (UG/L AS CU)	IRON (UG/L AS FE)	LEAD (UG/L AS PB)	MANGANESE (UG/L AS MN)	MERCURY (UG/L AS HG)	ZINC (UG/L AS ZN)	CARBON, ORGANIC (MG/L AS C)	NITROGEN, AMMONIA (MG/L AS N)
3	CLATSKAN. RM 0.5	NF1	11/20/80	1	<1	3	280	<1	50	<0.1	<10	5.2	--
2	CLATSKAN. RM 0.0	EF1	11/20/80	1	<1	1	10	1	170	<0.1	10	6.7	1.1
1	BEAVER SL RM 0.2	EF1	11/20/80	<1	<1	2	450	1	50	<0.1	40	15.0	--
5	CLATSKAN. RM 1.4	EF1	11/20/80	1	<1	<1	20	2	170	<0.1	10	5.2	0.25
3	CLATSKAN. RM 0.5	EF1	11/20/80	1	<1	2	140	<1	140	<0.1	<10	9.2	1.8
4	CLATSKAN. RM 0.7	EF1	11/20/80	1	<1	3	370	1	110	<0.1	20	11.0	2.6

S I T E N O.	C O D E	SITE DESCRIPTION	PHOSPHORUS ORTHOPHOSPHATE (UG/L AS P)	PHENOLS (UG/L)
3	CLATSKAN. RM 0.5	NF1	53	3
2	CLATSKAN. RM 0.0	EF1	48	30
1	BEAVER SL RM 0.2	EF1	<10	--
5	CLATSKAN. RM 1.4	EF1	47	25
3	CLATSKAN. RM 0.5	EF1	32	4
4	CLATSKAN. RM 0.7	EF1	48	130

TABLE 18C.--CLATSKANIE RIVER, OREGON PROJECT

ADDITIONAL DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '---' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E DESCRIPTION	SITE	DATE	ARSENIC (UG/L AS AS)	BARIUM (UG/L AS BA)	BERYL- LIUM (UG/L AS BE)	CYANIDE (UG/L AS CN)	NICKEL (UG/L AS NI)	NITRO- GEN, AM- MONIA + ORGANIC (MG/L AS N)	PH	SPE- CIFIC- CON- DUCT- ANCE (MICRO- MHOS/CM)	PHOS- PHORUS, (UG/L AS P)
3	CLATSKAN. RM 0.5	NF1	11/20/80	<1	<100	<10	4	1	--	7.6	147	6
2	CLATSKAN. RM 0.0	EF1	11/20/80	3	<100	<10	4	3	1.6	7.0	87	48
5	CLATSKAN. RM 1.4	EF1	11/20/80	--	--	--	--	--	1.3	6.5	69	--
3	CLATSKAN. RM 0.5	EF1	11/20/80	--	--	--	--	--	--	6.5	66	--
4	CLATSKAN. RM 0.7	EF1	11/20/80	3	<100	<10	4	3	2.6	6.2	66	48

TABLE 18D.--CLATSKANIE RIVER, OREGON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NF=NATIVE ESTUARINE WATER, NH=NATIVE EURHALINE WATER, NP=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH=ELUTRIATE WITH EURHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	ALDRIN (UG/L)	AME- TRYNE (UG/L)	ATRA- TONE (UG/L)	ATRA- ZINE (UG/L)	CHLOR- DANE (UG/L)	CYAN- AZINE (UG/L)	CYPRA- ZINE (UG/L)	DDD (UG/L)	DDE (UG/L)	DDT (UG/L)	DI- ELDRIN (UG/L)	ENDO- SULFAN (UG/L)
3	CLATSKAN.	RM 0.5	NF1 11/20/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
2	CLATSKAN.	RM 0.0	EF1 11/20/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
4	CLATSKAN.	RM 0.7	EF1 11/20/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01

S I T E NO.	C O D E	SITE DESCRIPTION	ENDRIN (UG/L)	HEPTA- CHLOR (UG/L)	HEPTA- EPOXIDE (UG/L)	LINDANE (UG/L)	METH- OXY- CHLOR (UG/L)	MIREX (UG/L)	PCB (UG/L)	NAPH- THA- LENES, POLY- CHLOR. (UG/L)	PER- THANE (UG/L)	PRONE- TONE (UG/L)	PROME- TRYNE (UG/L)	PRO- PAZINE (UG/L)
3	CLATSKAN.	RM 0.5	NF1	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1
2	CLATSKAN.	RM 0.0	EF1	<.01	<.01	<.01	<.01	<.01	0.1	--	<.1	<.1	<.1	<.1
4	CLATSKAN.	RM 0.7	EF1	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1

TABLE 18D.--CLATSKANIE RIVER, OREGON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES--CONTINUED

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	SILVEX (UG/L)	SIMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)
3		CLATSKAN. RM 0.5 NF1	<.01	<.1	<.01	<.1	<1	0.02	<.01	<.01
2		CLATSKAN. RM 0.0 EF1	<.01	<.1	<.01	<.1	<1	0.01	<.01	<.01
4		CLATSKAN. RM 0.7 EF1	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01

TABLE 18E.--CLATSKANIE RIVER, OREGON PROJECT

TOTAL RECOVERABLE CHEMICALS IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	SITE DESCRIPTION	DATE	ARSENIC (UG/G)	BARIUM (UG/G)	BERYL- LIUM (UG/G)	ZINC (UG/G)	NICKEL (UG/G)	CADMIUM (UG/G)	CHRO- MIUM (UG/G)	COPPER (UG/G)	CYANIDE (UG/G)	IRON (UG/G)	LEAD (UG/G)	MANGA- NESE (UG/G)	MERCURY (UG/G)
4	CLATSKAN. RM 0.7	BM 11/20/80	5	150	<1			1	9	21	<0.5	11000	10	190	0.05
2	CLATSKAN. RM 0.0	BM 11/20/80	7	150	<1			2	9	18	<0.5	12000	20	280	0.07

S I T E NO.	SITE DESCRIPTION	C O D E	NICKEL (UG/G)	ZINC (UG/G)	CARBON, INOR- GANIC (G/KG)	CARBON, INOR- GANIC (G/KG)	NITRO- GEN,NH4 (MG/KG) AS N	NITRO- GEN,NH4 + ORG. (MG/KG) AS N	PHOS- PHORUS (MG/KG) AS N
4	CLATSKAN. RM 0.7	BM	10	55	0.0	29	163	1600	720
2	CLATSKAN. RM 0.0	BM	10	115	0.2	20	72	1100	710

TABLE 18P.--CLATSKANIE RIVER, OREGON PROJECT

TOTAL RECOVERABLE INSECTICIDES AND HERBICIDES IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EF=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

SITE NO.	SITE DESCRIPTION	DATE	C O D E													
			ALDRIN (UG/KG)	CHLOR- DANE (UG/KG)	DDD (UG/KG)	DDE (UG/KG)	DDT (UG/KG)	DI- ELDRIN (UG/KG)	ENDO- SULFAN (UG/KG)	ENDRIN (UG/KG)	HEPTA- CHLOR (UG/KG)	HEPTA- CHLOR EPOXIDE (UG/KG)	LINDANE (UG/KG)			
4	CLATSKAN. RM 0.7 BM	11/20/80	<.1	<1	0.5	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1		
2	CLATSKAN. RM 0.0 BM	11/20/80	<.1	3	5.7	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
C O D E																
SITE NO.	DESCRIPTION		METH- OXY- CHLOR (UG/KG)		MIREX (UG/KG)	PCB (UG/KG)	PCN (UG/KG)	PER- THANE (UG/KG)	SILVEX (UG/KG)	TOXA- PHENE (UG/KG)	2,4-D (UG/KG)	2,4,5-T (UG/KG)	2,4-DP (UG/KG)			
4	CLATSKAN. RM 0.7 BM		<.1	<1	56	--	--	<1	<.1	<1	<.1	<.1	<.1	<.1	<.1	<.1
2	CLATSKAN. RM 0.0 BM		--	<.1	11	--	--	<1	<.1	<1	<.1	<.1	<.1	<.1	<.1	<.1

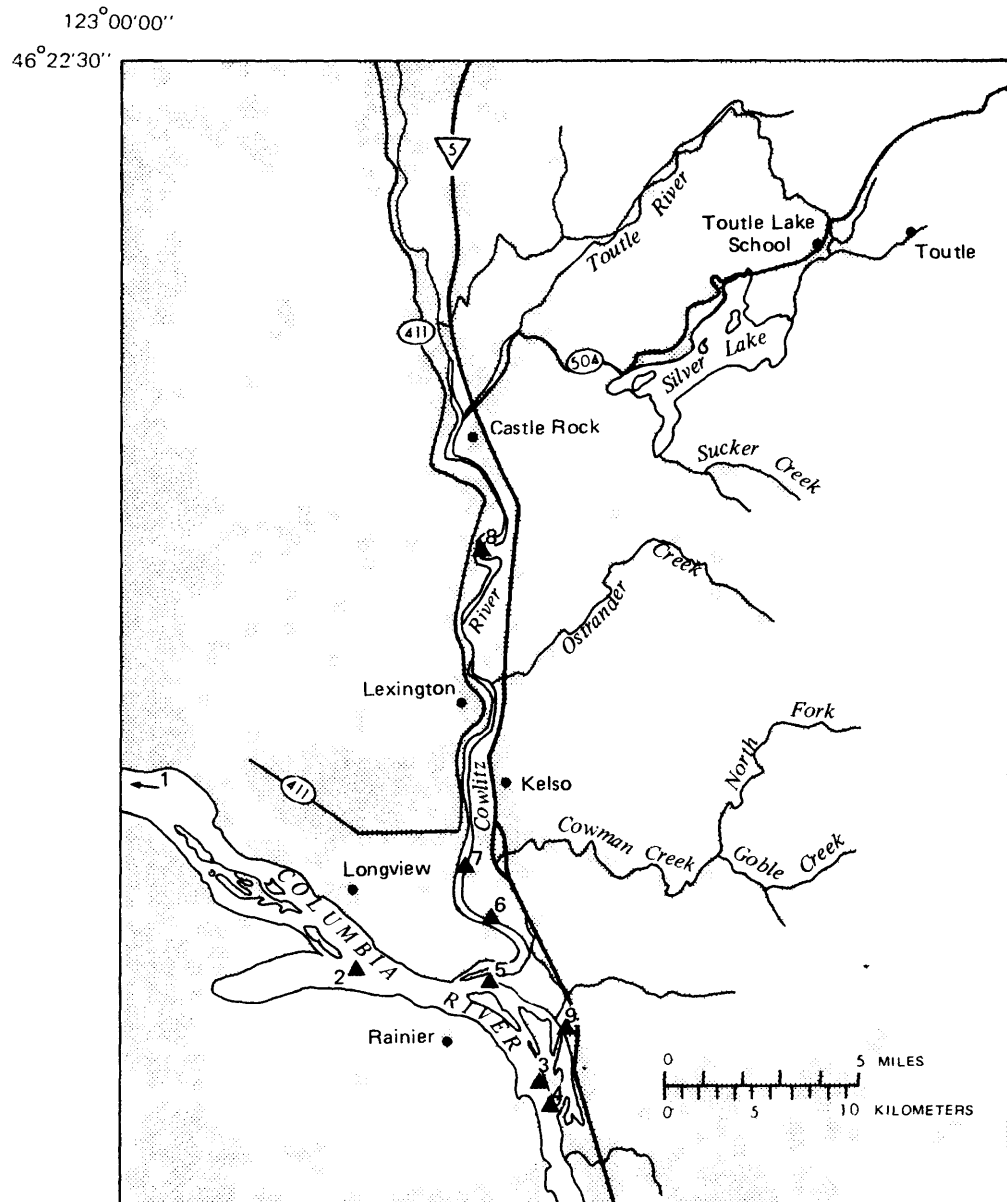


Figure 14. — Map of sampling sites for the Columbia and Cowlitz Rivers at Longview, project.

Table 19a.--Location of sampling sites, Columbia and Cowlitz Rivers,
Wash., project

Site no.	Site designation		Collec- tion date	Site location		Remarks
				Latitude	Longitude	
1	Columbia RM	32.7	05-14-80	46°16'01"	123°28'57"	In-water disposal site (same as site 1 in figure 12 and table 17).
2	do.	65.8	05-21-80	46°06'22"	122°57'53"	
3	do.	70.8	05-28-80	46°03'45"	122°53'09"	
4	do.	71.4	06-04-80	46°03'24"	122°52'59"	
5	Cowlitz RM	0.2	05-28-80	46°05'59"	122°54'25"	
6	do.	2.0	do.	46°06'54"	122°53'54"	
7	do.	3.5	do.	46°07'35"	122°55'10"	
8	do.	12.8	06-04-80	46°14'02"	122°54'16"	
9	Carrolls Channel near Columbia River		05-28-80	46°04'46"	122°52'16"	

TABLE 19B.--COLUMBIA AND COWLITZ RIVERS, WASHINGTON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NF=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NP=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BR=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	CADMIUM (UG/L AS CD)	CHROMIUM (UG/L AS CR)	COPPER (UG/L AS CU)	IRON (UG/L AS FE)	LEAD (UG/L AS PB)	MANGANESE (UG/L AS MN)	MERCURY (UG/L AS HG)	ZINC (UG/L AS ZN)	CARBON, ORGANIC (MG/L AS C)	NITROGEN, AMMONIA (MG/L AS N)
1	COLUMBIA RM 32.7	NF1 05/14/80	<1	<1	<1	<1	19	28	30	<0.1	<10	2.4	0.04
2	COLUMBIA RM 65.8	NF2 05/21/80	1	--	--	10	37	32	16	--	<10	--	--
3	COLUMBIA RM 70.8	NF3 05/28/80	<1	<1	<1	3	20	2	<10	<0.1	<10	3.2	0.03
4	COLUMBIA RM 71.4	NF4 06/04/80	<1	2	2	<1	20	4	<10	<0.1	<10	5.3	0.01
5	COWLITZ RM 0.2	NF5 05/28/80	<1	<1	<1	5	70	3	130	<0.1	<10	2.2	0.01
1	COLUMBIA RM 32.7	EF1 05/14/80	1	<1	<1	1	80	1	<10	<0.1	37	4.1	0.1
4	COLUMBIA RM 71.4	EF4 05/28/80	<1	<1	<1	3	20	3	540	<0.1	<10	4.9	0.01
5	COWLITZ RM 0.2	EF3 05/28/80	9	<1	<1	8	270	3	150	<0.1	30	1.3	0.01
6	COWLITZ RM 2.0	EF3 05/28/80	1	<1	<1	2	150	1	160	<0.1	<10	2.6	<0.1
7	COWLITZ RM 3.5	EF3 05/28/80	<1	<1	<1	8	230	2	100	<0.1	22	4.8	0.01
8	COWLITZ RM 12.8	EF4 06/04/80	<1	1	1	4	50	4	120	0.1	70	5.4	0.03
9	CARROLLS CHANNEL	EF3 05/28/80	<1	<1	<1	3	80	1	420	<0.1	<10	6.9	0.09

TABLE 19B.--COLUMBIA AND COWLITZ RIVERS, WASHINGTON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELutriATES--CONTINUED

S I T E NO.	C O D E	SITE DESCRIPTION	PHOSPHORUS		PHENOLS	
			ORTHOPHOSPHATE (UG/L AS P)		ORTHOPHOSPHATE (UG/L AS P)	PHENOLS (UG/L)
1	COLUMBIA RM	32.7 NF1	12		4	
2	COLUMBIA RM	65.8 NF2	<10		--	
3	COLUMBIA RM	70.8 NF3	21		12	
4	COLUMBIA RM	71.4 NF4	18		--	
5	COWLITZ RM	0.2 NF5	<10		10	
1	COLUMBIA RM	32.7 EF1	26		52	
4	COLUMBIA RM	71.4 EF4	17		110	
5	COWLITZ RM	0.2 EF3	16		210	
6	COWLITZ RM	2.0 EF3	19		190	
7	COWLITZ RM	3.5 EF3	18		28	
8	COWLITZ RM	12.8 EF4	20		--	
9	CARROLLS CHANNEL	EF3	<10		110	

TABLE 19C.---COLUMBIA AND COWLITZ RIVERS, WASHINGTON PROJECT

ADDITIONAL DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E	C O D E	SITE	DESCRIPTION	DATE	ARSENIC	BARIUM	BERYL- LIUM	CYANIDE	NICKEL	NITRO- GEN,AM- MONIA + ORGANIC	PH	SPE- CIFIC- CON- DUCT- ANCE	PHOS- PHORUS,
					(UG/L AS AS)	(UG/L AS BA)	(UG/L AS BE)	(UG/L AS CN)	(UG/L AS NI)	(MG/L AS N)	(UNITS) (MICRO- MHOS/CM)	(UG/L AS P)	
1		COLUMBIA RM 32.7	NF1	05/14/80	1	<100	<10	4	<1	1.8	7.8	143	47
2		COLUMBIA RM 65.8	NF2	05/21/80	--	<100	<10	--	--	--	7.6	139	--
3		COLUMBIA RM 70.8	NF3	05/28/80	1	<100	<10	3	1	0.4	7.9	124	34
4		COLUMBIA RM 71.4	NF4	06/04/80	1	<100	<10	--	2	0.5	8.0	133	52
5		COWLITZ RM 0.2	NF5	05/28/80	1	<100	<10	--	3	0.1	7.5	83	--
1		COLUMBIA RM 32.7	EF1	05/14/80	1	<100	<10	3	7	3.4	7.6	142	58
4		COLUMBIA RM 71.4	EF4	05/28/80	--	--	--	--	--	--	7.1	180	--
5		COWLITZ RM 0.2	EF3	05/28/80	1	<100	<10	4	3	0.3	7.3	112	34
6		COWLITZ RM 2.0	EF3	05/28/80	1	<100	<10	1	6	0.2	7.8	121	27
7		COWLITZ RM 3.5	EF3	05/28/80	--	--	--	--	--	--	7.1	130	--
8		COWLITZ RM 12.8	EF4	06/04/80	1	<100	<10	--	4	3.2	7.8	126	42
9		CARROLLS CHANNEL	EF3	05/28/80	--	--	--	--	--	--	6.9	190	--

TABLE 19D.--COLUMBIA AND COWLITZ RIVERS, WASHINGTON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

SITE NO.	C O D E	SITE DESCRIPTION	DATE	ALDRIN (UG/L)	AME-TRYNE (UG/L)	ATRA-TONE (UG/L)	ATRA-ZINE (UG/L)	CHLOR-DANE (UG/L)	CYAN-AZINE (UG/L)	CYPRA-ZINE (UG/L)	DDD (UG/L)	DDE (UG/L)	DDT (UG/L)	DI-ELDRIN (UG/L)	ENDO-SULFAN (UG/L)		
1	COLUMBIA	RM 32.7	NF1 05/14/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01	<.01	
3	COLUMBIA	RM 70.8	NF3 05/28/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01	<.01	
5	COWLITZ	RM 0.2	NF5 05/28/80	--	<.1	<.1	--	--	<.1	<.1	--	--	--	--	--	--	
1	COLUMBIA	RM 32.7	EF1 05/14/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01	<.01	
5	COWLITZ	RM 0.2	EF3 05/28/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01	<.01	
6	COWLITZ	RM 2.0	EF3 05/28/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01	<.01	
SITE NO.	C O D E	SITE DESCRIPTION	DATE	HEPTA-CHLOR (UG/L)	HEPTA-CHLOR EPOXIDE (UG/L)	LINDANE (UG/L)	METH-OXY-CHLOR (UG/L)	MIREX (UG/L)	PCB (UG/L)	NAPH-THA-LENES, POLY-CHLOR. (UG/L)	PER-THANE (UG/L)	PROME-TONE (UG/L)	PROME-TRYNE (UG/L)	PRO-PAZINE (UG/L)			
1	COLUMBIA	RM 32.7	NF1	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	
3	COLUMBIA	RM 70.8	NF3	0.02	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	
5	COWLITZ	RM 0.2	NF5	--	--	--	--	--	--	--	--	--	--	--	--	--	
1	COLUMBIA	RM 32.7	EF1	0.07	<.01	0.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	
5	COWLITZ	RM 0.2	EF3	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	
6	COWLITZ	RM 2.0	EF3	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	

TABLE 19D.--COLUMBIA AND COWLITZ RIVERS, WASHINGTON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES--CONTINUED

SITE NO.	SITE DESCRIPTION	C O D E	SILVEX (UG/L)	SIMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)
1	COLUMBIA RM 32.7	NF1	0.01	<.1	<.01	<.1	<1	0.01	<.01	0.01
3	COLUMBIA RM 70.8	NF3	0.01	<.1	<.01	<.1	<1	0.04	0.04	0.01
5	COWLITZ RM 0.2	NF5	--	--	<.01	--	--	--	<.01	--
1	COLUMBIA RM 32.7	EF1	0.01	<.1	<.01	<.1	<1	0.01	<.01	0.01
5	COWLITZ RM 0.2	EF3	0.01	<.1	<.01	<.1	<1	0.02	0.02	0.01
6	COWLITZ RM 2.0	EF3	<.01	<.1	<.01	<.1	<1	0.03	<.01	<.01

TABLE 19E.--COLUMBIA AND COWLITZ RIVERS, WASHINGTON PROJECT

TOTAL RECOVERABLE CHEMICALS IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	ARSENIC (UG/G)	BARIUM (UG/G)	BERYL- LIUM (UG/G)	CADMIUM (UG/G)	CHRO- MIUM (UG/G)	COPPER (UG/G)	CYANIDE (UG/G)	IRON (UG/G)	LEAD (UG/G)	MANGA- NESE (UG/G)	MERCURY (UG/G)
1	COLUMBIA RM	32.7 BM	05/15/80	4	30	<2.5	1	2	5	<0.5	5900	10	150	<.01
5	COWLITZ RM	0.2 BM	05/28/80	2	6	<2.5	1	1	16	<0.5	2800	10	45	0.05
8	COWLITZ RM	12.8 BM	06/04/80	2	3	<2.5	<1	1	16	1	1400	<10	32	0.02

S I T E NO.	C O D E	SITE DESCRIPTION	NICKEL (UG/G)	ZINC (UG/G)	CARBON, INOR- GANIC (G/KG)	CARBON, INORG + ORGANIC (G/KG)	NITRO- GEN,NH4 (MG/KG) AS N	NITRO- GEN,NH4 + ORG. (MG/KG) AS N	PHOS- PHORUS (MG/KG)
1	COLUMBIA RM	32.7 BM	10	25	<.1	1	18	85	400
5	COWLITZ RM	0.2 BM	<2.5	5	0.1	2	4	37	460
8	COWLITZ RM	12.8 BM	<2.5	4	0.1	1	5	29	320

TABLE 19F.--COLUMBIA AND COWLITZ RIVERS, WASHINGTON PROJECT

TOTAL RECOVERABLE INSECTICIDES AND HERBICIDES IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '---' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	D A T E	A L D R I N (U G /K G)	C H L O R - D A N E (U G /K G)	D D D (U G /K G)	D D E (U G /K G)	D D T (U G /K G)	D I - E L D R I N (U G /K G)	E N D O - S U L F A N (U G /K G)	E N D R I N (U G /K G)	H E P T A - C H L O R (U G /K G)	H E P T A - C H L O R E P O X I D E (U G /K G)	L I N D A N E (U G /K G)	
1	C	COLUMBIA RM 32.7	BM 05/15/80	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
5	O	COWLITZ RM 0.2	BM 05/28/80	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
8	D	COWLITZ RM 12.8	BM 06/04/80	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	M E T H - O X Y - C H L O R (U G /K G)	M I R E X (U G /K G)	P C B (U G /K G)	P C N (U G /K G)	P E R - T H A N E (U G /K G)	S I L V E X (U G /K G)	T O X A - P H E N E (U G /K G)	2,4-D (U G /K G)	2,4,5-T (U G /K G)	2,4-DP (U G /K G)	
1	C	COLUMBIA RM 32.7	<.1	<.1	<.1	--	<.1	<.1	<.1	<.1	<.1	<.1	<.1
5	O	COWLITZ RM 0.2	<.1	<.1	<.1	--	<.1	<.1	<.1	<.1	<.1	<.1	<.1
8	D	COWLITZ RM 12.8	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1

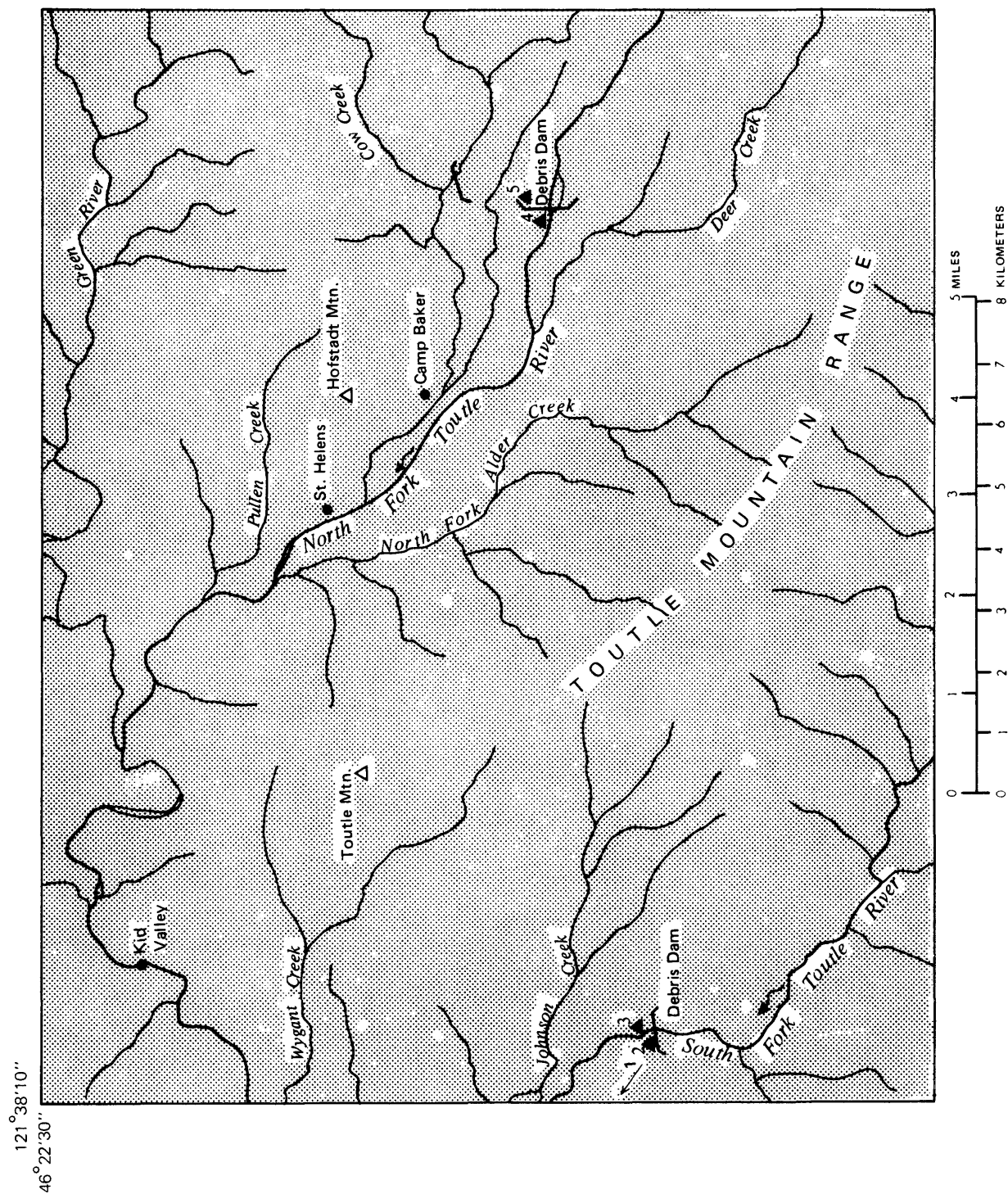


Figure 15. — Map of sampling sites for the North and South Forks Toutle River, WA, near retention structures.

Table 20a.--Location of sampling sites, North and South Forks Toutle River, Wash., near retention structures project

Site no.	Site designation		Collection date	Site location		Remarks
				Latitude	Longitude	
1	S.F. Toutle RM	4.1	11-25-80	46°19'08"	122°40'01"	S.F. Toutle River retention structure near here.
2	do.	6.0	do.	46°17'53"	122°37'33"	
3	do.	6.1	do.	46°17'50"	122°37'29"	
4	N.F. Toutle RM	20.3	do.	46°18'48"	122°28'23"	
5	do.	20.7	do.	46°18'44"	122°27'54"	

TABLE 20B.--NORTH AND SOUTH FORKS TOUTLE RIVER, WASHINGTON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '---' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	D A T E	C A D M I U M (U G /L A S C D)	C H R O M I U M (U G /L A S C R)	C O P P E R (U G /L A S C U)	I R O N (U G /L A S F E)	L E A D (U G /L A S P B)	M A N G A N E S E (U G /L A S M N)	M E R C U R Y (U G /L A S H G)	Z I N C (U G /L A S Z N)	C A R B O N, O R G A N I C (M G /L A S C)	N I T R O G E N, A M M O N I A (M G /L A S N)	
1	SF	TOUTLE RM 4.1	NF1 11/25/80	1	<1	2	100	<1	70	<0.1	<10	3.4	<0.1	<0.1
4	NF	TOUTLE RM 20.3	NF2 11/25/80	1	<1	4	10	<1	730	<0.1	<10	6.1	<0.1	<0.1
2	SF	TOUTLE RM 6.0	EF1 11/25/80	<1	<1	2	40	<1	40	<0.1	10	5.7	<0.1	0.02
3	SF	TOUTLE RM 6.1	EF1 11/25/80	1	<1	2	30	<1	30	<0.1	<10	3.3	<0.1	0.02
4	NF	TOUTLE RM 20.3	EF2 11/25/80	<1	<1	2	20	<1	530	<0.1	10	5.4	<0.1	0.01
5	NF	TOUTLE RM 20.7	EF2 11/25/80	1	<1	1	20	<1	520	<0.1	<10	6.3	<0.1	0.08
S I T E N O.														
S I T E D E S C R I P T I O N														
C H R O M I U M (U G /L A S C R)														
C O P P E R (U G /L A S C U)														
I R O N (U G /L A S F E)														
L E A D (U G /L A S P B)														
M A N G A N E S E (U G /L A S M N)														
M E R C U R Y (U G /L A S H G)														
Z I N C (U G /L A S Z N)														
C A R B O N, O R G A N I C (M G /L A S C)														
N I T R O G E N, A M M O N I A (M G /L A S N)														

TABLE 20C.--NORTH AND SOUTH FORKS TOUTLE RIVER, WASHINGTON PROJECT

ADDITIONAL DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E	C O D E	SITE	DATE	ARSENIC (UG/L AS AS)	BARIUM (UG/L AS BA)	BERYL- LIUM (UG/L AS BE)	CYANIDE (UG/L AS CH)	NICKEL (UG/L AS NI)	NITRO- GEN,AM- MONIA + ORGANIC (MG/L AS N)	PH	SPE- CIFIC- CON- DUCT- ANCE (MICRO- MHOS/CM)	PHOS- PHORUS, (UG/L AS P)
NO.		DESCRIPTION										
1	SF	TOUTLE RM 4.1	NF1	11/25/80	<1	<100	<10	1	0.2	7.6	60	38
4	NF	TOUTLE RM 20.3	NF2	11/25/80	<1	<100	<10	7	0.4	7.6	516	53
3	SF	TOUTLE RM 6.1	EF1	11/25/80	<1	<100	<10	4	0.2	7.5	64	--
5	NF	TOUTLE RM 20.7	EF2	11/25/80	<1	<100	<10	6	1.2	7.7	542	160

TABLE 20D.--NORTH AND SOUTH FORKS TOUTLE RIVER, WASHINGTON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	D A T E	A L D R I N (U G /L)	A M E - T R Y N E (U G /L)	A T R A - T O N E (U G /L)	A T R A - Z I N E (U G /L)	C H L O R - D A N E (U G /L)	C Y A N - A Z I N E (U G /L)	C Y P R A - Z I N E (U G /L)	D D D (U G /L)	D D E (U G /L)	D D T (U G /L)	D I - E L D R I N (U G /L)	E N D O - S U L F A N (U G /L)
1	SP	TOUTLE RM 4.1	NF1 11/25/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
4	NF	TOUTLE RM 20.3	NF2 11/25/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
3	SP	TOUTLE RM 6.1	EF1 11/25/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
5	NF	TOUTLE RM 20.7	EF2 11/25/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	D A T E	H E P T A - C H L O R (U G /L)	H E P T A - C H L O R E P O X I D E (U G /L)	L I N D A N E (U G /L)	M I R E X (U G /L)	P C B (U G /L)	P O L Y - C H L O R (U G /L)	P E R - T H A N E (U G /L)	P R O M E - T O N E (U G /L)	P R O M E - T R Y N E (U G /L)	P R O - P A Z I N E (U G /L)
1	SP	TOUTLE RM 4.1	NF1	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1
4	NF	TOUTLE RM 20.3	NF2	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1
3	SP	TOUTLE RM 6.1	EF1	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1
5	NF	TOUTLE RM 20.7	EF2	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1

TABLE 20D.--NORTH AND SOUTH FORKS TOUTLE RIVER, WASHINGTON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES--CONTINUED

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	S I L V E X (U G / L)	S I M A- Z I N E (U G / L)	S I M E- T O N E (U G / L)	S I M E- T R Y N E (U G / L)	T O X- A P H E N E (U G / L)	2,4-D (U G / L)	2,4-DP (U G / L)	2,4,5-T (U G / L)
1	SF	TOUTLE RM 4.1 NF1	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01
4	NF	TOUTLE RM 20.3 NF2	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01
3	SF	TOUTLE RM 6.1 EF1	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01
5	NF	TOUTLE RM 20.7 EF2	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01

TABLE 20E.--NORTH AND SOUTH FORKS TOUTLE RIVER, WASHINGTON PROJECT

TOTAL RECOVERABLE CHEMICALS IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURIHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURIHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	ARSENIC (UG/G)	BARIUM (UG/G)	BERYL- LIUM (UG/G)	CADMIUM (UG/G)	CHRO- MIUM (UG/G)	COPPER (UG/G)	CYANIDE (UG/G)	IRON (UG/G)	LEAD (UG/G)	MANGA- NESE (UG/G)	MERCURY (UG/G)
3	SF	TOUTLE TM 6.1	BM	11/25/80	<1	5	<1	2	8	<0.5	1500	<10	33	<.01
5	NF	TOUTLE RM 20.7	BM	11/25/80	<1	5	<1	2	14	<0.5	2300	10	44	<.01
<div> <div>S I T E NO.</div> <div>C O D E</div> <div>SITE DESCRIPTION</div> </div>														
3	SF	TOUTLE TM 6.1	BM	11/25/80	<1	5	<1	2	8	<0.5	1500	<10	33	<.01
5	NF	TOUTLE RM 20.7	BM	11/25/80	<1	5	<1	2	14	<0.5	2300	10	44	<.01

TABLE 20F.--NORTH AND SOUTH FORKS TOUTLE RIVER, WASHINGTON PROJECT

TOTAL RECOVERABLE INSECTICIDES AND HERBICIDES IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURIHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURIHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '-' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	A L D R I N (U G /K G)	C H L O R - D A N E (U G /K G)	D D D (U G /K G)	D D E (U G /K G)	D D T (U G /K G)	D I - E L D R I N (U G /K G)	E N D O - S U L F A N (U G /K G)	H E P T A - C H L O R (U G /K G)	H E P T A - C H L O R E P O X I D E (U G /K G)	L I N D A N E (U G /K G)
3	SF	TOUTLE TM 6.1 BM	11/25/80	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
5	NF	TOUTLE RM 20.7 BM	11/25/80	<.1	<.1	<.1	<.1	0.1	<.1	<.1	<.1	<.1
3	SF	TOUTLE TM 6.1 BM		<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
5	NF	TOUTLE RM 20.7 BM		<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1

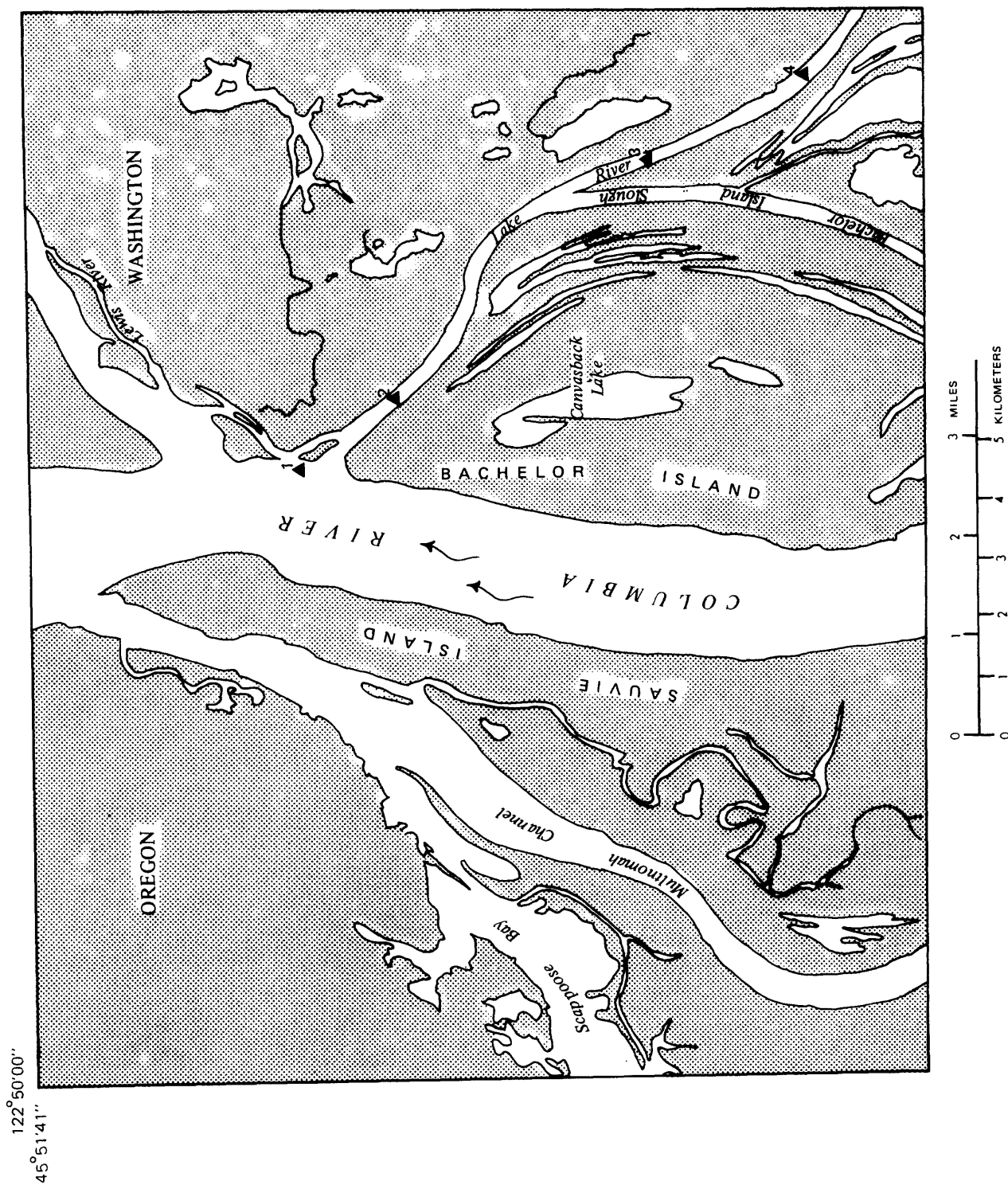


Figure 16. — Map of sampling sites for the Lake River, WA, project.

Table 21a.--Location of sampling sites, Lake River, Wash., project

Site no.	Site designation	Collec- tion date	Site location		Remarks
			Latitude	Longitude	
1	Lake RM 0.0	11-19-80	45°50'40"	122°46'50"	
2	do. 0.3	do.	45°50'27"	122°46'34"	
3	do. 2.0	do.	45°49'25"	122°45'15"	
4	do. 2.8	do.	45°48'49"	122°44'47"	

TABLE 21B.--LAKE RIVER, WASHINGTON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

SITE NO.	SITE DESCRIPTION	DATE	CADMIUM (UG/L AS CD)	CHROMIUM (UG/L AS CR)	COPPER (UG/L AS CU)	IRON (UG/L AS FE)	LEAD (UG/L AS PB)	MANGANESE (UG/L AS MN)	MERCURY (UG/L AS HG)	ZINC (UG/L AS ZN)	CARBON, ORGANIC (MG/L AS C)	NITROGEN, AMMONIA (MG/L AS N)
3	LAKE RM 2.0	NF1 11/19/80	1	<1	4	<10	1	<10	<0.1	<10	1.8	--
1	LAKE RM 0.0	EF1 11/19/80	1	<1	<1	<10	<1	160	<0.1	<10	5.0	0.39
2	LAKE RM 0.3	EF1 11/19/80	1	<1	1	50	<1	100	<0.1	20	5.6	3.5
3	LAKE RM 2.0	EF1 11/19/80	1	<1	1	40	<1	110	<0.1	10	5.9	2.6
4	LAKE RM 2.8	EF1 11/19/80	--	<1	1	30	<1	230	<0.1	10	6.1	0.28

SITE NO.	SITE DESCRIPTION	DATE	PHOSPHORUS ORTHOPHOSPHATE (UG/L AS P)	PHENOLS (UG/L)
3	LAKE RM 2.0	NF1	77	3
1	LAKE RM 0.0	EF1	37	6
2	LAKE RM 0.3	EF1	30	6
3	LAKE RM 2.0	EF1	27	100
4	LAKE RM 2.8	EF1	25	8

TABLE 21C.--LAKE RIVER, WASHINGTON PROJECT

ADDITIONAL DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E	C O D E	SITE	DESCRIPTION	DATE	ARSENIC (UG/L AS AS)	BARIUM (UG/L AS BA)	BERYL- LIUM (UG/L AS BE)	CYANIDE (UG/L AS CN)	NICKEL (UG/L AS NI)	NITRO- GEN,AM- MONIA + ORGANIC (MG/L AS N)	PH	SPE- CIFIC- CON- DUCT- ANCE (MICRO- MHOS/CH)	PHOS- PHORUS, (UG/L AS P)
3	LAKE RM 2.0	NF1	11/19/80	1	<100	<10	3	<1	--	8.2	183	77	
1	LAKE RM 0.0	EF1	11/19/80	--	--	--	--	--	--	--	7.9	171	--
2	LAKE RM 0.3	EF1	11/19/80	--	--	--	--	--	--	--	6.6	81	--
3	LAKE RM 2.0	EF1	11/19/80	--	--	--	--	--	--	--	6.7	62	--
4	LAKE RM 2.8	EF1	11/19/80	--	--	--	--	--	--	--	6.8	66	--

TABLE 21D.--LAKE RIVER, WASHINGTON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EF=ELUTRIATE WITH ESTUARINE WATER, EH=ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

SITE DESCRIPTION NO.	C O D E	DATE	ALDRIN (UG/L)	AME- TRYNE (UG/L)	ATRA- TONE (UG/L)	ATRA- ZINE (UG/L)	CHLOR- DANE (UG/L)	CYAN- AZINE (UG/L)	CYPRA- ZINE (UG/L)	DDD (UG/L)	DDE (UG/L)	DDT (UG/L)	DI- ELDRIN (UG/L)	ENDO- SULFAN (UG/L)
3 LAKE RM 2.0	NF1	11/19/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
SITE DESCRIPTION NO.	C O D E	ENDRIN (UG/L)	HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE (UG/L)	LINDANE (UG/L)	METH- OXY- CHLOR (UG/L)	MIREX (UG/L)	PCB (UG/L)	POLY- CHLOR. (UG/L)	PER- THANE (UG/L)	PROME- TONE (UG/L)	PROME- TRYNE (UG/L)	PRO- PAZINE (UG/L)	
3 LAKE RM 2.0	NF1	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	
SITE DESCRIPTION NO.	C O D E	SITE DESCRIPTION	SILVEX (UG/L)	SMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)				
3 LAKE RM 2.0	NF1	<.01	<.1	<.01	<.1	<.1	<.1	0.01	<.01	<.01				

121°57'30"
45°40'00"

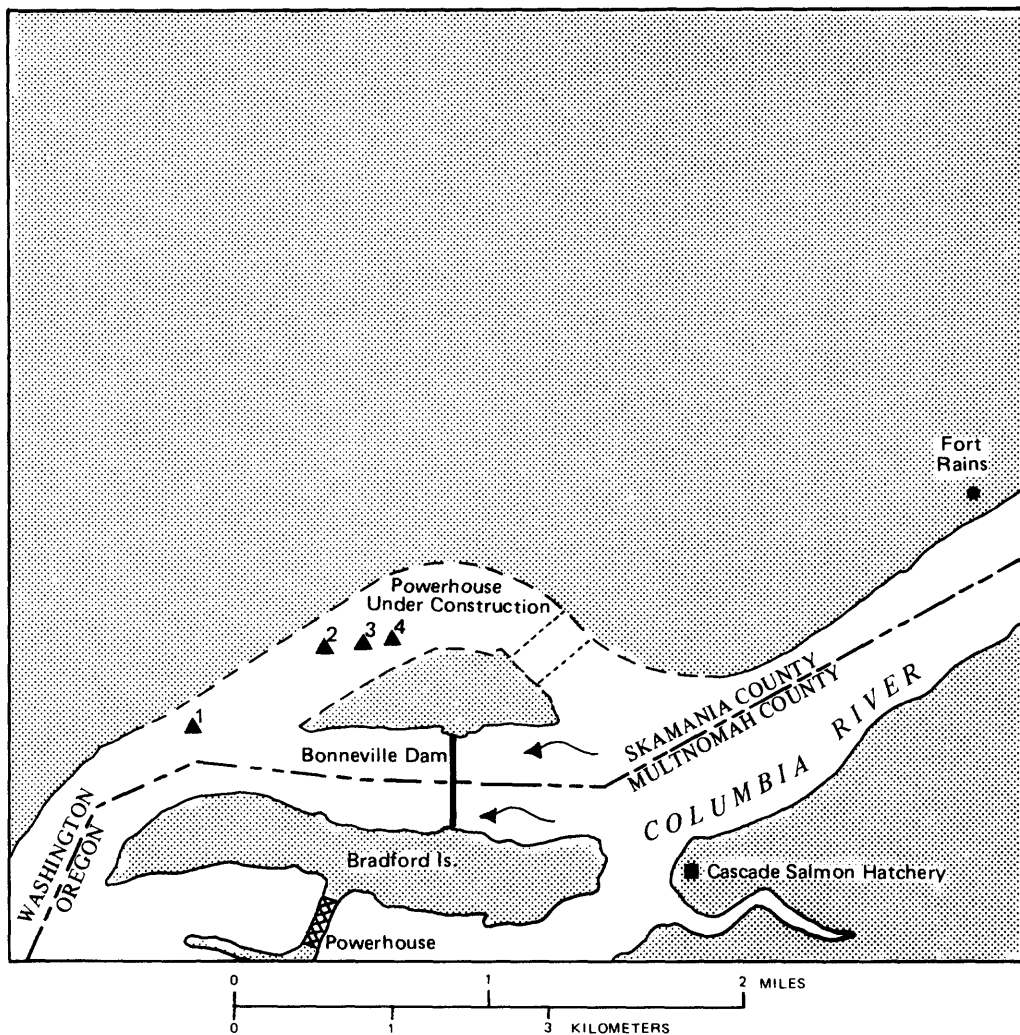


Figure 17. — Columbia River at powerhouse under construction at Bonneville Dam, WA.

Table 22a.--Location of sampling sites, Columbia River at powerhouse under construction at Bonneville Dam, Wash., project

Site no.	Site designation	Collection date	Site location		Remarks
			Latitude	Longitude	
1	Columbia RM 145.7	08-15-80	45°38'46"	121°57'02"	Powerhouse under construction near here.
2	do. 146	do.	45°38'54"	121°56'36"	
3	do.	do.	45°38'53"	121°56'42"	Do.
4	do.	do.	45°38'55"	121°56'32"	Do.

TABLE 22B.--COLUMBIA RIVER AT POWER HOUSE UNDER CONSTRUCTION AT BONNEVILLE DAM WASHINGTON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E SITE DESCRIPTION	DATE	CHROMIUM (UG/L AS CR)	COPPER (UG/L AS CU)		IRON (UG/L AS FE)		LEAD (UG/L AS PB)		MANGANESE (UG/L AS MN)		MERCURY (UG/L AS HG)		ZINC (UG/L AS ZN)		PHOSPHOROUS ORTHO-PHOSPHATE (UG/L AS P)	OIL AND GREASE (MG/L)
1	COLUMBIA RIVER	NF 08/15/80	<1	1	20	<1	<1	<1	<1	<1	<0.1	<0.1	<10	<10	<10	<10	--
2	COLUMBIA RIVER	EF 08/15/80	1	4	90	<1	<1	<1	<1	<1	<0.1	<0.1	22	<10	<10	<10	--
3	COLUMBIA RIVER	EF 08/15/80	<1	3	90	2	2	2	<1	<1	<0.1	<0.1	12	<10	<10	<10	0
4	COLUMBIA RIVER	EF 08/15/80	<1	8	40	1	1	1	<1	<1	0.1	0.1	<10	<10	<10	<10	0

S I T E NO.	C O D E SITE DESCRIPTION	DATE	ARSENIC (UG/L AS AS)		BARIUM (UG/L AS BA)		BORON- (UG/L AS B)		1/ CYANIDE (UG/L AS CN)		PH (UNITS)		SPE- CIFIC- CON- DUCT- ANCE (MICRO- MHOS)
1	COLUMBIA RIVER	NF 08/15/80	1	<100	10	--	8.1	145					
2	COLUMBIA RIVER	EF 08/15/80	1	<100	40	1	7.8	174					
3	COLUMBIA RIVER	EF 08/15/80	2	<100	30	--	8.3	119					
4	COLUMBIA RIVER	EF 08/15/80	1	<100	40	1	7.9	182					

1/ LOWER DETECTION LIMITS FOR CYANIDE ARE NOT AVAILABLE.

TABLE 22C.--COLUMBIA RIVER AT POWER HOUSE UNDER CONSTRUCTION AT BONNEVILLE DAM WASHINGTON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NF=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NP=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	ALDRIN (UG/L)	AME- TRYNE (UG/L)	ATRA- TONE (UG/L)	ATRA- ZINE (UG/L)	CHLOR- DANE (UG/L)	CYAN- AZINE (UG/L)	CYPR- ZINE (UG/L)	DDD (UG/L)	DDE (UG/L)	DDT (UG/L)	DI- ELDRIN (UG/L)	ENDO- SULFAN (UG/L)
1	C	COLUMBIA RIVER	NF 08/15/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
2	O	COLUMBIA RIVER	EF 08/15/80	<.01	--	--	<.1	<.1	--	--	<.01	<.01	<.01	<.01	<.01
3	D	COLUMBIA RIVER	EF 08/15/80	<.01	--	--	--	<.1	--	--	<.01	<.01	<.01	<.01	<.01
4	E	COLUMBIA RIVER	EF 08/15/80	<.01	--	--	--	<.1	--	--	<.01	<.01	<.01	<.01	<.01

S I T E NO.	C O D E	SITE DESCRIPTION	ENDRIN (UG/L)	HEPTA- CHLOR (UG/L)	HEPTA- CHLOR EPOXIDE (UG/L)	METH- OXY- CHLOR (UG/L)	MIREX (UG/L)	PCB (UG/L)	NAPH THA- LENES, POLY- CHLOR. (UG/L)	PER- THANE (UG/L)	PROME- TONE (UG/L)	PROME- TRYNE (UG/L)	PRO- PAZINE (UG/L)
1	C	COLUMBIA RIVER	NF <.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1
2	O	COLUMBIA RIVER	EF <.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	--
3	D	COLUMBIA RIVER	EF <.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	--	--	--
4	E	COLUMBIA RIVER	EF <.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	--	--	--

TABLE 22C.--COLUMBIA RIVER AT POWER HOUSE UNDER CONSTRUCTION AT BONNEVILLE DAM WASHINGTON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES--CONTINUED

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTON MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION										
			SILVEX (UG/L)	SIMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)		
1		COLUMBIA RIVER	<.01	<.1	<.01	<.1	<1	<.01	<.01	0.01		
2		COLUMBIA RIVER	<.01	<.1	--	<.1	<1	<.01	--	0.03		
3		COLUMBIA RIVER	--	--	--	--	<1	--	--	--		
4		COLUMBIA RIVER	--	--	--	--	<1	--	--	--		

TABLE 22D.--COLUMBIA RIVER AT POWER HOUSE UNDER CONSTRUCTION AT BONNEVILLE DAM WASHINGTON PROJECT

TOTAL RECOVERABLE CHEMICALS IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

SITE NO.	SITE DESCRIPTION	DATE	ARSENIC (UG/G)	BARIUM (UG/G)	BERYL- LIUM (UG/G)	BORON (UG/G)	CADMIUM (UG/G)	CHRO- MIUM (UG/G)	COPPER (UG/G)	CYANIDE (UG/G)	IRON (UG/G)	LEAD (UG/G)	MANGA- NESE (UG/G)
2	COLUMBIA RIVER	BM 08/15/80	4	70	<1	75	4	7	40	<0.5	12000	10	500
4	COLUMBIA RIVER	BM 08/15/80	4	140	<1	79	1	20	51	<0.5	32000	10	550

SITE NO.	SITE DESCRIPTION	MERCURY (UG/G)	NICKEL (UG/G)	ZINC (UG/G)	CARBON, INOR- GANIC (G/KG)	CARBON, INORG + ORGANIC (G/KG)	OIL AND GREASE (MG/KG)	NITRO- GEN,NH4 (MG/KG) AS N	NITRO- GEN,NH4 + ORG. (MG/KG) AS N	PHOS- PHORUS (MG/KG)
2	COLUMBIA RIVER	BM 0.07	20	41	0.10	3	0	8	220	520
4	COLUMBIA RIVER	BM 0.08	20	63	3.9	3.5	2000	20	200	980

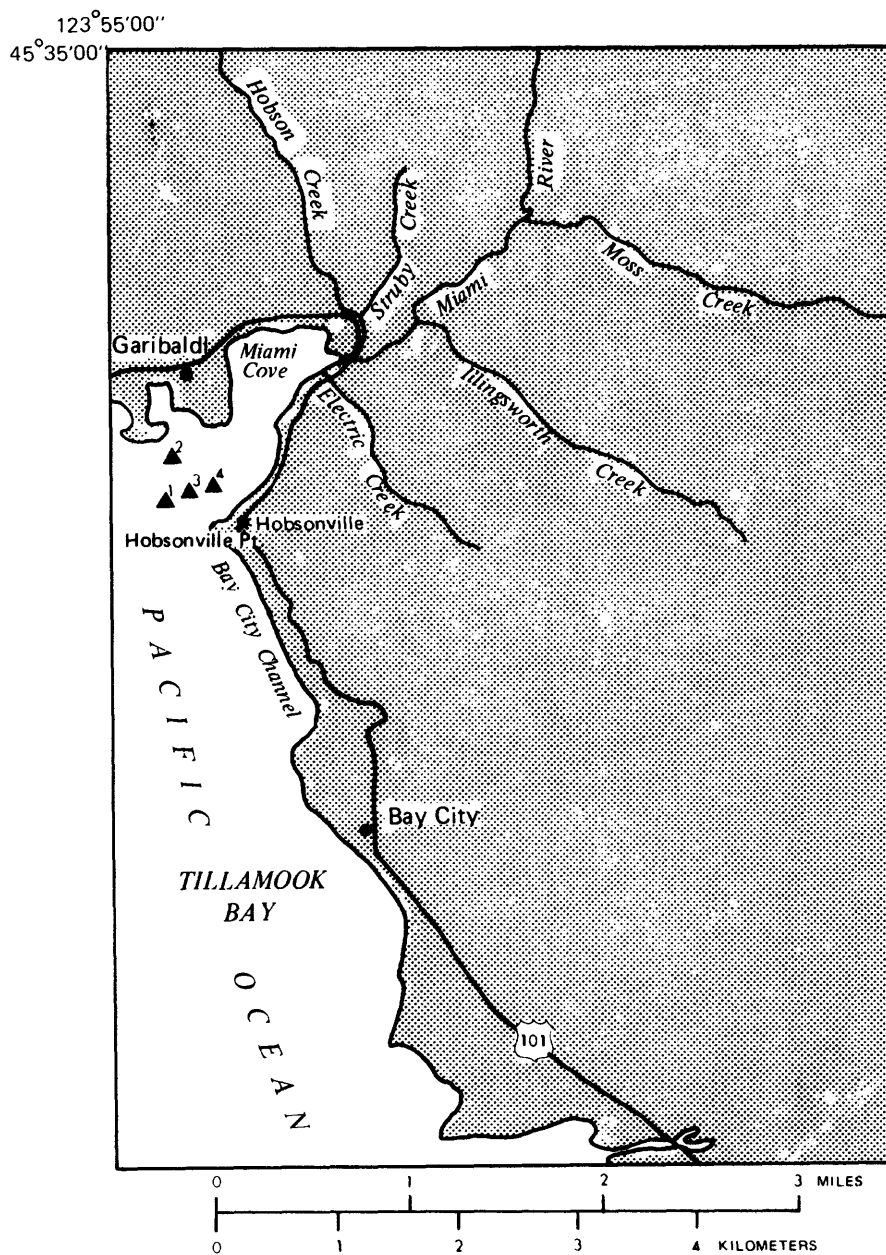


Figure 18. — Map of sampling sites for the Tillamook Bay near Garibaldi, OR, project.

Table 23a.--Location of sampling sites, Tillamook Bay near Garibaldi,
Oreg., project

Site no.	Site designation	Collec- tion date	Site location		Remarks
			Latitude	Longitude	
1	Garibaldi boat basin	12-15-80	45°33'11"	123°54'39"	
2	do.	12-16-80	45°33'19"	123°54'34"	
3	do.	12-15-80	45°33'13"	123°54'37"	
4	do.	do.	45°33'14"	123°54'16"	

TABLE 23B.--TILLAMOOK BAY NEAR GARIBALDI, OREGON, PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	CADIUM (UG/L AS CD)	CHROMIUM (UG/L AS CR)	COPPER (UG/L AS CU)	IRON (UG/L AS FE)	LEAD (UG/L AS PB)	MANGANESE (UG/L AS MN)	MERCURY (UG/L AS HG)	ZINC (UG/L AS ZN)	CARBON, ORGANIC (MG/L AS C)	NITROGEN, AMMONIA (MG/L AS N)
2	TIL.	BAY-GARBALDI NE1	12/16/80	<1	<1	<1	100	2	40	<0.1	40	3.3	0.04
2	TIL.	BAY-GARBALDI EE1	12/16/80	<1	<1	<1	400	<1	750	<0.1	40	12.0	1.2
1	TIL.	BAY-GARBALDI EE1	12/15/80	<1	<1	<1	130	1	890	<0.1	40	11.0	2.6
3	TIL.	BAY-GARBALDI EE1	12/15/80	1	<1	3	170	<1	810	<0.1	40	12.0	1.4
4	TIL.	BAY-GARBALDI EE1	12/15/80	<1	<1	<1	150	<1	660	<0.1	40	11.0	1.4
S I T E NO.	C O D E	SITE DESCRIPTION						PHOSPHORUS ORTHOPHOSPHATE (UG/L AS P)	PHENOLS (UG/L)				
2	TIL.	BAY-GARBALDI NE1						52	2				
2	TIL.	BAY-GARBALDI EE1						85	73				
1	TIL.	BAY-GARBALDI EE1						40	30				
3	TIL.	BAY-GARBALDI EE1						49	4				
4	TIL.	BAY-GARBALDI EE1						55	46				

TABLE 23C.--TILLAMOOK BAY NEAR GARIBALDI, OREGON, PROJECT

ADDITIONAL DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BN=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E	C O D E	SITE	DESCRIPTION	DATE	ARSENIC (UG/L AS AS)	BARIUM (UG/L AS BA)	BERYL- LIUM (UG/L AS BE)	CYANIDE (UG/L AS CH)	NICKEL (UG/L AS NI)	NITRO- GEN, AN- MONIA + ORGANIC (MG/L AS N)	PH	SPE- CIFIC- CON- DUCT- ANCE (MICRO- MHOS/CH) AS P)	PHOS- PHORUS, (UG/L AS P)
2	TIL.	BAY-GARIBALDI	NE1	12/16/80	1	<100	10	1	<1	0.1	8.1	40000	377
2	TIL.	BAY-GARIBALDI	EE1	12/16/80	2	<100	<10	2	<1	2.1	7.5	40700	228

TABLE 23D.--TILLAMOOK BAY NEAR GARIBALDI, OREGON, PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NP=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	D A T E	A L D R I N (UG/L)	A M E - T R Y N E (UG/L)	A T R A - T O N E (UG/L)	A T R A - Z I N E (UG/L)	C H L O R - D A N E (UG/L)	C Y A N - A Z I N E (UG/L)	C Y P R A - Z I N E (UG/L)	D D D (UG/L)	D D E (UG/L)	D D T (UG/L)	D I - E L D R I N (UG/L)	E N D O - S U L F A N (UG/L)
2	TIL.	BAY-GARBALDI	NE1	12/16/80	<.01	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
2	TIL.	BAY-GARBALDI	EE1	12/16/80	<.01	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	E N D R I N (UG/L)	H E P T A - C H L O R (UG/L)	H E P T A - C H L O R E P O X I D E (UG/L)	L I N D A N E (UG/L)	M E T H - O X Y - C H L O R (UG/L)	M I R E X (UG/L)	P C B (UG/L)	P O L Y - C H L O R (UG/L)	P E R - T H A N E (UG/L)	P R O M E - T O N E (UG/L)	P R O M E - T R Y N E (UG/L)	P R O - P A Z I N E (UG/L)
2	TIL.	BAY-GARBALDI	NE1	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1
2	TIL.	BAY-GARBALDI	EE1	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1

TABLE 23D.--TILLAMOOK BAY NEAR GARIBALDI, OREGON, PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES--CONTINUED

S I T E NO.	C O D E	SITE DESCRIPTION	SILVEX (UG/L)	SIMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)
2	TIL.	BAY-GARBALDI NE1	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01
2	TIL.	BAY-GARBALDI EE1	<.01	<.1	<.01	<.1	<1	<.01	<.01	<.01

TABLE 23F.--TILLAMOOK BAY NEAR GARIBALDI, OREGON, PROJECT

TOTAL RECOVERABLE INSECTICIDES AND HERBICIDES IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	CONCENTRATIONS (UG/KG)											
				ALDRIN	CHLOR- DANE	DDD	DDE	DDT	DI- ELDRIN	ENDO- SULFAN	ENDRIN	HEPTA- CHLOR	HEPTA- CHLOR EPOXIDE	LINDANE	
2	TIL.	BAY-GARBALDI BM	12/16/80	<.1	<.1	<.1	0.4	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
S I T E NO.	C O D E	SITE DESCRIPTION		CONCENTRATIONS (UG/KG)											
				METH- OXY- CHLOR	MIREX	PCB	PCN	PER- THANE	SILVEX	TOXA- PHENE	2,4-D	2,4,5-T	2,4-DP		
2	TIL.	BAY-GARBALDI BM		<.1	<.1	5	--	<.1	<.1	<.1	<.1	--	<.1		

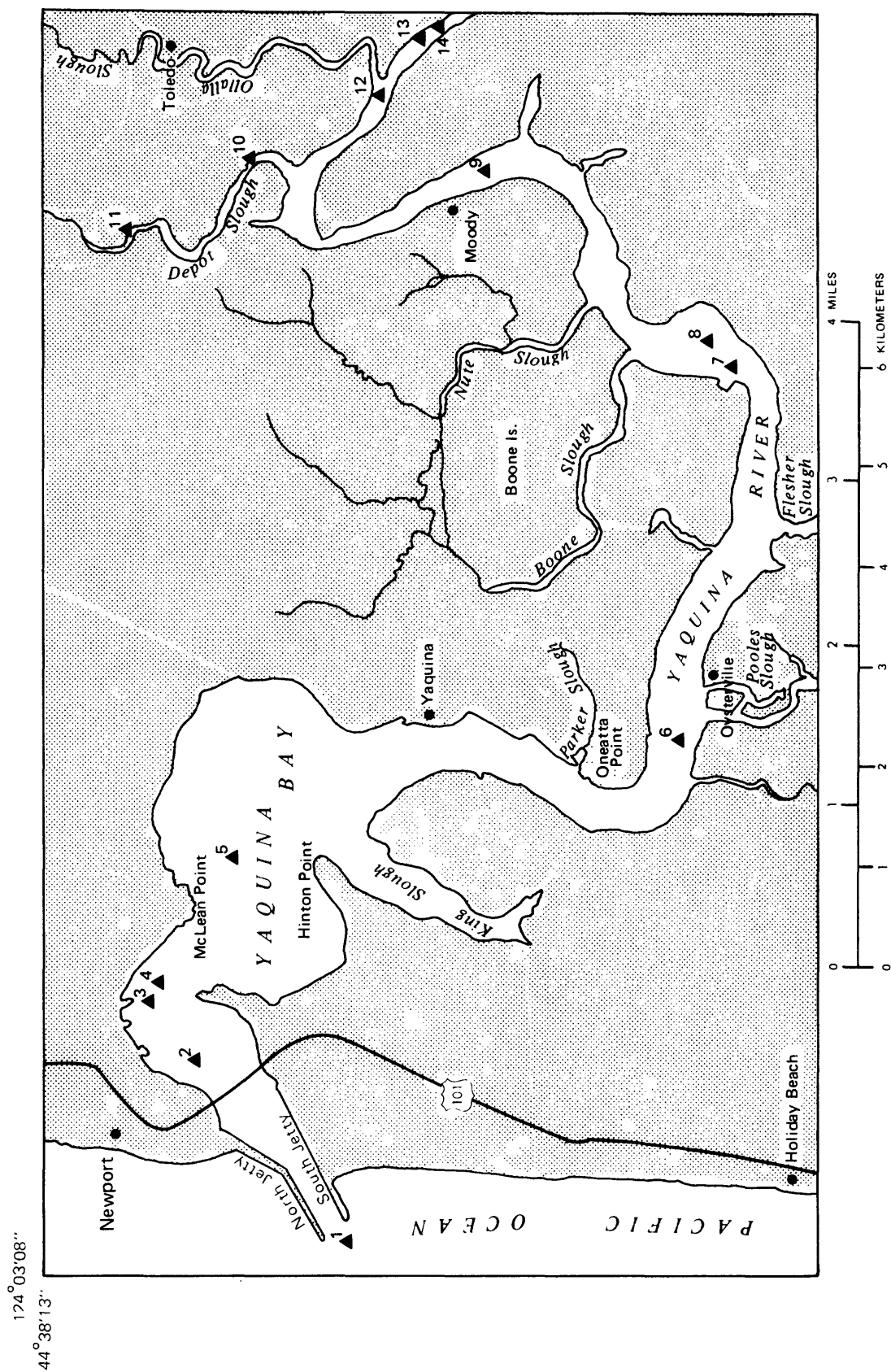


Figure 19. — Map of sampling sites for the Yaquina River, OR, project.

Table 24a.--Location of sampling sites, Yaquina River, Oreg., project

Site no.	Site designation	Collection date	Site location		Remarks
			Latitude	Longitude	
1	Pacific Ocean	06-11-80	44°36'38"	124°04'49"	
2	Yaquina RM 1.2	06-12-80	44°37'31"	124°03'05"	
3	do. 1.7	do.	44°37'47"	124°02'38"	
4	do. 1.8	do.	44°37'43"	124°02'31"	
5	do. 2.8	do.	44°37'13"	124°01'43"	
6	do. 6.3	do.	44°34'52"	124°00'46"	
7	do. 8.6	06-13-80	44°34'26"	123°57'53"	
8	do. 9.0	do.	44°34'40"	123°57'46"	
9	do. 11.0	do.	44°35'51"	123°56'21"	
10	Depot Slough RM 0.25	06-10-80	44°37'05"	123°56'14"	Confluence of Depot Slough and Yaquina River is at Yaquina RM 12.7.
11	Depot Slough RM 1.5	do.	44°37'51"	123°56'48"	
12	Yaquina RM 13.4	do.	44°36'26"	123°55'46"	
13	do. 13.8	do.	44°36'13"	123°55'21"	
14	do. 14.0	06-11-80	44°36'08"	123°55'15"	

TABLE 24B.--YAQUINA RIVER, OREGON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NP=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	SITE DESCRIPTION	C O D E	DATE	1/ CADMIUM (UG/L AS CD)	CHROMIUM (UG/L AS CR)	COPPER (UG/L AS CU)	IRON (UG/L AS FE)	LEAD (UG/L AS PB)	MANGANESE (UG/L AS MN)	MERCURY (UG/L AS HG)	2/ ZINC (UG/L AS ZN)	CARBON, ORGANIC (MG/L AS C)	NITROGEN, AMMONIA (MG/L AS N)
1	PACIFIC OCEAN	NE1	06/11/80	1.30	--	2	100	2	30	<0.1	11.0	6.4	0.1
14	YAQUINA	RM 14.0	NH2 06/11/80	0.11	--	3	20	<1	20	<0.1	3.3	4.5	0.06
2	YAQUINA	RM	1.2 EE1 06/12/80	0.88	<1	1	120	<1	40	<0.1	1.8	3.7	1.4
3	YAQUINA	RM	1.7 EE1 06/12/80	0.09	<1	1	120	<1	140	<0.1	1.2	3.2	0.86
3	YAQUINA	RM	1.7 EH2 06/12/80	0.41	<1	2	40	2	60	0.1	1.8	6.9	1.3
4	YAQUINA	RM	1.8 EE1 06/12/80	0.12	--	3	130	<1	90	<0.1	1.8	7.4	1.6
4	YAQUINA	RM	1.8 EH2 06/12/80	0.41	--	1	40	<1	40	<0.1	5.4	15.0	1.4
5	YAQUINA	RM	2.8 EE1 06/12/80	0.32	<1	3	160	<1	380	0.2	3.4	10.0	1.9
5	YAQUINA	RM	2.8 EH2 06/12/80	0.05	--	4	60	<1	180	<0.1	2.6	11.0	1.8
6	YAQUINA	RM	6.3 EE1 06/12/80	0.01	--	2	110	1	410	0.2	5.4	19.0	5.3
6	YAQUINA	RM	6.3 EH2 06/12/80	0.25	<1	6	40	<1	160	<0.1	1.7	27.0	4.1
7	YAQUINA	RM	8.6 EE1 06/13/80	0.08	<1	3	120	1	200	<0.1	8.3	4.0	0.41
7	YAQUINA	RM	8.6 EH2 06/13/80	0.18	<1	1	50	<1	80	<0.1	3.5	5.3	0.42
8	YAQUINA	RM	9.0 EE1 06/13/80	0.11	<1	2	110	<1	230	<0.1	4.8	3.0	0.38
8	YAQUINA	RM	9.0 EH2 06/13/80	0.14	<1	2	40	2	110	0.1	3.5	3.4	0.23
9	YAQUINA	RM	11.0 EE1 06/10/80	0.05	<1	4	126	<1	485	<0.1	2.7	4.5	1
9	YAQUINA	RM	11.0 EH2 06/10/80	0.08	<1	<1	40	<1	194	0.1	1.2	5.9	0.67
10	DEPOTS SL.	RM	.25 EE1 06/10/80	0.47	<1	2	4000	2	3600	0.2	12.0	14.0	14
10	DEPOTS SL.	RM	.25 EH2 06/10/80	0.15	--	3	770	3	1300	<0.1	4.1	12.0	9.1
11	DEPOTS SL.	RM	1.5 EE1 06/10/80	0.01	<1	<1	120	<1	630	<0.1	3.7	6.3	1.4
11	DEPOTS SL.	RM	1.5 EH2 06/10/80	0.06	<1	2	70	<1	410	<0.1	1.3	8.7	0.76
12	YAQUINA	RM	13.4 EE1 06/10/80	0.01	<1	11	110	<1	10000	0.1	2.7	5.6	4.5
13	YAQUINA	RM	13.8 EE1 06/10/80	0.26	<1	1	143	<1	5500	<0.1	2.5	0.5	1.3

1/ CHEMICAL ANALYSES FOR CADMIUM HAVE AND LOWER DETECTION LIMIT OF .01 UG/L.

2/ CHEMICAL ANALYSES FOR ZINC HAVE A LOWER DETECTION LIMIT OF .2 UG/L.

TABLE 24B.--YAUQUINA RIVER, OREGON PROJECT
DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES--CONTINUED

S I T E NO.	C O D E	SITE DESCRIPTION	PHOSPHORUS		PHENOLS (UG/L)
			ORTHOPHOSPHATE (UG/L AS P)		
1	PACIFIC OCEAN	NE1	14		<1
14	YAUQUINA	RM 14.0 NH2	22		<1
2	YAUQUINA	RM 1.2 EE1	19		9
3	YAUQUINA	RM 1.7 EE1	64		<1
3	YAUQUINA	RM 1.7 EH2	116		42
4	YAUQUINA	RM 1.8 EE1	77		12
4	YAUQUINA	RM 1.8 EH2	76		51
5	YAUQUINA	RM 2.8 EE1	19		7
5	YAUQUINA	RM 2.8 EH2	16		<1
6	YAUQUINA	RM 6.3 EE1	67		190
6	YAUQUINA	RM 6.3 EH2	87		200
7	YAUQUINA	RM 8.6 EE1	<10		10
7	YAUQUINA	RM 8.6 EH2	<10		11
8	YAUQUINA	RM 9.0 EE1	12		17
8	YAUQUINA	RM 9.0 EH2	<10		1
9	YAUQUINA	RM 11.0 EE1	38		170
9	YAUQUINA	RM 11.0 EH2	43		<1
10	DEPOTS SL.	RM .25 EE1	19		190
10	DEPOTS SL.	RM .25 EH2	18		95
11	DEPOTS SL.	RM 1.5 EE1	13		23
11	DEPOTS SL.	RM 1.5 EH2	22		1
12	YAUQUINA	RM 13.4 EE1	26		1
13	YAUQUINA	RM 13.8 EE1	28		<1

TABLE 24C.--YAQUINA RIVER, OREGON PROJECT

ADDITIONAL DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

SITE	NO.	DESCRIPTION	DATE	ARSENIC (UG/L AS AS)	BARIUM (UG/L AS BA)	BERYL- LIUM (UG/L AS BE)	CYANIDE (UG/L AS CN)	NICKEL (UG/L AS NI)	NITRO- GEN,AM- MONIA + ORGANIC (MG/L AS N)	PH	SPE- CIFIC- CON- DUCT- ANCE (MICRO- MHOS/CM)	PHOS- PHORUS, (UG/L AS P)
1 PACIFIC OCEAN	NE1		06/11/80	1	--	--	1	<1	0.4	8.2	56300	33
14 YAQUINA	RM 14.0 NH2		06/11/80	<1	<100	<10	1	2	0.5	7.5	14800	30
4 YAQUINA	RM 1.8 EE1		06/12/80	4	<100	10	2	4	2.9	--	42600	135
4 YAQUINA	RM 1.8 EH2		06/12/80	5	<100	<10	2	2	3.2	7.8	18700	233
10 DEPOTS SL. RM	.25 EE1		06/10/80	4	500	<10	2	3	14.0	7.0	42100	63
10 DEPOTS SL. RM	.25 EH2		06/10/80	2	<100	<10	2	2	11.0	7.4	15200	38

TABLE 24D.--YAQUINA RIVER, OREGON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURIHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH=ELUTRIATE WITH EURIHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	ALDRIN (UG/L)	AME- TRYNE (UG/L)	ATRA- TONE (UG/L)	ATRA- ZINE (UG/L)	CHLOR- DANE (UG/L)	CYAN- AZINE (UG/L)	CYPRA- ZINE (UG/L)	DDD (UG/L)	DDE (UG/L)	DDT (UG/L)	DI- ELDRIN (UG/L)	ENDO- SULFAN (UG/L)
1	PACIFIC OCEAN	NE1	06/11/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
14	YAQUINA RM 14.0	NH2	06/11/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
4	YAQUINA RM 1.8	EE1	06/12/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
4	YAQUINA RM 1.8	EH2	06/12/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
10	DEPOTS SL. RM .25	EE1	06/10/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
10	DEPOTS SL. RM .25	EH2	06/10/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01

S I T E NO.	C O D E	SITE DESCRIPTION	ENDRIN (UG/L)	HEPTA- CHLOR (UG/L)	HEPTA- CHLOR EPOXIDE (UG/L)	LINDANE (UG/L)	METH- OXY- CHLOR (UG/L)	MIREX (UG/L)	PCB (UG/L)	NAPH- THA- LENES, POLY- CHLOR. (UG/L)	PER- THANE (UG/L)	PROME- TONE (UG/L)	PRONE- TRYNE (UG/L)	PRO- PAZINE (UG/L)
1	PACIFIC OCEAN	NE1	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1
14	YAQUINA RM 14.0	NH2	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1
4	YAQUINA RM 1.8	EE1	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1
4	YAQUINA RM 1.8	EH2	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1
10	DEPOTS SL. RM .25	EE1	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1
10	DEPOTS SL. RM .25	EH2	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1

TABLE 24D.--YAQUINA RIVER, OREGON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELutriATES--CONTINUED

S I T E N O.	C O D E	SITE DESCRIPTION	SILVEX (UG/L)	SIMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)
1	PACIFIC OCEAN		NE1	<.01	<.01	<.1	<1	--	0.01	<.01
14	YAQUINA	RM 14.0	NH2	<.01	<.01	<.1	<1	<.01	<.01	<.01
4	YAQUINA	RM 1.8	EE1	<.01	<.01	<.1	<1	<.01	<.01	<.01
4	YAQUINA	RM 1.8	EH2	<.01	<.01	<.1	<1	<.01	<.01	<.01
10	DEPOTS SL.	RM .25	EE1	<.01	<.01	<.1	<1	<.01	<.01	<.01
10	DEPOTS SL.	RM .25	EH2	<.01	<.01	<.1	<1	0.04	<.01	<.01

TABLE 24E.--YAQUINA RIVER, OREGON PROJECT

TOTAL RECOVERABLE CHEMICALS IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	ARSENIC (UG/G)	BARIUM (UG/G)	BERYL- LIUM (UG/G)	CADMIUM (UG/G)	CHRO- MIUM (UG/G)	COPPER (UG/G)	CYANIDE (UG/G)	IRON (UG/G)	LEAD (UG/G)	MANGA- NESE (UG/G)	MERCURY (UG/G)
4	YAQUINA	RM 1.8	BM	06/12/80	6	2	1	10	8	<0.5	7200	10	50	0.02
10	DEPOTS SL.	RM .25	BM	06/10/80	12	5	1	30	39	<0.5	31000	40	270	0.03

S I T E NO.	C O D E	SITE DESCRIPTION	NICKEL (UG/G)	ZINC (UG/G)	CARBON, INOR- GANIC (G/KG)	CARBON, INOR- GANIC (G/KG)	NITRO- GEN,NH4 (MG/KG) AS N	NITRO- GEN,NH4 (MG/KG) AS N	PHOS- PHORUS (MG/KG) AS N
4	YAQUINA	RM 1.8	RM	10	7200	1.2	8	36	530
10	DEPOTS SL.	RM .25	BM	20	31000	0.4	77	210	1300
									250
									890

TABLE 24F.--YAUQUINA RIVER, OREGON PROJECT

TOTAL RECOVERABLE INSECTICIDES AND HERBICIDES IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	D A T E										
				ALDRIN	CHLOR- DANE	DDD	DDE	DDT	DI- ELDRIN	ENDO- SULFAN	ENDRIN	HEPTA- CHLOR EPOXIDE	LINDANE
				(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)
4	YAUQUINA	RM 1.8 BM	06/12/80	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
10	DEPOTS SL.	RM .25 BM	06/10/80	<.1	<.1	<.1	<.1	<.1	0.5	<.1	<.1	<.1	<.1
S I T E N O.	C O D E	S I T E D E S C R I P T I O N	D A T E										
				METH- OXY- CHLOR	MIREX	PCB	PCN	PER- THANE	SILVEX	TOXA- PHENE	2,4-D	2,4,5-T	2,4-DP
				(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)	(UG/KG)
4	YAUQUINA	RM 1.8 BM		<.1	<.1	26	<.1	<.1	<.1	<.1	<.1	<.1	<.1
10	DEPOTS SL.	RM .25 BM		<.1	<.1	34	<.1	<.1	<.1	<.1	<.1	<.1	<.1

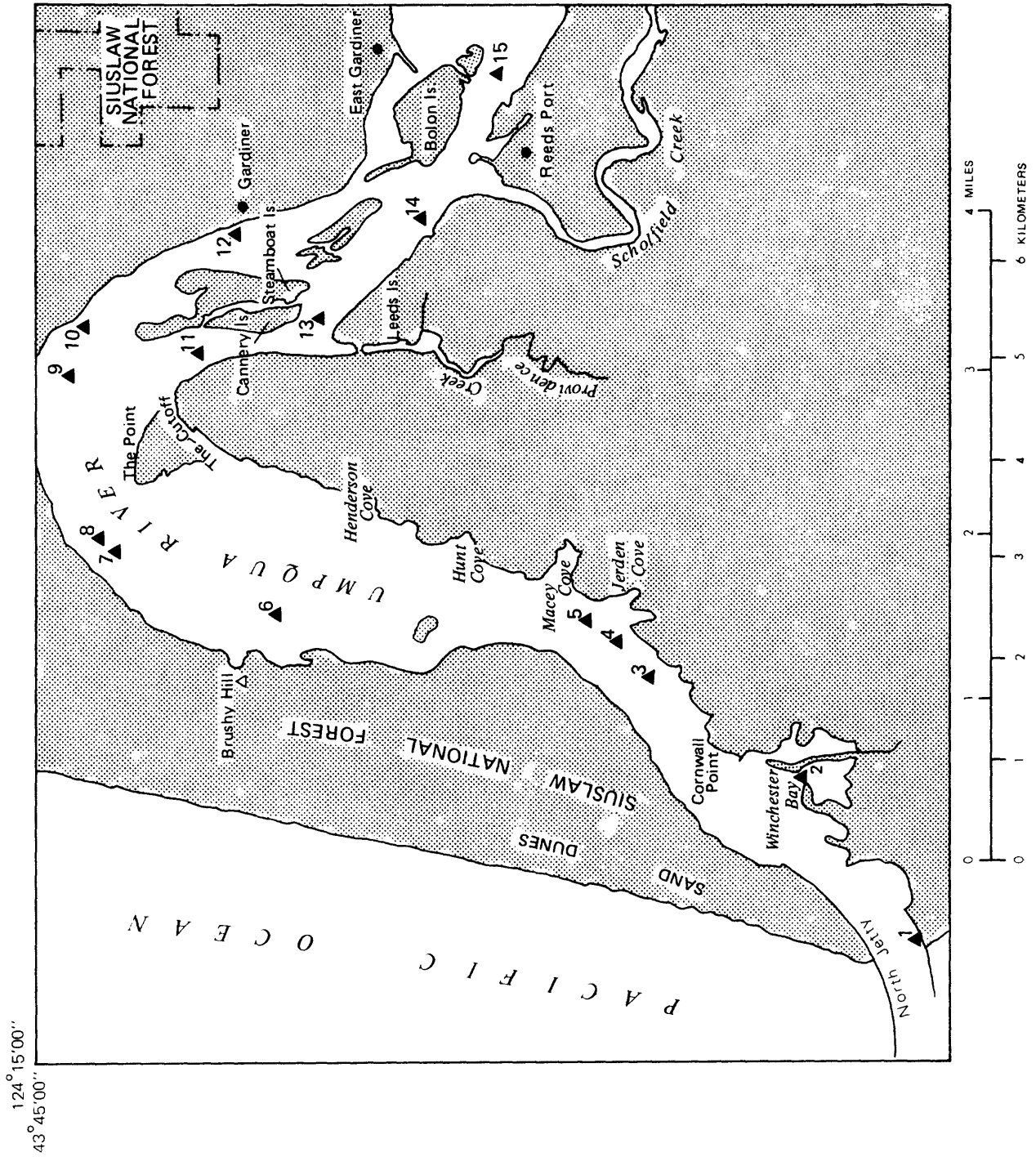


Figure 20. — Map of sampling sites for the Umpqua River, OR, project.

Table 25a.--Location of sampling sites, Umpqua River, Oreg., project

Site no.	Site designation		Collection date	Site location		Remarks
				Latitude	Longitude	
1	Umpqua RM	0.0	10-29-80	43°40'09"	124°12'11"	Mouth of boat basin.
2	Winchester Bay		10-28-80	43°40'58"	124°11'02"	
3	Umpqua RM	2.4	do.	43°41'31"	124°10'15"	Confluence of Scholfield Cr. and Yaquina River is at Yaquina RM 10.7.
4	do.	2.6	do.	43°41'38"	124°10'00"	
5	do.	2.8	do.	43°41'45"	124°09'49"	
6	do.	5.2	do.	43°43'37"	124°09'43"	
7	do.	6.4	do.	43°44'33"	124°09'18"	
8	do.	6.5	10-29-80	43°44'37"	124°09'12"	
9	do.	7.8	do.	43°44'50"	124°07'49"	
10	do.	8.1	10-30-80	43°44'40"	124°07'31"	
11	do.	8.7	do.	43°44'01"	124°07'40"	
12	do.	9.1	10-29-80	43°43'58"	124°06'48"	
13	do.	9.6	10-30-80	43°43'18"	124°07'20"	
14	do.	10.5	do.	43°42'49"	124°06'30"	
15	do.	11.4	do.	43°42'25"	124°05'33"	

TABLE 25B.--UMPQUA RIVER OREGON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '---' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	D A T E	C A D M I U M (U G /L A S C D)	C H R O M I U M (U G /L A S C R)	C O P P E R (U G /L A S C U)	I R O N (U G /L A S F E)	L E A D (U G /L A S P B)	M A N G A N E S E (U G /L A S M N)	M E R C U R Y (U G /L A S H G)	Z I N C (U G /L A S Z N)	C A R B O N, O R G A N I C (M G /L A S C)	N I T R O G E N, A M M O N I A (M G /L A S N)
1	UMPQUA RM	0.0	NE1 10/29/80	3	<1	5	120	2	30	<0.1	30	2.4	--
9	UMPQUA RM	7.8	NE2 10/30/80	2	<1	3	50	1	30	<0.1	20	2.4	--
2	WINCHESTER BAY		EE1 10/28/80	2	<1	5	160	2	220	0.1	40	7.6	1
3	UMPQUA RM	2.4	EE1 10/28/80	1	<1	3	170	<1	60	<0.1	20	11.0	0.9
4	UMPQUA RM	2.6	EE1 10/28/80	3	<1	3	170	2	30	<0.1	30	5.3	0.09
5	UMPQUA RM	2.8	EE1 10/28/80	1	<1	3	170	3	20	<0.1	30	3.3	0.26
6	UMPQUA RM	5.2	EE2 10/28/80	<1	1	3	90	3	190	<0.1	40	2.7	--
6	UMPQUA RM	5.2	EE1 10/28/80	3	10	3	200	2	240	<0.1	50	3.4	--
7	UMPQUA RM	6.4	EE2 10/28/80	1	3	2	60	4	110	<0.1	20	5.9	0.1
8	UMPQUA RM	6.5	EE2 10/29/80	1	2	2	60	4	70	<0.1	20	2.0	0.08
8	UMPQUA RM	6.5	EE1 10/29/80	1	2	2	120	1	130	<0.1	30	1.7	0.04
9	UMPQUA RM	7.8	EE2 10/29/80	1	1	2	100	1	670	<0.1	20	6.4	--
9	UMPQUA RM	7.8	EE1 10/29/80	1	2	3	280	<1	910	<0.1	40	5.1	--
10	UMPQUA RM	8.1	EE2 10/30/80	3	2	3	50	3	130	<0.1	30	2.8	0.22
11	UMPQUA RM	8.7	EE2 10/30/80	--	40	2	60	<1	90	<0.1	30	2.5	0.07
12	UMPQUA RM	9.1	EE2 10/29/80	--	2	2	60	2	1500	<0.1	30	3.9	2.4
13	UMPQUA RM	9.6	EE2 10/30/80	1	1	1	70	2	180	<0.1	20	3.6	--
14	UNPAUA RM	10.5	EE2 10/30/80	3	3	6	60	<1	220	<0.1	30	2.0	--
15	UMPQUA RM	11.4	EE2 10/30/80	2	3	4	50	4	180	<0.1	20	2.0	0.37
15	UMPQUA RM	11.4	EE1 10/30/80	2	3	3	110	4	120	<0.1	30	2.8	0.03

TABLE 25B.--UMPQUA RIVER OREGON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES--CONTINUED

SITE NO.	DESCRIPTION	C O D E	PHOSPHORUS		PHENOLS (UG/L)
			ORTHOPHOSPHATE (UG/L AS P)		
1	UMPQUA RM 0.0	NE1	69	6	
9	UMPQUA RM 7.8	NE2	57	2	
2	WINCHESTER BAY	EE1	47	34	
3	UMPQUA RM 2.4	EE1	<10	5	
4	UMPQUA RM 2.6	EE1	11	11	
5	UMPQUA RM 2.8	EE1	46	46	
6	UMPQUA RM 5.2	EE2	68	3	
6	UMPQUA RM 5.2	EE1	42	3	
7	UMPQUA RM 6.4	EE2	45	42	
8	UMPQUA RM 6.5	EE2	47	10	
8	UMPQUA RM 6.5	EE1	57	7	
9	UMPQUA RM 7.8	EE2	72	63	
9	UMPQUA RM 7.8	EE1	55	11	
10	UMPQUA RM 8.1	EE2	68	43	
11	UMPQUA RM 8.7	EE2	85	15	
12	UMPQUA RM 9.1	EE2	53	86	
13	UMPQUA RM 9.6	EE2	57	25	
14	UMPAUA RM 10.5	EE2	53	4	
15	UMPQUA RM 11.4	EE2	53	5	
15	UMPQUA RM 11.4	EE1	<10	--	

TABLE 25C.--UNPQUA RIVER OREGON PROJECT

ADDITIONAL DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

NO.	SITE	DESCRIPTION	DATE	ARSENIC (UG/L AS AS)	BARIUM (UG/L AS BA)	BERYL- LIUM (UG/L AS BE)	1/ CYANIDE (UG/L AS CN)	NICKEL (UG/L AS NI)	NITRO- GEN, AM- MONIA + ORGANIC (MG/L AS N)	PH	SPE- CIFIC- DUCT- ANCE (MICRO- MHOS/CM)	PHOS- PHORUS, (UG/L AS P)
1	UNPQUA RM 0.0	NE1	10/29/80	1	300	<10	2	5	--	8.1	40500	110
9	UNPQUA RM 7.8	NE2	10/30/80	1	200	<10	1	4	--	7.7	20300	105
2	WINCHESTER BAY	EE1	10/28/80	1	300	10	3	7	1.8	7.7	39600	88
6	UNPQUA RM 5.2	EE2	10/28/80	1	<100	10	1	8	--	7.5	24800	67
6	UNPQUA RM 5.2	EE1	10/28/80	1	300	20	2	10	--	7.7	45400	65
8	UNPQUA RM 6.5	EE2	10/29/80	1	<100	10	0	16	--	7.7	23000	99
8	UNPQUA RM 6.5	EE1	10/29/80	1	<100	20	3	16	--	7.7	41300	75
9	UNPQUA RM 7.8	EE2	10/29/80	1	500	<10	1	8	--	7.8	23200	72
9	UNPQUA RM 7.8	EE1	10/29/80	1	300	20	3	11	--	7.7	39800	83
15	UNPQUA RM 11.4	EE2	10/30/80	--	--	--	--	--	--	7.6	20940	--
15	UNPQUA RM 11.4	EE1	10/30/80	--	--	--	--	--	--	7.7	40000	--

1/
-- LOWER DETECTION LIMITS FOR CYANIDE ARE NOT AVAILABLE.

TABLE 25D.--UMPQUA RIVER OREGON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EF=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BN=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	ALDRIN (UG/L)	AME- TRYNE (UG/L)	ATRA- TONE (UG/L)	ATRA- ZINE (UG/L)	CHLOR- DANE (UG/L)	CYAN- AZINE (UG/L)	CYPRA- ZINE (UG/L)	DDD (UG/L)	DDE (UG/L)	DDT (UG/L)	DI- ELDRIN (UG/L)	ENDO- SULFAN (UG/L)
1	UMPQUA RM	0.0	NE1 10/29/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
9	UMPQUA RM	7.8	NE2 10/30/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
2	WINCHESTER BAY		EE1 10/28/80	--	<.1	<.1	<.1	--	<.1	<.1	--	--	--	--	--
6	UMPQUA RM	5.2	EE2 10/28/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
6	UMPQUA RM	5.2	EE1 10/28/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
8	UMPQUA RM	6.5	EE2 10/29/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
8	UMPQUA RM	6.5	EE1 10/29/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
9	UMPQUA RM	7.8	EE2 10/29/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
9	UMPQUA RM	7.8	EE1 10/29/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
S I T E NO.	C O D E	SITE DESCRIPTION	ENDRIN (UG/L)	HEPTA- CHLOR (UG/L)	HEPTA- CHLOR EPOXIDE (UG/L)	LINDANE (UG/L)	METH- OXY- CHLOR (UG/L)	MIREX (UG/L)	PCB (UG/L)	NAPH THA- LENES, POLY- CHLOR. (UG/L)	PER- THANE (UG/L)	PROME- TONE (UG/L)	PRONE- TRYNE (UG/L)	PRO- PAZINE (UG/L)	
1	UMPQUA RM	0.0	NE1	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	
9	UMPQUA RM	7.8	NE2	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	
2	WINCHESTER BAY		EE1	--	--	--	--	--	--	--	--	<.1	<.1	<.1	
6	UMPQUA RM	5.2	EE2	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	
6	UMPQUA RM	5.2	EE1	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	
8	UMPQUA RM	6.5	EE2	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	
8	UMPQUA RM	6.5	EE1	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	
9	UMPQUA RM	7.8	EE2	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	
9	UMPQUA RM	7.8	EE1	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1	

TABLE 25D.--UMPQUA RIVER OREGON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES--CONTINUED

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	SILVEX (UG/L)	SIMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)
1	UMPQUA RM	0.0	NE1	<.1	<.01	<.1	<1	<.01	<.01	<.01
9	UMPQUA RM	7.8	NE2	<.1	<.01	<.1	<1	<.01	<.01	<.01
2	WINCHESTER BAY		EE1	<.1	<.01	<.1	--	--	--	--
6	UMPQUA RM	5.2	EE2	<.1	<.01	<.1	<1	<.01	<.01	<.01
6	UMPQUA RM	5.2	EE1	<.1	<.01	<.1	<1	<.01	<.01	<.01
8	UMPQUA RM	6.5	EE2	<.1	<.01	<.1	<1	<.01	<.01	<.01
8	UMPQUA RM	6.5	EE1	<.1	<.01	<.1	<1	<.01	<.01	<.01
9	UMPQUA RM	7.8	EE2	<.1	<.01	<.1	<1	<.01	<.01	<.01
9	UMPQUA RM	7.8	EE1	<.1	<.01	<.1	<1	<.01	<.01	<.01

TABLE 25E.--UMPQUA RIVER OREGON PROJECT

TOTAL RECOVERABLE CHEMICALS IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	ARSENIC (UG/G)	BARIUM (UG/G)	BERYL- LIUM (UG/G)	CADMIUM (UG/G)	CHRO- MIUM (UG/G)	COPPER (UG/G)	CYANIDE (UG/G)	IRON (UG/G)	LEAD (UG/G)	MANGA- NESE (UG/G)	MERCURY (UG/G)
6	UMPQUA RM	5.2	BM 10/28/80	4	5	<1	<1	13	7	<0.5	7700	10	110	0.05
8	UMPQUA RM	6.5	BM 10/29/80	4	5	<1	<1	15	8	<0.5	9100	10	99	0.02
9	UMPQUA RM	7.8	BM 10/29/80	3	10	<1	<1	13	8	<0.5	7500	10	61	0.03
11	UMPQUA RM	8.7	BM 10/30/80	2	10	<1	<1	18	10	<0.5	13000	10	110	0.03
12	UMPQUA RM	9.1	BM 10/29/80	4	10	<1	<1	15	8	<0.5	9200	10	200	0.04
15	UMPQUA RM	11.4	BM 10/30/80	4	10	<1	1	13	10	<0.5	7300	<10	130	0.03

S I T E NO.	C O D E	SITE DESCRIPTION	NICKEL (UG/G)	ZINC (UG/G)	CARBON, INOR- GANIC (G/KG)	CARBON, INOR- GANIC (G/KG)	NITRO- GEN, NH4 (MG/KG) AS N	NITRO- GEN, NH4 + ORG. (MG/KG) AS N	PHOS- PHORUS (MG/KG)
6	UMPQUA RM	5.2	BM 20	22	0.0	2	6	160	370
8	UMPQUA RM	6.5	BM 20	23	0.1	2	2	117	410
9	UMPQUA RM	7.8	BM 20	22	0.0	7	20	300	340
11	UMPQUA RM	8.7	BM 20	26	0.0	3	4	130	410
12	UMPQUA RM	9.1	BM 20	24	0.0	4	19	210	420
15	UMPQUA RM	11.4	BM 20	21	0.0	1	2	110	440

TABLE 25F.--UMPQUA RIVER OREGON PROJECT

TOTAL RECOVERABLE INSECTICIDES AND HERBICIDES IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	INSECTICIDES AND HERBICIDES (UG/KG)												HERBICIDES (UG/KG)		
				ALDRIN	CHLOR- DANE	DDD	DDE	DDT	DI- ELDRIN	ENDO- SULFAN	ENDRIN	HEPTA- CHLOR EPOXIDE	HEPTA- CHLOR	HEPTA- CHLOR EPOXIDE	HEPTA- CHLOR EPOXIDE	HEPTA- CHLOR EPOXIDE	HEPTA- CHLOR EPOXIDE	HEPTA- CHLOR EPOXIDE
6	UMPQUA RM	5.2	BM 10/28/80	<.1	<.1	0.1	0.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
8	UMPQUA RM	6.5	BM 10/29/80	<.1	<.1	0.1	0.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
9	UMPQUA RM	7.8	BM 10/29/80	<.1	<.1	0.2	0.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
11	UMPQUA RM	8.7	BM 10/30/80	<.1	<.1	0.3	0.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
12	UMPQUA RM	9.1	BM 10/29/80	<.1	<.1	0.2	0.1	0.3	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
15	UMPQUA RM	11.4	BM 10/30/80	<.1	<.1	0.1	0.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
				HERBICIDES (UG/KG)														
S I T E NO.	C O D E	SITE DESCRIPTION	DATE	METH- OXY- CHLOR	MIREX	PCB	PCN	PER- THANE	SILVEX	TOXA- PHENE	2,4-D	2,4,5-T	2,4-DP	2,4-DP	2,4-DP	2,4-DP	2,4-DP	2,4-DP
6	UMPQUA RM	5.2	BM	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
8	UMPQUA RM	6.5	BM	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
9	UMPQUA RM	7.8	BM	<.1	<.1	--	--	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
11	UMPQUA RM	8.7	BM	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
12	UMPQUA RM	9.1	BM	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
15	UMPQUA RM	11.4	BM	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1

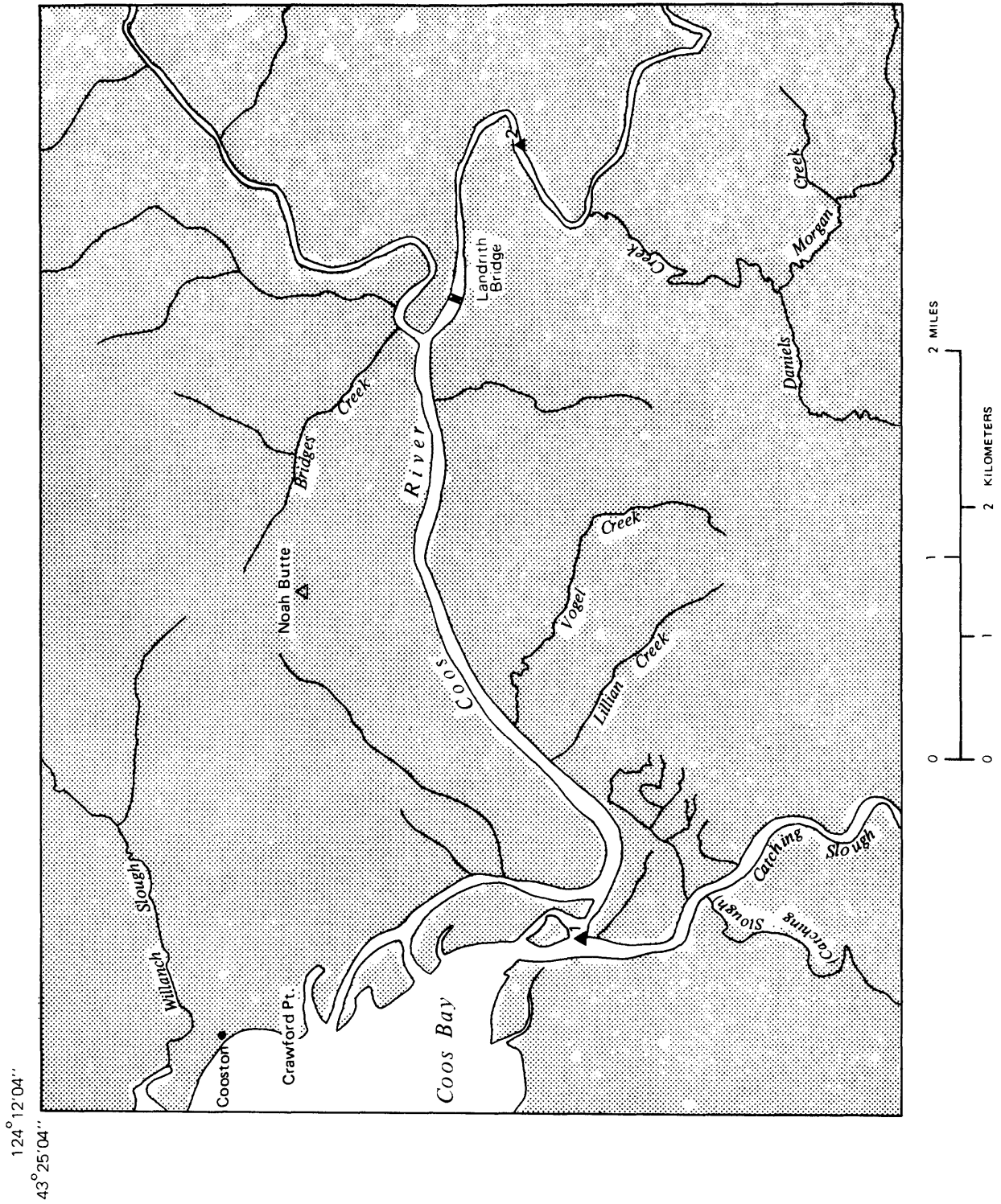


Figure 21. -- Map of sampling sites for Coos River, OR, project.

Table 26a.--Location of sampling sites, Coos River, Oreg., project

Site no.	Site designation	Collec- tion date	Site location		Remarks
			Latitude	Longitude	
1	Coos RM 0.0	09-25-80	43°22'44"	124°10'40"	
2	do. 7.5	do.	43°22'08"	124°04'29"	

TABLE 26B.--COOS RIVER, OREGON PROJECT

DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	S I T E D E S C R I P T I O N	D A T E	C A D M I U M (U G /L A S C D)	C H R O M I U M (U G /L A S C R)	C O P P E R (U G /L A S C U)	I R O N (U G /L A S F E)	L E A D (U G /L A S P B)	M A N G A N E S E (U G /L A S M N)	M E R C U R Y (U G /L A S H G)	Z I N C (U G /L A S Z N)	C A R B O N, O R G A N I C (M G /L A S C)	N I T R O G E N, A M M O N I A (M G /L A S N)	
1	COOS	RM 0.0	NE1	09/25/80	<1	1	3	150	4	50	60	0.2	2.2	0.12
2	COOS	RM 7.5	NF2	09/25/80	2	<1	2	110	4	20	10	<0.1	2.8	0.01
1	COOS	RM 0.0	EE1	09/25/80	2	<1	2	140	<1	50	40	0.1	3.1	0.13
2	COOS	RM 7.5	EF2	09/25/80	1	<1	1	30	1	350	<10	<0.1	3.2	0.1
				S I T E N O.	S I T E D E S C R I P T I O N		P H O S P H O R U S O R T H O P H O S P H A T E		P H E N O L S					
							(U G /L A S P)		(U G /L)					
1	COOS	RM 0.0	NE1				80		6					
2	COOS	RM 7.5	NF2				30		3					
1	COOS	RM 0.0	EE1				67		13					
2	COOS	RM 7.5	EF2				30		120					

TABLE 26C.--COOS RIVER, OREGON PROJECT

ADDITIONAL DISSOLVED CHEMICALS IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTON MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES '-.-' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E	C O D E	SITE	DESCRIPTION	DATE	ARSENIC (UG/L AS AS)	BARIUM (UG/L AS BA)	BERYL- LIUM (UG/L AS BE)	CYANIDE (UG/L AS CN)	NICKEL (UG/L AS NI)	NITRO- GEN,AM- MONIA + ORGANIC (MG/L AS N)	PH	SPE- CIFIC- CON- DUCT- ANCE (MICRO- MHOS/CM)	PHOS- PHORUS, (UG/L AS P)
1	COOS RM	0.0	NE1	09/25/80	1	100	10	1	<1	0.5	7.8	4500	88
2	COOS RM	7.5	NF2	09/25/80	1	<100	<10	1	<1	0.3	6.9	100	45
1	COOS RM	0.0	EE1	09/25/80	1	200	10	1	11	1.0	7.7	45813	45
2	COOS RM	7.5	EF2	09/25/80	1	<100	<10	1	<1	0.5	7.6	180	52

TABLE 26D.---COOS RIVER, OREGON PROJECT

DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	ALDRIN (UG/L)	AME- TRYNE (UG/L)	ATRA- TONE (UG/L)	ATRA- ZINE (UG/L)	CHLOR- DANE (UG/L)	CYAN- AZINE (UG/L)	CYPRA- ZINE (UG/L)	DDD (UG/L)	DDE (UG/L)	DDT (UG/L)	DI- ELDRIN (UG/L)	ENDO- SULFAN (UG/L)
1	COOS	RM 0.0	NE1 09/25/80	<.01	<.1	<.1	<.1	<.1	<.1	<.1	<.01	<.01	<.01	<.01	<.01
2	COOS	RM 7.5	NF2 09/25/80	<.01	--	--	<.1	<.1	--	--	<.01	<.01	<.01	<.01	<.01
1	COOS	RM 0.0	EE1 09/25/80	<.01	--	--	<.1	<.1	--	--	<.01	<.01	<.01	<.01	<.01
2	COOS	RM 7.5	EF2 09/25/80	<.01	--	--	<.1	<.1	--	--	<.01	<.01	<.01	<.01	<.01

S I T E NO.	C O D E	SITE DESCRIPTION	DATE	HEPTA- CHLOR (UG/L)	HEPTA- CHLOR (UG/L)	HEPTA- CHLOR (UG/L)	LINDANE (UG/L)	METH- OXY- CHLOR (UG/L)	MIREX (UG/L)	PCB (UG/L)	NAPH- THA- LENES, POLY- CHLOR. (UG/L)	PER- THANE (UG/L)	PROME- TONE (UG/L)	PROME- TRYNE (UG/L)	PRO- PAZINE (UG/L)
1	COOS	RM 0.0	NE1 <.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	<.1
2	COOS	RM 7.5	NF2 <.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	--
1	COOS	RM 0.0	EE1 <.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	--
2	COOS	RM 7.5	EF2 <.01	<.01	<.01	<.01	<.01	<.01	<.01	<.1	<.1	<.1	<.1	<.1	--

TABLE 26D.--COOS RIVER, OREGON PROJECT

S I T E N O.	SITE DESCRIPTION	C O D E		DISSOLVED INSECTICIDES AND HERBICIDES IN NATIVE WATER AND ELUTRIATES--CONTINUED									
		SILVEX (UG/L)	SIMA- ZINE (UG/L)	SIME- TONE (UG/L)	SIME- TRYNE (UG/L)	TOX- APHENE (UG/L)	2,4-D (UG/L)	2,4-DP (UG/L)	2,4,5-T (UG/L)				
1	COOS RM 0.0	NE1	<.01	<.01	<.1	<1	<.01	<.01	<.01				
2	COOS RM 7.5	NF2	<.01	--	<.1	<1	<.01	--	<.01				
1	COOS RM 0.0	EE1	<.01	--	<.1	<1	<.01	--	<.01				
2	COOS RM 7.5	EF2	<.01	--	<.1	<1	<.01	--	<.01				

TABLE 26E.--COOS RIVER, OREGON PROJECT

TOTAL RECOVERABLE CHEMICALS IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, MH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BN=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '--' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E N O.	C O D E	SITE DESCRIPTION	DATE	ARSENIC (UG/G)	BARIUM (UG/G)	BERYL- LIUM (UG/G)	CADMIUM (UG/G)	CHRO- MIUM (UG/G)	COPPER (UG/G)	CYANIDE (UG/G)	IRON (UG/G)	LEAD (UG/G)	MANGA- NESE (UG/G)	MERCURY (UG/G)
1	COOS RM 0.0	BM	09/25/80	<1	15	<1	1	14	4	<0.5	6300	10	130	0.03
2	COOS RM 7.5	BM	09/25/80	1	30	<1	<1	22	7	<0.5	12000	10	110	0.01
S I T E N O.														
C O D E														
SITE DESCRIPTION														
NICKEL (UG/G)														
ZINC (UG/G)														
CARBON, INOR- GANIC (G/KG)														
CARBON, INOR- GANIC (G/KG)														
NITRO- GEN, NH4 (MG/KG) AS N														
NITRO- GEN, NH4 (MG/KG) AS N														
NITRO- GEN, NH4 (MG/KG) AS N														
PHOS- PHORUS (MG/KG) AS N														
1	COOS RM 0.0	BM				10	<.1		2	<.2	90		300	
2	COOS RM 7.5	BM				10	<.1		6	<.2	180		420	

TABLE 26F.--COOS RIVER, OREGON PROJECT

TOTAL RECOVERABLE INSECTICIDES AND HERBICIDES IN BOTTOM MATERIAL

[FOR TYPE OF SAMPLE, REFER TO CODES: NE=NATIVE ESTUARINE WATER, NH=NATIVE EURYHALINE WATER, NF=NATIVE FRESH WATER, EE=ELUTRIATE WITH ESTUARINE WATER, EH= ELUTRIATE WITH EURYHALINE WATER, EF=ELUTRIATE WITH FRESH WATER, BM=BOTTOM MATERIAL. THE NUMBER FOLLOWING THE TWO DIGIT CODE INDICATES: FOR NATIVE WATER SAMPLES, THE NUMBER OF SAMPLES ANALYZED AND FOR ELUTRIATES, THE RESPECTIVE MIXING WATER. VALUES = '---' INDICATE THAT A CHEMICAL ANALYSES HAS NOT BEEN MADE.]

S I T E NO.	C O D E	SITE DESCRIPTION	DATE										
				ALDRIN (UG/KG)	CHLOR- DANE (UG/KG)	DDD (UG/KG)	DDE (UG/KG)	DDT (UG/KG)	DI- ELDRIN (UG/KG)	ENDO- SULFAN (UG/KG)	ENDRIN (UG/KG)	HEPTA- CHLOR (UG/KG)	HEPTA- CHLOR EPOXIDE (UG/KG)
1	COOS RM	0.0	BM	09/25/80	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
2	COOS RM	7.5	BM	09/25/80	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1

S I T E NO.	C O D E	SITE DESCRIPTION										
			METH- OXY- CHLOR (UG/KG)	MIREX (UG/KG)	PCB (UG/KG)	PCN (UG/KG)	PER- THANE (UG/KG)	SILVEX (UG/KG)	TOXA- PHENE (UG/KG)	2,4-D (UG/KG)	2,4,5-T (UG/KG)	2,4-DP (UG/KG)
1	COOS RM	0.0	BM	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1
2	COOS RM	7.5	BM	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1	<.1