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0

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6. Author

Name: E. W. Gustafson

Signature

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APPROVED FOR PUBLIC RELEASE

PHIAA

7. Abstract

6/22/92 U. Jones

This description of work was developed to investigate the impact to the Columbia River from the Operation of the production reactors in the 100 Areas. Approximately 52 samples will be taken downstream of the effluent pipelines and in areas of substantial sediment deposition.

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1.0 SCOPE OF WORK

This document details the Columbia River sediment investigation field activities associated with the 100 Area Operable Units remedial investigations. This description of work will serve as a field guide for those performing the work. It should be used in conjunction with remedial investigation/feasibility study work plan for the 100 Area Operable Units for general investigation strategy and with *Environmental Investigations and Site Characterization Manual* (WHC 1988a) for specific procedures.

2.0 GENERAL REQUIREMENTS

2.1 APPLICABLE PROCEDURES

All personnel working to this description will perform work in accordance with the following:

- WHC-EP-0383, *Environmental Engineering, Technology, and Permitting Function Quality Assurance Program Plan* (WHC 1990)
- WHC-CM-4-10, *Radiation Protection* (WHC 1988b)
- WHC-CM-4-11, *ALARA Program Manual* (WHC 1988c)
- WHC-CM-4-3, *Industrial Safety Manual*, Vols. 1 through 3, (WHC 1987)
- WHC-CM-7-5, *Environmental Compliance Manual* (WHC 1988d)
- Site-specific job safety analysis.

The associated field activities will also conform to the requirements of a site specific safety assessment to be completed prior to initiation of the field activities. The requirements of this assessment may potentially impact specific sampling protocol. All changes resulting from this assessment will be documented utilizing a Columbia River Sediment Sampling Project Change Form (Attachment 1).

2.2 PREREQUISITES

A readiness review will be completed by the cognizant engineer before sampling is attempted. The readiness review will be completed per EII 1.13, Environmental Engineering and Geotechnology Readiness Review (WHC 1988a). The Sampling Status Checklist (Attachment 2) will be initialed by the cognizant engineer or field team leader and dated as each step of the task is completed.

3.0 SAMPLING AND FIELD ACTIVITIES

3.1 LOCATION

This description of work addresses the sampling of Columbia River sediments located around outfall structures, within backwater sloughs and on the downriver side of islands. The extent of the sampling efforts will be limited to river sediments located between B Reactor and the Hanford Town Site.

Sample points were located in areas where contaminants were likely to settle out (i.e., areas of low velocity and just downstream from the outfall structures) (Figure 1). Exact sampling locations may vary from those depicted in Figure 1 as necessary for obtaining an adequate volume of sample material (Especially in the vicinity of the outfall structure as the current velocity in these areas may be too swift to allow for sediment deposition/collection). In these instances, the nearest downstream location with suitable conditions will be sampled. Deviations will be noted in the field logbook.

A total of 25 sampling locations (including two reference locations upstream of Vernita Bridge) were chosen utilizing the most current aerial photographs and maps available. Site conditions may vary depending on the seasonal and daily flow rate of the river. If it is determined that site conditions will not permit sampling, the field team leader will select an alternate site. Additional sampling, at locations identified during the implementation phase, may be conducted at the discretion of the field team leader.

Surface sediments will be gathered from the surface to a maximum depth of 6 in. Subsurface core samples will be collected from a composite of sediments in the 2 ft to 3 ft, 3 ft to 4 ft depths, etc., until a sample can no longer be obtained (possible constraints include an adequate sample bed and limitations of the core sampler). It is anticipated that two samples will be taken from each location.

The brief description of each sampling point will be recorded in the field logbook. A global positioning system survey instrument will be used to obtain the approximate latitude/longitude for each location.

3.2 SAMPLE ANALYSIS

The contaminants of concern for the Columbia River sediments are based upon those identified for the spring sampling effort conducted in the fall of 1991. They include ICP metals (including lead and mercury), standard gamma scan radionuclides, gross alpha, gross beta, and ⁹⁰Sr. These contaminants are known to exist in groundwater plumes located near the river as well as contaminants present in the effluent from the reactor river discharge lines.

Short-lived radiological isotopes are not considered by this study due to the time lapse since released into the environment.

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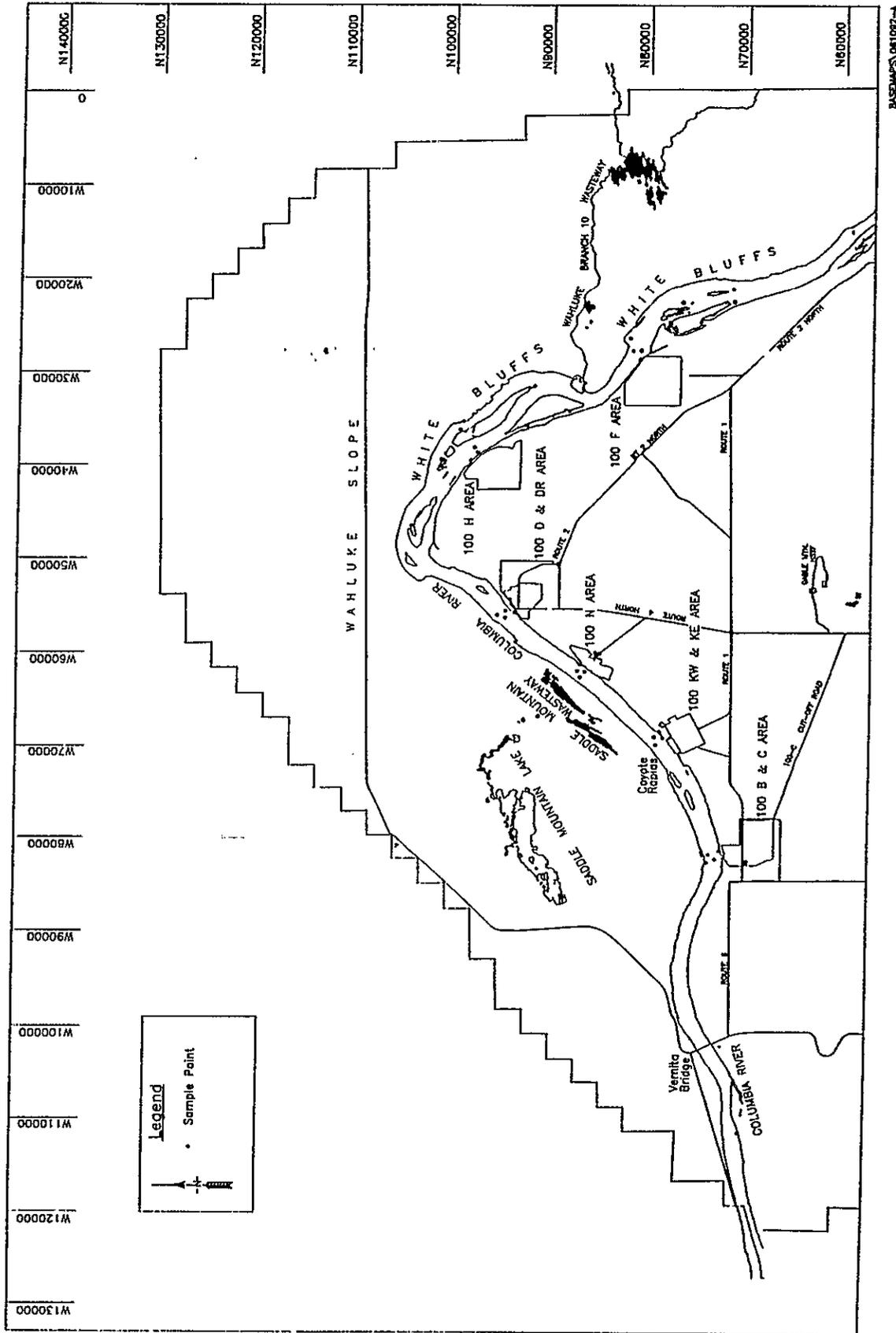


Figure 1. Columbia River Sediment Sampling Locations.

A total-activity analysis (required for offsite sample shipment and analysis) and sieve analysis (used to determine particle size distribution) will also be performed.

3.3 SAMPLE COLLECTION

The river sediment material shall be collected per EII 5.2, Soil and Sediment Sampling (WHC 1988a). Samples will be collected utilizing standard industry hand core sediment samplers. Surface samples may be collected utilizing a small bottom dredge sampler. These samplers allow for collection of sediment in shallow backwaters from a boat or in deeper waters utilizing divers. Sampling should be conducted during periods of low flow.

A field logbook will be used to document activities associated with the sample collection. The logbook will be used and maintained per EII 1.5 Field Logbooks (WHC 1988a).

A total of 53 samples will be collected, including quality assurance/quality control (QA/QC) samples. The trip blank and field blank have been deleted per OSWER Directive 9355.0-7B Appendix C, Section C.6 (p.13). The equipment blank media shall be silica sand. The following is a summary of the samples to be collected (Note: the sample numbers below assume two samples will be taken from each location).

- 4 samples below the 100-BC discharge lines and spillways (three discharge lines)
- 4 samples below the 100-K discharge line
- 4 samples below the 100-N discharge line and spillway
- 4 samples below the 100-D/DR discharge line and spillway
- 4 samples below the 100-H discharge line and spillway
- 4 samples below the 100-F discharge line and spillway
- 16 samples from backwater, sediment depositional areas
- 4 samples from background locations
- 3 equipment blank samples
- 3 duplicate samples
- 3 split samples.

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4.0 SAMPLE LABELING

The Hanford Environmental Information System (HEIS) is used to track the sample and laboratory data obtained during environmental investigations conducted under this description of work. Each sample will be identified and labeled with a unique HEIS sample number. HEIS numbers will be assigned in the field per the *Hanford Environmental Information System (HEIS) Operator's Manual* (WHC 1991). The sample location and corresponding HEIS numbers will be documented in the field logbook.

5.0 ANALYSES

Samples will be analyzed for ICP metals (including lead and mercury), standard gamma scan radionuclides, gross alpha, gross beta, ⁹⁰Sr as well as for particle size distribution. Estimated quantity of material needed for analyses are shown in Table 1. The laboratory will use existing Level IV methods for the chemical/metal constituents and Level V methods for radionuclides. Sample custody will follow the EII 5.1, Chain of Custody (WHC 1988a) procedure.

Table 1. Sediment Sample Analysis Requirements.

Analyte	Method	Holding time	Container/volume
ICP/AA metals, mercury, and lead	CLP	6 mo, 28 d, & 14 d	Glass/500 Ml
Strontium-90 Gross alpha Gross beta Gamma spec	Lab SOP	6 mo	Glass/1,000 Ml
Total Activity (222-S Lab)	Lab SOP	6 mo	Plastic or glass vial (at least 1 g)
Particle Size Distribution		N/A	

6.0 QUALITY ASSURANCE/QUALITY CONTROL REQUIREMENTS

Internal QA/QC samples shall be collected as specified in Appendix A, Quality Assurance Project Plan (DOE/RL 1992) and documented in the sampling logbook per EII 1.5, Field Logbooks (WHC 1988a). Quality assurance samples will include three equipment blank samples, three duplicate samples, and three split samples. The trip blank and field blank have been deleted per OSWER

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Directive 9355.0-7B Appendix C, Section C.6 (p.13). The equipment blank media shall be silica sand.

7.0 SCHEDULE

A field implementation date has not yet been established for the Columbia River sediment sampling activities. The months of September and October are recommended dates as river flow is typically at a seasonal low. Approximately 3 weeks will be needed to collect all of the samples identified. The exact schedule will be developed once the necessary resources are obtained. An Agreement Activity Notification form will be issued at least 5 days prior to the start of field work.

8.0 CHANGES TO DESCRIPTION OF WORK

Major changes to this description of work, such as analyzing different parameters or using different analytical methods, will be submitted on the Project Change Form (Attachment 2). As a minimum, the change will require the verbal approval of the field team leader and the operable unit coordinator. The change will be filed as an Engineering Change Notice and a copy will be inserted into the project file. Copies will be submitted to the regulatory agencies and the appropriate field personnel within 10 working days of the change.

9.0 REFERENCES

- DOE/RL, 1992, *Remedial Investigation/Feasibility Study Work Plan for the 100-BC-1 Operable Unit, Hanford Site, Richland, Washington*, DOE/RL-92-07, U.S. Department of Energy, Richland Field Office, Richland, Washington.
- WHC, 1987, *Industrial Safety Manual*, WHC-CM-4-3, Vol. 1 through 3, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1988a, *Environmental Investigations and Site Characterization Manual*, WHC-CM-7-7, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1988b, *Radiation Protection*, WHC-CM-4-10, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1988c, *ALARA Program Manual*, WHC-CM-4-11, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1988d, *Environmental Compliance Manual*, WHC-CM-7-5, Westinghouse Hanford Company, Richland, Washington.

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WHC, 1990, *Environmental Engineering, Technology, and Permitting Function Quality Assurance Program Plan*, WHC-EP-0383, Westinghouse Hanford Company, Richland, Washington.

WHC, 1991, *Hanford Environmental Information System (HEIS) Operator's Manual*, WHC-SP-0660, Westinghouse Hanford Company, Richland, Washington.

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ATTACHMENT 1

COLUMBIA RIVER SEDIMENT
SAMPLING CHECKLIST

Activity Performed

Signature/Date

PREJOB SAFETY MEETING COMPLETED

SAMPLES COLLECTED AND LABELED

SAMPLES SURVEYED BY HPT

SAMPLE PACKAGED IN SHIPPING CONTAINER

TOTAL ACTIVITY SCAN OF SAMPLES COMPLETED

CHAIN OF CUSTODY FORM COMPLETED

SAMPLES SHIPPED TO LABORATORY

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ATTACHMENT 2
COLUMBIA RIVER SEDIMENT SAMPLING PROJECT CHANGE FORM

Date: _____

Person Initiating Change: _____

Change: _____

Reason for Change: _____

APPROVAL:

Field Team Leader: _____

Operable Unit Coordinator: _____

Environmental QA Representative: _____

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