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Attachment 13

Decommissioning Work Plan
"Core Drill Sampling - 183-H Solar Evaporation Basins (Phase 1)
February 8, 1991, Rev. A-1

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CORE DRILL SAMPLING - 183-H SOLAR EVAPORATION BASINS (PHASE I)

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1.0 PURPOSE

This procedure describes the methods and equipment required to core drill through concrete floor structures for the purpose of obtaining Resource Conservation and Recovery Act (RCRA) soil samples for site characterization under basins 2 and 3 per Attachments 1 and 2. Similar sampling under basins 1 and 4 was completed in 1990 and is not addressed by this procedure. The following is an excerpt from the 183-H Solar Evaporation Basin Closure Plan that discusses this phase of the project.

"Internal Basin Soil Samples--The objectives of the internal basin shallow soil sampling have been to determine whether contaminated liquids escaped the basins, and what distribution such contamination may have had in the immediately underlying soils. This information will be used in selecting the deep soil sampling locations for Phase II sampling.

Access to the underlying soils will be obtained by coring through the 183-H Basins' concrete floors (Figure 1). The core holes will be drilled to a diameter up to 12 inches using standard concrete coring equipment. From the concrete core hole accesses, grab samples of the underlying soils will be collected with clean, stainless steel sampling tools, and transferred to a clean, stainless steel mixing bowl. When a sufficient amount of sample has been obtained for all of the required analyses, the sample will be thoroughly mixed, placed in appropriate sample containers along with any required sample preservatives, and stored appropriately until sent to the analyzing laboratory under chain of custody procedures. Sampling equipment will be decontaminated between samples and after sample collection. All of the sampling will be performed in accordance with Westinghouse Hanford Company's environmental procedures (WHC-CM-7-7). All the samples and blanks will be analyzed for the parameter listed in Attachment 1 and Table I.B-8 of the Closure Plan. All soil samples and concrete cores will be field-screened for volatile organic compounds and monitored with hand-held instruments for gamma radiation. These readings will be recorded in the field sampling records. Then the core holes in the 183-H Basins' floors will be backfilled with concrete to prevent infiltration of precipitation."

2.0 IMPACT LEVEL

The Impact Level is 3.

OFFICIALLY RELEASED ODM

3.0 SPECIAL EQUIPMENT

The following list is not meant to be all inclusive, but to indicate some of the special equipment not normally associated with decommissioning activities that may be necessary to perform the work.

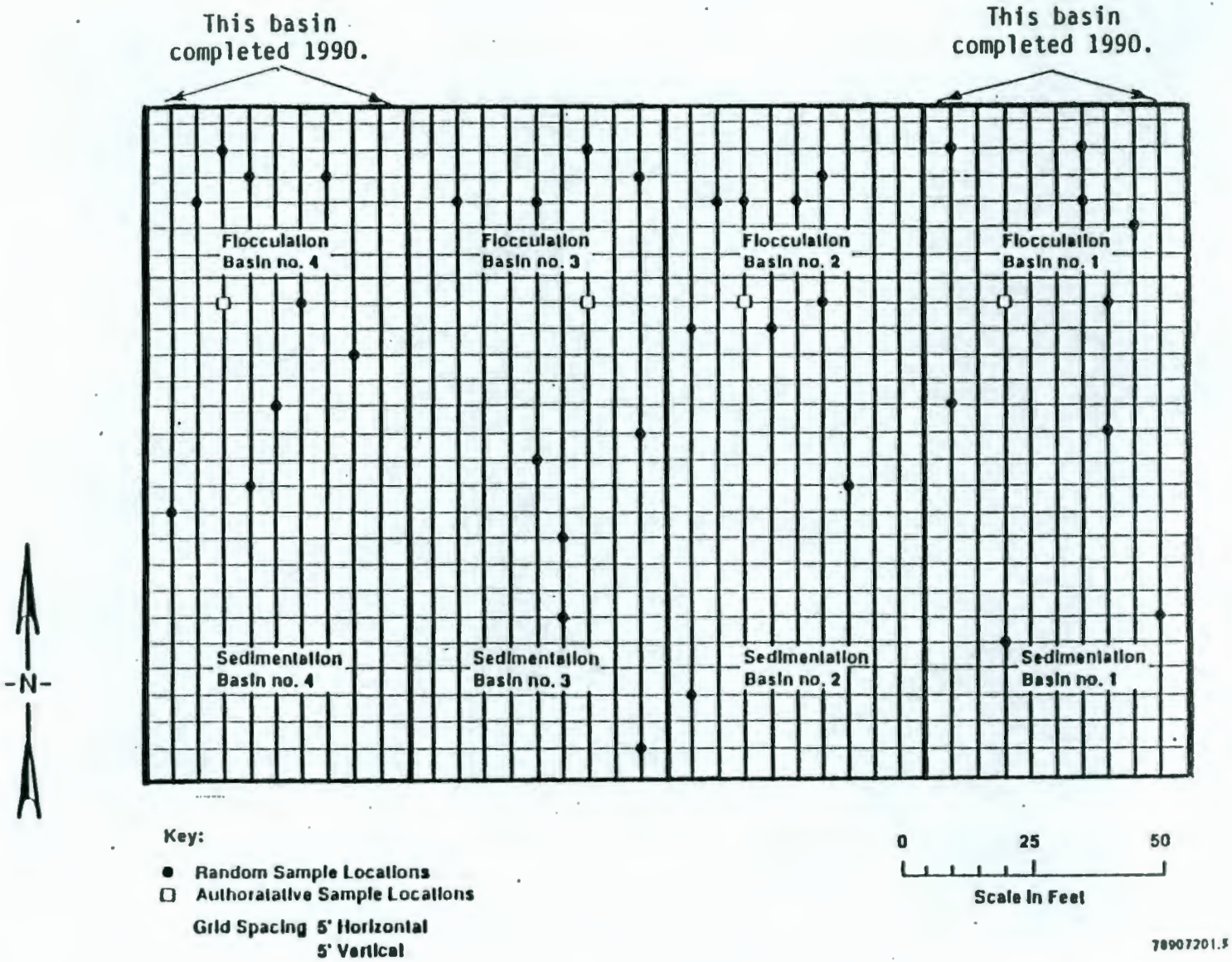

Figure 1. Basin 2 and 3 Sample Location.

3.0 SPECIAL EQUIPMENT (Cont'd)

- Electric Generator Set
- Core Drill Equipment
- Drill Mounting Bracket
- HILTI Concrete Bolting Equipment (or equivalent)
- Compressed Breathing Air
- Coarse sand, silicon carbide, or garnet
- Hoses
- ASTM TYPE IV Reagent Grade Water
- Approved grout material; Master Flow 928 Grout
- Steam cleaning equipment

4.0 HEALTH AND SAFETY REQUIREMENTS

4.1 Radiological Control

- WHC-CM-2-14, Hazardous Materials Packaging and Shipping.
- WHC-CM-4-10, Radiation Protection.
- WHC-CM-4-11, ALARA Program.
- WHC-CM-4-13, Operational Health Physics Procedures Manual.
- DD-026-020, Package and Transport Hazardous Waste.
- All work that is designated in this decommissioning work plan (DWP) is to be accomplished in accordance with Radiation Work Procedure (RWP) specifically prepared for this project.

4.2 Environmental Controls

- WHC-CM-7-5, Environmental Compliance Manual.

4.3 Industrial Safety

- WHC-CM-4-3 Vol. 1 and Vol. 2, Industrial Safety Manual, including but not limited to the following:
  - Standard A-2, "Accident and Injury Notification and Reporting."
  - Standard A-3, "Pre-Job Planning" Job Safety Analysis (JSA).

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- Standard PP-1, "Foot Protection."
- Standard PP-2, "Eye and Face Protection."
- Standard PP-4, "Protective Apparel."
- Standard PP-5, "Head Protection."

- WHC-CM-7-7, Environmental Investigation and Site Characterization Manual, EII 2.1, "Preparation of Hazardous Waste Operations Permits." The primary guidance for site safety related concerns and requirements will be designated in the Hazardous Waste Operations Permit (HWOP). This document will provide guidance for appropriate personnel protection equipment (PPE), site monitoring, chemical/radiological hazards, and potential safety hazards associated with this operations.

4.4 Other Requirements

- WHC-CM-6-7, Environmental Restoration Quality Assurance Program Plan Manual.
- WHC-IP-0136, Decontamination and Decommissioning Records Control Procedure.

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5.0 PREPARATORY WORK

Prior to core drilling, many preparatory tasks are required, such as equipment assembly and functional check out, wrapping drill rig to facilitate decontaminating, and to provide access to area to be sampled.

5.1 Because specific points of leakage associated with the high-nitrate levels in 1978 could not be identified, a random sampling scheme has been prepared. Five random sampling points have been selected within the floor of each sedimentation basin (total of 10 sample points). Four random sampling points have been selected within the floor of each flocculation basin (total of 8 sample points). One authoritative (non-random) sampling point will be field located near each basin's low point in each of the sedimentation basins (total of 2 sample points). A second authoritative (non-random) sampling point will be field located on a fracture (crack) in the concrete floor of each of the basins (total of 2 sample points). Thus, a total of 22 samples will be taken through the floors of the 183-H Solar Evaporation Basins 2 and 3.

The randomly selected floor sampling points were derived from the 5-foot square grid, as shown in Figure 1. The samples will be taken at the intersections of randomly selected grid lines. Two-digit random numbers, produced by a random number generator, were used to select the sample locations. If required, the sampling personnel will have the discretion to collect the samples within a radius of 1/2 grid space (2.5 ft) from the randomly selected sample points.

Decommissioning Engineering shall identify sample locations per DOE/RL 88-04, *Solar Evaporation Basins Closure/Post Closure Plan*, section I.B.4c(2) and Figure 1.

NOTE - Repeat steps 5.2 and 5.3 at each sample location as necessary.

5.2 Assemble core drill rig, attach 6 to 12 in. core drill bit onto spindle, and mount rig on the base. Initially, an 8-inch core drill bit will be used but may be changed with the agreement of the Field Team Leader and the Hanford Field Operations (HFO) Project Supervisor. Core drill bit(s) shall be decontaminated (per Attachment 2) prior to each use that will break through to underlying soil.

5.3 Connect drill rig base to concrete surface per the manufacturer's recommendations. Verify that a Ground Fault Interrupter is in the electrical supply circuit.

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6.0 CORE SAMPLING (Pre-Drilling)

NOTE - This section should be supplemented with drilling techniques as presented in the Con-Cut Instruction Manual that was provided with the boring equipment.

6.1 Locate core drilling equipment directly over sample location. Attach drill rig using HILTI concrete anchor bolts per the manufacturer's recommendations.

6.2 Open breathing air or cooling water and start drill motor, lower bit very slowly onto surface to be drilled. Use light feed pressure until bit crown has penetrated surface approximately 1/4 in.

6.3 Minimize the use of water in cutting operations. The liquid (water and concrete cuttings) slurry shall be allowed to accumulate in the basin low points. This liquid slurry will be absorbed and packaged as miscellaneous wastes (per Storage/Disposal Approval Record 6-1C-1AM-0) or solidified as liquid waste per DWP-H-026-00003. The determination as to which packaging method to use shall be made by the HFO Project Supervisor and is dependent on basin conditions/equipment availability at the time this work is to be done.

6.4 For the first 2 or 3 in., use light pressure to assure a gradual break-in of diamond cutting edge. Remove periodically and feel bit to assure it is not overheating.

NOTE - If core drill is too hot to touch, use less feed pressure and provide more cooling water. Remove outer gloves and feel core drill using thin cloth gloves.

6.5 When correct feed pressure has been determined, maintain a constant pressure. Avoid jerky or in-and-out type feeding or diamond cutting edge will crack.

NOTE - Too light a feed will polish diamonds and result in slow penetration. Excessively heavy feed will overheat drill and cause diamonds to pull out or overload the drill motor.

6.6 When reinforcement steel is contacted, reduce feed pressure. Continue penetration and increase cooling water flow as necessary.

CAUTION

Do not permit vibration, or severe diamond breakage or pullout will occur.

6.7 Keep bit penetrating at all times or diamonds will just polish. If bit does not penetrate, do not force it, remove from hole and examine immediately. If the diamonds on the cutting edge are flush with the metal, they are underexposed. This is caused by using too much water

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6.0 CORE SAMPLING (Pre-Drilling) (Cont'd)

or too little feed pressure. Drill needs resharpening per section 8.0. Replace with a new drill to continue work. If diamonds are exposed but shiny, they are polished. Use more feed pressure. Drill needs resharpening. Replace with a new drill to continue work.

6.8 Pre-drilling holes should proceed until the boring is approximately 5 in. deep or no more than 80 percent of estimated depth as provided by Decommissioning Engineering. The core boring should not penetrate through the concrete slab unless the sampling team is immediately available to collect samples per section 7.0 and Attachment 2. Otherwise, the location should be temporarily abandoned by removing the drill rig, blowing out the annulus space with air, and covering the bore hole with plastic sheeting or a wooden covering.

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7.0 CORE SAMPLING (Breakthrough and Sample Collection)

Use a decontaminated core drill bit (per Attachment 2) for each location. Used core drill bits are to be resharpened, per section 8.0, then decontaminated prior to reuse as described in Attachment 2.

7.1 Reinstall drill rig and restart drilling per steps 6.1 to 6.3, EXCEPT THAT THE ONLY COOLING WATER TO BE USED SHALL BE CONSIST OF FILLING THE ANNULAR SPACE WITH ASTM TYPE IV REAGENT GRADE WATER.

7.2 Continue to drill as discussed in section 6.0 except that the object now is to drill through the concrete slab. More ASTM Type IV Reagent Grade water may be added as necessary.

7.3 Remove the concrete core and drill rig from sample location to provide access to the soil immediately below the basin floor.

7.4 Following the sample collection per Attachment 2, final core hole abandonment shall proceed per section 9.0.

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8.0 SHARPENING CORE DRILL BITS

Bits can be sharpened by drilling into concrete block using water. Bit shall be decontaminated per Attachment 2 prior to use for breakthrough (section 7.0). Sharpening techniques presented here shall be supplemented with techniques as presented in the equipment instruction manual.

8.1 Start drilling into concrete using water.

8.2 Reduce water flow until it becomes very muddy. Continue using as little water as possible until penetration increases.

8.3 If drill does not open up, remove it from hole. Pour into groove a thick layer of sand, silicon carbide, or garnet; the coarser, the better.

8.4 Resume drilling with a minimum of water at slowest speed until drill motors strains, then withdraw bit. Allow sludge to settle, then repeat operation 5 to 10 times. Do not over stress.

8.5 Alternate: Drill several holes through a new cinder block or abrasive type brick or use light pressure on an abrasive grinding wheel.

8.6 After sharpening and prior to reuse for breakthrough (section 7.0), have the drill decontaminate per Attachment 2.

9.0 CORE HOLE ABANDONMENT

9.1 Visually inspect core hole, check that sampling equipment has been removed. Use wire brush to roughen the hole before placing the grout. Take a picture of each hole prior to grouting. Uniquely identify each picture to a specific bore hole.

9.2 Mix grout as directed on package.

9.3 Fill sampling void and cored hole with grout, tamp grout and agitate with steel bar to remove air pockets.

9.4 Mound up grout approximately 1/2 inch above basin floor level and spread out in radius of approximately 2 ft. Feather edges of grout into the concrete.

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10.0 DECONTAMINATION OF CORE DRILL RIG

The core drill rig shall be decontaminated and identified as clean prior to daily use or storage. Decontamination work shall be performed within the confines of a designated area within the 183-H Solar Evaporation Basins.

10.1 Arrange absorbent pillows in a circle to confine the rinsate.

10.2 If practical, position over open polyethylene-lined 55-gallon drum.

10.3 Purpose of the drum is to catch the rinsate.

10.4 Clean the exterior of the core drill rig.

10.5 Rinsate shall be collected and disposed of per DWP-H-026-00003.

10.6 If drill rig is to go into storage, label the rig to identify and indicate the decontamination date.

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11.0 WORK COMPLETION RECORD

		INITIALS	DATE
11.1	Personnel trained on the safety and mixed waste hazards and are familiarized with the DWP, RWP, and HWOP.	_____	_____
11.2	Equipment is available as outlined in section 3.0.	_____	_____
11.3	Sample locations are identified per step 5.1.	_____	_____
11.4	Basin 2 pre-drilling is completed.	_____	_____
11.5	Basin 2 samples are collected per Attachment 2.	_____	_____
11.6	Basin 3 pre-drilling is completed.	_____	_____
11.7	Basin 3 samples are collected per Attachment 2.	_____	_____
11.8	Basin 2 core holes are abandoned per section 9.0.	_____	_____
11.9	Basin 3 core holes are abandoned per section 9.0.	_____	_____

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ATTACHMENT 1

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ANALYTICAL REQUIREMENTS FOR 183-H SOIL

ANALYSIS	METHOD	HOLDING TIME	DETECTION LIMIT (Note 1)	CONTAINER TYPE	SAMPLE SIZE
Gross Alpha	9310		20 pCi/gr		
Gross Beta	9310		20 pCi/gr	P/G	
Gamma Scan	EPA 901.1	6 mos.	20 pCi/gr	Glass	250 ~~500~~ ml
Total Uranium	EPA 908		0.1 pCi/gr	(Note 2)	
Technetium-99	TP1628 (K-25)		1.0 pCi/gr		
Mercury	7470	28 days			
Arsenic	7061	6 mos.		P/G	
Lead	7421	6 mos.	Various for each metal	Glass	250 ml
Selenium	7741	6 mos.			
ICP/AA Metals	6010/7000 Series	6 mos.			
Anions (Nitrate, Nitrite, Fluoride, & Sulfate)	EPA 300	28 days	1.0 ppm	P/G Plastic	125 ml

NOTES:

1. K-25 is the lab currently under agreement to provide these analysis. Detection limits for each metal have been provided by separate correspondence. Other labs may be substituted as available.
2. Glass is preferred; however plastic may be used if glass is unavailable.
3. In addition, at least 5 grams of material shall be collected in a small plastic or glass vial for radiological screening at the 222-S Laboratory. This vial shall be labelled so as to correspond to the 3 external lab containers identified above.
4. 1 set of samples out of every 20 sets needs to consist of 3 times these volumes for matrix spike and matrix spike duplicate analyses at the lab.

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ATTACHMENT 2

183-H SOLAR EVAPORATION BASIN CORE

DRILL SOIL SAMPLING PLAN

ENVIRONMENTAL ENGINEERING

JANUARY 21, 1991

183-H SOLAR EVAPORATION BASIN CORE
DRILL SOIL SAMPLING PLAN

1. SCOPE/PURPOSE

The scope of this sampling effort is to collect soil samples for site characterization to meet the requirements of the "Internal Basin Soil Samples" section of the 183-H Solar Evaporation Basin Closure Plan.

2. SAMPLING TEAM

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To ensure a safe and organized field sampling job, the designated field team leader and sampler(s) will be responsible to see that all field activities are conducted in accordance with the procedures outlined in WHC-CM-7-7, Environmental Investigations and Site Characterizations Manual (WHC 1989). The Field Team Leader is responsible for all documentation required to provide verification and traceability of all samples and associated activities. Documents to be included and maintained according to Westinghouse Hanford manual requirements are:

- Registered field logbook
- Chain-of-custody with appropriate signatures
- Sample analysis request forms
- Copy of sampling plan
- Hazardous Waste Operating Procedure (HWOP)

3. SAMPLING EQUIPMENT

Decontaminated stainless steel equipment to be utilized for sample collection may include the following: spoons, scoops, bowls, augers, screens, and funnels.

A sufficient quantity of each item will be available for use at each individual sample site to prevent cross-contamination of samples. Sample containers with full quality assurance certification and having lids with teflon liners will be used for offsite analyses. Sample materials collected for radiation release purposes will be placed in clean bottles.

The following is a brief list of sampling materials to be utilized in this sampling effort:

- 60/120/250/500-ml plastic jars
- 120/250-ml amber glass jars
- Sample jar labels
- Protective gloves
- Ice chest with wet and "blue" ice
- Absorbent (vermiculite) for shipping
- Permanent marking pens
- Sampler extensions
- Evidence tape
- Other items as needed

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4. DATA QUALITY OBJECTIVES

4.1. ANALYTICAL LEVELS

The U.S. Environmental Protection Agency (EPA) guidance (1987) provides five analytical levels for environmental characterization. These definitions describe categories of analysis and are used for reference in this document. The analytical levels are summarized as follows:

- Level I, Field Screening--generally using hand-held equipment.
- Level II, Field Analyses--using portable analytical instruments, usually in a mobile laboratory
- Level III, Laboratory Analysis--quantitative analysis using standard, documented laboratory procedures.
- Level IV, Laboratory Analysis--quantitative analysis using procedures which follow stringent quality assurance and quality control protocols and documentations.
- Level V, Laboratory Analysis--nonstandard methods or special analytical services.

All onsite personnel health and safety screening will be conducted at the Level I category, as per the HWOP. Level II analyses maybe utilized to determine acceptable radionuclide values to meet shipping requirements. All

laboratory analysis for samples shall be performed to Level III requirements. The procedures will follow the chemical analysis methods and protocols established by EPA manual SW-846, Test Methods for Evaluation of Solid Waste (EPA 1986b); except where noted in Table 1.

4.2. CONTAMINANTS OF CONCERN

The 183-H Solar Evaporation Basin Closure Plan enumerates the constituents listed in Table 1 as the contaminants of concern for analysis in the soils around the basin.

TABLE A-1. ANALYTICAL METHODS FOR SOIL SAMPLING ANALYSIS

Constituent	Analytical Method
Arsenic	SW-846, 6010
Barium	SW-846, 6010
Beryllium	SW-846, 6010
Cadmium	SW-846, 6010
Chromium	SW-846, 6010
Copper	SW-846, 6010
Lead	SW-846, 6010
Manganese	SW-846, 6010
Mercury	SW-846, 7471
Nickel	SW-846, 6010
Selenium	SW-846, 6010
Silver	SW-846, 6010
Sodium	SW-846, 6010
Vanadium	SW-846, 6010
Zinc	SW-846, 6010
Fluoride	EPA 300
Nitrate	EPA 300
Sulfate	EPA 300
Uranium (total)	EPA 908
Technetium-99	TR 1629
Gross alpha	SW-846, 9310
Gross beta	SW-846, 9310
Gamma scan	

Note - Although Vanadium is listed as a waste, it has never been found in any waste designation sampling.

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5. FIELD SAMPLING METHODOLOGY

5.1. SAMPLING LOCATIONS

The objective of the internal basin shallow soil sampling is to determine whether contaminated liquids have escaped the basins; and if so, what the distribution of the contamination may be in the underlying soils. Random and authoritative samples will be collected from the locations noted and discussed in the DWP text (Figure 1).

Additional, discretionary sampling locations may be determined onsite by the Field Team Leader. Factors influencing selection of discretionary sampling locations may include evidence of contamination and similar inconsistencies that may indicate contamination.

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5.2. SAMPLE COLLECTION

All soil samples will be collected according to the protocols outlined in EII 5.2 "Soil and Sediment Sampling." At each sample point, the 8-inch concrete core will be removed allowing access to the underlying soil. Using separate sampling equipment at each sample location, the sampler will remove the top few inches of soil (1 to 2 in.) to decrease the inclusion of concrete dust in the sample and fill the required number of wide-mouthed glass or plastic jars. Depending on conditions at each sample location, stainless steel screens, bowls and shovels may be required to obtain soil samples in rocky substrates. Upon securing the caps and cleaning the exterior of all containers, the sample will be returned to the Field Team Leader and the sampler will verify time of collection, sample location, field conditions and any other pertinent information. Containers will be labeled and placed on ice. Prior to shipping, sample containers will be checked for sample integrity (i.e., broken bottles, caps, tight lids, etc.) secured with evidence tape and bagged to meet appropriate shipment requirements.

5.3. FIELD LOGBOOKS

A field logbook will be kept in accordance with the protocols outlined in EII 1.5, "Field Logbooks."

5.4. CHAIN-OF-CUSTODY

To establish the documentation necessary to ensure the traceability of samples from time of collection, EII 5.1, "Chain-of-Custody," will provide procedures for sample security. A copy of the WHC chain-of-custody form is shown in Figure A-1.

Westinghouse Hanford Company	CHAIN OF CUSTODY

Company Contact _____ Telephone _____

Sample Collected by _____ Date _____ Time _____

Sample Locations _____

Ice Chest No. _____ Field Logbook and Page No. _____

Remarks _____

Bill of Lading No. _____ Offsite Property No. _____

Method of Shipment _____

Shipped to _____

Possible Sample Hazards _____

Sample Identification

SAMPLE

Chain of Possession		
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

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Figure A-1. Chain-of-Custody Form.

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5.5. SAMPLE ANALYSES

An approved laboratory will be selected to conduct the analyses indicated in Attachment 1. Requests for appropriate analyses will be included on the WHC Sample Analysis Request form (Figure A-2) as provided in EII 5.2, "Soil and Sediment Sampling." Laboratory specific forms may be required and will be supplied by the Office of Sample Management.

5.6. DECONTAMINATION

All equipment which is utilized for direct collection of samples will have been previously cleaned in accordance with EII 5.5, "Decontamination of Equipment for RCRA/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Sampling." Core drilling bits which have received a radiation release may also be decontaminated according to this method or may be field decontaminated at the discretion of the Field Team Leader.

5.7. MODIFICATIONS TO SAMPLING PLAN

Under field conditions, the optimal aspects of the sample design may not be achievable (e.g., equipment malfunction or breakdown, weather conditions, soil conditions, physical barriers). Modifications to the planned activity may be necessary as decided by the Field Team Leader.

When field decisions are made by the Field Team Leader, necessary actions will be recorded in the field logbook along with circumstances requiring the action.

Circumstances or changing objectives may require major modifications of the basic sampling plan. In this situation, the Field Team Leader will submit the following information to the to the Cognizant Engineer for preparation of a DWP revision or a Procedure Change Authorization (PCA) and for inclusion in the Project File.

- sampling plan title
- section/subsection to be modified (chapter, title, page number), quoting section as given in sampling plan
- modifications or deviations, recording modified, deleted, or added statement
- technical summary of change
- approvals by original signers of the document or appropriate replacement shall be acquired per normal WHC Document Control procedures

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Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector _____ Date Sampled _____ Time _____ hours

Company Contact _____ Telephone (____) _____

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested

Field Information** _____

Special Handling and/or Storage _____

Possible Sample Hazards _____

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

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SAMPLE

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Figure A-2. Sample Analysis Request Form.

5.8. QUALITY ASSURANCE

Quality Assurance will be achieved through several areas which can include:

- Documentation (e.g., field logbook, chain-of-custody)
- Proper sample collection protocol
- Quality control samples (e.g., equipment blanks, trip blanks, field blanks, and duplicate samples)

Quality control samples will be collected in accordance with SW-846 guidelines, where applicable. Quality control samples will consist of duplicates, trip blanks, field blanks, and equipment blanks. At a minimum, one sample in 20 will be divided in the field, appropriately labeled, and treated as a duplicate. In the event that the sampling rate is less than 20 samples per week, at least one duplicate sample will be collected per week. All samples will be submitted to the same analytical laboratory.

At least one trip blank will be collected during this sampling effort. A trip blank will be brought to the field in sealed containers and transported to the laboratory with the field samples. Since the samples will not be laboratory tested for volatiles, only a limited number of trip blanks will be collected and laboratory grade silica sand will be used as the blank material.

At least one field blank will be transported from the field to the laboratory for this sampling effort. Field blanks will be treated identical to trip blanks except that they will be opened in the field for about the same duration as one sample collecting period, closed, properly labeled, resealed, and transported to the laboratory with the field samples. Since the samples will not be laboratory tested for volatiles, only a limited number of trip blanks will be used.

At least one equipment blank will be collected during this sampling effort. Equipment blanks will be identical to trip blanks except that they will be opened in the field and poured over or through the sample collecting equipment before sampling.

5.9. SHIPPING

Before samples can be packaged and sent offsite, they will be held until released following completion of a radiological survey, according to applicable regulations for offsite shipments. All shipping requirements will comply with EII 5.11 (WHC 1989) with the shipping containers being inspected by a Westinghouse Hanford traffic representative to ensure compliance with the U.S. Department of Transportation requirements. Delays at WHC shipping can be avoided or minimized by completing the following tasks:

- Inform WHC shipping at least 1 day prior to samples being shipped
- Have sample containers at WHC shipping around 1300 hours

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Items to be checked for completion before sample containers are released to shipping personnel are:

- Copies of chain-of-custody and sample analysis forms attached to inside of ice chest lid
- Identify shipping container with appropriate markings and labels (e.g., "This End Up" stickers)
- Seal the ice chest lid with tape; sign and date.

6. PERSONNEL TRAINING

As the primary means of protecting the health and safety of field personnel all individuals who enter the controlled zones will have received the appropriate training to be qualified as a "Hazardous Waste Worker" as outlined in EII 1.1, "Hazardous Waste Site Entry Requirements."

7. JOB SAFETY REQUIREMENTS

The primary guidance for all site-safety related concerns and requirements will be designated in the HWOP as outlined in EII 2.1, "Preparation of Hazardous Waste Operations Permits." Job specific related activities will be delineated in the HWOP and will provide guidance for appropriate personnel protection equipment (PPE), site monitoring, chemical/radiological hazards and potential safety hazards associated with the field/site environment.

All safety-related documents and sampling plans will be reviewed by field personnel prior to work commencement. A pre-job safety meeting and regular field-safety "tailgate" meetings will be held to review all safety considerations and identify any potential hazards not previously noted.

8. REFERENCES

EPA 1983, Standards Methods for Chemical Analysis of Water and Waste Water, EPA 600/4-79-026, U.S. Environmental Protection Agency, Washington, D.C.

EPA 1986a, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities, Title 40, Code of Federal Regulations, Part 264, U.S. Environmental Protection Agency, Washington, D.C.

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EPA 1986b, Test Methods for Evaluating Solid Waste - Physical/Chemical Methods, SW-846, 3rd Edition, U.S. Environmental Protection Agency, Washington, D.C.

EPA 1987, Data Quality Objectives for Remedial Response Activities, U.S. Environmental Protection Agency, Washington, D.C.

WHC 1989, Environmental Investigations and Site Characterization Manual, WHC-CM-7-7, Westinghouse Hanford Company, Richland, Washington.

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