Statement of Work for Services Provided by the Waste Sampling and Characterization Facility for the Effluent and Environmental Monitoring Program During Calendar Year 1997

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Under Project Hanford Management Contract DE-AC06-96RL13200

Approved for Public Release

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Document Title: **STATEMENT OF WORK FOR SERVICES PROVIDED BY THE WASTE SAMPLING AND CHARACTERIZATION FACILITY FOR THE EFFLUENT AND ENVIRONMENTAL MONITORING PROGRAM DURING CALENDAR YEAR 1997**

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STATEMENT OF WORK FOR SERVICES PROVIDED BY THE WASTE SAMPLING AND CHARACTERIZATION FACILITY FOR THE EFFLUENT AND ENVIRONMENTAL MONITORING PROGRAM DURING CALENDAR YEAR 1997

1.0 SCOPE OF SERVICES

This document defines the services the Waste Sampling & Characterization Facility (WSCF) shall provide the Effluent and Environmental Monitoring Program (EEM) throughout the calendar year for analysis. The purpose of the EEM Program is to monitor liquid and gaseous effluents, and the environment immediately around the facilities which may contain radioactive and hazardous materials. Monitoring data are collected, evaluated, and reported to determine their degree of compliance with applicable federal and state regulations and permits.

The Appendix identifies the samples EEM plans to submit for analysis in CY-1997. Analysis of effluent (liquid and air discharges) and environmental (air, liquid, animal, and vegetative) samples is required using standard laboratory procedures, in accordance with regulatory and control requirements cited in *Quality Assurance Program Plan for Radionuclide Airborne Emissions Monitoring* (especially Appendix G) (WHC 1995a), *Effluent Monitoring Quality Assurance Project Plan for Radionuclide Airborne Emissions Data* (WHC 1995b), *Operational Environmental Monitoring Program Quality Assurance Project Plan* (WHC 1994b), and *Hanford Analytical Services Quality Assurance Requirements Documents* (DOE 1996). Should changes to this document be necessary, WSCF or the Air & Water Services (A&WS) Organization may amend it at any time with a jointly approved internal memo.

2.0 REGULATORY REPORTING REQUIREMENTS

It is essential for the WSCF to meet the due dates specified. The analytical data required by those due dates are necessary to maintain compliance with environmental release reporting commitments mandated by regulatory agencies and the U.S. Department of Energy (DOE). Variances to technical criteria or due dates in this document must be documented by the WSCF and approved or acknowledged by A&WS.

2.1 Radionuclide Air Emissions Report for the *CLEAN AIR ACT*

This report documents radionuclide air emissions from the Hanford Site and the resulting effective dose equivalent to any member of the public from those emissions. This report complies with the reporting requirements of the *Code of Federal Regulations*, Title 40,

"Protection of the Environment," Part 61, "National Emissions Standards for Hazardous Air Pollutants," Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities" (40 CFR 61 Subpart H) and Chapter 246-247 of the Washington Administrative Code (WAC 246-247).

2.2 Environmental Releases Report

The purpose of this report is to fulfill the effluent discharge reporting requirements of DOE Order 5400.1 (DOE 1988) and to summarize the compliance status of effluent releases from PHMC and ERC facilities.

2.3 Hanford Site Environmental Report

Pacific Northwest National Laboratory annually compiles and publishes this report for DOE, in compliance with DOE Order 5400.1 (DOE 1988). A&WS and Near-Field Monitoring (NFM) provide the effluent and near-facility monitoring sections of this report.

2.4 Effluent Information System-onsite Discharge Information System Report

Each year A&WS compiles and transmits this report electronically, for all Hanford contractors, to Idaho National Engineering Laboratory in Idaho Falls for inclusion in the Effluent Information System/Onsite Discharge Information System (EIS/ODIS) database, in compliance with DOE Order 5484.1 (DOE 1983).

2.5 Near-facility Operational Environmental Monitoring Report

The Near-Field Monitoring Organization (NFM) of Rust Federal Services Northwest (RFSNW) publishes this report annually, for the EEM program. The report provides a yearly summary of sampling and analysis of soil, vegetation, ambient air, etc. near Hanford facilities. This monitoring is performed in accordance with 40 CFR 61 Subpart H, WAC 246-247, DOE Order 5400.1, and DOE Order 5820.2A requirements.

3.0 WSCF SERVICES AND DATA QUALITY OBJECTIVES

WSCF shall provide the following analytical services when analyzing low-level effluent and environmental samples from EEM.

3.1 Sample and Analysis Requirements

All services necessary shall be provided to complete the analytical requirements listed in Tables 3 through 7. Analyses shall be performed in accordance with applicable requirements and procedures contained in the references listed in section 1.0 above. Analytical results shall be expressed in the units shown for the respective minimum detectable concentrations (MDC) in the tables.

3.2 Composite Sample Requirements

All monthly liquid samples shall be composited monthly and reported electronically to A&WS within 45 days upon receiving all monthly samples and discharge volumes from the facilities. All results shall be in units of concentration.

Effluent air emission composite samples shall be composited quarterly and the first three quarters shall be reported electronically to A&WS by the dates listed below:

- First quarter air emission composite results . . . . . **June 30, 1997**
- Second quarter air emission composite results . . . . . **September 29, 1997**
- Third quarter air emission composite results . . . . . **December 31, 1997**

All results shall be in units of concentration.

Ambient air composite samples shall be composited bi-annually and reported electronically to RFSNW's NFM organization within 90 days of receiving all samples and data for compositing. All results shall be in units of concentration, unless otherwise specified.

3.3 Year-end Data Reporting Due Dates

The due dates for submission of year-end analysis results to A&WS for all samples collected up through December 31st are:

- Air emission data . . . . . **February 16, 1998**
- Liquid effluent data . . . . . **February 23, 1998**

The due dates for submission of year-end analysis results to RFSNW's NFM organization for all samples collected up through December 31st are:

- Environmental data
  (air, surface water, and pond vegetation and sediment) . . . . . **March 16, 1998**

All results shall be transmitted electronically and shall be in units of concentration, unless otherwise specified. The analysis results from any weekly, biweekly, or monthly

sample collected on or after January 1st of the succeeding new year will be applied to that year.

3.4 Laboratory Procedures

Use laboratory analytical procedures that are:

- In compliance with EPA Method 114, Section 4.0, "Quality Assurance Methods," 40 CFR Part 61, Appendix B (specifically, 4.4 and 4.5), and applicable requirements and procedures contained in the references listed in Section 1.0 above.
- In compliance with Chapter 6.0 of the *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance* document (DOE 1991).
- In compliance with the requirements specified in the *Hanford Analytical Services Quality Assurance Requirements Documents* (DOE 1996)
- Appropriate to the sample medium and size and the analysis requirements listed in Tables 1 through 4.

3.5 Quality Control

WSCF shall assure the integrity and validity of analytical test results through implementation of an internal quality control program. Standard methods shall be used whenever possible and methods that are developed or adapted shall be tested and completely documented.

Calibration and quality controls methods shall be performed using methods consistent with the *Hanford Analytical Services Quality Assurance Requirements Documents* (DOE 1996). WSCF shall provide data biannually to A&WS, which demonstrates that the data quality objectives for accuracy, precision, and completeness have been met Auditable quality control (QC) test results shall be provided within two weeks of requesting specific records..

WSCF shall participate in the U.S. DOE Environmental Measurements Laboratory (EML) inter-comparison program, as required per DOE/EH-0173T (DOE 1991). WSCF shall participate in all U.S. EPA laboratory inter-comparison programs, applicable to the analyses being performed. EML and EPA laboratory inter-comparison results shall be provided annually.

3.5.1 Water, Vegetation, and Soil Sample Analyses

The QC tests shall be for accuracy, precision, and completeness. The results of all QC tests shall be documented. Analytical problems identified through analysis of QC samples shall be promptly corrected. WSCF shall produce a minimum of 90% usable analytical data, for all EEM-related samples received. WSCF shall provide data to A&WS, which demonstrates that the accuracy, precision, and completeness objectives have been met, biannually.

WSCF shall prepare and analyze laboratory control standards (LCSs), blank and duplicate samples to verify the accuracy and precision of all radiochemical methods. The total number of such samples shall be no less than 10% of all ordered sample analyses. The LCSs shall be included with each batch of samples processed and have, insofar as possible, a matrix, volume, mass, and other relevant characteristics of the actual samples being analyzed. The LCSs shall have range of activity from five (5) times to no greater than twenty (20) times the MDC values in Tables 1 through 4.

Method accuracy requirements shall be met when 95% of the LCS results, fall within $\pm 25\%$. Precision requirements shall be met when duplicate results, for samples ≥ 5 times the MDC values in Tables 1 through 4 or when the analytical uncertainty is $\leq 20\%$, fall within $\pm 30\%$ relative percent difference.

3.5.2 Air Sample Analyses

The QC tests shall be for accuracy, precision, and completeness. The results of all QC tests shall be documented. Analytical problems identified through analysis of QC samples shall be promptly corrected. WSCF shall produce a minimum of 90% usable analytical data, for all EEM-related samples received. WSCF shall provide data to A&WS, which demonstrates that the accuracy, precision, and completeness objectives have been met, biannually.

Accuracy requirements shall be met when 95% of the results from counting instrument performance check standards, fall within $\pm 25\%$. Precision of air sample data shall be evaluated by recounting a portion of the samples analyzed, since the creation of duplicate samples is not feasible for air samples. A&WS will identify the samples to be used for precision analysis on a quarterly basis. A minimum of 10% of the samples analyzed, in which the sample results will be used for calculating effluent emissions, will be recounted to determine precision, approximately 72 samples. Precision requirements shall be met when samples, with activities ≥ 5 times the MDC values in Tables 1 through 4 or when the analytical uncertainty is $\leq 20\%$, fall within $\pm 30\%$ relative percent difference.

The requirements of Section 3.5.1 apply to air samples analyses which involve radiochemical separations. The data quality objectives, for air samples requiring radiochemical separations, shall be met when the objectives in specified in Section 3.5.1 are met.

3.6 Retention of and Access to Raw Data and Results

All raw data and analytical results shall be retained as quality assurance documents for a minimum period of 5 years, as specified by 40 CFR 61 Subpart H.

As needed, EEM shall have access to all available raw data and results related to EEM samples. WSCF shall provide analysis printouts upon request (e.g. GEA list of identified peaks).

3.7 Analytical Error & Minimum Detectable Concentration

WSCF shall provide the overall analytical error associated with each analytical result. Total analytical error shall be calculated at the 95% confidence interval.

WSCF shall ensure that the sample's MDC does not exceed the values specified in Tables 3 through 7, when the nominal sample volume is provided. WSCF will not be accountable for maintaining the MDC limits when samples less than the nominal sample volume are provided. When sample sizes are less than or greater than the nominal volumes specified in Tables 3 through 7, EEM may adjust the MDCs for samples by multiplying the specified MDC by the ratio of the actual sample size and the nominal sample size.

3.8 Routine Electronic Transfer of Analytical Data

WSCF shall routinely and electronically transmit total alpha and total beta results to A&WS and NFM, via the ABCASH database. WSCF shall electronically transmit all calendar-year 1997 data to A&WS by **February 23, 1998** and to NFM by **March 16, 1998.**

3.9 Archiving of Samples

Ambient air monitoring samples shall be archived upon the completion of the total α and β analysis. Archived ambient air samples will be composited and analyzed bi-annually by WSCF. These samples can be identified as the samples with the Nxxx series Electronic Data Processing (EDP) codes.

Effluent air samples with EDP Codes listed in the Table A2 of the Appendix, shall be archived prior to any analyses being performed. As a purchased service, upon receipt WSCF will sort effluent samples into samples to be analyzed and samples to be archived, regardless of any labeling on the samples. The EDP code for the samples to archived are located in the Appendix's Table A2. After each quarter, A&WS will provide specific analysis instructions to WSCF regarding the archived samples. All archived effluent air samples, from CY-1997, may be disposed of after **July 15, 1998.**

Backup record and effluent Continuous Air Monitor (CAM) air samples shall not be analyzed but shall be archived until **July 15, 1998**. These samples can be identified as the samples received in white envelopes stamped "Archive Only", with EDP code that are not listed in the Appendix.

3.10 Analysis Costs

The sample analysis costs provided in Tables 1 through 4. These prices contain additional fees associated with services specific to the EEM Program. Table 6 contains a detailed list of the additional services factored into unit prices. The analysis costs in Tables 1 through 2 are estimated and may fluctuate due to changes in prices and workscope. Adjustments made to sample analysis costs shall have the concurrence of EEM. Table 5 provides a matrix to assist in charging analysis costs to the appropriate cost account.

4.0 REFERENCES

40 CFR 61 Subpart H, *Code of Federal Regulations*, Title 40, "Protection of the Environment," Part 61, "National Emissions Standards for Hazardous Air Pollutants," Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities", as amended, U.S. Environmental Protection Agency, Washington, D.C.

40 CFR 61 Appendix B, *Code of Federal Regulations*, Title 40, "Protection of the Environment," Part 61, "National Emissions Standards for Hazardous Air Pollutants," Appendix B, "Quality Assurance Methods," as amended, Appendix B, U.S. Environmental Protection Agency, Washington, D.C.

ASTM, 1991, *Establishing a Measurement System Quality Control Program for Analytical Chemistry Laboratories Within the Nuclear Industry*, ASTM C 1210, American Society for Testing and Materials.

DOE, 1988a, *General Environmental Protection Program*, DOE Order 5400.1, U.S. Department of Energy, Washington, D.C.

DOE, 1988b, *Radioactive Waste Management*, DOE Order 5820.2A, U.S. Department of Energy, Washington, D.C.

DOE, 1983, *Environmental Protection, Safety and Health Protection Information Reporting Requirements*, DOE Order 5484.1, U.S. Department of Energy, Washington D.C.

DOE, 1991, *Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance*, DOE/EH-0173T, U.S. Department of Energy, Washington D.C.

DOE, 1996, *Hanford Analytical Services Quality Assurance Requirements Documents*, DOE/RL-96-68, U.S. Department of Energy, Richland, Washington.

HPS, 1996, *Performance Criteria for Radiobioassay*, HPS N13.30, an American National Standard, Health Physics Society, McLean, Virginia.

WAC 246-247, *Washington Administrative Code* Chapter 246-247, "Radiation Protection - Air Emissions," as amended, Washington Department of Health, Olympia, Washington.

WHC-CM-7-5, *Environmental Compliance*, Westinghouse Hanford Company, Richland, Washington.

WHC, 1994a, *Quality Assurance Project Plan for Facility Effluent Monitoring Plan Activities*, WHC-EP-0446 Revision 2, Westinghouse Hanford Company, Richland, Washington.

WHC, 1994b, *Operational Environmental Monitoring Program Quality Assurance Project Plan*, WHC-EP-0538 Revision 2, Westinghouse Hanford Company, Richland, Washington.

WHC, 1995a, *Quality Assurance Program Plan for Radionuclide Airborne Emissions Monitoring*, WHC-EP-0536 Revision 3, Westinghouse Hanford Company, Richland, Washington.

WHC, 1995b, *Effluent Monitoring Quality Assurance Project Plan for Radioactive Airborne Emissions Data*, WHC-EP-0528 Revision 2, Westinghouse Hanford Company, Richland, Washington.

Table 1.
Ambient and Effluent Air
Sample Analysis Criteria for WSCF.

AMBIENT & EFFLUENT AIR SAMPLE ANALYSIS CRITERIA				
Nominal Volume of Air Sampled	**Type of Analysis**	**MDC[a] (μCi/mL)[b]**	**TT (days)**	**Unit Price[c] ($)**
5.66 E+08 mL (20,000 ft^3)	Total α/β	2.0 E-15 (α) and 1.9 E-14 (β)	14	141.00
	Ag Zeolite	3.4 E-13 (^{106}Ru)	30	247.00
7.42 E+09 mL (262,000 ft^3)	Total α/β Composite Analysis	2.0 E-15 (α) and 1.9 E-14 (β)	90	141.00
	^{90}Sr	1.9 E-14	90	282.00
	Isotopic U (^{234}U, ^{235}U, ^{238}U)	7.1 E-15	90	353.00
	Isotopic Pu (^{238}Pu, $^{239/240}Pu$)	2.0 E-15	90	388.00
	^{241}Pu	1.0 E-13	90	400.00
	^{241}Am	1.9 E-15	90	353.00
	GEA[d]	1.9 E-14 (^{137}Cs)	90	176.00

MDC = Minimum Detectable Concentration
TT= Turnaround Time, starting from the receipt of all samples to be analyzed and all relevant sampling data, and ending when the results, in units of concentration, are received electronically.

a MDC's shall be as low as reasonably attainable, but shall not exceed the values specified in the table. MDC values obtained from 40 CFR 61 Appendix E Table II.

b Unless other units of measure are indicated.

c These prices contain additional fees associated with services specific to the EEM Program. Table 8 contains a detailed list of the additional services factored into unit prices.

d All positive GEA results shall be reported, with the exception of the short-lived ^{222}Rn and ^{220}Rn progeny.

Table 2.
Groundwater Monitoring and Liquid Effluent Sample Analysis Criteria for WSCF[a].

GROUNDWATER MONITORING & LIQUID EFFLUENT SAMPLE ANALYSIS CRITERIA				
Sample Size	Type of Analysis	MDC[b] (μCi/mL)[c]	TT (days)	Unit Price[d] ($)
1.0 L	Total α/ß	1.2 E-09 (α) and 4.0 E-08 (β)	45	141.00
	^{3}H	8.0 E-05	45	141.00
	^{90}Sr	4.0 E-08	45	240.00
	GEA[e]	1.2 E-07 (^{137}Cs)	45	176.00
	Isotopic U (^{234}U, ^{235}U, ^{238}U)	2.0 E-08	45	282.00
	Isotopic Pu (^{238}Pu, $^{239/240}Pu$)	1.2 E-09	45	296.00
	^{241}Am	1.2 E-09	45	282.00
	pH	NA	60	25.00
	NO_3	1.0 E-06 g/mL	60	212.00

MDC = Minimum Detectable Concentration
TT = Turnaround Time, starting from the receipt of all samples to be analyzed and all relevant sampling data, and ending when the results, in units of concentration, are received electronically.

a Liquid effluent samples shall be analyzed unfiltered, where as ground water samples shall be filtered and only the filtrate analyzed. The EDP codes for the liquid effluent samples are identified in memo 88420-94-130's Attachment.

b MDC's shall be as low as reasonably attainable, but shall not exceed the values specified in the table. MDC values obtained from 4% of the Derived Concentration Guidelines (DCG).

c Unless other units of measure are indicated.

d These prices contain additional fees associated with services specific to the EEM Program. Table 8 contains a detailed list of the additional services factored into unit prices.

e All positive GEA results shall be reported, with the exception of the short-lived ^{222}Rn and ^{220}Rn progeny.

Table 3.
Pond Vegetation and Sediment
Sample Analysis Criteria for WSCF.

POND VEGETATION AND SEDIMENT SAMPLE ANALYSIS CRITERIA				
Sample Size (dry weight) (g)	**Type of Analysis**	**MDC[a] (pCi/g)[b]**	**TT (days)**	**Unit price[d] ($)**
500	^{90}Sr	10.00	90	318.00
500	GEA[d]	0.20 (^{137}Cs)	90	205.00
500	Isotopic U (^{234}U, ^{235}U, ^{238}U)	0.04	90	388.00
500	Isotopic Pu (^{238}Pu, $^{239/240}Pu$)	1.00	90	388.00

MDC = Minimum Detectable Concentration
TT = Turnaround Time, starting from the receipt of all samples to be analyzed and all relevant sampling data, and ending when the results, in units of concentration, are received electronically.

a MDC's shall be as low as reasonably attainable, but shall not exceed the values specified in the table.
b Unless other units of measure are indicated
c All positive GEA results shall be reported, with the exception of the short-lived ^{222}Rn and ^{220}Rn progeny.
d These prices contain additional fees associated with services specific to the EEM Program. Table 8 contains a detailed list of the additional services factored into unit prices.
e Total uranium analyses will be performed until an isotopic uranium analysis is established.

Table 4.
Non-Routine Environmental Samples, Sample Analysis Criteria for WSCF[a].

NONROUTINE ENVIRONMENTAL SAMPLES, SAMPLE ANALYSIS CRITERIA				
Sample Size	Type of Analysis	MDC[b]	TT (days)	Unit Price[c] ($)
TBD	^{90}Sr	TBD	90	TBD
	GEA[d]	TBD	90	TBD
	Isotopic U (^{234}U, ^{235}U, ^{238}U)	TBD	90	TBD
	Isotopic Pu (^{238}Pu, $^{239/240}Pu$)	TBD	90	TBD

MDC = Minimum Detectable Concentration
TT = Turnaround Time, starting from the receipt of all samples to be analyzed and all relevant sampling data, and ending when the results, in units of concentration, are received electronically.
TBD = To Be Determined

a Occasional nonroutine air, liquid, vegetation, and sediment samples may need analysis. WSCF can not accept the following types of nonroutine samples: animals, feces, nests, or samples with an exposure rate > 1mR/h, and/or samples containing > 10 nCi of any alpha emitter.

b MDC values and units for nonroutine samples shall be dependent on sample type and commensurate with the values listed in Tables 1 through 3. MDC's shall be as low as reasonably attainable, but shall not exceed the values specified in the Tables 1 through 3.

c Cost for nonroutine samples shall be dependent on sample type and commensurate with the values listed in Tables 3 through 5.

d All positive GEA results shall be reported, with the exception of the short-lived ^{222}Rn and ^{220}Rn progeny.

Table 5.
Matrix for Charging Sample Analysis Costs.

Effluent Monitoring Samples	
Sample Category	**Cost Account[a]**
Effluent Air Samples	1R43U2
Effluent Air Samples from 1706-KE (EDP Codes: Y243, Y244)	Work Order
Effluent Liquid Samples	1R43U2
Near-Field Monitoring (NFM) Samples	
Sample Category	**Cost Account**
Total α and β Analysis of NFM Air Samples	1R43U2
Composite Analysis of 100-K Air Samples (EDP Codes: N401 - N404)	1R43U2
Composite Analysis of 100-N Air Samples (EDP Codes: N101 - N105)	Work Order
Composite Analysis of 200 and 300 Area Air Samples	1R43U2
Analysis of all Special Samples, Aquatic Vegetation, and Aquatic Sediment Samples	1R43U2

a TCPNs and work order numbers will not be included in this document, but will be provided to WSCF.

Table 6.
Additional Services
Factored into WSCF's Sample Analysis Prices for EEM Program.

Additional Services Provided by WSCF as Part of Routine Analysis of EEM Samples	
Sample Category	**Additional Services Provided**
Air Samples	Entering sample collection data into ABCASH, for facilities not equipped with bar coding equipment.
	Downloading all air sample results into ABCASH.
	Disposal of samples and wastes from chemical processing.
	Archiving NFM samples and effluent samples from major emission units, which receive composite analyses.
	Archiving samples from minor emission units, which receive quarterly analysis.
	Archiving backup effluent samples and effluent samples from minor emission units, which do not get analyzed.
	Notifying EEM POCs about zero ABCASH results.
	Sorting effluent samples into two groups: 1) samples to be analyzed and 2) samples to be archived.
	Assembly and preparation of samples for composite analysis.
	Preparation and analysis of QC samples (e.g. control standards, blanks, duplicates, matrix spikes, etc...).
Liquid Samples	Archiving samples until composite analysis is performed.
	Archiving unused samples until EEM reports are issued.
	Assembly and preparation of samples for composite analysis. Includes verifying receipt of all samples for composite, calculating effluent stream volumes and determining aliquot sizes for composite.
	Disposal of samples and wastes from chemical processing.
	Preparation and analysis of QC samples (e.g. control standards, blanks, duplicates, matrix spikes, etc...).
Miscellaneous	Supporting audits of the EEM Program.
	Participate in the prescribed laboratory intercomparison programs.
	Provide laboratory intercomparison results to EEM.
	Perform rush and emergency sample analyses.

GLOSSARY

ACRONYMS

A&WS	RFSH's Air & Water Services Organization
CAM	Continuous Air Monitor
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations
EDP Code	Electronic Data Processing Code
EIS-ODIS	Effluent Information System-Onsite Discharge Information System
EEM	Effluent and Environmental Monitoring Program
EML	Environmental Measurements Laboratory
EPA	U.S. Environmental Protection Agency
GEA	Gamma Energy Analysis
MDC	Minimum Detectable Concentration
NFM	RFSNW's Near-Field Monitoring Organization
PHMC	Project Hanford Management Contractor
RFSH	Rust Federal Services Hanford, Inc.
RFSNW	Rust Federal Services Northwest, Inc.
TT	Turnaround Time
TBD	To Be Determined
WAC	Washington Administrative Code
WSCF	Waste Sampling and Characterization Facility

DEFINITION OF TERMS

Accuracy. The degree of agreement of a measurement with a true or known value.

Completeness. A measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under correct normal conditions.

Precision. A measure of mutual agreement among individual measurements of the same property under similar conditions. Precision is best expressed in terms of standard deviation.

Turnaround time. Elapsed time, in days, starting from the receipt of all samples to be analyzed and all relevant sampling data, and ending when the results, in units of concentration, are received electronically.

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APPENDIX

Analytical Requirements for EEM Sampling During CY 1997

Table A1
Air Samples Receiving "Continuous" Routine Analyses by WSCF during CY 1997

Facility	EDP Codes	Stack ID Number	Analyses						
			Total alpha/beta	GEA[a]	Sr-90	Isotopic Pu[b]	Pu-241	Am-241	AgZ[c]
PUREX	A552	291-A-1	12	4	4	4	4	4	
	A511								12
B-Plant	B691	291-B-1	26	4	4	4		4	
WESF	B748	296-B-10	26	4	4				
East Tank Farms	E058	296-A-12	1	1	1	1		1	
	E059	296-A-17	26	4	4	4		4	
	E026 & E027								4
	E080	296-A-25	26	4	4	4		4	
	E270	296-A-27	26						
	E901	296-A-29	26						
	E013	296-A-40	26	4	4	4		4	
	E028 & E029								4
	E147	296-A-42	1	1	1	1		1	
	E152								1
	E069	296-C-5	26	4	4	4		4	
	E083	296-C-6	1	1	1	1		1	
	E084								1
	E068	296-P-16	26	4	4	4		4	
	E120	296-P-17	1	1	1	1		1	
	E039	296-P-26	1	1	1	1		1	
	E040 & E041								1
242-A Evaporator	E643	296-A-22	26	4	4	4		4	
	E001 & E002								16
West Tank Farms	E886	296-B-28	26	4	4	4		4	
	W190	296-P-23	1						
	W195	296-P-28	26						
	W111	296-S-15	26						
	W880	296-S-22	26	4	4	4		4	
	W145	296-S-25	1						
	W882	296-T-18	26	4	4	4		4	
	W884	296-U-11	1	1	1	1		1	
WRAP I	W123	296-W-4	20	3	3	3	3	3	
PFP	Z810	291-Z-1	26			4	4	4	
	Z813	296-Z-3	26			4	4	4	
		Totals	482	57	57	61	15	61	39

a Minimum GEA analysis will be for Co-60, Ru-106, Sn-113, Sb-125, Cs-134, Cs-137, Eu-152, Eu-154, and Eu-155. All positive GEA results shall be reported also.
b Air & Water Services will provide explicit instructions on the composited analyses of these samples.
c AgZ analysis includes Ru-106, Sn-113, Sb-125, and I-129.

Table A2
Archived Samples Requiring Total Alpha/Beta Analyses[a] by WSCF during CY 1997

Facility	EDP Codes	Stack ID Number	Samples Archived	Total Analyses
PUREX	A550	296-A-10	1	1
B-Plant	B686	291-B-5	26	4
	B690	296-B-13	7	1
East Tank Farms	E052	296-A-13	26	4
	E060	296-A-18	26	4
	E061	296-A-19	26	4
	E197	296-A-20	26	4
	E297	296-A-26	26	4
	E272	296-A-28	26	4
	E903	296-A-30	26	4
	E015	296-A-41	26	4
	E148	296-A-43	26	4
	E044	296-C-7	26	4
	E209	296-P-31	26	4
	E037	296-P-41	26	4
242-A	E645	296-A-21	26	4
ETF	E036	296-E-1	26	4
Tank Farm Characterization Project	E311-E399	296-P-32	2	2
	W301-W399		2	2
	E301-E399	296-P-33	10	4
	W301-W399		10	4
	E301-E399	296-P-34	10	4
	W301-W399		10	4
222-S Lab	S264	296-S-16	26	4
	S289	296-S-21	26	4
S-Plant & U-Plant	S006	291-S-1	4	4
	S032	296-S-2	4	4
	S015	296-S-7E	26	4
	S016	296-S-7W	4	1
	U771	291-U-1	4	4
T-Plant	T785	291-T-1	26	4
	T154	296-T-7	26	4
	T786	296-T-13	26	4
TRUSAF	T783	296-T-11	26	4
	T784	296-T-12	26	4
West Tank Farms	W191	296-P-22	26	4
	W096	296-S-18	26	4
	W117	296-T-17	26	4
	W003	296-W-3	26	4
WSCF	W010	696-W-1	4	4
	W011	696-W-2	4	4
Plutonium Finishing Plant	Z913	291-Z-5	26	4
	Z802	296-Z-6	26	4
	Z370	296-Z-10	26	4
	Z814	296-Z-14	26	4
	Z915	296-Z-15	1	1
		Totals	883	168

a These record samples will be archived upon receipt, prior to analysis. Air & Water Services will provide instructions regarding which samples to analyze or to composite and analyze, after each quarter.

Table A3
Liquid Effluent
Sample Analyses for CY-1997

Facility	EDP Code	Stream Code	Analyses						
			Total alpha/beta	GEA[a]	Sr-90	Isotopic Pu[b]	Am-241	Isotopic U[c]	Tritium
East Tank Farms	H115	CA8	6	6	6	6	6		
	H116	CAR	6	6	6	6	6		
242-A	H108	ACW	6	6	6	6	6	6	6
	H110	ASC	6	6	6	6	6		6
B-Plant	H117	CBC	6	6	6	6	6		
	Sample Totals		30	30	30	30	30	6	12

a Minimum GEA analysis will be for Co-60, Ru-106, Sn-113, Sb-125, Cs-134, Cs-137, Eu-152, Eu-154, and Eu-155. All positive GEA results shall be reported also.
b Isotopic plutonium analysis will include Pu-238 and Pu-239/240 results.
c Isotopic uranium analysis will include U-234, U-235, and U-238.

Table A4
Near-Field Monitoring[a]
CY-1997 Sample Analyses per Year

Sample Media	Area	Analysis									
		Total alpha/beta	GEA[b]	Sr-90	Isotopic Pu[c]	Pu-241	Am-241	Isotopic U[d]	Tritium	pH	Nitrate
Air	100-N	104	8	8	8			8			
	100-K	104	8	8	8	8		8			
	200	884	70	70	70		20	70			
	300	26	2	2	2			2			
Sample Totals		1118	88	88	88	8	20	88	0	0	0
Water	100										
	200	36	36	36	36			36	12	162	12
	300										
	400										
Sample Totals		36	36	36	36	0	0	36	12	162	12
Vegetation	100										
	200		56	56	56			56			
	300		16	16	16			16			
	400		1	1	1			1			
Sample Totals		0	73	73	73	0	0	73	0	0	0
Soil	100										
	200		56	56	56			56			
	300		16	16	16			16			
	400		1	1	1			1			
Sample Totals		0	73	73	73	0	0	73	0	0	0
Estimated NonRoutine Samples	Air		25	25	25		25	25			
	Soil		25	25	25						
	Vegetation		25	25	25			25			
Sample Totals		0	75	75	75	0	25	50	0	0	0

a All routine Near-Field Monitoring samples are identified by the Nxxx series or H001 through H100 EDP codes. Special samples are identified as "N" monitoring samples on the chain-of-custody form. Specific EDP codes are not provided in this table since, no other samples share the

b Minimum GEA analysis results will be reported for Co-60, Ru-106, Sn-113, Sb-125, Cs-134, Cs-137, Ce-144, Eu-152, Eu-154, Eu-155, and any other radionuclides having positive peaks identified in the gamma spectrum.

c Isotopic plutonium analysis will include Pu-238, and Pu-239/240 results.

d Isotopic uranium analysis will include U-238, U-234, and U-235 results.

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