Statement of Work for Services Provided by the Waste Sampling and Characterization Facility for the Effluent and Environmental Monitoring Program During Calendar Year 1998

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

Fluor Daniel Hanford, Inc.
Richland, Washington

Hanford Management and Integration Contractor for the
U.S. Department of Energy under Contract DE-AC-0696-RL13200

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Date Published
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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 1998**

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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 1998

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-1998. 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), *Near-Facility Environmental Monitoring Quality Assurance Project Plan* (WMNW 1997), and *Hanford Analytical Services Quality Assurance Requirements Documents* (DOE 1996). Should changes to this document be necessary, WSCF or the Waste Management Federal Services, Inc. (WMH) Air & Water Services (AWS) 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 AWS.

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 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. AWS and the Waste Management Federal Services, Inc., Northwest Operations (WMNW) Environmental Monitoring & Investigations Organization (EMI) provide the effluent and near-facility monitoring sections of this report.

2.4 Effluent Information System-onsite Discharge Information System Report

Each year AWS 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.

2.5 Hanford Site Near-Facility Environmental Monitoring Annual Report

EMI 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

Effluent air emission composite samples shall be composited quarterly or monthly and the first three quarters shall be reported electronically to AWS by the dates listed below:

- First quarter air emission composite results . . . . . **June 30, 1998**
- Second quarter air emission composite results . . . . . **September 30, 1998**
- Third quarter air emission composite results . . . . . **December 31, 1998**

All results shall be in units of concentration.

Ambient air composite samples shall be composited bi-annually and reported electronically to EMI 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 AWS for all samples collected up through December 31st are:

- Air emission data . . . . . **February 15, 1999**

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

- Environmental data
  (air, surface water, and pond vegetation and sediment) . . . . . **March 15, 1999**

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 AWS, which demonstrates that the data quality objectives for accuracy, precision, and completeness have been met. Audit able quality control (QC) test results shall be provided within two weeks of requesting specific records, without any additional charges. As a special request, audit able quality control (QC) test results can be provided in less than two weeks (e.g. within 24 hours, etc...), upon receiving a request for specific records. Special requests may require additional resources and funding, which is the responsibility of the requestor to provide.

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 and valid analytical data, for all EEM-related samples received. WSCF shall provide data to AWS, 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 all QC 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 AWS, 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. AWS 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 70 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 1 through 4, 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 1 through 4, 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 all analytical results to AWS and EMI, via the ABCASH database. WSCF shall electronically transmit all calendar-year 1998 data to AWS by **February 22, 1999** and to EMI by **March 15, 1999**.

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. Upon receipt, WSCF will sort effluent samples into samples to be analyzed and samples to be archived, regardless of any labeling on the samples. WSCF shall enter the sample collection data into ABCASH, when samples with EDP codes listed in Tables A1 and A2 have not been entered into ABCASH by the facility. After each quarter, AWS will provide specific analysis instructions to WSCF regarding the archived samples. All archived effluent air samples, from CY-1998, may be disposed of after **July 15, 1999**.

Backup record and effluent Continuous Air Monitor (CAM) air samples shall not be analyzed but shall be archived until **July 15, 1999**. These samples can be identified as the samples received in white envelopes stamped "Archive Only", with EDP codes 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.

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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, 1994, *Quality Assurance Project Plan for Facility Effluent Monitoring Plan Activities*, WHC-EP-0446 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.

WMNW, 1997, *Near-Facility Environmental Monitoring Quality Assurance Project Plan*, HNF-EP-0538 Revision 3, Waste Management Federal Services, Inc., Northwest Operations, Richland, Washington.

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

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
1.47 E+09 mL (51,900 ft^3)	^{90}Sr	1.9 E-14	90	282.00
	GEA[d]	1.9 E-14 (^{137}Cs)	90	176.00
	Isotopic Pu (^{238}Pu, $^{239/240}Pu$)	2.0 E-15	90	388.00
	^{241}Am	1.9 E-15	90	353.00
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
	Isotopic U (^{234}U, ^{235}U, ^{238}U)	7.1 E-15	90	353.00
	^{241}Pu	1.0 E-13	90	400.00

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].

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.

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

Sample Size (dry weight) (g)	Type of Analysis	MDC[a] (pCi/g)[b]	TT (days)	Unit price[e] ($)
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.
Nonroutine Environmental Samples, Sample Analysis Criteria for WSCF[a].

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]**
Total α/β and Isotopic Analysis of 200 Areas' Effluent Air Samples	1R43U2
Total α/β and Isotopic Analysis of 100-N Area's Air Samples (Air EDP Codes: Y211 and Y264)	Work Order
Total α/β Analysis of the Radiological Counting Faciltiy's Air Samples (Air EDP Codes: Y215 and Y216)	Work Order
Near-Facility Monitoring (NFM) Samples	
Sample Category	**Cost Account**
Total α/β Analysis of NFM's Air Samples	1R43U2
Isotopic Analysis of 100-K Area's Air Samples (Air EDP Codes: N401 - N404)	1R43U2
Total α/β and Isotopic Analysis of 100-N Area's Air, Soil, Vegetation, and Water Samples (Air EDP Codes: N101 - N105) (Soil EDP Codes: Y603, Y605, and Y608) (Veg. EDP Codes: Y703, Y705, Y708, Y718, Y719, and Y724) (Water EDP Codes: Y301-Y313)	Work Order
Isotopic Analysis of 100-B/C Areas' Air Samples (Air EDP Codes: N464-N466)	Work Order
Isotopic Analysis of 100-D/DR Areas' Air Samples (Air EDP Codes: N467-N470)	Work Order
Isotopic Analysis of ERDF's Air and Soil Samples (Air EDP Codes: N482-N484) (Soil EDP Code: D146)	Work Order
Isotopic Analysis of 300-FF-01's Air Samples (Air EDP Codes: N485-N487)	Work Order
Isotopic Analysis of 200 and 300 Areas' 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.

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

AWS	WMH'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
EMI	WMNW's Environmental Monitoring & Investigations Organization
EML	Environmental Measurements Laboratory
EPA	U.S. Environmental Protection Agency
GEA	Gamma Energy Analysis
LCS	Laboratory Control Standards
MDC	Minimum Detectable Concentration
NFM	Near-Facility Monitoring
PHMC	Project Hanford Management Contractor
TT	Turnaround Time
TBD	To Be Determined
WAC	Washington Administrative Code
WMH	Waste Management Federal Services of Hanford, Inc.
WMNW	Waste Management Federal Services Northwest, Inc., Northwest Operations
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 and usable 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 1998

Table A1
Air Samples Receiving "Continuous" Routine Analyses by WSCF during CY 1998

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	19	3	3	3		3	
	B001	296-B-1	14	2	2	2		2	
WESF	B748	296-B-10	26	4	4				
East Tank Farms	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	
	E039	296-P-26	1	1	1	1		1	
	E040 & E041								1
	E401	296-P-32	26	4	4	4		4	
242-A Evaporator	E643	296-A-22	26	4	4	4		4	
	E001 & E002								16
TWRS Char. Project	E307	296-P-33	10	1	1	1		1	
	E308	296-P-34	10	1	1	1		1	
TRUSAF	T783	296-T-11	4						
	T784	296-T-12	4						
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	W123	296-W-4	24	4	4	4	4	4	
PFP	Z810	291-Z-1	26			4	4	4	
	Z813	296-Z-3	26			4	4	4	
100-N	Y211	116-N	26	12	12	12		12	
	Y265	107-N	5						
		Totals	576	75	75	79	16	79	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 1998

Facility	EDP Codes	Stack ID Number	Samples Archived	Total Analyses
PUREX	A550	296-A-10	1	1
B-Plant	B658 B826 B827 B828 B829 B831	296-B-22 296-B-23 296-B-24 296-B-25 296-B-26 296-B-27	24	24
East Tank Farms	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
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	4	1
	S016	296-S-7W	52	4
	U771	291-U-1	4	4
Radiological Counting Facility	Y215	H0-64-4230	4	4
	Y214	MO-423	4	4
T-Plant	T785	291-T-1	26	4
	T154	296-T-7	26	4
	T786	296-T-13	1	1
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	296-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	813	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
Near-Facility Monitoring[a]
CY-1998 Sample Analyses per Year

Sample Media	Area	Analysis									
		Total alpha/beta	GEA[b]	Sr-90	Isotopic Pu[c]	Isotopic Pu-241	Isotopic Am-241	Isotopic U[d]	Tritium	pH	Nitrate
Air	100-B/C	78	6	6	6			6			
	100-D/DR	104	8	8	8			8			
	100-K	104	8	8	8	8		8			
	100-N	104	8	8	8			8			
	200	884	70	70	70		20	70			
	ERDF	78	6	6	6			6			
	300	26	2	2	2			2			
	300-FF-01	78	6					6			
Sample Totals		1456	114	108	108	8	20	114	0	0	0
Water	100		10	10					10		
	200	36	36	36	36			36	12	162	12
	300										
	400										
Sample Totals		36	46	46	36	0	0	36	22	162	12
Vegetation	100		10	10	10			10			
	200		56	56	56			56			
	300		16	16	16			16			
	400		1	1	1			1			
Sample Totals		0	83	83	83	0	0	83	0	0	0
Soil	100		8	8	8			8			
	200		56	56	56			56			
	300		16	16	16			16			
	400		1	1	1			1			
Sample Totals		0	81	81	81	0	0	81	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-Facility 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 these EDP codes.

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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