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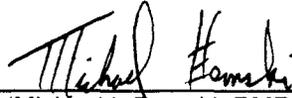
**MAIN AND PROTECTED AREA DECONTAMINATION FACILITIES  
SAMPLING AND ANALYSIS PLAN**

RF/RMRS-97-042

Revision 0

Date Effective: 9/4/97

APPROVED: \_\_\_\_\_

  
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## 1. OBJECTIVE

The objective of this Sampling and Analysis Plan (SAP) is to identify the specific analytical needs, sampling requirements, data handling requirements, and associated quality assurance/quality control (QA/QC) requirements for the Decontamination Facilities' samples. This SAP outlines the sampling requirements for the following items:

- Environmental Liquids
- Decontamination Sediments for on-site disposition

Note that if it is necessary to ship samples not previously characterized for radioactivity off-site for analysis, radiological screen samples must also be collected, analyzed, and the data assessed prior to shipment of the samples (refer to Section 4.4).

## 2. DECONTAMINATION FACILITY OVERVIEW

The Decontamination Facilities (DFs) consist of two functional areas: the equipment decontamination pad, and the environmental liquids management area. The facilities are designed to decontaminate equipment and to collect, store, and manage wastes from decontamination activities. The wastes generated from these activities are characterized for transfer and final disposition. The wastes will include environmental liquids and sediment wastes. This sampling and analysis plan is applicable to two

decontamination facilities: the Main Decontamination Facility (MDF) and the Protected Area Decontamination Facility (PADF). The MDF was constructed in March 1991 and updated in April 1996. The MDF is located in the southeast corner of the contractor's yard next to the 903 Pad at Rocky Flats Environmental Technology Site (RFETS). The PADF is located in the northeast corner of the Protected Area at RFETS. The PADF was constructed in November 1992. Access to the Protected Area (PA) requires special security procedures which includes a vehicle search, a personal property search, and possibly an escort.

## 2.1 UNIT PROCESS DISCUSSION

The DFs are designed and operated to decontaminate potentially contaminated equipment used in various activities at RFETS and to manage the wastes produced as a result of the decontamination. Decontamination is required for reassignment or reuse of equipment, tools, and machinery to prevent potential cross-contamination and to provide for such equipment and materials to be released off site. Decontamination of equipment is required to prevent the potential for personnel exposure and the spread of contamination to other parts of RFETS or off site.

The DFs are used by approved and trained personnel in accordance with RMRS/ER-OPS-FO.17, Main Decontamination Facility Normal Operations, and 5-21000-OPS-FO.12, Decontamination Facility Operations. All personnel using the facilities are required to contact the Facility Manager to schedule time for decontamination of their equipment at the facilities. The Decontamination Facilities (DFs) consist of two functional areas: the equipment decontamination pad, and the environmental liquids management area.

### Equipment Decontamination Pad

The equipment decontamination pads include a drainage system, a sump for collection of fluid runoff, and a pumping system for moving liquids from the sump to the environmental liquids management area. The

sediments are collected in the sump, cyclone separators, and holding tanks. Periodically, the sediments from the cyclone separators and holding tanks are placed in the sump. Wet sediments are sampled and characterized, removed from the sump, drummed, and stored for disposal.

#### Environmental Liquids Management Area

The environmental liquids management area consists of secondarily-contained storage and sedimentation tanks and a transfer pump, piping and cyclone separators. Environmental liquids collected in the pad sump are typically pumped through two cyclone separators in series. The separators remove larger particulates of the suspended solids remaining in the environmental liquids. At the MDF, the effluent from the cyclone separators flows through three sedimentation tanks set in series. When the residual sediments have settled, the relatively sediment-free liquids are then pumped from the sedimentation tanks to the large holding tanks. When the holding tanks become full, the liquids are transported to the Consolidated Water Treatment Facility (CWTF) for treatment and release.

### **3. SAMPLING APPROACH AND REQUIREMENTS**

This section addresses sample locations, frequency, specific analytical needs, sampling requirements, and associated quality assurance/quality control (QA/QC) requirements. Data collection follows requirements outlined in the Rocky Mountain Remediation Services, L.L.C. Quality Assurance Program Description (QAPD), RMRS-QAPD-001, Rev. 1, 1/01/97. Refer to Section 5.0 of this document for a discussion on the Data Quality Objectives (DQO's) for the DFs samples.

#### **3.1 SAMPLING LOCATIONS AND FREQUENCY**

Environmental materials generated at the DFs that may require sampling are as follows:

- Environmental liquids brought to the facilities by subcontractors and environmental liquids generated during decontamination of equipment and environmental material containers.

- Sediments in the decontamination pad sump.

The following is a list of sampling locations and associated Rocky Flats Environmental Data System (RFEDS) location codes:

- Waters (Not Routinely Sampled)
  - Storage Tank T104 DW01
  - Storage Tank T105 DW02
  - Storage Tank T204 DW03
  - Storage Tank T205 DW04
  - Storage Tank 6 DW06
  - Storage Tank 7 DW07
  - Storage Tank 8 DW08
  - Storage Tank 9 DW09
  - Storage Tank 10 DW10
  - Storage Tank 11 DW11
  - Equipment Rinsates DW12
  - Trip Blanks DW13
  - Pallet Rinsates DW14
  - Nondescript Water/Tanker Water DW15
  - Extra Location Codes DW16 - DW20
- Waste Stream Samples (sampled and evaluated prior to disposition)
  - MDF Sedimentation Tank DP00192
  - PADF Sedimentation Tank DP00293

Routinely generated waters will not be sampled, unless determined to be necessary by the Responsible CWTF Project Manager.

Water samples (as requested) will be collected, analyzed, and results submitted to the Responsible Manager for assessment in accordance with 4-I49-ENV-OPS-F0.31, Rev. 2, Influent Collection, Transfer, and Storage - Normal Operations - CWTF. Note that it may be necessary for the Responsible CWTF Project Manager to request samples/analyses based on knowledge of the influent source. A description of the sampling procedures is contained in Section 4.0.

**TABLE 3-1**  
**Sampling Summary**

RFEDS Location Code	Sample Location	Sample Type	Sampling Frequency <sup>1</sup>	Analytical Suites	Analytical Methods/Protocol Used
DW01 through DW20	Storage Tanks and Rinse Water	Aqueous	One grab sample as requested	Optional: VOCs; Total Metals; Total Radionuclides <sup>2</sup>	VOCs EPA 8240 or 8260 as appropriate; Metals TCL list, and Radiochemistry
DP00192	MDF Sump	Solid	One composite sample per 10 drumming events <sup>3</sup>	TCLP Volatiles <sup>5</sup> ; TCLP Metals <sup>5</sup> ; Total Radionuclides/ <sup>4</sup> Isotopic Analysis <sup>4</sup>	TCLP EPA 1311, VOCs EPA 8240 or 8260; TCLP Metals EPA 6010A & 7470; and Radiochemistry
DP00293	PADF Sump	Solid	One composite sample per 10 drumming events <sup>3</sup>	TCLP Volatiles <sup>5</sup> ; TCLP Metals <sup>5</sup> ; Total Radionuclides/ <sup>4</sup> Isotopic Analysis <sup>4</sup>	TCLP EPA 1311, VOCs EPA 8240 or 8260; TCLP Metals EPA 6010A & 7470; and Radiochemistry

1. Sampling frequency and analytical parameters may be increased at any time at the request of the Responsible Manager.
2. Radionuclides include Pu 239/240, Am 241, U 233/234, U 235, and U 238.
3. Sampling parameters must certify compliance with Land Disposal Requirement (LDR) requirements or off-site waste disposal criteria outlined in the Material Acceptance Process Manual, developed by ENVIROCARE.
4. Radionuclides include Pu 239/240, Am 241, U 233/234, U 235, and U 238. See Table 3-2 "Isotopic Analysis" for container, preservative, and holding time information.
5. See table 3-2 for container, preservative, and holding time information.

**TABLE 3-2**  
**Bottle, Preservation, and Analytical Requirements**  
**for Solids Analysis to Meet ENVIROCARE'S Mixed Waste Acceptance Criteria (WAC)**

Analytical Method	Analytes	Utah Cert. Required	Container	Preservative	Holding Time
Gamma Spectrometry	Gamma emitting radioisotopes	Yes	250-ml wide mouth glass or poly jar	None	6 months
Isotopic Analysis	Uranium, Americium & Plutonium isotopes	Yes	250-ml wide mouth glass or poly jar	None	6 months
SW-846, Chapter 7	Reactive Sulfide	Yes	combine with TCLP jar	Cool to 4 °C	7 days
SW-846 Method 9045	Reactive Cyanide	Yes	combine with TCLP jar	Cool to 4 °C	14 days
SW-846 Method 8240B/8260A	Soil pH or corrosivity	Yes	3 x 40-ml VOA vials - Teflon lined septa lids	Cool to 4 °C, HCl to pH<2	ASAP (up to 14 days)
SW-846 Method 8240B/8260A	Volatiles (Trip Blank)	Yes	120 or 125-ml widemouth glass jar with Teflon lined lid	Cool to 4 °C	14 days
TCLP SW-846 1311 (extraction)	Volatiles	Yes	1-L wide mouth jar with Teflon lined lid, as appropriate, so that the TCLP can be combined with other samples listed in this table.	Cool to 4 °C	180 days from extraction, 180 days from extraction to analysis, except Hg: 28 days to extraction, 28 days from extraction to analysis.
	8 TCLP metals + Cu, Zn, Sb, Be, Ni, Ti, V (Method 6010A, except Hg, Method 7470) all analyses with detection levels <RCRA UTS. Note: Use Method 7841, for Thallium if can't meet UTS levels with Method 6010A	Yes		Cool to 4 °C	14 days to TCLP extraction, 7 days to preparative extraction, 40 days from preparative extraction to analysis.
	TCLP Semivolatiles (Method 8270/8270A)				14 days to TCLP extraction, 14 days from extraction to analysis.
	TCLP Volatiles (Method 8240B/8260A)				14 days to TCLP extraction, 7 days to preparative extraction, 40 days from preparative extraction to analysis
	*TCLP Chlorinated Herbicides (Method 8150)				14 days to TCLP extraction, 7 days to preparative extraction, 40 days from preparative extraction to analysis
	*TCLP Organochlorine Pesticides (Method 8080/8081)				14 days to TCLP extraction, 7 days to preparative extraction, 40 days from preparative extraction to analysis
Determined by ENVIROCARE	ENVIROCARE Evaluation (finger print) samples	N/A	2 pound, as required	None	None

- Due to time constraints during sampling, the samples will be placed in a cooler with blue ice (if required) and transferred to the laboratory or sample refrigerator as soon as possible to chill the samples to 4°C±2°C. It is recognized that the cooler and samples will not achieve 4°C±2°C in the field. The field temperature of the cooler/samples will not be monitored to prevent causing a rise in temperature in the cooler/samples by opening the cooler multiple times. Radiological samples do not require refrigeration but must be secured in a cool, dry area to minimize the chance of cross-contamination.
- Sample bottles may be bagged in the field, in the subcontractor trailer, or delivered to the on-site laboratory without bags. The sampler/packer shall use best judgment when packing samples, and delivery of samples to the on-site lab will not require the stringent packing requirements applicable to off-site shipments. Multiple analytes may be combined in bottles if volumes and preservation are alike.
- Glass containers require Teflon-lined lids. Multiple analytes may be taken in larger single jars.
- TCLP Chlorinated Herbicides and Organochlorine Pesticides will only be performed at the request of ENVIROCARE to meet their disposal requirements.

### 3.2 ANALYTICAL METHODS

Table 3-1 summarizes the sampling locations, sampling frequencies, analytical suites, and analytical methods for the anticipated contaminants of concern. EPA's Contract Laboratory Program (CLP) protocols are considered Level IV analytical methods. The analytical methods are described in Test Methods for the Evaluation of Solid Waste, EPA SW-846, (EPA 1990). Radionuclides are analyzed by methods developed by or reviewed and approved by the EPA. The methods proposed for sample analysis are those recommended by the EPA and are deemed consistent with the data quality objectives (DQOs). In addition, Rocky Flats Statement of Work for Analytical Measurements, 1997, analytical specific QA/QC requirements will be used.

The analytical accuracy and precision goals are presented in the respective methods. These criteria include surrogate recoveries, matrix spike recoveries, matrix spike duplicate or laboratory duplicate precision, calibration linearity, laboratory control sample analyses, etc. Refer to the CLP protocols, the analytical methods, and the Rocky Flats Statement of Work for Analytical Measurements for an exact description of the QA/QC measures and acceptance ranges for each method.

### 3.3 BOTTLE AND PRESERVATION REQUIREMENTS

Tables 3-2 and 3-3 show the bottle and preservation requirements, storage temperature requirements, and maximum holding time for the aqueous and solid samples listed in Table 3-1.

**TABLE 3-3**  
**Bottle and Preservation Requirements for Water Analysis**

<u>Analysis<sup>a</sup></u>	<u>Bottle<sup>b</sup></u>	<u>Preservative<sup>c</sup></u>	<u>Maximum Holding Time</u>
Rad Screen	100 or 125ml/poly	HNO <sub>3</sub> 0.5ml	-
VOC	3 X 40ml/amb. glass	4°C/HCl 4 drops	14 days
Metals	Liter/poly	4°C/HNO <sub>3</sub> 2ml	6 months <sup>d</sup>
A/B,U	Gallon/poly	HNO <sub>3</sub> 8ml	6 months
Pu, Am	Gallon/poly	HNO <sub>3</sub> 8ml	6 months

<sup>a</sup> Due to time constraints during sampling, the samples will be placed in a cooler with blue ice (if required) and transferred to the laboratory or sample refrigerator as soon as possible to chill the samples to 4°C±2°C. It is recognized that the cooler and samples will not achieve 4°C±2°C in the field. The field temperature of the cooler/samples will not be monitored to prevent causing a rise in temperature in the cooler/samples by opening the cooler multiple times. Radiological samples do not require refrigeration but must be secured in a cool, dry area to minimize the chance of cross-contamination.

<sup>b</sup> Sample bottles may be bagged in the field, in the subcontractor trailer, or delivered to the on-site or local laboratory without bags. The sampler/packer shall use best judgment when packing samples, and delivery of samples to the on-site or local lab will not require the stringent packing requirements applicable to off-site shipments. Multiple analytes may be combined in bottles if volumes and preservation are alike.

<sup>c</sup> All non-volatile samples preserved with acid must be checked for pH; they must be below pH 2 for proper preservation.

<sup>d</sup> Maximum holding time for mercury is 28 days.

### **3.4 FIELD QUALITY CONTROL**

Field QC samples will be included to assure the accuracy and precision of the sampling procedures. Field sampling quality control will consist of the following:

- Collection of field duplicate samples will be at a minimum of 1 per 20 sediment samples;
- Collection of sampling equipment rinsate blanks at a minimum of 1 per 20 sediment samples (as appropriate);
- Collection of a trip blank (volatile organic compounds only) at a minimum of 1 per VOC sample shipment.

## **4. SAMPLING PROCEDURES**

This section discusses the methods for collecting, management, screening, packaging, and shipping DFs samples.

### **4.1 SAMPLE COLLECTION**

Periodically, solids from the sedimentation tanks and cyclone separators are combined with the sediments already in the sump for drumming and final disposition. Every tenth drumming event is sampled as a composite. The samples from the sump will be collected from the entire sump area and composited for analysis. A stainless steel beaker is used to collect the sediment samples. This sample is collected according to procedures outlined in 5-21000-OPS-FO.20, Sampling of Liquids and Solids from Environmental Materials Containers. The sampling date, time, and field data are collected and recorded on DATACAP Form FO.14D, Sample Collection Form.

Environmental liquids will only be sampled at the Facility Manager's discretion, since all liquids require sampling prior to delivery to the DFs. When collecting DFs water samples, it is important that the

particular unit being sampled is the water for delivery to the CWTF. This will ensure the sample is representative. The sampling date, time, and field data are collected on the DFs water samples and recorded on DATACAP Form FO.14L, Sample Collection Form. It is not necessary to follow a particular bottle order when collecting the samples. Sample collection order is indeterminate due to the sampling needs and strategies for this site, and therefore, may be modified for ease of sampling. Determination of residual chlorine is not required for sampling at the DFs. Samples are containerized, preserved, handled, and shipped in accordance with 5-21000-OPS-FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples.

When collecting water samples, do not touch the water as it enters the bottle and do not touch the inside of the bottle or cap. If either of these occur, discard the bottle, obtain a new one and collect a new sample. Purge water drained during sampling should be returned to the system. Spills will be collected and handled in accordance with Section 4 of the Hazardous Waste Requirements Manual (EG&G, 1994). Personal protective equipment will be removed and handled as outlined in SOP 5-21000-OPS-FO.06, Handling of Personal Protective Equipment, and Section 4.6 of this document, Personal Protective Equipment. All procedures shall be in accordance of the MDF Health and Safety Plan (RFP/ER-SAF-93-DCON).

Due to time constraints during sampling, the samples will be placed in a cooler with blue ice (if required) and transferred to the laboratory or sample refrigerator as soon as possible to chill the samples to  $4^{\circ}\text{C}\pm 2^{\circ}\text{C}$ . It is recognized that the cooler and samples will not achieve  $4^{\circ}\text{C}\pm 2^{\circ}\text{C}$  in the field. The temperature of the cooler/samples will not be monitored to prevent the cooler being opened multiple times. Radiological samples do not require refrigeration but must be secured in a cool, dry area to minimize the chance of cross-contamination.

#### **4.2 SAMPLE CUSTODY**

The chain of custody for sampling shall be filled out in accordance with 5-21000-OPS-FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples, and 4-B29-WR-OPS-FO.14, Field Data Management. Custody seals shall be placed on the sample containers after the samples are collected and prior to being relinquished from the sampler. The names of the samplers must be printed on the form. The samples will be kept under custody until both the COC and samples are relinquished for shipping. The COC is signed when samples are relinquished for analysis.

#### **4.3 SAMPLE EQUIPMENT DECONTAMINATION**

Equipment used at more than one location for collection of samples shall be decontaminated between sampling locations in the field, laboratory, or at the Decontamination Facility in accordance with 5-21000-OPS-FO.03, General Equipment Decontamination. Equipment decontamination is recorded in the facility logbook if the procedure is performed at the Decontamination Facility. Water used for equipment decontamination will be returned to the facility.

#### **4.4 RADIOLOGICAL SCREENING OF SAMPLES**

The radiological screening of samples in preparation for off-site shipment will comply with 5-21000-OPS-FO.18, Environmental Sample Radioactivity Content Screening. Environmental samples are considered non-radioactive (DOT Category I) if sample screening indicates a total activity less than 2,000 pCi/g for solids, or less than 2,000 pCi/mL for waters and have a gross alpha activity of less than 10,000 pCi/sample and gross beta activity of less than 100,000 pCi/sample.

In the event that samples are above 2,000 pCi/g(solids) or 2,000 pCi/mL (aqueous) for radioactivity, 4-B11-ER-OPS-FO.25, Shipment of Radioactive Materials Samples, will be used for sample shipment.

#### 4.5 SAMPLE STORAGE, PACKAGING AND SHIPPING

When sampling is complete (refer to Section 4.1 for sample collection details), the samples must be properly packaged and stored until they are shipped in accordance with 5-21000-OPS-FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples as applicable. The sampler/packer shall use best judgment when packing samples, and delivery of samples to the on-site lab will not require the stringent packaging requirements applicable to off-site shipments. If samples are to be shipped off-site, the samples shall be stored until results are received from the Radiological Screen samples (refer to Section 4.4 of this document). General chemistry samples must be stored in plastic bags and refrigerated at  $4^{\circ}\text{C}\pm 2^{\circ}\text{C}$  until shipped. Radiological samples do not require refrigeration but must be secured in a cool, dry area to minimize the chance of cross-contamination.

Samples which are collected and stored prior to shipment will be placed in the field refrigerator to  $4^{\circ}\text{C}\pm 2^{\circ}\text{C}$ . When in use the temperature of the field refrigerator is monitored. The samples are packaged with blue ice in a cooler and shipped to the laboratory. Cooler temperatures will be checked upon arrival at the laboratory.

Samples which are collected and shipped off-site during the same working day are packaged with blue ice to cool the samples as much as possible during shipment to the laboratory. Cooler temperatures will be checked upon arrival at the laboratory, but it is possible that the samples will achieve temperatures of  $4^{\circ}\text{C}\pm 2^{\circ}\text{C}$  only after being placed in the receiving laboratory refrigerator.

Because temperature measurements obtained shortly after packaging a cooler for shipment are grossly inaccurate, cooler temperatures will not be monitored prior to shipment. Cooler temperatures will be checked upon arrival at the laboratory. The release of sample coolers for off-site shipment shall be in accordance with Environmental Management Radiological Guidelines 3.02 (EMRG 3.02), and Radiological Operating Instructions 3.02 (ROI 3.02), as appropriate.

#### **4.6 PERSONAL PROTECTIVE EQUIPMENT**

Personal protective equipment for sample collection is specified in the DFs Health and Safety Plan (RFP/ER-SAF-93-DCON). Disposable Personal Protective Equipment (PPE) generated during sampling shall be bagged and delivered to the Health and Safety Specialists (refer to 5-21000-OPS-FO.06, Handling of Personal Protective Equipment as appropriate).

#### **5. DATA QUALITY OBJECTIVES**

As stated in EPA document Guidance for Planning for Data Collection in Support of Environmental Decision Making Using the Data Quality Objective Process, EPA QA/G-4, Interim Final, "the DQO Process is a series of planning steps based on the Scientific Method that is designed to ensure that the type, quantity, and quality of environmental data used in decision making are appropriate for the intended application." The DQO process consists of the following seven distinct steps: state the problem; identify the decision; identify inputs to the decision; define the study boundaries; develop a decision rule; specify limits on the decision error; and optimize the design for obtaining data. The following two sections discuss the DFs DQOs and parameters which will be used to ensure data quality and usability. Section 8.0 also discusses DQOs in relation to disposal issues.

##### **5.1 DATA QUALITY OBJECTIVES PROCESS**

###### Statement the Problem

The DQOs are designed to address sampling and analysis of solid wastes associated with the Decontamination Facilities including activities associated with the equipment decontamination pad and the environmental liquids management area. The solid wastes generated from these activities must be sampled and characterized for transfer and final disposition. Appropriate sampling of the waste stream for disposition may be modified by the Responsible Manager based on knowledge of the expected disposition.

Identify the Decision

Liquid waste from the Decontamination Facilities is accepted and treated at the CWTF. Historic information indicates that this water has little contaminant variation and no sampling of routine water from the MDF and PADF will be performed prior to acceptance. However, the Responsible Manager may choose to increase sampling for any influent waters based on circumstances/process knowledge. Solid samples will be evaluated for RCRA-regulated LDR constituents and according to ENVIROCARE's WAC to ensure that each constituent meets waste disposal criteria for either on-site or off-site disposal. Appropriate sampling of the waste stream for disposition may be modified by the Responsible Manager based on knowledge of the expected disposition. Sampling strategies will depend upon on-site and/or off-site waste disposal criteria.

Identify Inputs to the Decision

Sampling and analysis for the constituents listed on Table 3-1 will be performed for all solid waste generated from the Decontamination Facilities. Results will be evaluated according to relevant waste acceptance criteria for disposal at the on-site Sanitary Landfill. If the results are above the acceptance criteria for on-site disposal, sampling and analysis for constituents listed in Table 3-2, ENVIRONCARE's WAC, will be performed for off-site disposal. All constituents of concern can be measured to detection limits below the waste acceptance criteria.

Define the Boundaries of the Study

Decisions will apply to every tenth drumming event of solid waste/sediment from the Decontamination Facility sump. Sediment from the sump is considered to be composited since it is a mixture of decontamination waste deposited into the sump. One composite/grab sample for VOC analysis and one composite/grab sample for metals and rads will be collected from every tenth drumming event.

Develop a Decision Rule

VOCs, metals, and rads will be evaluated with respect to RCRA LDR requirements for disposal in the on-site Sanitary Landfill. The on-site Sanitary Landfill requires the submission of a signed form for disposal of

waste. The form incorporates the Landfill's acceptance criteria and is contained in the RMRS WAC-001-97 document. Based on historical data the range of concentration is well below the RCRA LDR. Further, the solid waste generated from the DFs has been determined to not exceed RCRA regulatory limits for TCLP metals and is characterized as a nonradioactive, nonhazardous waste (see RFETS Waste Stream and Residue Identification and Characterization (WSRIC), Building 903A). The solid waste generated from the DFs is expected to meet the RMRS WAC criteria for disposal in the Sanitary Landfill since it has been characterized as nonhazardous, nonradioactive, and is a routine waste. In addition, a "SafeSites" memorandum dated March 26, 1996, documents the decision to sample every tenth drumming event based on evidence that "Sampling to date has consistently shown that the sediments generated are not RCRA-regulated hazardous wastes." Therefore, the decision error for disposal either on-site or off-site is considered negligible and is the reason for the modification in the SAP. The consequences of deciding whether the solid waste is disposed on-site versus off-site include potential further contamination of the on-site Sanitary Landfill and site ground water; and possible RCRA violations. However, the Sanitary Landfill is currently being monitored and controlled in order to protect human health and the environment.

#### Specify Acceptable Limits on Decision Errors

Acceptable limits on decision errors are negligible based on historical data.

#### Optimize the Design

The design is based on historical data and eliminates a significant amount of sampling and analysis which will decrease costs for the Decontamination Facility operations. Sampling and analysis will be limited to the solid sample parameters shown on Table 3-1, unless the results indicate the waste cannot be disposed in the Sanitary Landfill. Based on previous results, it is expected that the samples will pass the RCRA TCLP criteria and may be disposed on-site. However, if any samples exceed the RCRA TCLP criteria, sampling and analysis will be performed as specified on Table 3-2 according to ENVIROCARE's WAC. Pesticide and herbicide sampling and analysis will not be performed unless ENVIROCARE requires these analyses be performed for disposal off-site.

## 5.2 PARCC PARAMETERS

The Precision, Accuracy, Representativeness, Completeness, and Comparability parameters (PARCC parameters) can be used as a means of ensuring and assessing the quality and usability of laboratory data as described in 2-G32-ER-ADM-08.02, Evaluation of ERM Data for Usability in Final Reports. The analytical program specifies using EPA-approved methods and analytical methods referenced in the Rocky Flats Statement of Work for Analytical Measurements, 1997, since these methods and associated QA/QC protocols are generally considered industry standards for producing accurate and precise data.

Volatile organic trip blank samples provide a measure of contamination that might be introduced into a sample set during sample collection or shipping. Field duplicated samples (at a minimum of 1 per 20 samples) and sampling equipment rinsate blanks (at a minimum of 1 per 20 as appropriate) will be taken to ensure sample quality. A comparison between real and duplicate samples must meet a Duplicate Error Ratio (DER) of 1.42 or less for radiological samples, and a 30% RPD for organic and inorganic samples. The RPD limits must be met for all samples with results greater than five times the reporting limit. The equation for DER calculation is as follows:

$$DER = \frac{|S - D|}{2 * \sqrt{\sigma_s^2 + \sigma_D^2}}$$

Where  $\sigma_s$  = Total propagated uncertainty of the sample  
 $\sigma_D$  = Total propagated uncertainty of the duplicate  
S = Sample Activity  
D = Duplicate Activity

Precision and accuracy objectives are evaluated on the basis of the detection limits specified in the referenced analytical method and/or data validation guidelines. For radionuclide analyses, the accuracy objectives specified in the Rocky Flats Statement of Work for Analytical Measurements, methods and data evaluation protocols will be followed.

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a qualitative parameter that emphasizes the proper design of the sampling program.

A completeness goal of 90% is expected for the DFs data; that is, for each sample taken and each analysis performed during the DFs sampling activities, the usable data points will be at least 90% of the theoretical amount of data points.

Comparability is a qualitative parameter that expresses the confidence with which one data set can be compared with another. To achieve comparability, DFs sampling will follow the approved SAP, which includes the use of standardized analytical protocols, consistent analytical methods, data collection following 5-21000-PS-FO.13, Containerization, Preserving, Handling and Shipping of Soil and Water Samples, and report data in consistent units of measurement.

## **6. DATA MANAGEMENT**

Each DFs sample point is assigned a unique Rocky Flats Environmental Data System (RFEDS) location code, and this unique code will be utilized on the COC form, applicable DATACAP forms, and during input to and retrieval from the RFEDS database. The RFEDS location codes utilized at the DFs are detailed in Section 2.0.

Field observations for water samples will include date, time and sampling method, and will be recorded on DATACAP form FO.14I, Sample Collection Form. Field observations for sediment samples will include, date, time, and collection method and will be recorded on DATACAP form FO.14D, Sample Collection Form.

A sample chain of custody (COC) will be initiated for collected DFs samples. The COC shall be maintained through sample storage and through all transfers of custody until the sample is received at the testing laboratory. COCs are archived for defensibility of the analytical and sampling data. Samples shall be logged in upon receipt at the analytical laboratory and sample tracking throughout the analytical process shall be maintained in accordance with laboratory procedures. 5-21000-OPS-FO.13, Containerization, Preserving, Handling, and Shipping of Soil and Water Samples and 4-B29-WR-OPS-FO.14, Field Data Management will be followed during sampling activities.

Results from the radiological screen will be sent to the Responsible Manager. Other results will be submitted to RFEDS to track, store, and retrieve project data. The sample collection information submitted to RFEDS will include sample number, volume collected or volume of container, sampler's name, sampling date, analysis parameter, and COC number in accordance with SOP FO.14, Field Data Management.

## **7. ANALYTICAL RESULTS EVALUATION**

This section discusses the use and control of nonconformances for the resulting analytical data.

### **7.1 CONTROL OF NONCONFORMANCES**

The requirements for the identification, control evaluation, and disposition of nonconforming items, samples, and data will be implemented as specified in Section 15.0 of the RMRS QAPD, as applicable. According to accepted site laboratory standards, 25 percent data validation will be performed.

### **7.2 USE OF ANALYTICAL RESULTS**

The water samples will be evaluated to determine treatment options at the CWTF. Solid samples will be evaluated for RCRA-regulated LDR constituents according to Table 3-1 to ensure that each constituent meets waste disposal criteria for on-site (Sanitary Landfill) disposal. If on-site disposal criteria cannot be

met, solid samples will be evaluated for ENVIROCARE's WAC according to Table 3-2 to ensure that each constituent meets waste disposal criteria for off-site disposal. Non-radioactive sediments are drummed and labeled per 4-K55-ENV-OPS-FO.10, Receiving, Marking, and Labeling Environmental Material Containers and WO-1027, Non-Radiological Waste Packaging. If the sediments are above radiological contamination limits, then the sediments will be packaged per WO-4034, Radiological Waste Packaging.

## **8. DATA QUALITY OBJECTIVES FOR DISPOSAL**

This section addresses only drummed sediments because environmental water sampling is optional and used for process information only.

Normally several drums of sediment are generated during each drumming event. The primary objectives of sediment sampling is to obtain defensible data that can be used to determine whether the physical and chemical properties of the waste comply with off-site or on-site waste disposal criteria as appropriate (for an example of off-site waste disposal criteria refer to the Material Acceptance Process Manual developed by ENVIROCARE). Additional information relating to the data quality objectives of the WSRIC program is presented in the WSRIC Program Description (EG&G 1993b).

### **8.1 DECISION RULE**

Sediments are not a listed waste, and are not expected to exhibit hazardous characteristics (reactivity, ignitability, corrosivity, or toxicity). The solids will meet RCRA LDR requirements if the analytical results demonstrate that the hazardous constituents are below treatment standards listed in 6 CCR 1007-3, Part 268.

## **8.2 DECISION DATA**

Analytical data will be used to determine if the sediments meet RCRA LDR treatment standards. Drums of sediment will be sampled as follows:

- One grab sample for VOCs
- One grab sample for metals and rads

If these analytical results are within the acceptable criteria for disposal in the on-site Sanitary Landfill, the solid wastes will be disposed of on-site. If the solid wastes do not meet acceptance criteria for disposal in the Sanitary Landfill, the drumming event will be further sampled and analyzed according to ENVIROCARE requirements for off-site disposal.

## **8.3 DECISION DOMAIN**

The spatial domain for this waste comprises all DFs sediments generated during decontamination of environmental materials employed during Interim Measure/Interim Remedial Action (IM/IRA) activities or ER Accelerated Action Projects.

## **8.4 DECISION DATA QUALITY OBJECTIVES**

The WSRIC Program Description lists the control criteria for the analytical methods that will be used on the samples. These criteria ensure that listed limits for analytical precision, accuracy, reproducibility, and bias are not exceeded.

## 9.0 RECORDS

The following documents generated during the performance of this procedure must be controlled as follows:

<u>Document</u>	<u>Record Type</u>	<u>Disposition</u>
Document History File	QA, Non-Permanent	Records Management transmits to RMRS Records Center, where retained for 12 months after procedure is superseded or canceled. RMRS Records Center staff then formally transmits to the Site Records Management organization for long term storage on accordance with the provisions of 1-77000-RM-001, Records Management Guidance for Records Sources.
Draft Versions of Document as Submitted for Review, and Peer Reviews	Non-QA	Records Management retains until procedure is approved, at which time the Draft versions may be discarded.