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11/21/94

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Module 2A Waste Characterization Study

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## 7. Abstract

This WRAP 2A Waste Characterization Study effort addresses those certification strategy functions related to characterization by defining criteria associated with each function, identifying administrative and design mechanisms for accomplishing each of these functions and evaluating alternatives where applicable. This work plan provides direction for completing the study.

## 8. RELEASE STAMP

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35 Station 21

WORK PLAN FOR WASTE RECEIVING AND PROCESSING  
MODULE 2A WASTE CHARACTERIZATION STUDY

November 1994

Cheryl L. Bergeson

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**WORK PLAN FOR WASTE RECEIVING AND PROCESSING  
MODULE 2A WASTE CHARACTERIZATION STUDY**

**1.0 INTRODUCTION**

This Waste Receiving and Processing Facility Module 2A (WRAP 2A) Waste Characterization Study effort evaluates alternate means of acquiring needed data in key certification areas identified in the strategy document (LeClair 1994) to reduce operational cost and improve operational efficiency.

**1.1 SCOPE**

This WRAP 2A Waste Characterization Study effort addresses those certification strategy functions related to characterization (LeClair 1994) by defining criteria associated with each function, identifying administrative and design mechanisms for accomplishing each of these functions and evaluating alternatives where applicable. This work plan provides direction for completing the study.

**1.2 OBJECTIVES**

This Characterization Study looks at alternatives to the Title 1 Design approach for incoming waste confirmation/ verification, radionuclide inventory tracking and final waste form testing. The primary objectives are listed below.

- Identify characterization data requirements for each characterization function defined in the certification strategy.
- Identify administrative and characterization/analytical mechanisms to accomplish each of the associated characterization functions.
- Evaluate alternate administrative and analytical methods by characterization function.
- Identify any future verification work required.

This Engineering Study will basically follow the standard engineering study format (WHC 1994).

### 1.3 DELIVERABLES

The primary objectives will result in an issued WRAP 2A Characterization Study that will contain the following deliverables.

- Preferred alternatives to the Title 1 Design approach to radionuclide inventory tracking.
- Preferred alternatives to the Title 1 Design approach for acquiring characterization data on incoming waste.
- Preferred alternative for assuring final waste form quality.

In addition, the information developed through this study effort will directly support other activities including the WRAP 2A Waste Analysis Plan development, Sample Plan development, and Data Management System functional requirements definition. These types of support are viewed as secondary objectives of the study effort.

The schedule for completing this effort is depicted in Table 1.

## 2.0 TASK DESCRIPTIONS/ASSOCIATED DELIVERABLES

This section defines the unique tasks that are required to complete the WRAP 2A Characterization Study effort. The tasks are grouped into functional areas to provide further definition.

### 2.1 SUPPORT STUDY

#### 2.1.1 Develop Review Team

Assign appropriate personnel to perform periodic reviews of the WRAP 2A Characterization Study deliverables. Reviews will occur at designated phases in the study effort (e.g., 30%, 60% and 90%), and at each phase, interim deliverables will be provided to the review team. This breakout of deliverables by study phase as summarized in Table 2. The review team will have representation from the following organizations:

- WRAP Process Engineering;
- WRAP 2A Projects; and
- WRAP Mechanical Engineering.

DELIVERABLE 2.1.1: List of assigned review team participants.



Table 1. WRAP 2A WASTE CHARACTERIZATION STUDY

11/07/94

Task No.	Activities	Start Date	Finish Date	Fiscal Year 1995																															
				Nov '94				Dec '94				Jan '95				Feb '95				Mar '95				Apr '95				May '95				Jun '95			
				7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12
2.1	SUPPORT STUDY	11/14/94	6/13/95	[Hatched bar]																															
2.1.1	Develop Review Team	11/14/94	11/21/94	[Bar]																															
2.1.2	Assign Study Team	11/14/94	11/21/94	[Bar]																															
2.1.3	Document Study Results	12/19/94	6/13/95	[Bar]																															
2.2	IDENTIFY DATA REQMNTS BY CHARACTERIZATION FUNCTION	11/21/94	1/3/95	[Hatched bar]																															
30%	Document 30% Deliverable	1/3/95	1/10/95	[Bar]																															
	Review Team Meeting	1/10/95		[Bar]																															
	Review 30% Deliverable	1/10/95	1/17/95	[Bar]																															
	Disposition 30% Comments	1/17/95	1/24/95	[Bar]																															
2.3	ALTERNATE CHARACTERIZATION METHODS & STRATEGIES	1/24/95	4/15/95	[Hatched bar]																															
2.3.1	Identify Alternate Characterization Methods	1/24/95	2/21/95	[Bar]																															
2.3.2	Define Evaluation Criteria	2/21/95	3/2/95	[Bar]																															
60%	Document 60% Deliverable	3/2/95	3/16/95	[Bar]																															
	Review Team Meeting	3/16/95		[Bar]																															
	Review 60% Deliverable	3/16/95	3/30/95	[Bar]																															
	Disposition 60% Comments	3/30/95	4/6/95	[Bar]																															
2.3.3	Evaluate Characterization Functions Alternatives	4/6/95	4/15/95	[Bar]																															
2.4	IDENTIFY FUTURE VERIFICATION REQUIRED	4/6/95	4/17/95	[Hatched bar]																															
90%	Document 90% Deliverable	4/17/95	5/2/95	[Bar]																															
	Review Team Meeting	5/2/95		[Bar]																															
	Review 90% Deliverable	5/2/95	5/16/95	[Bar]																															
100%	FINALIZE DOCUMENT	5/16/95	6/13/95	[Hatched bar]																															
	Disposition 90% Comments	5/16/95	5/23/95	[Bar]																															
	Incorporate Comments / Finalize Document	5/23/95	5/30/95	[Bar]																															
	Final Review / Signatures	5/30/95	6/6/95	[Bar]																															
	Issue Document	6/6/95	6/13/95	[Bar]																															

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TABLE 2. STUDY DELIVERABLES BY PHASE OF STUDY.

Percent Completion	Associated Deliverables
30%	2.1.1: List of assigned review team participants.
	2.1.2: List of study team participants and associated task responsibilities.
	2.2: Definitive list of analytical data requirements by characterization function.
60%	2.3.1: Alternatives to accomplish characterization functions.
	2.3.2: Evaluation criteria.
90%	2.3.3: Preferred alternatives to accomplish characterization functions.
	2.4: Identification of future verification.
100%	2.1.3: An engineering Study which documents all information and conclusions generated from this study effort.

**2.1.2 Assign Study Team**

Assign personnel to be responsible for task completion. For each of the tasks defined in this work plan, one individual will have lead responsibility for completion of the task and others may be assigned to assist in the task. Task leads will provide information in the agreed upon format per the schedule and will be requested to status their tasks at integration meetings held periodically with all study participants.

DELIVERABLE 2.1.2: List of study team participants and associated task responsibilities.

**2.1.3 Prepare Study Documentation**

Coordinate with individual contributors to develop 30%, 60%, and 90% deliverables as defined in Table 2. Issue documentation to review team at each of the review phases documenting all information generated to date. Consolidate comments, and work with individual contributors to resolve and incorporate comments. The final effort of this task will be the issuance of the engineering study per the standard format (WHC 1994).

DELIVERABLE 2.1.3: An engineering study which documents all information and conclusions generated from this study effort.

## 2.2 IDENTIFY DATA REQUIREMENTS BY CHARACTERIZATION FUNCTION

The data required to accomplish each certification strategy function associated with characterization will be identified. These functions are listed below.

- Determine Radionuclide Composition. The radionuclide composition of the incoming waste as well as the radionuclide composition of the final waste form must be known.
- Confirm Incoming Waste Identity. This function confirms the generator's physical and chemical characterization through limited analysis of the waste feed. This confirmation is the means by which operations assures that the waste received is the waste expected. The verification of bulk physical/chemical characterization also serves to assure that process control parameters are maintained.
- Support Formulation Selection. In order to assure the waste can be treated effectively, key chemical and physical characteristics/concentrations of new waste streams are assessed to support treatability studies. This information is used to select an appropriate formulation for treating the waste.
- Overcheck Final Waste Form Quality. Final waste form quality is confirmed analysis and testing in order to demonstrate final waste form adherence to the disposal site waste acceptance criteria and the concentration-based treatment standards.

DELIVERABLE 2.2: Definitive list of analytical data requirements by characterization function.

## 2.3 ALTERNATE CHARACTERIZATION METHODS AND STRATEGIES

### 2.3.1 Identify Alternate Characterization Methods

Identify existing and emerging analysis methods and strategies to support characterization. The existing and emerging analysis methods are to include on-line (e.g., raman spectroscopy) applications. Establish a technology data sheet to include a description, history, and applicability band (technology search).

DELIVERABLE 2.3.1: Alternatives to accomplish characterization functions.

### 2.3.2 Define Evaluation Criteria

Develop objective criteria with bounding parameters for each of the key analytical technologies/strategies that will be used to assess the alternative methods for accomplishing each regulatory function. The main objective is to support operations requiring less laboratory analysis.

DELIVERABLE 2.3.2: Evaluation criteria.

### 2.3.3 Evaluate Characterization Function Alternatives

Evaluate alternatives against criteria and arrive at preferred characterization strategy for obtaining necessary data elements. Criteria will be established from a function and operations position. At the conclusion of the study effort, preferred alternatives will be documented in the engineering study report (Task 2.1.3). Any issues, uncertainties or subsequent actions should also be identified and documented.

DELIVERABLE 2.3.3: Preferred alternative(s) to accomplish characterization functions.

### 2.4 IDENTIFY FUTURE VERIFICATION REQUIRED

This study will identify areas requiring further verification. These areas would include verification work and design modifications required to be performed beyond the conclusion of this study.

DELIVERABLE 2.4: Identification of future verification.

## 3.0 REFERENCES

- LeClair, M. D., 1994, *Waste Receiving and Processing Module 2A Waste Certification Strategy*, WHC-SD-W100-SP-001, Revision 0, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1994, *Engineering Practice Guidelines: Engineering Studies*, WHC-IP-1026, Appendix C, Revision 0, Westinghouse Hanford Company, Richland, Washington.