

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
All Waste Types or Wastestreams: Non-hazardous, radioactive secondary wastes.		

Completed By: Troy Eshleman	Date: 1/14/99
FPL: Deba Daymon	VMC: Troy Eshleman
Type of Activity (site investigation, EC, etc.): In-situ vitrification demonstration.	

Description of the Activity (e.g., drilling, surface sampling, excavation and recontouring, soil washing, etc.)

In-situ vitrification is considered a remedial alternative for some TA-21 Material Disposal Areas. This demonstration project will conduct the in-situ vitrification process in a non-radioactive, non-hazardous location adjacent to MDA V as demonstrated by the attached site characterization plan. As a result of the process several secondary wastes are anticipated, which include: contact wastes (i.e. PPE, plastic, disposable sampling equipment, packaging, etc.), HEPA filters, air scrubber waters, and water filters. Non-radioactive forms of cerium and cesium will be added to the soil as a tracer but should not impact the regulatory status of the wastes.

Acceptable Knowledge
Site Description, Site History, and Historical Waste Generating Processes or Activities: (Include dates for site history):

This project will be conducted outside of contaminated areas. Prior to mobilization a baseline site survey will be completed to verify pre-vitrification site conditions. The vitrification equipment maintains low-levels of residual fixed and loose radioactive contamination, primarily cesium and strontium. All wastes, except PPE and contact wastes, will be examined for potential carryover contamination from the equipment in addition to characterization proposed for individual processes discussed below.

Previous Investigation Analytical Results: (Report the analytical methods and results above background levels)

NA

62899



OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: HEPA Filters		

<p>Waste Description <u>Description of Waste Type, Potential Contaminants, Volume Estimate, and Waste Packaging:</u></p> <p>HEPA Filters will be generated from air emissions controls devices. Approximately 18, 24" x 24" x 11.5" units will be generated. These filters will be packaged in 55-gallon drums, labeled and managed as radioactive waste for disposal at TA-54.</p>
<p>Characterization Strategy <u>Description of Strategy:</u></p> <p>A core sample of the filter material (loaded surfaced) will be taken with an electric power drill and analyzed for any potential inorganic contaminants that may have been deposited on the HEPA unit surface. In addition, the gross Alpha, Beta, and Gamma Spec samples, and Sr-90 sample will be taken. If gross alpha activity is detected above natural background isotopic Pu, U, samples will be analyzed. No tritium analysis is required, the baseline sampling will demonstrate the absence of tritium.</p> <p><u>Waste Sampling*:</u> (If sampling will be used, indicate how many grab or composite samples will be collected per container or volume of waste and whether the waste is considered homogeneous or heterogeneous.)</p> <p>Two of the 18 filters will be sampled. This will be done by drilling a core hole in the middle of the contaminated side of the filter and collecting the particles as the sample media.</p> <p><small>* Grab sampling is appropriate for wastes that are fairly homogeneous, such as liquid wastes. * Composite sampling is appropriate for wastes that are heterogeneous, such as soil, sediment, and debris. * A sample of homogeneous or heterogeneous waste collected for VOC analysis should consist of a grab sample rather than a composite sample.</small></p>

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: HEPA Filters		

Analytical Strategy					
Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Containerized Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
Volatile Organic Constituents		N			
Semivolatile Constituents		N			
Organic Pesticides		N			
Organic Herbicides		N			
Pesticides and PCBs		N			
PCBs		N			
Total Cyanide		N			
Other Inorganic Constituents (specify)		N			
High Explosive Constituents		N			
Asbestos		N			
TPH		N			
TCLP Metals	1311	Y	X		
TCLP Organics		N			
TCLP Pesticides and Herbicides		N			
Gross Alpha	9310	Y	X		
Gross Beta	9310	Y	X		
Gross Gamma	Gamma Spec.	Y	X		
Gamma Spectroscopy	Gamma Sec.	Y	X		
Isotopic Plutonium	Alpha Spec	N	* As Specified		
Isotopic Uranium	Alpha Spec	Y	* As Specified		
Strontium-90		Y	X		

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: HEPA Filters		

Preliminary RCRA Determination

Based on available information, indicate the waste and whether it could potentially be any of the wastes as defined in 40 CRF 261. List the F-, D-, K-, P-, or U- category and number.

Non-RCRA

Preliminary RCRA Status

Non-RCRA: (No 90-Day Storage Requirement)
Describe how waste will be stored/handled:

RCRA: (90-Day Storage Requirement)
Waste will be stored/handled in accordance with 20 NMAC Generator Requirements

Preliminary Determination for Radioactivity

Based on available information, indicated the amount and type of radiation contamination expected in the waste.

Potentially-Radioactive based on contaminated equipment.

Preliminary Radioactivity Status

Material is not radioactive
Describe how waste will be stored/handled

Material is radioactive
Describe the controlled area, labeling, and protection against inadvertent contamination

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: Air Emissions Scrubber Waters		

Waste Description
Description of Waste Type, Potential Contaminants, Volume Estimate, and Waste Packaging:

Air emissions scrubbers will generate cooling/wash down waters. These waters are initially added to the process in aqueous form. In the process they both scrub and collect solids and cool the exhaust systems. Since the process will be conducted on non-hazardous soils the waters are expected to contain only industrial pollutants such as metals and suspended solids from soil dust. The process waters will be analyzed for carry-over contamination from the contaminated equipment.

The subcontractor estimates that 4000 gallons of liquid will be generated. The waste will be packaged in either 55-gallon drums or a bulk tank. A secondary containment will be constructed to contain at least the volume of one total waste container.

Characterization Strategy

Description of Strategy:

A composite sample will be taken and analyzed to meet the LANL TA-50 Low-level Radioactive Waste Acceptance Criteria for radioactive liquid disposal including gross Alpha, Beta, and Gamma Spectroscopy, and Sr-90 samples will be taken. If gross alpha activity is detected above natural background isotopic Pu, U, samples will be analyzed.

Additional coordination with ESH-18 will be required early in the process to submit a change of conditions notice under NPDES permitting requirements. No tritium analysis is required, the baseline sampling will demonstrate the absence of tritium. No waste shall be discharged to TA-50 prior to the notification.

Waste Sampling*: (If sampling will be used, indicate how many grab or composite samples will be collected per container or volume of waste and whether the waste is considered homogeneous or heterogeneous.)

One composite liquid sample will be collected from either three grabs samples from a tank or composited grab samples from at least three drums.

- * Grab sampling is appropriate for wastes that are fairly homogeneous, such as liquid wastes.
- * Composite sampling is appropriate for wastes that are heterogeneous, such as soil, sediment, and debris.
- * A sample of homogeneous or heterogeneous waste collected for VOC analysis should consist of a grab sample rather than a composite sample.

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: Air Emissions Scrubber Waters		

Analytical Strategy					
Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Containerized Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
Volatile Organic Constituents		N			
Semivolatile Constituents		N			
Organic Pesticides		N			
Organic Herbicides		N			
Pesticides and PCBs		N			
Other Inorganic Total Metals	6010	Y	X		
High Explosive Constituents		N			
Asbestos		N			
TPH		N			
TCLP Metals		N			
TCLP Organics		N			
Gross Alpha	9310	Y	X		
Gross Beta	9310	Y	X		
Gross Gamma	Gamma Spec.	Y	X		
Strontium - 90		Y	X		
Gamma Spectroscopy		Y	X		
Isotopic Plutonium		N			
TSS		Y	X		
COD		Y	X		
Nitrates		Y	X		
MicroTOX		Y	X		
pH	9040	Y	X		

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: Air Emissions Scrubber Waters		

Preliminary RCRA Determination
 Based on available information, indicate the waste and whether it could potentially be any of the wastes as defined in 40 CRF 261. List the F-, D-, K-, P-, or U- category and number.

Non-RCRA

Preliminary RCRA Status

Non-RCRA: (No 90-Day Storage Requirement)
 Describe how waste will be stored/handled:

RCRA: (90-Day Storage Requirement)
 Waste will be stored/handled in accordance with 20 NMAC Generator Requirements

Preliminary Determination for Radioactivity
 Based on available information, indicated the amount and type of radiation contamination expected in the waste.

Potentially radioactive based upon contaminated equipment.

Preliminary Radioactivity Status

Material is not radioactive
 Describe how waste will be stored/handled

Material is radioactive
 Describe the controlled area, labeling, and protection against inadvertent contamination

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: Flush Water		

Waste Description

Description of Waste Type, Potential Contaminants, Volume Estimate, and Waste Packaging:

The vitrification process requires installation of electrodes. This will be done by predrilling holes to insert the electrodes. Once installed these holes will be flushed at the end of each day to prevent freezing. The overflow aqueous fluid will be containerized and managed as industrial liquid. Since the process will be conducted on non-hazardous soils the waters are expected to contain only industrial pollutants such as metals and suspended solids from soil dust. The waters will be analyzed for carry-over contamination from the contaminated equipment.

The subcontractor estimates that 4000 gallons of liquid will be generated. The waste will be packaged in either 55-gallon drums or a bulk tank. A secondary containment will be constructed to contain at least the volume of one total waste container.

Characterization Strategy

Description of Strategy:

A composite sample will be taken and analyzed to meet the LANL TA-50 Waste Acceptance Criteria for low-level radioactive liquid disposal. In addition gross Alpha, Beta, and Gamma Spectroscopy, and Sr-90 samples will be taken. If gross alpha activity is detected above natural background isotopic Pu, U, samples will be analyzed.

Additional coordination with ESH-18 will be required early in the process to submit a change of conditions notice under NPDES permitting requirements. No tritium analysis is required, the baseline sampling will demonstrate the absence of tritium. No waste shall be discharged to TA-50 prior to the notification.

Waste Sampling*: (If sampling will be used, indicate how many grab or composite samples will be collected per container or volume of waste and whether the waste is considered homogeneous or heterogeneous.)

One composite liquid sample will be collected from either three grab samples from a tank or composited grab samples from at least three drums.

- Grab sampling is appropriate for wastes that are fairly homogeneous, such as liquid wastes.
- Composite sampling is appropriate for wastes that are heterogeneous, such as soil, sediment, and debris.
- A sample of homogeneous or heterogeneous waste collected for VOC analysis should consist of a grab sample rather than a composite sample.

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: Flush Waters		

Analytical Strategy					
Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Contaminated Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
Volatile Organic Constituents		N			
Semivolatile Constituents		N			
Organic Pesticides		N			
Organic Herbicides		N			
Pesticides and PCBs		N			
Other Inorganic Total Metals	6010	Y	X		
High Explosive Constituents		N			
Asbestos		N			
TPH		N			
TCLP Metals		N			
TCLP Organics		N			
Gross Alpha	9310	Y	X		
Gross Beta	9310	Y	X		
Gross Gamma	Gamma Spec.	Y	X		
Strontium - 90		Y	X		
Gamma Spectroscopy		Y	X		
Isotopic Plutonium		N			
TSS		Y	X		
COD		Y	X		
Nitrates		Y	X		
MicroTOX		Y	X		
pH	9040	Y	X		

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: Flush Waters		

Preliminary RCRA Determination	
Based on available information, indicate the waste and whether it could potentially be any of the wastes as defined in 40 CRF 261. List the F-, D-, K-, P-, or U- category and number.	
Non-RCRA	
Preliminary RCRA Status	
<input checked="" type="checkbox"/>	Non-RCRA: (No 90-Day Storage Requirement) Describe how waste will be stored/handled:
<input type="checkbox"/>	RCRA: (90-Day Storage Requirement) Waste will be stored/handled in accordance with 20 NMAC Generator Requirements

Preliminary Determination for Radioactivity	
Based on available information, indicated the amount and type of radiation contamination expected in the waste.	
Potentially radioactive based upon contaminated equipment.	
Preliminary Radioactivity Status	
<input type="checkbox"/>	Material is not radioactive Describe how waste will be stored/handled
<input checked="" type="checkbox"/>	Material is radioactive Describe the controlled area, labeling, and protection against inadvertent contamination

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: Water Filters		

<p>Waste Description <u>Description of Waste Type, Potential Contaminants, Volume Estimate, and Waste Packaging:</u></p> <p>Scrubber waters will be filtered prior to discharge to the holding tank. The filters will collect the majority of the suspended solids and it is anticipated that one drum of loaded polypropylene filters will be generated during the project. Potential contaminants include solids (metals) and compounds (organics and dissolved gases) removed from the air exhaust system post HEPA filtration.</p>
<p>Characterization Strategy</p> <p><u>Description of Strategy:</u></p> <p>A grab sample will be taken and TCLP metals and TCLP organics. In addition gross Alpha, Beta, and Gamma Spectroscopy, and Sr-90 samples will be analyzed. If gross alpha activity is detected above natural background isotopic Pu, U, and Gamma spectroscopy samples will be analyzed. No tritium analysis is required, the baseline sampling will demonstrate the absence of tritium.</p> <p>If no radioactive contamination is detected the wastes will be managed as New Mexico Special Waste.</p> <p><u>Waste Sampling*:</u> (If sampling will be used, indicate how many grab or composite samples will be collected per container or volume of waste and whether the waste is considered homogeneous or heterogeneous.)</p> <p>One sample will be collected by cutting small sections from one of the filter bags.</p> <ul style="list-style-type: none"> • Grab sampling is appropriate for wastes that are fairly homogeneous, such as liquid wastes. • Composite sampling is appropriate for wastes that are heterogeneous, such as soil, sediment, and debris. • A sample of homogeneous or heterogeneous waste collected for VOC analysis should consist of a grab sample rather than a composite sample.

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: Water Filters		

Analytical Strategy					
Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Containerized Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
Volatile Organic Constituents		N			
Semivolatile Constituents		N			
Organic Pesticides		N			
Organic Herbicides		N			
Pesticides and PCBs		N			
Other Inorganic -Total Metals		N			
TPH		N			
TCLP Metals	1311	Y	X		
TCLP Organics	1311	Y	X		
TCLP Pesticides and Herbicides		N			
Gross Alpha	9010	Y	X		
Gross Beta	9010	Y	X		
Gross Gamma	Gamma Spec	Y	X		
Strontium 90		Y	X		
Gamma Spectroscopy		Y	X		

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: Water Filters		

Preliminary RCRA Determination
 Based on available information, indicate the waste and whether it could potentially be any of the wastes as defined in 40 CRF 261. List the F-, D-, K-, P-, or U- category and number.

Non-RCRA

Preliminary RCRA Status

Non-RCRA: (No 90-Day Storage Requirement)
 Describe how waste will be stored/handled:

RCRA: (90-Day Storage Requirement)
 Waste will be stored/handled in accordance with 20 NMAC Generator Requirements

Preliminary Determination for Radioactivity
 Based on available information, indicated the amount and type of radiation contamination expected in the waste.

Potentially radioactive based upon contaminated equipment.

Preliminary Radioactivity Status

Material is not radioactive
 Describe how waste will be stored/handled

Material is radioactive
 Describe the controlled area, labeling, and protection against inadvertent contamination

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: Contact Waste (PPE, Plastic, Material Packaging, etc.)		

<p>Waste Description Description of Waste Type, Potential Contaminants, Volume Estimate, and Waste Packaging:</p> <p>Contact wastes consist of personal protective equipment (PPE), plastics used during operations, sampling equipment, material packaging, and other similar materials.</p>
<p>Characterization Strategy Description of Strategy:</p> <p>These wastes will be managed and stored as radioactive non-regulated waste. Waste will be packaged into LANL compactable waste containers for shipment to TA-54 compaction operations. Total estimated volume during a one month demonstration period is 3 cubic meters.</p> <p>Waste Sampling*: (If sampling will be used, indicate how many grab or composite samples will be collected per container or volume of waste and whether the waste is considered homogeneous or heterogeneous.)</p> <p>None.</p>
<p>• Grab sampling is appropriate for wastes that are fairly homogeneous, such as liquid wastes. • Composite sampling is appropriate for wastes that are heterogeneous, such as soil, sediment, and debris. • A sample of homogeneous or heterogeneous waste collected for VOC analysis should consist of a grab sample rather than a composite sample.</p>

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: Contact Waste (PPE, Plastic, Material Packaging, etc.)		

Analytical Strategy					
Analyte Category	Analytical Method	May be Present (yes, no, unknown)	Direct Sampling of Containerized Waste	Acceptable Knowledge Existing Information	Acceptable Knowledge Data from Proposed Site Characterization
Volatile Organic Constituents					
Semivolatile Constituents					
Organic Pesticides					
Organic Herbicides					
Pesticides and PCBs					
PCBs					
Total Cyanide					
Other Inorganic Constituents (specify)					
High Explosive Constituents					
Asbestos					
TPH					
TCLP Metals					
TCLP Organics					
TCLP Pesticides and Herbicides					
Gross Alpha					
Gross Beta					
Gross Gamma					
Tritium ¹					
Gamma Spectroscopy					
Isotopic Plutonium					
Total Plutonium					
Isotopic Uranium					
Total Uranium					
Strontium-90					
Americium-241					

¹ If tritium is not expected, attach a statement signed by the FPL stating that, based on a review of the available information and professional judgment, it is not necessary to sample for tritium at this site.

OU Number/FU	PRS/SWMU Number	Title
MDAs	TA-21 Near MDA V SWMU 21-014	In-Situ Vitrification Cold Demo
Specific Waste Type: Contact Waste (PPE, Plastic, Material Packaging, etc.)		

Preliminary RCRA Determination
 Based on available information, indicate the waste and whether it could potentially be any of the wastes as defined in 40 CRF 261. List the F-, D-, K-, P-, or U- category and number.

Non-RCRA

Preliminary RCRA Status

Non-RCRA: (No 90-Day Storage Requirement)
 Describe how waste will be stored/handled:

RCRA: (90-Day Storage Requirement)
 Waste will be stored/handled in accordance with 20 NMAC Generator Requirements

Preliminary Determination for Radioactivity
 Based on available information, indicated the amount and type of radiation contamination expected in the waste.

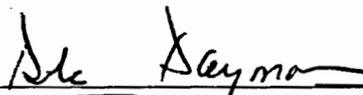
Radioactive based upon use of contaminated equipment.

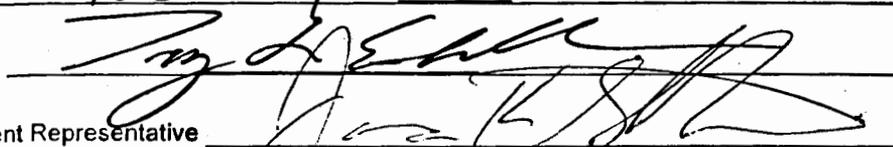
Preliminary Radioactivity Status

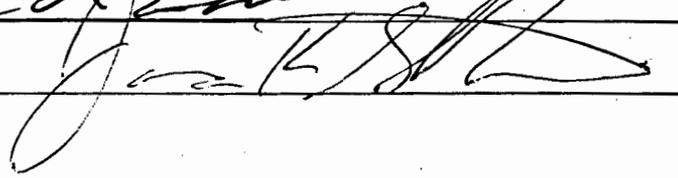
Material is not radioactive
 Describe how waste will be stored/handled

Material is radioactive
 Describe the controlled area, labeling, and protection against inadvertent contamination

Signatures:

Project Leader: 

ER WMC: 

Waste Management Representative 

Sampling and Analytical Requirements for "Clean" Soil Confirmation for the NTISV Cold Demonstration Mockup Bed

This memo summarizes the sampling and analytical requirements for the "clean" soil determination for the area where the NTISV Cold Demonstration Mockup Bed will be constructed.

Sampling Requirements

Four samples will be collected from an excavation at two different depth intervals. The samples will be collected near both ends of the excavation at approximately 3 ft and 6 ft below ground surface. The length of the excavation will be approximately the same length as the mockup bed. Based on guidance provided in the sampling plan discussion in Chapter Nine of EPA's SW-846, a total of four samples should be sufficient to characterize the estimated 1500 cubic feet of material to be included in the cold demonstration near MDA V. The information available on the physical and chemical properties of the site support the conclusion that the material is homogeneous in nature, and that the collection of four samples will be sufficient to meet three principle data objectives:

1. to collect data that is fully representative of the material;
2. to define the variability of the material; and
3. to provide sufficient accuracy and precision required to estimate the chemical characteristics of the material.

Analytical Requirements

The analyses will include the following:

- Gross alpha
- Gross beta
- Gross gamma
- Tritium
- TAL Metals
- Pesticides/PCBs
- Semivolatile organics (SVOCs)
- Volatile organics (VOCs)

The gross alpha, beta, and gamma analyses will be reviewed for the indication of concentrations above background for samples collected from DP mesa. Results for tritium and TAL metals will be compared to the background levels reported in the document "Inorganic and Radionuclide Background Data for Soils, Canyon Sediments, and Bandelier Tuff at Los Alamos National Laboratory," (Ryti et.al. 1998, ER ID# 58093). Pesticides, PCB, SVOC, and VOC data are not compared to background. These data will be reviewed and, if appropriate, a focused validation will be conducted on any organic compounds detected.

The "clean" determination will be made if the radionuclide and TAL metal data are within the expected background ranges. If any organic compounds are considered detected based on the results of the focused validation, the data will be re-assessed in relation to other similar mesa-top environments for determining the potential source(s) and significance of contamination.