

LOGSHEET FOR FIELD CHANGES TO CONTROLLED DOCUMENTS

Change Number	Date	Document Number	Document Title	Section/Page Modified	Description Of Change(s)	Responsible Manager Approval	ES&H/Q Approval	Radiological Engineering Approval	Quality Assurance Approval	Completion Of ADM 2.01 Checklist	Completion Of SESUSQD Checklist
4	7-14-98	RF/RMRS-97-010	Final Site Specific Health and Safety Plan for the Source Removal at Trench 1 IHSS 108	Section 7.4 Page 78 Table 7.2	Revised Radiological Suspension Guide Limits in the CA and RBA to be consistent with the RWP	[Signature]	[Signature]	[Signature]	[Signature]	NA	NA
4	7-14-98	RF/RMRS-97-010		Section 7.4 Page 79 Table 7.2	Revised Radiological Administrative limits for releasing equipment or material from the HCA to the CA and from the CA for unrestricted release	[Signature]	[Signature]	[Signature]	[Signature]	NA	NA
4	7-14-98	RF/RMRS-97-010		Section 7.4.3.4 Page 89	Deleted Oral Temperature from physiological heat stress monitoring	[Signature]	[Signature]	[Signature]	[Signature]	NA	NA
4	7-14-98	RF/RMRS-97-010		Section 7.7.13 Page 105	Revised to allow for work when one compressor is not operating or is out of specification after an evaluation of the adequacy of the breathing air supply	[Signature]	[Signature]	[Signature]	[Signature]	NA	NA

1. Affixed signatures indicate that Operations Review Committee (ORC) and/or Independent Safety Reviews are NOT applicable because Scope and Fundamental Technical Specifications were NOT changed. Also, related documents affected by the change(s) were modified accordingly.

Table 7.2  
 Monitoring Program Summary

RADIOLOGICAL SUSPENSION GUIDE LIMITS			
Hazard	Suspension Guide Limit/Hold Point	Action(s) to be Taken	Monitoring/Sampling Frequency
Equipment or material radiological contamination in "HCA"	Alpha contamination: 200,000 dpm/100cm <sup>2</sup> removable Beta/gamma contamination: 400,000 dpm/100cm <sup>2</sup> removable	Suspend operations, secure area and notify the Field Supervisor and Radiological Safety Technical Supervisor (RSTS)	Daily contamination control surveys within the "High Contamination Area".
Equipment and material radiological contamination in "CA"	Alpha contamination: 2,000 dpm/100cm <sup>2</sup> removable 10,000 dpm/100cm <sup>2</sup> total Beta/gamma contamination: 100,000 dpm/100cm <sup>2</sup> removable 500,000 dpm/100cm <sup>2</sup> total <sup>1</sup>	Suspend operations, secure area and notify the Field Supervisor and RSTS.	Daily contamination control surveys within the "Contamination Area".
Equipment and material radiological contamination in "RBA" or areas not controlled for radiological purposes	Alpha contamination: 20 dpm/100cm <sup>2</sup> removable 100 dpm/100cm <sup>2</sup> total Beta/gamma contamination: 1,000 dpm/100cm <sup>2</sup> removable 5,000 dpm/100cm <sup>2</sup> total <sup>1</sup>	Suspend operations, secure area and notify the Field Supervisor and RSTS.	Daily contamination control surveys within the "Radiological Buffer Area".
Personnel contamination.	> MDC <sup>2</sup> of instrument	Notify the Field Supervisor and RSTS.	Prior to exiting a "Contamination Area"
Airborne radioactivity	10 DAC <sup>3</sup> (U <sup>238</sup> Class Y) when supplied air or full-facepiece air-purifying respirators are worn 0.10 DAC (U <sup>238</sup> Class Y) when no respiratory is worn	Remove personnel from effected area, suspend operations, secure area and notify the Field Supervisor and RSTS.	Per the Radiological Work Permit and the ALARA Job Review
Beta/Gamma radiation in "HCA" or "CA"	10 mrad/hr gamma at 30 centimeters	Suspend operations, secure area and notify the Field Supervisor and RSTS. Performed neutron survey if > 10 mrad/hr gamma at 30 centimeters	Shiftly to characterize excavated material, waste packages, and work areas
	1000 mrad/hr beta on contact		
Presence of total Pu or U <sup>235</sup> as determined by gamma/alpha spec analysis	15 grams fissile U per pkgd container 3,960 grams enriched U per pkgd container 100 nCi/g Pu concentration 1 gram total Pu (WG Pu) per pkgd container	Suspend operations, secure area and notify Nuclear Safety and Criticality Safety.	Per the RMRS and Starnet SAPs

<sup>1</sup> Due to beta/gamma radiation penetrating the walls of waste packages, these limits for direct total beta/gamma may not be applicable.

<sup>2</sup> MDC - Minimum Detectable Counts

<sup>3</sup> DAC - Derived Air Concentration

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Table 7.2  
 Monitoring Program Summary (cont.)

RADIOLOGICAL ADMINISTRATIVE LIMITS			
Hazard	Action Level	Action(s) to be Taken	Monitoring/Sampling Frequency
Releasing equipment or material from the "HCA" to the "CA" with contamination above "CA" limits	Alpha contamination: 2,000 dpm/100cm <sup>2</sup> removable 10,000 dpm/100cm <sup>2</sup> total. Beta/gamma contamination: 100,000 dpm/100cm <sup>2</sup> removable 500,000 dpm/100cm <sup>2</sup> total <sup>1</sup>	Equipment or material may not exit "High Contamination Area". Decontaminate or dispose of as waste	Prior to removal of equipment or material from the "HCA" to a "CA"
Releasing equipment or material from a "CA" with contamination above unrestricted release limits	Alpha contamination: 20 dpm/100cm <sup>2</sup> removable 100 dpm/100cm <sup>2</sup> total Beta/gamma contamination: 1,000 dpm/100cm <sup>2</sup> removable 5,000 dpm/100cm <sup>2</sup> total <sup>1</sup>	Equipment or material may not exit "Contamination Area". Decontaminate or dispose of as waste.	Prior to removal of equipment or material from a "Contamination Area" to an area not controlled for radiological purposes
Suspected presence of Pu <sup>239</sup> or U <sup>235</sup> as determined by Electra alpha/beta ratios	Alpha/Beta ratio > 1:2	Notify the Field Supervisor and RSTS. Contain material if possible. Analyze with AP-2. If AP-2 is inconclusive, conduct analysis by gamma/alpha spectroscopy.	Daily contamination control surveys
Airborne radioactivity	> 0.10 DAC (U <sup>238</sup> Class Y)	Notify the Field Supervisor and RSTS. Post area as "Airborne Radioactivity Area"	Per the Radiological Work Permit and the ALARA Job Review
Gamma radiation in "HCA" or "CA"	> 2 mrad/hr general area dose rate	Notify the Field Supervisor and RSTS. Locate and if possible control the source.	Shiftily to characterize excavated material, waste packages, and work areas
	> 5 mrad/hr at 30 centimeters	Notify the Field Supervisor and RSTS. Post area as a "Radiation Area"	
Gamma radiation at "RBA" boundary	> 50 µrem/hr	Notify the Field Supervisor and RSTS. Adjust boundary until levels are < 50 µrem/hr	Weekly or as required to characterize the "RBA" boundary
Presence of Pu in waste per gamma spec analysis	Pu + Am <sup>241</sup> activity in excess of 2% of total U activity	Notify the Field Supervisor, the RSTS, and Radiological Engineering	Per the RMRS and Starnet SAPs
Presence of Pu <sup>239</sup> in soil as determined by gamma/alpha spec analysis	≥ 8,475 pCi/g in any soil sample	Notify Air Quality Management	Per the RMRS and Starnet SAPs

<sup>1</sup> Due to beta/gamma radiation penetrating the walls of waste packages, these limits for direct total beta/gamma may not be applicable.

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FO.01, *Air Monitoring and Dust Control*. This will be done by the use of a weather station equipped with a R.M. Young Co., Model 05103 Wind Speed Monitor. The monitor is calibrated semi-annually.

A Davis Instruments, Corp., Model Turbo Meter, handheld electronic wind speed monitor may also be used. The Turbo Meter uses a turbine which is suspended on sapphire jewel bearings. The turbine rotation is sensed by an infrared light beam whose signal is processed by a large scale integrated circuit. The Turbo Meter is factory calibrated and requires no maintenance except minor cleaning.

#### 7.4.3.4 Heat Stress Monitoring

Heat stress monitoring will be completed using a Metrosonics, Inc., Model HS-3700, Heat Stress Monitor. The instrument is a micro-processor based Wet Bulb Globe Thermometer (WBGT) which accurately measures environmental factors which contribute to heat stress. The WBGT reading displayed by the instrument, in either Fahrenheit or Celsius, is a weighted sum of the dry bulb, wet bulb, and verner globe temperatures. The WBGT is factory calibrated on an annual basis. Maintenance is minimal with only the wet bulb wick requiring periodic replacement. Monitoring frequency will depend on the work area temperature, the type of work being performed, and the type of PPE worn. See Appendix C for guidance and action levels for work involving the use of personal protective equipment. Readings in the field will be logged on the Daily WBGT Log.

In addition to WBGT monitoring, physiological heat stress monitoring will be performed in accordance with the NIOSH/OSHA/USCG/EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* as follows:

- Heart Rate Monitoring - The SSO or HSS will count the radial pulse of personnel exiting the Contamination Area or High Contamination Area as early as possible after exiting the Radiological Buffer Area. If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same. If the heart rate exceeds 110 beats per minute at the beginning of the next rest period, shorten the next work cycle by one-third.
- Since it is not possible to monitor the heart rate of all personnel exiting the Contamination Areas or High Contamination Area, monitoring will be conducted on personnel based on worst case work load, PPE worn, and other physiological factors.

#### 7.4.3.5 Cold Stress Monitoring

Cold stress monitoring will be accomplished by obtaining the air temperature and the wind speed and calculating the equivalent chill temperature using the ACGIH guidelines found in Appendix C. When in the field, wind speed, temperature, and equivalent chill temperature will be logged on the Daily Wind Speed/Cold Stress Log.

#### 7.4.3.6 Explosive, Oxygen Deficient/Enriched Monitoring

Air monitoring for explosive and oxygen deficient/enriched atmospheres will be conducted using a Mine Safety Appliances, Co., Model Passport. The Passport detects the concentration of explosive gases utilizing a catalyzed detector element and displays the results in percent (0-100) of the lower explosive limit. Because the Passport cannot be directly calibrated to a hydrogen standard, actual explosive levels of hydrogen will be calculated based on the conversion factor supplied by MSA. The passport also detects oxygen content with a range of 0-25%. The Passport is calibrated daily prior to use and requires factory calibration and service on a yearly basis. Daily calibration will be per the manufacturer's specifications and results will be entered in the Industrial Hygiene Instrumentation Calibration Logbook. Monitoring will be conducted in the temporary structure during the venting of drums and in the head space of drums as they are removed from the trench. Should monitoring results indicate levels >10% of the Lower Explosive Limit (LEL), all operations including the use of hand tools and other potential spark producing activities will be immediately suspended until levels drop below 10% of the LEL. Monitoring results will be recorded on the Daily Industrial Hygiene Monitoring Log.

#### 7.4.3.7 Diesel Combustion Gases Monitoring

Monitoring for diesel combustion gases will be done using a Mine Safety Appliances, Co., Model Passport equipped with carbon monoxide, nitrogen dioxide, and sulfur dioxide sensors. The Passport simultaneously displays real-time gas levels in the following ranges; carbon monoxide 0-1000 ppm, nitrogen dioxide 0-20 ppm, and sulfur dioxide 0-20 ppm. The Passport is calibrated daily prior to use and requires factory calibration and service on a yearly basis. Daily calibration will be per the manufacturer's specifications and results will be entered in the Industrial Hygiene Instrumentation Calibration Logbook. Monitoring will be conducted when diesel powered heavy equipment is operating.

Monitoring for nitric oxide will be accomplished using a Sensidyne Inc. Gas Sampling System equipped with nitric oxide colorimetric tubes. The tubes have a range of 2.5-200 parts-per-million. Monitoring will be conducted as needed to characterize levels inside the temporary structure. The hand held sampling pump is leak tested daily prior to use. Monitoring results will be recorded on the Daily Industrial Hygiene Monitoring Log.

#### 7.4.3.8 Hydrogen Cyanide Monitoring

Monitoring for hydrogen cyanide will be accomplished using a Sensidyne Inc. Gas Sampling System equipped with hydrogen cyanide colorimetric tubes. The tubes have a range of 2.0 - 50 parts-per-million. The hand held sampling pump is leak tested daily prior to use and monitoring results will be recorded on the Daily Industrial Hygiene Monitoring Log.

#### 7.4.3.9 Depleted Uranium Temperature Monitoring

Temperature measurements of depleted uranium in drums or soil will be obtained to provide an indication of rapid oxidation which may lead to the ignition of the depleted uranium. In addition, temperature measurements will be obtained by the Starmet HSS just prior to inerting to verify that the depleted uranium is not undergoing a thermal reaction which could ignite the mineral oil. Measurements will be obtained using a Newport Electronics Inc., Model OS521 handheld infrared thermometer in accordance with Operations Order No. 00-T1-09 *Temperature Measurements of Depleted Uranium Using Infrared Heat Gun*

#### 7.4.4 Personal and Area Integrated Air Sampling

In addition to real-time monitoring, personal and area integrated air sampling will be conducted, at the discretion of the Health and Safety Supervisor, at the excavation, the SIP, and the soil stockpile for VOCs, metals, cyanides, diesel emission gases, and dust. Job functions or work areas in the HCA/EZ and CA/EZ will be observed in order to sample the highest risk employees or areas. Samples will be obtained using Mine Safety Appliances, Co., Model Escort LC and SKC, Model 224-PCXR7, personal sampling pumps. The pumps will be calibrated before and after sampling using an A.P. Buck, Inc., Model M-5 (mini-Buck) primary gas flow calibrator. Daily calibration will be per the manufacturers specifications and results will be entered in the Industrial Hygiene Instrumentation Calibration Logbook. The mini-Buck is a National Institute of Science and Technology (NIST) traceable calibrator which is certified on a yearly basis by the manufacturer. All samples will be obtained in accordance with the procedures contained in the NIOSH Manual of Analytical Methods. Samples will be analyzed by an American Industrial Hygiene Association (AIHA) accredited laboratory. Table 7.3 is a list of the analytes to be sampled and the methods to be used. At the onset of the project all analytes will be sampled for on a daily basis. After review of the personal and/or area integrated sampling results, and at the discretion of the Health and Safety Supervisor (Certified Industrial Hygienist), the sampling frequency may be adjusted.

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- Upon approval from the RMRS Environmental Restoration Director or designee, excavation activities will resume.

#### 7.7.12 Presence of Volatile Organic Compounds in Soil

If analytical results show volatile organic compounds at levels greater than 114 parts-per-million in the soil, Air Quality Management shall be notified to determine if additional air emissions analysis and/or revisions to the Air Pollution Emission Notice will be required.

#### 7.7.13 Breathing Air Compressor Failure

Breathing air for the SCBAs and airline respirators will be supplied by two field located breathing air compressors. The breathing air supply systems are designed so that if both compressors fail there is an adequate supply of stored air to allow personnel to conduct a limited amount of work, place the depleted uranium in a fire-safe configuration, and egress the temporary structure. If only one of the compressors fails or is out of specification as stated in Operations Order No. OO-T1-05, *Use of MSA Custom 4500 II Self Contained Breathing Apparatus and PremAire™ Air Line System*, work will be evaluated as to the amount of breathing air available to conduct operations. However, if both compressors fails or are out of specifications, the following actions will be taken:

- all activities will be immediately suspended and the Field Operations Deputy Project Manager or designee and Field Supervisor will be notified;
- RMRS Industrial Hygiene supervision will be notified;
- all nonessential personnel will exit the temporary structure by normal egress routes;
- all depleted uranium will be placed in a fire-safe configuration via inerting as follows;
  - SIP personnel will immediately inert all depleted uranium waste packages heading to or already at the SIP; and
  - the excavator operator will inert material in the trench with non-uranium containing soil;;
- once the temporary structure is secured and the depleted uranium is in a fire-safe configuration, remaining personnel will exit the temporary structure; and
- upon approval from the RMRS Environmental Restoration Director or designee, work activities will resume.

#### 7.7.14 Electronic Personal Dosimeter Alarm Inside the Temporary Structure

Electronic Personal Dosimeters (EPDs) will be issued to selected personnel as determined by Radiological Engineering. The EPDs will track personnel exposures on a daily basis and will alarm at unexpected area