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Energy Systems Environmental Restoration Program
ORNL Environmental Restoration Program

**Waste Management Plan for Environmental Monitoring in Waste
Area Grouping 6 at Oak Ridge National Laboratory,
Oak Ridge, Tennessee**

Date Issued—March 1994

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OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37831-6285
managed by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

MASTER

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Certification:

The information provided in this Project Waste Management Plan has been prepared in accordance with the ORNL Environmental Restoration Document for Preparing Waste Management Plans, the Waste Handling Procedures for Construction Projects, EP-D-21, and the appropriate Waste Acceptance Criteria Documents. All information herein is believed to be true on the basis of project information available at this time:

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ACRONYMS

DOE	U.S. Department of Energy
ER	Environmental Restoration
ESD	Environmental Sciences Division
GCO	Generator Certification Official
HWOS	Hazardous Waste Operations Supervisor
LLW	low-level radioactive waste
LLLW	liquid low-level radioactive waste
NPDES	National Pollutant Discharge Elimination System
NRWTP	Non-Radiological Wastewater Treatment Plant
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Act
PWTP	Process Waste Treatment Plant
QA	quality assurance
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
SLLW	Solid low-level waste
SSHO	Site Safety and Health Officer
SWMU	Solid Waste Management Unit
SWSA	Solid Waste Storage Area
TRU	transuranic waste
WAC	waste acceptance criteria
WAG	Waste Area Grouping
WMO	Waste Management Operations
WMP	Waste Management Plan
WMRAD	Waste Management and Remedial Action Division

EXECUTIVE SUMMARY

The main purpose of this Waste Management Plan is to identify the waste that is expected to be generated in connection with the surface and groundwater monitoring at Waste Area Grouping 6 and to indicate the method of disposal. Another purpose of this plan is to identify the organization, responsibilities, and administrative controls that will be followed to ensure proper handling of the waste.

1. GENERAL PROJECT INFORMATION

1.1 SITE HISTORY

Waste Area Grouping (WAG) 6, approximately 2 miles southwest of the main plant area of the Oak Ridge National Laboratory (ORNL), is a shallow land burial facility used for the disposal of low-level radioactive wastes (LLW) and, until May 1986, chemical wastes. WAG 6 comprises three solid waste management units (SWMUs): an emergency waste basin, an explosives detonation trench, and Solid Waste Storage Area (SWSA) 6.

The emergency waste basin was designed for retention of liquids including radioactive liquid low-level wastes (LLLW) but has never been used. The explosives detonation trench (located within SWSA 6) was used to contain debris from the detonation of shock-sensitive materials. SWSA 6, the largest of the WAG 6 SWMUs (68 acres), was opened in 1969 as an shallow land burial site for LLW and nonradioactive wastes. SWSA 6 is the principal source of potential environmental contamination from WAG 6. In 1991, *Resource Conservation and Recovery Act (RCRA) Facility Investigation for WAG 6*, ES/ER-22 and ORNL/ER/Sub-87/99053/5, (Bechtel National, Inc., 1991) revealed that WAG 6 posed risks to human health and the environment. This environmental monitoring program will track the surface and groundwater quality surrounding the WAG 6 area to determine whether degradation of water quality is occurring.

1.2 PROJECT DESCRIPTION

The WAG 6 environmental monitoring project consists of a preparation phase and a monitoring phase. During the preparation phase, 6 new wells and 9 piezometers will be installed, 15 wells that have not been used recently will be redeveloped, and a surface water monitoring station (Monitoring Station 4) will be constructed. Appendix A shows the location of the wells and piezometers to be installed and surface water monitoring sites. Other environmental monitoring activities being performed at WAG 6 (but not be considered in this report) include the construction of two additional monitoring stations, Monitoring Station 1/2 and Monitoring Station 3. The wastes generated from these projects will be considered in separate waste management plans.

The monitoring phase will include sampling of groundwater and surface water. The groundwater monitoring program will include 19 downgradient wells, 11 upgradient wells, and 15 wells located in the interior of the WAG 6 area. The current program calls for upgradient wells to be sampled semiannually for the contaminants of concern listed in Table 1 and geochemical parameters. The downgradient and interior wells will be sampled and analyzed quarterly for contaminants of concern and geochemical parameters.

The surface water monitoring program will include samples from 12 monitoring sites. Samples will be taken following storm events (estimated in this report to occur monthly) and analyzed for radionuclides, total suspended solids, volatiles, and geochemical parameters.

Table 1. Contaminants of concern as identified by the RCRA Facility Investigation

Media	Contaminant
Groundwater, seeps, and springs	<p>Metals: barium, cadmium, lead, arsenic, mercury, silver</p> <p>Radionuclides: tritium, cobalt-60, strontium-90, cesium-137, radium-224/226, plutonium-238, plutonium-239/240, curium-244</p> <p>VOCs*: trichloroethene, trichloromethane, benzene, vinyl chloride, 1,2-dichloroethane, carbon tetrachloride, ethyl benzene, 1,2-dichloroethene, tetrachloroethane</p>
Surface water	<p>Radionuclides: tritium, cobalt-60, strontium-90, cesium-137, plutonium-239/240, curium-242, curium-244</p> <p>VOCs*: trichloroethene, 1,2-dichloroethene, tetrachloroethane, vinyl chloride</p>
Bedload stream sediments	Radionuclides: tritium, cobalt-60, strontium-90, cesium-137

* VOCs and heavy metals are identified as a contaminant of concern if the levels detected in the remedial investigation meet or exceed a Safe Drinking Water Act maximum contaminant level or health-based criteria in the case of sediments.

1.3 SCHEDULE

Preparation phase activities are expected to be completed by November 1993. Sampling is scheduled to begin in December 1993. Monitoring is expected to last 5 years, after which the need for continued monitoring will be decided.

2. ORGANIZATIONAL STRUCTURE AND RESPONSIBILITY

The organizational structure for this project is presented in Appendix B, and specific waste management responsibilities are listed in the Waste Management Plan Checklist (Appendix D). This project will be accomplished with the joint resources of the following participants:

- U.S. Department of Energy (DOE),
- Martin Marietta Energy Systems (as Facility Manager),
- MK-Ferguson of Oak Ridge Company (as Construction Manager),
- Highland Drilling Company, and
- CDM Federal Programs Corporation.

A brief summary of responsibilities and duties follows.

2.1 U.S. DEPARTMENT OF ENERGY

DOE will furnish overall program management and provide project support as required through the DOE/ORNL site office. Additionally, all coordination with the U.S. Environmental Protection Agency and the Tennessee Department of Environment and Conservation will be DOE's responsibility.

2.2 MARTIN MARIETTA ENERGY SYSTEMS, INC.

Energy Systems, as the Facility Manager, is responsible for managing and operating ORNL under prime contract to DOE. The WAG 6 Environmental Monitoring Project will be conducted and supervised by the Waste Management and Remedial Action Division (WMRAD) of Energy Systems for the ORNL Environmental Restoration (ER) Program. Various groups within Energy Systems have specific responsibility related to waste management as follows.

- The Energy Systems ER Program will provide overall project oversight and assume ultimate responsibility for Energy Systems.
- Energy Systems Engineering will
 - manage the project,
 - prepare standard project documentation,
 - incorporate data into as-built drawings, and
 - prepare a certified-for-construction package.
- The Environmental Sciences Division (ESD) at ORNL will provide technical oversight.
- Energy Systems support organizations will
 - provide health physics oversight,
 - provide industrial hygiene oversight, and
 - provide environmental compliance support and oversight.

- The WMRAD will
 - provide Facility Manager support,
 - provide a Generator Certification Official (GCO), and
 - provide Waste Management Operations (WMO) support.
- The ORNL Groundwater Coordinator will
 - coordinate resolution of groundwater issues and
 - provide data concerning groundwater monitoring.
- The ORNL Surface Water Coordinator will
 - coordinate resolution of surface water issues and
 - provide data concerning surface water monitoring.

2.3 MK-FERGUSON OF OAK RIDGE COMPANY

MK-Ferguson will construct Monitoring Station 4 during the preparation phase of this project. MK-F will provide all field personnel and all construction equipment and associated maintenance necessary for constructing the monitoring station. During construction, MK-Ferguson, as waste generator (Sect. 3.8), will perform all waste segregation, packaging, labeling, and transportation (WMO will transport liquid from the temporary waste storage area to the appropriate facility). Throughout construction as well as throughout the remainder of the environmental monitoring campaign, MK-Ferguson will provide a Site Safety and Health Officer (SSHO) and coordination between Energy Systems and the subcontractors, Highland Drilling Company and CDM Federal Programs Corporation.

2.4 HIGHLAND DRILLING COMPANY

Highland Drilling Company will install wells and piezometers and redevelop wells during the preparation phase of this project. Highland Drilling Company will provide all field personnel and all construction equipment and associated maintenance necessary for this activity. In addition, Highland Drilling Company, as waste generator (Sect. 3.8), will perform waste segregation, packaging, labeling, and transportation as required (WMO will transport liquid from the temporary waste storage area to the appropriate facility).

2.5 CDM FEDERAL PROGRAMS CORPORATION

CDM Federal Programs Corporation will perform monitoring during the monitoring phase of this project. CDM Federal Programs Corporation will provide all field personnel and equipment and associated maintenance necessary for the monitoring phase of this project. In addition, CDM Federal Programs Corporation, as waste generator (Sect. 3.8), will perform waste segregation, packaging, labeling, and transportation as required (WMO will transport liquid from the temporary waste storage area to the appropriate facility).

2.6 GENERATOR CERTIFICATION OFFICIAL

The GCO must be an Energy Systems employee (unless the ORNL Laboratory Certification Official waives this requirement) who has successfully completed waste generator training for solid low-level waste (SLLW), satellite accumulation area training, the GCO training module, 90-day accumulation area training (required only for generation of hazardous waste), 40-h Occupational Safety and Health Act (OSHA) training, and radiation worker training. In terms of specific responsibilities, the GCO

- serves as the interface between the project, the ORNL Laboratory Certification Official, and the ORNL WMO in addressing generator problems and waste certification requirements;
- initiates and completes the GCO section of UCN Form 2109, *Request for Transfer, Storage, or Disposal of Wastes*;
- certifies by signing UCN Form 2109, *Request for Transfer, Storage, or Disposal of Wastes*, that the waste was packaged in accordance with the ORNL waste acceptance criteria, ORNL SLLW certification program plan, and SLLW quality assurance (QA) plan requirements;
- ensures that each containerized waste item is identified with a properly completed Waste Item Description form and bar code label (beginning on September 13, 1993) and verifies that the container is sealed, labeled, and meets all applicable criteria for transfer to Waste Management;
- certifies that the information on the Container Packing List is complete and accurate and that the waste was packaged by personnel with appropriate training;
- ensures that the generation of wastes follows a documented and Waste Management-approved certification program;
- periodically inspects or audits waste-generating and waste-managing activities to ensure that they meet the requirements of an approved certification program;
- reviews and approves nonconformance reports and trends, log-in sheets, training records, and facility-specific procedures for the proper packaging and handling of SLLW;
- reviews and approves all project waste management plans and associated checklists;
- ensures that SLLW is properly classified, adequately characterized, and packaged in accordance with waste management plan criteria and applicable waste acceptance criteria; and
- makes arrangements or designates someone to make arrangements with WMO for pickup and transfer of waste packages to the designated storage or treatment facility.

2.7 LABORATORY CERTIFICATION OFFICIAL

The Laboratory Certification Official implements and manages the ORNL SLLW Certification Program. The Laboratory Certification Official's specific responsibilities are to

- review and approve project waste management plans and associated checklists and
- approve all plans affiliated with generating transuranic wastes.

2.8 GENERATOR

The generator is the responsible Energy Systems organization, prime contractor, subcontractor, or person that is actually generating the waste. The generator's specific responsibilities are as follows.

- Properly containerizes, packages, and segregates all waste generated as part of the project.
- Completes and signs box S1 of the Waste Item Description portion of UCN Form 2109, *Request for Transfer, Storage, or Disposal of Waste*.
- Completes UCN Form 2109, *Request for Transfer, Storage, or Disposal of Wastes* (if hazardous waste is generated).
- Minimizes SLLW production.
- Attends and successfully completes current ORNL SLLW generator training and facility-specific training before generating SLLW.
- Interfaces with the GCO to ensure that any issues in SLLW characterization are promptly brought to the attention of the responsible individuals and that any new certification requirements or procedures are promptly instituted.
- Provides as much data as possible for certification of SLLW and documents the data on UCN Form 2109, *Request for Transfer, Storage, or Disposal of Wastes*.
- Assists the GCO with the preparation of the new Waste Pickup Request form and Container Packing List (beginning on September 13, 1993).

3. WASTE GENERATION

3.1 WASTE GENERATING ACTIVITIES

During well and piezometer installation and Monitoring Station 4 construction, contractor waste will be generated in the form of decontamination solutions, development water, soil cuttings, and miscellaneous noncontaminated trash.

During monitoring activities, the bulk of the waste will be water that is removed from wells during purging activities before sampling. In addition, small amounts of decontamination fluids, protective gloves, plastics, and glassware will be generated.

During drilling and installation activities, health physics personnel will use portable alpha and beta/gamma detectors to monitor for radioactivity in the material removed. Industrial health personnel will use portable ionization detectors to monitor the material for volatile organics. Wherever possible, the soil cuttings will be used as backfill within WAG 6. Any contaminated material excavated or generated during monitoring activities will be maintained in separate polyvinyl-covered stockpiles until disposal. Exclusion areas will be set up, and contamination control will be maintained as defined in the Site Safety and Health Plan.

3.2 WASTES TO BE GENERATED

Appendix C contains a detailed listing of wastes to be generated. No waste other than very low activity waste is expected to be generated as a result of this project. If transuranic waste is encountered, the Laboratory Certification Official will be notified and an amendment to this plan will be issued.

3.3 CHARACTERIZATION OF WASTE STREAMS

Results from laboratory characterization of liquid samples removed as part of the environmental monitoring sampling campaign will be used to identify contaminants in the waste liquid.

Laboratory analyses will identify any RCRA materials that may be present. Laboratory isotopic analyses will identify any radioactive isotopes and their respective contributions to the total activity of the contamination present in the liquid. By assuming a constant concentration of the identified isotopes (and neglecting the nonlinearity of ionization potential as isotopic concentration is varied), the approximate curie content of each isotope present on subsequently contaminated personal protective, sampling, and handling equipment may be calculated as in the following example.

From laboratory analysis, isotopic breakdown of the original sample could be as follows.

Isotope	Percent of total activity
^{137}Cs	25
^{90}Sr	25
^{240}Pu	50

If a calibrated field instrument having an efficiency specific to an identified isotope (^{137}Cs) of 0.2 cpm/dpm yields a reading of 1000 cpm gamma when scanning a piece of handling equipment, the contribution of the gamma decay of that isotope may be calculated as follows.

$$\frac{\left(\frac{1000 \text{ cpm}}{0.2 \text{ cpm/dpm}} \right)}{2.2 \times 10^6 \text{ dpm}/\mu\text{Ci}} = 2.27 \times 10^{-3} \mu\text{Ci gamma (Cs-137 in this example)}$$

Assuming that the isotopic breakdown in this waste packet is similar to the original laboratory analysis, the respective activity of ^{90}Sr and ^{240}Pu can be calculated by comparing their relative concentrations to that for ^{137}Cs as follows:

$$2.27 \times 10^{-3} \mu\text{Ci} \times 25/25 = 2.27 \times 10^{-3} \mu\text{Ci } ^{90}\text{Sr}$$

$$2.27 \times 10^{-3} \mu\text{Ci} \times 50/25 = 4.54 \times 10^{-3} \mu\text{Ci } ^{240}\text{Pu}$$

All calculations made in determining isotopic breakdown will be recorded for use in completing waste transfer documentation (see Section 5.3).

Industrial Hygiene personnel will use portable ionization detectors to monitor excavated soil for the presence of volatile organics. Health Physics personnel will use portable alpha and beta/gamma detectors to monitor the soil for the presence of radioactivity. If screening indicates the presence of volatile organics or radioactive contamination above Category 2 limits as defined in *Health, Safety, and Environmental Protection Procedure for Excavating Operations*, ORNL/M-116/R1 (J. D. Sherrod, 1988) or if previous analyses indicate the presence of RCRA materials, the waste generator shall ensure that appropriate analyses are performed.

The waste generators shall ensure the integrity of the samples by following the chain-of-custody procedure described in *Test Methods for Evaluating Solid Waste*, EPA-SW-846. This procedure includes the steps necessary to trace possession and handling of samples from the time of collection through analysis and final disposition.

4. WASTE HANDLING

4.1 GENERATING

DOE and Energy Systems control programs governing engineering, construction, and waste disposal activities will be implemented for this project. These programs include sampling and analysis; waste certification; hazardous waste and radiation worker training; quality assurance; environmental, safety, and health; health physics; and configuration management. These programs will ensure compliance with all applicable state and federal regulatory requirements including RCRA; Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the associated Superfund Amendments and Reauthorization Act (SARA); OSHA; and Department of Transportation regulations for the proper handling and control of radioactive and hazardous wastes.

4.2 SEGREGATING

Health physics personnel will use portable alpha and beta/gamma detectors to monitor the material removed for the presence of radioactivity. Industrial hygiene personnel will use portable ionization detectors to monitor the material for the presence of volatile organics. The results of these activities in combination with data contained in the RCRA Facility Investigation will be used to properly segregate all waste and determine the need for a 90-day or satellite accumulation area.

4.3 PACKAGING AND HANDLING

Waste will be packaged under the guidance of the GCO. The individual signing as waste generator shall be present during all waste packaging. SLLW will be packaged to comply with *Waste Acceptance Criteria for Radioactive Solid Waste Disposal at SWSA-6, WMRA-WMPC-203*. For any SLLW, the GCO and the generator shall complete UCN Form 2109, *Request for Transfer, Storage, or Disposal of Wastes*. The GCO shall ensure that a Health Physics form UCN-2785, "Radiation Tag," is attached to the waste container (beginning September 13, 1993, a barcode label must be attached) and request pick-up of the package after acceptance by Radioactive Solid Waste Operations.

Category 1 and 2 soil as defined in ORNL/M-116/R1 (J. D. Sherrod, 1988) will be stockpiled at the waste temporary storage area for reuse (soil with activity at background levels may also be sent to the Y-12 Plant Recontour Site). Soil or material that is stockpiled for later use or relocation will be covered with polyvinyl sheeting. All waste soil will be handled according to ORNL/M-116/R1, unless the soil is deemed investigation-derived waste.

Waste generated from environmental monitoring activities associated with remedial investigation may be considered investigation-derived waste and may be handled according to the *Management of Investigation-Derived Waste During Site Investigations*, EPA/540/G-91/009 (EPA, 1990). The investigation-derived waste management strategy is aimed at minimizing waste, particularly in areas of minimal contamination. The general options for managing

investigation-derived waste are collection and either immediate disposal or some type of interim management. Interim management may include storage or other temporary measures. The specific activities at WAG 6 that may be classified as remedial investigation activities have not yet been identified. Therefore, the waste volume estimates in this report do not reflect the use of the investigation-derived waste management strategy.

Waste liquids will be collected in 55-gal drums or tanks, which will be monitored for radioactivity, volatile organics, and pH. If a representative sample of the liquid has not been characterized as described in Sect. 4.3, the generator will ensure that other appropriate analyses (as required by the ORNL Liquid Waste Treatment Systems Waste Acceptance Criteria, WM-WMCO-201) are performed. Following analysis, the liquid either will be released on-site or transferred by WMO to a tanker truck and transported to the Non-Radiological Wastewater Treatment Plant (NRWTP) or the Process Waste Treatment Plant (PWTP). If any liquid meets RCRA criteria (defined in 40 CFR 260 series), a satellite or 90-day accumulation area will be established until control of the liquid is transferred to the Hazardous Waste Operations Group or the Liquid and Gaseous Waste Operations Group (the PWTP and NRWTP can accept low concentrations of some RCRA liquids as specified by WM-WMCO-201).

Following revision of the current National Pollutant Discharge Elimination System (NPDES) permit, regulations may permit disposal of noncontaminated purge water in nearby streams. This option will be considered after approval of the new NPDES permit. In addition, release criteria, release location, and permitting requirements will be evaluated following approval.

4.4 DECONTAMINATION OF EQUIPMENT

All drill rigs, nondedicated pumps, tools, and related equipment will be screened for radioactive contamination and volatile organics. Contaminated equipment will be decontaminated as directed in the site health and safety plan. Before use of the well drilling steam cleaning area, all users must read and sign the *Criteria for the Well Drilling Steam Cleaning Area at ORNL*.

5. WASTE MINIMIZATION

All efforts will be made to minimize waste generation during the course of the project. At least the following actions will be taken:

- Site delivery of materials for well installation activities will be properly planned and executed to minimize the delivery of excess materials.
- As little water as possible will be used in decontamination operations. Whenever possible, water will be processed by the NRWTP or the PWTP or released on-site instead of being disposed of in the liquid low-level waste (LLLW) system.
- Subcontractors will be required to remove all excess delivered materials from the site.
- All generated wastes will be segregated to minimize the disposal of nonrecyclable, noncontaminated, and nonhazardous wastes.
- Where appropriate, the investigation-derived waste strategy will be implemented.

6. CONTROL PROGRAMS

6.1 HEALTH PHYSICS AND INDUSTRIAL HYGIENE SURVEY

Health Physics and Industrial Hygiene will perform surveillance during well drilling and installation activities to identify radioactive and volatile organic contamination. The GCO, as designated by WMRAD, will be responsible for determining whether additional testing or sampling is required by Energy Systems. Excavated materials will be properly handled and temporarily stockpiled on polyvinyl sheeting in the temporary storage area to prevent the spread or loss of any material containing radioactive or organic contamination.

6.2 CONTROLS

Health physics personnel will monitor field activities to ensure handling of wastes in a manner that will prevent the spreading, mixing, or loss of any soil suspected of containing organic or radiologically contaminated material. Industrial hygiene personnel will monitor wastes for volatile organics.

6.3 PERSONNEL EXPOSURE CONTROL

Health physics and industrial hygiene personnel will perform surveillance during well drilling and installation activities to identify radioactive contamination and organic vapors. If radioactively contaminated areas are encountered during the field activities, standard radiation protection measures defined in the site safety and health plan will be followed to ensure personnel safety. Work exposure times and other conditions will be established by the health physicist in charge. The construction manager will ensure that personnel exposure is as low as reasonably achievable during all work in contaminated areas or areas subject to radiation exposure.

6.4 TRAINING

Personnel involved in on-site activities must have training and pre-employment medical assessment as required by the site safety and health plan. They must also have hazardous waste and radiation worker training. Personnel responsible for completing and signing waste tracking and disposal forms must have the 40-h SARA/OSHA and SLLW generator training and must be present during packaging. All individuals packaging SLLW must have SLLW generator training. The GCO and the generator must have training as described in Sects. 3.6 and 3.8, respectively. If hazardous waste is encountered, the generator must also have waste generator training for satellite accumulation areas and/or 90-day accumulation areas. Personnel engaged in excavation operations shall be trained in accordance with the requirements in ORNL/M-116/R1 (J. D. Sherrod, 1991).

6.5 QA REQUIREMENTS

Energy Systems, in its role as facility manager, will track participant activities and consolidate records and reports to ensure that project QA activities are performed and that required documentation is complete. Surveillances will be conducted as defined in the QA Plan.

6.6 SPILL CONTROL

The site safety and health plan addresses spill control. As detailed in the plan, the first responder will use a spill control kit to contain spills.

7. WASTE TEMPORARY STORAGE

Polyvinyl sheeting will be used to isolate radioactively contaminated soil and solid material from the environment until properly packaged for disposal. Potentially contaminated waste water will be drummed and will remain at the work site in the temporary storage area until analytical results are available. Once characterization is complete, waste water will be transported to the NRWTP or PWTP or will be released on-site (or stored by the Hazardous Waste Operations Group if the water does not meet the requirements of WM-WMCO-201).

REFERENCES

- Bechtel National, Inc., *RCRA Facility Investigation for WAG 6*. ES/ER-22, ORNL/ER/Sub-87/99053/5, Oak Ridge National Laboratory, September 1991.
- J. D. Sherrod, *Health, Safety, and Environmental Protection Procedure for Excavating Operations*, ORNL/M-116/R1, Oak Ridge National Laboratory, March 1988.
- U. S. Environmental Protection Agency, *Management of Investigation-Derived Waste During Site Investigations*, EPA/540/G-91/009, Office of Solid Waste and Emergency Response, May 1990.

Appendix A

MAPS

A-3

Fig. A.1. Location of WAG 6.

Fig. A.2. New well and piezometer location.

Appendix B
WAG 6 ORGANIZATION CHART

B-3

Fig. B.1. WAG 6 organization chart.

Appendix C
WASTE VOLUME ESTIMATION

Table C.1. Waste volume estimation (annual waste generation—groundwater sampling)

Type of waste ^a	Volume assumptions	Volume	Category of waste ^b	Disposal method
Purge water and decontaminated water	55 gal per well sampling event	8690 gal	22, 24, or 25	Release on-site (if permitted by new NPDES requirements), or NRWTP or PWTP
Returned sample water	See following pages	180 gal	22 or 24	NRWTP, PWTP, or LLLW
Used sample bottles	See following pages		-	Clean and reuse
Miscellaneous trash (personal protective equipment, plastics, paper)	1 ft ³ per sample (only gloves required for personal protective equipment)	158 ft ³	5 or 8	Y-12 Plant Landfill or site designated by WMO

^a All waste is classified as contractor waste.

^b See Tables C.8 and C.9 for solid waste and Table C.10 for liquid waste.

Table C.2. Waste volume estimation (annual waste generation—surface water sampling)

Type of waste ^a	Volume assumptions	Volume	Category of waste ^b	Disposal method
Decontamination water	1 L per sample event	76 gal	22 or 24	NRWTP or PWTP
Sample water	See following pages	1712 gal	18, 22, or 24	NRWTP, PWTP, or LLLW
Used sample bottles	See following pages	-	-	Clean and reuse
Miscellaneous trash (personal protective equipment, plastics, paper, etc.)	1 ft ³ per sample event (only gloves required for personal protective equipment)	24 ft ³	5 or 8	Y-12 Plant Landfill or site designated by WMO

^a All waste is classified as contractor waste.

^b See Tables C.8 and C.9 for solid waste and Table C.10 for liquid waste.

Table C.3. Waste volume estimation (new well installation and old well redevelopment, April 1993–June 1993)

Type of waste ^a	Volume assumptions ^b	Volume	Category of waste ^c	Disposal method
Soil cuttings	6 wells averaging 40 ft deep; 12 piezometers, averaging 23 ft deep	400 ft ³	1	Y-12 Plant Recontour site or reuse on-site
Development water	6 new wells, 15 old wells	3150 gal	22, 24, or 25	Release on-site (if permitted by new NPDES requirements) or NRWTP or PWTP
Decontamination solutions	5 gal per new well	30 gal	22 or 24	NRWTP or PWTP
Miscellaneous trash (personal protective equipment, paper, plastics, etc.)	0.5 ft ³ per ft of depth	258 ft ³	5 or 8	Y-12 Plant Landfill or site designated by WMO

^a All waste is classified as contractor waste.

^b Based on 1992 Draft Methodology for Generating Waste Volume Estimates (Energy Systems)

^c See Tables C.8 and C.9 for solid waste and Table C.10 for liquid waste.

Table C.4. Waste volume estimation (installation of Monitoring Station 4, April 1993-June 1993)

Type of waste ^a	Volume (ft ³) ^b	Category of waste ^c	Disposal method
Wood edge forms, plywood, etc.	23	2	Wood storage area
Wire and conduit scraps, tape scraps	3	5	Y-12 Plant Landfill
Cardboard, miscellaneous paper	12	3	7000 Area compactor
Wire fence, rebar and steel scrap, wire mesh	1070	4	7000 Area metal recycle area
Plastic sheeting, miscellaneous plastics	17	5	Y-12 Plant Landfill
Silt fencing	11	5	Y-12 Plant Landfill
Excavated soil	5712	1	Y-12 Recontour site (or reuse on-site)
Rock with little soil	810	1	Y-12 Recontour site
Vegetation	3630	-	ORNL nursery (for mulch)
Miscellaneous trash	10	5	Y-12 Plant Landfill
Personal protective equipment	384	5 or 8	Y-12 Landfill (or site designated by WMO)
Wash water	150 (gal)	22 or 24	NRWTP or PWTP

^a All waste is classified as contractor waste.

^b Volumes based on estimates for Monitoring Station 3.

^c See Tables C.8 and C.9 for solid waste and Table C.10 for liquid waste.

Table C.5. Waste estimate justification (surface water sampling and analytical schedule, performance sampling)

Parameters	Volume per sample	Number of samples to be taken											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Gross alpha													
Gross beta													
Total radioactive Sr													
Gamma spectrometry	1 L	120	120	120	120	120	120	120	120	120	120	120	120
Tritium	1 L	120	120	120	120	120	120	120	120	120	120	120	120
Total suspended solids													
Volatile organic compounds	3 × 40 mL	38	38	38	38	38	38	38	38	38	38	38	38
Metals	1 L	35	35	35	35	35	35	35	35	35	35	35	35
Anions	1 L												
Dissolved organic/ inorganic carbon													
Alkalinity		35	35	35	35	35	35	35	35	35	35	35	35
Total monthly volume generated (L)		315	315	315	315	315	315	315	315	315	315	315	315
Total annual volume generated (L)		3775											

Table C.6. Waste estimate justification (groundwater quality sampling and analytical schedule, operational sampling)

Parameters	Volume per sample	Number of samples to be taken											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Gross alpha2 Gross beta Total radioactive Sr Gamma spectrometry	1 L	61	61	61	61	61	61	61	61	61	61	61	61
Tritium Total suspended solids	1 L	61	61	61	61	61	61	61	61	61	61	61	61
Volatile organic carbons	3 × 40 mL	43	43	43	43	43	43	43	43	43	43	43	43
Metals	1 L	49	49	49	49	49	49	49	49	49	49	49	49
Anions Dissolved organic/ inorganic carbon Alkalinity	1 L	49	49	49	49	49	49	49	49	49	49	49	49
Total monthly volume generated (L)		225	225	225	225	225	225	225	225	225	225	225	225
Total annual volume generated (L)		2706											

Table C.7. Groundwater quality sampling and analytical schedule (baseline characterization phase).

Parameters	Volume per sample	Number of samples to be taken											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Gross alpha Gross beta Total radioactive Sr Gamma spectrometry	4 L	45	0	0	19	0	0	45	0	0	19	0	0
Tritium	100 mL	45	0	0	19	0	0	45	0	0	19	0	0
Volatile organic carbons	3 × 40 mL	45	0	0	19	0	0	45	0	0	19	0	0
Metals	500 mL	45	0	0	34	0	0	45	0	0	34	0	0
Anions	2 × 40 mL	45	0	0	34	0	0	45	0	0	34	0	0
Dissolved organic/ inorganic carbon	125 mL	45	0	0	34	0	0	45	0	0	34	0	0
Alkalinity	100 mL	45	0	0	34	0	0	45	0	0	34	0	0
Total monthly volume generated (L)		230	0	0	110	0	0	230	0	0	110	0	0
Total annual volume generated (L)		680											

Table C.8. Solid waste categories

Waste category	Waste included
Noncontaminated	<ul style="list-style-type: none"> • Noncontaminated soil, rock, concrete • Noncontaminated wood • Noncontaminated cardboard • Noncontaminated metal (except rebar, wire fence, steel scrap) • Noncontaminated garbage/refuse placed in green dumpster (except metal bands, plastics, silt, fence, wire scraps, conduit scraps, weld rods, glass)
Hazardous	<ul style="list-style-type: none"> • Nonradioactive, hazardous, asbestos/asbestos contaminated • Nonradioactive, hazardous, RCRA materials
Low level	<ul style="list-style-type: none"> • Very low activity (VLA), nonhazardous • VLA, hazardous, asbestos/asbestos contaminated • VLA, hazardous, RCRA materials • Radioactive, non-RCRA, TRU • Radioactive, nonhazardous, LLW (>200 mR/h) • Radioactive, nonhazardous, noncompactible, LLW (<200 mR/h) • Radioactive, nonhazardous, compactible, LLW (<200 mR/h) • Radioactive, hazardous, asbestos/asbestos contaminated • Radioactive, RCRA, TRU • Radioactive, hazardous, LLW

Table C.9. Solid waste package requirements and destinations

Solid waste type and category	Package requirements	Destination
<i>Noncontaminated solid</i>		
1	Package to prevent loss during transport	Y-12 Plant recontour site
2	Package to prevent loss during transport	Wood storage area off Bethel Valley Road
3	Package to prevent loss during transport	7000 Area compactor
4	Package to prevent loss during transport	7000 Area metal recycle area
5	Plastic bags in garbage cans at site	Y-12 Plant landfill (quantity limited by quota)
<i>Hazardous</i>		
6	Package per ORNL Industrial Hygiene procedures	Y-12 Plant landfill (quantity limited by quota)
7	Package per Hazardous Waste Operations Supervisor (HWOS)	Site designated by HWOS
<i>Low-Level</i>		
8	Package per SWSA 6 Waste Acceptance Criteria instructions ^a	Site designated by WMO
9	Package per ORNL Industrial Hygiene procedures	SWSA 6 asbestos disposal site
10	Package per RSWO instructions	Site designated by HWOS
11	Package per RSWO instructions	SWSA 5 site designated by RSWO
12	Package per SWSA 6 waste acceptance criteria (WAC) instructions ^a	SWSA 6
13	Package per SWSA 6 WAC instructions ^a	SWSA 6
14	Package per SWSA 6 WAC instructions ^a	SWSA 5 box compactor
15	Package per ORNL Industrial Hygiene procedures and SWSA 6 WAC instructions ^a	SWSA 6 asbestos disposal site
16	Package per RSWO and HWOS instructions	Site designated by HWOS
17	Package per RSWO and HWOS instructions	Site designated by HWOS

^a Waste acceptance criteria for radioactive solid waste disposal at SWSA 6 (WMRA-WMPC-203).

Table C.10. Liquid waste package requirements and destinations

Liquid waste type and category	Package requirements ^a	Destination
Liquid low-level waste		
18	2.5-gal polyethylene bottles	Radioactive Waste Evaporation Facility
19	LGWOD tanker truck	Valve Box 2
20	LGWOD dumpster truck	Valve Box 2
Process waste		
21	55-gal drums	Process Waste Treatment Plant
22	Other—arrange with LGWOD	Process Waste Treatment Plant
Nonradiological waste		
23	55-gal drums	Nonradiological Waste Treatment Plant
24	Other—arrange with LGWOD	Nonradiological Waste Treatment Plant
Noncontaminated waste		
25	Written consent of the Liquid Waste Certification Officer and consultation with the Environmental Compliance Section	Storm sewer system

^a Arrangements for receipt of bottles, tanker trucks, and dumpster trucks must be made with LGWOD.

Note: Waste acceptance criteria for the waste categories shown here may be found in *ORNL Liquid Waste Treatment Systems Waste Acceptance Criteria*, WM-WMCO-201, July 1991.

Appendix D

WASTE MANAGEMENT PLAN CHECKLIST

Waste Management Plan Checklist
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Date: August 28, 1993

-
1. Project Name: Expected Start/Completion Date: 5/94 - 5/97
Waste Area Grouping 6 Environmental Monitoring

Responsible Engineering Project Manager: S. D. Van Hoesen

Phone: 574-7264

Address: Building 1000/MS 6338

Location of Project (WAG, building, street, etc.): WAG 6

Organization/Subcontractor Performing Waste Generation Task:
MK-Ferguson (MK-F) (Monitoring Station 4 installation - preparation phase)
Highland Drilling Co. (Well installation & redevelopment - preparation phase)
CDM Federal Program Corp. (Sampling - monitoring phase)

Charge Number for Waste Management/P&E Activities: PX 122-R02

DOE Site Reference Number: TBD

ORNL ER Work Breakdown Structure No. (Level 6): 1.4.12.6.1.06

-
2. Responsible ER WAG/Task Manager: S. D. Van Hoesen

Phone: 574-7264

Address: Building 1000/MS 6338

Responsible ORNL Construction Engineer: R. B. Knott

Phone: 574-6553

Address: Building 2647/MS 6319

Responsible Site ES&H Coordinator: MK-F

Phone:

Address:

Fig. D.1. Waste Management Plan Checklist.

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Please attach a drawing or sketch of the proposed location(s) of the waste-generating activities to this document.

See Project Waste Management Plan (PWMP) Attachment 1

If there is no place to store or dispose of this waste, you must inform the ER Site Remediation Manager or Program Manager before any waste is generated.

3. Project Description (site history and scope of project):

A. Site History

WAG 6, approximately 2 miles southwest of the main plant area of the Oak Ridge National Laboratory (ORNL), is a shallow land burial facility used for the disposal of low-level radioactive wastes (LLW) and, until recently, chemical wastes. WAG 6 comprises three Solid Waste Management Units (SWMUs): an Emergency Waste Basin (EWB), an Explosives Detonation Trench (EDT), and Solid Waste Storage Area (SWSA) 6.

The EWB was designed for retention of liquids including low-level radioactive wastes but has never been used for its intended purpose. The EDT (located within SWSA 6) was used to contain debris from the detonation of shock-sensitive materials. SWSA 6, the largest of the WAG 6 SWMUs (68 acres), was opened in 1969 as a shallow land burial site for LLW, mixed, and nonradioactive wastes. SWSA 6 is the principle source of potential environmental contamination from WAG 6.

In 1991, a Resource Conservation and Recovery Act (RCRA) Facility Investigation revealed that WAG 6 posed unacceptable risks to human health and the environment. The environmental monitoring program will track the surface and groundwater quality surrounding the WAG 6 area to determine if degradation of water quality is occurring.

B. Project Description

The WAG 6 environmental monitoring project consists of a preparation phase and a monitoring phase. During the preparation phase six new wells and nine piezometers will be installed, 15 wells which have not been used recently will be redeveloped, and a surface water monitoring station (MS4) will be constructed.

The groundwater monitoring program will include 19 downgradient wells, 11 upgradient wells, and 15 wells located in the interior of the WAG 6 area. The current program calls for upgradient wells to be sampled semiannually for the contaminants of concern (CoCs) listed in Table 1 of the PWMP and geochemical parameters. The downgradient and interior wells will be sampled and analyzed quarterly for CoCs and geochemical parameters.

The surface water monitoring program will include samples from 12 different monitoring sites. Samples will be taken following storm events (estimated in the PWMP to occur monthly) and analyzed for radionuclides, total suspended solids, volatiles, and geochemical parameters.

Fig. D.1 (continued)

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4. Completion and Signatures of Waste Management Forms: (Beginning in September of 1993, new waste transfer documents will be required. Personnel who will be responsible for the preparation of these documents should contact Waste Management for instructions.

Individuals who have not taken the proper training authorizing them to sign off on Waste Disposal forms UCN-2822 and UCN-16114 should contact Kory Gabrielsen at 576-4374. Specific Training Requirements: Solid Low-Level and Transuranic Waste

A. Request for Storage or Disposal of Radioactive Waste:

Form UCN-2822

MK-F (Monitoring Station installation)

Highland Drilling (wells & piezometers)

S. Childs
 Requester's Name

CDM (monitoring phase)
 Health Physics Technician's Name

B. Log in Data Sheet:

Form UCN-16114

MK-F/Highland Drilling/CDM
 Generator's Name

Remedial Action GCO
 Notes 1, 2, and 3 Name(s)

Fig. D.1 (continued)

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- C. Request for Disposal of Hazardous Waste Material: **NA** (no hazardous waste is expected to be generated)

Forms UCN-13698 and UCN-13698A

MK-F/Highland Drilling/CDM
Subcontractor/Prime Contractor
Waste Generator Name

MK-F/Highland Drilling/CDM
Health Physics Technician's Name

Remedial Action GCO
MMES Waste Generator Name

- D. Request for Disposal of Asbestos or Material Containing Asbestos: **NA**
Process knowledge is sufficient to ensure that no Asbestos will be encountered.

Form UCN-11386

-NA-
Requester's Name

- E. Request for Disposal of Sanitary/Industrial Waste and Spoil Material

Form UCN-2109/Trip Ticket (Obtain form from ORNL Hazardous Waste Operations Group.)

K. G. Edgemon
Authorized Name

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5. Person or organization responsible for completing the ORNL ER Weekly Waste Generation Report:

MK-F, Highland Drilling Co., & CDM Federal Programs Corp.

6. Organization or person responsible for providing prime or subcontractor with characterization data for waste disposal:

Energy Systems Engineering

7. Organization or person responsible for obtaining samples from waste containers and transporting those samples to the analytical laboratory for characterization purposes:

MK-F, Highland Drilling Co., & CDM Federal Programs Corp.

8. Describe sampling plan for taking samples (from waste containers or the area of contamination) that are to be sent to the lab for characterization information which will be used in completing the waste disposal forms.

Results from laboratory characterization of liquid samples removed as part of the environmental monitoring sampling campaign will be used to identify contaminants in the waste liquids to be sent to Waste Management Operations for disposal. The contamination content of subsequently contaminated PPE and handling equipment may be estimated from these results and field screening as described in Section 4.3 of the PWMP.

Samples of any liquid waste that has not yet been characterized will be drawn from the drums in which the liquid is stored. The drums will remain in the Temporary Storage Area until analytical results are received. At this time the contents will be released or the drums will be appropriately labeled and the liquid will be transferred to Waste Management Operations.

9. Organization or person responsible for performing analysis on waste samples for characterization purposes:

Energy Systems Analytical Chemistry Division

10. What analyses will be requested to characterize the waste?

RCRA metals, pH, volatile organics analyses, isotopic analyses, or others as required (no hazardous waste is expected)

11. List the process knowledge available to characterize the waste:

Field screening, historical knowledge, ORNL Groundwater Quality Assessment Reports, Oak Ridge Reservation Environmental Reports, the RFI, and RI/FS.

Fig. D.1 (continued)

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12. Is the available process knowledge enough to properly characterize the waste?

Process knowledge is sufficient for characterization of waste soil unless field screening indicates levels of contamination greater than expected. Results from laboratory characterization of liquid samples removed as part of the environmental monitoring sampling campaign will be used to identify contaminants in the waste liquids to be sent to Waste Management Operations for disposal. The contamination content of subsequently contaminated PPE and handling equipment may be estimated from these results and field screening as described in Section 4.3 of the PWMP. Further characterization of liquid waste will be required if field screening identifies an area of atypical contamination or if the liquid is from an area which has not been characterized during this project.

13.	<u>Waste Stream/Source</u>	<u>Type</u>	<u>Category</u>	<u>Volume (cubic feet)*</u>	<u>Suspected Contaminants</u>
	(1) Purge and Decon water	Liquid	Clean/VLA	1,613 (12,066 gal)	See Table 1 of PWMP for list of contaminants of concern.
	(2) Decon solutions	Liquid	Clean/VLA	4 (30 gal)	
	(3) Returned sample water	Liquid	Clean/VLA	253 (1892 gal)	
	(4) Misc. trash (PPE, etc.)	Misc.	Clean/VLA	834	
	(5) Cutting/excavation	Soil	Clean/VLA	6,112	
	(6) Excavation	Rock	Clean/VLA	810	
	(7) Clearing vegetation	Veg.	Clean	3,630	
	(8) Covering/fencing mat'l	Plastic	Clean	31	
	(9) Steel scrap	Metal	Clean	1,070	
	(10) Packaging scrap	Cardboard	Clean	12	
	(11) Plywood, forms, scrap	Wood	Clean	23	

* Waste volume estimates based on 1992 Draft Methodology for Generating Waste Volume Estimates and information shown in Attachment 3 of PWMP.

14. Will a spill control kit be on-site during waste generation activities? Y/N/NA
Yes - Addressed in the Site Safety and Health Plan

Is a first responder emergency action plan in place, in case of a spill or a line puncture?
 This means in addition to contacting Laboratory Protection (911). Please be specific.

Yes - Addressed in the Site Safety and Health Plan

What will the spill control kit consist of? (Be specific)

The spill control kit is described in detail in the Site Safety and Health Plan. The kit will contain, at a minimum, polyvinyl sheeting, spill control pillows, dry sorbents, absorbent booms, and trash bags.

15. What organization or persons will be assigned the responsibility of properly containerizing the waste, labeling the waste containers, and labeling and bagging contaminated material?

MK-F, Highland Drilling Co., & CDM Federal Programs Corp.

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16. Which of the following areas will be required to temporarily store the project waste until the waste can be transferred to ORNL Waste Management Operations?

If hazardous waste is generated, it will be maintained in an appropriate temporary storage area.

- A. Radiological Waste Storage Area: Yes

Location: Temporary Storage Area

Responsible organization or person that will manage area:
MK-F/CDM/Highland Drilling Co.

- B. 90-Day Storage Facility for hazardous or mixed waste: Possible (Hazardous waste is not expected, however, a 90-Day Storage Facility will be set-up in advance if necessary)

Location: Temporary Storage Area (contingency only)

Responsible organization or person that will manage area:
TBD

- C. Satellite Accumulation Area: Possible (a Satellite Accumulation area may be established if waste volume does not exceed 55 gal or, if arrangements can be made, to transport RCRA waste to a TSD facility within 3 days of generation)

Location: Temporary Storage Area (contingency only)

Responsible organization or person that will manage area:
MK-F/CDM/Highland Drilling Co.

- D. If any of the above areas will not be used to manage the waste, please give specific details to how this waste will be managed.

Soil that is stockpiled will be isolated from the environment using polyvinyl sheeting.

Have training requirements (e.g., Satellite Accumulation Area and 90-Day Accumulation Area) been fulfilled to manage the storage area?
Arrangements will be made to train personnel.

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17. Have you spoken to ORNL compliance personnel pertaining to your requirements for managing a temporary satellite, 90-day or radiological waste storage area? **Yes**

N. S. Dailey

Person Contacted

574-8774

Phone

List the specific requirements:

18. A. Can the ORNL Hazardous Waste Group take charge of the hazardous or mixed waste generated? **Yes** (no hazardous waste is expected)

If not now, when?

List any specific requirements:

Volume of Waste (cubic feet):

L. Wesley

Person Contacted

574-7467

Phone

- B. Can the Solid Radioactive Waste group accept the volume of radiological waste that will be generated? **Yes**

If not now, when?

List any specific requirements:

Volume of Waste (cubic feet): See PWMP, Attachment 3

B. McClelland

Person Contacted

574-4126

Phone

**Waste Management Plan Checklist
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- C. Can the Liquid Gaseous Waste Group accept the liquid waste that will be generated?
Yes

If not now, when?

List any specific requirements:

Volume of Waste (cubic feet): See PWMP, Attachment 3

<u>J. Baldwin</u>	<u>574-1663</u>
Person Contacted	Phone

- D. Do you plan to generate any brine solution, sludge or sediment waste, if so how will you manage this waste? Give specific details. No

For waste that cannot be managed by any of the above ORNL Waste Operation groups, what is your alternative for managing the waste? Give specific details.

- E. Will any large volumes of uncontaminated be generated?

Only soil that will remain at WAG 6.

19. Will any TRU or TRU mixed waste be generated? No

20. What person or organization will be responsible for transporting the waste from the generation area to the temporary waste storage area to await final pickup by Martin Marietta Energy Systems (MMES)? MK-F, Highland Drilling Co., and CDM Federal Programs Corp.

Describe the route that will be used to transport waste to the temporary waste storage area, treatment facility, or disposal facility:

Liquids will be collected in appropriate containers, monitored for radioactivity, volatile organics, and pH. They will be placed in a Temporary Staging Area as directed by the Generator Certification Official (GCO). The liquid will be transferred to an MC312 tanker truck and transported to the Non-Radiological Wastewater Treatment Plant (NRWTP) or Process Waste Treatment Plant (PWTP) as directed by the Waste Management and Remedial Action Division (WMRAD).

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21. Will MMES Waste Management Operations be responsible for transporting waste from site of waste generation or the waste storage area to an MMES storage or disposal facility? Y/N/NA Yes

J. Baldwin
 MMES Person Contacted

574-1663
 Phone

Give specific details regarding who or what organization will be transporting the waste from the site of waste generation or waste storage area to an Energy Systems storage, disposal, or treatment facility.

MK-F, Highland Drilling Co., and CDM Federal Programs Corp. personnel will collect the liquid in containers compatible with a Liquid and Gaseous Waste Operations Department (LGWOD) tanker. Waste Management Operations will then transport the liquid to the appropriate treatment or disposal facility via tanker truck.

-
22. A. Will waste require transporting over public roads? Yes (noncontaminated waste only)
- B. Will waste require transporting over DOE roads before 9 a.m. and after 4 p.m.?
 No
- C. List the Department of Transportation issues that address transporting this waste: DOT regulations (found in Part 49 of the Code of Federal Regulations)
- D. List the resolutions to those issues: All waste transportation must meet DOT regulations.
- E. Have you communicated the issues of transporting the waste and associated resolutions to ORNL Transportation Operation Management Department and received their concurrence of how the waste may be transported? Yes

R. Walker
 Person Contacted

574-5522
 Phone

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23. Identify your waste minimization and waste reduction techniques in detail that you will be implementing such as:

☒ Segregation	☐ In-Field Pretreatment
☒ Decontamination	☒ Waste Handling (Spill Control)
☒ Compaction	☒ Material Recycle (Solvents, Containers)
☐ Solvent Substitution	☐ Material Reuse (Solvents, Wash Waters)
☐ Sludge Dewatering	☐ Cutting Fluids Recovery
☐ Selection of PPE	☒ Selection of Equipment
☐ Other	

Description of Special Techniques and Expected Effectiveness: None

24. List the specific MMES site or facility intended for final waste disposal, treatment, or storage:

<u>Solid Waste</u>		<u>Volume of Waste (cubic feet)</u>
1. Clean Dumpster	Y	See PWMP
2. Radiological Dumpster	N	
3. Silo	N	
4. Tumulus	N	
5. Wells	N	
6. TRU Aboveground Storage	N	
7. Y-12/K-25	Y	See PWMP

<u>Liquid Waste</u>		<u>Volume of Waste (cubic feet)</u>
1. Process Waste Treatment Plant	Y	See PWMP
2. Nonradiological Waste Treatment	Y	See PWMP

Specific training requirement for managing bottled waste includes Liquid Low-Level Waste training. Contact John R. Parrott at 574-6595.

<u>Hazardous/Mix Waste Facility Location</u>	<u>Volume of Waste (cubic feet)</u>
1.	

25. Attach any additional information that will give further clarification of your waste management plan. (i.e., Project Documents, Quality Assurance Plans, etc.)

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Approvals

WAG 6 Environmental
 Monitoring

Project Name

S. D. Van Hoesen 9/10/93

S. D. Van Hoesen
 Waste Management Plan
 Checklist Completed by

J. H. Thompson / S. D. Van Hoesen 7/30/93
 Project Manager

Date

Steve E. Miller
 Generator Certification Official

8/30/93
 Date

Conrad E. Miller
 Environmental Compliance and
 Documentation

9-10-93
 Date

[Signature] 7/13/93
 ORNL Waste Management Operations
 Organization

ER-11-7822
 ORNL Waste Management Plan
 Document Number

Date

Charles Clark
 ORNL Environmental Restoration
 Program

9/13/93
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[Signature]
 ORNL Laboratory Certification Official

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