Department of Energy
Albuquerque Operations
Los Alamos Area Office
Los Alamos, New Mexico 87544

SEP 27 1985

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Denise Fort, Director
N.M. Environmental Improvement Division
P. O. Box 968
Santa Fe, New Mexico 87504-0968

RECEIVED
OCT 01 1985
HAZARDOUS WASTE SECTION

Dear Ms. Fort:

RE: Notice of Violation (NOV) letter dated August 26, 1985

The enclosed information is the Department of Energy's (DOE) official response to your Division's NOV letter dated August 26, 1985. This submittal includes amendments to the May 1, 1985 Part B hazardous waste permit application and amended Part A application. Part B amendments will be labelled and can be inserted into the Division's official Part B Permit application.

In direct response to findings 1 and 2, the following actions have been taken: (1) the accumulation tag on the tank for plate shop hazardous wastes has the accumulation date readily available and in place, and (2) the container in question at TA-54 Area L has been replaced.

The enclosures are specific to the other findings (violations) noted in the NOV and provide the required documentation in compliance with Section 74-4-10 of the New Mexico Hazardous Waste Act. Where appropriate, a brief explanatory narrative accompanies the enclosure.

o Enclosure 1 - A revised Part B Table of Contents.

o Enclosure 2 - Documentation and policies that assure less than 90 day storage and a quality assurance program for maintaining container integrity.

o Enclosure 3 - A Certification Document certifying that warning signs in English and Spanish are posted at the entrance to the active portions of all hazardous waste facilities.

o Enclosure 4 - A Certification Document certifying to the date that the personnel training program was implemented at the Laboratory.

o Enclosure 5 - Closure Plans for Technical Areas (TA):

TA 40-2 Magazine Container Storage Area
TA 40 Scrap Detonation Site
TA 3-102 Container Storage Area
TA 22-24 Magazine Storage Area

16444

o Enclosure 6 - Closure and Post-Closure Plans for Technical Areas (TA):

TA-54 Area G

o Enclosure 7 - Closure and Post-Closure Plans for TA 54 Area L that supersedes Section 9.4 in the Laboratory 's Part B permit application.

o Enclosure 8 - A revised Contingency Plan that supersedes Section 7.1 thru 7.11 and tables in 7-6 in the existing Laboratory's Part B permit application.

o Enclosure 9 - A revised Waste Analysis Plan that supersedes Section 3.2 thru 3.3 in the existing Laboratory's Part B permit application.

o Enclosure 10 - Revised Closure Plans for: TA 14, 15, 36, and 39 - Detonation Sites; TA 16 Burn Pads; and TA 50-1 - Batch Treatment Plant that supersedes Section 9.2 thru 9.3.1.3 in the existing Laboratory's Part B permit application.

o Enclosure 11 - A revised Part A reflecting TA 16 Area P. This new Part A supersedes Section 1.2 in the Laboratory's Part B application.

o Enclosure 12 - Closure Plan and schedule for TA 16 Area P to prepare a complete and adequate Closure Plan to the Environmental Improvement Division. As stated in DOE's November 1, 1984 letter, Area P was scheduled to be characterized starting July 1985, and lasting through September 1986.

If you have any questions concerning these responses, please feel free to contact Avedon Gallegos at 667-5288.

Sincerely,

Harold E. Valencia
Area Manager
U.S. Department of Energy
Albuquerque Operations
Owner

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R-00009A

insert figure 2-1

CLOSURE AND POST CLOSURE PLANS FOR TA 54-AREA G LANDFILL AT LOS ALAMOS NATIONAL LABORATORY

Legal Owner: United States Department of Energy
Address : Los Alamos Area Office
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September 1985

AREA G
TABLE OF CONTENTS

		PAGE
1.0	Introduction	1-1
2.0	Area G Description	2-1
3.0	Waste Description	3-1
4.0	Closure Plan	4-1
4.1	Partial Closure	4-1
4.2	Closure of Regulated Wastes Landfill	4-2
4.3	Final Contour	4-3
4.4	Infiltration	4-5
4.5	Decontamination	4-6
4.6	Sampling and Analytical Procedures	4-7
4.6.1	General Considerations	4-7
4.6.2	Sampler	4-8
4.6.3	Cleaning and Storage of Sampler	4-11
4.6.4	Sampling Procedures	4-11
4.6.5	Sample Handling	4-12
4.6.6	Sampling Parameters	4-16
4.6.7	Analytical Procedures	4-16
4.6.8	Contamination Criteria	4-16
4.7	Decontamination Verification	4-16
4.8	Closure Schedule	4-17
4.9	Certification	4-18
4.10	Post Closure	4-19
5.0	General Considerations	5-1
5.1	Contact Person	5-1
5.2	Quality Assurance	5-1
5.3	Split Samples	5-2
5.4	Facility Access	5-2
5.5	Cooperation	5-2

APPENDIX A Area G Current Existing Survey
APPENDIX B Area G Original Survey

TABLES

3-1 Mixed, Regulated or Appendix VIII Constituent Waste Disposed of at Area G Since 1971

4-1 TA 54-Area G Disposal Pit Use Dates

4-2 Soil Sample Analysis Constituents

4-3 Checklist of Items Required for Field Sampling

4-4 Ground Water Sampling Methodology and Monitoring

FIGURES

2-1 TA 54-Area G

4-1 Veihmeyer Soil Sampler

4-2 Examples of Sample Labels

4-3 Example of Sample Seal

4-4 Chain of Custody Record

4-5 Hazardous Materials Sample Analysis Request

1.0 INTRODUCTION

Area G at Los Alamos National Laboratory is situated on Mesita del Buey in TA-54 and is the primary operating radioactive solid waste burial/storage site at the Laboratory. Burial facilities include pits and shafts, all of varying dimensions. Certain radioactive mixed and nonradioactive hazardous chemical wastes have been buried along with the radioactive wastes at Area G. Such wastes include scintillation vials, asbestos, beryllium residues, empty pesticide containers, PCB-contaminated solids, and solid trash wastes contaminated or suspected of being contaminated by hazardous wastes. The hazardous wastes regulated by RCRA represent less than 1 percent of the total volume of wastes buried at Area G. Area G is a waste disposal facility operated under a Resource Conservation and Recovery Act (RCRA) Part A permit. A Part B permit is not being sought for this facility and Area G will be closed under interim authority.

2.0 AREA G DESCRIPTION

The active portion of the site comprises a total area of 63 acres. Burial/storage facilities within the area include pits, shafts, trenches, and pads, all of varying dimensions. The facility has only been used for pit and shaft disposal of regulated wastes. Trench and pad storage is applicable to non-regulated wastes. Figure 2-1 shows the present layout of Area G within the fenced portion of the site, and support facilities at the site. A more detailed description of the use of these facilities and of the current waste management operations is contained in the Los Alamos Final Environmental Impact Statement. TA 54 Area G has been an active landfill site for low level radioactive wastes since 1957.

3.0 WASTE DESCRIPTION

The majority of the wastes that are buried in Area G is low level radioactive waste. A list of certain regulated mixed wastes, and Appendix VIII constituents that have been placed in pits and shafts at Area G is given in Table 3-1, along with the waste container volume and the number of the pit or shaft into which the waste was placed. The waste list is based on a computer inventory which includes data only back to 1971. Most of the wastes listed in Table 3-1 are radioactive and are therefore mixed wastes. All regulated wastes transported to Area G are containerized or are a contaminated piece of equipment. The waste volumes listed on Table 3-1 are the volumes of the container or the estimated volume taken up by the contaminated equipment and does not include voids in partially filled containers, or the volume of adsorbents. The hazardous waste regulated by RCRA consists of less than 1 percent of the total wastes buried at Area G. Much of the previously mentioned wastes are containerized. Only solid wastes or liquid wastes packed in adsorbents are accepted at Area G. Trucks deliver containerized wastes to Area G. For pit disposal, the truck drives to the bottom of the pit and the wastes are unloaded and covered with backfill at the end of the day. For shaft disposal, containerized wastes are delivered to the site, unloaded next to the shaft, then placed in the shaft with a crane. No regulated wastes have ever been stored for more than 90 days or treated at Area G. There are no wastes in storage or treatment at the start of closure.

4.0 CLOSURE PLAN

4.1 Partial Closure

Partial closure has occurred at Area G when pits and shafts were closed as they were filled. In all disposal facilities, wastes are buried beneath the undisturbed rock (tuff) surface to minimize potential erosion effects. Shafts were filled with wastes to a level no higher than 3 feet below the "spill point" (lowest point on the shaft rim). Wastes were covered with a minimum of 0.5 feet layer of compacted crushed tuff. The final cover of a shaft was noncontaminated concrete, a minimum of 3 feet thick, slightly rounded, and extending about 0.5 feet above the land surface. Identifying engineering markers, brass caps,were placed in the final pour of seal concrete. Because shafts contain primarily radioactive wastes, information on the cap included the wording "Buried Radioactive Wastes," along with the shaft number, radionuclides buried, total curies, and dates of use.

The pits were closed when the waste level reached 3 feet of the spill point. The pits were filled with crushed compacted tuff (minimum 3 feet) overlain by topsoil (approximately 4 inches). The final cover was graded to match the original land surface, and grass has been planted.

The pits that have been closed and the date closed are shown on Table 4-1. Shaft 124 is the only shaft open which has received a regulated waste.

4.2 Closure of Regulated Wastes Landfill

The following closure is specific to pits and shafts that are open and have received regulated wastes. This includes pit 29 and shaft 124. Area G will be closed to acceptance of RCRA wastes and will continue to receive radioactive wastes.

Only wastes in solid or solidified form are accepted for burial. Shafts will be filled with nonregulated wastes to a level no higher than 3 feet below the "spill point" (lowest point on the shaft rim). Wastes are to be covered with a minimum of a 0.5 feet layer of compacted crushed tuff. The final cover of a shaft will be noncontaminated concrete, a minimum of 3 feet thick, slightly rounded, and extending about 0.5 feet above the land surface and extending beyond the shaft edge 6 inches. Identifying engineering markers, brass caps, will be placed on the final pour of seal concrete in the shaft. Because shafts contain radioactive wastes, information on the cap will include the wording "Buried Radioactive Wastes," along with the shaft number, radionuclides buried, total curies, and dates of use.

The pits are closed when the waste level reaches 3 feet of the spill point. The pit is filled with crushed compacted tuff (minimum 3 feet) overlain by topsoil (approximately 4"). The final cover of a pit will be at or above the original land surface, as required for contouring to provide the desired drainage within the area and provide for settling.

Wastes are placed in the pits in layers and each layer is covered with a layer of crushed tuff. Compaction is provided by delivery truck traffic and earth moving equipment. When the pit is filled within 3 feet of the spill point, the pit next to the full pit is excavated, and the excavated material stored in a pile on top of the full pit to provide further compaction. The stored excavated material is removed to provide layer fill and backfill in the pit it came from as that pit is filled. When the neighboring pit is nearly full, the excess tuff is removed and the full pit cover is contoured, covered with top soil and revegetated.

Provisions will be made to control run-off in the disposal area to minimize infiltration and erosion of the final cover of the pit. Turf-forming grasses and bunch grasses will be planted in the final cover to prevent wind and sheet wash erosion. The grass will be watered and fertilized for two growing seasons to ensure successful revegetation. Identifying engineering type markers will be placed at two diagonal corners of each pit. The markers, at least 12 inches in diameter, will be set approximately 2-3 deep in undisturbed tuff and will extend 0.5 to 1.0 feet above the ground surface.

4.3 Final Contour

In general, pit covers are contoured to match the original contour, sloping gently from the axis downward to the east. Areas including several pits are revegetated when disposal operations have moved far enough from the covered pits that truck and earth

moving equipment traffic no longer disrupts the area. Following revegetation, the area is resurveyed. Appendix A includes plats for those areas for which the final survey has been completed. Appendix B contains the original contour maps for areas not included in Appendix A and represents the target contours for pits in those areas including pit 29.

Because it is a mesa top, the surface is not prone to pond water. Temporary berms are formed at the inlet and outlet of a pit and a ditch is cut on the upslope side to prevent surface drainage into the pit while it is opened. These surface drainage controls are degraded by truck and earth moving equipment and are reconstructed and maintained daily using earth moving equipment. Because these controls are field constructed and change almost daily, their adequacy is judged by observing drainage patterns during precipitation. Surface drainage for closed pits follows the natural contours and is shown for completed areas on the plats in Appendix A.

On closing Area G for regulated wastes and as part of the closure plan, an engineering study for the entire site will be conducted to determine if existing drainage facilities are adequate to meet regulatory requirements, to minimize maintenance, and to control run-on so that exposure of the waste is prevented and infiltration is minimized. Should the engineering study determine any inadequacies, the surface water drainage controls will be redesigned using good engineering practice. Design improve-

ments can include modifications of contour to reduce slopes and minimize erosion as well as controls such as the use of rip rap, cobbles, diversion structures, and paving of drainage channels.

The findings of the engineering study and any design changes will be submitted to the NMEID within 30 days of the study completion for review and approval. Should the NMEID not approve the findings of the study, or the engineering design, the Laboratory will negotiate with NMEID for modifications that are acceptable to both parties.

As part of the closure, the existing cap design for all shafts containing regulated waste will be improved to prevent undercutting of the cap. An 8 inch deep by 8 inch wide trench will be dug a minimum of 1.5 feet from the edge of each shaft. Additional concrete will be added to the cap to extend the cap out and fill the trench.

4.4 Infiltration

Because only solid and solidified waste have been placed in the pits and shafts, the potential for leachate formation and transport to groundwater depends on infiltration. The adequacy of the pit cover design is based on information that indicates that run off and potential evapotranspiration exceed precipitation for the mesa top and that there is no infiltration to generate leachate. Information to support this position was in the "Ground Water Monitoring Waiver Request" submitted July 26, 1984,

and in subsequent submittals supporting the monitoring waiver. Additional information is being gathered in response to the May 7, 1985 Compliance Order/Schedule.

4.5 Decontamination

Area G will be closed in place, so that no waste will be removed unless the soil surface shows signs of contamination. There have been no spills of regulated waste at Area G. Nevertheless the soil surface in Area G around pit 29 and access areas to pit 29 will be inspected for signs of contamination, such as discolored areas or unidentified residues. Soil samples will be taken from any areas where leakage appears to have occurred, and analyzed for waste constituents for that area (Table 4-2). The results from the analysis shall be compared to four background control samples. If hazardous waste constituents show a significant increase over background levels, the areas containing the constituents will be excavated and the material placed in drums for transport to Area L for storage. Ultimate disposal will depend on the nature of the contamination. Decontamination will be verified by obtaining samples that do not contain hazardous waste constituents significantly higher than those found in the controls. Excavated areas will be backfilled to grade.

No decontamination of equipment is anticipated during closure because no contact is expected between the previously buried wastes and equipment.

If it appears that contamination is evident in the soil, all equipment used to clean up the area in question will be decontaminated by steam cleaning or washing with a detergent (Liquinox or Alconox) solution. The equipment will be put on a sheet of plastic which will cover a bermed area to collect the residue, and will be washed or cleaned to remove any contaminants. The residue will be left to evaporate and the solid residue, if any, will be picked up, placed in a drum and transferred to Area L for storage and disposal.

Personnel washing down equipment will wear rubber gloves, neoprene acid/solvent resistant coveralls, rubber boots, and a face shield. The Laboratory's Industrial Hygiene Group, HSE-5, will review the site situation and recommend additional protective clothing and or respiratory protection as necessary.

4.6 Sampling and Analytical Procedures

While specific sampling and analytical methods are described here, any applicable method described in Test Methods for Evaluating Solid Wastes, USEPA, most current edition (SW846) may be used.

4.6.1 General Considerations

If sampling is necessary due to contamination of the soil, then adequate preparation for sampling of any regulated waste is necessary. A checklist of items required for field sampling helps

to ensure proper preparation. Such a checklist is given in Table 4-3. This table lists the minimal equipment, accessories, and supplies necessary to sample regulated wastes.

4.6.2 Sampler

A trowel and/or scoop, and a Veihmeyer soil sampler, will be used to sample the soil. The trowel and/or scoop will be used to sample the topsoil. A Veihmeyer soil sampler will be used to take core samples at one foot intervals to bedrock or to a maximum depth of three feet for the initial survey. Outlined below are descriptions of the samplers.

4.6.2.1 Trowel and/or Scoop

The garden variety trowel looks like a small shovel. The blade is usually about 7 by 13 cm (3 by 5 in) with a sharp tip. A laboratory scoop is similar to the trowel but the blade is usually more curved and has a closed upper end to permit the containment of material. Scoops come in different sizes and makes. Stainless steel with 7 by 15 cm (2 3/4 by 6 in) blades are preferred. A trowel can be bought from hardware stores; the scoop can be bought from laboratory supply houses.

4.6.2.1(a) Sampling Procedures

- At regular intervals, take small, equal portions of sample from the surface or near the surface of the material to be sampled.
- Combine the samples in a glass containers.

- Cap the container, attach the label and seal, record in field log book, and complete sample analysis request sheet and chain of custody record.
- Deliver the sample to the laboratory for analysis.

4.6.2.2 Veihmeyer Sampler

The Veihmeyer sampler is recommended for core sampling of most types of soil, but it may not be applicable to sampling stony, rocky, or very wet soil. The basic sampler is shown in Figure 4-1. The tube is chromium-molybdenum steel in various lengths and is calibrated every 30.48 cm (12 in). Different points are available for different types of soil and sampling. Each point is shaped to penetrate specific types of soil without pushing the soil ahead of it, thus preventing the core from compacting in the tube. The standard point is adequate for most general sampling purposes. The inside taper of each point is designed to keep the sample from being sucked out of the tube as it is pulled from the ground. The drive head protects the top of the tube from deforming when the tube is driven into the ground with the drive hammer, which doubles as a drive weight and handle when pulling the sampler from the ground. When the sampler tube cannot be pulled easily from the ground, a special puller jack and grip are also available.

4.6.2.2(a) Sampling Procedures

- Assemble the sampler by screwing in the tip and the drive head on the sampling tube.

- Insert the tapered handle (drive guide) of the drive hammer through the drive head.
- Place the sampler in a perpendicular position on the soil to be sampled.
- With the left hand holding the tube, drive the sampler into the ground to the desired sampling depth by pounding the drive head with the drive hammer. Do not drive the tube further than the tip of the hammer's drive guide.
- Record the length of the tube that penetrated the ground.
- Remove the drive hammer and fit the keyhole-like opening on the flat side of the hammer onto the drive head. In this position, the hammer serves as a handle for the sampler.
- Rotate the sampler at least two revolutions to shear off the sample at the bottom.
- Lower the sampler handle (hammer) until it just clears the two ear-like protrusions on the drive head and rotate about 90 degrees.
- Withdraw the sampler from the ground by pulling the handle (hammer) upwards. When the sampler cannot be withdrawn by hand, as in deep soil sampling, use the puller jack and grip.
- Dislodge the hammer from the sampler, turn the sampler tube upside down, tap the head gently against the hammer, and carefully recover the sample from the tube. The sample should slip out easily.
- Collect additional core samples if needed.

- Label the samples, affix the seals, record in the field log book, complete sample analysis request sheet and chain of custody record, and deliver the samples to the laboratory for analysis.

4.6.3 Cleaning and Storage of Sampler

The sampler must be clean before use. The used sampler must be washed with a warm detergent solution (Liquinox or Alconox), rinsed several times with tap water, rinsed with distilled water, drained of excess water, and air-dried or wiped dry. Improper cleaning of sample equipment will cause cross contamination of samples. The absence of contamination is of particular importance in these samples, because they will be taken for regulatory purposes. Clean samplers should be stored in a clean and protected area in polyethiene plastic tubes or bags.

4.6.4 Sample Handling

After a sample is transferred into the glass or polyethiene container, the container must be tightly capped as quickly as possible to prevent the loss of volatile components and to exclude possible oxidation from the air. The sample should be refrigerated or treated with preservatives. To split or withdraw an aliquot of a sample, considerable mixing, homogenization, or quartering is required to ensure that representative or identical portions are obtained. When transferring a sample aliquot, open the glass container as briefly as possible.

4.6.5 Identification of Sample

Each sample must be labeled and sealed properly immediately after collection.

4.6.5.1 Sample Labels

Sample Labels (Figure 4-2) are necessary to prevent misidentification of samples. Gummed paper labels or tags are adequate. The label must include at least the following information:

- Name of Collector
- Date and time of collection
- Place of collection
- Collector's sample number, which uniquely identifies the sample.

4.6.5.2 Sample Seals

Sample seals are used to preserve the integrity of the sample from the time it is collected until it is opened in the Laboratory. Gummed paper seals can be used as official sample seals. The paper seal must carry information such as:

- Collector's name
- Date and time of sampling
- Collector's sample number. This number must be identical with the number on the sample label.

The seal must be attached in such a way that it is necessary to break it in order to open the glass sample container. An example of a sample seal is shown in Figure 4-3.

4.6.5.3 Field Log Book

All information pertinent to a field survey and/or sampling must be recorded in a log book. This must be a bound book, preferably with consecutively numbered pages that are 21.6 by 27.9 cm (8 1/2 by 11 in). Entries in the log book must include at least the following:

- Purpose of sample
- Location of sampling and address
- Producer of waste and address
- Type of process producing waste
- Type of waste
- Declared waste components and concentrations
- Number and volume of sample taken
- Description of sampling point
- Date and time of collection
- Collector's sample identification number(s)
- Sample distribution
- References such as maps or photographs of the sampling site
- Field observation
- Any field measurements made such as pH, flammability, explosibility, etc.

Sampling situations vary widely. No general rule can be given as to the extent of information that must be entered in the log book. A good rule, however, is to record sufficient informa-

tion so that someone can reconstruct the sampling situation without relying on the collector's memory. The log book must be protected and kept in a safe place.

4.6.5.4 Chain of Custody Record

To establish the documentation necessary to trace sample possession from the time of collection, a chain of custody record must be filled out and accompany every sample. The record becomes especially important when the sample is to be introduced as evidence in a court litigation. An example of a chain of custody record is illustrated in Figure 4-4. The record must contain the following minimum information:

- Collector's sample number
- Signature of collector
- Date and time of collection
- Place and address of collection
- Waste type
- Signatures of persons involved in the chain of possession
- Inclusive dates of possession

4.6.5.5 Sample Analysis Request Sheet

The sample analysis request sheet (Figure 4-5) is intended to accompany the sample on delivery to the laboratory. The field portion of this form must be completed by the person collecting the sample and should include most of the pertinent information

noted in the log book. The laboratory portion of this form is intended to be completed by the laboratory personnel and to include:

- Name of person receiving the sample
- Laboratory sample number
- Date of sample receipt
- Analyses to be performed

4.6.5.6 Sample Delivery to the Laboratory

The sample should be delivered to the laboratory for analyses as soon as practicable, usually the same day as the sampling. The sample must be accompanied by the chain of custody record and by a sample analysis request sheet. The sample must be delivered to the person in the laboratory authorized to receive samples.

4.6.5.7 Shipping of Samples

When a sample is shipped to the laboratory, it must be packaged in a proper container to avoid leakage and/or breakage. Acceptable packing materials include sawdust, crumpled newspapers, vermiculite, polyurethane chips, etc. Other samples that require refrigeration must be packed with reusable plastic packs or cans of frozen freezing gels in molded polyurethene boxes with a sturdy fiberboard protective case. The boxes must be taped closed with masking type or fiber plastic tape. All packages must be accompanied by a sample analysis request sheet and chain of custody record. Complete address of the sender and the receiving laboratory must legibly appear on each package.

4.6.6 Sampling Parameters

Each sample will be analyzed for selected wastes stored whose presence in samples would indicate a breach of containment (Table 4-2).

4.6.7 Analytical Procedures

The test methods that will be used by the laboratory to perform analyses for the selected constituents are found in the SW-846. All analytical testing will be performed in a laboratory using appropriate EPA procedures with QA/QC in conformance with EPA requirements.

4.6.8 Contamination Criteria

Soil samples will be considered contaminated if the analyses for selected constituents show a significant increase over the background samples using statistical methods described in SW-846. A minimum of four background samples will have to be obtained to be statistically comparative. Background samples will be site selected based on similar topography and geology to the site under study. Each background sample will be a composite of four cores taken at least 10 feet apart.

4.7 Decontamination Verification

Decontamination of the site, if needed, will be demonstrated by additional sampling, testing and analysis. The removal of contaminated soil will leave an exposed surface, which will be sam-

pled in the same area. Analysis will be conducted only on the constituents that caused the area to be contaminated. The program will be repeated until contamination is no longer evident.

4.8 Closure Schedule

The closure plan for TA-54 Area G will be submitted to the NMEID on September 30, 1985. Upon written approval of the plan by NMEID, no additional regulated wastes will be admitted to the Area. Closure of Area G requires that pit 29 be filled with non-regulated waste and covered with the excavated material from the pit next to it. Pit 32 will be in service while the pit next to pit 29 is excavated, therefore, two pits must be filled before the compaction dirt is removed from pit 29, allowing final grading. The following list gives the time required for each closure step and the approximate date of completion.

ACTIVITY	TIME REQUIRED	APPROXIMATE DATE OF COMPLETION
Submit closure plan		September 30, 1985
Approve closure plan	3 months (under NMEID control)	January, 1986
Complete filling pit 29	6 months	March, 1986
Inspect soil and analytical Survey for contamination	2 months	May, 1986
Remove contaminated soil	2 months	July, 1986
Decontaminate equipment	15 days	August, 1986
Implement modification of shaft covers including design, contracting and construction	1 year	January, 1987

Excavate pit neighboring pit 29 and store excavated material on pit 29 compaction	3 months	December, 1986
Complete filling pit 32 with non-regulated wastes	1.5 years	September, 1987
Complete filling neighboring pit with non-regulated wastes and removal of stored crushed tuff from pit 29	1.5 years	March, 1989
Conduct Area G drainage engineering study	1 year	March, 1989
Final grade, prepare, topsoil, and revegetate	3 months	June, 1989
Construct Area G drainage controls	1 year	March, 1990
Irrigate and fertilize grass cover	2 growing seasons	October 1991

The year of closure is 1986 (starting year). Total closure time from approval of the closure plan is six years. Because of the nature of closure required, approval of a closure period greater than 180 days required under HWMR 206.C.2.d.(2) is requested per HWMR 206.C.2.d.(2)(b)(i).

4.9 Certification

An independent registered professional engineer and a representative of the DOE shall witness the closure and ensure that the closure follows this plan. Upon completion of closure, the engineer and the DOE shall prepare a letter certifying that Area G has been closed in accordance with the plan. The letter shall be dated and signed by each party, and stamped by the engineer. The

original copy shall be submitted by the DOE to the Director of the NMEID, with one copy maintained at the Division Office and one copy maintained by the HSE-8 Regulatory Compliance Section.

4.10 Post-Closure

Within 90 days after closure is completed, the EPA, NMEID, DOE, and the county of Los Alamos shall be furnished with a survey plat indicating the location and dimensions of all the closed pits and shafts. The plat shall be prepared and certified by a professional land surveyor. The plat filed with Los Alamos County shall include a note, prominently displayed, which states the owner's or operator's obligation to restrict disturbance of the site in accordance with 206.C.2.g(3). In addition, the EPA, NMEID, DOE, and County of Los Alamos shall be provided with the records of type, location, and quantities of wastes stored. Information for wastes buried before the promulgation of hazardous waste regulations shall be estimated based on available records. Also in accordance with State Law, a notation on the deed to the facility property (or on some other document that is normally examined during title search) that will, in perpetuity, notify any potential purchaser of the property that the land has been used to manage hazardous waste.

The property deed shall be noted or documented to comply with the requirements of HWMR 206.C.2.j.

The site shall be inspected semi-annually, checking:

- the cover system for integrity, settlement and erosion,
- the site drainage system for any blockages or evidence of poor function,
- the integrity of the fence, gate and locks, and
- the condition of the surveyed benchmarks.

Repairs shall be made to any of the items mentioned in the semi-annual checklist should the inspection reveal conditions requiring further attention for the proper function of the closure system. Monitoring consistent with ensuring containment of radioactive wastes, which represents the major portion of buried wastes, shall be maintained. Soil, sediment, surface water, and biota sampling shall be taken every three years. Samples shall be analyzed for constituents (Table 4-2), whose presence in samples would indicate a breach of containment.

Post-closure care activities shall be performed for 30 years as required by 206.C.2g(1) and will consist of at least:

(a) groundwater monitoring and reporting in accordance with the requirements of 206.C.1 and

(b) maintenance of monitoring and waste containment systems as specified in 206.C.(b), C.6.c. and f., C.8.g, and C.9.d. where applicable.

For the groundwater monitoring program samples will be obtained from six observation wells, three in Canada del Buey and three in Pajarito Canyon. Sampling and analysis will be performed starting on November 30, 1985, and be repeated quarterly for the first year. The sampling methodology and monitoring for the groundwater monitoring program are contained in the SW-846 revisions and will be used by LANL in its program. The applicable SW 846 section numbers can be found in Table 4-4. The samples will be analyzed for the parameters outlined in HWMR 206.C.1.c(2). For each of the indicator parameters in 206.C.1.c(2)(c) at least four replicate measurements will be obtained for each sample. The initial background arithmetic mean and variance must be determined by pooling the replicate measurements for the respective parameter concentrations or values in samples obtained from upgradient wells during the first year.

Records shall be kept of inspections, repairs, sampling, and analytical results for the duration of post-closure care activities. The name, address, and phone number of the person and/or office to contact about the facility during the post-closure care period is:

Harold Valencia
Area Manager,Los Alamos Area Office
U.S. Department of Energy
Los Alamos, New Mexico
Phone:(505)667-5105

5.0 General Considerations

5.1 Contact Person

Upon approval of this closure plan, the NMEID and LANL will coordinate in writing to the respective contact person(s) for organization of activities and communications between the parties under the plan. The parties will provide timely written notification of any changes in the designation of contact persons during the term of this plan. LANL will provide a minimum of ten days advance notice to the NMEID through the NMEID contact person(s), of any construction, sampling, or activities conducted.

5.2 Quality Assurance

Effectiveness of the programs contained in this plan is specifically dependent on the proper sampling, analytical methods, and techniques. LANL will use sampling, quality assurance, quality control, and chain of custody procedures that are consistent with the USEPA Regulations throughout all activities. All analytical testing will be performed in a laboratory using appropriate USEPA procedures with QA/QC in conformance with USEPA requirements.

LANL will submit the following information for NMEID approval before any soil sampling in the closure plan:

- The name and the Quality Assurance and Control procedures of the laboratory doing the analysis of the samples. This will include appropriate USEPA procedures for analytical methodology, sample preservation, and detection limits of constituents.

o Detailed chain of custody and sampling methods indicating a step-by-step procedure for taking samples.

5.3 Split Samples

Upon request by authorized representatives of the NMEID, LANL will provide split samples of any samples collected under to this plan. If any analysis is made of such samples, a copy of the results of the analysis shall be furnished promptly to LANL. This includes all relevant technical data generated by the NMEID representatives, their agents, or contractors. Samples taken at Area G may contain radioactivity. Any laboratory receiving radioactive samples must be properly equipped to handle these samples.

5.4 Facility Access

LANL will provide reasonable access to its facility upon request to authorized representatives of the NMEID for the purpose of monitoring, sampling, and observing activities carried out under this plan. NMEID representatives shall comply with established LANL safety and security practices.

5.5 Cooperation

LANL and the EID's representatives will cooperate to the fullest extent possible in the reporting and exchange of data developed under to this plan. Copies within LANL's possession of results of a sampling and analyses, and other relevant technical data generated by the parties or their agents or contractors under

this plan, including raw data, field notes, laboratory bench sheets and reports will be exchanged as soon as practicable. In the event LANL contracts with a laboratory to perform work hereunder and the State of New Mexico requests from the laboratory copies of raw data, field notes, or laboratory bench sheets generated for LANL, LANL shall indicate to the laboratory that it has no objection to such documents being provided to the State of New Mexico.

TABLE 3-1
MIXED, REGULATED OR APPENDIX VIII
CONSTITUENT WASTE DISPOSED OF AT AREA G

WASTE	VOLUME(M^3)*	VOLUME (GAL)*	PIT/SHAFT
ORGANICS			
Organic chemicals	0.03		S057
Carcinogens	.42		P27
Carcinogens lab waste clothing, bottles, filters	1.13		P28
Organics	.10		S124
TOTAL	1.68	444.6	
GASES			
Empty flourine gas cylinders	.113	29.9	P27
ACIDS			
MO & HCl liquids	.11		S055
Empty waste acid	.04		P29
TOTAL	0.15	40.0	
REACTIVES			
Lithium hydride disk	.02		S078
Pyrophoric powder	.003		S043
Sodium loop	.11		S039
Sodium loop	.08		S091
Sodium	.76		S096
Combustible waste	.07		P27
TOTAL	1.043	275.1	
PESTICIDES/HERBICIDES			
Empty pesticide barrels (herbicide)	.41		P19
Pesticide drums	.41		P25
Empty pesticide drums (herbicide & insecticide)	.28		P25
Empty herbicide cont. and obsolete herb. material	.14		P27
Empty herbicide cont.	.83		P27
Empty herbicide cont. (roundup)	.09		P27
Empty herbicide containers	.03		P27
Empty herbicide containers	.73		P27

TABLE 3-1 Continued
MIXED, REGULATED OR APPENDIX VIII
CONSTITUENT WASTE DISPOSED AT AREA G

WASTE	VOLUME(M^3)*	VOLUME (GAL)*	PIT/SHAFT
Empty herbicide containers	.73		P27
Empty herbicide containers	.79		P27
Empty herbicide containers	.73		P27
Pesticides	.04		P33
Empty pesticide containers	1.13		P29
Herbicides	.10		P33
Herbicides	.10		P33
Herbicide container	1.10		P33
Herbicide container	.90		P33
Empty packets of pesticide	.28		P26
Empty sacks and drums of herbicide	1.35		P26
Empty herbicide containers	.22		P29
Empty herbicide containers	.84		P29
Empty herbicide containers	1.10		P33
Empty herbicide containers	.10		P33
Empty pesticide containers	.19		P33
Empty herbicide containers	.20		P26
Empty herbicide containers	.30		P26
Empty herbicide containers	.50		P26
Plastic herbicide containers	.14		P26
Empty herbicide and pesticide containers	.28		S35
Empty herbicide containers	.03		P27
TOTAL	14.07	3717.3	
SOLVENTS			
Xylene counter sol'n bottles with vermiculite	.20		P07
Xylene, toluene with scintillation	.20		P07
PCS scintillation fluid toluene aquasol glass vials	.62		P07
Xylene counting sol'n	.62		P07
Acetone	1.04		P05
Contaminated Solvent	.03		P19
Scintillation counting sol'n	.20		P20
Toluene	3.03		P20
Solvent	.45		P24
Toluene and xylene	.62		P20
Solvent	.001		S107
Counting sol'n	.03		S050

TABLE 3-1 Continued
MIXED, REGULATED OR APPENDIX VIII
CONSTITUENT WASTE DISPOSED AT AREA G

WASTE	VOLUME(M^3)*	VOLUME (GAL)*	PIT/SHAFT
Solvent & solid material also containing As&Hg	.01		S072
Scintillation counting solution	.20		P20
Counting vials	.41		P24
Counting vials	.41		P20
Counting vials	.41		S150
Counting vials	.41		S150
Liquid scintillating cocktail	.20		P20
Counting vials and solution	.51		P20
Xylene & toluene solvent scintillation	.20		P20
Counting vials and solution	.20		P20
Vials with counting solution	.20		P13
Vials with counting solution	.62		P20
Counting solution toluene	.20		P20
Counting vials	1.04		P22
Counting vials sol'n	.20		P22
Counting vials sol'n	.83		P22
Counting vials sol'n	.20		P22
Counting vials sol'n	.96		P22
Counting vials sol'n	.20		P22
Counting vials sol'n	.20		P22
Counting vials sol'n	.83		P18
Counting vials sol'n	2.29		P18
Scintillation counting vials	1.24		P18
Scintillation counting vials	.16		P18
Scintillation vials	1.04		P18
Scintillation vials	1.04		P18
Scintillation vials	1.66		P18
Counting Sol'n	.20		P18
Counting sol'n	.45		P18
Counting sol'n	.41		P10
Counting sol'n	.75		P25
Counting sol'n	2.70		P25
Counting sol'n	.62		P25
Scintillation fluids	1.24		P25
Counting fluids	.11		P25
Counting fluids	2.29		P10
Scintillation vials	1.66		P25
Counting vials	.45		S115
Scintillation	2.29		S115
Scintillation vials	1.87		S115

TABLE 3-1 Continued
MIXED, REGULATED OR APPENDIX VIII
CONSTITUENT WASTE DISPOSED AT AREA G

WASTE	VOLUME(M^3)*	VOLUME (GAL)*	PIT/SHAFT
Scintillation vials	1.66		S104
Vials	.20		S103
Vials Xylene	.34		S114
Vials Xylene	.34		S103
Vials Xylene	.34		S115
Vials Xylene	.45		S097
TOTAL	41.28	1096.2	
METALS			
5 empty mercury flasks	.14		P21
Beryllium pieces	.02		S079
Beryllium	1.24		P24
Beryllium scrap	.06		S068
Beryllium scrap	.14		S062
Be trash	.22		S040
Be & BeO, broken chips	.06		S032
BeO_2	.11		S032
Be_7 & Hg	.08		S029
Be chips	.03		S045
H_2 F_2 contam. mercury in mercury container	.003		S041
Steel pipe, Be waste	2.29		P06
BeO, chips & dust	.11		S058
Beryllium	22.08		P21
Be glass shapes	.11		S058
Be glass shapes	.11		S061
Beryllium	.22		S061
Beryllium solids	1.35		P21
Be metal shapes	.03		S061
Be shapes	.04		S061
Be metal, Be oxide	.03		S054
Be thin window target foil	.01		S067
Contaminated Be blocks	1.19		P13
Chunk Be	.03		S094
Be waste	.33		P18
Contaminated waste cans Be inside	.22		P18
Be contaminated trash	.84		P19
Be contaminated	.56		P19
Be contaminated	.84		P19
Be contaminated	.28		P10
Be stainless reactor control rods	.18		P25

TABLE 3-1 Continued
MIXED, REGULATED OR APPENDIX VIII
CONSTITUENT WASTE DISPOSED AT AREA G

WASTE	VOLUME(M^3)*	VOLUME (GAL)*	PIT/SHAFT
Be stainless reactor control rods	.24		P25
Hg vapor	.22		P13
Hg filled ignitrons	.08		P13
Hg contaminated felt	.03		P19
Be waste chips	.45		P18
Mercury contaminated barometer	.07		S097
Mercury filled tubes	.06		S094
Contaminated mercury	.02		S093
Hg contaminated pipes	.11		P18
Hg in electronic tubes	.01		S093
Pressure guage containing mercury	.03		S083
Barium nitrate	6.79		P28
Barium nitrate	6.79		P28
Barium nitrate	4.41		P28
Asbestos, beryllium waste	.42		P27
Barium nitrate	6.79		P28
Be waste	.62		P28
Be waste	.42		P28
Be waste	.56		P27
Be waste	.33		P27
Be waste	.45		P25
Be waste	.28		P27
Lead slags	.76		P27
Be contaminated materials	1.45		P27
Mixed fission products, Hq contaminted	.11		P27
Lead batteries	.10		P28
Be wastes (dust)	.39		P33
Be wastes	.90		P33
Be container pump & bottle	.20		P33
Be contaminated waste	.40		P33
Lead scrap	.80		P33
Lead scrap	.30		P33
Arsine waste	.10		P33
Bags with Be contam.	.20		P33
Be & thallium waste	.01		S35
Be waste	6.20		S120
Boxes with Be contam.	.30		P33
Be chips rag wipes	.06		S122
Barium nitrate	.90		P33
Storage batteries and frames	.20		P33

TABLE 3-1 Continued
MIXED, REGULATED OR APPENDIX VIII
CONSTITUENT WASTE DISPOSED OF AT AREA G

WASTE	VOLUME(M^3)*	VOLUME (GAL)*	PIT/SHAFT
Cooling tower debris	8.00		P29
Be & CO contam. waste	1.13		P26
Be chips, rags	.06		S122
Be contam. waste	.06		P29
Be chips and waste	.08		P29
TOTAL	112.82	29807.0	

*Volumes noted are the volumes of the waste container and include voids, packing materials, and adsorbents.

TABLE 4-1
TA 54 AREA G
DISPOSAL PIT USE DATES

PIT#	BEGIN DATE	END DATE
1	1957	4/19/61
2	4/20/61	7/31
3	6/63	4/21/66
4	4/66	11/67
5	12/66	3/67
6	10/69	9/72
7	3/74	10/75
8	10/71	3/74
9 (retriev.)	11/74	11/79
10	5/79	3/80
12	10/71	11/75
13	11/76	9/77
16	10/71	7/75
17	8/78	3/74
18	2/78	8/79
19	11/75	8/79
20	11/75	4/77
21	8/72	12/74
22	9/76	3/78
24	8/75	11/76
25	12/79	5/81
26	2/84	2/85
27	5/81	7/82
28	12/81	4/83
33	11/82	7/84

Pit 29 is currently in use.
Pit 32 has been excavated.

TABLE 4-2
SOIL SAMPLE ANALYSIS
CONSTITUENTS

EPA Hazardous Waste Number	Metals	EP Toxic Regulated Concentrations	EPA* Analytical Method
D004	Arsenic	5.0 mg/l	6010
D005	Barium	100.00	6010
D006	Cadmium	1.0	6010
D007	Chromium	5.0	6010
D008	Lead	5.0	6010
D009	Mercury	0.2	7470 or 7471
D010	Selenium	1.0	6010
D011	Silver	5.0	6010
-	Nickel	-	6010
-	Beryllium	-	6010

<u>Organics</u>

GC/MS for volatiles	8240
GC/MS for semivolatiles	8250

<u>Other</u>

Cyanide	9010
Nitrate	9200

*Analytical methods may include any applicable methods found in USEPA SW 846

TABLE 4-3
CHECKLIST OF ITEMS REQUIRED FOR FIELD SAMPLING

Quantity	Item	Use	Supplier
1	Field log book	To keep sample records	Office supply stores
1	Disposable towels or rags	To clean sampling equipment	Terry towels or equivalent. Available at chemical supply houses
6	Large poly-ethylene bags	To store waste papers, rags, etc.	Plastic supply houses
12	Polyethylene bags	To store sample containers	Plastic supply houses
4	Waterproof pens	To complete records and labels	Stationery stores
1	Apron, oil and acid proof	Protective garment	McMaster-Carr Co. P.O. Box 4355 Chicago, Ill.
1	Face mask	Protective garment	MSA 400 Penn Center Blvd. Pittsburg, Pa. 15235
1	Liquinox or Alconox Detergent	Used to clean sampler	

TABLE 4-4
SAMPLING METHODOLOGY AND MONITORING

	Second Edition Section Number
Sampling methodology	1.4
Groundwater Sampling	1.4.6
Monitoring	3.0
Groundwater	3.1

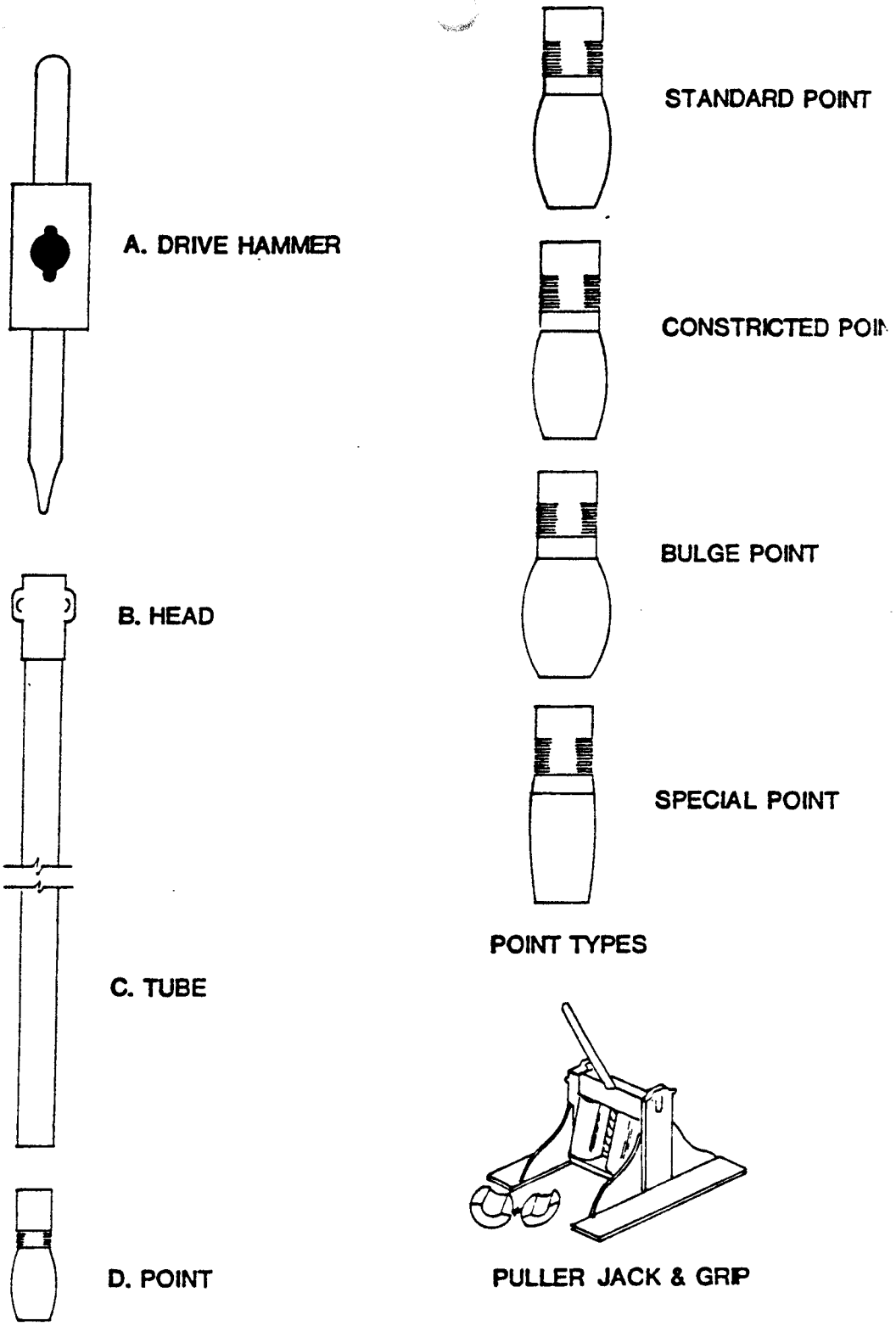

FIGURE 4-1

VEIHMEYER SOIL SAMPLER

FIGURE 4-2
EXAMPLES OF SAMPLE LABELS

OFFICIAL SAMPLE LABEL

Collector_____ Collector's Sample No._____

Place of Collection_____

_____

Date Sampled_____ Time Sampled_____

Field Information_____

_____

_____

ALTERNATE SAMPLE LABEL

DATE_____ TIME_____ SAMPLE NO._____ ORIGIN_____

LOCATION SAMPLED

_____

DESCRIPTION

_____

REMARKS

_____

REQUESTED ANALYSIS

_____

SAMPLED BY: (PRINT AND SIGN) LOG REFERENCE

TAG NO.____OF____

_____

FIGURE 4-3
EXAMPLE OF SAMPLE SEAL

OFFICIAL SAMPLE SEAL

Collected by_____ Collector's Sample No._____
(Signature)

Date Collected_____ Time Collected_____

Place Collected_____

_____

_____

FIGURE 4-4
CHAIN OF CUSTODY RECORD
Hazardous Materials
Collectors Sample No.____

Location of Sampling: __Producer __Hauler __Disposal Site

__Other:_____

Company's Name_____Telephone (___)_____

Address_____
number street city state zip

Collector's Name_____Telephone (___)_____
signature

Date Sampled_____ Time Sampled_____hours

Type of Process Producing Waste_____

Waste Type Code_____ Other_____

Field Information_____

_____

_____

Sample Allocation:

1. _____
name of organization

2. _____
name of organization

3. _____
name of orgainzation

Chain of Possession

1. _____ _____ _____ _____
signature title inclusive dates

2. _____ _____ _____ _____
signature title inclusive dates

3. _____ _____ _____ _____
signature title inclusive dates

FIGURE 4-5
HAZARDOUS MATERIALS SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector_____ Date Sampled_____ Time_____hours

Location of Sampling_____
name of company, disposal site, etc.

Address_____
number street city state zip

Telephone (___)_____ Company Contact_____

HML NO. (Lab only)	COLLECTOR'S SAMPLE NO.	TYPE OF SAMPLE*	FIELD INFORMATION

Analysis Requested_____

_____

_____

Special Handling and/or Storage_____

_____

PART II: LABORATORY SECTION

Received by_____Title_____Date_____

Sample Allocation: __HML __LBL __LABL __SRL Date_____

Analysis Required_____

_____

_____

*Indicate whether sample is sludge, soil, etc.; **Use back of page for additional information.

APPENDIX A

AREA G CURRENT EXISTING SURVEY

APPENDIX B

AREA G ORIGINAL SURVEY