U-005-202.58

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REMOVAL SITE EVALUATION MAINTENANCE WAREHOUSE-BUILDING 12 MARCH 1993

DOE-FN/FERMCO

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RESEARCH

REMOVAL SITE EVALUATION

MAINTENANCE WAREHOUSE - BUILDING 12

Fernald Environmental Management Project

U.S. Department of Energy

March, 1993

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REMOVAL SITE EVALUATION

MAINTENANCE WAREHOUSE - BUILDING 12 CONSTRUCTION

1.0 INTRODUCTION

This project consists of the construction of a new Maintenance Warehouse needed to support CERCLA and waste management activities at this National Priorities List (NPL) site. The new building will be located north of the existing Maintenance Building (Building 12) (see Figure 1). The construction of this building will require excavation of soil for building foundations and miscellaneous underground utilities. The excavation will generate excess soil and gravel. Some of the soil and gravel excavated will be used as backfill around the new maintenance warehouse; the remainder will be stockpiled on-site.

Construction of the new warehouse will require excavation of approximately 1240 cubic yards of soil of which 620 will be used as backfill around the new building. Excess soil will be placed northeast of the Boiler Plant in existing controlled stockpiles established under Phase I of Removal Action 17 "Improved Storage of Soil and Debris". Of the two stockpiles located in this area, one pile stores soil containing less than 100 pCi/g uranium; the second pile stores soil containing soil with greater than 100 pCi/g uranium.

This Removal Site Evaluation (RSE) has been completed by the Department of Energy (DOE) under authorities delegated by Executive Order 12580 under Section 104 of CERCLA and is consistent with Section 300.410 of the National Oil and Hazardous Substance Pollution Control Contingency Plan (NCP). This RSE addresses the existing conditions at the new Maintenance Warehouse site and the activities proposed to construct this facility. The RSE has been completed to support the decision as to whether the current conditions warrant a removal action. Controls implemented to support this construction activity are also presented in this RSE to demonstrate that the proposed construction will not cause deterioration of the existing site conditions.

2.0 SOURCE TERM

Consistent with 40 CFR 300.410(a), the RSE includes a removal preliminary assessment which is based upon readily available information as described in 40 CFR 300.410(c).

A RCRA Determination/Radiological Characterization was completed in 1990 (see

reference 1 below) to characterize the soil to be excavated for this project. A re-evaluation of this characterization was completed on November 24, 1992, (see reference 2 below) to assure conformance to current standards.

Reference:

1) WEMCO:R(SW):90-044, S. G. Schneider to J. E. Wiley, "RCRA Determination/Radiological Characterization for Maintenance Warehouse-Building 12", dated March 1, 1990.

2) WEMCO:EM:RCRA(FME):92-176, J. P. Erfman to R. W. Helmes, "Re-evaluation of the RCRA Determination for the Maintenance Warehouse - Building 12 Project", dated November 24, 1992.

Process knowledge was supplemented by sampling and analyses to complete both RCRA Determination letters. Soil samples were collected in the proposed construction area and analyzed for EP Toxicity metals and radiological parameters. A summary of the analytical results is included in the attachment.

The radiological characterization of reference 2 has determined most of the soil to contain less than 100 pCi/g uranium. (Thorium and radium contamination were negligible). However, higher levels of uranium contamination were identified at sample point 5. Figure 2 in the attachment shows a proposed distribution of soil contamination based on analytical results. The terms "low level waste" and "category II waste" as shown on Figure 2 are based on past site procedures and no longer apply to the disposal of soil at the FEMP. All excess soil from this project will be placed into the existing controlled stockpiles northeast of the Boiler Plant and managed in accordance with Removal Action 17.

As indicated in references 1 & 2, metals were <u>not</u> detected in quantities exceeding RCRA regulatory limits for EP Toxicity analysis. These limits were established based on the toxicity of the regulated material in order to protect human health and the environment. Since the concentrations of these regulated constituents do not exceed these protective limits, the threat created by a release from this material is very small. The threat is even further reduced when the site control procedures discussed below are implemented. At this point, the threat of a toxic metals release becomes negligible.

Historical records and process knowledge of the work area did not reveal any known use of hazardous chemicals within the project area as indicated in references 1 & 2. The analytical data discussed previously supports this position. Uranium is the only noteworthy contaminant at this project site.

3.0 EVALUATION OF THE MAGNITUDE OF THE POTENTIAL THREAT

Uranium contamination in soil at the proposed building site creates a threat of release through suspension of the soil particles in the air or migration of the contaminants through wind and water erosion. Removal Action 17 was created to mitigate the threat of release from uranium contaminated soils at the FEMP. Some of the controls implemented as part of Removal Action 17 are described in below in greater detail.

- Excess soil from this project will be stockpiled according to Removal Action 17 criteria. Soil indicated as low level waste on Figure 2 will be segregated from the remaining soil and placed in the controlled stockpile for soil containing greater than 100 pCi/g uranium. Segregation will be confirmed by radiological monitoring. Excess soil containing greater-than-background levels of contamination as indicated on a hand-held beta/gamma frisker will be placed in the stockpile for soil containing greater than 100 pCi/g uranium as specified in Removal Action 17.

- Phase I of Removal Action 17 requires placement on and covering of contaminated soils with a heavy, nonpermeable tarpaulin. The tarpaulins not only prevent the spread of contamination through wind erosion and provide runon and runoff controls.

Additional controls to be set in place as part of this construction activity to protect human health and the environment include the following:

- Physical barriers will be in position around the work area to prevent unauthorized access.

- Protective clothing and respiratory protection will be provided for workers, as required.

- Plastic tarpaulins and bags and appropriate containers will be readily available to contain radiologically-contaminated materials, as required.

- Runoff controls will be established, as required.

Based on the information discussed above and given the FEMP procedures and protocols detailing radiological monitoring, worker personal protective equipment, and controls to limit dust generation and contamination migration, the potential health impacts to either the workers, the public, or the environment are insignificant.

4.0 ASSESSMENT OF THE NEED FOR REMOVAL ACTION

Consistent with 40 CFR 300.410 of the NCP, the DOE shall determine the appropriateness of a removal action. Eight factors to be considered in this determination are listed in 40 CFR 300.415(b)(2). Based on the data presented above, the following of the eight criteria listed in the NCP applies to this project.

- 40 CFR 300.415(b)(2)(v)
  Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released

As discussed previously, the potential of a release or migration of uranium from the project site is negligible. The low levels of contamination at this site also support the conclusion that any threat resulting from uranium contamination at this site is negligible. Thus, while the above criterion can be applied to the new Maintenance Warehouse project, it does not constitute the need for a removal action.

5.0 APPROPRIATENESS OF A RESPONSE

Based on the evaluation of all the above factors, it has been determined that a removal action will not be necessary and this project should be continued as a best management practice in support of the CERCLA remediation is process and waste management. Furthermore, the controls planned in conjunction with this construction activity and management procedures established in accordance with Removal Action 17 are adequate to mitigate any hazards created by contamination at this site and to prevent deterioration of existing site conditions.

ATTACHMENT 1

FEED MATERIALS PRODUCTION CENTER
CONSTRUCTION WASTE IDENTIFICATION/DISPOSITION FORM

PART I - PROJECT DESCRIPTION

Date ___/___/___

Project Title EHSI IMPROVEMENTS / WMCO WMCO Project No. 1.1.3.2.09

Project Description Maintenance Warehouse Bldg 12

Project Location (include location drawing if possible) _____

Project Engineer _____ Phone _____ Cons'tion Dates: Start ___/___/___ End ___/___/___

PART II - CONSTRUCTION WASTE DETAILS

Date ___/___/___

WASTE TYPE	UNCONTAMINATED WASTE VOLUME Cu. Ft.	UNCONTAMINATED WASTE WEIGHT Pounds	UNCONTAMINATED WASTE DISPOSITION LOCATION *	CONTAMINATED WASTE VOLUME Cu. Ft.	CONTAMINATED WASTE WEIGHT Pounds	CONTAMINATED WASTE DISPOSITION LOCATION *
Soil				11,192	1,119,200	Bldg 12
Rubble (concrete, block, etc.)						
Metal CLEAN t > 1/4						
REFUSE						
Process Equipment						
~~Mixed Solid/Liquid~~						
Asbestos						
~~Liquid~~						
~~PCBs~~						
~~Hazardous/Radioactive Mixed~~						
~~Toxic/Radioactive Mixed~~						
Wood						
~~Other (specify)~~						

* Also complete PART III - FUTURE USE MATERIAL OWNERSHIP and DISPOSITION.

Form FMPC 1 2/16 (12/84)

CONTINGENCY FACTOR 15%

2QFY91
ESCALATION FACTOR 1.108

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ATTACHMENT 2

Soil Sampling Completed 5/1/89

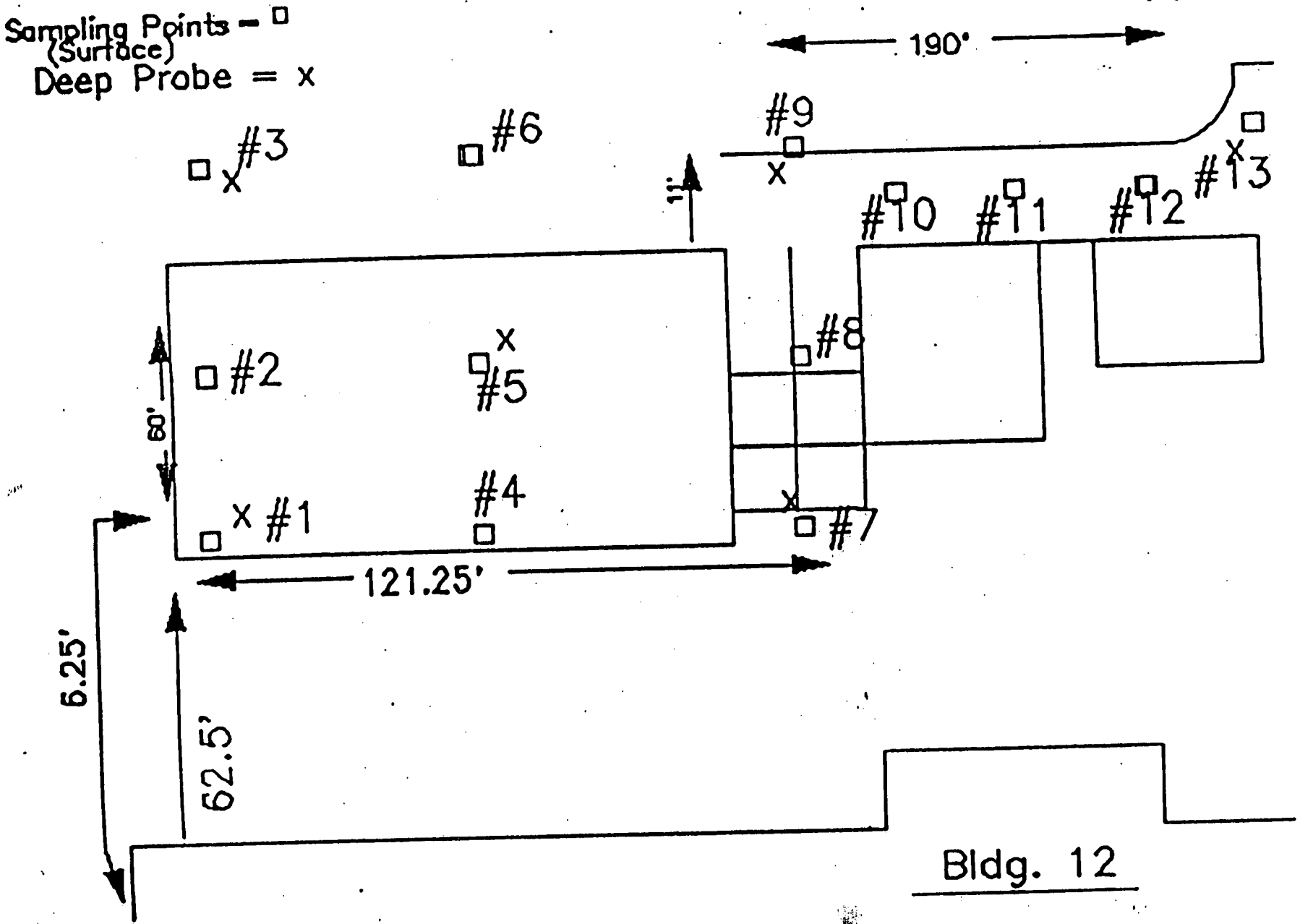


FIGURE 1. Sampling Locations

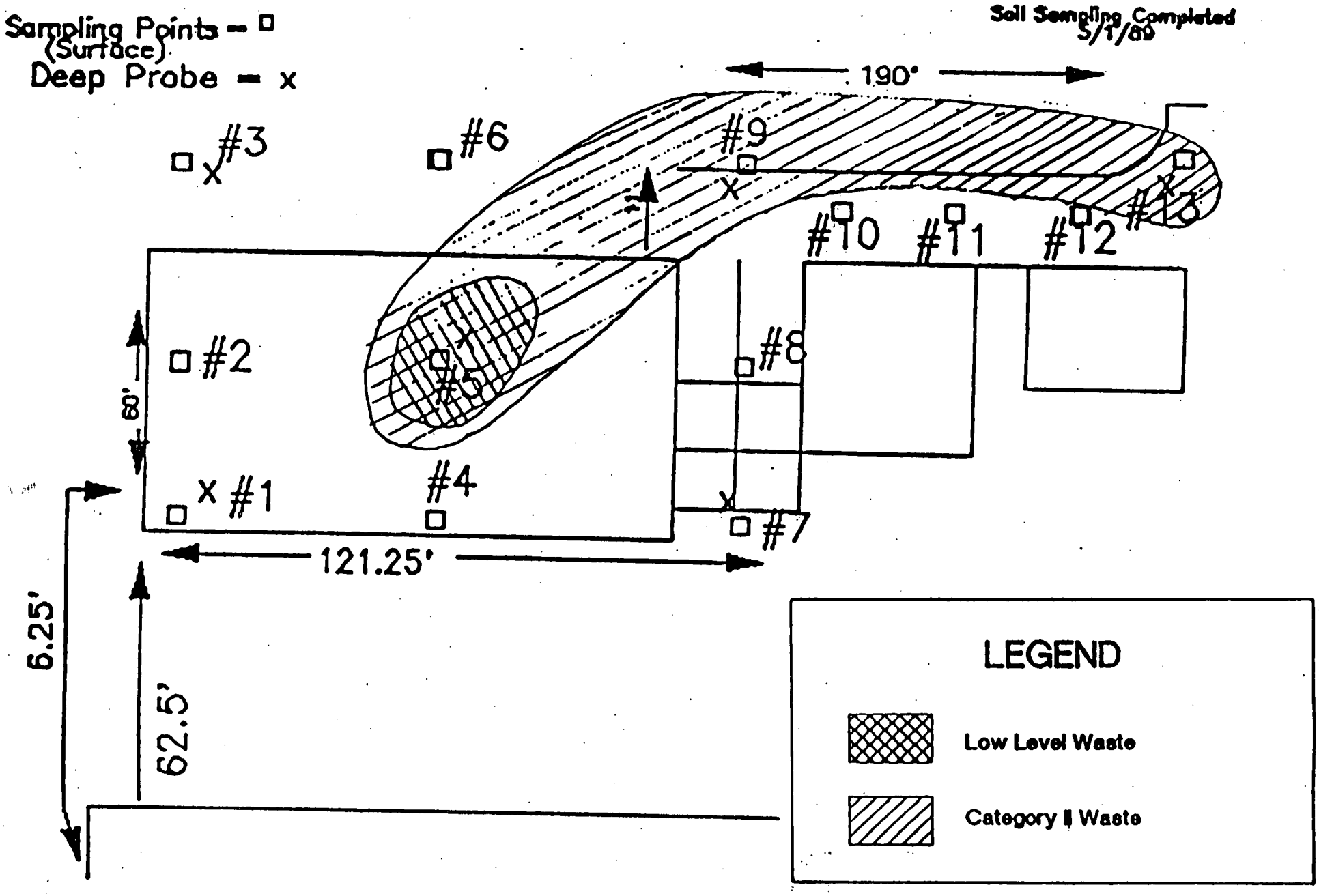
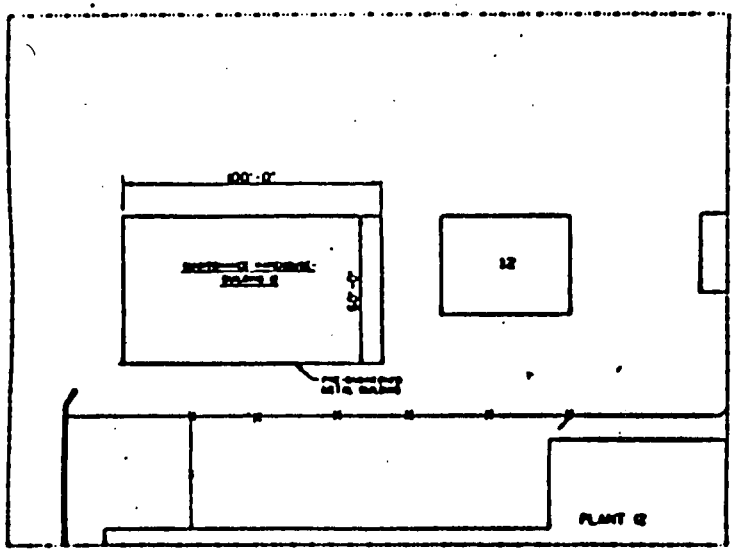
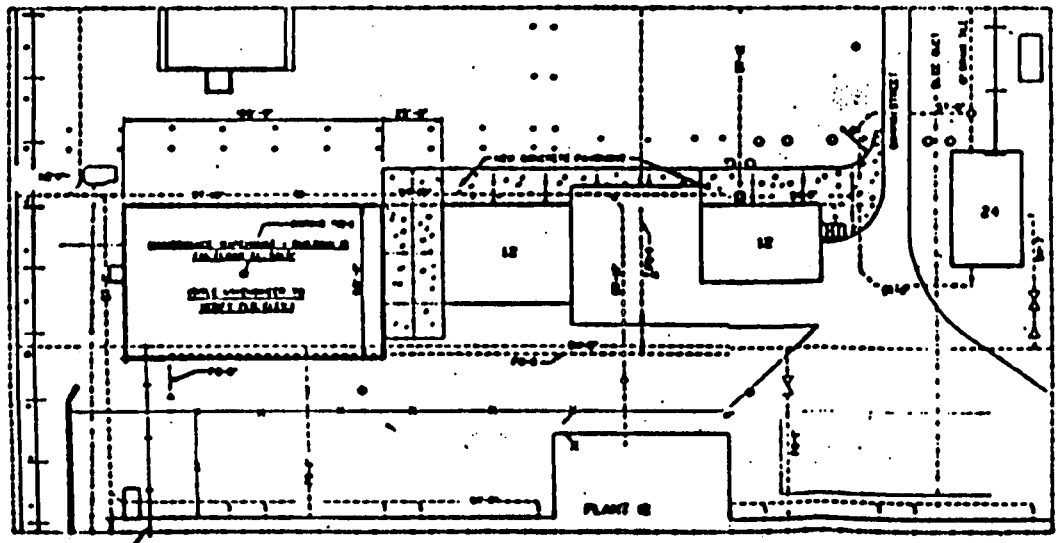


FIGURE 2. Possible Distributions of Waste Categories



ROOF PLAN



SITE PLAN

UNITED STATES
DEPARTMENT OF ENERGY

A. M. KINNEY, INC.

ENVIRONMENTAL, HEALTH & SAFETY IMPROVEMENTS

MAINTENANCE WAREHOUSE - BUILDING 12
PLANS

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ATTACHMENT 3

From: J. P. Erfman (6085) WEMCO:EM:RCRA(FME):92-176

Date: November 24, 1992

Subject: RE-EVALUATION OF THE RCRA DETERMINATION FOR THE MAINTENANCE WAREHOUSE BUILDING 12 PROJECT

To : R.W. Helmes

Ref:
1. WEMCO Site Standard Operating Procedure, SSOP-0044, "Management of Soil, Debris and Waste From a Project," issued June 19, 1992
2. WEMCO Safety Procedure SP-P-35-010, "Unrestricted Release of Materials from FEMP," issued March 13, 1990
3. Environmental Compliance Spill/Release Incident Tracking Report, dated September 1, 1992
4. Upset Condition Documentation, issued September 18, 1990
5. Site-Wide Characterization Report, issued August 1992
6. WMCO:R(SW):90-044, S.G Schneider to J.E. Wiley, "RCRA Determination/ Radiological Characterization For Maintenance Warehouse - Building 12," dated March 1, 1990
7. WMCO:SR(WR):89-089, "Historical Survey of Proposed Construction Sites for The EHSI Project," dated February 15, 1989
8. WMCO:EC&QA:91-323, E.D. Savage to G.W. Westerbeck, "Methodology For Estimating TC Herbicides In Soils at The FEMP," dated July 19, 1991

This memo transmits a re-evaluation of the RCRA determination for the Maintenance Warehouse - Building 12 Project. The waste to be generated by this project is approximately 180 Yd^3 of soil.

PROCESS KNOWLEDGE

This project is located in the controlled area of the FEMP, north of the Main Maintenance Building 12 and south of the Coal Pile Runoff Basin.

Process knowledge of the area includes a historical survey conducted by Solid Waste Engineering. The survey indicates that the area is clear of any potential problems per Reference 7.

In 1990 seven surface soil samples were collected from the proposed construction area in support of the previous RCRA determination/ Radiological characterization (Reference 6) and analyzed for EP Toxicity and full radiological contaminants. The results of this sampling campaign did not demonstrate the presence of any EP Tox constituent in excess of the regulatory levels.

The construction site for this project borders on an area that has been treated with herbicides; Weedar 64 and Weedone 170. Calculations performed on the amount of product applied, amount of active ingredient in the product, and area of product application indicate that TCLP results would be well below regulatory levels per Reference Number 8. These estimates are confirmed by TCLP results for soils in areas of known application over a period of years.

SAMPLING AND ANALYSIS

Based on the low levels of EP Tox contaminants present in the soil tested in 1990 and the fact that this area was never used in the processing or storage of uranium, there is no reason to suspect any exhumed soil or any other form of demolition rubble from the area would exhibit any characteristic which would classify it as hazardous waste and further sampling for TCLP is not required.

The results of the radiological sampling performed in 1990 indicate that the soil falls under the Category 1 level per Reference Number 1.

RCRA DETERMINATION

The soil generated by this project has been determined to be RCRA non-hazardous (a.k.a non-RCRA) by previous sampling and process knowledge of the area.

No materials have been identified that would cause the waste to meet any of the hazardous waste listings under OAC 3745-51 (in lieu of 40 CFR 261, Subpart D) or exhibit any of the hazardous waste characteristics under OAC 3745-21 to 24, (in lieu of 40 CFR 261.21 to 24) or the revised Toxicity Characteristic under 40 CFR 261.24.

SUMMARY

The soil generated by this project has been determined to be RCRA non-hazardous (a.k.a non-RCRA) by previous sampling and process knowledge of the area.

Radiological sampling performed in 1990 indicated that the soil falls under the Category 1 level per Reference Number 1.

It is FME's intention to provide radiological characterizations and RCRA determinations of construction waste prior to its generation. FME believes that these determinations properly represent the waste or waste streams discussed herein. The determinations apply only to soil waste listed on the Construction Waste Identification/Disposition (CWID) Form dated November 19, 1992. Any additional waste must be evaluated independently and requires the issuance of a separate determination letter.

If there are any questions, please call me at extension 6085 or C. S. Waugh at extension 6777.

Jerome P. Erfman

J. P. Erfman
Facilities and Materials Evaluation
RCRA Programs

JPE:bbs

c: J. E. Clements
M. L. Frost
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S. G. Schneider
R. A. Thiel
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T. J. Walsh
C. S. Waugh
K. N. Wintz

Central Files
FME Files
RCRA Operating Record

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From: S. G. Schneider WMCO:R(SW):90-044

Date: March 1, 1990

Subject: RCRA DETERMINATION/RADIOLOGICAL CHARACTERIZATION FOR MAINTENANCE WAREHOUSE - BUILDING 12

To : J. E. Wiley

Reference: 1. WMCO:SR(WR):89-089, "Historical Survey of Proposed Construction Sites for the EHSI Project," dated February 15, 1989

2. Feed Materials Production Center Site Procedure, FMPC 720, "Control of Construction Wastes," issued November 10, 1988

This memo transmits the radiological characterization and RCRA determination for soil to be excavated in the construction of the Maintenance Warehouse north of Building 12. It is anticipated, according to the Construction Waste identification/Disposal form (CWID), that 11,192 cubic feet (1,119,200 pounds) of soil will be excavated.

RADIOLOGICAL CHARACTERIZATION

Process knowledge of the project area includes a historical survey conducted by Solid Waste Engineering. The survey indicates that the area was not felt to have any potential problems (Reference 1).

Soil samples were collected from the area of the project site as shown in Figure 1. Analyses were conducted on discrete surface samples from seven of these locations for total uranium, uranium isotopic weight percent, total thorium, thorium 228, radium 226 activity, and plutonium activity. In addition, a subsurface (one foot depth) composite sample from six locations was analyzed for total uranium and thorium. Results of these analyses are presented in Table 1 and discussed below.

Results of the uranium analyses indicate that the soil contains uranium ranging from slightly depleted to slightly enriched (0.51 to 0.79 percent U235). The uranium activity (calculated) ranges from 12 pCi/gm to 120 pCi/gm and varies with the sample location. Of the seven surface samples, four were within the Category 1 range (#s 1s, 3s, 7s, 11s), two were within the Category 2 range (#s 9s, 13s), and one exceeded the maximum for Category 2 (# 5s; categories are from FMPC-720, Reference 2). The analytical results for the composite subsurface sample are within the range of Category 1 giving indication that the contamination may be limited to the surface soils.

The results of thorium analyses indicate that all of the samples were within the range for Category 1 material.

Radium analyses indicate a range of activities from 0.096 to 1.27 pCi/g. Plutonium activities range from 0.16 to 1.0 d/m/g. SWC is currently researching plutonium and radium standards as they apply to this project. Nonetheless, FMPC 720 Rubble categories are based on activities of Thorium and Uranium only.

In summary, the results indicate that the radiological contamination limiting the management of the excavated soil is based on the uranium activity in the area. The Thorium concentrations do not limit the disposal alternatives, as they are well within Category I ranges. The area around sample 5s that exceeds the maximum for Category 2 must be packaged for disposal as low-level waste. The areas around samples 9s and 11s that are within the Category 2 range may be used as backfill in the controlled area or stockpiled in the controlled area. The remaining areas that are within the Category 1 range may be used as backfill in the uncontrolled area of the FMPC or stockpiled in the K-65 storage area.

Figure 2 shows a possible interpretation of the distribution of the various waste categories. Actual boundaries must be determined using field instruments during excavation.

RCRA Determination

Process knowledge of the project area includes the following:

(1) The project area does not show any apparent contamination.

(2) The project engineer had no history of chemical contamination or spills.

Soil samples were collected from the project area in the locations shown in Figure 1. Extraction Procedure (EP) toxicty analyses were run for RCRA metals on seven of these samples as shown in Table 1. The analytical results show that none of the samples exhibited the characteristic of EP-toxicity.

In summary, process knowledge and sampling results indicate that the soil from the area does not appear to be a RCRA hazardous waste.

Conclusion

The soil excavated in the construction of the Maintenance Warehouse-Building 12 project must be managed in accordance with the Uranium activity as discussed above. The soils in the area of sample number 5 appear to be low level wastes. The soils near sample numbers 9 and 13 appear to be Category 2 wastes. All other soils are Category 1 wastes. Field instrumentation should be used to establish the boundaries of these categories. Subsurface soils appear to be Category 1 material. The soil does not appear to be hazardous waste under RCRA.

If during the excavation, unanticipated radiological activity or reason to suspect potential RCRA contamination is encountered, Solid Waste Compliance should be contacted.

Sue Schneider, Manager
Solid Waste Compliance

c: S. L. Bradley
J. E. Clements
I. W. Diggs
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J. H. Fath
M. J. Galper
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S. C. Hoskins
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L. A. Sexton
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P. C. Weddle
W. A. Weinreich

Central Files
SWC File

TABLE 1
MAINTENANCE WAREHOUSE BUILDING 12
ANALYSIS RESULTS

SAMPLE NUMBER	URANIUM TOTAL (ppm)	CALCULATED URANIUM ACTIVITY (pCi/g)	URANIUM WEIGHT PERCENT		THORIUM TOTAL (ppm)	CALCULATED THORIUM ACTIVITY (pCi/g)	THORIUM 228 (pCi/g)	RADIUM 226 (pCi/g)	PLUTONIUM (d/m/g)	RCRA METALS EP-TOXICITY RESULTS*
1s	17	12	U-234	0.005	<23	<5.6	<3.2	1.27	<1.0	ALL METALS BELOW REGULATORY LIMITS
			U-235	0.79						
			U-236	0.022						
			U-238	99.18						
3s	33	22	U-234	0.004	<23	<5.6	<3.2	<0.38	<1.0	ALL METALS BELOW REGULATORY LIMITS
			U-235	0.7						
			U-236	0.016						
			U-238	99.28						
5s	179	120	U-234	0.005	<23	<3.1	0.57	0.26	1.0	ALL METALS BELOW REGULATORY LIMITS
			U-235	0.75						
			U-236	0.014						
			U-238	99.23						
7s	44	30	U-234	0.005	<23	<2.5	<0.06	0.096	0.51	ALL METALS BELOW REGULATORY LIMITS
			U-235	0.73						
			U-236	0.012						
			U-238	99.26						
9s	103	70	U-234	0.005	<23	<2.7	0.19	0.55	0.29	ALL METALS BELOW REGULATORY LIMITS
			U-235	0.72						
			U-236	0.013						
			U-238	99.26						
11s	27	16	U-234	0.004	<23	<3.3	0.83	0.86	0.16	ALL METALS BELOW REGULATORY LIMITS
			U-235	0.51						
			U-236	0.008						
			U-238	99.47						
13s	85	54	U-234	0.004	<23	<2.7	0.18	0.26	0.38	ALL METALS BELOW REGULATORY LIMITS
			U-235	0.6						
			U-236	0.01						
			U-238	99.39						
14 (Composite of 1ft samples from 1,3,5,7,9,13)	38	25	U-234	--	<23	<5.6	--	--	--	--
			U-235	--						
			U-236	--						
			U-238	--						

* Extraction Procedure Toxicity analysis for arsenic, barium, cadmium, chromium, lead, mercury, silver, and selenium.