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PROJECT SPECIFIC PLAN FOR THE GREAT MIAMI RIVERBANK CHARACTERIZATION MAY 1993

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ADDENDUM

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for the

GREAT MIAMI RIVERBANK CHARACTERIZATION

WBS No. 50.03.15

Draft Addendum to the
Remedial Investigation/Feasibility Study
Work Plan

Prepared by

Fernald Environmental Restoration Management Corporation

Prepared for

U.S. Department of Energy
Fernald Field Office

Under Contract DE-ACO5-92OR219723

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1.0 INTRODUCTION

The objective of this Project Specific Plan (PSP) is to determine the nature and extent of contaminated soil and debris that are present along the west bank of the Great Miami River (GMR) in the vicinity of the Fernald Environmental Management Project (FEMP) discharge line. Activities identified in this PSP will supplement those identified in the South Groundwater Contamination Plume Removal Action Work Plan, Part 2/3 (SPWP) and the FEMP "Best Management Practice (BMP) Action for Retrieval of Contaminated Rubble at the Great Miami River Outfall."

1.1 BACKGROUND/PREVIOUS ACTIONS

In April 1992, contaminated concrete riprap was found at the existing FEMP discharge line location on the GMR. The radiological readings from the contaminated riprap showed activities exceeding the Department of Energy (DOE) Order 5400.5, "Free-Release Criteria," e.g., alpha, beta, and gamma activities exceeding 1000 dpm. On July 9, 1992, "BMP Action for Retrieval of Contaminated Rubble at the Great Miami River Outfall" was implemented. Contaminated riprap and soil material were removed, containerized, and transported to the FEMP under provisions identified in the BMP. In addition, surface radiological surveys and soil sampling were conducted to ensure that the area satisfied DOE free-release criteria.

On July 28, 1992, additional contaminated concrete rubble was found during pipeline excavation activities for the new FEMP discharge line. The contaminated rubble materials were removed, containerized, and transported to the FEMP in accordance with the previously referenced BMP.

On August 26, 1992, contaminated soil and FEMP process materials were found during pipeline excavation and Manhole 183B (see Section 3 for locations) construction activities associated with the South Groundwater Contamination Plume Removal Action Project, Part 2. DOE presented formal notification of this finding to the appropriate regulatory agencies and the general public. To prevent unauthorized site entry and personal exposure, a limited-access "contamination area," approximately 36 square feet, was established in the vicinity of the contaminated materials. The boundaries of the "contamination area" were subsequently increased, based on radiological surveys conducted during excavation stabilization activities. Radiological field-screening measurements of up to 150,000

disintegrations per minute (approximately 150 times the DOE free-release standard) were observed within the contamination area.

1.2 PLACEMENT OF CONTAMINATED MATERIALS

The origin of the contaminated materials within the construction area is not documented; however, its placement may have been associated with concrete riprap deposited to minimize riverbank erosion. Placement of the contaminated materials may have occurred through demolition activities, such as removing large sections of concrete pads adjacent to process buildings. These operations were conducted approximately 25 years ago to allow for construction of new storage pads. In addition, potentially contaminated gravel may have been removed in areas adjacent to the process buildings. Decontamination requirements, if any, for the rubble and gravel were not as stringent as current regulatory standards. Therefore, potentially contaminated demolition rubble and gravel appear to have been staged for unrestricted use at the FEMP or the existing discharge location.

Several current and former FEMP employees were interviewed to establish the approximate time frame and material types deposited at the Great Miami River to deter erosion at the existing FEMP discharge line. The consensus is that several truck loads of the rubble materials were deposited at the existing FEMP discharge line location approximately 20 to 25 years ago. However, the exact time frame, the size of the truck, the number of loads deposited, or the radiological monitoring results of the rubble materials could not be determined from these interviews or subsequent data file investigations.

1.3 PRIOR CHARACTERIZATION ACTIVITIES

In order to complete the discharge line construction, the area contained within the cofferdam which was installed due east of Manhole 183B, required characterization prior to excavation for the installation of the new FEMP discharge line. These excavation materials were containerized and transported to the FEMP for staging and characterization prior to disposition. This effort was completed prior to work plan approval, so that discharge line construction milestones identified in the Amended Consent Agreement would not be impacted.

1.4 DATA NEEDS AND DATA QUALITY OBJECTIVES (DQOs)

In order to assure that there is no additional contamination, the area contained within the FEMP property and construction easements will be investigated under this work plan addendum.

Soil and rubble radiological surveys and sampling are required to satisfy the following data needs:

- Identify the presence of contaminants and establish concentration levels within the study area.
- Determine the aerial extent of contamination.
- Determine the appropriate level of health and safety requirements for protection of site workers if a removal action is required.
- Provide data to determine the need for and scope of a removal action.

The FEMP Sitewide CERCLA Quality Assurance Project Plan (SCQ), established Analytical Support Levels (ASLs) A through E. Appropriate ASLs for each data need are presented in Table 1-1.

1.5 PERFORMANCE STANDARDS

The following regulatory performance standards are applicable for riverbank media characterization:

- Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 regulations.
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and any Applicable or Relevant and Appropriate Requirements (ARARs).
- Department of Energy (DOE) Order 5400.5.
- Amended Consent Agreement of September 1991.

2.0 ENVIRONMENTAL SETTING

The characterization area for this work plan is located along the west bank of the Big Bend area of the GMR floodplain due east of the FEMP facility. The Big Bend of the GMR is a large westward migrating meander which is actively eroding the western riverbank resulting in a steep-sloped riverbank. The floodplain is approximately 10 to 20 feet above the normal river level and slumping of the riverbank has occurred in localized areas.

TABLE 1-1
DATA QUALITY OBJECTIVES FOR GREAT MIAMI RIVERBANK CHARACTERIZATION

Activities	Soil borings at 18 triangular grid sample point locations and a surface radiological survey. Analyze 112 (maximum) samples for total uranium and thorium; analyze 18 (maximum) samples for full radiological analysis.
Objectives	Determine nature and extent of contaminated soils/media at the GMR riverbank.
Prioritized data uses	Data will be used to: 1) identify contaminants and concentration levels within the study area; and 2) determine if a further remedial action is needed.
Appropriate analytical level	Radiological field screening: ASL A; total uranium and thorium: ASL B; total radiological parameter list: ASL C and D.
Constituents of concern	Total uranium and radiological parameters (reference TAL 50.03.15A and B, Table 5-1 and 5-2).
Level of concern	DOE Order 5400.5, "Free-Release Criteria" (alpha, beta, and gamma activity exceeds 1000 dpm).
Required detection limits	Documented in Section D.11.4, Sitewide CERCLA Quality Assurance Project Plan (SCQ) (Draft, September 1992).
Critical samples	The soils/media sampling are considered critical to determine nature and extent of contamination at the GMR riverbank; number of samples will be determined by presence or absence of non-penetratable objects encountered during split spoon operations.

The land adjacent to the characterization area is primarily used for agriculture. Northwest of the study area, the land is used for local cultural events and entertainment. Further information concerning the regional, environmental, and demographic settings of the FEMP and adjacent areas, including the proposed study areas, are provided in the FEMP Sitewide Characterization Report (SWCR, DOE 1992b).

3.0 SAMPLING METHODOLOGY

This section provides details of the sampling methodology for the study area.

3.1 PRECONSTRUCTION CHARACTERIZATION SAMPLING

The FEMP installed a cofferdam within the study area for protection of the new FEMP discharge line during construction. Prior to the cofferdam construction, soil sampling and analyses were performed on October 6 - 8, 1992, to identify contaminants and their concentration levels in order to establish worker protection requirements during discharge line construction. The sampling also delineated the subsurface conditions which may be indicative of those within the proposed study area in this work plan, and investigated the feasibility of conducting soil sampling on the steep-sloped riverbank.

These pre-construction characterization activities were conducted under the Part 2/3 South Plume Work Plan and project specific health and safety plan. Soil samples were completed at 3-foot x 5-foot grid nodes (Figure 3-1), from the surface to an approximate total depth corresponding to the proposed trench excavation base. Soil samples were collected in 2-foot increments from the surface to the total depth of each sample using a stainless steel hand auger. Each sample was field screened for radiological activities, using a beta/gamma radiation detection device. After field screening, each soil sample was retained for radiological analyses identical to that identified in Section 5.0. Borings 1, 2, 3, 5, and 6 were completed to approximate total depths of 7 to 9 feet below land surface. Soil Borings 4, 7, 8, and 9 were terminated at total depths of 1 to 2 feet when objects which could not be penetrated were encountered.

A total of 26 soil samples were collected for field screening and FEMP laboratory radiological analyses. Field screening results are presented in Table 3-1. Beta/gamma activities at the GMR site were found to be at background levels of 60 to 100 counts per minute (cpm). However, soil samples collected at samples 4 and 5 exhibited beta/gamma activities elevated approximately 90 to 230 cpm above background.

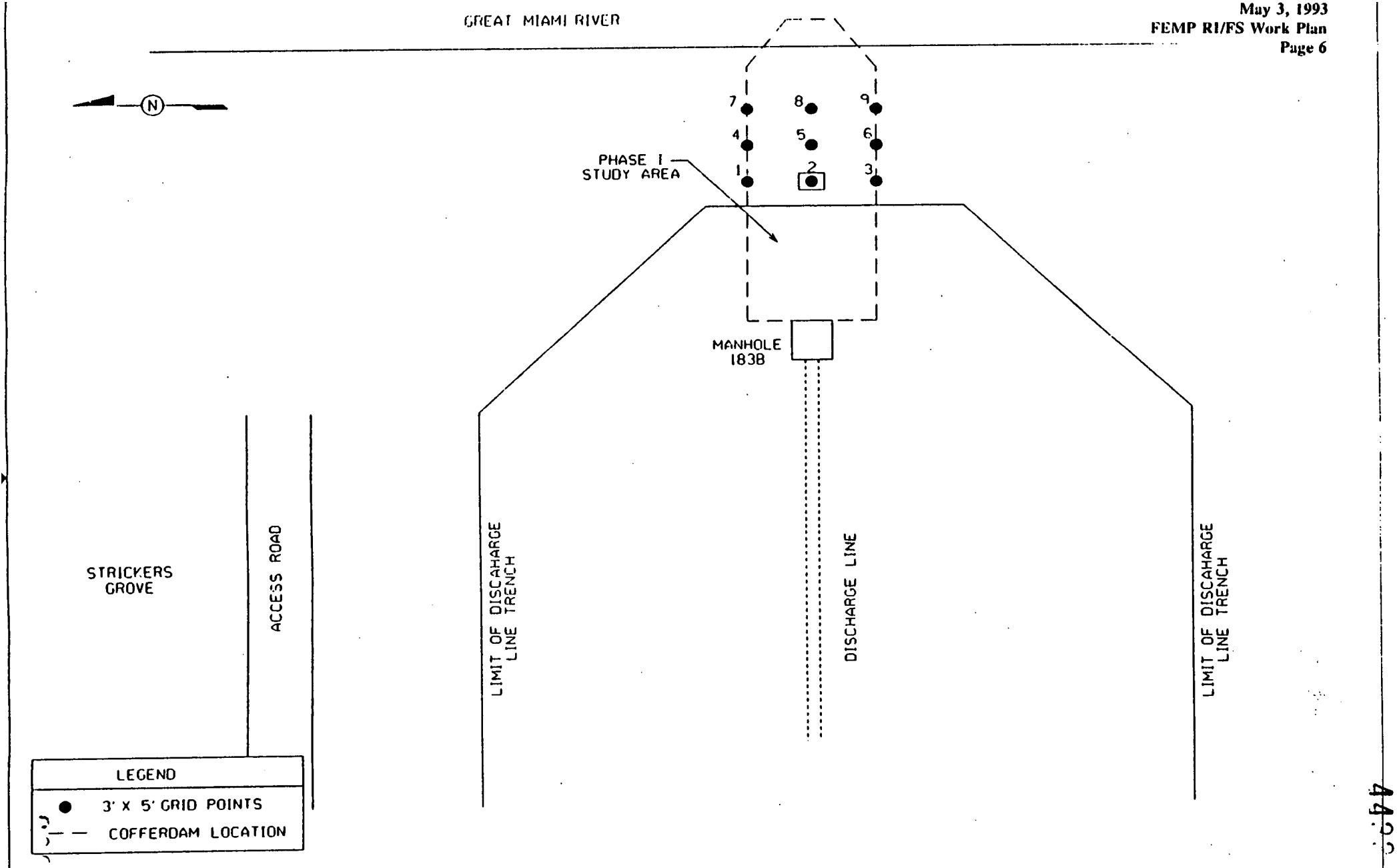

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FIGURE 3-1
PRECONSTRUCTION CHARACTERIZATION
SAMPLE LOCATION MAP

REV

FERMCO RESTORATION MANAGEMENT CORPORATION

TABLE 3-1
FIELD SCREENING RESULTS

Sample Pt. Location	Depth (in feet)	Sample Number	Beta/Gamma (cpm)
1	0 - 2	92-216-5283	60
	2 - 4	92-216-5284	60
	4 - 6	92-216-5285	60
	6 - 8	92-216-5286	60
	8 - 9	92-216-5287	60
2	0 - 2	92-216-5288	60
	2 - 4	92-216-5289	60
	4 - 6	92-216-5290	60
	6 - 8	92-216-5291	60
3	0 - 2	92-216-5292	60
	2 - 4	92-216-5293	60
	4 - 6	92-216-5294	60
	6 - 8	92-216-5295	60
4	0 - 2	92-216-5312	290
5	0 - 2	92-216-5313	190
	2 - 4	92-216-5314	190
	4 - 6	92-216-5315	190
	6 - 7	92-216-5316	190
6	0 - 2	92-216-5317	80
	2 - 4	92-216-5318	90
	4 - 6	92-216-5319	90
	6 - 7	92-216-5320	80
		92-216-5321 (Duplicate)	80
7	0 - 1	92-216-5335	80
8	0 - 1	92-216-5336	80
9	0 - 1	92-216-5337	80
Background Readings			60 - 100

The FEMP laboratory radiological analyses of the soil samples (Table 3-2) confirmed field screening data. Elevated concentrations (relative to the site) for total uranium, total thorium, U-234, U-235, U-236, U-238, Th-228, Th-230, and Th-232 are localized at samples 4 and 5 with their maximum values of 107 ug/g for total U, 84 ug/g for total Th, 41 pCi/g for U-234, 1.7 pCi/g for U-235, 0.056 pCi/g for U-236, 36 pCi/g for U-238, 22 pCi/g for Th-228, 2.8 pCi/g for Th-230, and 8.9 pCi/g for Th-232. Background

values for radiological elements in soils near the study area are referenced in "CERCLA/RCRA Background Soil Study," (DOE, March 1993). Background values for total Uranium and total Thorium, as referenced in this study, for example, range from 3.38 ug/g to 3.93 ug/g and 10.63 ug/g to 14.24 ug/g, respectively.

3.2 SAMPLING PLAN

In order to provide defensible and statistically valid data which satisfies the data needs presented in Section 1.5, the FEMP shall follow sampling protocol described in EPA 230/02-89-042, "Methods for Evaluating the Attainment of Cleanup Standards, Volume I, Soils and Solid Media." For this characterization, it is recommended that a combination of systematic and biased samples be collected for field-screening and laboratory analyses.

The areas within the FEMP construction easements will be characterized by a surface radiological survey followed by soil sampling and analysis activities. Soil sampling will be completed at systematic grid nodes and at locations identified by the surface radiological survey. Figures 3-2 and 3-3 show the layout of the 10-foot by 10-foot grid for the surface radiological survey and the tentative location of the soil samples. The sampling will be at 20-foot spacings in three rows separated by 20 feet. The center row will be offset laterally from the first and third rows by 10 feet (Figure 3-3). If the surface radiation survey identifies elevated readings within five feet of a sampling location, the samples will be moved to the location of the surface contamination. If surface contamination is discovered greater than five feet from a grid sampling location, an additional sample will be drilled at the location of the surface contamination. If this program identifies the presence of additional surface or subsurface contamination beyond the FEMP construction easements, an appropriate action plan will be prepared to expand the investigation to determine the full extent of the problem.

3.2.1 Surface Radiological Survey

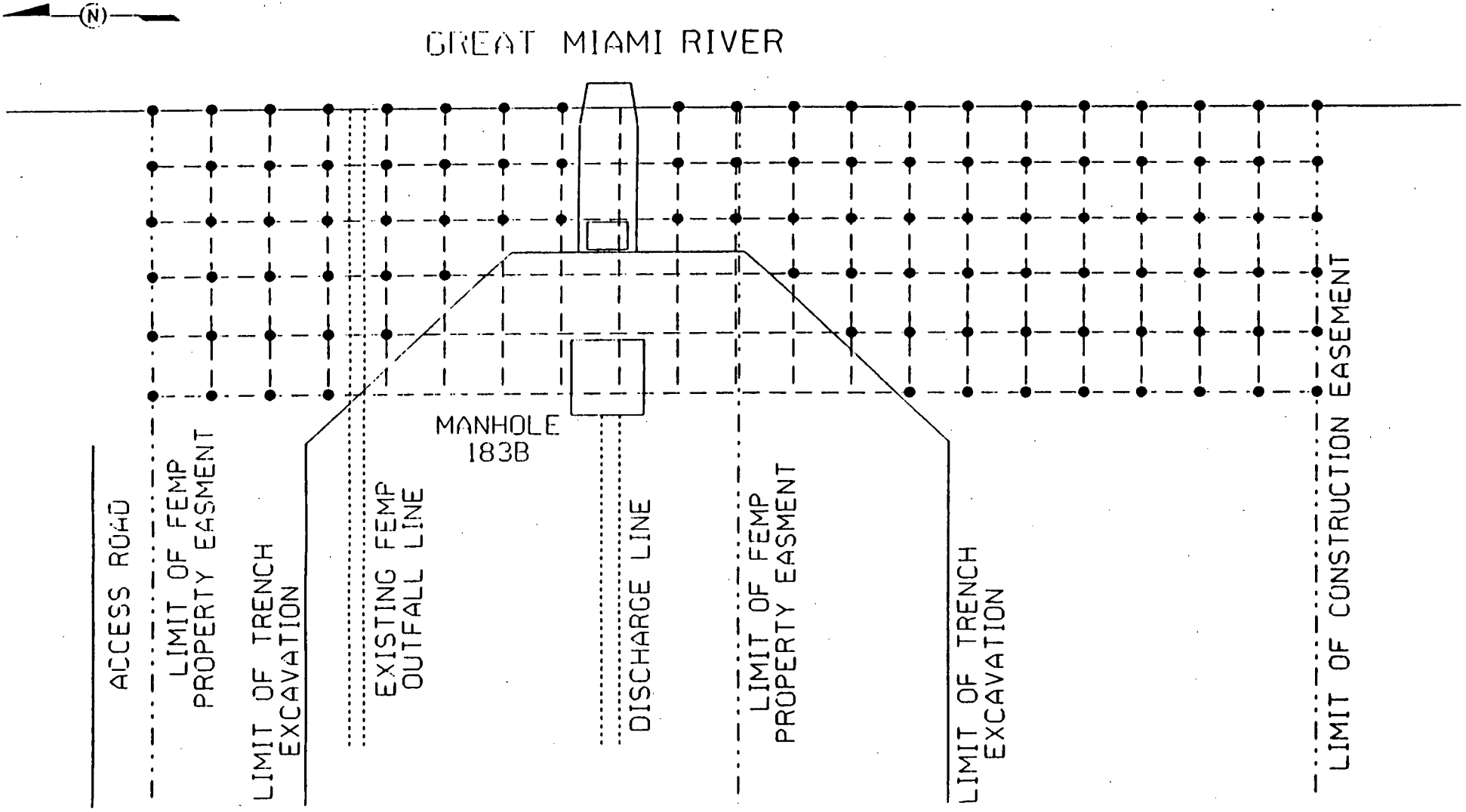
A 10-foot by 10-foot square grid will be established within the FEMP property and construction easement areas (Figure 3-2). The area will be extended if the extent of contamination warrants this. Discrete surface radiological activities will be measured at each grid node using a large volume scintillation detector, such as an Eberline SPA-3. In addition, surface radiological activities will be measured within each grid section using a serpentine-like pattern. These data will be plotted to identify areas exhibiting

TABLE 3-2
SUMMARY of ANALYSES
PRECONSTRUCTION SAMPLES
GREAT MIAMI RIVERBANK CHARACTERIZATION

Sample Location Point	Sample Depth	Date Collected	Sample Number	Total U (UG/G)	Th (UG/G)	U-234 (pCi/g)	U-235 (pCi/g)	U-236 (pCi/g)	U-238 (pCi/g)	Th-228 (pCi/g)	Th-230 (pCi/g)	Th-232 (pCi/g)
1	0-2	October 6, 1992	92-216-5283	25	<18	7.9E+00	4.0E-01	7.8E-02	8.3E+00	1.3	1.9	1.1
	2-4	October 6, 1992	92-216-5284	<11	<18	<4.0E+00	<1.8E-01	<3.5E-02	<3.7E+00	0.75	1.0	0.67
	4-6	October 6, 1992	92-216-5285	<11	<18	<3.3E+00	<1.8E-01	<3.0E-02	<3.7E+00	0.59	0.98	0.80
	6-8	October 6, 1992	92-216-5286	11	<18	<3.5E+00	1.8E-01	3.4E-02	3.7E+00	0.65	1.0	0.70
	8-9	October 6, 1992	92-216-5287	11	<18	3.7E+00	1.8E-01	3.1E-02	3.7E+00	0.42	0.62	0.41
2	0-2	October 6, 1992	92-216-5288	<11	<18	<3.2E+00	<1.7E-01	<2.9E-02	<3.7E+00	0.92	0.87	0.67
	2-4	October 6, 1992	92-216-5289	<11	<18	<4.1E+00	<1.8E+01	<4.1E-02	<3.7E+00	0.87	1.0	.072
	4-6	October 6, 1992	92-216-5290	<11	<18	<3.9E+00	<1.7E-01	<4.6E-02	<3.7E+00	0.73	1.2	0.81
	6-8	October 6, 1992	92-216-5291	14	<18	3.2E+00	2.3E-01	3.6E-02	4.7E+00	0.43	0.80	0.61
3	0-2	October 6, 1992	92-216-5292	<11	<18	<3.4E+00	<1.7E-01	<2.1E-02	<3.7E+00	1.1	1.2	0.75
	2-4	October 6, 1992	92-216-5293	13	<18	3.8E+00	2.1E-01	5.3E-02	4.3E+00	1.1	1.3	0.91
	4-6	October 6, 1992	92-216-5294	13	<18	4.1E+00	2.1E-00	4.9E-02	4.3E+00	0.92	0.99	0.75
	6-8	October 6, 1992	92-216-5295	11	<18	4.2E+00	1.8E-01	4.9E-02	3.7E+00	0.84	0.97	0.84
4	0-2	October 7, 1992	92-216-5312	107	84	4.1E+01	1.7E+00	5.6E-01	3.6E+01	18.0	2.8	8.9
5	0-2	October 7, 1992	92-216-5313	51	61	2.0E+01	8.2E-01	2.3E-01	1.7E+01	22	2.5	7.7
	2-4	October 7, 1992	92-216-5314	68	<18	2.6E+01	1.1E+00	3.3E-01	2.3E+01	1.4	1.3	1.2
	4-6	October 7, 1992	92-216-5315	19	<18	6.3E+00	3.0E-01	7.6E-02	6.3E+00	0.81	0.83	0.76
	6-7	October 7, 1992	92-216-5316	21	<18	7.6E+00	3.4E-01	9.4E-02	7.0E+00	0.76	0.91	0.86
6	0-2	October 7, 1992	92-216-5317	28	<18	8.5E+00	4.5E-01	1.5E-01	9.3E+00	0.95	1.1	1.1
	2-4	October 7, 1992	92-216-5318	16	<18	5.1E+00	2.6E-01	6.7E-02	5.3E+00	1.1	1.1	0.84
	4-6	October 7, 1992	92-216-5319	N/A	N/A	3.7E+00	1.9E-01	4.2E-02	4.0E+00	1.1	0.74	0.57
	6-7	October 7, 1992	92-216-5320	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		October 7, 1992	92-216-5321 (Duplicate)	14	<18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	0-1	October 7, 1992	92-216-5335	N/A	N/A	7.8E+00	3.4E-01	1.2E-01	7.0E+00	0.97	0.92	0.89
8	0-1	October 7, 1992	92-216-5336	N/A	N/A	<4.0E+00	<1.8E-01	<4.9E-02	<3.7E+00	0.40	0.83	0.58
9	0-1	October 7, 1992	92-216-5337	N/A	N/A	<4.5E+00	<1.9E-01	<7.3E-02	<3.7E+00	0.64	0.88	0.52

TABLE 3-2
SUMMARY of ANALYSES
PRECONSTRUCTION SAMPLES
GREAT MIAMI RIVERBANK CHARACTERIZATION

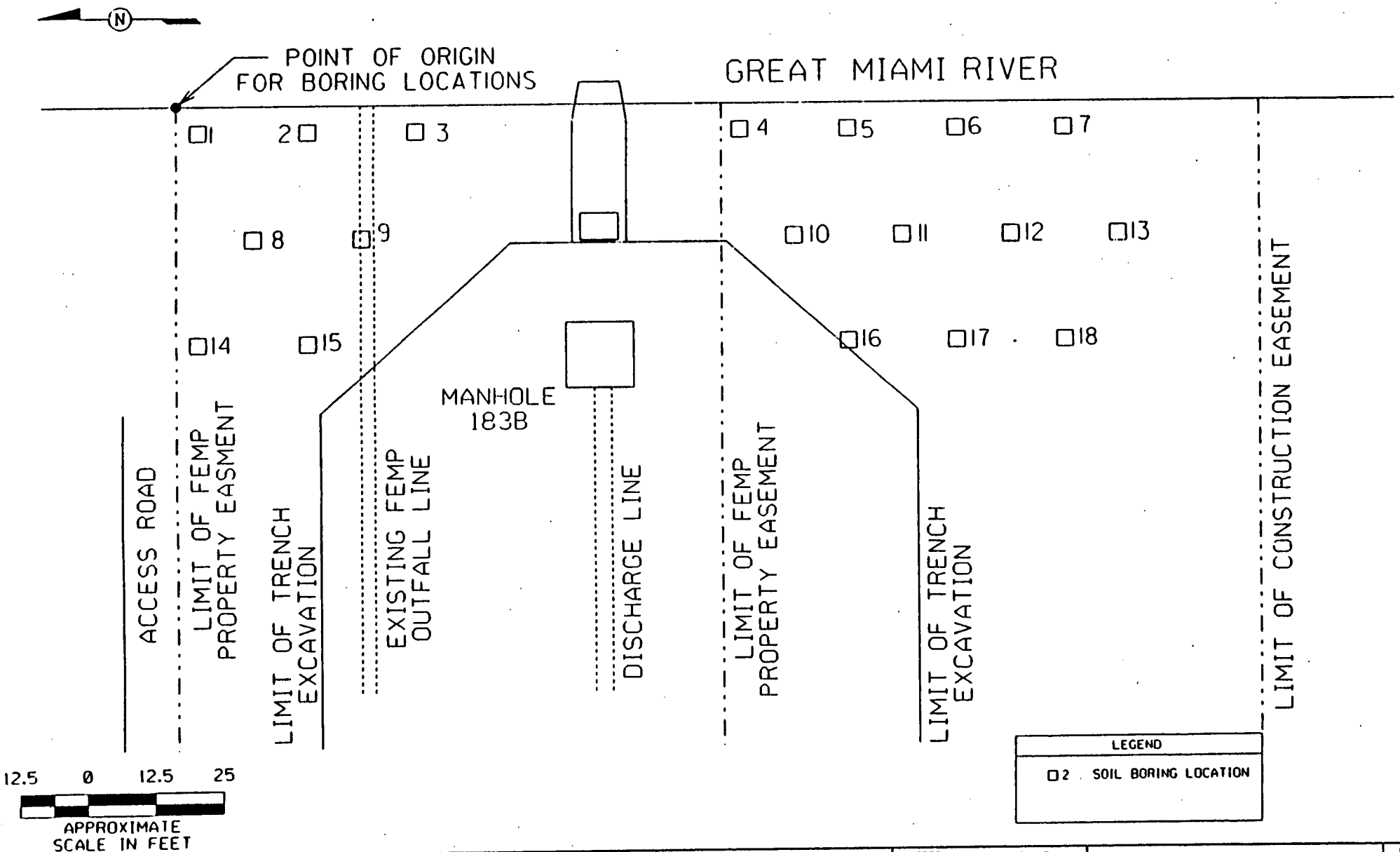
Sample Location Point	Sample Depth	Date Collected	Sample Number	Total U (UG/G)	Th (UG/G)	U-234 (pCi/g)	U-235 (pCi/g)	U-236 (pCi/g)	U-238 (pCi/g)	Th-228 (pCi/g)	Th-230 (pCi/g)	Th-232 (pCi/g)
1	0-2	October 6, 1992	92-216-5283	25	<18	7.9E+00	4.0E-01	7.8E-02	8.3E+00	1.3	1.9	1.1
	2-4	October 6, 1992	92-216-5284	<11	<18	<4.0E+00	<1.8E-01	<3.5E-02	<3.7E+00	0.75	1.0	0.67
	4-6	October 6, 1992	92-216-5285	<11	<18	<3.3E+00	<1.8E-01	<3.0E-02	<3.7E+00	0.59	0.98	0.80
	6-8	October 6, 1992	92-216-5286	11	<18	<3.5E+00	1.8E-01	3.4E-02	3.7E+00	0.65	1.0	0.70
	8-9	October 6, 1992	92-216-5287	11	<18	3.7E+00	1.8E-01	3.1E-02	3.7E+00	0.42	0.62	0.41
2	0-2	October 6, 1992	92-216-5288	<11	<18	<3.2E+00	<1.7E-01	<2.9E-02	<3.7E+00	0.92	0.87	0.67
	2-4	October 6, 1992	92-216-5289	<11	<18	<4.1E+00	<1.8E+01	<4.1E-02	<3.7E+00	0.87	1.0	.072
	4-6	October 6, 1992	92-216-5290	<11	<18	<3.9E+00	<1.7E-01	<4.6E-02	<3.7E+00	0.73	1.2	0.81
	6-8	October 6, 1992	92-216-5291	14	<18	3.2E+00	2.3E-01	3.6E-02	4.7E+00	0.43	0.80	0.61
3	0-2	October 6, 1992	92-216-5292	<11	<18	<3.4E+00	<1.7E-01	<2.1E-02	<3.7E+00	1.1	1.2	0.75
	2-4	October 6, 1992	92-216-5293	13	<18	3.8E+00	2.1E-01	5.3E-02	4.3E+00	1.1	1.3	0.91
	4-6	October 6, 1992	92-216-5294	13	<18	4.1E+00	2.1E-00	4.9E-02	4.3E+00	0.92	0.99	0.75
	6-8	October 6, 1992	92-216-5295	11	<18	4.2E+00	1.8E-01	4.9E-02	3.7E+00	0.84	0.97	0.84
4	0-2	October 7, 1992	92-216-5312	107	84	4.1E+01	1.7E+00	5.6E-01	3.6E+01	18.0	2.8	8.9
5	0-2	October 7, 1992	92-216-5313	51	61	2.0E+01	8.2E-01	2.3E-01	1.7E+01	22	2.5	7.7
	2-4	October 7, 1992	92-216-5314	68	<18	2.6E+01	1.1E+00	3.3E-01	2.3E+01	1.4	1.3	1.2
	4-6	October 7, 1992	92-216-5315	19	<18	6.3E+00	3.0E-01	7.6E-02	6.3E+00	0.81	0.83	0.76
	6-7	October 7, 1992	92-216-5316	21	<18	7.6E+00	3.4E-01	9.4E-02	7.0E+00	0.76	0.91	0.86
6	0-2	October 7, 1992	92-216-5317	28	<18	8.5E+00	4.5E-01	1.5E-01	9.3E+00	0.95	1.1	1.1
	2-4	October 7, 1992	92-216-5318	16	<18	5.1E+00	2.6E-01	6.7E-02	5.3E+00	1.1	1.1	0.84
	4-6	October 7, 1992	92-216-5319	N/A	N/A	3.7E+00	1.9E-01	4.2E-02	4.0E+00	1.1	0.74	0.57
	6-7	October 7, 1992	92-216-5320	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		October 7, 1992	92-216-5321 (Duplicate)	14	<18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	0-1	October 7, 1992	92-216-5335	N/A	N/A	7.8E+00	3.4E-01	1.2E-01	7.0E+00	0.97	0.92	0.89
8	0-1	October 7, 1992	92-216-5336	N/A	N/A	<4.0E+00	<1.8E-01	<4.9E-02	<3.7E+00	0.40	0.83	0.58
9	0-1	October 7, 1992	92-216-5337	N/A	N/A	<4.5E+00	<1.9E-01	<7.3E-02	<3.7E+00	0.64	0.88	0.52



12.5 0 12.5 25
APPROXIMATE SCALE IN FEET

● DISCRETE SURVEY POINT

FERMCO RESTORATION MANAGEMENT CORPORATION	NOTES:	REF. NO.: DATE:	APPROVED: DATE:	DRAFTER: WILLIAMS	**FIGURE 3-2** SURFACE RADIOLOGICAL SURVEY GRID
		REF. NO.: DATE:	APPROVED: DATE:	DESIGN FILE: fig3.2.dgn	
		REF. NO.: DATE:	APPROVED: DATE:	DEPARTMENT: GIS	
		REF. NO.: DATE:	APPROVED: DATE:	DWG. NO.: cll-0020	
				DATE: 3-25-93	REV 0



RMCO
RESTORATION MANAGEMENT CORPORATION

NOTES:
ORIGIN OF GRID IS ASSUMED TO BE AT THE INTERSECTION OF THE NORTHERN EXTENT OF THE FEMP PROPERTY EASEMENT AND THE GREAT MIAMI RIVER

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REF. NO.:	DATE:	APPROVED:	DATE:

DRAFTER:	WILLIAMS
DESIGN FILE:	fig3.3.dgn
DEPARTMENT:	GIS
DWG. NO.:	c11-0024
DATE:	3-26-93

FIGURE 3-3
SOIL SAMPLING LOCATION

REV 0

detectable alpha activities or beta/gamma activities in excess of 1000 dpm (DOE Order 5400.5, Free-Release Criterion for Loose Contamination).

3.2.2 Soil Samples

Soil samples will be collected at each systematic triangular grid point (Figure 3-3) and at judgmental sample points, which will be selected on the basis of surface radiological survey data. All soil sampling will be done with a split spoon sampler using a convectional auger rig from the surface to an approximate total depth of 13 feet below surface grade, to groundwater, or to non-penetrating surfaces, whichever occurs first.

Soil samples will be accumulated in 18-inch increments, and laid out on plastic sheeting. Each soil sample will be field screened for radiological contaminants, using a pancake GM radiation detection meter, and retained for total uranium and thorium analyses. The soil sample exhibiting the greatest radiological activity reading will be retained for full radiological analysis. If radiological activity readings at a given soil sampling location remain constant with increased depth, the soil sample that appears to be in disturbed material, will be submitted for full radiological analyses.

Table 3-3 gives the tentative locations of the samples and their approximate depth. If all borings go the a total depth of 13 feet there will be a maximum of 112 samples collected and 18 will be sent to the laboratory isotopic analyses.

3.3 HISTORIC AIR PHOTOGRAPH REVIEW

Air photographs that show the Great Miami River over the time frame in which the FEMP has operated will be analyzed. All possible indications revealing that erosion control was implemented will be documented. These areas will then be inspected for large riprap, and concrete slabs will be frisked with a pancake GM meter to determine if radiological contamination is present. If radiological contamination is found, an appropriate remedial action will be developed to remove the material.

3.4 RECORD KEEPING

Field activities will be recorded in field activity daily logs (FADLs). Sampling logs, media-specific

TABLE 3-3
SAMPLE POINT LOCATIONS

Sample Point	North (ft)	East (ft)	Estimated Depth (ft)
1	4.0	5.0	2.0 - 4.0
2	24.0	5.0	2.0 - 4.0
3	44.0	5.0	2.0 - 4.0
4	104.0	5.0	0.0 - 2.0
5	124.0	5.0	2.0 - 4.0
6	154.0	5.0	0.0 - 2.0
7	164.0	5.0	4.0 - 6.0
8	14.0	25.0	10.0 - 12.0
9	34.0	25.0	4.0 - 6.0
10	114.0	25.0	12 - 13
11	134.0	25.0	12.0 - 13.0
12	154.0	25.0	10.0 - 12.0
13	174.0	25.0	12.0 - 13.0
14	4.0	45.0	12.0 - 13.0
15	24.0	45.0	12.0 - 13.0
16	124.0	45.0	12.0 - 13.0
17	144.0	45.0	12.0 - 13.0
18	164.0	45.0	12.0 - 13.0

Note: Origin of grid is assumed to be at the intersection of the northern extent of the FEMP property easement and the Great Miami River. The origin point will be surveyed.

sample collection logs, calibration logs, photographs, and sketches may also be used to document field activities, site conditions, or unusual observations.

Detailed record keeping requirements that are to be generated by field sampling personnel are provided in Section 5.1 and Appendices B (forms D.1-D.13) and J of the FEMP SCQ.

3.5 SPLIT SPOON PROCEDURES AND BOREHOLE ABANDONMENT

Soil sampling will be completed using split spoon samplers. Augers will be used only if they are required to keep the hole open for the split spoon. Soil samples will be continuously collected, scanned over the 18 inch increments, and laid out on plastic sheeting. A qualified geologist, hydrogeologist, or geological engineer will be present at the site and responsible for sample operations and field data logging activities. Detailed split spoon sampling procedures are provided in Sections 5.2.1, 5.2.2, Appendix J, and Appendix K of the FEMP SCQ. Borings will be filled with grout to within 30 inches of the surface and cemented to the surface as prescribed in the SCQ, Appendix J.

3.6 ANALYTICAL PROGRAM

This section provides the required radiological analytical tests to be conducted for this characterization, and sample container, preservation, and holding time requirements for solid and liquid matrix samples. Standard analytical procedures for radiological analyses are provided in the FEMP SCQ, Appendix G. The Target Analyte List for this characterization is provided in Table 3-4.

Soil/solid media samples collected within the study area will be retained and analyzed at ASL B according to the SCQ, for the following radiological parameters:

- Total Uranium, in ug/g
- Isotopic Uranium (U-234, U-235, and U-238), in pCi/g
- Total Thorium, in ug/g
- Isotopic Thorium (T-228, T-230 and T-232), in pCi/g

Soil/solid media samples collected within the study area will be retained and analyzed at a frequency of one per soil sample, for ASL C analyses to determine the following constituents:

- Uranium (U-234, U-235, U-238), in pCi/g
- Thorium (Th-228, Th-230, Th-232), in pCi/g
- Radium (Ra-226, Ra-228), in pCi/g
- Lead (Pb-210), in pCi/g
- Technetium (Tc-99), in pCi/g
- Neptunium (Np-237), in pCi/g
- Plutonium (Pu-238, Pu-239, Pu-240), in pCi/g
- Strontium (Sr-90), in pCi/g
- Ruthenium (Ru-106), in pCi/g
- Cesium (Cs-137), in pCi/g

TABLE 3-4

EAT MIAMI RIVERBANK CHARACTERIZATION

'LES TO BE ANALYZED AT THE ITOR LAB

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' RI/FS – FULL RADIOLOGICAL – ANALYTICAL PARAMETERS

RADIOLOGICAL	Pay Item
Cesium 137	56
Neptunium 237	
Plutonium 238	
Plutonium 239/240	
Radium 226	
Radium 228	
Ruthenium 106	
Strontium 90	
Technetium 99	
Thorium 228	
Thorium 230	
Thorium 232	
Total Thorium	
Total Uranium	
Uranium 234	
Uranium 235/236	
Uranium 238	

MISC. RADIOLOGICAL	
Gross alpha	19
Gross beta	

3.7 SAMPLE CUSTODY, FIELD STORAGE, AND SHIPMENT OF SAMPLES

Pertinent sample collection data will be recorded on the FEMP Sitewide Analysis Request/Custody Record, which will accompany the respective samples to the designated analytical laboratory. Each sample will be containerized, labeled, and stored in coolers located within the exclusion zone. Upon completion of daily field activities, the samples will be transported to the designated analytical facility for analysis. In general, these samples will be shipped as environmental samples or radioactive materials. Radioactive material samples will be labeled as "Limited Specific Activity (LSA)" or "Limited Quantity, n.o.s.(not otherwise specified), UN2910," if field screening indicates above background radioactivity.

Detailed sample custody, field storage and shipment of samples procedures, are provided in Sections 7.0 and 6.7 of the FEMP SCQ, respectively.

3.8 EQUIPMENT AND PERSONNEL DECONTAMINATION

Detailed equipment and personnel decontamination procedures are provided in Section 6.8 and Appendix K of the FEMP SCQ. The level of decontamination, as specified in Section 11 of Appendix K, will be Level II.

4.0 ORGANIZATION AND RESPONSIBILITIES

This PSP has been developed by the CRU5 RI/FS Project Manager to fulfill data needs for the FEMP Site Characterization to be reported in the OU 5 RI. The CRU5 RI/FS project manager has full responsibility and authority for the content and specifications in this PSP. Any changes to the activities specified in this PSP must have the approval of the CRU5 RI/FS project manager prior to implementation. It is specified in this PSP must have the approval of the CRU5 RI/FS project managerprior to the CRU5 RI/FS project manager's responsibility to secure any off-property access permits required for the completion of this PSP.

4.1 FIELD ACTIVITIES

Field activities are to be conducted by the FEMP Site Characterization Group using SCQ approved work procedures. Field activities include sample handling, preservation, shipment, and notification of the laboratories. Groundwater sampling will be conducted using the procedures covered in Section 6 and Appendix K of the SCQ. The Site Characterization Group has full responsibility for the development of

the field activity guidelines and field sampling plans. In addition, the Site Characterization Group will assign unique sample numbers for all samples collected.

At the completion of field activities associated with this PSP, a task completion report will prepared and submitted to the CRU5 RI/FS project manager. The report will include copies of all field forms, data sheets, and activity logs, as well as a written summary of the field activities noting any variances from either the work plan or SCQ procedures.

4.2 HEALTH AND SAFETY

The FERMCO Health and Safety Department will be responsible for the development, implementation, and monitoring of a site-specific health and safety plan for each of the field work sites. This plan will include specific programs for radiological and nonradiological monitoring and controls as specified by the SCQ and presented in Section 3 of this PSP.

4.3 QUALITY ASSURANCE (QA) AND QUALITY CONTROL (QC)

The FERMCO QA department will assure the contents of this PSP conform to the requirements of the SCQ. The FERMCO QC will monitor field activities to assure that all work conducted in the execution of this PSP conforms to the appropriate standards specified in the SCQ.

5.0 HEALTH AND SAFETY CONSIDERATIONS

Effective health and safety programs for any activity are based on an effective training program. All involved personnel will receive adequate training prior to implementation of the field work for this PSP. This training will make employees aware of all physical, radiological, and chemical hazards which may be encountered during this project.

All FEMP employee and subcontractor personnel who will be performing field work during this project are required to have completed all Occupational Safety and Health Administration (OSHA)-mandated 1910.120 Hazardous Waste Site Worker training. In addition, personnel must complete all applicable annual refresher training.

The Department of Energy (DOE) regulations at the FEMP require a series of site-specific training courses related to the site. These courses are designed to augment OSHA-required training and provide additional training specific to the hazards which exist at the FEMP. Field personnel participating in the performance of this project will be trained to the SCQ.

In summary, employee awareness and clearly delineated lines of authority and responsibility have been designed to provide for effective health and safety related knowledge specific to each activity.

5.1 TASK SPECIFIC PLANS

All aspects of this PSP will be performed in accordance with all existing applicable DOE, United States Environmental Protection Agency (U.S. EPA), OSHA, and the State of Ohio Health and Safety Regulations. Additionally, all practices will be managed in accordance with commonly accepted practices used in the hazardous waste industry.

Each field activity has a separate task-specific health and safety plan, which has been prepared in accordance with the FEMP Site Health and Safety Plan. For each project task and sub-task, a health and safety technician will monitor the field crew's activities.

Project-specific health and safety plans address the hazards typically encountered by personnel when performing the specified field work. The plans specify proper equipment for health and safety monitoring and personnel protection, and detail the criteria for selecting monitoring equipment and protective clothing. Each member of a field crew is required to participate in a health and safety training session specific to each field project before beginning the field work. In addition to the task-specific health and safety plans, formal approval of the field activities specified in this PSP will be obtained prior to the implementation of field work.

5.2 RADIOLOGICAL MONITORING AND CONTROLS

Radiological monitoring for this work plan will be achieved using existing institutional controls commonly utilized at the FEMP. For those areas of the FEMP which are under existing institutional radiological controls, any employee who will be entering such areas is required to possess and wear a thermal luminescent detector (TLD) to monitor for exposure to radiological contamination. In addition, each

employee is required to participate in a regularly-scheduled urine analysis program which is designed to monitor for radiological exposure.

For areas which are subject to more restrictive radiological controls when the potential for exposure is greater, Radiation Worker Permits are necessary and will be obtained prior to the field work being performed in those areas. A radiological technician will be assigned to each field crew performing any activities in an area which could be expected or result in site workers being exposed to levels of radiological contamination exceeding DOE requirements.

Ingress and egress of personnel, equipment and vehicles to and from radiologically-controlled areas will be monitored with "real time" radiation detection instruments. Monitoring results which exceed FEMP-determined exposure guidelines will be further evaluated as to the possible source(s). Measures necessary to remediate radiological contamination sources will be implemented. Such measures may include, but are not limited to, personnel training, decontamination, employee exposure monitoring, increased personnel monitoring, personnel protective equipment, and sampling of suspect materials encountered.

If the responsible radiological technician assigned to the field activities being performed identifies a real or potential condition which could or will result in an unsafe condition, then that person has the responsibility to cease field operations until the unsafe condition has been corrected.

5.3 NONRADIOLOGICAL MONITORING AND CONTROLS

Monitoring of potential health and safety problems associated with nonradiological hazards are evaluated with a health and safety technician. Also, all field crews are responsible for hazard awareness and recognition. Task specific training is designed to enhance the performance of all field work using good and safe work practices.

Evaluating the potential for personnel exposure to organic contaminants will be achieved mainly through the use of an HNu P-101 Photoionization Detector. Other equipment which could potentially be used include Drager Tubes, oxygen meters, and combustible gas indicators.

6.0 QUALITY ASSURANCE/QUALITY CONTROL

This section provides field and laboratory quality assurance/quality control (QA/QC) requirements and protocols applicable to this characterization. Detailed information concerning QA/QC requirements and protocol is provided in Sections 3.0, 4.0, 8.0, 10.0, 11.0, 15.0, and 16.0; and Appendices A, C, D, E, F, I, and J of the FEMP SCQ.

6.1 FIELD QA/QC SAMPLES

Equipment rinsates will be collected at a rate of one per twenty pieces of a type of equipment cleaned by a specific decontamination method. The rinsates will be analyzed for all radiological parameters listed in Table 3-4. A duplicate soil sample will be collected at a frequency of one is ten samples. This duplicate will consist of a lengthwise division of the split spoon sample.

6.2 FIELD SCREENING EQUIPMENT CALIBRATION AND DOCUMENTATION

Field screening instrumentation, such as radiation detection meters, will be checked on a daily basis for proper operation. Any equipment that fails calibration or becomes inoperable will be tagged and taken out of service. Such equipment will be repaired and recelebrated before reuse.

Radiation detection meters will be checked before each use to ensure that the date of required calibration has not been exceeded. Field screening instrumentation checks and calibration will be recorded in Field Activity Daily Logs and instrument-specific calibration logs.

7.0 WASTE DISPOSITION

The following wastes will be generated during characterization activities:

- Unused soil cores
- Contact wastes
- Equipment decontamination solutions

The following subsections provide the proposed disposition methodology for each type of waste generated.

7.1 SOIL CORES

Unused soil cores will be placed in clean 55-gallon drums, labelled according to project, contents, and location, and sent to the designated waste interim storage location for future characterization, disposition, and disposal.

7.2 CONTACT WASTES

Contact wastes, such as personal protective equipment (PPE) and rags or wipes (paper towels, Chemwipes, etc.), will be placed in plastic bags or 55-gallon drums and transported to the FEMP for appropriate disposition. Contact waste handling and disposition is discussed in the SCQ, Appendix K.

7.3 DECONTAMINATION SOLUTIONS

Equipment decontamination solutions will be transferred to U.S. Department of Transportation (DOT)-approved, bung-type, 55-gallon drums, labeled as "Decontamination Solutions." The drums will be placed on wooden pallets, underlaid by diked Herculite sheeting to prevent contaminant migration resulting from spills or leaks. Upon completion of field activities for each characterization phase, the drummed decontamination solutions will be transported to the FEMP for storage and appropriate disposal.

8.0 FIELD SAMPLING PLAN

Sampling for this project will be performed by the Site Characterization/Data Management SC/DM of the FERMCO Environmental Management Division.

8.1 SAMPLE TEAM ORGANIZATION

Due to the nature, objectives, and programmatic requirements of this project, actual sampling locations and analysis parameter selection are designated by FERMCO personnel of CRU5.

8.1.1 Organizational Structure

Field sampling crews will be directly supervised by the SC/DM Field Operations Manager. Each field crew will consist of two sampling technicians. Additional sampling custodial staff will interact with the sampling crews and the FEMP or contract laboratory performing the sampling analysis.

The Field Operations Manager is responsible for the coordination and effective use of all personnel on site and for proper maintenance of the record of all field activities. In addition, the field coordinator is responsible for field quality control including issuance and tracking of measurement and test equipment.

Field sampling personnel are responsible for the collection of the samples in accordance with the approved PSP. All activities associated with the execution of sampling are to be documented on the appropriate Field Activity Daily Logs (FADLs) which are to be completed by the sampling technicians for each location. These technicians are also responsible for ensuring that the proper sampling equipment is available and in serviceable condition. Also, proper decontamination of equipment between each sampling point is the responsibility of these staff.

Additional sampling custodial staff who interact with the FEMP or contract laboratory are responsible for ensuring that proper sampling containers, preservatives and sampling coolers are available and in serviceable condition. The sampling custodians are also responsible for sample labeling, handling, storage, and sample-required paperwork, such as a Chain of Custody/Request for Analysis (CC/RFA) Form. These must be completed before the samples are submitted to the appropriate FEMP or contractor laboratory for analysis. Finally, sampling custodians are responsible for logging in all collected samples, delivering the samples to the FEMP laboratory, or sending the samples with accompanying paperwork, to the contract laboratory.

8.1.3 Sampling Schedule

The surface radiation survey must be conducted in April or May, 1993. Data from all field work must be available by August 1, 1993, in order to meet the deadlines for the OU 5 RI Report.

9.0 REFERENCES

IT Corporation, Aug. 1988, "Hydrogeologic Study of FMPC Discharge to the Great Miami River."

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