RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-05828-MR
ADDRESS: 140 MIRIAM AVENUE

AUGUST 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION
P.O. Box 1569
Grand Junction, Colorado 81502

APPROVED BY Michael K Tucker
M. TUCKER
DOE PROJECT ENGINEER

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REA05828:REA-KL018

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-05828-MR, is a single-family residence located at 140 Miriam Avenue, Grand Junction, Colorado.

The purpose of this assessment is to evaluate the extent of uranium millsite contamination at this property. This assessment includes recommended remedial action, estimated volume of material to be removed, and estimated cost of the proposed action.

1.2 Evaluation and Recommendation

The action recommended is the removal of contaminated material and restoration of the property to its original condition. The identified residual radioactive material found on this property is tailings; the estimated volume is: exterior, 324 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is $18,825. Remedial action on this property will take approximately 14 days to complete.

Area A will not be included in this remedial action, as discussed in Section 4.0 of this REA.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 140 Miriam Avenue, Grand Junction, Colorado

Zoning: Residential (RSF-8)

Lot Size: Approximately 12,700 sf (0.29 acres)

Legal Description: Lot 8, Block 5, Artesia Heights Replat, Section 25, 1S 1W, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 1 mile south of the State of Colorado Tailings Repository. Appendix Figure 2.1 shows the property location relative to its surroundings.

Utilities: Utility locations are shown in Appendix Figure 2.2.

Electrical:	Overhead
Gas:	Underground
Telephone:	Overhead
Sewer:	Underground
Water:	Underground
Cable TV:	Overhead

Bordering Properties:

North:	Single-family residence
South:	Vacant lot
East:	Alley
West:	Miriam Avenue

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-family residence
Size:	Approximately 2,393 sf
Construction Date:	1954
Construction:	Wood-frame with metal lap siding and cinder block
Foundation:	House is monolithic concrete floor and footing; garage is concrete stemwall on spread footing
Footing Depth:	Approximately 14" to bottom of footing from grade at the house; varies approximately 14" to 42" to bottom of footing from grade at the garage
Basement:	None

Crawl Space: None
Condition: Fair

Other Structures: None

General Remarks:

Structures, utilities, landscaping, and other special features of this property are included in Appendix Figure 2.2.

Historical Data:

This structure is not over 50 years old. Therefore, it does not meet the eligibility criteria for consideration of inclusion on the National Register of Historic Places.

3.0 RADIOLOCIC SURVEY

3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-05828-MR on April 24, 1985. Data collection methods were performed in accordance with procedures fully described in the Radiologic Support Operations Procedures Manual GJ-07(84) (Bendix Field Engineering Corporation, 1984). These data were evaluated to determine the areal and vertical extent of uranium mill tailings contamination at this property as well as any other contaminated material that may have originated from the millsite.

A review of historical information from the files of the Colorado Department of Health (CDH) and the inclusion data from the Bendix Spillover Survey was conducted. These records indicate contamination in the south yard adjacent to the primary structure, and along the north fence line.

The Bendix radiologic survey was designed to investigate the entire property, with emphasis on previously identified areas of contamination. Conclusions based upon data analyses are discussed in Section 3.5, Extent of Contamination. Photocopies of the Official Survey Report, Memo of Understanding, team leader notes, and deconvolution graphs are included in the Appendix (Section 6.0).

3.2 Gamma Exposure-Rate Surveys

3.2.1 Exterior Findings

Background Readings: 15 to 17 uR/h
Highest Outside Gamma Reading (HOG): 66 uR/h

Exterior radium-concentration measurements are presented in Appendix Table 3.1. Grid-point survey results are shown in Appendix Figure 3.1. Appendix Figure 3.2 presents the ranges of elevated gamma readings and indicates areas of possible contamination.

3.2.2 Interior Findings

Background Readings: 15 to 17 uR/h
Highest Inside Gamma Reading (HIG): 51 uR/h

Interior radium-concentration measurements are presented in Appendix Table 3.2. Interior gamma exposure-rate measurements are summarized in Appendix Table 3.3. Appendix Figure 3.3 shows interior exposure rates and locations of these measurements.

3.3 Boreholes, Soil Samples, and Other Measurements

Areas which displayed elevated gamma levels were further investigated; these areas are shown in Appendix Figures 3.3 and 3.4. Data from these investigations are included in Appendix Tables 3.1 and 3.2.

3.4 Radon/Radon Daughter Concentration (RDC)

Determined by CDH: 0.013 gross working level (WL). No additional RDC measurements were taken by Bendix.

3.5 Extent of Contamination

Appendix Figures 3.5a and 3.5b shows identified areas and estimated depths of contamination on this property, based on assessments of all measurements taken. As noted in these figures, areas recommended for remedial action that contain identified residual radioactive materials are:

(AREA A) Inside the primary structure, there is contamination beneath the laundry and storage-room floor. The total depth of contamination extends 21 inches, from the surface of the 5-inch-thick uncontaminated concrete slab (approximately 120 sf; excluded from this remedial action).

(AREA B) North of the primary structure, along the north property boundary, contamination is 24 inches in depth (approximately 36 sf).

(AREA C) A large deposit at the north and west sides of the property is contaminated to a depth of 12 inches (approximately 2,677 sf).

(AREA D) The estimated depth of contamination north of the primary structure is 11 inches beneath a 4-inch-thick concrete slab. The total estimated depth of contamination is 15 inches, based on information collected in Area E (approximately 202 sf).

(AREA E) West of the primary structure, contamination is 15 inches deep (approximately 3,592 sf). This area includes a continuous concrete fence-curb.

(AREA F) In the west yard, adjacent to the south concrete curb, the depth of contamination is 21 inches (approximately 75 sf).

(AREA G) In the driveway, contamination extends to a total depth of 15 inches, including a 4-inch-thick concrete slab (approximately 264 sf).

(AREA H) An isolated deposit at the south property boundary, adjacent to the driveway, is contaminated to a depth of 12 inches (approximately 39 sf).

(AREA I) At the south side of the primary structure, the contamination is 9 inches deep (approximately 60 sf).

(AREA J) Five deposits in the city easement west of the property boundary are contaminated to a depth of 6 inches (approximately 618 sf).

(AREA K) North of the primary structure, a small area of contamination is 6 inches deep (approximately 12 sf).

(AREAS REQUIRING FURTHER INVESTIGATION DURING REMEDIAL ACTION)

Area D should be closely monitored, because the contamination may extend further underneath the concrete slab than surface gamma readings indicated.

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-05828-MR, includes select removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figure 3.5b) and transport of removed material to the disposal site.

Remedial action will not be performed on Area A of this property because the levels of radioactivity in these areas do not exceed the EPA Standards (40 CFR 192), as described below:

(1) Indoor radon-decay products shall not exceed a working level of 0.03, nor, to the extent possible, a working level of 0.02. (At this property the gross working level, as determined by CDH, is 0.013.)

(2) Indoor gamma radiation shall not exceed 20 microroentgens per hour (uR/h) above background levels. (At this location the interior background readings were found to be between 15 and 17 uR/h, with the highest mean surface gamma reading at 32 uR/h.)

After remedial action is completed, the areas involved will be restored to original condition in accordance with the Bendix drawings, Vicinity Properties General Construction Specification (Bendix Field Engineering Corporation, 1984), and Statement of Work for Construction Subcontractor.

Dislocation of the occupants will not be required for this remedial action, but the owner's personal property will have to be relocated and moved back.

4.2 Evaluation of Recommended Remedial Action

Volume calculations of the areas included for remedial action are presented in Appendix Table 4.1. Cost estimates are presented in Appendix Table 4.2.

Estimated cost of remedial action is $18,825.

This remedial action will result in select removal of the identified residual radioactive materials.

Owner preference is as follows:

1) That remedial action be completed within one year;
2) That remedial action work be done after October 1, 1985, because of the garden;
3) That the existing concrete driveway be replaced with a new 8′ wide concrete driveway; and
4) That the contamination in Area H be replaced with roadbase.

No legal or other complications are foreseen at this time.

5.0 REFERENCES

ARIX, A Professional Corporation, Procedures Manual for the Grand Junction Remedial Action Program, for Colorado Department of Health, Radiation Control Division, and the U.S. Department of Energy, 1983.

Bendix Field Engineering Corporation, Procedures Manual Radiologic Support Operations Grand Junction Vicinity Properties, (GJ-07), for U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

Bendix Field Engineering Corporation, Engineering, Construction, and Land Support Manual Grand Junction Vicinity Properties Project, (GJ-08), for U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

Bendix Field Engineering Corporation, Grand Junction Vicinity Properties Operating Manual, (GJ-16) for U.S. Department of Energy, Nuclear Energy Programs, Division of Remedial Action Projects, UMTRA, 1984.

Bendix Field Engineering Corporation, Vicinity Properties General Construction Specification, for U.S. Department of Energy, Nuclear Energy Programs, Division of Remedial Action Projects, UMTRA, 1984.

Bendix Field Engineering Corporation, Environmental Assessment of Preliminary Cleanup Activities at Offsite Properties Contaminated by Tailings from the Grand Junction Inactive Uranium Millsite, (GJ-04), for U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations, Albuquerque, New Mexico, 1983.

U.S. Department of Energy, Programmatic Memorandum of Agreement (DOE No. DE-GM04-84AL28460) between the U.S. Department of Energy, the Advisory Council on Historic Preservation, and the Colorado State Historic Preservation Officer, for UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

U.S. Department of Energy, Vicinity Properties Management and Implementation Manual, for UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

U.S. Environmental Protection Agency, Standards for Remedial Action at Inactive Uranium Processing Sites (40 CFR Part 192), Washington, D.C., 1983.

6.0 APPENDIX

This Appendix contains the following:

Appendix Tables:

Table 3.1	Radium Concentrations at Exterior Locations
Table 3.2	Radium Concentrations at Interior Locations
Table 3.3	Summary of Interior Gamma Exposure Rates
Table 4.1	Area and Volume Calculations
Table 4.2	Estimated Cost of Decontamination and Restoration

Appendix Figures:

Figure 2.1	Vicinity Map
Figure 2.2	Site Plan
Figure 3.1	Exterior Grid-Point Exposure Rates
Figure 3.2	Exterior Gamma Scan
Figure 3.3	Interior Gamma Exposure Rates and Sample Locations
Figure 3.4	Exterior Sample Locations
Figure 3.5a	Interior Estimated Extent of Contamination
Figure 3.5b	Exterior Estimated Extent of Contamination

Official Survey Report
Memo of Understanding
Team Leader Notes
Deconvolution Graphs (Apparent Radium-226 Concentration)

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
3	131300	00	DS	1.8		*	
		00-06	SS			4.2	
4	138290	00	DS	3.0		*	
		06	DS	<1.0		*	
		12	DS	1.7		*	
		00-06	SS			6.8	
5	141274	00	DS	11.9		*	
		06	DS	2.4		*	
6	154250	00	DS	2.9		*	
		06	DS	1.4		*	
		00-06	SS			3.0	
7	160240	00	DS	12.9		*	West of fence line
		06	DS	1.6		*	
8	160290	03	TC	5.4		*	Northwest corner of
		06	TC	5.1		*	property
		09	TC	4.9		*	
		12	TC	4.6		*	DC = 9 inches
		15	TC	4.3		*	Based on the
		18	TC	4.3		*	deconvolution graph
		21	TC	4.2		*	
		24	TC	4.1		*	
		27	TC	4.1		*	
		30	TC	4.1		*	
		33	TC	4.0		*	
9	168227	00	DS	1.3		*	Driveway
		00-06	SS			4.1	
10	168237	03	TC	34.8		*	DC = 21 inches
		06	TC	42.9		*	Based on the
		09	TC	44.5		*	deconvolution graph
		12	TC	38.0		*	
		15	TC	26.4		*	
		18	TC	18.2		*	
		21	TC	11.3		*	
		24	TC	7.5		*	
		27	TC	5.6		*	
		30	TC	5.1		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
10	168237	33	TC	5.2		*	
		36	TC	5.0		*	
		39	TC	4.4		*	
		42	TC	4.3		*	
11	170245	03	TC	14.6		*	West yard
		06	TC	13.8		*	
		09	TC	10.7		*	DC = 12 inches
		12	TC	7.6		*	Based on the
		15	TC	5.9		*	deconvolution graph
		18	TC	4.9		*	
		21	TC	4.3		*	
		24	TC	4.0		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
		36	TC	4.0		*	
		39	TC	3.8		*	
		42	TC	3.7		*	
12	178270	03	TC	13.2		*	West yard
		06	TC	13.5		*	
		09	TC	10.7		*	DC = 12 inches
		12	TC	7.7		*	Based on the
		15	TC	5.9		*	deconvolution graph
		18	TC	5.1		*	
		21	TC	4.8		*	
		24	TC	4.6		*	
		27	TC	4.4		*	
		30	TC	4.4		*	
		33	TC	4.4		*	
		36	TC	4.3		*	
		39	TC	4.2		*	
		42	TC	4.1		*	
13	184229	03	TC	12.9		*	Driveway
		06	TC	10.6		*	
		09	TC	8.2		*	DC = 15 inches
		12	TC	6.4		*	Based on the
		15	TC	5.3		*	deconvolution graph
		18	TC	4.8		*	
		21	TC	4.4		*	
		24	TC	4.3		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
13	184229	27	TC	4.2		*	
		30	TC	4.2		*	
14	185263	03	TC	14.3		*	DC = 12 inches
		06	TC	12.1		*	Based on the
		09	TC	8.6		*	deconvolution graph
		12	TC	6.4		*	
		15	TC	5.2		*	
		18	TC	4.5		*	
		21	TC	4.2		*	
		24	TC	3.9		*	
		27	TC	4.0		*	
		30	TC	3.9		*	
		33	TC	3.8		*	
15	190237	03	TC	13.4		*	West yard
		06	TC	12.3		*	
		09	TC	9.3		*	DC = 15 inches
		12	TC	6.9		*	Based on the
		15	TC	5.2		*	deconvolution graph
		18	TC	4.7		*	
		21	TC	4.4		*	
		24	TC	4.2		*	
		27	TC	4.2		*	
		30	TC	4.1		*	
		33	TC	4.2		*	
16	190250	03	TC	14.3		*	West yard
		06	TC	13.6		*	
		09	TC	10.7		*	DC = 12 inches
		12	TC	7.4		*	Based on the
		15	TC	5.5		*	deconvolution graph
		18	TC	4.8		*	
		21	TC	4.4		*	
		24	TC	4.2		*	
		27	TC	4.2		*	
		30	TC	4.2		*	
		33	TC	4.3		*	
		36	TC	4.2		*	
		39	TC	4.1		*	
17	190295	03	TC	9.0		*	
		06	TC	8.3		*	
		09	TC	6.4		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
17	190295	12	TC	5.1		*	DC = 12 inches
		15	TC	4.4		*	Based on the
		18	TC	4.0		*	deconvolution graph
		21	TC	3.7		*	
		24	TC	3.7		*	
		27	TC	3.7		*	
		30	TC	3.7		*	
		33	TC	3.7		*	
		36	TC	3.6		*	
		39	TC	3.6		*	
		42	TC	3.6		*	
		45	TC	3.6		*	
		48	TC	3.6		*	
		51	TC	3.6		*	
		54	TC	3.5		*	
		57	TC	3.4		*	
		60	TC	3.3		*	
		63	TC	3.2		*	
		66	TC	3.0		*	
18	198262	03	TC	21.6		*	West yard
		06	TC	21.4		*	
		09	TC	16.8		*	DC = 15 inches
		12	TC	11.6		*	Based on the
		15	TC	7.6		*	deconvolution graph
		18	TC	5.8		*	
		21	TC	5.0		*	
		24	TC	4.6		*	
		27	TC	4.3		*	
		30	TC	4.2		*	
		33	TC	4.2		*	
		36	TC	4.3		*	
		39	TC	4.4		*	
		42	TC	4.4		*	
19	200213	00	DS	3.0		*	Driveway
		06	DS	10.3		*	
		12	DS	<1.0		*	
20	217232	03	TC	25.3		*	Driveway
		06	TC	27.9		*	
		09	TC	20.6		*	DC = 15 inches
		12	TC	13.3		*	Based on the
		15	TC	8.7		*	deconvolution graph

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
20	217232	18	TC	6.4		*	
		21	TC	5.3		*	
		24	TC	4.6		*	
		27	TC	4.3		*	
		30	TC	4.1		*	
		33	TC	4.1		*	
		36	TC	4.0		*	
		39	TC	4.1		*	
21	219301	00	DS	2.9		*	North fence line
		06	DS	2.0		*	
		00-06	SS			9.5	
22	228255	03	TC	14.4		*	DC = 15 inches
		06	TC	15.5		*	Based on the
		09	TC	11.6		*	deconvolution graph
		12	TC	8.0		*	
		15	TC	6.0		*	
		18	TC	5.0		*	
		21	TC	4.5		*	
		24	TC	4.1		*	
		27	TC	4.0		*	
		30	TC	4.0		*	
		33	TC	4.0		*	
		36	TC	4.1		*	
23	242231	03	TC	3.9		*	Water line
		06	TC	4.1		*	
		09	TC	4.3		*	DC = 0 inches
		12	TC	4.3		*	
		15	TC	4.1		*	
		18	TC	4.1		*	
		21	TC	4.1		*	
		24	TC	4.0		*	
		27	TC	4.0		*	
		30	TC	4.0		*	
24	245248	00	DS	1.1		*	West edge of
		00-06	SS			5.6	sidewalk
25	245290	00	DS	3.9		*	West edge of patio
		06	DS	5.8		*	under concrete
		09	DS	4.6		*	Horizontal Cave in

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
26	245300	03	TC	6.8		*	North of primary
		06	TC	7.1		*	structure
		09	TC	6.7		*	
		12	TC	5.9		*	DC = 15 inches
		15	TC	4.9		*	Based on the
		18	TC	4.5		*	deconvolution graph
		21	TC	4.3		*	
		24	TC	4.1		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
27	252229	03	TC	3.2		*	Flower bed
		06	TC	4.2		*	
		09	TC	5.3		*	DC = 24 inches
		12	TC	6.5		*	Based on the
		15	TC	6.4		*	deconvolution graph
		18	TC	5.7		*	
		21	TC	5.0		*	
		24	TC	4.3		*	
		27	TC	4.1		*	
		30	TC	4.1		*	
		33	TC	3.9		*	
		36	TC	3.9		*	
		39	TC	3.8		*	
28	253302	00	DS	1.7		*	Flower bed
29	269296	00	DS	2.6		*	
		06	DS	1.4		*	
30	274206	00	DS	2.5		*	South side of
		06	DS	1.2		*	primary structure
		00-06	SS			2.7	
31	276286	03	TC	3.5		*	Suspected abandoned
		06	TC	3.8		*	septic tank
		09	TC	4.0		*	
		12	TC	3.9		*	DC = 0 inches
		15	TC	4.0		*	
		18	TC	4.1		*	
		21	TC	4.1		*	
		24	TC	4.1		*	
		27	TC	4.2		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
31	276286	30	TC	4.1		*	
		33	TC	4.1		*	
		36	TC	4.2		*	
32	278204	03	TC	6.4		*	South of primary
		06	TC	6.1		*	structure
		09	TC	5.3		*	
		12	TC	4.7		*	DC = 9 inches
		15	TC	4.4		*	Based on the
		18	TC	4.1		*	deconvolution graph
		21	TC	4.1		*	
		24	TC	4.1		*	
		27	TC	4.1		*	
		30	TC	4.1		*	
		33	TC	3.9		*	
		36	TC	3.9		*	
33	278273	03	TC	3.3		*	Sewer line
		06	TC	3.5		*	
		09	TC	3.6		*	DC = 0 inches
		12	TC	3.6		*	
		15	TC	3.6		*	
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.7		*	
		30	TC	3.6		*	
		33	TC	3.7		*	
		36	TC	3.7		*	
		39	TC	3.7		*	
		42	TC	3.7		*	
		45	TC	3.7		*	
		48	TC	3.5		*	
		51	TC	3.5		*	
		54	TC	3.5		*	
		57	TC	3.4		*	
		60	TC	3.4		*	
		63	TC	3.3		*	
34	280285	00	DS	<1.0		*	Background
		00-06	SS			2.2	
		03	TC	2.8		*	North side of
		06	TC	3.2		*	primary structure
		09	TC	3.5		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
34	280285	12	TC	3.8		*	DC = 0 inches
		15	TC	3.9		*	
		18	TC	3.9		*	
		21	TC	3.9		*	
		24	TC	3.8		*	
		27	TC	3.8		*	
		30	TC	3.7		*	
		33	TC	3.6		*	
35	282301	00	DS	1.3		*	
		00-06	SS			4.1	
36	290204	03	TC	4.0		*	DC = 0 inches
		06	TC	4.3		*	
		09	TC	4.3		*	
		12	TC	4.2		*	
		15	TC	4.1		*	
		18	TC	4.0		*	
		21	TC	4.0		*	
		24	TC	4.0		*	
		27	TC	4.1		*	
		30	TC	4.0		*	
		33	TC	3.9		*	
		36	TC	3.9		*	
		39	TC	3.9		*	
		42	TC	4.0		*	
		45	TC	4.0		*	
		48	TC	3.9		*	
		51	TC	3.9		*	
		54	TC	3.9		*	
		57	TC	3.9		*	
		60	TC	3.9		*	
37	293205	03	TC	4.6		*	South of primary
		06	TC	4.9		*	structure
		09	TC	4.7		*	Auger refusal
		12	TC	4.4		*	
		15	TC	4.3		*	DC = 0 inches
		18	TC	4.3		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	In Situ Ra-226 (pCi/g) Spectr.	Chem Ra-226 (pCi/g)	Comments
38	302270	00	DS	<1.0		*	Suspected gas line

Measurement Types:
GB = GAD-6 Borehole
GS = GAD-6 Surface
DS = Delta Scintillometer
TC = Total Count Borehole
SS = Soil Sample
BH = Combined GAD-6 and Total Count Borehole

Notes:
DC = Depth of Contamination
* = No Soil Sample Taken
[n] = Reading Taken n-Inches Above Floor or Ground
Date of Survey = 04-24-85
Team Leader = RRV

RADRPT V85.1<850225.1330> Table 3.2

Radium Concentrations at Interior Locations

DOE ID #GJ-05828-MR 140 Miriam Avenue

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	In Situ Ra-226 (pCi/g) Spectr.	Chem Ra-226 (pCi/g)	Comments
1		00-05	SS			2.1	Concrete core
		03	TC	75.0		*	Laundry, storage
		06	TC	111.4		*	room
		09	TC	119.8		*	Auger refusal
		12	TC	110.1		*	
		15	TC	81.4		*	DC = 21 inches
		18	TC	53.9		*	Based on the
		21	TC	35.2		*	deconvolution graph
		24	TC	29.9		*	
2		00-06	SS			1.9	Concrete core
		06-12	SS			1.8	Moist, sandy soil
		03	TC	3.6		*	
		06	TC	4.3		*	DC = 0 inches
		09	TC	5.1		*	
		12	TC	5.5		*	
		15	TC	5.4		*	
		18	TC	5.2		*	
		21	TC	4.9		*	
		24	TC	4.7		*	
		27	TC	4.7		*	
		30	TC	4.6		*	
		33	TC	4.5		*	
		36	TC	4.3		*	
		39	TC	4.2		*	
		42	TC	4.2		*	
		45	TC	4.1		*	
		48	TC	4.0		*	
		51	TC	4.0		*	
		54	TC	4.0		*	
		57	TC	3.9		*	
		60	TC	3.8		*	
		63	TC	3.6		*	
		66	TC	3.3		*	
		69	TC	3.1		*	

Measurement Types:
- GB = GAD-6 Borehole
- GS = GAD-6 Surface
- DS = Delta Scintillometer
- TC = Total Count Borehole
- SS = Soil Sample
- BH = Combined GAD-6 and Total Count Borehole

Notes:
- DC = Depth of Contamination
- * = No Soil Sample Taken
- [n] = Reading Taken n-Inches Above Floor or Ground
- Date of Survey = 04-24-85
- Team Leader = RRV

Table 3.3
Summary of Interior Gamma Exposure Rates
DOE ID No. GJ-05828-MR 140 Miriam Avenue

Location *	Number of Readings Taken at Waist Level	Range at Waist Level (uR/h)	Mean at Waist Level (uR/h)	Number of Readings Taken at Surface	Range at Surface (uR/h)	Mean Surface (uR/h)
LAUNDRY AND STORAGE ROOM	8	15-43	27	8	16-51	32
PRIMARY STRUCTURE	*	*	*	*	15-17	*

* The historical data indicate the absence of interior contamination at this property. This information was investigated by performing a walking gamma scan. These areas and the ranges of gamma measurements are shown in Appendix Figure 3.3. Exposure rates in the laundry and storage room are also shown in Appendix Figure 3.3.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-05828-MR

AREA	CALCULATIONS(ft)		SF		DEPTH(ft)		CF		CUBIC YARDS
EXTERIOR									
Concrete									
D	14 x 19	=	266						
	3 x 2	=	6						
			272	x	0.3	=	82		
E	82 x 1	=	82	x	0.5	=	41		
G	70 x 8	=	560						
	12 x 12	=	144						
	9 x 3	=	<27>						
			677	x	0.3	=	203		
	Volume of Concrete					=	326	= 326/27 =	12
Contaminated Fill									
B	12 x 3	=	36	x	2.0	=	72		
C	28 x 35	=	980						
	5 x 20	=	100						
	37 x 13	=	481						
	10 x 52	=	520						
	3 x 62	=	186						
	25 x 5	=	125						
	13 x 5	=	65						
	13 x 10	=	130						
	9 x 10	=	90						
			2,677	x	1.0	=	2,677		
D	14 x 9	=	126						
	7 x 10	=	70						
	2 x 3	=	6						
			202	x	1.0	=	202		

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-05828-MR

AREA	CALCULATIONS(ft)		SF		DEPTH(ft)		CF			CUBIC YARDS
E	55 x 5	=	275							
	62 x 5	=	310							
	10 x 50	=	500							
	20 x 55	=	1,100							
	7 x 37	=	259							
	23 x 26	=	598							
	20 x 10	=	200							
	5 x 70	=	350							
			3,592	x	1.3	=	4,670			
F	15 x 5	=	75	x	1.8	=	135			
G	4 x 66	=	264	x	1.0	=	264			
H	13 x 3	=	39	x	1.0	=	39			
I	12 x 5	=	60	x	0.8	=	48			
J	12 x 4	=	48							
	40 x 10	=	400							
	10 x 10	=	100							
	10 x 5	=	50							
	4 x 5	=	20							
			618	x	0.5	=	309			
K	3 x 4	=	12	x	0.5	=	6			
	Volume of Contaminated Fill					=	8,422	=	8,422/27	= 312
	TOTAL VOLUME - EXTERIOR									= 324

See Appendix Figure 3.5b For Areas

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-05828-MR Page 1 of 2

EXTERIOR		
Remove identified residual radioactive material 324 cy @ $14.50/cy	$	4,698
Remove concrete drive, patio, and curb 1,031 sf @ $1.48/sf		1,526
Saw-cut concrete patio 14 lf @ $2/lf		28
Remove/replace chainlink fence 101 lf @ $2.60/lf		263
Replace concrete drive, patio, and curb 1,031 sf @ $1.50/sf		1,547
Replace area with soil/compost (weed-free) 154 cy @ $12.50/cy		1,925
Replace area with roadbase 37 cy @ $11.50/cy		426
Replace area with topsoil 133 cy @ $9.50/cy		1,264
Replace sod 2,656 sf @ $.25/sf		664
Remove/replace sprinkler system 6,000 sf @ $.15/sf		900
Remove, store, replace personal property		100
Landscaping		100
TOTAL EXTERIOR	$	13,441

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-05828-MR

TOTAL EXTERIOR	$ 13,441
TOTAL INTERIOR	0
ACCESS CONTROL	250
SUBTOTAL	$ 13,691
CONTINGENCY @ 10%	1,369
SUBTOTAL	$ 15,060
CONTRACTOR OVERHEAD & PROFIT @ 25%	3,765
GRAND TOTAL	$ 18,825

VG081685
REA05828/REA-KL018/LMR

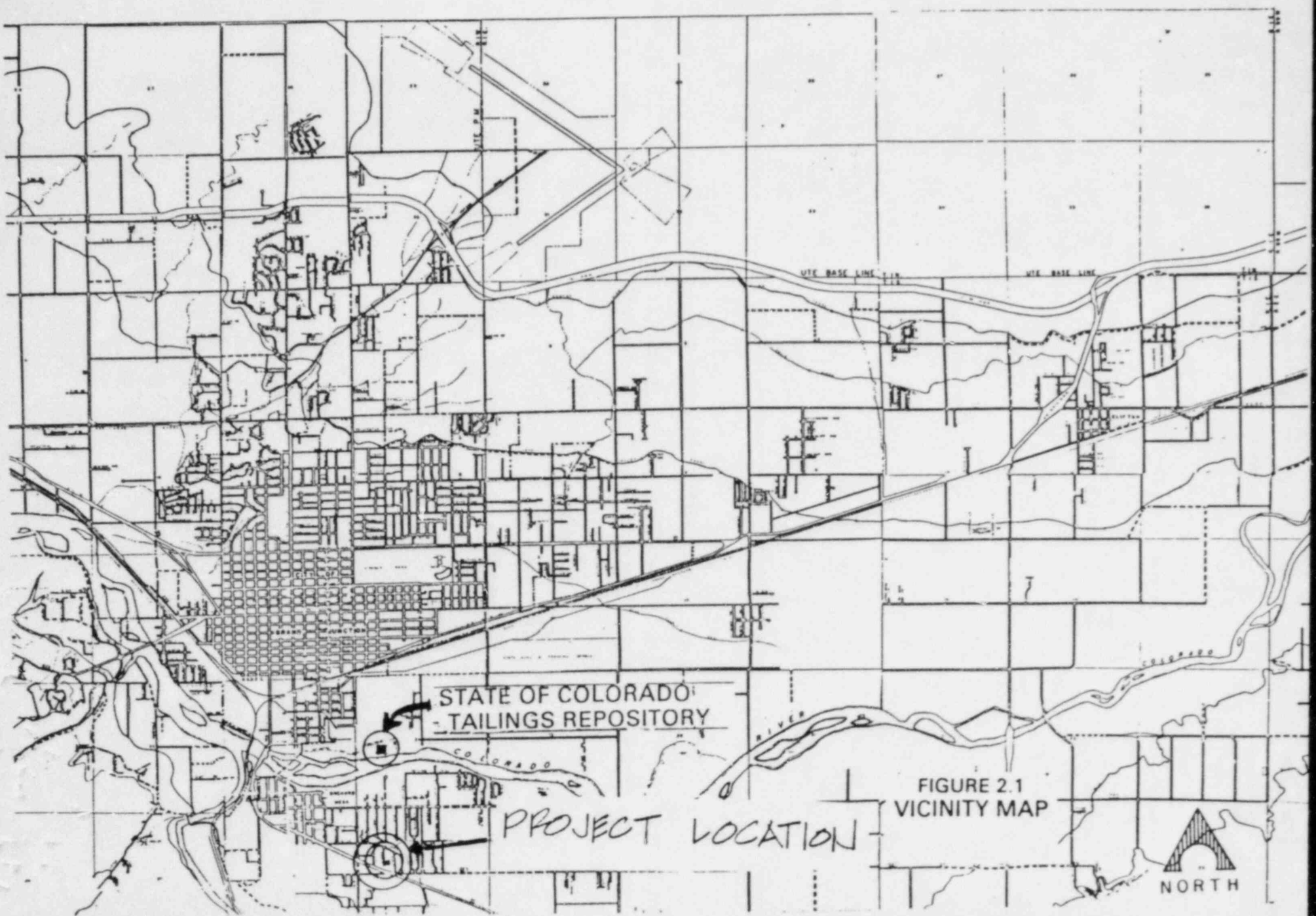
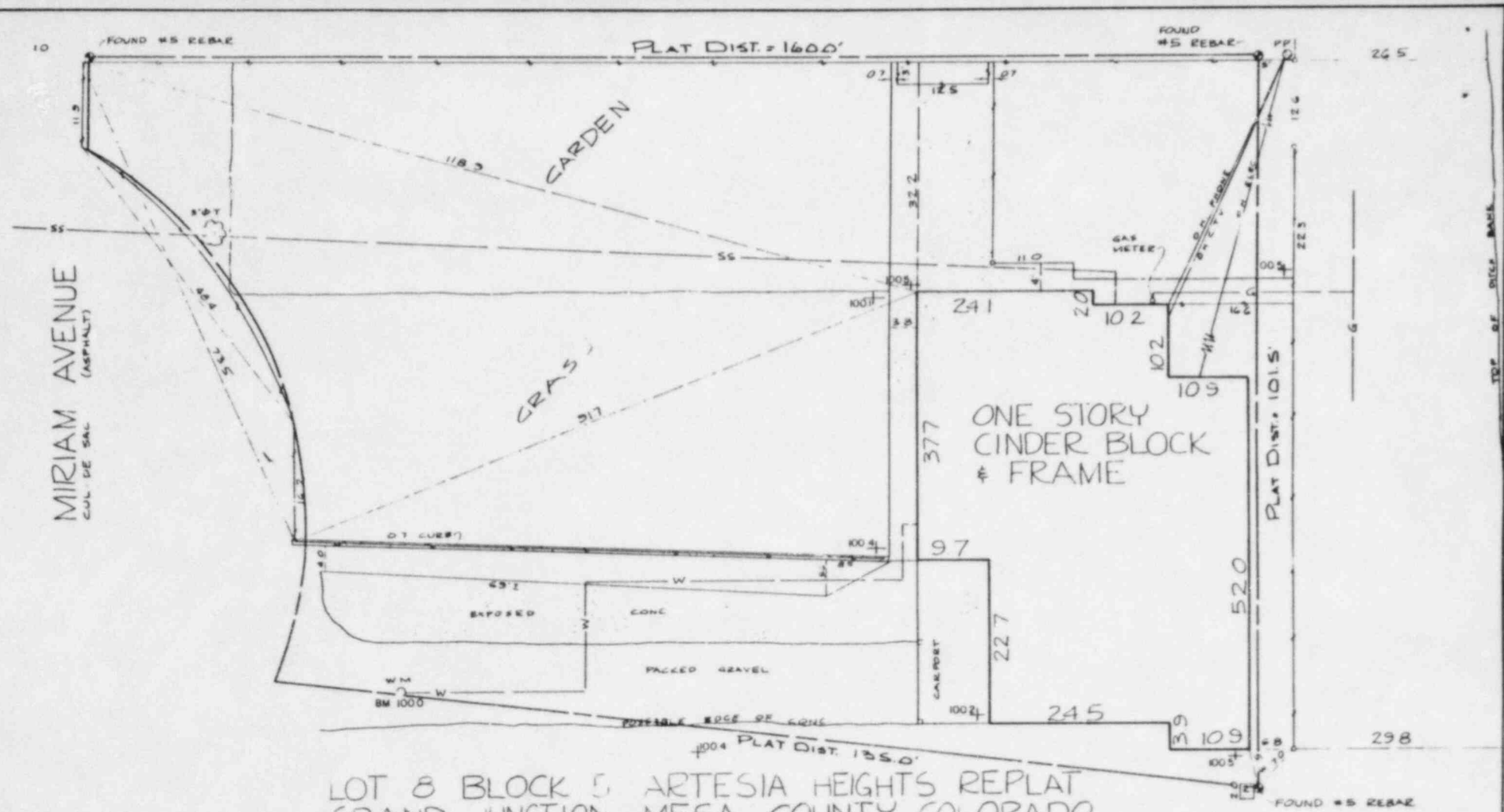


FIGURE 2.1
VICINITY MAP



This drawing, prepared for the Uranium Mill Tailings Remedial Action Project, is for the sole use of the U.S. Department of Energy and its contractors. It is not a land survey plat or an improvement survey plat and is not to be relied upon for the establishment of fence, building, or other future improvement lines.

FIGURE 2.2 SITE PLAN

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECT OFFICE COLORADO	DOE ID NO GJ 05828 MR
ADDRESS 140 MIRIAM AVENUE GRAND JUNCTION, COLORADO	
SURV ELB 4/2/85 DRAFT TJ 4/6/85	CK AS [illegible]
DRAWING NO 3 C 615 F 1	SHEET 1 OF 1

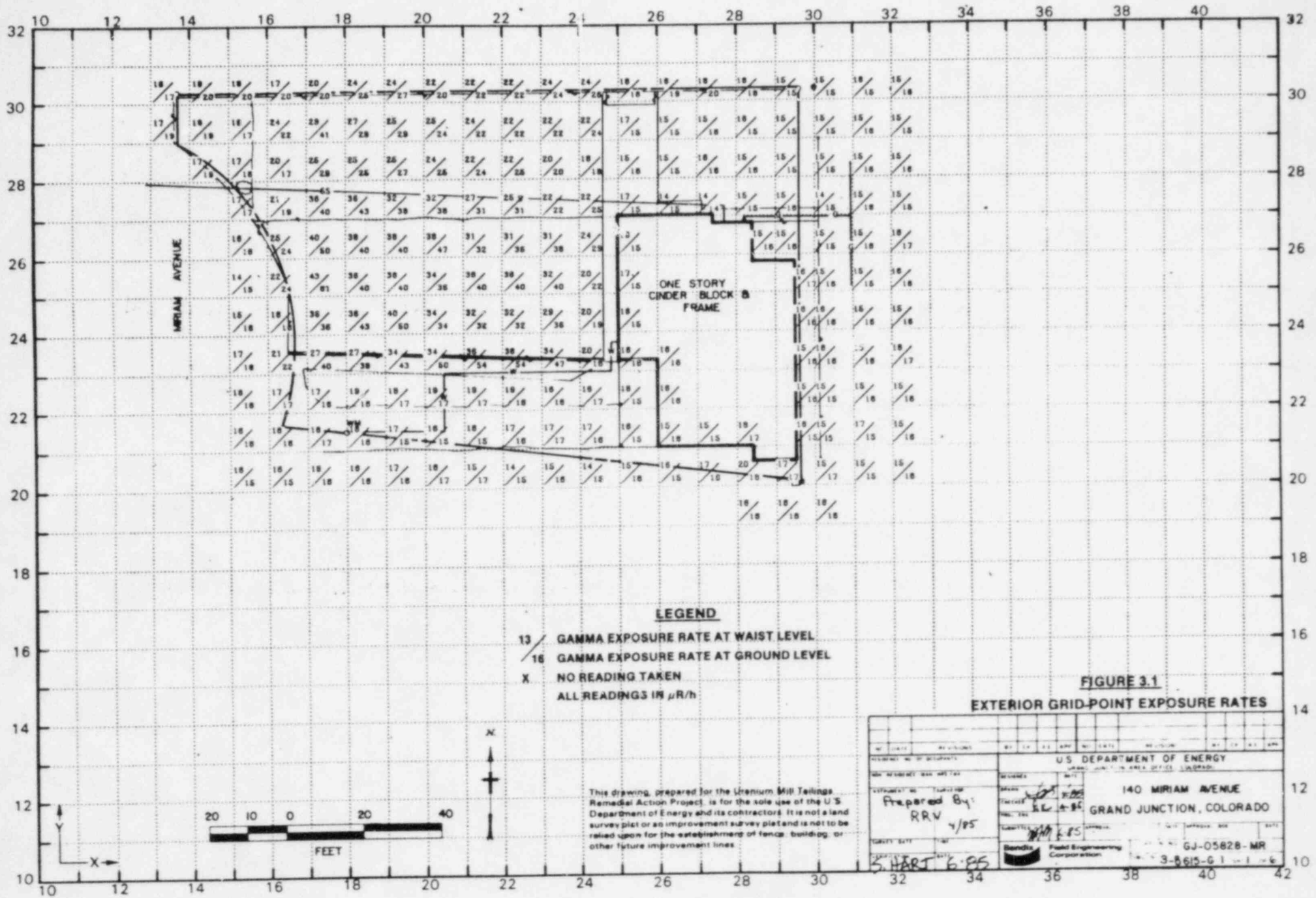


FIGURE 3.1

EXTERIOR GRID-POINT EXPOSURE RATES

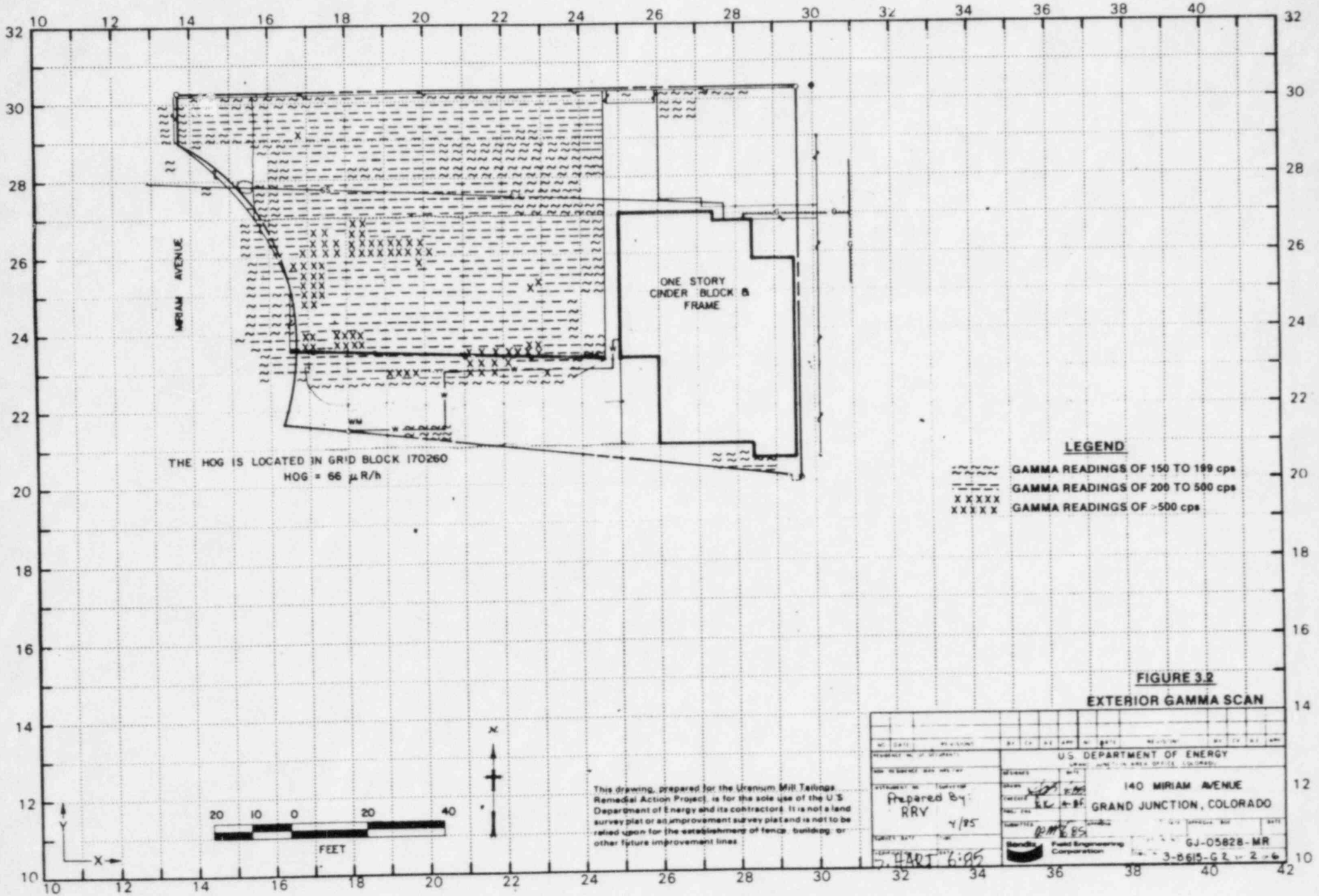


FIGURE 3.2

EXTERIOR GAMMA SCAN

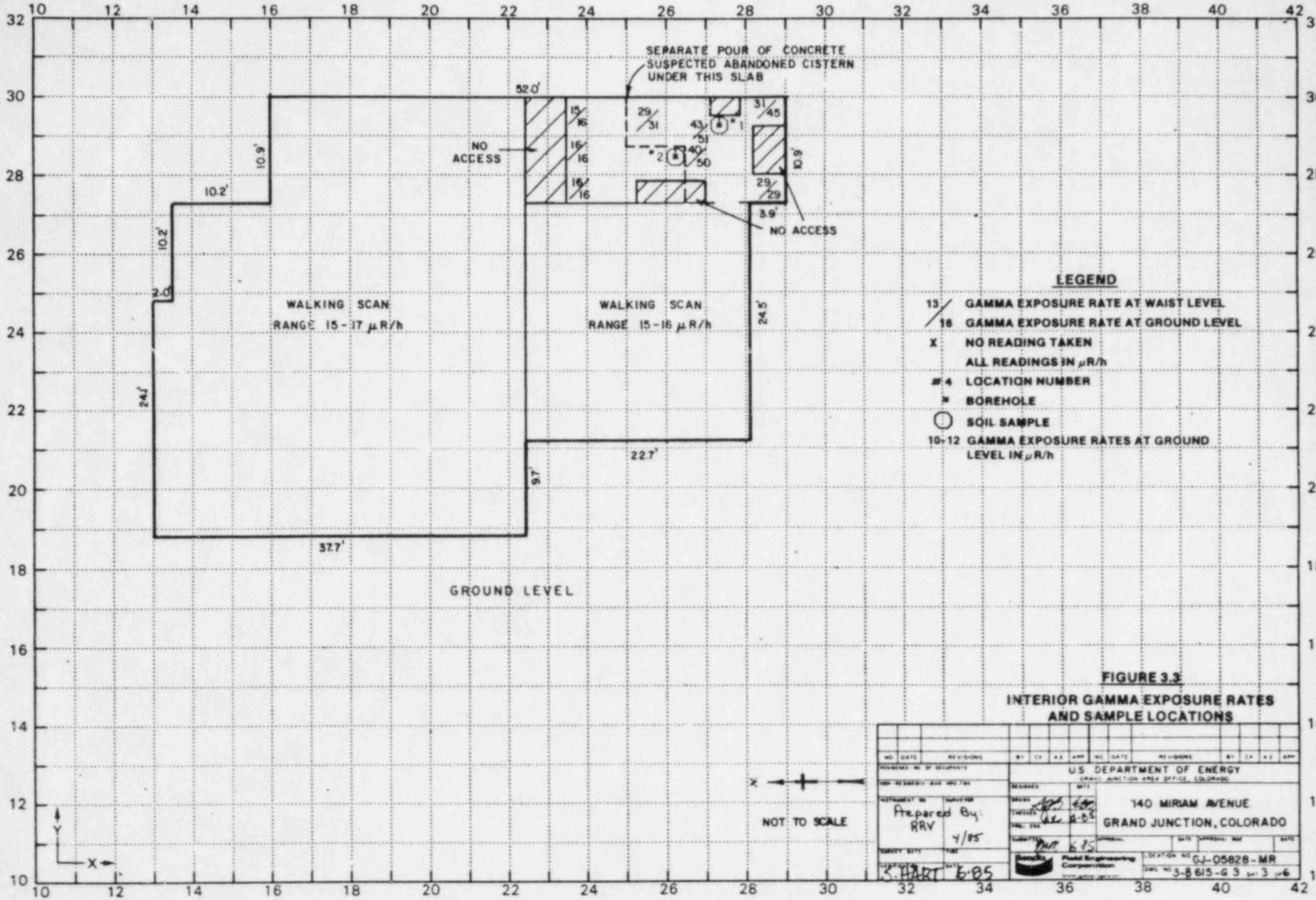


FIGURE 3.3

INTERIOR GAMMA EXPOSURE RATES AND SAMPLE LOCATIONS

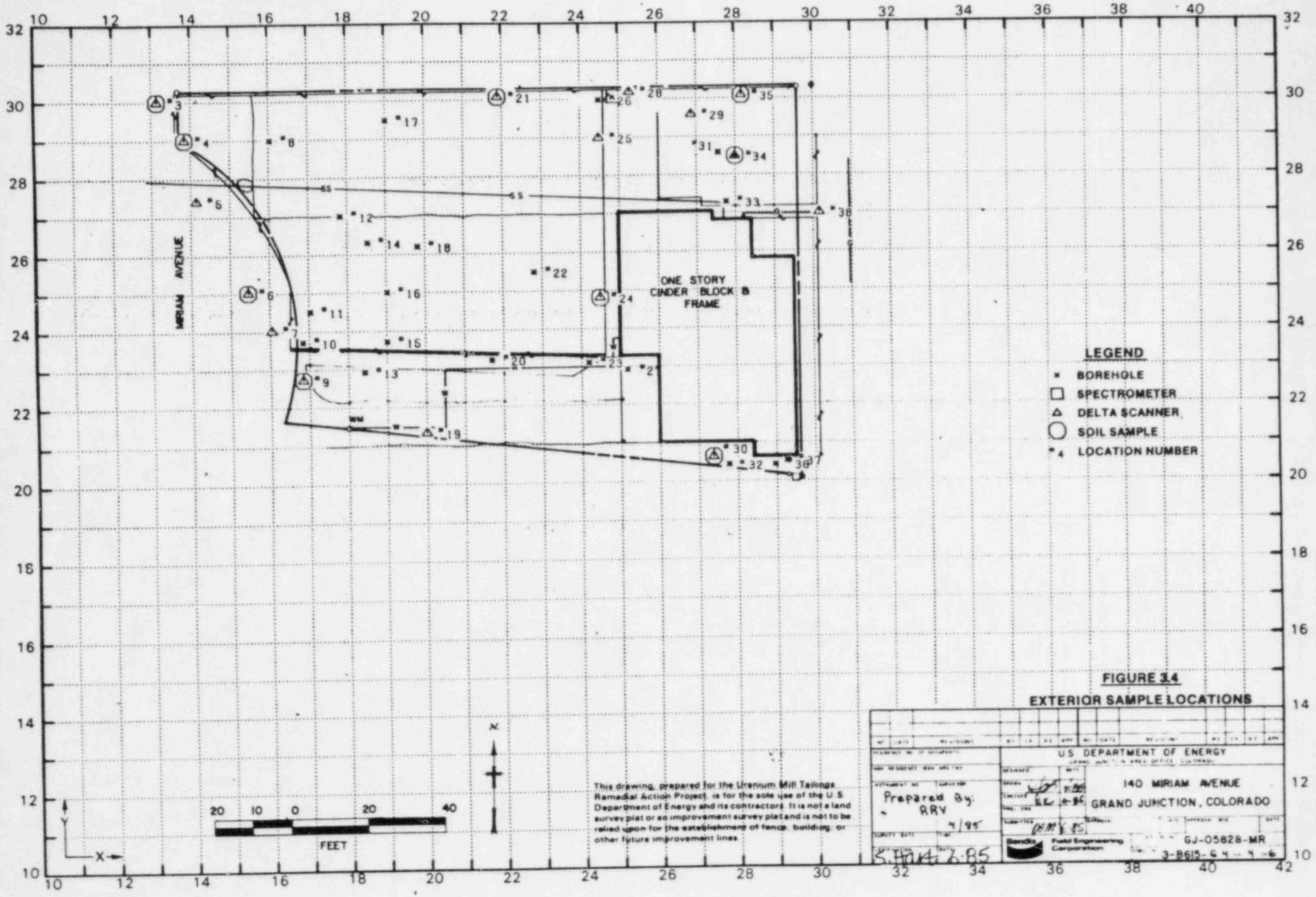


FIGURE 3.4

EXTERIOR SAMPLE LOCATIONS

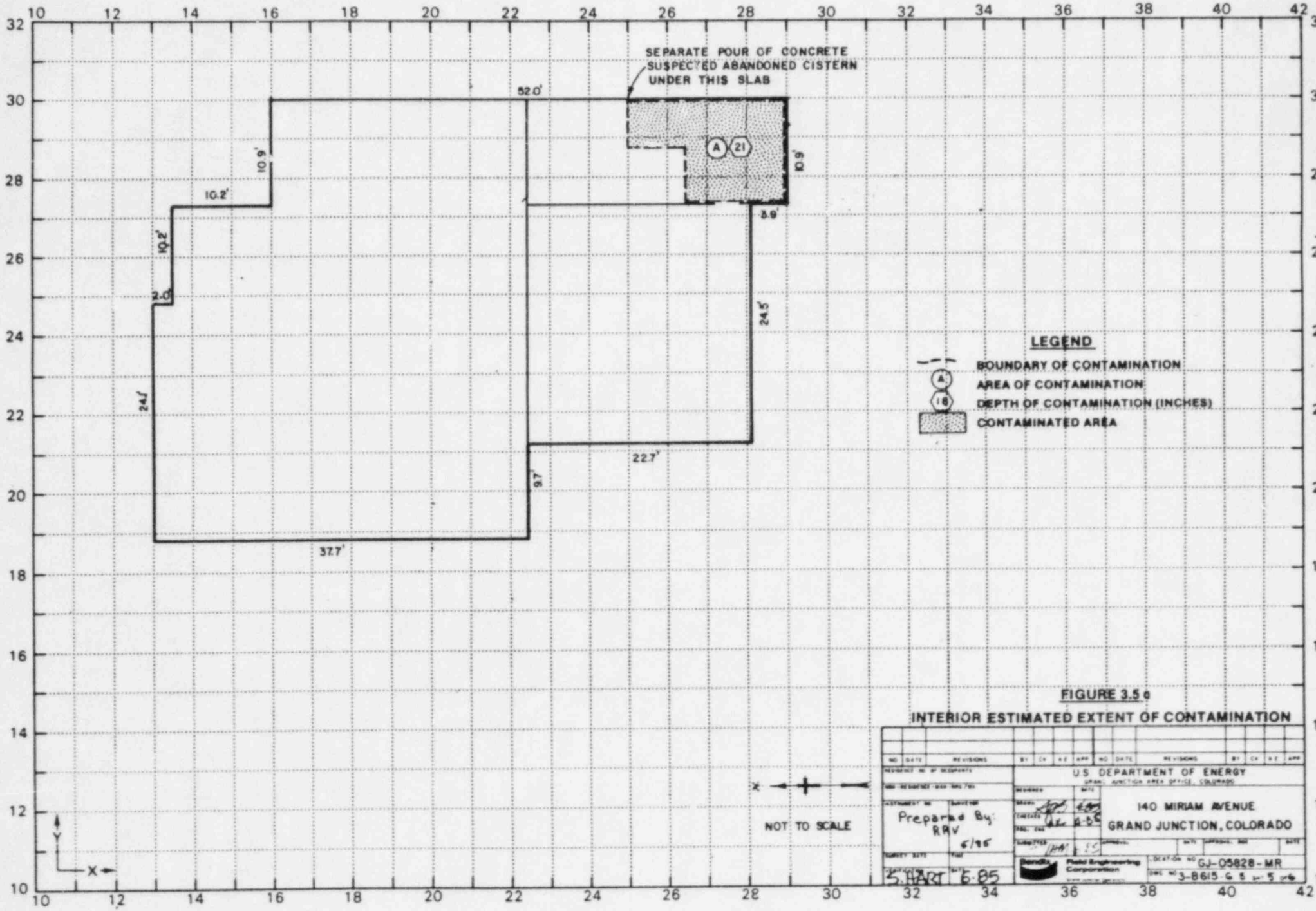


FIGURE 3.5 c

INTERIOR ESTIMATED EXTENT OF CONTAMINATION

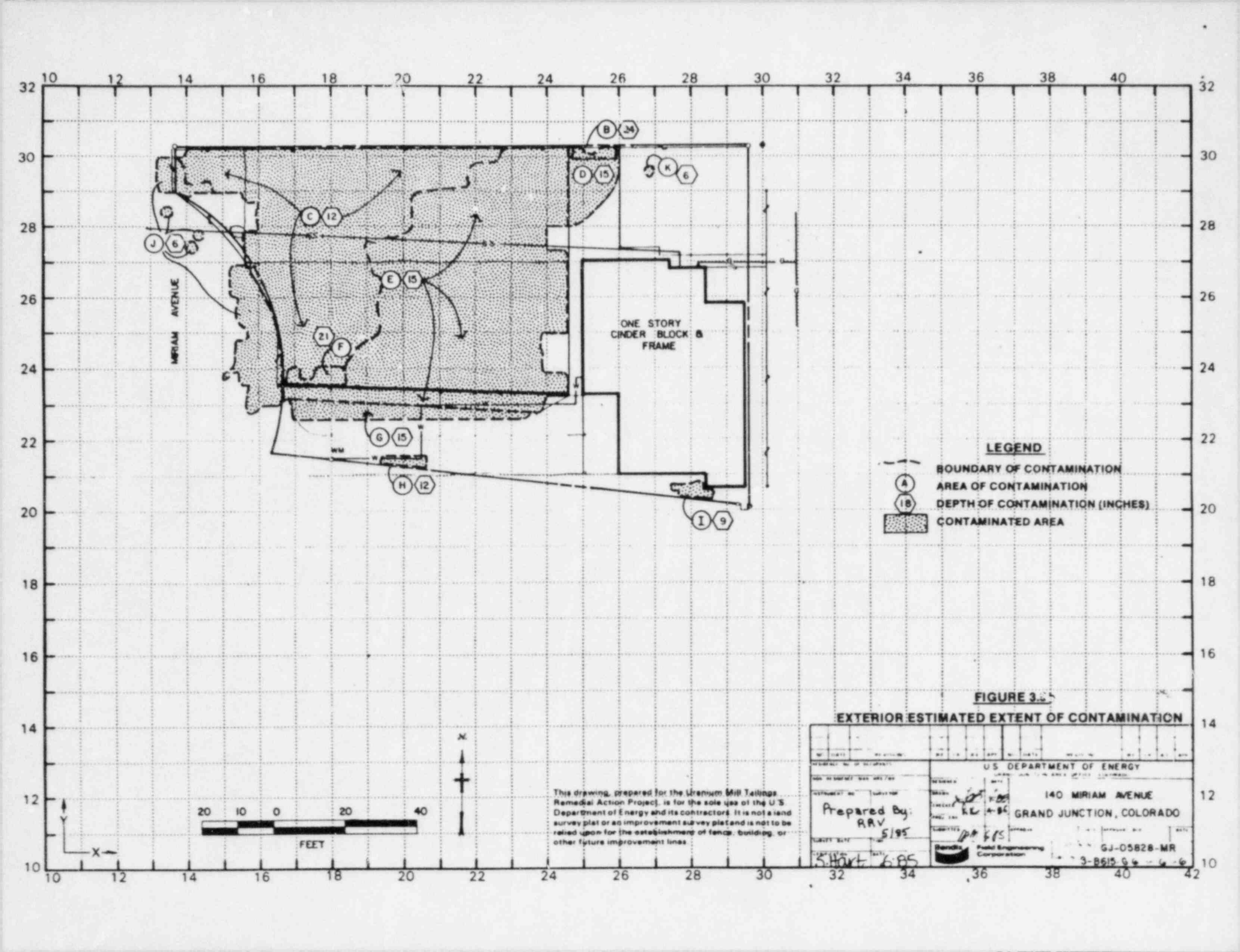


FIGURE 3.
EXTERIOR ESTIMATED EXTENT OF CONTAMINATION

3/85

DOE ID NO. GJ-05828-MR Date May 10, 1985

U.S. DEPARTMENT OF ENERGY
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT
GRAND JUNCTION VICINITY PROPERTIES

Official Survey Report

Property Address 140 Miriam Avenue

Property Owner Thomas G. Perry

Address of Owner (if different from above) _____

Report Prepared By Robert R. Vialpando

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

1 ___ 1 No evidence of residual radioactive material on surveyed property.

1 XX 1 Residual ractioactive materials found at the following locations:

1 XX 1 In open areas.

1 ___ 1 Under or around exterior improvements.

1 ___ 1 Under or around a typically nonoccupied structure.

1 XX 1 Under or around a typically occupied structure.

II. RESULTS OF RADIOLOGIC ASSESSMENT

1 ___ 1 Levels of radiation from residual radioactive materials, if any, do not exceed EPA Standards and no action is required under the Uranium Mill Tailings Remedial Action Project.

1 XX 1 Levels of radiation from residual radioactive materials exceed EPA Standards such that Remedial Action is recommended and will be accomplished, with your consent, as soon as budget and schedule permit.

cc:
G. A. Franz, III, GJ/CDH
J. Themelis, Mgr. UMTRA Proj. Off.

HIG = 51 uR/h
HOG = 66 uR/h

ALLIED Bendix Aerospace

Bendix Field Engineering Corporation
P. O. Box 1569
Grand Junction, CO 81502-1569
Telephone (303) 242-8621
Telex 454-338

May 29, 1985

Colorado Department of Health
222 South 6th Street
Grand Junction, Colorado 81501

ATTN: Elaine Brummett

Dear Elaine:

The following is in response to your questions and comments during the Technical Review concerning Department of Energy (DOE) Identification (ID) number GJ-05828-MR, 140 Miriam Avenue, conducted on 24 April 1985.

Concerning questions 1 through 3. A new exterior estimated extent of contamination map has been generated, to correct errors made on the depths of contamination at Locations 4, 7, 8, 14, 16, and 17.

4. According to the owner (Thomas G. Perry) and by visual observation, the utility lines exit the primary structure as shown on the surveyor's sketch (photo copy).

Thank you for your time and cooperation. If you should have additional questions or comments you may contact me at 242-8621, extension 472.

Sincerely,

Robert R. Vialpando

Robert R. Vialpando
RSD Survey Team Leader

RRV:pr

CDH.LETTER:05858.VIALPANDO

MEMORANDUM

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado 81501

DATE: April 24, 1985

TO: Files

FROM: Robert R. Vialpando

SUBJECT: Team Leader Notes - GJ-05828-RS

Address: 140 Miriam Street

Owner: Thomas G. Perry

Telephone: 245-2685

Weather: Partly cloudy and cool.

Occupancy: Five

Team Members

R.R. Vialpando (Team Leader)	C. Adams
D. Bell	B. Beltz
D. Dow	L. Kula
H. Mattison	P. Tuhey

Instruments

Scintillometers - C-1127, C-1128, C-1151, C-1185, C-1247, C-1033
Deltas - C-3937, C-3940, C-3942
Total Counts - C-3957, C-4006

Colorado Department of Health (CDH) indicates contamination to be located in the south yard adjacent to the primary structure and in the north yard along the fence line. No Oak Ridge National Laboratoary (ORNL) data available, this property was a Bendix spillover inclusion survey. 24 April 1985, 0830.

Bendix team members were met by Mr. Perry. Approval for site survey was given. Family consisted of Mr. and Mrs. Perry and three children; ages 7, 9, and 11 years old. Mr. Perry stated that the previous owner had hauled in mill tailings to deactivate the excessive alkaline soil. Mr. Perry also mentioned that there was a possible abandoned septic tank in the north yard adjacent to the primary structure in 1982. Utility lines were field located by the Bendix team members and verified by Mr. Perry.

An interior walking scan was performed in the primary structure, also in the attached garage, laundry, and storage room. No elevated readings were found in the living quarters or garage. The laundry and storage room showed readings excessively high to background.

There were visible signs indicating two separate pours of concrete in the storage and laundry room. The older pour showing the elevated readings.

Two interior locations were designated. The first having an auger refusal at 24 inches. There were visible tailings sighted after the concrete core was removed from the hole. The hole was then logged with a total count meter, the measurements taken were considerably higher than that of background. Location 2 was also cored then logged with the total count meter. The measurements encountered were basically background except for measurements taken between 18 to 19 inches, which are believed to be shine from the contaminated area. Further methods of investigation to clarify tailings involvement were taken from the exterior.

Two boreholes were augered adjacent to the south wall of the building, also footing/foundation data was collected. The later information led the Bendix team leader to suspect an abandoned cistern located in that area.

On the exterior, 10-foot grids were laid out. The property is approximately 100 feet by 147 feet in size. An exterior gamma scan and grid-point exposure-rate measurement were taken to verify CDH and Bendix data. Elevated measurements were detected in the north, west, and south yards. These areas were further investigated by auger holes, which were then logged with a total count meter. Elevated counts were essentially surface contamination being detected. In the north yard adjacent to the concrete slab delta scintillometer measurements were taken horizontally under the concrete slab to a depth of 16 inches. The soil under the slab caved in, preventing accurate measurements to

be taken. Another location was designated in the flower bed along the fence line. A delta and auger borehole were performed. Measurements taken indicate contamination to be under the concrete slab and should be closely monitored during remedial action. This statement shall be entered in the Radiologic and Engineering Assessment (REA). The flower bed soil was level to the concrete slab.

Utility lines investigated by auger holes and totsl count measurements were the sewer and water lines. Also, the suspected septic tank, which is believed to be nonfunctional was field located in the north yard (it was buried under 6-inches of dirt).

The Bendix team members were unsuccessful in locating the gas line. A surface delta was performed over the approximate location of the gas line using the surveyors property location map. There was no visual sign when a depth hole of 42 inches was dug. Several surface and 6-inch deltas were performed outside the property boundary on the city street to prove that the elevated readings shown there were shine from the contaminated area.

Nine soil samples were brought back for gamma analysis.

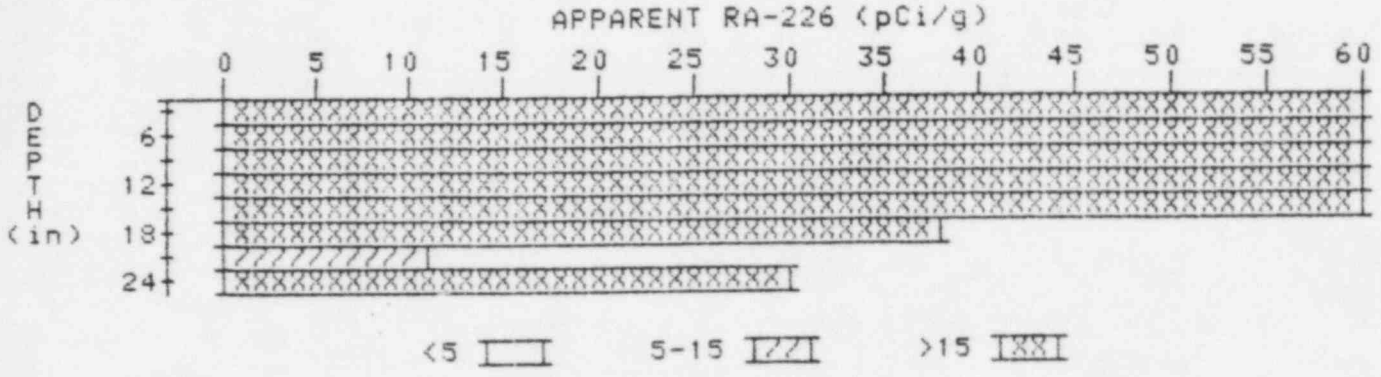
A spillover map was generated for the property south, adjacent to Department of Energy (DOE) Identification (ID) number GJ-05828 (address: 142 Miriam Avenue, location: DOE ID number GJ-43729). No structure is present at this property. It is believed to be an abandoned artesian well.

All actions and work details were performed in a safe manner. No accidents occurred while on the site survey.

Bendix team members were frisked for possible contamination. No contamination was found on personnel.

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 1
LOCATION:

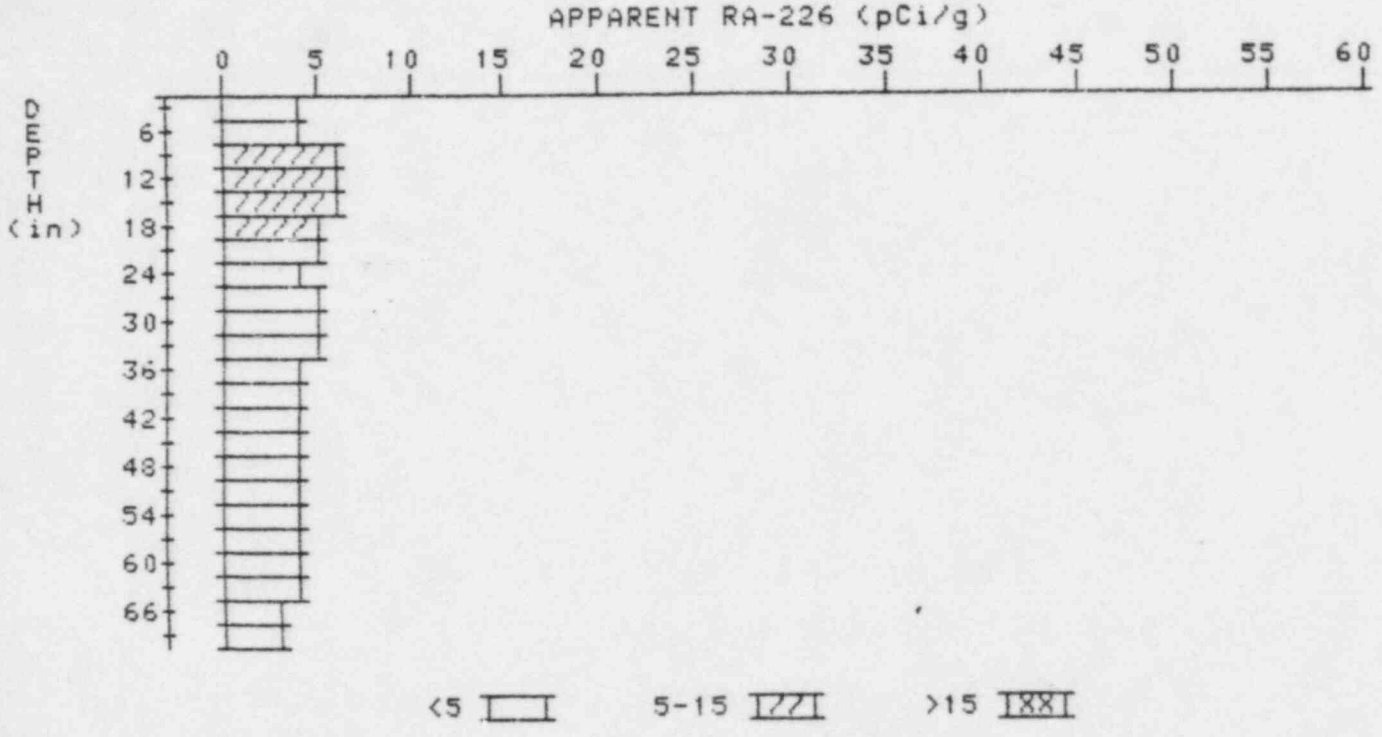


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	75.0	75.0
6	111.4	161.2
9	119.8	152.0
12	110.1	143.9
15	81.4	79.3
18	53.9	38.3
21	35.2	11.4
24	29.9	29.9

*DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 2
LOCATION:



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.6	3.6
6	4.3	4.1
9	5.1	5.8
12	5.5	6.4
15	5.4	5.6
18	5.2	5.4
21	4.9	4.7
24	4.7	4.3
27	4.7	4.9
30	4.6	4.6
33	4.5	4.7
36	4.3	4.1
39	4.2	4.0
42	4.2	4.4
45	4.1	4.1

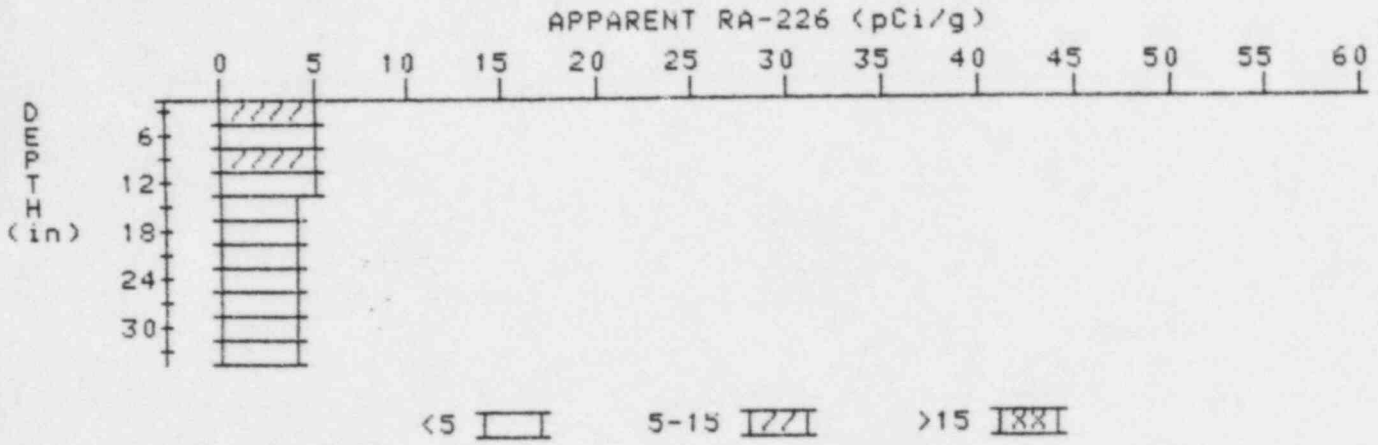
48	4.0	3.8
51	4.0	4.0
54	4.0	4.2
57	3.9	3.9
60	3.8	4.0
63	3.6	3.8
66	3.3	3.1
69	3.1	3.1

'DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

8

PROPERTY NUMBER: GJ-05328-MR
HOLE NUMBER: 8
LOCATION: 160290

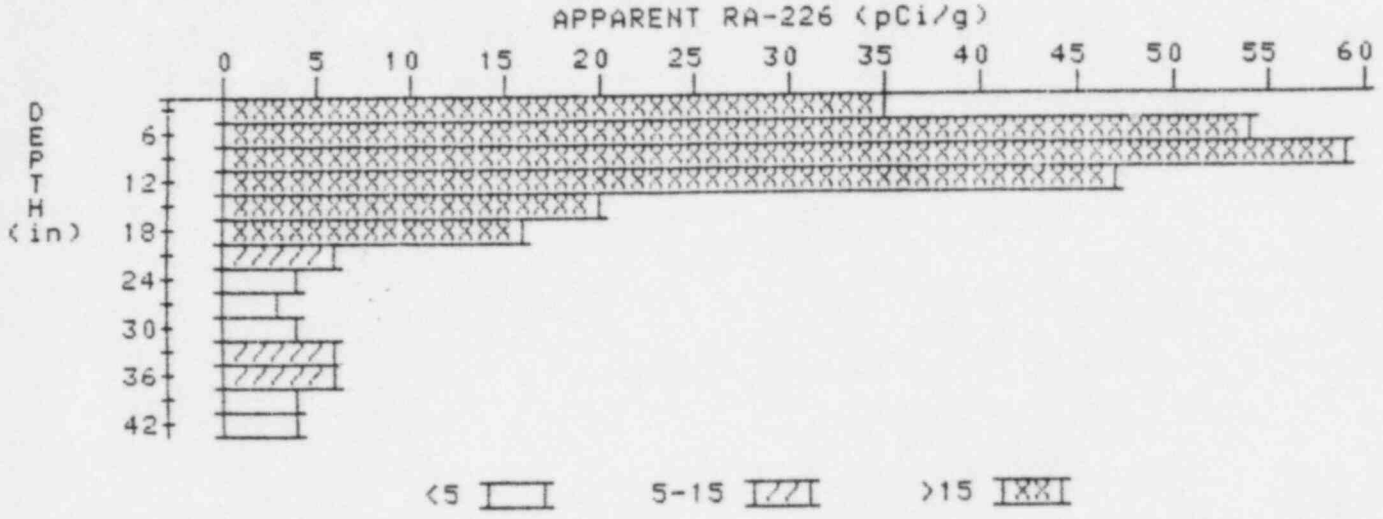


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.4	5.4
6	5.1	4.9
9	4.9	5.1
12	4.6	4.6
15	4.3	3.8
18	4.3	4.5
21	4.2	4.2
24	4.1	3.9
27	4.1	4.1
30	4.1	4.3
33	4.0	4.0

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

10

PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 10
LOCATION: 168237

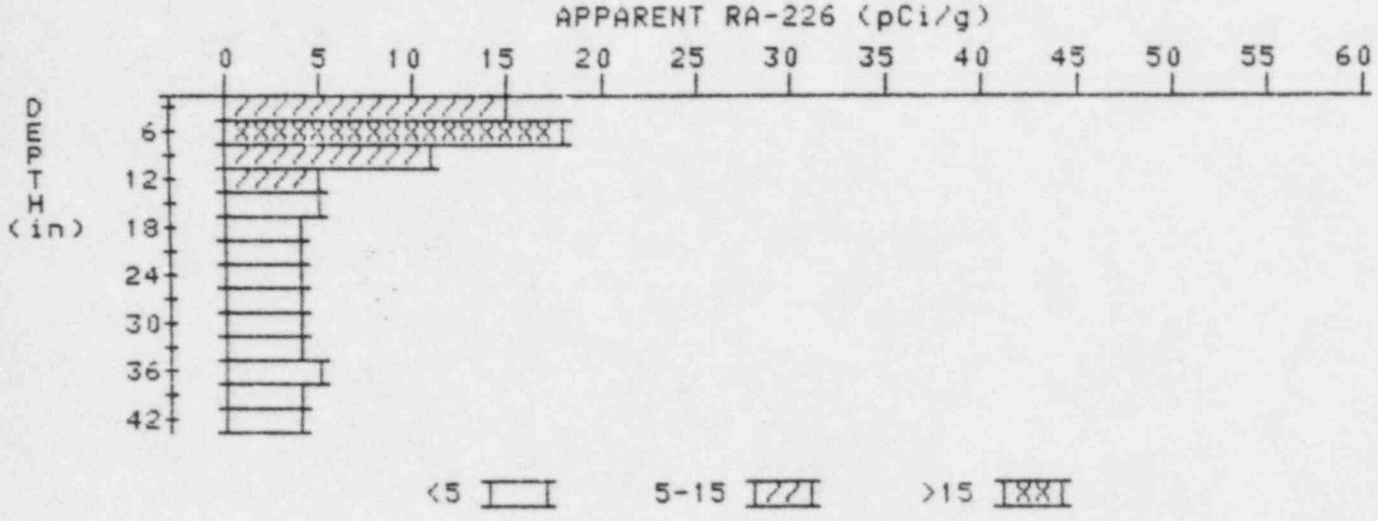


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	34.8	34.8
6	42.9	54.5
9	44.5	58.9
12	38.0	47.1
15	26.4	20.4
18	18.2	15.9
21	11.3	5.8
24	7.5	4.1
27	5.6	3.1
30	5.1	4.0
33	5.2	5.7
36	5.0	5.7
39	4.4	3.5
42	4.3	4.3

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 11

PROPERTY NUMBER: GJ-05829-MR
HOLE NUMBER: 11
LOCATION: 170245

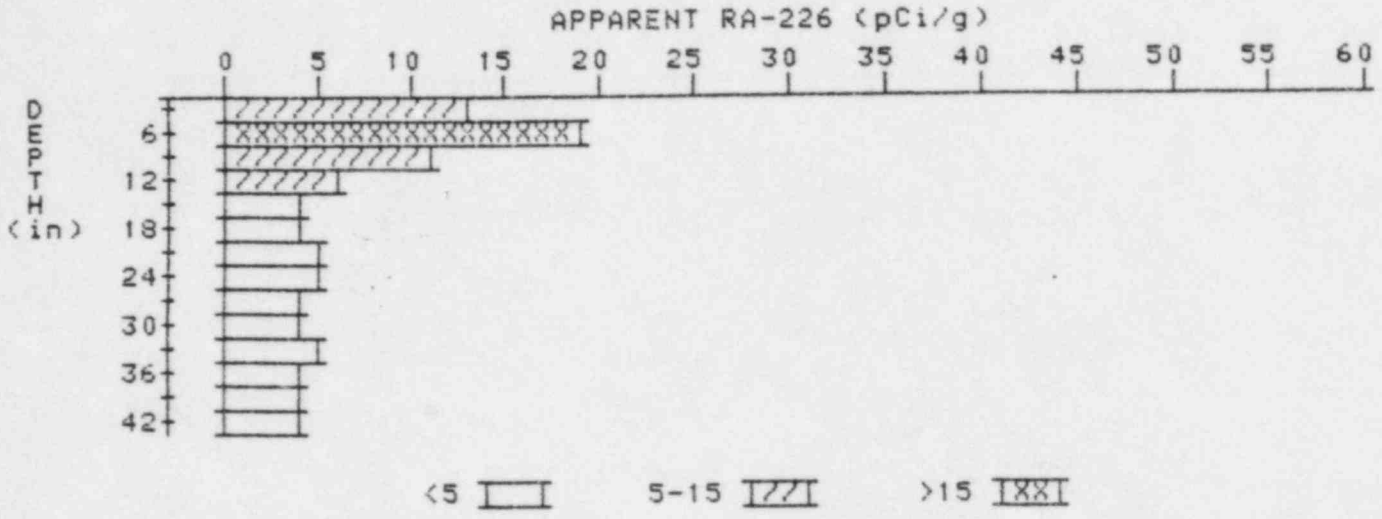


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	14.6	14.6
6	13.8	17.9
9	10.7	10.7
12	7.6	5.1
15	5.9	4.7
18	4.9	4.2
21	4.3	3.8
24	4.0	3.6
27	3.9	3.7
30	3.9	3.9
33	3.9	3.7
36	4.0	4.5
39	3.8	3.6
42	3.7	3.7

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 12

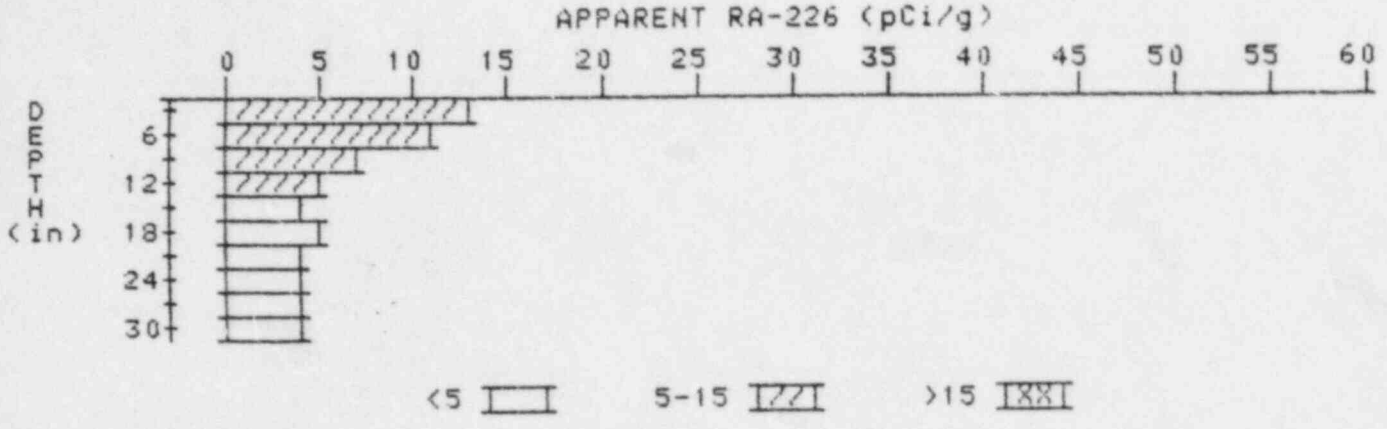
PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 12
LOCATION: 178270



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	13.2	13.2
6	13.5	19.0
9	10.7	11.1
12	7.7	5.6
15	5.9	4.1
18	5.1	4.2
21	4.8	4.6
24	4.6	4.6
27	4.4	4.0
30	4.4	4.4
33	4.4	4.6
36	4.3	4.3
39	4.2	4.2
42	4.1	4.1

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

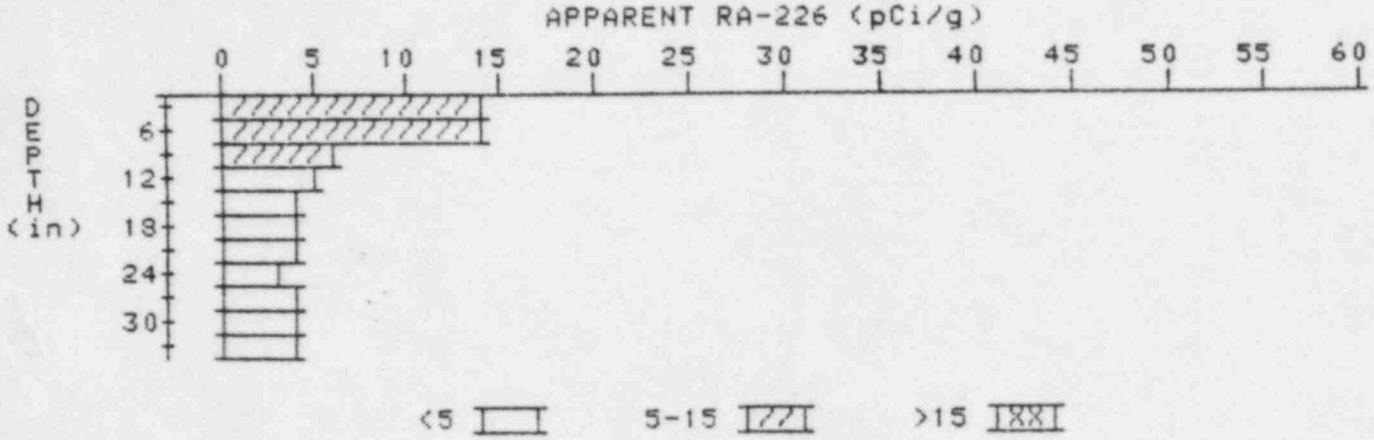
PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 13
LOCATION: 184229



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	12.9	12.9
6	10.6	10.8
9	8.2	7.1
12	6.4	5.2
15	5.3	4.2
18	4.8	4.6
21	4.4	3.9
24	4.3	4.3
27	4.2	4.0
30	4.2	4.2

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

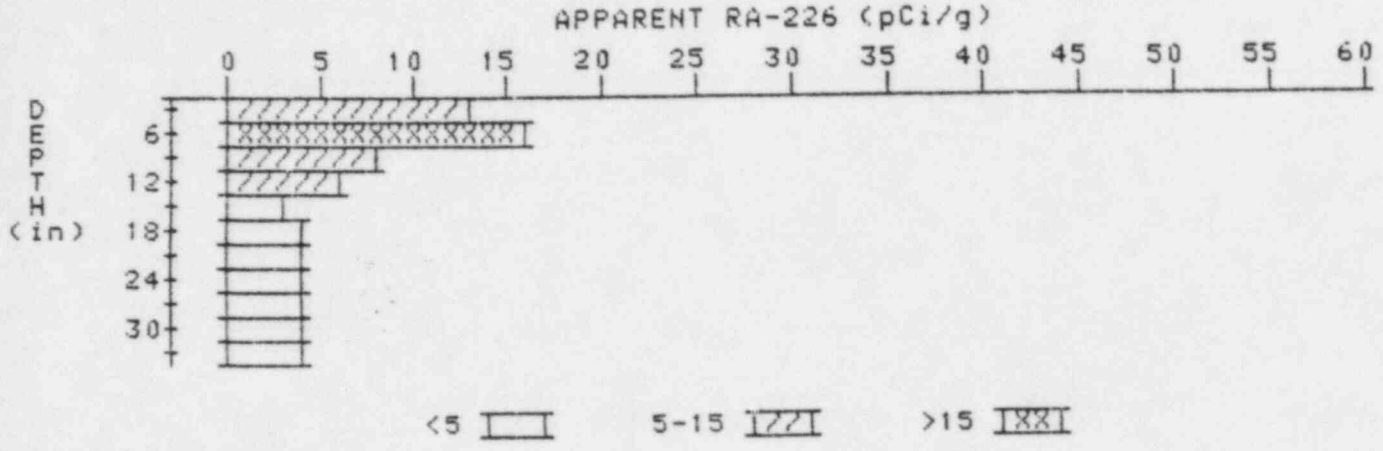
PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 14
LOCATION: 185263



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	14.3	14.3
6	12.1	14.4
9	8.6	6.3
12	6.4	4.6
15	5.2	4.3
18	4.5	3.8
21	4.2	4.2
24	3.9	3.2
27	4.0	4.4
30	3.9	3.9
33	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 15

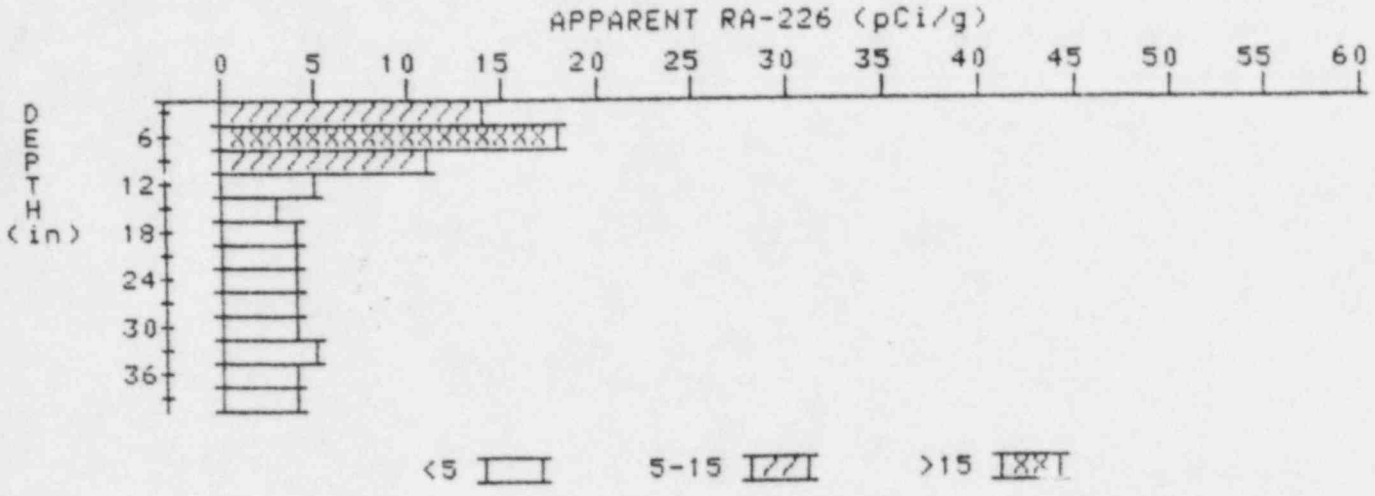
PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 15
LOCATION: 190237



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	13.4	13.4
6	12.3	15.7
9	9.3	8.2
12	6.9	5.7
15	5.2	3.1
18	4.7	4.3
21	4.4	4.2
24	4.2	3.8
27	4.2	4.4
30	4.1	3.7
33	4.2	4.2

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 16
LOCATION: 190250

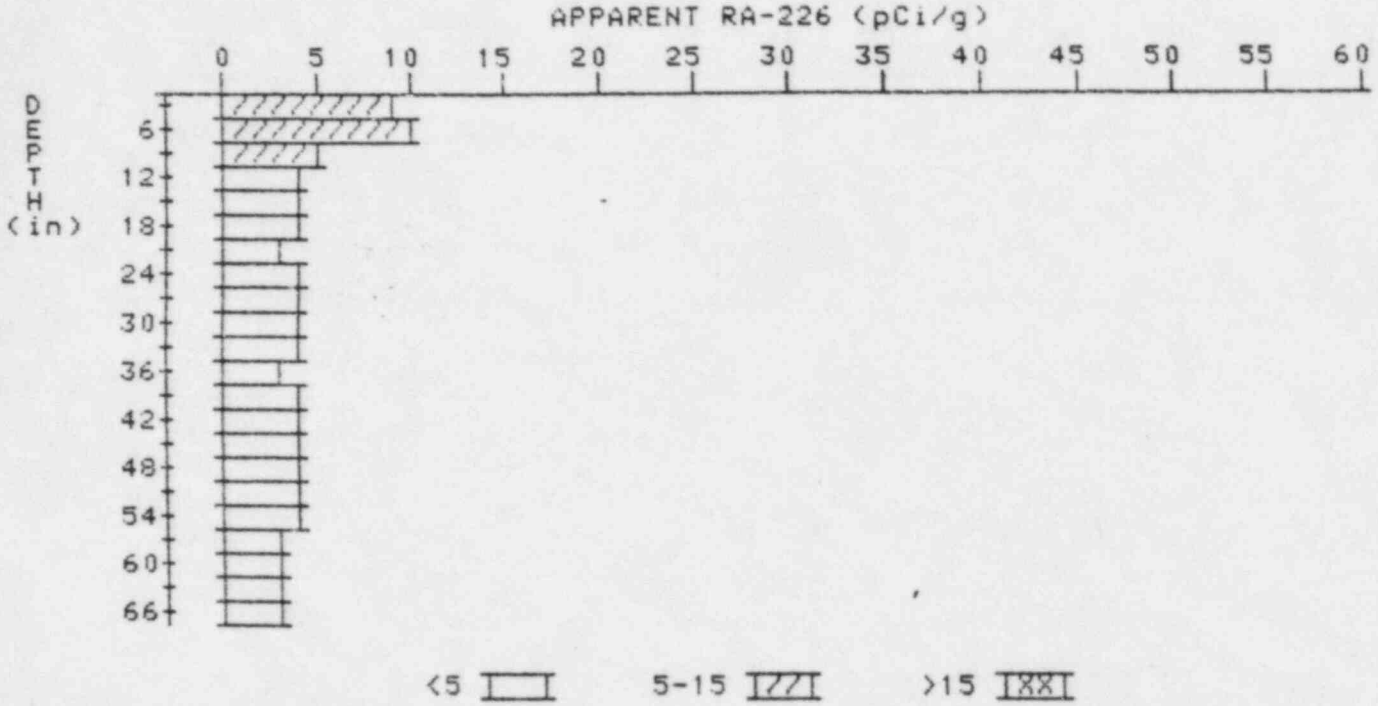


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	14.3	14.3
6	13.6	17.5
9	10.7	11.4
12	7.4	4.9
15	5.5	3.4
18	4.8	4.3
21	4.4	4.0
24	4.2	3.8
27	4.2	4.2
30	4.2	4.0
33	4.3	4.7
36	4.2	4.2
39	4.1	4.1

'DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 17

PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 17
LOCATION: 190295



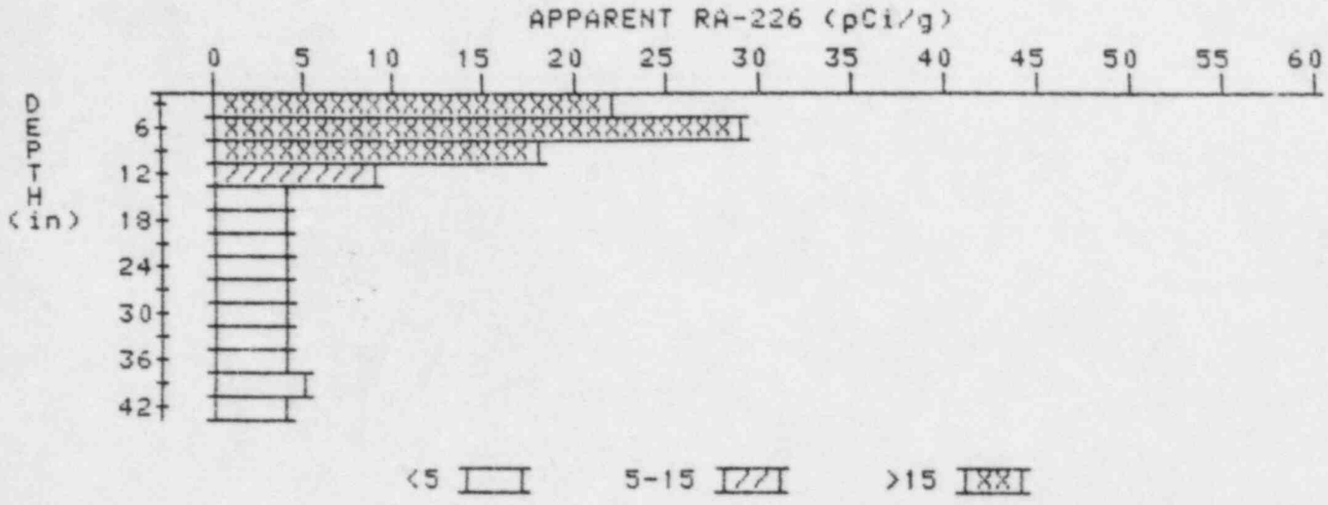
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	9.0	9.0
6	8.3	10.4
9	6.4	5.3
12	5.1	4.0
15	4.4	3.9
18	4.0	3.8
21	3.7	3.2
24	3.7	3.7
27	3.7	3.7
30	3.7	3.7
33	3.7	3.9
36	3.6	3.4
39	3.6	3.6
42	3.6	3.6
45	3.6	3.6
48	3.6	3.6

51	3.6	3.8
54	3.5	3.5
57	3.4	3.4
60	3.3	3.3
63	3.2	3.4
66	3.0	3.0

'DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 18

PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 18
LOCATION: 198262

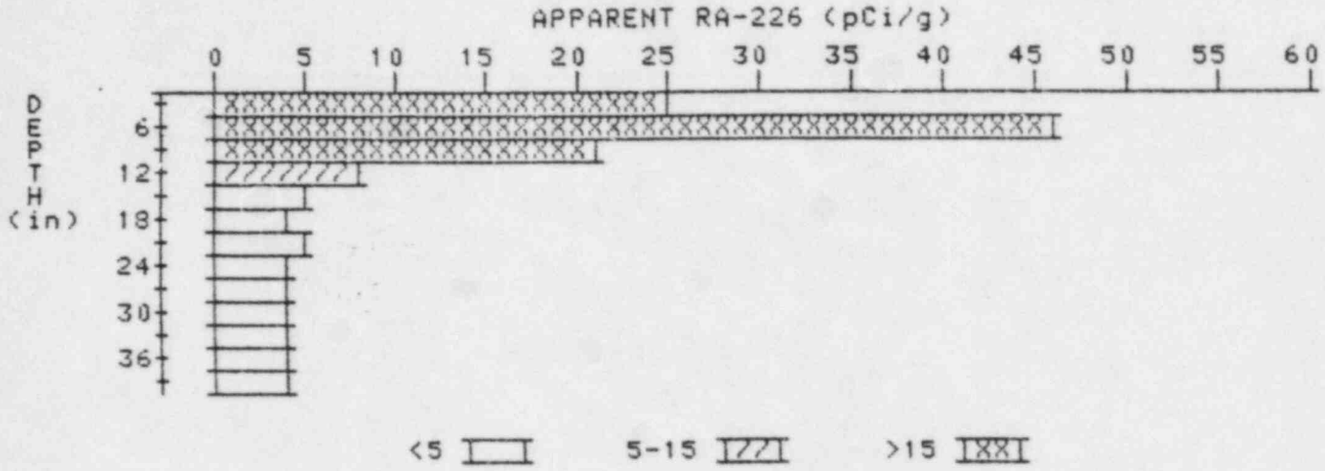


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	21.6	21.6
6	21.4	29.2
9	16.8	17.9
12	11.6	9.5
15	7.6	3.7
18	5.8	4.0
21	5.0	4.3
24	4.6	4.4
27	4.3	3.9
30	4.2	4.0
33	4.2	4.0
36	4.3	4.3
39	4.4	4.6
42	4.4	4.4

'DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 20 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 20
LOCATION: 217232

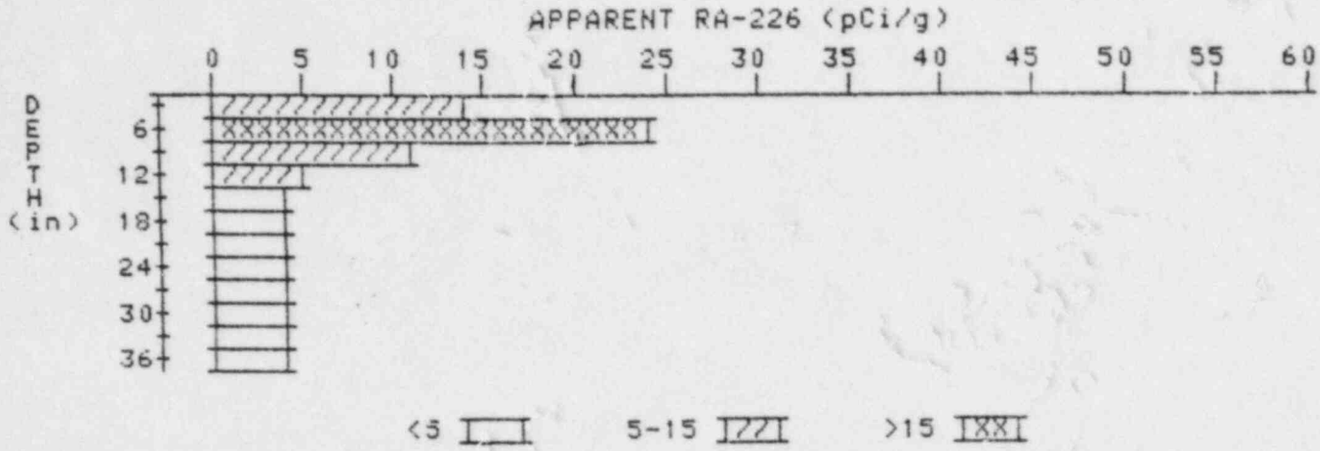


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	25.3	25.3
6	27.9	45.5
9	20.6	20.6
12	13.3	8.5
15	8.7	4.6
18	6.4	4.3
21	5.3	4.6
24	4.6	3.9
27	4.3	4.1
30	4.1	3.7
33	4.1	4.3
36	4.0	3.6
39	4.1	4.1

·DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 22
DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 22
LOCATION: 228255

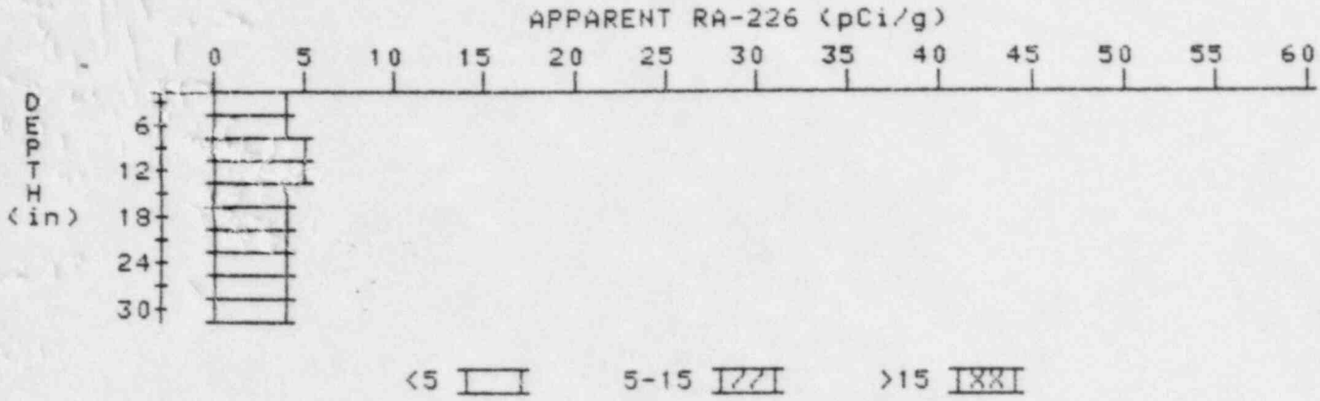


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	14.4	14.4
6	15.5	24.4
9	11.6	11.1
12	8.0	5.2
15	6.0	4.2
18	5.0	4.1
21	4.5	4.3
24	4.1	3.6
27	4.0	3.8
30	4.0	4.0
33	4.0	3.8
36	4.1	4.1

'DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION 23
DECONVOLUTION GRAPH

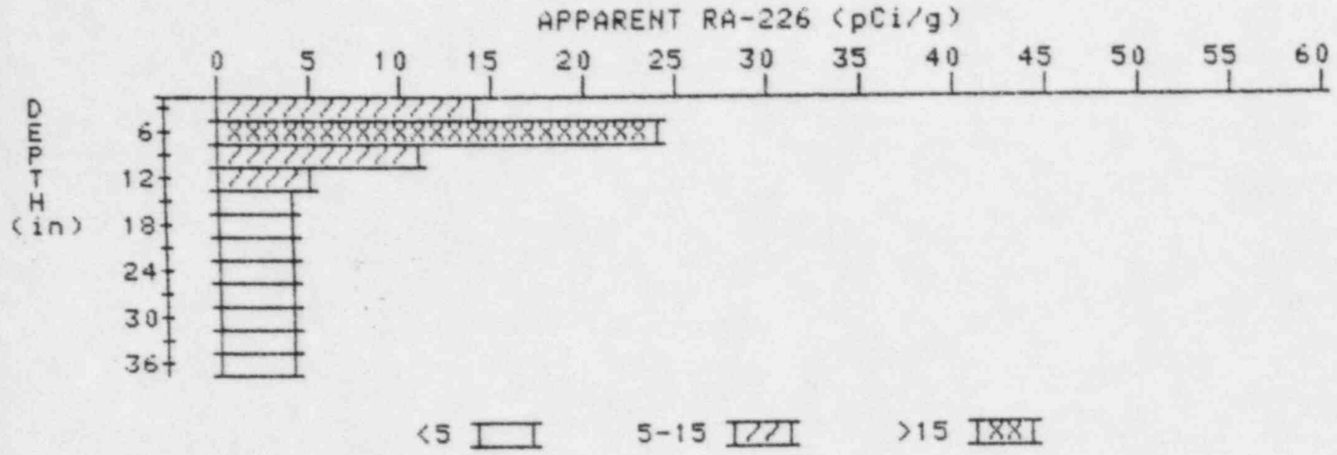
PROPERTY NUMBER: GJ-05823-MR
HOLE NUMBER: 23
LOCATION: 242231



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.9	3.9
6	4.1	4.1
9	4.3	4.7
12	4.3	4.7
15	4.1	3.7
18	4.1	4.1
21	4.1	4.3
24	4.0	3.8
27	4.0	4.0
30	4.0	4.0

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

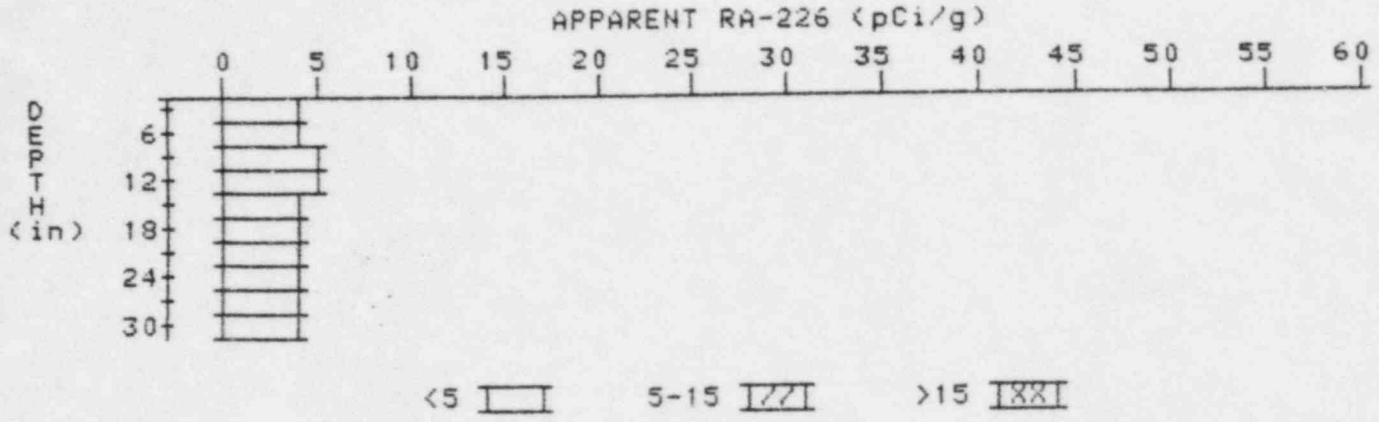
PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 22
LOCATION: 228255



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	14.4	14.4
6	15.5	24.4
9	11.6	11.1
12	8.0	5.2
15	6.0	4.2
18	5.0	4.1
21	4.5	4.3
24	4.1	3.6
27	4.0	3.8
30	4.0	4.0
33	4.0	3.8
36	4.1	4.1

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

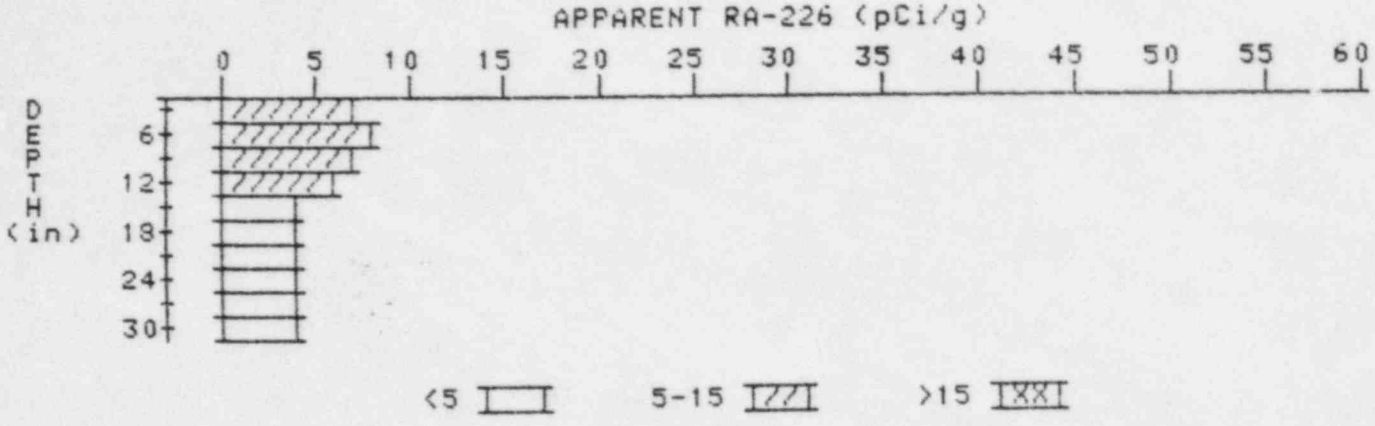
PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 23
LOCATION: 242231



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.9	3.9
6	4.1	4.1
9	4.3	4.7
12	4.3	4.7
15	4.1	3.7
18	4.1	4.1
21	4.1	4.3
24	4.0	3.8
27	4.0	4.0
30	4.0	4.0

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 26
LOCATION: 245300



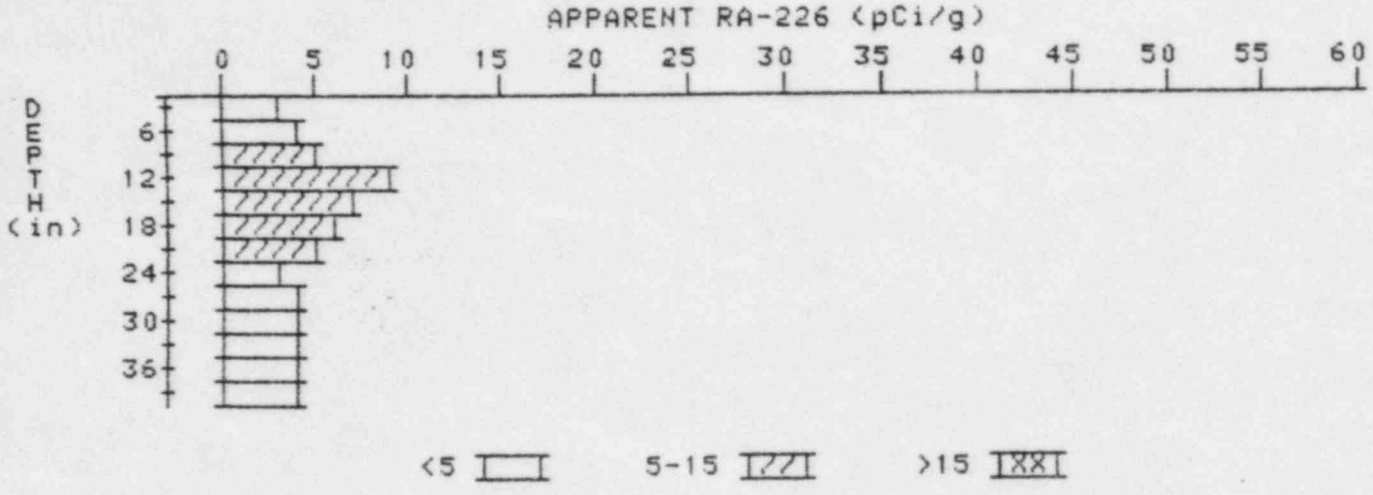
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.8	6.8
6	7.1	8.3
9	6.7	7.4
12	5.9	6.3
15	4.9	3.8
18	4.5	4.1
21	4.3	4.3
24	4.1	4.1
27	3.9	3.5
30	3.9	3.9

'DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

27

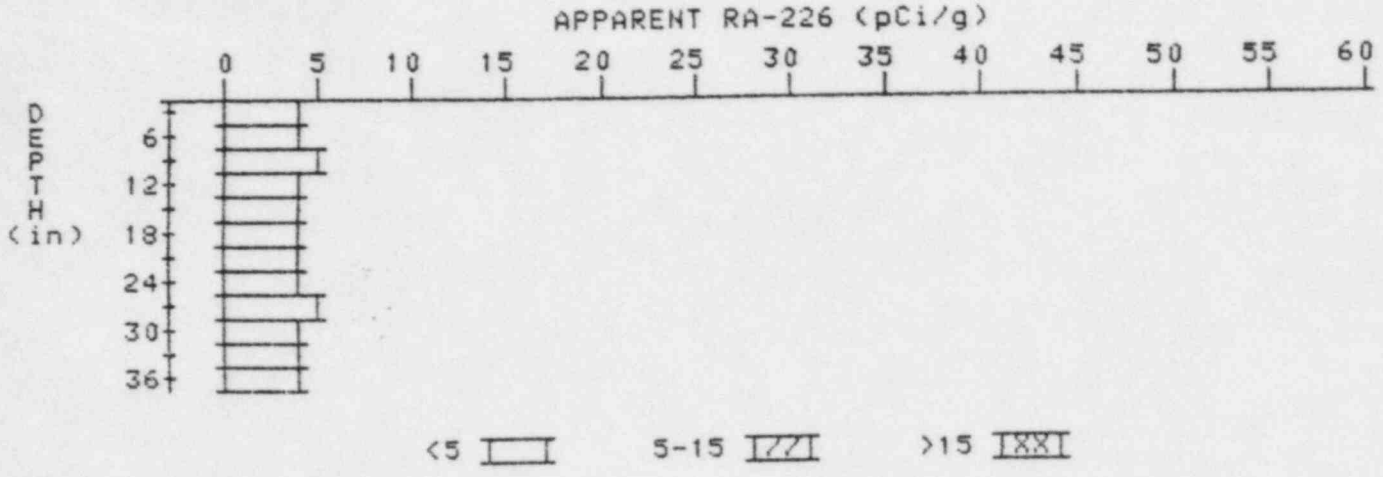
PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 27
LOCATION: 252229



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.2	3.2
6	4.2	4.0
9	5.3	5.1
12	6.5	8.8
15	6.4	7.5
18	5.7	5.7
21	5.0	5.0
24	4.3	3.4
27	4.1	3.7
30	4.1	4.5
33	3.9	3.5
36	3.9	4.1
39	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

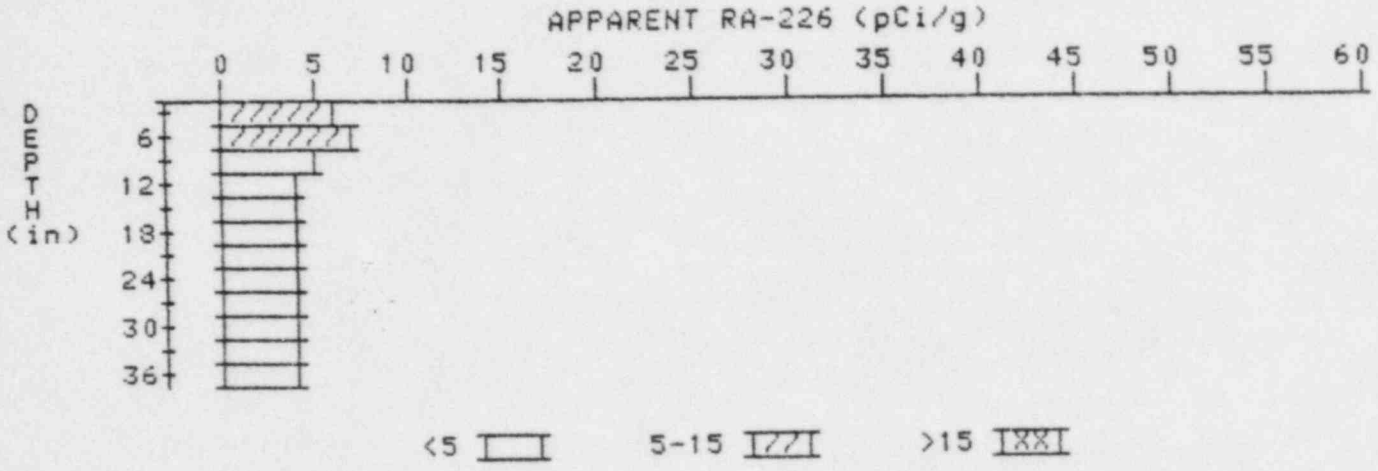
PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 31
LOCATION: 276286



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.5	3.5
6	3.8	4.0
9	4.0	4.5
12	3.9	3.5
15	4.0	4.0
18	4.1	4.3
21	4.1	4.1
24	4.1	3.9
27	4.2	4.6
30	4.1	3.9
33	4.1	3.9
36	4.2	4.2

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

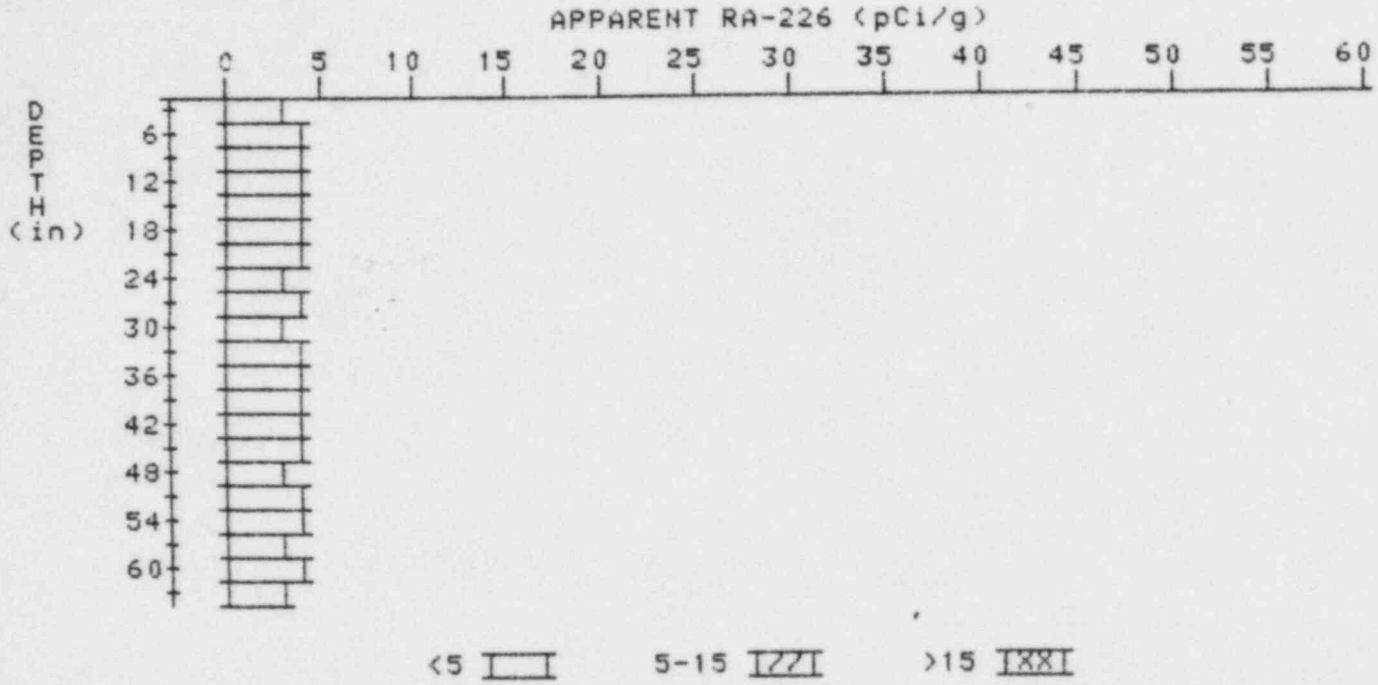
PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 32
LOCATION: 278204



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.4	6.4
6	6.1	7.0
9	5.3	4.9
12	4.7	4.2
15	4.4	4.4
18	4.1	3.6
21	4.1	4.1
24	4.1	4.1
27	4.1	4.1
30	4.1	4.5
33	3.9	3.5
36	3.9	3.9

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 33
LOCATION: 278273

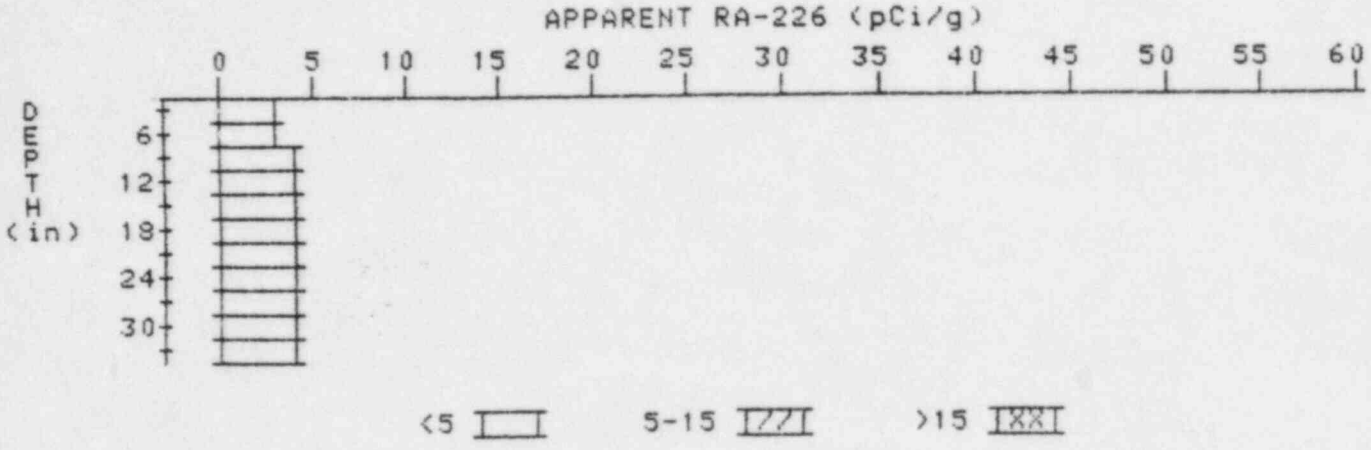


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.5	3.7
9	3.6	3.8
12	3.6	3.6
15	3.6	3.6
18	3.6	3.6
21	3.6	3.6
24	3.6	3.4
27	3.7	4.1
30	3.6	3.2
33	3.7	3.9
36	3.7	3.7
39	3.7	3.7
42	3.7	3.7
45	3.7	4.1
48	3.5	3.1
51	3.5	3.5

54	3.5	3.7
57	3.4	3.2
60	3.4	3.6
63	3.3	3.3

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

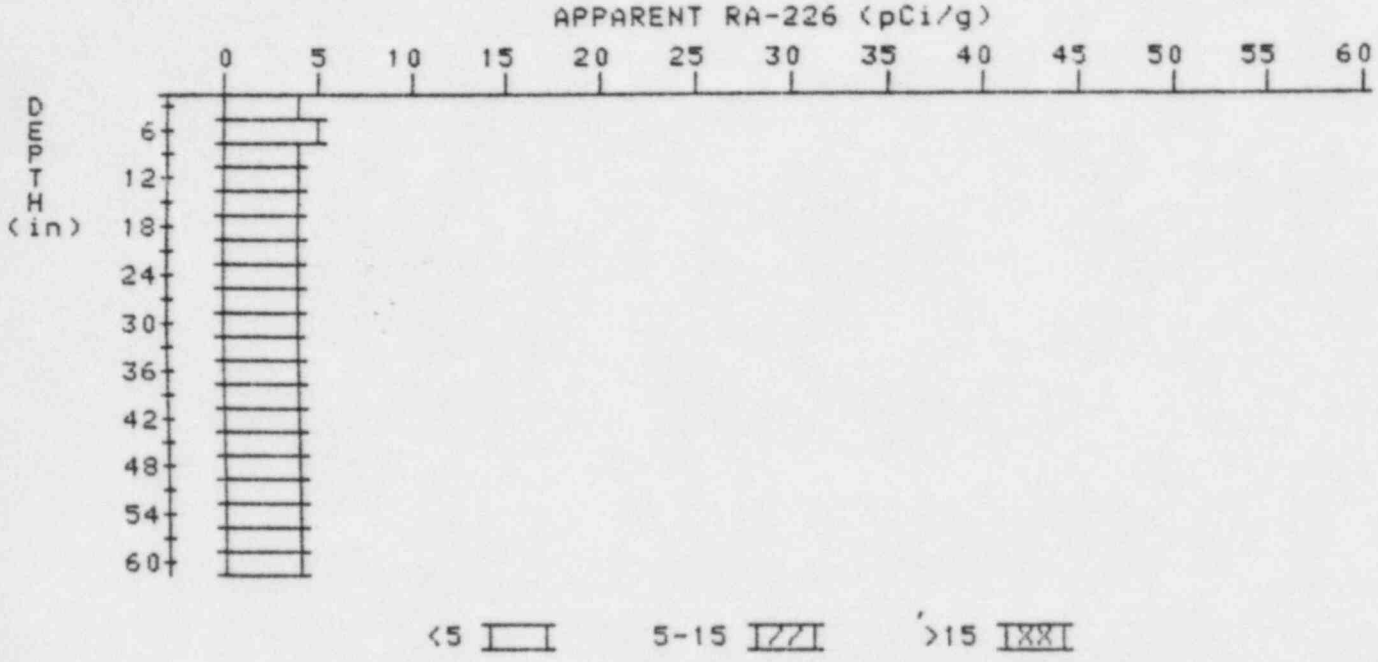
PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 34
LOCATION: 280285



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.8	2.8
6	3.2	3.4
9	3.5	3.5
12	3.8	4.2
15	3.9	4.1
18	3.9	3.9
21	3.9	4.1
24	3.8	3.6
27	3.8	4.0
30	3.7	3.7
33	3.6	3.6

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 36
LOCATION: 290204

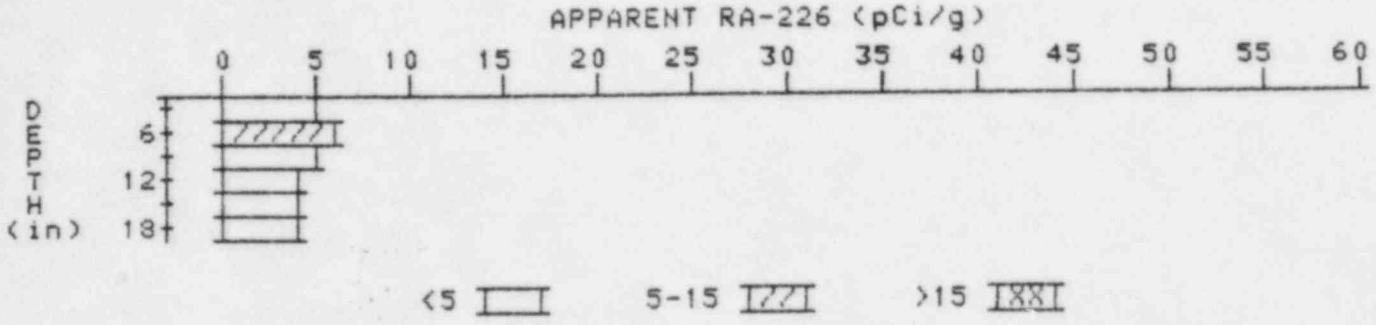


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.0	4.0
6	4.3	4.8
9	4.3	4.5
12	4.2	4.2
15	4.1	4.1
18	4.0	3.8
21	4.0	4.0
24	4.0	3.8
27	4.1	4.5
30	4.0	4.0
33	3.9	3.7
36	3.9	3.9
39	3.9	3.7
42	4.0	4.2
45	4.0	4.2
48	3.9	3.7
51	3.9	3.9
54	3.9	3.9

57	3.9	3.9
60	3.9	3.9

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05828-MR
HOLE NUMBER: 37
LOCATION: 293205



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.6	4.6
6	4.9	5.8
9	4.7	4.9
12	4.4	4.0
15	4.3	4.1
18	4.3	4.3