

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-13649-MR

ADDRESS: 736 26 1/2 ROAD

JULY 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION
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REA13649:REA-AB004

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-13649-MR, is a single-family residence located at 736 26 1/2 Road, 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, 171 cu. yd.; interior, 46 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$24,889. Remedial action on this property will take approximately 28 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 736 26 1/2 Road, Grand Junction, Colorado

Zoning: Residential (R-1-B)

Lot Size: Approximately 14,263 sf (0.33 acre)

Legal Description: Lot 1, Block 1, Melody Park Subdivision, Section 35, T1N, R1W, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 4 miles northwest 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:	G 3/8 Road
South:	Single-family residence
East:	Single-family residence
West:	26 1/2 Road

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-family residence
Size:	Approx. 1,900 sf
Construction Date:	1964
Construction:	Wood-frame
Foundation:	Concrete stem-wall on spread footings with crawl space
Footing Depth:	Approximately 10" to bottom of footing from grade
Basement:	None
Crawl Space:	Under primary structure
Condition:	Average

Other Structures:

Type:	Attached garage
Size:	Approximately 440 sf
Construction:	Wood-frame
Foundation:	Concrete slab-on-grade
Condition:	Average

Type:	Playhouse
Size:	Approximately 170 sf
Construction:	Wood-frame
Foundation:	Wood
Condition:	Average

General Remarks:

Tailings contamination is spotted over the property and under the garage and wood patio deck. It appears as individual pockets of backfill. 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 RADIOLOGIC SURVEY

3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-13649-MR on February 27, 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 Oak Ridge National Laboratory (ORNL) was conducted. These records indicate that contamination is located in the garage, under the driveway, and under the wooden deck east of the primary structure. These records also indicate contamination in the yard north and east of the primary structure, and in the west entryway.

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: 13 to 15 uR/h
Highest Outside Gamma Reading (HOG): 60 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: 13 to 14 uR/h
Highest Inside Gamma Reading (HIG): 27 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 Figures 3.3a and 3.3b show 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 3.3a, 3.3b, 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: 0.009 gross working level (WL). No additional RDC measurements were taken by Bendix.

3.5 Extent of Contamination

Appendix Figures 3.5a and 3.5b show 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) In the garage, the soil beneath a 4-inch-thick concrete slab is contaminated to a depth of 33 inches measured from the surface of the slab (approximately 440 sf). The concrete is not contaminated.
- (AREA B) The soil under the southern portion of the wooden deck east of the primary structure is contaminated to a depth of 21 inches (approximately 274 sf). The septic tank is located in this area.
- (AREA C) Under the wooden deck north of Area B, the soil is contaminated to a depth of 27 inches measured from the surface of an uncontaminated 4-inch-thick concrete slab (approximately 216 sf).
- (AREA D) The soil in the planter east of the primary structure is contaminated to a depth of 12 inches (approximately 68 sf).
- (AREA E) The depth of contamination from the surface of the driveway is 15 inches. The driveway consists of an uncontaminated 4-inch-thick concrete slab covered by 2 inches of asphalt (approximately 560 sf).
- (AREA F) West of the primary structure the depth of contamination is 12 inches, measured from the surface of an uncontaminated 4-inch-thick concrete porch (approximately 60 sf).
- (AREA G) The soil in the planter north of the primary structure is contaminated to a depth of 18 inches (approximately 36 sf).

- (AREA H) The total depth of contamination from the surface of the contaminated 3-inch-thick concrete sidewalk at the northeast corner of the primary structure is 12 inches (approximately 60 sf).
- (AREA I) A portion of the lawn east of the primary structure has contamination extending to a depth of 15 inches (approximately 543 sf).
- (AREA J) In the lawn northeast of the primary structure, the depth of contamination is 9 inches (approximately 534 sf).
- (AREA K) The lawn north of Area I and east of the primary structure is contaminated to a depth of 15 inches (approximately 336 sf).
- (AREA L) The graveled area east of the driveway is contaminated to a depth of 9 inches (approximately 85 sf).
- (AREA M) North of the primary structure, a deposit under an uncontaminated 4-inch-thick concrete sidewalk extends to a depth of 18 inches (approximately 54 sf).
- (AREA N) The depth of contamination in the north lawn is 18 inches (approximately 510 sf).
- (AREA O) West of the entryway, contamination extends to an estimated depth of 12 inches, based on data collected in Area H (approximately 45 sf).
- (AREA P) A small deposit next to the sidewalk running north through the north yard is contaminated to a depth of 12 inches (approximately 8 sf).
- (AREA Q) A small deposit at the northwest corner of the property is contaminated to a depth of 6 inches (approximately 12 sf).
- (AREA R) In the yard northwest of the primary structure the contamination is 6 inches deep (approximately 119 sf).
- (AREA S) The depth of contamination in the planter northwest of the primary structure is 6 inches (approximately 40 sf).
- (AREAS REQUIRING FURTHER INVESTIGATION DURING REMEDIAL ACTION)

- Some slightly elevated readings were recorded in the crawl space adjacent to the garage. This area should be checked after other sources of radiation have been removed.
- Area K is in the region of the leach field. Because of obstructions in the soil, depth explorations were not possible. Contamination may extend beyond the assessed area. Monitoring should be done during remedial action to assure that all contaminated materials are removed.

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-13649-MR, includes removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figures 3.5a and 3.5b), and transport of removed material to the disposal site.

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.

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 \$24,889.

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

There is no owner preference with respect to remedial action and 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-CMD4-84AL28460) 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 3.3a	Interior Gamma Exposure Rates and Sample Locations - Crawl Space
Figure 3.3b	Interior Gamma Exposure Rates and Sample Locations - Ground Floor
Figure 3.4	Exterior Sample Locations
Figure 3.5a	Interior Estimated Extent of Contamination (Garage)
Figure 3.5b	Exterior Estimated Extent of Contamination
Official Survey Report	
Memo of Understanding	
Team Leader Notes	
Deconvolution Graphs (Apparent Radium-226 Concentration)	

Radium Concentrations at Exterior Locations

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
8	150240	00	DS	1.0		*	Background
		00-06	SS			2.9	West yard
		03	TC	2.9		*	
		06	TC	3.4		*	DC = 0 inches
		09	TC	3.6		*	
		12	RM	3.7	2.0	*	
		15	TC	3.7		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	BH	3.7	1.9	*	
		27	TC	3.7		*	
		30	BH	3.8	1.6	*	
		33	TC	3.7		*	
		36	TC	3.7		*	
9	168284	00	DS	2.8		*	Lawn, northwest
		06	DS	1.7		*	corner of the
		12	DS	1.6		*	property
10	170262	03	TC	4.5		*	West yard
		06	TC	4.6		*	
		09	TC	4.2		*	DC = 6 inches
		12	TC	4.0		*	Based on all
		15	TC	3.9		*	data taken
		18	TC	3.9		*	
		21	TC	3.8		*	
		24	TC	3.9		*	
11	170263	03-09	SS			6.3	Front yard
12	177240	00	DS	5.6		*	Concrete sidewalk
		08	DS	23.9		*	Horizontally under concrete
13	179203	03	TC	3.5		*	DC = 0 inches
		06	TC	3.7		*	
		09	TC	3.8		*	
		12	TC	3.7		*	
		15	TC	3.7		*	
		18	TC	3.7		*	

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
14	179209	03	TC	3.4		*	DC = 0 inches Water line
		06	TC	3.6		*	
		09	TC	3.7		*	
		12	TC	3.7		*	
		15	TC	3.8		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.8		*	
		27	TC	3.7		*	
15	179221	00	DS	2.1		*	DC = 0 inches West foundation
		06	DS	2.6		*	
		03	TC	3.6		*	
		06	TC	3.8		*	
		09	TC	4.0		*	
		12	TC	4.1		*	
		15	TC	4.1		*	
		18	TC	4.2		*	
		21	TC	4.1		*	
		24	TC	4.1		*	
		27	TC	4.1		*	
		30	TC	4.0		*	
16	181198	03	TC	3.3		*	Gas line DC = 0 inches
		06	TC	3.5		*	
		09	TC	3.8		*	
		12	TC	3.9		*	
		15	TC	4.0		*	
		18	TC	3.8		*	
		21	TC	3.6		*	
		24	TC	3.7		*	
		27	TC	3.6		*	
17	181248	00-04	SS			4.0	Core
		04-10	SS			21.0	Soil with brick fragments
		03	TC	11.5		*	DC = 12 inches Based on the deconvolution graph
		06	TC	11.6		*	
		09	TC	8.9		*	
		12	TC	6.3		*	
		15	TC	4.9		*	

Radium Concentrations at Exterior Locations

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
18	183245	00	DS	1.4		*	Planter in front of house
19	187283	00	DS	2.9		*	By north sidewalk
		06	DS	3.0		*	
		12	DS	1.1		*	
20	193197	03	TC	3.4		*	DC = 0 inches
		06	TC	3.7		*	
		09	TC	4.0		*	
		12	TC	4.2		*	
		15	TC	4.0		*	
		18	TC	3.9		*	
		21	TC	3.7		*	
		24	TC	3.6		*	
		27	TC	3.6		*	
		30	TC	3.7		*	
		33	TC	3.8		*	
21	195265	03	TC	7.7		*	Lawn north side of house DC = 18 inches Based on the deconvolution graph
		06	TC	9.2		*	
		09	TC	9.4		*	
		12	TC	7.8		*	
		15	TC	6.5		*	
		18	TC	5.6		*	
		21	TC	5.2		*	
		24	TC	4.9		*	
		27	TC	4.8		*	
22	200254	03	TC	7.3		*	North side of house DC = 18 inches Based on the deconvolution graph
		06	TC	7.7	6.2	*	
		09	TC	7.6		*	
		12	BH	6.8	6.7	*	
		15	TC	6.0		*	
		18	BH	4.9	4.6	*	
		21	TC	4.4		*	
		24	TC	4.0		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
		33	TC	3.8		*	
		36	BH	3.9	2.2	*	
		39	TC	3.9		*	

Radium Concentrations at Exterior Locations

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
23	207267	00	DS	34.1		*	6 inches west of driveway
24	208293	03	TC	4.2		*	DC = 0 inches
		06	TC	4.4		*	
		09	TC	4.3		*	
		12	TC	4.1		*	
		15	TC	4.1		*	
		18	TC	4.1		*	
		21	TC	4.0		*	
		24	TC	4.1		*	
		27	TC	4.1		*	
25	210222	03	TC	127.1		*	Through concrete under wood deck Auger refusal
		06	TC	141.5		*	
		09	TC	142.1		*	
		12	TC	130.9		*	
		15	TC	117.5		*	
		18	TC	100.6		*	
		21	TC	76.7		*	
		24	TC	47.8		*	
		27	TC	28.8		*	DC = 27 inches Based on the deconvolution graph
		30	TC	18.1		*	
		33	TC	12.4		*	
		36	TC	9.3		*	
		39	TC	7.6		*	
		42	TC	6.7		*	
		45	TC	6.4		*	
26	212212	03	TC	7.3		*	Sewer line under wood deck
		06	TC	7.1		*	
		09	TC	6.2		*	
		12	TC	5.8		*	
		15	TC	5.6		*	
		18	TC	5.4		*	
		21	TC	5.0		*	
		24	TC	4.7		*	
		27	TC	4.6		*	DC = 21 inches Based on the deconvolution graph
		30	TC	4.4		*	
		33	TC	4.4		*	

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
27	216199	03	TC	3.7		*	South of patio in rock garden
		06	TC	4.0		*	
		09	TC	4.1		*	
		12	TC	3.9		*	DC = 0 inches
		15	TC	3.8		*	
		18	TC	3.8		*	
28	220260	03	TC	16.3		*	In driveway
		06	TC	26.3		*	
		09	TC	30.8		*	
		12	TC	21.6		*	DC = 15 inches Based on the deconvolution graph
		15	TC	13.2		*	
		18	TC	8.6		*	
		21	TC	6.5		*	
		24	TC	5.5		*	
		27	TC	5.0		*	
		30	TC	4.7		*	
		33	TC	4.7		*	
		36	TC	4.5		*	
		39	TC	4.6		*	
		42	TC	4.6		*	
		45	TC	4.7		*	
		48	TC	4.7		*	
29	224210	00	DS	2.6		*	Under deck
		06	DS	<1.0		*	On septic tank
		00-06	SS			4.8	Moist clay
30	229225	03	TC	7.1		*	East side of house near patio
		06	BH	7.0	4.7	*	
		09	TC	6.1		*	
		12	BH	5.2	3.0	*	DC = 12 inches Based on the deconvolution graph
		15	TC	4.8		*	
		18	BH	4.4	1.9	*	
		21	TC	4.2		*	
		24	BH	4.0	1.5	*	
31	231230	00-04	SS			4.9	Core
		03	TC	8.6		*	East yard on sidewalk
		06	TC	9.5		*	
		09	TC	7.3		*	DC = 12 inches Based on the deconvolution graph
		12	TC	5.9		*	
		15	TC	4.9		*	

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
31	231230	18	TC	4.4		*	
		21	TC	4.3		*	
		24	TC	4.0		*	
		27	TC	3.8		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
32	233234	00	DS	6.8		*	On edge of sidewalk
		10	DS	6.8		*	Horizontally under
						*	sidewalk 3 inches
						*	in from edge
33	235240	03	TC	8.4		*	East yard
		06	TC	7.5		*	
		09	TC	5.8		*	DC = 9 inches
		12	TC	4.9		*	Based on the
		15	TC	4.4		*	deconvolution graph
		18	TC	4.4		*	
		21	TC	4.4		*	
34	240209	03	TC	3.5		*	DC = 0 inches
		06	TC	4.2		*	
		09	TC	4.4		*	
		12	TC	4.5		*	
		15	TC	4.6		*	
		18	TC	4.6		*	
		21	TC	4.6		*	
		24	TC	4.6		*	
35	245265	03	TC	3.4		*	DC = 0 inches
		06	TC	4.0		*	
		09	TC	4.0		*	
		12	TC	4.0		*	
		15	TC	4.1		*	
		18	TC	4.1		*	
		21	TC	4.1		*	
		24	TC	4.1		*	
36	250220	03	TC	12.7		*	Auger refusal
		06	TC	17.2		*	East yard
		09	TC	14.9		*	
		12	TC	10.6		*	DC = 15 inches
		15	TC	8.1		*	Based on the
		18	TC	6.7		*	deconvolution graph

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
36	250220	21	TC	5.8		*	
		24	TC	5.1		*	
		27	TC	4.6		*	
37	251229	03	TC	3.8		*	Leach field DC = 15 inches Based on the deconvolution graph
		06	TC	4.7		*	
		09	TC	5.2		*	
		12	TC	5.2		*	
		15	TC	5.3		*	
		18	TC	5.3		*	
		21	TC	5.2		*	
		24	TC	5.2		*	
		27	TC	5.1		*	
		30	TC	5.0		*	
		33	TC	4.9		*	
		36	TC	4.8		*	
		39	TC	4.8		*	
		42	TC	4.7		*	
		45	TC	4.7		*	
		48	TC	4.5		*	
38	251239	03	TC	3.2		*	DC = 0 inches
		06	TC	3.9		*	
		09	TC	4.2		*	
		12	TC	4.3		*	
		15	TC	4.3		*	
		18	TC	4.3		*	
		21	TC	4.3		*	
		24	TC	4.3		*	
		27	TC	4.4		*	
		30	TC	4.5		*	
		33	TC	4.7		*	
		36	TC	4.7		*	
		39	TC	4.6		*	
		42	TC	4.7		*	
		45	TC	4.5		*	
		48	TC	4.5		*	
		51	TC	4.6		*	
		54	TC	4.6		*	
		57	TC	4.5		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-13649-MR

736 26 1/2 Road

Page 8 of 9

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
39	251240	03	TC	3.8		*	Leach field
		06	TC	4.2		*	Hit water
		09	TC	4.7		*	
		12	TC	5.1		*	DC = >18 inches
		15	TC	5.3		*	Based on all data
		18	TC	5.5		*	
40	251245	03	TC	3.3		*	DC = 0 inches
		06	TC	4.0		*	
		09	TC	4.3		*	
		12	TC	4.5		*	
		15	TC	4.6		*	
		18	TC	4.6		*	
		21	TC	4.7		*	
		24	TC	4.6		*	
		27	TC	4.5		*	
		30	TC	4.7		*	
		33	TC	4.8		*	
		36	TC	4.8		*	
		39	TC	4.8		*	
41	252240	03	TC	3.5		*	DC = 0 inches
		06	TC	4.0		*	
		09	TC	4.2		*	
		12	TC	4.4		*	
		15	TC	4.5		*	
		18	TC	4.6		*	
		21	TC	4.6		*	
		24	TC	4.5		*	
		27	TC	4.5		*	
		30	TC	4.5		*	
		33	TC	4.6		*	
		36	TC	4.6		*	
		39	TC	4.6		*	
		42	TC	4.5		*	
		45	TC	4.5		*	
		48	TC	4.4		*	
		51	TC	4.5		*	
		54	TC	4.5		*	
		57	TC	4.4		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-13649-MR

736 26 1/2 Road

Page 9 of 9

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
42	270210	03	TC	2.8		*	East yard DC = 0 inches
		06	TC	3.3		*	
		09	TC	3.7		*	
		12	TC	3.9		*	
		15	TC	3.9		*	
		18	TC	3.8		*	
		21	TC	3.8		*	

Tool 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 = 02-28-85
 Team Leader = JDG

Radium Concentrations at Interior Locations

DOE ID #GJ-13649-MR

736 26 1/2 Road

Page 1 of 1

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr		
1		00-04	SS			5.1	
		04-13	SS			276.4	
		03	TC	76.5		*	Garage
		06	TC	123.7		*	Auger refusal
		09	TC	149.6		*	
		12	TC	161.1		*	DC = 33 inches
		15	TC	164.9		*	Based on the
		18	TC	162.2		*	deconvolution graph
		21	TC	154.2		*	
		24	TC	134.5		*	
		27	TC	105.2		*	
		30	TC	65.0		*	
		33	TC	37.9		*	
		36	TC	23.9		*	
		39	TC	17.1		*	
		42	TC	13.2		*	
		45	TC	10.4		*	
		48	TC	8.6		*	
		51	TC	7.5		*	
		54	TC	6.7		*	
		57	TC	5.9		*	
		60	TC	5.6		*	
		63	TC	5.4		*	
		66	TC	5.6		*	
2		00	DS	1.6		*	Crawl space
3		00	DS	1.4		*	Crawl space
4		00	DS	2.6		*	Crawl space
5		00	DS	<1.0		*	Crawl space
6		00	DS	1.5		*	Crawl space
7		00	DS	1.7		*	Concrete entry to crawl space

Tool 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 = 02-28-85
 Team Leader = JDG

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)
CRAWL SPACE 00		-	-	24	14-20	16
ROOM A	11	14-24	16	11	14-27	16
ROOM B	05	13-15	14	05	13-16	14
ROOM C	06	11-14	13	05	13-14	14
ROOM D	06	12-13	13	06	12-13	13
ROOM E	10	11-13	13	10	10-13	13
ROOM F	06	13-16	14	03	13-14	14
ROOM G	07	12-24	15	06	13-17	15
ROOM H	03	14-18	15	03	14-18	15
ROOM I	03	13-24	20	02	19-22	21
GARAGE 1	12	33-47	41	12	34-70	52
GARAGE 2	04	19-40	29	04	20-49	32
SHED	04	12-13	13	04	12-13	13

*Exposure Rates and Room Locations Shown in Appendix Figures 3.3a and 3.3b

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-13649-MR

Page 1 of 4

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
INTERIOR					
	Concrete				
A	20 x 22 =	440	x 0.3 =	132	
	Volume of Concrete			132	= 132/27 = 5
	Contaminated Fill				
A	20 x 22 =	440	x 2.5 =	1,100	
	Volume of Fill			1,100	= 1,100/27 = 41
	TOTAL VOLUME - INTERIOR				= 46
EXTERIOR					
	Concrete				
C	18 x 12 =	216	x 0.3 =	65	
E	20 x 20 =	400	x 0.3 =	120	
F	4 x 12 =	48			
	2 x 7 =	14			
	1 x 4 =	4			
		66	x 0.3 =	20	
H	4 x 4 =	16			
	2 x 22 =	44			
		60	x 0.3 =	18	
M	3 x 20 =	60	x 0.3 =	18	
	Volume of Concrete			241	= 241/27 = 9

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-13649-MR

Page 2 of 4

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
Asphalt					
E	20 x 46	= 920	x 0.2	= 184	
				184	
Volume of Asphalt				= 184	= 184/27 = 7
Contaminated Fill					
B	20 x 12	= 240			
	2 x 9	= 18			
	4 x 4	= 16			
		274	x 1.8	= 493	
C	18 x 12	= 216	x 2.0	= 432	
D	2 x 25	= 50			
	2 x 9	= 18			
		68	x 1.0	= 68	
E	20 x 28	= 560	x 0.8	= 448	
F	4 x 12	= 48			
	2 x 4	= 8			
	1 x 4	= 4			
		60	x 0.7	= 42	
G	18 x 2	= 36	x 1.5	= 54	
H	4 x 4	= 16			
	2 x 22	= 44			
		60	x 0.7	= 42	

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-13649-MR

Page 3 of 4

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
I	20 x 20	=	400		
	13 x 11	=	143		
			<u>543</u>	x 1.3 =	706
J	15 x 23	=	345		
	9 x 21	=	189		
			<u>534</u>	x 0.8 =	427
K	10 x 21	=	210		
	14 x 9	=	126		
			<u>336</u>	x 1.3 =	437
L	3 x 20	=	60		
	5 x 5	=	25		
			<u>85</u>	x 0.8 =	68
M	18 x 3	=	54	x 1.2 =	65
N	10 x 18	=	180		
	22 x 15	=	330		
			<u>510</u>	x 1.5 =	765
O	3 x 10	=	30		
	3 x 5	=	15		
			<u>45</u>	x 1.0 =	45
P	2 x 4	=	8	x 1.0 =	8
Q	4 x 3	=	12	x 0.5 =	6

Table 4.1
Area And Volume Calculations
DOE ID No. GJ-13649-MR

Page 4 of 4

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
R	5 x 4 =	20			
	9 x 11 =	99			
		<u>119</u>	x 0.5 =	60	
S	4 x 10 =	40	x 0.5 =	20	
Volume of Fill				= 4,186	= 4,186/27 = 155
TOTAL VOLUME - EXTERIOR					= 171

See Appendix Figures 3.5a and 3.5b For Areas

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-13649-MR

Page 1 of 3

INTERIOR

Remove concrete garage slab		
440 sf @ \$2.50/sf	\$	1,100
Shore interior and exterior garage walls		
85 lf @ \$3/lf		255
Remove identified residual radioactive material		
41 cy @ \$44/cy (manual-open)		1,804
Install radon vent system		
4" perforated pipe - 85 lf @ \$2.50/lf = 213		
6" solid riser - 3 vf @ \$50/vf = 15		
6" cap and tee - 1 @ \$20/ea = 20		
		<hr/>
		248
		248
Replace area with compacted road base		
41 cy @ \$11.50/cy		472
Replace reinforced concrete slab		
440 sf @ \$2.25/sf		990
Remove, store, and replace storage cabinets		150
		<hr/>
	TOTAL INTERIOR	\$ 5,019

EXTERIOR

Remove and replace firewood - store on site		50
Remove and discard wood deck		
500 sf @ \$1/sf		500
Remove and discard wood walk, east and south of wood deck *		
90 sf @ \$.50/sf		45
Remove concrete:		
Patio (Under wood deck) *	216	
Driveway (under 2" asphalt) **	400	
Front porch	60	
Sidewalks	120	
	<hr/>	
	796 sf @ \$1.48/sf	1,178

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-13649-MR

Page 2 of 3

Remove asphalt driveway	
920 sf @ \$.60/sf	552
Remove identified residual radioactive material	
25 cy @ \$44/cy (manual-open)	1,100
130 cy @ \$14.50/cy (machine-open)	1,885
Replace areas with:	
Compacted road base	
81 cy @ \$11.50/cy	932
Topsoil	
74 cy @ \$9.50/cy	703
Reconstruct wood deck	
500 sf @ \$5/sf	2,500
Reconstruct wood box	500
Reconstruct reinforced concrete garage apron	
80 sf @ \$1.50/sf	120
Replace asphalt driveway	
920 sf @ \$1.50/sf	1,380
Replace concrete walks and front porch	
186 sf @ \$1.50/sf	279
Recontour surface between Areas N and R for drainage	50
Remove and replace redwood borders	
100 lf @ \$1/lf	100
Replace pea gravel	
1 cy @ \$16/cy	16
Remove and replace chain link fence	
40 lf @ \$2.60/lf	104
Remove, store and replace decorative rock	40
Resod areas including surface between Areas N and R	
2,371 sf @ \$.25/sf	593
Replace landscaping - flowers, roses etc.	
100 sf @ \$2.00/sf	200

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-13649-MR

Page 3 of 3

Install 6 mil polyethylene	25
Sterilize surface under new deck	30
	<hr/>
TOTAL EXTERIOR	\$ 12,882
TOTAL INTERIOR	5,019
ACCESS CONTROL	200
	<hr/>
SUBTOTAL	\$ 18,101
CONTINGENCY @ 10%	1,810
	<hr/>
SUBTOTAL	\$ 19,911
CONTRACTOR OVERHEAD & PROFIT @ 25%	4,978
	<hr/>
GRAND TOTAL	\$ 24,889

* 216 sf of concrete patio under wood deck is not to be replaced.

** 400 sf of concrete under asphalt driveway is not to be replaced.

AAB073085

REAL3649:AB-004:LMR

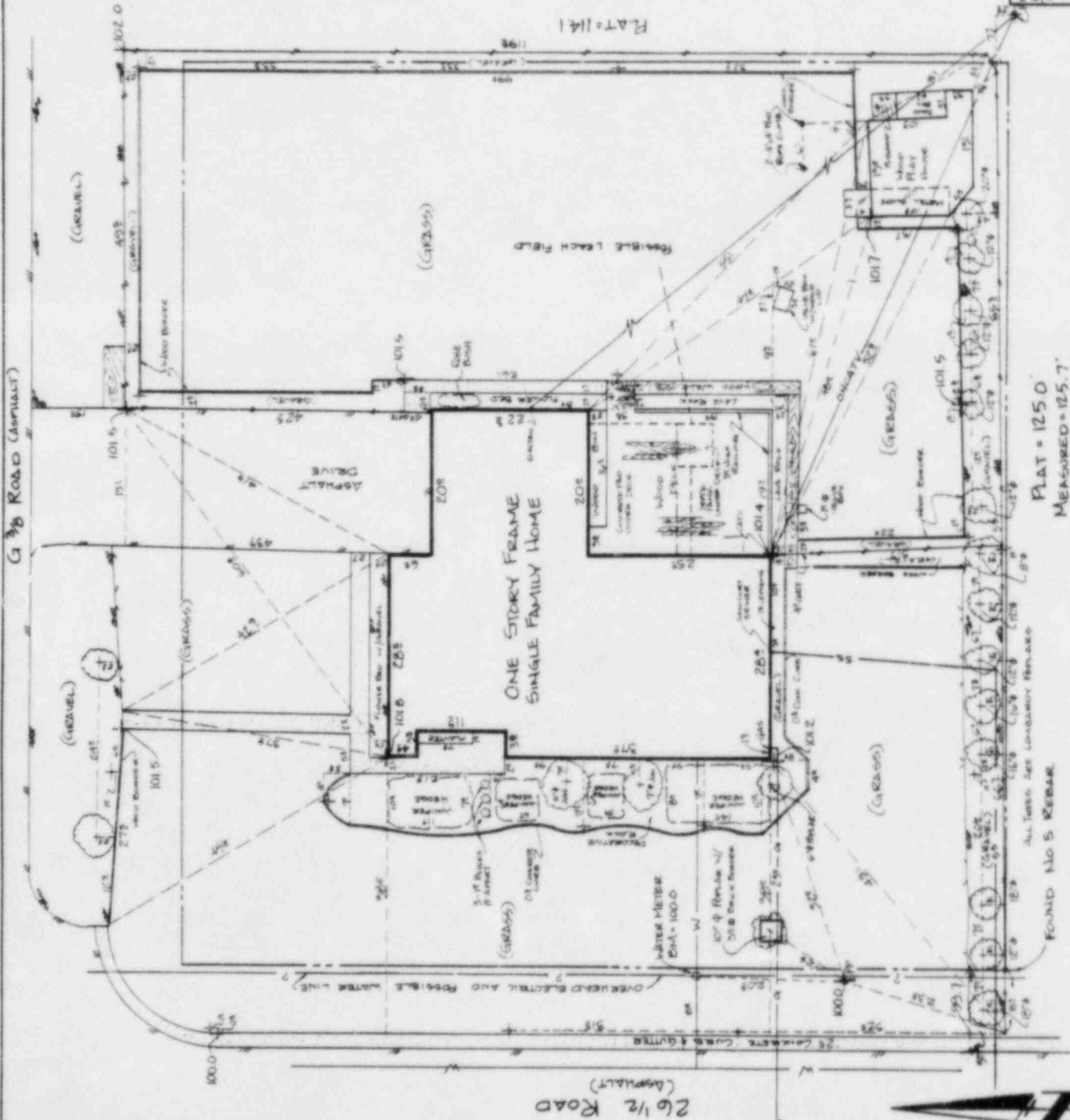


STATE OF COLORADO
TAILINGS REPOSITORY

FIGURE 2.1
VICINITY MAP



G 3/8 ROAD (ASPHALT)

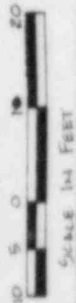


LOT 1 BLOCK 1
MELODY PARK SUBDIVISION,
SECTION 35, T. 1 N., R. 1 W.,
GRAND JUNCTION, COLORADO

FIGURE 2.2

U.S. DEPARTMENT OF ENERGY	LOCATION NO.
GRAND JUNCTION AREA OFFICE, COLORADO	GJ13649 MR
ADDRESS	
136 26 1/2 ROAD	
OWNER	GRAND JUNCTION, COLO.
TENANT	
BURY 12.85 2.21 85	DRAFT 12.25.85
DRAWING NO. 3-C-52.5	-F1
	SHEET 1 OF 1

This drawing prepared by the Grand Junction Area Office, U.S. Department of Energy, is for the use of the U.S. Department of Energy and for contractors. It is not a legal survey plat for the establishment of title, nor is it to be used for the establishment of title, nor is it to be used for the establishment of title.



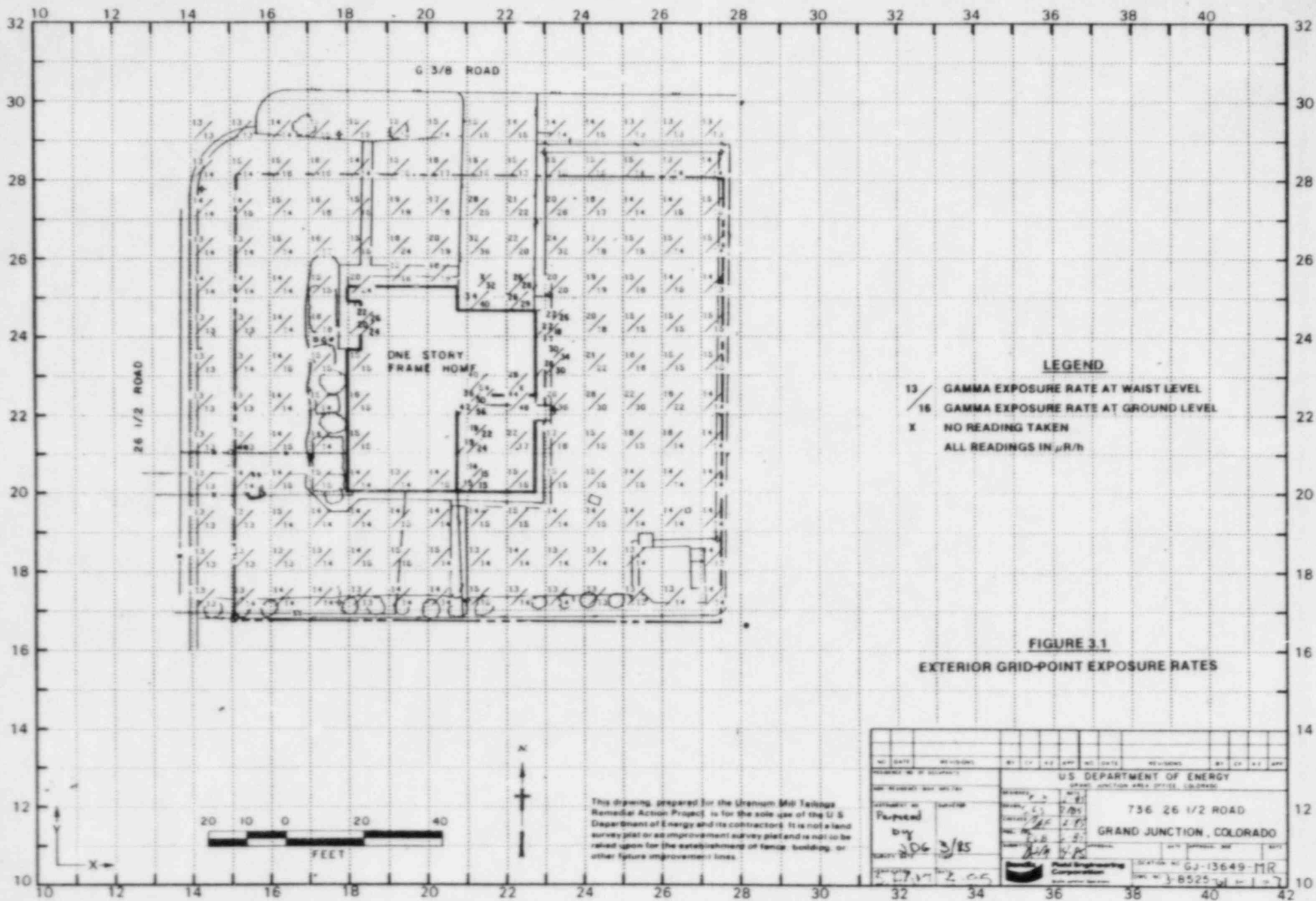
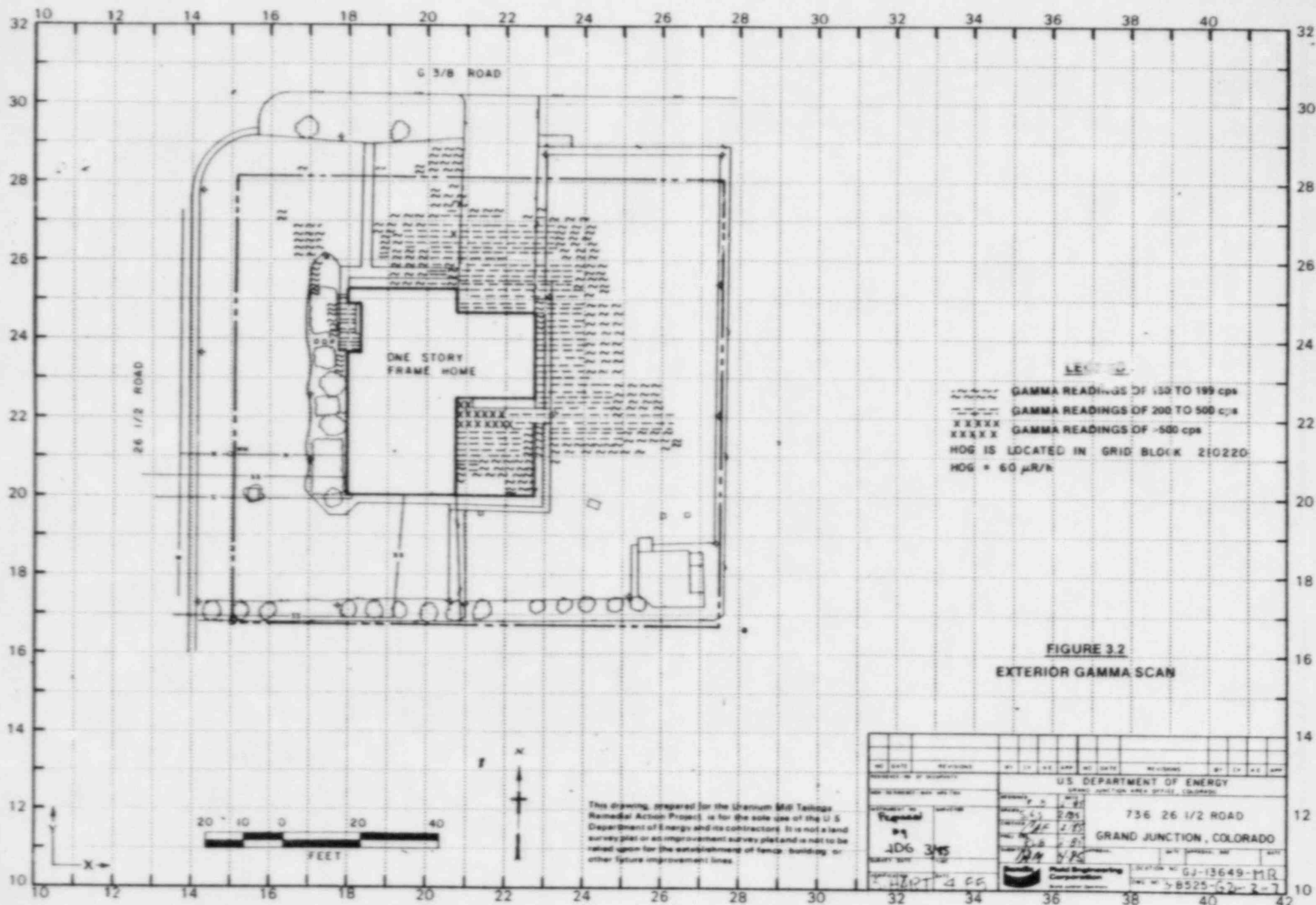
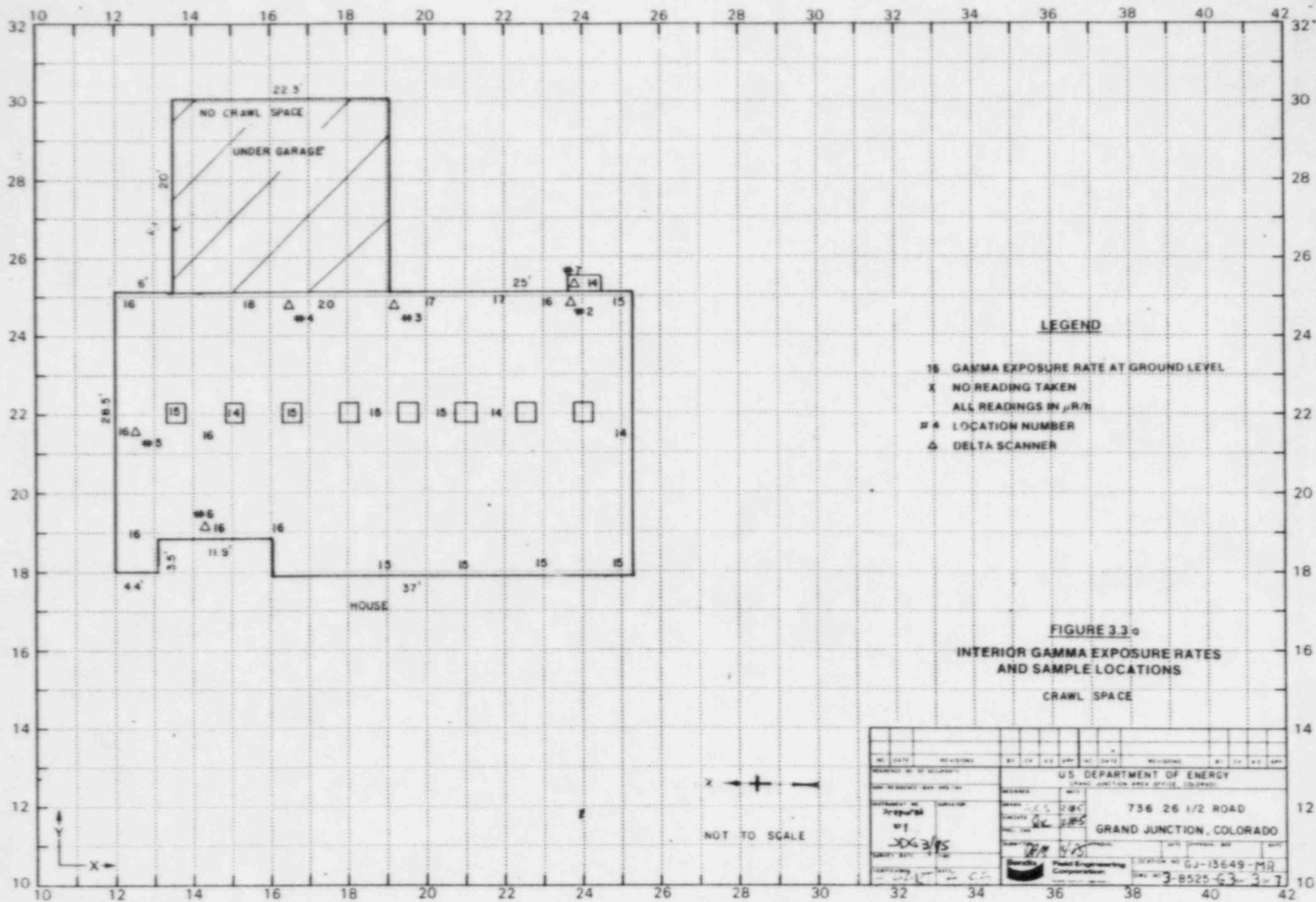
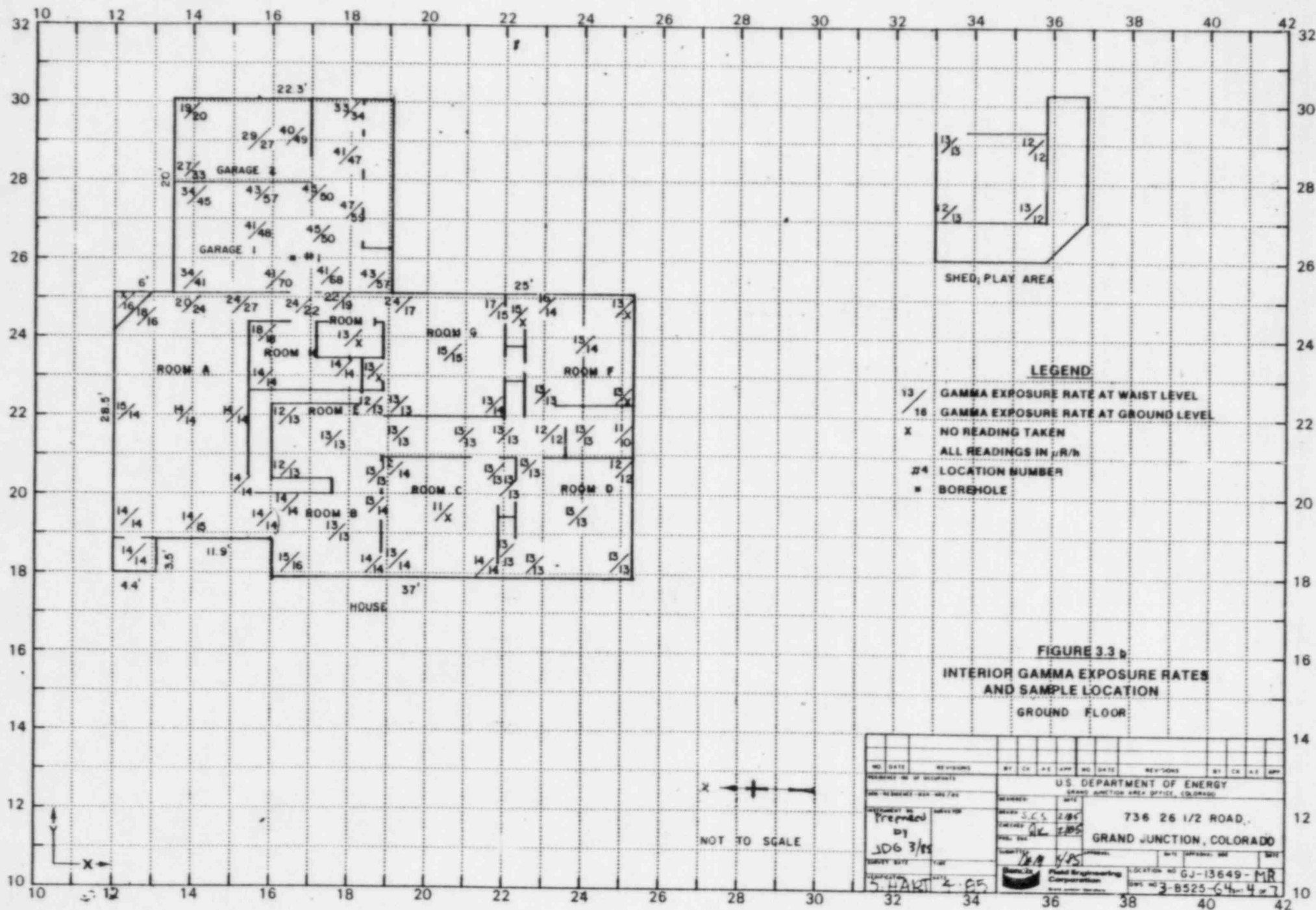


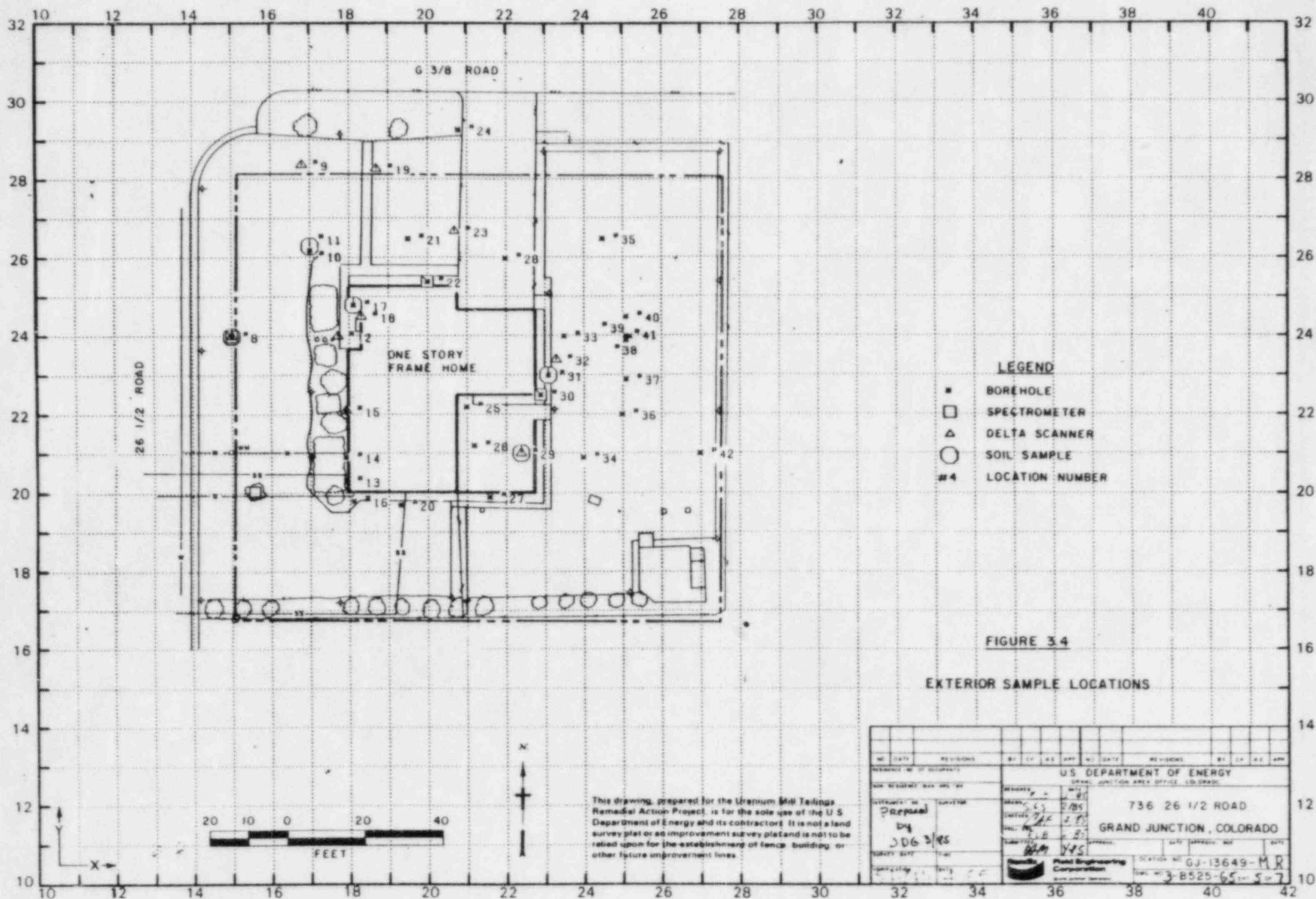
FIGURE 3.1
EXTERIOR GRID-POINT EXPOSURE RATES

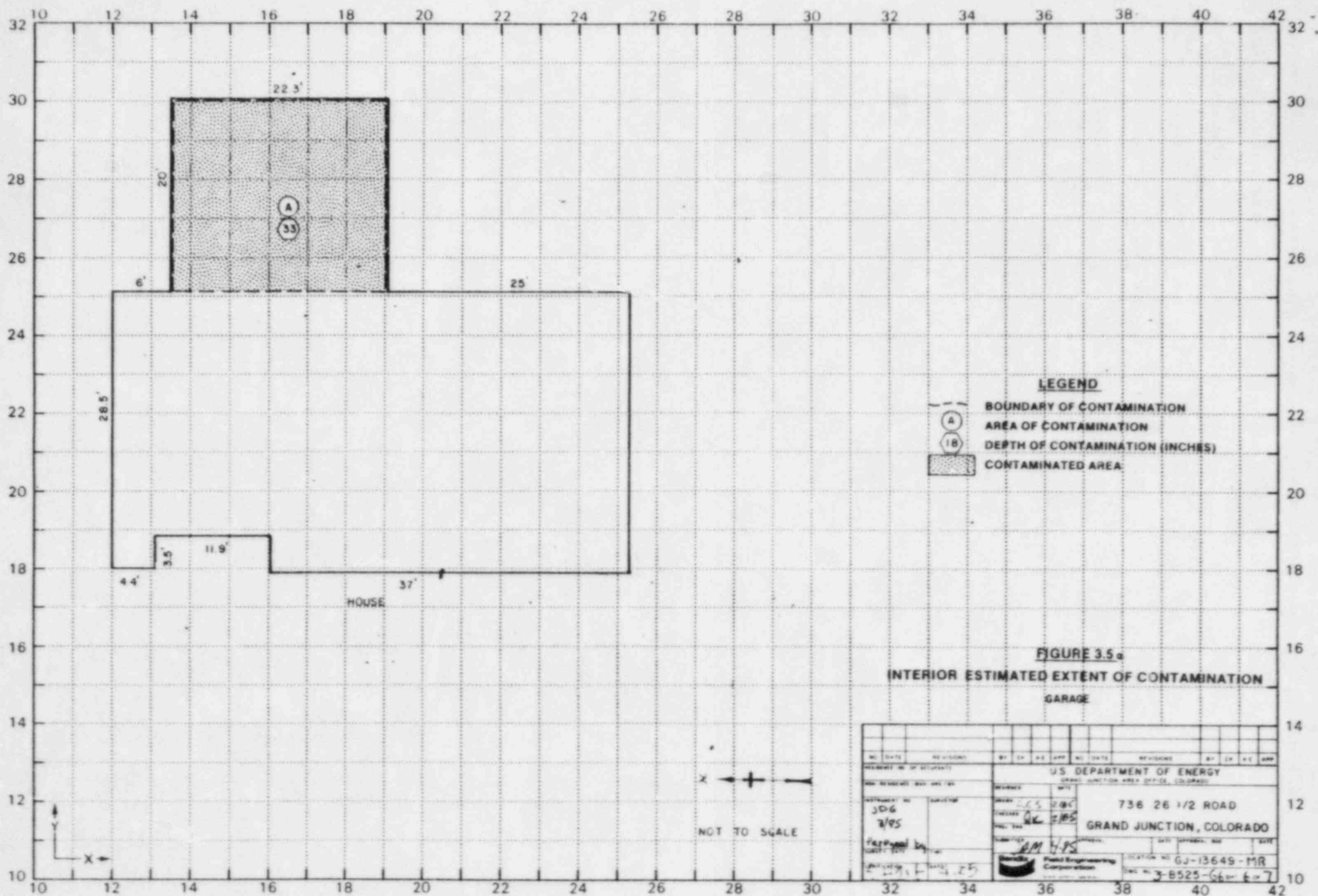






NO. DATE		REVISIONS		BY CH. A.E. APP.		NO. DATE		REVISIONS		BY CH. A.E. APP.	
PREPARED BY: <i>Frederick</i> DATE: <i>3/8/81</i> SURVEY SITE: <i>5 HART</i>											
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO 736 26 1/2 ROAD, GRAND JUNCTION, COLORADO PROJECT NO: <i>3-8525-64-4</i> DRAWING NO: <i>3-8525-64-4</i>											





LEGEND

BOUNDARY OF CONTAMINATION

AREA OF CONTAMINATION

DEPTH OF CONTAMINATION (INCHES)

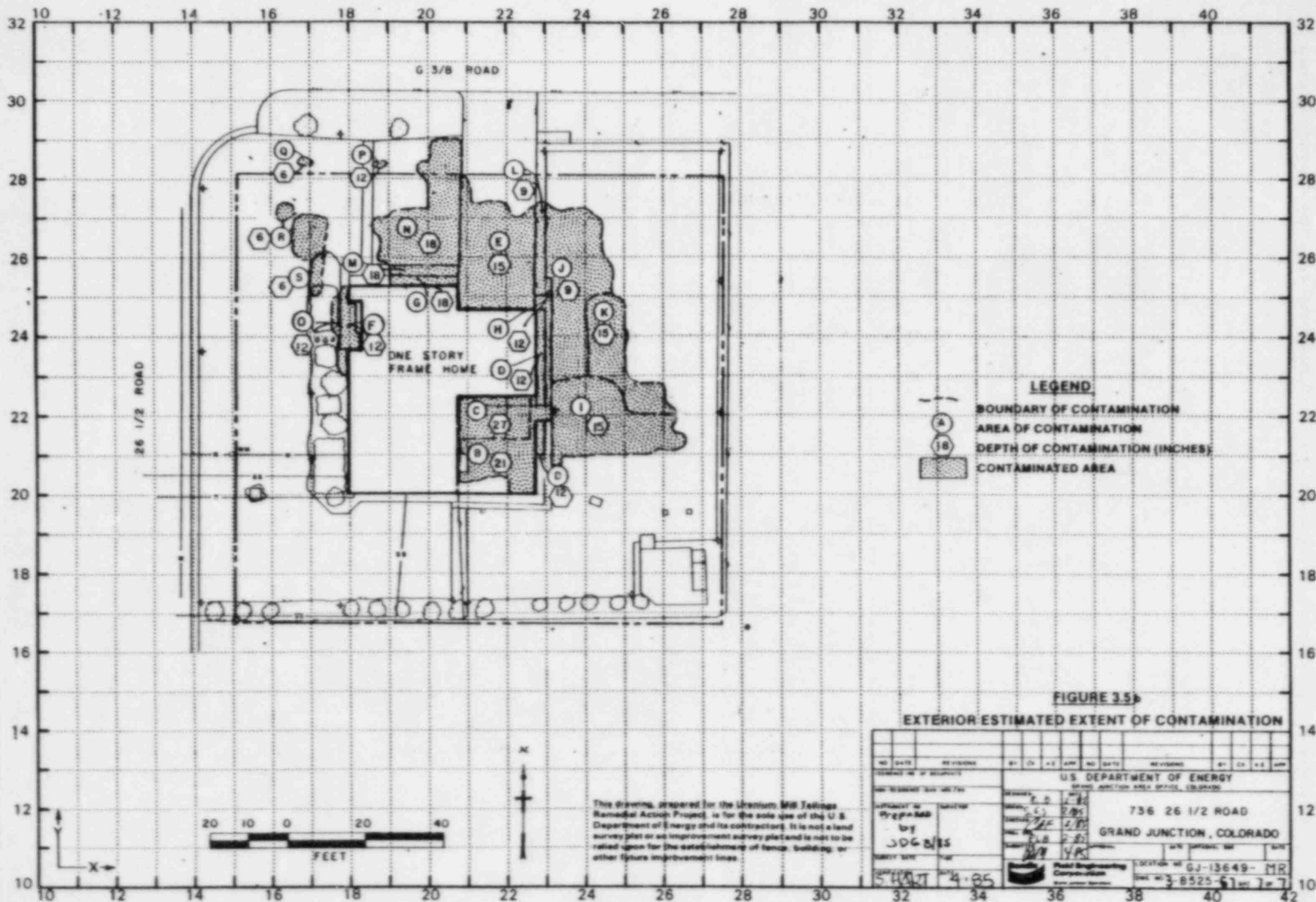
CONTAMINATED AREA

FIGURE 3.5 a

INTERIOR ESTIMATED EXTENT OF CONTAMINATION

GARAGE

[illegible]



Location No. GI-13640-MA Date 3/27/85

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

Official Survey Report

Property Address 736 26 1/2 Road
Property Owner Sandra L. Muster
Address of Owner (if different from above) _____
Report Prepared By James D. Garcia

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

- ☐ No evidence of residual radioactive material on surveyed property.
- ☒ Residual radioactive materials found at the following locations:
- ☒ In open areas.
 - ☒ Under or around exterior improvements.
 - ☐ Under or around a typically nonoccupied structure.
 - ☒ Under or around a typically occupied structure.

II. RESULTS OF RADIOLOGIC ASSESSMENT

- ☐ 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.
- ☒ 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 = 27 uR/hr

HOG = 60 uR/hr

Bendix

**Field Engineering
Corporation**

Grand Junction Operations

P.O. Box 1100
Grand Junction, CO 81501
Tel: 242-8621

A Subsidiary of
The Bendix Corporation

March 27, 1985

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

ATTN: Coleen Campbell

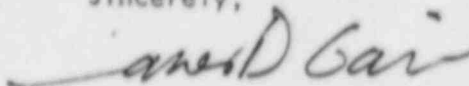
Dear Coleen:

This letter is in follow-up of the Technical Review for Department of Energy (DOE) Identification (ID) number GJ-13649-~~RS~~^{MS}, conducted on 27 March 1985.

1. The radium table has been corrected to show the depth of contamination for sample location number 22 (200254) to be 18-inches.
2. The delta at (233234) was taken under the sidewalk horizontally, 3-inches in from the edge of the sidewalk.
3. It has been noted in the REA that Area 'K' be closely monitored during remedial action.
4. It has been noted in the REA that the crawl space adjacent to the garage be closely monitored for spillover contamination, during remedial action.

Thank you for your time and cooperation. If you have further questions or comments, please contact me at 242-8621, extension 473.

Sincerely,



James D. Garcia
Radiologic Survey Team

JG:dk

INTERNAL
MEMORANDUM

Bendix Field Engineering Corporation
Grand Junction Projects Office

Date: March 7, 1985

To: Files

From: James Garcia

Subject: Team Leader Notes - GJ-13649-MR

Address: 736 26 1/2 Road

Owner: Mrs. Wuster

Team Members

J. Garcia	R. Vialpando
P. Tuhey	M. Duran
I. Caley	R. Beltz
S. Southern	D. Martz

Instruments

Scintillometer - 1149, 1185, 1208, 1184
Total Count - 1062, 3573
Delta - 3935, 3943
Spectrometer - 0498

Today (February 27, 1985) the Team Members and myself will only be able to perform an exterior survey. The homeowner will not be at home until Saturday (March 2, 1985) to let us inside the home.

While performing a delta at 224210, we hit concrete at six inches below ground level. When we return Saturday (March 2, 1985) I shall question Mrs. Wuster to see if she is aware of what this concrete slab is made of and how far it extends. I also intend on asking her for permission to remove a row of planks from her deck so that I may check out the high readings that appear to be coming from under her deck.

J. Garcia
Team Leader Notes
GJ-13649-MR
March 7, 1985
Page 2

Revisit

Team Members

J. Garcia	D. Martz
B. Foust	C. Adams

Instruments

Scintillometer - 1149, 1185, 1035
Delta - 3935
Total Count - 1062, 3573

Date: March 2, 1985

Billie Foust and Dave Martz will be performing the interior survey.

Mrs. Wuster informed me that the concrete we hit when performing a delta on our last visit (27 February 1985) was the top of her septic tank. She also commented that they have never been on the city sewer system.

We discovered a leach field (active) in the yard east of Mrs. Wuster's house. We intend on exploring the sewer line and the leach field.

When removing some of the planks from the deck we discovered a concrete patio underneath so we cored and augered. I believe that this slab and the one in the garage were poured at the same time because the total count readings appeared to be similar. As for what to do about the false sewer lines, I will have to discuss this with D. Mackler. I may decide to draw them in and send it to drafting.

J. Garcia
Team Leader Notes
GJ-13649-MR
March 7, 1985
Page 3

Revisit

Team Members

D. Martz	K. Cary
J. Garcia	

Instruments

Total Count - 3956

Date: March 7, 1985

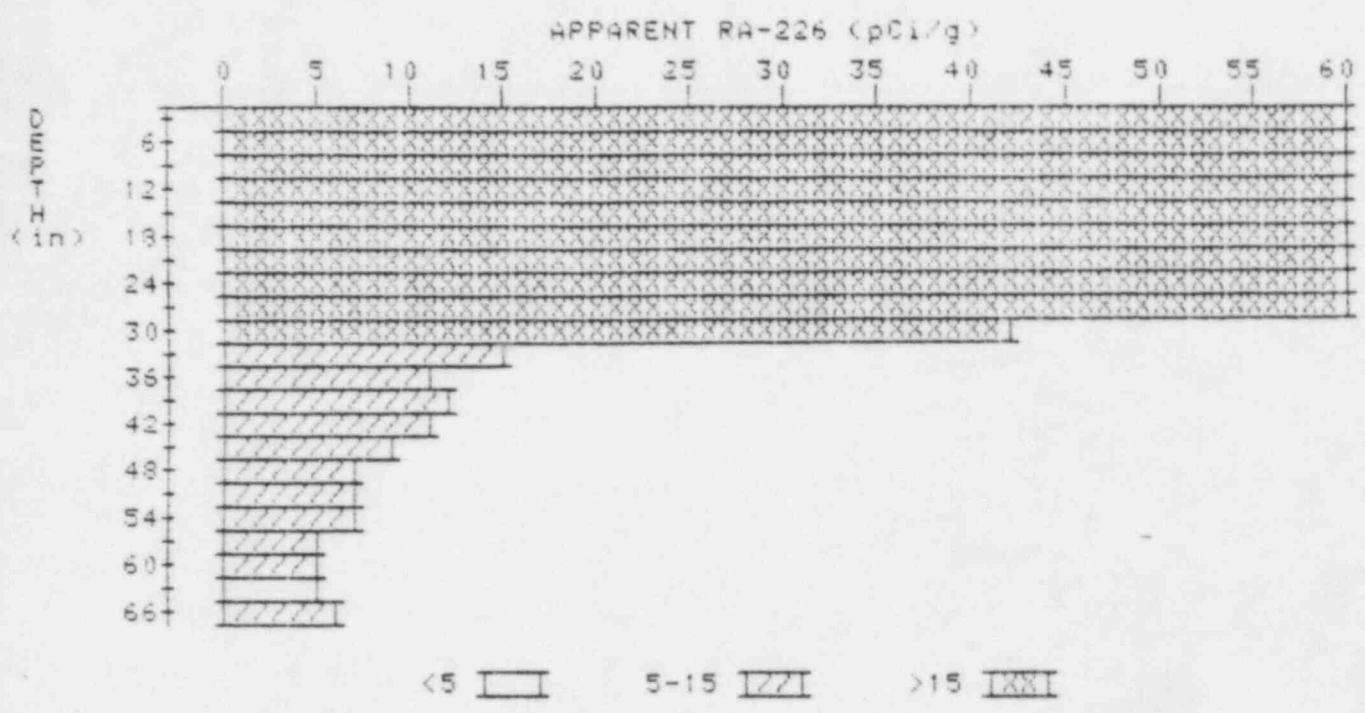
Due to inconclusive data concerning the yard east of the house around the leach field, it was suggested that I drill a few more holes to establish a depth for that area. We augered several more holes in the leach field and logged them. I think I shall have sufficient data now.

When speaking with D. Mackler about the sewer line, septic tank, and leach field, he suggested that I send a letter to Mel Scott, Dennis Price, and Bill Frost informing them of the error on the maps. This will be done so there will be no need to alter the maps myself.

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

1

PROPERTY NUMBER: GJ-13649-MR
HOLE NUMBER: 1
LOCATION:



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	76.5	76.5
6	123.7	161.6
9	149.6	175.2
12	161.1	174.8
15	164.9	176.5
18	162.2	171.6
21	154.2	175.0
24	134.5	151.6
27	105.2	124.6
30	65.0	41.7
33	37.9	14.6
36	23.9	11.1
39	17.1	11.9
42	13.2	11.2
45	10.4	8.6
48	8.6	7.4

51
54
57
60
63
66

7.5
6.7
5.9
5.6
5.4
5.6

7.0
6.7
5.0
5.4
4.7
5.6

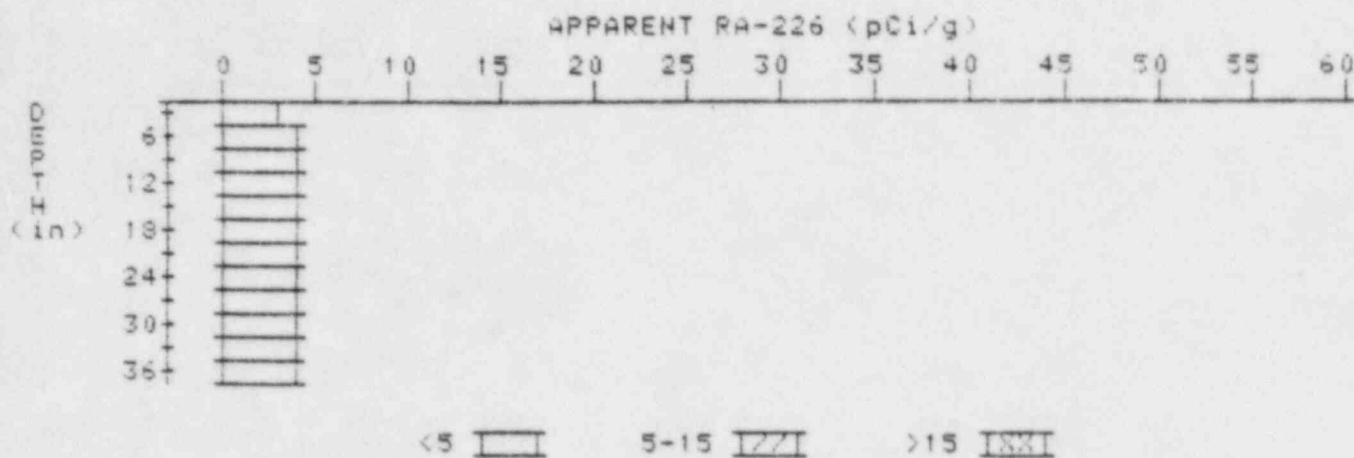
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

8

PROPERTY NUMBER: GJ-13649-MR

HOLE NUMBER: 3

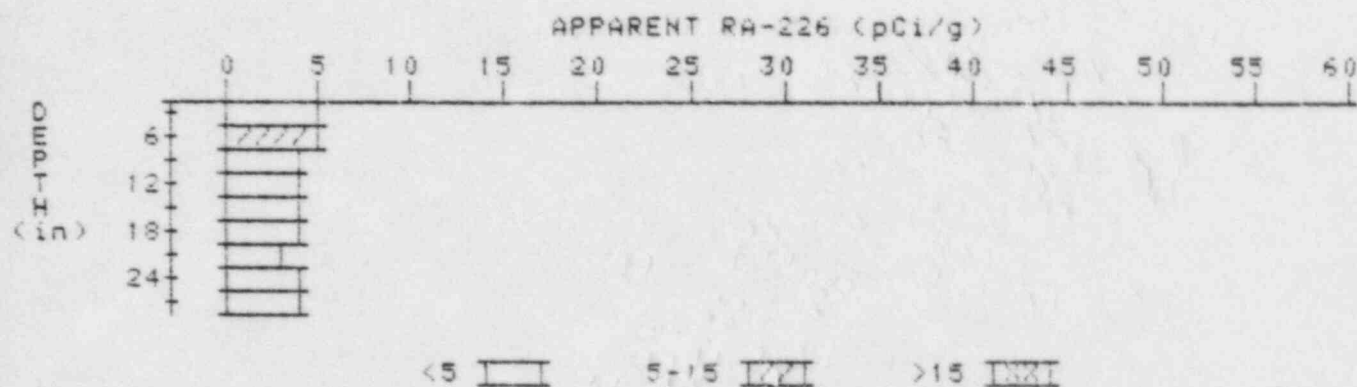
LOCATION: 150240



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.9	2.9
6	3.4	3.9
9	3.6	3.8
12	3.7	3.9
15	3.7	3.5
18	3.8	4.0
21	3.8	4.0
24	3.7	3.5
27	3.7	3.5
30	3.8	4.2
33	3.7	3.5
36	3.7	3.7

APPARENT RADIUM-226 CONCENTRATION 10 DECONVOLUTION GRAPH

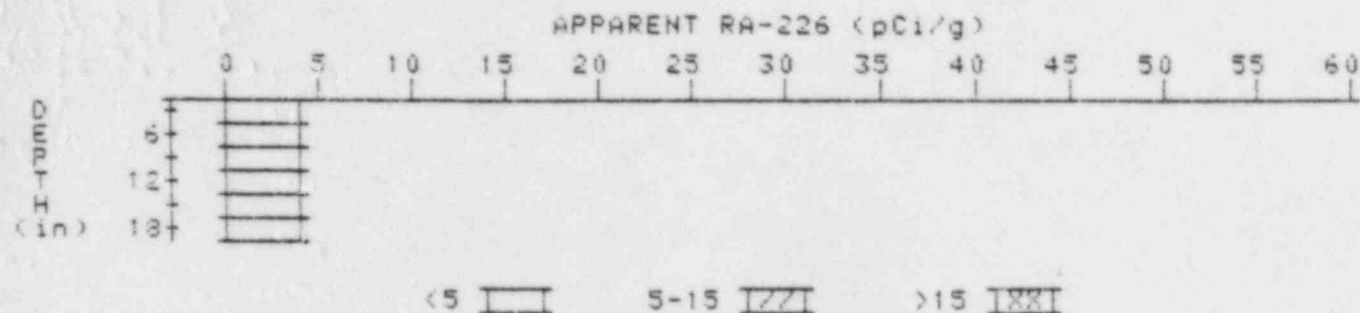
PROPERTY NUMBER: GJ-13649-MR
HOLE NUMBER: 10
- LOCATION: 170262



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.5	4.5
6	4.6	5.5
9	4.2	3.8
12	4.0	3.8
15	3.9	3.7
18	3.9	4.1
21	3.8	3.4
24	3.9	4.1
27	3.9	3.9

APPARENT RADIUM-226 CONCENTRATION 13 DECONVOLUTION GRAPH

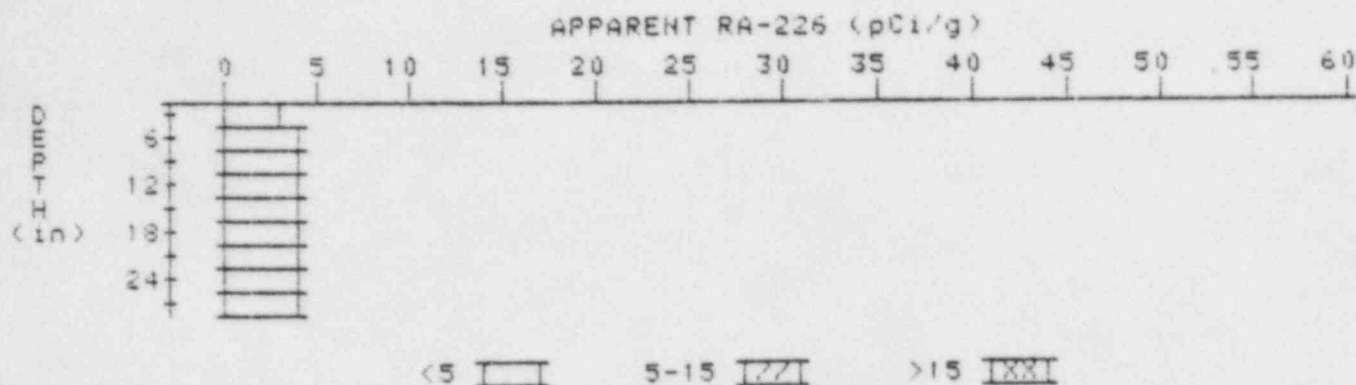
PROPERTY NUMBER: GJ-13649-MR
HOLE NUMBER: 13
LOCATION: 179203



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.5	3.5
6	3.7	3.9
9	3.8	4.2
12	3.7	3.5
15	3.7	3.7
18	3.7	3.7

APPARENT RADIUM-226 CONCENTRATION 14 DECONVOLUTION GRAPH

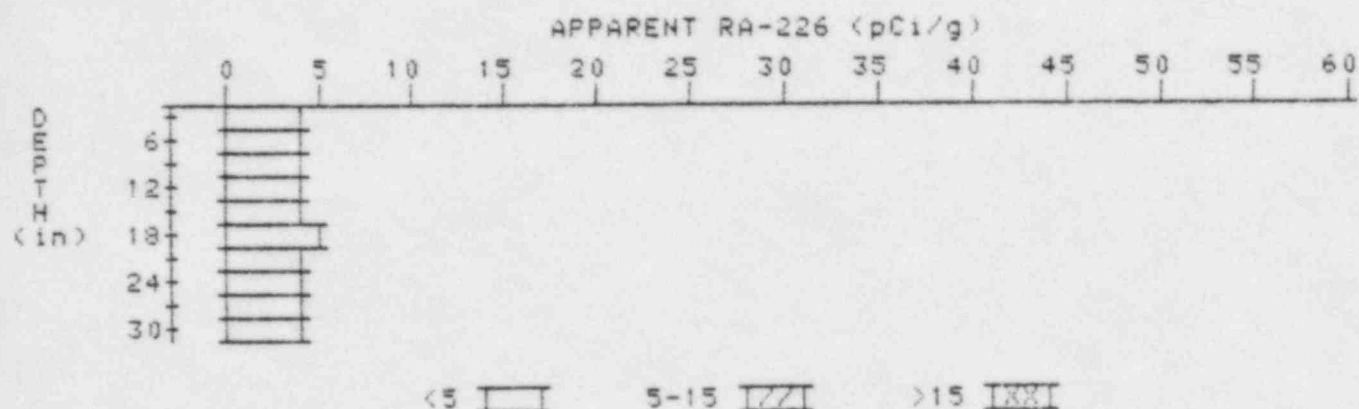
PROPERTY NUMBER: GJ-13649-MR
HOLE NUMBER: 14
LOCATION: 179209



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

APPARENT RADIUM-226 CONCENTRATION 15 DECONVOLUTION GRAPH

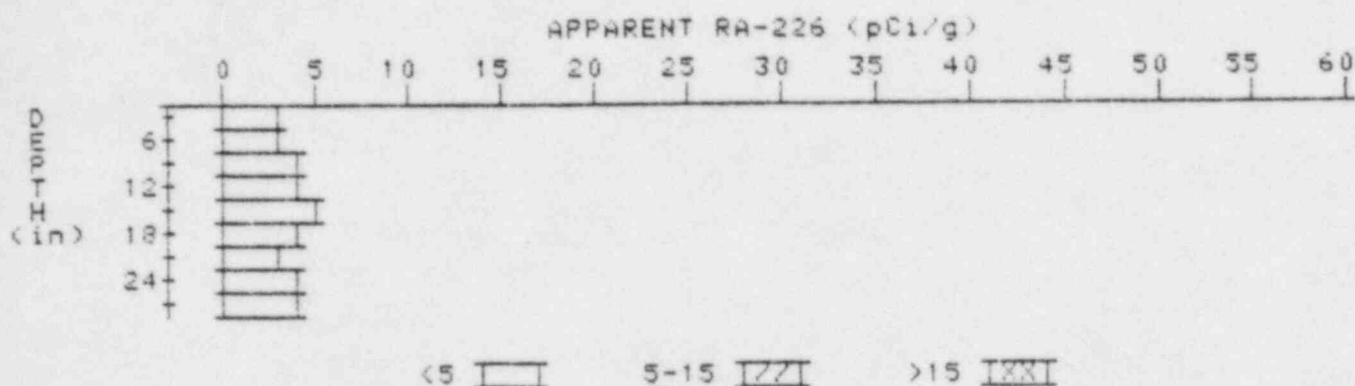
PROPERTY NUMBER: GJ-13649-MR
HOLE NUMBER: 15
LOCATION: 179221



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.6	3.6
6	3.8	3.8
9	4.0	4.2
12	4.1	4.3
15	4.1	3.9
18	4.2	4.6
21	4.1	3.9
24	4.1	4.1
27	4.1	4.3
30	4.0	4.0

APPARENT RADIUM-226 CONCENTRATION 16 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR
HOLE NUMBER: 16
LOCATION: 181198



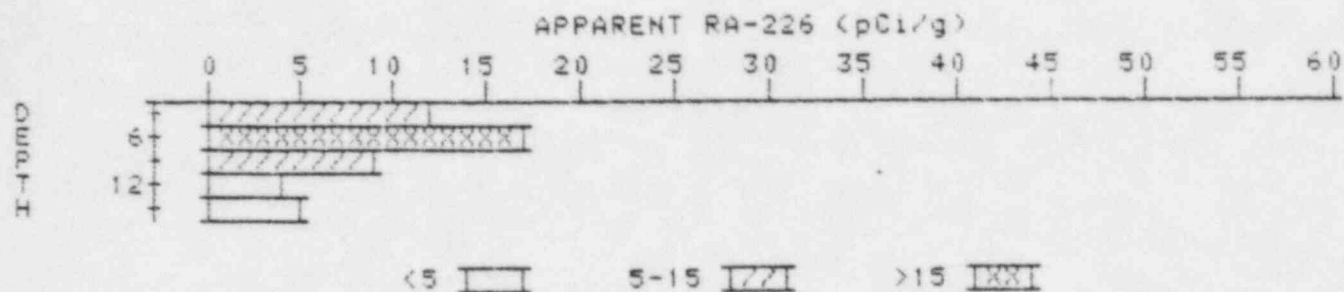
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.5	3.3
9	3.8	4.2
12	3.9	3.9
15	4.0	4.5
18	3.8	3.8
21	3.6	3.1
24	3.7	4.1
27	3.6	3.6

APPARENT RADIUM-226 CONCENTRATION 17 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR

HOLE NUMBER: 17

LOCATION: 181248



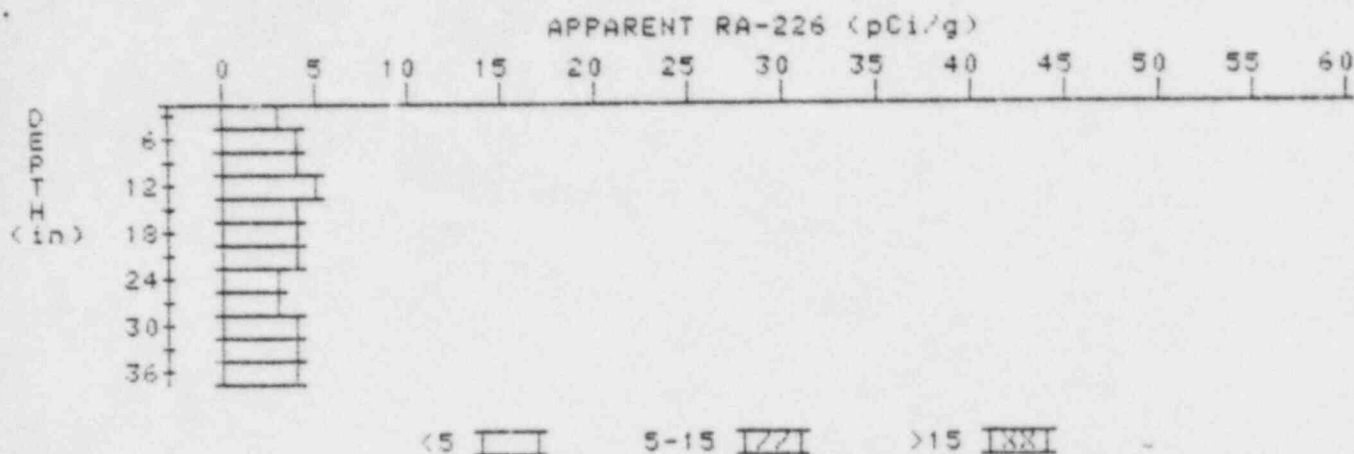
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	11.5	11.5
6	11.6	16.6
9	8.9	8.7
12	6.3	4.2
15	4.9	4.9

APPARENT RADIUM-226 CONCENTRATION 20 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR

HOLE NUMBER: 20

✓ LOCATION: 193197



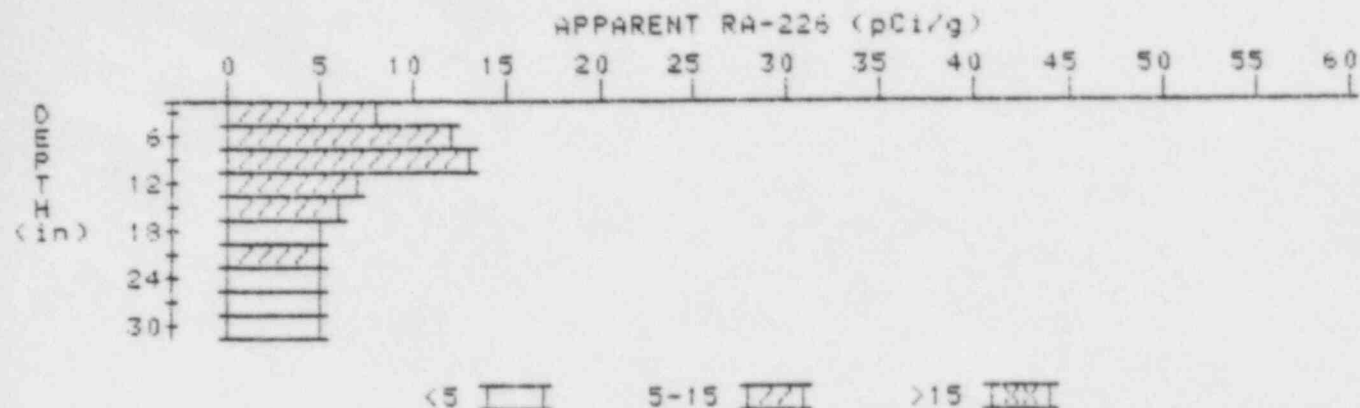
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.4	3.4
6	3.7	3.7
9	4.0	4.2
12	4.2	4.9
15	4.0	3.8
18	3.9	4.1
21	3.7	3.5
24	3.6	3.4
27	3.6	3.4
30	3.7	3.7
33	3.8	4.0
36	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION 21 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR

HOLE NUMBER: 21

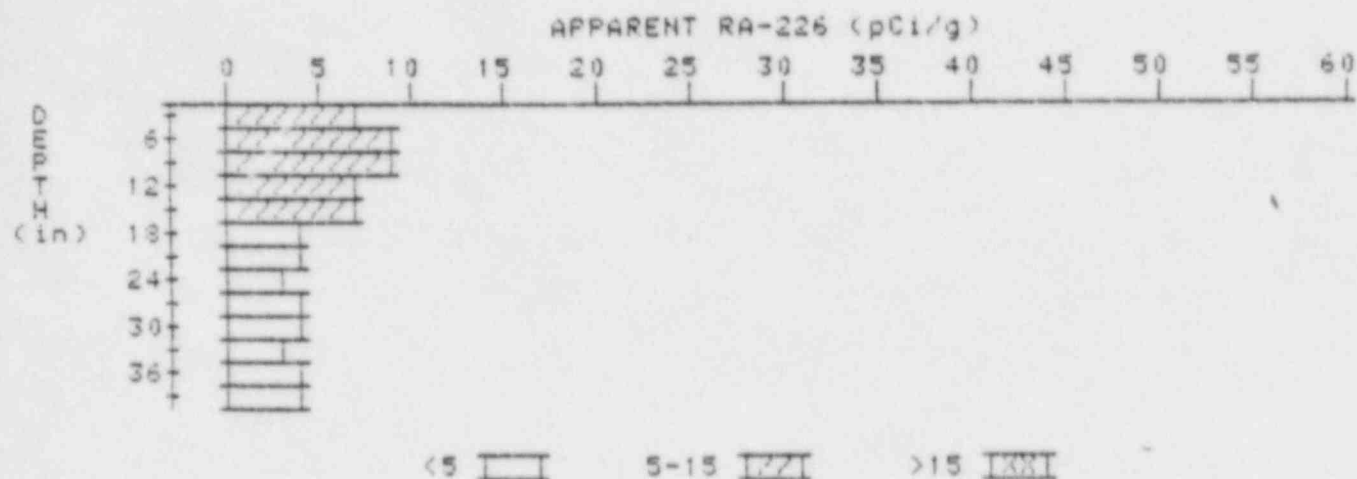
LOCATION: 195265



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	7.7	7.7
6	9.2	11.5
9	9.4	12.6
12	7.3	7.3
15	6.5	5.8
18	5.6	4.7
21	5.2	5.0
24	4.9	4.5
27	4.8	4.8
30	4.7	4.7

APPARENT RADIUM-226 CONCENTRATION 22 DECONVOLUTION GRAPH

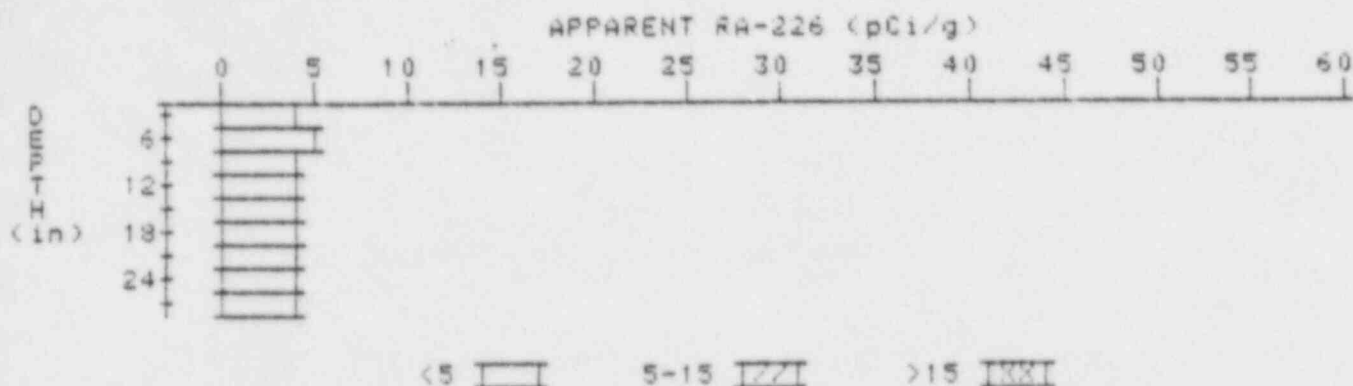
PROPERTY NUMBER: GJ-13649-MR
HOLE NUMBER: 22
LOCATION: 200254



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	7.3	7.3
6	7.7	8.6
9	7.6	8.8
12	6.8	6.8
15	6.0	6.5
18	4.9	3.8
21	4.4	4.2
24	4.0	3.5
27	3.9	3.7
30	3.9	4.1
33	3.8	3.4
36	3.9	4.1
39	3.9	3.9

APPARENT RADIUM-226 CONCENTRATION 24 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR
HOLE NUMBER: 24
LOCATION: 208293



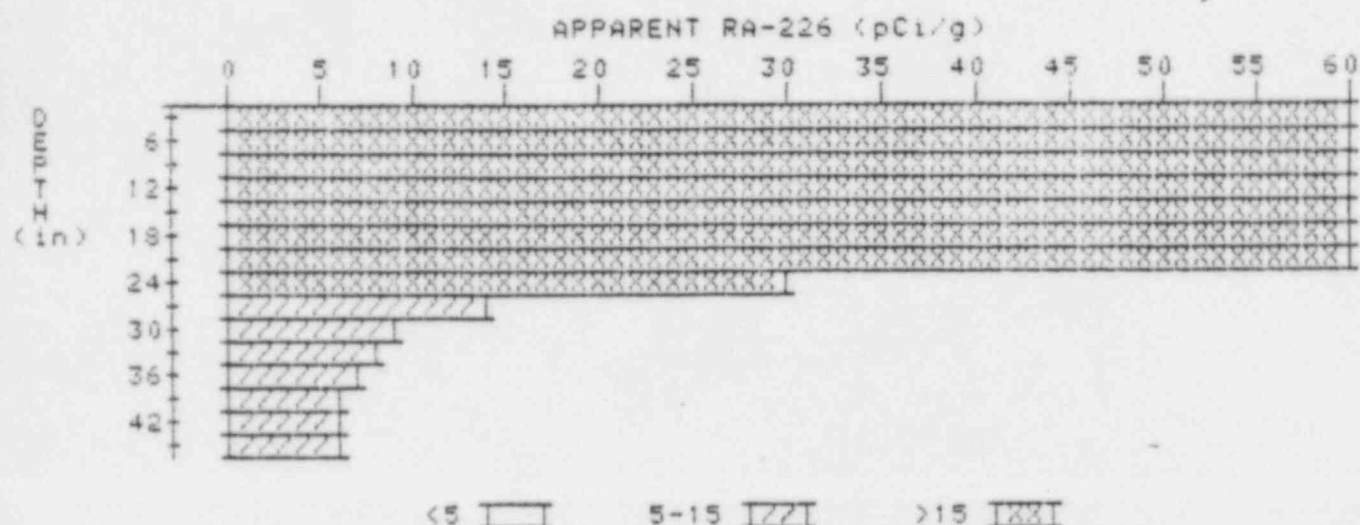
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.2	4.2
6	4.4	4.9
9	4.3	4.5
12	4.1	3.7
15	4.1	4.1
18	4.1	4.3
21	4.0	3.6
24	4.1	4.3
27	4.1	4.1

APPARENT RADIUM-226 CONCENTRATION 25 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR

HOLE NUMBER: 25

LOCATION: 210222



Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	127.1	127.1
6	141.5	166.0
9	142.1	163.1
12	130.9	134.8
15	117.5	123.7
18	100.6	113.0
21	76.7	85.6
24	47.8	30.2
27	28.8	14.0
30	18.1	9.2
33	12.4	7.8
36	9.3	6.8
39	7.6	6.2
42	6.7	5.6
45	6.4	6.4

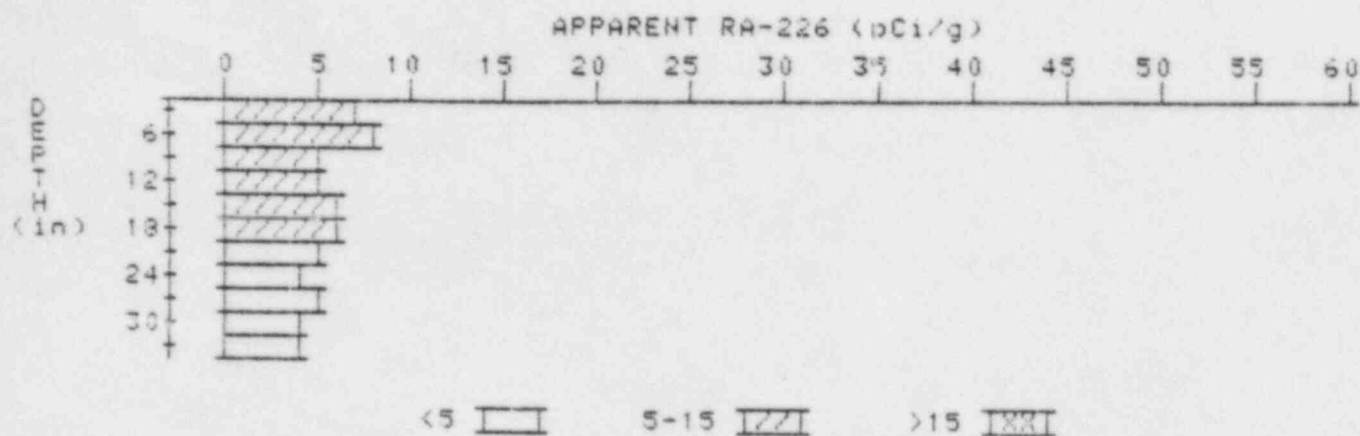
APPARENT RADIUM-226 CONCENTRATION 26

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR

HOLE NUMBER: 26

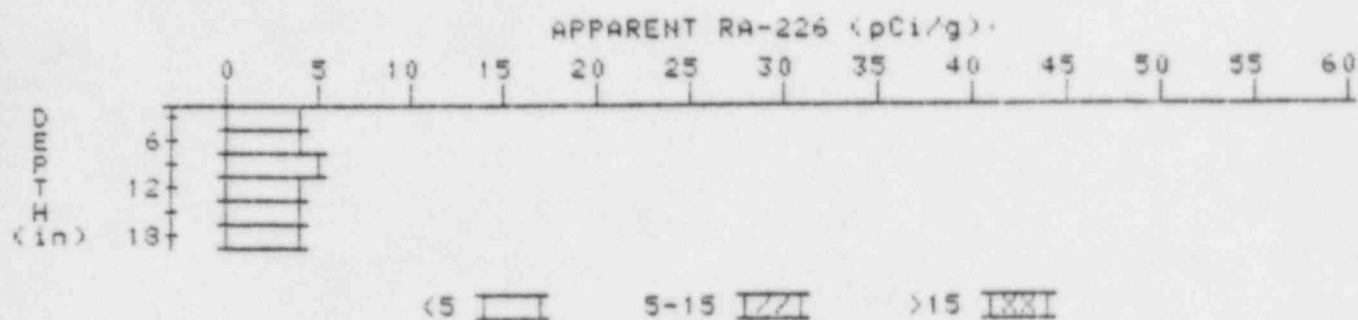
LOCATION: 212212



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	7.3	7.3
6	7.1	8.3
9	6.2	5.3
12	5.8	5.4
15	5.6	5.6
18	5.4	5.8
21	5.0	4.8
24	4.7	4.3
27	4.6	4.8
30	4.4	4.0
33	4.4	4.4

APPARENT RADIUM-226 CONCENTRATION 27 DECONVOLUTION GRAPH

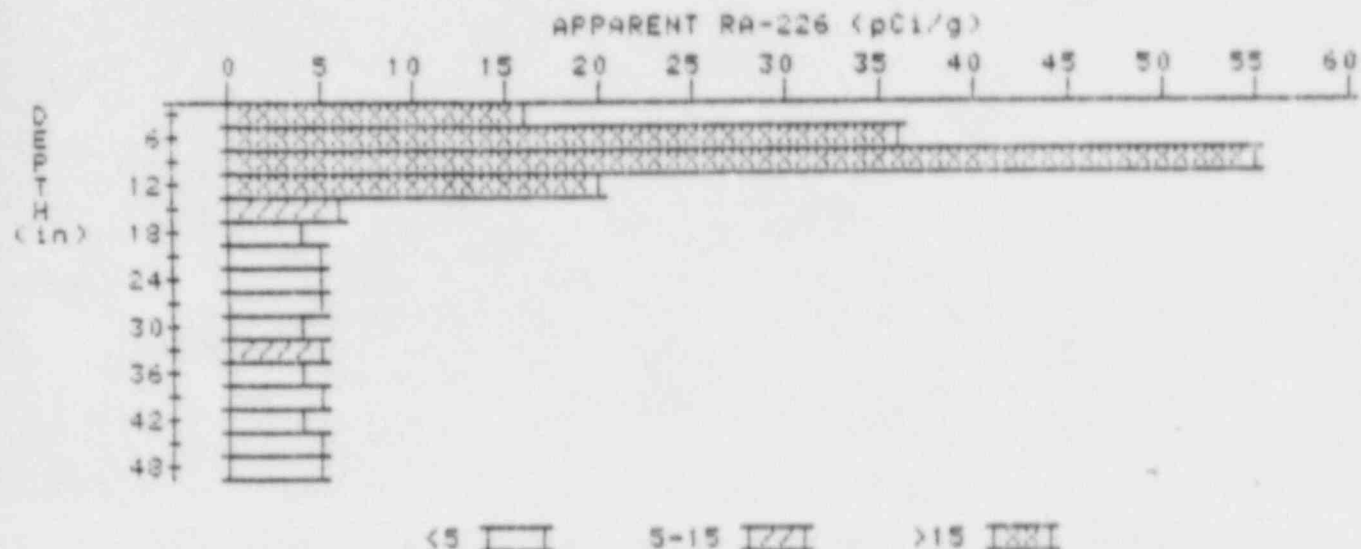
PROPERTY NUMBER: GJ-13649-MR
HOLE NUMBER: 27
LOCATION: 216199



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.7	3.7
6	4.0	4.4
9	4.1	4.6
12	3.9	3.7
15	3.8	3.6
18	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION 28 DECONVOLUTION GRAPH

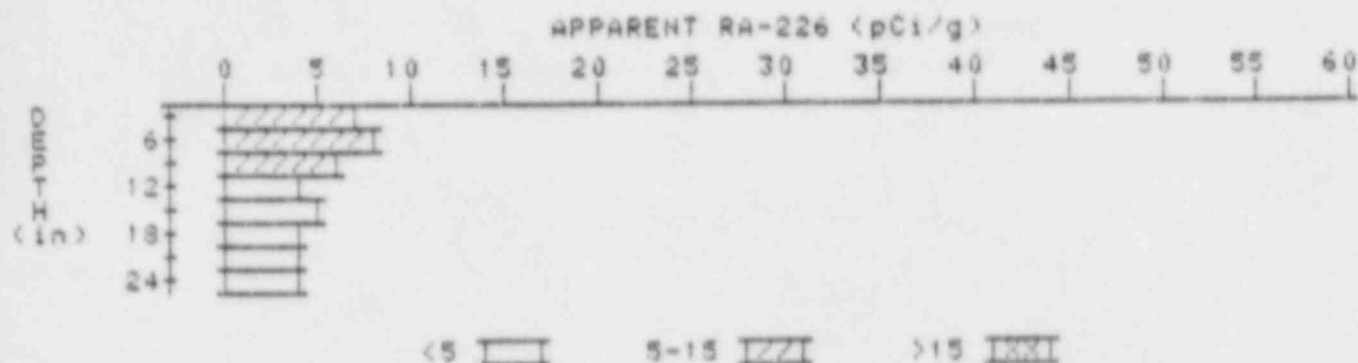
PROPERTY NUMBER: GJ-13649-MR
HOLE NUMBER: 23
LOCATION: 220260



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	16.3	16.3
6	26.3	36.1
9	30.8	55.2
12	21.6	20.2
15	13.2	6.4
18	9.6	4.2
21	6.5	4.5
24	5.5	4.6
27	5.0	4.6
30	4.7	4.2
33	4.7	5.1
36	4.5	4.0
39	4.6	4.8
42	4.6	4.4
45	4.7	4.9
48	4.7	4.7

APPARENT RADIUM-226 CONCENTRATION 30 DECONVOLUTION GRAPH

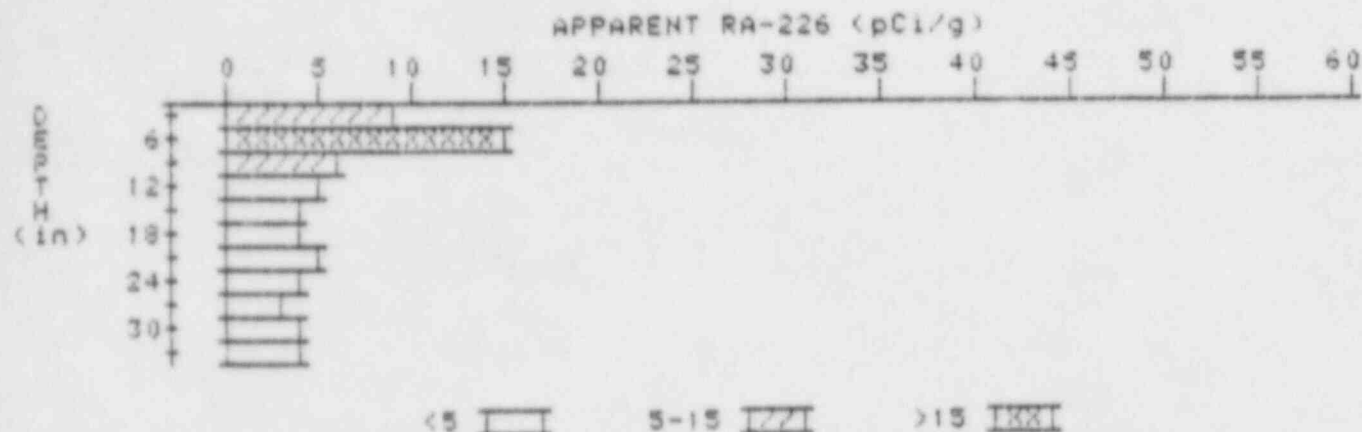
PROPERTY NUMBER: GJ-13649-MA
HOLE NUMBER: 30
LOCATION: 229225



Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	7.1	7.1
6	7.0	8.4
9	6.1	6.1
12	5.2	4.3
15	4.8	4.8
18	4.4	4.0
21	4.2	4.2
24	4.0	4.0

APPARENT RADIUM-226 CONCENTRATION 31 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR
HOLE NUMBER: 31
LOCATION: 231230



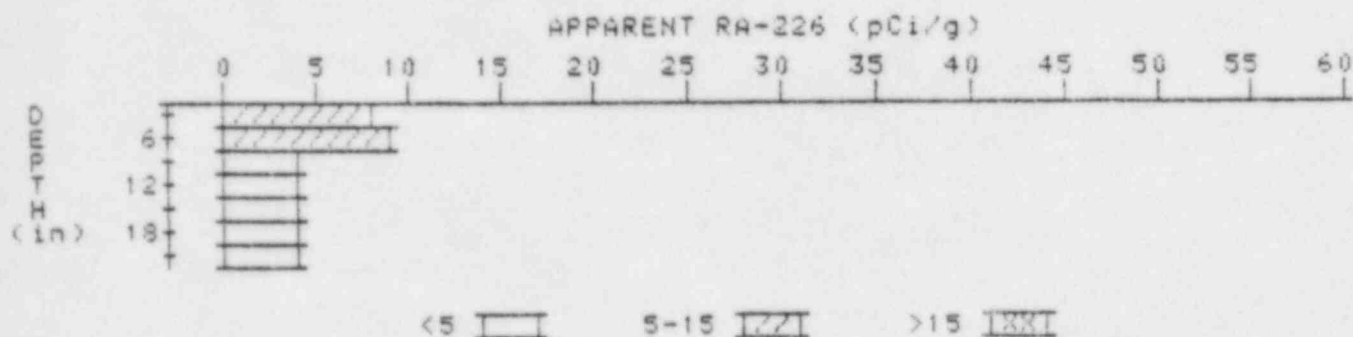
Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	8.6	8.6
6	9.5	15.0
9	7.3	6.1
12	5.8	4.7
15	4.9	4.2
18	4.4	3.7
21	4.3	4.7
24	4.0	3.6
27	3.6	3.3
30	3.9	4.1
33	3.9	3.9

APPARENT RADIUM-226 CONCENTRATION 33 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR

HOLE NUMBER: 33

LOCATION: 235240



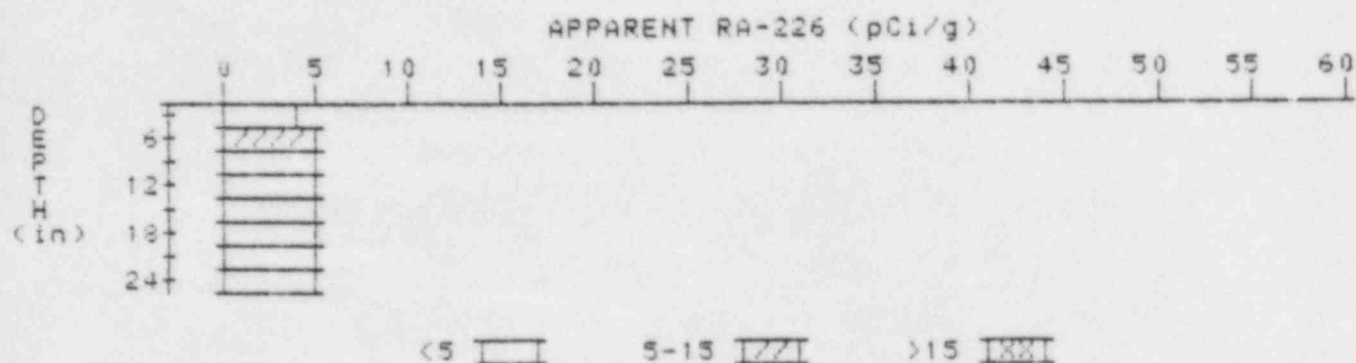
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	8.4	8.4
6	7.5	8.9
9	5.8	4.4
12	4.9	4.2
15	4.4	3.5
18	4.4	4.4
21	4.4	4.4

APPARENT RADIUM-226 CONCENTRATION 34 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR

HOLE NUMBER: 34

LOCATION: 240209



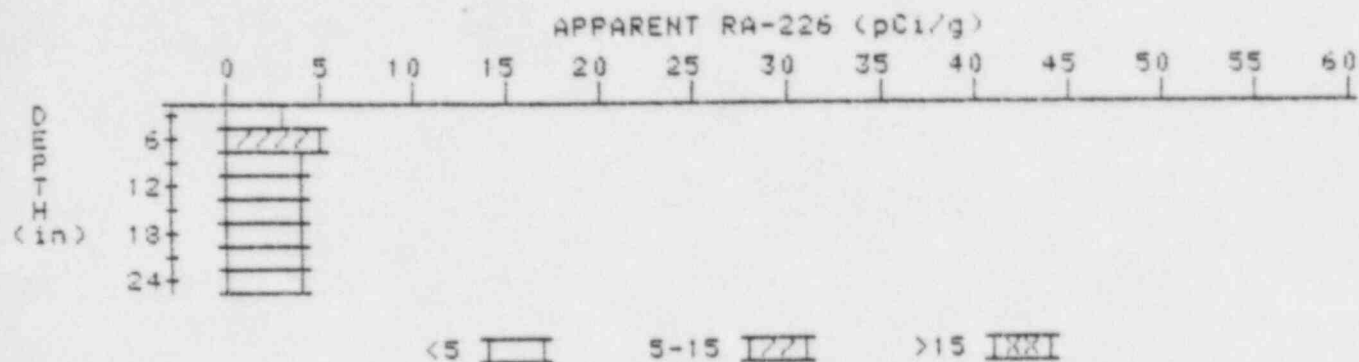
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.5	3.5
6	4.2	5.1
9	4.4	4.6
12	4.5	4.5
15	4.6	4.8
18	4.6	4.6
21	4.6	4.6
24	4.6	4.6

APPARENT RADIUM-226 CONCENTRATION 35 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR

HOLE NUMBER: 35

LOCATION: 245265



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.4	3.4
6	4.0	5.1
9	4.0	4.0
12	4.0	3.8
15	4.1	4.3
18	4.1	4.1
21	4.1	4.1
24	4.1	4.1

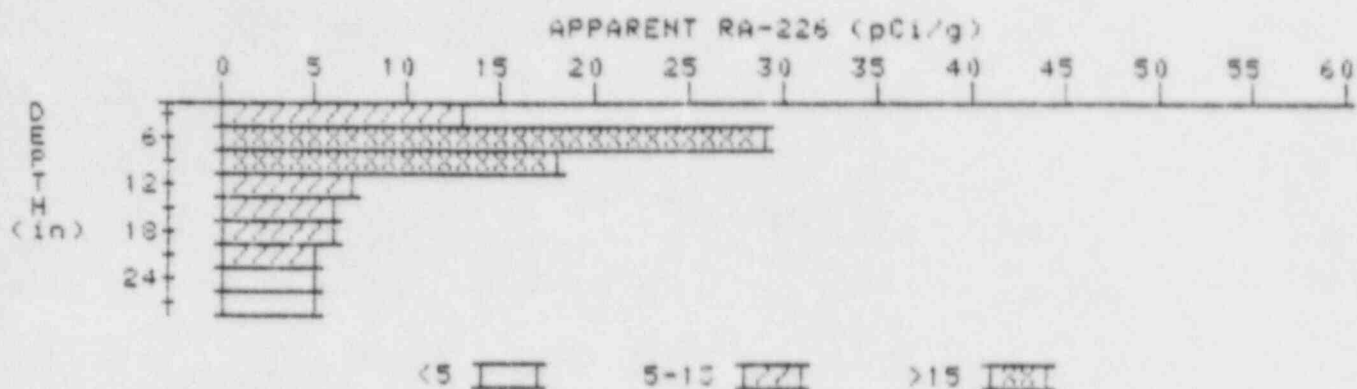
APPARENT RADIUM-226 CONCENTRATION 36

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-M/R

HOLE NUMBER: 36

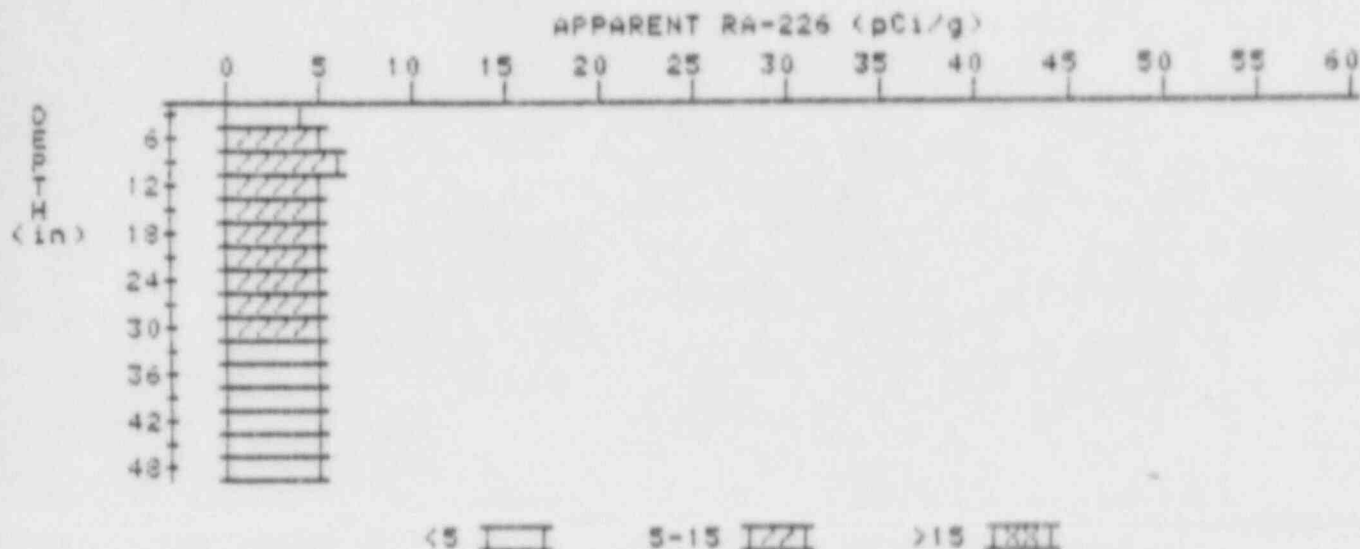
LOCATION: 250220



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	12.7	12.7
6	17.2	29.3
9	14.9	18.5
12	10.6	7.4
15	8.1	6.1
18	6.7	5.8
21	5.8	5.4
24	5.1	4.7
27	4.6	4.6

APPARENT RADIUM-226 CONCENTRATION 37 DECONVOLUTION GRAPH

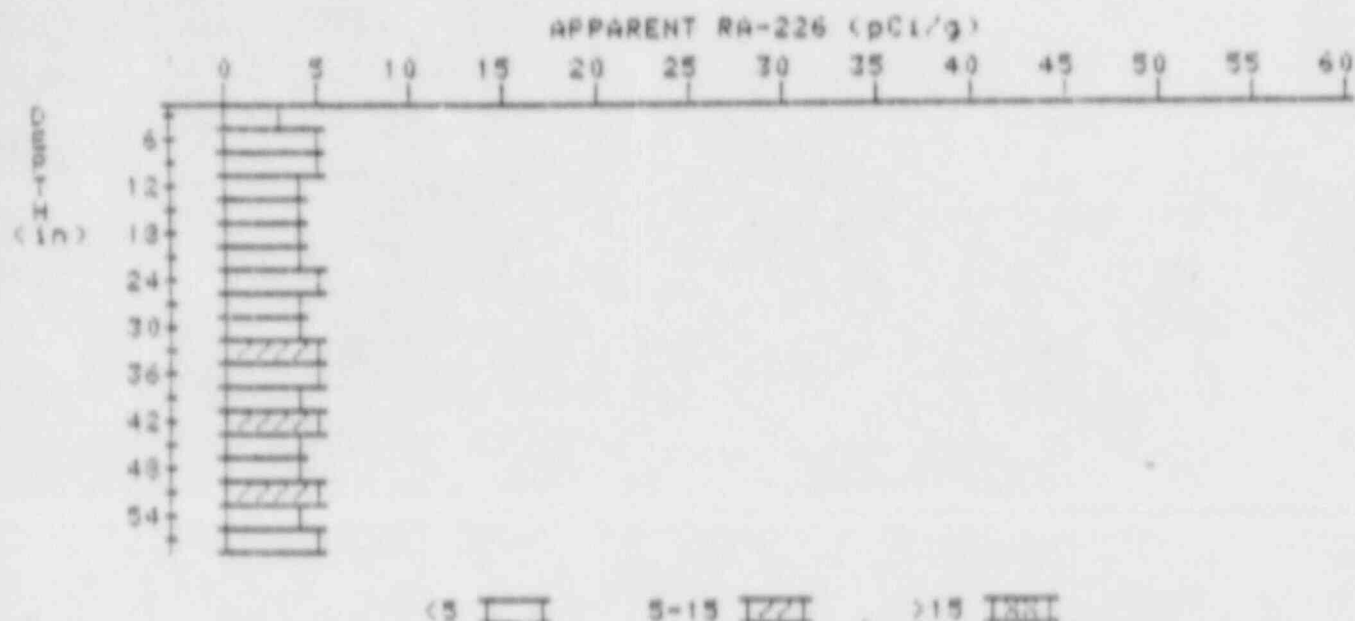
PROPERTY NUMBER: GJ-13649-MR
HOLE NUMBER: 37
LOCATION: 251229



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.8	3.8
6	4.7	5.4
9	5.2	6.1
12	5.2	5.0
15	5.3	5.5
18	5.3	5.5
21	5.2	5.0
24	5.2	5.4
27	5.1	5.1
30	5.0	5.0
33	4.9	4.9
36	4.8	4.6
39	4.8	5.0
42	4.7	4.5
45	4.7	4.9
48	4.6	4.6

APPARENT RADIUM-226 CONCENTRATION 38 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR
HOLE NUMBER: 38
LOCATION: 251239



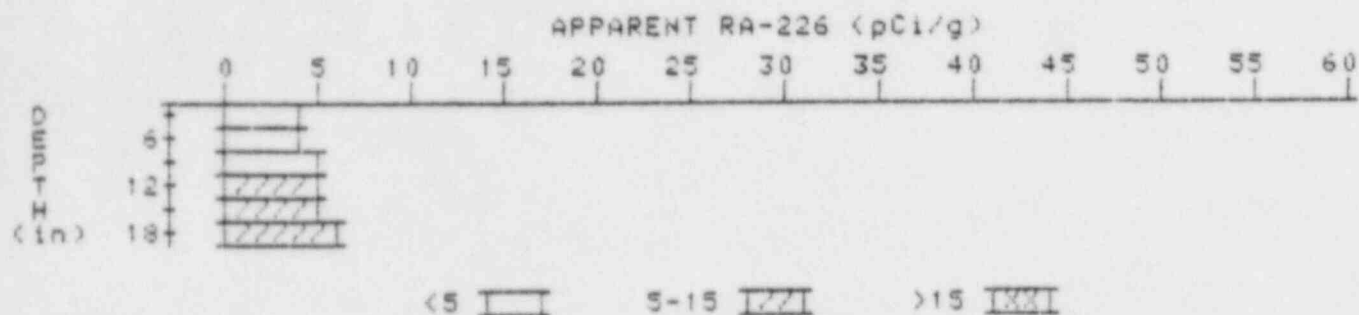
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.2	3.2
6	3.9	4.6
9	4.2	4.6
12	4.3	4.5
15	4.3	4.3
18	4.3	4.3
21	4.3	4.1
24	4.4	4.6
27	4.4	4.2
30	4.5	4.3
33	4.7	5.1
36	4.7	4.9
39	4.6	4.2
42	4.7	5.2
45	4.5	4.3
48	4.4	3.9
51	4.6	5.1
54	4.5	4.3

APPARENT RADIUM-226 CONCENTRATION 39 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR

HOLE NUMBER: 39

LOCATION: 251240



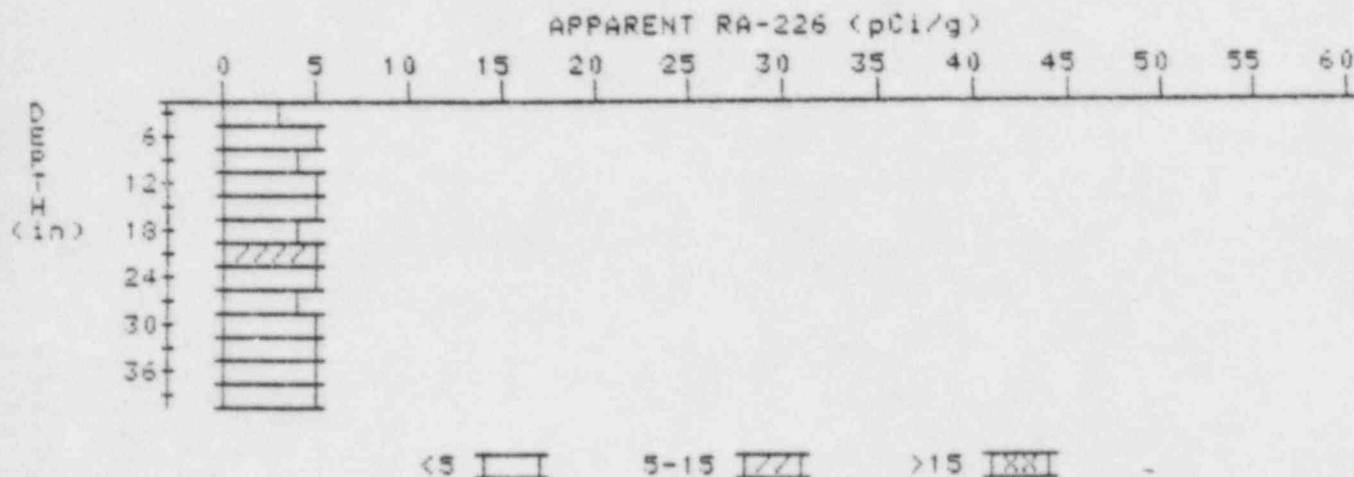
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.8	3.8
6	4.2	4.0
9	4.7	4.9
12	5.1	5.5
15	5.3	5.3
18	5.5	5.5

APPARENT RADIUM-226 CONCENTRATION 40 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR

HOLE NUMBER: 40

LOCATION: 251245



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	4.0	4.7
9	4.3	4.5
12	4.5	4.7
15	4.6	4.8
18	4.6	4.4
21	4.7	5.1
24	4.6	4.6
27	4.5	4.0
30	4.7	4.9
33	4.8	5.0
36	4.8	4.8
39	4.8	4.8

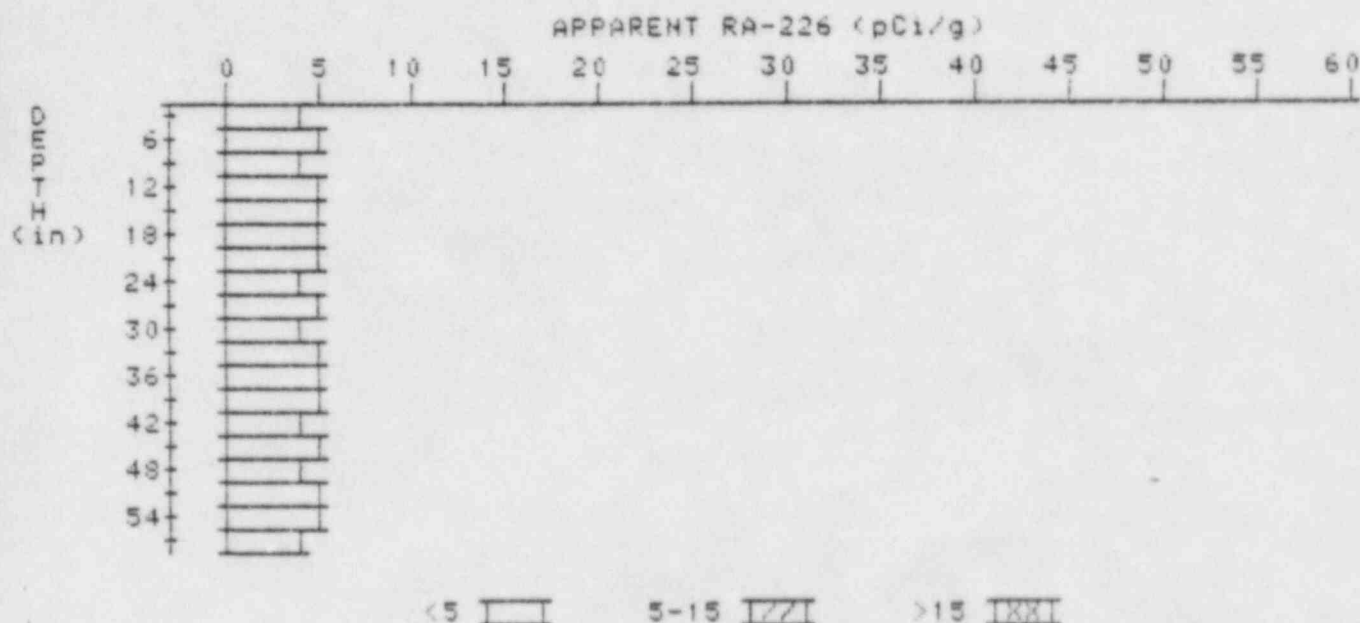
APPARENT RADIUM-226 CONCENTRATION 41

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR

HOLE NUMBER: 41

LOCATION: 252240



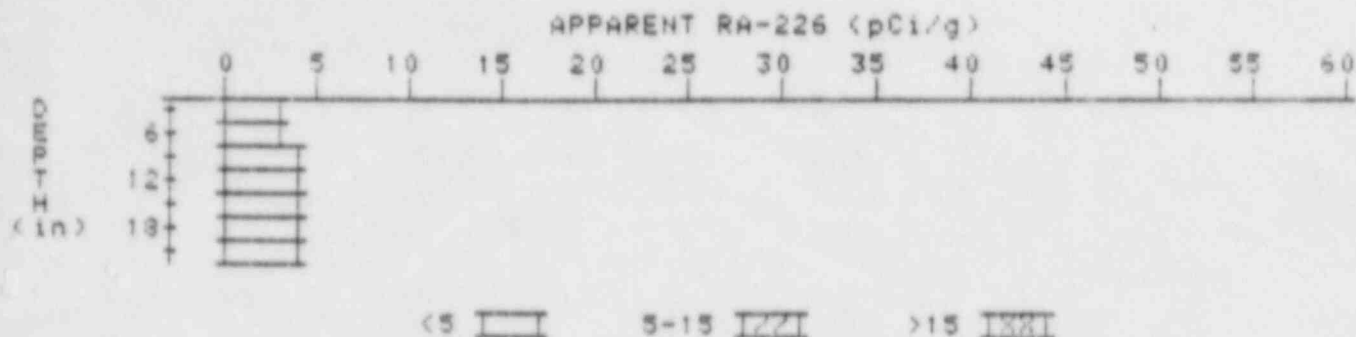
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.5	3.5
6	4.0	4.3
9	4.2	4.2
12	4.4	4.6
15	4.5	4.5
18	4.6	4.8
21	4.6	4.8
24	4.5	4.3
27	4.5	4.5
30	4.5	4.3
33	4.6	4.8
36	4.6	4.6
39	4.6	4.3
42	4.5	4.3
45	4.5	4.7
48	4.4	4.0
51	4.5	4.7
54	4.5	4.7

APPARENT RADIUM-226 CONCENTRATION 42 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13649-MR

HOLE NUMBER: 42

LOCATION: 270210



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.8	2.8
6	3.3	3.5
9	3.7	4.1
12	3.9	4.3
15	3.9	4.1
18	3.8	3.6
21	3.8	3.8