

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-08842-RS
ADDRESS: 2521 SOUTH BROADWAY

AUGUST 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION
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DATE

September 3, 1985

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-08842-RS, is a single-family residence located at 2521 South Broadway, 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, 323 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action is \$12,951. Remedial action on this property will take approximately 21 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 2521 South Broadway, Grand Junction, Colorado

Zoning: Commercial (C)

Lot Size: Approximately 8,097 sf (0.186 acre)

Legal Description: From the southwest corner of Section 15, T.1S, R.1W., on a line bearing N 76° 04' E 940.0 feet, thence N 59° 57' E 370.0 feet, thence N 30° 30' E 60.29 feet to point of beginning, thence N 54° 28' W 125.0 feet, thence N 35° 32' E 72.0 feet, thence S 48° 44' E 120.2 feet, thence S 30° 30' W 60.29 feet to point of beginning, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 2 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:	Single-family residence
South:	Single-family residence
East:	Vacant property (watershed)
West:	South Broadway

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-family residence
Size:	Approximately 1,033 sf
Construction Date:	1957
Construction:	Wood-frame
Foundation:	Concrete
Footing Depth:	Approximately 45" to bottom of footing from grade
Basement:	None
Crawl Space:	Full
Condition:	Fair

Other Structures:

Type:	Garage
Size:	Approximately 240 sf
Construction:	Wood-frame
Foundation:	Concrete slab-on-grade
Condition:	Fair

Type:	Shed
Size:	Approximately 70 sf
Construction:	Metal
Foundation:	Concrete slab
Condition:	Fair

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 RADIOLOGIC SURVEY

3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-08842-RS on April 5, 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 contamination in the southwest yard along the property line, at the southwest side of the garage, and in a circular flower bed in the south yard.

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, 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: 12 to 15 uR/h
Highest Outside Gamma Reading (HOG): 69 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: 11 to 13 uR/h
Highest Inside Gamma Reading (HIG): 13 uR/h

Interior gamma exposure-rate measurements are summarized in Appendix Table 3.2. Appendix Figure 3.3 shows interior exposure rates and the 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 Figure 3.4. Data from these investigations are included in Appendix Table 3.1.

3.4 Radon/Radon Daughter Concentration (RDC)

The working level was not assessed by CDH. No RDC measurements were taken by Bendix.

3.5 Extent of Contamination

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

- (AREA A) Contamination extends to a depth of 11 inches below an uncontaminated 4-inch-thick concrete sidewalk, which lies northeast of the primary structure. The total depth of contamination is 15 inches (approximately 128 sf).
- (AREA B) A deposit of contamination lies directly northeast of the primary structure along the sidewalk. The contamination extends to a depth of 12 inches (approximately 32 sf).
- (AREA C) A deposit northeast of the primary structure, directly adjacent to Area B, is contaminated to a depth of 6 inches (approximately 32 sf).
- (AREA D) A deposit in the flower bed, southwest of the primary structure, is contaminated to a depth of 15 inches (approximately 10 sf).
- (AREA E) The sewer line southwest of the primary structure is contaminated to a depth of 15 inches (approximately 112 sf).
- (AREA F) The southeast yard originally sloped down a total vertical distance of 10 feet toward a drainage ditch. This portion of the property was filled in with contaminated material to level the yard. The depth of this deposit could not be effectively determined because of the inconsistent and variable nature of the contamination. The estimated depth of contamination is approximately 84 inches as determined by conditions (approximately 2,386 sf).

(AREAS REQUIRING FURTHER INVESTIGATION DURING REMEDIAL ACTION)

The soil beneath the garage should be monitored during remedial action because the contamination surrounding the garage is inconsistent and variable.

Removal of the contamination should be gradual and should be monitored closely to ensure only the removal of mill tailings.

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-08842-RS, includes removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figure 3.5) 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 \$12,951.

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-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	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
Figure 3.4	Exterior Sample Locations
Figure 3.5	Exterior Estimated Extent of Contamination

Official Survey Report

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. C	Spectr.		
1	169212	03	TC	2.0		*	Northwest of the primary structure
		06	TC	2.2		*	
		09	TC	2.2		*	DC = 0 inches
		12	TC	2.2		*	
		15	TC	2.1		*	
		18	TC	2.0		*	
		21	TC	2.0		*	
		24	TC	2.0		*	
		27	TC	2.0		*	
		30	TC	2.0		*	
		33	TC	2.0		*	
		36	TC	2.0		*	
		39	TC	2.0		*	
		42	TC	1.9		*	
		45	TC	2.0		*	
		48	TC	2.0		*	
		51	TC	1.9		*	
		54	TC	1.8		*	
		57	TC	1.8		*	
		60	TC	1.9		*	
2	169251	03	TC	6.0		*	By sidewalk in driveway
		06	TC	4.5		*	
		09	TC	3.5		*	DC = 6 inches Based on the deconvolution graph
		12	TC	2.8		*	
		15	TC	2.4		*	
		18	TC	2.4		*	
		21	TC	2.1		*	
		24	TC	2.0		*	
		27	TC	2.0		*	
		30	TC	1.9		*	
		33	TC	1.9		*	
		36	TC	1.8		*	
3	171202	00	DS	<1.0		*	Water line
		00-06	SS			1.2	Northwest of the primary structure
		03	TC	2.3		*	
		06	TC	2.6		*	
		09	TC	2.7		*	Background
		12	TC	2.7		*	
		15	TC	2.7		*	
		18	TC	2.6		*	DC = 0 inches
		21	TC	2.6		*	
		24	TC	2.6		*	

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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.		
3	171202	27	TC	2.6		*	
		30	TC	2.6		*	
		33	TC	2.6		*	
		36	TC	2.5		*	
		39	TC	2.6		*	
		42	TC	2.6		*	
4	175209	00	DS	<1.0		*	Gas line
		18	DS	<1.0		*	
		00-06	SS			1.0	
5	178208	00	DS	<1.0		*	Northwest foundation
6	184248	00-04	SS			1.3	Core
		04-10	SS			34.3	Soil under sidewalk
		03	TC	10.0		*	Northeast of the
		06	TC	18.3		*	primary structure
		09	TC	26.6		*	
		12	TC	20.4		*	DC = 15 inches
		15	TC	10.6		*	Based on the
		18	TC	6.6		*	deconvolution graph
		21	TC	4.7		*	
		24	TC	3.8		*	
		27	TC	3.1		*	
		30	TC	2.8		*	
		33	TC	2.6		*	
		36	TC	2.5		*	
7	187209	03	TC	3.2		*	Sewer line south-
		06	TC	4.1		*	west of the
		09	TC	5.1		*	primary structure
		12	TC	5.0		*	DC = 15 inches
		15	TC	4.4		*	Based on the
		18	TC	4.0		*	deconvolution graph
		21	TC	3.8		*	
		24	TC	3.7		*	
8	188201	03	TC	3.5		*	West of primary
		06	TC	4.5		*	structure by
		09	TC	5.3		*	sewer line
		12	TC	4.8		*	

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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	188201	15	TC	4.4		*	DC = 15 inches
		18	TC	4.1		*	Based on the
		21	TC	3.9		*	deconvolution graph
		24	TC	3.8		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
9	190250	03	TC	10.6		*	Northeast of the
		06	TC	10.4		*	primary structure
		09	TC	7.7		*	
		12	TC	5.1		*	DC = 12 inches
		15	TC	3.9		*	Based on the
		18	TC	3.3		*	deconvolution graph
		21	TC	2.9		*	
		24	TC	2.7		*	
		27	TC	2.5		*	
		30	TC	2.3		*	
		33	TC	2.2		*	
		36	TC	2.2		*	
		39	TC	2.4		*	
10	201230	03	TC	3.1		*	Sewer line
		06	TC	3.4		*	Southeast of the
		09	TC	3.6		*	primary structure
		12	TC	3.7		*	
		15	TC	3.7		*	DC = 0 inches
		18	TC	3.7		*	
		21	TC	3.6		*	
		24	TC	3.6		*	
		27	TC	3.6		*	
		30	TC	3.7		*	
		33	TC	3.8		*	
		36	TC	4.0		*	
		39	TC	4.2		*	
		42	TC	4.1		*	
		45	TC	4.1		*	
		48	TC	4.2		*	
		51	TC	4.1		*	
		54	TC	4.2		*	
		57	TC	4.1		*	
		60	TC	4.2		*	
		63	TC	4.2		*	
		66	TC	4.1		*	
		69	TC	4.2		*	

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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.		
11	205228	03	TC	3.0		*	South property DC = 0 inches
		06	TC	3.5		*	
		09	TC	3.8		*	
		12	TC	4.0		*	
		15	TC	4.0		*	
		18	TC	4.1		*	
		21	TC	4.1		*	
		24	TC	4.2		*	
		27	TC	4.0		*	
		30	TC	4.2		*	
12	210230	03	TC	3.4		*	Southeast property DC > 54 inches Based on the deconvolution graph
		06	TC	4.1		*	
		09	TC	4.6		*	
		12	TC	5.0		*	
		15	TC	5.4		*	
		18	TC	5.7		*	
		21	TC	6.2		*	
		24	TC	6.7		*	
		27	TC	7.5		*	
		30	TC	8.3		*	
		33	TC	8.0		*	
		36	TC	7.7		*	
		39	TC	7.2		*	
		42	TC	7.0		*	
		45	TC	6.9		*	
		48	TC	6.8		*	
		51	TC	6.8		*	
		54	TC	6.7		*	
13	220230	03	TC	9.1		*	Southeast yard DC > 60 inches Based on the deconvolution graph
		06	TC	12.0		*	
		09	TC	13.6		*	
		12	TC	14.2		*	
		15	TC	14.4		*	
		18	TC	15.2		*	
		21	TC	17.4		*	
		24	TC	21.9		*	
		27	TC	28.3		*	
		30	TC	43.6		*	
		33	TC	71.7		*	

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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.		
13	220230	36	TC	107.9		*	
		39	TC	132.6		*	
		42	TC	151.2		*	
		45	TC	163.7		*	
		48	TC	168.3		*	
		51	TC	168.6		*	
		54	TC	165.1		*	
		57	TC	157.9		*	
		60	TC	147.9		*	
14	221219	00	DS	1.3		*	Southeast yard
		06	DS	2.5		*	
		12	DS	2.9		*	
		18	DS	4.3		*	DC > 18 inches
		00-06	SS			1.7	
15	224241	00	DS	1.3		*	South yard by
		06	DS	10.6		*	square grill
		12	DS	32.3		*	
		03	TC	9.0		*	DC > 39 inches
		06	TC	12.4		*	Based on the
		09	TC	17.2		*	deconvolution graph
		12	TC	25.3		*	
		15	TC	40.3		*	
		18	TC	65.4		*	
		21	TC	94.8		*	
		24	TC	105.3		*	
		27	TC	98.0		*	
		30	TC	78.0		*	
		33	TC	55.7		*	
		36	TC	38.8		*	
		39	TC	27.4		*	
16	225210	03	TC	24.7		*	Southeast yard
		06	TC	41.0		*	
		09	TC	53.7		*	DC = 30 inches
		12	TC	58.6		*	Based on the
		15	TC	58.9		*	deconvolution graph
		18	TC	57.8		*	
		21	TC	50.9		*	
		24	TC	32.4		*	
		27	TC	19.6		*	
		30	TC	11.7		*	

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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.		
16	225210	33	TC	8.1		*	
		36	TC	6.7		*	
		39	TC	6.0		*	
		42	TC	5.1		*	
		45	TC	4.8		*	
		48	TC	4.6		*	
		51	TC	4.5		*	
		54	TC	4.3		*	
		57	TC	4.1		*	
		60	TC	4.0		*	
		63	TC	4.0		*	
		66	TC	4.0		*	
		69	TC	4.1		*	
17	225215	00	DS	3.3		*	Southeast yard
		06	DS	6.0		*	
		12	DS	4.3		*	DC > 12 inches
		00-06	SS			1.1	
18	225220	03	TC	4.5		*	Southeast yard
		06	TC	5.9		*	
		09	TC	7.2		*	DC = 42 inches
		12	TC	8.0		*	Based on the
		15	TC	9.5		*	deconvolution graph
		18	TC	12.1		*	
		21	TC	15.8		*	
		24	TC	21.6		*	
		27	TC	31.5		*	
		30	TC	48.7		*	
		33	TC	60.9		*	
		36	TC	55.8		*	
		39	TC	33.5		*	
		42	TC	19.0		*	
		45	TC	13.6		*	
		48	TC	10.2		*	
		51	TC	8.7		*	
		54	TC	7.9		*	
		57	TC	7.6		*	
		60	TC	7.6		*	
		63	TC	7.8		*	
		66	TC	8.0		*	

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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.		
19	225245	03	TC	4.4		*	West side of garage DC > 51 inches Based on the deconvolution graph
		06	TC	5.3		*	
		09	TC	6.1		*	
		12	TC	7.8		*	
		15	TC	9.8		*	
		18	TC	13.5		*	
		21	TC	19.8		*	
		24	TC	28.6		*	
		27	TC	31.9		*	
		30	TC	28.6		*	
		33	TC	30.6		*	
		36	TC	36.6		*	
		39	TC	42.8		*	
		42	TC	43.2		*	
		45	TC	34.0		*	
		48	TC	25.3		*	
		51	TC	17.6		*	
20	225249	00	DS	<1.0		*	South side of garage
		06	DS	<1.0		*	
21	226196	03	TC	22.1		*	West of property line DC > 69 inches Based on the deconvolution graph
		06	TC	25.0		*	
		09	TC	17.9		*	
		12	TC	11.6		*	
		15	TC	8.1		*	
		18	TC	6.1		*	
		21	TC	5.0		*	
		24	TC	4.6		*	
		27	TC	4.5		*	
		30	TC	4.6		*	
		33	TC	4.5		*	
		36	TC	4.7		*	
		39	TC	4.8		*	
		42	TC	5.0		*	
		45	TC	5.3		*	
		48	TC	5.7		*	
		51	TC	6.0		*	
		54	TC	6.3		*	
		57	TC	6.7		*	
		60	TC	6.8		*	
		63	TC	6.7		*	
		66	TC	6.1		*	
		69	TC	5.9		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-08842-RS

2521 South Broadway

Page 8 of 13

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
22	226202	03	TC	26.9		*	Southwest yard
		06	TC	38.5		*	
		09	TC	34.0		*	
		12	TC	21.8		*	
		15	TC	15.1		*	DC > 30 inches Based on the deconvolution graph
		18	TC	11.7		*	
		21	TC	10.2		*	
		24	TC	9.1		*	
		27	TC	8.9		*	
		30	TC	9.0		*	
23	230233	00	DS	3.2		*	South yard by circular flower bed
		06	DS	<1.0		*	
24	230270	03	TC	3.8		*	Southeast of the garage
		06	TC	4.1		*	
		09	TC	4.2		*	
		12	TC	4.3		*	
		15	TC	4.5		*	DC > 48 inches Based on the deconvolution graph
		18	TC	4.8		*	
		21	TC	5.4		*	
		24	TC	6.0		*	
		27	TC	6.6		*	
		30	TC	7.7		*	
		33	TC	9.4		*	
		36	TC	12.0		*	
		39	TC	16.0		*	
		42	TC	24.6		*	
		45	TC	38.8		*	
		48	TC	49.0		*	
25	235264	03	TC	3.9		*	Southwest corner of garage
		06	TC	5.1		*	
		09	TC	7.0		*	
		12	TC	9.6		*	DC = 21 inches Based on the deconvolution graph
		15	TC	10.1		*	
		18	TC	7.4		*	
		21	TC	5.6		*	
		24	TC	4.7		*	
		27	TC	4.4		*	
		30	TC	4.2		*	
		33	TC	4.2		*	
		36	TC	4.3		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-08842-RS

2521 South Broadway

Page 9 of 13

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
25	235264	39	TC	4.3		*	
		42	TC	4.4		*	
		45	TC	4.4		*	
		48	TC	4.5		*	
		51	TC	4.5		*	
		54	TC	4.6		*	
26	236250	03	TC	2.6		*	Southeast corner of garage
		06	TC	3.2		*	
		09	TC	3.8		*	
		12	TC	4.3		*	DC = 0 inches
		15	TC	4.3		*	
		18	TC	4.5		*	
		21	TC	4.2		*	
		24	TC	4.0		*	
		27	TC	4.3		*	
		30	TC	4.1		*	
		33	TC	4.2		*	
		36	TC	4.3		*	
		39	TC	4.4		*	
		42	TC	4.5		*	
		45	TC	4.6		*	
		48	TC	4.7		*	
		51	TC	4.6		*	
27	238255	03	TC	2.6		*	Southeast of garage
		06	TC	3.3		*	
		09	TC	3.9		*	
		12	TC	4.2		*	DC = 0 inches
		15	TC	4.7		*	
		18	TC	4.8		*	
		21	TC	4.5		*	
		24	TC	4.3		*	
		27	TC	4.1		*	
		30	TC	3.9		*	
		33	TC	4.0		*	
		36	TC	4.0		*	
		39	TC	4.0		*	
		42	TC	4.0		*	
		45	TC	4.0		*	
		48	TC	4.0		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-08842-RS

2521 South Broadway

Page 10 of 13

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
27	238255	51	TC	4.0		*	
		54	TC	4.1		*	
		57	TC	4.0		*	
		60	TC	3.9		*	
		63	TC	3.9		*	
		66	TC	4.0		*	
		69	TC	4.0		*	
		71	TC	4.0		*	
		74	TC	4.0		*	
		77	TC	3.9		*	
28	240240	03	TC	3.0		*	Rock garden in southeast yard
		06	TC	3.6		*	
		09	TC	4.0		*	
		12	TC	4.1		*	DC > 81 inches Based on the deconvolution graph
		15	TC	4.3		*	
		18	TC	4.4		*	
		21	TC	4.6		*	
		24	TC	5.0		*	
		27	TC	5.4		*	
		30	TC	5.7		*	
		33	TC	6.0		*	
		36	TC	6.5		*	
		39	TC	7.9		*	
		42	TC	10.6		*	
		45	TC	13.6		*	
		48	TC	13.2		*	
		51	TC	10.3		*	
		54	TC	8.7		*	
		57	TC	7.8		*	
		60	TC	7.2		*	
		63	TC	7.0		*	
29	245213	66	TC	7.0		*	
		69	TC	6.8		*	
		72	TC	6.7		*	
		75	TC	6.7		*	
		78	TC	6.8		*	
		81	TC	6.6		*	
29	245213	03	TC	4.4		*	Southeast yard
		06	TC	5.1		*	
		09	TC	5.9		*	
		12	TC	6.7		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-08842-RS

2521 South Broadway

Page 11 of 13

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
29	245213	15	TC	8.3		*	DC > 48 inches Based on the deconvolution graph
		18	TC	11.2		*	
		21	TC	17.7		*	
		24	TC	27.4		*	
		27	TC	35.4		*	
		30	TC	26.7		*	
		33	TC	17.5		*	
		36	TC	11.8		*	
		39	TC	8.2		*	
		42	TC	8.2		*	
		45	TC	7.5		*	
		48	TC	7.1		*	
30	245199	03	TC	25.4		*	Southwest of the property line DC = 84 inches Based on the deconvolution graph
		06	TC	29.9		*	
		09	TC	27.8		*	
		12	TC	23.6		*	
		15	TC	18.9		*	
		18	TC	14.1		*	
		21	TC	10.3		*	
		24	TC	8.4		*	
		27	TC	7.8		*	
		30	TC	7.8		*	
		33	TC	7.8		*	
		36	TC	8.2		*	
		39	TC	9.1		*	
		42	TC	11.3		*	
		45	TC	14.5		*	
		48	TC	18.4		*	
		51	TC	23.3		*	
		54	TC	31.1		*	
		57	TC	43.9		*	
		60	TC	62.8		*	
		63	TC	83.5		*	
		66	TC	112.8		*	
		69	TC	130.3		*	
		72	TC	134.0		*	
		75	TC	126.5		*	
		78	TC	103.7		*	
		81	TC	72.1		*	
		84	TC	46.4		*	
		87	TC	31.8		*	
		90	TC	23.0		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-08842-RS

2521 South Broadway

Page 12 of 13

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
30	245199	93	TC	18.6		*	
		96	TC	15.0		*	
		99	TC	13.5		*	
31	245259	03	TC	3.8		*	Southeast property DC = 18 inches Based on the deconvolution graph
		06	TC	4.7		*	
		09	TC	6.1		*	
		12	TC	7.6		*	
		15	TC	6.7		*	
		18	TC	5.3		*	
		21	TC	4.4		*	
		24	TC	4.4		*	
		27	TC	4.1		*	
		30	TC	3.9		*	
		33	TC	3.7		*	
		36	TC	3.7		*	
		39	TC	3.7		*	
		42	TC	3.7		*	
		45	TC	3.7		*	
32	248255	03	TC	3.3		*	South of garage DC = 0 inches
		06	TC	4.3		*	
		09	TC	5.0		*	
		12	TC	4.7		*	
		15	TC	4.3		*	
		18	TC	4.1		*	
		21	TC	3.9		*	
		24	TC	3.9		*	
		27	TC	3.8		*	
33	250230	03	TC	3.0		*	South yard DC > 66 inches Based on the deconvolution graph
		06	TC	3.7		*	
		09	TC	4.2		*	
		12	TC	4.2		*	
		15	TC	4.4		*	
		18	TC	4.6		*	
		21	TC	4.7		*	
		24	TC	4.8		*	
		27	TC	5.3		*	
		30	TC	5.3		*	
		33	TC	5.7		*	
		36	TC	6.1		*	
		39	TC	6.7		*	
		42	TC	7.2		*	
		45	TC	7.5		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-08842-RS

2521 South Broadway

Page 13 of 13

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
33	250230	45	TC	7.5		*	
		48	TC	7.9		*	
		51	TC	8.8			
		54	TC	10.5		*	
		57	TC	12.9		*	
		60	TC	17.2		*	
		63	TC	24.1		*	
		66	TC	38.5		*	
34	255245	00	DS	<1.0		*	Backyard southeast
		03	TC	2.7		*	of property line
		06	TC	3.1		*	
		09	TC	3.4		*	DC = 0 inches
		12	TC	3.6		*	
		15	TC	3.8		*	
		18	TC	3.7		*	
		21	TC	3.9		*	
		24	TC	3.9		*	
35	260225	00	DS	7.1		*	Backyard southeast
		03	TC	4.8		*	property line
		06	TC	3.8		*	
		09	TC	3.7		*	
		12	TC	3.7		*	DC = 0 inches
		15	TC	3.8		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.9		*	
		27	TC	3.8		*	
		30	TC	3.8		*	

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 = 04-05-85
 Team Leader = CH

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)
-----	-----	-----	-----	-----	-----	-----
PRIMARY STRUCTURE	*	*	*	*	11-13	*
GARAGE	12	12-14	13	12	12-14	14
SHED	04	13-14	14	04	14-14	14
=====	=====	=====	=====	=====	=====	=====

* The CDH and ORNL data indicate the absence of interior contamination at this property. This information was investigated by performing a walking gamma scan in the primary structure. This information and the exposure rates in the garage and shed shown in Appendix Figure 3.3.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-08842-RS

Page 1 of 1

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
EXTERIOR					
Concrete					
A	4 x 32 =	128	x 0.3 =	38	
Volume of concrete				= 38	= 38/27 = 1
Contaminated Fill					
A	4 x 32 =	128	x 1.0 =	128	
B	2 x 16 =	32	x 1.0 =	32	
C	2 x 16 =	32	x 0.5 =	16	
D	2 x 5 =	10	x 1.3 =	13	
E	28 x 4 =	112	x 1.3 =	146	
F	43 x 52 =	2,236			
	15 x 10 =	150			
		2,386	x 3.5* =	8,351	
Volume of Contaminated Fill				= 8,686	= 8,686/27 = 322
TOTAL VOLUME - EXTERIOR					= 323

* The steeply sloping ground at Area F required that the depths must be averaged to result in the correct volume of contaminated fill.

See Appendix Figure 3.5 For Areas

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-08842-RS

Page 1 of 2

Remove contaminated material (machine) 322 cy @ \$14.50/cy	\$ 4,669
Replace topsoil (12") 94 cy @ \$9.50/cy	893
Replace sod 122 sf @ \$0.35/sf	43
Replace pit run 221 cy @ \$9/cy	1,989
Replace roadbase 7 cy @ \$11.50/cy	81
Remove and replace concrete walk 128 sf @ \$3/sf	384
Remove and replace concrete steps Lump Sum	160
Remove and replace step stones Lump Sum	50
Remove and replace flagstone Lump Sum	50
Remove and replace clothesline Lump Sum	150
Remove and replace in-ground BBQ Lump Sum	250
Remove and replace planter stone Lump Sum	100
New saplings 4 ea @ \$100 ea.	400
	<hr/>
TOTAL EXTERIOR	\$ 9,219

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-08842-RS

Page 2 of 2

TOTAL EXTERIOR	\$	9,219
TOTAL INTERIOR		0
ACCESS CONTROL		200
		<hr/>
SUBTOTAL	\$	9,419
CONTINGENCY @ 10%		942
		<hr/>
SUBTOTAL	\$	10,361
CONTRACTOR OVERHEAD & PROFIT @ 25%		2,590
		<hr/>
GRAND TOTAL	\$	12,951

=====

FHW083085
REA08842/REA-GE010/AP

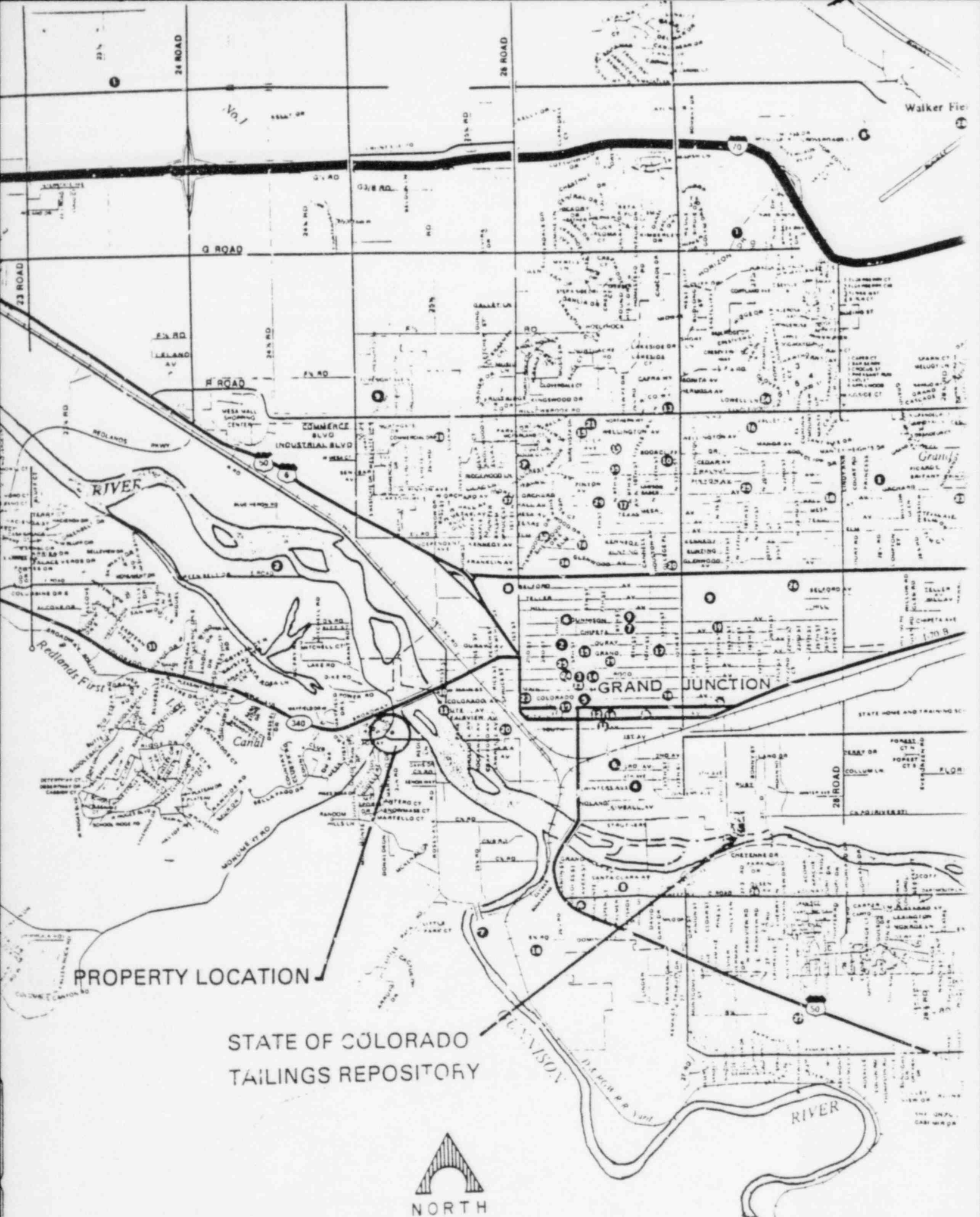


FIGURE 2.1
VICINITY MAP

5.48°44'E, 120.2 FEET, THEN S. 30°30'W, 60.29 FEET TO POINT OF BEGINNING.

NOTE: OWNER OF THIS PLATTED PROPERTY OWNS ADJOINING LOT. SEE GJ08843 RS.

FIGURE 2.2 SITE PLAN

U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION PROJECT OF THE COLORADO
2521 SOUTH BROADWAY
GRAND JUNCTION, COLORADO
SUN: WHL 13.18.85 (LAT: 38.13.20.85)
DRAWING NO: 3-C-56

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 plan and is not a legal description. It is not to be relied upon for the establishment of fence, building, or other future improvement lines.

SOUTH BROADWAY
(GRAVEL)

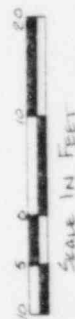
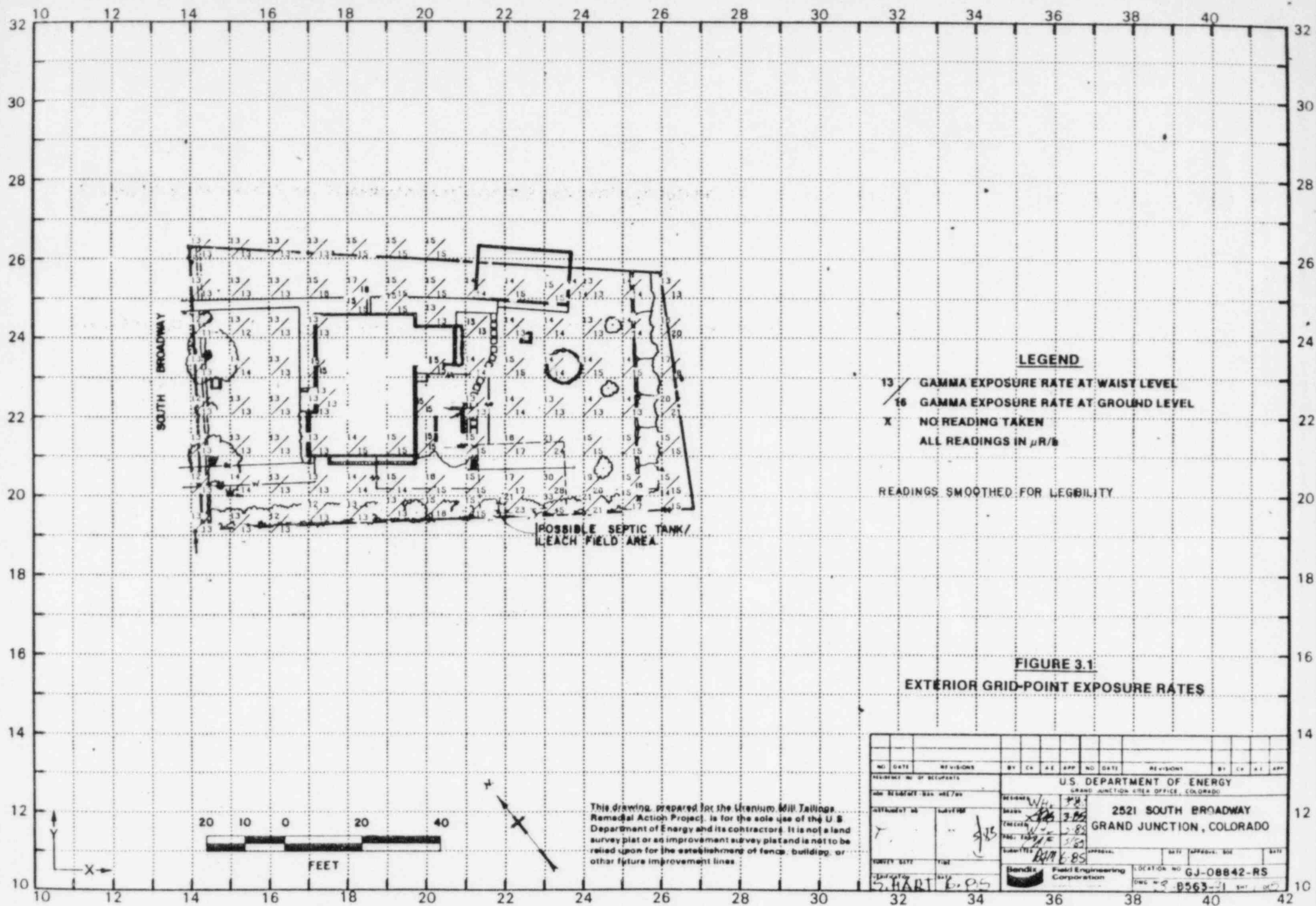
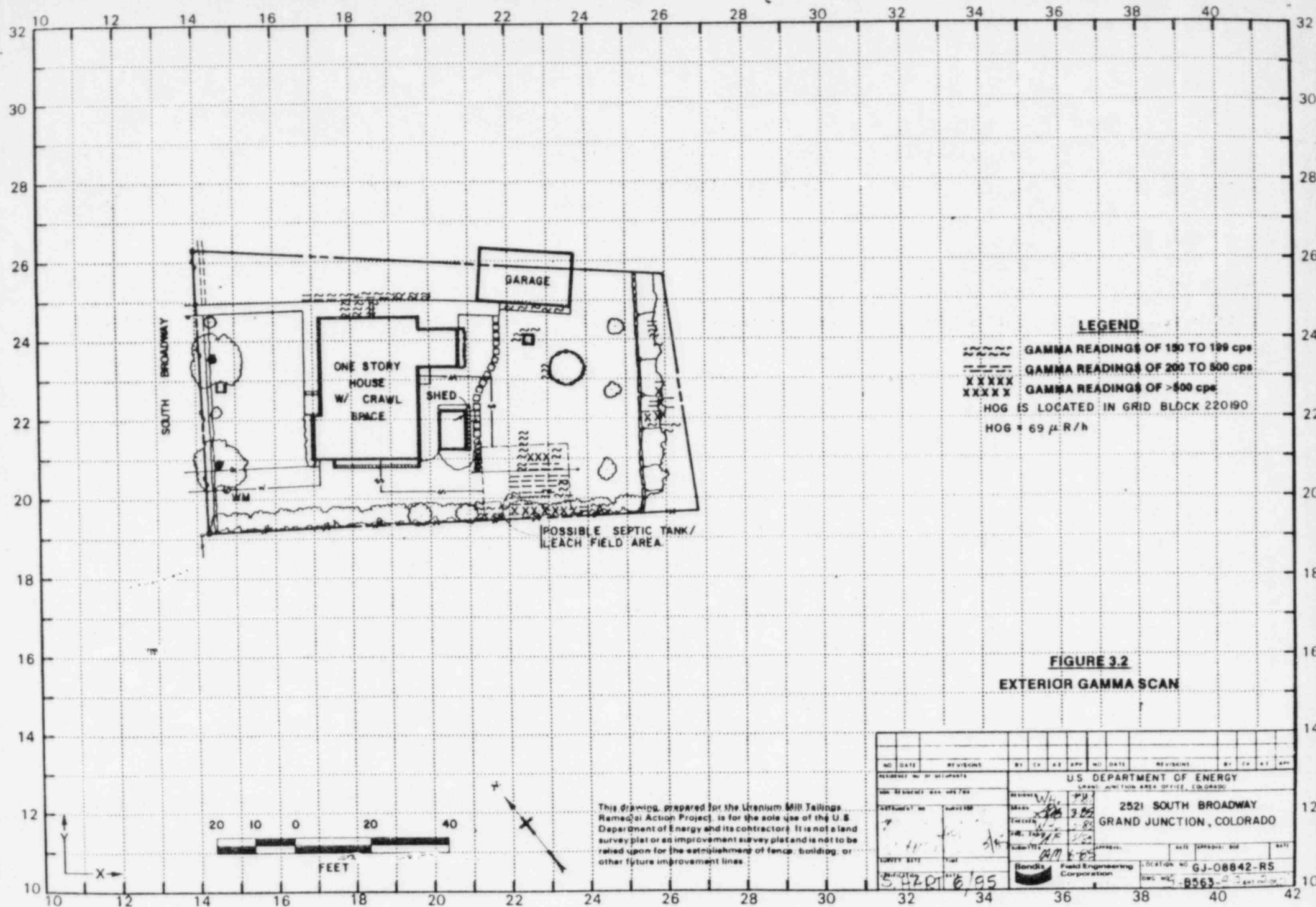


FIGURE 2.2 SITE PLAN

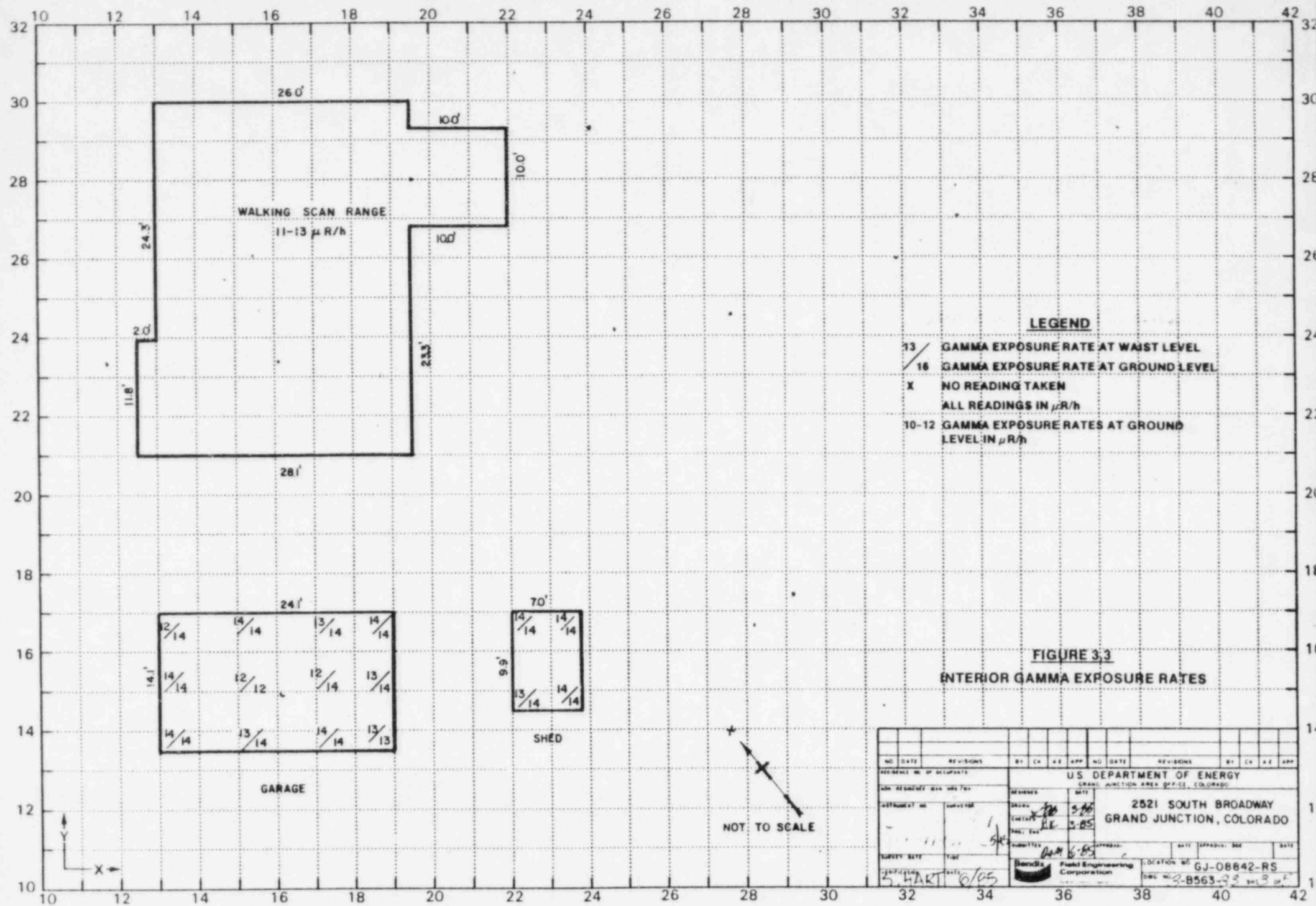
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECT OF THE COLORADO ADDRESS 2521 SOUTH BROADWAY GRAND JUNCTION, COLORADO SURV. WHL 310-B5 (HART) RSK 1320 B5 DRAWING NO 3 C 560-F1	1954 GJOBA42-R5 ALLIED Bureau of Geographical Names, U.S. Geological Survey
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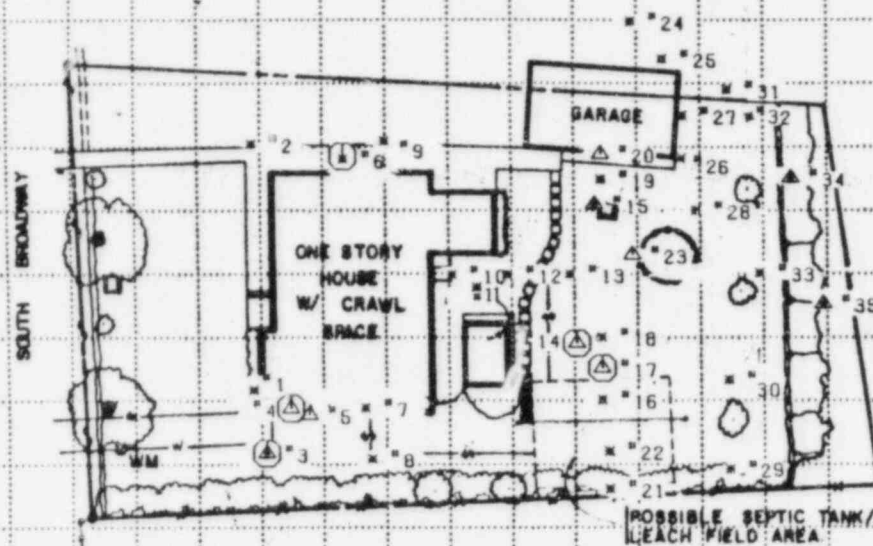
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NO.	DATE	REVISIONS	BY	CH	AS	APP.	NO.	DATE	REVISIONS	BY	CH	AS	APP.
RESIDENT NO. OF OCCUPANTS													
<div style="display: flex; justify-content: space-between;"> <div> MAX. RESIDENTS MAX. OCC. PER ATTACHED NO. </div> <div> US DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO 2521 SOUTH BROADWAY GRAND JUNCTION, COLORADO </div> </div>													
<div style="display: flex; justify-content: space-between;"> <div> SURVEY SITE 5.47.21 </div> <div> DATE 6/95 </div> <div> BANDS Field Engineering Corporation </div> <div> LOCATION NO. GJ-08842-RS </div> </div>													
<div style="display: flex; justify-content: space-between;"> <div> DATE 6/95 </div> <div> DATE 6/95 </div> <div> DATE 6/95 </div> <div> DATE 6/95 </div> </div>													





LEGEND

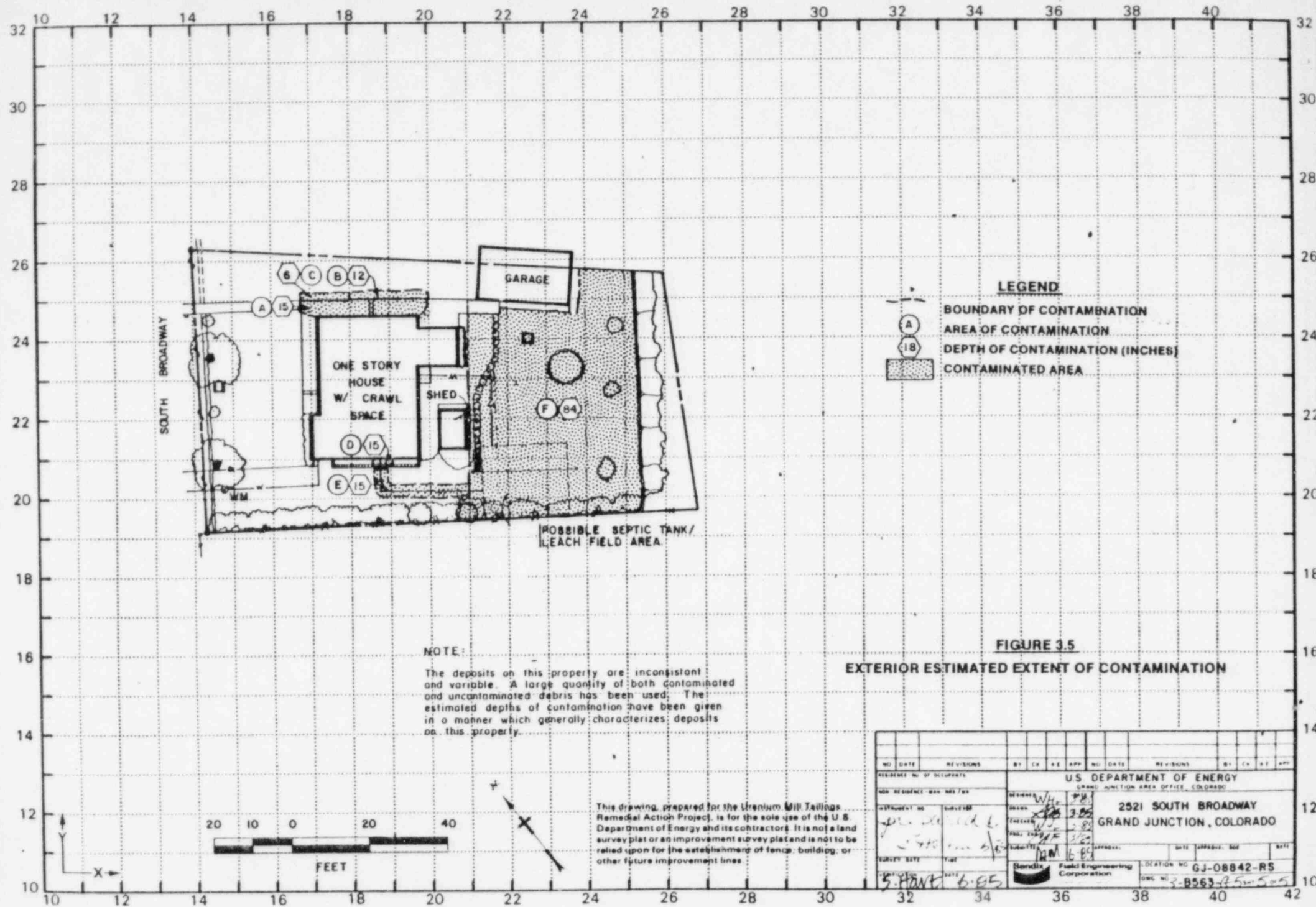
- BOREHOLE
- △ DELTA SCANNER
- SOIL SAMPLE
- #4 LOCATION NUMBER

FIGURE 3.4

EXTERIOR SAMPLE LOCATIONS

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NO.		DATE		REVISIONS		BY		CH		X		APP		NO.		DATE		REVISIONS		BY		CH		X		APP	
RESIDENT NO. OF OCCUPANTS														US DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO													
2521 SOUTH BROADWAY GRAND JUNCTION, COLORADO																											
DETAILED NO.														REVISION													
DATE														DATE													
SURVEY DATE														DATE													
6/85														6/85													
Bordix Field Engineering Corporation														Bordix Field Engineering Corporation													
LOCATION NO. GJ-08842-RS														DWC NO. 2-8563-24													



3/85

DOE ID NO. GJ-08842-RS

Date May 22, 1985

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

Official Survey Report

Property Address 2521 South Broadway

Property Owner Claude and Hazel Wright

Address of Owner (if different from above) _____

Report Prepared By Carol Holmes

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 = 13 uR/h
HOG = 69 uR/h

ALLIED Bendix
Aerospace

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

DATE: April 19, 1985
TO: Files
FROM: Carol Holmes
SUBJECT: GJ-08842-RS

Address: 2521 South Broadway

Owner: Claude R. Wright

Weather: Warm and dry.

Team Members

C. Holmes (Team Leader)
A. Quintana
M. Dexter

D. Dow
S. Milton
R. Herman

Instruments

Crutch Scintillometer - C-1205, C-1247, C-1181
Delta Scintillometer - C-3942, C-3943
Total Count - C-3959, C-3956, C-4006

Date: April 5, 1985

There were not any problems gridding this property.

Scanning proved to point to contamination in the backyard around the leach field, along the garage (underneath a rock collection and dinosaur boxes), along the sidewalk, and a few spots in the backyard.

Team Leader Notes
Carol Holmes
GJ-08842-RS
April 19, 1985
Page 2

Augering in the backyard has created some problems. There are huge hunks of asphalt, concrete, and rocks, so consequently we will have a few refusal locations on our data sheets.

I spoke to Mr. Wright about his backyard. He helped us locate the leach field and gave us some history about his property. In the early 1960's his backyard dropped approximately 10 feet. It was filled with several truckloads of fill that included rocks, sand, and just whatever.

As we continued to auger in several locations we found visible tailings two and three flights (60-to 90-inches) down.

We were able to finish up, but I will probably need to revisit the location.

Revisit

Date: April 9, 1985

Team Members

C. Holmes (Team Leader)	M. Dexter
C. Adams	

Instruments

Delta Scintillometer - C-3937
Total Count - C-3573

We augered two holes at grid locations 255245 and 169251. The first hole (169251) was done to define the contaminated area, of which it did. The second hole (255245) is close to the northeast property line. There were several chunks of rip-rap around this area and I believe while scanning we were picking up elevated readings from this and not the soil directly underneath.

Team Leader Notes
Carol Holmes
GJ-08842-RS
April 19, 1985
Page 3

Revisit

Date: April 19, 1985

Team Members

C. Holmes (Team Leader)
M. Heronema

J. Johnson

Instrument

Total Count - C-3573

We investigated the area around the garage, more of the backyard, and an area on the adjacent property (between garages).

It appears that the southeast and southwest sides of the garage are not contaminated, but a few feet out on either side of the garage has definite higher readings.

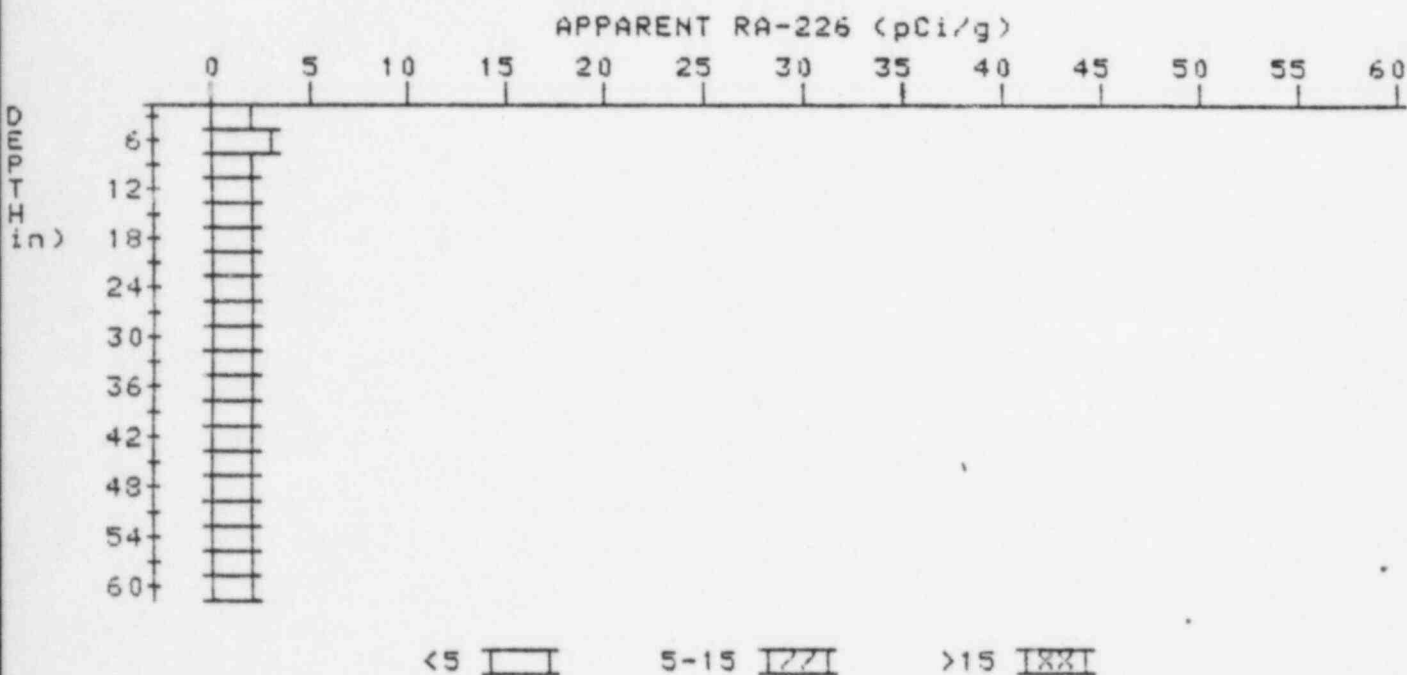
A few of the boreholes were auger refusals.

APPARENT RADIUM-226 CONCENTRATION 1 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08842-RS

HOLE NUMBER: 1

LOCATION: 169212



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.0	2.0
6	2.2	2.6
9	2.2	2.2
12	2.2	2.4
15	2.1	2.1
18	2.0	1.8
21	2.0	2.0
24	2.0	2.0
27	2.0	2.0
30	2.0	2.0
33	2.0	2.0
36	2.0	2.0
39	2.0	2.2
42	1.9	1.5
45	2.0	2.2
48	2.0	2.2
51	1.9	1.9
54	1.8	1.6

57
60

1.8
1.9

1.6
1.9

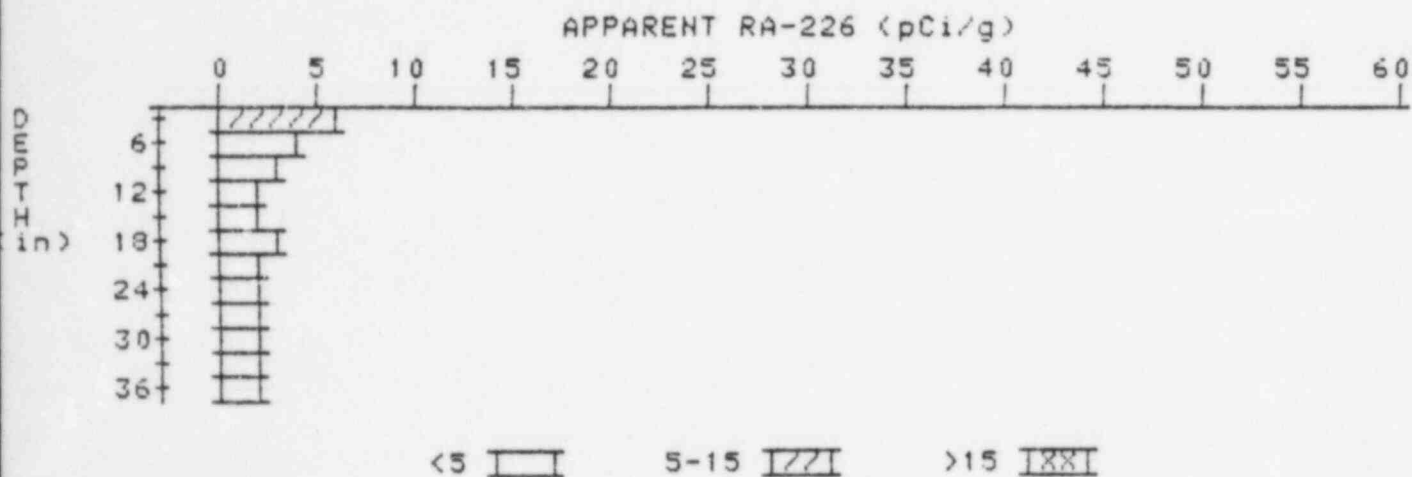
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

2

PROPERTY NUMBER: GJ-08842-RS

HOLE NUMBER: 2

LOCATION: 169251



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	6.0	6.0
6	4.5	3.6
9	3.5	3.0
12	2.8	2.3
15	2.4	1.7
18	2.4	2.9
21	2.1	1.7
24	2.0	1.8
27	2.0	2.2
30	1.9	1.7
33	1.9	2.1
36	1.8	1.8

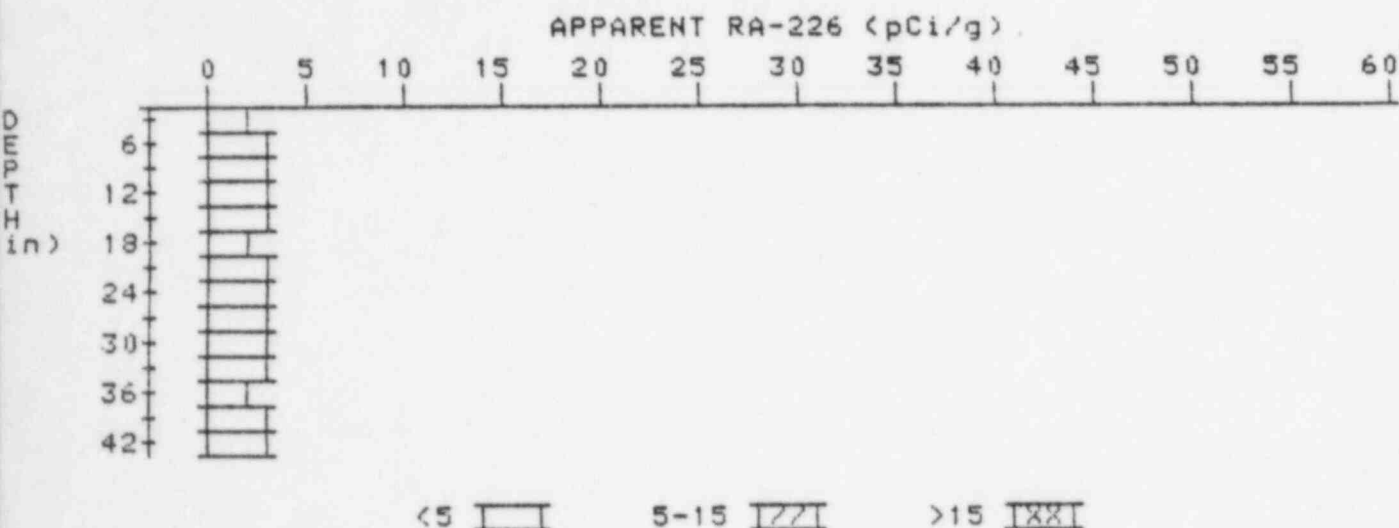
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

3

PROPERTY NUMBER: GJ-08842-RS

HOLE NUMBER: 3

LOCATION: 171202



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.3	2.3
6	2.6	3.0
9	2.7	2.9
12	2.7	2.7
15	2.7	2.9
18	2.6	2.4
21	2.6	2.6
24	2.6	2.6
27	2.6	2.6
30	2.6	2.6
33	2.6	2.8
36	2.5	2.1
39	2.6	2.8
42	2.6	2.6

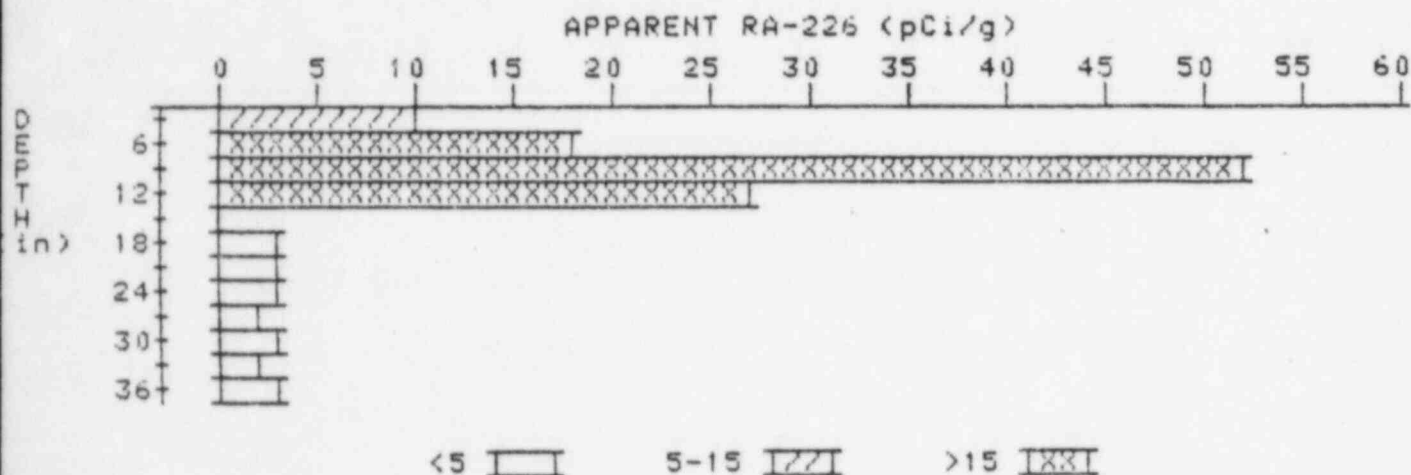
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

6

PROPERTY NUMBER: GJ-08842-RS

HOLE NUMBER: 6

LOCATION: 184248



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	10.0	10.0
6	18.3	18.3
9	26.6	52.4
12	20.4	26.8
15	10.6	.3
18	6.6	2.9
21	4.7	2.9
24	3.8	3.4
27	3.1	2.4
30	2.8	2.6
33	2.6	2.4
36	2.5	2.5

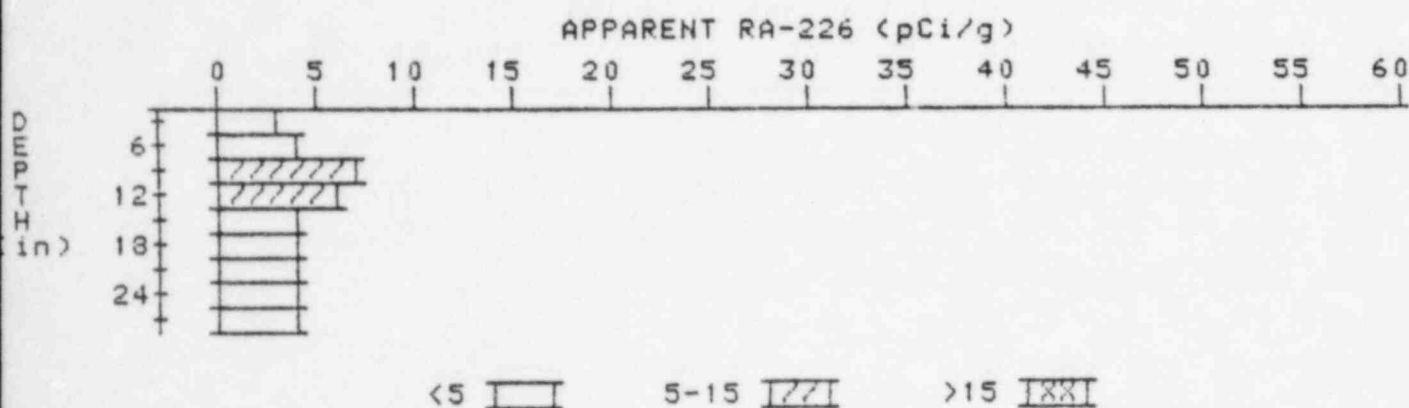
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

7

PROPERTY NUMBER: GJ-08842-RS

HOLE NUMBER: 7

LOCATION: 187209



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.2	3.2
6	4.1	3.9
9	5.1	7.1
12	5.0	5.9
15	4.4	4.0
18	4.0	3.6
21	3.8	3.6
24	3.7	3.5
27	3.7	3.7

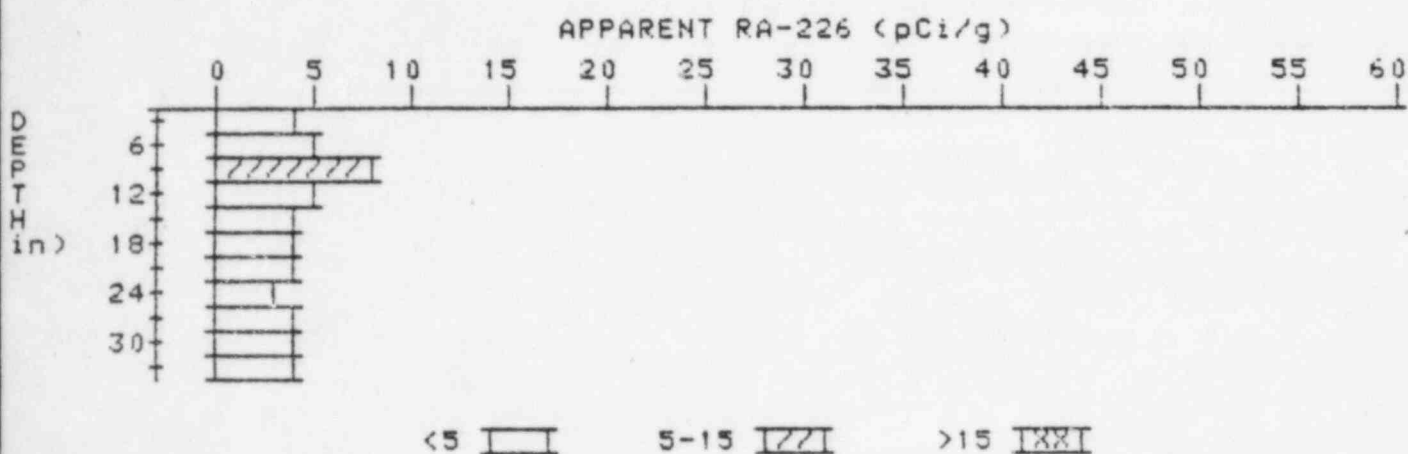
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

8

PROPERTY NUMBER: GJ-08842-RS

HOLE NUMBER: 8

LOCATION: 188201



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.5	3.5
6	4.5	4.9
9	5.3	7.6
12	4.8	4.6
15	4.4	4.2
18	4.1	3.9
21	3.9	3.7
24	3.8	3.4
27	3.9	4.1
30	3.9	3.9
33	3.9	3.9

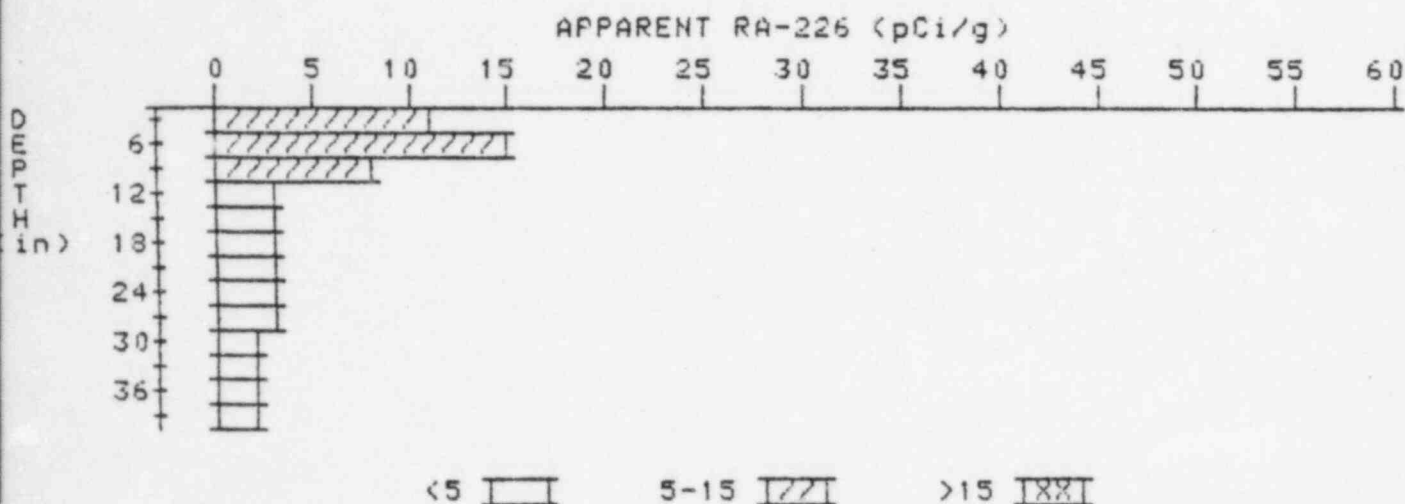
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

9

PROPERTY NUMBER: GJ-08842-RS

HOLE NUMBER: 9

LOCATION: 190250



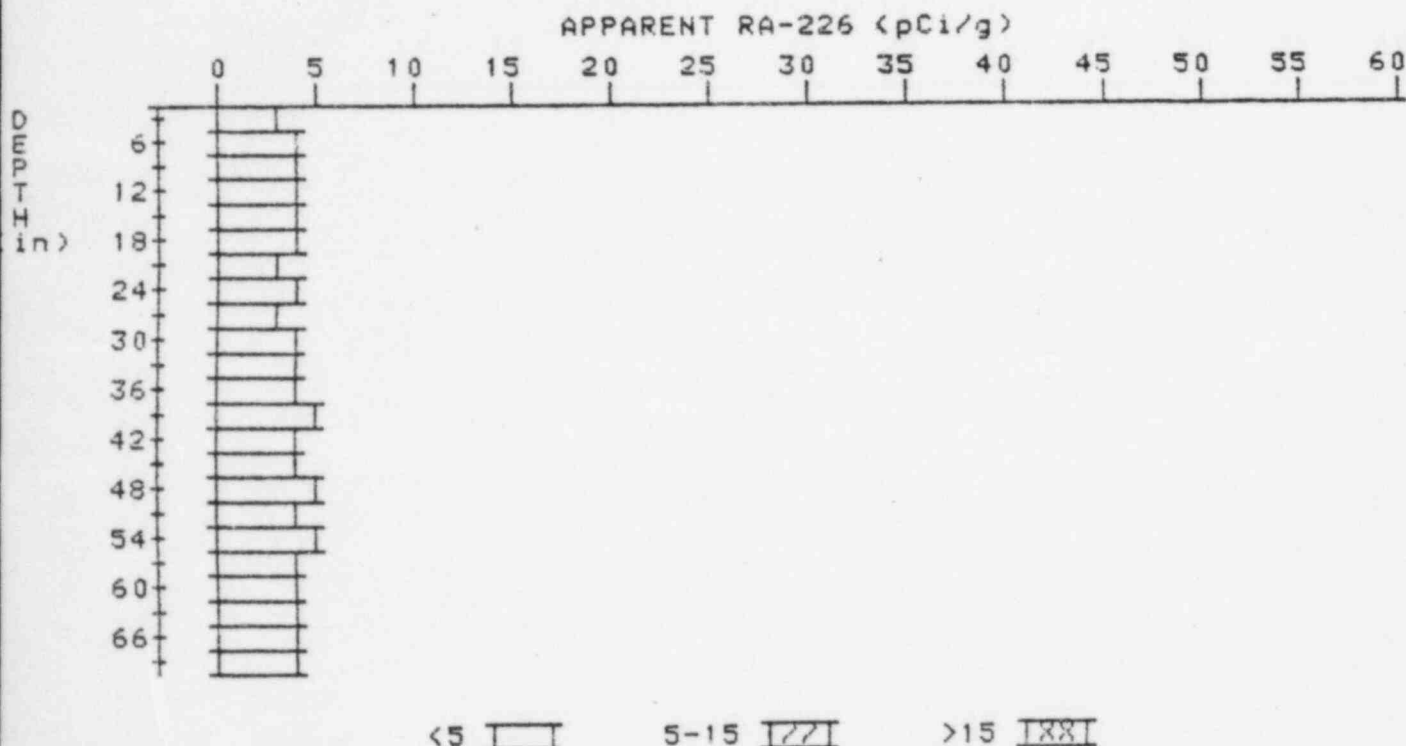
Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	10.6	10.6
6	10.4	14.8
9	7.7	7.5
12	5.1	2.6
15	3.9	2.3
18	3.3	2.9
21	2.9	2.5
24	2.7	2.7
27	2.5	2.5
30	2.3	2.1
33	2.2	2.0
36	2.2	1.3
39	2.4	2.4

APPARENT RADIUM-226 CONCENTRATION 10 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08842-RS

HOLE NUMBER: 10

LOCATION: 201230

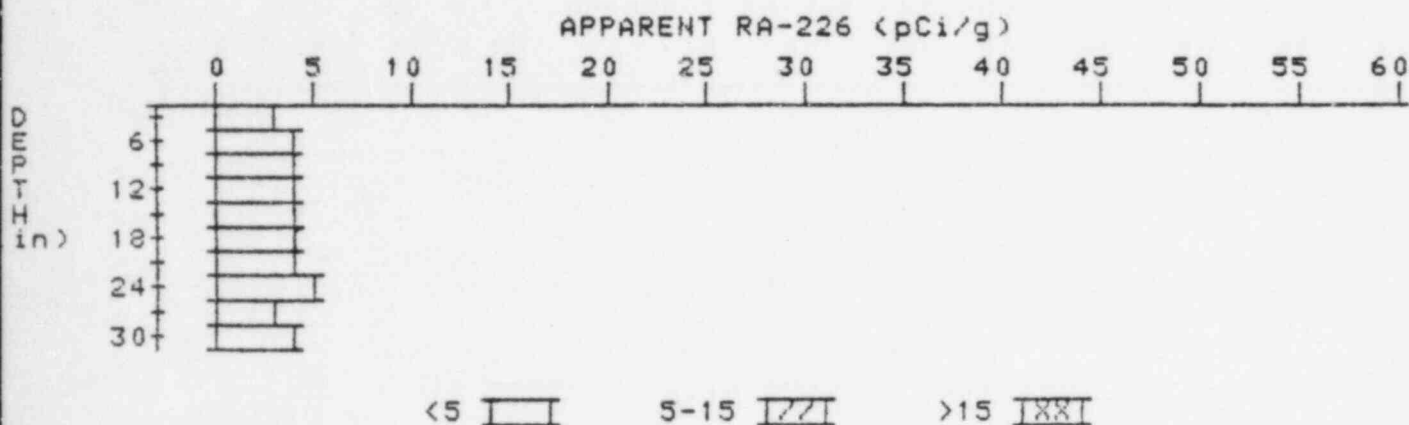


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.1	3.1
6	3.4	3.6
9	3.6	3.8
12	3.7	3.9
15	3.7	3.7
18	3.7	3.9
21	3.6	3.4
24	3.6	3.6
27	3.6	3.4
30	3.7	3.7
33	3.8	3.6
36	4.0	4.0
39	4.2	4.7
42	4.1	3.9
45	4.1	3.9

48	4.2	4.6
51	4.1	3.7
54	4.2	4.6
57	4.1	3.7
60	4.2	4.4
63	4.2	4.4
66	4.1	3.7
69	4.2	4.2

APPARENT RADIUM-226 CONCENTRATION 11 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08842-RS
HOLE NUMBER: 11
LOCATION: 205228



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.5	3.9
9	3.8	4.0
12	4.0	4.4
15	4.0	3.8
18	4.1	4.3
21	4.1	3.9
24	4.2	4.7
27	4.0	3.3
30	4.2	4.2

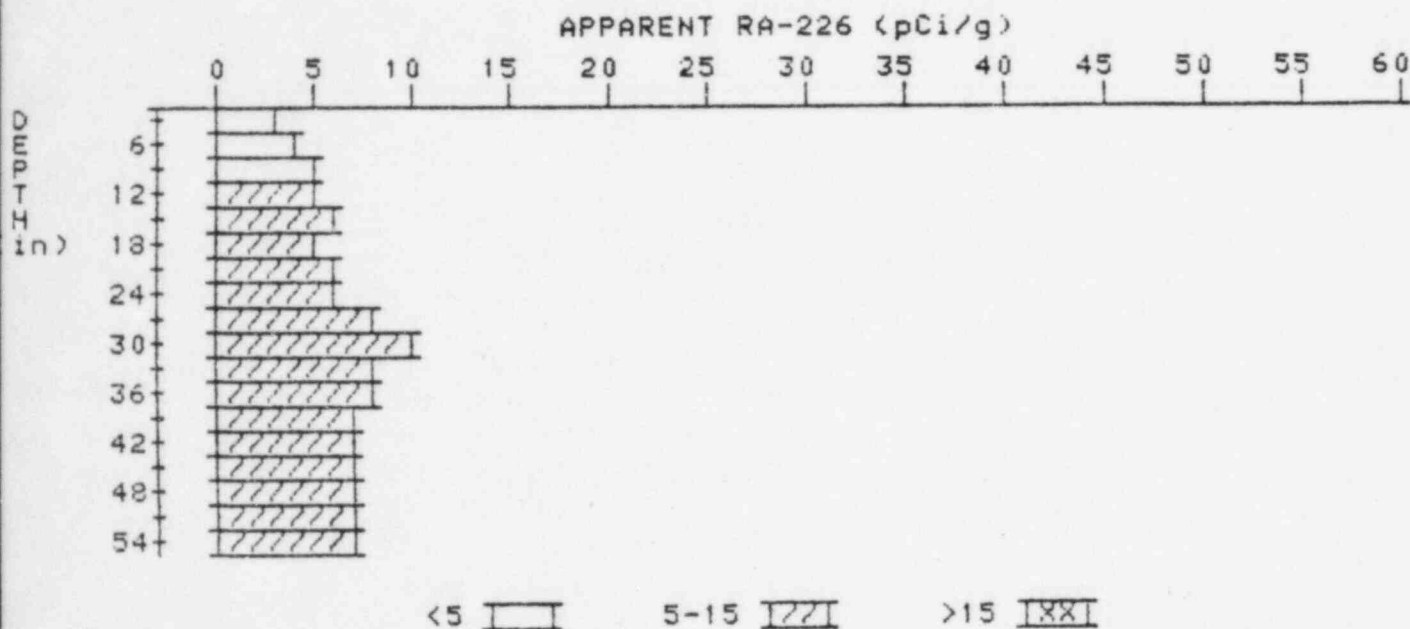
APPARENT RADIUM-226 CONCENTRATION 12

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08842-RS

HOLE NUMBER: 12

LOCATION: 210230

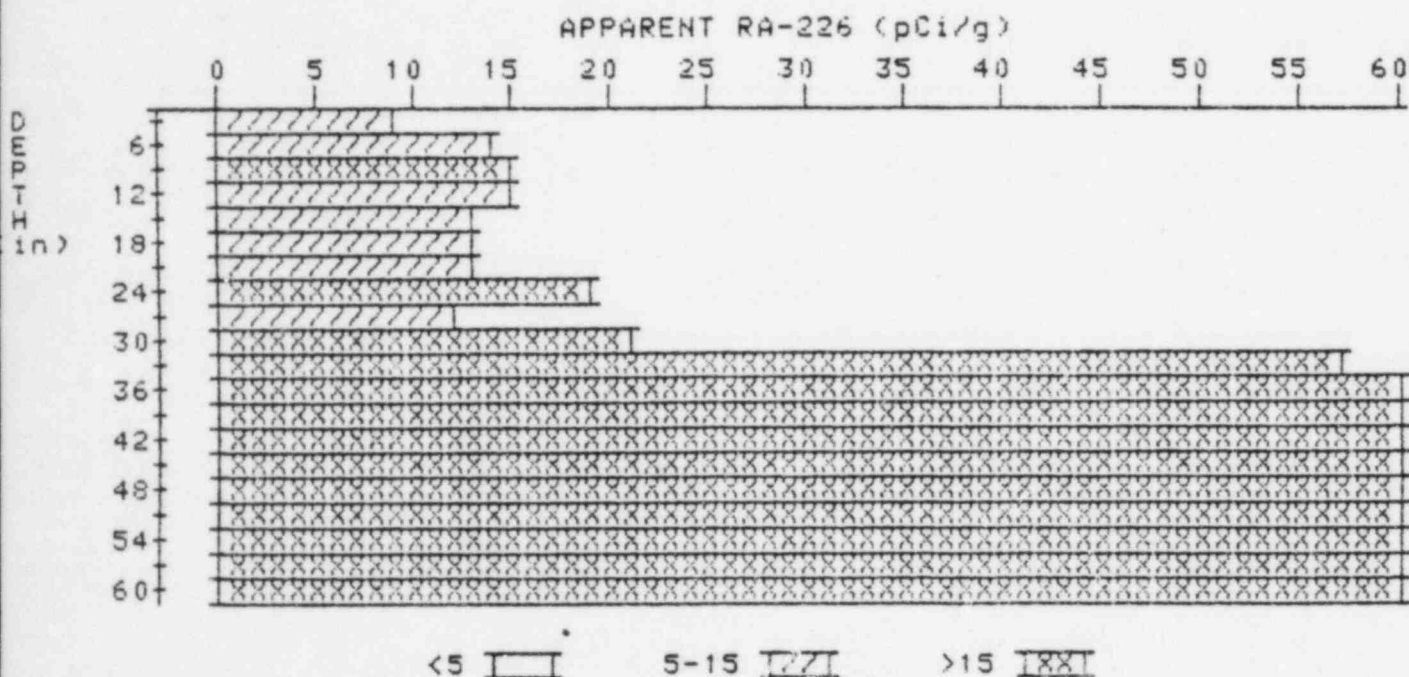


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.4	3.4
6	4.1	4.5
9	4.6	4.8
12	5.0	5.0
15	5.4	5.6
18	5.7	5.3
21	6.2	6.2
24	6.7	6.2
27	7.5	7.5
30	8.3	10.3
33	8.0	8.0
36	7.7	8.1
39	7.2	6.7
42	7.0	6.8
45	6.9	6.9
48	6.8	6.6
51	6.8	7.0
54	6.7	6.7

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

13

PROPERTY NUMBER: GJ-08842-RS
HOLE NUMBER: 13
LOCATION: 220230



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	9.1	9.1
6	12.0	14.3
9	13.6	15.4
12	14.2	14.9
15	14.4	13.3
18	15.2	12.7
21	17.4	13.3
24	21.9	19.5
27	28.3	12.5
30	43.6	20.8
33	71.7	57.3
36	107.9	128.3
39	132.6	143.4
42	151.2	162.0
45	163.7	177.7
48	168.3	175.9
51	168.6	175.4
54	165.1	171.7

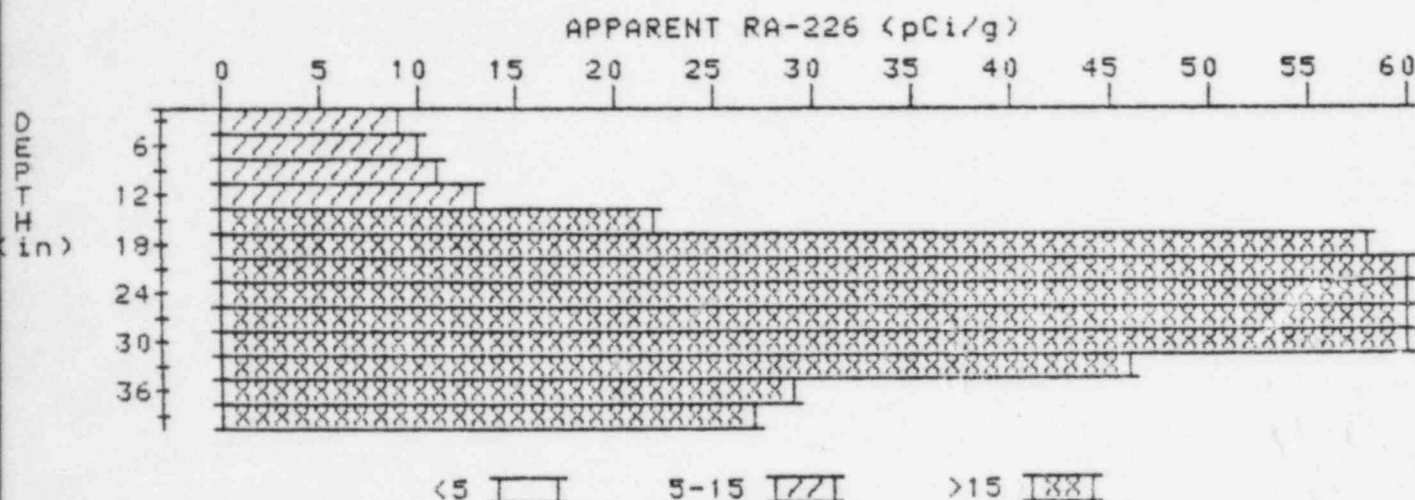
57
60

157.9
147.9

162.9
147.9

APPARENT RADIUM-226 CONCENTRATION 15 DECONVOLUTION GRAPH

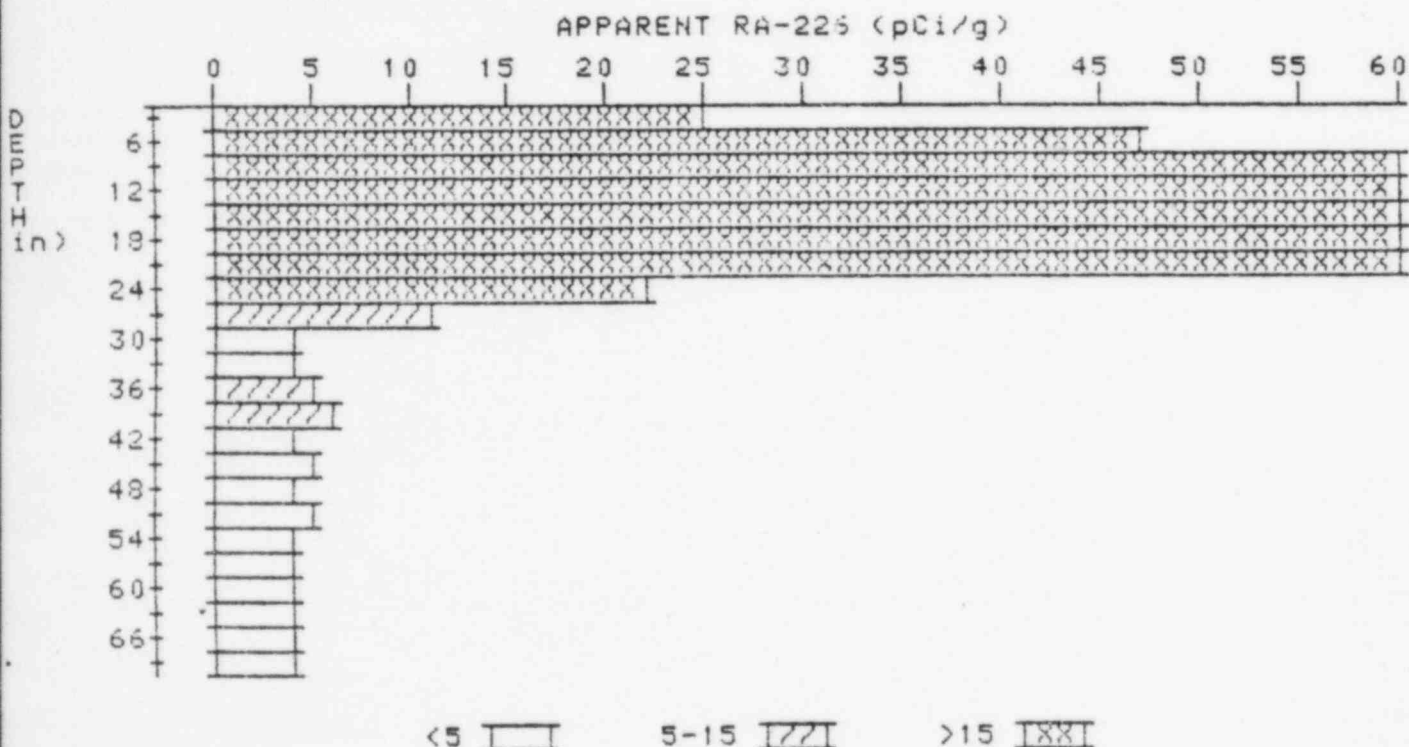
PROPERTY NUMBER: GJ-08842-RS
HOLE NUMBER: 15
LOCATION: 224241



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	9.0	9.0
6	12.4	9.9
9	17.2	11.3
12	25.3	13.0
15	40.3	22.3
18	65.4	57.8
21	94.8	128.4
24	105.3	136.9
27	98.0	120.6
30	78.0	82.1
33	55.7	46.1
36	38.8	29.0
39	27.4	27.4

APPARENT RADIUM-226 CONCENTRATION 16 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08842-RS
HOLE NUMBER: 16
LOCATION: 225210

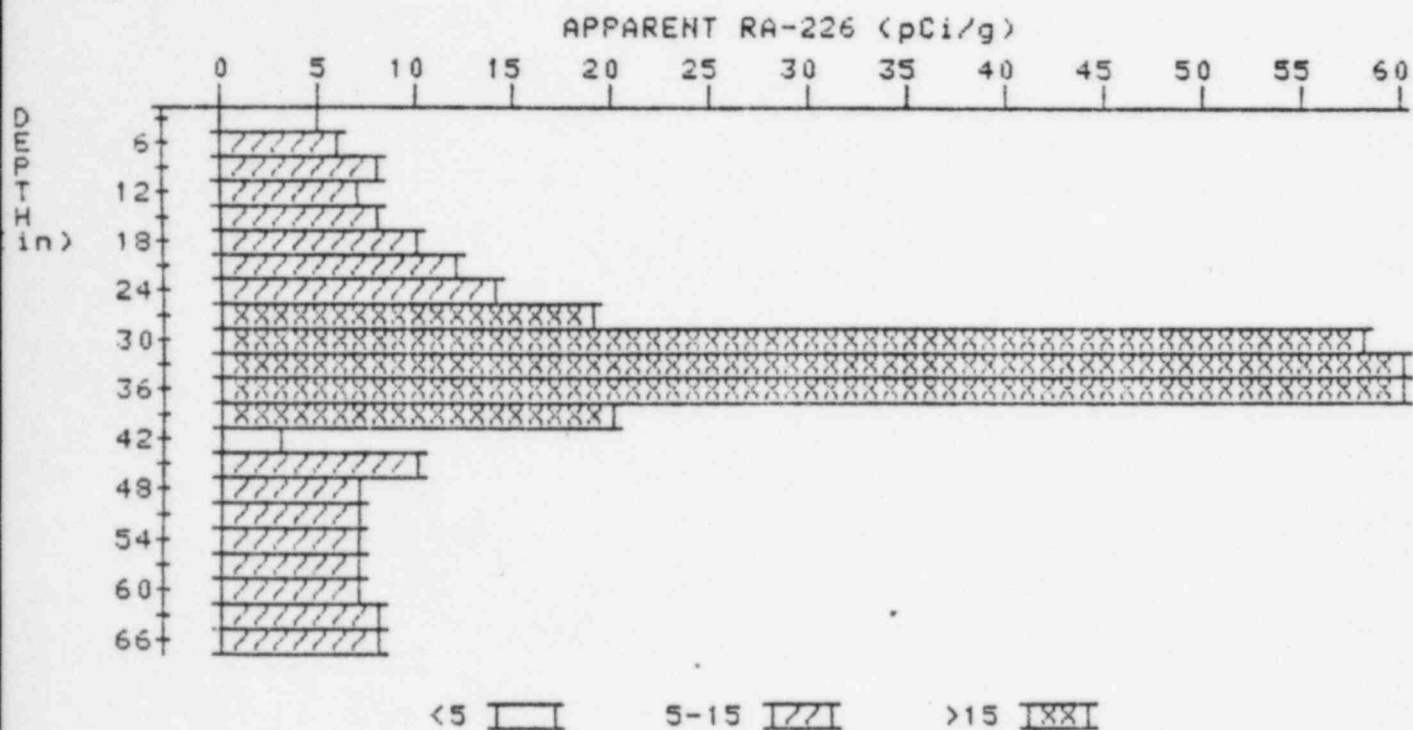


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	24.7	24.7
6	41.0	47.4
9	53.7	67.6
12	58.6	66.8
15	58.9	61.4
18	57.8	69.1
21	50.9	71.5
24	32.4	22.3
27	19.6	10.9
30	11.7	4.1
33	8.1	4.2
36	6.7	5.5
39	6.0	6.4
42	5.1	4.0
45	4.8	4.6

48	4.6	4.4
51	4.5	4.7
54	4.3	4.3
57	4.1	3.9
60	4.0	3.8
63	4.0	4.0
66	4.0	3.8
69	4.1	4.1

APPARENT RADIUM-226 CONCENTRATION 18 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08342-RS
HOLE NUMBER: 18
LOCATION: 225220

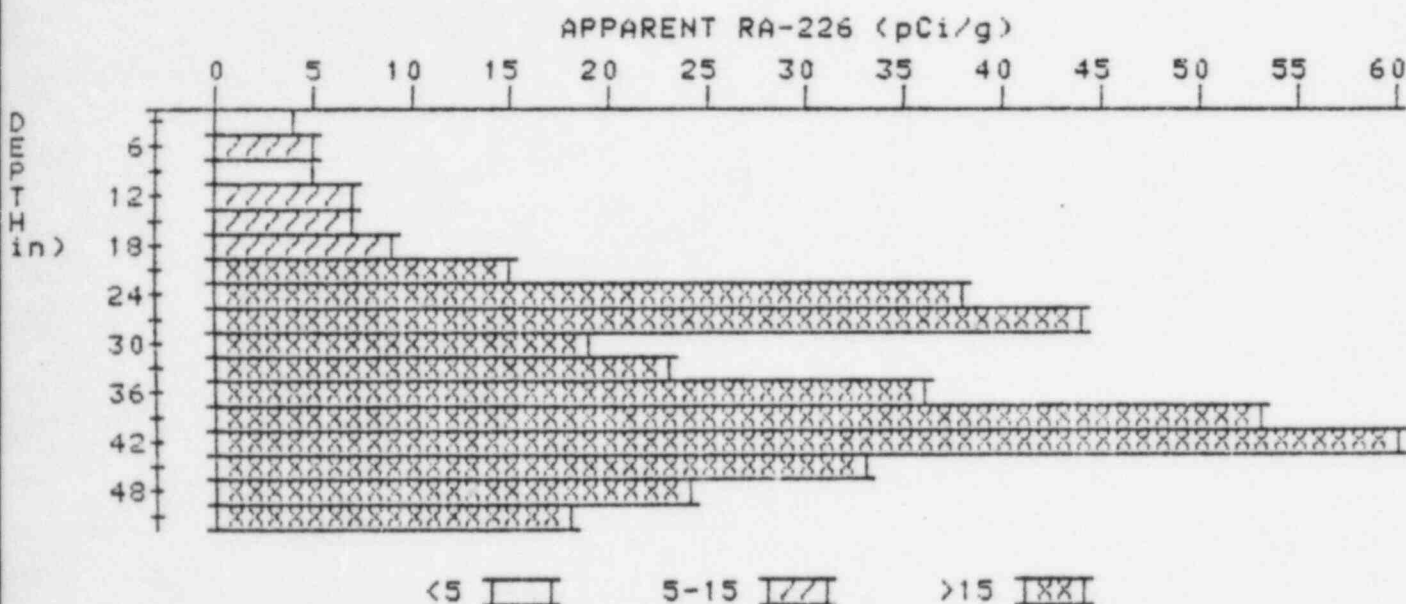


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.5	4.5
6	5.9	6.1
9	7.2	8.1
12	8.0	6.8
15	9.5	7.5
18	12.1	10.1
21	15.8	12.1
24	21.6	14.3
27	31.5	18.5
30	48.7	57.6
33	60.9	91.7
36	55.8	86.4
39	33.5	19.6
42	19.0	2.8
45	13.6	10.0
48	10.2	6.8

51	8.7	7.5
54	7.9	7.0
57	7.6	7.1
60	7.6	7.2
63	7.8	7.8
66	8.0	8.0

APPARENT RADIUM-226 CONCENTRATION 19 DECONVOLUTION GRAPH

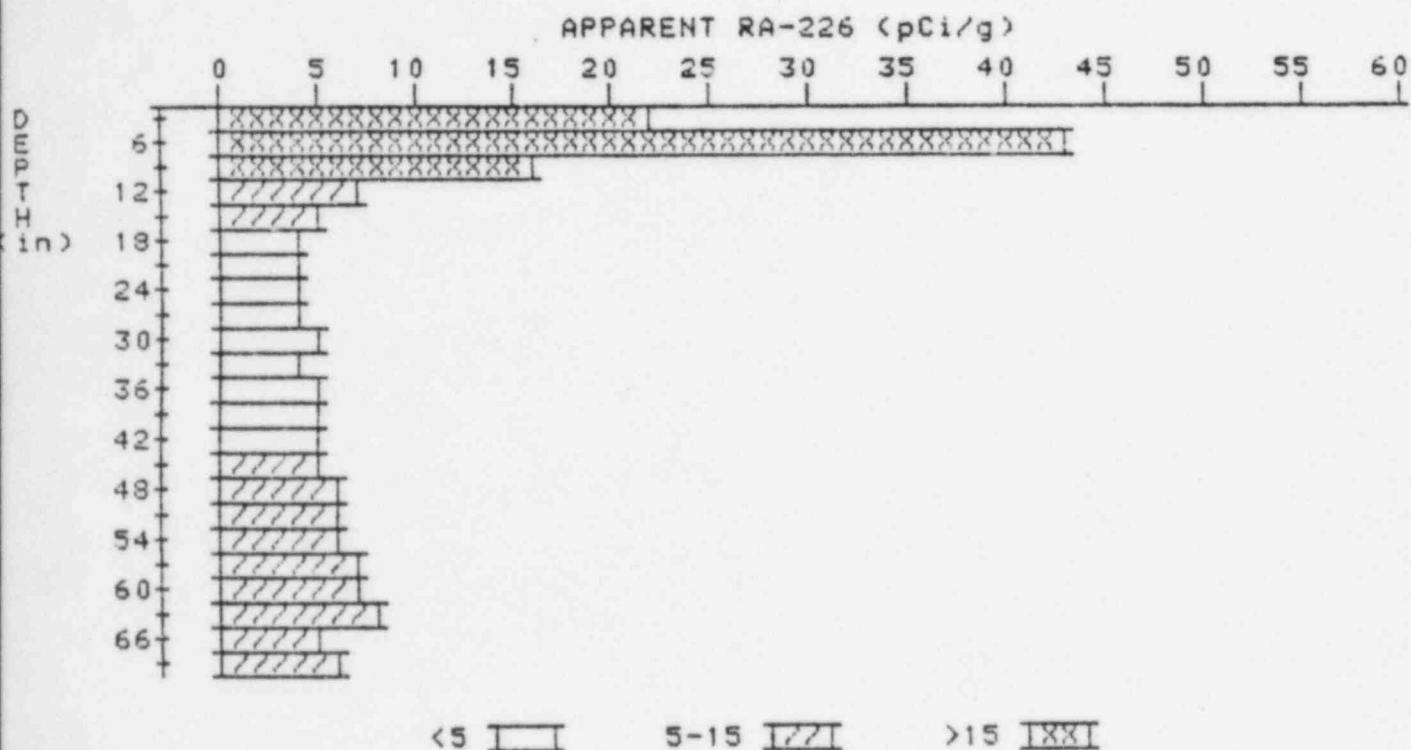
PROPERTY NUMBER: GJ-08842-R3
HOLE NUMBER: 19
LOCATION: 225245



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.4	4.4
6	5.3	5.5
9	6.1	4.5
12	7.8	7.3
15	9.8	6.8
18	13.5	8.9
21	19.8	15.4
24	28.6	38.4
27	31.9	43.6
30	28.6	19.2
33	30.6	23.5
36	36.6	36.2
39	42.8	53.1
42	43.2	60.3
45	34.0	33.1
48	25.3	23.5
51	17.6	17.6

APPARENT RADIUM-226 CONCENTRATION 21 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08842-RS
HOLE NUMBER: 21
LOCATION: 226196



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	22.1	22.1
6	25.0	42.8
9	17.9	16.5
12	11.6	6.6
15	3.1	5.4
18	6.1	4.5
21	5.0	3.8
24	4.6	4.1
27	4.5	4.1
30	4.6	5.0
33	4.5	4.0
36	4.7	4.9
39	4.3	4.6
42	5.0	4.3
45	5.3	5.1

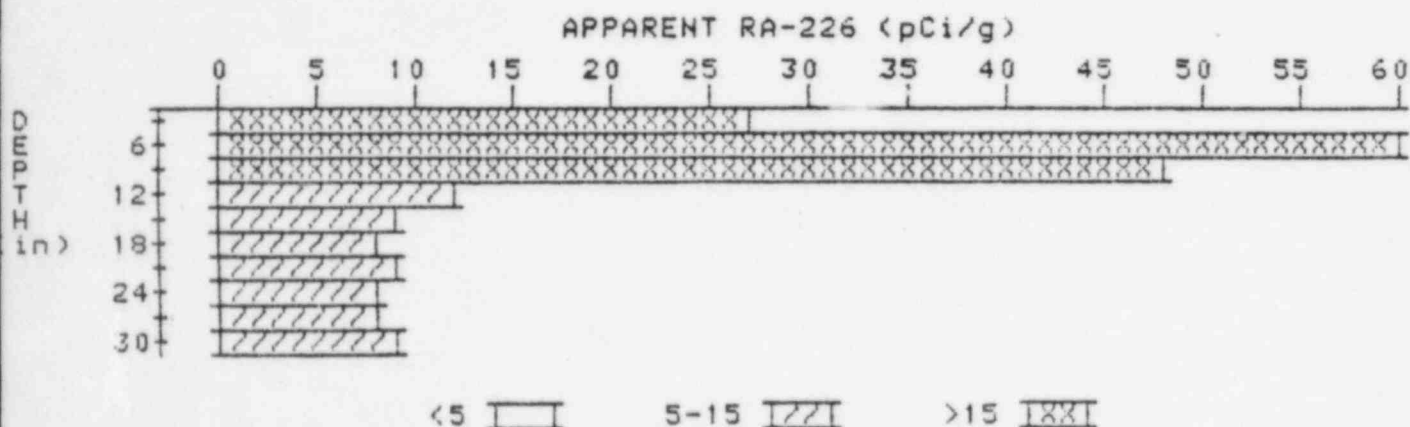
48	5.7	5.9
51	6.0	6.0
54	6.3	6.1
57	6.7	7.2
60	6.8	7.2
63	6.7	7.6
66	6.1	5.4
69	5.9	5.9

APPARENT RADIUM-226 CONCENTRATION 22 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08842-RS

HOLE NUMBER: 22

LOCATION: 226202



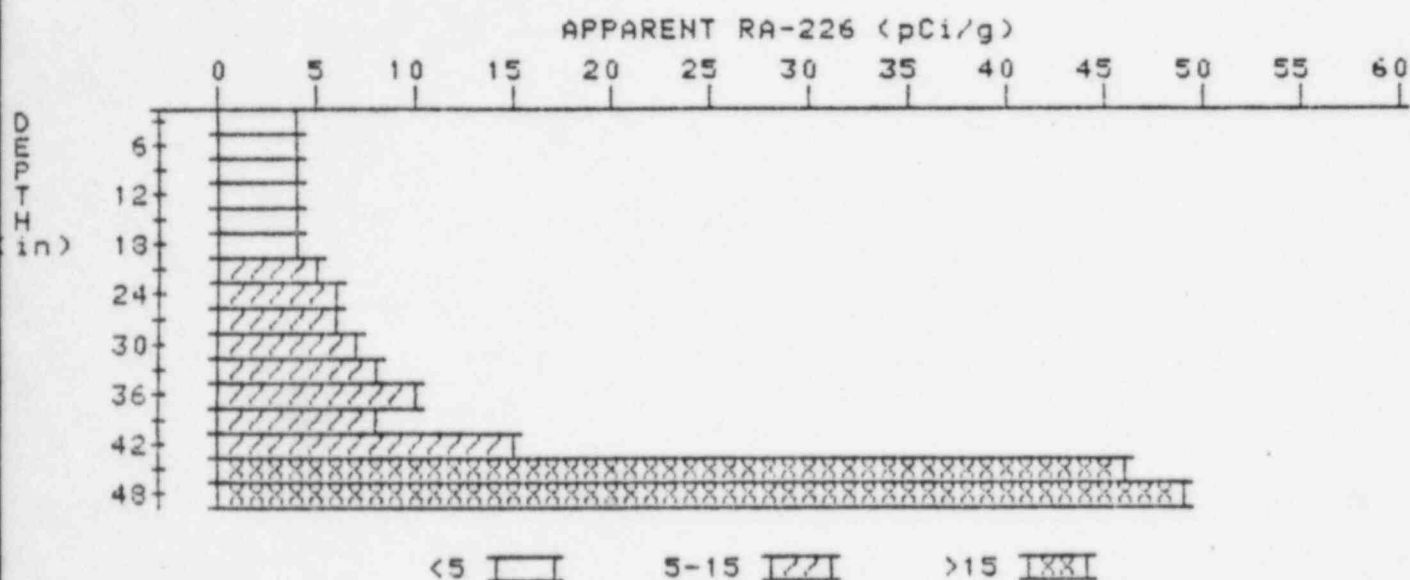
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	26.9	26.9
6	38.5	67.1
9	34.0	47.7
12	21.8	12.0
15	15.1	9.2
18	11.7	8.3
21	10.2	9.5
24	9.1	7.5
27	8.9	8.4
30	9.0	9.0

APPARENT RADIUM-226 CONCENTRATION 24 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08342-RS

HOLE NUMBER: 24

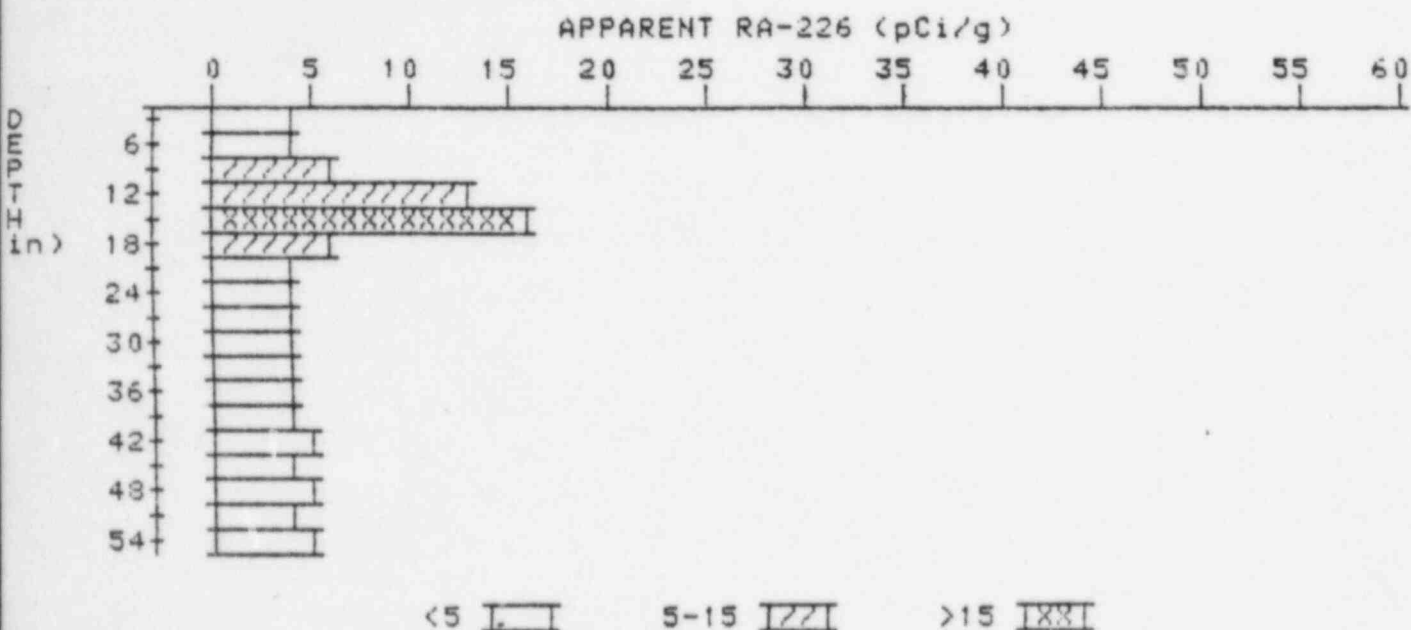
LOCATION: 230270



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.8	3.8
6	4.1	4.5
9	4.2	4.2
12	4.3	4.1
15	4.5	4.3
18	4.8	4.3
21	5.4	5.4
24	6.0	6.0
27	6.6	5.7
30	7.7	6.6
33	9.4	7.8
36	12.0	9.5
39	16.0	7.8
42	24.6	14.6
45	38.8	45.9
48	49.0	49.0

APPARENT RADIUM-226 CONCENTRATION 25 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08342-RS
HOLE NUMBER: 25
LOCATION: 235264



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.9	3.9
6	5.1	3.9
9	7.0	5.8
12	9.6	13.3
15	10.1	15.8
18	7.4	5.8
21	5.6	4.0
24	4.7	3.6
27	4.4	4.2
30	4.2	3.8
33	4.2	4.0
36	4.3	4.5
39	4.3	4.1
42	4.4	4.6
45	4.4	4.2
48	4.5	4.7
51	4.5	4.3
54	4.6	4.6

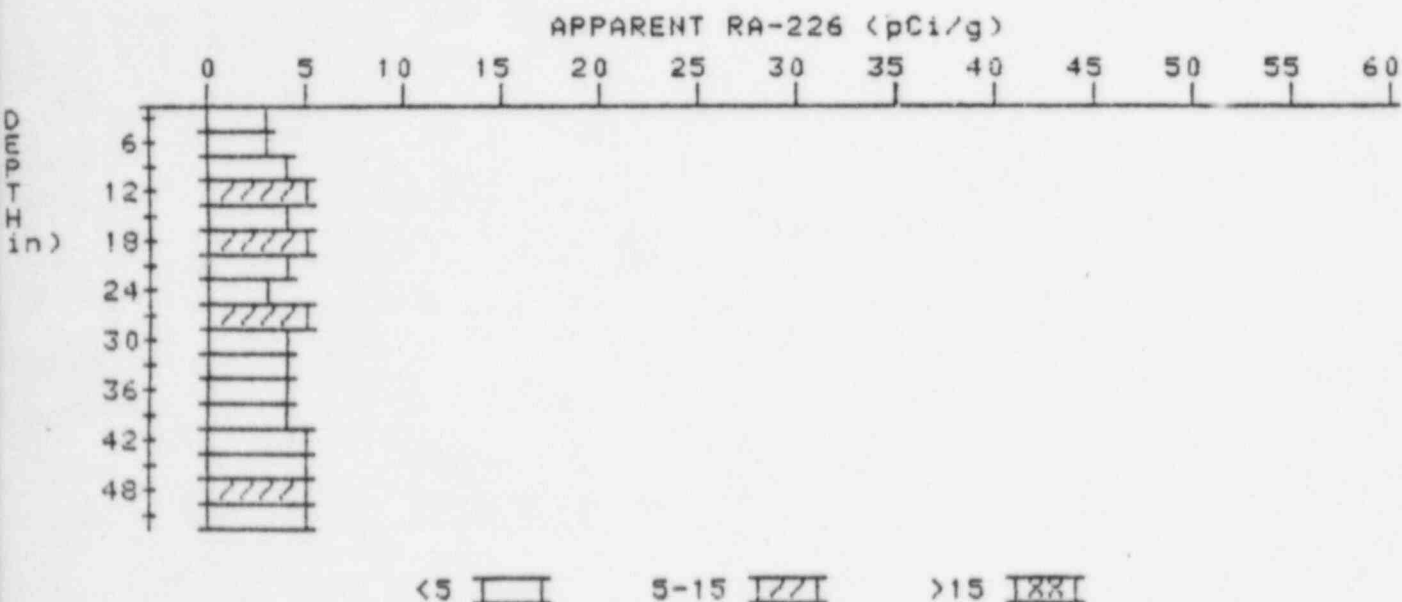
APPARENT RADIUM-226 CONCENTRATION 26

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03342-R3

HOLE NUMBER: 26

LOCATION: 236250



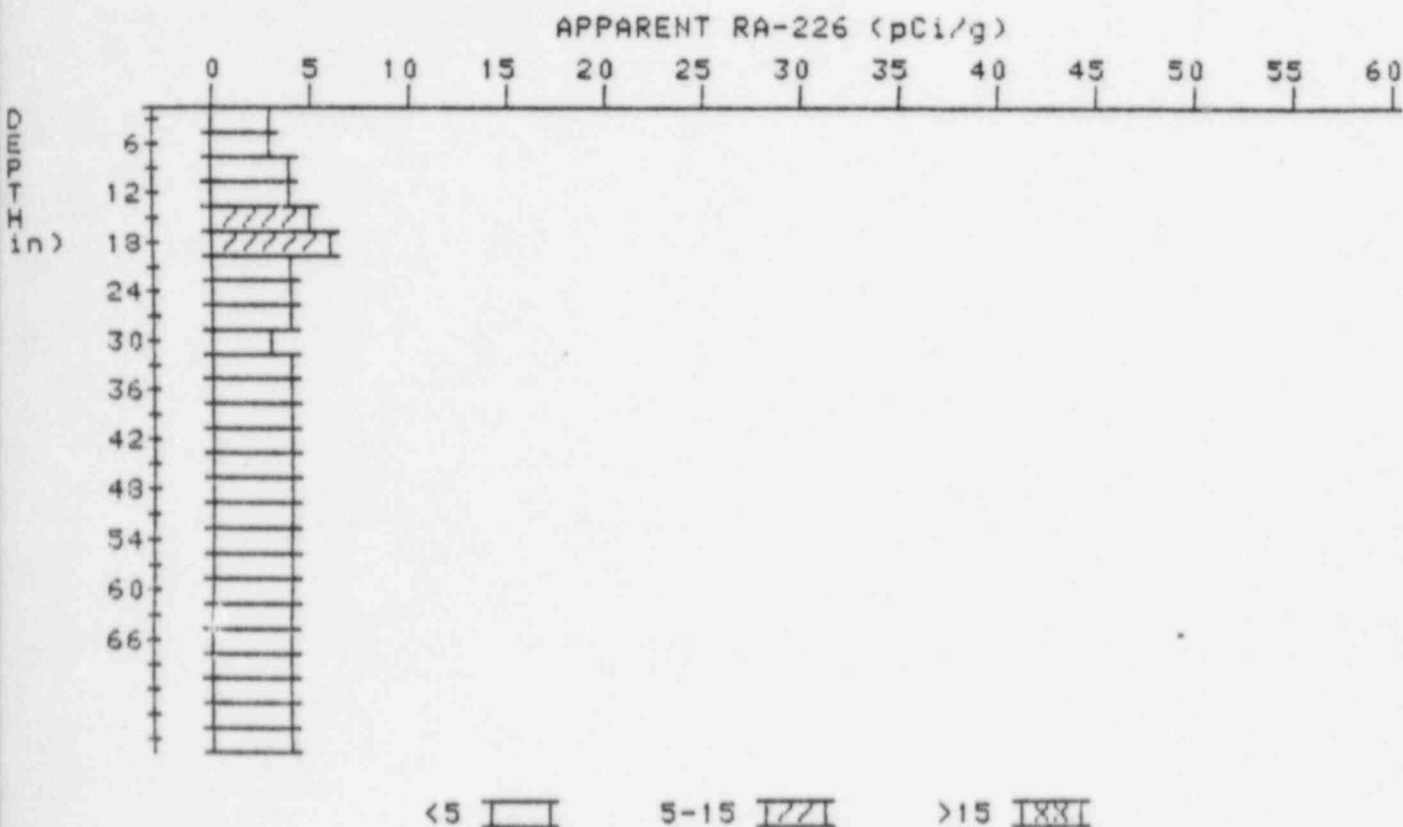
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.6	2.6
6	3.2	3.2
9	3.8	4.0
12	4.3	5.2
15	4.3	3.9
18	4.5	5.4
21	4.2	4.0
24	4.0	3.1
27	4.3	5.2
30	4.1	3.6
33	4.2	4.2
36	4.3	4.3
39	4.4	4.4
42	4.5	4.5
45	4.6	4.6
48	4.7	5.1
51	4.6	4.6

APPARENT RADIUM-226 CONCENTRATION 27 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08842-RS

HOLE NUMBER: 27

LOCATION: 238255

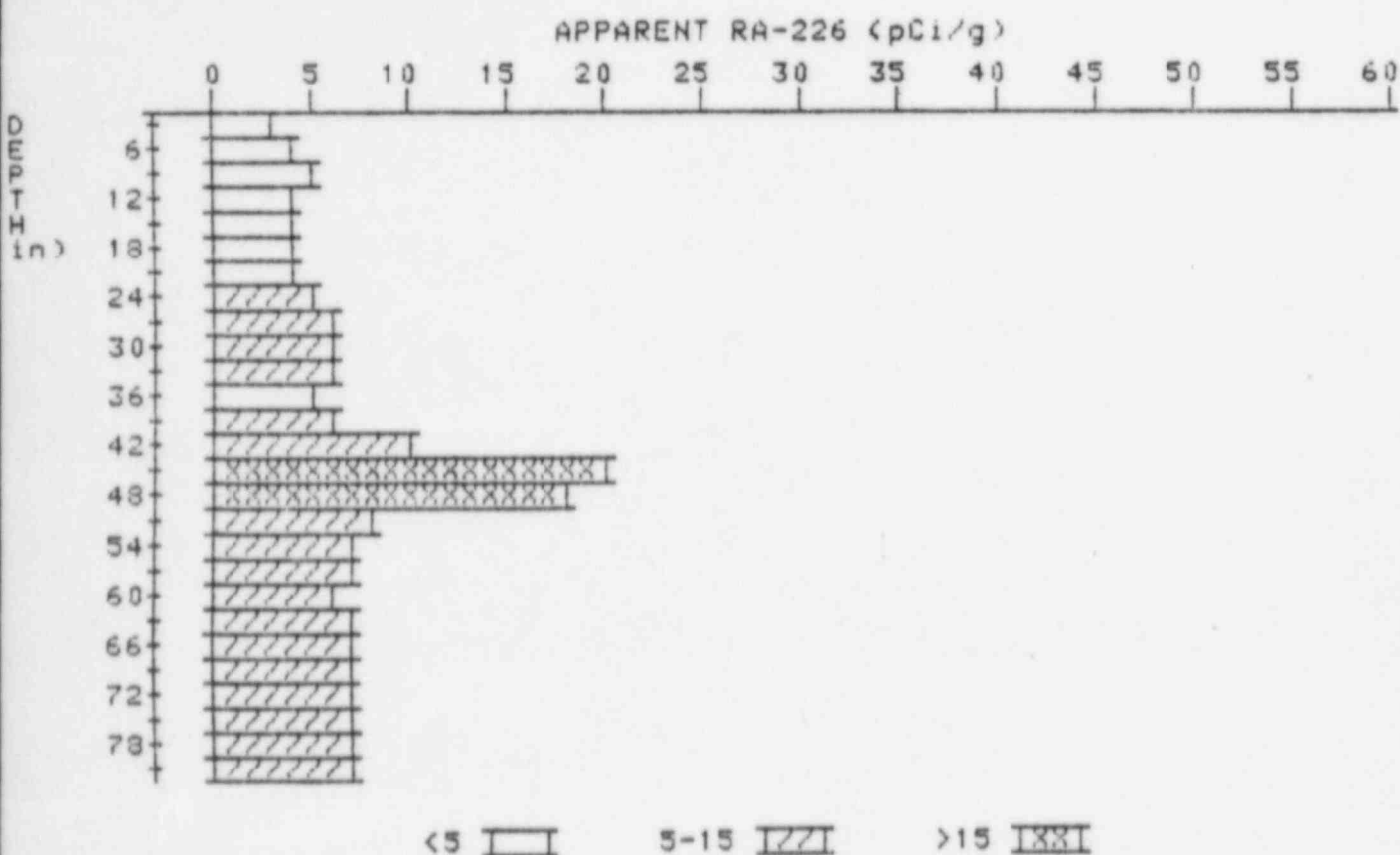


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.6	2.6
6	3.3	3.5
9	3.9	4.4
12	4.2	3.8
15	4.7	5.4
18	4.8	5.5
21	4.5	4.3
24	4.3	4.3
27	4.1	4.1
30	3.9	3.4
33	4.0	4.2
36	4.0	4.0
39	4.0	4.0

42	4.0	4.0
45	4.0	4.0
48	4.0	4.0
51	4.0	3.8
54	4.1	4.5
57	4.0	4.0
60	3.9	3.7
63	3.9	3.7
66	4.0	4.2
69	4.0	4.0
71	4.0	4.0
74	4.0	4.2
77	3.9	3.9

APPARENT RADIUM-226 CONCENTRATION 28 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08842-R3
HOLE NUMBER: 28
LOCATION: 240240



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.6	4.0
9	4.0	4.5
12	4.1	3.9
15	4.3	4.5
18	4.4	4.2
21	4.6	4.2
24	5.0	5.0
27	5.4	5.6
30	5.7	5.7
33	6.0	5.6
36	6.5	4.9

39	7.9	5.6
42	10.6	10.1
45	13.6	19.6
48	13.2	17.6
51	10.3	8.0
54	8.7	7.5
57	7.8	7.3
60	7.2	6.5
63	7.0	6.6
66	7.0	7.4
69	6.8	6.6
72	6.7	6.5
75	6.7	6.5
78	6.8	7.3
81	6.6	6.6

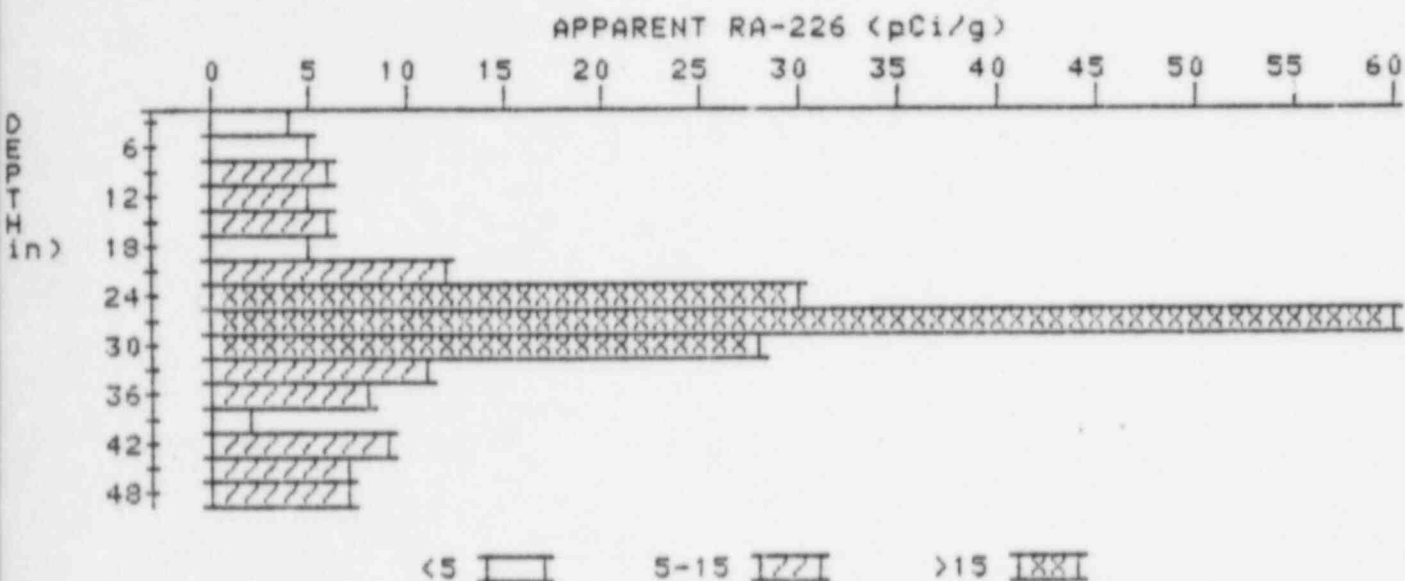
APPARENT RADIUM-226 CONCENTRATION 29

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08342-R3

HOLE NUMBER: 29

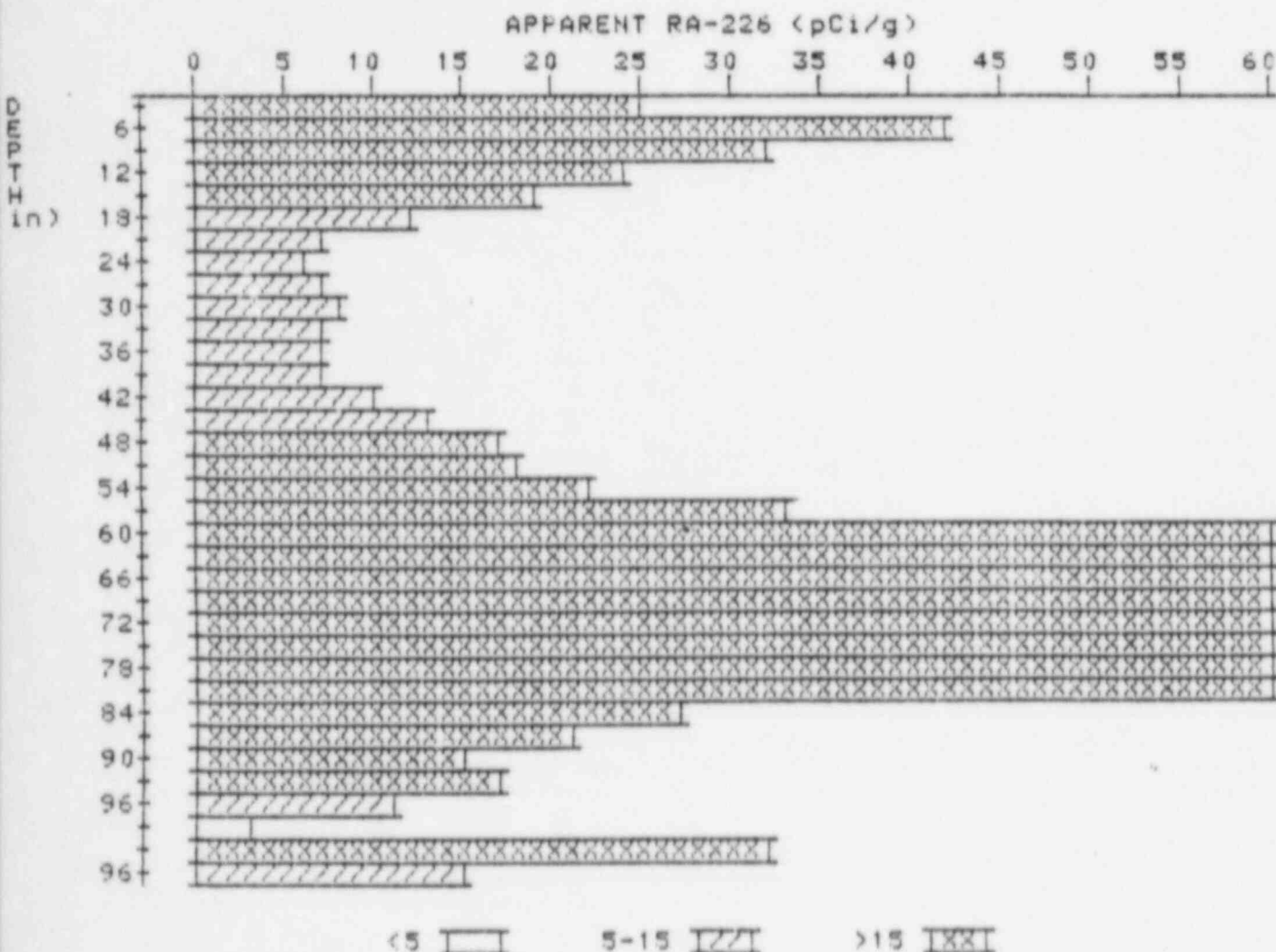
LOCATION: 245213



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.4	4.4
6	5.1	4.9
9	5.9	5.9
12	6.7	5.3
15	8.3	6.0
18	11.2	4.8
21	17.7	12.0
24	27.4	30.4
27	35.4	65.1
30	26.7	27.6
33	17.5	11.3
36	11.8	8.1
39	8.2	1.8
42	8.2	9.4
45	7.5	7.0
48	7.1	7.1

APPARENT RADIUM-226 CONCENTRATION 30 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08842-RS
HOLE NUMBER: 30
LOCATION: 245199

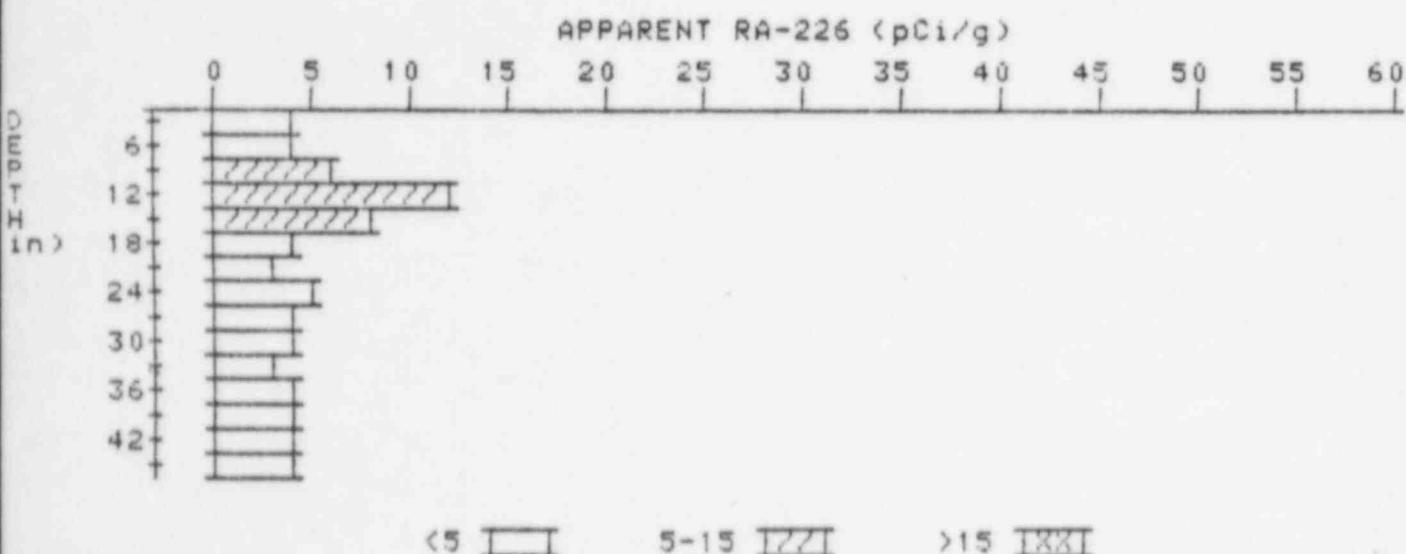


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	25.4	25.4
6	29.9	41.6
9	27.8	31.5
12	23.6	24.5
15	18.9	19.1
18	14.1	12.3

21	10.3	6.9
24	8.4	6.1
27	7.8	6.7
30	7.8	7.3
33	7.8	7.1
36	8.2	7.3
39	9.1	6.8
42	11.3	9.5
45	14.5	13.3
48	18.4	16.6
51	23.3	18.1
54	31.1	22.2
57	43.9	33.1
60	62.8	59.6
63	83.5	68.2
66	112.8	133.8
69	130.3	154.8
72	134.0	153.9
75	126.5	153.7
78	103.7	119.3
81	72.1	61.6
84	46.4	26.7
87	31.8	21.5
90	23.0	15.2
93	18.6	17.2
96	15.0	11.3
99	13.5	2.7
93	18.1	32.3
96	14.7	14.7

APPARENT RADIUM-226 CONCENTRATION 31 DECONVOLUTION GRAPH

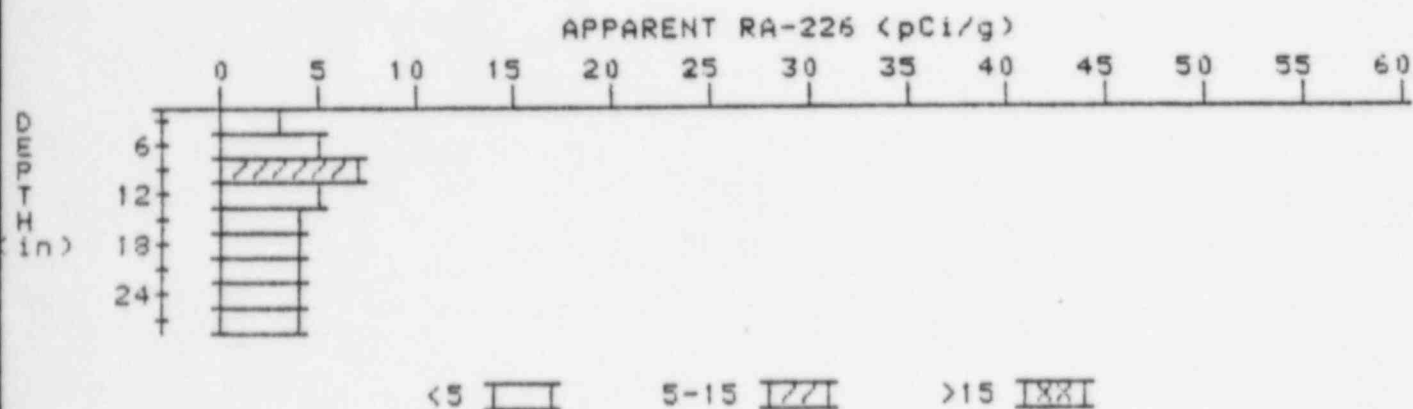
PROPERTY NUMBER: GJ-03342-RS
HOLE NUMBER: 31
LOCATION: 245259



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.8	3.8
6	4.7	3.8
9	6.1	5.9
12	7.6	11.9
15	6.7	7.6
18	5.3	4.4
21	4.4	2.9
24	4.4	4.9
27	4.1	3.9
30	3.9	3.9
33	3.7	3.3
36	3.7	3.7
39	3.7	3.7
42	3.7	3.7
45	3.7	3.7

APPARENT RADIUM-226 CONCENTRATION 32 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08842-RS
HOLE NUMBER: 32
LOCATION: 248255



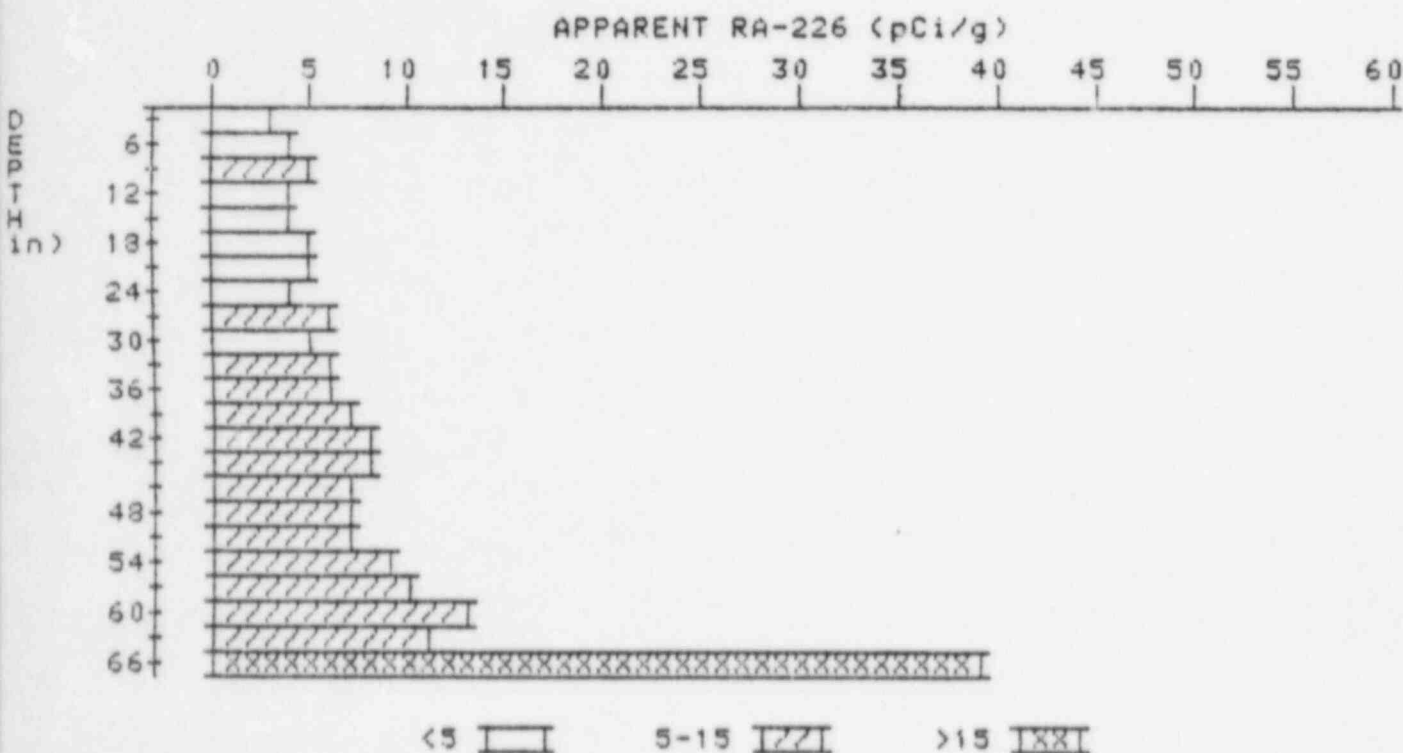
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	4.3	4.3
9	5.0	6.3
12	4.7	4.9
15	4.3	3.9
18	4.1	4.1
21	3.9	3.5
24	3.9	4.1
27	3.3	3.3

APPARENT RADIUM-226 CONCENTRATION 33 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08842-RS

HOLE NUMBER: 33

LOCATION: 250230



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.7	4.1
9	4.2	5.1
12	4.2	3.8
15	4.4	4.4
18	4.6	4.8
21	4.7	4.7
24	4.8	4.1
27	5.3	6.2
30	5.3	4.6
33	5.7	5.7
36	6.1	5.7
39	6.7	6.9
42	7.2	7.6
45	7.5	8.0

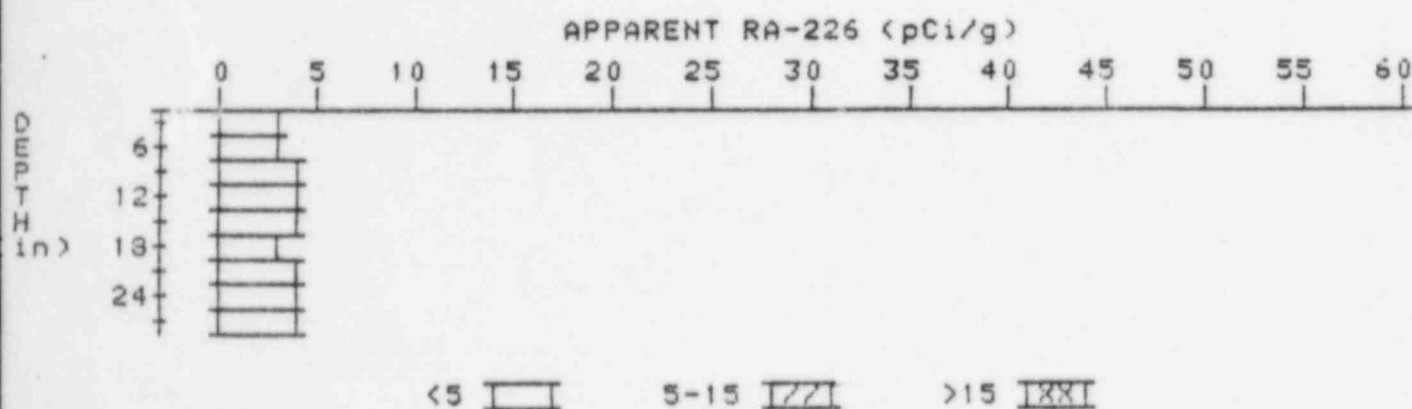
45	7.5	6.8
48	7.9	7.0
51	8.8	7.4
54	10.5	9.3
57	12.9	9.5
60	17.2	12.6
63	24.1	10.8
66	38.5	38.5

APPARENT RADIUM-226 CONCENTRATION 34 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-08342-RS

HOLE NUMBER: 34

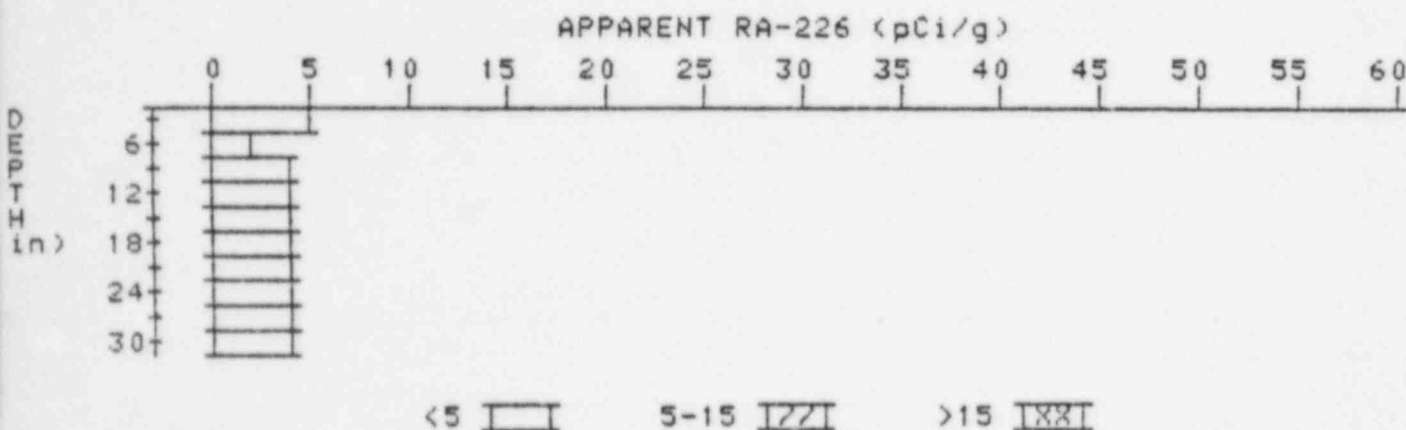
LOCATION: 255245



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.7	2.7
6	3.1	3.3
9	3.4	3.6
12	3.6	3.6
15	3.8	4.3
18	3.7	3.2
21	3.9	4.3
24	3.9	3.9
27	3.9	3.9

APPARENT RADIUM-226 CONCENTRATION 35 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03842-RS
HOLE NUMBER: 35
LOCATION: 260225



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.8	4.8
6	3.8	2.2
9	3.7	3.5
12	3.7	3.5
15	3.8	4.0
18	3.8	3.8
21	3.8	3.6
24	3.9	4.3
27	3.8	3.6
30	3.8	3.8