

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-13027-RS  
ADDRESS: 833 WEST MAIN STREET

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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August 1, 1985

REAL3027:REA-613

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## 1.0 EXECUTIVE SUMMARY

### 1.1 Introduction

The location, DOE ID No. GJ-13027-RS, is a single-family residence located at 833 West Main Street, 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 within the legal property boundaries 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, 61 cu. yd.; interior, 0 cu. yd.

No remedial action will be performed on a major portion of Area A and all of Area B, as discussed in Section 4.0 of this REA.

Estimated cost to perform remedial action, including dislocation when applicable, is \$2,388. Remedial action on this property will take approximately 5 days to complete.

## 2.0 PROPERTY DESCRIPTION

### 2.1 General Description

Address: 833 West Main Street, Grand Junction, Colorado

Zoning: Residential (RSF-8)

Lot Size: Approximately 8,600 sf (0.20 acre)

Legal Description: The north 85 feet of the following described tract: Beginning 90 feet west of the northeast corner of Lot 14, Block 1, Grand River Subdivision, south to the east bank of the Colorado River, thence northwesterly along the river to a point west of beginning, thence east to beginning, except for highway right-of-way, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 2 mile(s) 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:	None

Bordering Properties:

North:	West Main Street
South:	Vacant land
East:	Single-family residence
West:	Colorado River

### 2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-story residence
Size:	Approximately 850 sf
Construction Date:	1898
Construction:	Wood-frame
Foundation:	Mudsill - 8" x 8" timbers
Footing Depth:	Approximately 12" to bottom of footing from grade



Basement: None  
Crawl Space: Yes  
Condition: Good

Other Structures:

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

Type: Shed  
Size: Approximately 300 sf  
Construction: Wood-frame  
Foundation: Concrete slab-on-grade  
Condition: Good

General Remarks:

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

Historical Data:

This structure is over 50 years old. Therefore, it does meet the eligibility criteria for consideration of inclusion on the National Register of Historic Places.

Alterations to Structure: A 180 sf porch on north, a 200 sf addition on the west, and a 340 sf addition to the south.

Architectural Significance: None known

Historical Significance: None known

### **3.0 RADIOLOGIC SURVEY**

#### **3.1 Introduction**

Radiologic data were collected by Bendix at DOE ID No. GJ-13027-RS on May 9, 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 north and west yards.

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, deconvolution graphs, and Exterior Gamma Scan map are included in the Appendix (Section 6.0).

#### **3.2 Gamma Exposure-Rate Surveys**

##### **3.2.1 Exterior Findings**

Background Readings: 14 to 17 uR/h  
Highest Outside Gamma Reading (HOG): 139 uR/h

Exterior radium-concentration measurements are presented in Appendix Table 3.1. Grid-point survey results are shown in Appendix Figure 3.1.

##### **3.2.2 Interior Findings**

Background Readings: 13 to 18 uR/h  
Highest Inside Gamma Reading (HIG): 18 uR/h

Interior gamma exposure-rate measurements are summarized in Appendix Table 3.2.

#### **3.3 Boreholes, Soil Samples, and Other Measurements**

Areas which displayed elevated gamma levels were further investigated; these areas are shown in Appendix Figure 3.2. 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 3.3 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) Surface Material: soil  
 Direction From Primary Structure: north, in the street right-of-way and partially extending over the legal property boundary  
 Total Depth of Contamination: estimated at 78 inches  
 Comments: The depth of contamination is based on data collected at DOE ID #GJ-01207-RS. This area is contaminated fill around a 48-inch storm drain; 150 sf of this area is within the legal property boundaries, while 1200 sf is in the street right-of-way. Only the part of Area A in the street right-of-way will be excluded from remedial action.  
 Approximate Square Footage: 150
- (Area B) Surface Material: concrete  
 Direction From Primary Structure: north, in the street right-of-way  
 Total Depth of Contamination: estimated at 78 inches  
 Other (height of thickness): 4-inch-thick concrete  
 Comments: The depth of contamination is based on data collected at DOE ID #GJ-01207-RS. This area is contaminated fill around a 48-inch storm drain.  
 Approximate Square Footage: 250 (excluded from remedial action)
- (Area C) Surface Material: soil  
 Direction From Primary Structure: northwest  
 Total Depth of Contamination: 12 inches  
 Approximate Square Footage: 360
- (Area D) Surface Material: soil  
 Direction From Primary Structure: west  
 Total Depth of Contamination: 9 inches  
 Approximate Square Footage: 280

(Area E) Surface Material: soil  
Direction From Primary Structure: west  
Total Depth of Contamination: 6 inches  
Comments: Two deposits are included in this area.  
Approximate Square Footage: 202

#### 4.0 RECOMMENDED REMEDIAL ACTION

##### 4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-13027-RS, includes removal of all areas within the legal property boundaries identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figure 3.3) and transport of removed material to the disposal site.

A major portion of Area A and all of Area B are located beyond the legal property boundaries in the street right-of-way. These areas are associated with a 48-inch diameter concrete storm sewer and a gas line that are bedded in tailings.

If the Department of Energy determines that the storm sewer and gas line deposits should be removed, it is recommended that the portion of Area A which is in the street right-of-way, and all of Area B, be removed as part of remedial action project DOE ID No. GJ-97003-OT. This project would be performed in cooperation with the City of Grand Junction if utility improvements are made in this area. This remedial action project, GJ-97003-OT, would be the most efficient and cost-effective method of tailings removal. It would allow for identification of tailings involvement of other adjacent properties along the utilities and their removal under a single subcontract utilizing a utility subcontractor.

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 \$2,388.

This remedial action will result in removal of the identified residual radioactive materials found within the legal property boundaries.

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 Sample Locations
Figure 3.3	Estimated Extent of Contamination

Official Survey Report

Memo of Understanding

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Exterior Gamma Scan Map

## 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.		
1	129279	00	DS	1.5		*	West of primary structure
		06	DS	1.2		*	
2	129285	03	TC	11.5		*	Auger refusal DC = >54 inches
		06	TC	13.9		*	
		09	TC	13.3		*	
		12	BH	11.1	7.8	*	
		15	TC	9.7		*	
		18	TC	8.3		*	
		21	TC	7.2		*	
		24	BH	7.0	4.0	*	
		27	TC	7.0		*	
		30	TC	7.0		*	
		33	TC	7.4		*	
		36	TC	8.0		*	
		39	TC	8.9		*	
		42	TC	9.9		*	
		45	TC	10.5		*	
		48	TC	10.8		*	
		51	TC	10.5		*	
		54	TC	9.9		*	
		57	TC	9.3		*	
		60	TC	8.3		*	
3	132271	00	DS	1.5		*	West of primary structure
		06	DS	<1.0		*	
4	136280	03	TC	21.7		*	DC = 12 inches Based on the deconvolution graph
		06	BH	17.4	15.0	*	
		09	TC	11.8		*	
		12	TC	8.5		*	
		15	TC	6.4		*	
		18	BH	5.5	2.5	*	
		21	TC	5.0		*	
		24	TC	4.7		*	
		27	TC	4.6		*	
		30	TC	4.6		*	
		33	TC	4.7		*	
		36	TC	4.8		*	
		39	TC	4.9		*	
		42	TC	4.8		*	
		45	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.		
5	137254	00	DS	1.1		*	West of primary structure
		06	DS	2.5		*	
		12	DS	1.1		*	
6	140252	03	TC	4.8		*	West of primary structure DC = 6 inches Based on all available data
		06	TC	4.4		*	
		09	TC	4.0		*	
		12	TC	3.9		*	
		15	TC	3.7		*	
		18	TC	3.7		*	
		21	TC	3.7		*	
		24	TC	3.8		*	
		27	TC	4.0		*	
		30	TC	4.0		*	
		33	TC	4.0		*	
		36	TC	4.0		*	
		39	TC	4.0		*	
		42	TC	4.0		*	
7	140268	00	DS	1.7		*	West of primary structure
		06	DS	1.3		*	
8	144286	03	TC	12.0		*	Auger refusal DC = >39 inches
		06	BH	13.7	12.9	*	
		09	TC	14.9		*	
		12	TC	12.9		*	
		15	TC	11.1		*	
		18	BH	10.5	7.3	*	
		21	TC	10.6		*	
		24	TC	9.8		*	
		27	TC	9.2		*	
		30	TC	9.0		*	
		33	TC	9.1		*	
		36	TC	9.1		*	
		39	TC	9.0		*	
9	145215	00	DS	<1.0		*	Background DC = 0 inches
		00-06	SS			2.0	
		03	TC	3.0		*	
		06	TC	3.6		*	
		09	TC	3.8		*	
		12	BH	3.9	1.6	*	
		15	TC	4.0		*	

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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.		
9	145215	18	TC	4.2		*	
		21	TC	4.2		*	
		24	BH	4.3	2.6	*	
		27	TC	4.7		*	
		30	TC	4.5		*	
		33	TC	4.3		*	
		36	TC	4.1		*	
10	145259	00	DS	2.0		*	West of primary
		06	DS	<1.0		*	structure
11	145273	03	TC	5.7		*	DC = 12 inches
		06	TC	5.5		*	Based on the
		09	TC	5.4		*	deconvolution graph
		12	TC	4.4		*	
		15	TC	4.0		*	
		18	TC	3.9		*	
		21	TC	3.9		*	
		24	TC	3.9		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
		33	TC	4.1		*	
		36	TC	4.1		*	
		39	TC	4.1		*	
		42	TC	4.0		*	
12	148265	00	DS	7.7		*	West of primary
		06	DS	1.4		*	structure
13	151268	03	TC	3.3		*	West of primary
		06	TC	3.6		*	structure
		09	TC	3.5		*	DC = 6 inches
		12	TC	3.5		*	Based on all
		15	TC	3.5		*	available data
		18	TC	3.6		*	
		21	TC	3.7		*	
		24	TC	3.7		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.9		*	
		36	TC	3.9		*	
		39	TC	3.9		*	
		42	TC	3.8		*	
		45	TC	3.7		*	

## 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.		
14	155262	00	DS	3.5		*	West of primary structure
		06	DS	<1.0		*	
15	156257	00	DS	2.1		*	West of primary structure
		06	DS	<1.0		*	
16	157268	00	DS	7.5		*	West of primary structure
		06	DS	1.9		*	
17	157284	03	TC	14.0		*	Auger refusal
		06	TC	12.1		*	Northwest of
		09	TC	9.8		*	primary structure
		12	TC	7.8		*	DC = 12 inches
		15	TC	6.6		*	Based on the
		18	TC	6.0		*	deconvolution graph
		21	TC	5.9		*	
		24	TC	5.8		*	
		27	TC	5.8		*	Elevated readings
		30	TC	5.6		*	are shine from
		33	TC	5.8		*	nearby deposit
		36	TC	5.7		*	
		39	TC	5.6		*	
		42	TC	5.5		*	
		45	TC	5.5		*	
		48	TC	5.2		*	
		51	TC	4.9		*	
		54	TC	4.8		*	
18	163273	03	TC	5.4		*	DC = 9 inches
		06	TC	5.2		*	Based on the
		09	TC	4.5		*	deconvolution graph
		12	TC	4.1		*	
		15	TC	4.1		*	
		18	TC	4.0		*	
		21	TC	4.0		*	
		24	TC	4.0		*	
		27	TC	4.1		*	
		30	TC	4.1		*	
		33	TC	4.1		*	
		36	TC	4.0		*	
		39	TC	3.9		*	
		42	TC	3.8		*	

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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.		
19	163288	03	TC	52.1		*	Auger refusal
		06	TC	71.0		*	Northwest of primary
		09	TC	72.2		*	structure
		12	TC	48.2		*	
		15	TC	25.7		*	
		18	TC	14.9		*	DC = >51 inches
		21	TC	10.8		*	
		24	TC	8.5		*	
		27	TC	7.7		*	
		30	TC	7.4		*	
		33	TC	7.2		*	
		36	TC	7.3		*	
		39	TC	7.3		*	
		42	TC	7.2		*	
		45	TC	7.0		*	
		48	TC	6.5		*	
		51	TC	5.9		*	
20	164283	03	TC	22.0		*	Auger refusal
		06	TC	15.2		*	DC = 12 inches
		09	TC	10.6		*	Based on the
		12	TC	7.3		*	deconvolution graph
		15	TC	5.5		*	
		18	TC	4.8		*	
		21	TC	4.5		*	
		24	TC	4.4		*	
		27	TC	4.4		*	
		30	TC	4.5		*	
		33	TC	4.6		*	
		36	TC	4.7		*	
21	165272	00	DS	3.0		*	15 feet west of
		06	DS	1.6		*	primary structure
22	170284	03	TC	10.9		*	Auger refusal
		06	TC	9.3		*	Northwest of primary
		09	TC	7.3		*	structure
		12	TC	5.8		*	DC = 12 inches
		15	TC	4.8		*	Based on the
		18	TC	4.6		*	deconvolution graph
		21	TC	4.3		*	

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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.		
22	170284	24	TC	4.4		*	
		27	TC	4.4		*	
		30	TC	4.4		*	
		33	TC	4.6		*	
		36	TC	4.6		*	
		39	TC	4.7		*	
		42	TC	4.6		*	
		45	TC	4.6		*	
23	171273	03	TC	4.2		*	DC = 0 inches
		06	TC	4.4		*	
		09	TC	4.3		*	
		12	TC	4.0		*	
		15	TC	3.9		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.7		*	
		27	TC	3.7		*	
		30	TC	3.8		*	
		33	TC	3.9		*	
		36	TC	4.0		*	
		39	TC	4.0		*	
		42	TC	3.9		*	
24	175282	00	DS	1.2		*	
		06	DS	1.0		*	
25	175285	00	DS	2.2		*	
		06	DS	<1.0		*	
26	176272	00	DS	<1.0		*	3 feet west of primary structure
		06	DS	<1.0		*	
27	176277	00	DS	2.1		*	3 feet west of primary structure
		06	DS	1.1		*	
28	180266	03	TC	3.4		*	West of primary structure DC = 0 inches
		06	TC	3.7		*	
		09	TC	3.6		*	
		12	TC	3.7		*	
		15	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.		
28	180266	18	TC	3.7		*	
		21	TC	3.7		*	
		24	TC	3.7		*	
		27	TC	3.7		*	
		30	TC	3.7		*	
		33	TC	3.5		*	
		36	TC	3.4		*	
		39	TC	3.3		*	
29	181281	00	DS	1.6		*	2 feet north of
		06	DS	1.1		*	primary structure
30	181288	00	DS	1.1		*	North of primary
		06	DS	1.9		*	structure
		00-06	SS			2.1	Sandy soil
31	185292	00	DS	2.3		*	North of primary
		06	DS	2.8		*	structure
		12	DS	2.4		*	DC = >39 inches
		18	DS	2.5		*	
		03	TC	3.9		*	
		06	TC	4.1		*	
		09	TC	4.5		*	
		12	TC	4.7		*	
		15	TC	5.0		*	
		18	TC	5.0		*	
		21	TC	5.2		*	
		24	TC	5.5		*	
		27	TC	5.9		*	
		30	TC	6.3		*	
		33	TC	6.4		*	
		36	TC	6.6		*	
		39	TC	6.7		*	
32	187293	03	TC	4.1		*	Hit storm drain
		06	TC	4.9		*	DC = >12 inches
		09	TC	5.9		*	
		12	TC	7.3		*	

## Radium Concentrations at Exterior Locations

DOE ID #GJ-13027-RS

833 West Main Street

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.		
33	190280	03	TC	3.9		*	North of primary structure DC = 0 inches
		06	TC	4.0		*	
		09	TC	3.9		*	
		12	TC	3.9		*	
		15	TC	3.8		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.8		*	
		27	TC	3.8		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
		36	TC	4.1		*	
34	193298	00	DS	4.9		*	20 feet north of primary structure Top of storm drain
		06	DS	3.9		*	
		12	DS	2.9		*	
		18	DS	2.9		*	
35	204262	00	DS	<1.0		*	Gas line
		06	DS	1.7		*	
		18	DS	1.1		*	
36	204273	03	TC	2.9		*	East of primary structure DC = 0 inches
		06	TC	3.2		*	
		09	TC	3.5		*	
		12	TC	3.5		*	
		15	TC	3.6		*	
		18	TC	3.7		*	
		21	TC	3.5		*	
		24	TC	3.5		*	
		27	TC	3.6		*	
		30	TC	3.6		*	
		33	TC	3.5		*	
37	204297	00	DS	3.9		*	20 feet north of primary structure
		06	DS	3.4		*	
		12	DS	1.8		*	
38	229299	00	DS	3.0		*	North property line
		06	DS	5.1		*	
		12	DS	8.0		*	

## Radium Concentrations at Exterior Locations

DOE ID #GJ-13027-RS

833 West Main Street

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.		
39	229304	03	TC	2.9		*	DC = 0 inches
		06	TC	3.2		*	
		09	TC	3.5		*	
		12	TC	3.7		*	
		15	TC	3.9		*	
		18	TC	4.0		*	
		21	TC	4.0		*	
		24	TC	4.0		*	
		27	TC	4.0		*	
		30	TC	3.9		*	
		33	TC	3.8		*	
		36	TC	3.8		*	
		39	TC	3.8		*	
		42	TC	3.8		*	
		45	TC	3.8		*	
		48	TC	3.9		*	
40	231296	00	DS	4.0		*	On sidewalk
		06	DS	16.0		*	
		12	DS	5.0		*	Top of storm drain

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 = 05-09-85  
 Team Leader = TDH



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	5	15-17	16	5	15-16	16
GROUND FLOOR	*	*	*	*	13-18	*
GARAGE	*	*	*	*	13-14	*
SHED	*	*	*	*	13-15	*

---

\* The historical data indicate the absence of interior contamination at this property. This information was investigated by performing a walking gamma scan.

Table 4.1  
Area and Volume Calculations  
DOE ID No. GJ-13027-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					
A	3 x 50 =	150	x 6.5 =	975	
C	15 x 13 =	195			
	33 x 5 =	165			
		<hr/>			
		360	x 1.0 =	360	
D	35 x 8 =	280	x 0.8 =	224	
E	6 x 7 =	42			
	4 x 40 =	160			
		<hr/>			
		202	x 0.5 =	101	
				<hr/>	
TOTAL VOLUME - EXTERIOR				= 1,660 = 1,660/27 =	61

Note: Calculations are based on deposits found within the legal property boundaries

See Appendix Figure 3.3 For Areas

=====

Table 4.2  
Estimated Cost of Decontamination and Restoration  
DOE ID No. GJ-13027-RS

Page 1 of 1

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EXTERIOR

Remove identified residual radioactive material

61 cy @ \$14.50/cy (machine-open)

\$ 885

Replace areas with compacted roadbase

30 cy @ \$11.50/cy

345

Replace areas with topsoil

31 cy @ \$9.50/cy

295

---

TOTAL EXTERIOR \$ 1,525

TOTAL INTERIOR 0

ACCESS CONTROL 100

---

SUBTOTAL \$ 1,625

CONTINGENCY @ 5% 81

---

SUBTOTAL \$ 1,706

CONTRACTOR OVERHEAD & PROFIT @ 40% 682

---

GRAND TOTAL \$ 2,388

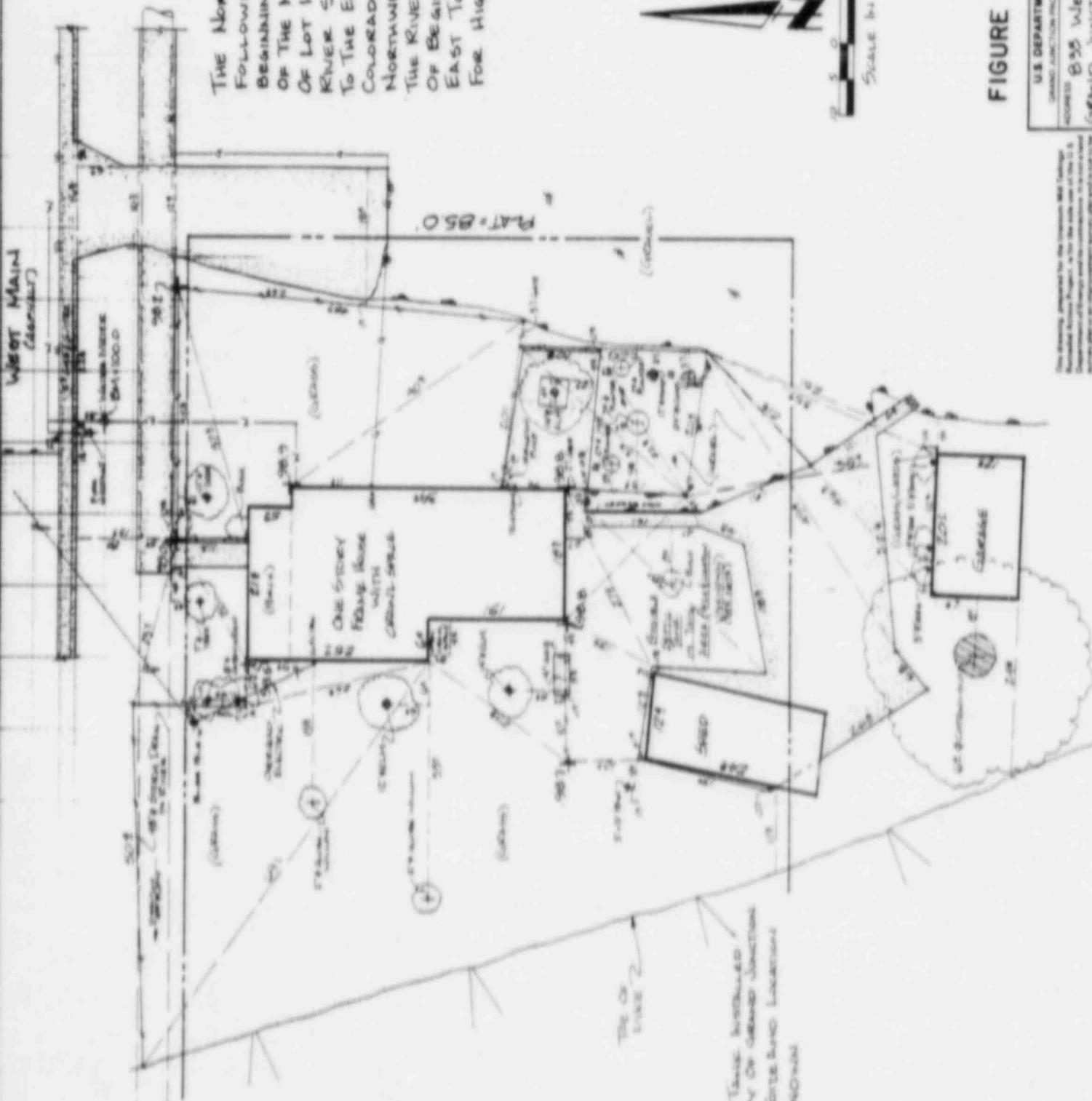
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RRD73085

REAL3027/REA-613/LMR



West Main  
(center)



THE NORTH 85.0 FEET OF THE FOLLOWING DESCRIBED TRACT: BEGINNING 90.0 FEET WEST OF THE NORTHEAST CORNER OF LOT 14 BLOCK 1 GRAND RIVER SUBDIVISION, SOUTH TO THE EAST BANK OF THE COLORADO RIVER, THENCE NORTHWESTERLY ALONG THE RIVER TO A POINT WEST OF BEGINNING, THENCE EAST TO BEGINNING EXCEPT FOR HIGHWAY R.O.W.



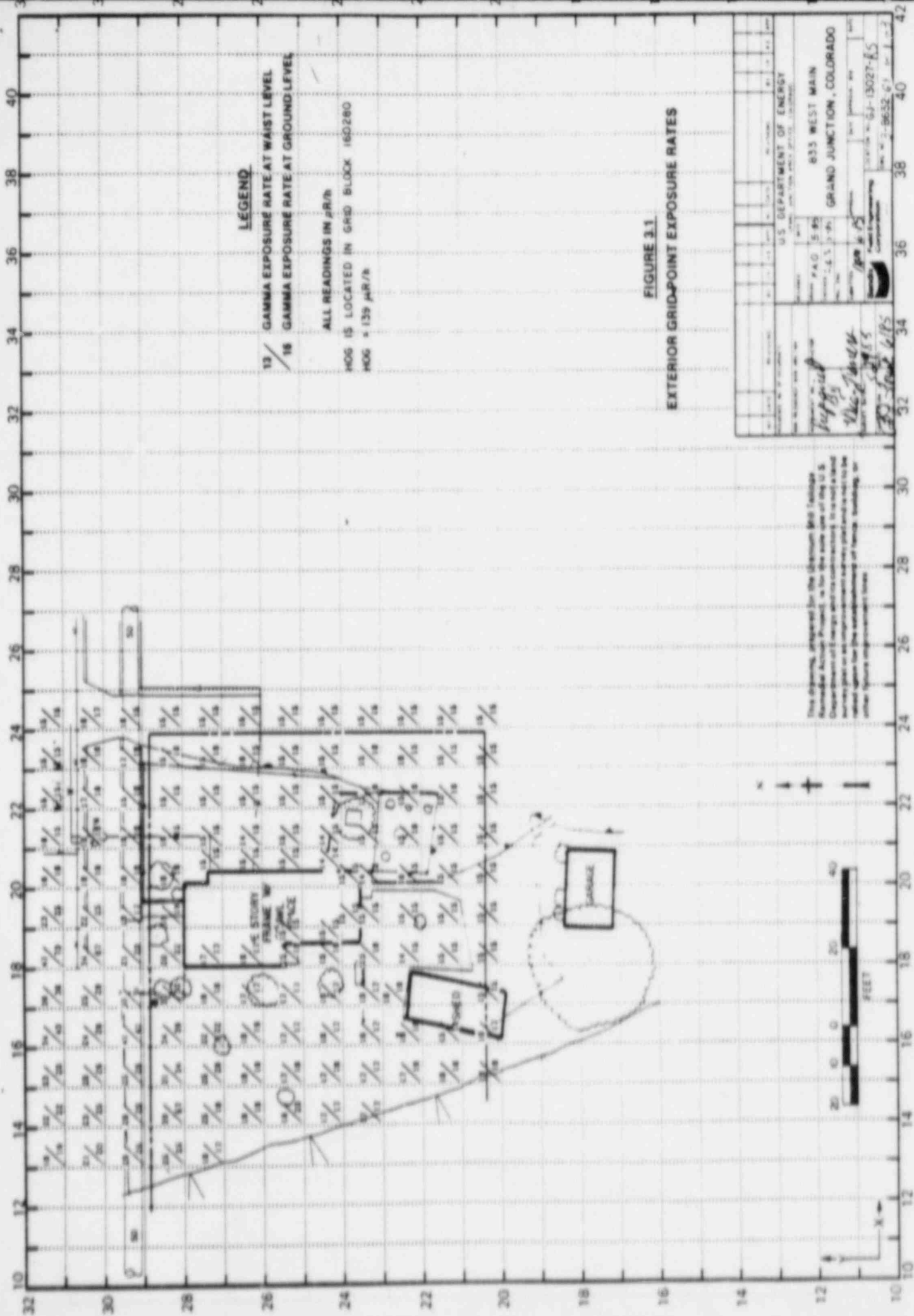
0 5 10 20  
SCALE IN FEET

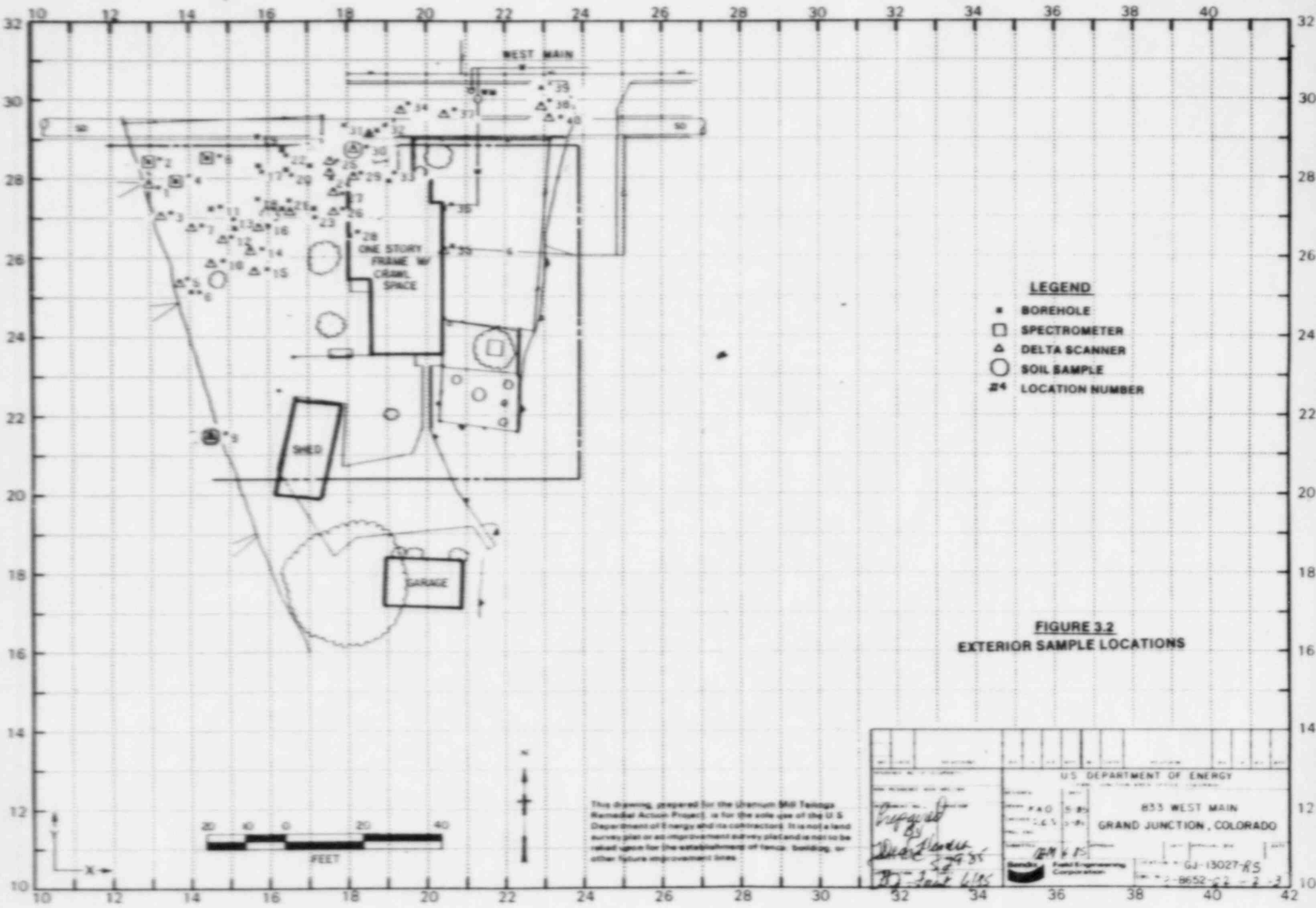
FIGURE 2.2 SITE PLAN

Note:  
SEWER LINE INSTALLED BY CITY OF GRAND JUNCTION  
EXACT SITE AND LOCATION UNKNOWN

This drawing prepared for the Grand Junction Water Treatment Plant. It is not to be used for any other purpose without the written consent of the U.S. Department of Energy. It is not to be used for any other purpose without the written consent of the U.S. Department of Energy.

U.S. DEPARTMENT OF ENERGY	DATE: 01/15/02
GRAND JUNCTION PROJECT OFFICE, COLO. JUNCTION	PROJECT NO. 15027 RS
ADDRESS: 835 West Main	OWNER: Grand Junction, Colorado
CITY: GRAND JUNCTION, COLORADO	DATE: 01/15/02
PROJECT NO. 15027 RS	SCALE: 1" = 20'
DRAWING NO. 5-652-01	SHEET 1 OF 1

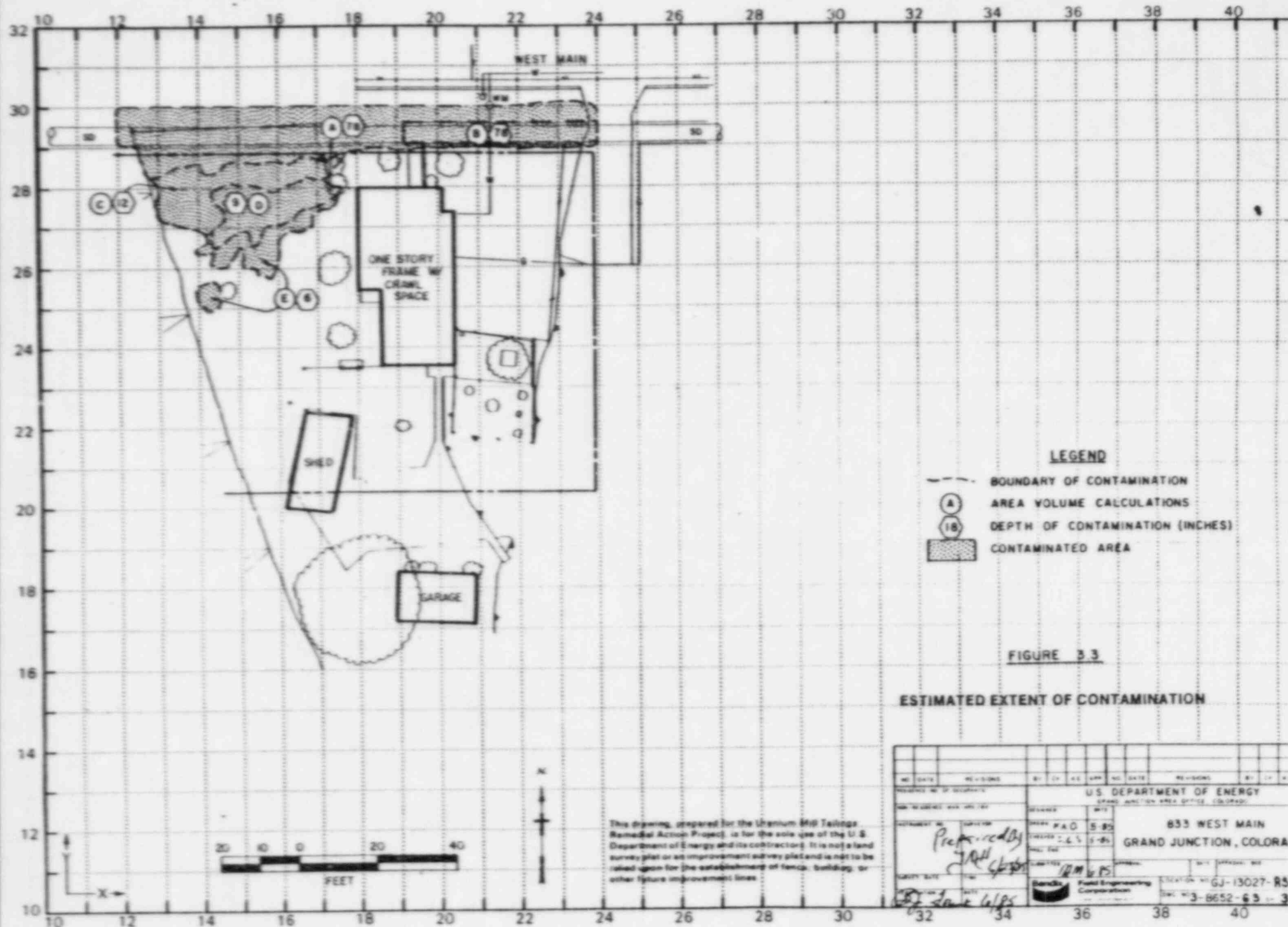




**FIGURE 3.2**  
**EXTERIOR SAMPLE LOCATIONS**

U.S. DEPARTMENT OF ENERGY 833 WEST MAIN GRAND JUNCTION, COLORADO	
Project: GJ-13027-RS Date: 11-1-85 Drawn: [Signature] Checked: [Signature] Approved: [Signature]	GJ-13027-RS 11-1-85 11-1-85





NO. DATE		REVISIONS		BY	CHK	APP	NO.	DATE	REVISIONS		BY	CHK	APP
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE (COLORADO)													
PROJECT NO. 13027-R5				SHEET NO. 5-85				833 WEST MAIN GRAND JUNCTION, COLORADO					
DRAWN BY: JAH				CHECKED BY: JAH				DATE: 1/15/85					
SCALE: 1" = 40'				PROJECT: RM & PS				SHEET: 5-85					
DATE: 1/15/85				BY: JAH				APP: JAH					
PROJECT: RM & PS				SHEET: 5-85				DATE: 1/15/85					
PROJECT: RM & PS				SHEET: 5-85				DATE: 1/15/85					



Location No. GJ-13027-RSDate 5-13-85

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

Official Survey Report

Property Address 833 West Main StreetProperty Owner Donald RodgersAddress of Owner (if different from above) SameReport Prepared By T. Dean Herrera

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 = 18 uR/hrHOG = 139 uR/hr



Bendix  
Aerospace

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

June 5, 1985

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

ATTN: Chuck Thornberg

Dear Chuck:

The following is in response to your questions and comments during the Technical Review concerning Department of Energy (DOE) Identification (ID) number GJ-13027-RS, conducted on May 9, 1985.

1. There is no sewer connected to this facility; it is only on a septic system.
2. A revisit was made on this property in order to perform an auger on the septic tank. Mr. Rogers informed me that the City of Grand Junction installed the septic tank in 1973.

A copy of the revisit Team Leader notes has been included.

Thank you for your time and cooperation. If you should have additional questions or comments you may contact me at 242-8621, extension 280.

Very truly yours,

T. Dean Herrera  
RSD Survey Team Leader

TDH:pr

ALLIED Bendix  
Aerospace

Bendix Field Engineering Corporation  
Grand Junction Operations  
Grand Junction, Colorado

Date: May 10, 1985

To: Files

From: T. Dean Herrera

Subject: Team Leader Notes - GJ-13027-RS

Address: 833 West Main

Owner: Donald Rodgers

Occupancy: One

Team Members

D. Herrera (Team Leader)  
P. Egidi  
P. Tuhey  
N. Wallace  
V. Young  
R. Herman

T. Flores  
S. Southern  
A. Quintana  
S. Larsen  
M. Duran  
M. Gilfillan

Instruments

See Equipment Summary Sheet.

The team members located the elevated gamma readings at the areas Oak Ridge National Laboratory (ORNL) indicated, the north side of the primary structure.

The drawing by Bendix indicates that a storm drain extends parallel with the sidewalk. During the augering and the investigation of the storm drain, we encountered pit run (over size rocks), which made augering very difficult.

Team Leader Notes  
T. Dean Herrera  
GJ-13027-RS  
May 10, 1985  
Page 2

Tom Flores made a visit to the city shop to try and obtain some history of the storm drain. Tom was told that it is approximately 48 inches, but no one at the City Shop knew if the drain had been placed in tailings.

All utilities were investigated; there is no indication of tailings around any of the lines.

All personnel were frisked before lunch break.

The footing/foundation of the primary structure is built on timbers.

Date: May 10, 1985

Dan Fossey and myself returned to survey the interior of the shed and garage; the scan showed no elevated gamma readings.

The septic tank was investigated; a lot of oversized rocks were encountered. The auger would only go down approximately 18 inches. The total count was placed at the bottom of the hole and counted. No elevated gamma readings was recorded; it appears to be free of tailings. Mr. Rogers informed me that the tank was installed by the City of Grand Junction in 1973.

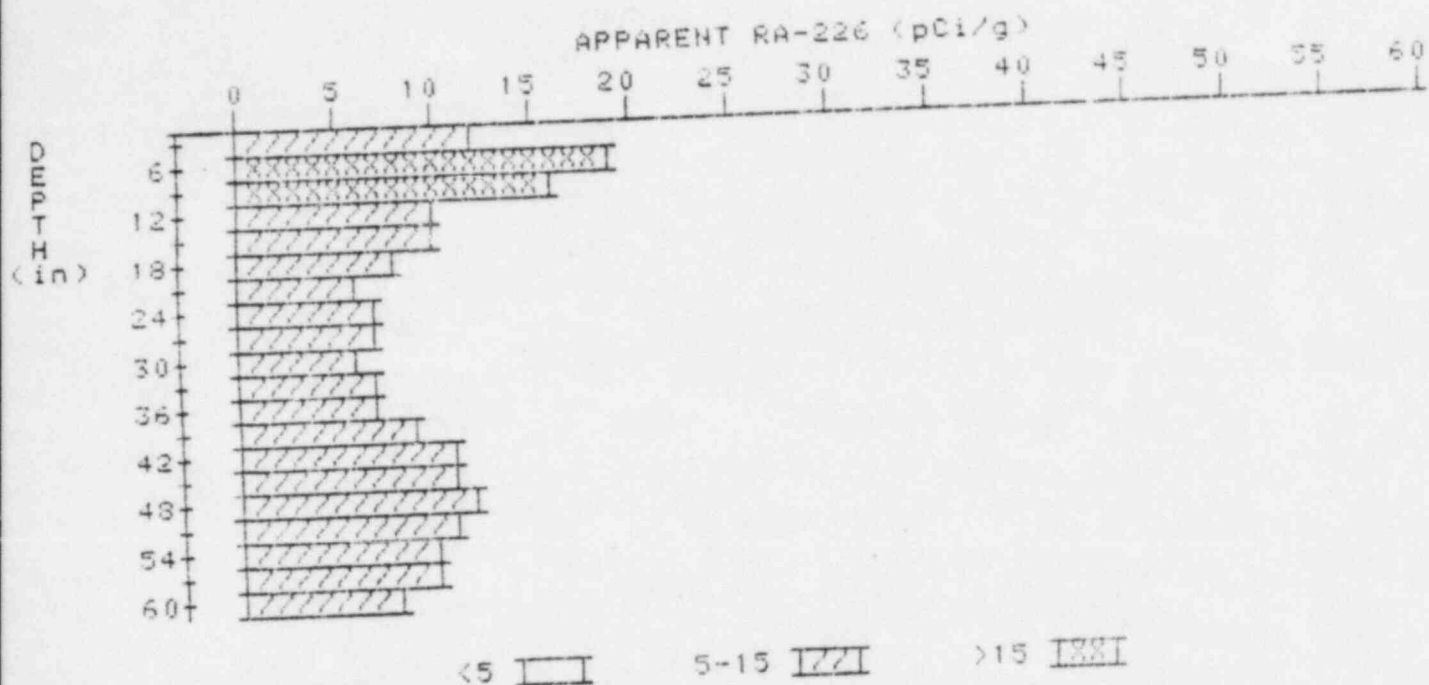
Team Leader Notes  
T. Dean Herrera  
GJ-13027-RS  
May 28, 1985  
Page 3

On 24 May 1985, R. Vialpando and myself discussed the probability that the storm drain is buried in tailings. Since I had difficulty augering the storm drain, and based on the assessment of DOE ID GJ-01207, the depth of 78 inches is going to be referenced for the depth at DOE ID GJ-13027 property.

# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

2

PROPERTY NUMBER: GJ-13027-RS  
HOLE NUMBER: 2  
LOCATION: 129285



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	11.5	11.5
6	13.9	19.2
9	13.3	16.1
12	11.1	9.7
15	9.7	9.7
18	8.3	7.8
21	7.2	5.6
24	7.0	6.6
27	7.0	7.0
30	7.0	6.3
33	7.4	7.0
36	8.0	7.5
39	8.9	8.7
42	9.9	10.6
45	10.5	11.0
48	10.8	11.9
51	10.5	11.0
54	9.9	9.9

57  
60

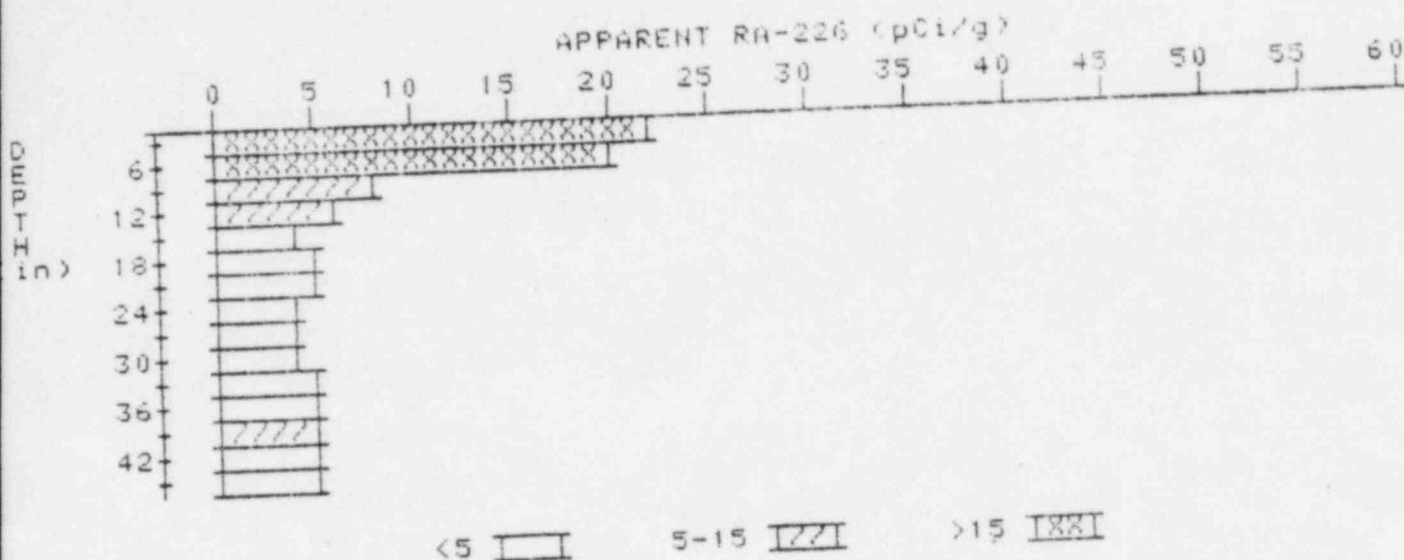
9.3  
8.3

10.0  
8.3

# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

4

PROPERTY NUMBER: GJ-13027-RS  
HOLE NUMBER: 4  
LOCATION: 136280



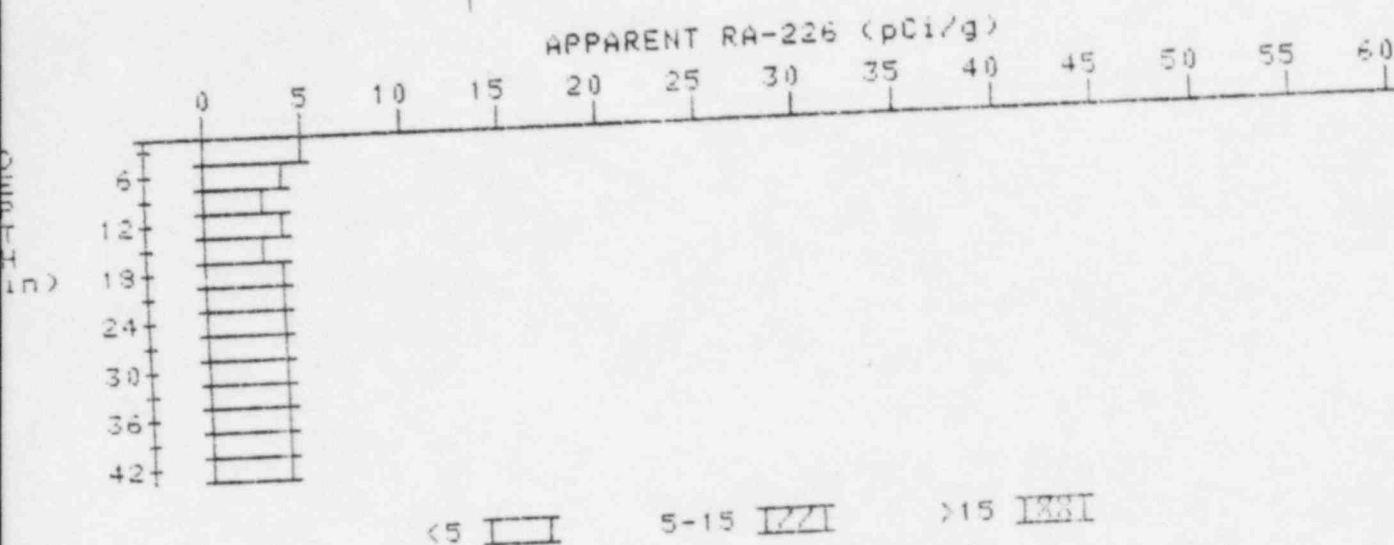
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	21.7	21.7
6	17.4	19.7
9	11.8	7.7
12	8.5	6.4
15	6.4	4.3
18	5.5	4.8
21	5.0	4.6
24	4.7	4.3
27	4.6	4.4
30	4.6	4.4
33	4.7	4.7
36	4.8	4.8
39	4.9	5.3
42	4.8	4.6
45	4.8	4.8



# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

6

PROPERTY NUMBER: GJ-13027-RS  
HOLE NUMBER: 6  
LOCATION: 140252

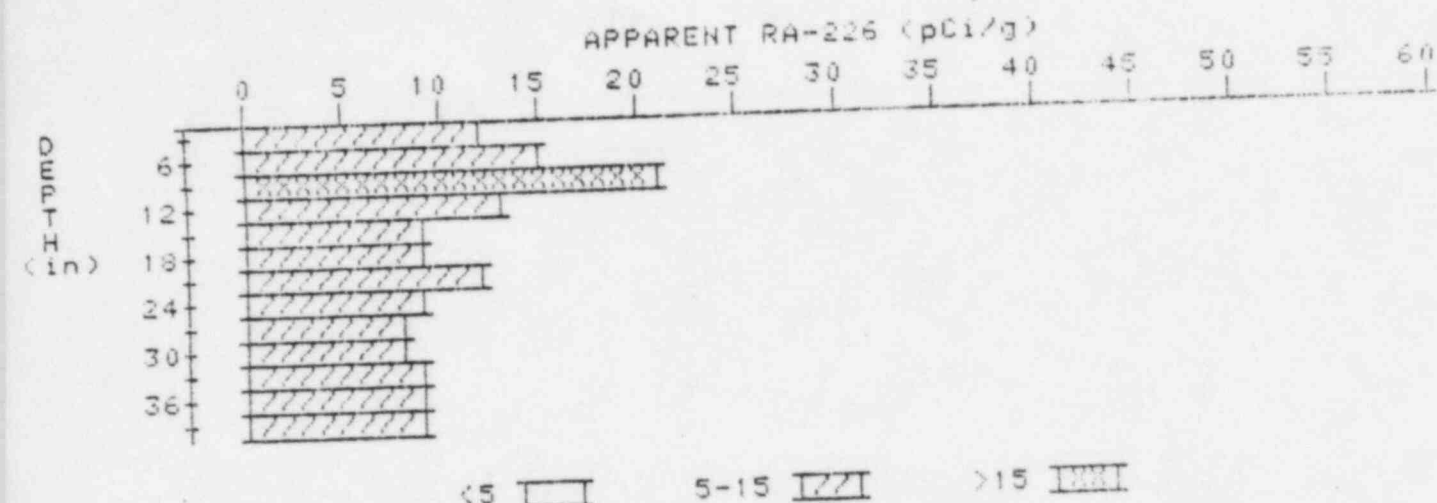


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.8	4.0
6	4.4	4.4
9	4.0	3.5
12	3.9	4.1
15	3.7	3.3
18	3.7	3.7
21	3.7	3.5
24	3.8	3.6
27	4.0	4.4
30	4.0	4.0
33	4.0	4.0
36	4.0	4.0
39	4.0	4.0
42	4.0	4.0

# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

8

PROPERTY NUMBER: GJ-13027-RS  
HOLE NUMBER: 8  
LOCATION: 144286

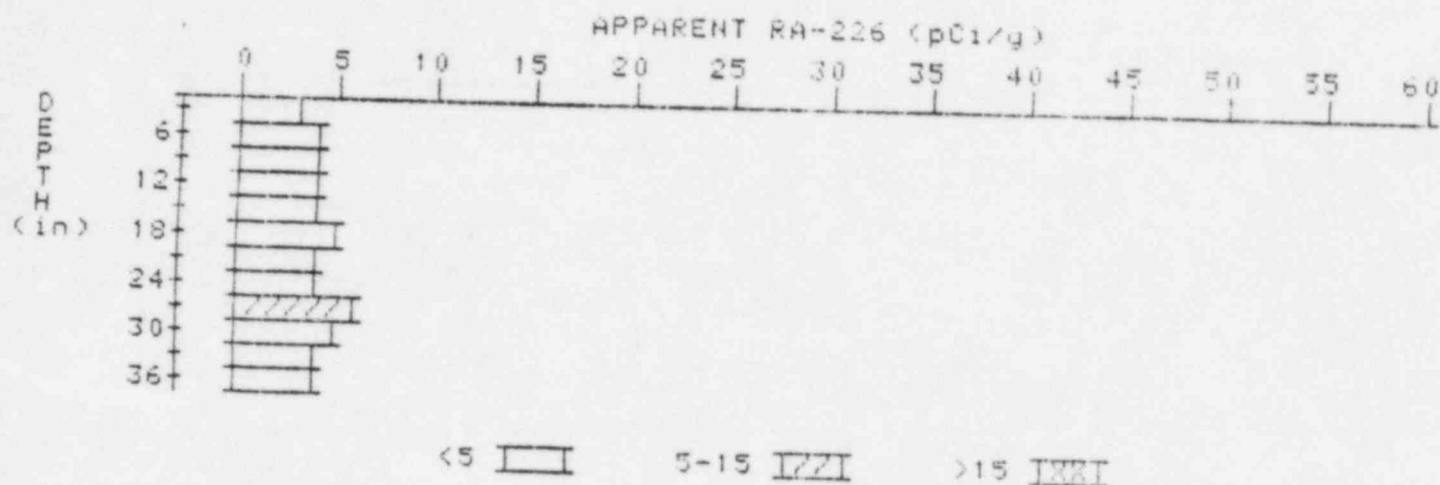


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	12.0	12.0
6	13.7	14.6
9	14.9	20.6
12	12.9	12.5
15	11.1	9.0
18	10.5	9.3
21	10.6	12.2
24	9.8	9.4
27	9.2	8.5
30	9.0	8.5
33	9.1	9.3
36	9.1	9.3
39	9.0	9.0

# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

9

PROPERTY NUMBER: GJ-13027-RS  
HOLE NUMBER: 9  
LOCATION: 145215



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.6	4.3
9	3.8	4.0
12	3.9	3.9
15	4.0	3.8
18	4.2	4.6
21	4.2	4.0
24	4.3	3.8
27	4.7	5.8
30	4.5	4.5
33	4.3	4.3
36	4.1	4.1

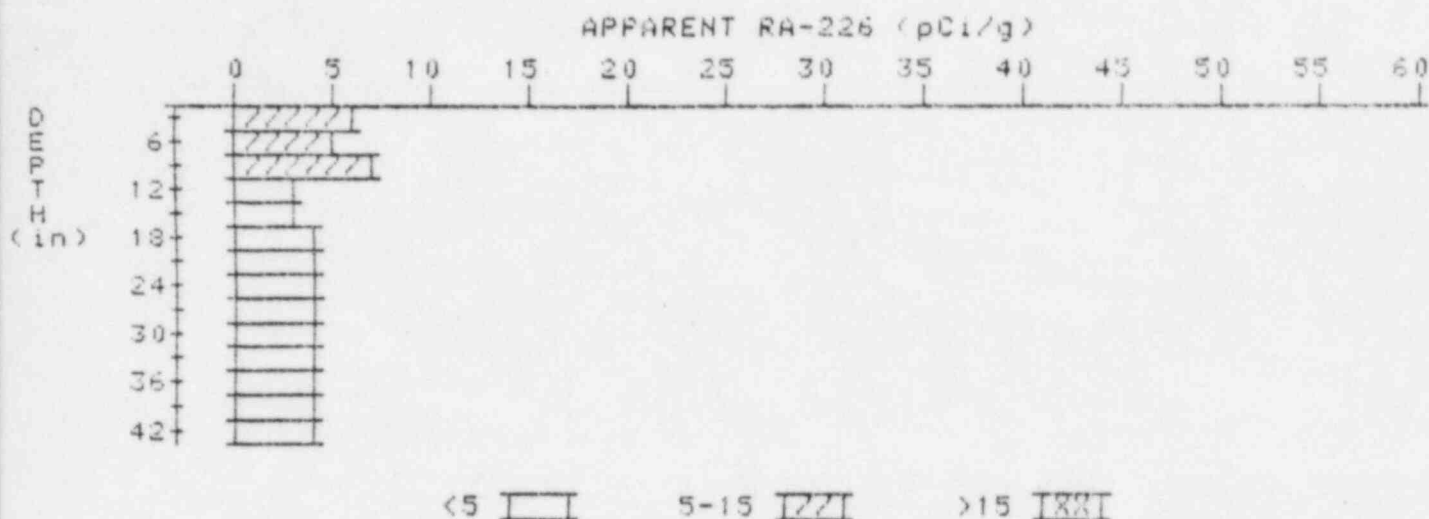
# APPARENT RADIUM-226 CONCENTRATION 11

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13027-RS

HOLE NUMBER: 11

LOCATION: 145273



Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	5.7	5.7
6	5.5	5.3
9	5.4	7.0
12	4.4	3.3
15	4.0	3.5
18	3.9	3.7
21	3.9	3.9
24	3.9	3.9
27	3.9	3.9
30	3.9	3.5
33	4.1	4.5
36	4.1	4.1
39	4.1	4.3
42	4.0	4.0

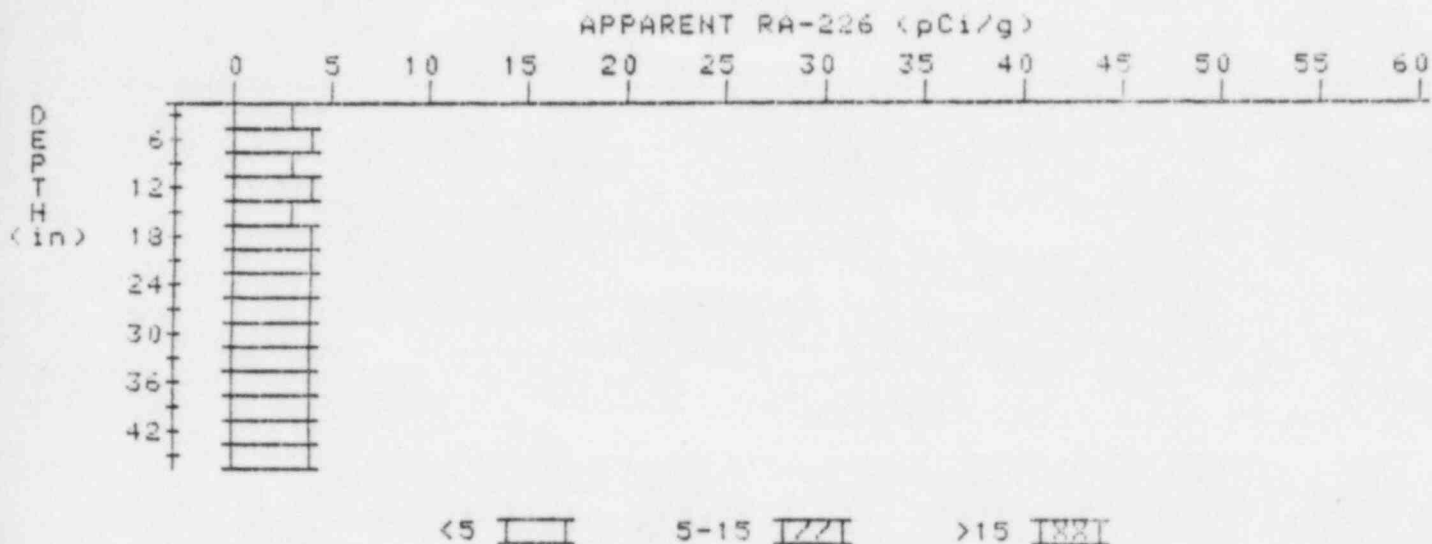
# APPARENT RADIUM-226 CONCENTRATION 13

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13027-RS

HOLE NUMBER: 13

LOCATION: 151268



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.6	4.3
9	3.5	3.3
12	3.5	3.5
15	3.5	3.3
18	3.6	3.6
21	3.7	3.9
24	3.7	3.5
27	3.8	4.0
30	3.8	3.6
33	3.9	4.1
36	3.9	3.9
39	3.9	4.1
42	3.8	3.8
45	3.7	3.7

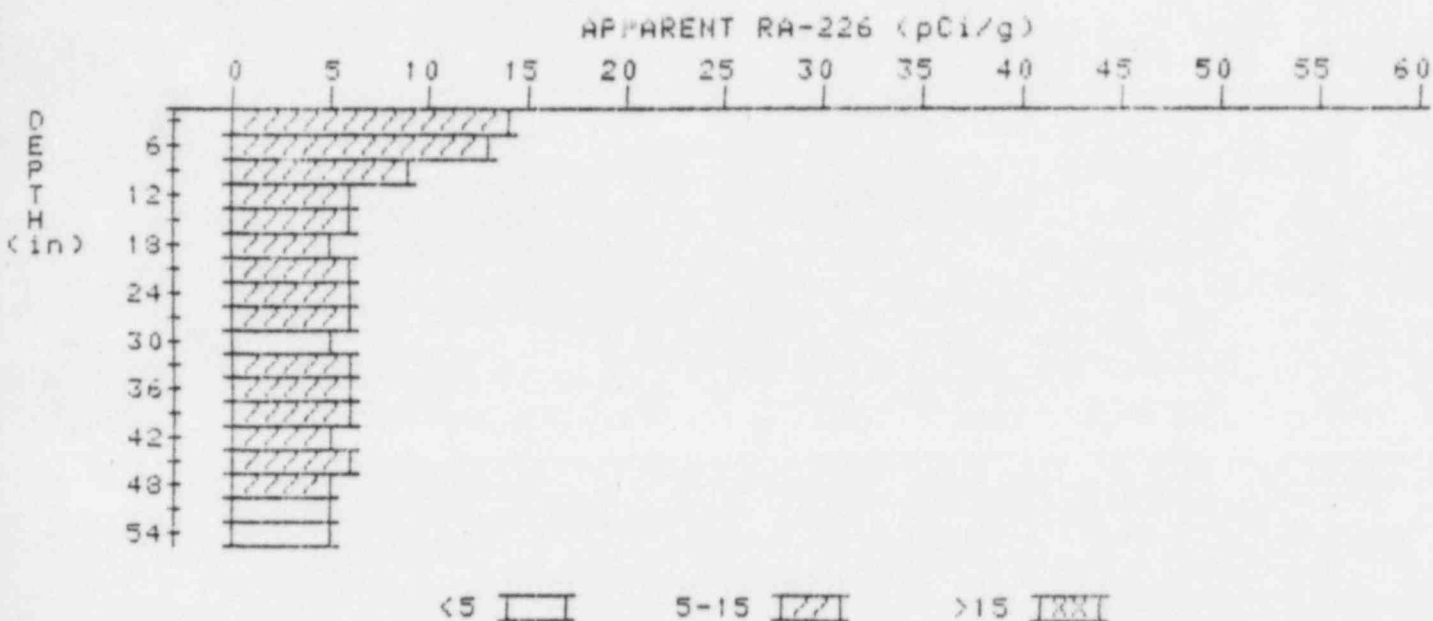
# APPARENT RADIUM-226 CONCENTRATION 17

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13027-RS

HOLE NUMBER: 17

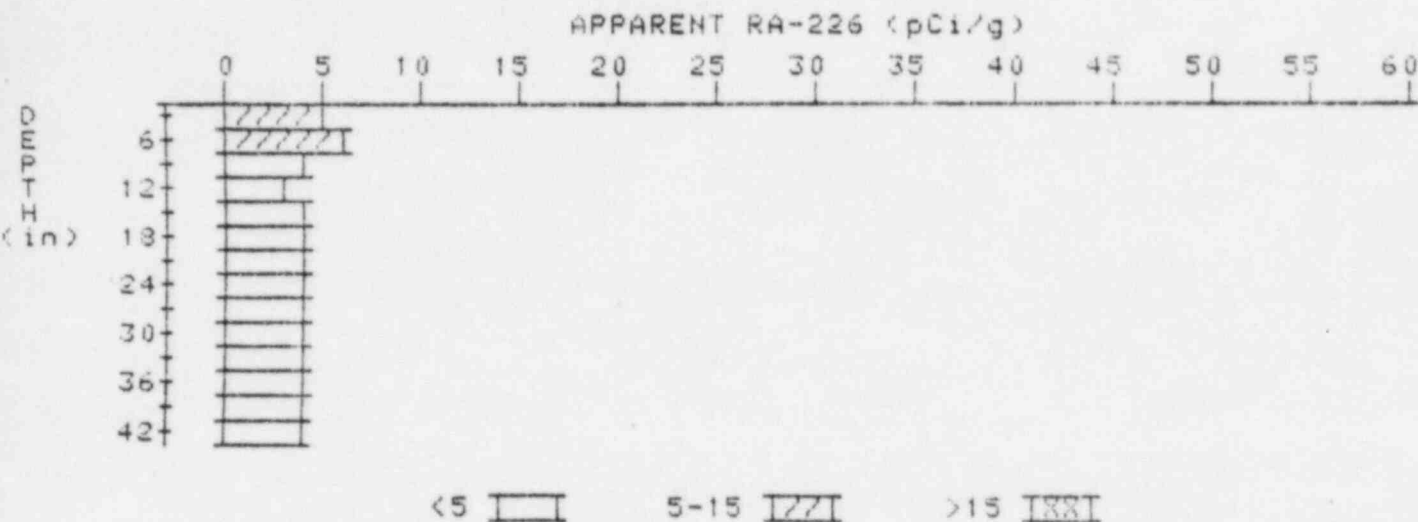
LOCATION: 157284



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	14.0	14.0
6	12.1	12.8
9	9.8	9.3
12	7.8	6.4
15	6.6	5.5
18	6.0	5.1
21	5.9	5.9
24	5.8	5.6
27	5.8	6.2
30	5.6	4.9
33	5.8	6.3
36	5.7	5.7
39	5.6	5.6
42	5.5	5.3
45	5.5	6.0
48	5.2	5.2
51	4.9	4.5
54	4.8	4.8

# APPARENT RADIUM-226 CONCENTRATION 18 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13027-RS  
HOLE NUMBER: 18  
LOCATION: 163273



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.4	5.4
6	5.2	6.1
9	4.5	4.0
12	4.1	3.4
15	4.1	4.3
18	4.0	3.8
21	4.0	4.0
24	4.0	3.8
27	4.1	4.3
30	4.1	4.1
33	4.1	4.3
36	4.0	4.0
39	3.9	3.9
42	3.8	3.8

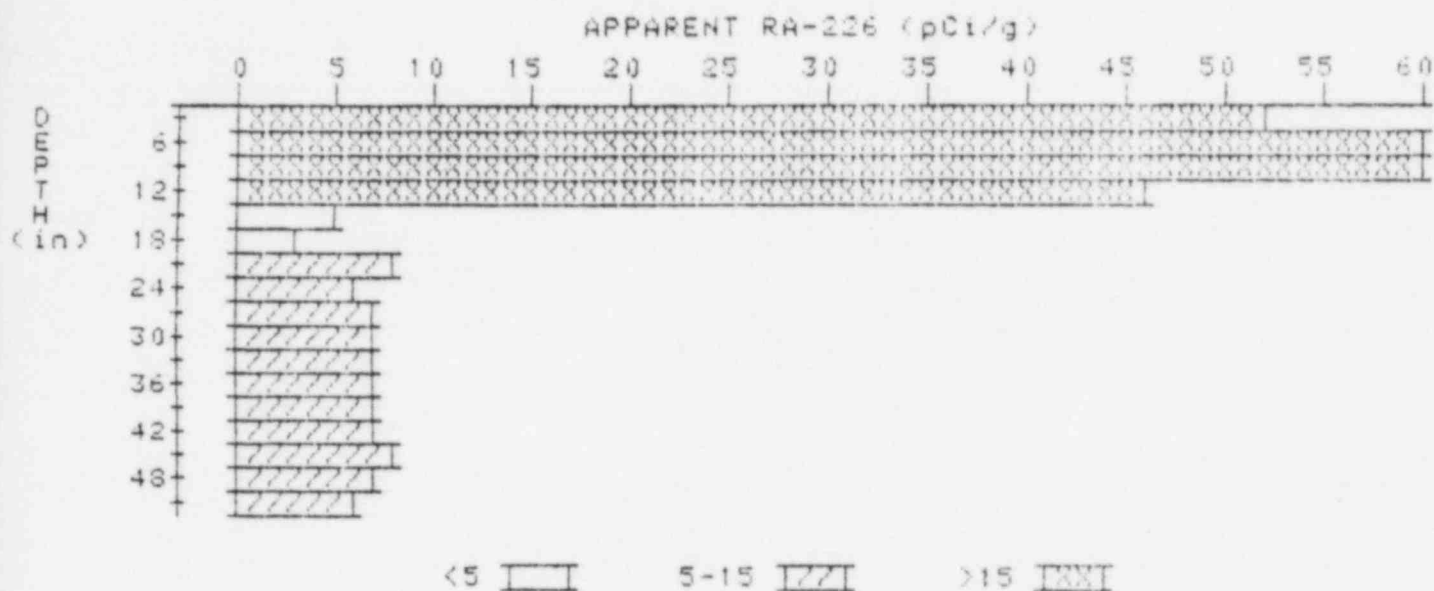
# APPARENT RADIUM-226 CONCENTRATION 19

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13027-RS

HOLE NUMBER: 19

LOCATION: 163288

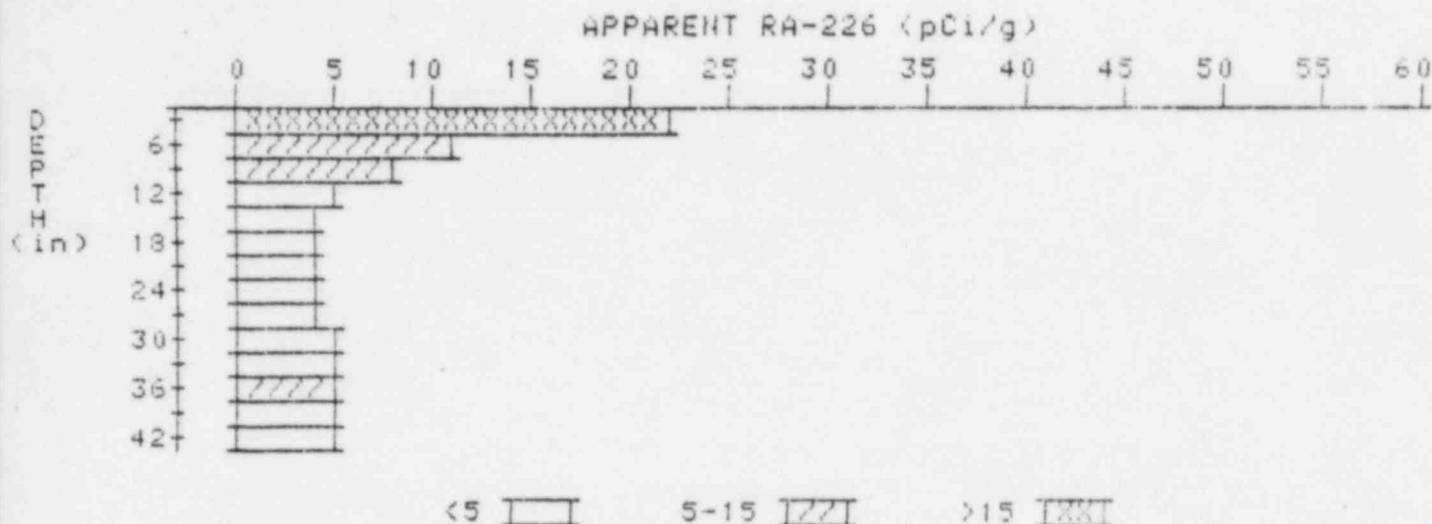


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	52.1	52.1
6	71.0	102.5
9	72.2	117.0
12	48.2	45.5
15	25.7	4.9
18	14.9	3.0
21	10.3	7.6
24	8.5	5.8
27	7.7	6.8
30	7.4	7.2
33	7.2	6.7
36	7.3	7.5
39	7.3	7.3
42	7.2	7.4
45	7.0	7.5
48	6.5	6.7
51	5.9	5.9



# APPARENT RADIUM-226 CONCENTRATION 20 DECONVOLUTION GRAPH

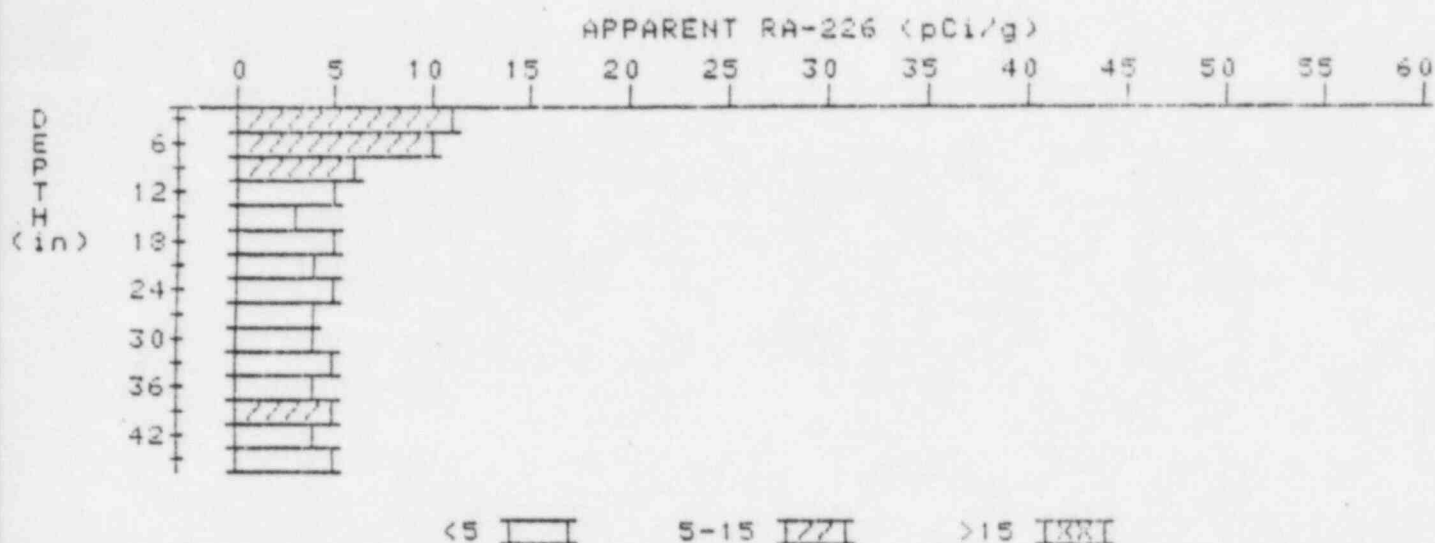
PROPERTY NUMBER: GJ-13027-RS  
HOLE NUMBER: 20  
LOCATION: 164283



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	22.0	22.0
6	15.2	11.3
9	10.6	8.3
12	7.3	4.6
15	5.5	3.5
18	4.8	4.1
21	4.5	4.1
24	4.4	4.2
27	4.4	4.2
30	4.5	4.5
33	4.6	4.6
36	4.7	5.1
39	4.6	4.6
42	4.5	4.5

# APPARENT RADIUM-226 CONCENTRATION 22 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13027-RS  
HOLE NUMBER: 22  
LOCATION: 170284



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	10.9	10.9
6	9.3	10.0
9	7.3	6.4
12	5.8	4.9
15	4.8	3.4
18	4.6	4.8
21	4.3	3.6
24	4.4	4.6
27	4.4	4.4
30	4.4	4.0
33	4.6	5.0
36	4.6	4.4
39	4.7	5.1
42	4.6	4.4
45	4.6	4.6

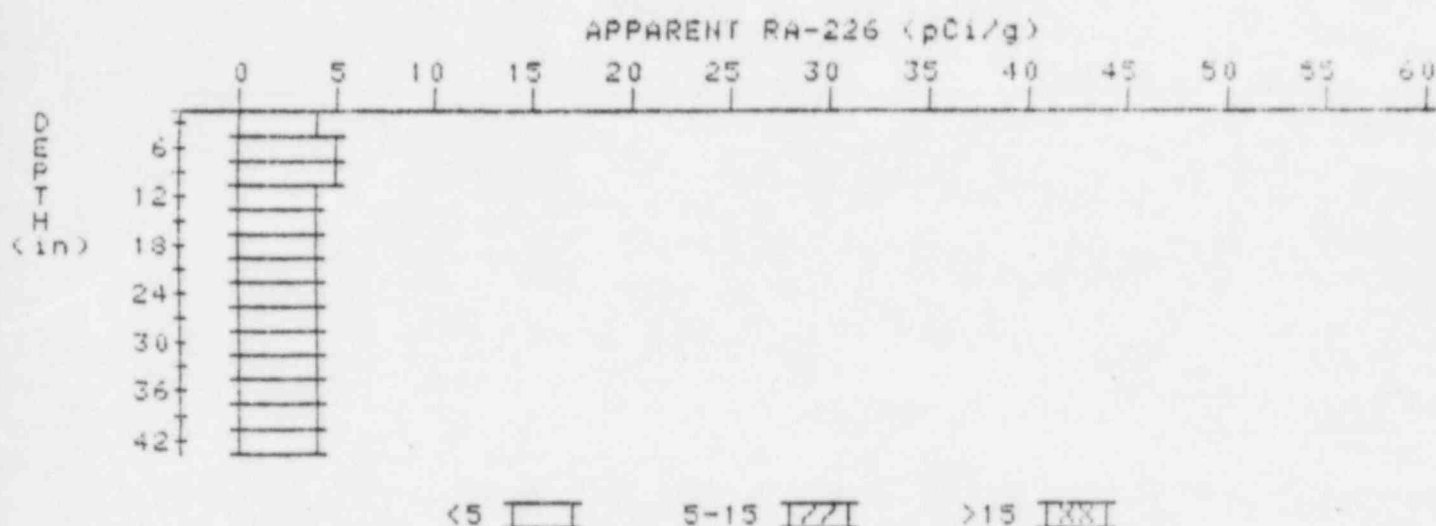
# APPARENT RADIUM-226 CONCENTRATION 23

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13027-RS

HOLE NUMBER: 23

LOCATION: 171273



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	4.7
12	4.0	3.6
15	3.9	3.9
18	3.8	3.6
21	3.8	4.0
24	3.7	3.5
27	3.7	3.5
30	3.8	3.8
33	3.9	3.9
36	4.0	4.2
39	4.0	4.2
42	3.9	3.9

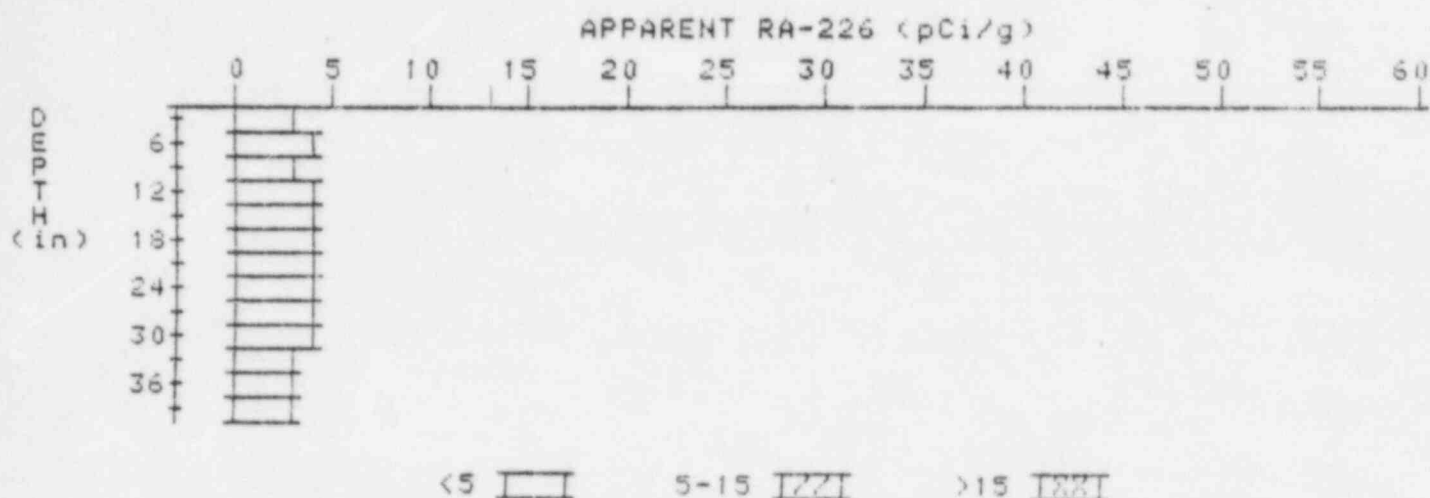
# APPARENT RADIUM-226 CONCENTRATION 28

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13027-RS

HOLE NUMBER: 28

LOCATION: 180266



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.4	3.4
6	3.7	4.4
9	3.6	3.2
12	3.7	3.9
15	3.7	3.7
18	3.7	3.7
21	3.7	3.7
24	3.7	3.7
27	3.7	3.7
30	3.7	4.1
33	3.5	3.3
36	3.4	3.4
39	3.3	3.3

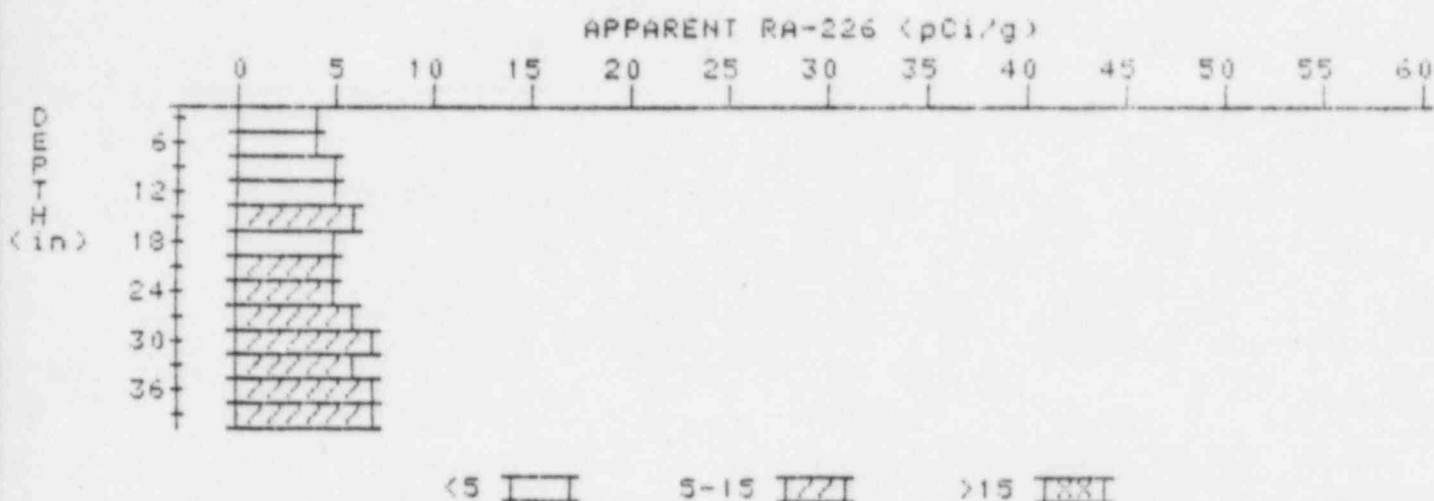
# APPARENT RADIUM-226 CONCENTRATION 31

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13027-R3

HOLE NUMBER: 31

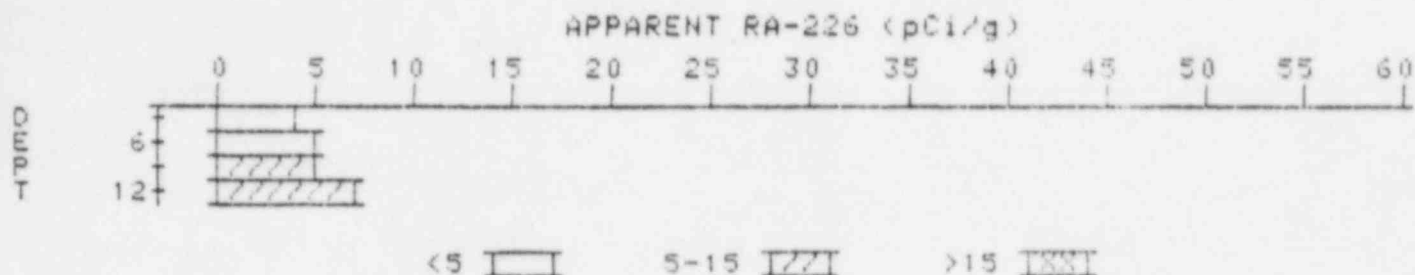
LOCATION: 185292



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.9	3.9
6	4.1	3.7
9	4.5	4.9
12	4.7	4.5
15	5.0	5.5
18	5.0	4.6
21	5.2	5.0
24	5.5	5.3
27	5.9	5.9
30	6.3	6.6
33	6.4	6.2
36	6.6	6.8
39	6.7	6.7

# APPARENT RADIUM-226 CONCENTRATION 32 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13027-RS  
HOLE NUMBER: 32  
LOCATION: 187293



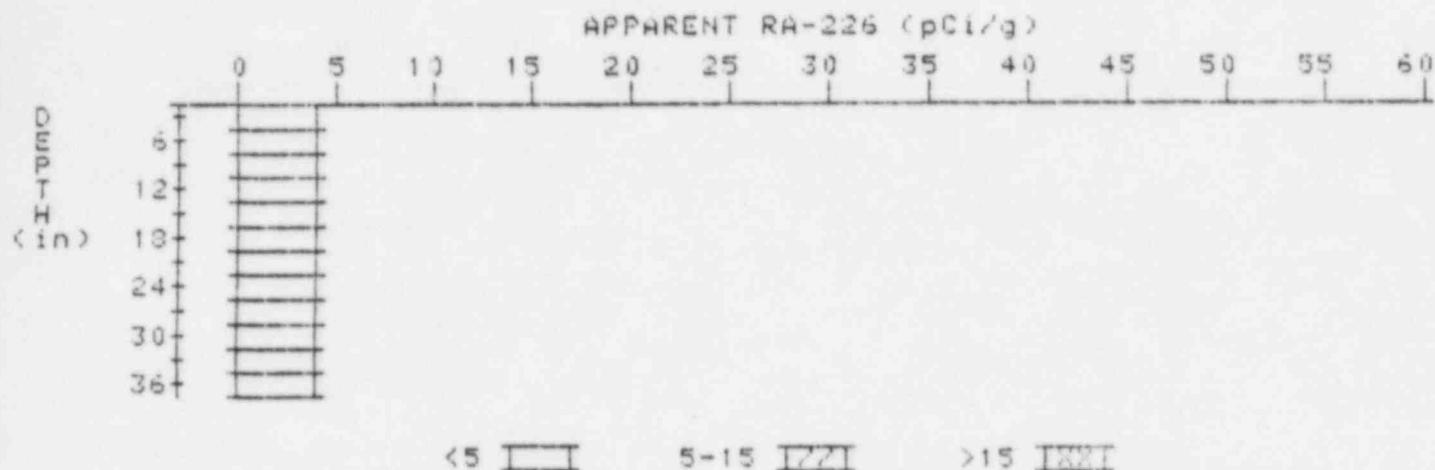
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.1	4.1
6	4.9	4.5
9	5.9	5.2
12	7.3	7.3

# APPARENT RADIUM-226 CONCENTRATION 33 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13027-RS

HOLE NUMBER: 33

LOCATION: 190280



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.9	3.9
6	4.0	4.4
9	3.9	3.7
12	3.9	4.1
15	3.8	3.6
18	3.8	3.8
21	3.8	3.8
24	3.8	3.8
27	3.8	3.6
30	3.9	4.1
33	3.9	3.5
36	4.1	4.1

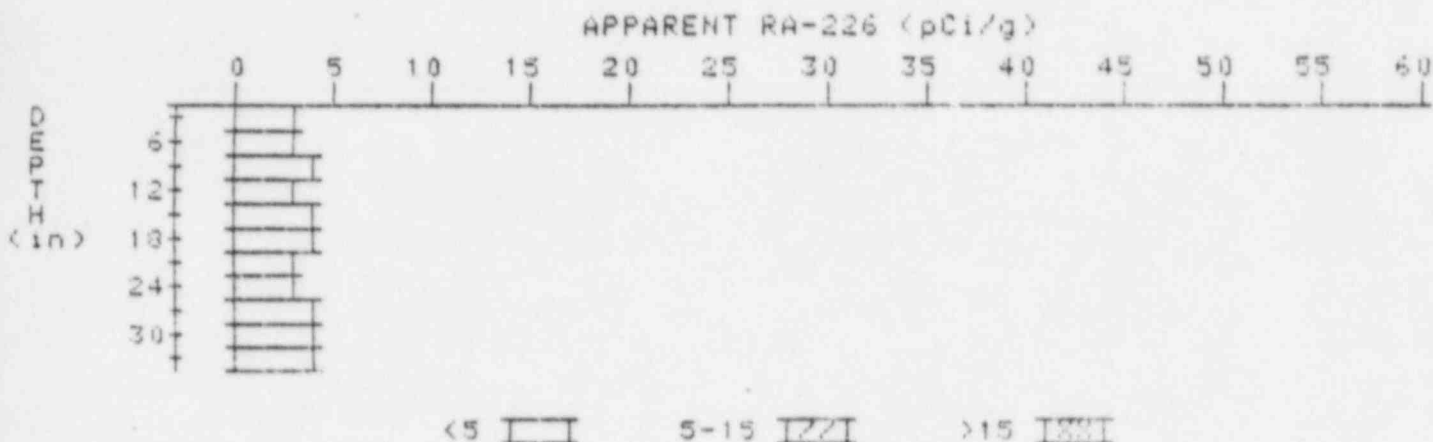
# APPARENT RADIUM-226 CONCENTRATION 36

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13027-RS

HOLE NUMBER: 36

LOCATION: 204273

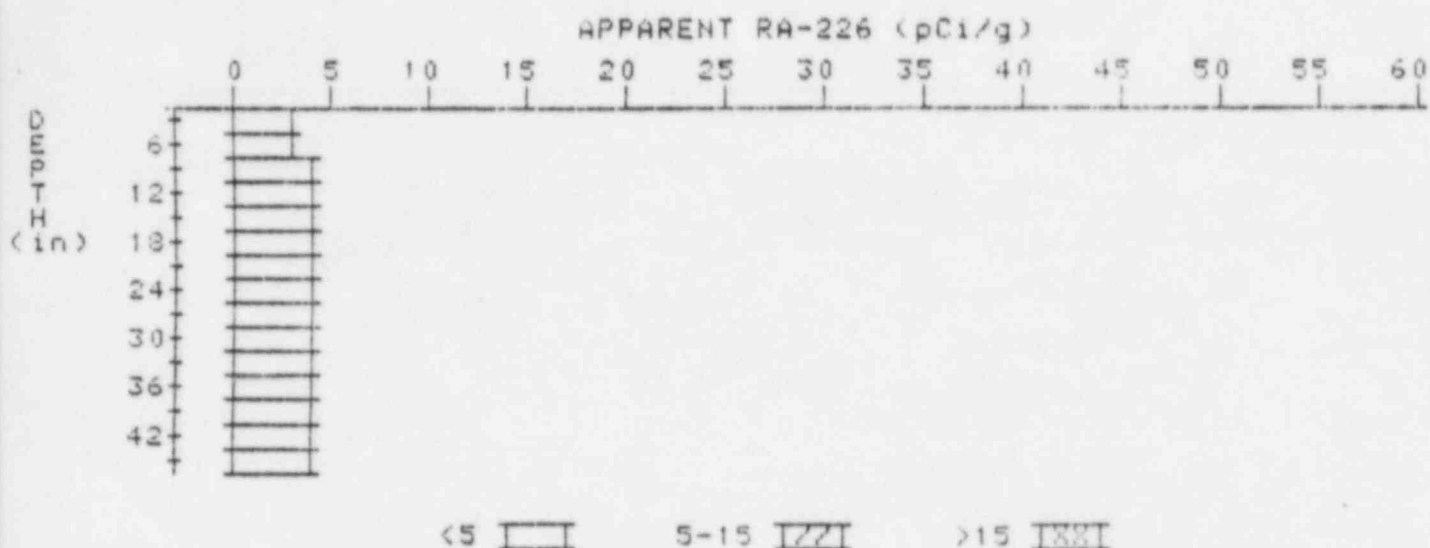


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
=====	=====	=====
3	2.9	2.9
6	3.2	3.2
9	3.5	4.0
12	3.5	3.3
15	3.6	3.6
18	3.7	4.2
21	3.5	3.1
24	3.5	3.3
27	3.6	3.6
30	3.6	3.6
33	3.8	3.8



# APPARENT RADIUM-226 CONCENTRATION 39 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-13027-RS  
HOLE NUMBER: 39  
LOCATION: 229304



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.9	2.9
6	3.2	3.2
9	3.5	3.7
12	3.7	3.7
15	3.9	4.3
18	3.9	3.9
21	3.9	3.9
24	3.9	3.7
27	4.0	4.4
30	3.9	3.9
33	3.8	3.6
36	3.8	3.8
39	3.8	3.8
42	3.8	3.8
45	3.8	3.8

