

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-03089-RS  
ADDRESS: 1745 ORCHARD AVENUE

SEPTEMBER 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION  
P.O. Box 1569  
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APPROVED BY

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DATE

*September 11, 1985*

REA03089:REA-622

8509270161 850912  
PDR WASTE  
WM-54 PDR

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## 1.0 EXECUTIVE SUMMARY

### 1.1 Introduction

The location, DOE ID No. GJ-03089-RS, is a single-family residence located at 1745 Orchard Avenue, Grand Junction, Colorado.

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

### 1.2 Evaluation and Recommendation

The action recommended is the removal of contaminated material and restoration of the property to its original condition. The identified residual radioactive material found on this property is tailings; the estimated volume is: exterior, 23 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action is \$3,080. Remedial action on this property will take approximately 14 days to complete.

## 2.0 PROPERTY DESCRIPTION

### 2.1 General Description

Address: 1745 Orchard Avenue, Grand Junction, Colorado

Zoning: Residential (RSF-8)

Lot Size: Approximately 5,200 sf (0.12 acres)

Legal Description: Lot 5, Block 1, Elmwood Plaza Subdivision, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 3 mile(s) north 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:	Orchard Avenue
South:	Alley
East:	North 18th Street
West:	Single-family residence

### 2.2 Existing Facilities and Structures

Primary Structure:

Type:	Two-story residence
Size:	Approximately 1,600 sf
Construction Date:	Unknown
Construction:	Wood-frame
Foundation:	Concrete stemwall on spread footing
Footing Depth:	Approximately 28" to bottom of footing from grade
Basement:	None
Crawl Space:	Yes - under entire living area
Condition:	Good

Other Structures:

Type:	Garage
Size:	Approximately 270 sf
Construction:	Concrete block/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 was moved to the site in 1950 and appears not be 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-03089-RS on August 12, 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 the historical information available for this property was conducted to determine the areas of potential contamination identified during previous radiologic assessments.

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, 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: 15 to 16  $\mu\text{R/h}$   
Highest Outside Gamma Reading (HOG): 51  $\mu\text{R/h}$

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

##### 3.2.2 Interior Findings

Background Readings: 14 to 16  $\mu\text{R/h}$   
Highest Inside Gamma Reading (HIG): 16  $\mu\text{R/h}$

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; the locations and types of these investigations 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: Northwest  
 Total Depth of Contamination: 6 inches  
 Comments: Since thick bushes prevented more investigation, this area should be closely monitored during remedial action.  
 Approximate Square Footage: 72
- (Area B) Surface Material: Concrete  
 Direction From Primary Structure: South  
 Other Directions: North and east of the garage  
 Total Depth of Contamination: 12 inches  
 Other (height or thickness): 4-inch-thick concrete  
 Comments: There are three deposits in this area. The two small deposits north of the garage should be closely monitored during remedial action.  
 Approximate Square Footage: 371
- (Area C) Surface Material: Soil  
 Direction From Primary Structure: Southeast  
 Other Directions: East of the garage  
 Total Depth of Contamination: Estimated at 12 inches  
 Comments: The depth of contamination is based on data collected in Area B.  
 Approximate Square Footage: 25
- (Area D) Surface Material: Soil  
 Direction From Primary Structure: South  
 Other Directions: South of the garage  
 Total Depth of Contamination: 12 inches  
 Comments: A garden is within this contaminated area.  
 Approximate Square Footage: 50
- (Area E) Surface Material: Soil  
 Direction From Primary Structure: South  
 Other Directions: South of the garage  
 Total Depth of Contamination: 36 inches  
 Comments: A garden is within this contaminated area.  
 Approximate Square Footage: 18

- (Area F) Surface Material: Soil  
Direction From Primary Structure: South  
Other Directions: South of the garage  
Total Depth of Contamination: 6 inches  
Approximate Square Footage: 18
- (Area G) Surface Material: Sparse grass and weeds  
Direction From Primary Structure: South  
Other Directions: South of the garage  
Total Depth of Contamination: 12 inches  
Approximate Square Footage: 75
- (Area H) Surface Material: Soil  
Direction From Primary Structure: South  
Other Directions: North of the garage  
Total Depth of Contamination: 12 inches  
Approximate Square Footage: 15

#### **4.0 RECOMMENDED REMEDIAL ACTION**

##### **4.1 Decontamination and Restoration**

The recommended remedial action for this property, DOE ID No. GJ-03089-RS, includes removal of all areas 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.

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 \$3,080.

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 Sample Locations
Figure 3.3	Exterior Estimated Extent of Contamination

Official Survey Report

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Exterior Gamma Scan Map

## Radium Concentrations at Exterior Locations

DOE ID #GJ-03089-RS

1745 Orchard Avenue

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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	141212	00	DS	1.0		*	Water line DC = 0 inches
		03	TC	2.2		*	
		06	TC	2.5		*	
		09	TC	2.6		*	
		12	TC	2.8		*	
		15	TC	2.8		*	
		18	TC	2.8		*	
		21	TC	2.8		*	
		24	TC	2.9		*	
		27	TC	2.9		*	
		30	TC	2.8		*	
		33	TC	2.9		*	
		36	TC	2.9		*	
		39	TC	2.9		*	
		42	TC	2.9		*	
		45	TC	3.0		*	
		48	TC	3.1		*	
		51	TC	3.0		*	
		54	TC	3.0		*	
		57	TC	2.9		*	
		60	TC	2.9		*	
2	164202	00	DS	2.2		*	West property line
		06	DS	1.3		*	
3	168201	00	DS	5.4		*	
		06	DS	2.9		*	
4	174203	00	DS	1.5		*	West of the primary structure
		06	DS	1.8		*	
5	180210	00	DS	1.3		*	West foundation DC = 0 inches
		03	TC	2.7		*	
		06	TC	3.1		*	
		09	TC	3.3		*	
		12	TC	3.3		*	
		15	TC	3.2		*	
		18	TC	3.2		*	
		21	TC	3.1		*	
		24	TC	3.1		*	

## Radium Concentrations at Exterior Locations

DOE ID #GJ-03089-RS

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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	180210	27	TC	3.2		*	
		30	TC	3.2		*	
		33	TC	3.1		*	
		36	TC	3.2		*	
6	190230	00	DS	1.2		*	Background
		03	TC	2.6		*	East foundation
		06	TC	2.9		*	DC = 0 inches
		09	TC	3.0		*	
		12	TC	3.0		*	
		15	TC	3.0		*	
		18	TC	2.9		*	
		21	TC	2.9		*	
		24	TC	3.1		*	
		27	TC	3.1		*	
		30	TC	3.2		*	
		33	TC	3.2		*	
		36	TC	3.2		*	
		39	TC	3.1		*	
7	197201	00	DS	1.7		*	West of the primary
		03	TC	2.7		*	structure
		06	TC	3.0		*	Sewer line
		09	TC	3.1		*	DC = 0 inches
		12	TC	3.2		*	
		15	TC	3.1		*	
		18	TC	3.1		*	
		21	TC	3.1		*	
		24	TC	3.1		*	
		27	TC	3.1		*	
		30	TC	3.1		*	
		33	TC	3.1		*	
		36	TC	3.1		*	
		39	TC	3.1		*	
		42	TC	3.1		*	
		45	TC	3.1		*	
		48	TC	3.0		*	
		51	TC	3.0		*	
		54	TC	3.1		*	
		57	TC	3.1		*	
		60	TC	3.1		*	
		63	TC	3.1		*	
		66	TC	3.1		*	

## Radium Concentrations at Exterior Locations

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
8	211251	00	DS	2.3		*	Gas line
		06	DS	1.2		*	
		22	DS	1.6		*	
9	212220	00	DS	4.3		*	South of the primary structure
		06	DS	8.0		*	
		12	DS	3.7		*	
		03	TC	4.7		*	
		06	TC	5.5		*	
		09	TC	5.4		*	DC = 12 inches Based on the deconvolution graph
		12	TC	4.7		*	
		15	TC	4.1		*	
		18	TC	3.8		*	
		21	TC	3.5		*	
		24	TC	3.5		*	
		27	TC	3.4		*	
		30	TC	3.4		*	
		33	TC	3.3		*	
10	229209	00	DS	7.2		*	On concrete
11	230207	00	DS	1.1		*	On concrete
12	230214	00	DS	<1.0		*	On patio
13	231212	00	DS	2.2		*	
14	232238	00	DS	1.1		*	On driveway
15	233231	00	DS	<1.0		*	On driveway
16	235230	00	DS	4.2		*	On driveway
17	246239	00	DS	30.3		*	Core in driveway
		03	TC	32.7		*	
		06	TC	39.4		*	
		09	TC	29.5		*	
		12	TC	16.9		*	DC = 12 inches Based on the deconvolution garph
		15	TC	10.4		*	
		18	TC	7.2		*	
		21	TC	5.6		*	
		24	TC	4.9		*	
		27	TC	4.5		*	
		30	TC	4.3		*	

## 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.		
17	246239	33	TC	4.1		*	
		36	TC	4.0		*	
		39	TC	4.0		*	
		42	TC	3.8		*	
		45	TC	3.7		*	
		48	TC	3.7		*	
18	248216	00	DS	10.3		*	South of the garage
		06	DS	3.4		*	
		12	DS	1.9		*	
19	248227	00	DS	2.3		*	On driveway
20	249207	00	DS	2.6		*	South of the garage
		06	DS	5.0		*	
		12	DS	3.1		*	
21	249240	00	DS	2.8		*	On driveway
22	249247	00	DS	5.9		*	On driveway
23	251233	00	DS	4.6		*	On driveway
24	252209	00	DS	3.8		*	South of the garage
		06	DS	8.6		*	
		12	DS	3.7		*	
		03	TC	5.0		*	
		06	TC	6.4		*	
		09	TC	7.8		*	
		12	TC	8.5		*	
		15	TC	8.6		*	
		18	TC	7.5		*	
		21	TC	7.3		*	
		24	TC	9.2		*	
		27	TC	14.2		*	
		30	TC	22.3		*	
		33	TC	25.6		*	
		36	TC	16.3		*	DC = 36 inches
		39	TC	8.9		*	Based on the
		42	TC	5.6		*	deconvolution graph
		45	TC	4.3		*	
		48	TC	3.7		*	
		51	TC	3.3		*	
		54	TC	3.3		*	

## Radium Concentrations at Exterior Locations

DOE ID #GJ-03089-RS

1745 Orchard Avenue

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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.		
24	252209	57	TC	3.3		*	
		60	TC	3.3		*	
		63	TC	3.2		*	
25	252221	00	DS	3.3		*	South of the garage
		06	DS	2.2		*	
26	253215	00	DS	20.2		*	South of the garage
		03	TC	22.8		*	
		06	TC	30.3		*	
		09	TC	26.4		*	
		12	TC	17.2		*	DC = 12 inches
		15	TC	10.7		*	Based on the
		18	TC	7.5		*	deconvolution graph
		21	TC	5.7		*	
		24	TC	5.0		*	
		27	TC	4.4		*	
		30	TC	3.9		*	
		33	TC	3.8		*	
		36	TC	3.7		*	
		39	TC	3.7		*	
27	257212	00	DS	2.3		*	South of the
		06	DS	4.9		*	garage
		12	DS	1.3		*	

Measurement GB = GAD-6 Borehole  
Types: 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 = 08-12-85  
Team Leader = PT

Table 3.2

## Summary of Interior Gamma Exposure Rates

DOE ID No. GJ-03089-RS

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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	-	-	-	04	16	16
Ground Floor	*	*	*	*	14-16	*
Garage	*	*	*	*	15-17	*
Shed	*	*	*	*	14-16	*

\* A walking gamma scan was performed to confirm the absence of interior contamination.

Table 4.1  
Area and Volume Calculations  
DOE ID No. GJ-03089-RS

Page 1 of 1

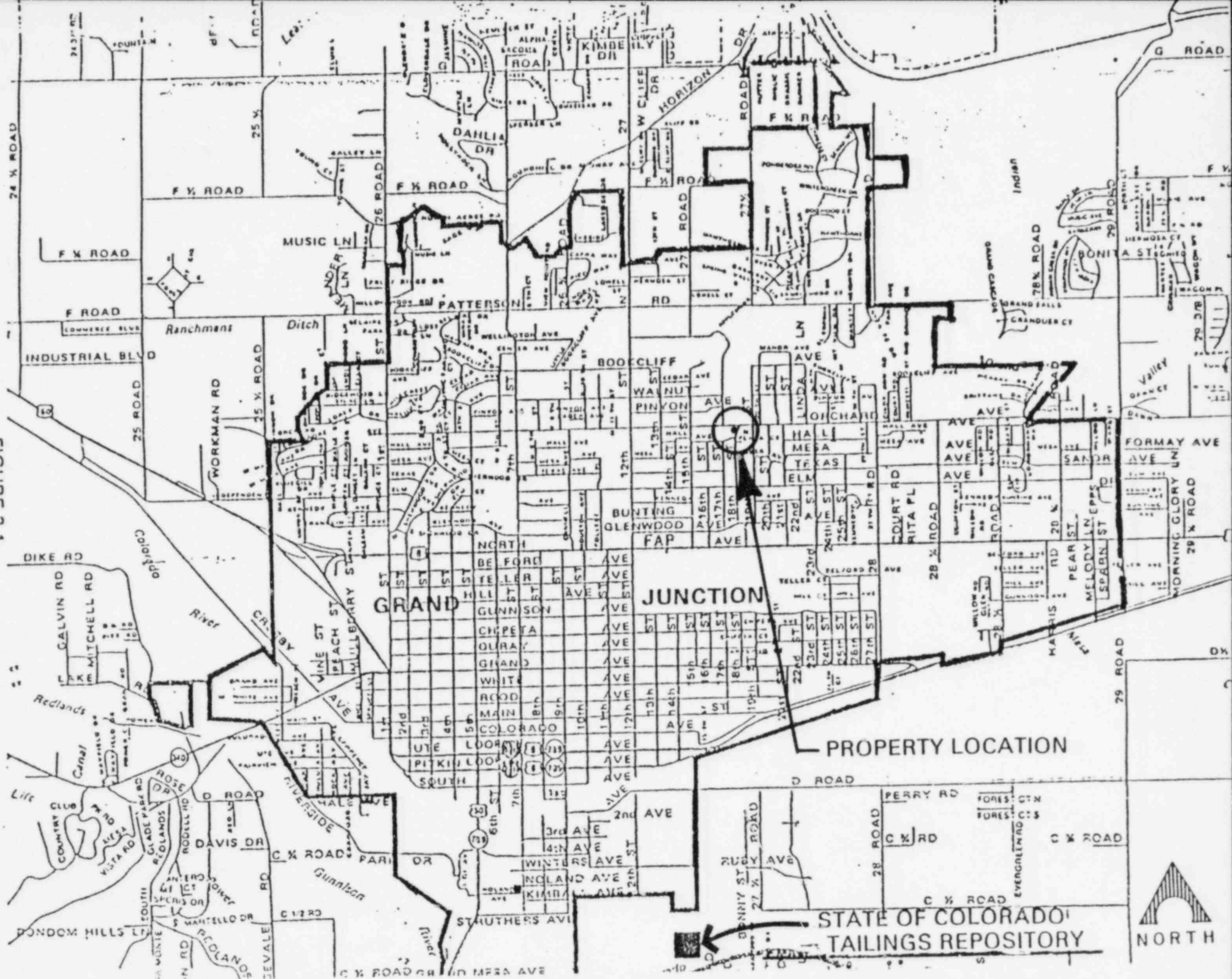
<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH (ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
EXTERIOR					
	Concrete				
B	16 x 22 =	352			
	5 x 3 =	15			
	1 x 7 =	7			
		<hr/>			
		374	x 0.3 =	112	
				<hr/>	
	Volume of Concrete			= 112	= 112/27 = 4
	Contaminated Fill				
A	4 x 18 =	72	x 0.5 =	36	
B	16 x 22 =	352			
	4 x 3 =	12			
	7 x 1 =	7			
		<hr/>			
		371	x 0.7 =	260	
C	5 x 10/2 =	25	x 1.0 =	25	
D	5 x 10 =	50	x 1.0 =	50	
E	3 x 6 =	18	x 3.0 =	54	
F	6 x 3 =	18	x 0.5 =	9	
G	5 x 15 =	75	x 1.0 =	75	
H	3 x 5 =	15	x 1.0 =	15	
				<hr/>	
	Volume of Fill			= 524	= 524/27 = 19
					<hr/>
	TOTAL VOLUME - EXTERIOR				= 23

See Appendix Figure 3.3 For Areas

EXTERIOR

Remove/replace concrete 374 sf @ \$3/sf	\$ 1,122
Remove identified residual radioactive material	
16 cy @ \$14.50/cy (machine-open)	232
3 cy @ \$44/cy (manual-open)	132
Replace areas with roadbase 10 cy @ \$11.50/cy	115
Replace areas with topsoil 9 cy @ \$9.50/cy	86
Replace area with sod 25 sf @ \$.50/sf	13
Replace plantings Lump sum	150
	<hr/>
TOTAL EXTERIOR	\$ 1,850
TOTAL INTERIOR	0
ACCESS CONTROL	150
	<hr/>
SUBTOTAL	\$ 2,000
CONTINGENCY @ 10%	200
	<hr/>
SUBTOTAL	\$ 2,200
CONTRACTOR OVERHEAD & PROFIT @ 40%	880
	<hr/>
GRAND TOTAL	\$ 3,080

FIGURE 2.1  
VICINITY MAP

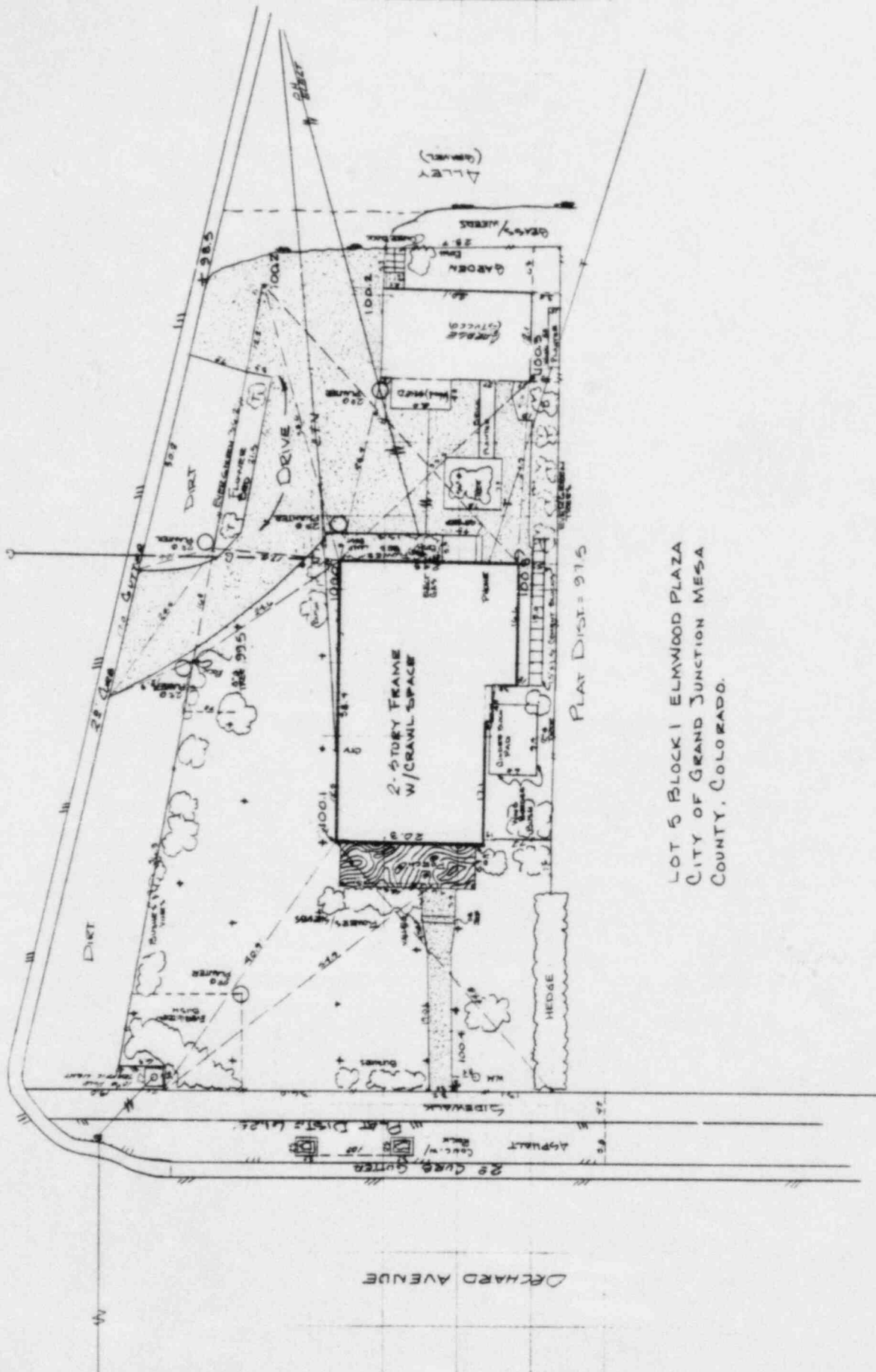


PROPERTY LOCATION

STATE OF COLORADO  
TAILINGS REPOSITORY



N 18<sup>TH</sup> STREET



LOT 5 BLOCK 1 ELMWOOD PLAZA  
CITY OF GRAND JUNCTION MESA  
COUNTY, COLORADO.

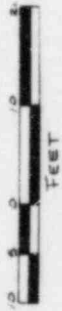
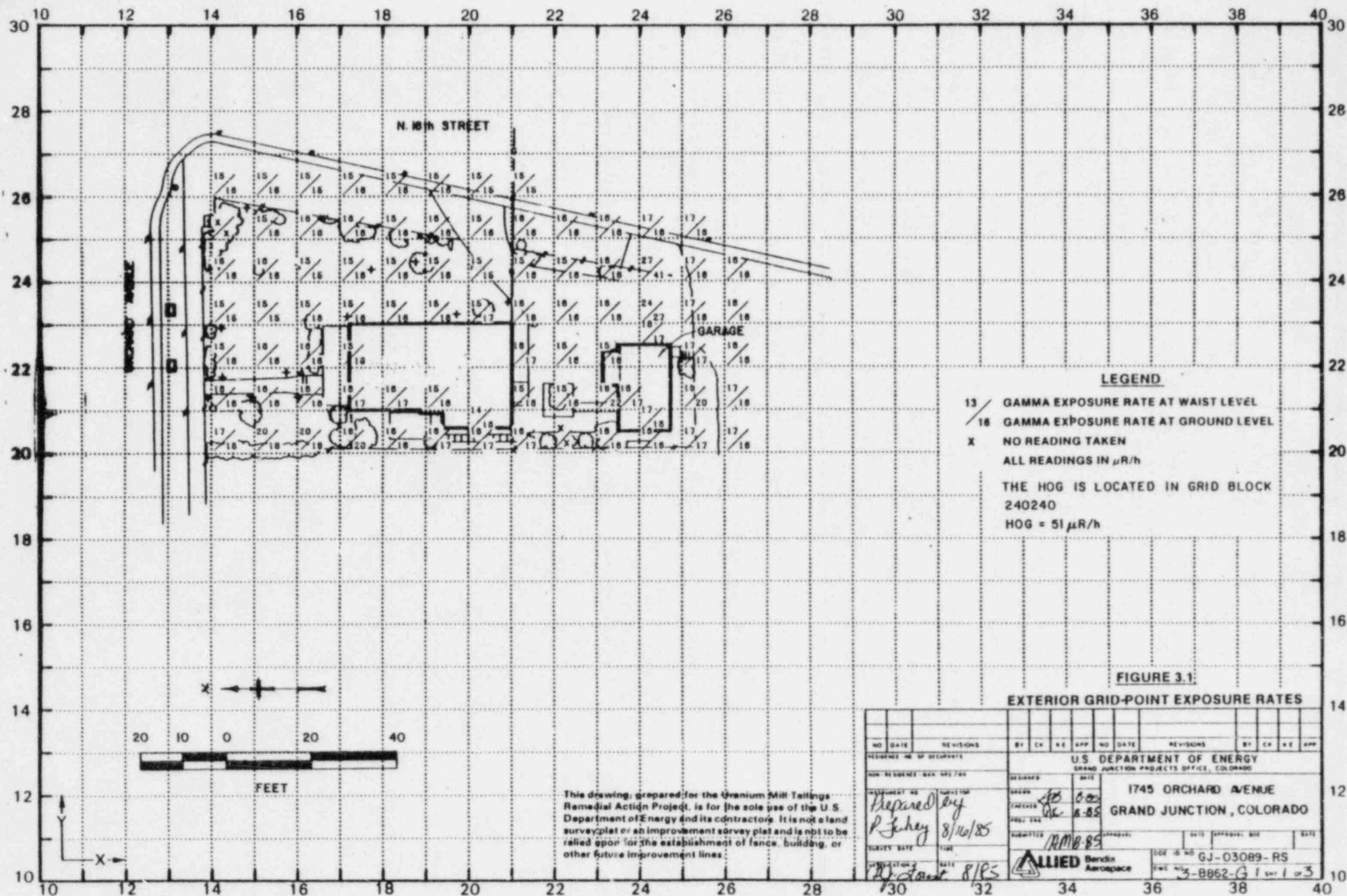


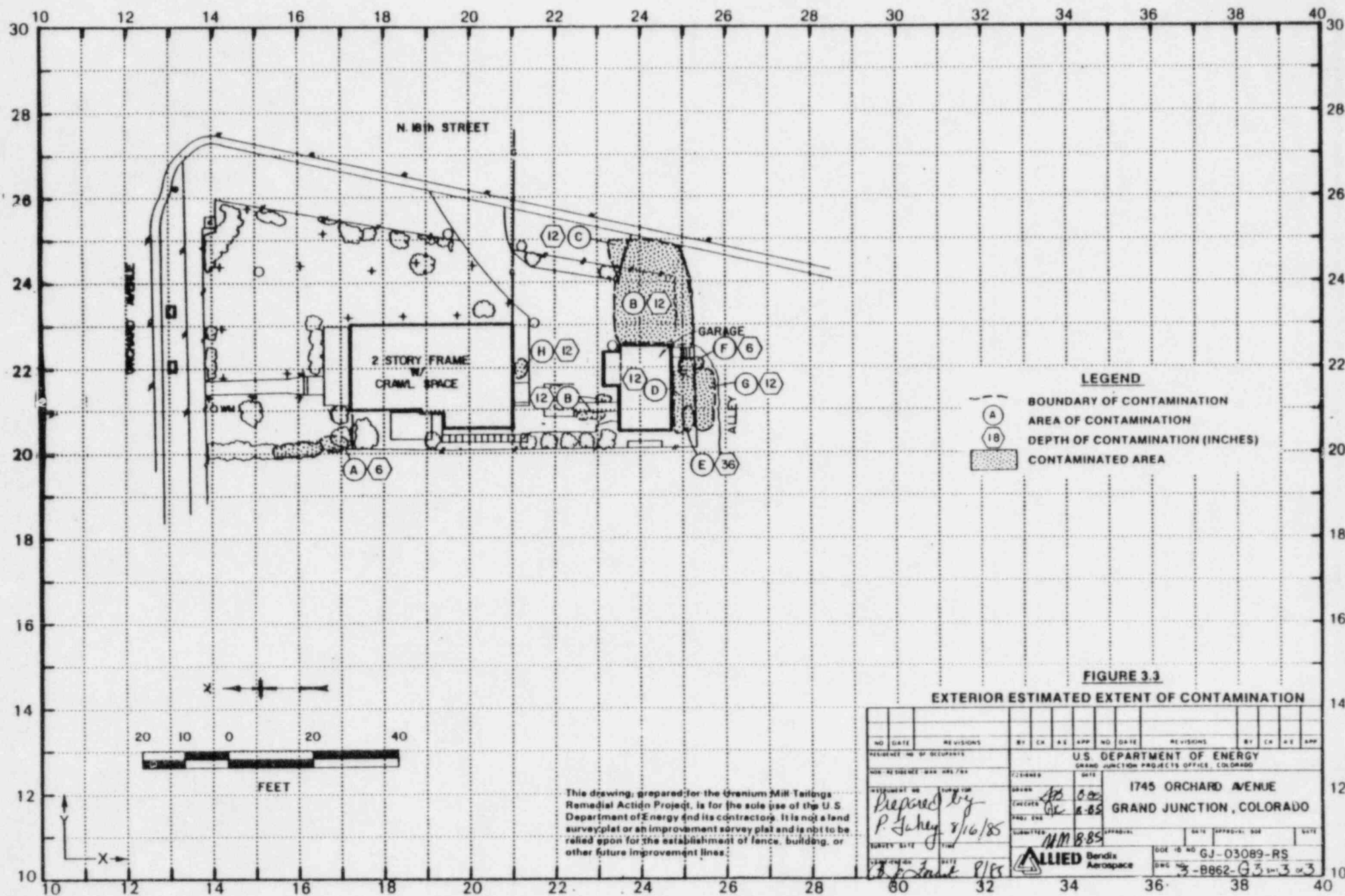
FIGURE 2.2 SITE PLAN

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 to be used for any other purpose without the express written consent of the U.S. Department of Energy.

U.S. DEPARTMENT OF ENERGY	DATE: 05/08/85
GRAND JUNCTION PROJECT OFFICE, COLORADO	PROJECT NO. 55028 RS
ADDRESS: 1745 ORCHARD AVE	DESIGNED BY: ALBERT
GRAND JUNCTION, COLORADO	ENGINEER: ALBERT
SURV. 22, 8-1-85	DRAWN: 22, 8-1-85
DRAWING NO. 2-C-842.2-F1	SHEET 1 OF 1







3/85

DOE ID NO. GJ-03089-RS

Date August 19, 1985

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

Official Survey Report

Property Address 1745 Orchard Avenue

Property Owner Louie Pantuso

Address of Owner (if different from above) \_\_\_\_\_

Report Prepared By Penny Tuhey

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

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

1 XXX 1 Residual radioactive materials found at the following locations:

1 XXX 1 In open areas.

1 XXX 1 Under or around exterior improvements.

1 XXX 1 Under or around a typically nonoccupied structure.

1 1 Under or around a typically occupied structure.

II. RESULTS OF RADIOLOGIC ASSESSMENT

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

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

cc:

G. A. Franz, III, GJ/CDH

J. Themelis, Mgr. UMTRA Proj. Off.

HIG = 16 uR/h  
HOG = 51 uR/h

MEMORANDUM

ALLIED Bendix  
Aerospace

Bendix Field Engineering Corporation  
Grand Junction Operations  
Grand Junction, Colorado

Date: August 12, 1985

To: Files

From: Penny Tuhey

Subject: Team Leader Notes - GJ-03089-RS

Address: 1745 Orchard Avenue

Owner: Louie Pantuso

Arrival Time: 8:00 AM

Team Members

P. Tuhey (Team Leader)	D. Dow
P. Hardy	D. Bell
M. Dexter	

Instruments

Scintillometers: C-1206, C-1028, C-1128  
Deltas: C-4062, C-4059, C-3940  
Total Count Meters: C-1062

Verbal approval to conduct the survey was given by Mr. Pantuso.

Mr. Pantuso did not have much information to give us about his property.

Team Leader Notes  
Penny Tuhey  
GJ-03089-RS  
August 12, 1985  
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An interior grid point survey was conducted in the crawl space, no elevated readings were found, but due to no access in parts of the crawl space, an interior gamma scan at ground level was performed. The crawl space entry is located on the south side of the primary structure.

Both the garage and shed were gamma scanned, no elevated readings were found.

On the exterior, the property was laid out in 10- by 10-foot grids. An exterior gamma scan and grid point survey were performed to verify or deny data taken by the Colorado Department of Health (CDH) and Oak Ridge National Laboratory (ORNL).

Elevated readings were located east and south of the garage. Two isolated deposits were also detected, one north of the garage, the other adjacent to the south side of the primary structure. These areas were further investigated with deltas (surface and subsurface) and auger holes, which were then logged.

A core was drilled and then augered in the concrete slab, east of the garage. The borehole indicated elevated readings. The core was 4-inches thick.

Elevated readings spilled over onto the adjacent property to the west. A dash, which was within this area, was impossible to reach with a delta or auger because of the dense shrubbery. The homeowner of the adjacent property was contacted because of possible spillover. I was informed that she had already been contacted by an employee of ORNL, and proceeded to show me a package (forms, letters, etc.) from ORNL.

Two auger holes were performed adjacent to the primary structure on the east and west sides for footing/foundation data. No elevated readings were found.

The gas line is located east of the primary structure. The water line is located in the north yard, and the sewer line on the west side of the primary structure. The gas line was delta scanned. The water and sewer lines were also delta scanned, auger holes were drilled, and then logged. No elevated readings were found.

Team Leader Notes  
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Scintillometer C-1028 malfunctioned shortly after beginning our gamma scan. Instrument C-1028 was red tagged as defective and replaced with scintillometer C-1128. Areas that were scanned with instrument C-1028 were rescanned with C-1128. Both instruments were reading approximately the same.

No accidents or problems occurred during the survey.

The survey was completed at approximately 2:30 PM. All team members were alpha scanned before break, lunch, and before leaving the property.

#### REVISIT

Date: August 23, 1985

The purpose of this revisit was to delta scan the surface of the gas line again. Deltas were also taken on the patio and on the concrete surrounding the contaminated areas. These readings showed these areas to be clean except for the deltas taken on the concrete south of the driveway.

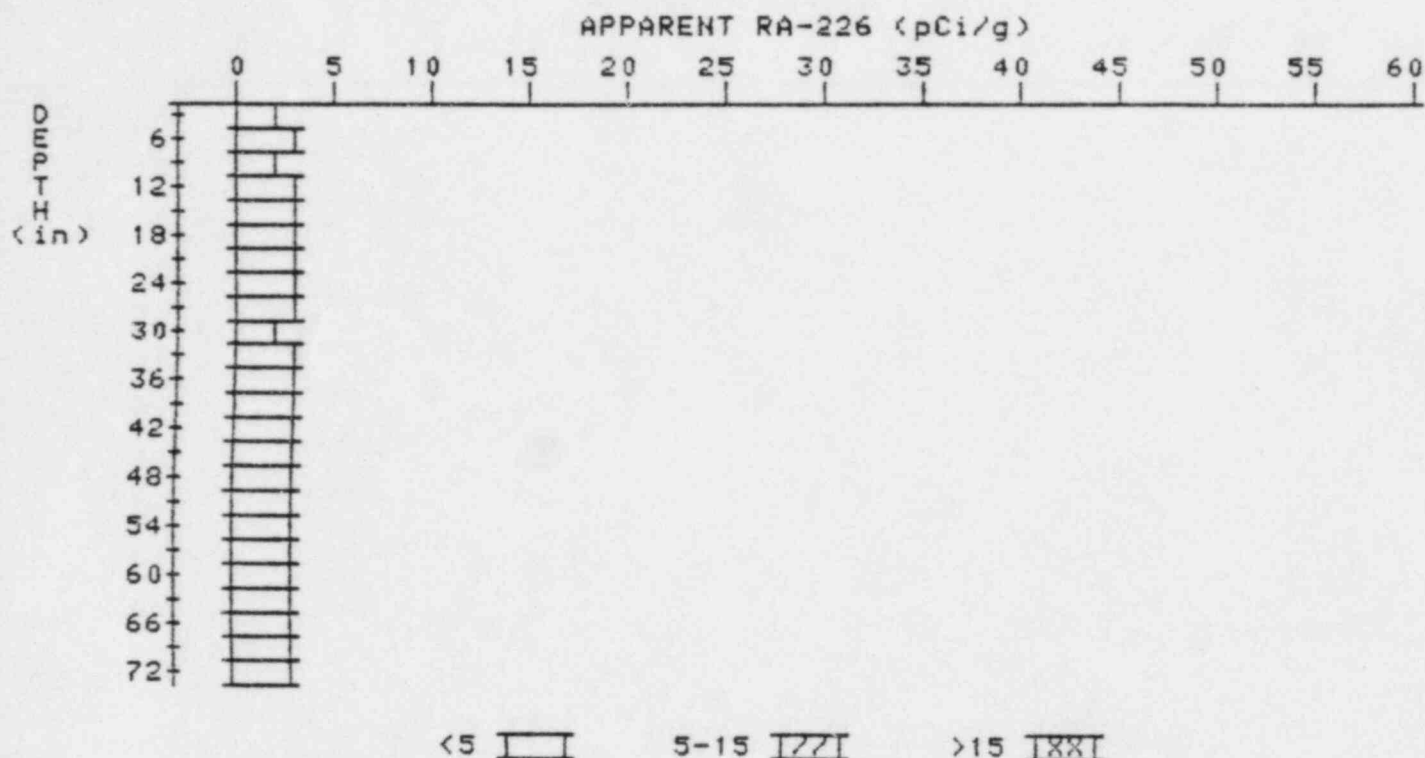
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

1

PROPERTY NUMBER: GJ-03089-RS

HOLE NUMBER: 1

LOCATION: 141212



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.2	2.2
6	2.5	2.9
9	2.6	2.4
12	2.8	3.2
15	2.8	2.8
18	2.8	2.8
21	2.8	2.6
24	2.9	3.1
27	2.9	3.1
30	2.8	2.4
33	2.9	3.1
36	2.9	2.9
39	2.9	2.9
42	2.9	2.7
45	3.0	3.0

48	3.1	3.5
51	3.0	2.8
54	3.0	3.2
57	2.9	2.7
60	2.9	2.9
63	2.9	2.9
66	2.9	2.7
69	3.0	3.4
72	2.9	2.9

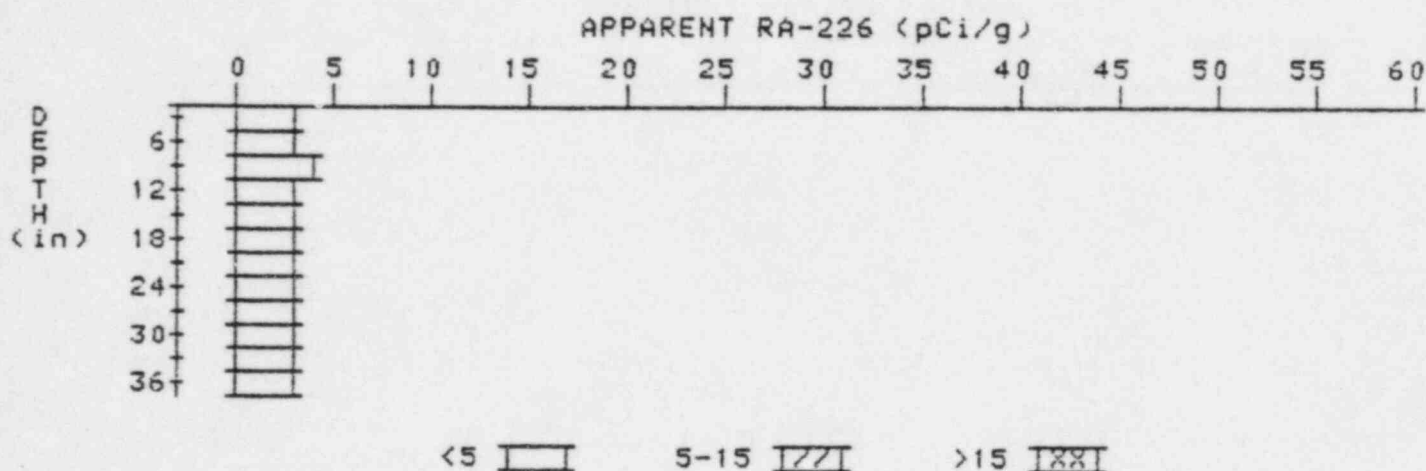
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

5

PROPERTY NUMBER: GJ-03089-RS

HOLE NUMBER: 5

LOCATION: 180210



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.7	2.7
6	3.1	3.5
9	3.3	3.7
12	3.3	3.5
15	3.2	3.0
18	3.2	3.4
21	3.1	2.9
24	3.1	2.9
27	3.2	3.4
30	3.2	3.4
33	3.1	2.7
36	3.2	3.2

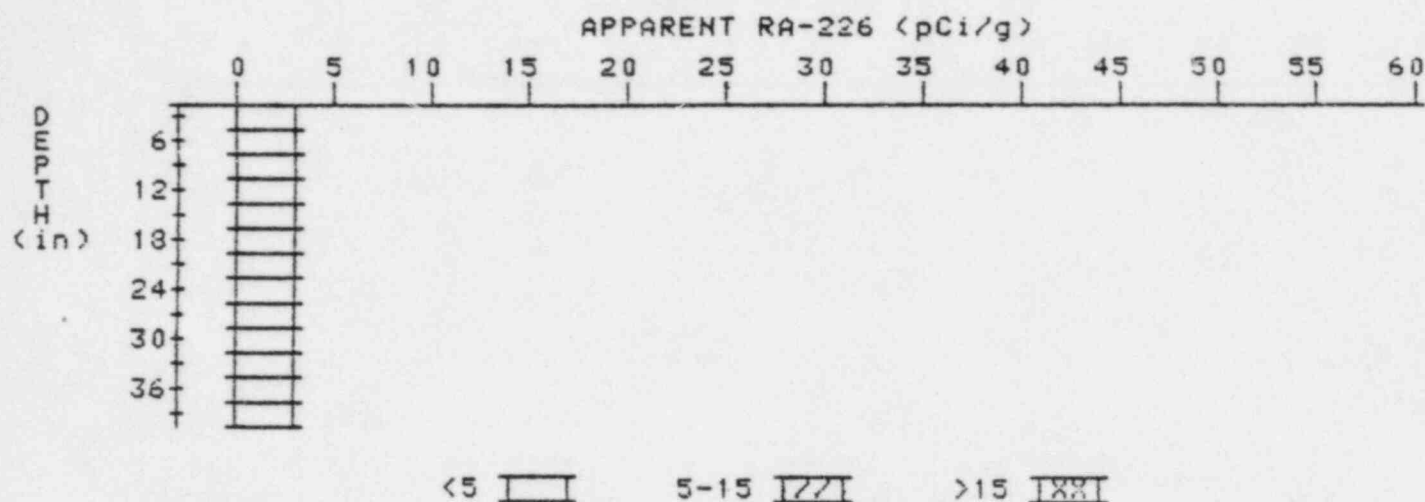
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

6

PROPERTY NUMBER: GJ-03089-RS

HOLE NUMBER: 6

LOCATION: 190230



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.6	2.6
6	2.9	3.3
9	3.0	3.2
12	3.0	3.0
15	3.0	3.2
18	2.9	2.7
21	2.9	2.5
24	3.1	3.5
27	3.1	2.9
30	3.2	3.4
33	3.2	3.2
36	3.2	3.4
39	3.1	3.1

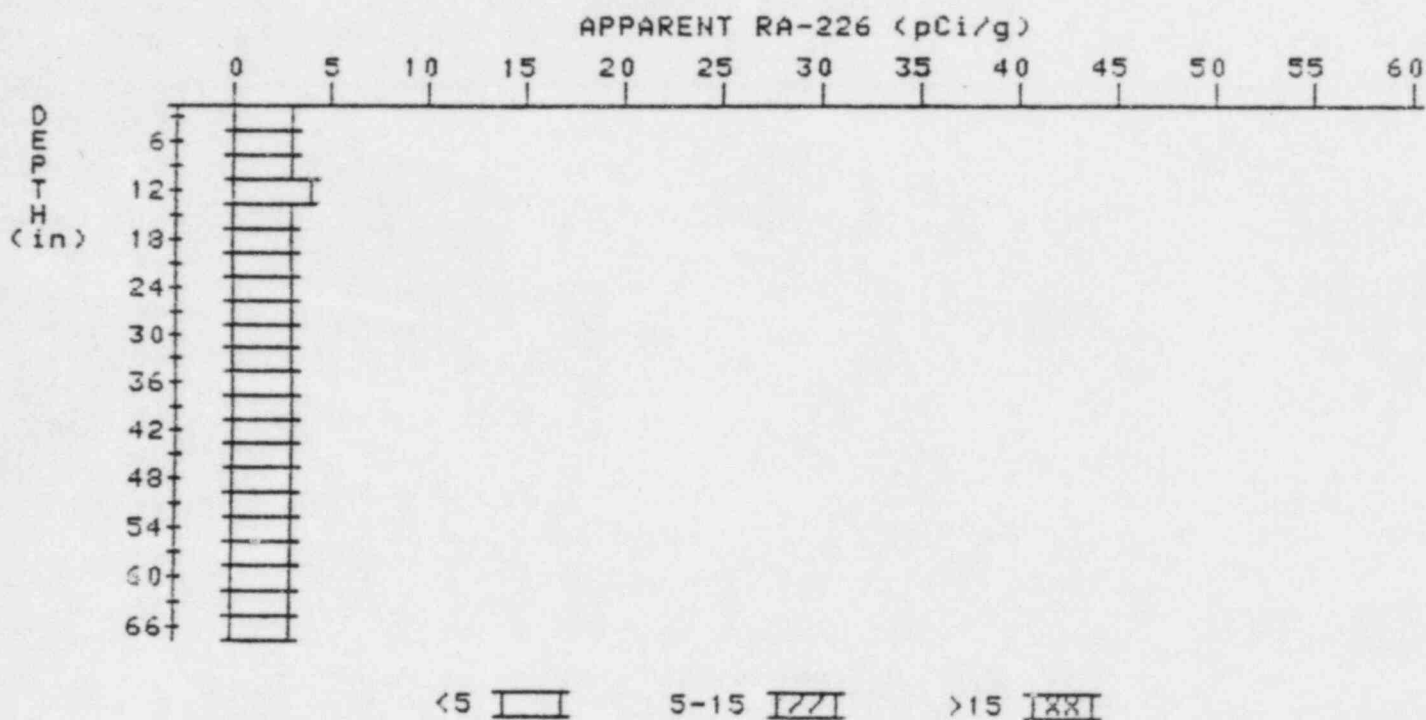
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

7

PROPERTY NUMBER: GJ-03089-RS

HOLE NUMBER: 7

LOCATION: 197201



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.7	2.7
6	3.0	3.4
9	3.1	3.1
12	3.2	3.6
15	3.1	2.9
18	3.1	3.1
21	3.1	3.1
24	3.1	3.1
27	3.1	3.1
30	3.1	3.1
33	3.1	3.1
36	3.1	3.1
39	3.1	3.1
42	3.1	3.1
45	3.1	3.3
48	3.0	2.8

51	3.0	2.8
54	3.1	3.3
57	3.1	3.1
60	3.1	3.1
63	3.1	3.1
66	3.1	3.1

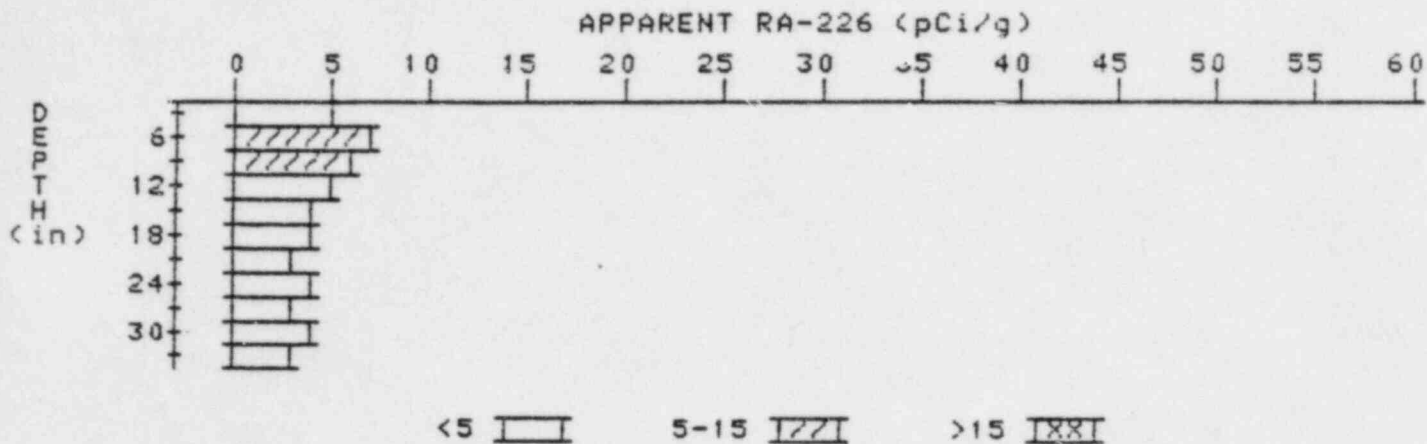
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

9

PROPERTY NUMBER: GJ-03089-RS

HOLE NUMBER: 9

LOCATION: 212220



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.7	4.7
6	5.5	7.1
9	5.4	6.5
12	4.7	4.5
15	4.1	3.6
18	3.8	3.8
21	3.5	3.0
24	3.5	3.7
27	3.4	3.2
30	3.4	3.6
33	3.3	3.3

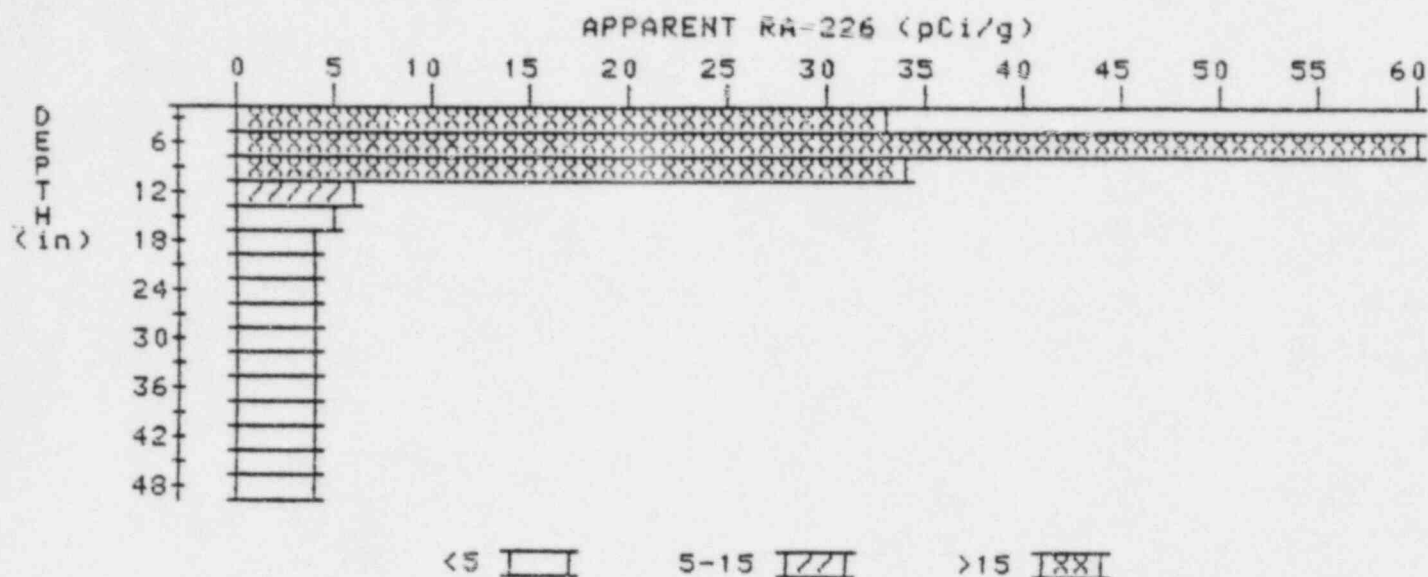
# APPARENT RADIUM-226 CONCENTRATION 17

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03089-RS

HOLE NUMBER: 17

LOCATION: 246239



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	32.7	32.7
6	39.4	68.9
9	29.5	34.3
12	16.9	6.1
15	10.4	4.5
18	7.2	4.4
21	5.6	4.0
24	4.9	4.4
27	4.5	4.1
30	4.3	4.3
33	4.1	3.9
36	4.0	3.8
39	4.0	4.4
42	3.8	3.6
45	3.7	3.5
48	3.7	3.7

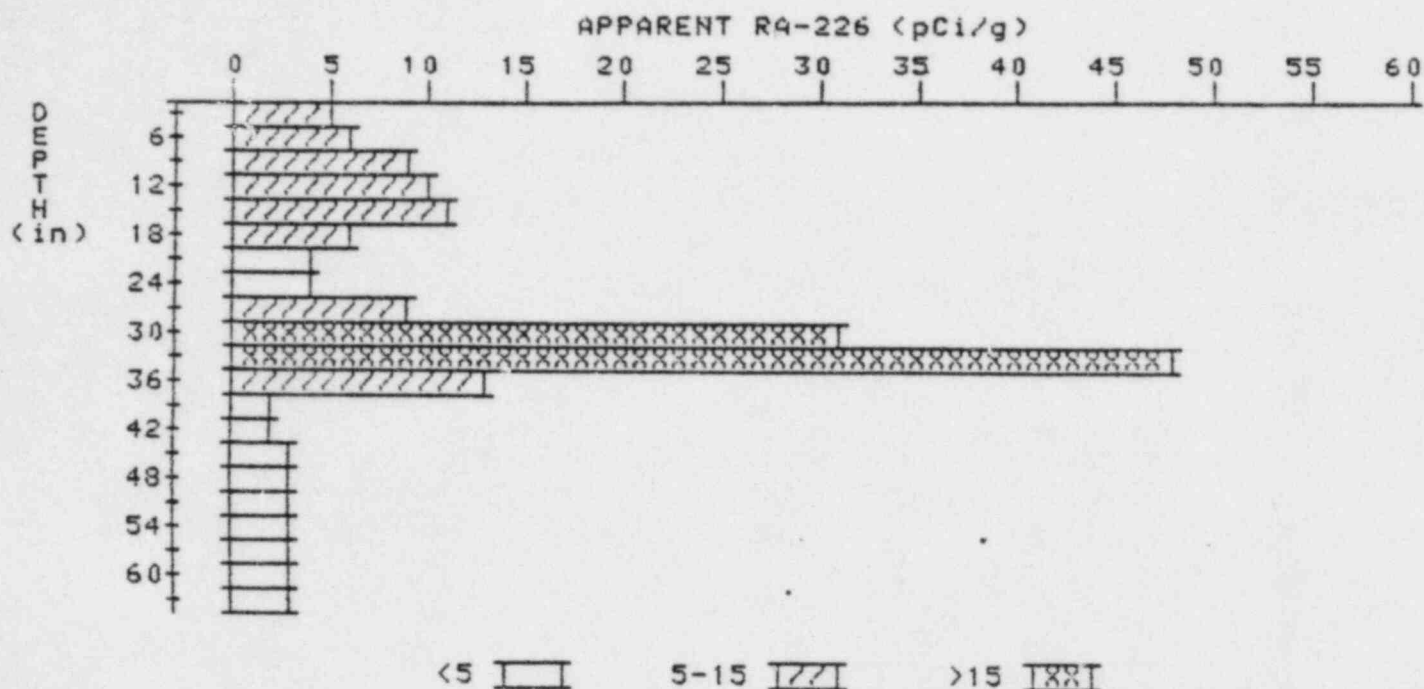
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

24

PROPERTY NUMBER: GJ-03089-RS

HOLE NUMBER: 24

LOCATION: 252209



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.0	5.0
6	6.4	6.4
9	7.8	9.0
12	8.5	9.6
15	8.6	10.7
18	7.5	5.9
21	7.3	3.6
24	9.2	3.7
27	14.2	8.7
30	22.3	30.8
33	25.6	48.0
36	16.3	12.9
39	8.9	1.6
42	5.6	2.0
45	4.3	3.1
48	3.7	3.3
51	3.3	2.6

54  
57  
60  
63

3.3  
3.3  
3.3  
3.2

3.3  
3.3  
3.5  
3.2

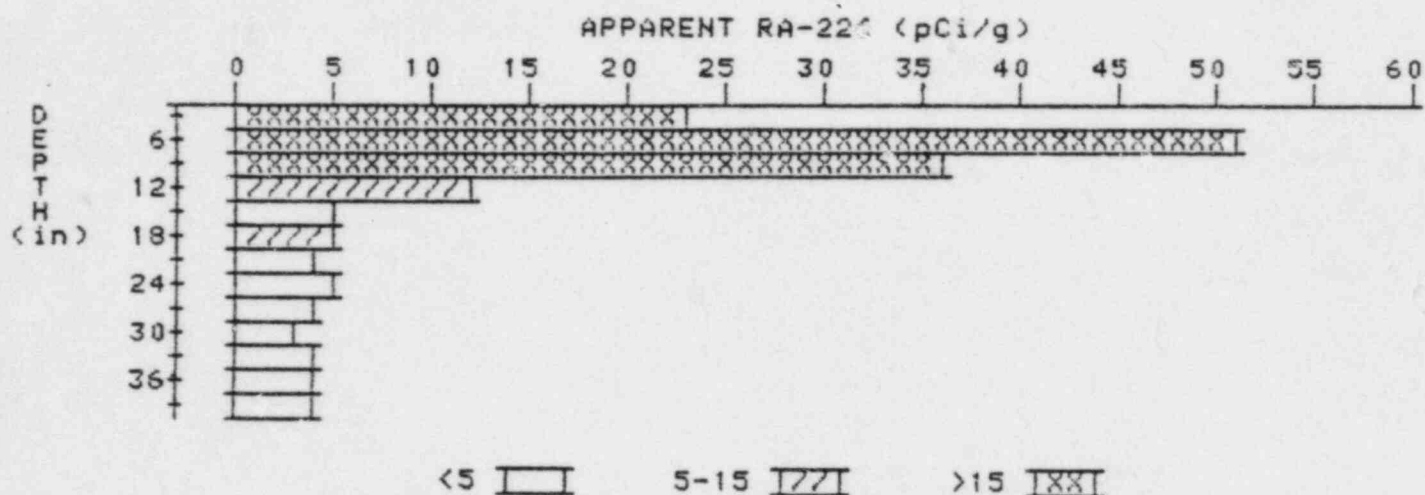
# APPARENT RADIUM-226 CONCENTRATION 26

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-03039-RS

HOLE NUMBER: 26

LOCATION: 253215



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	22.8	22.8
6	30.3	50.6
9	26.4	35.8
12	17.2	12.4
15	10.7	4.8
18	7.5	5.0
21	5.7	3.7
24	5.0	4.8
27	4.4	4.2
30	3.9	3.2
33	3.8	3.8
36	3.7	3.5
39	3.7	3.7

