

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-01381-RS
ADDRESS: 1610 NORTH 20TH STREET

AUGUST 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

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

APPROVED BY

Michael K. Tucker

M. TUCKER

DOE PROJECT ENGINEER

DATE

August 27, 1985

REA01381:REA-710

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-01381-RS, is a single-family residence located at 1610 North 20th 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 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, 38 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$4,124. Remedial action on this property will take approximately 10 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 1610 North 20th Street, Grand Junction, Colorado

Zoning: Residential (RSF-8)

Lot Size: Approximately 9,000 sf (0.20 acres)

Legal Description: Lot 7, Block 2, Del Mar Park Refile, 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:	Mesa Avenue
South:	Single-family residence
East:	Single-family residence
West:	North 20th Street

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-story residence with attached carport
Size:	Approximately 900 sf
Construction Date:	1954
Construction:	Wood-frame
Foundation:	Concrete stemwall on spread footing
Footing Depth:	Not Determined
Basement:	None
Crawl Space:	Yes - under entire living area
Condition:	Good

Other Structures:

Type:	Carport/Shed 3
Size:	Approximately 918 sf
Construction:	Wood-frame
Foundation:	Concrete slab-on-grade
Condition:	Good

Type:	Shed 1 and Shed 2
Size:	Approximately 80 and 60 sf, respectively
Construction:	Prefabricated metal with wood floors
Foundation:	None
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 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-01381-RS on July 23, 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 to determine areas of potential contamination identified during previous radiologic assessments of this property.

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: 14 to 15 uR/h
Highest Outside Gamma Reading (HOG): 65 uR/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: 13 to 15 uR/h
Highest Inside Gamma Reading (HIG): 15 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; 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: Gravel
Direction From Primary Structure: Northeast
Other Directions: Adjacent to alley
Total Depth of Contamination: 12 inches
Other (height or thickness): 2-inch-thick gravel
Approximate Square Footage: 90
- (Area B) Surface Material: Gravel
Direction From Primary Structure: Northeast
Other Directions: South of city sidewalk
Total Depth of Contamination: 15 inches
Other (height or thickness): 2-inch-thick gravel
Comments: The total depth of contamination is based on data from Area F.
Approximate Square Footage: 32
- (Area C) Surface Material: Soil
Direction From Primary Structure: North
Other Directions: South of city sidewalk
Total Depth of Contamination: 12 inches
Approximate Square Footage: 75
- (Area D) Surface Material: Soil
Direction From Primary Structure: North
Other Directions: South of city sidewalk
Total Depth of Contamination: 6 inches
Approximate Square Footage: 105
- (Area E) Surface Material: Soil
Direction From Primary Structure: Northwest
Other Directions: Adjacent to city sidewalk
Total Depth of Contamination: 12 inches
Approximate Square Footage: 42
- (Area F) Surface Material: Concrete (sidewalk)
Direction From Primary Structure: Northeast, north, and northwest
Total Depth of Contamination: 15 inches
Other (height or thickness): 4-inch-thick concrete
Approximate Square Footage: 480

- (Area G) Surface Material: Lava rock
Direction From Primary Structure: West
Other Directions: Adjacent to city sidewalk
Total Depth of Contamination: 6 inches
Other (height or thickness): 2-inch-thick lava rock
Comments: The water meter pit is in this area.
Approximate Square Footage: 171
- (Area H) Surface Material: Flagstone
Direction From Primary Structure: West
Total Depth of Contamination: 6 inches
Other (height or thickness): 2-inch-thick flagstone
Comments: The depth of contamination is based on data
collected in Area G.
Approximate Square Footage: 12

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-01381-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 \$4,124.

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 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-01381-RS

1610 North 20th Street

Page 1 of 3

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
1	134207	00	DS	2.4		*	Next to city sidewalk
		06	DS	5.2		*	
		12	DS	2.5		*	
2	135225	00	DS	4.0		*	Next to city sidewalk
		06	DS	2.8		*	
3	136191	03	TC	3.3		*	Water line DC = 6 inches Based on all data available
		06	TC	3.6		*	
		09	TC	4.0		*	
		12	TC	4.2		*	
		15	TC	4.4		*	
		18	TC	4.5		*	
		21	TC	4.5		*	
		24	TC	4.4		*	
		27	TC	4.5		*	
		30	TC	4.5		*	
		33	TC	4.4		*	
		36	TC	4.3		*	
		39	TC	4.2		*	
		42	TC	4.3		*	
		45	TC	4.2		*	
		48	TC	4.2		*	
		51	TC	4.2		*	
		54	TC	4.1		*	
		57	TC	4.1		*	
		60	TC	4.1		*	
4	138175	03	TC	23.4		*	Through core in city sidewalk DC = 15 inches Based on the deconvolution graph
		06	TC	17.8		*	
		09	TC	16.3		*	
		12	TC	11.2		*	
		15	TC	6.3		*	
		18	TC	5.6		*	
		21	TC	5.2		*	
		24	TC	4.8		*	
		27	TC	4.6		*	
5	138245	00	DS	5.1		*	Next to city sidewalk
		06	DS	2.7		*	
6	142169	00	DS	2.9		*	Next to city sidewalk
		06	DS	1.9		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-01381-RS

1610 North 20th Street

Page 2 of 3

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
7	146265	00	DS	10.4		*	Next to city sidewalk
		06	DS	5.7		*	
		12	DS	2.5		*	
8	147274	03	TC	80.8		*	Through core in city sidewalk DC = 15 inches Based on the ture deconvolution graph
		06	TC	66.6		*	
		09	TC	41.4		*	
		12	TC	28.2		*	
		15	TC	14.9		*	
		18	TC	11.4		*	
		21	TC	9.3		*	
		24	TC	7.8		*	
		27	TC	6.9		*	
		30	TC	6.3		*	
		33	TC	5.9		*	
		36	TC	5.4		*	
		39	TC	5.0		*	
		42	TC	4.9		*	
		45	TC	4.7		*	
		48	TC	4.7		*	
9	156284	00	DS	25.0		*	Next to city sidewalk
		06	DS	14.7		*	
		12	DS	5.1		*	
10	158284	00	DS	1.1		*	East driveway
		06	DS	1.4		*	
11	160140	00	DS	4.8		*	Next to city sidewalk
		06	DS	2.6		*	
12	167202	00	DS	<1.0		*	Water line
13	170230	00	DS	1.4		*	Foundation
14	170280	00	DS	13.7		*	Alley
		06	DS	5.0		*	
		12	DS	1.7		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-01381-RS

1610 North 20th Street

Page 3 of 3

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
15	195211	00	DS	1.5		*	Gas line
		12	DS	<1.0		*	
16	195223	00	DS	1.5		*	Foundation
17	199214	00	DS	1.1		*	Sewer line
		03	TC	3.4		*	DC = 0 inches
		06	TC	3.7		*	Background
		09	TC	3.8		*	
		12	TC	3.9		*	
		15	TC	3.9		*	
		18	TC	3.9		*	
		21	TC	3.9		*	
		24	TC	4.0		*	
		27	TC	4.0		*	
		30	TC	4.1		*	
		33	TC	4.2		*	
		36	TC	4.1		*	
		39	TC	4.2		*	
		42	TC	4.3		*	
		45	TC	4.2		*	
		48	TC	4.1		*	
		51	TC	4.3		*	
		54	TC	4.2		*	
		57	TC	4.0		*	
		60	TC	4.1		*	

Measurement Types:

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

Notes: DC = Depth of Contamination
 * = No Soil Sample Taken
 [n] = Reading Taken n-Inches
 Above Floor or Ground
 Date of Survey = 07-23-85
 Team Leader = TRU

Table 3.2

Summary of Interior Gamma Exposure Rates

DOE ID No. GJ-01381-RS 1610 North 20th Street Page 1 of 1

Location	Number of Readings Taken at Waist Level	Range at Waist Level (uR/h)	Mean at Waist Level (uR/h)	Number of Readings Taken at Surface	Range at Surface (uR/h)	Mean Surface (uR/h)
Crawl Space	00	00	00	12	16-16	16
Ground Floor	*	*	*	*	13-15	*
Shed 1	*	*	*	*	13-15	*
Shed 2	*	*	*	*	13-14	*
Shed 3	*	*	*	*	12-13	*

* Walking gamma scans were performed to confirm the absence of interior contamination.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-01381-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				
F	160 x 3 =	480			
	10 x 10 =	100			
		<hr/>			
		580	x 0.3 =	174	
				<hr/>	
	Volume of Concrete			= 174 =	174/27 = 6
	Contaminated Fill				
A	6 x 15 =	90	x 1.0 =	90	
B	2 x 16 =	32	x 1.3 =	42	
C	25 x 3 =	75	x 1.0 =	75	
D	35 x 3 =	105	x 0.5 =	53	
E	14 x 3 =	42	x 1.0 =	42	
F	160 x 3 =	480	x 1.0 =	480	
G	25 x 3 =	75			
	2 x 48 =	96			
		<hr/>			
		171	x 0.5 =	86	
H	3 x 4 =	12	x 0.5 =	6	
				<hr/>	
	Volume of Fill			= 874 =	874/27 = 32
	TOTAL VOLUME - EXTERIOR				= 38

See Appendix Figure 3.3 For Areas

EXTERIOR

Remove/replace concrete sidewalk 580 sf @ \$3/sf	\$ 1,740
Remove identified residual radioactive material 32 cy @ \$14.50/cy (machine-open)	464
Replace areas with roadbase 21 cy @ \$11.50/cy	242
Replace areas with topsoil 11 cy @ \$9.50/cy	105
Remove/replace flagstone 12 sf @ \$4/sf	48
Replace areas with sod 230 sf @ \$.40/sf	92
Replace area with decorative rock 171 sf @ \$.25/sf	43
	<hr/>
TOTAL EXTERIOR	\$ 2,734
TOTAL INTERIOR	0
ACCESS CONTROL	150
	<hr/>
SUBTOTAL	\$ 2,884
CONTINGENCY @ 10%	288
	<hr/>
SUBTOTAL	\$ 3,172
CONTRACTOR OVERHEAD & PROFIT @ 30%	952
	<hr/>
GRAND TOTAL	\$ 4,124

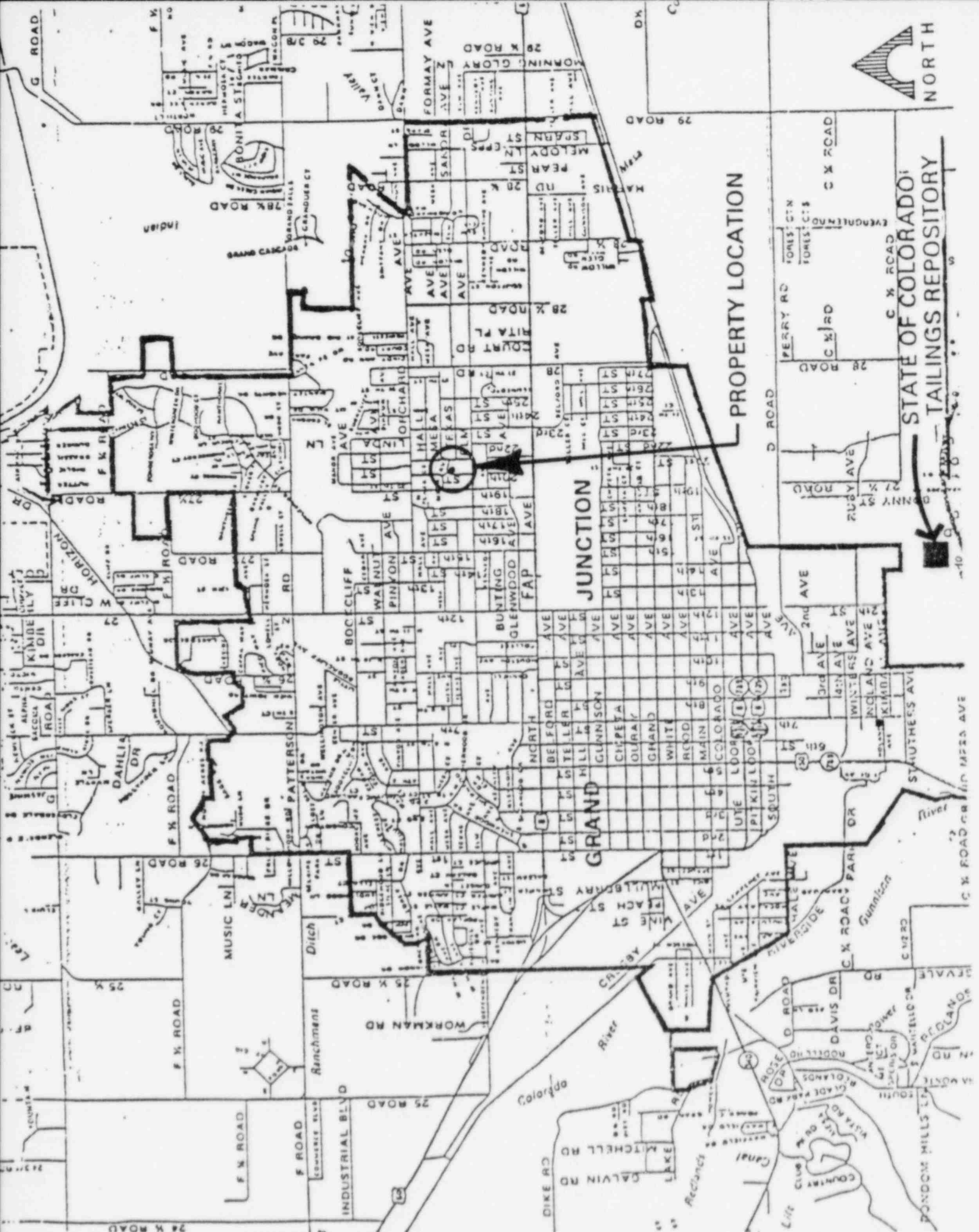


FIGURE 2.1
VICINITY MAP

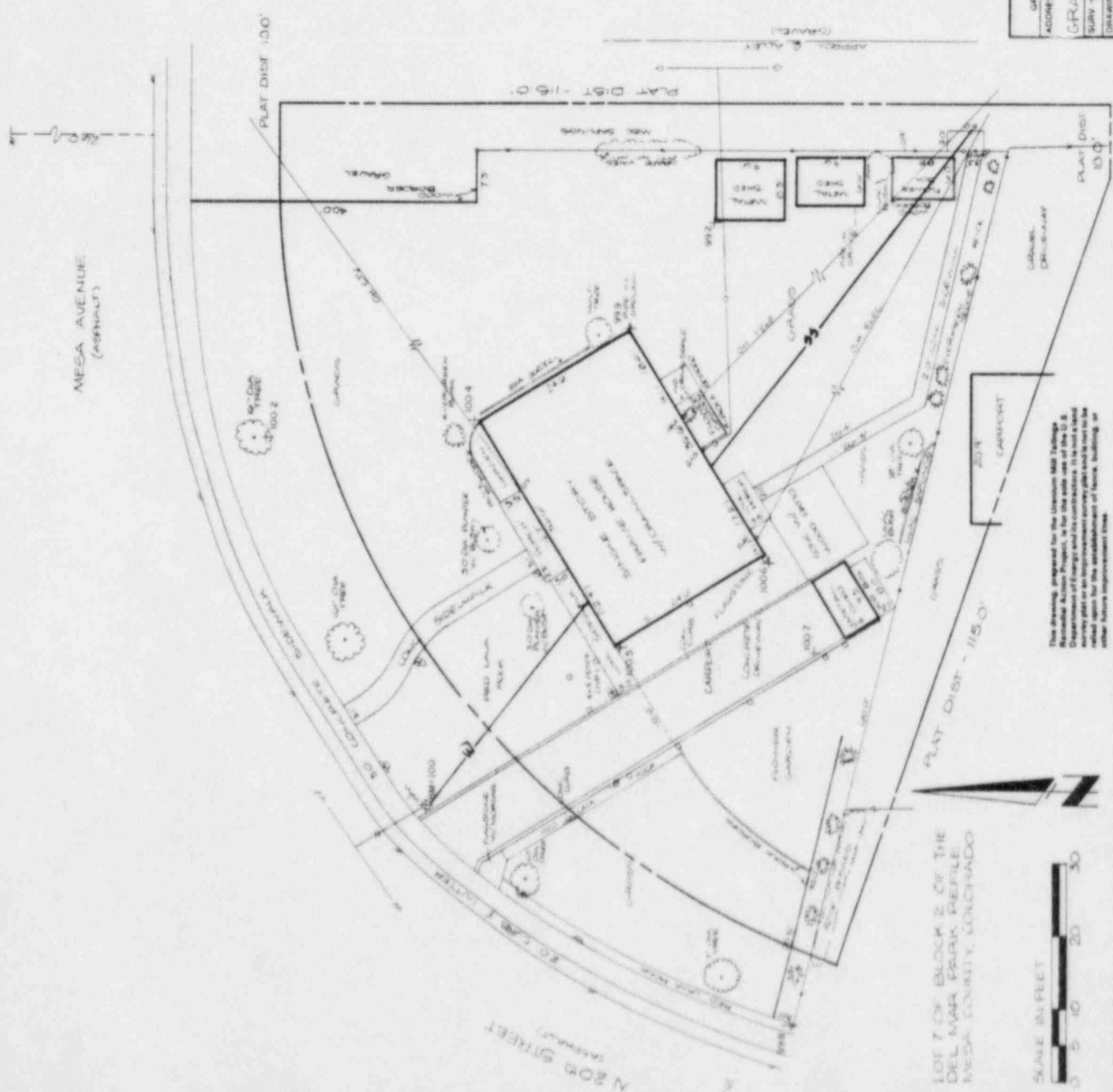
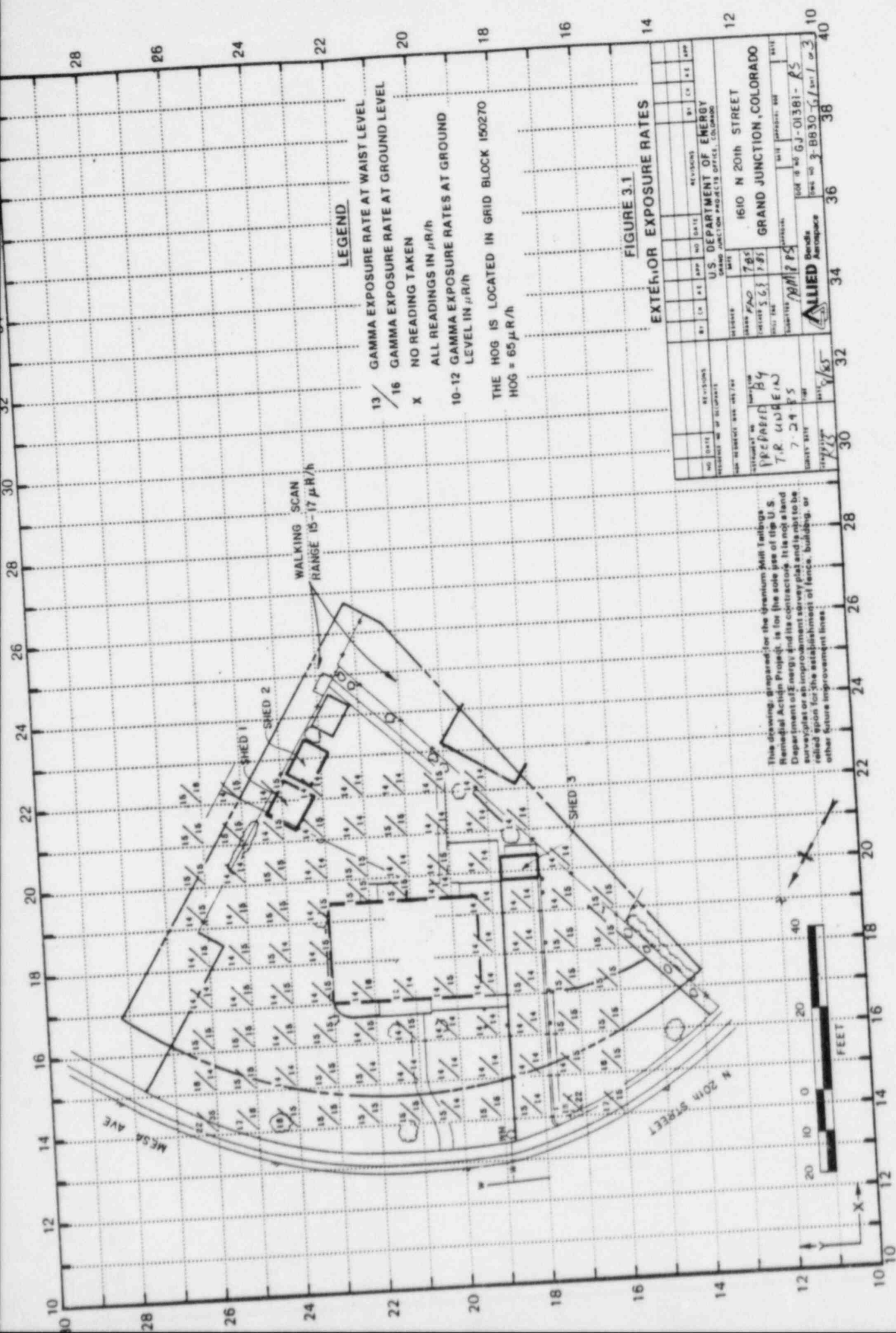


FIGURE 2.2 SITE PLAN

U.S. DEPARTMENT OF ENERGY	DISE ID NO.	CJ01321 RS
GRAND JUNCTION PROJECT OFFICE, COLORADO	ADDRESS	1600 N 20th STREET
GRAND JUNCTION, COLORADO	SURV T3/T7-15-B6	DRAFT R3/7/17 RS
DRAWING NO. 5-15-20 FI	DATE	7-17-85
	SHEET	1 OF 1

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 valid survey plat or an improvement survey plat and is not to be relied upon for the establishment of future building or other future improvement lines.



LEGEND

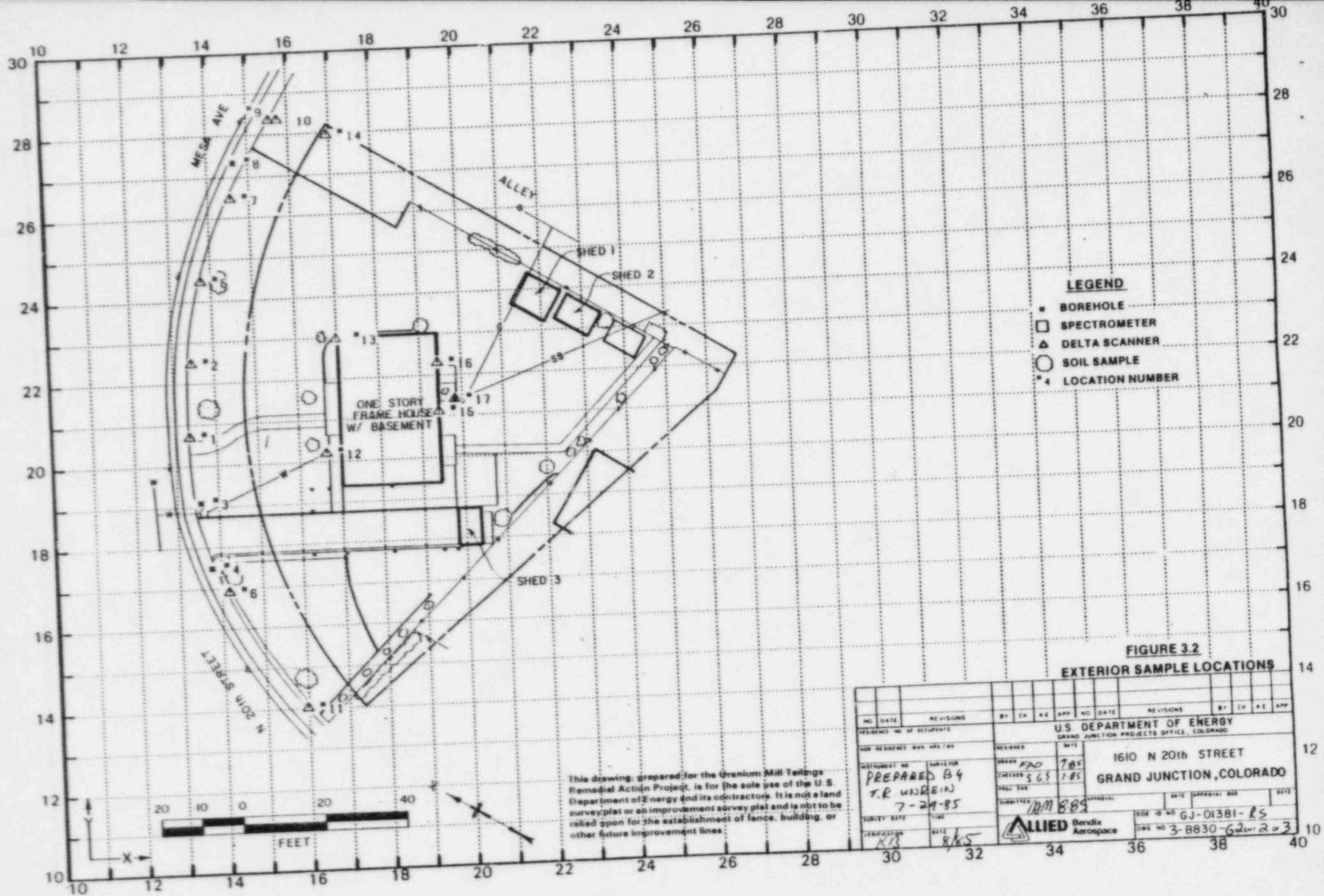
- 13 / GAMMA EXPOSURE RATE AT WAIST LEVEL
- 16 / GAMMA EXPOSURE RATE AT GROUND LEVEL
- X / NO READINGS TAKEN
- ALL READINGS IN $\mu R/h$
- 10-12 GAMMA EXPOSURE RATES AT GROUND LEVEL IN $\mu R/h$
- THE HOG IS LOCATED IN GRID BLOCK 150270
- HOG = $65 \mu R/h$

FIGURE 3.1

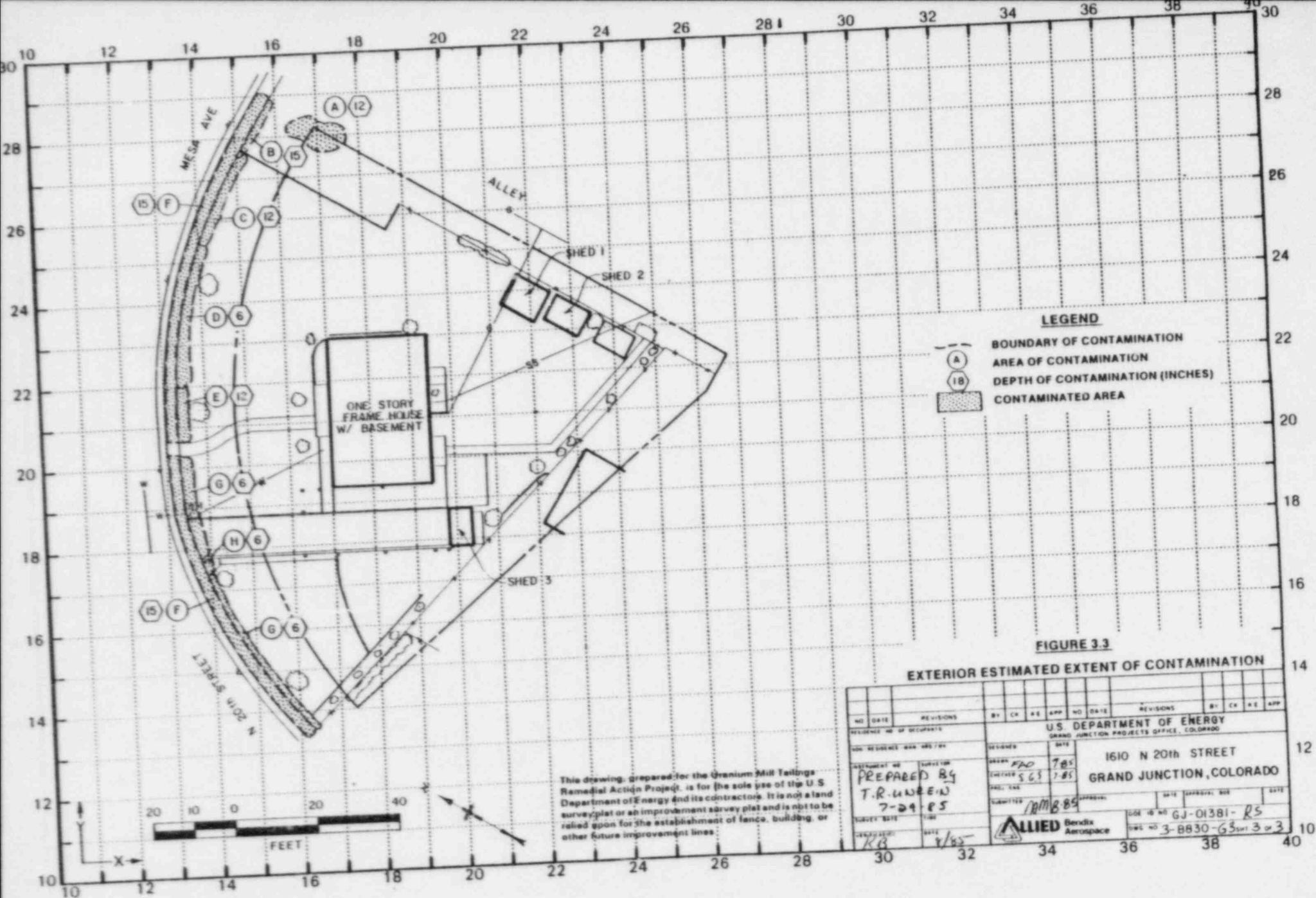
EXTERIOR EXPOSURE RATES

NO	DATE	BY	CR	AE	APP	NO	DATE	BY	CR	AE	APP
<p>U.S. DEPARTMENT OF ENERGY GRAND JUNCTION RADIOACTIVE OFFICE, COLORADO</p>											
<p>1610 N 20th STREET GRAND JUNCTION, COLORADO</p>											
<p>PROJECT NO. 785 PROJECT SCS 785 SHEET NO. 10</p>											
<p>DATE 7/24/85 TIME 10:00 AM BY T.R. WILSON CHECKED BY [signature] APPROVED BY [signature]</p>											
<p>U.S. DEPARTMENT OF ENERGY GRAND JUNCTION RADIOACTIVE OFFICE, COLORADO</p>											

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



NO. DATE		REVISIONS		BY	CHK	RE	APP	NO. DATE	REVISIONS		BY	CHK	RE	APP
<p>DESIGNED BY: FAD DATE: 7-85</p> <p>DRAWN BY: SGS DATE: 7-85</p> <p>CHECKED BY: RM 889 DATE: 7-24-85</p> <p>SURVEY DATE: 7-24-85</p>														
<p>U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECTS OFFICE, COLORADO</p> <p>1610 N 20th STREET GRAND JUNCTION, COLORADO</p> <p>DATE: 7-85 APPROVAL: RM 889 DATE: 7-85</p> <p>ISSUE NO: 6J-01381-RS DATE: 7-85</p> <p>DWG NO: 3-BB30-62-2-3</p>														
<p>ALLIED Bendix Aerospace</p>														



NO	DATE	REVISIONS	BY	CHK	RE	APP	NO	DATE	REVISIONS	BY	CHK	RE	APP
RESIDENCE NO. OF OCCUPANTS							U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECTS OFFICE, COLORADO						
NON-RESIDENCE: BSA HAS / YN							DESIGNED						
INSTRUMENT NO.							DATE						
PREPARED BY T.R. UNKLEN 7-24-85							DRAWN FND 7-85						
SURVEY SITE							CHECKED SGS 7-85						
DATE							APP. TAG						
DRAWN							DATE						
DATE							APPROVAL						
ALLIED							Bendix Aerospace						
JOB NO. GJ-01381-RS							DATE						
DWE NO. 3-8830-63							DATE						

3/85

DOE ID NO. GJ-01381-RS Date July 29, 1985

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

Official Survey Report

Property Address 1610 North 20th Street
Property Owner J.W. and B. Emery
Address of Owner (if different from above) Same
Report Prepared By T.R. Unrein

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 = 15 uR/h
EOG = 65 uR/h

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: July 23, 1985

To: Files

From: Thomas R. Unrein

Subject: Team Leader Notes - GJ-01381-RS

Address: 1610 North 20th Street

Owner: J.W. and B. Emery

Occupancy: Two

Team Members

T. Unrein (Team Leader)	V. Hebel
D. Bell	L. Kula
N. Wallace	S. Larsen
R. Wilkins	

Instruments

Crutch Scintillometer: C-1185, C-1158, C-1214
Total Count: C-4005
Downhole Spectrometer: C-3943, C-4059

The survey team arrived at the property at 11:00 AM and began gridding the property and conducting the interior survey (which showed no elevated gamma readings). When this was completed, the survey team went to lunch.

The exterior scan showed elevated readings associated with the city sidewalk. This corresponds with the background and inclusion data.

All utility lines were investigated.

Team Leader Notes
Thomas R. Unrein
GJ-01381-RS
July 23, 1985
Page 2

This property has a crawl space instead of a basement, as shown on the maps.

Instrument SC-1149 failed in the field, no readings were taken.

Several attempts were made to auger adjacent to the house so that an investigation of the water line could be performed; however, we were unsuccessful. Augers were performed adjacent to the water meter pit instead.

After coring the sidewalk, tailings were visible underneath it.

The survey was completed at 3:25 PM. All team members were alpha scanned before returning to the office.

Note: Team members used the downhole scintillometer to check Location 170230 - range of 160 to 210 counts per second (cps). Bottom of the hole reading - 180 cps. Location 195233 - range 150 to 210. Bottom of the hole reading 190 cps. Threshold (SC-1214) - 230 cps.

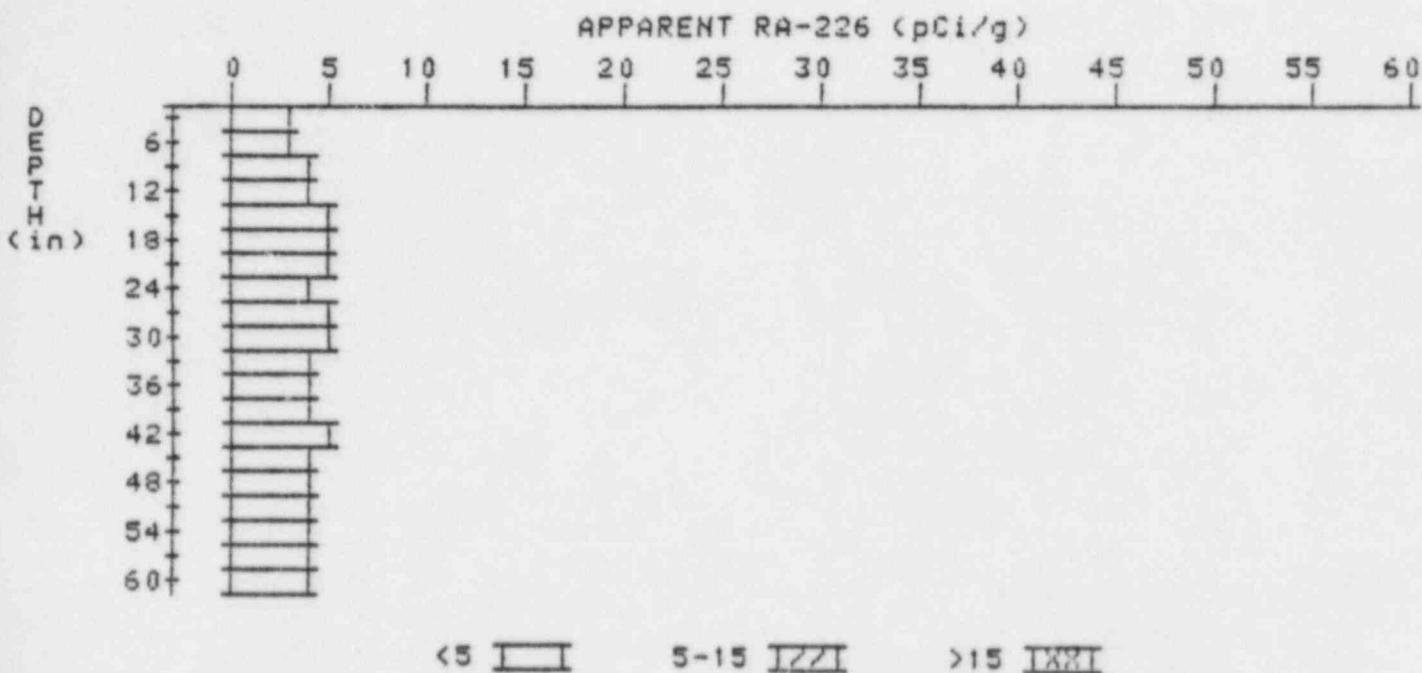
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

3

PROPERTY NUMBER: GJ-01381-RS

HOLE NUMBER: 3

LOCATION: 136191



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.6	3.4
9	4.0	4.4
12	4.2	4.2
15	4.4	4.6
18	4.5	4.7
21	4.5	4.7
24	4.4	4.0
27	4.5	4.7
30	4.5	4.7
33	4.4	4.4
36	4.3	4.3
39	4.2	3.8
42	4.3	4.7
45	4.2	4.0
48	4.2	4.2
51	4.2	4.4
54	4.1	3.9

57
60

4.1
4.1

4.1
4.1

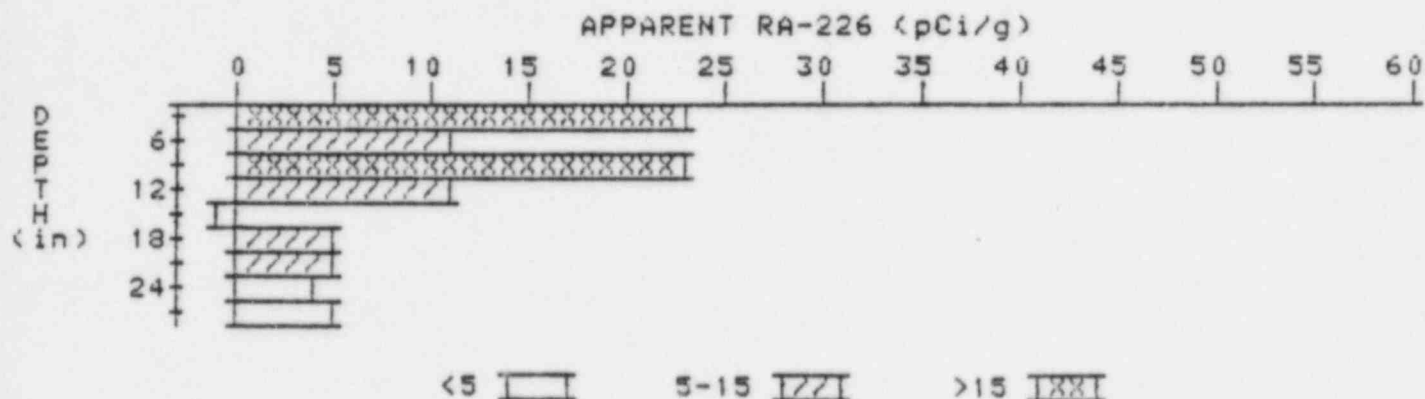
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

4

PROPERTY NUMBER: GJ-01381-RS

HOLE NUMBER: 4

LOCATION: 138175



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	23.4	23.4
6	17.8	10.5
9	16.3	22.7
12	11.2	10.8
15	6.3	-1.2
18	5.6	5.1
21	5.2	5.2
24	4.8	4.4
27	4.6	4.6

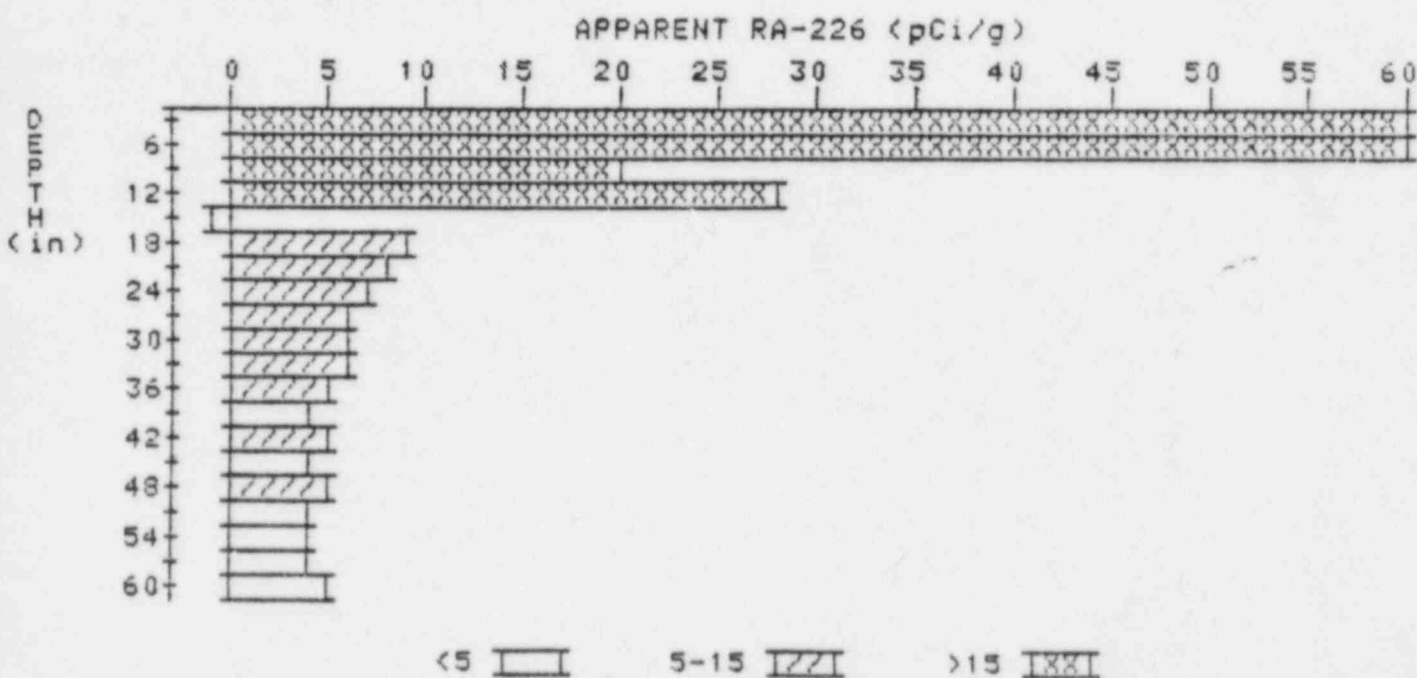
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

8

PROPERTY NUMBER: GJ-01381-RS

HOLE NUMBER: 8

LOCATION: 147274



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	80.9	80.9
6	66.6	86.2
9	41.4	20.1
12	28.2	28.4
15	14.9	-2.5
18	11.4	8.9
21	9.3	8.2
24	7.8	6.7
27	6.9	6.4
30	6.3	5.9
33	5.9	6.1
36	5.4	5.2
39	5.0	4.5
42	4.9	5.1
45	4.7	4.3
48	4.7	5.1
51	4.5	4.3
54	4.4	4.2

57
60

4.4
4.6

4.0
4.6

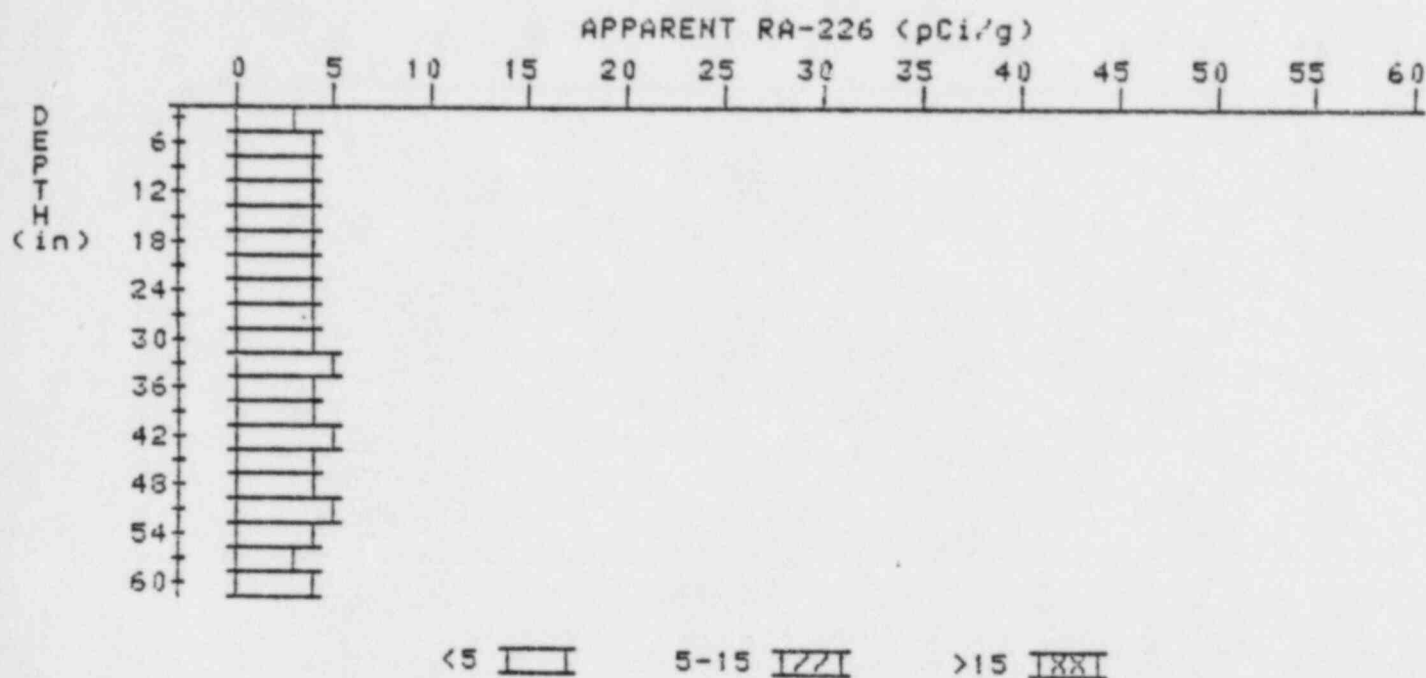
APPARENT RADIUM-226 CONCENTRATION 17

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01381-RS

HOLE NUMBER: 17

LOCATION: 199214



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.4	3.4
6	3.7	4.1
9	3.8	3.8
12	3.9	4.1
15	3.9	3.9
18	3.9	3.9
21	3.9	3.7
24	4.0	4.2
27	4.0	3.8
30	4.1	4.1
33	4.2	4.6
36	4.1	3.7
39	4.2	4.2
42	4.3	4.7
45	4.2	4.2
48	4.1	3.6
51	4.3	4.8
54	4.2	4.4

57
60

4.0
4.1

3.5
4.1

