

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-02178-RS  
ADDRESS: 1370 NORTH 17TH 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  
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DOE PROJECT ENGINEER

DATE

September 3, 1985

REA02178:REA-621

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PDR WASTE PDR  
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## 1.0 EXECUTIVE SUMMARY

### 1.1 Introduction

The location, DOE ID No. GJ-02178-RS, is a single-family residence located at 1370 North 17th 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, 15 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action is \$1,100. Remedial action on this property will take approximately 5 days to complete.

## 2.0 PROPERTY DESCRIPTION

### 2.1 General Description

Address: 1370 North 17th Street, Grand Junction, Colorado

Zoning: Residential (RSF-8)

Lot Size: Approximately 6,188 sf (0.14 acres)

Legal Description: North 23.0 feet of Lot 22 and the south 29.0 feet of Lot 23, Block 4, Elmwood Plaza Refile, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 2 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:	Single-family residence
South:	Single-family residence
East:	Alley
West:	North 17th Street

### 2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-story residence
Size:	Approximately 730 sf
Construction Date:	1954
Construction:	Wood-frame
Foundation:	Concrete stemwall on spread footing
Footing Depth:	Approximately 24" to bottom of footing from grade
Basement:	None
Crawl Space:	Yes - under entire living area
Condition:	Good

Other Structures:

Type:	Shed 1
Size:	Approximately 30 sf
Construction:	Wood-frame
Foundation:	None
Condition:	Fair

Type:	Shed 2
Size:	Approximately 20 sf
Construction:	Wood-frame
Foundation:	None
Condition:	Fair

General Remarks:

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

Historical Data:

This structure is not over 50 years old. Therefore, it does not meet the eligibility criteria for consideration of inclusion on the National Register of Historic Places.

### 3.0 RADIOLOGIC SURVEY

#### 3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-02178-RS on August 6, 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 17 uR/h  
Highest Outside Gamma Reading (HOG): 49 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: 15 to 17 uR/h  
Highest Inside Gamma Reading (HIG): 12 uR/h (ORNL)

Interior radium-concentration measurements are presented in Appendix Table 3.2. Interior gamma exposure-rate survey results in Shed 1 are shown in Appendix Figure 3.2. Interior gamma exposure-rate measurements are summarized in Appendix Table 3.3.

#### 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 Figures 3.2 and 3.3. Data from these investigations is included in Appendix Tables 3.1 and 3.2.

### 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 Figures 3.4a and 3.4b show identified areas and estimated depths of contamination on this property, based on assessments of all measurements taken. As noted in these figures, areas recommended for remedial action that contain identified residual radioactive materials are:

- (Area A) Surface Material: Soil  
 Direction From Primary Structure: Northeast  
 Other Directions: Under Shed 1  
 Total Depth of Contamination: Estimated at 12 inches  
 Comments: The depth of contamination is based on data collected in Area B. The shed has a wooden floor on grade.  
 Approximate Square Footage: 28
- (Area B) Surface Material: Soil  
 Direction From Primary Structure: Northeast  
 Other Directions: East of driveway  
 Total Depth of Contamination: 12 inches  
 Approximate Square Footage: 224
- (Area C) Surface Material: Gravel  
 Direction From Primary Structure: North  
 Other Directions: In driveway  
 Total Depth of Contamination: 6 inches  
 Approximate Square Footage: 176
- (Area D) Surface Material: Lawn  
 Direction From Primary Structure: North  
 Other Directions: North and south of driveway  
 Total Depth of Contamination: 6 inches  
 Comments: This area consists of two deposits.  
 Approximate Square Footage: 48
- (Area E) Surface Material: Lawn  
 Direction From Primary Structure: East  
 Other Directions: Adjacent to primary structure  
 Total Depth of Contamination: 6 inches  
 Comments: This area consists of two small deposits.  
 Approximate Square Footage: 32
- (Area F) Surface Material: Soil  
 Direction From Primary Structure: East  
 Other Directions: Southeast corner of Shed 2  
 Total Depth of Contamination: 6 inches  
 Approximate Square Footage: 42

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

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

The recommended remedial action for this property, DOE ID No. GJ-02178-RS, includes removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figures 3.4a and 3.4b) 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 \$1,100.

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	Radium Concentrations at Interior Locations
Table 3.3	Summary of Interior Gamma Exposure Rates
Table 4.1	Area and Volume Calculations
Table 4.2	Estimated Cost of Decontamination and Restoration

Appendix Figures:

Figure 2.1	Vicinity Map
Figure 2.2	Site Plan
Figure 3.1	Exterior Exposure Rates
Figure 3.2	Interior Gamma Exposure Rates and Sample Locations
Figure 3.3	Exterior Sample Locations
Figure 3.4a	Interior Estimated Extent of Contamination
Figure 3.4b	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-02178-RS

1370 North 17th Street

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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.		
2	172248	00	DS	1.7		*	North of primary structure
3	173241	00	DS	1.5		*	Northwest of primary structure
4	176226	00	DS	1.5		*	Water line
		03	TC	2.9		*	Background
		06	TC	3.3		*	DC = 0 inches
		09	TC	3.6		*	
		12	TC	3.9		*	
		15	TC	3.7		*	
		18	TC	3.7		*	
		21	TC	3.8		*	
		24	TC	3.8		*	
		27	TC	3.9		*	
		30	TC	3.8		*	
		33	TC	3.9		*	
		36	TC	4.0		*	
		39	TC	4.2		*	
5	177246	00	DS	3.3		*	North of primary structure
		03	TC	3.8		*	DC = 6 inches
		06	TC	3.7		*	Based on all available data
		09	TC	3.6		*	
		12	TC	3.5		*	
		15	TC	3.6		*	
		18	TC	3.7		*	
		21	TC	3.7		*	
6	179246	00	DS	4.4		*	North of primary structure
		03	TC	5.0		*	Gravel driveway
		06	TC	4.8		*	DC = 6 inches
		09	TC	4.3		*	Based on all available data
		12	TC	3.8		*	
		15	TC	3.8		*	
7	180243	00	DS	3.1		*	Northwest corner of primary structure
		06	DS	1.6		*	
8	181253	00	DS	3.4		*	North of driveway
		06	DS	1.6		*	

## Radium Concentrations at Exterior Locations

DOE ID #GJ-02178-RS

1370 North 17th Street

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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	186241	00	DS	6.4		*	North of primary structure
		06	DS	1.4		*	
10	190207	00	DS	1.9		*	South foundation
		26	DS	<1.0		*	
11	190241	00	DS	3.9		*	North foundation
12	190250	00	DS	6.9		*	North of primary structure
13	197245	00	DS	2.8		*	East end of driveway DC = 6 inches Based on all available data
		03	TC	3.7		*	
		06	TC	3.9		*	
		09	TC	3.9		*	
		12	TC	3.7		*	
		15	TC	3.6		*	
		18	TC	3.6		*	
		21	TC	3.6		*	
		24	TC	3.7		*	
		27	TC	3.8		*	
		30	TC	3.7		*	
		33	TC	3.8		*	
		36	TC	3.9		*	
14	197253	00	DS	2.0		*	North of primary structure
15	200241	00	DS	2.2		*	Northeast corner of primary structure
		06	DS	<1.0		*	
16	201215	00	DS	2.9		*	East of primary structure
		06	DS	1.0		*	
17	201220	00	DS	2.2		*	East of primary structure
		06	DS	1.8		*	
18	201223	00	DS	3.1		*	Gas line East foundation
		06	DS	2.8		*	
19	202226	00	DS	2.4		*	East of primary structure
		06	DS	1.8		*	

## Radium Concentrations at Exterior Locations

DOE ID #GJ-02178-RS

1370 North 17th Street

Page 3 of 4

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
20	202247	00	DS	1.1		*	In driveway
		03	TC	3.2		*	DC = 0 inches
		06	TC	3.5		*	
		09	TC	3.6		*	Auger refusal
		12	TC	3.7		*	
		15	TC	3.7		*	
21	203255	00	DS	2.3		*	Northeast end of
		06	DS	1.5		*	driveway by fence
22	204235	00	DS	1.5		*	South of Shed 2
23	205221	00	DS	2.2		*	East of primary structure
24	210236	00	DS	3.2		*	Southeast corner of
		06	DS	1.3		*	Shed 2
25	212229	00	DS	1.1		*	Sidewalk
26	213240	00	DS	26.5		*	Northeast of Shed 2
		03	TC	14.3		*	DC = 12 inches
		06	TC	15.4		*	Based on the
		09	TC	11.4		*	deconvolution graph
		12	TC	7.8		*	
		15	TC	5.9		*	
		18	TC	5.0		*	
		21	TC	4.5		*	
		24	TC	4.3		*	
		27	TC	4.4		*	
		30	TC	4.4		*	
		33	TC	4.4		*	
		36	TC	4.7		*	
27	215253	00	DS	23.9		*	East of Shed 1
		03	TC	13.0		*	DC = 12 inches
		06	TC	12.2		*	Based on the
		09	TC	9.1		*	deconvolution graph
		12	TC	6.7		*	
		15	TC	5.5		*	
		18	TC	4.6		*	
		21	TC	4.2		*	
		24	TC	4.3		*	
		27	TC	4.2		*	

## Radium Concentrations at Exterior Locations

DOE ID #GJ-02178-RS

1370 North 17th Street

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
27	215253	30	TC	4.3		*	
		33	TC	4.3		*	
		36	TC	4.4		*	
		39	TC	4.5		*	
28	218234	00	DS	<1.0		*	East of
		06	DS	<1.0		*	primary structure
29	221250	00	DS	1.5		*	South of north property line
30	225245	00	DS	1.4		*	East yard

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 = 08-06-85

Team Leader = TC

## Radium Concentrations at Interior Locations

DOE ID #GJ-02178-RS

1370 North 17th Street

Page 1 of 1

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
1		00	DS	14.3		*	Inside door of Shed 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 = 08-06-85  
Team Leader = TC

Table 3.3

## Summary of Interior Gamma Exposure Rates

DOE ID No. GJ-02178-RS 1370 North 17th 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	*	*	*	*	15-17	*
Shed 1	02	37-37	37	02	42-43	43
Shed 2	*	*	*	*	16-17	*

\* Gamma scans were performed to confirm the absence of interior contamination. Exposure rates in Shed 1 are shown in Appendix Figure 3.2.



Table 4.1  
Area and Volume Calculations  
DOE ID No. GJ-02178-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					
	Contaminated Fill				
A*	4 x 7 =	28	x 1.0 =	28	
B	14 x 16 =	224	x 1.0 =	224	
C	8 x 22 =	176	x 0.5 =	88	
D	3 x 16 =	48	x 0.5 =	24	
E	4 x 5 =	20			
	3 x 4 =	12			
		32	x 0.5 =	16	
	6 x 7 =	42	x 0.5 =	21	
TOTAL VOLUME - EXTERIOR				= 401 =	401/27 = 15

\*Note: Shed 1 in Area A is portable and shall be considered as exterior involvement.

See Appendix Figures 3.4a and 3.4b For Areas

DOE ID NO. GJ-02178-RS; AREA AND VOLUME CALCULATIONS; EXTERIOR; TOTAL VOLUME - EXTERIOR; 401 CUBIC FEET; 15 CUBIC YARDS

---

EXTERIOR

Remove/replace shed and contents

Lump sum \$ 100

Remove identified residual radioactive material

13 cy @ \$14.50/cy 189

2 cy @ \$44/cy 88

Replace areas with roadbase

3 cy @ \$11.50/cy 35

Replace areas with topsoil

12 cy @ \$9.50/cy 114

Replace areas with sod

80 sf @ \$.50/sf 40

---

TOTAL EXTERIOR \$ 566

TOTAL INTERIOR 0

ACCESS CONTROL 100

---

SUBTOTAL \$ 666

CONTINGENCY @ 10% 67

---

SUBTOTAL \$ 733

CONTRACTOR OVERHEAD & PROFIT @ 50% 367

---

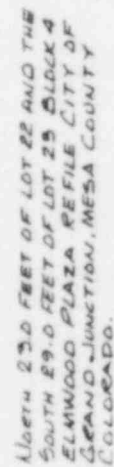
GRAND TOTAL \$ 1,100

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RR083085

REA02178/REA-621/LMR

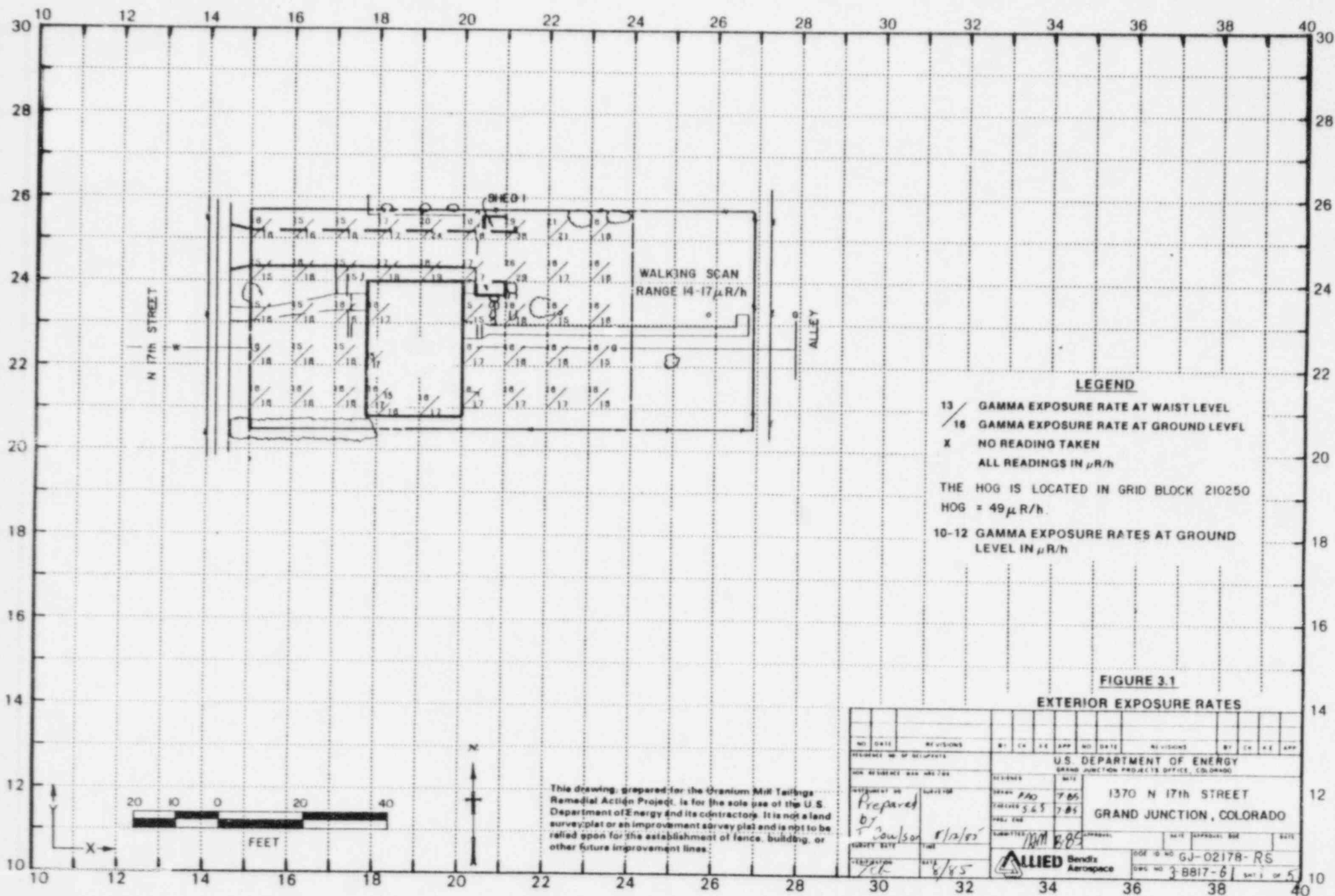


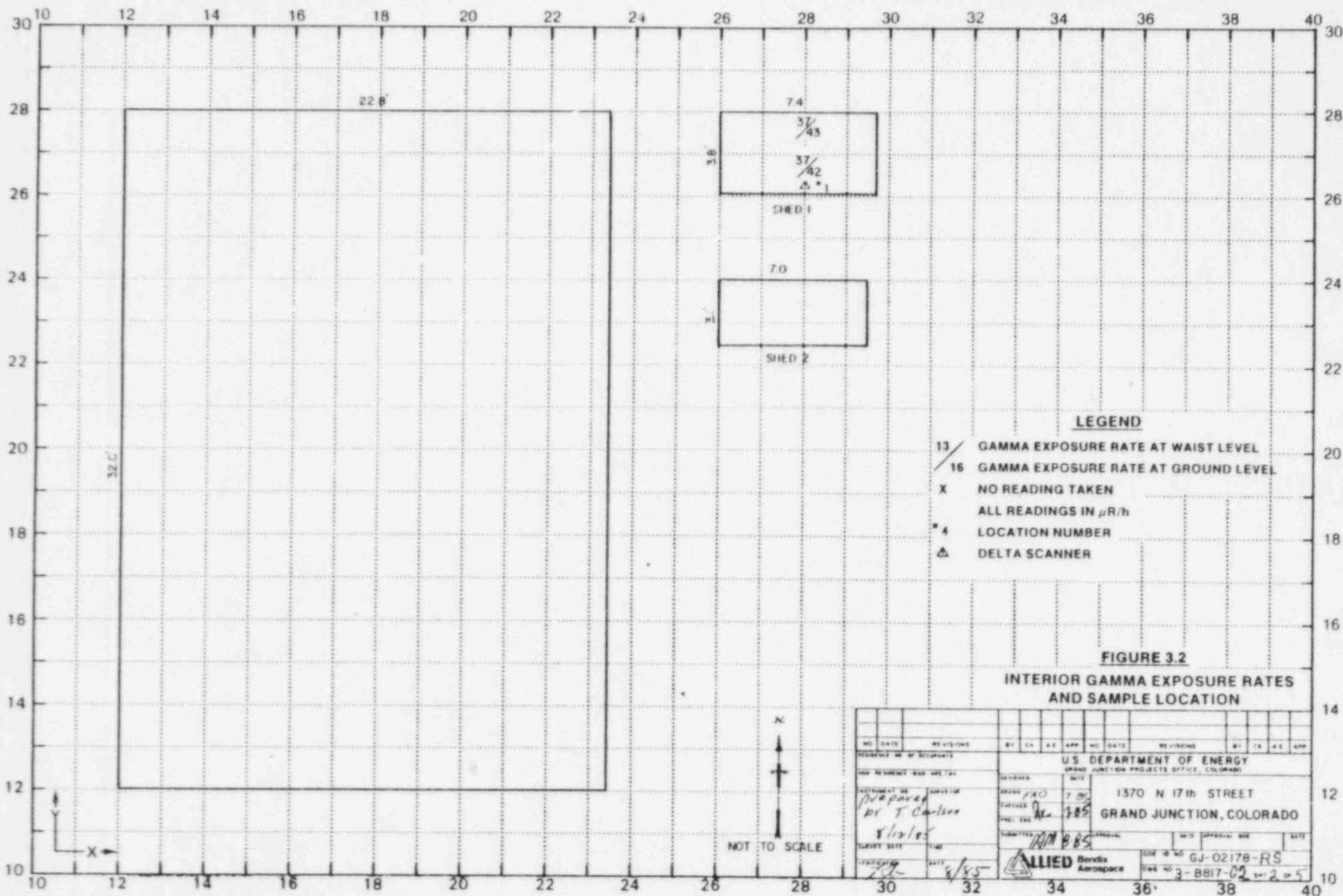


**FIGURE 2.2 SITE PLAN**

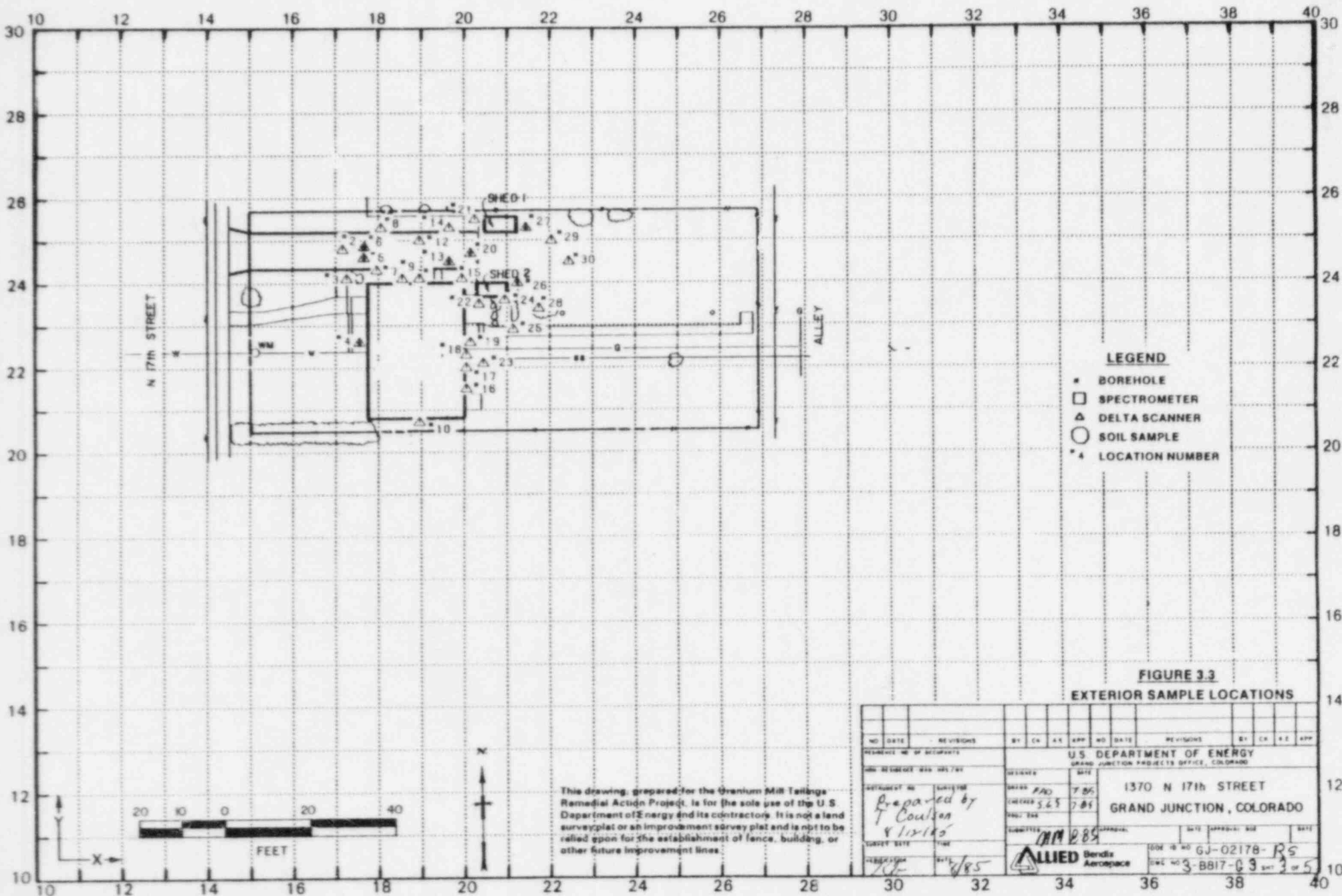
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECT OFFICE, CO. COLORADO	DOE IO NO JJ 02178 B3
ADDRESS 1370 N 17TH STREET GRAND JUNCTION, COLORADO	ALUMED 1000 Made with 100% Recycled Paper
SURV 268 7-11-45	ON 268 7-11-45
PARITING NO 3. C 2917 F1	SHEET

This drawing, prepared for the UNESCO MAB Tallahassee River/Florida National Project, is for the site one of the U.S. Geological Survey's National Wetlands Inventory. It is not a land survey plan or an improvement survey plan and is not to be used for the establishment of survey, building, or other claims or improvements.









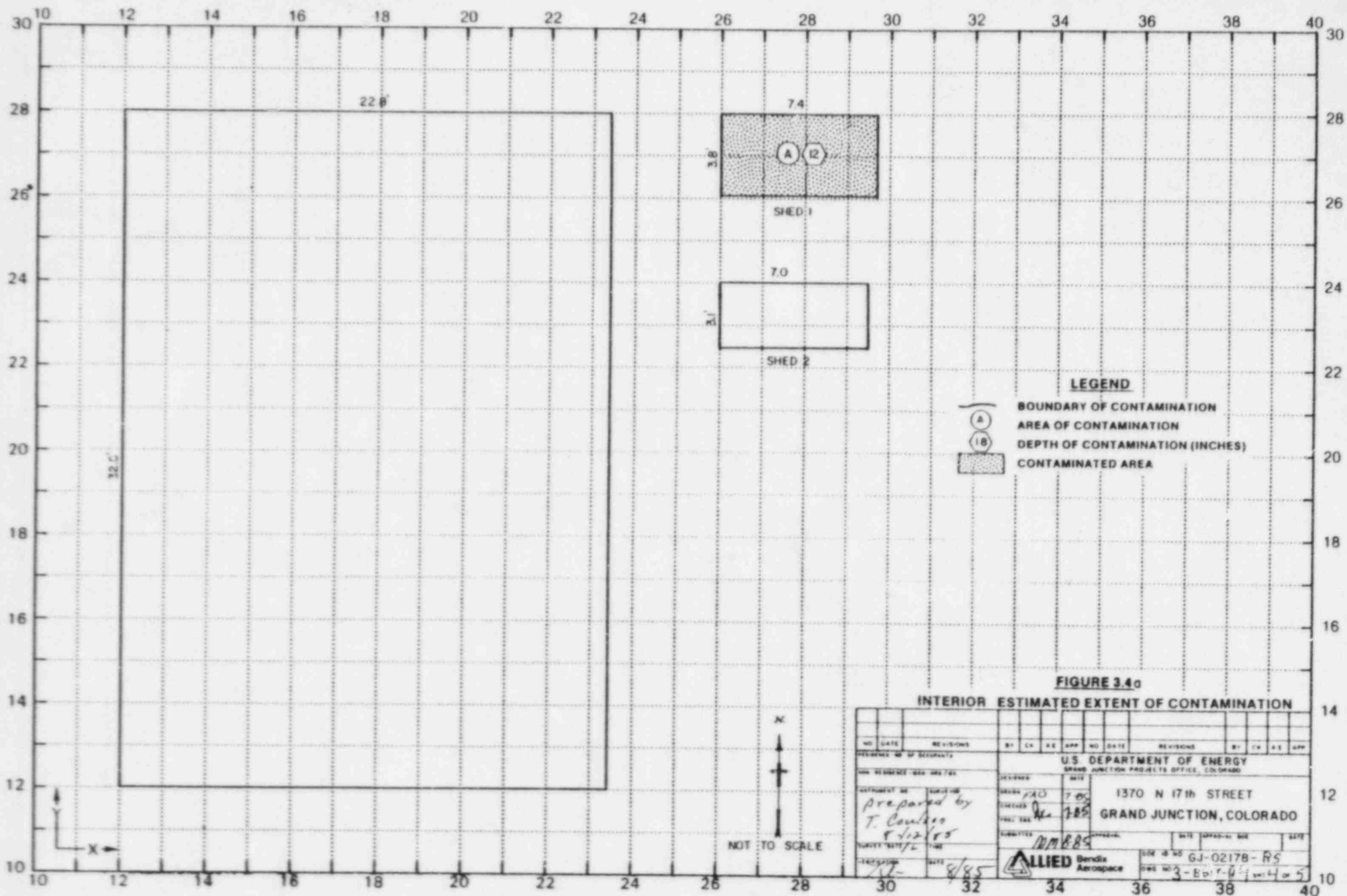
# **LEGEND**

- \* BOREHOLE
- SPECTROMETER
- △ DELTA SCANNER
- SOIL SAMPLE
- \* LOCATION NUMBER

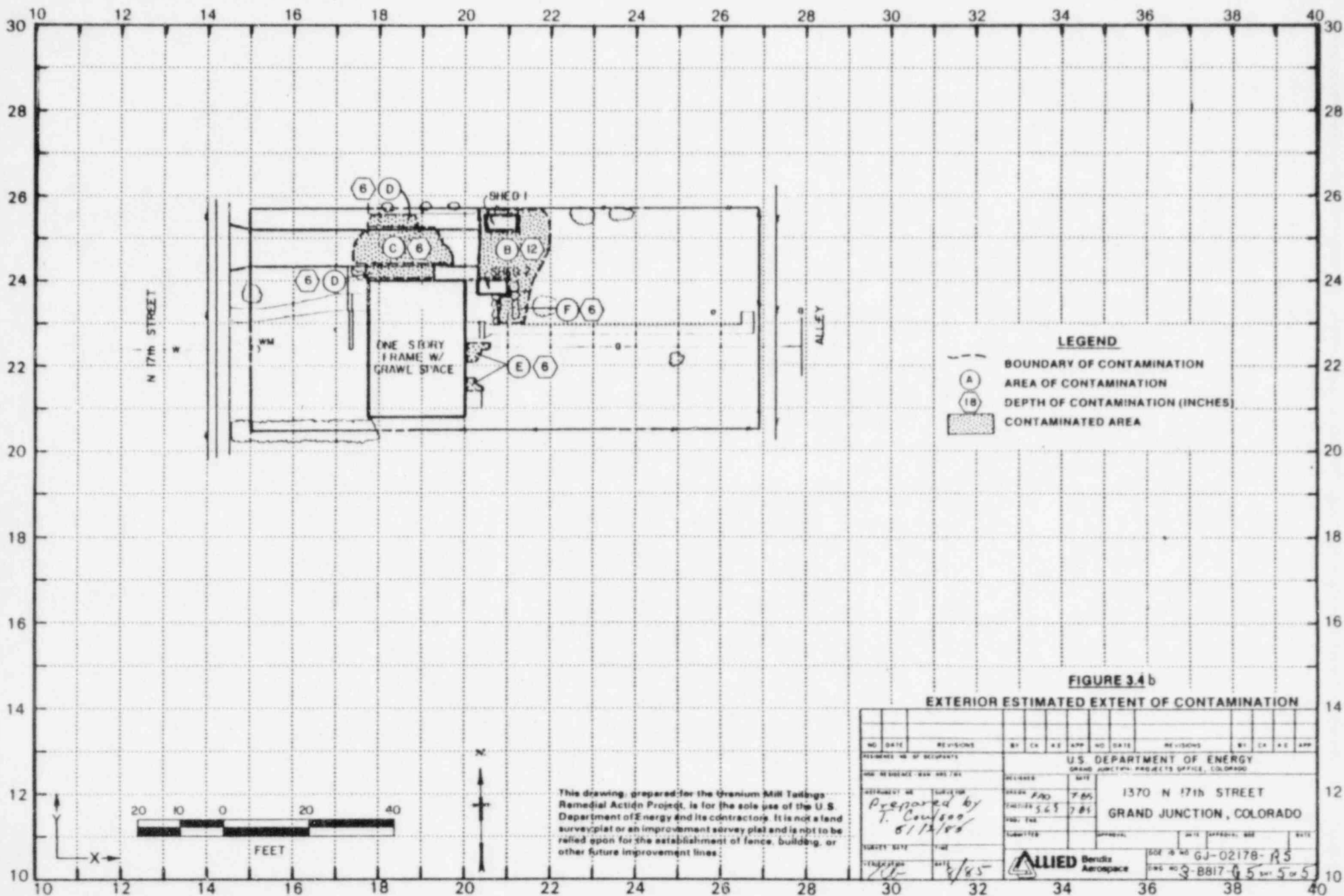
**FIGURE 3.3**

## **EXTERIOR SAMPLE LOCATIONS**

NO.	DATE	REVISIONS	BY	CHK	APP	NO.	DATE	REVISIONS	BY	CHK	APP
REFERENCE NO. OF DEPARTMENTS						U.S. DEPARTMENT OF ENERGY					
DATE RECEIVED AND DEL. BY						GRAND JUNCTION PROJECTS OFFICE, COLORADO					
DESIGNER			DATE			DESIGNER			DATE		
CHECKED			DATE			CHECKED			DATE		
DRAWN			DATE			DRAWN			DATE		
SUBMITTER			DATE			SUBMITTER			DATE		
TARGET SITE			DATE			TARGET SITE			DATE		
APPROVED			DATE			APPROVED			DATE		
<p>Prepared by T. Coulton &amp; L. L. L. L.</p>						<p>1370 N 17th STREET GRAND JUNCTION, COLORADO</p>					
<p>ALLIED</p>						<p>DOE IS NO GJ-02178-RS SHE NO 3-BB17-09 SET 3 OF 5</p>					







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

3/85

DOE ID NO. GJ-02178-R5

Date 8/21/85

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

Official Survey Report

Property Address 1370 North 17th Street

Property Owner Ted J. Carrico

Address of Owner (if different from above) P.O. Box 2, Palisade, Colo.

Report Prepared By Terry Coulson

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 = 12 (ORNL) uR/h  
HOG = 49 uR/h

MEMORANDUM

ALLIED Bendix  
Aerospace

Bendix Field Engineering Corporation  
Grand Junction Operations  
Grand Junction, Colorado

Date: August 6, 1985

To: Files

From: Terry Coulson

Subject: Team Leader Notes - GJ-02178-RS

Address: 1370 North 17th Street

Owner: Ted J. Carrico  
P.O. Box 2  
Palisade, Colorado

Occupancy: One

Team Members

T. Coulson (Team Leader)	P. Hardy
V. Rothman	S. Larsen
M. Duran	

Instruments

See Equipment Summary sheet

Oak Ridge National Laboratory (ORNL) data indicates contamination in the east portion of the driveway and in the yard northeast of the house.

The utility lines were located in the crawl space, corresponding locations were taken in the yard. Even though the new sewer line was obvious, it was not drawn on any of the maps by the surveyors. Team members augered adjacent to the clean out.

A walking scan was performed in the back section of the east yard.

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The tenant is concerned about dust particles during construction. He inquired about what measures would be taken to protect the inside of the house.

Locations of downhole scintillometer data:

Location 176226 - range 140 to 185 cps - water line at 39 inches  
Location 190241 - range 175 to 180 cps - north foundation at 24 inches  
Location 205221 - range 180 to 200 cps - sewer line at 36 inches  
Location 201223 - range 160 to 205 cps - gas line at 30 inches  
Location 172248 - range 130 to 150 cps - driveway at 12 inches

The survey was completed at 11:45 AM.

All team members were alpha scanned before leaving the property.

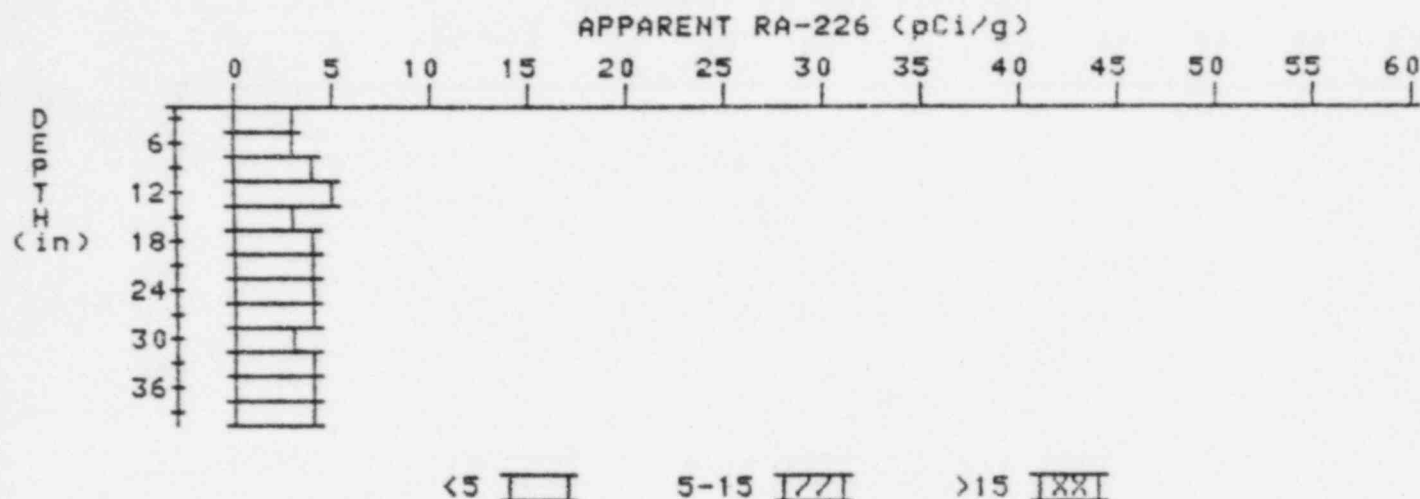
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

4

PROPERTY NUMBER: GJ-02178-RS

HOLE NUMBER: 4

LOCATION: 176226

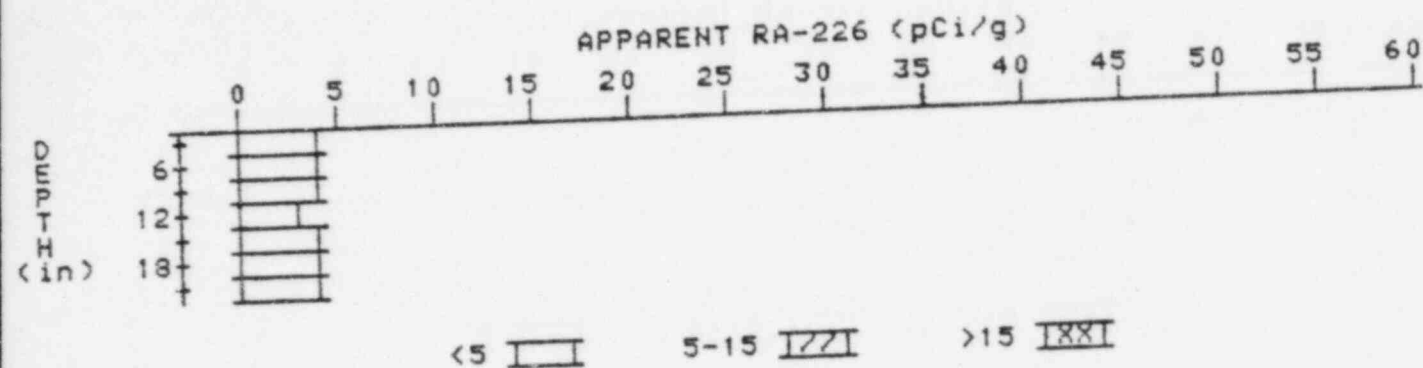


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.9	2.9
6	3.3	3.5
9	3.6	3.6
12	3.9	4.8
15	3.7	3.3
18	3.7	3.5
21	3.8	4.0
24	3.8	3.6
27	3.9	4.3
30	3.8	3.4
33	3.9	3.9
36	4.0	3.8
39	4.2	4.2

# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

5

PROPERTY NUMBER: GJ-02178-RS  
HOLE NUMBER: 5  
LOCATION: 177246



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.8	3.8
6	3.7	3.7
9	3.6	3.6
12	3.5	3.1
15	3.6	3.6
18	3.7	3.9
21	3.7	3.7

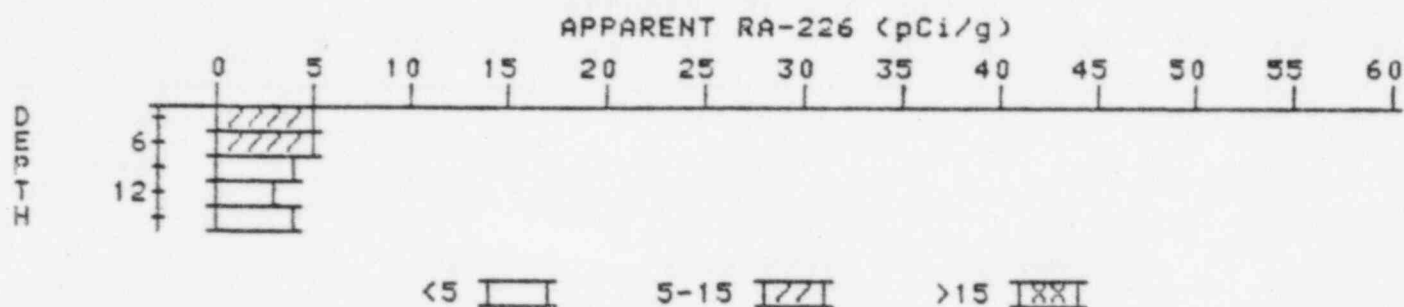
# APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

6

PROPERTY NUMBER: GJ-02178-RS

HOLE NUMBER: 6

LOCATION: 179246

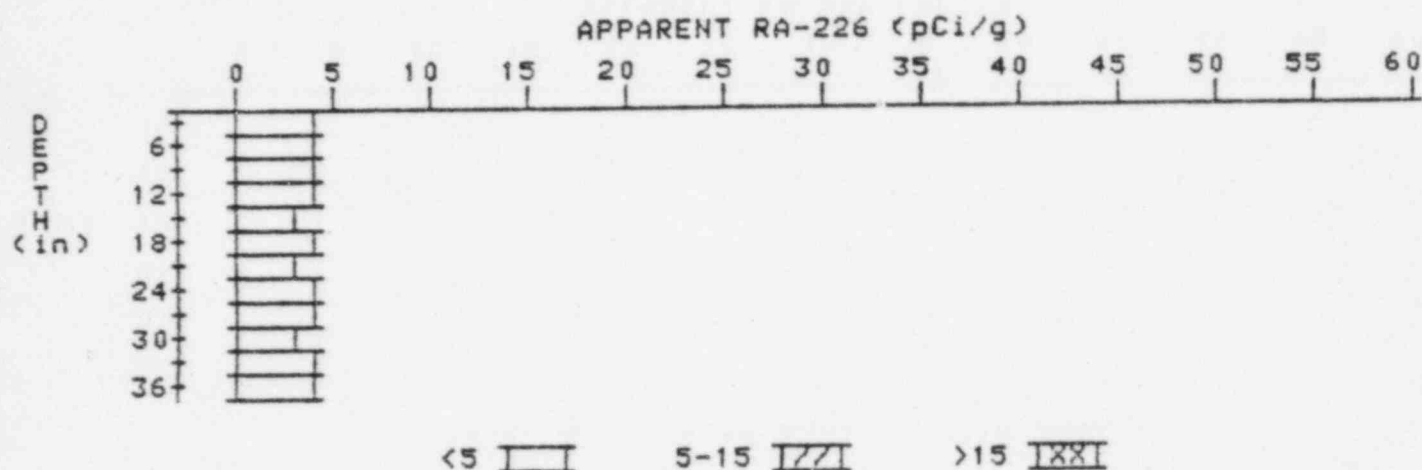


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.0	5.0
6	4.8	5.3
9	4.3	4.3
12	3.8	2.9
15	3.8	3.8

# APPARENT RADIUM-226 CONCENTRATION 13

## DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02178-RS  
HOLE NUMBER: 13  
LOCATION: 197245

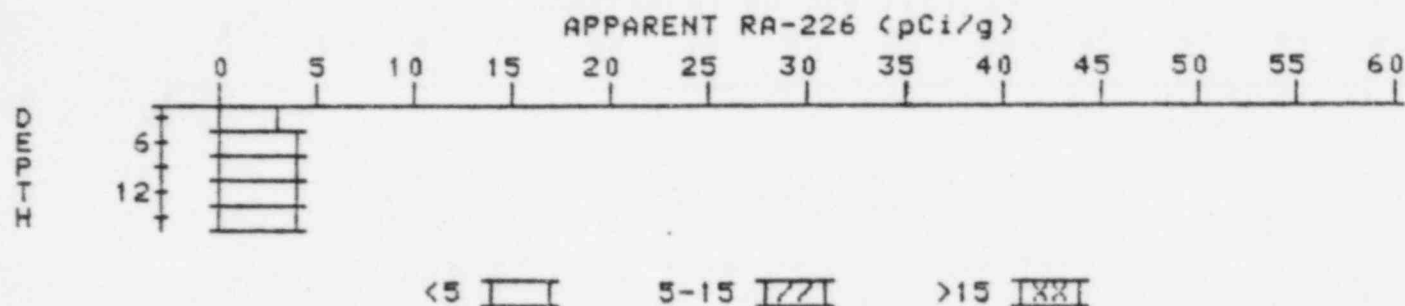


Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.7	3.7
6	3.9	4.3
9	3.9	4.3
12	3.7	3.5
15	3.6	3.4
18	3.6	3.6
21	3.6	3.4
24	3.7	3.7
27	3.8	4.2
30	3.7	3.3
33	3.8	3.8
36	3.9	3.9



# APPARENT RADIUM-226 CONCENTRATION 20 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02178-RS  
HOLE NUMBER: 20  
LOCATION: 202247



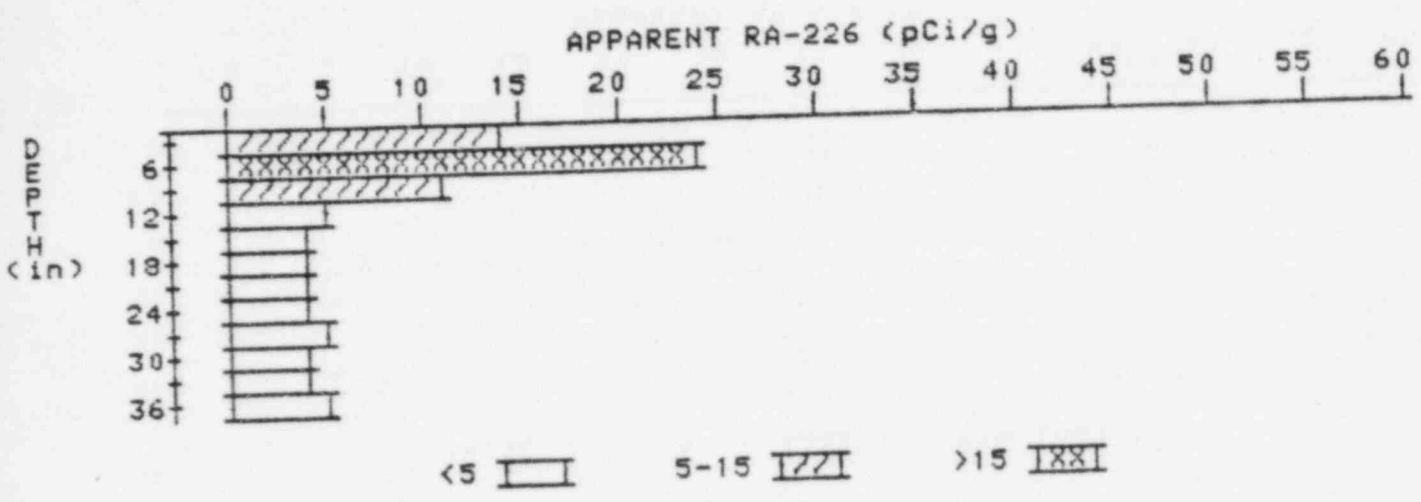
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.2	3.2
6	3.5	3.9
9	3.6	3.6
12	3.7	3.9
15	3.7	3.7

APPARENT RADIUM-226 CONCENTRATION

DECONVOLUTION GRAPH

26

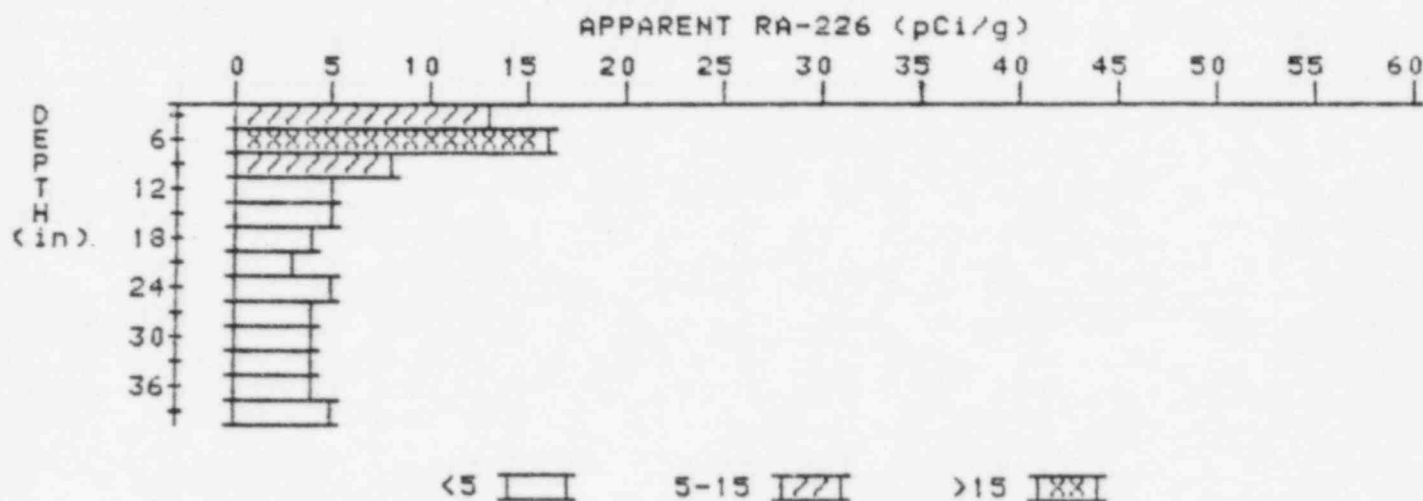
PROPERTY NUMBER: GJ-02178-RS  
HOLE NUMBER: 26  
LOCATION: 213240



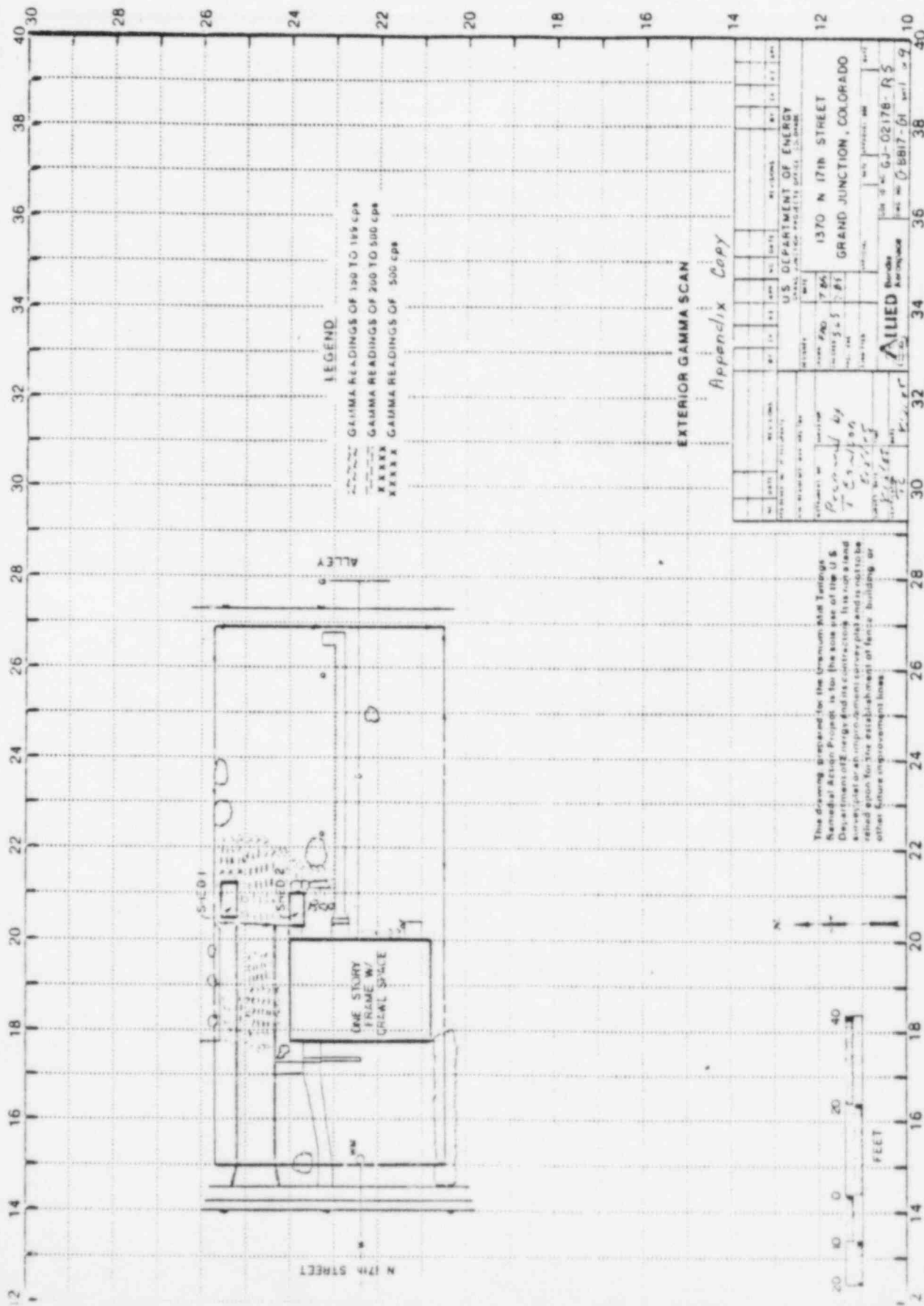
Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	14.3	14.3
6	15.4	24.5
9	11.4	10.7
12	7.8	4.8
15	5.9	4.1
18	5.0	4.3
21	4.5	4.0
24	4.3	3.8
27	4.4	4.6
30	4.4	4.4
33	4.4	3.9
36	4.7	4.7

# APPARENT RADIUM-226 CONCENTRATION 27 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02178-RS  
HOLE NUMBER: 27  
LOCATION: 215253



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	13.0	13.0
6	12.2	16.3
9	9.1	7.9
12	6.7	4.6
15	5.5	5.0
18	4.6	3.7
21	4.2	3.3
24	4.3	4.7
27	4.2	3.8
30	4.3	4.5
33	4.3	4.1
36	4.4	4.4
39	4.5	4.5



**U.S. DEPARTMENT OF ENERGY**  
 OFFICE OF ENVIRONMENTAL AND SAFETY ADMINISTRATION  
 1370 N 17th STREET  
 GRAND JUNCTION, COLORADO

**ALLIED** (Logo)  
 1370 N 17th STREET  
 GRAND JUNCTION, COLORADO

Project No. GJ-02178-RS  
 Date: 08/17-61

Scale: 1" = 40'

Drawn by: [Signature]  
 Checked by: [Signature]  
 Date: 8/17/61