

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-01167-RM
ADDRESS: 626 GUNNISON AVENUE

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

M. K. Tucker

M. TUCKER
DOE PROJECT ENGINEER

DATE

August 16, 1985

REA01167:REA-707

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
1.0 EXECUTIVE SUMMARY	1
1.1 Introduction	1
1.2 Evaluation and Recommendation	1
2.0 PROPERTY DESCRIPTION	2
2.1 General Description	2
2.2 Existing Facilities and Structures	2
3.0 RADIOLOGIC SURVEY	4
3.1 Introduction	4
3.2 Gamma Exposure-Rate Surveys	4
3.2.1 Exterior Findings	4
3.2.2 Interior Findings	4
3.3 Boreholes, Soil Samples, and Other Measurements	4
3.4 Radon/Radon Daughter Concentration	5
3.5 Extent of Contamination	5
4.0 RECOMMENDED REMEDIAL ACTION	6
4.1 Decontamination and Restoration	6
4.2 Evaluation of Recommended Remedial Action	6
5.0 REFERENCES	7
6.0 APPENDIX	8

1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-01167-RM, is two single-family residences located at 626 Gunnison 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, 1 cu. yd.; interior, 3 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$557. Remedial action on this property will take approximately 3 days to complete.

After reviewing the CDH files concerning this property, there appears to be no duplication of clean-up efforts with work previously performed by CDE under GJRAP nor conflict with UMTRAP Legislation, Section 102, Paragraph A, Subparagraph C.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 626 Gunnison Avenue, Grand Junction, Colorado

Zoning: Residential (RMF-32)

Lot Size: Approximately 7,500 sf (0.17 acres)

Legal Description: Lots 24 and 25, Block 39, 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:	Alley
South:	Gunnison Avenue
East:	Single-family residence
West:	Single-family residence

2.2 Existing Facilities and Structures

Primary Structure: House 2

Type:	Single-story residence
Size:	Approximately 1,050 sf
Construction Date:	1905
Construction:	Wood-frame
Foundation:	Concrete wall on spread footing
Footing Depth:	Approximately 80" to bottom of footing from grade at basement, 24" at crawlspace
Basement:	Yes - north half of structure
Crawl Space:	Yes - south half of structure
Condition:	Good

Secondary Structure:

House 2

Type: Single-story residence
 Size: Approximately 375 sf
 Construction Date: Unknown
 Construction: Wood-frame
 Foundation: Concrete wall on spread footing
 Footing Depth: Not determined
 Basement: None
 Crawl Space: Yes
 Condition: Fair

Other Structures:

Type: Garage
 Size: Approximately 450 sf
 Construction: Wood-frame
 Foundation: Concrete stemwall and mudsill
 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: Approximate 150 sf addition to north side of house.

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-01167-RM on June 18, 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 south of the garage and a small deposit northeast of the primary structure.

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: 13 to 17 uR/h
Highest Outside Gamma Reading (HOG): 33 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 16 uR/h
Highest Inside Gamma Reading (HIG): 16 uR/h

Interior radium-concentration measurements are presented in Appendix Table 3.2. Interior gamma exposure-rate measurements are summarized in Appendix Table 3.3. Appendix Figures 3.2a and 3.2b show interior exposure rates and locations of these measurements.

3.3 Boreholes, Soil Samples, and Other Measurements

Areas which displayed elevated gamma levels were further investigated; these areas are shown in Appendix Figures 3.2a, 3.2b, and 3.3. Data from these investigations are 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: North of House 2
Other Directions: Interior of garage
Total Depth of Contamination: 6 inches
Comments: The garage is divided into two rooms, one has a concrete floor, the other has dirt floor.
Approximate Square Footage: 144

(Area B) Surface Material: Soil
Direction From Primary Structure: North of House 2
Other Directions: South side of garage
Total Depth of Contamination: 6 inches
Approximate Square Footage: 45

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-01167-RM, 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

This property has been included for remedial action based on ORNL soil sample S4 of 82 pCi/g.

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 \$557.

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 Office, 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 Grid-Point Exposure Rates
Figure 3.2a	Interior Gamma Exposure Rates and Sample Locations
Figure 3.2b	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-01167-RM

626 Gunnison Avenue

Page 1 of 4

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
17	126250	00	DS	1.9		*	Northwest of garage
18	128270	00	DS	2.3		*	North side of garage
19	129290	00	DS	1.7		*	North side of garage DC = 0 inches
		03	TC	2.9		*	
		06	TC	3.1		*	
		09	TC	3.2		*	
		12	TC	3.1		*	
		15	TC	3.2		*	
		18	TC	3.1		*	
		21	TC	3.1		*	
		24	TC	3.1		*	
		27	TC	3.0		*	
		30	TC	2.9		*	
20	150273	00	DS	2.3		*	Southwest corner of garage DC = 0 inches
		03	TC	3.4		*	
		06	TC	4.0		*	
		09	TC	4.6		*	
		12	TC	4.6		*	
		15	TC	4.3		*	
		18	TC	4.1		*	
		21	TC	3.9		*	
		24	TC	3.8		*	
21	150280	00	DS	3.4		*	South of garage DC = 6 inches Based on all available data
		03	TC	4.2		*	
		06	TC	4.6		*	
		09	TC	4.4		*	
		12	TC	4.0		*	
		15	TC	3.7		*	
		18	TC	3.5		*	
		21	TC	3.4		*	
		24	TC	3.3		*	
22	151287	00	DS	2.6		*	South of garage DC = 6 inches Based on all available data
		00	GS		3.2	*	
		03	TC	3.6		*	
		06	TC	4.0		*	
		09	TC	4.1		*	
		12	TC	3.9		*	
		15	TC	3.8		*	
		18	TC	3.6		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-01167-RM

626 Gunnison Avenue

Page 2 of 4

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
22	151287	21	TC	3.5		*	
		24	TC	3.4		*	
		27	TC	3.3		*	
23	151291	00	DS	7.0		*	Southeast corner of garage
		03	TC	7.3		*	
		06	TC	8.7		*	
		09	TC	5.5		*	DC = 6 inches Based on all available data
		12	TC	4.1		*	
		15	TC	3.7		*	
		18	TC	3.5		*	
		21	TC	3.4		*	
		24	TC	3.3		*	
		27	TC	3.3		*	
		30	TC	3.3		*	
24	154275	00	DS	1.8		*	South of garage
		06	DS	1.7		*	
		12	DS	1.9		*	
25	154283	00	DS	2.0		*	South of garage
		03	TC	2.8		*	
		06	TC	3.1		*	DC = 0 inches
		09	TC	3.3		*	
		12	TC	3.3		*	
		15	TC	3.3		*	
		18	TC	3.4		*	
		21	TC	3.4		*	
		24	TC	3.4		*	
26	155289	27	TC	3.3		*	
		00	DS	1.5		*	South of garage
		03	TC	2.7		*	
		06	TC	3.0		*	DC = 0 inches
		09	TC	3.1		*	
		12	TC	3.2		*	
		15	TC	3.2		*	
		18	TC	3.2		*	
		21	TC	3.3		*	
		24	TC	3.3		*	
		27	TC	3.4		*	
		30	TC	3.4		*	
		33	TC	3.3		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-01167-RM

626 Gunnison Avenue

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.		
27	160263	00	DS	1.5		*	Gas line
		13	DS	<1.0		*	House 1
28	194262	00	DS	1.6		*	Gas line
		13	DS	<1.0		*	House 2
29	195274	00	DS	1.3		*	Sewer line
		03	TC	2.7		*	House 2
		06	TC	3.0		*	
		09	TC	3.3		*	DC = 0 inches
		12	TC	3.4		*	
		15	TC	3.5		*	
		18	TC	3.5		*	
		21	TC	3.5		*	
		24	TC	3.4		*	
		27	TC	3.3		*	
		30	TC	3.3		*	
		33	TC	3.4		*	
		36	TC	3.4		*	
		39	TC	3.2		*	
		42	TC	3.3		*	
		45	TC	3.3		*	
		48	TC	3.3		*	
		51	TC	3.4		*	
30	251279	00	DS	1.8		*	Water line
		03	TC	2.9		*	House 2
		06	TC	3.0		*	
		09	TC	3.2		*	DC = 0 inches
		12	TC	3.3		*	
		15	TC	3.3		*	
		18	TC	3.3		*	
		21	TC	3.3		*	
		24	TC	3.3		*	
		27	TC	3.3		*	
		30	TC	3.2		*	
		33	TC	3.2		*	
		36	TC	3.3		*	
		39	TC	3.2		*	
		42	TC	3.3		*	
		45	TC	3.3		*	
		48	TC	3.3		*	

Radium Concentrations at Exterior Locations

DOE ID #GJ-01167-RM

626 Gunnison Avenue

Page 4 of 4

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
31	260253	00	DS	<1.0		*	Southwest of House 2 Background
		00	GS		1.7	*	
		03	TC	2.8		*	
		06	TC	3.0		*	DC = 0 inches
		09	TC	3.1		*	
		12	TC	3.3		*	
		15	TC	3.2		*	
		18	TC	3.2		*	
		21	TC	3.2		*	
		24	TC	3.2		*	
		27	TC	3.2		*	
		30	TC	3.1		*	
		33	TC	2.9		*	

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 = 06-18-85
Team Leader = JH

Radium Concentrations at Interior Locations

DOE ID #GJ-01167-RM

626 Gunnison Avenue

Page 1 of 2

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	<1.0		*	Root cellar
2		00	DS	1.8		*	Basement Southeast corner
3		00	DS	1.2		*	Basement Northeast corner
4		00	DS	<1.0		*	Basement
5		00	DS	1.1		*	Basement
6		00	DS	<1.0		*	Center of storage room
7		[54]	DS	1.1		*	Stairwell wall
8		00	DS	1.1		*	Basement Southwest corner
9		00	DS	<1.0		*	Basement Northwest corner
10		00	DS	1.3		*	Landing
11		00-04	SS			1.4	Concrete core
		03	TC	2.8		*	Basement
		06	TC	3.1		*	
		09	TC	3.2		*	
		12	TC	3.1		*	DC = 0 inches
		15	TC	3.0		*	
		24	TC	2.9		*	
12		00	DS	13.1		*	Garage
		06	DS	2.2		*	
		03	TC	5.7		*	DC = 6 inches
		06	TC	5.8		*	Based on all
		09	TC	5.4		*	Available data

Radium Concentrations at Interior Locations

DOE ID #GJ-01167-RM

626 Gunnison Avenue

Page 2 of 2

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
12		12	TC	4.5		*	
		15	TC	4.0		*	
		18	TC	3.6		*	
		21	TC	3.5		*	
		24	TC	3.4		*	
		24	TC	2.9		*	
13		00	DS	1.2		*	On concrete inside garage
14		00	DS	1.3		*	Garage
		03	TC	2.7		*	Southwest corner
		06	TC	2.9		*	
		09	TC	3.1		*	DC = 0 inches
		12	TC	3.3		*	
		15	TC	3.2		*	
		18	TC	3.3		*	
		21	TC	3.2		*	
		24	TC	3.3		*	
		27	TC	3.3		*	
		30	TC	3.2		*	
		33	TC	3.1		*	
15		00	DS	1.4		*	Garage
		03	TC	2.8		*	Southwest corner
		06	TC	3.1		*	
		09	TC	3.2		*	DC = 0 inches
		12	TC	3.2		*	
		15	TC	3.2		*	
		18	TC	3.1		*	
		21	TC	3.0		*	
		24	TC	3.1		*	
		27	TC	3.1		*	
		30	TC	3.1		*	
16		00	DS	<1.0		*	On concrete inside garage

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 = 06-18-85
Team Leader = JH

Table 3.3
Summary of Interior Gamma Exposure Rates

DOE ID No. GJ-01167-RM 626 Gunnison Avenue 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)
House 1	*	*	*	*	14-16	*
House 2	*	*	*	*	13-15	*
Room A	05	17-18	18	05	17-18	18
Room B	05	17-19	18	05	18-19	18
Room C	04	18-19	18	05	18-19	18
Garage	05	16-18	17	05	17-20	18
Work Room	05	16-17	17	05	16-17	16

=====

* Walking gamma scans were performed to confirm the absence of interior contamination at this location. Exposure rates in basement rooms of house 2 and garage are shown in Appendix Figures 3.2a and 3.2b.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-01167-RM

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>
INTERIOR (Garage)					
	Contaminated Fill				
A	12 x 12 =	144	x 0.5 =	72	
				<hr/>	
	TOTAL VOLUME - INTERIOR			= 72	= 72/27 = 3
EXTERIOR					
	Contaminated Fill				
B	3 x 15 =	45	x 0.5 =	23	
				<hr/>	
	TOTAL VOLUME - EXTERIOR			= 23	= 23/27 = 1

See Appendix Figure 3.4a and 3.4b For Areas

=====

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-01167-RM

Page 1 of 1

INTERIOR (Garage)

Remove identified residual radioactive material 3 cy @ \$44/cy (manual-open)	\$ 132
Replace area with roadbase 3 cy @ \$11.50/cy	35
Shore exterior wall 15 lf @ \$3/lf	45
	<hr/>
SUBTOTAL INTERIOR	\$ 212

EXTERIOR

Remove identified residual radioactive material 1 cy @ \$14.50/cy (machine-open)	\$ 15
Replace area with topsoil 1 cy @ \$9.50/cy	10
	<hr/>
TOTAL EXTERIOR	\$ 25
TOTAL INTERIOR	212
ACCESS CONTROL	100
	<hr/>
SUBTOTAL	\$ 337
CONTINGENCY @ 10%	34
	<hr/>
SUBTOTAL	\$ 371
CONTRACTOR OVERHEAD & PROFIT @ 50%	186
	<hr/>
GRAND TOTAL	\$ 557

RR080785
REA01167/REA-707/AP



FIGURE 2.1
VICINITY MAP



LEGAL DESC.
 LOTS 24 AND 25
 BLOCK 39, WITHIN
 GRAND JUNCTION
 CITY LIMITS, MESA CO.

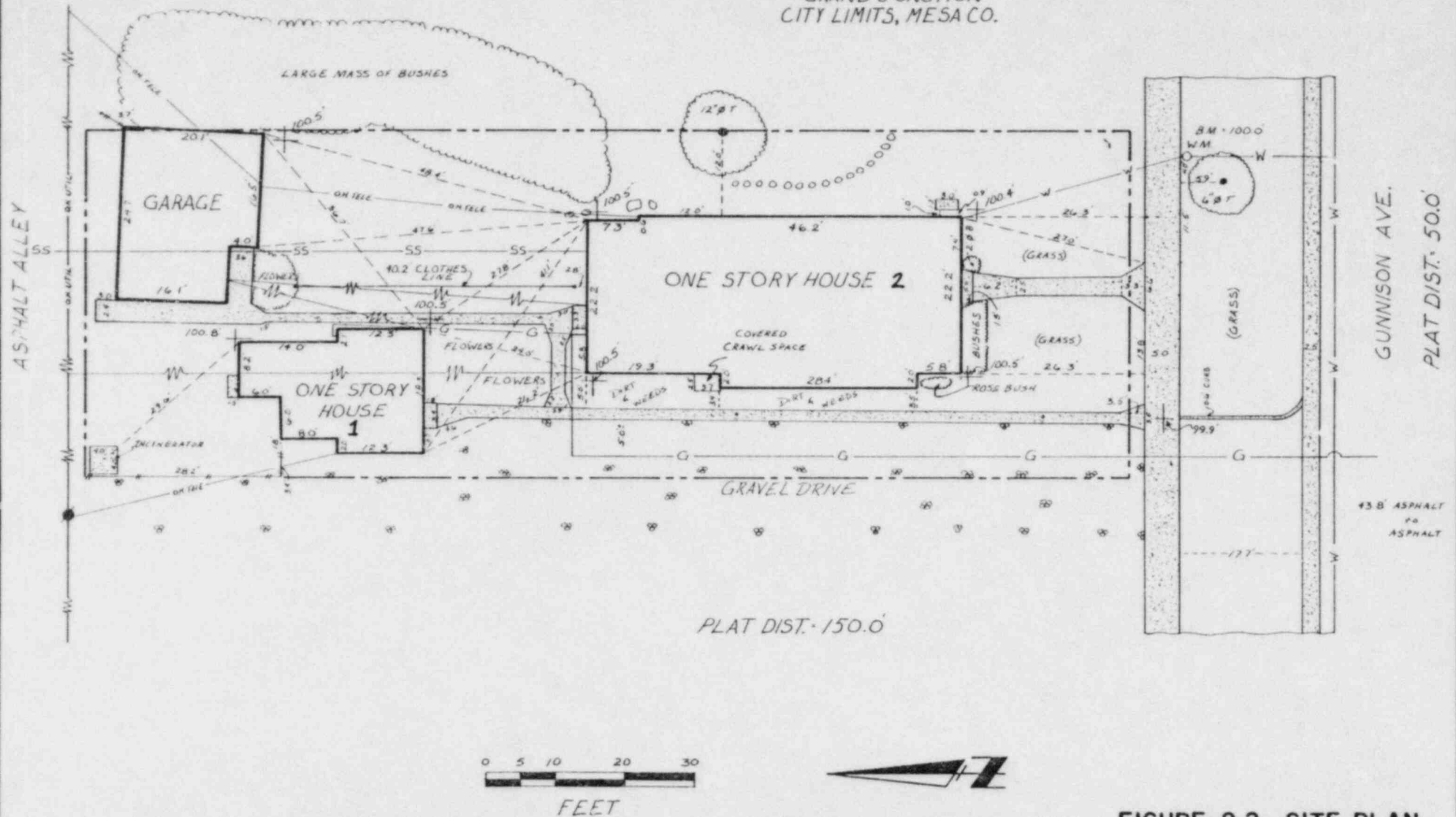



FIGURE 2.2 SITE PLAN

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 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.

U.S. DEPARTMENT OF ENERGY		DOI ID NO.
GRAND JUNCTION PROJECT OFFICE, COLORADO		CJ01167RM
ADDRESS 626 GUNNISON AVE.		
GRAND JUNCTION, CO.		
SURV GDE/6-3-85	DRAFT AGJ/6-9-85	CK A-2-4-85
DRAWING NO. JC 710 F1		SHEET 2 OF 2

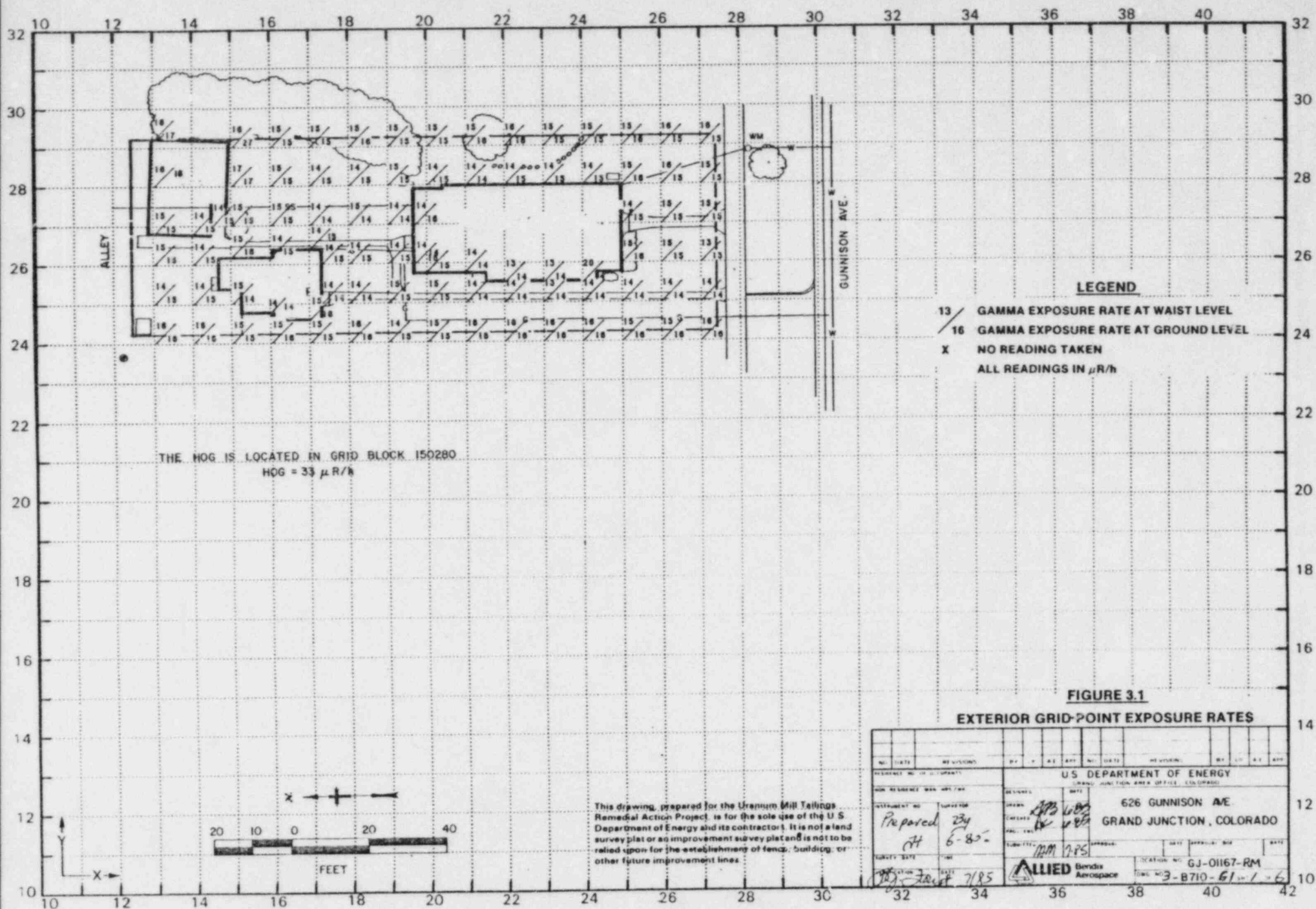
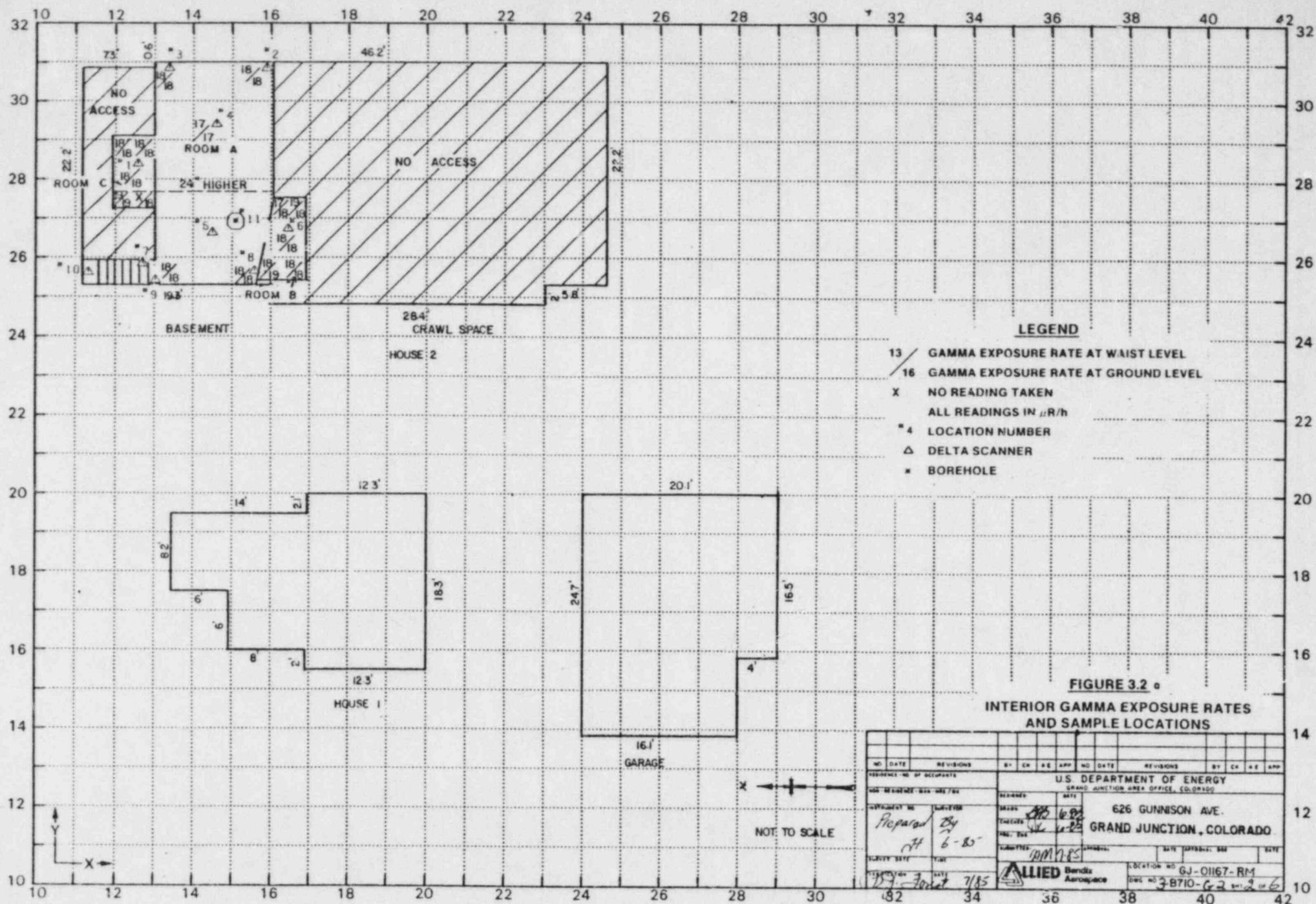
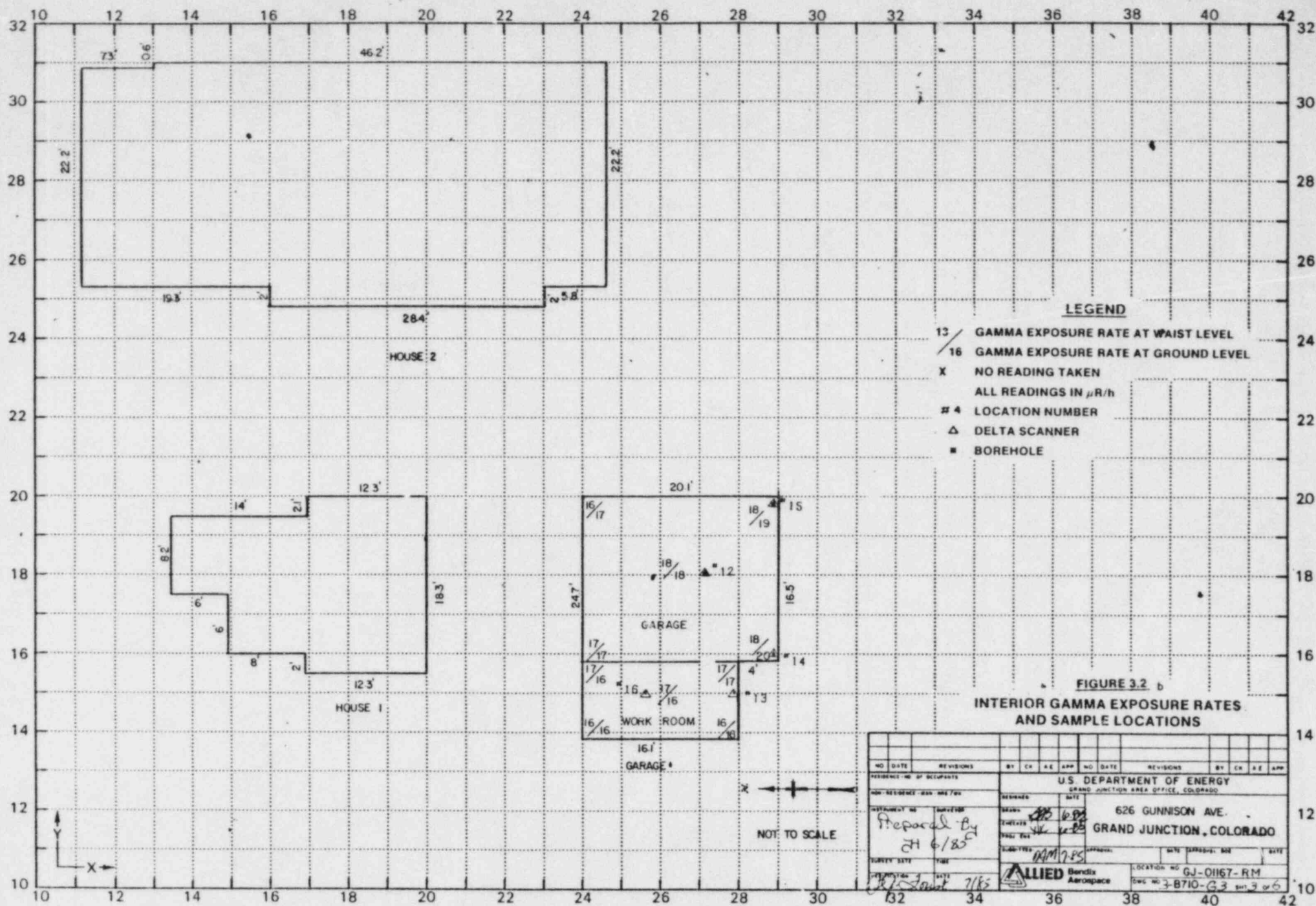


FIGURE 3.1

EXTERIOR GRID-POINT EXPOSURE RATES

NO. DATE		NO. DATE		NO. DATE		NO. DATE		NO. DATE	
U.S. DEPARTMENT OF ENERGY									
626 GUNNISON AVE. GRAND JUNCTION, COLORADO									
PREPARED BY JH 6-85		CHECKED BY JH 6-85		APPROVED BY JH 6-85		DATE 7-85		BY JH	
SURVEY DATE 7-85		BY JH		ALLIED Bendis Aerospace		LOCATION NO. GJ-01167-RM		DOW NO. 3-B710-61-1-6	



[illegible]

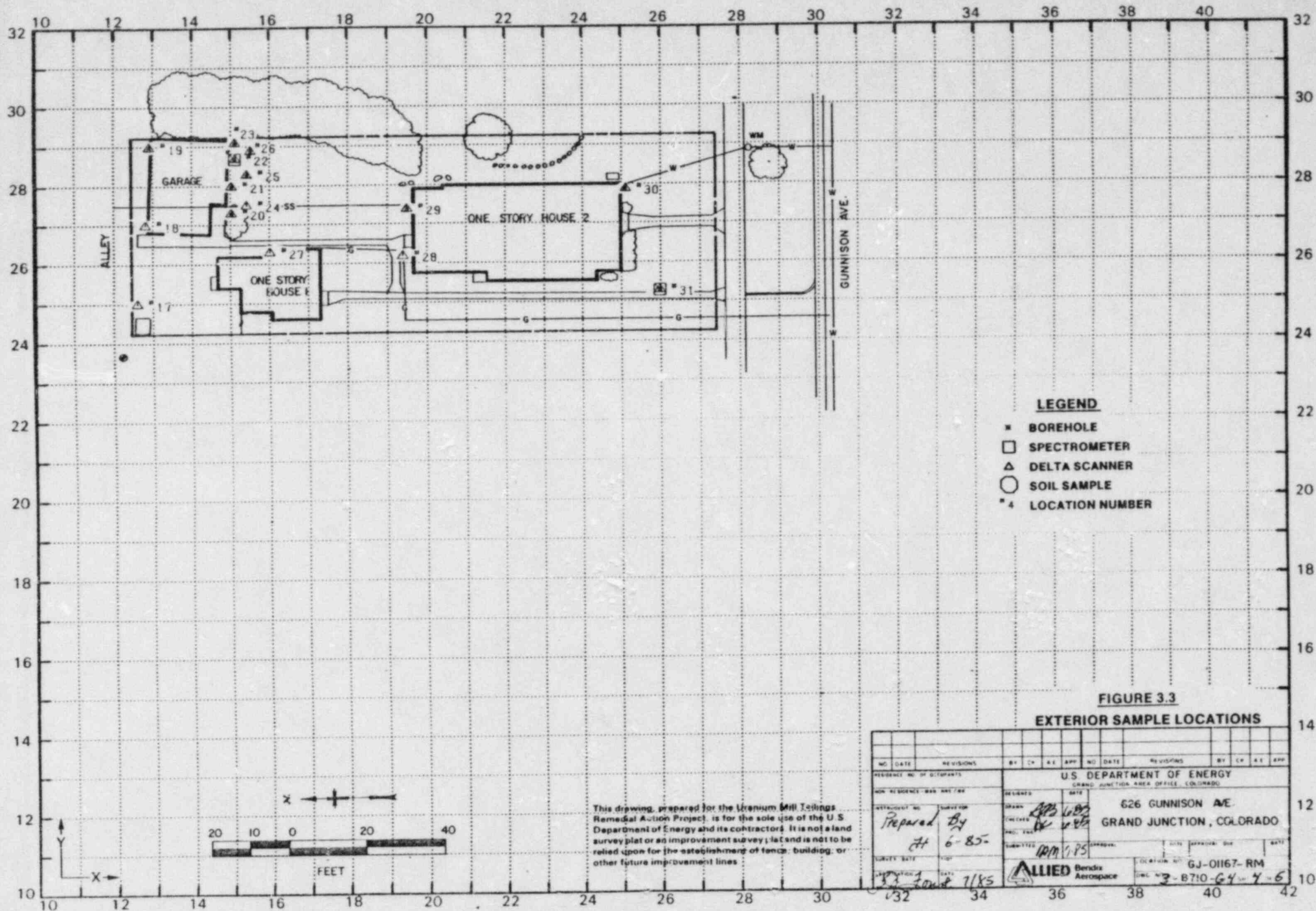
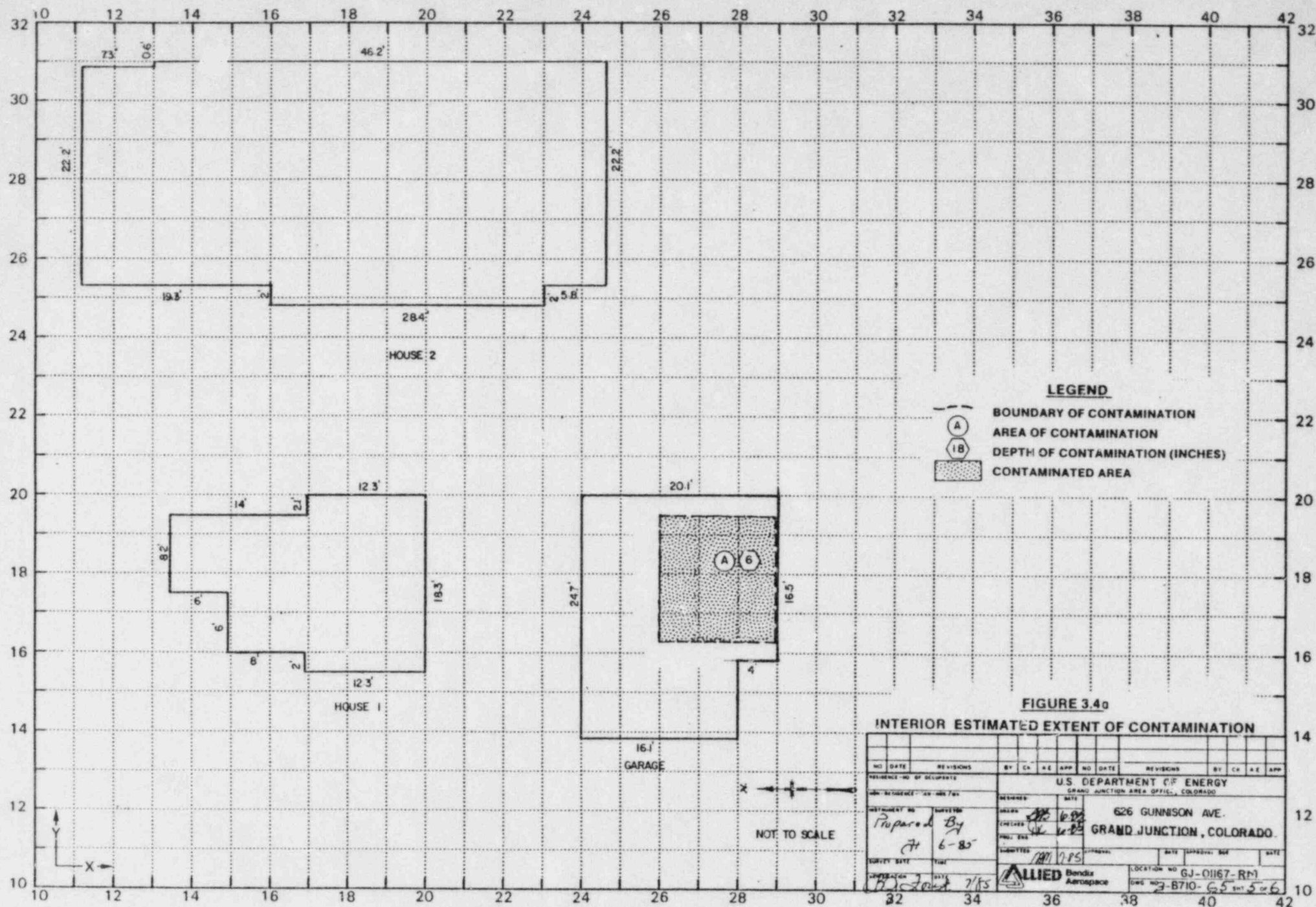


FIGURE 3.3

EXTERIOR SAMPLE LOCATIONS

NO. DATE REVISIONS BY CH. R.E. APP. NO. DATE REVISIONS BY CH. R.E. APP.			
RESIDENT NO. OF OCCUPANTS			
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO			
626 GUNNISON AVE. GRAND JUNCTION, COLORADO			
DRAWN BY JH 6-85		CHECKED BY JH 6-85	
DATE 6/1/85		DATE 6/1/85	
APPROVED BY JH 6-85		APPROVED BY JH 6-85	
ALLIED Bendix Aerospace		LOCATION NO. GJ-01167-RM	
32 34 36 38 40 42		32 34 36 38 40 42	



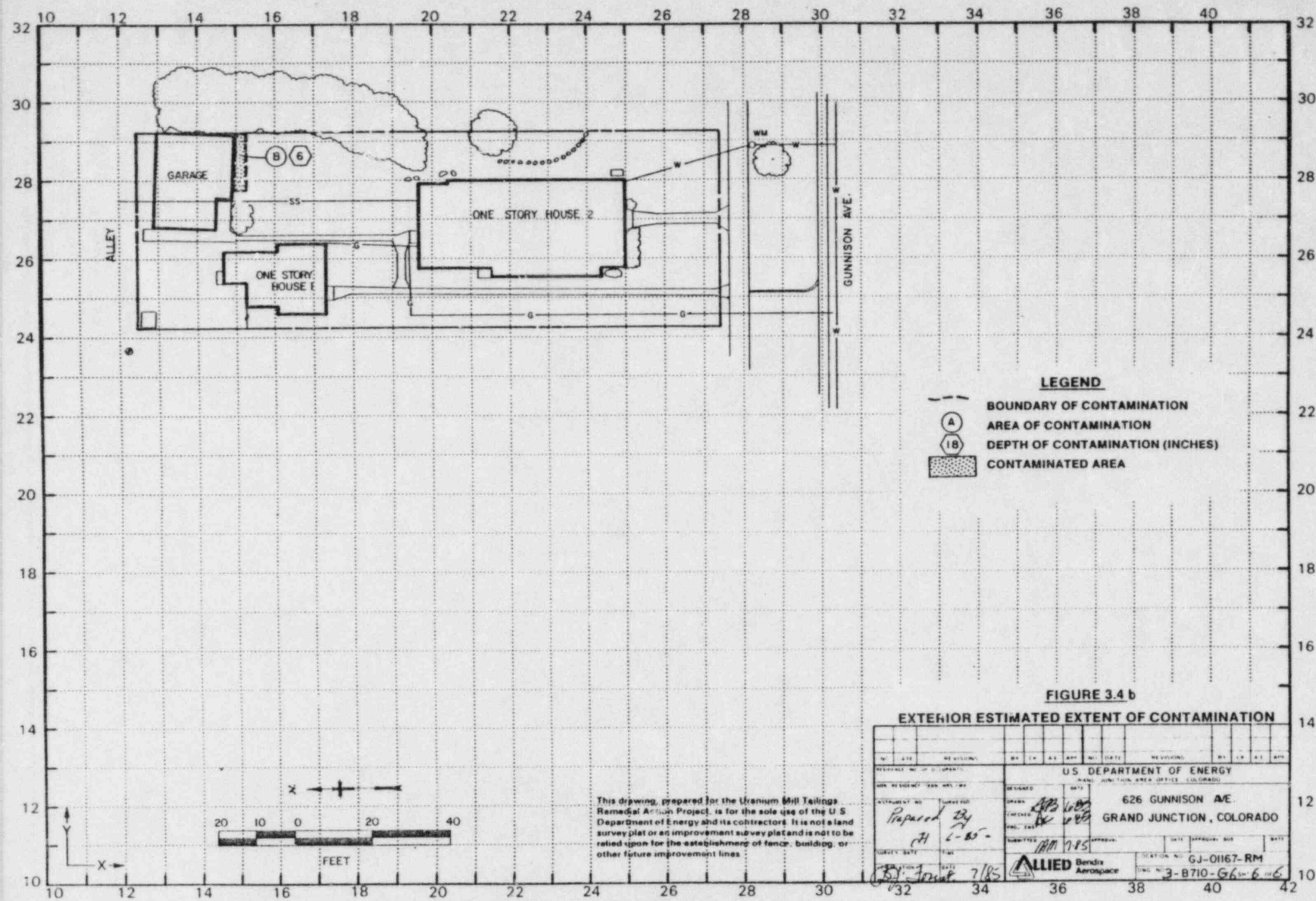


FIGURE 3.4 b

EXTERIOR ESTIMATED EXTENT OF CONTAMINATION

EXTENSION ESTIMATED EXTENSION CONFIRMATION												12		
NO. 6-12		RE-CLASS.		BY 1-4		DATE 6-12		RE-CLASS.		BY 1-4		DATE		12
RECEIVED NO. OF COPIES				U.S. DEPARTMENT OF ENERGY								12		
MAIN RESIDENCY FOR MAILING				NAME, JUNCTION AREA OFFICE, COLORADO								12		
ATTACHMENT NO.				DESIGNED		DATE		626 GUNNISON AVE.				12		
Prepared By				DRAWN		DATE		GRAND JUNCTION, COLORADO				12		
7-1-85				CHECKED		DATE						12		
				APPROVED		DATE						12		
CURRENCY DATE				SUBMITTED		DATE		APPROVED				12		
7/1/85				7/1/85								12		
ALLIED Bendix Aerospace				LOCATION NO.				GJ-01167-RM				10		
3-8710-G6				CIRCUIT NO.				3-8710-G6				10		

3/85

DOE ID NO. GI-01167-RM Date July 3, 1985

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

Official Survey Report

Property Address 626 Gunnison Ave. Grand Junction, Colorado
Property Owner Mrs. Dorothy McCollom
Address of Owner (if different from above) 1063 Park, Meeker, Colorado
Report Prepared By Jana Hebel

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

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

☒ 1 Residual radioactive materials found at the following locations:

☐ 1 In open areas.

☐ 1 Under or around exterior improvements.

☒ 1 Under or around a typically nonoccupied structure.

☐ 1 Under or around a typically occupied structure.

II. RESULTS OF RADIOLOGIC ASSESSMENT

☐ 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 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, CJ/CDH
J. Themelis, Mgr. UMTRA Proj. Off.

HIG = 16 uR/h
HOG = 33 uR/h

MEMORANDUM

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: June 19, 1985

To: Files

From: Juna Hebel

Subject: *Juna Hebel*
Team Leader Notes - GJ-01167-R11

Address: 626 Gunnison Avenue

Telephone: None

Occupancy: Two

Owner: Dorothy McCollom
1063 Park
Meeker, Colorado
878-5846

Date of Survey: June 18 and 19, 1985

Colorado Department of Health (CDH) and Oak Ridge National Laboratory (ORNL) data indicates contamination to be located in the yard and city sidewalk south of the primary structure.

Date: June 18, 1985, 1330 hours.

Weather: Hot and sunny (nice).

Team Members

J. Hebel (Team Leader)
D. Dow
D. Clay
M. Johnson

S. Southern
D. Bell
G. Larsen

Team Leader Notes
Juna Hebel
GJ-01167-RM
June 19, 1985
Page 2

Instruments

Scintillometers: C-1206, C-1236, C-3502, C-1158, C-3510, C-1184,
C-1214
Delta Scintillometers: C-3940, C-3936

The Bendix team arrived at 626 Gunnison approximately 1315 hours on June 18, 1985. The approval to survey was given by Mrs. McCollom at this time. Mrs. McCollom signed a consent form for access to conduct the survey. Mrs. McCollom bought this property the first part of May 1985, so a new consent form was needed. Mrs. McCollom lives and owns property in Meeker, Colorado. GJ-01167 was bought mostly for a winter home.

An interior gamma survey was performed on the ground floor of House 2. No elevated readings were discovered. A walking scan was also performed in the basement of the primary structure, elevated measurements were found. The basement floor has two different levels and two small rooms. One is a root cellar and the other is a storage area. The basement was further investigated by performing grid points and delta measurements.

Date: June 19, 1985, 0730 hours.

Weather: Nice and sunny.

Team Members

J. Hebel (Team Leader)	S. Southern
G. Larsen	M. Johnson

Instruments

Scintillometers: C-1115, C-1042
Surface Scintillometer: C-3431
Delta Scintillometer: C-4059
Total Count Meter: C-1062

Team Leader Notes
Juna Hebel
GJ-01167-RM
June 19, 1985
Page 3

In the basement a core was augered in the concrete floor, which was logged with a total count meter. The core was 4 inches thick and was used for a sample, which was sent to the analytical chemistry laboratory for analysis. The lab analysis showed no contamination in the concrete, nor did the total count logging or deltas. Elevated readings, that we discovered here, must have been geometry.

The crawl space was inaccessible.

An interior walking scan was performed on House 1. No elevated readings were discovered.

An interior walking scan was performed in the garage, elevated measurements were found. This area was further investigated by performing grid points, deltas, auger holes, and then logged with a total count meter.

The garage is divided by a wall into two sections, one is a small section with a concrete floor and the other is a larger section with a dirt floor.

On the exterior, the property was laid out in 10-foot by 10-foot grids. An exterior gamma scan and grid point survey was performed in order to verify or deny data taken by CDH and ORNL.

Elevated measurements were detected in the north yard and on the south side of the garage. These areas were further investigated by deltas, surface spectrometer measurements, and auger holes. The auger holes were logged with a total count meter.

Elevated readings went up to the property line, on the east side adjacent to the south side of the garage. Contamination does not spread to the adjacent property at this point.

Utility lines were investigated by auger holes, that were then logged with a total count meter.

A surface and subsurface delta was performed over and on top of the gas line of the primary structure and small house. No evidence of contamination was found around the utilities.

Team Leader Notes
Juna Hebel
GJ-01167-RM
June 19, 1985
Page 4

No evidence of foundation contamination was found around House 2, House 1, or the garage. The large section of the garage with the dirt floor has no foundation.

All work details and actions were performed in a safe manner. No accidents occurred while on the site. The team members were frisked for possible contamination, none was found on persons.

Team Leader Notes
Juna Hebel
GJ-01167-RM
July 23, 1985
Page 5

Revisit

Date: July 23, 1985

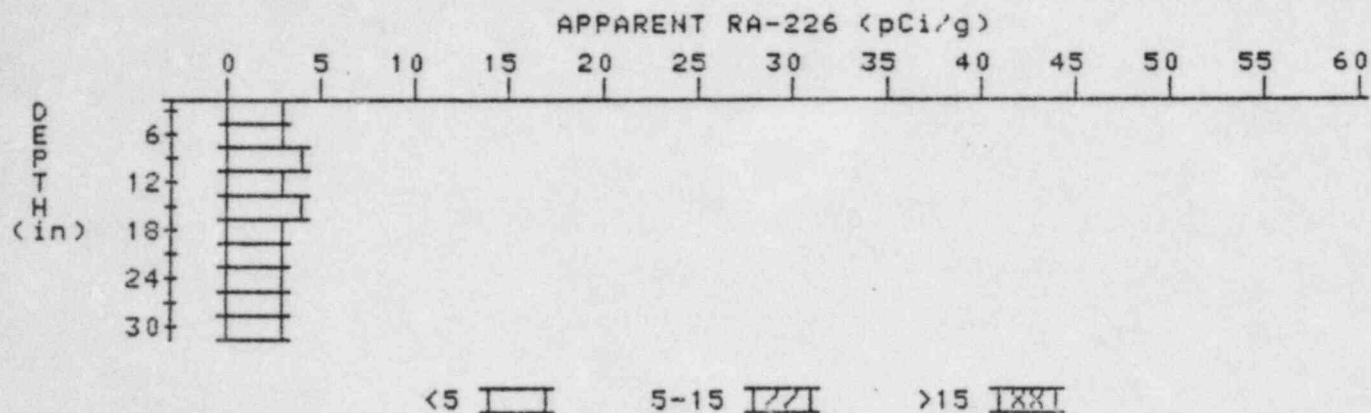
Purpose: Soil Samples

A soil sample was taken from Location 12 (interior) of the garage. The reason for this is to prove that contamination in the garage is infact tailings. This sample was sent to the Petrology Laboratory on 23 July 1985. I received the soil analysis result on 29 July 1985, it reads as follows: The XRD patterns of samples are very similar to the pattern for the Grand Junction mill tailings sample. There was also a soil sample taken from Location 22 (outside), south of the garage.

ORNL data showed a small deposit northeast of House 2. This area was scanned over several times, no deposit could be found at this location.

APPARENT RADIUM-226 CONCENTRATION 19 DECONVOLUTION GRAPH

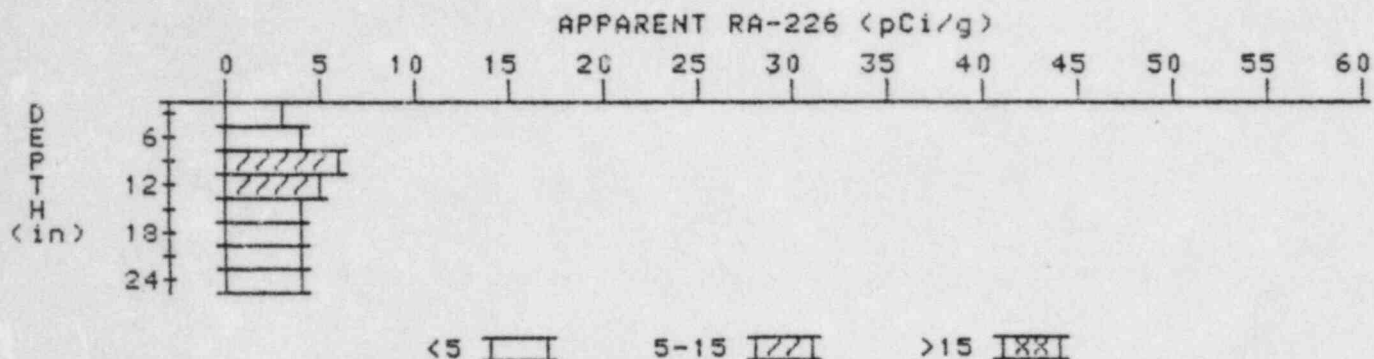
PROPERTY NUMBER: GJ-01167-RM
HOLE NUMBER: 19
LOCATION: 129290



Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	2.9	2.9
6	3.1	3.3
9	3.2	3.6
12	3.1	2.7
15	3.2	3.6
18	3.1	2.9
21	3.1	3.1
24	3.1	3.3
27	3.0	3.0
30	2.9	2.9

APPARENT RADIUM-226 CONCENTRATION 20 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01167-RM
HOLE NUMBER: 20
LOCATION: 150273



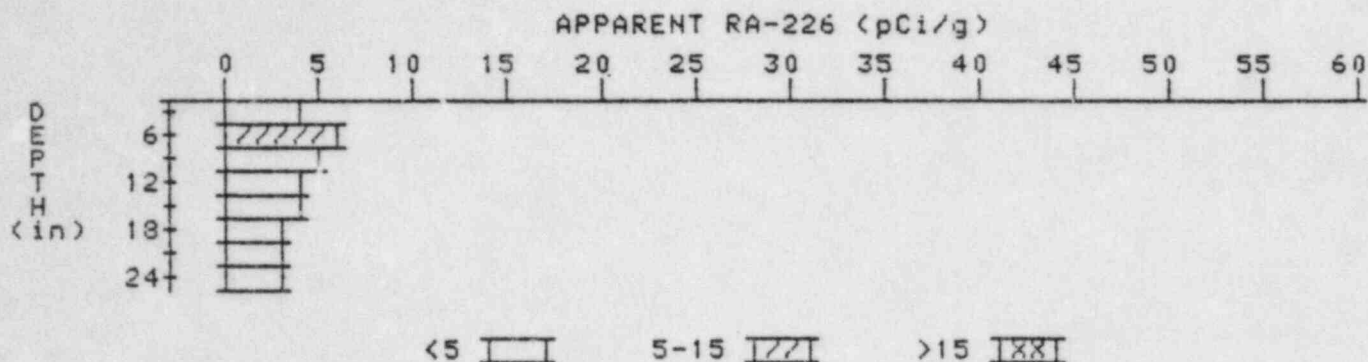
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.4	3.4
6	4.0	4.0
9	4.6	5.7
12	4.6	5.1
15	4.3	4.1
18	4.1	4.1
21	3.9	3.7
24	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION 21 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01167-RM

HOLE NUMBER: 21

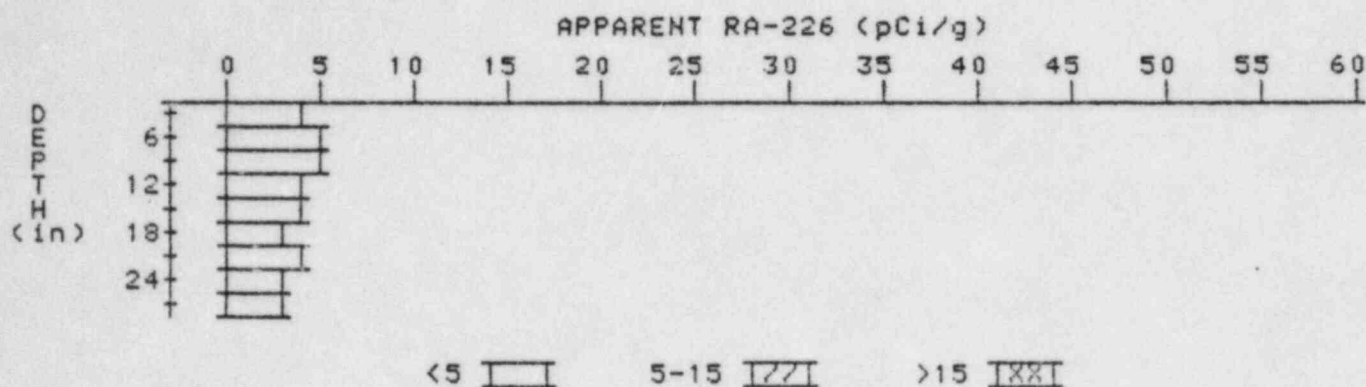
LOCATION: 150280



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.2	4.2
6	4.6	5.7
9	4.4	4.8
12	4.0	3.8
15	3.7	3.5
18	3.5	3.3
21	3.4	3.4
24	3.3	3.3

APPARENT RADIUM-226 CONCENTRATION 22 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01167-RM
HOLE NUMBER: 22
LOCATION: 151287



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.6	3.6
6	4.0	4.5
9	4.1	4.6
12	3.9	3.7
15	3.8	4.0
18	3.6	3.4
21	3.5	3.5
24	3.4	3.4
27	3.3	3.3

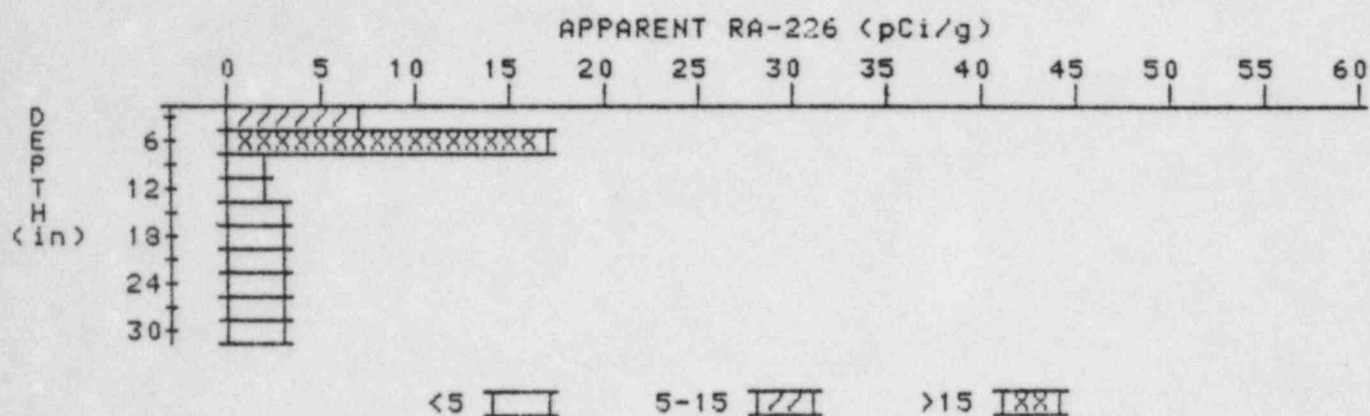
APPARENT RADIUM-226 CONCENTRATION 23

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01167-RM

HOLE NUMBER: 23

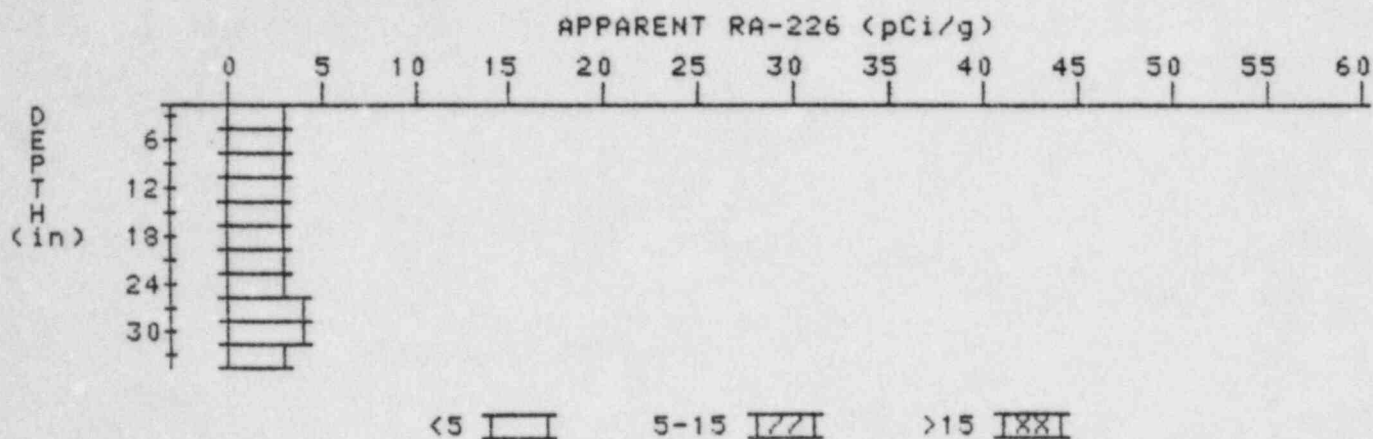
LOCATION: 151291



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	7.3	7.3
6	8.7	16.9
9	5.5	2.3
12	4.1	2.3
15	3.7	3.3
18	3.5	3.3
21	3.4	3.4
24	3.3	3.1
27	3.3	3.3
30	3.3	3.3

APPARENT RADIUM-226 CONCENTRATION 26 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01167-RM
HOLE NUMBER: 26
LOCATION: 155289



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	3.4
15	3.2	3.2
18	3.2	3.0
21	3.3	3.5
24	3.3	3.1
27	3.4	3.6
30	3.4	3.6
33	3.3	3.3

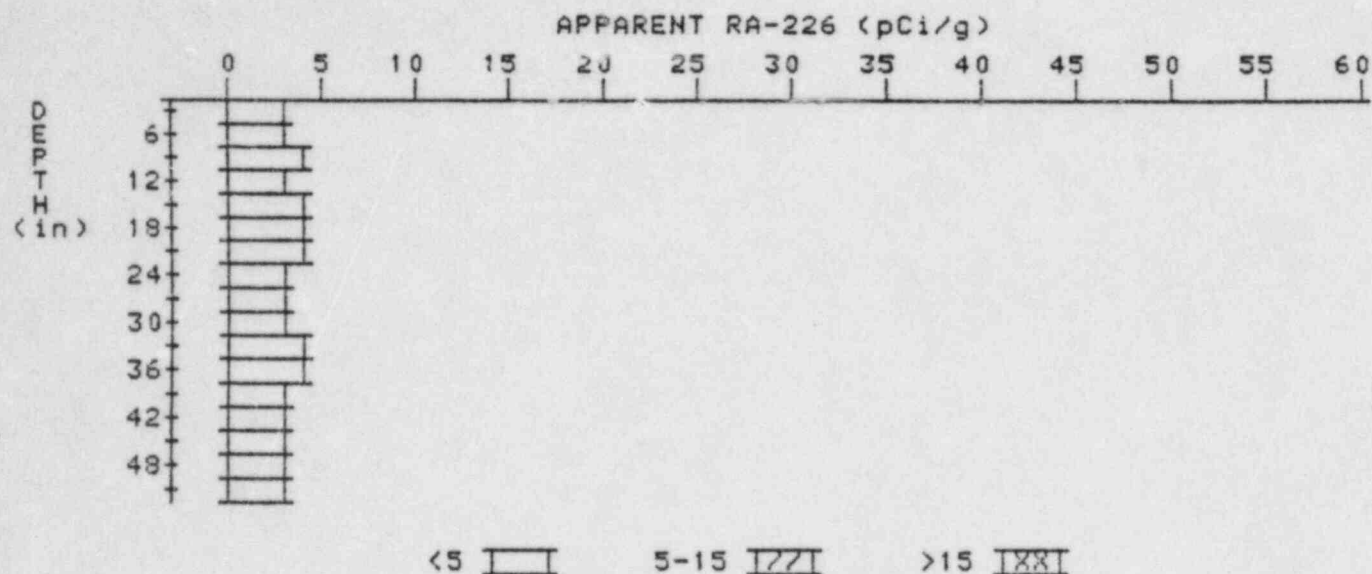
APPARENT RADIUM-226 CONCENTRATION 29

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01167-RM

HOLE NUMBER: 29

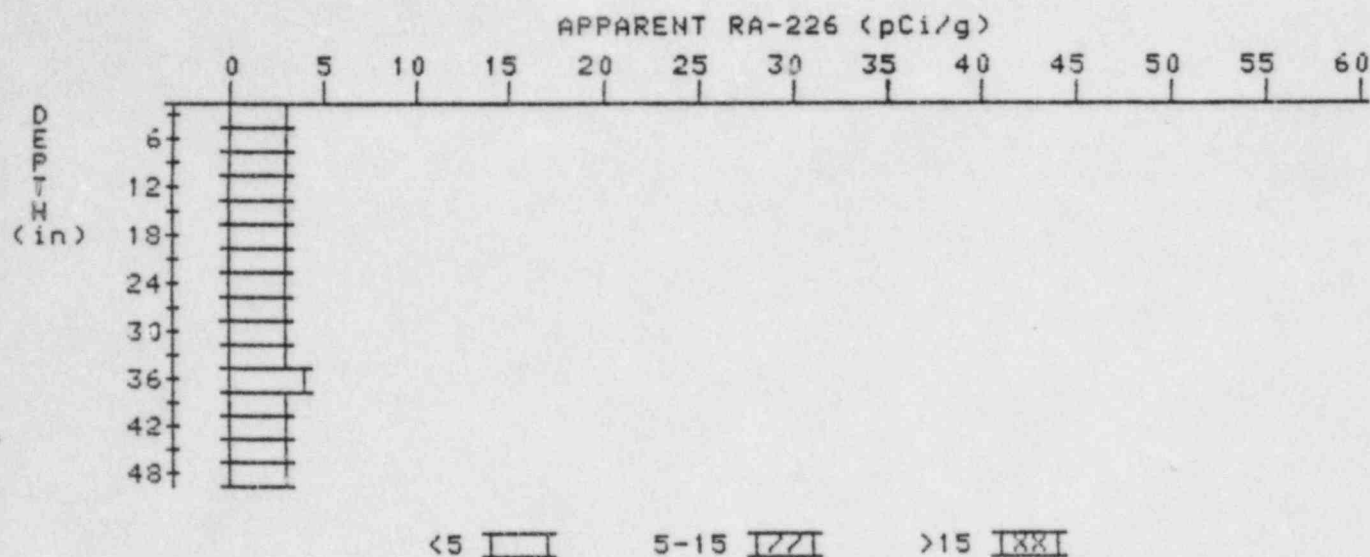
LOCATION: 195274



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.7	2.7
6	3.0	3.0
9	3.3	3.7
12	3.4	3.4
15	3.5	3.7
18	3.5	3.5
21	3.5	3.7
24	3.4	3.4
27	3.3	3.1
30	3.3	3.1
33	3.4	3.6
36	3.4	3.8
39	3.2	2.7
42	3.3	3.5
45	3.3	3.3
48	3.3	3.1
51	3.4	3.4

APPARENT RADIUM-226 CONCENTRATION 30 DECONVOLUTION GRAPH

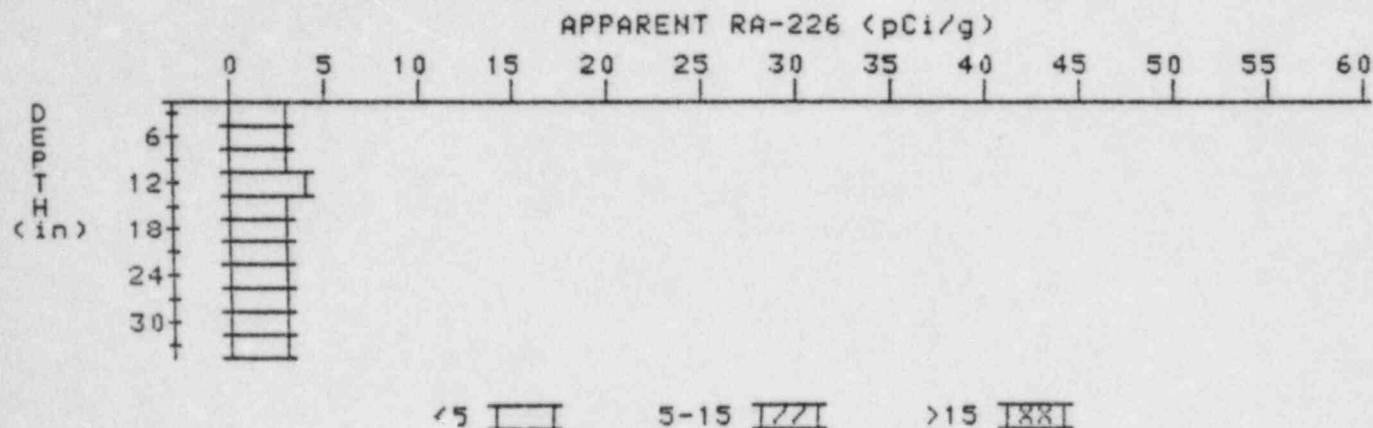
PROPERTY NUMBER: GJ-01167-RM
HOLE NUMBER: 30
LOCATION: 251279



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.9	2.9
6	3.0	2.8
9	3.2	3.4
12	3.3	3.5
15	3.3	3.3
18	3.3	3.3
21	3.3	3.3
24	3.3	3.3
27	3.3	3.5
30	3.2	3.0
33	3.2	3.0
36	3.3	3.7
39	3.2	2.8
42	3.3	3.5
45	3.3	3.3
48	3.3	3.3

APPARENT RADIUM-226 CONCENTRATION 31 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01167-RM
HOLE NUMBER: 31
LOCATION: 260253



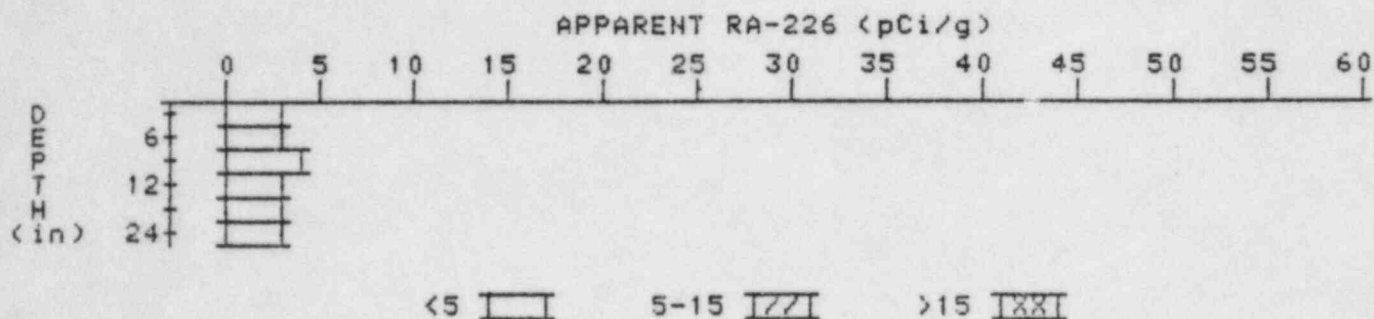
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.8	2.8
6	3.0	3.2
9	3.1	2.9
12	3.3	3.8
15	3.2	3.0
18	3.2	3.2
21	3.2	3.2
24	3.2	3.2
27	3.2	3.4
30	3.1	3.3
33	2.9	2.9

APPARENT RADIUM-226 CONCENTRATION 11 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01167-RM

HOLE NUMBER: 11

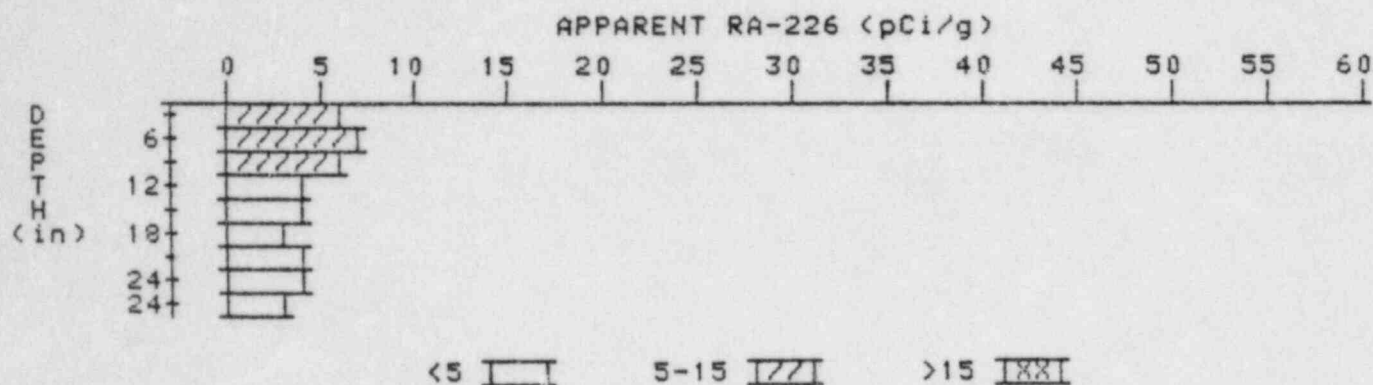
LOCATION:



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.8	2.8
6	3.1	3.5
9	3.2	3.6
12	3.1	3.1
15	3.0	3.0
24	2.9	2.9

APPARENT RADIUM-226 CONCENTRATION 12 DECONVOLUTION GRAPH

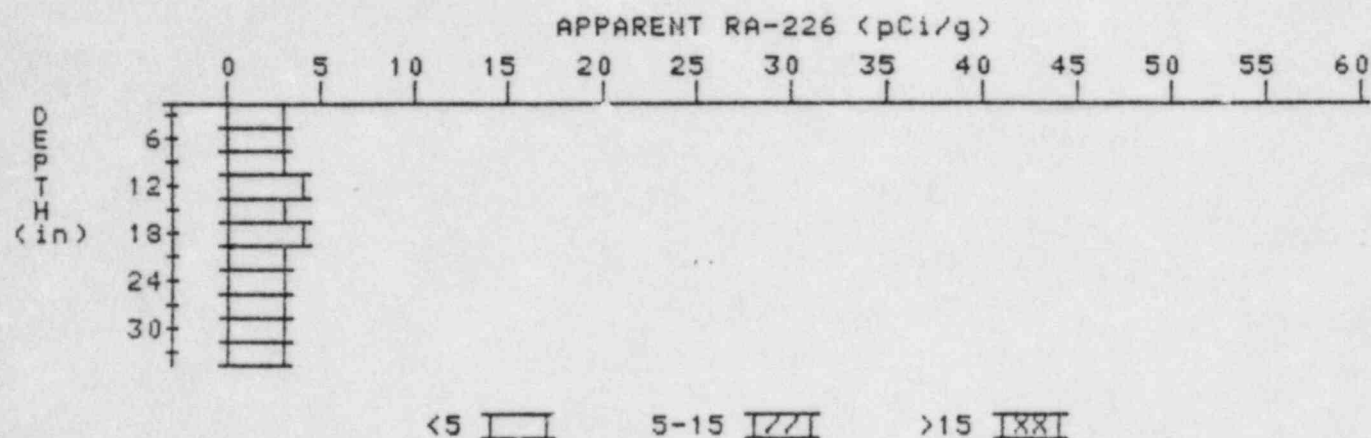
PROPERTY NUMBER: GJ-01167-RM
HOLE NUMBER: 12
LOCATION:



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.7	5.7
6	5.8	6.7
9	5.4	6.3
12	4.5	3.8
15	4.0	3.8
18	3.6	3.1
21	3.5	3.5
24	3.4	4.1
24	2.9	2.9

APPARENT RADIUM-226 CONCENTRATION 14 DECONVOLUTION GRAPH

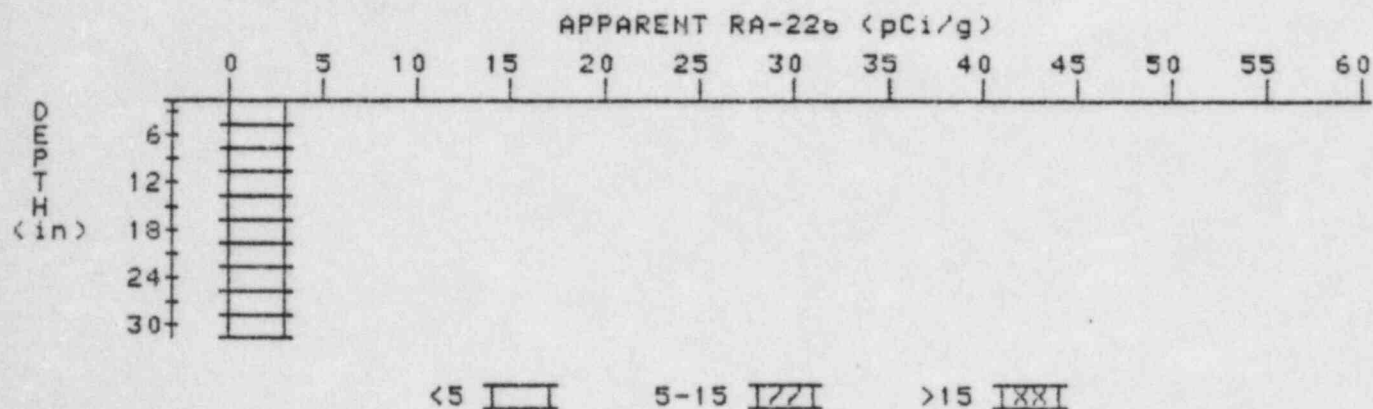
PROPERTY NUMBER: GJ-01167-RM
HOLE NUMBER: 14
LOCATION:



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.7	2.7
6	2.9	2.9
9	3.1	3.1
12	3.3	3.8
15	3.2	2.8
18	3.3	3.7
21	3.2	2.8
24	3.3	3.5
27	3.3	3.5
30	3.2	3.2
33	3.1	3.1

APPARENT RADIUM-226 CONCENTRATION 15 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01167-RIA
HOLE NUMBER: 15
LOCATION:



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.8	2.8
6	3.1	3.5
9	3.2	3.4
12	3.2	3.2
15	3.2	3.4
18	3.1	3.1
21	3.0	2.6
24	3.1	3.3
27	3.1	3.1
30	3.1	3.1

