

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-14639-MR
ADDRESS: 3142 F ROAD

JULY 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION
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APPROVED BY

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DATE

July 25, 1985

REAL4639:REA-610

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-14639-MR, is a single-family residence/farm located at 3142 F Road, 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, 18 cu. yd.; interior, 2 cu. yd.

Area A will not be included in this remedial action, as discussed in Section 4.0 of this REA.

Estimated cost to perform remedial action, including dislocation when applicable, is \$3,395. Remedial action on this property will take approximately 21 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 3142 F Road, Grand Junction, Colorado

Zoning: Residential (R-2)

Lot Size: Approximately 1,042,680 sf (23.9 acres)

Legal Description: East 1/2 of the southeast 1/4 of the southwest 1/4 and east 5 acres of the west 1/2 of the southeast 1/4 of the southwest 1/4 of section 3, 1 south, 1 east. Less canal and excluding south 50 feet for road right-of-way as per B-1410, P-299 and also excluding beginning north 50 feet and west 20 feet from southeast corner of the southwest 1/4 of said section 3, west 13 feet, then north 50 feet, then east 13 feet, then south 50 feet to beginning as per B-1419, P-504 of Mesa County records for right-of-way, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 5 miles northeast 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 Figures 2.2a and 2.2b.

Electrical:	Overhead
Gas:	Underground
Telephone:	Underground
Sewer:	Underground
Water:	Underground
Cable TV:	Overhead

Bordering Properties:

North:	Single-family residence/farm
South:	F Road
East:	31 1/2 Road
West:	Single-family residence/farm

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-family residence
Size:	Approximately 3,410 sf
Construction Date:	1921

Construction:	Two-story wood-frame house with partial basement
Foundation:	Concrete foundation wall and footing in the original house; thickened concrete slab-on-grade in the additions
Footing Depth:	Approximately 108" to bottom of footing from grade in original structure and approximately 24" to bottom of footing from grade on additions.
Basement:	Yes; partial
Crawl Space:	No
Condition:	Fair

Other Structures:

Type:	Garage 1
Size:	Approximately 404 sf
Construction:	Wood-frame
Foundation:	Concrete slab with thickened edge
Condition:	Fair
Type:	Garage 2
Size:	Approximately 3,282 sf
Construction:	Wood timber frame on the south; timber-frame earth-covered on the north
Foundation:	Partial concrete slab/dirt
Condition:	Fair
Type:	Shed 1
Size:	Approximately 286 sf
Construction:	Wood-frame
Foundation:	Dirt
Condition:	Fair
Type:	Shed 2
Size:	Approximately 101 sf
Construction:	Wood-frame
Foundation:	Dirt
Condition:	Fair
Type:	Shed 3
Size:	Approximately 196 sf
Construction:	Wood-frame
Foundation:	Dirt
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 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: Extensive alterations to the interior and additions to the original structure on the north and east.

Architectural Significance: None

Historical Significance: None

3.0 RADIOLOGIC SURVEY

3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-14639-MR on April 30, 1985. Data collection methods were performed in accordance with procedures fully described in the Radiologic Support Operations Procedures Manual GJ-07(84) (Bendix Field Engineering Corporation, 1984). These data were evaluated to determine the areal and vertical extent of uranium mill tailings contamination at this property as well as any other contaminated material that may have originated from the millsite.

A review of historical information from the files of the Colorado Department of Health (CDH) and the inclusion data from Oak Ridge National Laboratory (ORNL) was conducted. These records indicate contamination in the garage north of the primary structure, the lawn southeast of the primary structure, scattered in areas north of the primary structure, the steps on the east side of the primary structure, and the north quarter 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, and deconvolution graphs are included in the Appendix (Section 6.0).

3.2 Gamma Exposure-Rate Surveys

3.2.1 Exterior Findings

Background Readings: 12 to 15 uR/h
Highest Outside Gamma Reading (HOG): 125 uR/h

Exterior radium-concentration measurements are presented in Appendix Table 3.1. Grid-point survey results are shown in Appendix Figures 3.1a and 3.1b. Appendix Figures 3.2a and 3.2b present the ranges of elevated gamma readings and indicate areas of possible contamination.

3.2.2 Interior Findings

Background Readings: 13 to 16 uR/h
Highest Inside Gamma Reading (HIG): 26 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 3.3a, 3.3b, 3.3c, and 3.3d 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 3.3d and 3.4. Data from these investigations are included in Appendix Tables 3.1 and 3.2.

3.4 Radon/Radon Daughter Concentration (RDC)

Determined by CDH: 0.010 gross working level (WL). No additional RDC measurements were taken by Bendix.

3.5 Extent of Contamination

Appendix Figures 3.5a, 3.5b, and 3.5c 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) The 4-inch-thick concrete slab in the north addition of the primary structure is contaminated, based on information collected in Area K. The slab is covered with floor tile and carpeting (approximately 519 sf; not included in remedial action).
- (AREA B) There is a 1-inch-thick soil and dust covering on the concrete slab in Garage 2. The soil and dust contain contaminated material (approximately 454 sf).
- (AREA C) A deposit is east of the concrete slab in Garage 2. The depth of contamination is 6 inches (approximately 2 sf).
- (AREA D) Two deposits are south of the southeast corner of Garage 2. This contamination extends to a depth of 6 inches (approximately 24 sf).
- (AREA E) Contamination south of Garage 2 extends to a depth of 6 inches (approximately 21 sf).
- (AREA F) Two deposits south of the southwest corner of Garage 2 extend to a depth of 6 inches (approximately 44 sf).
- (AREA G) Contamination northwest of Shed 2 extends to a depth of 12 inches (approximately 10 sf).
- (AREA H) Two small deposits are present east of Shed 3. The depth of contamination is 6 inches (approximately 30 sf).
- (AREA I) Contamination south of Garage 1, in a fenced garden, extends to a depth of 12 inches (approximately 10 sf).
- (AREA J) Two small deposits north of the primary structure are 6 inches deep (approximately 30 sf).

- (AREA K) A contaminated 4-inch-thick concrete slab is at the east side of the addition to the primary structure (approximately 30 sf).
- (AREA L) Contamination around the north and west foundations of the primary structure is 24 inches deep (approximately 66 sf).
- (AREA M) A tailings deposit east of the primary structure extends to a depth of 12 inches (approximately 135 sf).
- (AREA N) A deposit in the center of Area M, east of the primary structure, is 15 inches deep (approximately 70 sf).
- (AREA O) The contaminated concrete steps and landing on the east side of the primary structure are 5 inches thick. The soil beneath the concrete is not contaminated, based on data collected in Area K (approximately 23 sf).
- (AREAS REQUIRING FURTHER INVESTIGATION DURING REMEDIAL ACTION)
The soil under the concrete slab of the addition should be monitored during remedial action. The concrete core in Area K showed only contaminated concrete, but Area L, a deposit against the exterior foundation, is contaminated to a depth of 24 inches.

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-14639-MR, includes select removal of areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figures 3.5b and 3.5c) and transport of removed material to the disposal site.

Area A, as discussed in Section 3.5 and shown on Appendix Figure 3.5a, will not be included in this remedial action for the following reasons:

1. Interior RDC working level does not exceed EPA Standard.
2. Interior gamma does not exceed EPA Standard.

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 \$3,395.

This remedial action will result in removal of the identified residual radioactive materials.

The owner expressed concern over the possible removal of the large maple in Areas M and N. This tree should be hand excavated with care to try and save it. The farm is primarily a fruit orchard. Harvesting operations will make remedial action construction impossible during the months of August and September. 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 2.2a	Site Plan
Figure 2.2b	Site Plan
Figure 3.1a	Exterior Grid-Point Exposure Rates (Oversize Drawing)
Figure 3.1b	Exterior Gamma Exposure Rates
Figure 3.2a	Exterior Gamma Scan (Oversize Drawing)
Figure 3.2b	Exterior Gamma Scan
Figure 3.3a	Interior Gamma Exposure Rates (Basement)
Figure 3.3b	Interior Gamma Exposure Rates (Ground Floor)
Figure 3.3c	Interior Gamma Exposure Rates (First Floor)
Figure 3.3d	Interior Gamma Exposure Rates and Sample Locations (Garages)
Figure 3.4	Exterior Sample Locations (Oversize Drawing)
Figure 3.5a	Interior Estimated Extent of Contamination (House-Ground Floor)
Figure 3.5b	Interior Estimated Extent of Contamination (Garages)
Figure 3.5c	Exterior Estimated Extent of Contamination (Oversize Drawing)

Official Survey Report

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Radium Concentrations at Exterior Locations

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3142 F Road

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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.		
4	396357	00	DS	6.8		*	DC = 6 inches
		06	DS	<1.0		*	
5	396374	00	DS	4.0		*	By Garage 2
		06	DS	<1.0		*	DC = 6 inches
6	401391	00	DS	16.9		*	By Garage 2
		06	DS	1.4		*	DC = 6 inches
7	403358	00	DS	2.6		*	By Garage 2
		06	DS	<1.0		*	DC = 6 inches
8	472335	00	DS	35.4		*	By west dirt road
		06	DS	17.2		*	DC = 12 inches
		12	DS	1.6		*	
9	518381	00	DS	29.9		*	North property
		06	DS	1.6		*	DC = 6 inches
		12	DS	<1.0		*	
10	527396	00	DS	42.7		*	North property
		06	DS	1.3		*	DC = 6 inches
		12	DS	<1.0		*	
11	555385	00	DS	<1.0		*	North side
		00-06	SS			1.7	Background
		03	TC	2.8		*	
		06	TC	2.9		*	DC = 0 inches
		09	TC	3.2		*	
		12	TC	3.2		*	
		15	TC	3.2		*	
		18	TC	3.1		*	
		21	TC	3.1		*	
		24	TC	3.1		*	
		27	TC	3.1		*	
		30	TC	3.1		*	
		33	TC	3.0		*	
		36	TC	2.9		*	
12	584425	00	DS	20.3		*	Fenced area of
		06	DS	3.8		*	north yard
		12	DS	2.1		*	DC = 12 inches
		18	DS	2.2		*	
		18-24	SS			3.7	Cinders

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.		
13	597375	00	DS	48.9		*	North property
		06	DS	<1.0		*	DC = 6 inches
14	602389	00	DS	107.8		*	North property
		06	DS	<1.0		*	DC = 6 inches
15	608370	00	DS	1.5		*	Foundation
		03	TC	3.0		*	Next to primary
		06	TC	3.2		*	structure
		09	TC	3.2		*	DC = 0 inches
		12	TC	3.3		*	
		15	TC	3.4		*	
		18	TC	3.5		*	
		21	TC	3.5		*	
		24	TC	3.4		*	
		27	TC	3.3		*	
		30	TC	3.3		*	
		33	TC	3.2		*	
16	620349	00	DS	1.1		*	West side primary
		03	TC	3.3		*	structure
		06	TC	3.7		*	
		09	TC	4.0		*	
		12	TC	4.4		*	DC = 24 inches
		15	TC	5.1		*	Based on the
		18	TC	5.4		*	deconvolution graph
		21	TC	5.5		*	
		24	TC	4.7		*	
		27	TC	3.9		*	
		30	TC	3.4		*	
17	622378	00-04	SS			7.2	Concrete core
		04-10	SS			2.8	Soil under core
		03	TC	5.7		*	North on back step
		06	TC	5.7		*	
		09	TC	5.5		*	DC = 4 inches
		12	TC	4.7		*	Based on the
		15	TC	3.9		*	thickness of the
		18	TC	3.6		*	concrete core
		21	TC	3.4		*	
		24	TC	3.5		*	
		27	TC	3.4		*	
		30	TC	3.3		*	
		33	TC	3.3		*	

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.		
18	643415	00	DS	1.7		*	In the garden
		06	DS	<1.0		*	
19	648384	00	DS	7.8		*	Concrete landing
20	648386	00	DS	7.7		*	Top of stairs
21	648388	00-05	SS			15.8	Concrete core
22	649409	03	TC	4.2		*	Sewer line
		06	TC	4.4		*	
		09	TC	4.0		*	DC = 0 inches
		12	TC	3.6		*	
		15	TC	3.3		*	
		18	TC	3.1		*	
		21	TC	2.9		*	
		24	TC	3.0		*	
		27	TC	3.0		*	
		30	TC	3.0		*	
		33	TC	3.1		*	
		36	TC	3.2		*	
		39	TC	3.3		*	
		42	TC	3.4		*	
		45	TC	3.4		*	
		48	TC	3.4		*	
		51	TC	3.2		*	
		54	TC	3.3		*	
		57	TC	3.3		*	
		60	TC	3.2		*	
		63	TC	3.2		*	
		66	TC	3.2		*	
23	650408	00	DS	1.1		*	East property
		06	DS	1.1		*	
24	650420	03	TC	16.8		*	In garden
		06	TC	17.8		*	
		09	TC	14.1		*	DC = 15 inches Based on the deconvolution graph
		12	TC	9.3		*	
		15	TC	6.5		*	
		18	TC	5.0		*	
		21	TC	4.1		*	
		24	TC	3.7		*	
		27	TC	3.4		*	

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.		
24	650420	30	TC	3.1		*	
		33	TC	3.0		*	
		36	TC	2.9		*	
25	650430	03	TC	3.3		*	Septic system
		06	TC	3.3		*	
		09	TC	3.3		*	DC = 0 inches
		12	TC	3.1		*	
		15	TC	3.2		*	
		18	TC	3.2		*	
		21	TC	3.2		*	
		24	TC	3.2		*	
		27	TC	3.2		*	
		30	TC	3.2		*	
26	653352	03	TC	3.1		*	Foundation and
		06	TC	3.2		*	phone line
		09	TC	3.2		*	
		12	TC	3.1		*	DC = 0 inches
		15	TC	3.2		*	
		18	TC	3.3		*	
		21	TC	3.2		*	
		24	TC	3.2		*	
		27	TC	3.1		*	
		30	TC	3.1		*	
		33	TC	3.2		*	
		36	TC	3.2		*	
		39	TC	3.2		*	
		42	TC	3.3		*	
		45	TC	3.3		*	
		48	TC	3.3		*	
		51	TC	3.3		*	
		54	TC	3.2		*	
		57	TC	3.1		*	
		60	TC	3.2		*	
		63	TC	3.2		*	
		66	TC	3.2		*	
		69	TC	3.2		*	
		72	TC	3.3		*	
		75	TC	3.3		*	
		78	TC	3.3		*	
		81	TC	3.3		*	
		84	TC	3.4		*	
		87	TC	3.4		*	

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.		
26	653352	90	TC	3.5		*	
		93	TC	3.5		*	
27	653413	00	DS	16.2		*	In the garden
		03	TC	8.1		*	
		06	TC	8.6		*	DC = 12 inches
		09	TC	7.2		*	Based on the
		12	TC	5.6		*	deconvolution graph
		15	TC	4.5		*	
		18	TC	3.9		*	
		21	TC	3.5		*	
		24	TC	3.2		*	
		27	TC	3.0		*	
		30	TC	3.0		*	
		33	TC	3.0		*	
		36	TC	3.0		*	
28	670385	03	TC	3.0		*	Foundation
		06	TC	3.1		*	
		09	TC	3.1		*	DC = 0 inches
		12	TC	3.1		*	
		15	TC	3.0		*	
		18	TC	2.9		*	
		21	TC	2.8		*	
		24	TC	2.9		*	
		27	TC	2.7		*	
		30	TC	2.8		*	
29	678352	03	TC	2.5		*	Water line
		06	TC	2.8		*	
		09	TC	3.0		*	DC = 0 inches
		12	TC	3.1		*	
		15	TC	3.0		*	
		18	TC	3.0		*	
		21	TC	3.1		*	
		24	TC	3.1		*	
		27	TC	3.1		*	
		30	TC	3.2		*	
		33	TC	3.1		*	
		36	TC	3.2		*	

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.		
30	679356	00	DS	<1.0		*	Gas line
		06	DS	<1.0		*	
		12	DS	<1.0		*	

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 = 04-30-85
Team Leader = JJ

Radium Concentrations at Interior Locations

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Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
1		03	TC	3.4		*	In garage
		06	TC	3.0		*	
		09	TC	2.8		*	DC = 0 inches
		12	TC	2.9		*	
		15	TC	2.8		*	
		18	TC	2.8		*	
		21	TC	2.8		*	
		24	TC	2.8		*	
		27	TC	2.8		*	
		30	TC	2.8		*	
2		00	DS	3.5		*	In garage
		06	DS	<1.0		*	DC = 6 inches
3		00	DS	196.3		*	In garage Taken on the soil on the concrete slab
		01	DS	1.2		*	Taken after the soil had been swept away DC = 1 inch

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 = 04-30-85
 Team Leader = JJ

Table 3.3
Summary of Interior Gamma Exposure Rates

DOE ID No. GJ-14639-MR 3142 F Road 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)
ROOM A	12	15-17	16	12	15-17	16
ROOM B	05	15-16	16	05	15-17	16
ROOM C	15	15-17	16	15	15-17	16
ROOM D	06	17-18	18	06	23-25	24
ROOM E	21	16-19	17	21	22-25	24
ROOM F	05	13-14	14	05	13-15	14
ROOM G	03	13-14	14	03	13-14	13
ROOM H	05	14-15	14	05	14-15	14
ROOM I	02	13-14	14	02	14-14	14
ROOM J	02	13-14	14	02	14-15	15
ROOM K	05	14-15	15	05	14-15	14
ROOM L	05	14-14	14	05	14-15	14
ROOM M	09	14-19	15	09	14-19	15
ROOM N	05	14-14	14	05	14-14	14
ROOM O	*	*	*	*	14-15	*
SHED 1	05	13-14	13	05	14-14	14
SHED 2	02	15-15	15	02	15-16	16
SHED 3	03	14-15	15	03	15-15	15
GARAGE 1	07	12-15	14	07	13-15	14
GARAGE 2	26	15-24	18	26	15-218	29

*Exposure Rates and Room Locations Shown in Appendix Figures 3.3a, 3.3b, and 3.3d. A walking gamma scan was performed in Room O. The range of gamma measurements is shown in Appendix Figure 3.3c.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-14639-MR

Page 1 of 2

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
INTERIOR					
A	20.5 x 25.3 =	519	(excluded)		
	Tailings				
B	25.5 x 17.8 =	454	x 0.1 =	45	
C	1.8 x 1.0 =	2	x 0.5 =	1	
	Total Volume Tailings			46 =	46/27 = 2
	TOTAL VOLUME - INTERIOR				= 2
EXTERIOR					
	Concrete				
K	6 x 5 =	30	x 0.3 =	9	
O	3.8 x 3.0 =	11			
	3.0 x 4.1 =	12			
		23	x 0.4 =	9	
	Total Volume Concrete			18 =	18/27 = 1
	Tailings				
D	4 x 3 x 2 =	24	x 0.5 =	12	
E	3 x 7 =	21	x 0.5 =	11	
F	5 x 7 =	35			
	3 x 3 =	9			
		44	x 0.5 =	22	
G	2 x 5 =	10	x 1.0 =	10	
H	3 x 5 x 2 =	30	x 0.5 =	15	

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-14639-MR

Page 2 of 2

<u>AREA</u>	<u>CALCULATIONS(ft)</u>	<u>SF</u>	<u>DEPTH(ft)</u>	<u>CF</u>	<u>CUBIC YARDS</u>
I	5 x 2 =	10	x 1.0 =	10	
J	3 x 5 x 2 =	30	x 0.5 =	15	
L	33 x 2 =	66	x 2.0 =	132	
M	3 x 45 =	135	x 1.0 =	135	
N	7 x 10 =	70	x 1.3 =	91	
				453	
Total Volume Tailings				=	453/27 = 17
TOTAL VOLUME - EXTERIOR					= 18

See Appendix Figures 3.5a, 3.5b, and 3.5c For Areas

INTERIOR

Remove/store/replace personal property items in Area B & C	
Lump sum	\$ 100
Vacuum and sweep Area B	
Lump sum	100
Remove contaminated material and backfill with roadbase in Area C	
Lump sum	50
	<hr/>
SUBTOTAL INTERIOR	\$ 250

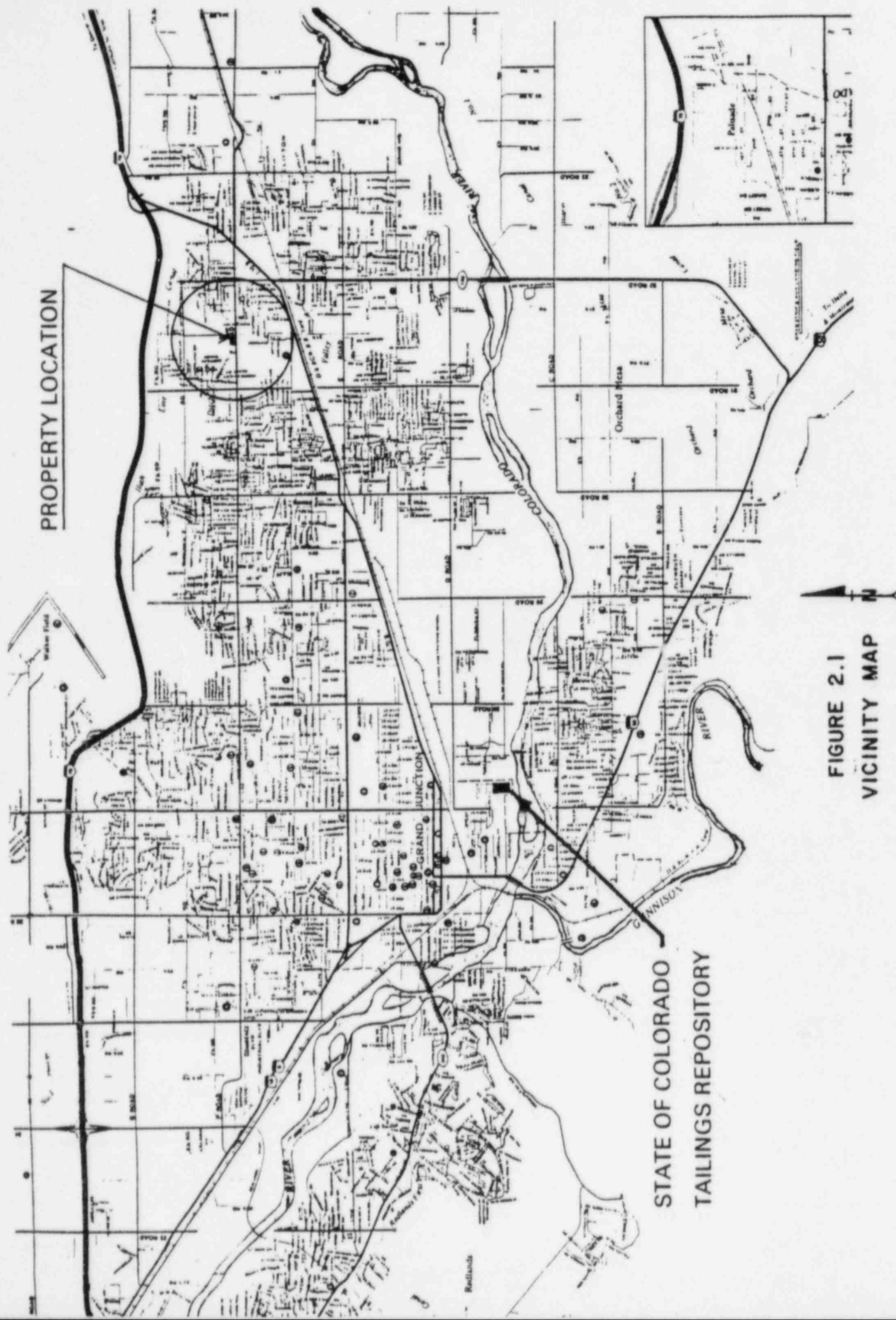
EXTERIOR

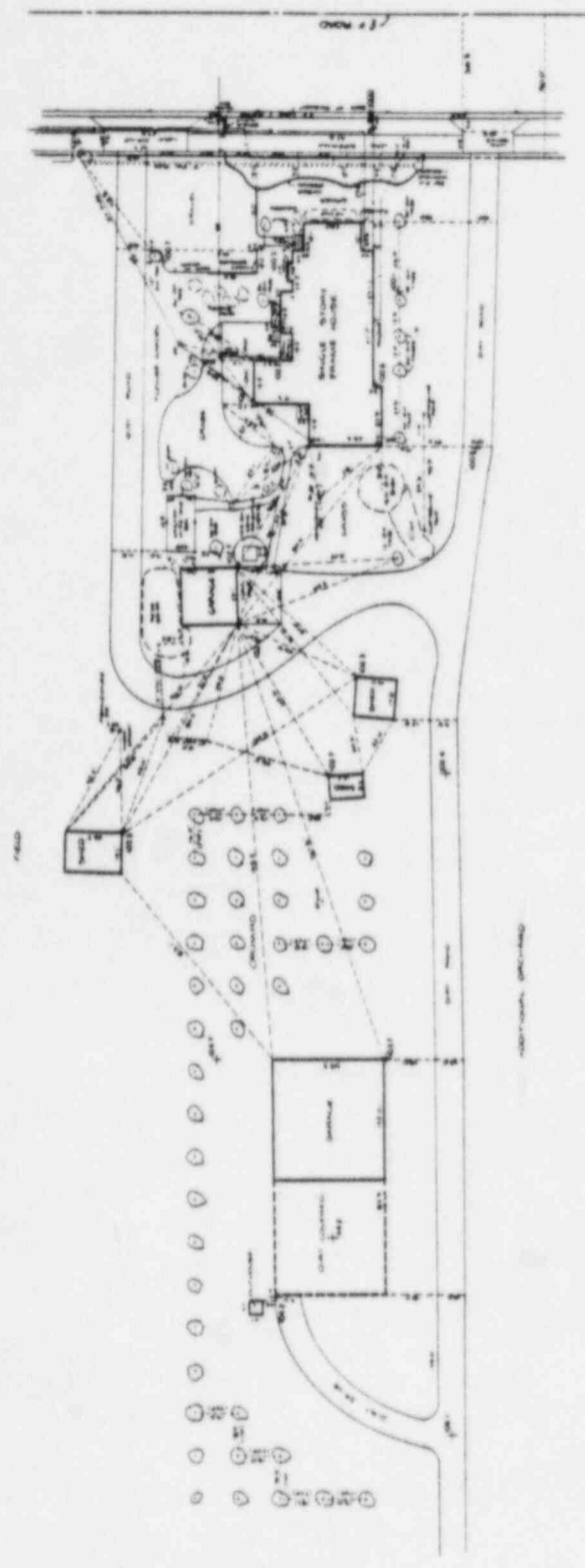
Remove/store/replace personal property items	
Lump sum	\$ 200
Remove/store/replace concrete stoop (4")	
30 sf @ \$3/sf	90
Remove/replace concrete stoop and steps	
1 cy @ \$300/cy	300
Remove identified residual radioactive materials	
6 cy @ \$44/cy (manual)	264
11 cy @ 14.50/cy (machine)	160
Replace areas	
with roadbase - 2 cy @ \$11.50/cy	23
with topsoil - 6 cy @ \$9.50/cy	57
with sandy loam - 9 cy @ \$10/cy	90
Install metal handrail	
Lump sum	100
Replace areas with perennial plantings	
215 sf @ \$2/sf	430
Replace areas with sod	
96 sf \$.50/sf	48
Cleanup, damp-proofing, etc.	
Lump sum	100
	<hr/>
SUBTOTAL EXTERIOR	\$ 1,862

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-14639-MR Page 2 of 2

TOTAL EXTERIOR	\$	1,862
TOTAL INTERIOR		250
ACCESS CONTROL		250
		<hr/>
SUBTOTAL	\$	2,362
CONTINGENCY @ 15%		354
		<hr/>
SUBTOTAL	\$	2,716
CONTRACTOR OVERHEAD & PROFIT @ 25%		679
		<hr/>
GRAND TOTAL	\$	3,395

CK072385
REAL4639/REA-610/LMR





EAST 1/2 OF THE SOUTH EAST 1/4 OF THE SOUTH WEST 1/4 AND EAST 1/2 ACRES OF THE WEST 1/2 OF THE SOUTH EAST 1/4 OF THE SOUTH WEST 1/4 OF SECTION 3, T.1 SOUTH, R.1 EAST, LEWIS CANAL, AND EXCLUDING SOUTH 80 FEET FOR ROAD RIGHT OF WAY AS PER 80-140-10-200 AND ALSO EXCLUDING BEGINNING NORTH 20 FEET AND WEST 20 FEET FROM SOUTH EAST CORNER OF THE SOUTH WEST 1/4 OF SAID SECTION 3, WEST 15 FEET, THEN NORTH 80 FEET, THEN EAST 15 FEET, THEN SOUTH 80 FEET TO BEGINNING AS PER 80-140-10-200, P. BOX OF WASH COUNTY RECORDS FOR CITY OF GRAND JUNCTION, COLORADO.

FIGURE 2.2a SITE PLAN

SCALE IN FEET
0 20 40 80



SHEET 2

U.S. DEPARTMENT OF ENERGY	DATE: 07/14/04	BY: HK
PROJECT: 2042 F. ROAD	DESIGNED BY: [Signature]	CHECKED BY: [Signature]
GRAND JUNCTION, COLORADO	DATE: 07/14/04	BY: [Signature]
SCALE: 1" = 40'	DATE: 07/14/04	BY: [Signature]

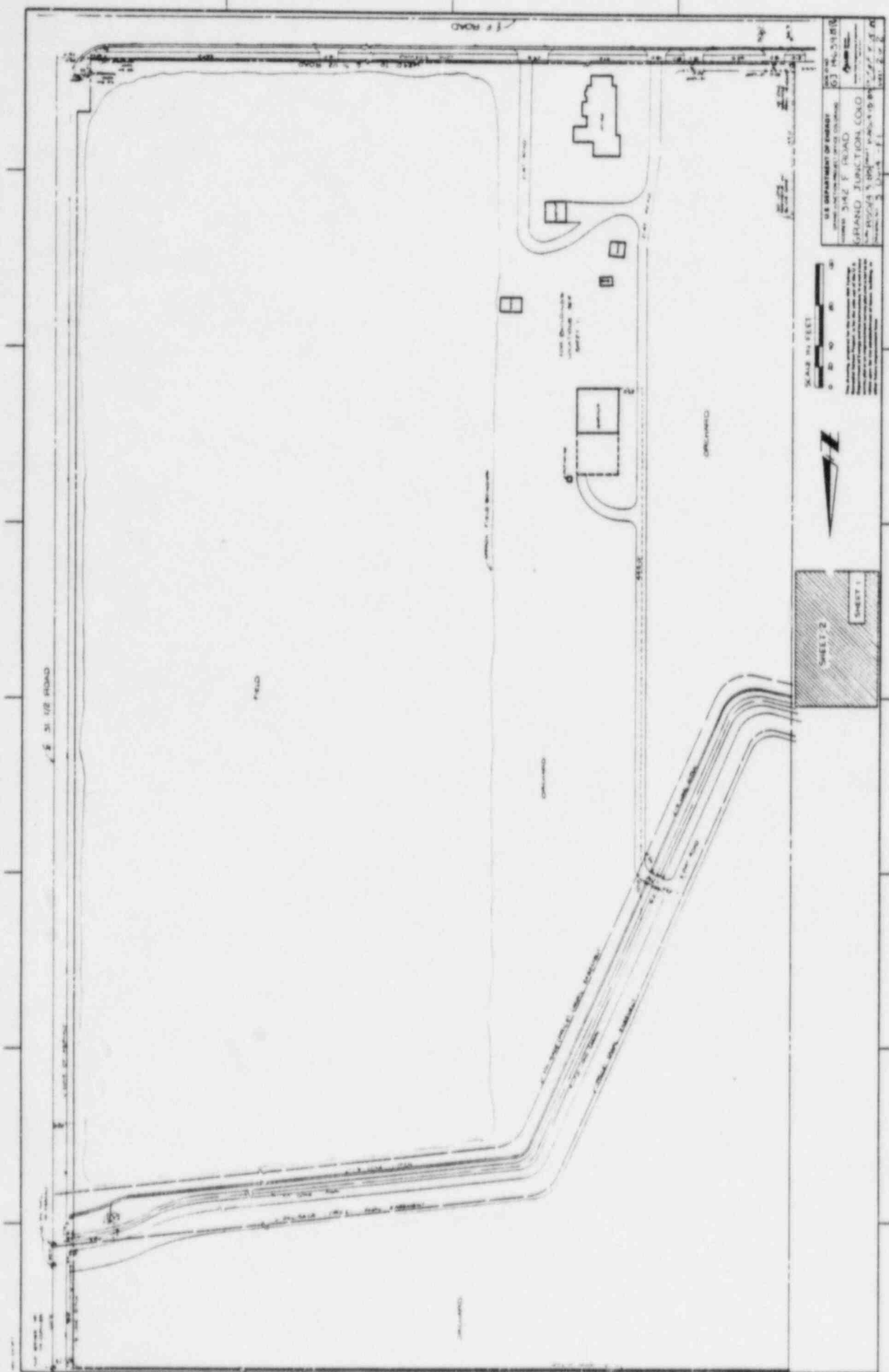
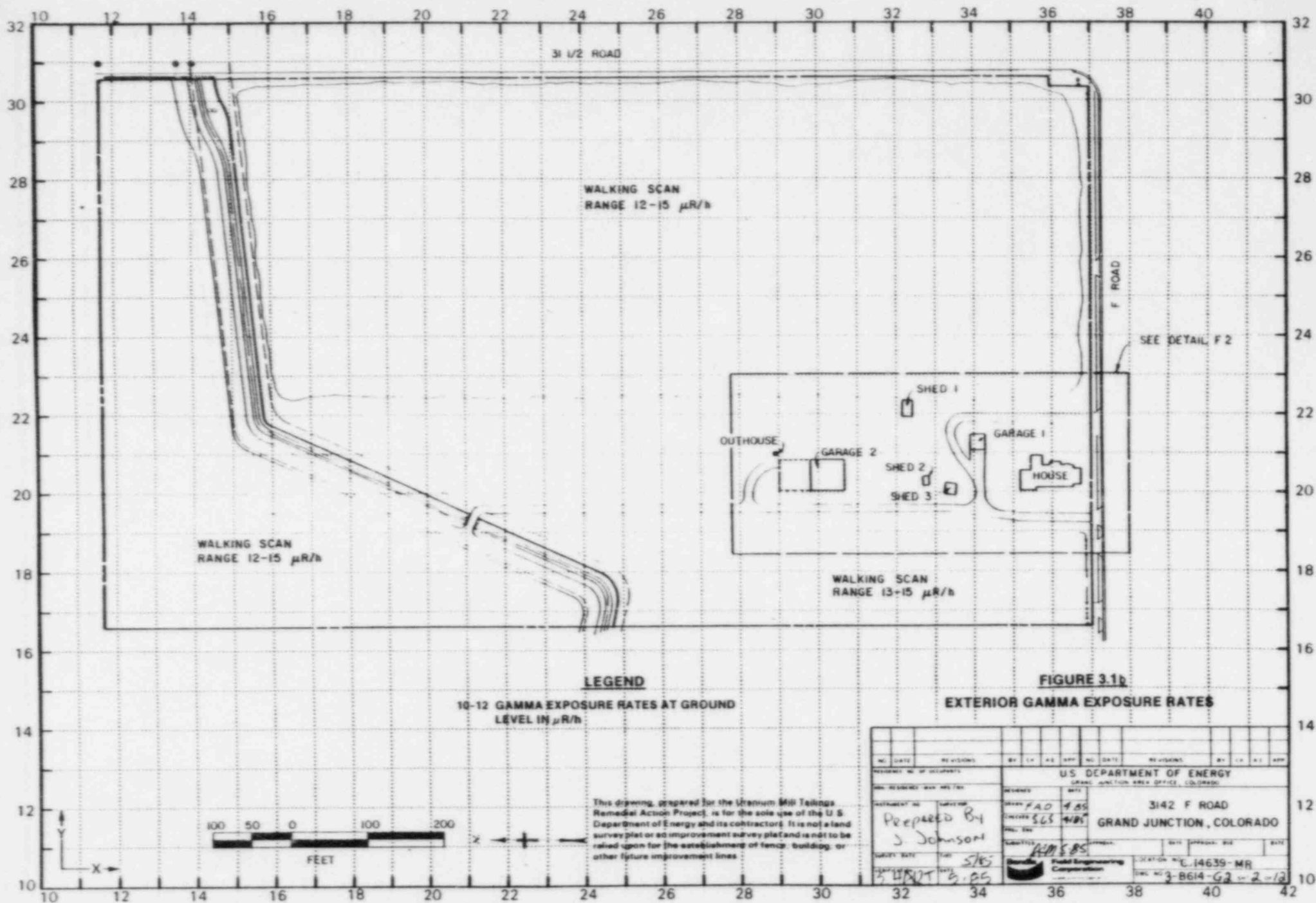


FIGURE 2.2b SITE PLAN



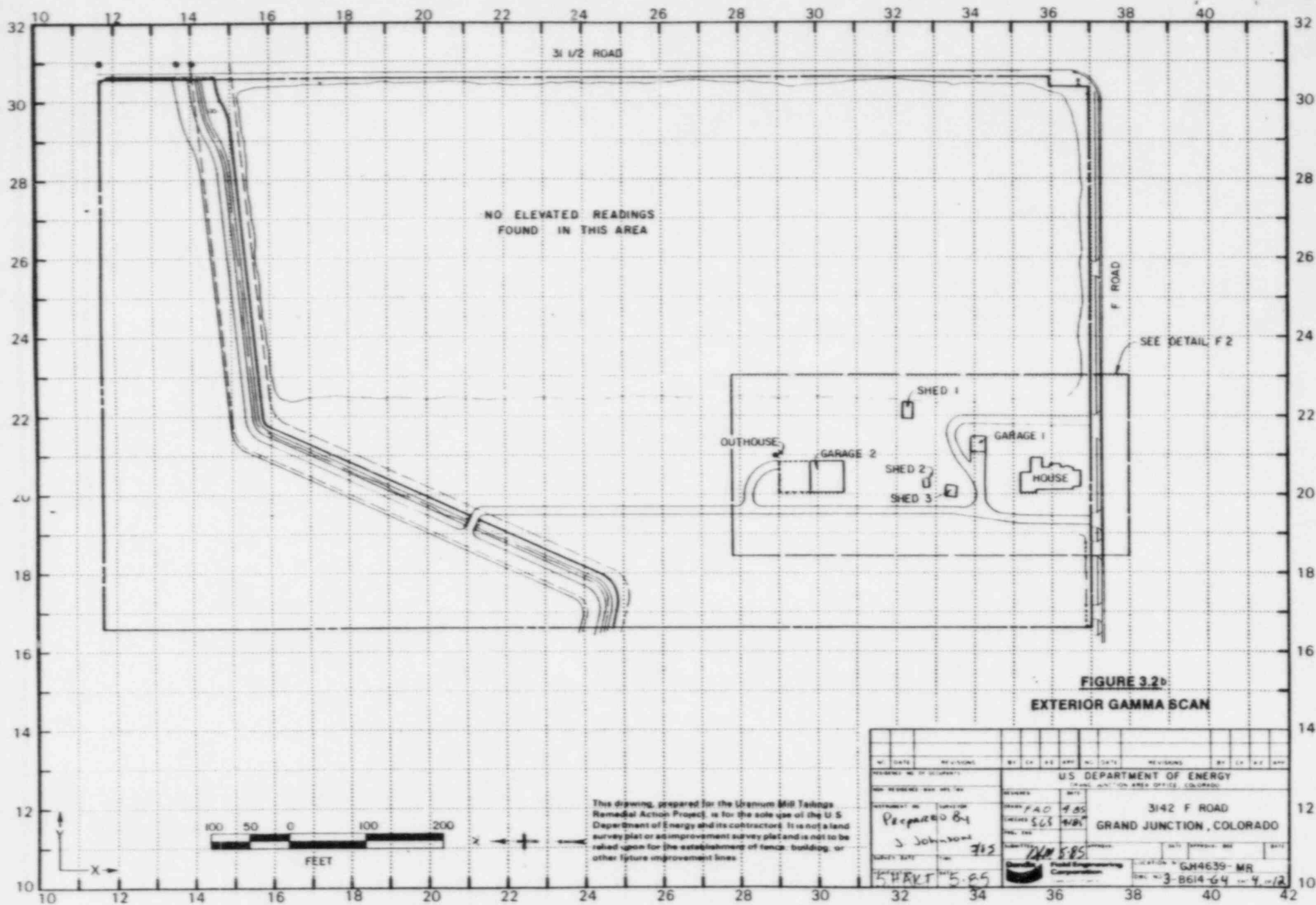
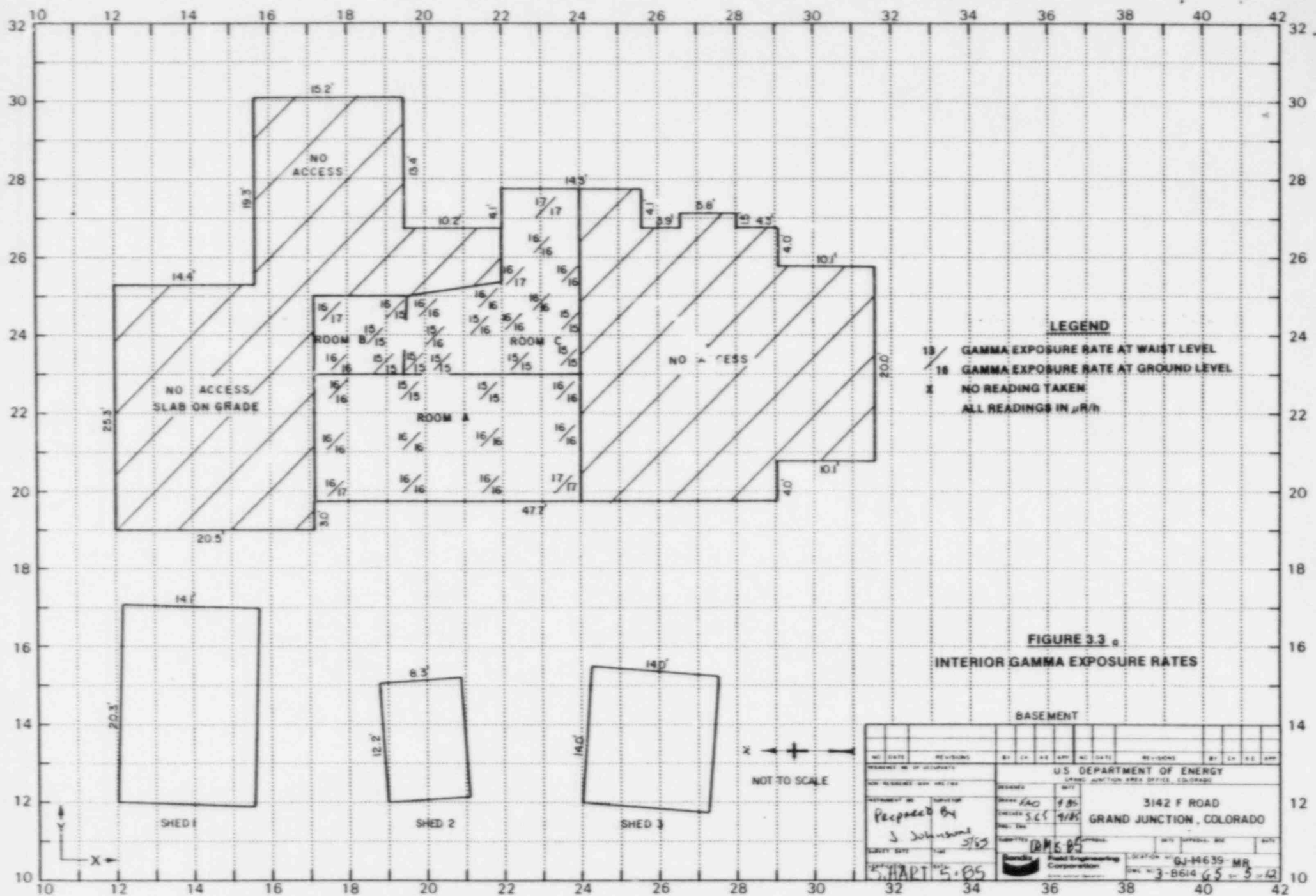
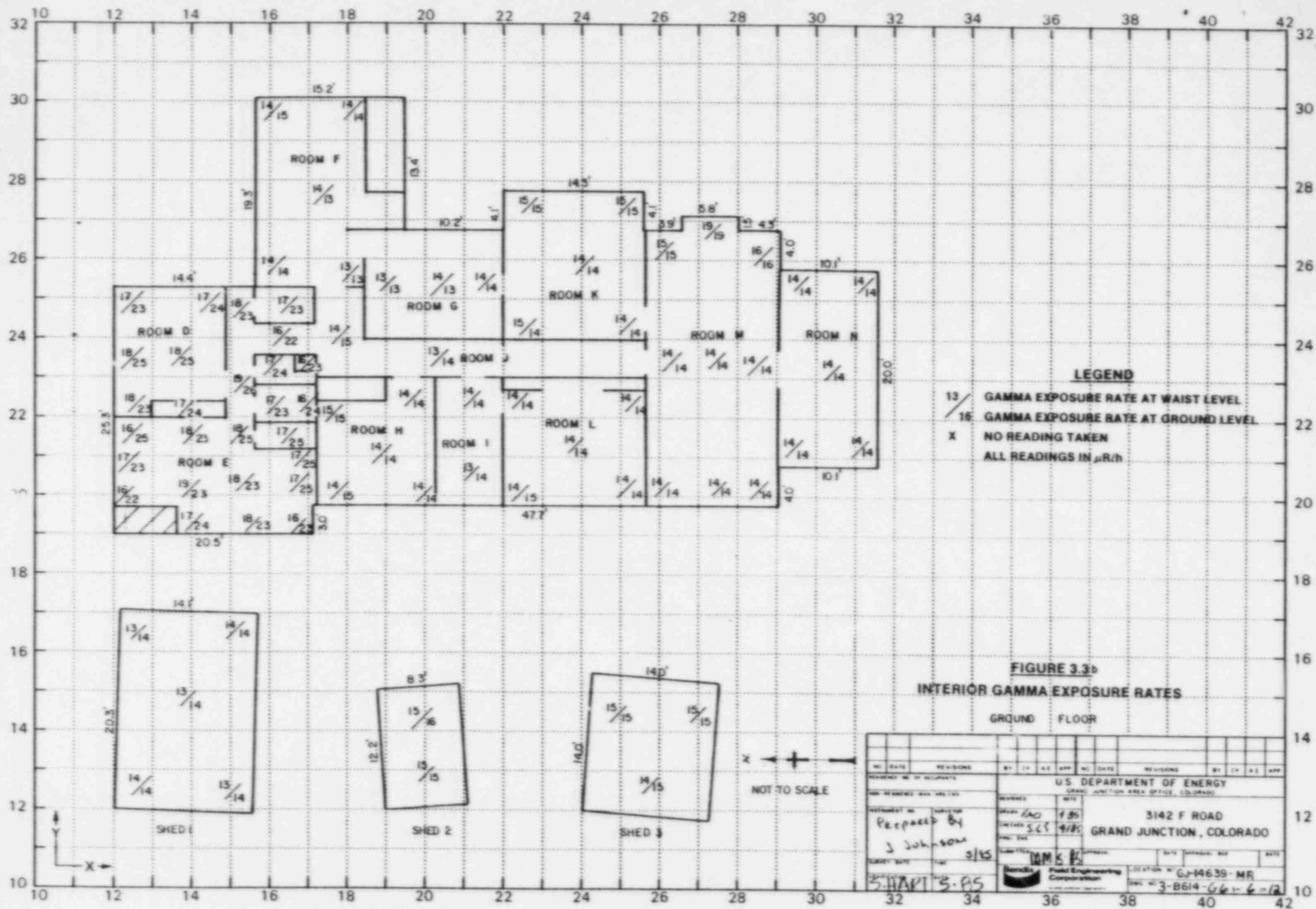


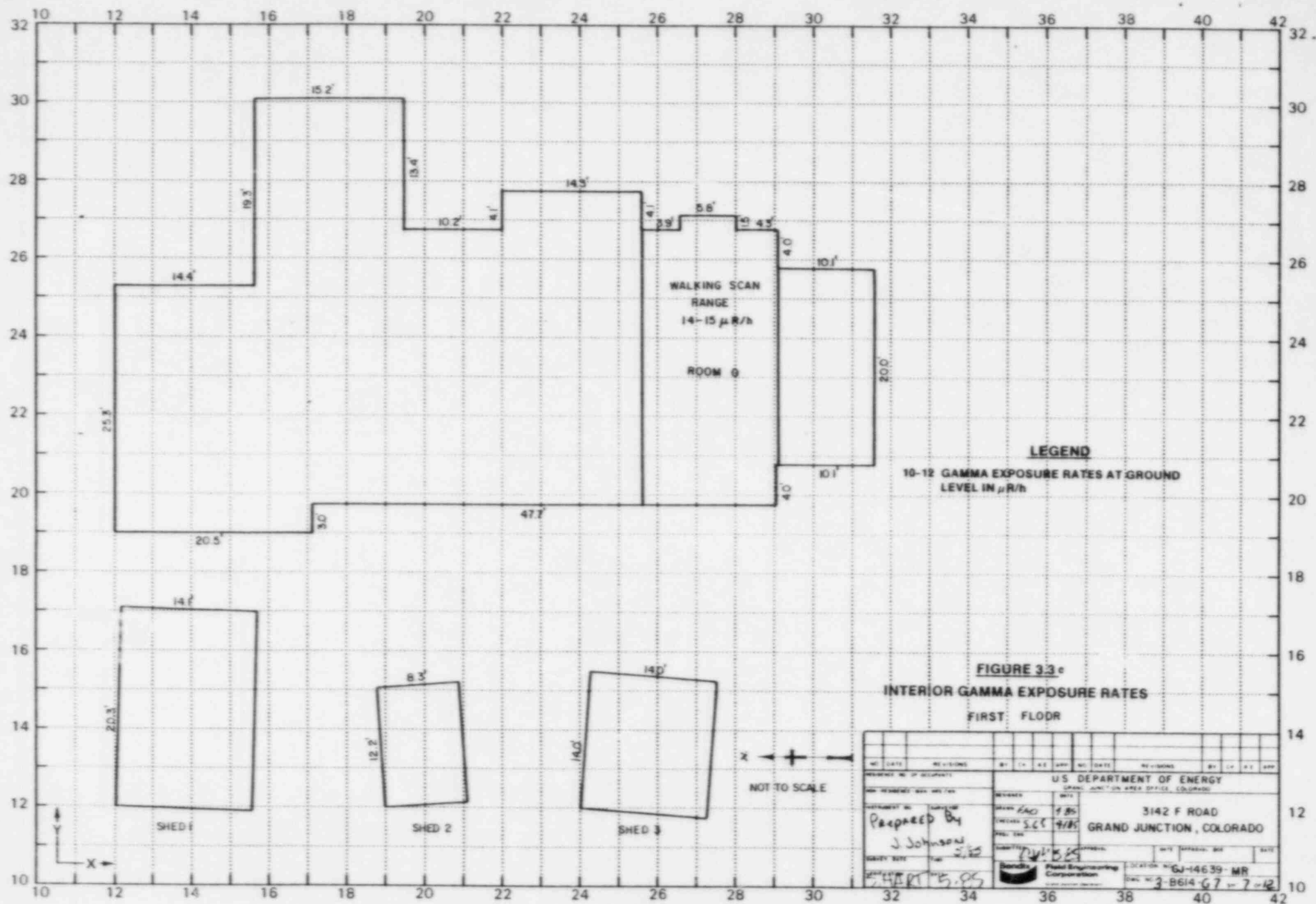
FIGURE 3.2b
EXTERIOR GAMMA SCAN

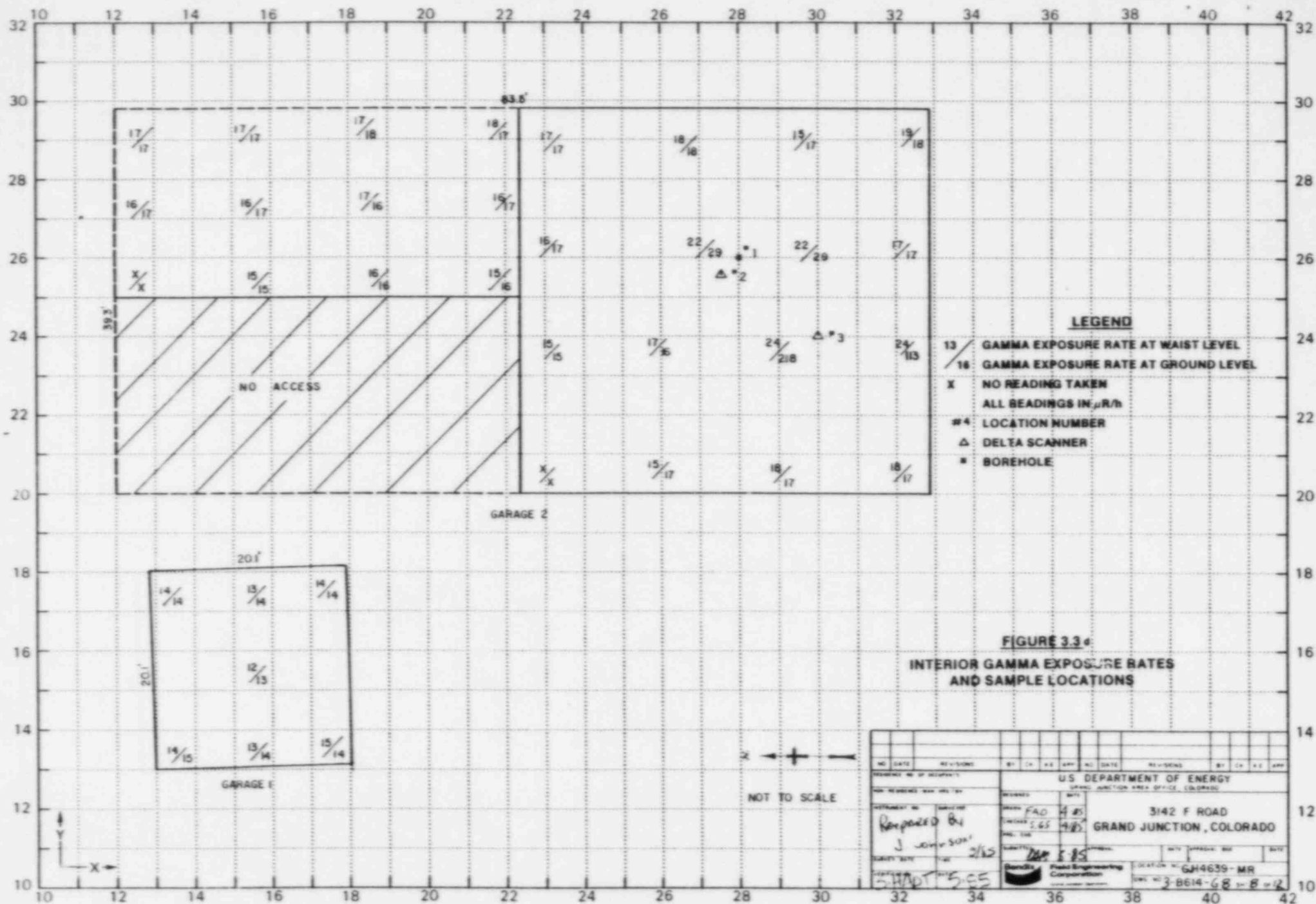
NO. DATE		REVISIONS		BY CH. P.E. APP. NO. DATE		REVISIONS		BY CH. P.E. APP.	
PREPARED BY: <i>Prepared by</i> CHECKED: <i>568</i> DATE: <i>5.85</i> SURVEY DATE: <i>5.85</i>									
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO					3142 F ROAD GRAND JUNCTION, COLORADO				
PROJECT NO. <i>54481</i> DATE <i>5.85</i>					LOCATION: <i>GM4639-MR</i> DATE: <i>3-86</i>				

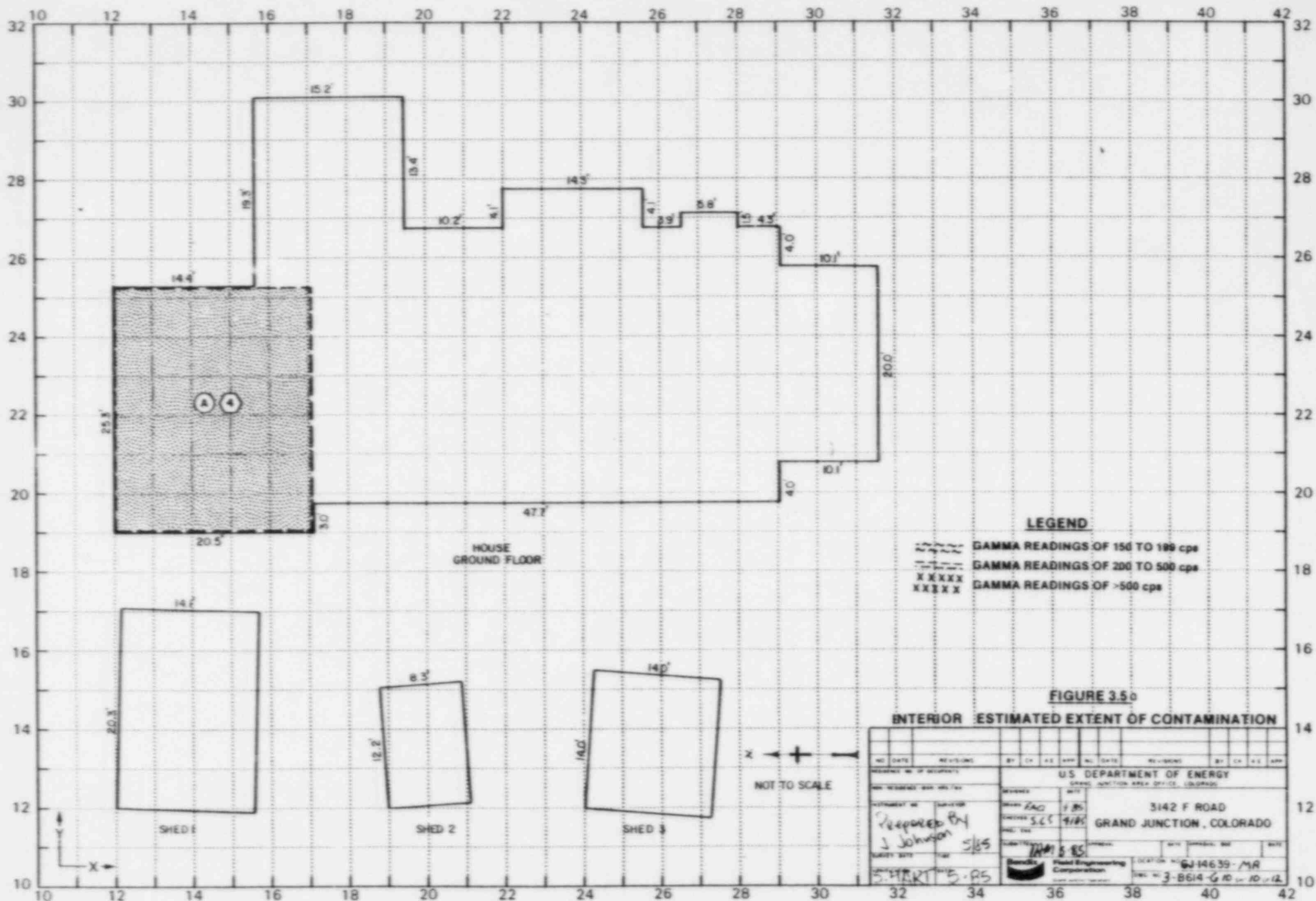


NO. DATE				REVISIONS				BY				CH				H.E.				APP.			
<p>U.S. DEPARTMENT OF ENERGY</p> <p>GRAND JUNCTION AREA OFFICE, COLORADO</p> <p>3142 F ROAD</p> <p>GRAND JUNCTION, COLORADO</p>																							
<p>PROJECT NO. 3142 F ROAD</p> <p>PROJECT NAME: 3142 F ROAD</p> <p>PROJECT DATE: 3/85</p> <p>PROJECT BY: J. Johnson</p> <p>PROJECT SITE: 3142 F ROAD</p>								<p>DESIGNED BY: J. Johnson</p> <p>DESIGNED DATE: 3/85</p> <p>DESIGNED BY: J. Johnson</p> <p>DESIGNED DATE: 3/85</p>															
<p>PROJECT NO. 3142 F ROAD</p> <p>PROJECT NAME: 3142 F ROAD</p> <p>PROJECT DATE: 3/85</p> <p>PROJECT BY: J. Johnson</p> <p>PROJECT SITE: 3142 F ROAD</p>								<p>DESIGNED BY: J. Johnson</p> <p>DESIGNED DATE: 3/85</p> <p>DESIGNED BY: J. Johnson</p> <p>DESIGNED DATE: 3/85</p>															
<p>PROJECT NO. 3142 F ROAD</p> <p>PROJECT NAME: 3142 F ROAD</p> <p>PROJECT DATE: 3/85</p> <p>PROJECT BY: J. Johnson</p> <p>PROJECT SITE: 3142 F ROAD</p>								<p>DESIGNED BY: J. Johnson</p> <p>DESIGNED DATE: 3/85</p> <p>DESIGNED BY: J. Johnson</p> <p>DESIGNED DATE: 3/85</p>															

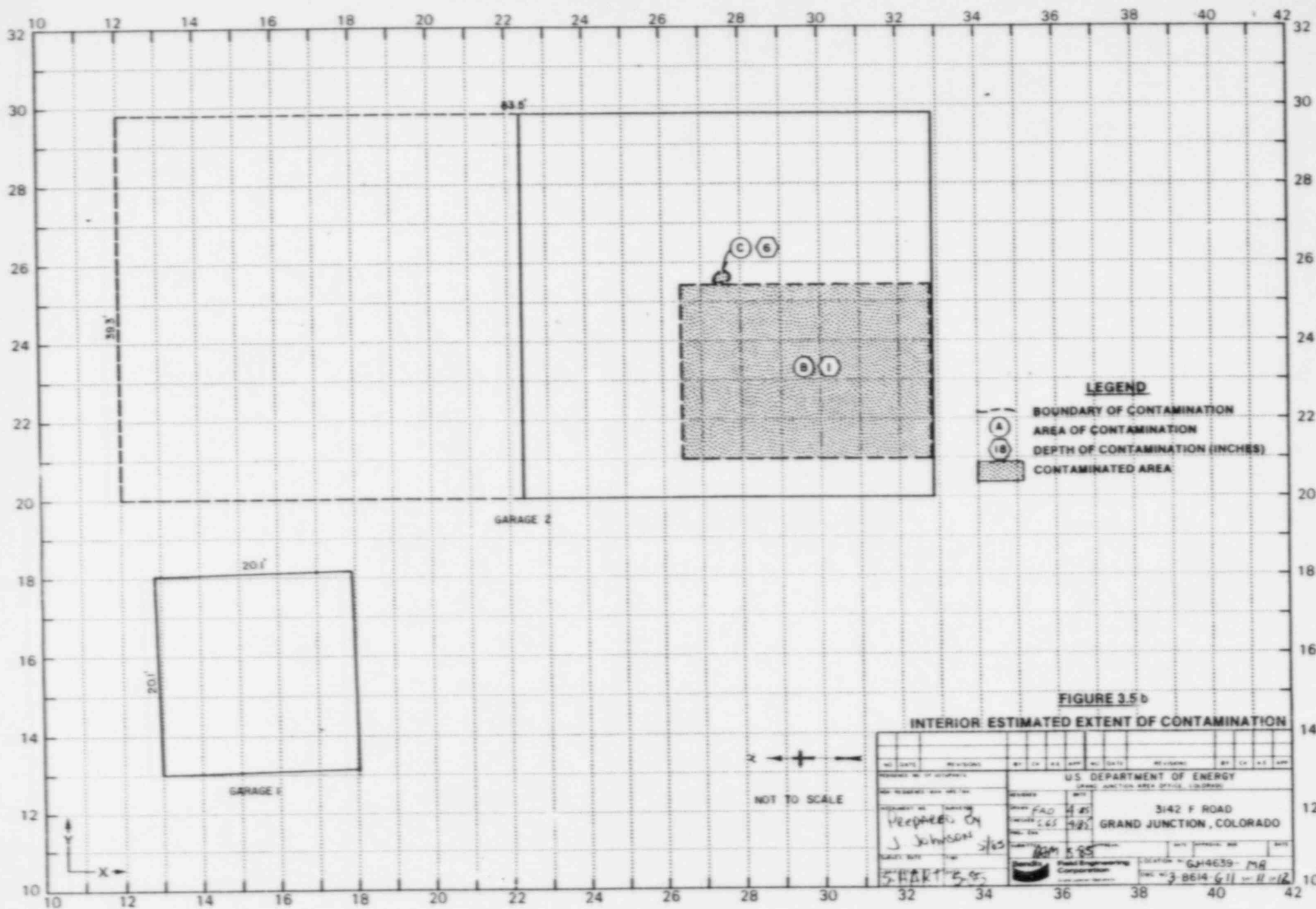








NO. DATE		REVISIONS		BY	CHK	APP	NO. DATE	REVISIONS		BY	CHK	APP
PREPARED BY J. Johnson 5/1/85												
PROJECT NO. 3142 F ROAD GRAND JUNCTION, COLORADO												
DRAWN BY J. Johnson 5/1/85												
CHECKED BY J. Johnson 5/1/85												
SCALE 1" = 10'												
DATE 5/1/85												
PROJECT NO. 3142 F ROAD GRAND JUNCTION, COLORADO												
DRAWN BY J. Johnson 5/1/85												
CHECKED BY J. Johnson 5/1/85												
SCALE 1" = 10'												



3/85

DOE ID NO. GJ-14639-MR

Date 05-15-85

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

Official Survey Report

Property Address 3142 F Road

Property Owner Wm. M. and Shirley P. Ela

Address of Owner (if different from above) Same

Report Prepared By Jay Johnson

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, GJ/CDH

J. Themelis, Mgr. UMTRA Proj. Off.

HIG = 26 uR/h
HOG = 125 uR/h

MEMORANDUM

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado 81501

DATE: April 30, 1985

TO: Files

FROM: Jay Johnson

SUBJECT: Team Leader Notes - GJ-14639-MR

Address: 3142 F Road

Owner:

Weather: Warm, sunny.

Team Members

J. Johnson (Team Leader)
C. Adams
M. Dexter
S. Larsen
M. Gilfillan
A. Quintana
V. Young
T. Ciocco
P. Tuhey
D. Dow

M. Heronema
S. Soathern
V. Rothman
R. Schouten
P. Hardy
D. Bell
L. Kula
H. Mattison
M. Duran

— This property is a five acre lot with an orchard and corn field.

The house and other buildings on the property comprise about one acre of the lot. This one acre was gridded in 10-foot grids and scanned. The remaining four acres were gridded in 50-foot grids and a walking scan was performed. Contamination was found in various parts of the yard; in the east steps, east of the house, in an area where there was once a sandbox, in the north addition of the house, and in the garage.

Team Leader Notes
Jay Johnson
GJ-14639-MR
April 30, 1985
Page 2

The addition had carpet and tile floors so exploration holes could not be performed in this area.

A small concrete pad extended from under the new addition on the east side and is the same concrete slab that is under the addition.

A core and hole was augered with the concrete showing the contamination.

The contamination in the garage is a small layer of soil and dust on top of a concrete slab.

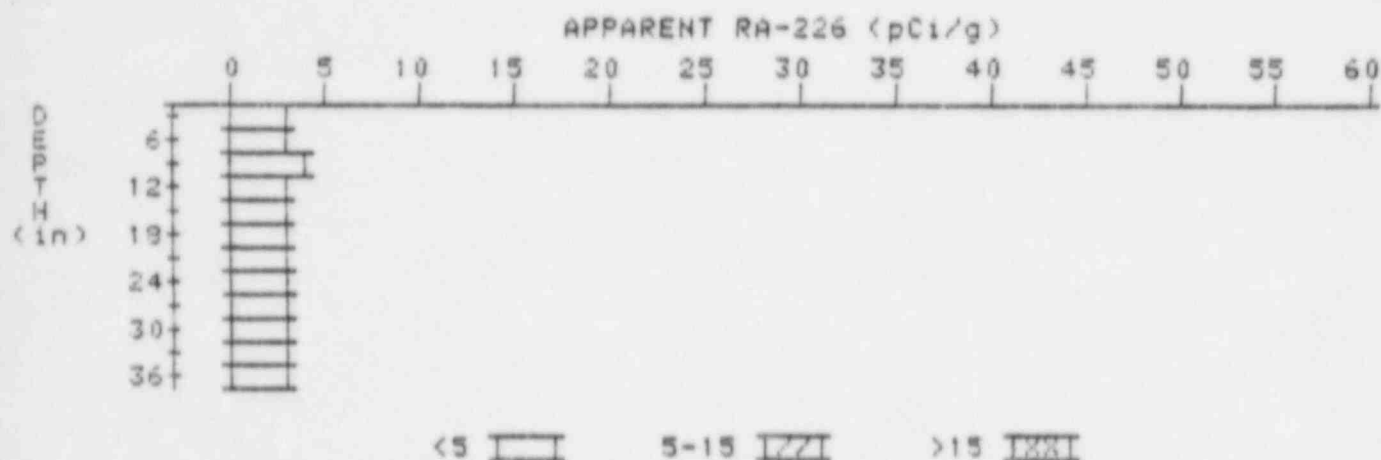
The basement was checked for utility lines, it was noted that all of the utility lines come in through the crawl space.

There is an old cistern that is in the basement. It showed no contamination.

East of the old sand box is an area of an old septic tank. A hole was augered in this area with negative results.

APPARENT RADIUM-226 CONCENTRATION 11 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-14639-MR
HOLE NUMBER: 11
LOCATION: 555385



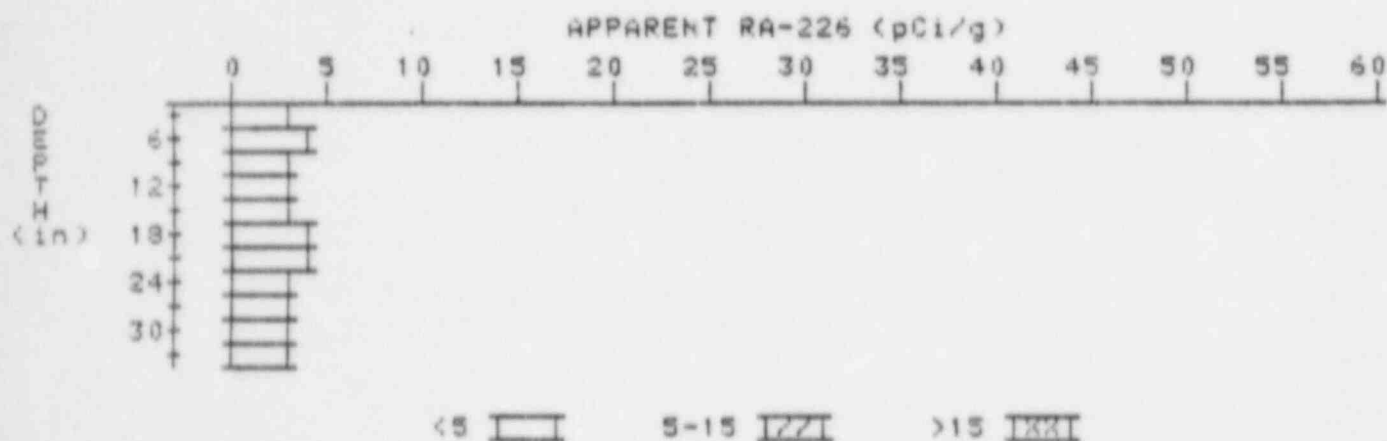
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.8	2.8
6	2.9	2.5
9	3.2	3.7
12	3.2	3.2
15	3.2	3.4
18	3.1	2.9
21	3.1	3.1
24	3.1	3.1
27	3.1	3.1
30	3.1	3.3
33	3.0	3.0
36	2.9	2.9

APPARENT RADIUM-226 CONCENTRATION 15 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-14639-MR

HOLE NUMBER: 15

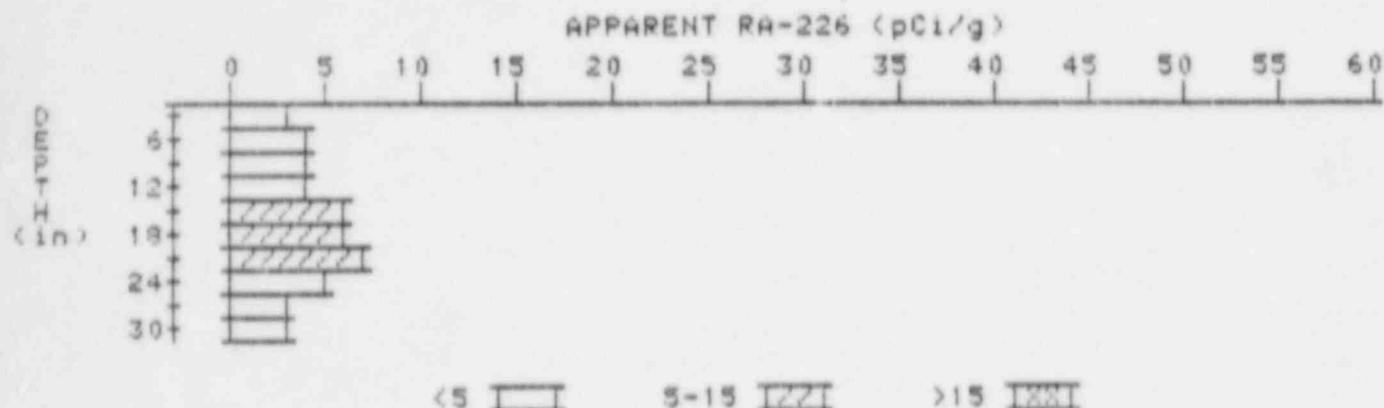
LOCATION: 608370



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

APPARENT RADIUM-226 CONCENTRATION 16 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-14639-MR
HOLE NUMBER: 16
LOCATION: 620349



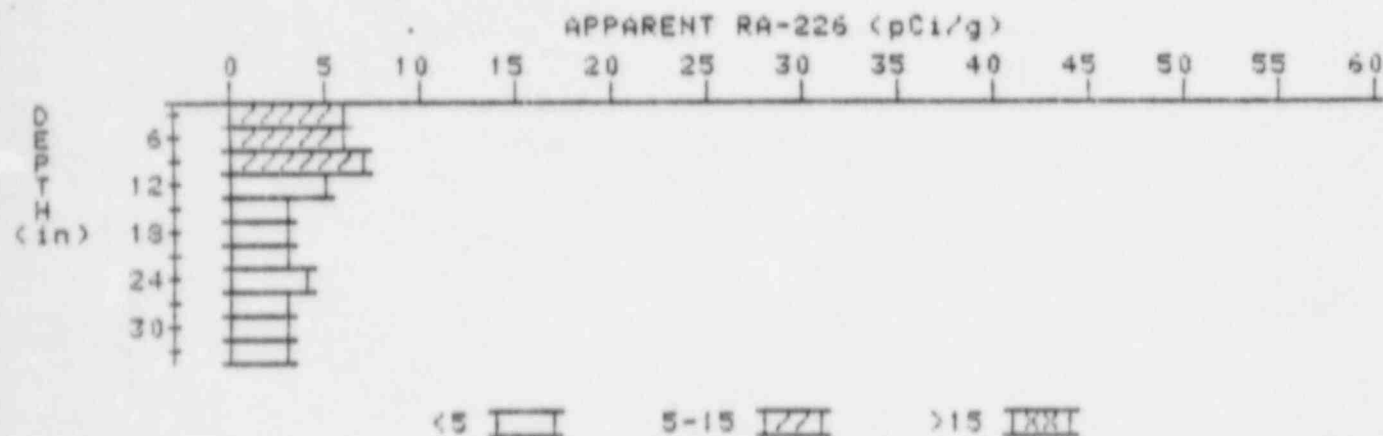
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.7	3.9
9	4.0	3.9
12	4.4	3.9
15	5.1	5.8
18	5.4	5.9
21	5.5	7.1
24	4.7	4.7
27	3.9	3.4
30	3.4	3.4

APPARENT RADIUM-226 CONCENTRATION 17 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-14639-MR

HOLE NUMBER: 17

LOCATION: 622370



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.7	5.7
6	5.7	6.1
9	5.5	6.6
12	4.7	4.7
15	3.9	3.0
18	3.6	3.4
21	3.4	2.9
24	3.5	3.9
27	3.4	3.4
30	3.3	3.1
33	3.3	3.3

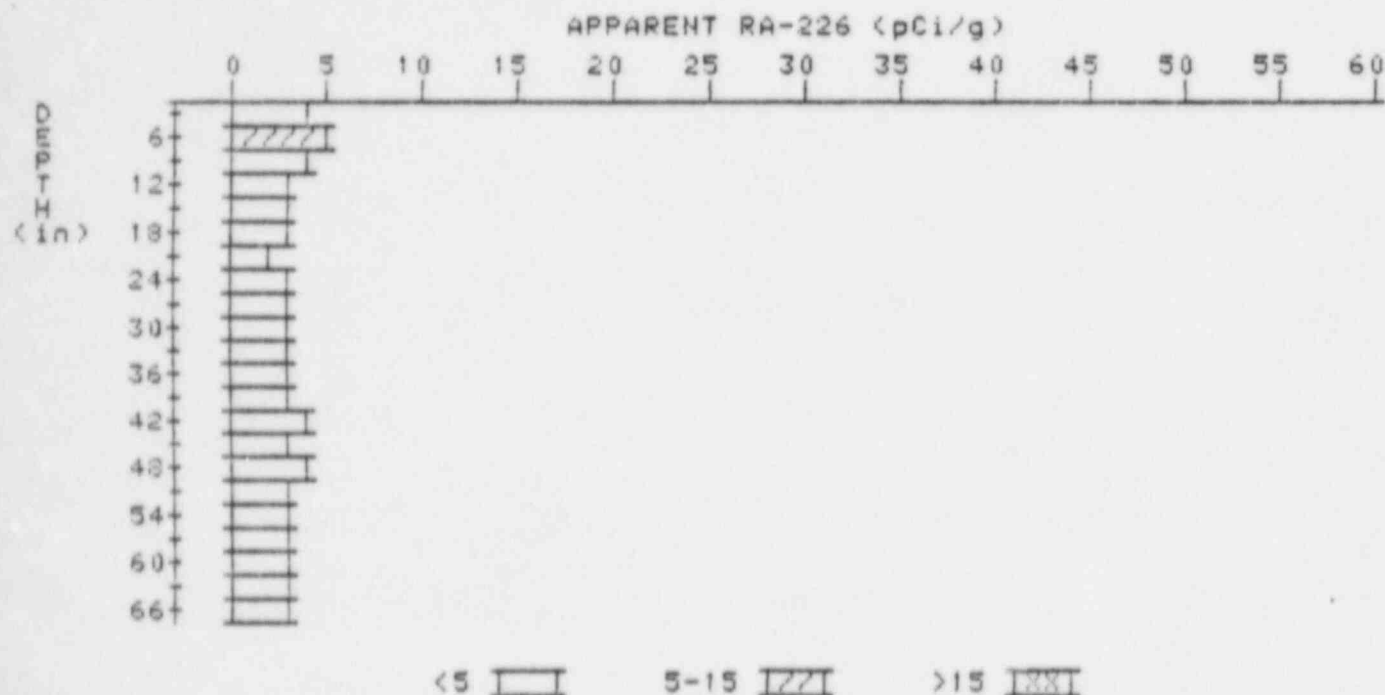
APPARENT RADIUM-226 CONCENTRATION 22

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-14639-MR

HOLE NUMBER: 22

LOCATION: 649409



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.2	4.2
6	4.4	5.5
9	4.0	4.0
12	3.6	3.4
15	3.3	3.1
18	3.1	3.1
21	2.9	2.4
24	3.0	3.2
27	3.0	3.0
30	3.0	2.8
33	3.1	3.1
36	3.2	3.2
39	3.3	3.3
42	3.4	3.6
45	3.4	3.4
48	3.4	3.9

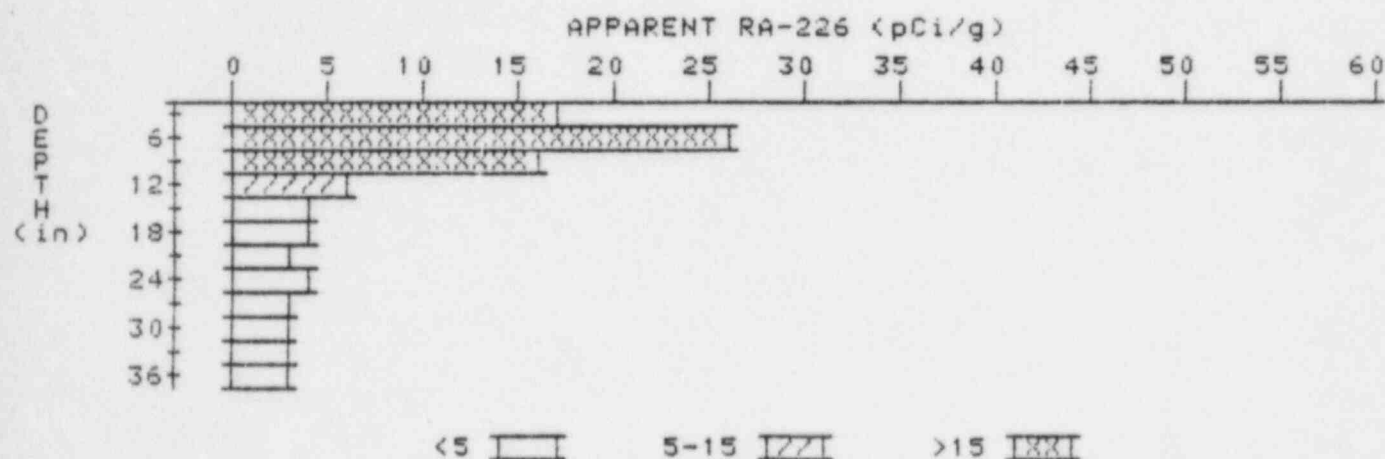
51
54
57
60
63
66

3.2
3.3
3.3
3.2
3.2
3.2

2.7
3.5
3.5
3.0
3.2
3.2

APPARENT RADIUM-226 CONCENTRATION 24 DECONVOLUTION GRAPH

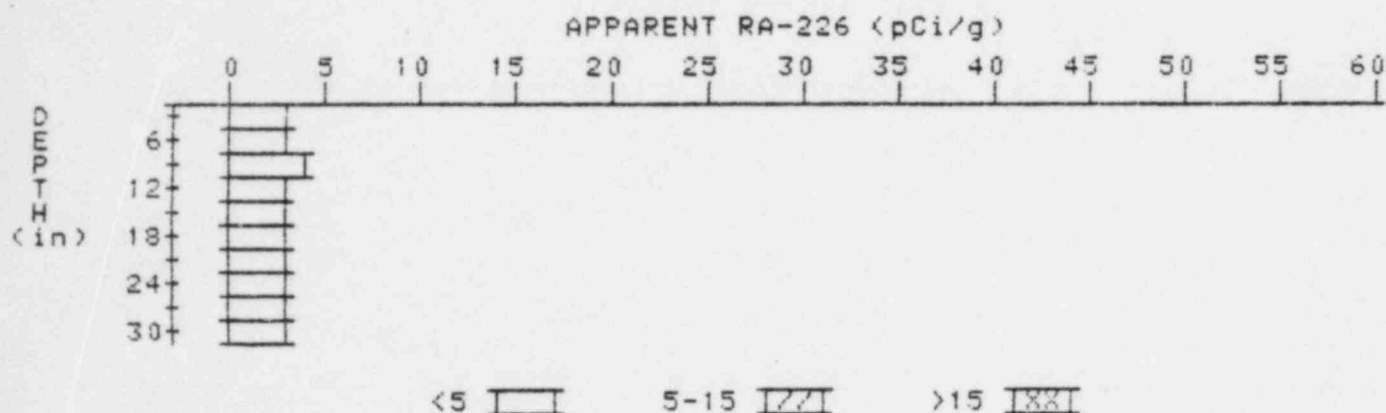
PROPERTY NUMBER: GJ-14639-MR
HOLE NUMBER: 24
LOCATION: 650420



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	16.8	16.8
6	17.8	26.2
9	14.1	16.1
12	9.3	5.7
15	6.5	4.2
18	5.0	3.9
21	4.1	3.2
24	3.7	3.5
27	3.4	3.4
30	3.1	2.7
33	3.0	3.0
36	2.9	2.9

APPARENT RADIUM-226 CONCENTRATION 25 DECONVOLUTION GRAPH

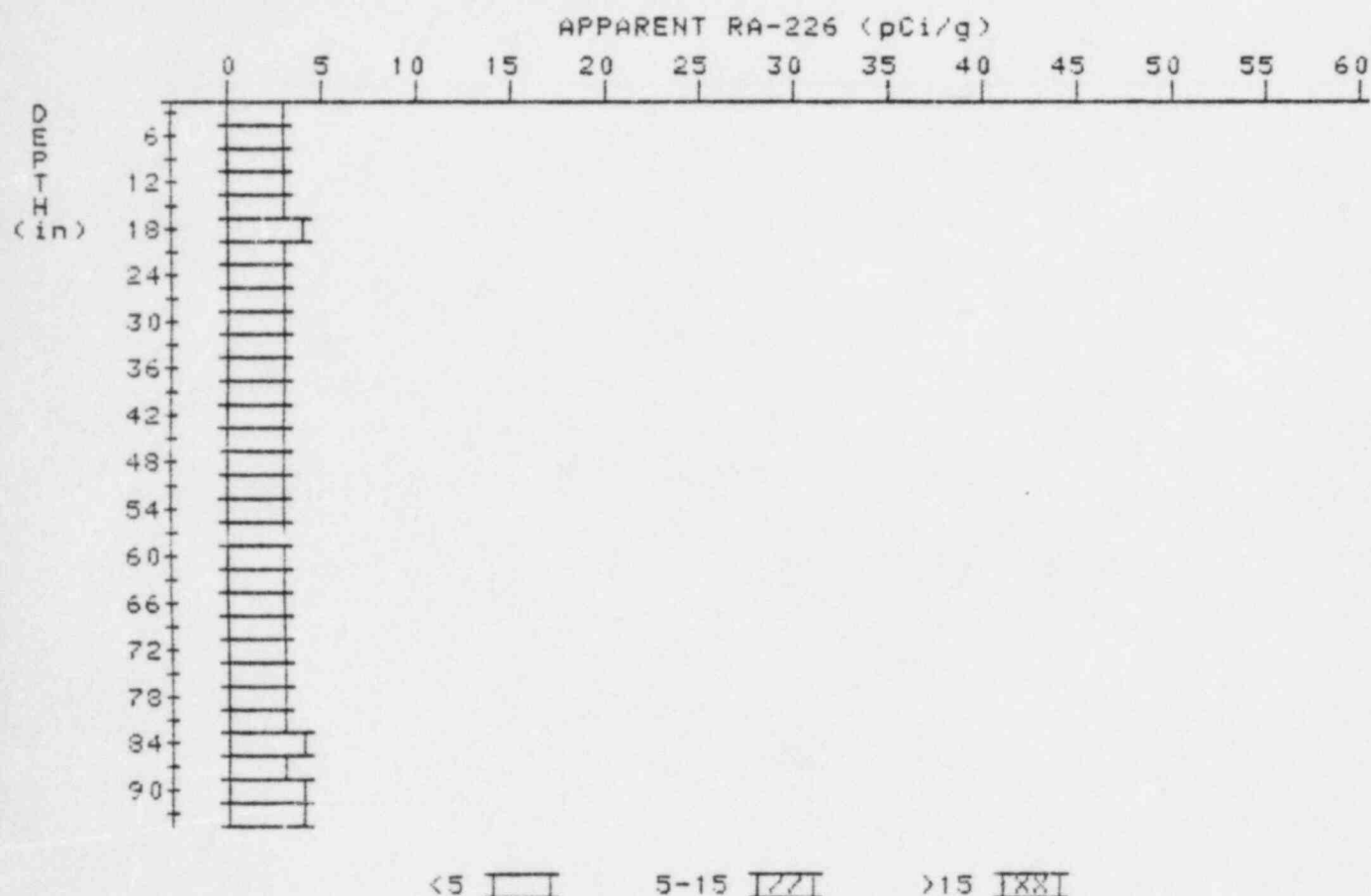
PROPERTY NUMBER: GJ-14639-MR
HOLE NUMBER: 25
LOCATION: 650430



Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	3.3	3.3
6	3.3	3.3
9	3.3	3.7
12	3.1	2.6
15	3.2	3.4
18	3.2	3.2
21	3.2	3.2
24	3.2	3.2
27	3.2	3.2
30	3.2	3.2

APPARENT RADIUM-226 CONCENTRATION 26 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-14639-MR
HOLE NUMBER: 26
LOCATION: 653352

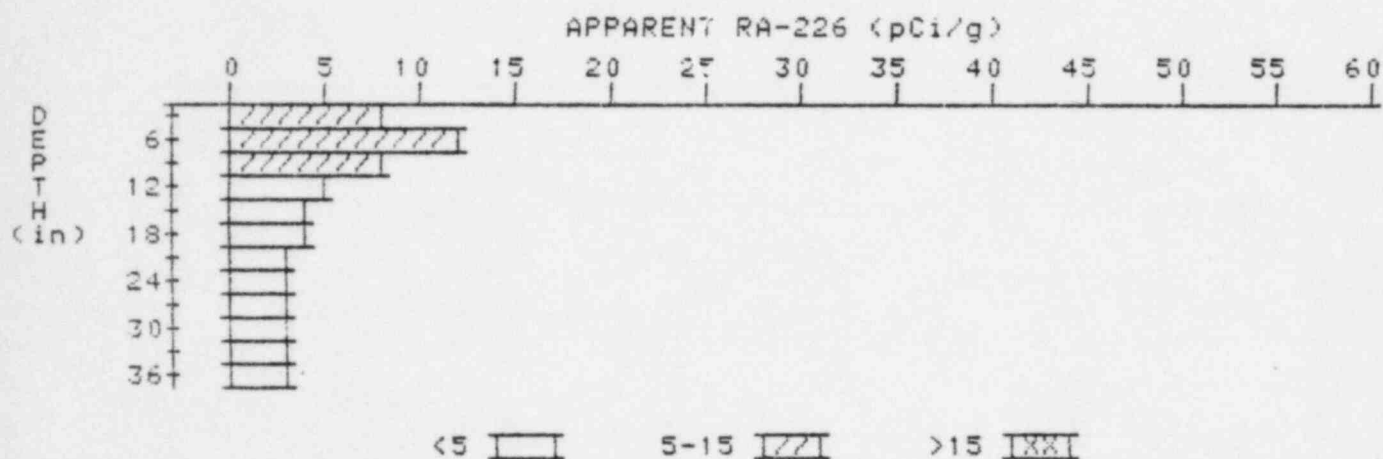


Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Deconvolved	Deconvolved
3	3.1	3.1
6	3.2	3.4
9	3.2	3.4
12	3.1	2.7
15	3.2	3.2
18	3.3	3.7
21	3.2	3.0
24	3.2	3.4
27	3.1	2.9

30	3.1	2.9
33	3.2	3.4
36	3.2	3.2
39	3.2	3.0
42	3.3	3.5
45	3.3	3.3
48	3.3	3.3
51	3.3	3.5
54	3.2	3.2
57	3.1	2.7
60	3.2	3.4
63	3.2	3.2
66	3.2	3.2
69	3.2	3.0
72	3.3	3.5
75	3.3	3.3
78	3.3	3.3
81	3.3	3.1
84	3.4	3.6
87	3.4	3.2
90	3.5	3.7
93	3.5	3.5

APPARENT RADIUM-226 CONCENTRATION 27 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-14639-MR
HOLE NUMBER: 27
LOCATION: 653413



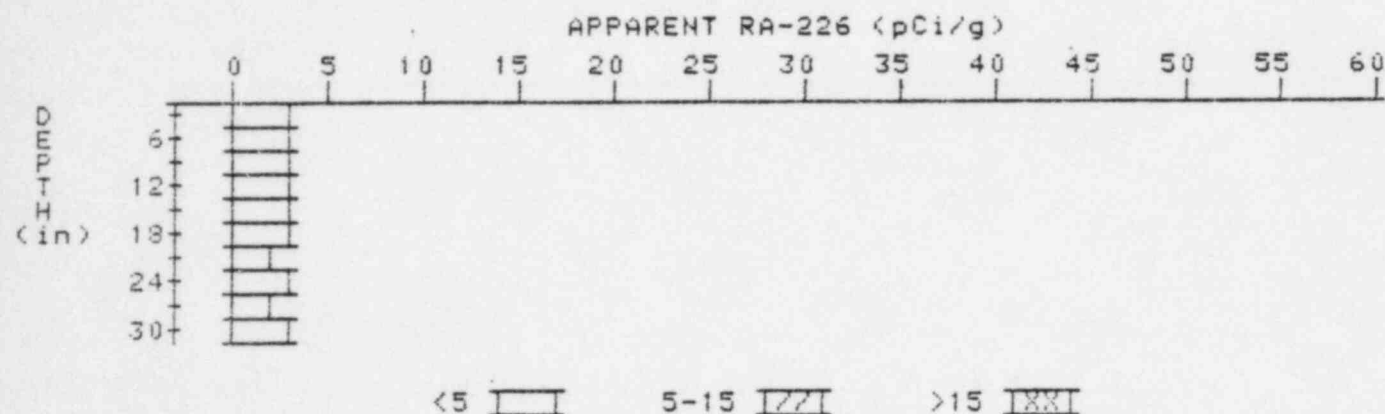
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	8.1	8.1
6	8.6	12.0
9	7.2	7.6
12	5.6	4.7
15	4.5	3.6
18	3.9	3.5
21	3.5	3.3
24	3.2	3.0
27	3.0	2.6
30	3.0	3.0
33	3.0	3.0
36	3.0	3.0

APPARENT RADIUM-226 CONCENTRATION 28 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-14639-MR

HOLE NUMBER: 28

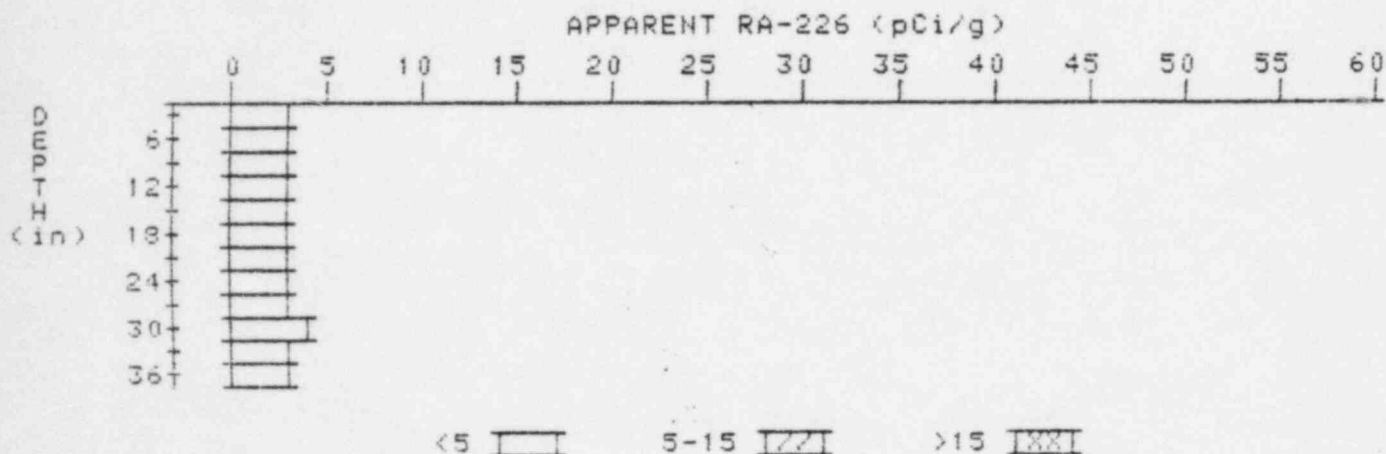
LOCATION: 670385



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.0	3.0
6	3.1	3.3
9	3.1	3.1
12	3.1	3.3
15	3.0	3.0
18	2.9	2.9
21	2.8	2.4
24	2.9	2.4
27	2.7	2.2
30	2.8	2.3

APPARENT RADIUM-226 CONCENTRATION 29 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-14639-MR
HOLE NUMBER: 29
LOCATION: 678352



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	2.5	2.5
6	2.8	3.0
9	3.0	3.2
12	3.1	3.5
15	3.0	2.8
18	3.0	2.8
21	3.1	3.3
24	3.1	3.1
27	3.1	2.9
30	3.2	3.6
33	3.1	2.7
36	3.2	3.2

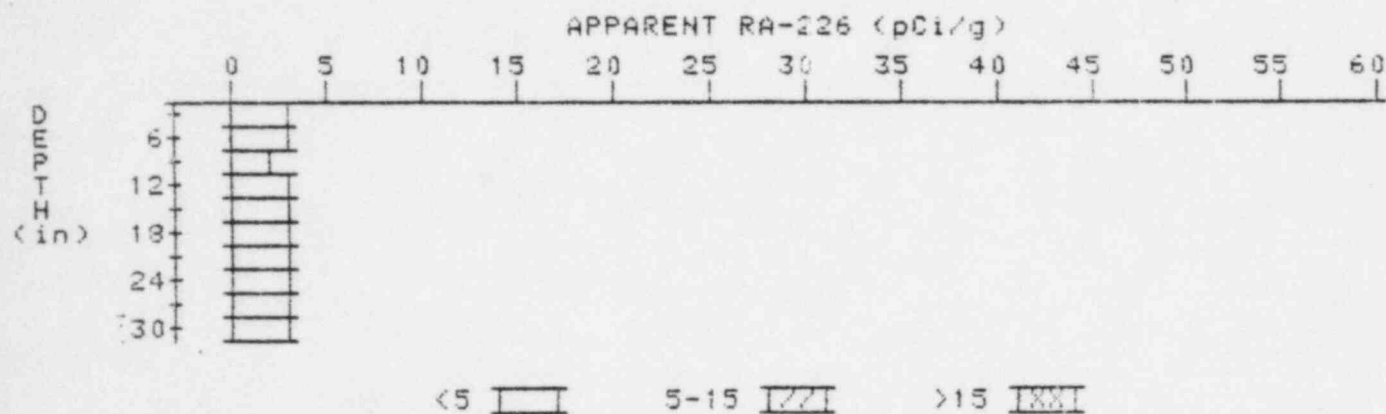
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

1

PROPERTY NUMBER: GJ-14639-MR

HOLE NUMBER: 1

LOCATION:



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.4	3.4
6	3.0	2.6
9	2.8	2.3
12	2.9	3.3
15	2.8	2.6
18	2.8	2.8
21	2.8	2.8
24	2.8	2.8
27	2.8	2.8
30	2.8	2.8

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