

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-05659-RS
ADDRESS: 102 MIRIAM AVENUE

MAY 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION
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DATE May 23, 1985

REA05659:REA-602

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-05659-RS, is a single-family residence located at 102 Miriam 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 contaminated 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, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$1,460. Remedial action on this property will take approximately five days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 102 Miriam Avenue, Grand Junction, Colorado

Zoning: Single-family residence

Lot Size: Approximately 11,400 sf (0.3 acre)

Legal Description: Lot 1, BLK 5, Artesia Heights Replat, SEC 25 1S 1W, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately one mile south 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/underground
Gas:	Underground
Telephone:	Overhead
Sewer:	Underground
Water:	Underground
Cable TV:	Overhead

Bordering Properties:

North:	Sherman Drive
South:	Single-family residence
East:	Single-family residence
West:	Miriam Avenue

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-family residence
Size:	Approximately 1,223 sf
Construction Date:	1955
Construction:	Wood-frame
Foundation:	Slab-on-grade
Footing Depth:	Approximately 8" to bottom of footing from grade
Basement:	None
Crawl Space:	None
Condition:	Fair

Other Structures:

Type:	Shed
Size:	Approximately 80 sf
Construction:	Wood
Foundation:	None
Condition:	Fair

Type:	Garage
Size:	Approximately 895 sf
Construction:	Wood-frame
Foundation:	Slab-on-grade
Condition:	Fair

Improvements or Attachments to Structure:

Additions:	Enclosed porch, wood shed
Porches:	
Type:	Enclosed porch
Size:	Approximately 214 sf
Location:	Northeast corner of the house
Patios:	None
Driveways:	
Type:	Concrete
Location:	From Miriam Avenue to the house
Sidewalks:	
Type:	Concrete
Location:	From Miriam Avenue to the house; from Sherman Drive to the house
Fences:	
Type:	Chain link
Location:	Around perimeter of yard, 6 ft high wood on the east side
General Remarks:	The property is poorly landscaped; the main structure is in fair condition. 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-05659-RS on March 7, 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, along the east property line, and south of the driveway.

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, Memo of Understanding, 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: 15 to 16 uR/h
Highest Outside Gamma Reading (HOG): 117 uR/h

Exterior radium-concentration measurements are presented in Appendix Table 3.1. Grid-point survey results are shown in Appendix Figure 3.1. Appendix Figure 3.2 presents the ranges of elevated gamma readings and indicates areas of possible contamination.

3.2.2 Interior Findings

Background Readings: 11 to 13 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 Figure 3.3 shows 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 3.3 and 3.4. 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 Figure 3.5 shows identified areas and estimated depths of contamination on this property, based on assessments of all measurements taken. As noted in this figure, areas recommended for remedial action that contain identified residual radioactive materials are:

- (AREA A) Adjacent to the south side of the garage there is contamination to a depth of 15 inches (approximately 34 sf).
- (AREA B) South of the garage, beyond Area A, there is contamination to a depth of 12 inches (approximately 154 sf).
- (AREA C) Within Area D, south of the driveway, there is contamination to a depth of 12 inches (approximately 84 sf).
- (AREA D) South of the driveway there is contamination to a depth of 6 inches (approximately 252 sf).
- (AREA E) South of the garage there is contamination to a depth of 6 inches (approximately 95 sf).
- (AREA F) East of the primary structure there is contamination to a depth of 6 inches (approximately 28 sf).
- (AREA G) East of the primary structure there is contamination to a depth of 18 inches (approximately 8 sf).

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-05659-RS, includes removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figure 3.5) 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 \$1,460.

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

Owner preference is to have the remedial action done as soon as possible. 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 Grid-Point Exposure Rates
Figure 3.2	Exterior Gamma Scan
Figure 3.3	Interior Gamma Exposure Rates and Sample Location - Ground Floor
Figure 3.4	Exterior Sample Locations
Figure 3.5	Exterior Estimated Extent of Contamination

Official Survey Report

Memo of Understanding

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Radium Concentrations at Exterior Locations

DOE ID No. GJ-05659-RS

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Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot.	Ct Spectr.		
2	170220	00	DS	1.5		*	Background
		00-06	SS			2.1	
		03	TC	3.2		*	DC = 0 inches
		06	BH	3.6	<1.0	*	
		09	TC	3.9		*	
		12	BH	4.2	1.4	*	
		15	TC	4.3		*	
		18	BH	4.3	1.0	*	
		21	TC	4.2		*	
		24	BH	4.1	1.3	*	
		27	TC	4.0		*	
		30	BH	3.7	<1.0	*	
		33	TC	3.7		*	
		36	TC	3.8		*	
3	188256	00	DS	1.8		*	Gas line
		16	DS	1.4		*	On gas line
4	203275	00	DS	8.0		*	East side of house
		06	DS	1.7		*	DC = 6 inches
5	204225	00	DS	1.6		*	West side next to water line
		03	TC	3.2		*	
		06	TC	3.6		*	
		09	TC	3.9		*	DC = 0 inches
		12	TC	4.1		*	
		15	TC	4.2		*	
		18	TC	4.2		*	
		21	TC	4.2		*	
		24	TC	4.2		*	
		27	TC	4.1		*	
		30	TC	3.9		*	
		33	TC	3.8		*	
		36	TC	3.7		*	
		39	TC	3.6		*	
		42	TC	3.5		*	
		45	TC	3.4		*	
		48	TC	3.4		*	
		51	TC	3.3		*	
		54	TC	3.2		*	
		57	TC	3.1		*	
		60	TC	3.1		*	

Radium Concentrations at Exterior Locations

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Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
6	204269	00	DS	1.3		*	Next to sewer line
		03	TC	3.8		*	
		06	TC	4.0		*	DC = 0 inches
		09	TC	4.3		*	
		12	TC	4.4		*	
		15	TC	4.4		*	
		18	TC	4.3		*	
		21	TC	4.2		*	
		24	TC	4.0		*	
		27	TC	3.9		*	
		30	TC	3.8		*	
		33	TC	3.7		*	
		36	TC	3.6		*	
		39	TC	3.6		*	
		42	TC	3.5		*	
		45	TC	3.6		*	
		48	TC	3.6		*	
		51	TC	3.6		*	
		54	TC	3.6		*	
		57	TC	3.6		*	
		60	TC	3.5		*	
7	216283	00	DS	1.1		*	East side of house
		00-06	SS			2.7	
		03	TC	3.6		*	DC = 0 inches
		06	TC	3.9		*	
		09	TC	4.2		*	
		12	TC	4.3		*	
		15	TC	4.4		*	
		18	TC	4.4		*	
		21	TC	4.2		*	
		24	TC	4.1		*	
		27	TC	3.9		*	
		30	TC	3.8		*	
8	227268	00	DS	29.3		*	East of house
		06	DS	3.7		*	
		12	DS	2.4		*	DC = 18 inches
		18	DS	2.3		*	
		24	DS	<1.0		*	
9	266220	00	DS	<1.0		*	On driveway

Radium Concentrations at Exterior Locations

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Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
10	266227	00	DS	<1.0		*	On driveway
11	268220	00	DS	5.7		*	Next to driveway
		06	DS	1.4		*	DC = 6 inches
12	269227	00	DS	4.3		*	Next to driveway
		06	DS	1.9		*	DC = 6 inches
13	269250	00	DS	29.5		*	South side of house
		03	TC	13.0		*	
		06	TC	10.6		*	DC = 15 inches
		09	TC	8.5		*	Based on the
		12	TC	6.6		*	deconvolution graph
		15	TC	5.5		*	
		18	TC	4.9		*	
		21	TC	4.6		*	
		24	TC	4.4		*	
		27	TC	4.3		*	
		30	TC	4.3		*	
		33	TC	4.3		*	
		36	TC	4.2		*	
		39	TC	3.9		*	
		42	TC	3.8		*	
		45	TC	3.7		*	
		48	TC	3.5		*	
		51	TC	3.5		*	
		54	TC	3.6		*	
		57	TC	3.5		*	
		60	TC	4.0		*	
14	269257	00	DS	5.3		*	Next to foundation
		03	TC	5.2		*	
		06	TC	4.7		*	DC = 6 inches
		09	TC	4.4		*	Based on the
		12	TC	4.3		*	deconvolution graph
		15	TC	4.2		*	
		18	TC	4.0		*	
		21	TC	4.0		*	
		24	TC	3.8		*	
		27	TC	3.8		*	
15	273215	00	DS	12.4		*	
		03	TC	8.9		*	Next to driveway
		06	TC	7.3		*	South side

Radium Concentrations at Exterior Locations

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Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
15	273215	09	TC	6.1		*	
		12	TC	5.5		*	DC = 12 inches
		15	TC	5.1		*	Based on the
		18	TC	4.8		*	deconvolution graph
		21	TC	4.5		*	
		24	TC	4.4		*	
		27	TC	4.1		*	
		30	TC	4.0		*	
		33	TC	3.8		*	
		36	TC	3.8		*	
16	275205	00	DS	7.4		*	Southwest of
		03	TC	4.4		*	driveway
		06	TC	4.4		*	
		09	TC	4.5		*	DC = 6 inches
		12	TC	4.5		*	Based on all
		15	TC	4.4		*	data taken
		18	TC	4.3		*	
		21	TC	4.2		*	
		24	TC	3.9		*	
		27	TC	3.7		*	
		30	TC	3.5		*	
17	275225	00	DS	2.3		*	
		03	TC	4.4		*	Southwest of house
		06	TC	4.6		*	
		09	TC	4.5		*	DC = 6 inches
		12	TC	4.5		*	Based on all
		15	TC	4.6		*	data taken
		18	TC	4.6		*	
		21	TC	4.5		*	
		24	TC	4.3		*	
		27	TC	4.1		*	
		30	TC	3.9		*	
		33	TC	3.8		*	
		36	TC	3.7		*	
18	275253	00	DS	19.8		*	South of house
		03	TC	12.9		*	
		06	TC	10.8		*	DC = 12 inches
		09	TC	8.1		*	Based on the
		12	TC	6.4		*	deconvolution graph
		15	TC	5.5		*	
		18	TC	5.0		*	

Radium Concentrations at Exterior Locations

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Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot.	Ct Spectr.		
18	275253	21	TC	4.7		*	
		24	TC	4.5		*	
		27	TC	4.5		*	
		30	TC	4.6		*	
		33	TC	4.7		*	
		36	TC	4.2		*	
		39	TC	4.0		*	
		42	TC	3.8		*	
		45	TC	3.9		*	
19	280246	00	DS	3.6		*	South side of
		03	TC	4.1		*	garage
		06	TC	4.2		*	
		09	TC	4.3		*	DC = 12 inches
		12	TC	4.3		*	Based on all
		15	TC	4.2		*	data taken
		18	TC	4.0		*	
		21	TC	3.8		*	
		24	TC	3.7		*	
		27	TC	3.7		*	
		30	TC	3.6		*	
		33	TC	3.5		*	
20	283215	00	DS	2.4		*	DC = 0 inches
		03	TC	4.0		*	
		06	TC	4.3		*	
		09	TC	4.4		*	
		12	TC	4.6		*	
		15	TC	4.5		*	
		18	TC	4.5		*	
		21	TC	4.4		*	
		24	TC	4.3		*	
		27	TC	4.0		*	
		30	TC	3.9		*	
		33	TC	3.8		*	
21	285205	00	DS	1.2		*	Southwest yard
							DC = 0 inches
22	285225	00	DS	1.9		*	DC = 0 inches
		03	TC	3.9		*	
		06	TC	4.2		*	
		09	TC	4.4		*	
		12	TC	4.4		*	

Radium Concentrations at Exterior Locations

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Loc No.	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g)		Chem Ra-226 (pCi/g)	Comments
				Tot. Ct	Spectr.		
22	285225	15	TC	4.4		*	
		18	TC	4.3		*	
		21	TC	4.2		*	
		24	TC	4.0		*	
		27	TC	3.9		*	
		30	TC	3.7		*	
		33	TC	3.6		*	
23	285285	00	DS	<1.0		*	Southeast yard
		00-06	SS			1.6	
		03	TC	3.1		*	DC = 0 inches
		06	TC	3.5		*	
		09	TC	3.7		*	
		12	TC	3.9		*	
		15	TC	3.9		*	
		18	TC	3.8		*	
		21	TC	3.7		*	
		24	TC	3.8		*	
		27	TC	3.6		*	
		30	TC	3.6		*	
		33	TC	3.5		*	

Tool 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 = 03-07-85
 Team Leader = SM

Radium Concentrations at Interior Locations

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=====						
In Situ Ra-226						
Loc	Grid	Depth	Meas.	(pCi/g)		Chem Ra-226
No.	Location	(in.)	Type	Tot. Ct	Spectr.	(pCi/g)

1		00	DS	1.2		*
						In garage South wall
=====						

Tool 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 = 03-07-85
Team Leader = SM

Table 3.3
Summary of Interior Gamma Exposure Rates

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Location	Number of Readings Taken at Waist Level	Range at Waist Level (uR/h)	Mean at Waist Level (uR/h)	Number of Readings Taken at Surface	Range at Surface (uR/h)	Mean Surface (uR/h)
*						
-----	-----	-----	-----	-----	-----	-----
PRIMARY	*	*	*	*	11-13	*
STRUCTURE						
GARAGE	12	11-16	12	12	12-16	13
-----	-----	-----	-----	-----	-----	-----

* The CDH and ORNL data indicated the absence of interior contamination at this property. This information was investigated by performing a walking gamma scan of the primary structure. These areas and the ranges of gamma measurements are shown in Appendix Figure 3.3. Exposure rates in the garage are also shown in Appendix Figure 3.3.

Table 4.1
Area and Volume Calculations
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<u>AREA</u>	<u>CALCULATIONS(ft)</u>		<u>SF</u>	<u>DEPTH(ft)</u>		<u>CF</u>	<u>CUBIC YARDS</u>
A	2 x 17	=	34	x	1.3	=	44
B	11 x 14	=	154	x	1.0	=	154
C	7 x 12	=	84	x	1.0	=	84
D	28 x 12 (Minus Area C)	=	336 (84)				
			<u>252</u>	x	0.5	=	126
E	19 x 5	=	95	x	0.5	=	48
F	7 x 4	=	28	x	0.5	=	14
G	4 x 2	=	8	x	1.5	=	12
TOTAL VOLUME - EXTERIOR						=	482 = 482/27 = 18

See Appendix Figure 3.5 For Areas

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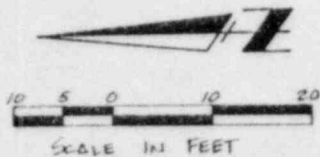
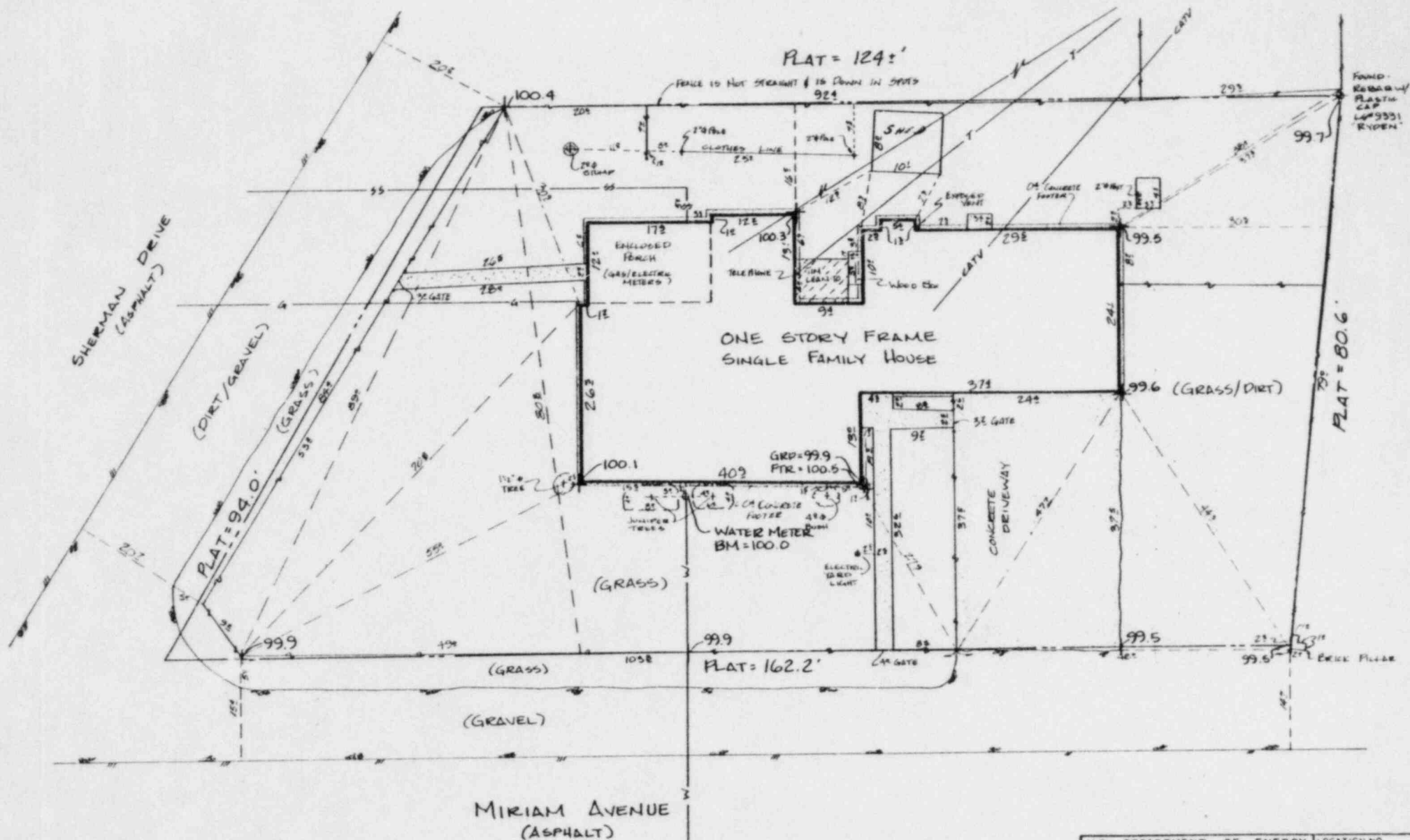
Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-05659-RS Page 1 of 1

Remove identified residual radioactive material (machine-open)		
15 cy @ \$14.50/cy	\$	218
Remove identified residual radioactive material (manual-open)		
3 cy @ \$44.00/cy		132
Remove concrete		
Lump sum @ \$50.00		50
Replace topsoil		
18 cy @ \$9.50/cy		171
Remove/Replace 42" chain link fence		
25 lf @ \$1.00/lf		25
		<hr/>
TOTAL EXTERIOR	\$	596
TOTAL INTERIOR		0
ACCESS CONTROL		250
		<hr/>
SUBTOTAL	\$	846
CONTINGENCY @ 15%		127
		<hr/>
SUBTOTAL	\$	973
CONTRACTOR OVERHEAD & PROFIT @ 50%		487
		<hr/>
GRAND TOTAL	\$	1,460

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LR/050785
REA05659/REA-602/LR

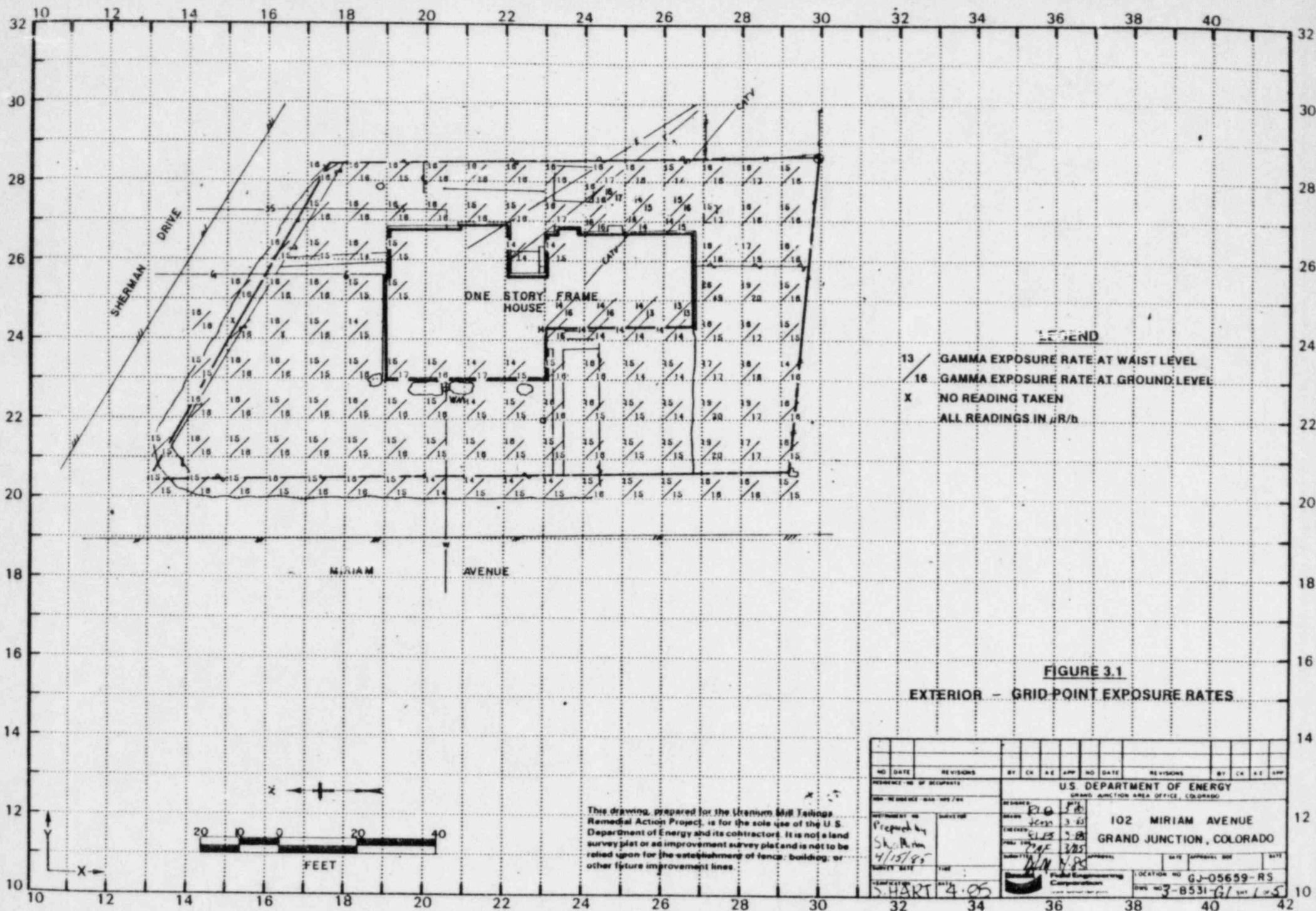
LOT 1 BLOCK 5 ARTESIA HEIGHTS REPLAT
SECTION 25, T. 1 S., R. 1 W.,
GRAND JUNCTION, COLORADO.

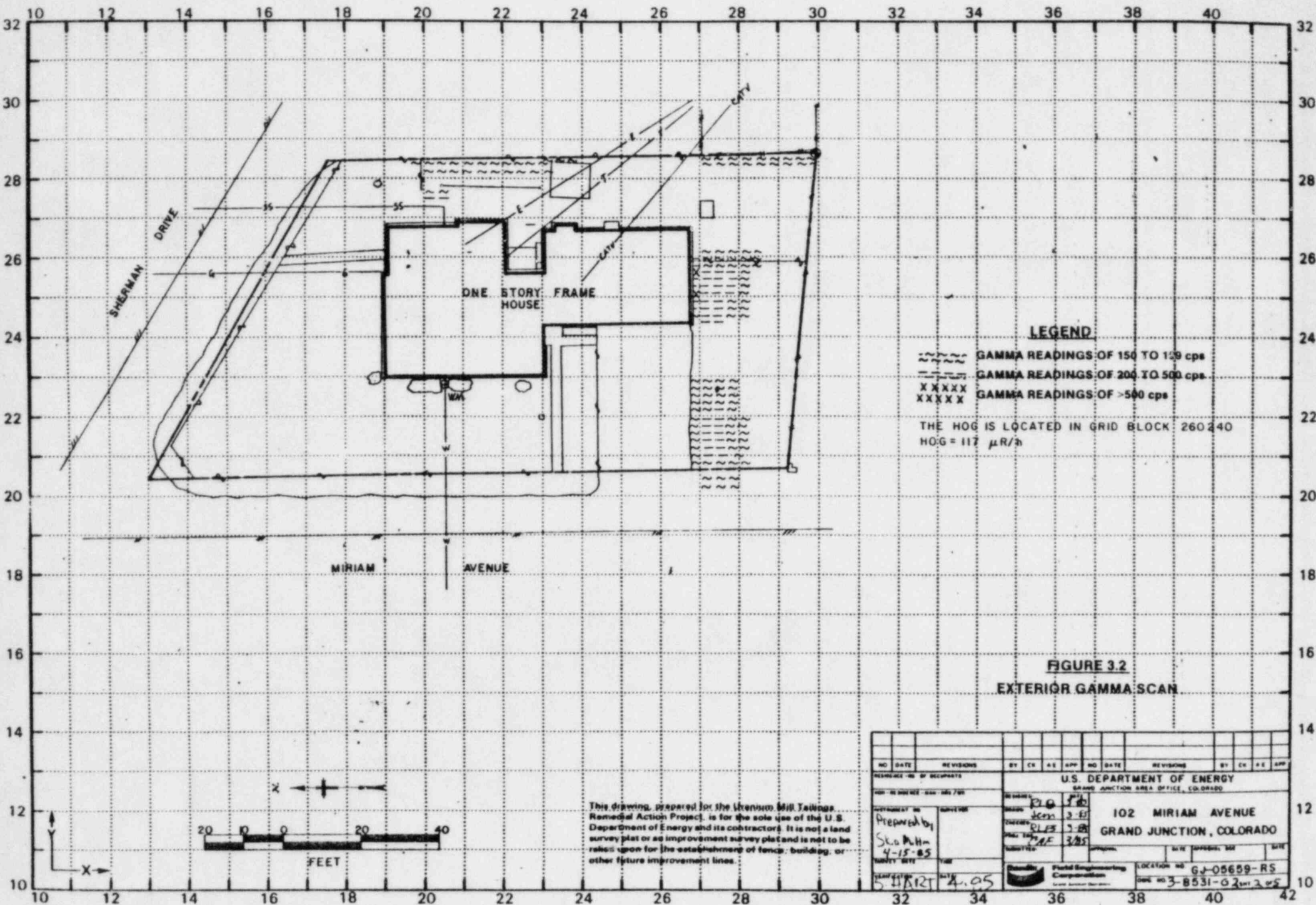


This drawing, prepared for the Uranium Mill Tailings Remedial Action Project, is for the sole use of the U.S. Department of Energy and its contractors. It is not a land survey plat or an improvement survey plat and is not to be relied upon for the establishment of fence, building, or other future improvement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

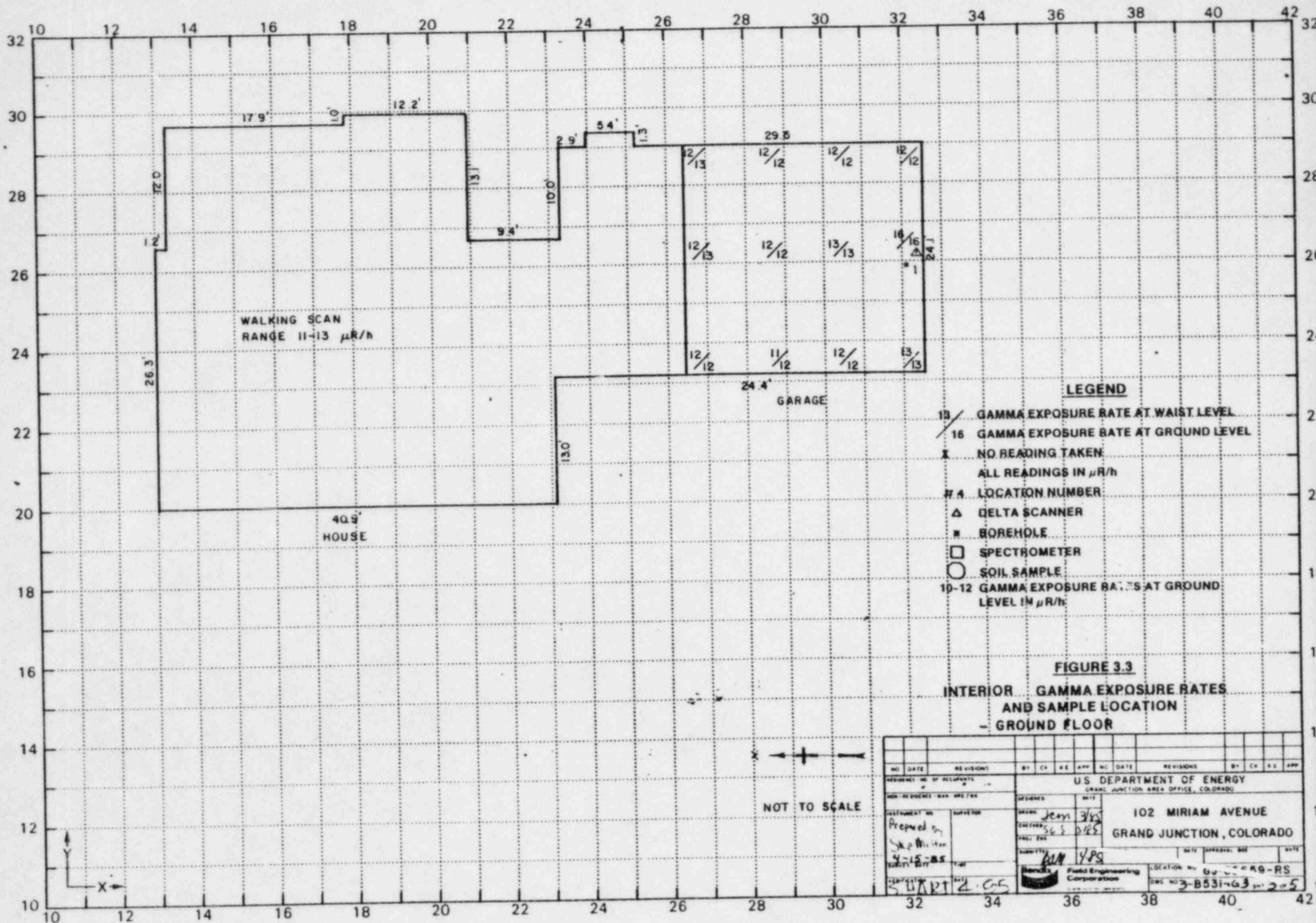
FIGURE 2.2 SITE PLAN

U.S. DEPARTMENT OF ENERGY		LOCATION NO.
GRAND JUNCTION AREA OFFICE, COLORADO		GJ05659RS
ADDRESS		
102 MIRIAM AVENUE		
GRAND JUNCTION, COLO.		
OWNER		TELE.
TENANT		TELE.
SURV. RLB 3185	DRAFT RSK 3185	CR. 302 3-1-85
DRAWING NO. 3-C-531-F1		SHEET 1 OF 1

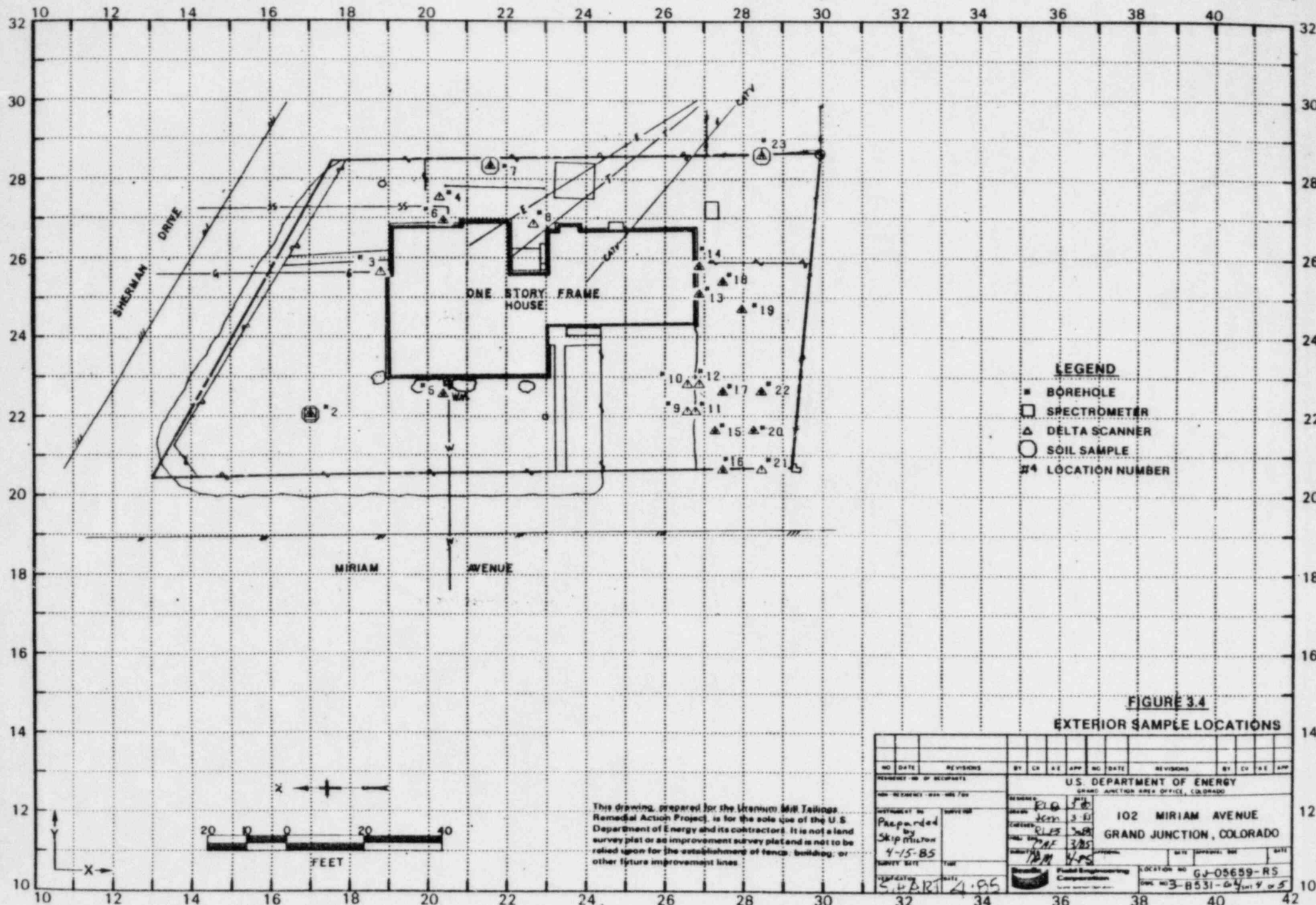




This drawing, prepared for the Uranium Mill Tailings Remedial Action Project, is for the sole use of the U.S. Department of Energy and its contractors. It is not a land survey plat or an improvement survey plat and is not to be relied upon for the establishment of fence, building, or other future improvement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



NO.	DATE	REVISION	BY	CHK	APP	NO.	DATE	REVISION	BY	CHK	APP
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO											
PROJECT NO. 102 MIRIAM AVENUE PREPARED BY 3/65 CHECKED BY 3/65 DRAWN BY 3/65 SCALE 1/8" = 1'-0" DATE 3/65 APPROVAL 3/65 FIELD ENGINEERING CORPORATION 3-B531-63-2-5						LOCATION NO. 102 MIRIAM AVENUE GRAND JUNCTION, COLORADO					



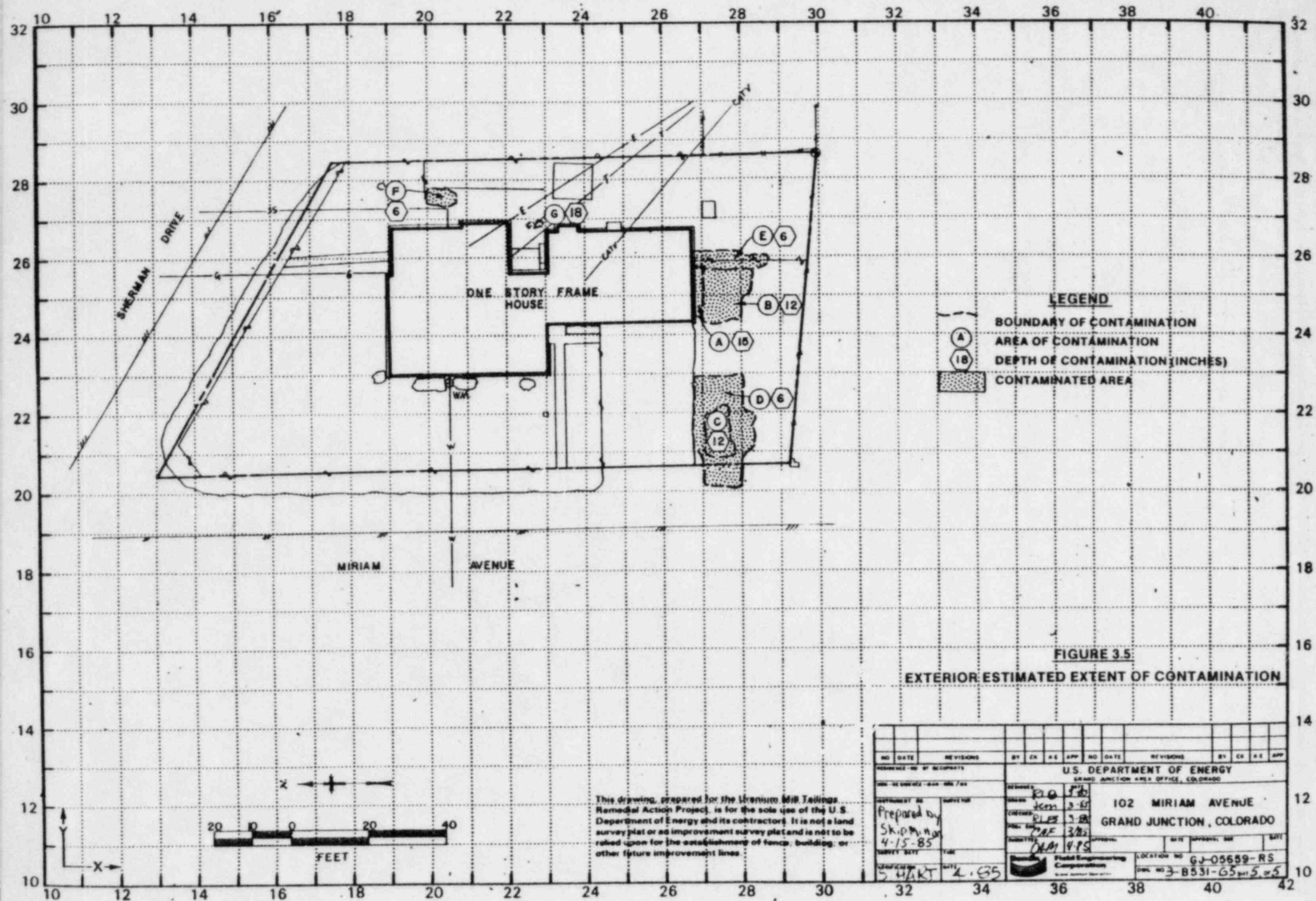
LEGEND

- BOREHOLE
- SPECTROMETER
- △ DELTA SCANNER
- SOIL SAMPLE
- # LOCATION NUMBER

FIGURE 3.4

EXTERIOR SAMPLE LOCATIONS

NO. DATE REVISIONS BY CR A.E. APP. NO. DATE REVISIONS BY CR A.E. APP.									
U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO									
102 MIRIAM AVENUE GRAND JUNCTION, COLORADO									
INSTRUMENT NO. SURVEYED Prepared by Skip Milton 4-15-85 SURVEY DATE					REVISIONS 1. 3-85 2. 3-85 3. 4-85 4. 4-85				
LOCATION NO. GJ-05659-RS					DATE APPROVED DATE				
DATE 4-95					DATE 3-85				



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.

[illegible]

3/85

LOE ID NO. GJ-05659-RS

Date 2/7/85

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

Official Survey Report

Property Address 102 Miriam Avenue

Property Owner James O'Brien

Address of Owner (if different from above) _____

Report Prepared By Skip Milton

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

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

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

1 XX 1 In open areas.

1 1 Under or around exterior improvements.

1 XX 1 Under or around a typically nonoccupied structure.

1 1 Under or around a typically occupied structure.

II. RESULTS OF RADIOLOGIC ASSESSMENT

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

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

cc:

G. A. Franz, III, GJ/CDH

J. Themelis, Mgr. UMTRA Proj. Off.

HIG = 16 uR/h
HOG = 117 uR/h



**Field Engineering
Corporation**

Grand Junction Operations

RECEIVED

APR 3 1985

Colo. Dept. of Health
Grand Jct. Office

P.O. Box 1569
Grand Junction, CO 81502
Tel (303) 242-8621

A Subsidiary of
The Bendix Corporation

April 2, 1985

Colorado Department of Health
222 South 6th Street
Grand Junction, Colorado 81501

ATTN: Coleen Campbell

Subject: GJ-05659-RS

Dear Coleen:

Regarding the issues discussed at the Technical Review on Department of Energy (DOE) Identification (ID) number GJ-05659-RS. The areas requiring additional work or comments are as follows:

3. Sample location number 6 has been added to figure 3.4, sample locations map.
4. All of the maps will have their proper figure numbers.
5. Sub surface deltas were taken at locations number 11 (268220) and number 12 (269227).
6. Sample location number 16 (275205) has been incorporated into Area 'E'.
7. The depth of Area 'G' has been changed 21-inches depth.
8. Borehole number 19 (280246) is not representative of Area 'B'.



9. Bore number 22 is not contaminated and I took it off the radium table

Thank you for your time and cooperation. If you should have additional questions or comments you may reach me at 242-8621, extension 433.

Sincerely,

A handwritten signature in cursive script that reads "Skip Milton".

Skip Milton
Radiologic Survey Team

SM:dk

INTERNAL
MEMORANDUM

Bendix Field Engineering Corporation
Grand Junction Projects Office

Date: February 7, 1985

To: Files

From: Skip Milton

Subject: Team Leader Notes - GJ-05659-RS

Address: 102 Mirian Avenue

Weather: Clear, sunny

Team Members

M. Duran	B. Wilkins
C. Adams	N. Wallace
P. Tuhey	H. Mattison
D. Bell	S. Milton
J. Johnson	

Instruments

C-1182, C-1247, C-3943, C-3941, C-3573, C-3959, C-3431, C-1128, C-1149, C-1205

The gridding of the property was completed without difficulty.

An interior survey of the primary structure showed no elevated readings.

Scintillometer C-1149 became inoperative, however, verification with another Scintillometer showed the last readings to be accurate.

Health and Safety arrived at the property. No discrepancies were noted.

Spillover was noted on the adjacent property to the east. The homeowner was contacted and a Spillover Consent form was obtained.

A spillover scan was performed. Elevated readings ranging from 150 cps to 500 cps were found extending approximately 30 to 40-feet onto the adjacent property along the east property line (257 Sherman Avenue).

Team Leader Notes
Skip Milton
GJ-05659-RS
February 7, 1985
Page 2

All utility lines were located and investigated. Deltas were taken on top of the gas line. Boreholes were performed adjacent to the water and sewer lines.

The footing foundation is an 8-inch x 16-inch monolithic with a 3-inch concrete skirt.

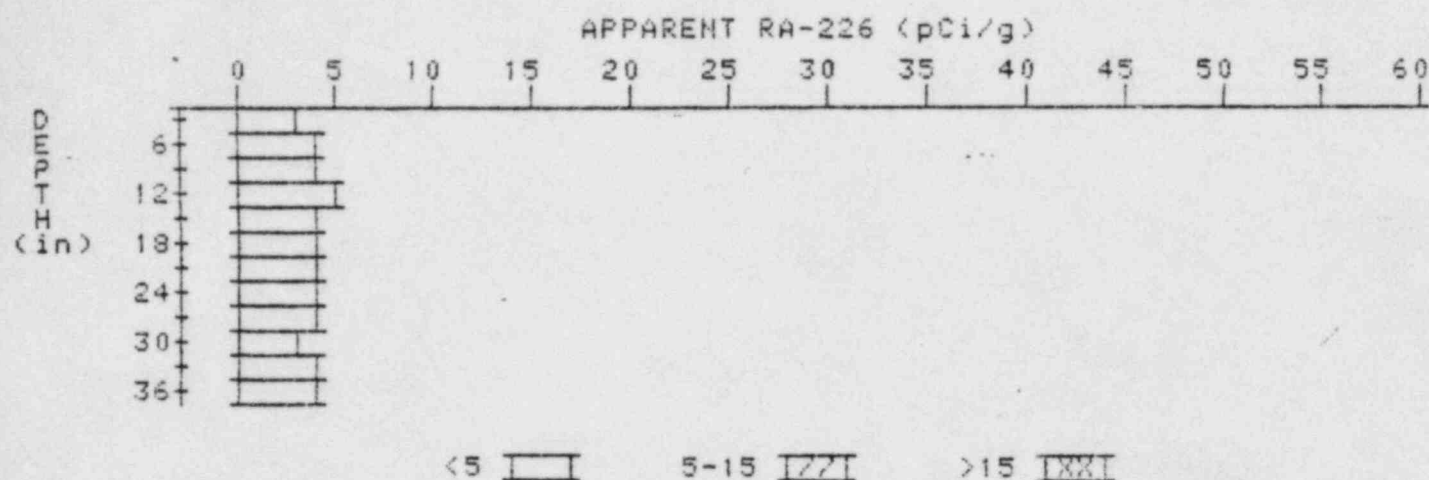
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

2

PROPERTY NUMBER: GJ-05659-RS

HOLE NUMBER: 2

LOCATION: 170220



Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	3.2	3.2
6	3.6	3.8
9	3.9	3.9
12	4.2	4.6
15	4.3	4.5
18	4.3	4.5
21	4.2	4.2
24	4.1	4.1
27	4.0	4.4
30	3.7	3.2
33	3.7	3.5
36	3.8	3.8

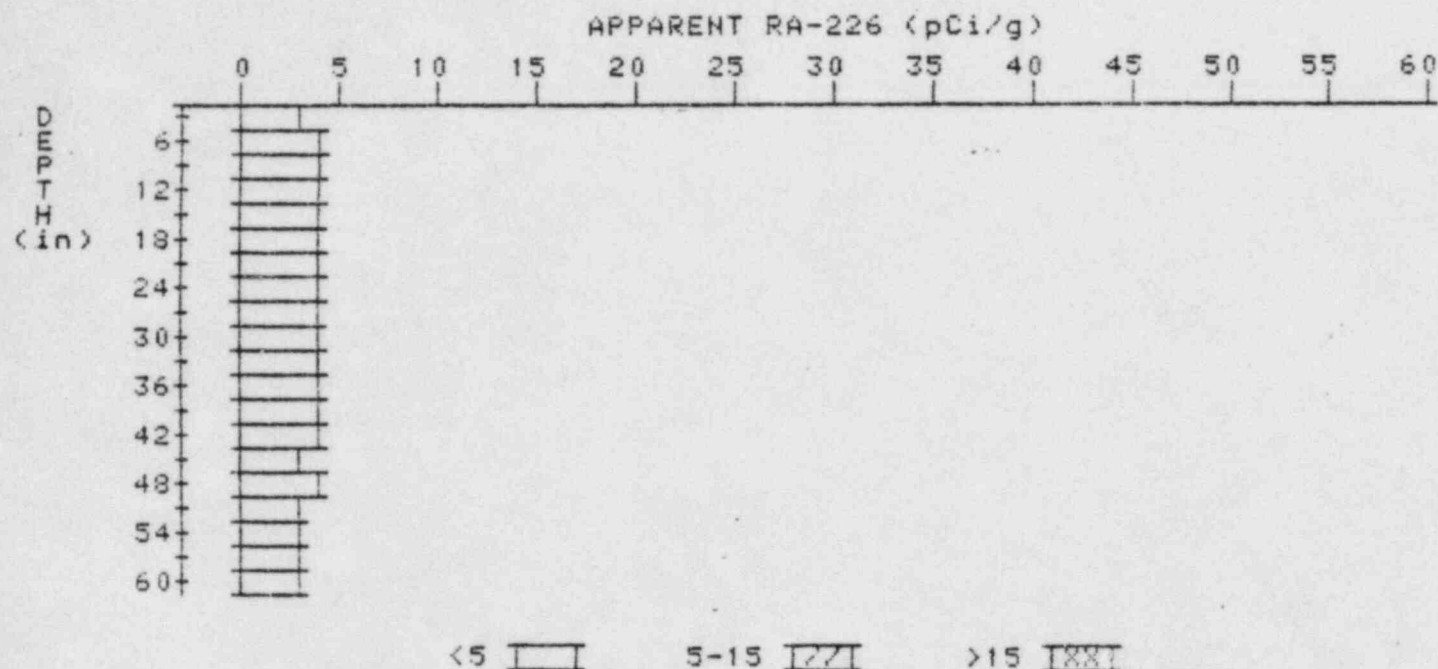
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

5

PROPERTY NUMBER: GJ-05659-RS

HOLE NUMBER: 5

LOCATION: 204225



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.2	3.2
6	3.6	3.8
9	3.9	4.1
12	4.1	4.3
15	4.2	4.4
18	4.2	4.2
21	4.2	4.2
24	4.2	4.4
27	4.1	4.3
30	3.9	3.7
33	3.8	3.8
36	3.7	3.7
39	3.6	3.6
42	3.5	3.5
45	3.4	3.2
48	3.4	3.6
51	3.3	3.3
54	3.2	3.2

57
60

3.1
3.1

2.9
3.1

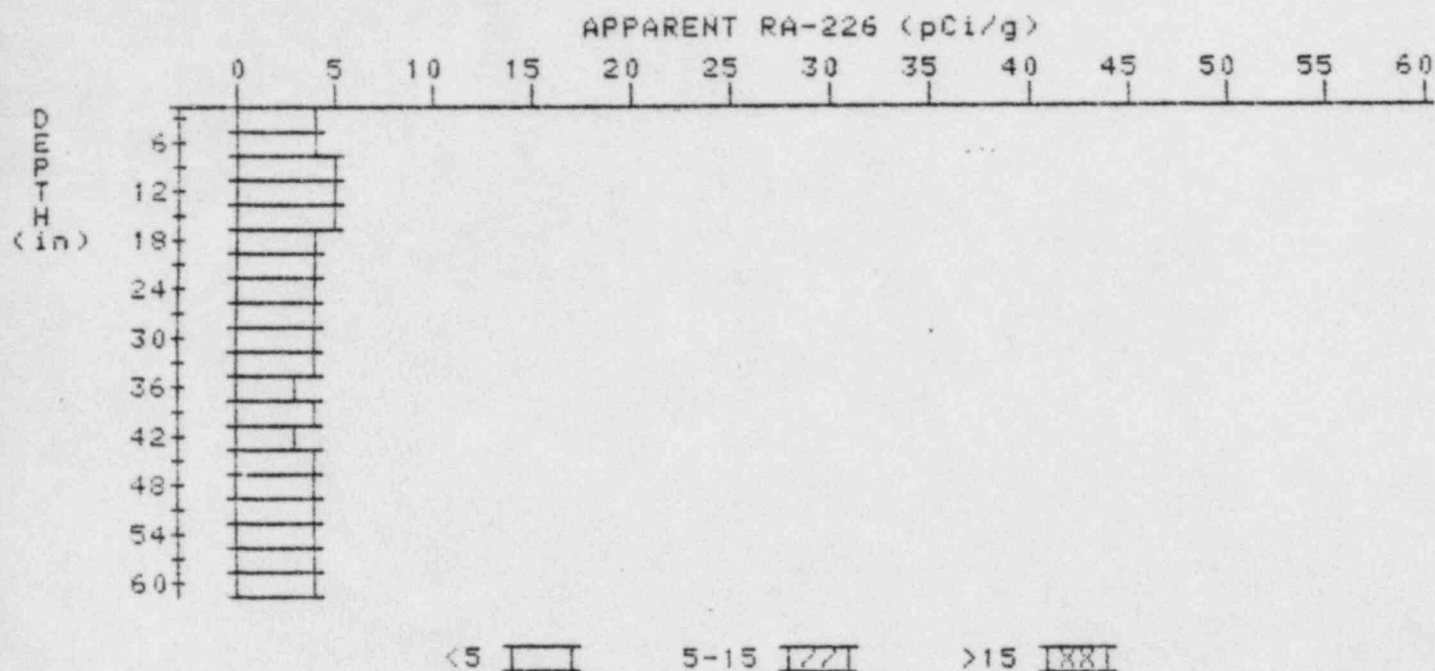
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

6

PROPERTY NUMBER: GJ-05659-R3

HOLE NUMBER: 6

✓LOCATION: 204269



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.8	3.8
6	4.0	3.8
9	4.3	4.7
12	4.4	4.6
15	4.4	4.6
18	4.3	4.3
21	4.2	4.4
24	4.0	3.8
27	3.9	3.9
30	3.8	3.8
33	3.7	3.7
36	3.6	3.4
39	3.6	3.8
42	3.5	3.1
45	3.6	3.8
48	3.6	3.6
51	3.6	3.6
54	3.6	3.6

37
60

3.6
3.5

3.8
3.5

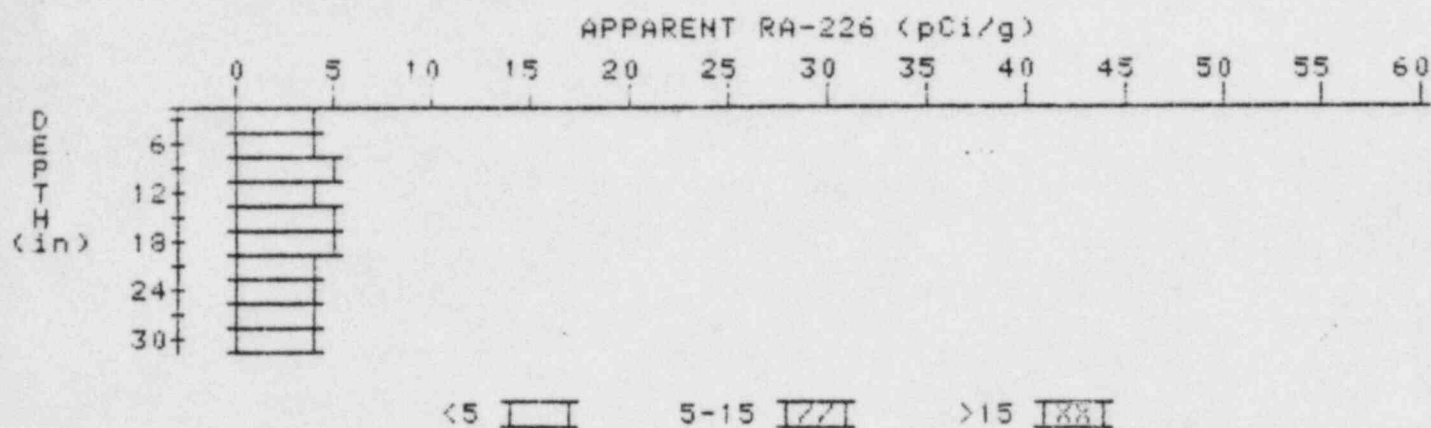
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

7

PROPERTY NUMBER: GJ-05659-RS

HOLE NUMBER: 7

LOCATION: 216283



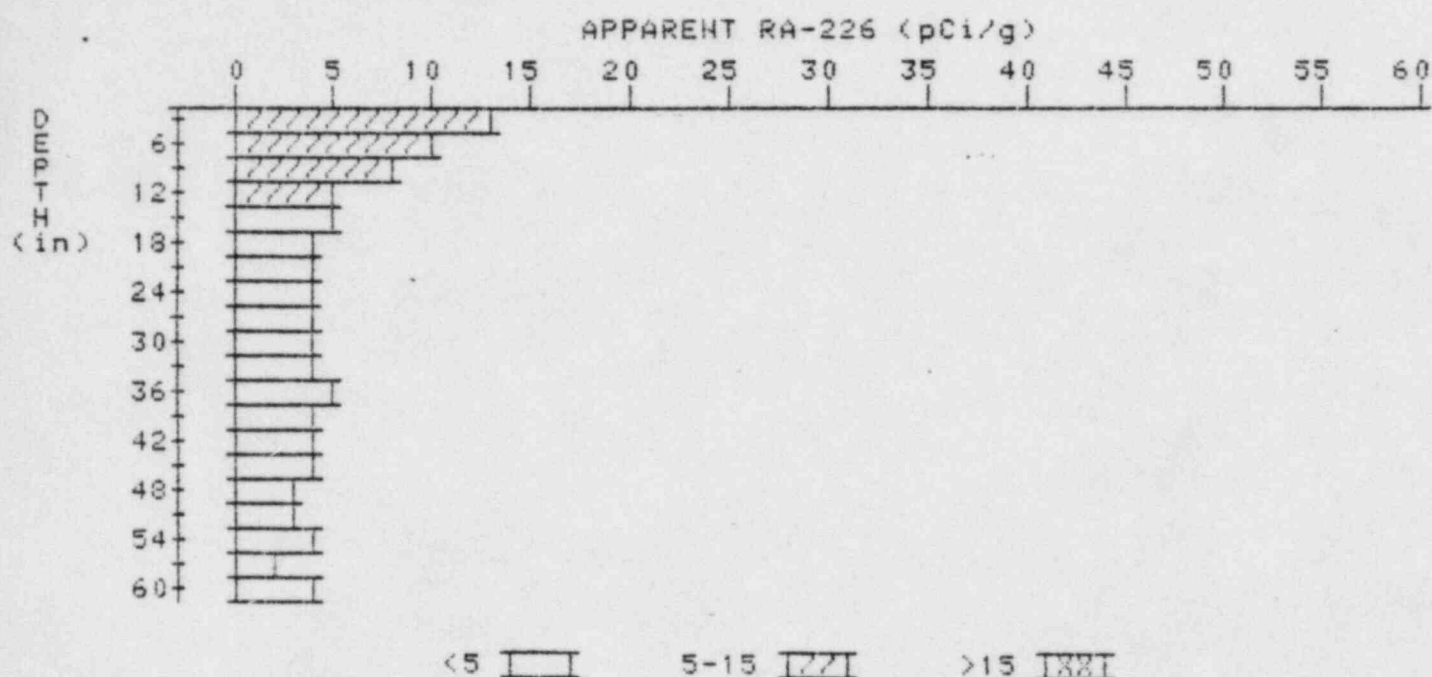
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.6	3.6
6	3.9	3.9
9	4.2	4.6
12	4.3	4.3
15	4.4	4.6
18	4.4	4.8
21	4.2	4.0
24	4.1	4.3
27	3.9	3.7
30	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION 13 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05659-RS

HOLE NUMBER: 13

LOCATION: 269250



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	13.0	13.0
6	10.6	10.1
9	3.5	3.1
12	6.6	5.2
15	5.5	4.6
18	4.9	4.4
21	4.6	4.4
24	4.4	4.2
27	4.3	4.1
30	4.3	4.3
33	4.3	4.3
36	4.2	4.6
39	3.9	3.5
42	3.8	3.3
45	3.7	3.9
48	3.5	3.1
51	3.5	3.3
54	3.6	4.0

57
60

3.5
4.0

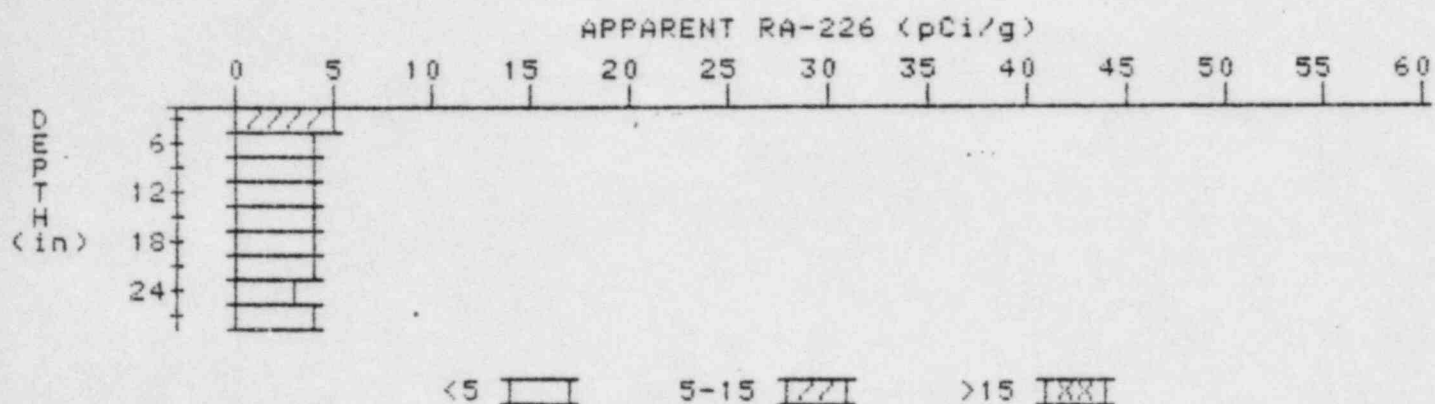
2.4
4.0

APPARENT RADIUM-226 CONCENTRATION 14 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05659-RS

HOLE NUMBER: 14

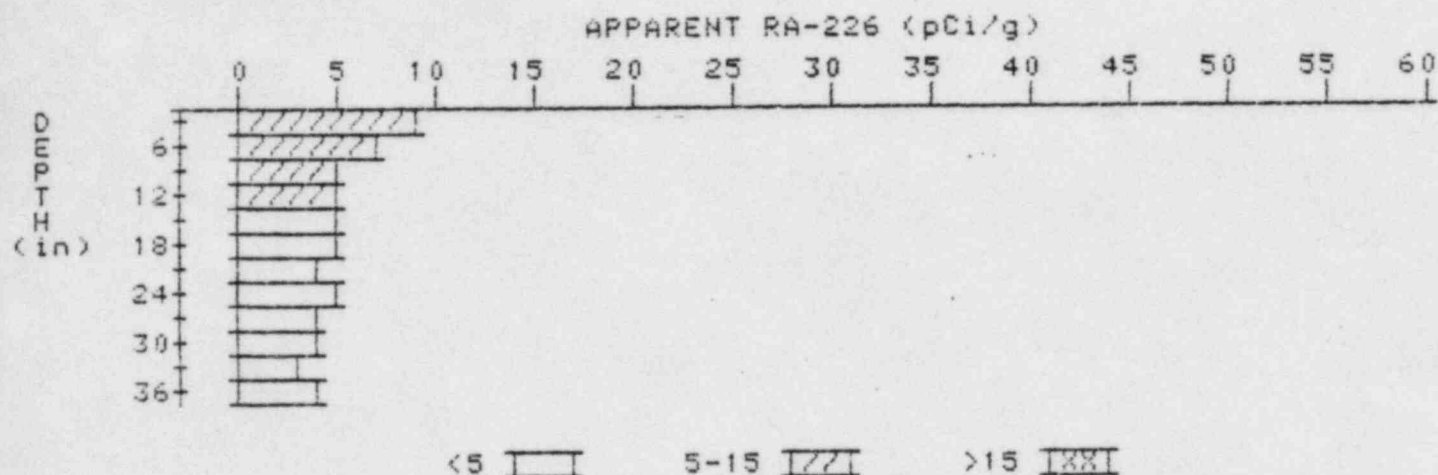
LOCATION: 269257



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	5.2	5.2
6	4.7	4.3
9	4.4	4.0
12	4.3	4.3
15	4.2	4.4
18	4.0	3.6
21	4.0	4.4
24	3.8	3.4
27	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION 15 DECONVOLUTION GRAPH

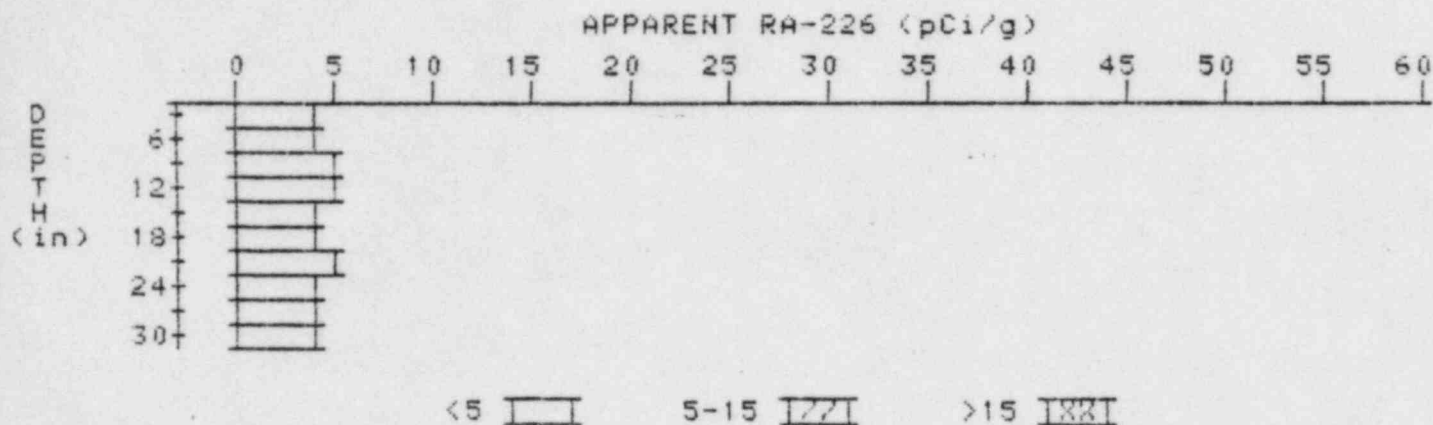
PROPERTY NUMBER: GJ-05659-RS
HOLE NUMBER: 15
LOCATION: 273215



Depth (in)	Apparent Radium-226 (pCi/g)	Apparent Radium-226 (pCi/g)
	Undeconvolved	Deconvolved
3	8.9	8.9
6	7.3	6.6
9	6.1	5.0
12	5.5	5.1
15	5.1	4.9
18	4.8	4.8
21	4.5	4.1
24	4.4	4.8
27	4.1	3.7
30	4.0	4.2
33	3.8	3.4
36	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION 16 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05659-RS
HOLE NUMBER: 16
LOCATION: 275205



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.4	4.4
6	4.4	4.2
9	4.5	4.7
12	4.5	4.7
15	4.4	4.4
18	4.3	4.3
21	4.2	4.6
24	3.9	3.7
27	3.7	3.7
30	3.5	3.5

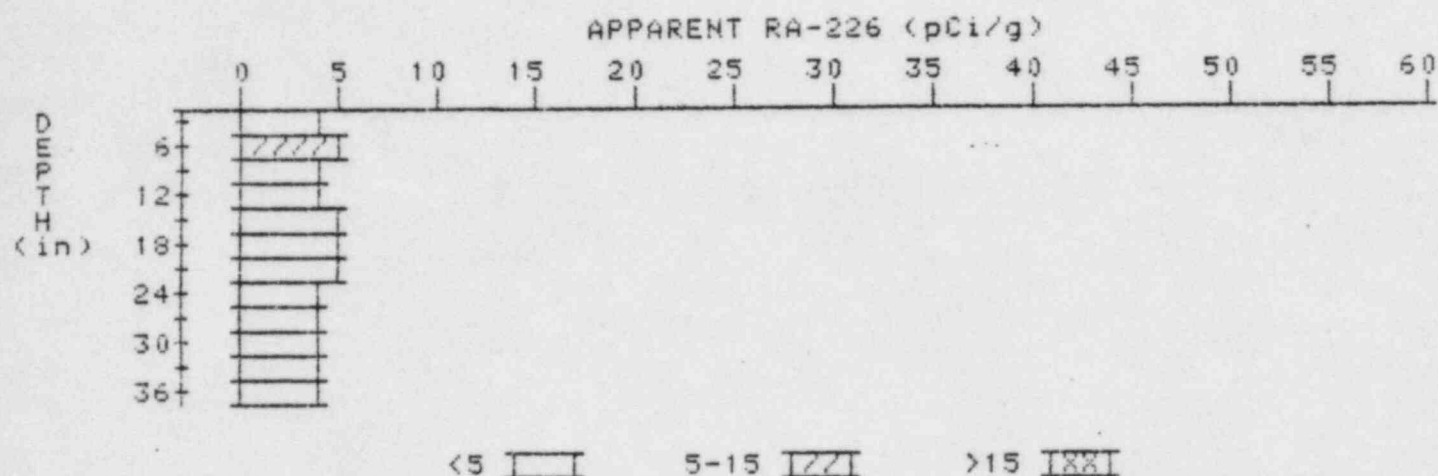
APPARENT RADIUM-226 CONCENTRATION 17

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05659-RS

HOLE NUMBER: 17

LOCATION: 275225



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.4	4.4
6	4.6	5.1
9	4.5	4.3
12	4.5	4.3
15	4.6	4.8
18	4.6	4.8
21	4.5	4.7
24	4.3	4.3
27	4.1	4.1
30	3.9	3.7
33	3.8	3.8
36	3.7	3.7

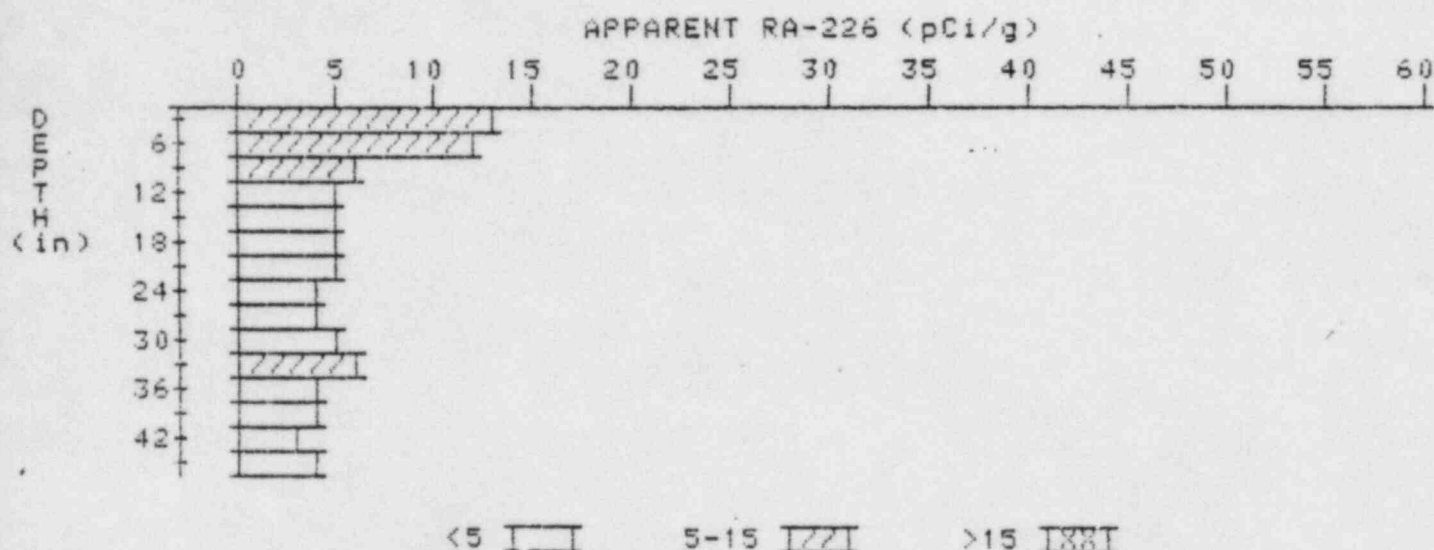
APPARENT RADIUM-226 CONCENTRATION 18

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05659-R3

HOLE NUMBER: 18

LOCATION: 275253



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	12.9	12.9
6	10.8	11.9
9	8.1	6.3
12	6.4	5.0
15	5.5	4.8
18	5.0	4.6
21	4.7	4.5
24	4.5	4.1
27	4.5	4.3
30	4.6	4.6
33	4.7	5.8
36	4.2	3.7
39	4.0	4.0
42	3.8	3.3
45	3.9	3.9

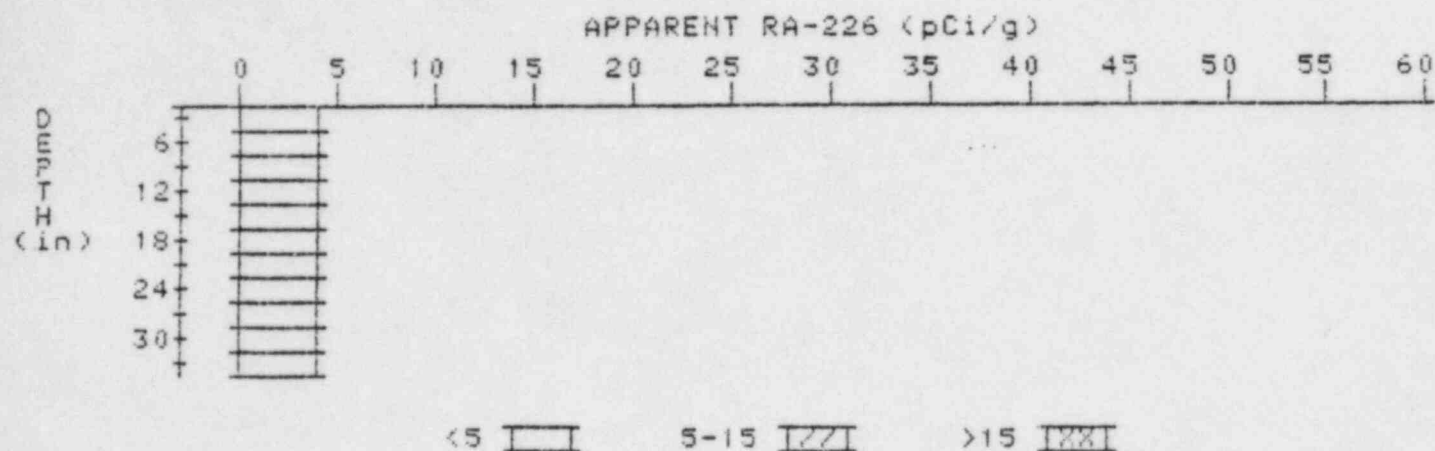
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

19

PROPERTY NUMBER: GJ-05659-RS

HOLE NUMBER: 19

LOCATION: 280246



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.1	4.1
6	4.2	4.2
9	4.3	4.5
12	4.3	4.5
15	4.2	4.4
18	4.0	4.0
21	3.8	3.6
24	3.7	3.5
27	3.7	3.9
30	3.6	3.6
33	3.5	3.5

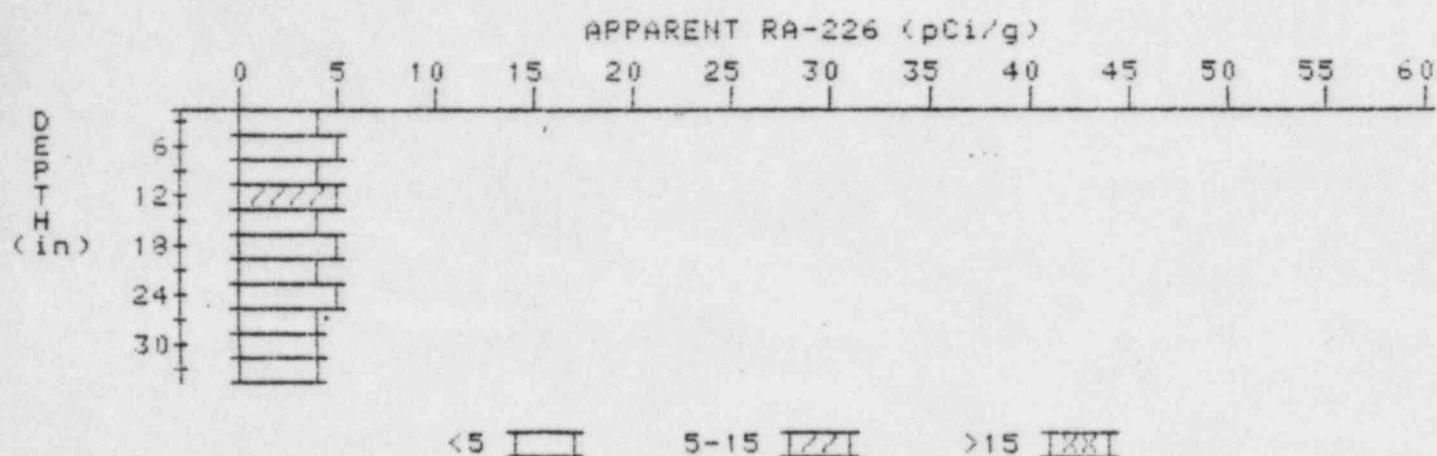
APPARENT RADIUM-226 CONCENTRATION 20

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05659-RS

HOLE NUMBER: 20

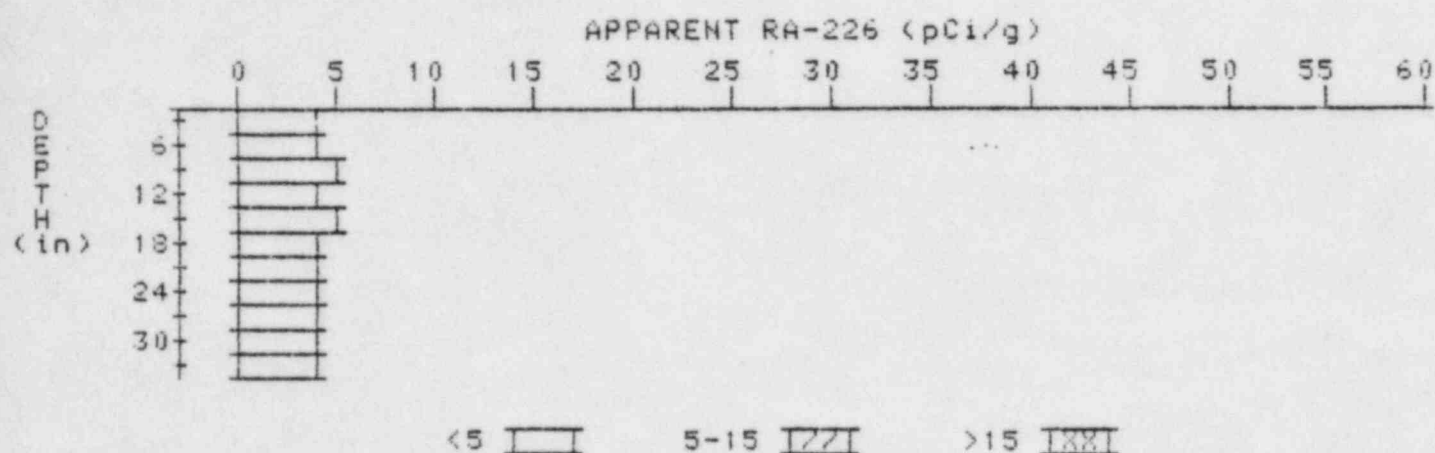
LOCATION: 283215



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	4.0	4.0
6	4.3	4.7
9	4.4	4.2
12	4.6	5.1
15	4.5	4.3
18	4.5	4.7
21	4.4	4.4
24	4.3	4.7
27	4.0	3.6
30	3.9	3.9
33	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION 22 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05659-RS
HOLE NUMBER: 22
LOCATION: 285225



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.9	3.9
6	4.2	4.4
9	4.4	4.3
12	4.4	4.4
15	4.4	4.6
18	4.3	4.3
21	4.2	4.4
24	4.0	3.8
27	3.9	4.1
30	3.7	3.5
33	3.6	3.6

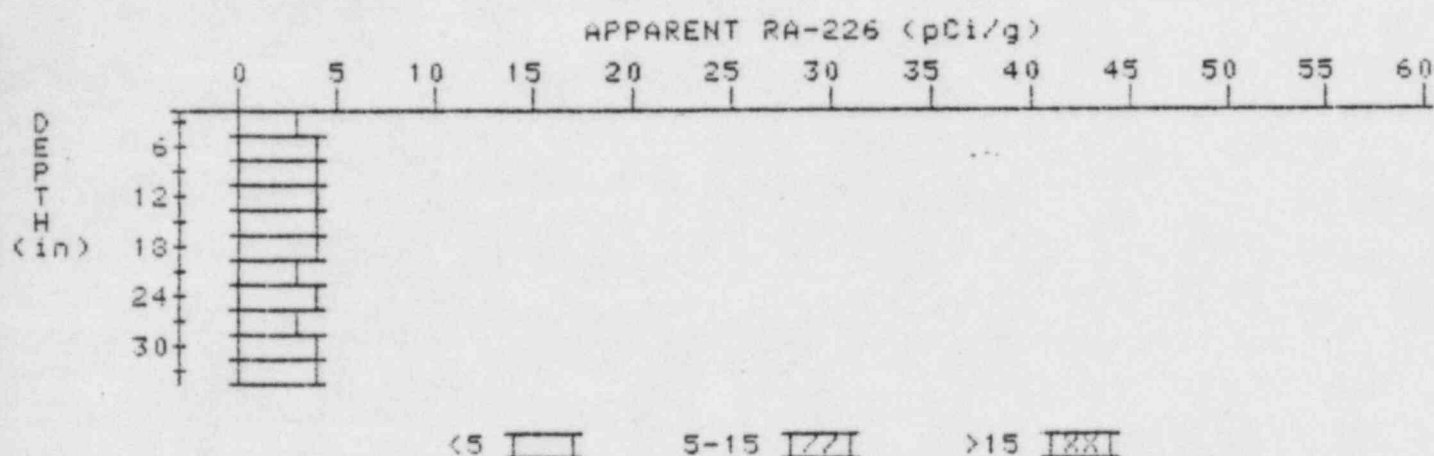
APPARENT RADIUM-226 CONCENTRATION 23

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05659-RS

HOLE NUMBER: 23

LOCATION: 285285



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.1	3.1
6	3.5	3.9
9	3.7	3.7
12	3.9	4.3
15	3.9	4.1
18	3.8	3.8
21	3.7	3.3
24	3.8	4.3
27	3.6	3.2
30	3.6	3.8
33	3.5	3.5