

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-05168-MR
ADDRESS: 542 MELODY LANE

AUGUST 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION
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August 27, 1985

REA05168:REA-708

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-05168-MR, is a single-family residence located at 542 Melody Lane, 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, 169 cu. yd.; interior, 1 cu. yd.

It is recommended that no remedial action be performed on Area A, as discussed in Section 4.0 of this REA.

Estimated cost to perform remedial action, including dislocation when applicable, is \$12,840. Remedial action on this property will take approximately 21 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 542 Melody Lane, Grand Junction, Colorado

Zoning: Residential (RSF-8)

Lot Size: Approximately 10,190 sf (0.23 acres)

Legal Description: North 62.0 feet of Lot 13 and south 12.0 feet of Lot 14, Block 2, Parkerson Subdivision, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 2 mile(s) 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 Figure 2.2.

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

Bordering Properties:

| | |
|--------|-------------------------|
| North: | Single-family residence |
| South: | Single-family residence |
| East: | Utility easement |
| West: | Melody Lane |

2.2 Existing Facilities and Structures

Primary Structure:

| | |
|--------------------|---------------------------------------------------|
| Type: | Single-story residence |
| Size: | Approximately 1,200 sf |
| Construction Date: | 1961 |
| Construction: | Wood-frame |
| Foundation: | Concrete stemwall on spread footing |
| Footing Depth: | Approximately 15" to bottom of footing from grade |
| Basement: | None |
| Crawl Space: | Yes - under entire living area |
| Condition: | Good |

Other Structures:

| | |
|---------------|------------------------|
| Type: | Shed |
| Size: | Approximately 90 sf |
| Construction: | Prefabricated metal |
| Foundation: | Concrete slab-on-grade |
| Condition: | Good |

General Remarks:

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

Historical Data:

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

3.0 RADIOLOGIC SURVEY

3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-05168-MR on July 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 that this is a spillover inclusion property. The spillover contamination is along the south property boundary.

The Bendix radiologic survey was designed to investigate the entire property, with emphasis on previously identified areas of contamination. Conclusions based upon data analyses are discussed in Section 3.5, Extent of Contamination. Photocopies of the Official Survey Report, team leader notes, deconvolution graphs, and Exterior Gamma Scan map are included in the Appendix (Section 6.0).

3.2 Gamma Exposure-Rate Surveys

3.2.1 Exterior Findings

Background Readings: 14 to 17 uR/h
Highest Outside Gamma Reading (HOG): 94 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: 15 to 18 uR/h
Highest Inside Gamma Reading (HIG): 60 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 3.2 shows interior exposure rates.

3.3 Boreholes, Soil Samples, and Other Measurements

Areas which displayed elevated gamma levels were further investigated; these areas are shown in Appendix Figures 3.2 and 3.3. Data from these investigations are included in Appendix Tables 3.1 and 3.2.

3.4 Radon/Radon Daughter Concentration (RDC)

Determined by CDH: 0.005 gross working level (WL). No additional RDC measurements were taken by Bendix.

3.5 Extent of Contamination

Appendix Figures 3.4a and 3.4b show identified areas and estimated contamination on this property, based on assessments of all measurements taken. As noted in this figure, areas that contain identified residual radioactive materials are:

- (Area A) Surface Material: Soil
Direction From Primary Structure: Interior
Other Directions: Southwest corner of crawl space
Total Depth of Contamination: 6 inches
Comments: The contamination is a mound of sandy soil along the footing.
Approximate Square Footage: 35 - this area is excluded from remedial action
- (Area B) Surface Material: Gravel
Direction From Primary Structure: West
Other Directions: West end of driveway
Total Depth of Contamination: 15 inches
Other (height or thickness): 2-inch-thick layer of gravel
Approximate Square Footage: 200
- (Area C) Surface Material: Gravel
Direction From Primary Structure: South
Other Direction: In driveway
Total Depth of Contamination: 12 inches
Other (height or thickness): 2-inch-thick layer of gravel
Approximate Square Footage: 1,822
- (Area D) Surface Material: Concrete
Direction From Primary Structure: South and west
Total Depth of Contamination: 12 inches
Other (height or thickness): 4-inch-thick sidewalk
Comments: The depth of contamination is based on data collected in Areas C and E
Approximate Square Footage: 185
- (Area E) Surface Material: Lawn
Direction From Primary Structure: West
Other Directions: North of Area D
Total Depth of Contamination: 12 inches
Approximate Square Footage: 145

- (Area F) Surface Material: Concrete
Direction From Primary Structure: East
Other Directions: In carport
Total Depth of Contamination: 12 inches
Other (height or thickness): 4-inch-thick slab
Approximate Square Footage: 680
- (Area G) Surface Material: Lawn
Direction From Primary Structure: East
Other Directions: Adjacent to Area C
Total Depth of Contamination: 15 inches
Approximate Square Footage: 480
- (Area H) Surface Material: Concrete
Direction From Primary Structure: Southeast
Total Depth of Contamination: 12 inches
Other (height or thickness): 4-inch-thick slab
Comments: The total depth of contamination is based
on data collected in Areas C and F
Approximate Square Footage: 264
- (Area I) Surface Material: Lawn
Direction From Primary Structure: East
Other Directions: Adjacent to Area G
Total Depth of Contamination: 6 inches
Approximate Square Footage: 580
- (Area J) Surface Material: Lawn
Direction From Primary Structure: East
Other Directions: East of Area F
Total Depth of Contamination: 12 inches
Approximate Square Footage: 50
- (Area K) Surface Material: Lawn
Direction From Primary Structure: East
Other Directions: North and east of Area J
Total Depth of Contamination: 6 inches
Approximate Square Footage: 120
- (Area L) Surface Material: Lawn
Direction From Primary Structure: West
Other Directions: Along west property boundary
Total Depth of Contamination: 18 inches
Approximate Square Footage: 80
- (Area M) Surface Material: Lawn
Direction From Primary Structure: West
Other Directions: East of Area L
Total Depth of Contamination: 12 inches
Approximate Square Footage: 140

(Area N) Surface Material: Lawn
Direction From Primary Structure: West
Other Directions: Adjacent to primary structure
Total Depth of Contamination: 6 inches
Approximate Square Footage: 620

(Areas Requiring Further Investigation During Remedial Action)
The soil under the shed, located just east of Area H,
should be checked for contamination during remedial
action.

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-05168-MR, includes select 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.

Remedial action will not be performed on Area A of this property because the levels of radioactivity in this area do not exceed the EPA Standards (40 CFR 192), as described below:

- (1) Indoor radon-decay products shall not exceed a working level of 0.03, nor, to the extent possible, a working level of 0.02. (At this property the gross working level, as determined by CDH, is 0.005.)
- (2) Indoor gamma radiation shall not exceed 20 microroentgens per hour (uR/h) above background levels. (At this location the interior background readings were found to be between 15 and 18 uR/h, with the highest mean surface gamma reading in the crawlspace at 34 uR/h.)

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 \$12,840.

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

There is no owner preference with respect to remedial action and no legal or other complications are foreseen at this time.

5.0 REFERENCES

ARIX, A Professional Corporation, Procedures Manual for the Grand Junction Remedial Action Program, for Colorado Department of Health, Radiation Control Division, and the U.S. Department of Energy, 1983.

Bendix Field Engineering Corporation, Procedures Manual Radiologic Support Operations Grand Junction Vicinity Properties, (GJ-07), for U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

Bendix Field Engineering Corporation, Engineering, Construction, and Land Support Manual Grand Junction Vicinity Properties Project, (GJ-08), for U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

Bendix Field Engineering Corporation, Grand Junction Vicinity Properties Operating Manual, (GJ-16) for U.S. Department of Energy, Nuclear Energy Programs, Division of Remedial Action Projects, UMTRA, 1984.

Bendix Field Engineering Corporation, Vicinity Properties General Construction Specification, for U.S. Department of Energy, Nuclear Energy Programs, Division of Remedial Action Projects, UMTRA, 1984.

Bendix Field Engineering Corporation, Environmental Assessment of Preliminary Cleanup Activities at Offsite Properties Contaminated by Tailings from the Grand Junction Inactive Uranium Millsite, (GJ-04), for U.S. Department of Energy, UMTRA Project Office, Albuquerque Operations, Albuquerque, New Mexico, 1983.

U.S. Department of Energy, Programmatic Memorandum of Agreement (DOE No. DE-GM04-84AL28460) between the U.S. Department of Energy, the Advisory Council on Historic Preservation, and the Colorado State Historic Preservation Officer, for UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

U.S. Department of Energy, Vicinity Properties Management and Implementation Manual, for UMTRA Project Office, Albuquerque Operations Office, Albuquerque, New Mexico, 1984.

U.S. Environmental Protection Agency, Standards for Remedial Action at Inactive Uranium Processing Sites (40 CFR Part 192), Washington, D.C., 1983.

6.0 APPENDIX

This Appendix contains the following:

Appendix Tables:

| | |
|-----------|---------------------------------------------------|
| Table 3.1 | Radium Concentrations at Exterior Locations |
| Table 3.2 | Radium Concentrations at Interior Locations |
| Table 3.3 | Summary of Interior Gamma Exposure Rates |
| Table 4.1 | Area and Volume Calculations |
| Table 4.2 | Estimated Cost of Decontamination and Restoration |

Appendix Figures:

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

Official Survey Report

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Exterior Gamma Scan Map

Radium Concentrations at Exterior Locations

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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. | | |
| 3 | 152270 | 00 | DS | 9.8 | | * | West side of |
| | | 06 | DS | 15.8 | | * | primary structure |
| | | 03 | TC | 4.9 | | * | DC = 18 inches |
| | | 06 | TC | 6.1 | | * | Based on the |
| | | 09 | TC | 7.4 | | * | deconvolution graph |
| | | 12 | TC | 7.3 | | * | |
| | | 15 | TC | 6.1 | | * | |
| | | 18 | TC | 5.1 | | * | |
| | | 21 | TC | 4.5 | | * | |
| | | 24 | TC | 4.3 | | * | |
| | | 27 | TC | 4.1 | | * | |
| | | 30 | TC | 4.0 | | * | |
| | | 33 | TC | 3.9 | | * | |
| | | 36 | TC | 3.8 | | * | |
| | | 39 | TC | 3.8 | | * | |
| | | 42 | TC | 3.5 | | * | |
| 4 | 154220 | 00 | DS | 7.3 | | * | Driveway |
| | | 06 | DS | 40.8 | | * | Southwest of |
| | | 03 | TC | 13.5 | | * | primary structure |
| | | 06 | TC | 22.0 | | * | DC = 15 inches |
| | | 09 | TC | 27.2 | | * | Based on the |
| | | 12 | BH | 19.9 | 7.5 | * | deconvolution graph |
| | | 15 | TC | 12.4 | | * | |
| | | 18 | TC | 8.4 | | * | |
| | | 21 | TC | 6.4 | | * | |
| | | 24 | TC | 5.6 | | * | |
| | | 27 | TC | 5.1 | | * | |
| | | 30 | TC | 4.9 | | * | |
| | | 33 | TC | 4.3 | | * | |
| | | 36 | TC | 4.9 | | * | |
| | | 39 | TC | 4.8 | | * | |
| | | 42 | TC | 4.4 | | * | |
| | | 45 | TC | 4.1 | | * | |
| 5 | 160255 | 00 | DS | 1.5 | | * | West of primary |
| | | 06 | DS | 2.0 | | * | structure |
| 6 | 160270 | 00 | DS | 15.2 | | * | West of primary |
| | | 06 | DS | 12.9 | | * | structure |
| | | 03 | TC | 12.0 | | * | DC = 12 inches |
| | | 06 | TC | 15.3 | | * | Based on the |
| | | 09 | TC | 15.4 | | * | deconvolution graph |
| | | 12 | TC | 11.7 | | * | |

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. | | |
| 6 | 160270 | 15 | TC | 8.1 | | * | |
| | | 18 | TC | 6.1 | | * | |
| | | 21 | TC | 5.0 | | * | |
| | | 24 | TC | 4.6 | | * | |
| | | 27 | TC | 4.3 | | * | |
| | | 30 | TC | 4.1 | | * | |
| | | 33 | TC | 4.1 | | * | |
| | | 36 | TC | 4.1 | | * | |
| | | 39 | TC | 3.8 | | * | |
| 7 | 165234 | 03 | TC | 14.5 | | * | Southwest of primary structure DC = 12 inches Based on the deconvolution graph |
| | | 06 | TC | 14.5 | | * | |
| | | 09 | TC | 10.2 | | * | |
| | | 12 | BH | 7.2 | 4.0 | * | |
| | | 15 | TC | 5.8 | | * | |
| | | 18 | TC | 5.2 | | * | |
| | | 21 | TC | 4.7 | | * | |
| | | 24 | TC | 4.4 | | * | |
| | | 27 | TC | 4.3 | | * | |
| | | 30 | TC | 4.2 | | * | |
| | | 33 | TC | 4.3 | | * | |
| | | 36 | TC | 4.2 | | * | |
| | | 39 | TC | 3.9 | | * | |
| 8 | 165238 | 00 | DS | 5.3 | | * | West of primary structure Horizontal |
| | | 06 | DS | 7.3 | | * | |
| | | 12 | DS | 2.8 | | * | |
| | | 12 | DS | 5.5 | | * | |
| 9 | 170225 | 00 | DS | 19.8 | | * | Southwest of primary structure DC = 12 inches Based on the deconvolution graph |
| | | 06 | DS | 24.9 | | * | |
| | | 12 | DS | 3.6 | | * | |
| | | 03 | TC | 33.7 | | * | |
| | | 06 | TC | 31.6 | | * | |
| | | 09 | TC | 19.6 | | * | |
| | | 12 | TC | 11.7 | | * | |
| | | 15 | TC | 7.9 | | * | |
| | | 18 | TC | 6.2 | | * | |
| | | 21 | TC | 5.5 | | * | |
| | | 24 | TC | 5.1 | | * | |
| | | 27 | TC | 5.0 | | * | |
| | | 30 | TC | 4.9 | | * | |
| | | 33 | TC | 4.9 | | * | |
| | | 36 | TC | 4.7 | | * | |

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. | | |
| 9 | 170225 | 39 | TC | 4.3 | | * | |
| | | 42 | TC | 4.0 | | * | |
| | | 45 | TC | 3.8 | | * | |
| | | 48 | TC | 3.7 | | * | |
| | | 51 | TC | 3.6 | | * | |
| | | 54 | TC | 3.5 | | * | |
| | | 57 | TC | 3.5 | | * | |
| | | 60 | TC | 3.6 | | * | |
| | | 63 | TC | 3.7 | | * | |
| 10 | 172285 | 00 | DS | 6.0 | | * | West side of primary structure |
| | | 06 | DS | 3.6 | | * | |
| | | 12 | DS | 1.6 | | * | |
| 11 | 180233 | 03 | TC | 43.8 | | * | Southwest corner of primary structure DC = 12 inches Based on the deconvolution graph |
| | | 06 | TC | 51.3 | | * | |
| | | 09 | TC | 40.3 | | * | |
| | | 12 | BH | 23.8 | 11.1 | * | |
| | | 15 | TC | 14.6 | | * | |
| | | 18 | TC | 9.9 | | * | |
| | | 21 | TC | 7.7 | | * | |
| | | 24 | TC | 6.7 | | * | |
| | | 27 | TC | 6.4 | | * | |
| | | 30 | TC | 6.0 | | * | |
| | | 33 | TC | 5.7 | | * | |
| | | 36 | TC | 5.5 | | * | |
| | | 39 | TC | 5.1 | | * | |
| | | 42 | TC | 4.6 | | * | |
| | | 45 | TC | 4.2 | | * | |
| | | 48 | TC | 4.0 | | * | |
| 12 | 180270 | 03 | TC | 3.9 | | * | |
| | | 54 | TC | 3.9 | | * | |
| | | 57 | TC | 4.0 | | * | |
| | | 60 | TC | 4.1 | | * | |
| | | 00 | DS | 3.0 | | * | |
| | | 06 | DS | 2.0 | | * | |
| | | 03 | TC | 3.7 | | * | |
| | | 06 | TC | 3.7 | | * | |
| 13 | 181254 | 09 | TC | 3.7 | | * | Water line DC = 0 inches |
| | | 12 | TC | 3.7 | | * | |
| | | 15 | TC | 3.7 | | * | |
| | | 18 | TC | 3.7 | | * | |
| | | 03 | TC | 3.7 | | * | |
| | | 06 | TC | 3.7 | | * | |

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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 | 181254 | 21 | TC | 3.7 | | * | |
| | | 24 | TC | 3.7 | | * | |
| | | 27 | TC | 3.7 | | * | |
| | | 30 | TC | 3.7 | | * | |
| 14 | 182280 | 00 | DS | 3.0 | | * | Gas line |
| | | 18 | DS | 1.4 | | * | |
| 15 | 187235 | 03 | TC | 58.0 | | * | Core by front door |
| | | 06 | TC | 75.1 | | * | DC = 12 inches |
| | | 09 | TC | 63.0 | | * | Based on the |
| | | 12 | BH | 41.7 | 28.2 | * | deconvolution graph |
| | | 15 | TC | 26.2 | | * | |
| | | 18 | TC | 17.4 | | * | |
| | | 21 | TC | 12.4 | | * | |
| | | 24 | TC | 10.0 | | * | |
| | | 27 | TC | 8.3 | | * | |
| | | 30 | TC | 7.3 | | * | |
| | | 33 | TC | 6.7 | | * | |
| | | 36 | TC | 6.0 | | * | |
| | | 39 | TC | 5.1 | | * | |
| | | 42 | TC | 4.7 | | * | |
| | | 45 | TC | 4.5 | | * | |
| | | 48 | TC | 4.2 | | * | |
| | | 51 | TC | 4.2 | | * | |
| | | 54 | TC | 4.1 | | * | |
| | | 57 | TC | 4.2 | | * | |
| | | 60 | TC | 4.1 | | * | |
| | | 63 | TC | 4.2 | | * | |
| | | 66 | TC | 4.2 | | * | |
| 16 | 190281 | 03 | TC | 3.5 | | * | North of primary |
| | | 06 | TC | 3.7 | | * | structure |
| | | 09 | TC | 3.9 | | * | DC = 0 inches |
| | | 12 | TC | 3.8 | | * | |
| | | 15 | TC | 3.8 | | * | |
| | | 18 | TC | 3.9 | | * | |
| | | 21 | TC | 3.8 | | * | |
| | | 24 | TC | 3.8 | | * | |
| | | 27 | TC | 3.8 | | * | |
| | | 30 | TC | 3.7 | | * | |

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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. | | |
| 17 | 200229 | 03 | TC | 30.9 | | * | South of primary DC = 12 inches Based on the deconvolution graph |
| | | 06 | TC | 36.0 | | * | |
| | | 09 | TC | 29.3 | | * | |
| | | 12 | BH | 18.6 | 6.9 | * | |
| | | 15 | TC | 11.9 | | * | |
| | | 18 | TC | 8.3 | | * | |
| | | 21 | TC | 6.6 | | * | |
| | | 24 | TC | 5.8 | | * | |
| | | 27 | TC | 5.4 | | * | |
| | | 30 | TC | 5.2 | | * | |
| | | 33 | TC | 4.8 | | * | |
| | | 36 | TC | 4.6 | | * | |
| | | 39 | TC | 4.5 | | * | |
| | | 42 | TC | 4.4 | | * | |
| | | 45 | TC | 4.2 | | * | |
| | | 48 | TC | 4.1 | | * | |
| | | 51 | TC | 4.0 | | * | |
| | | 54 | TC | 3.9 | | * | |
| | | 57 | TC | 3.9 | | * | |
| | | 60 | TC | 3.8 | | * | |
| | | 63 | TC | 3.8 | | * | |
| | | 66 | TC | 3.8 | | * | |
| 18 | 210281 | 03 | TC | 3.0 | | * | Northwest corner of primary structure DC = 0 inches |
| | | 06 | TC | 3.4 | | * | |
| | | 09 | TC | 3.6 | | * | |
| | | 12 | TC | 3.8 | | * | |
| | | 15 | TC | 3.8 | | * | |
| | | 18 | TC | 3.9 | | * | |
| | | 21 | TC | 3.9 | | * | |
| | | 24 | TC | 3.8 | | * | |
| | | 27 | TC | 3.8 | | * | |
| | | 30 | TC | 3.7 | | * | |
| | | 33 | TC | 3.8 | | * | |
| | | 36 | TC | 3.7 | | * | |
| 19 | 214250 | 03 | TC | 7.9 | | * | Core in patio East of primary structure DC = 12 inches Based on the deconvolution graph |
| | | 06 | TC | 9.9 | | * | |
| | | 09 | TC | 8.1 | | * | |
| | | 12 | TC | 6.1 | | * | |
| | | 15 | TC | 5.2 | | * | |
| | | 18 | TC | 4.6 | | * | |
| | | 21 | TC | 4.3 | | * | |
| | | 24 | TC | 4.3 | | * | |
| | | 27 | TC | 4.2 | | * | |

Radium Concentrations at Exterior Locations

DOE ID #GJ-05168-MR

542 Melody Lane

Page 6 of 9

| Loc # | Grid Location | Depth (in.) | Meas. Type | In Situ Ra-226 (pCi/g) | | Chem Ra-226 (pCi/g) | Comments |
|-------|---------------|-------------|------------|------------------------|---------|---------------------|---------------------------|
| | | | | Tot. Ct | Spectr. | | |
| 19 | 214250 | 30 | TC | 4.2 | | * | |
| | | 33 | TC | 4.3 | | * | |
| | | 36 | TC | 4.3 | | * | |
| | | 39 | TC | 4.2 | | * | |
| | | 42 | TC | 4.2 | | * | |
| | | 45 | TC | 4.3 | | * | |
| | | 48 | TC | 4.1 | | * | |
| | | 51 | TC | 4.1 | | * | |
| | | 54 | TC | 3.9 | | * | |
| | | 57 | TC | 3.9 | | * | |
| | | 60 | TC | 3.8 | | * | |
| | | 63 | TC | 3.7 | | * | |
| | | 66 | TC | 3.6 | | * | |
| | | 69 | TC | 3.6 | | * | |
| 20 | 214252 | 03 | TC | 4.3 | | * | Inside cistern |
| | | 06 | TC | 4.6 | | * | |
| | | 09 | TC | 4.9 | | * | |
| | | 12 | TC | 5.1 | | * | |
| | | 15 | TC | 5.1 | | * | |
| | | 18 | TC | 5.1 | | * | |
| | | 21 | TC | 5.1 | | * | |
| | | 24 | TC | 5.2 | | * | |
| | | 27 | TC | 5.4 | | * | |
| | | 30 | TC | 5.6 | | * | |
| | | 33 | TC | 5.8 | | * | |
| | | 36 | TC | 5.9 | | * | |
| | | 39 | TC | 6.1 | | * | |
| | | 42 | TC | 6.6 | | * | |
| | | 45 | TC | 7.0 | | * | |
| | | 48 | TC | 7.6 | | * | |
| | | 51 | TC | 8.2 | | * | |
| | | 54 | TC | 9.3 | | * | |
| | | 57 | TC | 9.6 | | * | |
| 21 | 215254 | 00 | DS | <1.0 | | * | Top of cistern |
| 22 | 215259 | 00 | DS | 1.3 | | * | Top of cistern |
| 23 | 215261 | 00 | DS | 5.8 | | * | Next to cistern |
| 24 | 225255 | 00 | DS | 8.0 | | * | East of primary structure |
| | | 06 | DS | 4.1 | | * | |
| | | 12 | DS | 2.2 | | * | |

Radium Concentrations at Exterior Locations

DOE ID #GJ-05168-MR

542 Melody Lane

Page 7 of 9

| Loc # | Grid Location | Depth (in.) | Meas. Type | In Situ Ra-226 (pCi/g) | | Chem Ra-226 (pCi/g) | Comments |
|-------|---------------|-------------|------------|------------------------|---------|---------------------|---------------------|
| | | | | Tot. Ct | Spectr. | | |
| 25 | 233269 | 03 | TC | 4.1 | | * | Core in patio |
| | | 06 | TC | 56.2 | | * | East of primary |
| | | 09 | TC | 42.4 | | * | structure |
| | | 12 | BH | 23.9 | 9.5 | * | DC = 12 inches |
| | | 15 | TC | 14.7 | | * | Based on the |
| | | 18 | TC | 10.6 | | * | deconvolution graph |
| | | 21 | TC | 8.5 | | * | |
| | | 24 | TC | 7.4 | | * | |
| | | 27 | TC | 6.8 | | * | |
| | | 30 | TC | 6.3 | | * | |
| | | 33 | TC | 5.9 | | * | |
| | | 36 | TC | 5.6 | | * | |
| | | 39 | TC | 5.4 | | * | |
| | | 42 | TC | 5.0 | | * | |
| | | 45 | TC | 4.7 | | * | |
| | | 48 | TC | 4.6 | | * | |
| | | 51 | TC | 4.4 | | * | |
| 26 | 236221 | 00 | DS | 4.5 | | * | Southeast of |
| | | 06 | DS | 11.8 | | * | primary structure |
| | | 03 | TC | 8.2 | | * | South of carport |
| | | 06 | TC | 11.5 | | * | DC = 12 inches |
| | | 09 | TC | 10.6 | | * | Based on the |
| | | 12 | TC | 7.5 | | * | deconvolution graph |
| | | 15 | TC | 5.9 | | * | |
| | | 18 | TC | 5.1 | | * | |
| | | 21 | TC | 4.6 | | * | |
| | | 24 | TC | 4.4 | | * | |
| | | 27 | TC | 4.3 | | * | |
| | | 30 | TC | 4.2 | | * | |
| | | 33 | TC | 4.1 | | * | |
| | | 36 | TC | 4.1 | | * | |
| | | 39 | TC | 4.0 | | * | |
| 27 | 238274 | 00 | DS | 10.5 | | * | East of primary |
| | | 06 | DS | 7.6 | | * | structure |
| | | 12 | DS | 4.5 | | * | DC = 12 inches |
| | | 03 | TC | 10.1 | | * | Based on the |
| | | 06 | TC | 11.5 | | * | deconvolution graph |
| | | 09 | TC | 10.3 | | * | |
| | | 12 | TC | 8.1 | | * | |
| | | 15 | TC | 6.4 | | * | |
| | | 18 | TC | 5.6 | | * | |
| | | 21 | TC | 5.2 | | * | |

Radium Concentrations at Exterior Locations

DOE ID #GJ-05168-MR

542 Melody Lane

Page 8 of 9

| Loc # | Grid Location | Depth (in.) | Meas. Type | In Situ Ra-226 (pCi/g) | | Chem Ra-226 (pCi/g) | Comments |
|-------|---------------|-------------|------------|------------------------|---------|---------------------|---------------------------------------------------------------------------------|
| | | | | Tot. Ct | Spectr. | | |
| 27 | 238274 | 24 | TC | 4.8 | | * | |
| | | 27 | TC | 4.6 | | * | |
| | | 30 | TC | 4.4 | | * | |
| | | 33 | TC | 4.4 | | * | |
| | | 36 | TC | 4.3 | | * | |
| | | 39 | TC | 4.0 | | * | |
| | | 42 | TC | 3.8 | | * | |
| | | 45 | TC | 3.5 | | * | |
| 28 | 242240 | 03 | TC | 23.3 | | * | East of primary structure DC = 15 inches Based on the deconvolution graph |
| | | 06 | TC | 26.9 | | * | |
| | | 09 | TC | 21.6 | | * | |
| | | 12 | BH | 14.7 | 5.4 | * | |
| | | 15 | TC | 9.9 | | * | |
| | | 18 | TC | 7.3 | | * | |
| | | 21 | TC | 5.9 | | * | |
| | | 24 | TC | 5.4 | | * | |
| | | 27 | TC | 4.9 | | * | |
| | | 30 | TC | 4.8 | | * | |
| | | 33 | TC | 4.5 | | * | |
| | | 36 | TC | 4.4 | | * | |
| | | 39 | TC | 4.3 | | * | |
| | | 42 | TC | 3.8 | | * | |
| | | 45 | TC | 3.9 | | * | |
| | | 48 | TC | 3.9 | | * | |
| | | 51 | TC | 3.7 | | * | |
| | | 54 | TC | 3.6 | | * | |
| | | 57 | TC | 3.6 | | * | |
| | | 60 | TC | 3.7 | | * | |
| | | 63 | TC | 3.8 | | * | |
| 29 | 243274 | 00 | DS | 4.7 | | * | Northeast of primary structure |
| | | 06 | DS | 1.5 | | * | |
| 30 | 245228 | 00 | DS | 5.9 | | * | Horizontal |
| | | 06 | DS | 6.5 | | * | |
| | | 12 | DS | 2.6 | | * | |
| | | 12 | DS | 5.4 | | * | |
| 31 | 250274 | 00 | DS | 1.7 | | * | Northeast of primary structure |
| | | 06 | DS | 1.4 | | * | |
| 32 | 260240 | 00 | DS | 6.4 | | * | East of primary structure |
| | | 06 | DS | 2.6 | | * | |

Radium Concentrations at Exterior Locations

DOE ID #GJ-05168-MR

542 Melody Lane

Page 9 of 9

| Loc # | Grid Location | Depth (in.) | Meas. Type | In Situ Ra-226 (pCi/g) | | Chem Ra-226 (pCi/g) | Comments |
|-------|---------------|-------------|------------|------------------------|---------|---------------------|-----------------|
| | | | | Tot. Ct | Spectr. | | |
| 33 | 265235 | 00 | DS | 4.9 | | * | East of primary |
| | | 06 | DS | 2.0 | | * | structure |
| 34 | 265245 | 00 | DS | 3.8 | | * | East of primary |
| | | 06 | DS | 2.0 | | * | structure |
| 35 | 265255 | 00 | DS | 4.3 | | * | East of primary |
| | | 06 | DS | 2.7 | | * | structure |
| | | 12 | DS | 1.0 | | * | |
| | | 12 | DS | 1.4 | | * | Horizontal |
| 36 | 270270 | 00 | DS | 1.0 | | * | Background |
| | | 03 | TC | 3.1 | | * | East of primary |
| | | 06 | TC | 3.4 | | * | structure |
| | | 09 | TC | 3.6 | | * | DC = 0 inches |
| | | 12 | BH | 3.7 | 1.0 | * | |
| | | 15 | TC | 3.7 | | * | |
| | | 18 | TC | 3.8 | | * | |
| | | 21 | TC | 3.7 | | * | |
| | | 24 | TC | 3.8 | | * | |
| | | 27 | TC | 3.6 | | * | |
| | | 30 | TC | 3.5 | | * | |
| | | 33 | TC | 3.5 | | * | |
| 37 | 280240 | 00 | DS | 4.8 | | * | East of primary |
| | | 06 | DS | 2.5 | | * | structure |

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 = 07-07-85
Team Leader = DF

Radium Concentrations at Interior Locations

DOE ID #GJ-05168-MR

542 Melody Lane

Page 1 of 1

| Loc # | Grid Location | Depth (in.) | Meas. Type | In Situ Ra-226 (pCi/g) | | Chem Ra-226 (pCi/g) | Comments |
|-------|---------------|-------------|------------|------------------------|---------|---------------------|------------------|
| | | | | Tot. Ct | Spectr. | | |
| 1 | | 00 | DS | 32.4 | | * | Southwest corner |
| | | 06 | DS | 2.4 | | * | of crawl space |
| 2 | | 00 | DS | 2.3 | | * | Crawl space |

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

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

Table 3.3

Summary of Interior Gamma Exposure Rates

DOE ID No. GJ-05168-MR

542 Melody Lane

Page 1 of 1

| Location | Number of Readings Taken at Waist Level | Range at Waist Level (uR/h) | Mean at Waist Level (uR/h) | Number of Readings Taken at Surface | Range at Surface (uR/h) | Mean Surface (uR/h) |
|-------------|-----------------------------------------------------|--------------------------------------|-------------------------------------|----------------------------------------------|-------------------------------|---------------------------|
| Crawl Space | - | - | - | 34 | 17-224 | 34 |
| Room A | 15 | 17-40 | 24 | 15 | 17-60 | 27 |
| Room B | 14 | 17-24 | 19 | 14 | 17-27 | 19 |
| Room C | 01 | 27-27 | 27 | 01 | 26-26 | 26 |
| Room D | 06 | 15-17 | 16 | 06 | 15-17 | 16 |
| Room E | 08 | 16-16 | 16 | 08 | 15-17 | 16 |
| Room F | 08 | 16-17 | 16 | 08 | 16-17 | 16 |
| Room G | 08 | 16-18 | 17 | 08 | 16-18 | 17 |
| Room H | 02 | 16-17 | 17 | 02 | 17-17 | 17 |
| Shed | 03 | 16-16 | 16 | 03 | 16-16 | 16 |

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-05168-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

Contaminated Fill

| | | | | | |
|----|-------|---|----|---|----------------------|
| A* | 2 x 4 | = | 8 | | |
| | 3 x 9 | = | 27 | | |
| | | | 35 | x | 0.5 = 18 = 18/27 = 1 |

TOTAL VOLUME - INTERIOR

= 1

EXTERIOR

Concrete

| | | | | | |
|---|----------|---|-----|---|-----------|
| D | 3 x 30 | = | 90 | | |
| | 6 x 7 | = | 42 | | |
| | 2.5 x 21 | = | 53 | | |
| | | | 185 | x | 0.3 = 56 |
| | | | | | |
| F | 28 x 24 | = | 672 | | |
| | 15 x 18 | = | 270 | | |
| | | | 942 | x | 0.3 = 283 |
| | | | | | |
| H | 12 x 22 | = | 264 | x | 0.3 = 79 |

Volume of Concrete

= 418 = 418/27 = 15

Contaminated Fill

| | | | | | |
|---|----------|---|-------|---|-------------|
| B | 10 x 20 | = | 200 | x | 1.3 = 260 |
| | | | | | |
| C | 20 x 20 | = | 400 | | |
| | 15 x 52 | = | 780 | | |
| | 17 x 26 | = | 442 | | |
| | | | 1,622 | x | 1.0 = 1,622 |
| | | | | | |
| D | 3 x 30 | = | 90 | | |
| | 6 x 7 | = | 42 | | |
| | 2.5 x 21 | = | 53 | | |
| | | | 185 | x | 0.7 = 130 |

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-05168-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> |
|-------------------|-------------------------|------------|------------------|-----------|--------------------|
| E | 10 x 10 = | 100 | | | |
| | 15 x 3 = | 45 | | | |
| | | <u>145</u> | x 1.0 = | 145 | |
| F | 18 x 25 = | 450 | | | |
| | 10 x 10 = | 100 | | | |
| | 10 x 13 = | 130 | | | |
| | | <u>680</u> | x 0.7 = | 476 | |
| G | 12 x 28 = | 336 | | | |
| | 12 x 12 = | 144 | | | |
| | | <u>480</u> | x 1.3 = | 624 | |
| H | 12 x 22 = | 264 | x 0.7 = | 185 | |
| I | 7 x 30 = | 210 | | | |
| | 10 x 17 = | 170 | | | |
| | 25 x 8 = | 200 | | | |
| | | <u>580</u> | x 0.5 = | 290 | |
| J | 5 x 10 = | 50 | x 1.0 = | 50 | |
| K | 4 x 30 = | 120 | x 0.5 = | 60 | |
| L | 8 x 10 = | 80 | x 1.5 = | 120 | |
| M | 5 x 28 = | 140 | x 1.0 = | 140 | |
| N | 30 x 28 = | 840 | | | |
| Minus Areas L & M | = | (220) | | | |
| | | <u>620</u> | x 0.5 = | 310 | |

Volume of Fill = 4,412 = 4,412/27 = 163

TOTAL VOLUME - EXTERIOR = 178

* Area A will not be included as part of this remedial action.

See Appendix Figures 3.4a and 3.4b For Areas

=====

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-05168-MR

Page 1 of 1

EXTERIOR

| | |
|------------------------------------------------------------------------------------------------------------------------|--------------|
| Remove/replace concrete walks, slab, and carport 1,391 sf @ \$3/sf | \$ 4,173 |
| Shore carport walls 48 lf @ \$3/lf | 144 |
| Remove identified residual radioactive material 153 cy @ \$14.50/cy (machine-open) 10 cy @ \$44/cy (manual-open) | 2,219 440 |
| Replace areas with topsoil 59 cy @ \$9.50/cy | 561 |
| Replace areas with roadbase 104 cy @ \$11.50/cy | 1,196 |
| Replace areas with sod 2,200 sf @ \$.25/sf | 550 |
| Replace plantings Lump sum | 400 |

TOTAL EXTERIOR \$ 9,683

TOTAL INTERIOR 0

ACCESS CONTROL 100

SUBTOTAL \$ 9,783

CONTINGENCY @ 5% 489

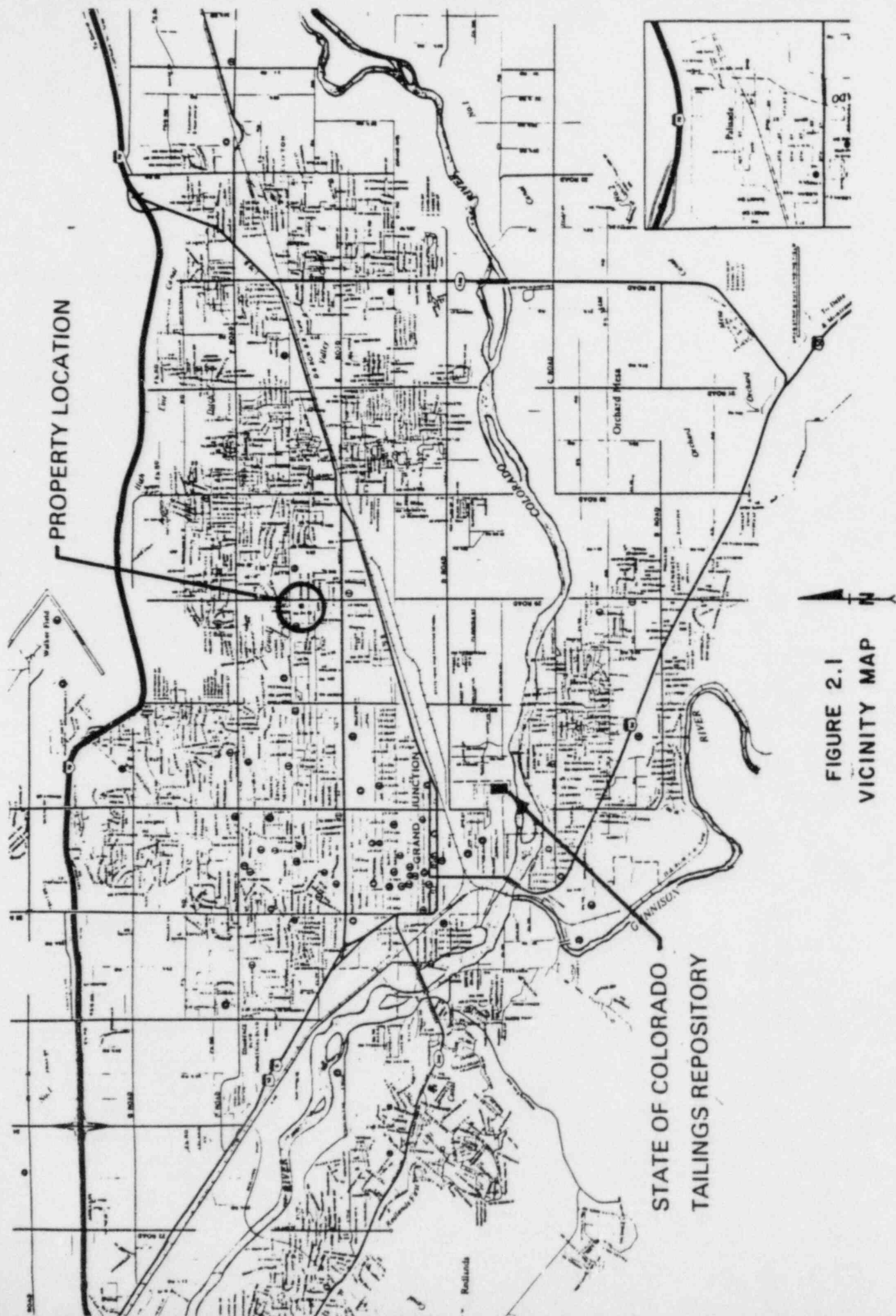
SUBTOTAL \$ 10,272

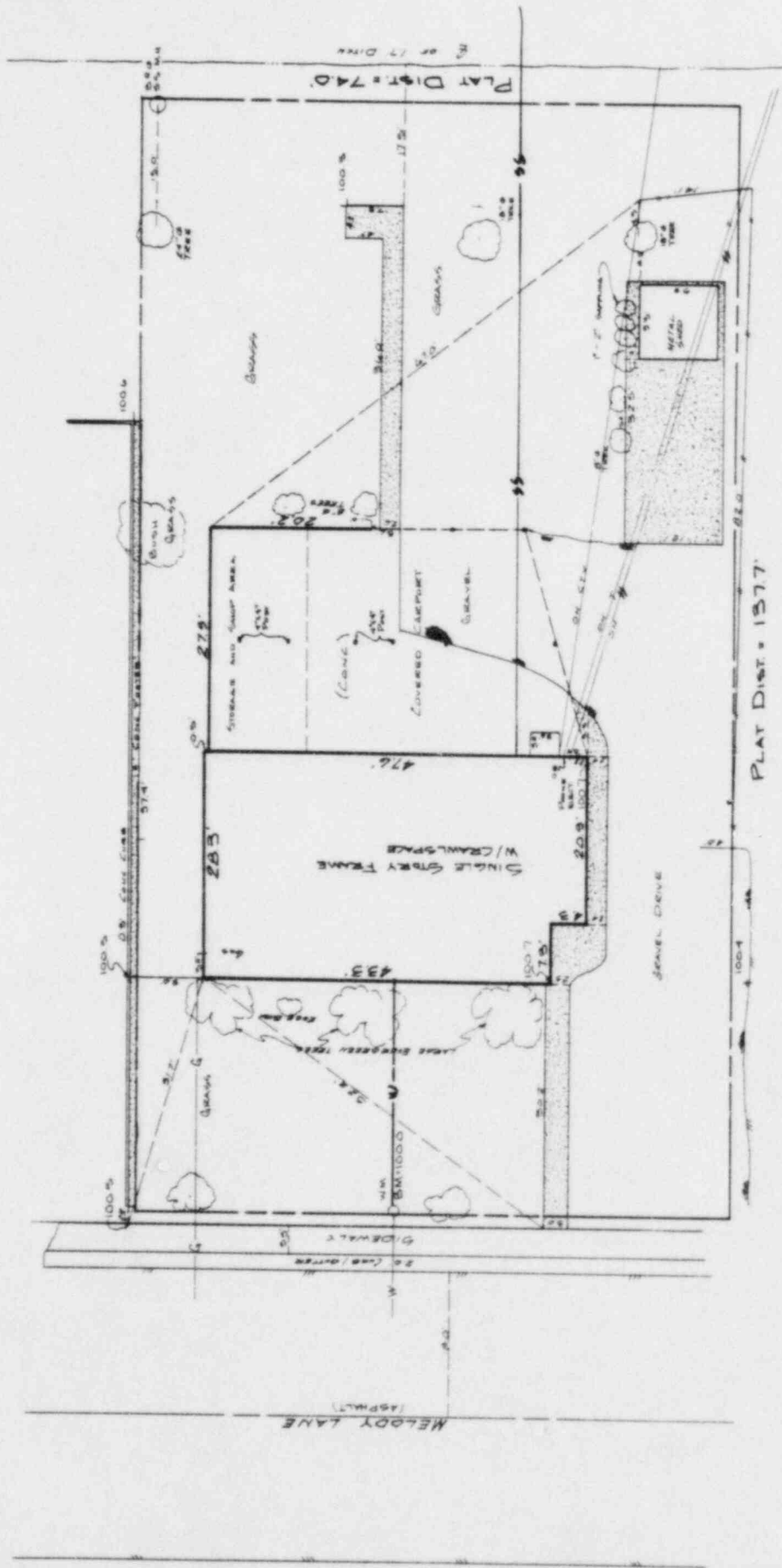
CONTRACTOR OVERHEAD & PROFIT @ 25% 2,568

GRAND TOTAL \$ 12,840

=====

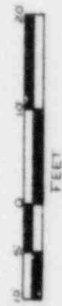
RR082185
REA05168/REA-708/AP





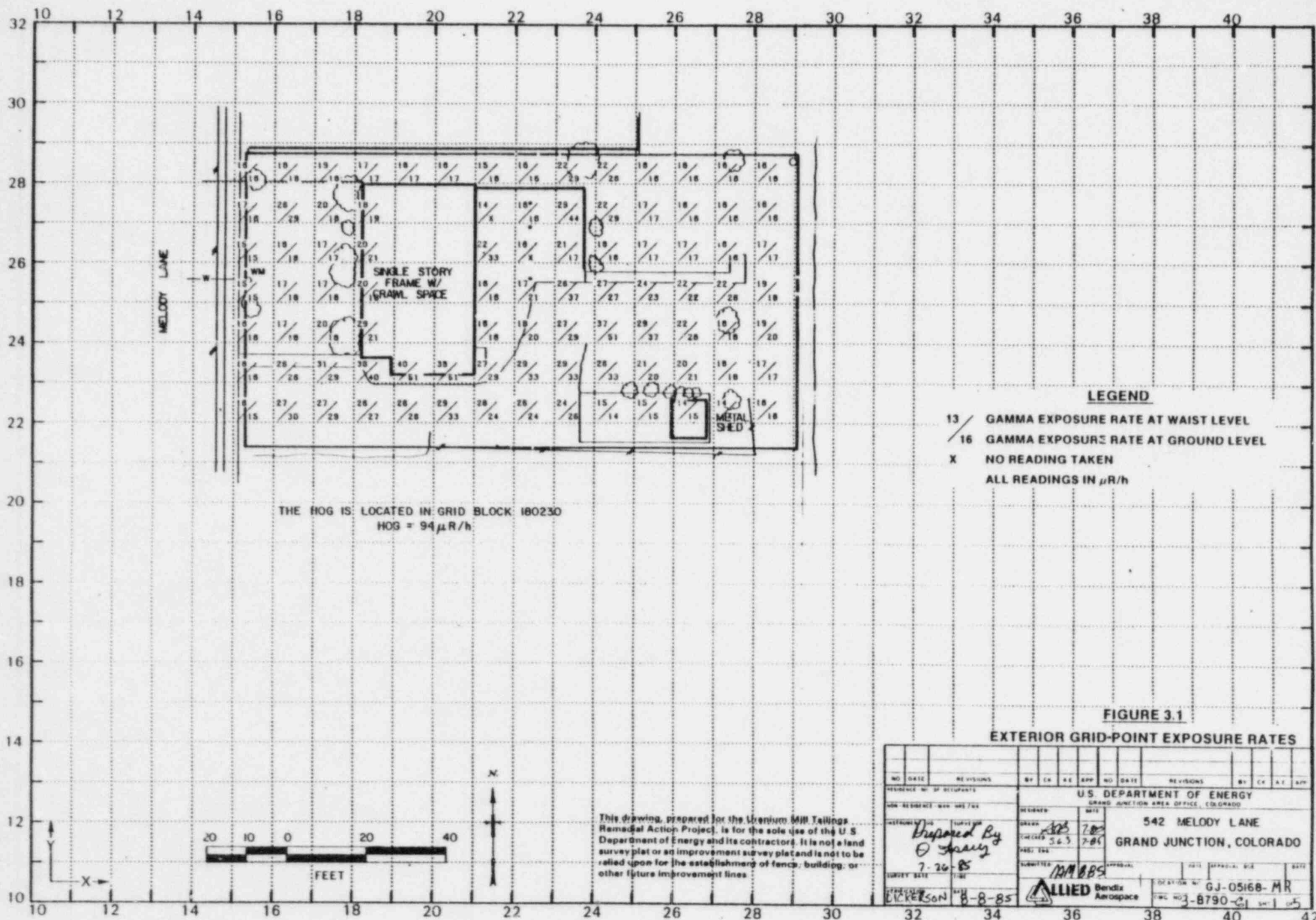
NORTH 120 FEET OF LOT 13 AND SOUTH
120 FEET OF LOT 14 BLOCK 2 PARKERSOU
SUBDIVISION CITY OF GRAND JUNCTION

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 legal document and should not be used for any other purpose without the express written consent of the U.S. Department of Energy.

| | |
|-----------------------------------------|--------------|
| U.S. DEPARTMENT OF ENERGY | GOE ID NO |
| GRAND JUNCTION PROJECT OFFICE, COLORADO | 63-05166-MR |
| ADDRESS 542 MELODY LANE | |
| GRAND JUNCTION, COLORADO | |
| SURV 72-B5 | GRANT 72-B5 |
| DRAWING NO 3-C-790-F1 | SHEET 1 OF 1 |



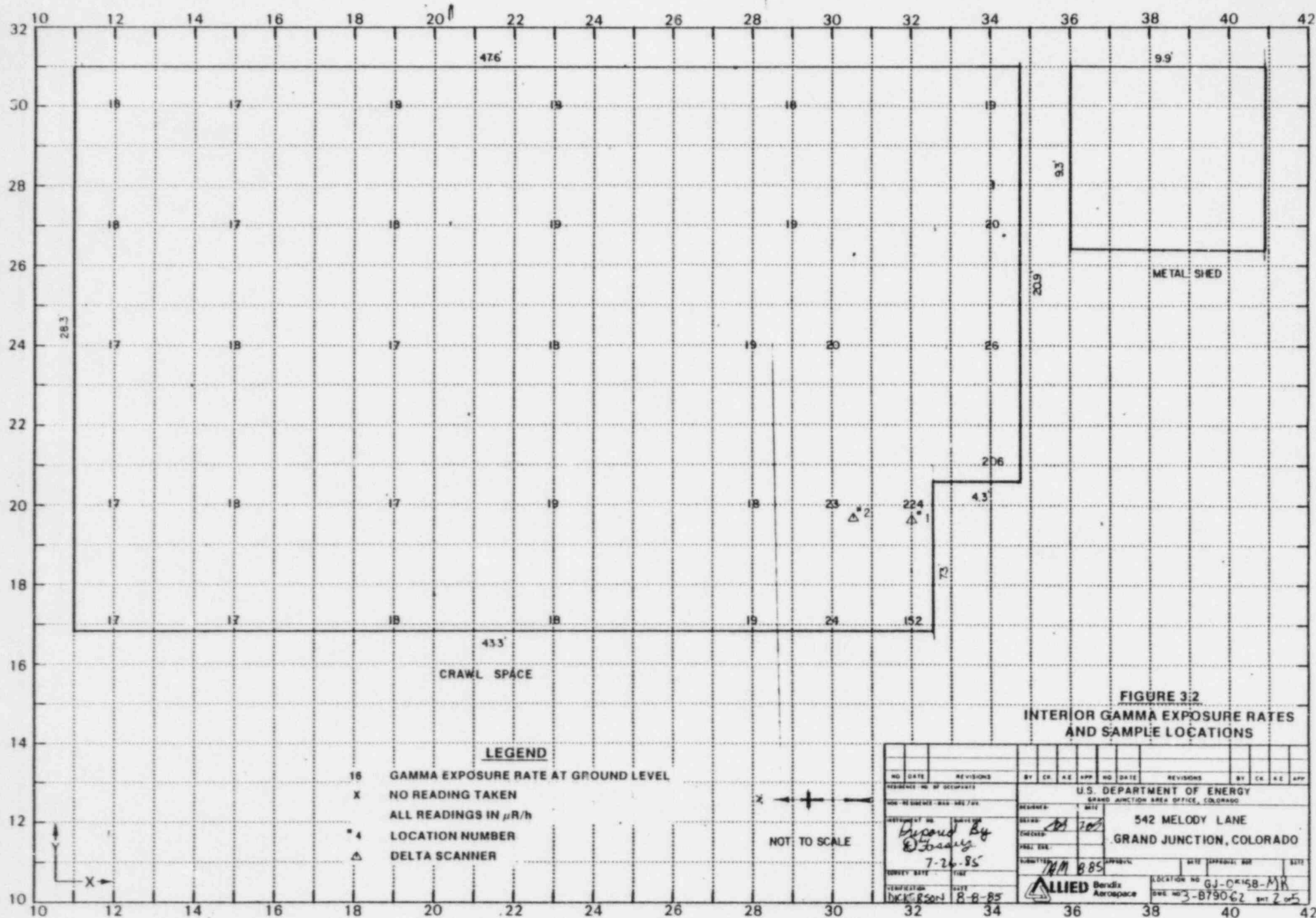
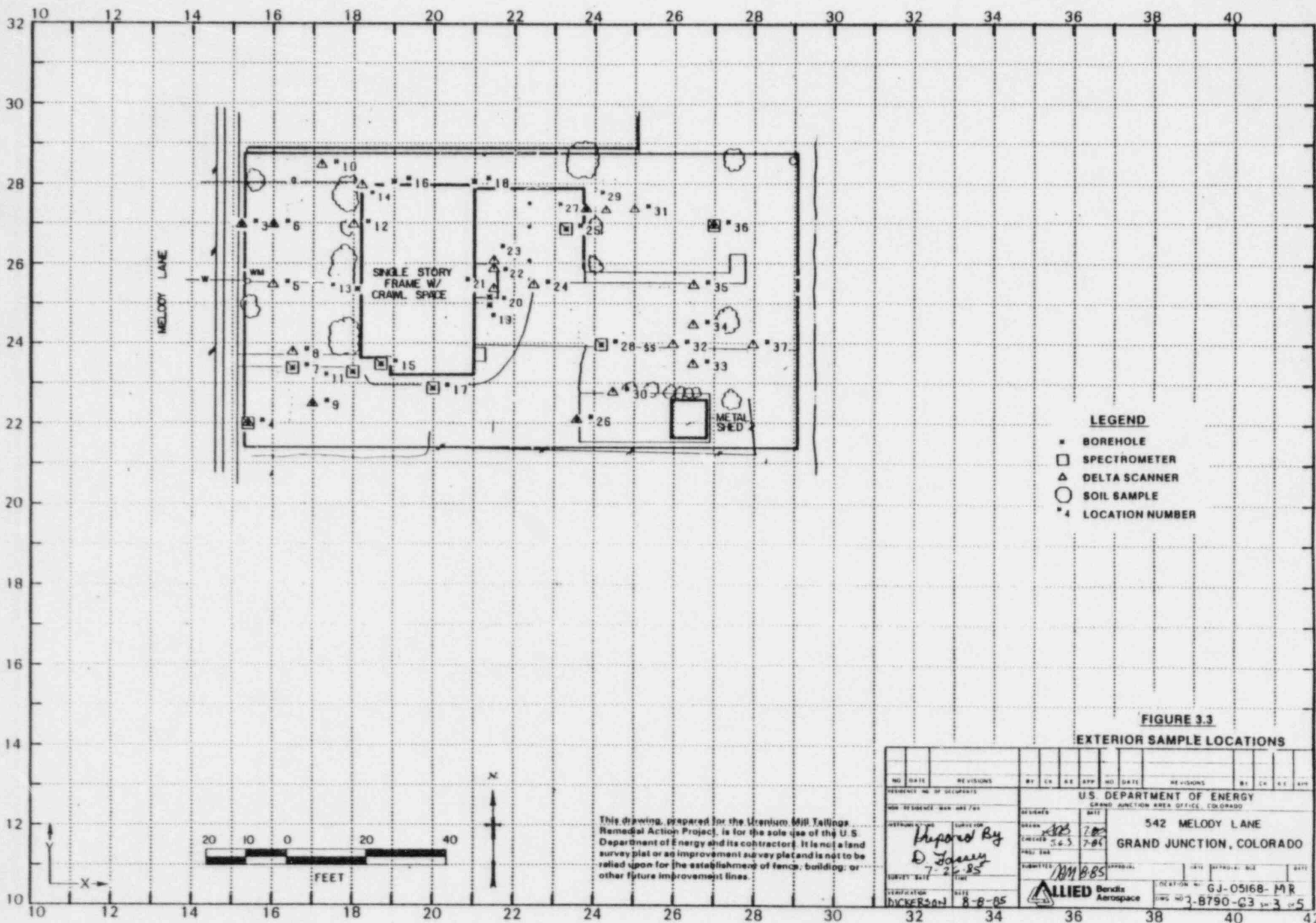


FIGURE 3.2
INTERIOR GAMMA EXPOSURE RATES
AND SAMPLE LOCATIONS

| | | | | | | | |
|-------------------------------------------------------------------|--|------------------------|--|---------------------------------------------|--|---------------------------------|--|
| 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 | | | | | | | |
| DESIGNED BY <i>Byond By</i> | | DATE <i>7-26-85</i> | | 542 MELODY LANE GRAND JUNCTION, COLORADO | | | |
| CHECKED BY <i>Byond By</i> | | DATE <i>7-26-85</i> | | QUANTITY <i>14M 885</i> | | DATE <i>7-26-85</i> | |
| SURVEY DATE <i>7-26-85</i> | | TIME <i>18-8-85</i> | | ALLIED Bendix Aerospace | | LOCATION NO. <i>GJ-0K15B-MR</i> | |
| DRAWN BY <i>Byond By</i> | | DATE <i>7-26-85</i> | | DUE NO. <i>3-879062</i> | | SHEET <i>2 OF 5</i> | |



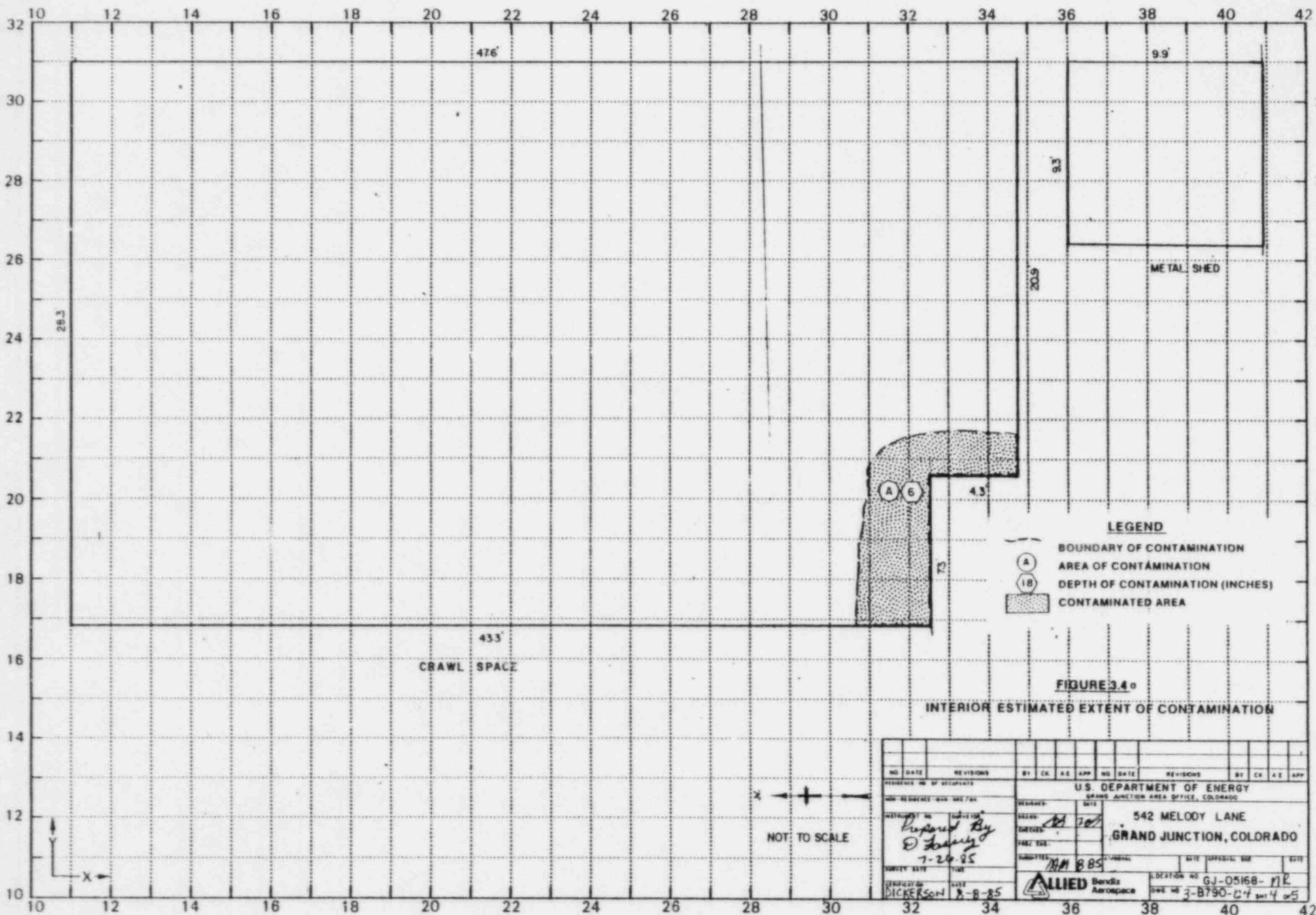
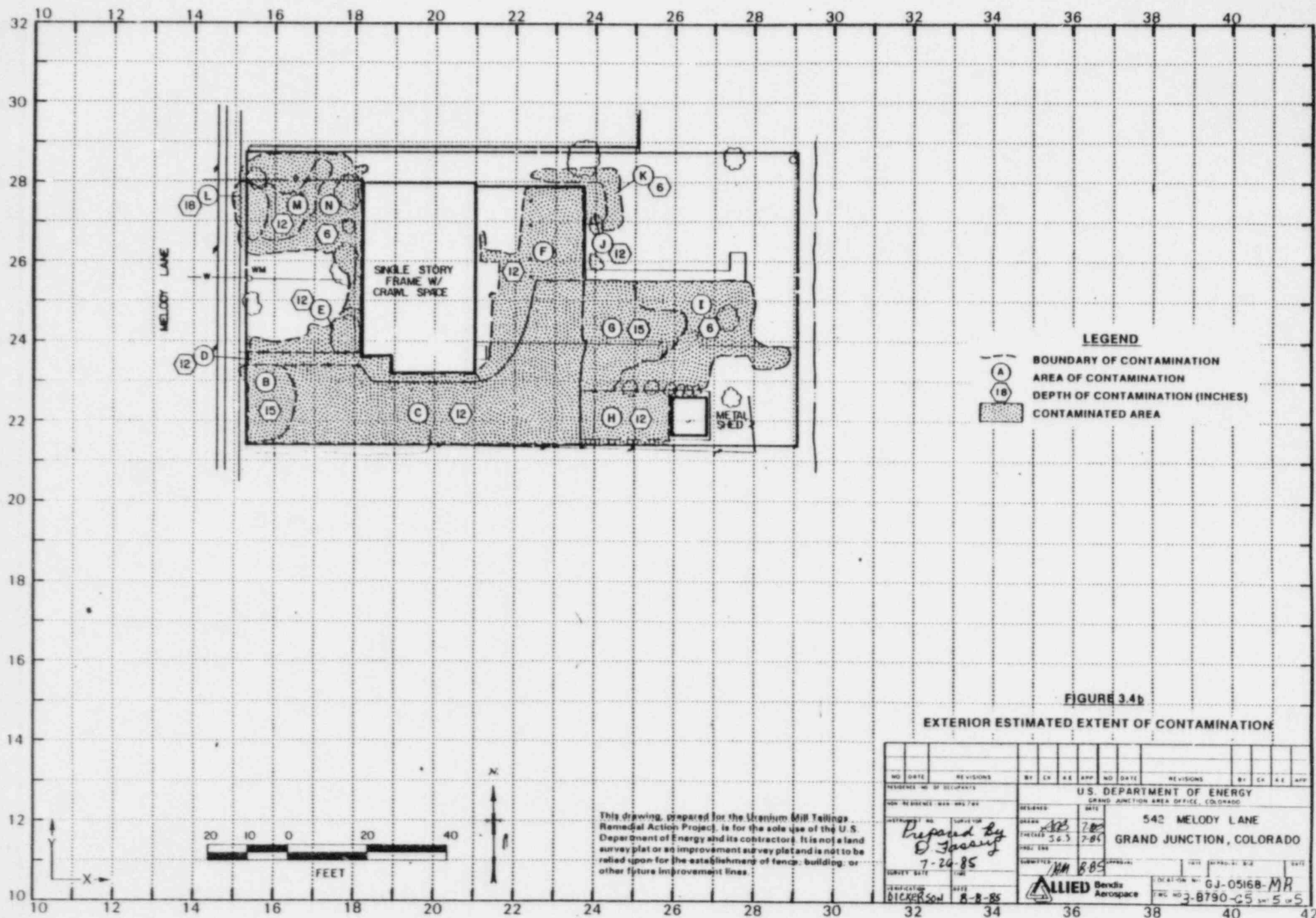


FIGURE 3.4a

INTERIOR ESTIMATED EXTENT OF CONTAMINATION

| REVISIONS | | | | REVISIONS | | | |
|-------------------------------------------------------------------|------|----|-----|-------------------------------------------------------------------|------|----|-----|
| NO. | DATE | BY | CHK | NO. | DATE | BY | CHK |
| U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO | | | | 542 MELODY LANE GRAND JUNCTION, COLORADO | | | |
| RECEIVED: <i>7-26-85</i> | | | | DATE: <i>7-26-85</i> | | | |
| DRAWN BY: <i>D. DICKERSON</i> | | | | CHECKED BY: <i>MM 885</i> | | | |
| DATE: <i>8-8-85</i> | | | | DATE: <i>8-8-85</i> | | | |
| DRAWN BY: <i>DICKERSON</i> | | | | DATE: <i>8-8-85</i> | | | |
| U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO | | | | U.S. DEPARTMENT OF ENERGY GRAND JUNCTION AREA OFFICE, COLORADO | | | |
| 542 MELODY LANE GRAND JUNCTION, COLORADO | | | | 542 MELODY LANE GRAND JUNCTION, COLORADO | | | |
| RECEIVED: <i>7-26-85</i> | | | | DATE: <i>7-26-85</i> | | | |
| DRAWN BY: <i>D. DICKERSON</i> | | | | CHECKED BY: <i>MM 885</i> | | | |
| DATE: <i>8-8-85</i> | | | | DATE: <i>8-8-85</i> | | | |
| DRAWN BY: <i>DICKERSON</i> | | | | DATE: <i>8-8-85</i> | | | |



3/85

DOE ID NO. GJ-05168-MR

Date July 26, 1985

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

Official Survey Report

Property Address 542 Melody Lane Grand Jct., Co. 81501

Property Owner Keith C. Puckett

Address of Owner (if different from above)

Report Prepared By Daniel P. Fossey

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

☐ No evidence of residual radioactive material on surveyed property.

☒ Residual radioactive materials found at the following locations:

☒ In open areas.

☒ Under or around exterior improvements.

☐ Under or around a typically nonoccupied structure.

☒ Under or around a typically occupied structure.

II. RESULTS OF RADIOLOGIC ASSESSMENT

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

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

cc:

G. A. Franz, III, GJ/CDH

J. Themelis, Mgr. UMTRA Proj. Off.

HIG = 60 uR/h

HOG = 94 uR/h

MEMORANDUM

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: July 12, 1985

To: Files

From: Daniel Fossey

Subject: Team Leader Notes - GJ-05168-MR

Address: 542 Melody Lane

Owner: Keith C. Puckett

Arrival Time: 12:00 Noon

Team Members

D. Fossey (Team Leader)
V. Rothman
V. Young
H. Mattison
L. Kula

S. Southern
M. Duran
N. Wallace
S. Larsen

Instruments

See Equipment Summary sheet

This is a spillover inclusion property. Spillover data indicates contamination along the south property boundary.

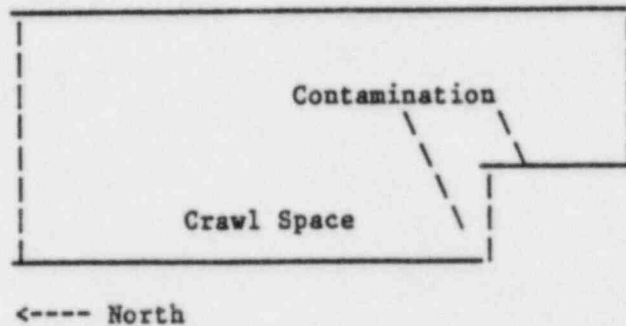
The exterior gamma scan showed elevated gamma readings throughout the majority of the yard.

Gridding was difficult due to a number of disabled cars and miscellaneous clutter.

The water and sewer lines were located by the team members during the exterior gamma scan. The gas line was marked by Public Service.

Team Leader Notes
Daniel Fossey
GJ-05168-MR
July 12, 1985
Page 2

The interior gamma survey showed elevated gamma readings along the south wall of the primary structure. Further investigation revealed a mound of what appeared to be tailings sand along the footing of the south end of the crawl space. This was further investigated by delta scanner readings.



At 2:30 PM it was determined that there was not sufficient time to complete the survey by quitting time. The decision was made to return to the compound and finish the survey the next day (July 12, 1985). This decision was made by Dave Mackler.

Team Leader Notes
Daniel Fossey
GJ-05168-MR
July 12, 1985
Page 3

Date: July 12, 1985

Arrival Time: 8:00 AM

Team Members

| | |
|-------------------------|-------------|
| D. Fossey (Team Leader) | H. Mattison |
| R. Herman | D. Herrera |
| V. Hebel | V. Young |

Instruments

See Equipment Summary sheet

A core was drilled in the sidewalk adjacent to the south entrance of the primary structure. Also two cores were drilled in the concrete slab of the carport, east of the primary structure.

The downhole scintillometer was not used to investigate the utilities or foundation, since there were elevated gamma readings in all of these areas.

The survey was completed at 12:00 noon.

Team Leader Notes
Daniel Fossey
GJ-05168-MR
August 19, 1985
Page 4

Revisit

Date: August 19, 1985

The purpose of this revisit is to investigate the concrete cistern located east of the primary structure. Total count readings were taken along the southeast corner of the cistern. Three additional delta readings were also taken, two on top of the cistern, and one just north of the cistern.

This additional data shows that the concrete cistern is not contaminated. However, there is 12-inches of contamination along the north, east, and south walls of the cistern. These findings are supported by data collected during the original radiologic survey conducted on 12 July 1985.

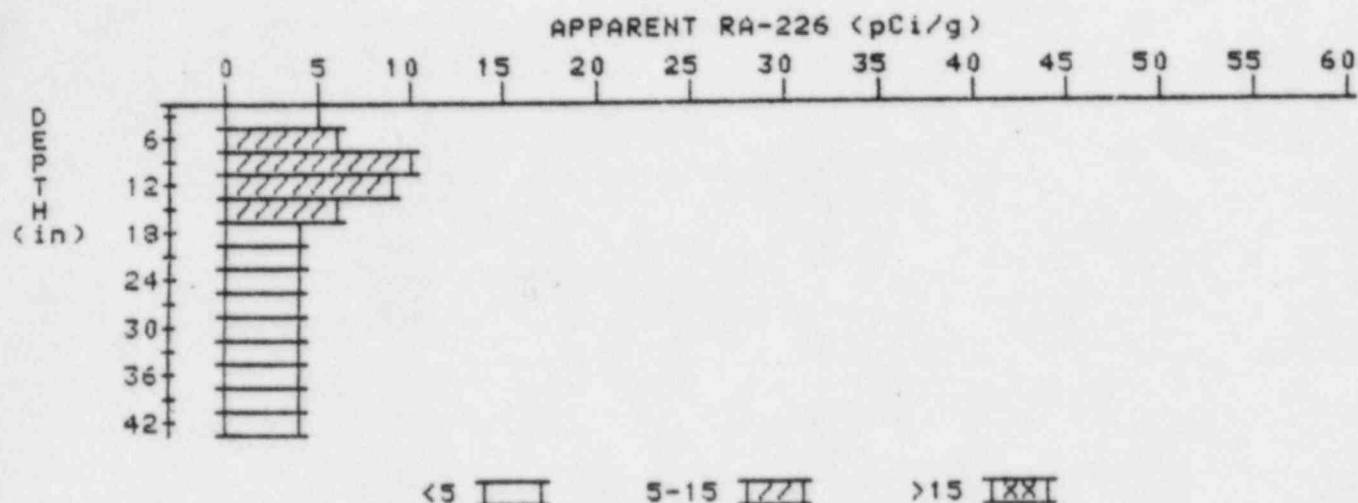
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

3

PROPERTY NUMBER: GJ-05168-MR

HOLE NUMBER: 3

LOCATION: 152270

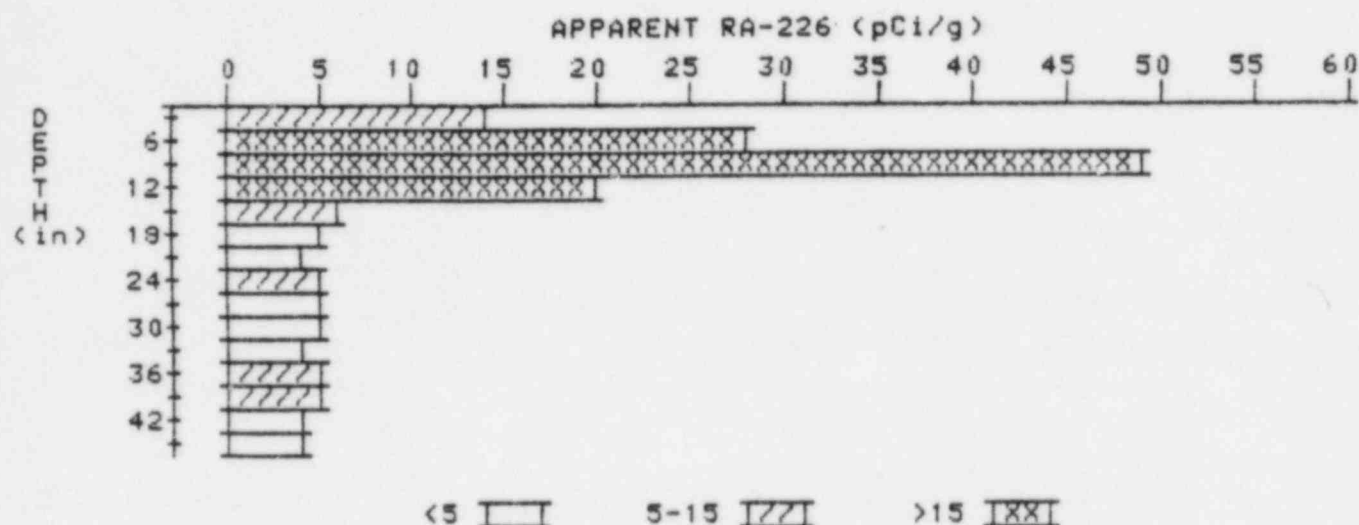


| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 4.9 | 4.9 |
| 6 | 6.1 | 5.9 |
| 9 | 7.4 | 9.9 |
| 12 | 7.3 | 9.3 |
| 15 | 6.1 | 5.7 |
| 18 | 5.1 | 4.4 |
| 21 | 4.5 | 3.8 |
| 24 | 4.3 | 4.3 |
| 27 | 4.1 | 3.9 |
| 30 | 4.0 | 4.0 |
| 33 | 3.9 | 3.9 |
| 36 | 3.8 | 3.6 |
| 39 | 3.8 | 4.3 |
| 42 | 3.5 | 3.5 |

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

4

PROPERTY NUMBER: GJ-05168-MR
HOLE NUMBER: 4
LOCATION: 154220

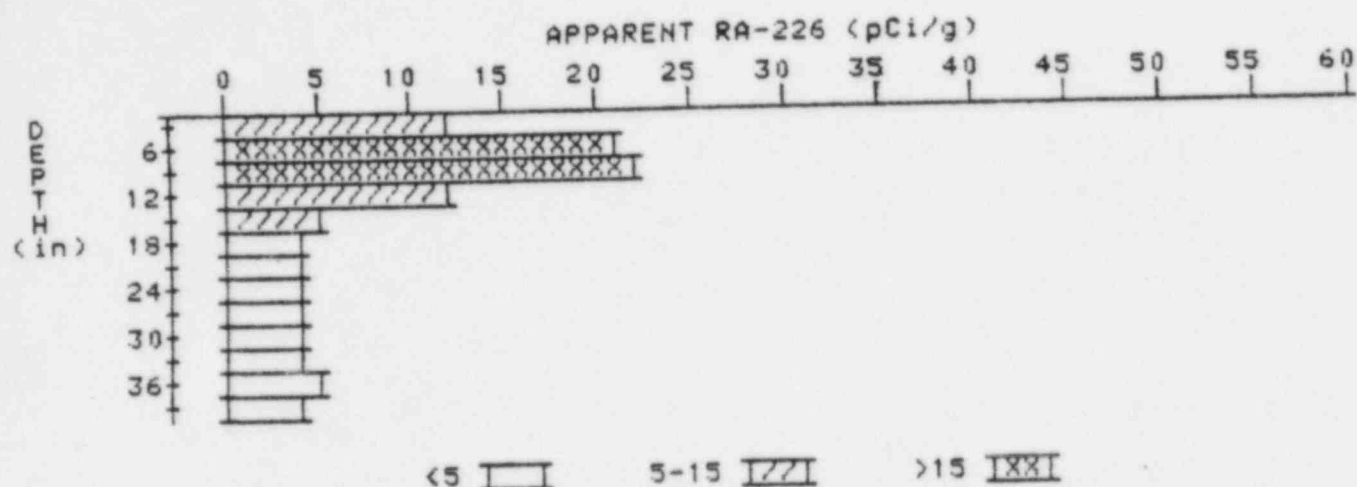


| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 13.5 | 13.5 |
| 6 | 22.0 | 27.9 |
| 9 | 27.2 | 49.4 |
| 12 | 19.9 | 20.3 |
| 15 | 12.4 | 6.2 |
| 18 | 8.4 | 4.8 |
| 21 | 6.4 | 4.3 |
| 24 | 5.6 | 5.1 |
| 27 | 5.1 | 4.6 |
| 30 | 4.9 | 4.7 |
| 33 | 4.8 | 4.4 |
| 36 | 4.9 | 5.3 |
| 39 | 4.8 | 5.3 |
| 42 | 4.4 | 4.2 |
| 45 | 4.1 | 4.1 |

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

6

PROPERTY NUMBER: GJ-05168-MR
HOLE NUMBER: 6
LOCATION: 160270



| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 12.0 | 12.0 |
| 6 | 15.3 | 21.0 |
| 9 | 15.4 | 22.2 |
| 12 | 11.7 | 11.5 |
| 15 | 8.1 | 5.3 |
| 18 | 6.1 | 4.5 |
| 21 | 5.0 | 3.8 |
| 24 | 4.6 | 4.4 |
| 27 | 4.3 | 4.1 |
| 30 | 4.1 | 3.7 |
| 33 | 4.1 | 4.1 |
| 36 | 4.1 | 4.6 |
| 39 | 3.8 | 3.8 |

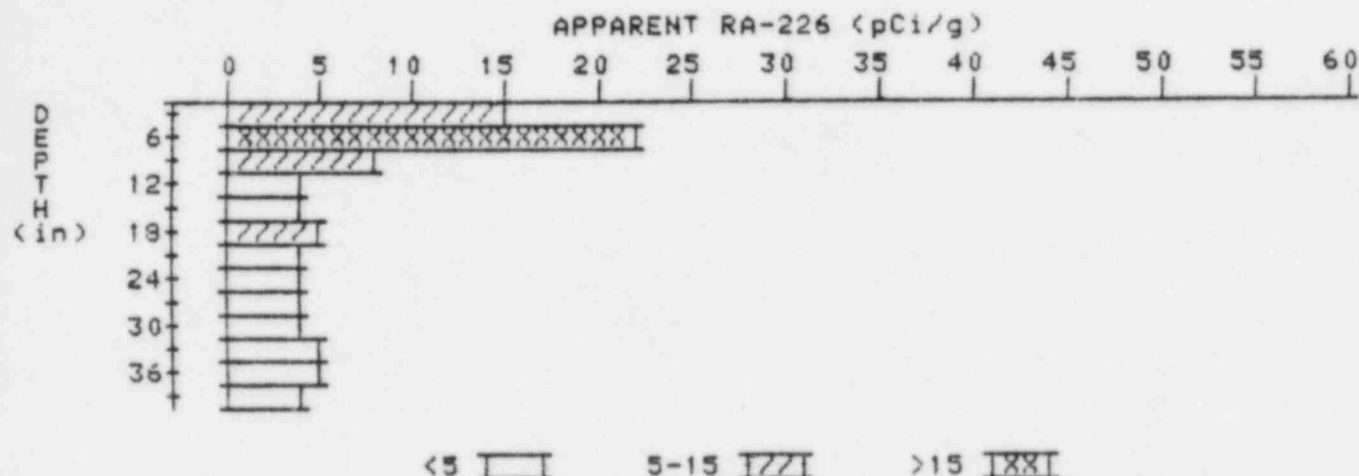
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

7

PROPERTY NUMBER: GJ-05168-MR

HOLE NUMBER: 7

LOCATION: 165234



| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 14.5 | 14.5 |
| 6 | 14.5 | 22.1 |
| 9 | 10.2 | 7.9 |
| 12 | 7.2 | 4.4 |
| 15 | 5.8 | 4.4 |
| 18 | 5.2 | 5.0 |
| 21 | 4.7 | 4.3 |
| 24 | 4.4 | 4.0 |
| 27 | 4.3 | 4.3 |
| 30 | 4.2 | 3.8 |
| 33 | 4.3 | 4.7 |
| 36 | 4.2 | 4.6 |
| 39 | 3.9 | 3.9 |

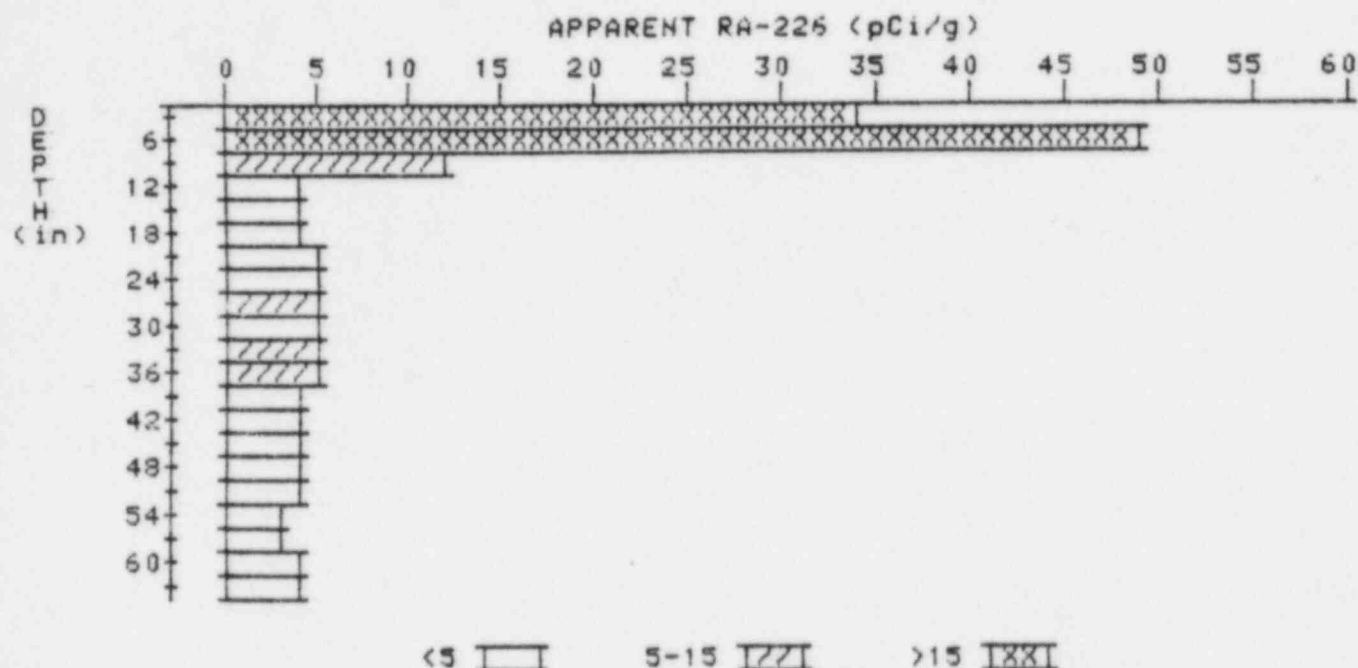
APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

9

PROPERTY NUMBER: GJ-05168-MR

HOLE NUMBER: 9

LOCATION: 170225



| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 33.7 | 33.7 |
| 6 | 31.6 | 49.2 |
| 9 | 19.6 | 12.3 |
| 12 | 11.7 | 4.4 |
| 15 | 7.9 | 4.2 |
| 18 | 6.2 | 4.4 |
| 21 | 5.5 | 5.0 |
| 24 | 5.1 | 4.6 |
| 27 | 5.0 | 5.0 |
| 30 | 4.9 | 4.7 |
| 33 | 4.9 | 5.3 |
| 36 | 4.7 | 5.1 |
| 39 | 4.3 | 4.1 |
| 42 | 4.0 | 3.8 |
| 45 | 3.8 | 3.6 |
| 48 | 3.7 | 3.7 |
| 51 | 3.6 | 3.6 |

54
57
60
63

3.5
3.5
3.6
3.7

3.3
3.3
3.6
3.7

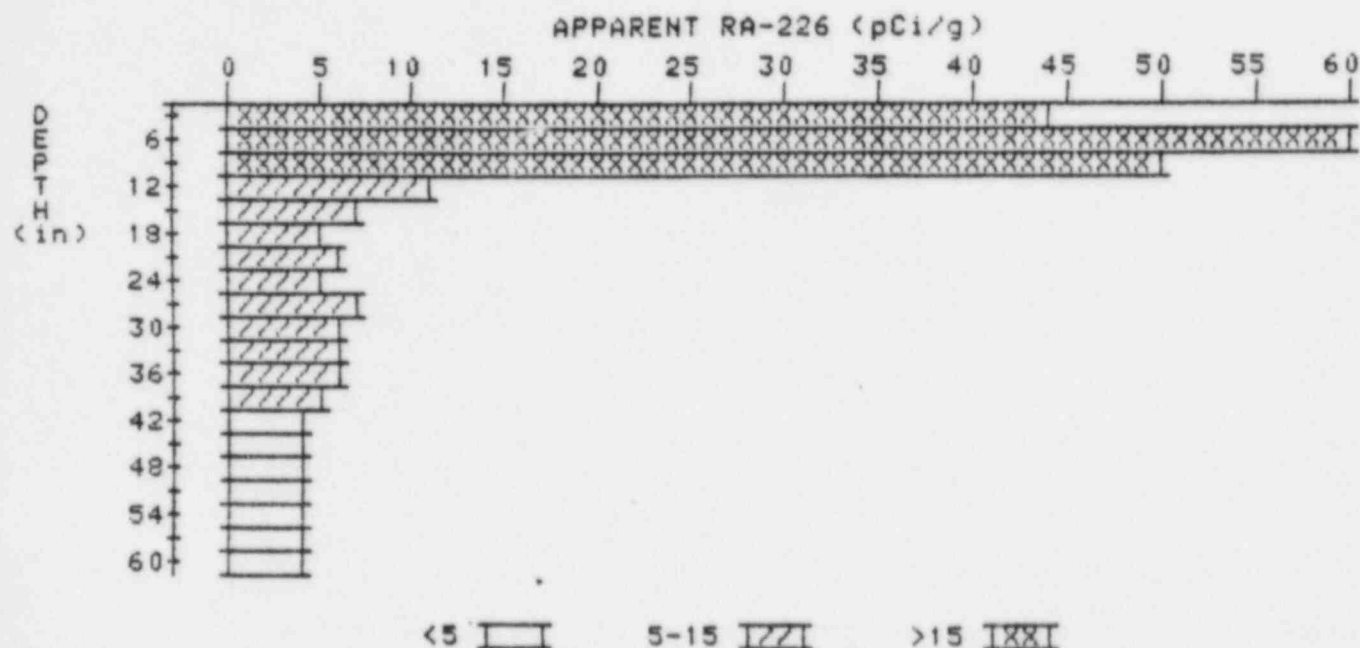
APPARENT RADIUM-226 CONCENTRATION 11

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05168-MR

HOLE NUMBER: 11

LOCATION: 190233



| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 43.8 | 43.8 |
| 6 | 51.3 | 84.2 |
| 9 | 40.3 | 50.1 |
| 12 | 23.8 | 10.8 |
| 15 | 14.6 | 6.6 |
| 18 | 9.9 | 5.5 |
| 21 | 7.7 | 5.6 |
| 24 | 6.7 | 5.5 |
| 27 | 6.4 | 6.6 |
| 30 | 6.0 | 5.8 |
| 33 | 5.7 | 5.5 |
| 36 | 5.5 | 5.9 |
| 39 | 5.1 | 5.3 |
| 42 | 4.6 | 4.4 |
| 45 | 4.2 | 3.8 |
| 48 | 4.0 | 3.8 |
| 51 | 3.9 | 3.7 |
| 54 | 3.9 | 3.7 |

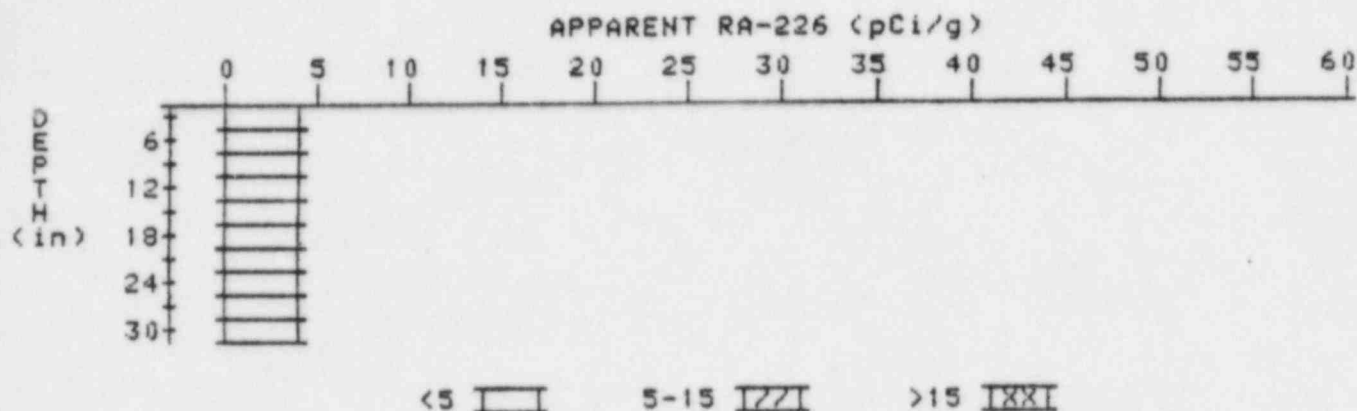
57
60

4.0
4.1

4.0
4.1

APPARENT RADIUM-226 CONCENTRATION 13 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05168-MR
HOLE NUMBER: 13
LOCATION: 181254



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

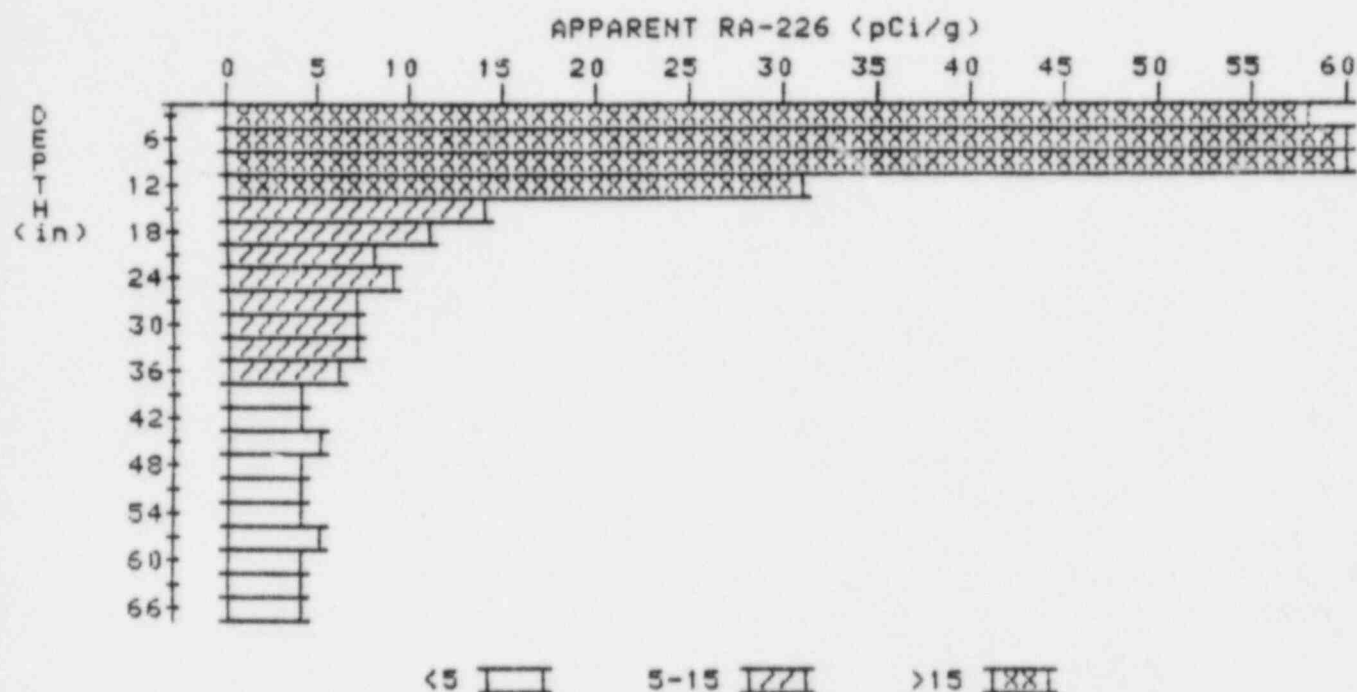
APPARENT RADIUM-226 CONCENTRATION 15

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05168-MR

HOLE NUMBER: 15

LOCATION: 187235

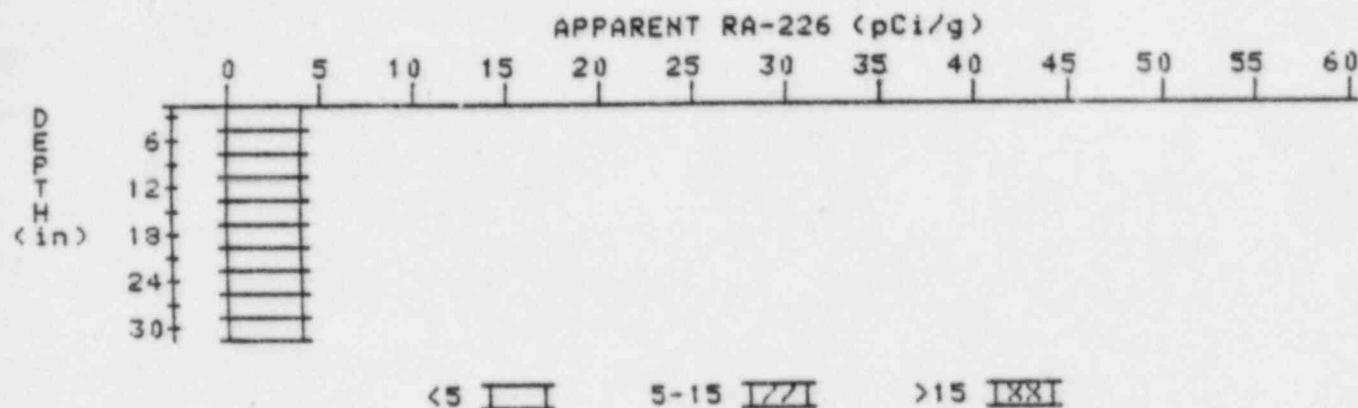


| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 58.0 | 58.0 |
| 6 | 75.1 | 127.0 |
| 9 | 63.0 | 79.4 |
| 12 | 41.7 | 31.4 |
| 15 | 26.2 | 14.3 |
| 18 | 17.4 | 10.6 |
| 21 | 12.4 | 7.8 |
| 24 | 10.0 | 8.8 |
| 27 | 8.3 | 7.1 |
| 30 | 7.3 | 6.6 |
| 33 | 6.7 | 6.9 |
| 36 | 6.0 | 6.4 |
| 39 | 5.1 | 4.2 |
| 42 | 4.7 | 4.3 |
| 45 | 4.5 | 4.7 |
| 48 | 4.2 | 3.7 |

| | | |
|----|-----|-----|
| 51 | 4.2 | 4.4 |
| 54 | 4.1 | 3.7 |
| 57 | 4.2 | 4.6 |
| 60 | 4.1 | 3.7 |
| 63 | 4.2 | 4.4 |
| 66 | 4.2 | 4.2 |

APPARENT RADIUM-226 CONCENTRATION 16 DECONVOLUTION GRAPH

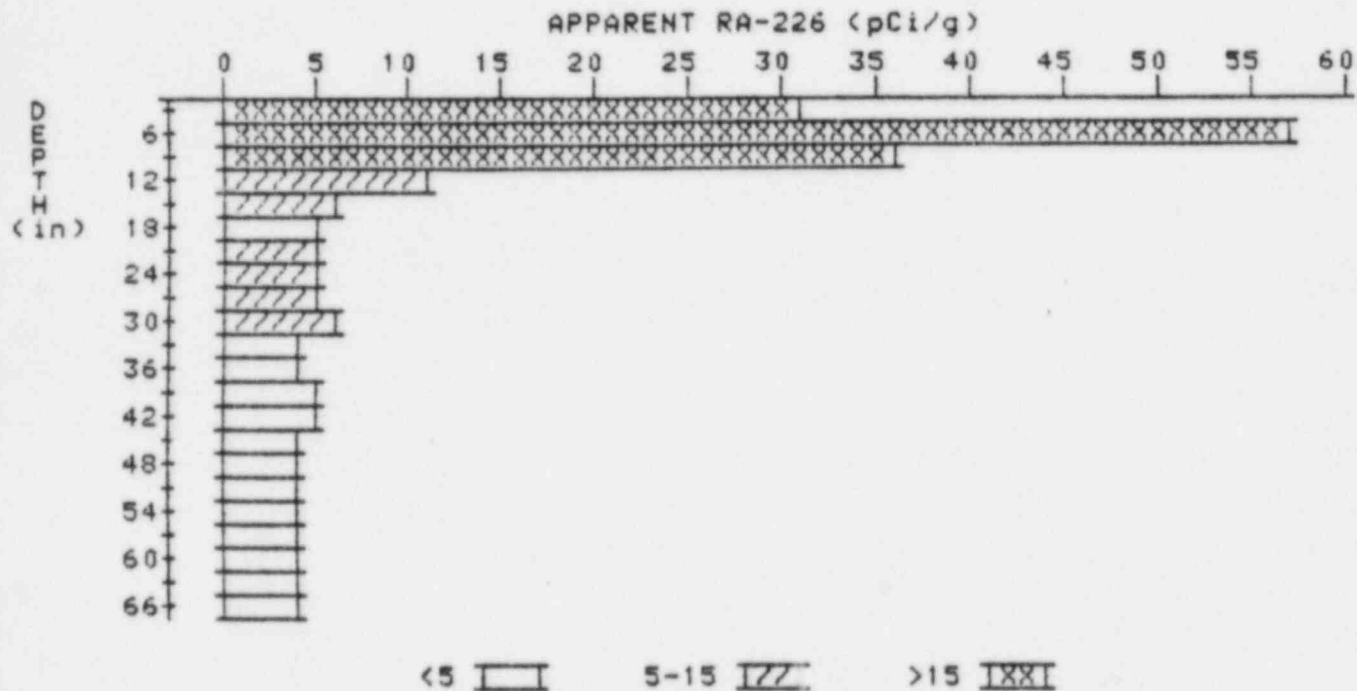
PROPERTY NUMBER: GJ-05168-MR
HOLE NUMBER: 16
LOCATION: 190281



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

APPARENT RADIUM-226 CONCENTRATION 17 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05168-MR
HOLE NUMBER: 17
LOCATION: 200229



| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 30.9 | 30.9 |
| 6 | 36.0 | 57.0 |
| 9 | 29.3 | 36.4 |
| 12 | 18.6 | 11.5 |
| 15 | 11.9 | 6.4 |
| 18 | 8.3 | 4.9 |
| 21 | 6.6 | 5.0 |
| 24 | 5.8 | 5.1 |
| 27 | 5.4 | 5.0 |
| 30 | 5.2 | 5.6 |
| 33 | 4.8 | 4.4 |
| 36 | 4.6 | 4.4 |
| 39 | 4.5 | 4.5 |
| 42 | 4.4 | 4.6 |
| 45 | 4.2 | 4.0 |
| 48 | 4.1 | 4.1 |

| | | |
|----|-----|-----|
| 51 | 4.0 | 4.0 |
| 54 | 3.9 | 3.7 |
| 57 | 3.9 | 4.1 |
| 60 | 3.8 | 3.6 |
| 63 | 3.8 | 3.8 |
| 66 | 3.8 | 3.8 |

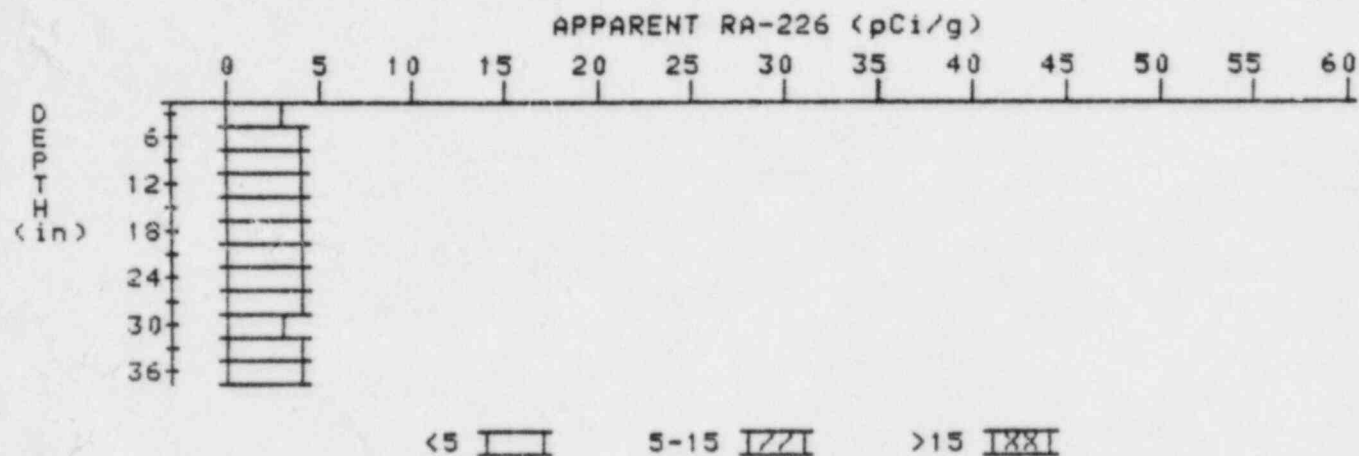
APPARENT RADIUM-226 CONCENTRATION 18

DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05168-MR

HOLE NUMBER: 18

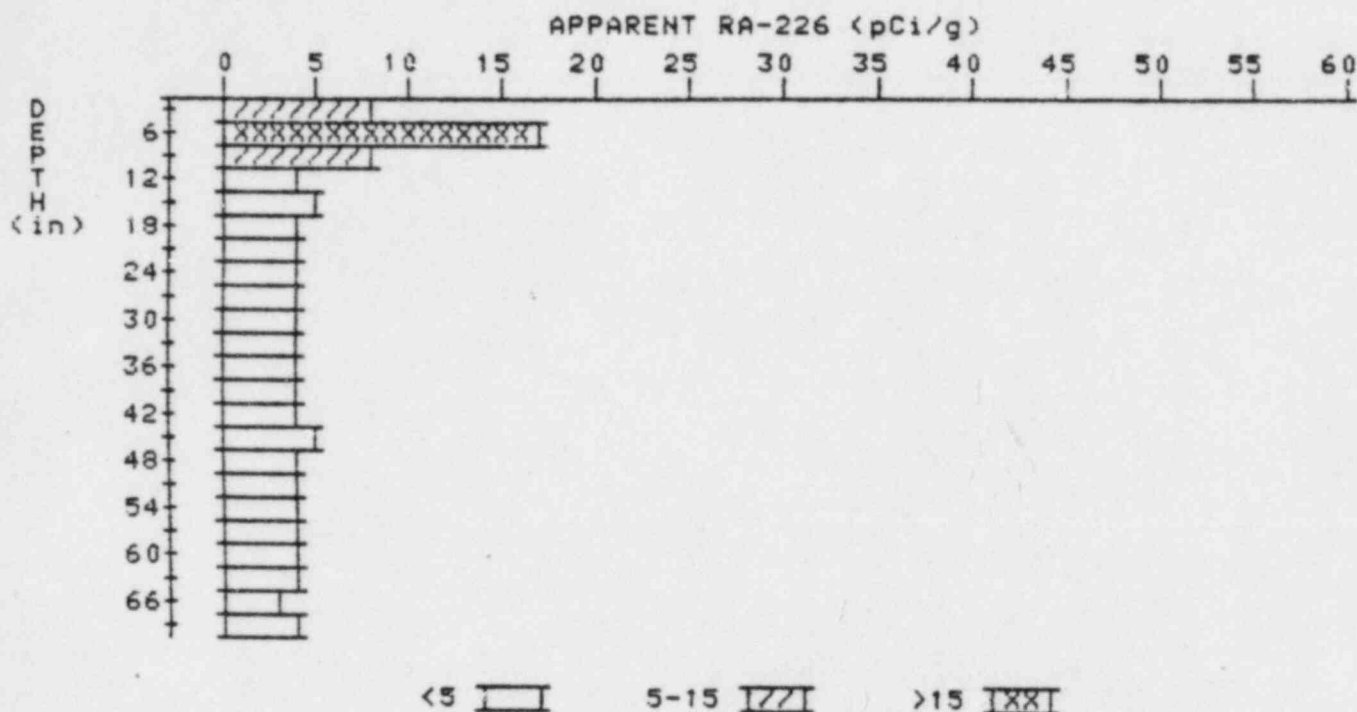
LOCATION: 210281



| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 3.0 | 3.0 |
| 6 | 3.4 | 3.8 |
| 9 | 3.6 | 3.6 |
| 12 | 3.8 | 4.2 |
| 15 | 3.8 | 3.6 |
| 18 | 3.9 | 4.1 |
| 21 | 3.9 | 4.1 |
| 24 | 3.8 | 3.6 |
| 27 | 3.8 | 4.0 |
| 30 | 3.7 | 3.3 |
| 33 | 3.8 | 4.2 |
| 36 | 3.7 | 3.7 |

APPARENT RADIUM-226 CONCENTRATION 19 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05168-MR
HOLE NUMBER: 19
LOCATION: 214250

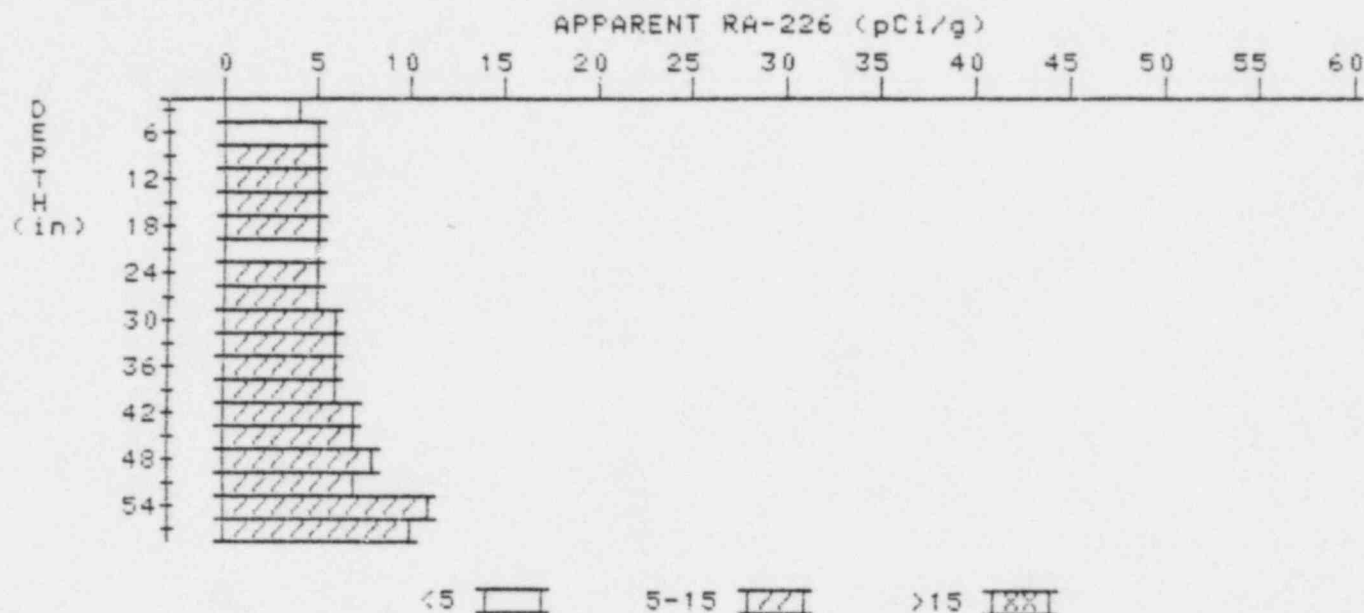


| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 7.9 | 7.9 |
| 6 | 9.9 | 16.7 |
| 9 | 8.1 | 8.5 |
| 12 | 6.1 | 4.1 |
| 15 | 5.2 | 4.7 |
| 18 | 4.6 | 4.1 |
| 21 | 4.3 | 3.8 |
| 24 | 4.3 | 4.5 |
| 27 | 4.2 | 4.0 |
| 30 | 4.2 | 4.0 |
| 33 | 4.3 | 4.5 |
| 36 | 4.3 | 4.5 |
| 39 | 4.2 | 4.0 |
| 42 | 4.2 | 4.0 |
| 45 | 4.3 | 4.8 |

| | | |
|----|-----|-----|
| 48 | 4.1 | 3.7 |
| 51 | 4.1 | 4.5 |
| 54 | 3.9 | 3.5 |
| 57 | 3.9 | 4.1 |
| 60 | 3.8 | 3.8 |
| 63 | 3.7 | 3.7 |
| 66 | 3.6 | 3.4 |
| 69 | 3.6 | 3.6 |

APPARENT RADIUM-226 CONCENTRATION 20 DECONVOLUTION GRAPH

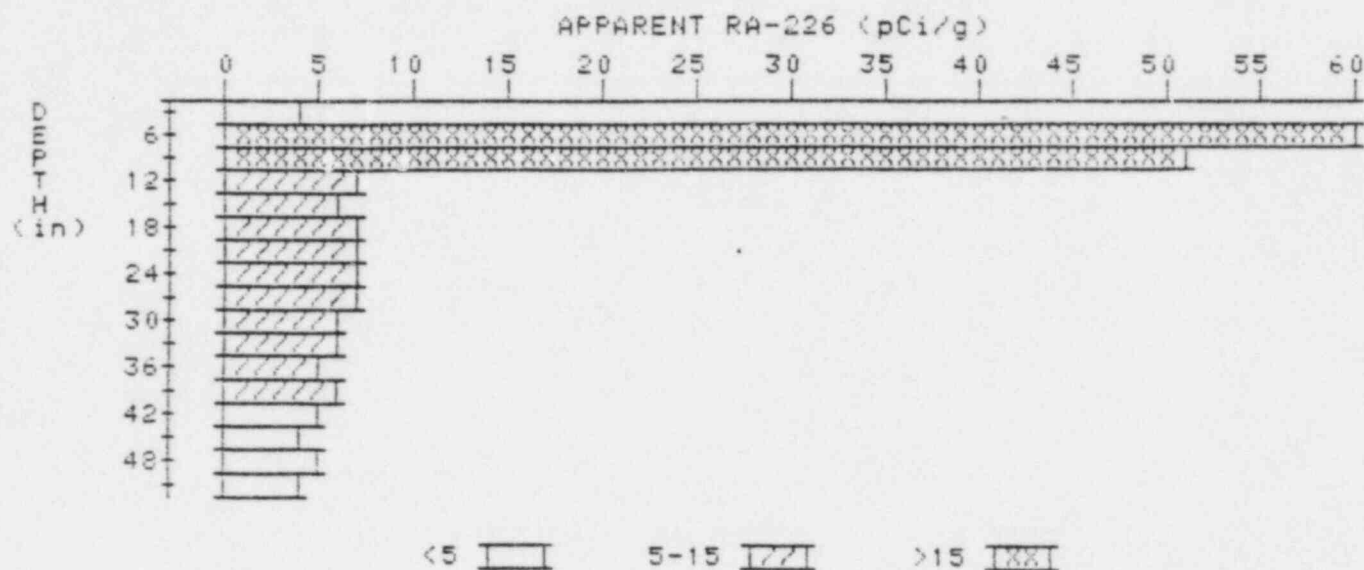
PROPERTY NUMBER: GJ-05168-MR
HOLE NUMBER: 20
LOCATION: 214252



| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 4.3 | 4.3 |
| 6 | 4.6 | 4.6 |
| 9 | 4.9 | 5.1 |
| 12 | 5.1 | 5.5 |
| 15 | 5.1 | 5.1 |
| 18 | 5.1 | 5.1 |
| 21 | 5.1 | 4.9 |
| 24 | 5.2 | 5.0 |
| 27 | 5.4 | 5.4 |
| 30 | 5.6 | 5.6 |
| 33 | 5.8 | 6.0 |
| 36 | 5.9 | 5.7 |
| 39 | 6.1 | 5.6 |
| 42 | 6.6 | 6.8 |
| 45 | 7.0 | 6.6 |
| 48 | 7.6 | 7.6 |
| 51 | 8.2 | 7.3 |
| 54 | 9.3 | 10.7 |

APPARENT RADIUM-226 CONCENTRATION 25 DECONVOLUTION GRAPH

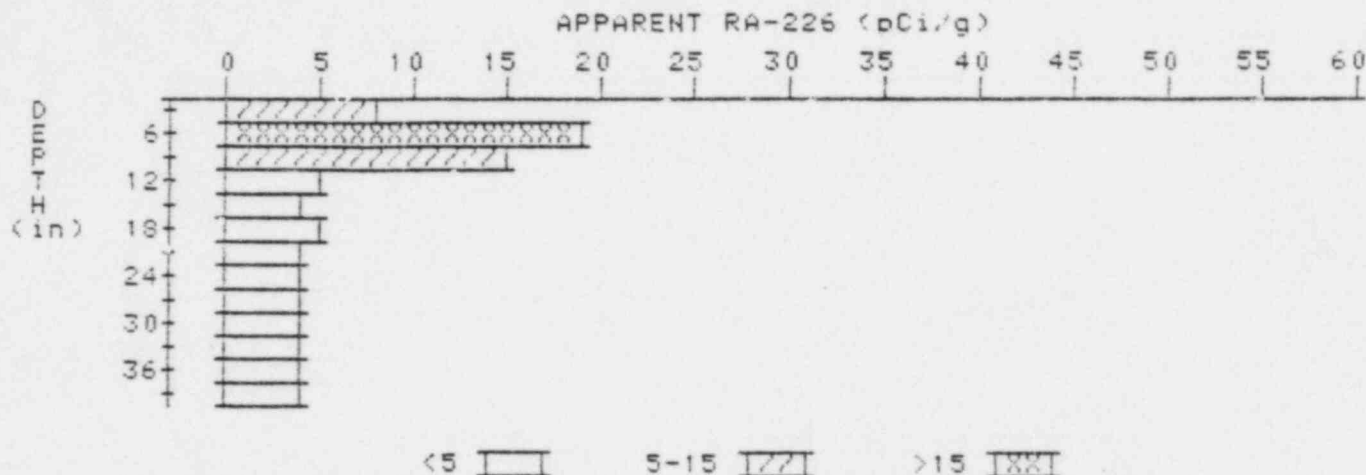
PROPERTY NUMBER: GJ-05168-MR
HOLE NUMBER: 25
LOCATION: 233269



| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 4.1 | 4.1 |
| 6 | 56.2 | 173.4 |
| 9 | 42.4 | 50.8 |
| 12 | 23.9 | 7.4 |
| 15 | 14.7 | 5.6 |
| 18 | 10.6 | 7.0 |
| 21 | 8.5 | 6.7 |
| 24 | 7.4 | 6.5 |
| 27 | 6.8 | 6.6 |
| 30 | 6.3 | 6.1 |
| 33 | 5.9 | 5.7 |
| 36 | 5.6 | 5.4 |
| 39 | 5.4 | 5.8 |
| 42 | 5.0 | 4.8 |
| 45 | 4.7 | 4.3 |
| 48 | 4.6 | 4.8 |
| 51 | 4.4 | 4.4 |

APPARENT RADIUM-226 CONCENTRATION 26 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05168-MR
HOLE NUMBER: 26
LOCATION: 236221

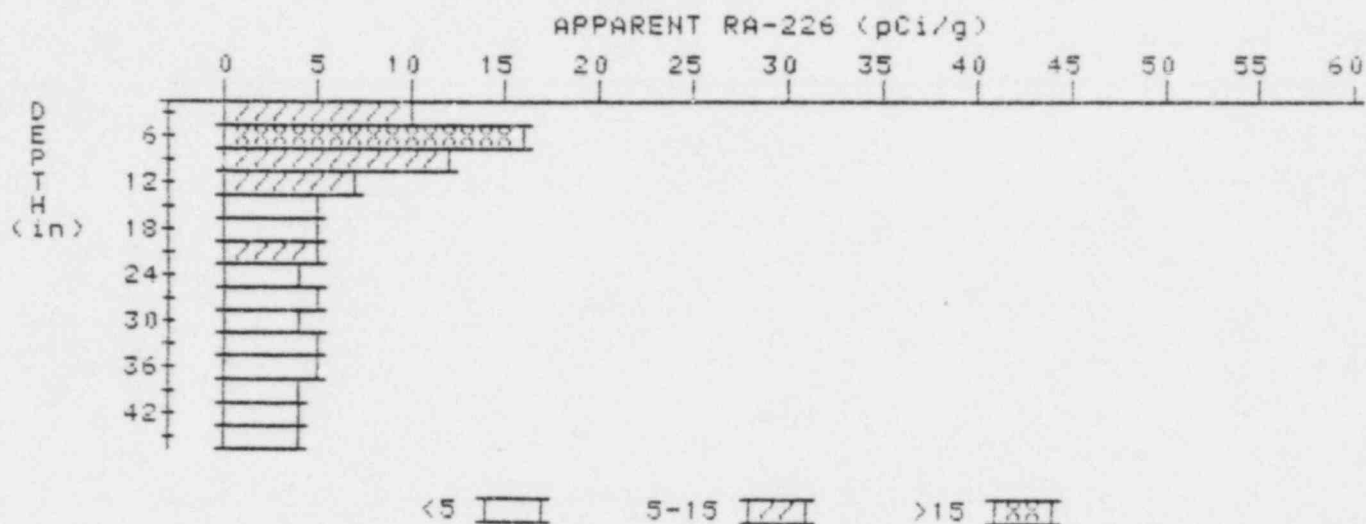


| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 8.2 | 8.2 |
| 6 | 11.5 | 19.0 |
| 9 | 10.6 | 14.5 |
| 12 | 7.5 | 4.8 |
| 15 | 5.9 | 4.5 |
| 18 | 5.1 | 4.6 |
| 21 | 4.6 | 4.1 |
| 24 | 4.4 | 4.2 |
| 27 | 4.3 | 4.3 |
| 30 | 4.2 | 4.2 |
| 33 | 4.1 | 3.9 |
| 36 | 4.1 | 4.3 |
| 39 | 4.0 | 4.0 |

APPARENT RADIUM-226 CONCENTRATION 27

DECONVOLUTION GRAPH

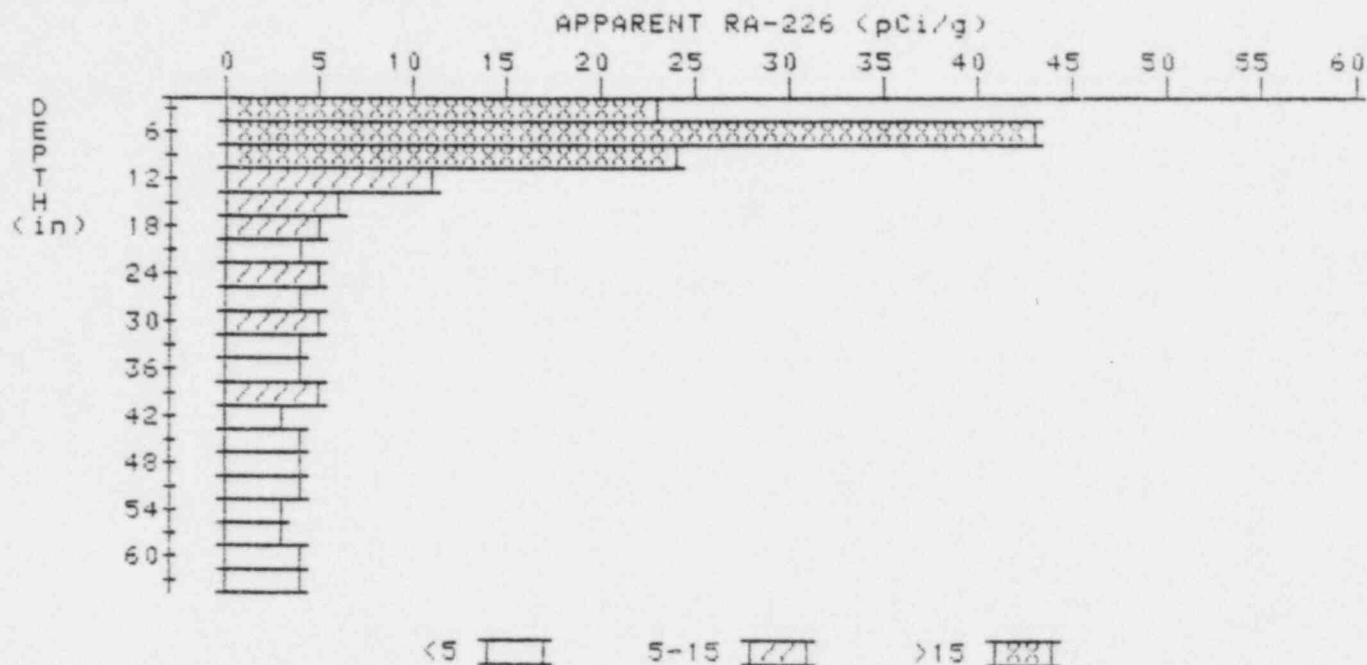
PROPERTY NUMBER: GJ-05168-MR
HOLE NUMBER: 27
LOCATION: 238274



| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 10.1 | 10.1 |
| 6 | 11.5 | 16.1 |
| 9 | 10.3 | 12.1 |
| 12 | 8.1 | 7.2 |
| 15 | 6.4 | 4.8 |
| 18 | 5.6 | 4.9 |
| 21 | 5.2 | 5.2 |
| 24 | 4.8 | 4.4 |
| 27 | 4.6 | 4.6 |
| 30 | 4.4 | 4.0 |
| 33 | 4.4 | 4.6 |
| 36 | 4.3 | 4.7 |
| 39 | 4.0 | 3.8 |
| 42 | 3.8 | 4.0 |
| 45 | 3.5 | 3.5 |

APPARENT RADIUM-226 CONCENTRATION 28 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05168-MR
HOLE NUMBER: 28
LOCATION: 242240



| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 23.3 | 23.3 |
| 6 | 26.9 | 42.7 |
| 9 | 21.6 | 24.4 |
| 12 | 14.7 | 11.0 |
| 15 | 9.9 | 6.0 |
| 18 | 7.3 | 5.2 |
| 21 | 5.9 | 4.3 |
| 24 | 5.4 | 5.4 |
| 27 | 4.9 | 4.2 |
| 30 | 4.8 | 5.2 |
| 33 | 4.5 | 4.1 |
| 36 | 4.4 | 4.4 |
| 39 | 4.3 | 5.0 |
| 42 | 3.8 | 2.7 |
| 45 | 3.9 | 4.1 |
| 48 | 3.9 | 4.3 |
| 51 | 3.7 | 3.5 |

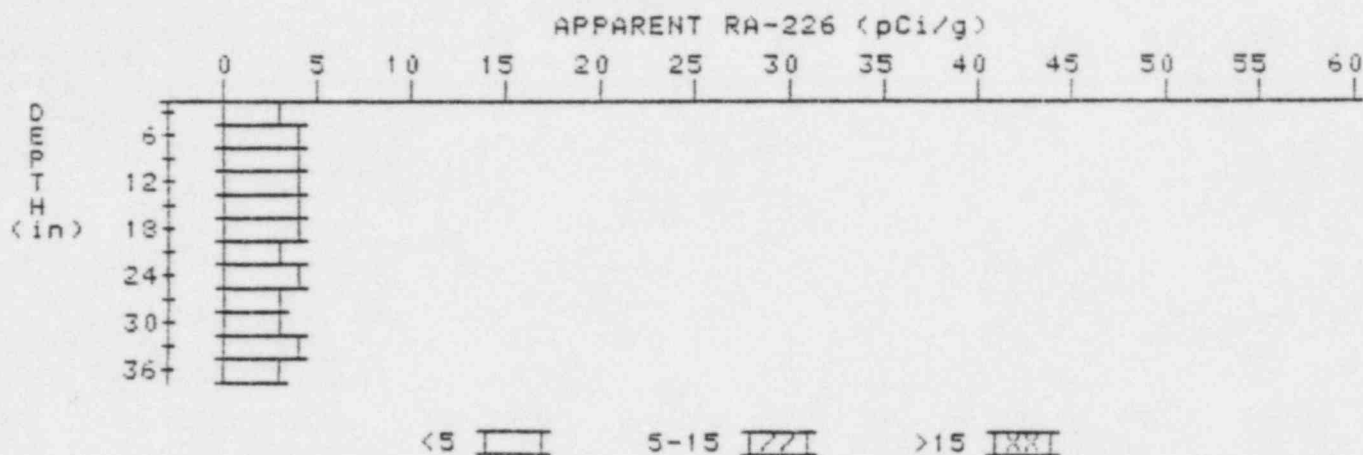
54
57
60
63

3.6
3.6
3.7
3.8

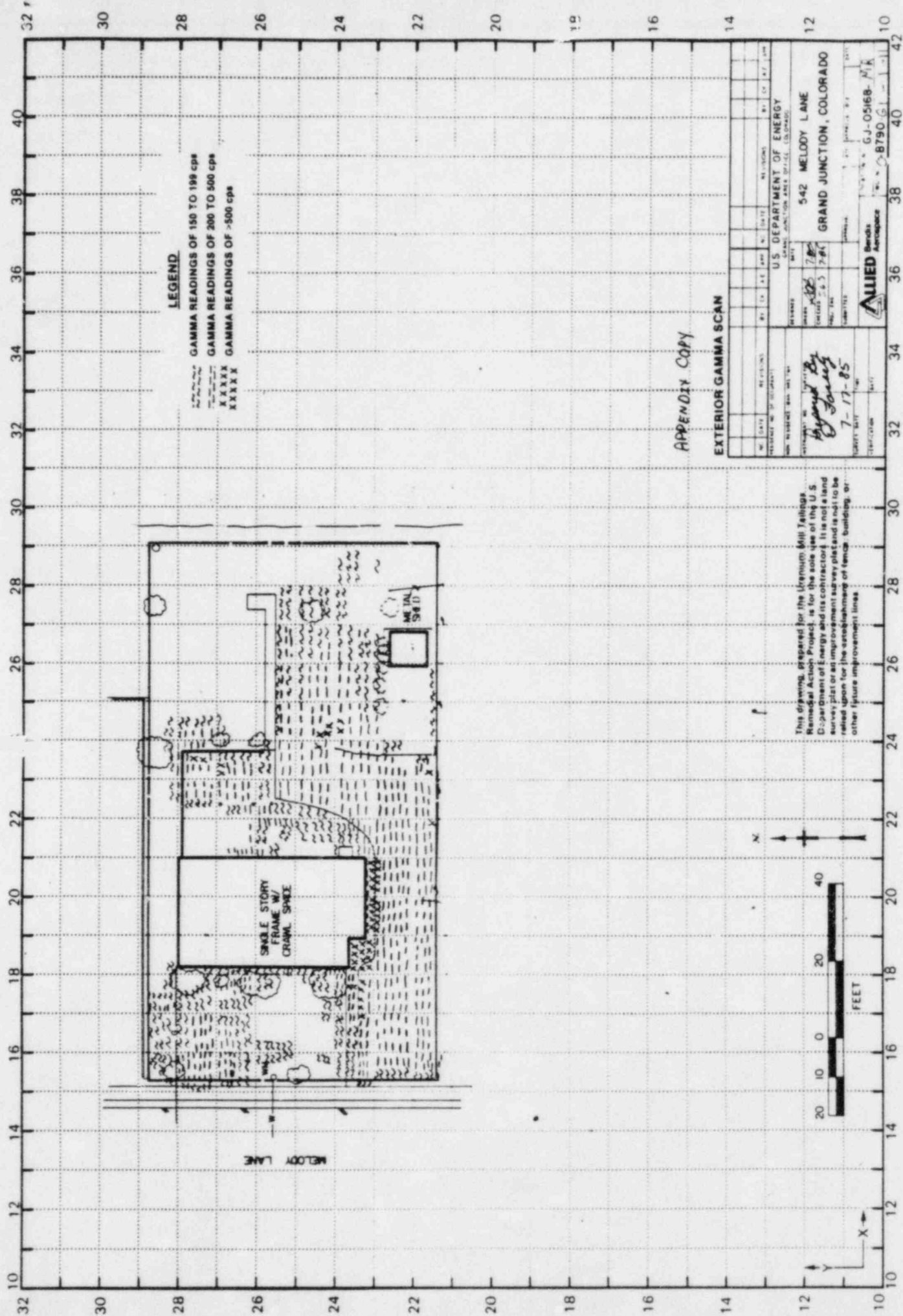
3.4
3.4
3.7
3.8

APPARENT RADIUM-226 CONCENTRATION 36 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-05168-MR
HOLE NUMBER: 36
LOCATION: 270270



| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 3 | 3.1 | 3.1 |
| 6 | 3.4 | 3.6 |
| 9 | 3.6 | 3.8 |
| 12 | 3.7 | 3.9 |
| 15 | 3.7 | 3.5 |
| 18 | 3.8 | 4.2 |
| 21 | 3.7 | 3.3 |
| 24 | 3.8 | 4.3 |
| 27 | 3.6 | 3.4 |
| 30 | 3.5 | 3.3 |
| 33 | 3.5 | 3.7 |
| 36 | 3.4 | 3.4 |



APPENDIX COPY

EXTERIOR GAMMA SCAN

[illegible]