

RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-01138-RS
ADDRESS: 2660 G ROAD

JULY 1985

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

BENDIX FIELD ENGINEERING CORPORATION
P.O. Box 1569
Grand Junction, Colorado 81502

APPROVED BY

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DATE

July 25, 1985

REA01138:REA-612

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-01138-RS, is a single-family residence located at 2660 G Road, Grand Junction, Colorado.

The purpose of this assessment is to evaluate the extent of uranium millsite contamination at this property. This assessment includes recommended remedial action, estimated volume of material to be removed, and estimated cost of the proposed action.

1.2 Evaluation and Recommendation

The action recommended is the removal of contaminated material and restoration of the property to its original condition. The identified residual radioactive material found on this property is tailings; the estimated volume is: exterior, 33 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is \$2,944. Remedial action on this property will take approximately 7 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 2660 G Road, Grand Junction, Colorado

Zoning: Residential (R-1-B)

Lot Size: Approximately 55,060 sf (1.26 acres)

Legal Description: Lots 4 and 5, Sacoma Court Subdivision, Section 35, T1N R1W, UM, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 4 miles north of the State of Colorado Tailings Repository. Appendix Figure 2.1 shows the property location relative to its surroundings.

Utilities: Utility locations are shown in Appendix Figure 2.2.

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

Bordering Properties:

| | |
|--------|-------------------------|
| North: | Vacant land |
| South: | G Road |
| East: | Single-family residence |
| West: | Single-family residence |

2.2 Existing Facilities and Structures

Primary Structure:

| | |
|--------------------|---------------------------------------------------|
| Type: | Single-story residence |
| Size: | Approximately 2,630 sf |
| Construction Date: | Not determined |
| Construction: | Wood-frame with brick veneer |
| Foundation: | Concrete wall on spread footing |
| Footing Depth: | Approximately 62" to bottom of footing from grade |
| Basement: | Yes - partial |
| Crawl Space: | None |
| Condition: | Good |

Other Structures:

| | |
|---------------|------------------------|
| Type: | Garage/shed |
| Size: | Approximately 1,673 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 does not appear to be 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-01138-RS on May 28, 1985. Data collection methods were performed in accordance with procedures fully described in the Radiologic Support Operations Procedures Manual GJ-07(84) (Bendix Field Engineering Corporation, 1984). These data were evaluated to determine the areal and vertical extent of uranium mill tailings contamination at this property as well as any other contaminated material that may have originated from the millsite.

A review of historical information from the files of the Colorado Department of Health (CDH) and the inclusion data from Oak Ridge National Laboratory (ORNL) was conducted. These records indicate contamination in the yard only.

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): 43 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 17 uR/h
Highest Inside Gamma Reading (HIG): 22 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.

3.3 Boreholes, Soil Samples, and Other Measurements

Areas which displayed elevated gamma levels were further investigated; these areas are shown in Appendix Figure 3.2. 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 taken by Bendix.

3.5 Extent of Contamination

Appendix Figure 3.3 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) Southwest of the metal building, contamination in the soil extends to a depth of 12 inches (approximately 42 sf).
- (Area B) West of the primary structure, the concrete curb is contaminated. The curb is 4 inches wide and 6 inches deep (approximately 31 sf).
- (Area C) In the asphalt driveway, northwest of the primary structure, contamination extends to a depth of 6 inches (approximately 15 sf).
- (Area D) West of the primary structure, contamination in the lawn extends to a 6-inch depth (approximately 12 sf).
- (Area E) The lawn, northeast of the primary structure, is contaminated to a depth of 6 inches (approximately 6 sf).
- (Area F) Contamination in the lawn, east of the primary structure, is 12 inches deep (approximately 216 sf).
- (Area G) Southeast of the primary structure, contamination in the lawn extends to a depth of 18 inches (approximately 388 sf).

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-01138-RS, includes removal of all areas identified as containing radioactive material (as discussed in Section 3.5 and shown in Appendix Figure 3.3) 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 \$2,944.

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 | Exterior Sample Locations |
| Figure 3.3 | Exterior Estimated Extent of Contamination |

Official Survey Report

Team Leader Notes

Deconvolution Graphs (Apparent Radium-226 Concentration)

Exterior Gamma Scan Map

Radium Concentrations at Exterior Locations

DOE ID #GJ-01138-RS

2660 G Road

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| Loc # | Grid Location | Depth (in.) | Meas. Type | In Situ Ra-226 (pCi/g) | | Chem Ra-226 (pCi/g) | Comments |
|-------|---------------|-------------|------------|------------------------|---------|---------------------|---------------------|
| | | | | Tot. Ct | Spectr. | | |
| 20 | 229412 | 03 | TC | 6.6 | | * | |
| | | 06 | TC | 7.0 | | * | |
| | | 09 | TC | 6.2 | | * | |
| | | 12 | TC | 5.3 | | * | DC = 12 inches |
| | | 15 | TC | 4.8 | | * | Based on the |
| | | 18 | TC | 4.5 | | * | deconvolution graph |
| | | 21 | TC | 4.5 | | * | |
| | | 24 | TC | 4.4 | | * | |
| | | 27 | TC | 4.3 | | * | |
| | | 30 | TC | 4.3 | | * | |
| | | 33 | TC | 4.1 | | * | |
| | | 36 | TC | 4.1 | | * | |
| | | 39 | TC | 4.1 | | * | |
| 21 | 234360 | 00 | DS | 7.1 | | * | On concrete |
| 22 | 235360 | 00 | LS | 1.8 | | * | Next to driveway |
| | | 06 | DS | 1.6 | | * | |
| | | 12 | DS | 1.6 | | * | |
| 23 | 240480 | 00 | DS | 1.6 | | * | Background |
| | | 00 | GS | | 1.1 | * | DC = 0 inches |
| | | 03 | TC | 3.4 | | * | |
| | | 06 | BH | 4.0 | 1.5 | * | |
| | | 09 | TC | 4.4 | | * | |
| | | 12 | BH | 4.6 | 1.8 | * | |
| | | 15 | TC | 4.6 | | * | |
| | | 18 | TC | 4.7 | | * | |
| | | 21 | TC | 4.8 | | * | |
| | | 24 | BH | 4.7 | 1.6 | * | |
| | | 27 | TC | 4.7 | | * | |
| | | 30 | TC | 4.7 | | * | |
| | | 33 | TC | 4.7 | | * | |
| 24 | 263402 | 00 | DS | 4.7 | | * | On asphalt driveway |
| | | 03 | TC | 4.3 | | * | |
| | | 06 | TC | 4.4 | | * | DC = 6 inches |
| | | 09 | TC | 4.5 | | * | Based on all |
| | | 12 | TC | 4.5 | | * | available data |
| | | 15 | TC | 4.5 | | * | |
| | | 18 | TC | 4.4 | | * | |
| | | 21 | TC | 4.2 | | * | |
| | | 24 | TC | 4.1 | | * | |
| | | 27 | TC | 4.2 | | * | |

Radium Concentrations at Exterior Locations

DOE ID #GJ-01138-RS

2660 G Road

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| Loc # | Grid Location | Depth (in.) | Meas. Type | In Situ Ra-226 (pCi/g) | | Chem Ra-226 (pCi/g) | Comments |
|-------|---------------|-------------|------------|------------------------|---------|---------------------|-----------------------------------------|
| | | | | Tot. Ct | Spectr. | | |
| 24 | 263402 | 30 | TC | 4.2 | | * | |
| | | 33 | TC | 4.3 | | * | |
| | | 36 | TC | 4.4 | | * | |
| | | 39 | TC | 4.4 | | * | |
| | | 42 | TC | 4.5 | | * | |
| | | 45 | TC | 4.4 | | * | |
| | | 48 | TC | 4.2 | | * | |
| | | 51 | TC | 4.1 | | * | |
| | | 54 | TC | 4.1 | | * | |
| | | 57 | TC | 4.1 | | * | |
| | | 60 | TC | 4.2 | | * | |
| | | 63 | TC | 4.1 | | * | |
| | | 66 | TC | 4.0 | | * | |
| | | 69 | TC | 3.9 | | * | |
| | | 72 | TC | 3.8 | | * | |
| 25 | 268362 | 00 | DS | 3.5 | | * | West of primary structure |
| | | 06 | DS | 2.7 | | * | |
| | | 12 | DS | 2.2 | | * | |
| 26 | 271378 | 03 | TC | 3.6 | | * | DC = 0 inches |
| | | 06 | TC | 4.1 | | * | |
| | | 09 | TC | 4.4 | | * | |
| | | 12 | TC | 4.4 | | * | |
| | | 15 | TC | 4.4 | | * | |
| | | 18 | TC | 4.4 | | * | |
| | | 21 | TC | 4.4 | | * | |
| | | 24 | TC | 4.3 | | * | |
| | | 27 | TC | 4.3 | | * | |
| | | 30 | TC | 4.3 | | * | |
| | | 33 | TC | 4.3 | | * | |
| | | 36 | TC | 4.2 | | * | |
| 27 | 283379 | 00 | DS | <1.0 | | * | North of primary structure |
| | | 00 | GS | | 2.1 | * | |
| | | 00 | GS | | 1.8 | * | |
| 28 | 285350 | 00 | DS | 1.1 | | * | On concrete |
| | | 00 | GS | | 4.5 | * | |
| | | 00 | GS | | 4.2 | * | |
| 29 | 320334 | 00 | DS | 1.3 | | * | South next to side of primary structure |
| | | 06 | DS | 2.1 | | * | |
| | | 12 | DS | 1.5 | | * | |

Radium Concentrations at Exterior Locations

DOE ID #GJ-01138-RS

2660 G Road

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| Loc # | Grid Location | Depth (in.) | Meas. Type | In Situ Ra-226 (pCi/g) | | Chem Ra-226 (pCi/g) | Comments |
|-------|---------------|-------------|------------|------------------------|---------|---------------------|-------------------------------------------------------|
| | | | | Tot. Ct | Spectr. | | |
| 30 | 344340 | 00 | DS | 2.1 | | * | Gas line |
| | | 06 | DS | 1.2 | | * | |
| | | 18 | DS | 1.3 | | * | |
| 31 | 346353 | 00 | DS | 1.6 | | * | Sewer line |
| | | 06 | DS | 2.1 | | * | |
| | | 18 | DS | <1.0 | | * | |
| | | 24 | DS | 1.0 | | * | |
| 32 | 353372 | 00 | DS | 3.4 | | * | Next to walkway |
| | | 06 | DS | 1.8 | | * | |
| | | 12 | DS | 1.8 | | * | |
| 33 | 360360 | 03 | TC | 5.5 | | * | DC = 12 inches Based on the deconvolution graph |
| | | 06 | TC | 6.3 | | * | |
| | | 09 | TC | 6.0 | | * | |
| | | 12 | TC | 5.1 | | * | |
| | | 15 | TC | 4.7 | | * | |
| | | 18 | TC | 4.3 | | * | |
| | | 21 | TC | 4.3 | | * | |
| | | 24 | TC | 4.3 | | * | |
| | | 27 | TC | 4.3 | | * | |
| | | 30 | TC | 4.3 | | * | |
| | | 33 | TC | 4.1 | | * | |
| | | 36 | TC | 4.2 | | * | |
| | | 39 | TC | 4.2 | | * | |
| | | 42 | TC | 4.3 | | * | |
| | | 45 | TC | 4.3 | | * | |
| | | 48 | TC | 4.3 | | * | |
| | | 51 | TC | 4.4 | | * | |
| | | 54 | TC | 4.5 | | * | |
| | | 57 | TC | 4.4 | | * | |
| 34 | 400280 | 03 | TC | 8.3 | | * | Lawn Southwest corner of property |
| | | 06 | BH | 11.3 | 9.6 | * | |
| | | 09 | TC | 11.3 | | * | |
| | | 12 | TC | 8.8 | | * | |
| | | 15 | TC | 6.8 | | * | DC = 18 inches Based on the |
| | | 18 | BH | 5.7 | 3.8 | * | |
| | | 21 | TC | 5.0 | | * | |

Radium Concentrations at Exterior Locations

DOE ID #GJ-01138-RS

2660 G Road

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| Loc # | Grid Location | Depth (in.) | Meas. Type | In Situ Ra-226 (pCi/g) | | Chem Ra-226 (pCi/g) | Comments |
|-------|---------------|-------------|------------|------------------------|---------|---------------------|---------------------|
| | | | | Tot. Ct | Spectr. | | |
| 34 | 400280 | 24 | TC | 4.7 | | * | deconvolution graph |
| | | 27 | TC | 4.6 | | * | |
| | | 30 | BH | 4.5 | 2.0 | * | |
| | | 33 | TC | 4.4 | | * | |
| | | 36 | TC | 4.3 | | * | |
| | | 39 | TC | 4.3 | | * | |

Measurement Type: 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 = 05-28-85
Team Leader = DGD

Radium Concentrations at Interior Locations

DOE ID #GJ-01138-RS

2660 G Road

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| Loc # | Grid Location | Depth (in.) | Meas. Type | In Situ Ra-226 (pCi/g) | | Chem Ra-226 (pCi/g) | Comments |
|-------|---------------|-------------|------------|------------------------|---------|---------------------|-----------------------|
| | | | | Tot. Ct | Spectr. | | |
| 1 | | 00 | DS | 1.2 | | * | |
| | | 00 | GS | | 3.2 | * | |
| 2 | | 00 | DS | <1.0 | | * | Breezeway |
| 3 | | 00 | DS | <1.0 | | * | |
| 4 | | 00 | DS | <1.0 | | * | Breezeway |
| 5 | | 00 | DS | 1.6 | | * | |
| | | 00 | GS | | 4.2 | * | |
| 6 | | 00 | DS | 1.3 | | * | |
| | | 00 | GS | | 4.7 | * | |
| 7 | | 00 | DS | <1.0 | | * | |
| 8 | | 00 | DS | 1.6 | | * | Breezeway |
| 9 | | 00 | DS | <1.0 | | * | Breezeway |
| 10 | | 00 | DS | 1.1 | | * | |
| 11 | | 00 | DS | 1.5 | | * | Breezeway |
| 12 | | 00 | DS | 1.3 | | * | Breezeway |
| 13 | | 00 | DS | <1.0 | | * | |
| 14 | | 00 | DS | <1.0 | | * | Concrete floor |
| | | 00 | GS | | 2.2 | * | Garage |
| 15 | | 00 | DS | 2.0 | | * | Concrete floor |
| | | 00 | GS | | 1.8 | * | Garage |
| 16 | | 00 | DS | <1.0 | | * | Concrete floor |
| | | 00 | GS | | 2.2 | * | Garage |
| 17 | | 00 | DS | <1.0 | | * | Concrete floor/garage |
| 18 | | [16] | DS | 1.4 | | * | Horizontal |
| | | [18] | GS | | 3.8 | * | Horizontal |
| | | 00 | GS | | 4.4 | * | Horizontal |

Radium Concentrations at Interior Locations

DOE ID #GJ-01138-RS

2660 G Road

Page 2 of 2

| Loc # | Grid Location | Depth (in.) | Meas. Type | In Situ Ra-226 (pCi/g) | | Chem Ra-226 (pCi/g) | Comments |
|-------|---------------|-------------|------------|------------------------|---------|---------------------|------------|
| | | | | Tot. Ct | Spectr. | | |
| 19 | | [24] | DS | 1.4 | | * | Horizontal |
| | | 00 | DS | 2.8 | | * | Horizontal |
| | | [24] | GS | | 2.3 | * | Horizontal |
| | | 00 | GS | | 4.6 | * | Horizontal |

Measurement Type: 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 = 05-28-85
 Team Leader = DGD

Table 3.3
Summary of Interior Gamma Exposure Rates

DOE ID No. GJ-01138-RS 2660 G Road Page 1 of 1

| Location | Number of Readings Taken at Waist Level | Range at Waist Level (uR/h) | Mean at Waist Level (uR/h) | Number of Readings Taken at Surface | Range at Surface (uR/h) | Mean Surface (uR/h) |
|-------------------|-----------------------------------------------------|--------------------------------------|-------------------------------------|----------------------------------------------|-------------------------------|---------------------------|
| Basement | * | * | * | * | 15-17 | * |
| Breezeway | 13 | 16-20 | 18 | 13 | 18-22 | 20 |
| Garage | 08 | 16-18 | 17 | 08 | 16-18 | 18 |
| Metal Building | * | * | * | * | 15-16 | * |

* The historical data indicates the absence of interior contamination at this property. This information was investigated by performing a gamma survey.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-01138-RS

Page 1 of 1

| <u>AREA</u> | <u>CALCULATIONS(ft)</u> | <u>SF</u> | <u>DEPTH(ft)</u> | <u>CF</u> | <u>CUBIC YARDS</u> |
|-------------|----------------------------|-----------|------------------|-----------|--------------------|
| EXTERIOR | | | | | |
| | Concrete/Asphalt | | | | |
| B | 0.3 x 103 = | 31 | x 0.5 = | 16 | |
| C | 5 x 7 = | 35 | x 0.5 = | 18 | |
| | Volume of Concrete/Asphalt | | | = 34 | = 34/27 = 1 |
| | Contaminated Fill | | | | |
| A | 7 x 6 = | 42 | x 1.0 = | 42 | |
| C | 5 x 3 = | 15 | x 0.5 = | 8 | |
| D | 6 x 2 = | 12 | x 0.5 = | 6 | |
| E | 3 x 2 = | 6 | x 0.5 = | 3 | |
| F | 12 x 18 = | 216 | x 1.0 = | 216 | |
| G | 24 x 12 = | 288 | | | |
| | 10 x 10 = | 100 | | | |
| | | 388 | x 1.5 = | 582 | |
| | Volume of Fill | | | = 857 | = 857/27 = 32 |
| | TOTAL VOLUME - EXTERIOR | | | | = 33 |

See Appendix Figure 3.3 For Areas

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-01138-RS Page 1 of 1

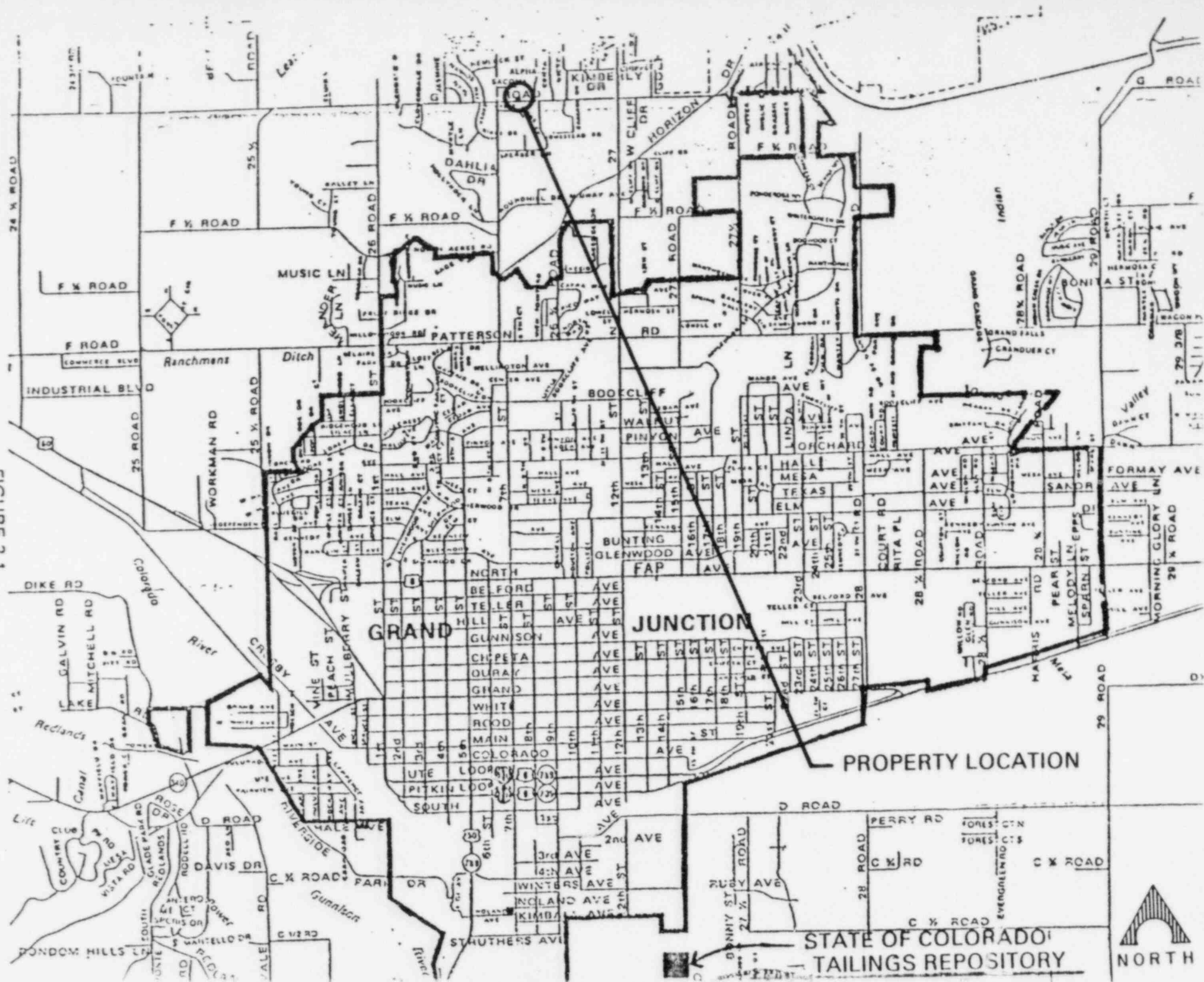
EXTERIOR

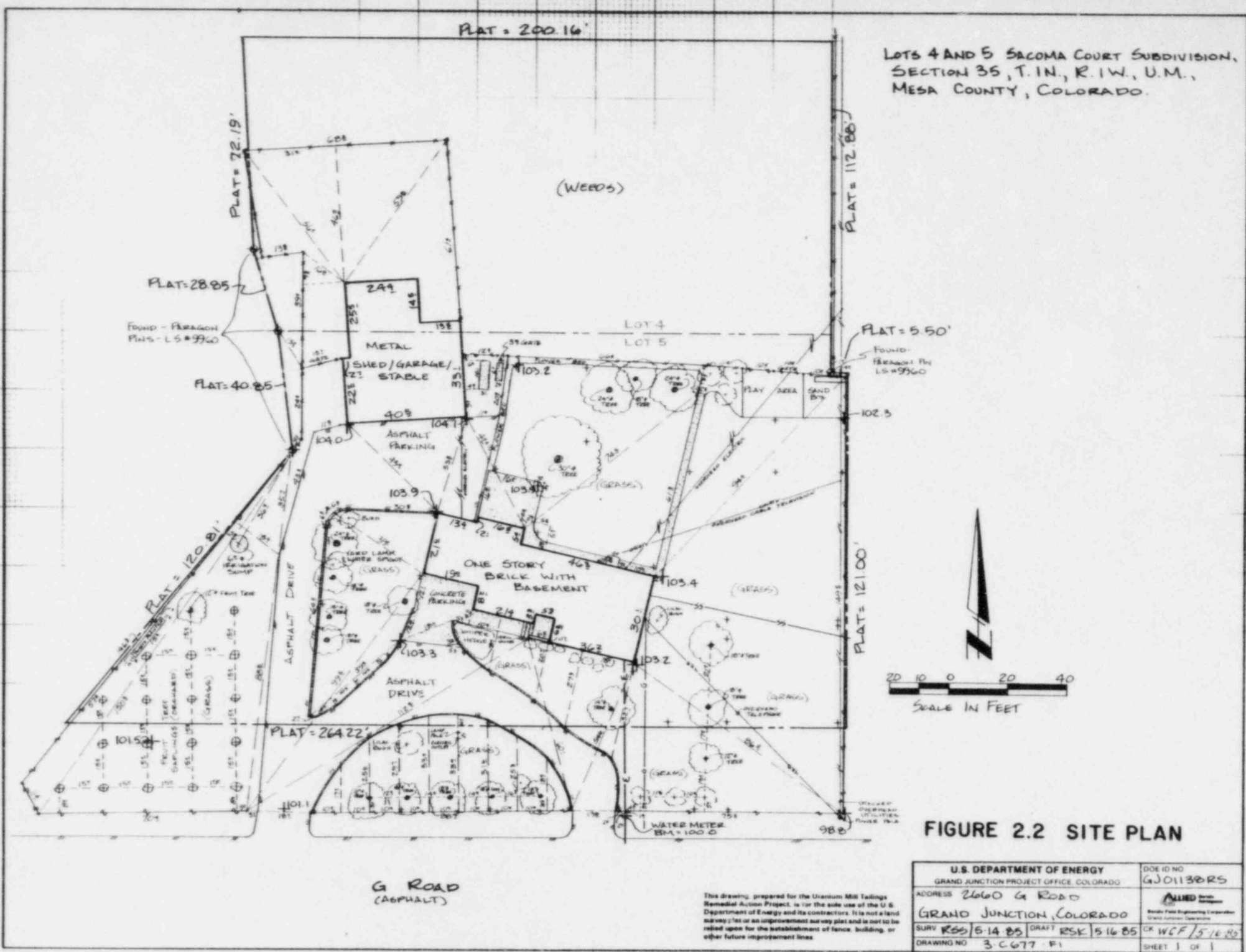
| | | |
|-------------------------------------------------|----|-------|
| Remove identified residual radioactive material | | |
| 30 cy @ \$14.50/cy (machine-open) | \$ | 435 |
| 2 cy @ \$44/cy (manual-open) | | 88 |
| Remove/replace concrete curb | | |
| 103 lf @ \$4.50/lf | | 464 |
| Replace areas with roadbase | | |
| 7 cy @ \$11.50/cy | | 81 |
| Replace areas with topsoil | | |
| 25 cy @ \$9.50/cy | | 238 |
| Replace areas with sod | | |
| 667 sf @ \$.35/sf | | 233 |
| Remove/replace asphalt | | |
| 35 sf @ \$3.50/sf | | 123 |
| | | <hr/> |
| TOTAL EXTERIOR | \$ | 1,662 |
| TOTAL INTERIOR | | 0 |
| ACCESS CONTROL | | 250 |
| | | <hr/> |
| SUBTOTAL | \$ | 1,912 |
| CONTINGENCY @ 10% | | 191 |
| | | <hr/> |
| SUBTOTAL | \$ | 2,103 |
| CONTRACTOR OVERHEAD & PROFIT @ 40% | | 841 |
| | | <hr/> |
| GRAND TOTAL | \$ | 2,944 |

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LR072485
REA01138/REA-612/LMR

FIGURE 2.1
VICINITY MAP



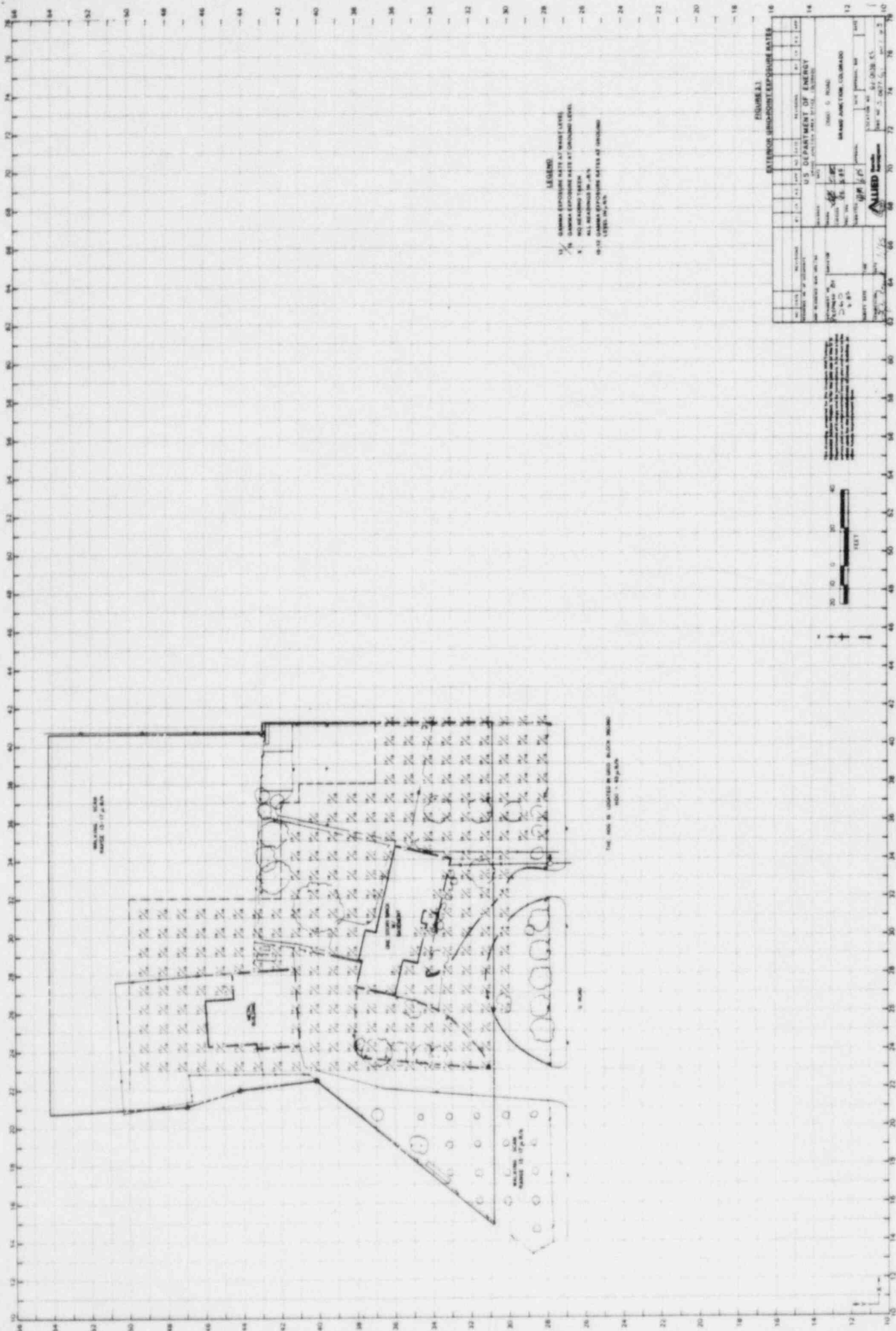


LOTS 4 AND 5 SACOMA COURT SUBDIVISION,
SECTION 35, T.1N., R.1W., U.M.,
MESA COUNTY, COLORADO.

FIGURE 2.2 SITE PLAN

| | | | |
|-----------------------------------------|-------------------|----------------|--------------|
| U.S. DEPARTMENT OF ENERGY | | | DOE ID NO |
| GRAND JUNCTION PROJECT OFFICE, COLORADO | | | GJ01138RS |
| ADDRESS 2660 G ROAD | | | |
| GRAND JUNCTION, COLORADO | | | |
| SURV R55/5-14-85 | DRAFT RSK/5-16-85 | OR WCF/5-16-85 | |
| DRAWING NO 3-C677-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 plan or an improvement survey plan and is not to be relied upon for the establishment of fence, building, or other future improvement lines.



3/85

DOE ID NO. GJ-01138-RS

Date 12 June, 1985

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

Official Survey Report

Property Address 2660 G Road

Property Owner Robert and Victoria Bray

Address of Owner (if different from above) _____

Report Prepared By David Dille

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

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

☒ 1 Residual radioactive materials found at the following locations:

☒ 1 In open areas.

☒ 1 Under or around exterior improvements.

☐ 1 Under or around a typically nonoccupied structure.

☒ 1 Under or around a typically occupied structure.

II. RESULTS OF RADIOLOGIC ASSESSMENT

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

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

cc:

G. A. Franz, III, GJ/CDH

J. Themelis, Mgr. UMTRA Proj. Off.

HIG = 22 uR/h
HOG = 43 uR/h

MEMORANDUM

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: May 29, 1985
To: Files
From: David G. Dille
Subject: Team Leader Notes - GJ-01138-RS

Address: 2660 G Road

Owner: Robert and Victoria Bray

Occupancy: Five

Weather: Breezy, warm.

Team Members

| | |
|------------------------|-------------|
| D. Dille (Team Leader) | P.J. Bonner |
| L. Kula | S. Larsen |
| R. Wilkins | D. Dow |
| M. Duran | D. Bell |
| A. Raabe | P. Hardy |
| M. Dexter | V. Young |
| V. Rothman | |

Date: May 28, 1985

Colorado Department of Health (CDH) and Oak Ridge National Laboratory (ORNL) historical information indicates contamination in the yard east and west of the primary structure (house) and also indicates the interior has general background exposure rate.

Mrs. Bray did not know when the house (primary structure) was constructed. They have resided here for the past 3-1/2 years. She requested that we keep our depth investigations (depth deltas and boreholes) to a minimum, and that we also receive permission for each location prior to digging/augering.

Team Leader Notes
David G. Dille
GJ-01138-RS
May 29, 1985
Page 2

A scan of the basement, including the walls, was conducted. Readings ranging from 105 to 135 cps were received.

An investigation of the patio (breezway) and attached garage revealed elevated gamma readings on the brick walls and on the floor. Mrs. Bray declined permission to core in the concrete floor.

A series of delta measurements and spectrometer readings were taken on the floor and walls in this area.

A gamma scan and exposure rate survey was performed over the property.

All team members were frisked before leaving the property.

Date: May 29, 1985

Bendix team crew returned to GJ-01138-RS to complete the survey.

Mrs. Bray reiterated that holes must be kept at a minimum.

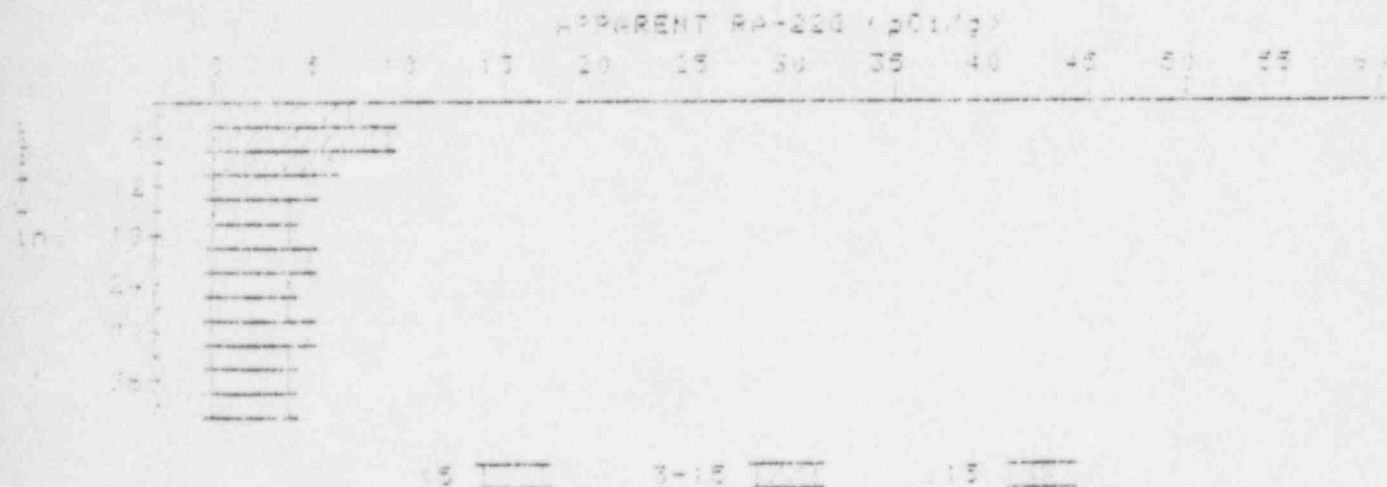
Six boreholes and several deltas were done.

The water line appears to enter the primary structure further west than depicted on the map (adjacent to 370334).

All team members were frisked before leaving the property.

APPARENT RADIUM-226 CONCENTRATION 20 DECONVOLUTION GRAPH

PROPERTY NUMBER: 03-01138-R6
HOLE NUMBER: 20
LOCATION: 220112



| Region | Apparent Radium-226 (pCi/g) | Apparent Radium-226 (pCi/g) |
|--------|-----------------------------------|-----------------------------------|
| | Unconvolved | Deconvolved |
| ===== | ===== | ===== |
| 5 | 8.8 | 8.8 |
| 6 | 7.0 | 7.1 |
| 7 | 6.2 | 6.4 |
| 8 | 4.3 | 4.5 |
| 9 | 4.8 | 4.4 |
| 10 | 4.9 | 5.0 |
| 11 | 4.5 | 5.7 |
| 12 | 4.4 | 5.4 |
| 13 | 4.4 | 4.7 |
| 14 | 4.1 | 4.7 |
| 15 | 4.1 | 4.1 |
| 16 | 4.1 | 4.1 |

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 23

PROPERTY NUMBER: 01-01139-R6
 HOLE NUMBER: 23
 LOCATION: 240480

APPARENT RA-226 (pCi/g)

0 5 10 15 20 25 30 35 40 45 50 55 60



15

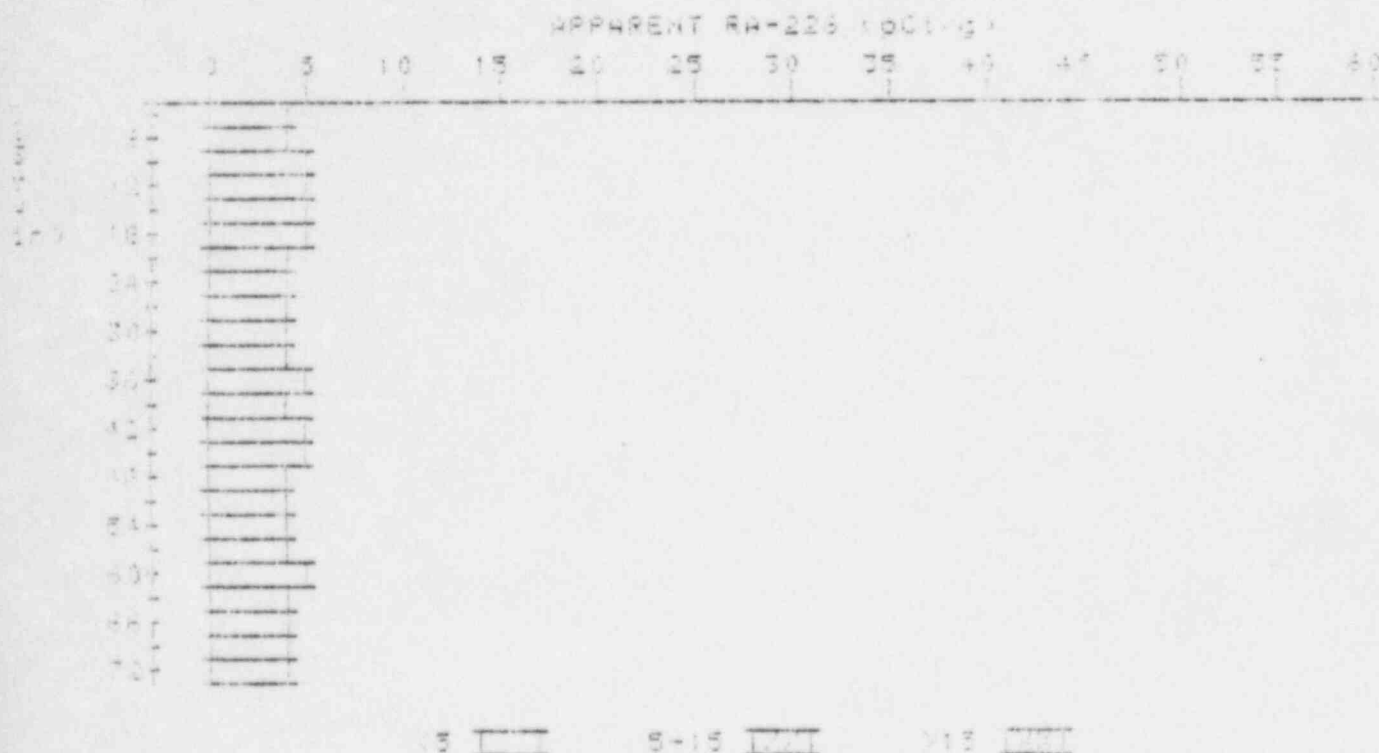
5-15

15

| Depth (in) | Apparent Radium-226 (pCi/g) | Apparent Radium-226 (pCi/g) |
|---------------|-----------------------------------|-----------------------------------|
| | Unconvolved | Deconvolved |
| 0 | 3.4 | 3.4 |
| 5 | 4.0 | 4.3 |
| 9 | 4.4 | 4.8 |
| 12 | 4.6 | 5.0 |
| 15 | 4.8 | 4.8 |
| 18 | 4.7 | 4.7 |
| 21 | 4.6 | 4.6 |
| 24 | 4.4 | 4.4 |
| 27 | 4.3 | 4.3 |
| 30 | 4.2 | 4.2 |
| 33 | 4.1 | 4.1 |

APPARENT RADIUM-226 CONCENTRATION 24 DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-01138-R3
HOLE NUMBER: 24
LOCATION: 263402

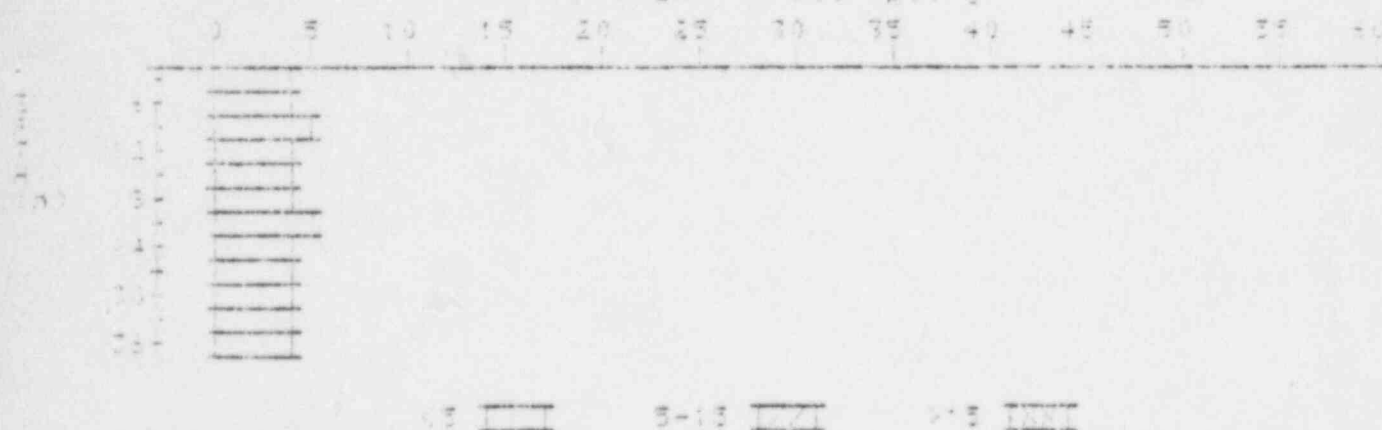


| Depth (in) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 0 | 4.4 | 4.4 |
| 10 | 4.4 | 4.4 |
| 20 | 4.4 | 4.4 |
| 30 | 4.4 | 4.4 |
| 40 | 4.4 | 4.4 |
| 50 | 4.4 | 4.4 |
| 60 | 4.4 | 4.4 |
| 70 | 4.4 | 4.4 |
| 80 | 4.4 | 4.4 |
| 90 | 4.4 | 4.4 |
| 100 | 4.4 | 4.4 |
| 110 | 4.4 | 4.4 |
| 120 | 4.4 | 4.4 |
| 130 | 4.4 | 4.4 |
| 140 | 4.4 | 4.4 |
| 150 | 4.4 | 4.4 |
| 160 | 4.4 | 4.4 |
| 170 | 4.4 | 4.4 |
| 180 | 4.4 | 4.4 |
| 190 | 4.4 | 4.4 |
| 200 | 4.4 | 4.4 |
| 210 | 4.4 | 4.4 |
| 220 | 4.4 | 4.4 |
| 230 | 4.4 | 4.4 |
| 240 | 4.4 | 4.4 |
| 250 | 4.4 | 4.4 |
| 260 | 4.4 | 4.4 |
| 270 | 4.4 | 4.4 |
| 280 | 4.4 | 4.4 |
| 290 | 4.4 | 4.4 |
| 300 | 4.4 | 4.4 |
| 310 | 4.4 | 4.4 |
| 320 | 4.4 | 4.4 |
| 330 | 4.4 | 4.4 |
| 340 | 4.4 | 4.4 |
| 350 | 4.4 | 4.4 |
| 360 | 4.4 | 4.4 |
| 370 | 4.4 | 4.4 |
| 380 | 4.4 | 4.4 |
| 390 | 4.4 | 4.4 |
| 400 | 4.4 | 4.4 |
| 410 | 4.4 | 4.4 |
| 420 | 4.4 | 4.4 |
| 430 | 4.4 | 4.4 |
| 440 | 4.4 | 4.4 |
| 450 | 4.4 | 4.4 |
| 460 | 4.4 | 4.4 |
| 470 | 4.4 | 4.4 |
| 480 | 4.4 | 4.4 |
| 490 | 4.4 | 4.4 |
| 500 | 4.4 | 4.4 |
| 510 | 4.4 | 4.4 |
| 520 | 4.4 | 4.4 |
| 530 | 4.4 | 4.4 |
| 540 | 4.4 | 4.4 |
| 550 | 4.4 | 4.4 |
| 560 | 4.4 | 4.4 |
| 570 | 4.4 | 4.4 |
| 580 | 4.4 | 4.4 |
| 590 | 4.4 | 4.4 |
| 600 | 4.4 | 4.4 |
| 610 | 4.4 | 4.4 |
| 620 | 4.4 | 4.4 |
| 630 | 4.4 | 4.4 |
| 640 | 4.4 | 4.4 |
| 650 | 4.4 | 4.4 |
| 660 | 4.4 | 4.4 |
| 670 | 4.4 | 4.4 |
| 680 | 4.4 | 4.4 |
| 690 | 4.4 | 4.4 |
| 700 | 4.4 | 4.4 |
| 710 | 4.4 | 4.4 |
| 720 | 4.4 | 4.4 |
| 730 | 4.4 | 4.4 |
| 740 | 4.4 | 4.4 |
| 750 | 4.4 | 4.4 |
| 760 | 4.4 | 4.4 |
| 770 | 4.4 | 4.4 |
| 780 | 4.4 | 4.4 |
| 790 | 4.4 | 4.4 |
| 800 | 4.4 | 4.4 |
| 810 | 4.4 | 4.4 |
| 820 | 4.4 | 4.4 |
| 830 | 4.4 | 4.4 |
| 840 | 4.4 | 4.4 |
| 850 | 4.4 | 4.4 |
| 860 | 4.4 | 4.4 |
| 870 | 4.4 | 4.4 |
| 880 | 4.4 | 4.4 |
| 890 | 4.4 | 4.4 |
| 900 | 4.4 | 4.4 |
| 910 | 4.4 | 4.4 |
| 920 | 4.4 | 4.4 |
| 930 | 4.4 | 4.4 |
| 940 | 4.4 | 4.4 |
| 950 | 4.4 | 4.4 |
| 960 | 4.4 | 4.4 |
| 970 | 4.4 | 4.4 |
| 980 | 4.4 | 4.4 |
| 990 | 4.4 | 4.4 |
| 1000 | 4.4 | 4.4 |

43
51
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57
60
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66
69
72

4.2
4.1
4.1
4.1
4.2
4.1
4.0
3.9
3.8

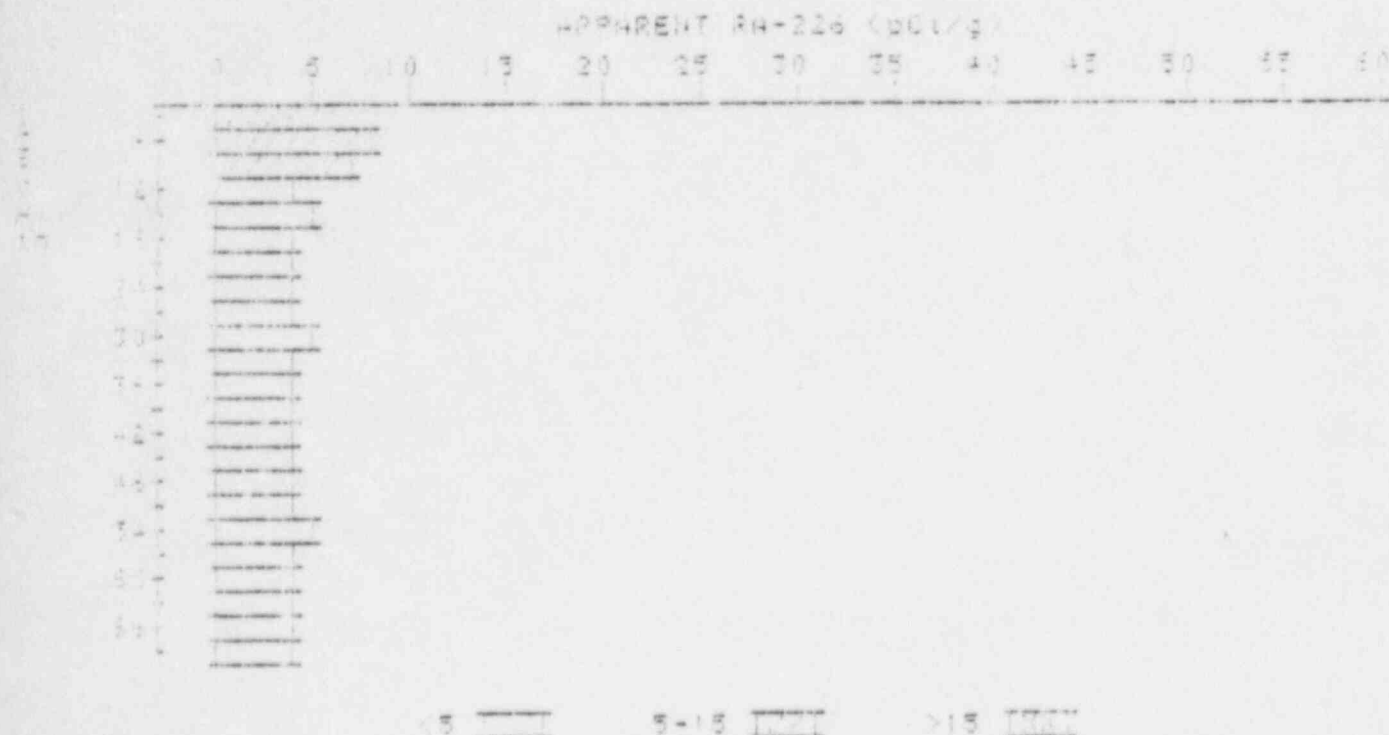
4.0
3.9
4.1
4.4
4.6
4.1
4.0
3.7
3.3

APPARENT $K_d = 0.26$ (gCl/g)

| Depth in' | Apparent | | Corrected | |
|--------------|----------------------|----------------------|----------------------|----------------------|
| | Radio-228 (cpm/g) | Radio-214 (cpm/g) | Radio-228 (cpm/g) | Radio-214 (cpm/g) |
| 0 | 7.6 | 7.6 | 7.6 | 7.6 |
| 5 | 4.1 | 4.9 | 4.1 | 4.9 |
| 10 | 4.4 | 4.9 | 4.4 | 4.9 |
| 15 | 4.4 | 4.4 | 4.4 | 4.4 |
| 20 | 4.4 | 4.4 | 4.4 | 4.4 |
| 25 | 4.4 | 4.4 | 4.4 | 4.4 |
| 30 | 4.4 | 4.6 | 4.4 | 4.6 |
| 35 | 4.7 | 4.7 | 4.7 | 4.7 |
| 40 | 4.7 | 4.7 | 4.7 | 4.7 |
| 45 | 4.7 | 4.7 | 4.7 | 4.7 |
| 50 | 4.7 | 4.7 | 4.7 | 4.7 |

APPARENT RADIUM-226 CONCENTRATION 33 DECONVOLUTION GRAPH

PROPERTY NUMBER: 90-1128-R9
HOLE NUMBER: 33
LOCATION: 384060

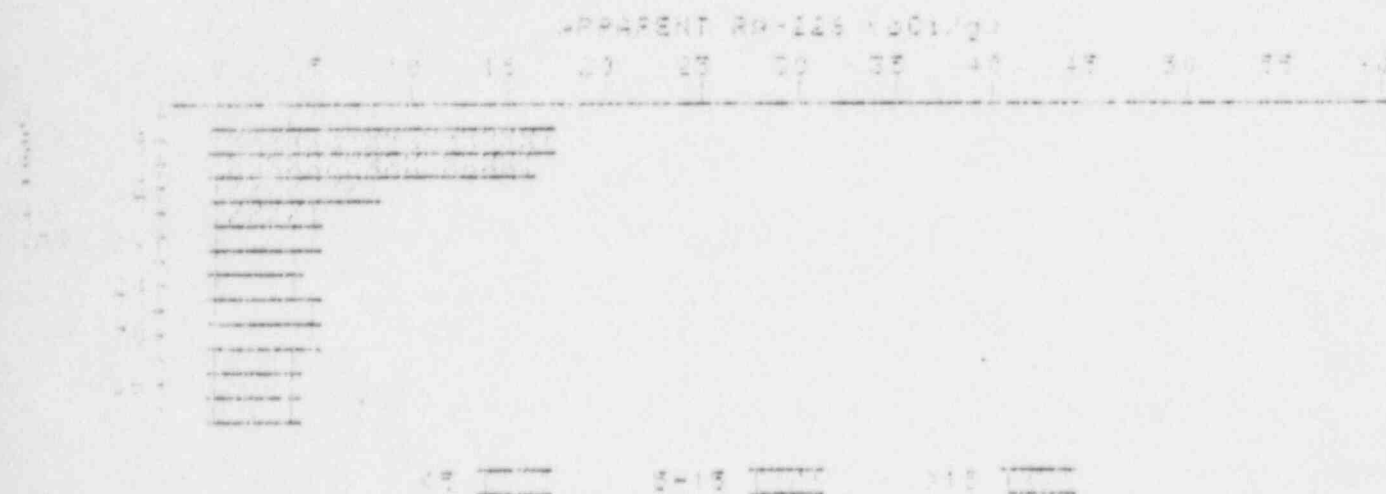


| Depth (ft) | Apparent Radium-226 (pCi/g) Undeconvolved | Apparent Radium-226 (pCi/g) Deconvolved |
|---------------|----------------------------------------------------|--------------------------------------------------|
| 0.0-0.1 | 5.8 | 5.8 |
| 0.1-0.2 | 5.3 | 5.3 |
| 0.2-0.3 | 5.0 | 5.0 |
| 0.3-0.4 | 5.1 | 4.8 |
| 0.4-0.5 | 4.7 | 4.6 |
| 0.5-0.6 | 4.8 | 4.5 |
| 0.6-0.7 | 4.8 | 4.4 |
| 0.7-0.8 | 4.8 | 4.4 |
| 0.8-0.9 | 4.8 | 4.4 |
| 0.9-1.0 | 4.8 | 4.4 |
| 1.0-1.1 | 4.8 | 4.4 |
| 1.1-1.2 | 4.8 | 4.4 |
| 1.2-1.3 | 4.8 | 4.4 |
| 1.3-1.4 | 4.8 | 4.4 |
| 1.4-1.5 | 4.8 | 4.4 |
| 1.5-1.6 | 4.8 | 4.4 |
| 1.6-1.7 | 4.8 | 4.4 |
| 1.7-1.8 | 4.8 | 4.4 |
| 1.8-1.9 | 4.8 | 4.4 |
| 1.9-2.0 | 4.8 | 4.4 |
| 2.0-2.1 | 4.8 | 4.4 |
| 2.1-2.2 | 4.8 | 4.4 |
| 2.2-2.3 | 4.8 | 4.4 |
| 2.3-2.4 | 4.8 | 4.4 |
| 2.4-2.5 | 4.8 | 4.4 |
| 2.5-2.6 | 4.8 | 4.4 |
| 2.6-2.7 | 4.8 | 4.4 |
| 2.7-2.8 | 4.8 | 4.4 |
| 2.8-2.9 | 4.8 | 4.4 |
| 2.9-3.0 | 4.8 | 4.4 |
| 3.0-3.1 | 4.8 | 4.4 |
| 3.1-3.2 | 4.8 | 4.4 |
| 3.2-3.3 | 4.8 | 4.4 |
| 3.3-3.4 | 4.8 | 4.4 |
| 3.4-3.5 | 4.8 | 4.4 |
| 3.5-3.6 | 4.8 | 4.4 |
| 3.6-3.7 | 4.8 | 4.4 |
| 3.7-3.8 | 4.8 | 4.4 |
| 3.8-3.9 | 4.8 | 4.4 |
| 3.9-4.0 | 4.8 | 4.4 |
| 4.0-4.1 | 4.8 | 4.4 |
| 4.1-4.2 | 4.8 | 4.4 |
| 4.2-4.3 | 4.8 | 4.4 |
| 4.3-4.4 | 4.8 | 4.4 |
| 4.4-4.5 | 4.8 | 4.4 |
| 4.5-4.6 | 4.8 | 4.4 |
| 4.6-4.7 | 4.8 | 4.4 |
| 4.7-4.8 | 4.8 | 4.4 |
| 4.8-4.9 | 4.8 | 4.4 |
| 4.9-5.0 | 4.8 | 4.4 |
| 5.0-5.1 | 4.8 | 4.4 |
| 5.1-5.2 | 4.8 | 4.4 |
| 5.2-5.3 | 4.8 | 4.4 |
| 5.3-5.4 | 4.8 | 4.4 |
| 5.4-5.5 | 4.8 | 4.4 |
| 5.5-5.6 | 4.8 | 4.4 |
| 5.6-5.7 | 4.8 | 4.4 |
| 5.7-5.8 | 4.8 | 4.4 |
| 5.8-5.9 | 4.8 | 4.4 |
| 5.9-6.0 | 4.8 | 4.4 |

DECON 185 (K250TLA 0823)

APPARENT RADIUM-226 CONCENTRATION 34 DECONVOLUTION GRAPH

PROPERTY NUMBER: 00-41138-RS
HOLE NUMBER: 14
LOCATION: #00290



| COUNTS GROSS | APPARENT Radium-226 (DPI/G) | APPARENT Radium-226 (DPI/G) |
|-----------------|-----------------------------------|-----------------------------------|
| | UNDECONVOLVED | DECONVOLVED |
| 1000 | 0.0 | 0.0 |
| 1100 | 11.0 | 10.0 |
| 1200 | 11.0 | 10.0 |
| 1300 | 0.0 | 0.0 |
| 1400 | 0.0 | 0.0 |
| 1500 | 0.0 | 0.0 |
| 1600 | 0.0 | 0.0 |
| 1700 | 0.0 | 0.0 |
| 1800 | 0.0 | 0.0 |
| 1900 | 0.0 | 0.0 |
| 2000 | 0.0 | 0.0 |
| 2100 | 0.0 | 0.0 |
| 2200 | 0.0 | 0.0 |
| 2300 | 0.0 | 0.0 |
| 2400 | 0.0 | 0.0 |
| 2500 | 0.0 | 0.0 |
| 2600 | 0.0 | 0.0 |
| 2700 | 0.0 | 0.0 |
| 2800 | 0.0 | 0.0 |
| 2900 | 0.0 | 0.0 |
| 3000 | 0.0 | 0.0 |
| 3100 | 0.0 | 0.0 |
| 3200 | 0.0 | 0.0 |
| 3300 | 0.0 | 0.0 |
| 3400 | 0.0 | 0.0 |
| 3500 | 0.0 | 0.0 |
| 3600 | 0.0 | 0.0 |
| 3700 | 0.0 | 0.0 |
| 3800 | 0.0 | 0.0 |
| 3900 | 0.0 | 0.0 |
| 4000 | 0.0 | 0.0 |

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