

**RADIOLOGIC AND ENGINEERING ASSESSMENT**

FOR

DOE ID NO.: GJ-43553-VL  
ADDRESS: 3011 1/2 D 1/2 ROAD

AUGUST 1985

FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

ALBUQUERQUE OPERATIONS OFFICE

DEPARTMENT OF ENERGY

BY

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

APPROVED BY

M. K. Tucker <sup>63</sup> RA  
M. TUCKER  
DOE PROJECT ENGINEER

DATE

August 1, 1985

REA43553-REA-704

8508140037 850502  
PDR WASTE PDR  
WM-54

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## 1.0 EXECUTIVE SUMMARY

### 1.1 Introduction

The location, DOE ID No. GJ-43553-VL, is a vacant lot located at 3011 1/2 D 1/2 Road, Grand Junction, Colorado.

The purpose of this assessment is to evaluate the extent of uranium millsite contamination at this property and present a recommendation based on this assessment.

### 1.2 Evaluation and Recommendation

It is recommended that no remedial action be performed on this property (as discussed in Section 4.0) and that a Property Completion Report be prepared for use in the DOE certification process. The identified residual radioactive material found on this property is tailings; the estimated volume is: exterior, 9 cu. yd.; interior, 0 cu. yd.

## 2.0 PROPERTY DESCRIPTION

### 2.1 General Description

Address: 3011 1/2 D 1/2 Road, Grand Junction, Colorado

Zoning: Agricultural-Forest Transition (AFT)

Lot Size: Approximately 197,000 sf (4.5 acres)

Legal Description: Beginning 775.5 feet east and 30 feet south of W1/4 corner Section 16, 1S, 1E, south 183 feet, west 151 feet, south 390.61 feet, east 141 feet, south 298.5 feet, east 191 feet, north 689.11 feet, west 141 feet, north 183 feet, west 40 feet to beginning, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 3 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: None  
Gas: None  
Telephone: None  
Sewer: None  
Water: None  
Cable TV: None

Bordering Properties:

North: D 1/2 Road  
South: Vacant land  
East: Single-family residence  
West: Single-family residence

### 2.2 Existing Facilities and Structures

Primary Structure: None

General Remarks:

Features of this property are included in Appendix Figure 2.2.

Historical Data: Not applicable

### 3.0 RADIOLOGIC SURVEY

#### 3.1 Introduction

Radiologic data were collected by Bendix at DOE ID No. GJ-43553-VL on June 21, 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 Bendix spillover data indicates contamination located in the far northern part of the property along the west property line.

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 3.4, 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: 16 to 17 uR/h  
Highest Outside Gamma Reading (HOG): 23 uR/h

Exterior radium-concentration measurements are presented in Appendix Table 3.1. Grid-point survey and walking scan results are shown in Appendix Figures 3.1a and 3.1b.

#### 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 Table 3.1.

### 3.4 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) Surface Material: Soil  
Other Directions: North end of property  
Total Depth of Contamination: 6 inches  
Comments: This is a vacant lot with spillover contamination from the property to the west which has since been cleaned up.  
Approximate Square Footage: 460

#### 4.0 RECOMMENDED REMEDIAL ACTION

##### 4.1 Decontamination and Restoration

We do not recommend decontamination and restoration of this property. It is recommended that no remedial action be performed and that a brief Property Completion Report be prepared for use in the DOE certification process.

##### 4.2 Evaluation of Recommended Remedial Action

The recommendation that no remedial action be performed on this property is made because the levels of radioactivity on this property fall below the EPA Standards (40 CFR 192) when averaged over 100 m<sup>2</sup>.

The EPA Standards are:

- (1) 5 pCi/g above background, averaged over the first 15 cm of soil below the surface; and
- (2) 15 pCi/g above background, averaged over 15-cm-thick layers of soil more than 15 cm below the surface.

Appendix Table 4.1 presents the area and volume calculations of contamination present on the property. The average radium concentration for this property is 4.32 pCi/g which falls below the EPA Standard of 7 pCi/g, including background. Appendix Table 4.2 presents the calculations for concentrations of Radium-226 in soil for this location.



## 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 4.1 | Area and Volume Calculations                         |
| Table 4.2 | Calculations for Concentration of Radium-226 in Soil |

Appendix Figures:

|             |  |
|-------------|--|
| Figure 2.1  | Vicinity Map                               |
| Figure 2.2  | Site Plan                                  |
| Figure 3.1a | Exterior Exposure Rates                    |
| Figure 3.1b | Exterior 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-43553-VL

3011 1/2 D 1/2 Road

Page 1 of 2

| Loc # | Grid Location | Depth (in.) | Meas. Type | In Situ Ra-226 (pCi/g) |         | Chem Ra-226 (pCi/g) | Comments                    |
|-------|---------------|-------------|------------|------------------------|---------|---------------------|-----------------------------|
|       |               |             |            | Tot. Ct                | Spectr. |                     |                             |
| 1     | 348333        | 00          | DS         | 7.5                    |         | *                   | Vacant lot                  |
|       |               | 06          | DS         | 1.7                    |         | *                   |                             |
| 2     | 352342        | 00          | DS         | 1.8                    |         | *                   |                             |
|       |               | 06          | DS         | 1.6                    |         | *                   |                             |
| 3     | 358347        | 00          | DS         | 1.5                    |         | *                   |                             |
|       |               | 06          | DS         | 1.5                    |         | *                   |                             |
| 4     | 360332        | 00          | DS         | 4.1                    |         | *                   |                             |
|       |               | 06          | DS         | 1.3                    |         | *                   |                             |
| 5     | 360338        | 00          | DS         | 6.7                    |         | *                   |                             |
|       |               | 06          | DS         | <1.0                   |         | *                   |                             |
|       |               | 00          | GS         |                        | 6.9     | *                   |                             |
| 6     | 360344        | 00          | DS         | 2.4                    |         | *                   |                             |
|       |               | 06          | DS         | 1.6                    |         | *                   |                             |
|       |               | 00          | GS         |                        | 1.9     | *                   |                             |
| 7     | 368347        | 00          | DS         | 7.3                    |         | *                   |                             |
|       |               | 06          | DS         | 2.2                    |         | *                   |                             |
|       |               | 00          | GS         |                        | 5.6     | *                   |                             |
| 8     | 378338        | 00          | DS         | 3.5                    |         | *                   |                             |
|       |               | 06          | DS         | 1.2                    |         | *                   |                             |
|       |               | 00          | GS         |                        | 4.1     | *                   |                             |
| 9     | 380331        | 00          | DS         | 3.3                    |         | *                   |                             |
|       |               | 06          | DS         | 2.1                    |         | *                   |                             |
| 10    | 460360        | 00          | DS         | 2.3                    |         | *                   | Background<br>DC = 0 inches |
|       |               | 00          | GS         |                        | <1.0    | *                   |                             |
|       |               | 03          | TC         | 3.2                    |         | *                   |                             |
|       |               | 06          | TC         | 3.6                    |         | *                   |                             |
|       |               | 09          | TC         | 3.7                    |         | *                   |                             |
|       |               | 12          | TC         | 3.8                    |         | *                   |                             |
|       |               | 15          | TC         | 3.9                    |         | *                   |                             |
|       |               | 18          | TC         | 3.9                    |         | *                   |                             |
|       |               | 21          | TC         | 3.9                    |         | *                   |                             |

## Radium Concentrations at Exterior Locations

DOE ID #GJ-43553-VL

3011 1/2 D 1/2 Road

Page 2 of 2

| ===== |          |       |       |                |         |             |          |
|-------|----------|-------|-------|----------------|---------|-------------|----------|
|       |          |       |       | In Situ Ra-226 |         |             |          |
| Loc   | Grid     | Depth | Meas. | (pCi/g)        |         | Chem Ra-226 |          |
| #     | Location | (in.) | Type  | Tot. Ct        | Spectr. | (pCi/g)     | Comments |
| ----- |          |       |       |                |         |             |          |
| 10    | 460360   | 24    | TC    | 3.9            |         | *           |          |
|       |          | 27    | TC    | 3.9            |         | *           |          |
| ===== |          |       |       |                |         |             |          |

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

Notes: DC = Depth of Contamination  
\* = No Soil Sample Taken  
[n] = Reading Taken n-Inches  
Above Floor or Ground  
Date of Survey = 06-21-85  
Team Leader = TDH

Table 4.1  
Area and Volume Calculations  
DOE ID No. GJ-43553-VL

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                |                         |           |                  |           |                    |
| A                       | 32 x 10                 | =         | 320              |           |                    |
|                         | 7 x 20                  | =         | 140              |           |                    |
|                         |                         |           |                  |           |                    |
|                         |                         |           | 460              | x 0.5 =   | 230                |
|                         |                         |           |                  |           |                    |
| TOTAL VOLUME - EXTERIOR |                         |           |                  | = 230     | = 230/27 = 9       |

NOTE: Total square feet of Area A = 460 square feet  
460 square feet = 42.2 square meters

See Appendix Figure 3.3 For Areas

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Table 4.2  
Calculations for Concentration of Radium-226 in Soil  
DOE ID No. GJ-43553-VL

Page 1 of 1

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$$C_{avg} = \frac{C_c \times A_c + C_b (100m^2 - A_c)}{100m^2}$$

Where

$C_{avg}$  = Concentration average (pCi/g)

$C_c$  = Concentration of Contamination (pCi/g)

$A_c$  = Area of Concentration (m<sup>2</sup>)

$C_b$  = Background Concentration (pCi/g)

$$C_{avg} = \frac{7.5 \times 42.2 + 2 (100 - 42.2)}{100}$$

$$C_{avg} = 4.32 < 7$$

Therefore, concentration does not exceed EPA Standards of 7 pCi/g

NOTE: Background Radium concentration for this area is 2 pCi/g

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REA43553/REA-704/AP

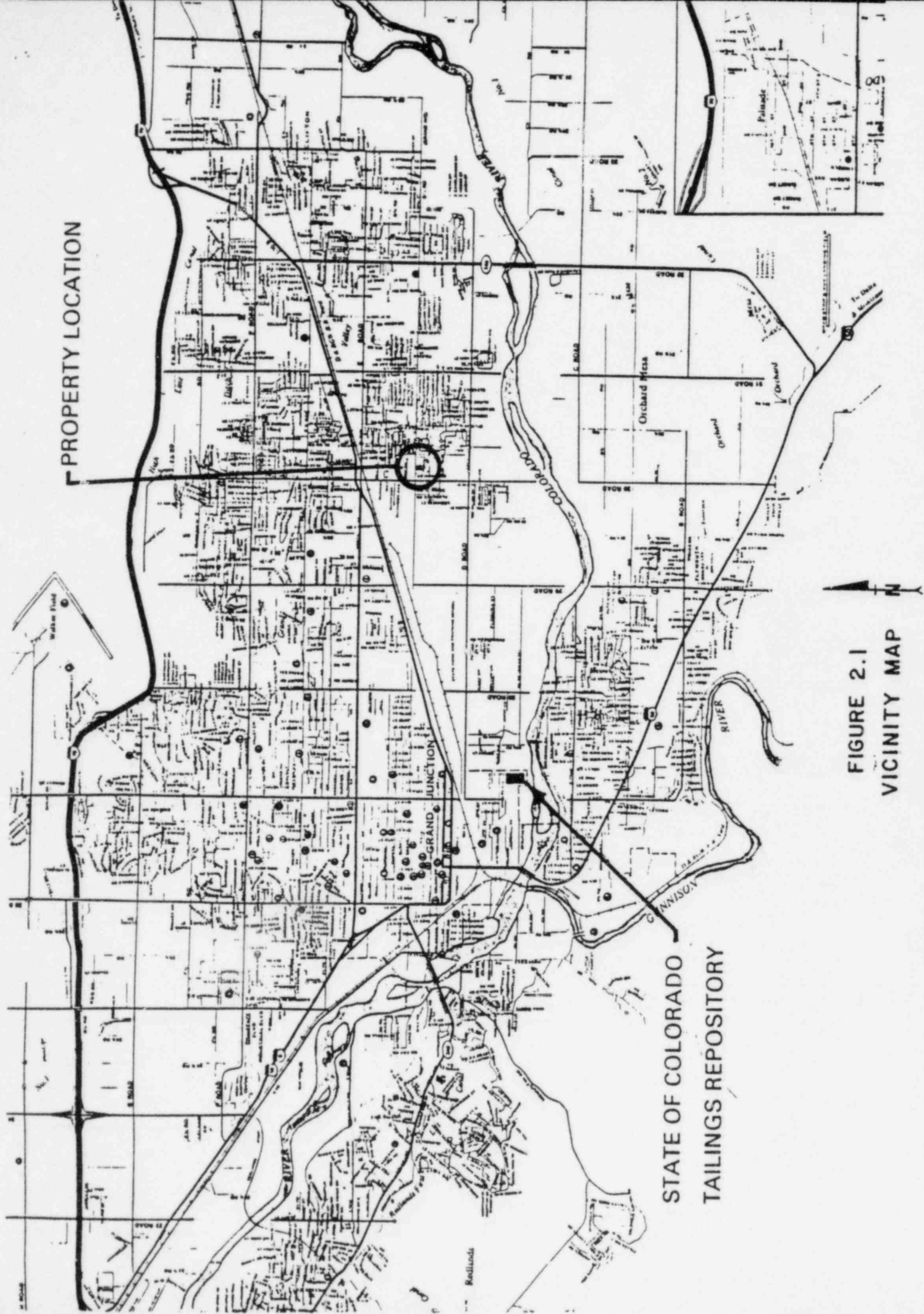


FIGURE 2.1  
VICINITY MAP

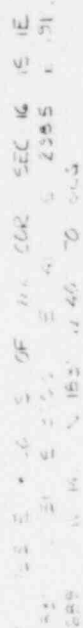
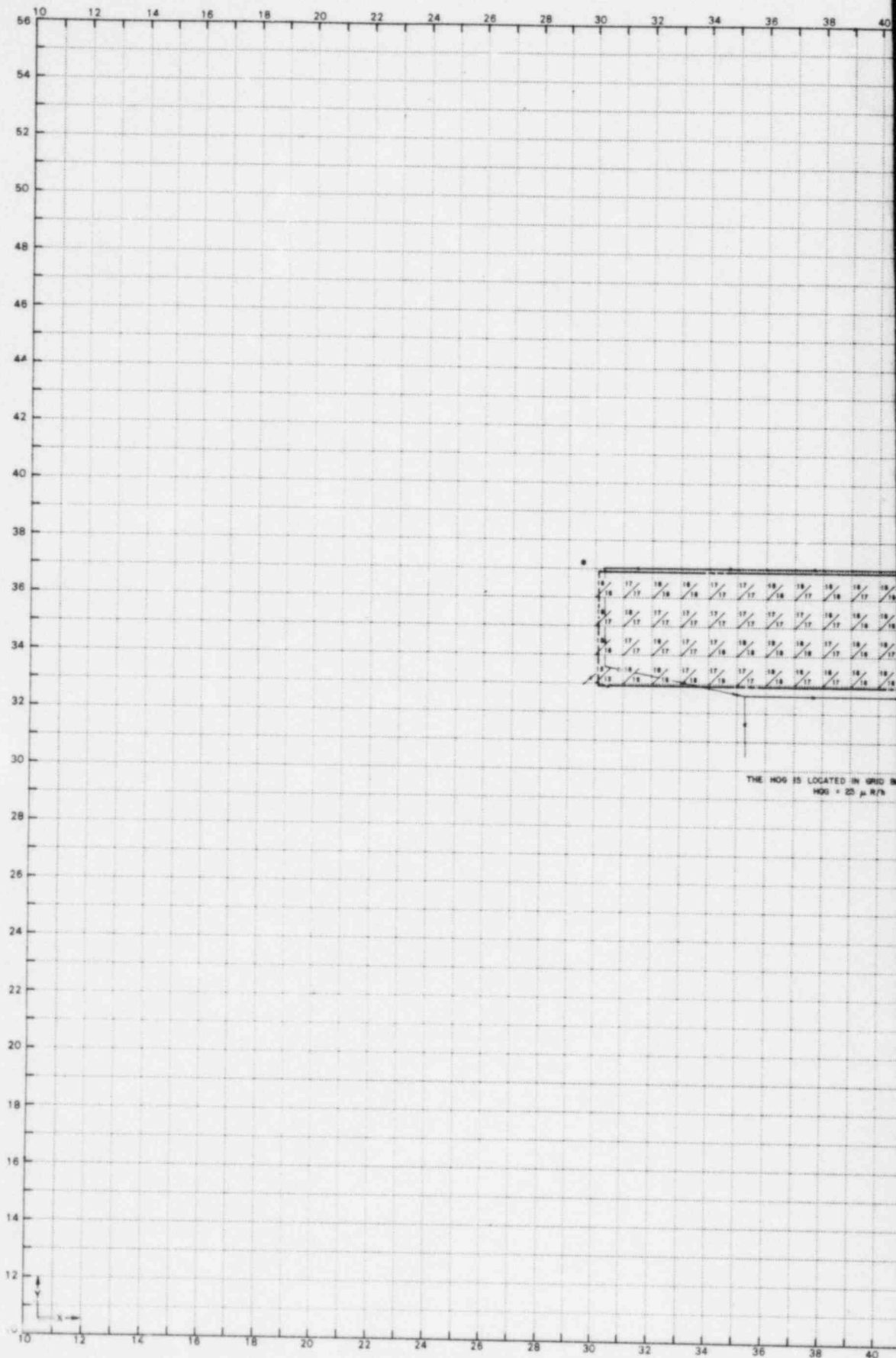


FIGURE 2.2 SITE PLAN



|  |                        |
|--|------------------------|
| U.S. DEPARTMENT OF ENERGY<br>GENERAL INVESTIGATION DIVISION (OFFICE OF ORDO) | DOE ID NO<br>634553 VL |
| ADDRESS 2012 DE ROAD   | ALUMINUM               |
| GRAND UNIFICATION, CONGRADO  | DATE RECEIVED          |
| DATE 05/23/88  | DATE 11/16/88          |
| BY 10/15/88  | BY 10/15/88            |

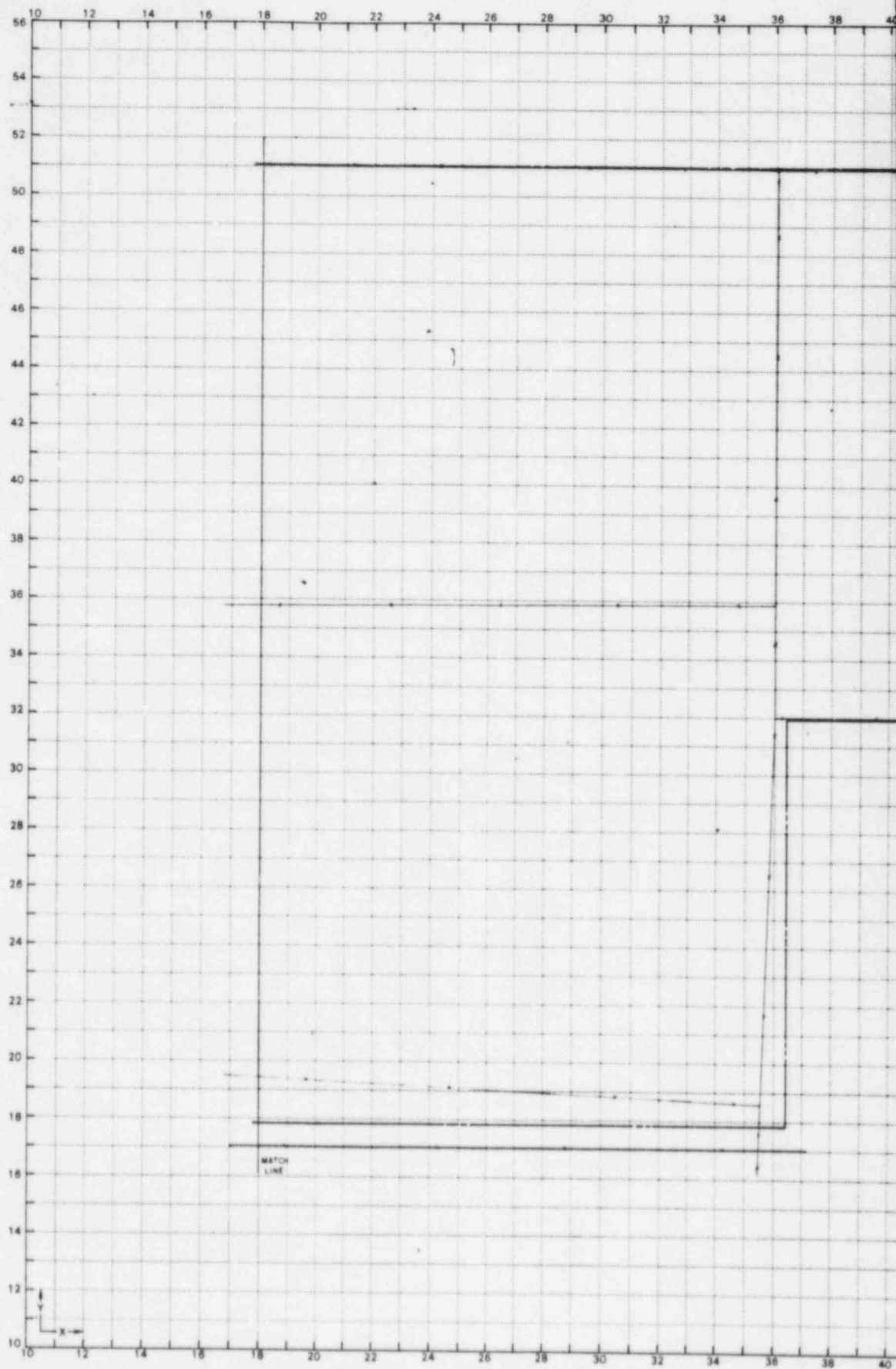




Also Available On  
Aperture Card

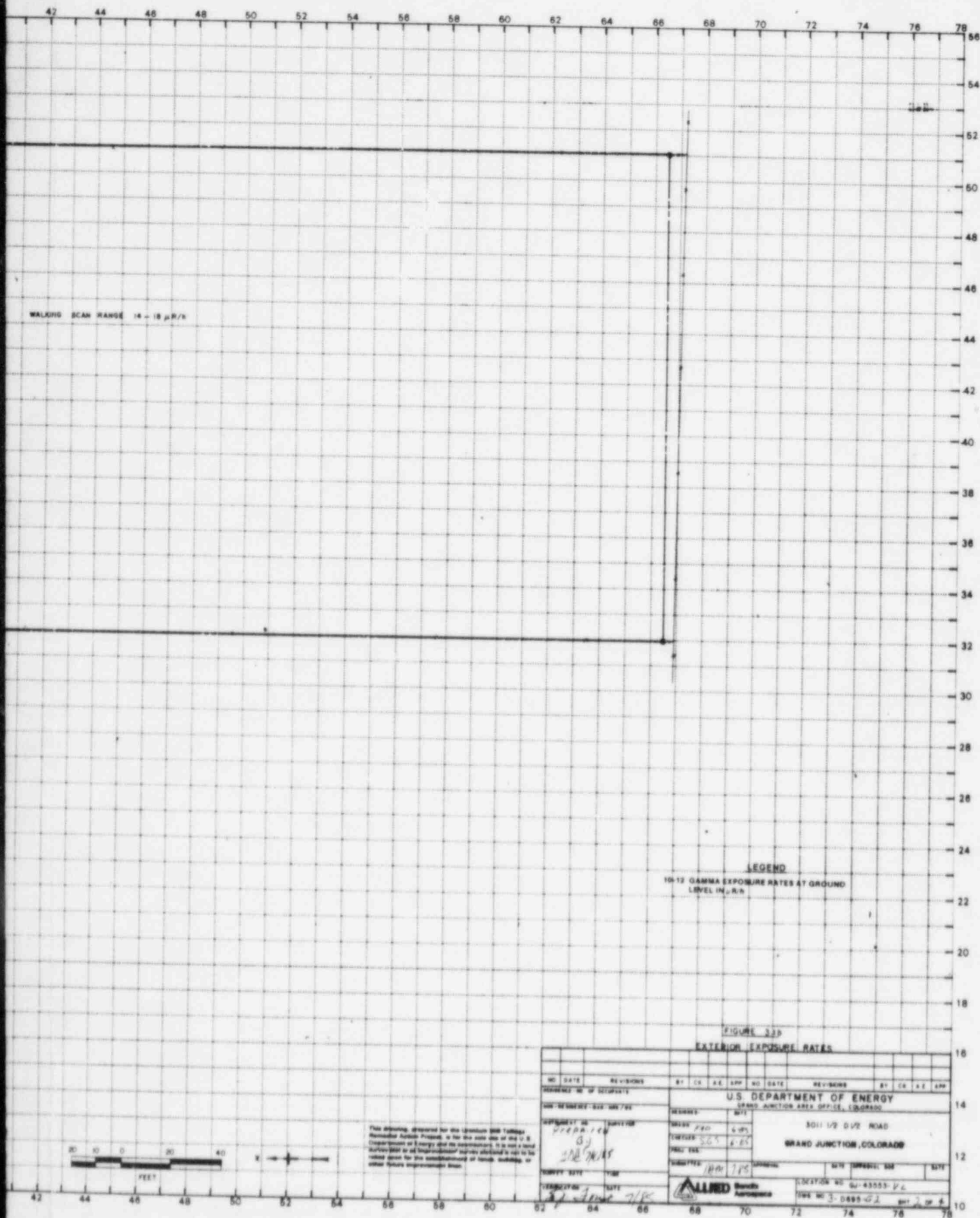
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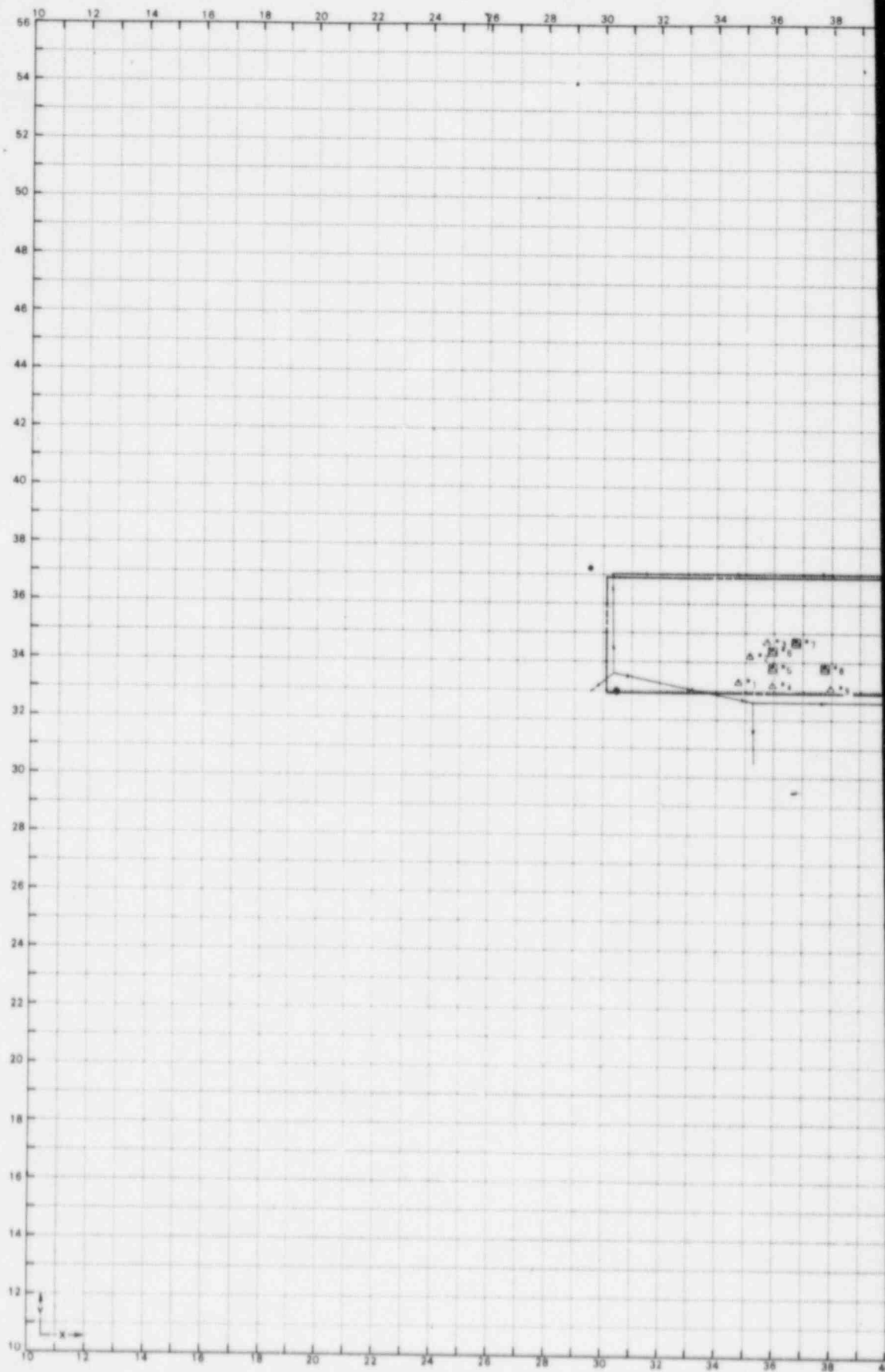
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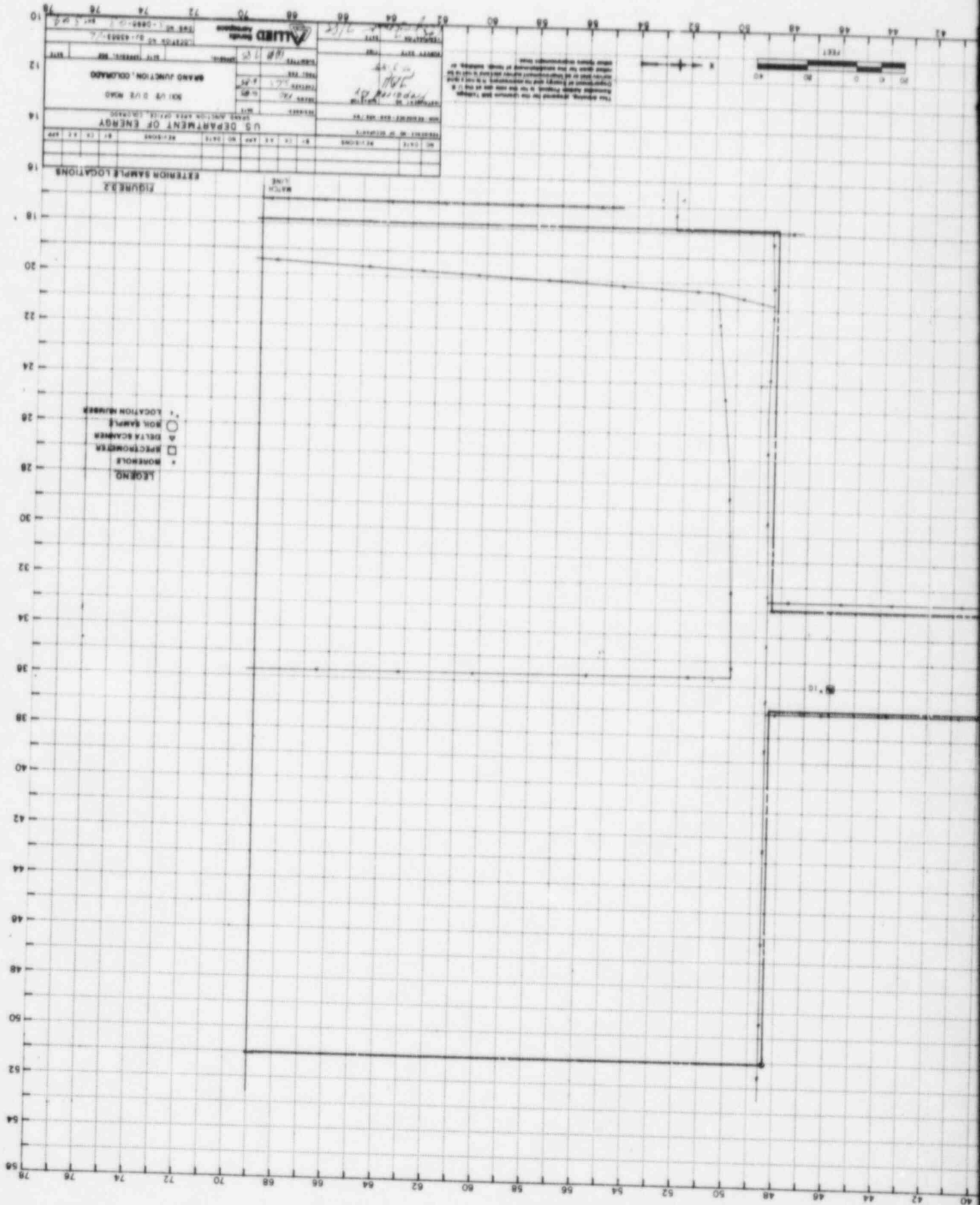
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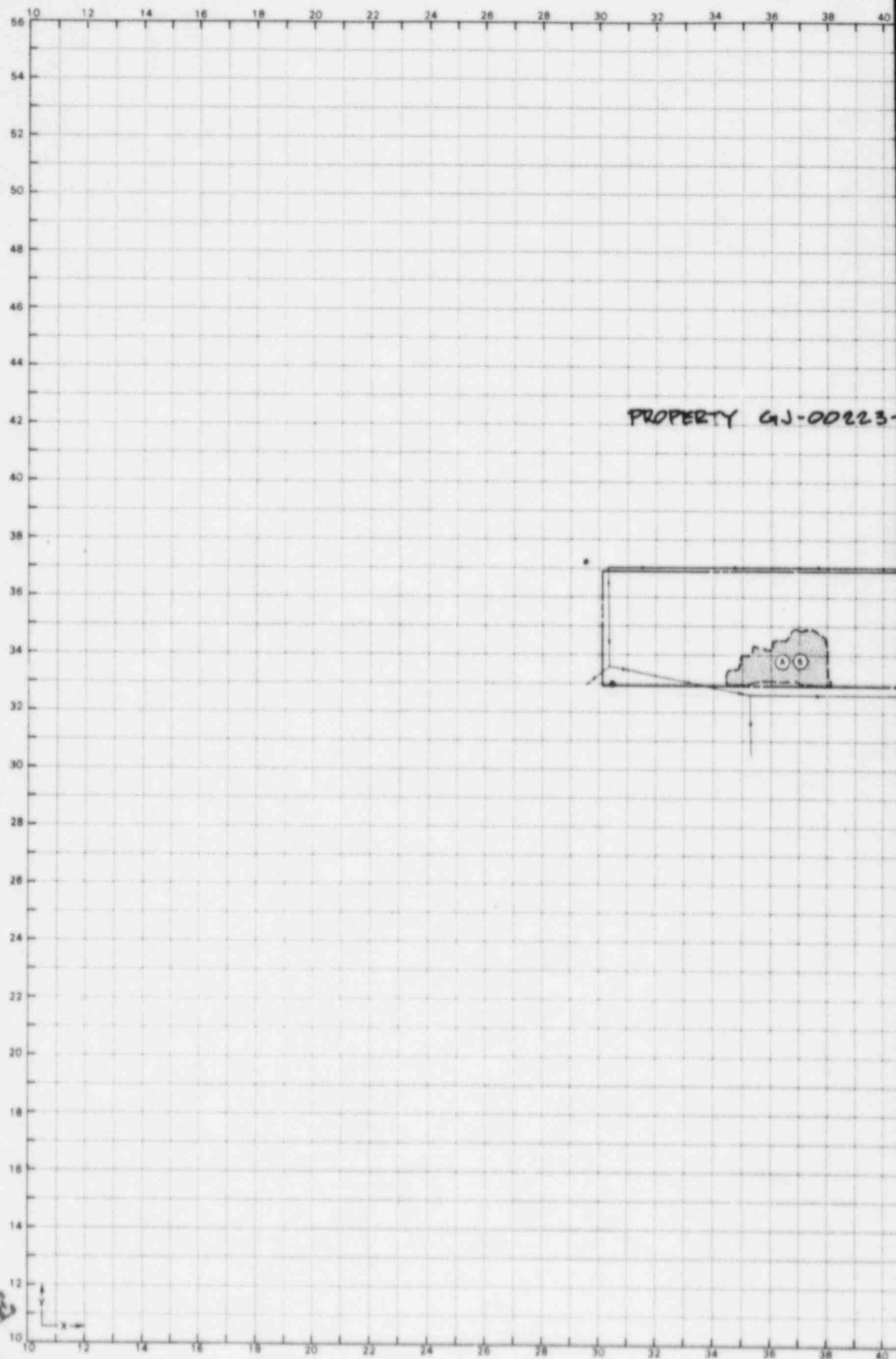


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3/85

DOE ID NO. GJ-43553-VL 1

Date 7/1/85

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

Official Survey Report

Property Address 3011 1/2 D 1/2 Road

Property Owner Church of Christ

Address of Owner (if different from above) 539 28 1/2 Road

Report Prepared By T.D.H.

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 = N/A uR/h  
HOG = 23 uR/h

MEMORANDUM

ALLIED Bendix  
Aerospace

Bendix Field Engineering Corporation  
Grand Junction Operations  
Grand Junction, Colorado

Date: June 21, 1985

To: Files

From: T. Dean Herrera

Subject: Team Leader Notes - GJ-43553-VL

Address: 3011-1/2 D-1/2 Road

Owner: Church of Christ  
Vacant lot/field

Contact Person: Richard Fyffe

Weather: Sunny, 96-degrees

Arrival Time: 0715 Hours

Team Members

T. Dean Herrera (Team Leader)  
V. Hebel  
H. Lucero  
V. Young

D. Fossey  
K. Roemer  
H. Mattison

Instruments

See Equipment Summary sheet.

On 20 June 1985, I (Dean Herrera) requested a Bendix survey team to go to 3011-1/2 D-1/2 Road and place survey markers in the vacant lot to be surveyed.

When we arrived at the property, team members located the survey markers in the vacant lot. I have set 50-foot grid lines. The lot will be scanned to locate elevated gamma readings.

Team Leader Notes  
T. Dean Herrera  
GJ-43553-VL  
June 21, 1985  
Page 2

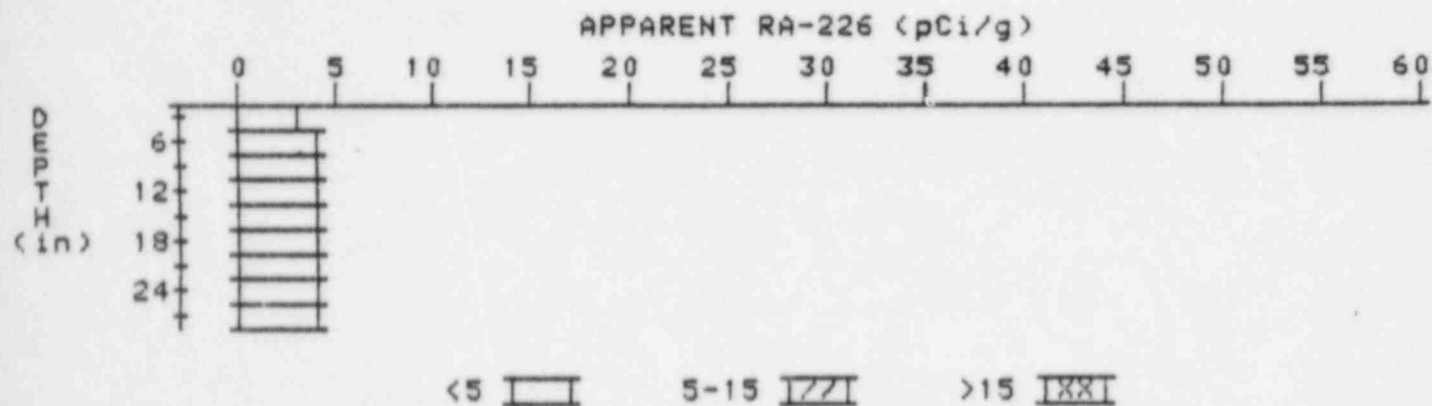
Team members have located elevated gamma readings on the north end of the property. The area has been gridded and scanned, also exposure rates have been taken around this area of contamination.

The property owner to the west of 3011 D-1/2 Road, stated that her property has just received remedial action. The neighbor also stated the vacant lot at one time was owned by her and her husband. She informed me that no tailings were used in the lot toward the south.

The survey was completed by lunch time, all team members were frisked before leaving the property.

# APPARENT RADIUM-226 CONCENTRATION 10 DECONVOLUTION GRAPH

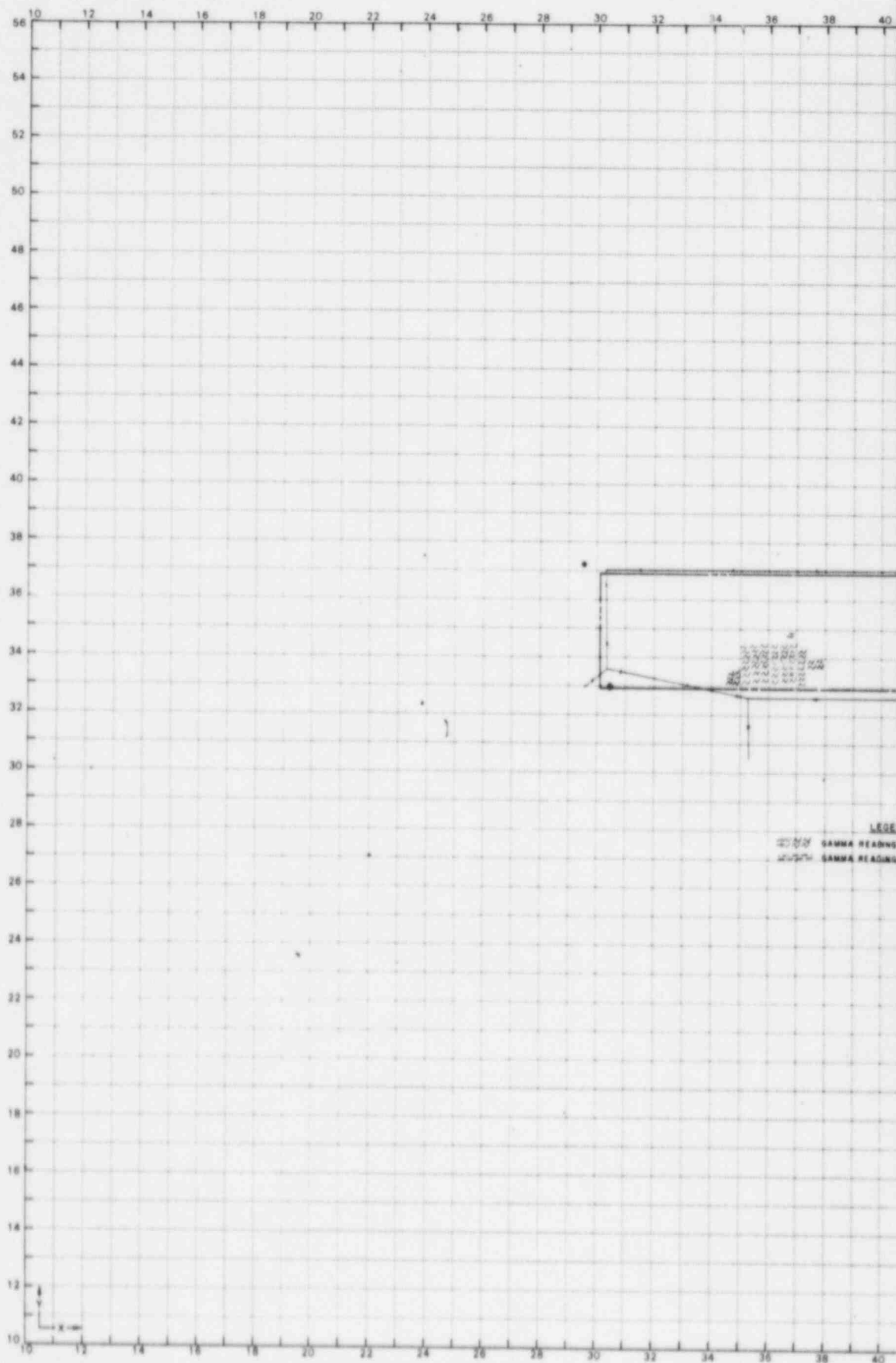
PROPERTY NUMBER: GJ-43553-VL  
HOLE NUMBER: 10  
LOCATION: 460360

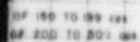


| Depth<br>(in) | Apparent<br>Radium-226<br>(pCi/g)<br>Undeconvolved | Apparent<br>Radium-226<br>(pCi/g)<br>Deconvolved |
|---------------|--|--|
| 3             | 3.2  | 3.2  |
| 6             | 3.6  | 4.1  |
| 9             | 3.7  | 3.7  |
| 12            | 3.8  | 3.8  |
| 15            | 3.9  | 4.1  |
| 18            | 3.9  | 3.9  |
| 21            | 3.9  | 3.9  |
| 24            | 3.9  | 3.9  |
| 27            | 3.9  | 3.9  |

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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 to be re-replicated or an improvement upon and is not to be offered for the establishment of laws, building, or other future improvement laws.

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