RADIOLOGIC AND ENGINEERING ASSESSMENT

FOR

DOE ID NO.: GJ-02246-RS
ADDRESS: 1370 NORTH 20TH STREET

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 Michael K. Tucker
M. TUCKER
DOE PROJECT ENGINEER

DATE August 26, 1985

REA02246:REA-619

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

1.1 Introduction

The location, DOE ID No. GJ-02246-RS, is a single-family residence located at 1370 North 20th Street, 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, 5 cu. yd.; interior, 0 cu. yd.

Estimated cost to perform remedial action, including dislocation when applicable, is $368. Remedial action on this property will take approximately 4 days to complete.

2.0 PROPERTY DESCRIPTION

2.1 General Description

Address: 1370 North 20th Street, Grand Junction, Colorado

Zoning: Residential (RSF-8)

Lot Size: Approximately 6,401 sf (0.15 acres)

Legal Description: South 5 feet of Lot 1, and north 46 feet of Lot 2, Block 4, Arcadia Village Refile, City of Grand Junction, County of Mesa, State of Colorado.

Point of Reference: This property is located approximately 2 mile(s) 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
Gas:	Underground
Telephone:	Overhead
Sewer:	Underground
Water:	Underground
Cable TV:	Overhead

Bordering Properties:

North:	Single-family residence
South:	Single-family residence
East:	Alley (gravel)
West:	North 20th Street

2.2 Existing Facilities and Structures

Primary Structure:

Type:	Single-story residence
Size:	Approximately 855 sf
Construction Date:	1954
Construction:	Wood-frame
Foundation:	Concrete stemwall on spread footing
Footing Depth:	Not determined
Basement:	None
Crawl Space:	Yes - under entire living area
Condition:	Good

Other Structures: None

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-02246-RS on July 12, 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 Bendix spillover data was conducted to determine areas of potential contamination identified during previous radiologic assessments of this property.

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: 15 to 16 uR/h
Highest Outside Gamma Reading (HOG): 34 uR/h

Exterior radium-concentration measurements are presented in Appendix Table 3.1. Exterior exposure rates are shown in Appendix Figure 3.1.

3.2.2 Interior Findings

Background Readings: 13 to 16 uR/h
Highest Insid Gamma Reading (HIG): 16 uR/h

Interior gamma exposure-rate measurements are summarized in Appendix Table 3.2.

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 Radon/Radon Daughter Concentration (RDC)

The working level was not assessed by CDH. No RDC measurements were taken by Bendix.

3.5 Extent of Contamination

Appendix Figure 3.3 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
Direction From Primary Structure: East
Total Depth of Contamination: 12 inches
Approximate Square Footage: 66

(Area B) Surface Material: Soil
Direction From Primary Structure: East
Other Directions: North and south of sidewalk
Total Depth of Contamination: 6 inches
Comments: Two deposits
Approximate Square Footage: 61

(Area C) Surface Material: Soil, gravel
Direction From Primary Structure: East
Other Directions: Southeast property corner
Total Depth of Contamination: 6 inches
Approximate Square Footage: 56

(Area D) Surface Material: Soil
Direction From Primary Structure: East
Other Directions: Northeast property corner
Total Depth of Contamination: 6 inches
Approximate Square Footage: 33

4.0 RECOMMENDED REMEDIAL ACTION

4.1 Decontamination and Restoration

The recommended remedial action for this property, DOE ID No. GJ-02246-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

This property is included because it is a spillover from adjacent property GJ-01376-RS.

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 $368.

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 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 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

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
1	170255	03	TC	3.1		*	Next to water
		06	TC	3.4		*	line
		09	TC	3.7		*	
		12	TC	3.9		*	
		15	TC	3.9		*	
		18	TC	4.1		*	
		21	TC	4.0		*	
		24	TC	4.0		*	
		27	TC	4.0		*	
		30	TC	4.1		*	
		33	TC	4.1		*	
2	178234	00	DS	1.5		*	Southwest of primary structure
3	190271	03	TC	3.3		*	North foundation
		06	TC	3.5		*	
		09	TC	3.7		*	
		12	TC	3.8		*	DC = 0 inches
		15	TC	3.8		*	
		18	TC	3.8		*	
		21	TC	3.8		*	
		24	TC	3.8		*	
		27	TC	3.8		*	
		30	TC	3.8		*	
		33	TC	3.9		*	
		36	TC	3.8		*	
4	206251	00	DS	1.9		*	Gas line
		21	DS	1.5		*	On gas line
5	220253	00	DS	1.7		*	Next to sewer line
		03	TC	3.4		*	
		06	TC	3.6		*	DC = 0 inches
		09	TC	3.8		*	
		12	TC	3.8		*	
		15	TC	3.9		*	
		18	TC	3.9		*	
		21	TC	3.9		*	
		24	TC	4.0		*	
		27	TC	3.9		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
		36	TC	3.9		*	

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	Spectr.	Chem Ra-226 (pCi/g)	Comments
5	220253	39	TC	3.9		*	
		42	TC	3.8		*	
		45	TC	3.9		*	
		48	TC	3.9		*	
		51	TC	4.0		*	
		54	TC	4.0		*	
		57	TC	4.0		*	
		60	TC	3.9		*	
		63	TC	3.9		*	
6	240240	00	DS	2.5		*	Next to sidewalk
		03	TC	3.5		*	DC = 0 inches
		06	TC	3.7		*	
		09	TC	3.8		*	
		12	TC	3.9		*	
		15	TC	4.0		*	
		18	TC	4.0		*	
		21	TC	4.1		*	
		24	TC	4.1		*	
		27	TC	4.0		*	
		30	TC	3.9		*	
		33	TC	3.9		*	
		36	TC	3.9		*	
7	252235	00	DS	6.4		*	Next to sidewalk
		06	DS	3.1		*	
		12	DS	1.1		*	
8	254243	00	DS	2.8		*	Next to sidewalk
		06	DS	1.9		*	Horizontal
		06	DS	1.8		*	
9	258235	00	DS	3.7		*	Next to sidewalk
		06	DS	2.8		*	
		12	DS	1.7		*	
10	270233	00	DS	4.0		*	Southeast corner
		06	DS	2.1		*	of property

Loc #	Grid Location	Depth (in.)	Meas. Type	In Situ Ra-226 (pCi/g) Tot. Ct	In Situ Ra-226 (pCi/g) Spectr.	Chem Ra-226 (pCi/g)	Comments
11	271275	00	DS	4.9		*	Northeast corner
		06	DS	1.1		*	of property

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 = 07-12-85
Team Leader = SM

Table 3.2
Summary of Interior Gamma Exposure Rates

DOE ID No. GJ-02246-RS 1370 North 20th Street

Location	Number of Readings Taken at Waist Level	Range at Waist Level (uR/h)	Mean at Waist Level (uR/h)	Number of Readings Taken at Surface	Range at Surface (uR/h)	Mean Surface (uR/h)
Primary Structure	*	*	*	*	13-16	*

* A walking gamma scan was performed to confirm the absence of interior contamination at this location.

Table 4.1
Area and Volume Calculations
DOE ID No. GJ-02246-RS

AREA	CALCULATIONS(ft)		SF		DEPTH(ft)		CF				CUBIC YARDS
EXTERIOR											
	Contaminated Fill										
A	6 x 11	=	66	x	1.0	=	66				
B	7 x 7	=	49								
	6 x 2	=	12								
			61	x	0.5	=	31				
C	4 x 14	=	56	x	0.5	=	28				
D	3 x 11	=	33	x	0.5	=	17				
	TOTAL VOLUME - EXTERIOR					=	142	=	142/27	=	5

See Appendix Figure 3.3 For Areas

Table 4.2
Estimated Cost of Decontamination and Restoration
DOE ID No. GJ-02246-RS Page 1 of 1

EXTERIOR		
Remove identified residual radioactive material 5 cy @ $14.50/cy (machine-open)		$ 73
Replace areas with compacted roadbase 1 cy @ $11.50/cy		12
Replace areas with topsoil 4 cy @ $9.50/cy		38
	TOTAL EXTERIOR	$ 123
	TOTAL INTERIOR	0
	ACCESS CONTROL	100
	SUBTOTAL	$ 223
	CONTINGENCY @ 10%	22
	SUBTOTAL	$ 245
	CONTRACTOR OVERHEAD & PROFIT @ 50%	123
	GRAND TOTAL	$ 368

LR082085
REA02246/REA-619/LMR

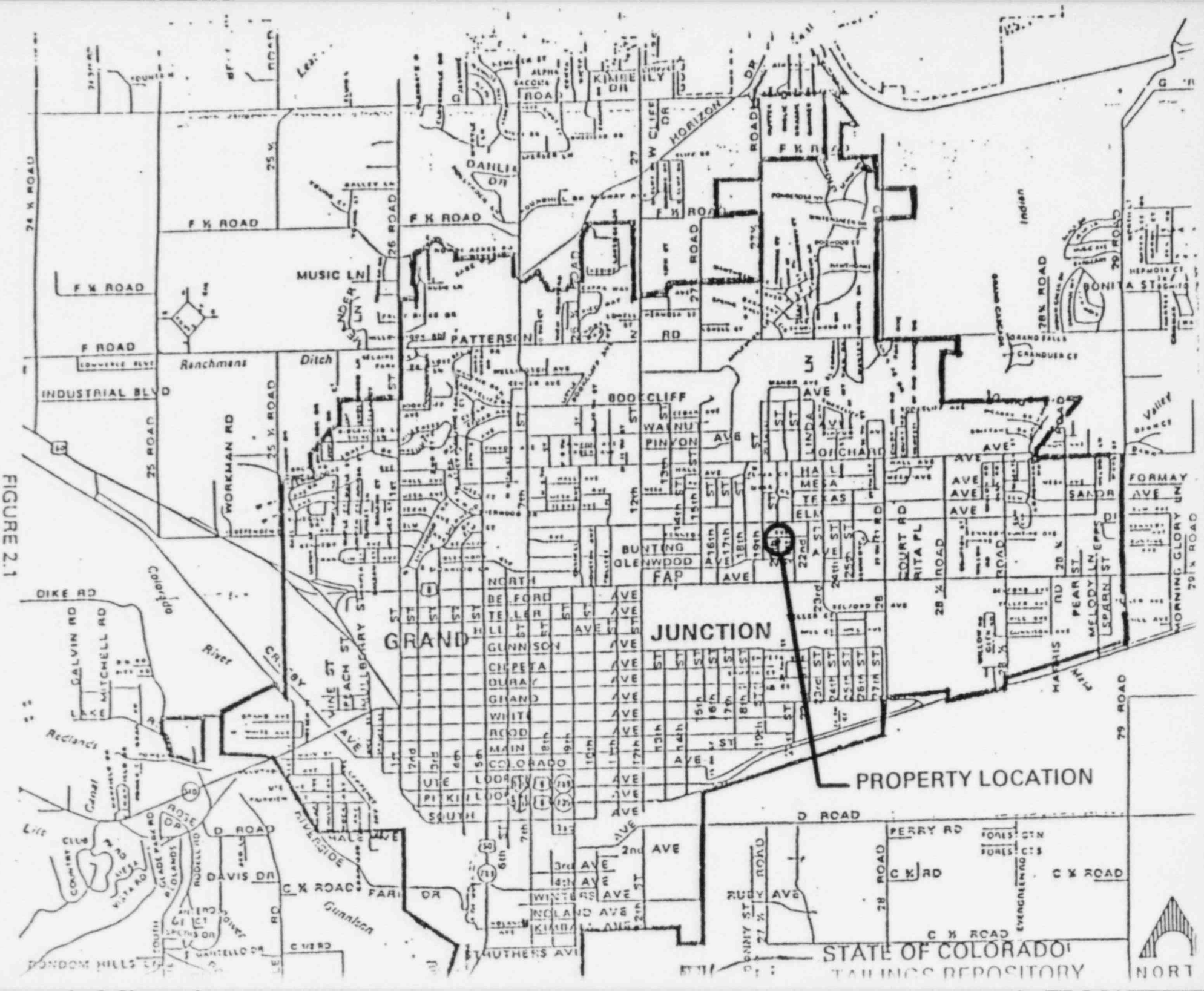
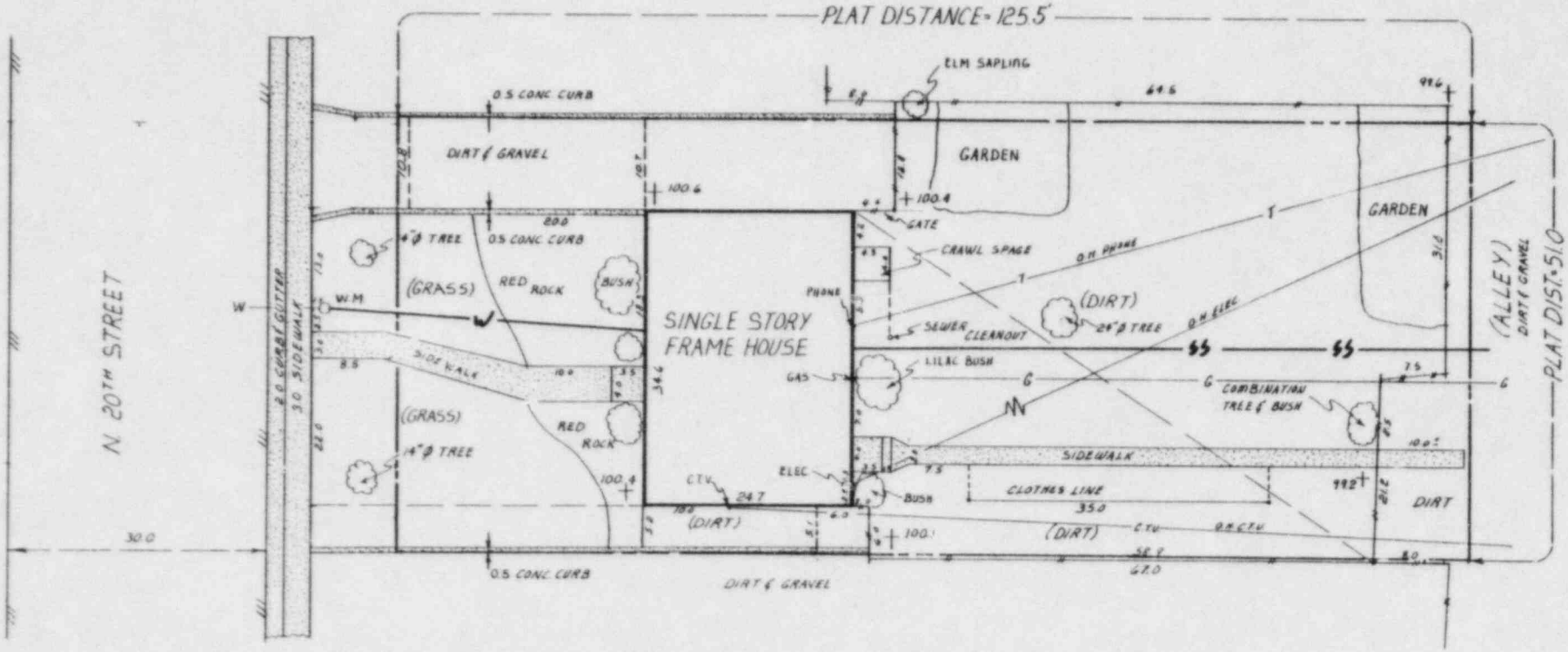


FIGURE 2.1
VICINITY MAP



LEGAL DESCRIPTION

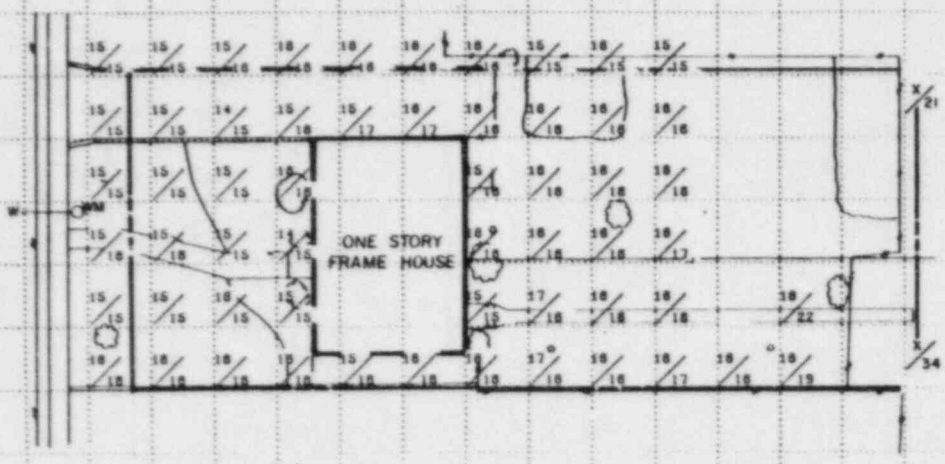
S. 5 FT. OF LOT 1, + N. 46 FT. OF LOT 2 BLK 4, ARCADIA VILLAGE REFILE

10' 5' 0 10' 20'

SCALE IN FEET

FIGURE 2.2 SITE PLAN

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECT OFFICE, COLORADO		DOE ID NO. GJ-02246-RS
ADDRESS 1370 N. 20TH STREET GRAND JUNCTION, COLORADO		ALLIED Bendix Aerospace Bendix Field Engineering Corporation Grand Junction Operations
SURV WHL/T-1-85	DRAFT JRG/T 9-85	CK CAF 7-9-85
DRAWING NO. 3-C-807-F1		SHEET 1 OF 1



LEGEND

13 / 16 GAMMA EXPOSURE RATE AT WAIST LEVEL / GAMMA EXPOSURE RATE AT GROUND LEVEL

X NO READING TAKEN

ALL READINGS IN $\mu R/h$

THE HOG IS LOCATED IN GRID BLOCK 270230

HOG = 34 $\mu R/h$

FIGURE 3.1

EXTERIOR EXPOSURE RATES

20 10 0 20 40

FEET

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

U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION AREA OFFICE, COLORADO

1370 N 20th STREET
GRAND JUNCTION, COLORADO

Prepared by
1-18-85

DRAWN FAO 7-85
CHECKED 7-85

DICKERSON 8-1-85

ALLIED Bendix Aerospace

LOCATION NO. GJ-02246-F

DWG. NO. 2-8807-

FIGURE 3.2

EXTERIOR SAMPLE LOCATIONS

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

U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION AREA OFFICE, COLORADO

1370 N 20th STREET
GRAND JUNCTION, COLORADO

ALLIED Bendix Aerospace

GJ-02246-RS
I-8807-FI

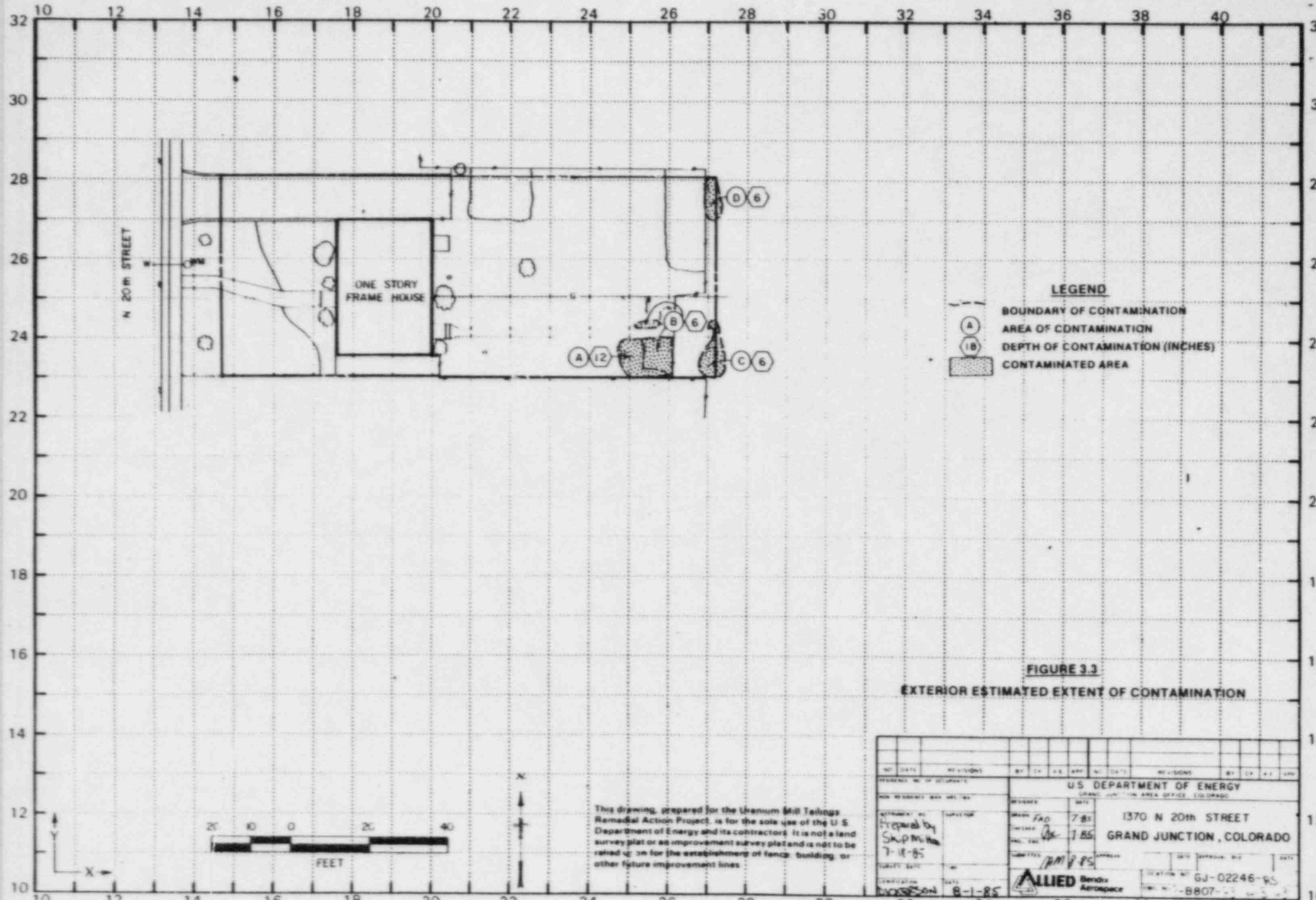


FIGURE 3.3

EXTERIOR ESTIMATED EXTENT OF CONTAMINATION

3/85

DOE ID NO. GJ-02246-RS Date 7-18-85

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

Official Survey Report

Property Address 1370 North 20th Street

Property Owner Charles J. and Irene I. Desrosiers

Address of Owner (if different from above) 2643 F1/2 Road

Report Prepared By Skip Milton

I. PRESENCE/ABSENCE OF RESIDUAL RADIOACTIVE MATERIALS

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

1 XXX 1 Residual ractioactive materials found at the following locations:

1 XXX 1 In open areas.

1 XXX 1 Under or around exterior improvements.

1 ___ 1 Under or around a typically nonoccupied structure.

1 ___ 1 Under or around a typically occupied structure.

II. RESULTS OF RADIOLOGIC ASSESSMENT

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

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

cc:
G. A. Franz, III, GJ/CDH
J. Themelis, Mgr. UMTRA Proj. Off.

HIG = 16 uR/h
HOG = 34 uR/h

MEMORANDUM

ALLIED Bendix
Aerospace

Bendix Field Engineering Corporation
Grand Junction Operations
Grand Junction, Colorado

Date: July 12, 1985

To: Files

From: Skip Milton

Subject: Team Leader Notes - GJ-02246-RS

Address: 1370 North 20th Street

Owner: Charles J. Desrosiers

Weather: Sunny, warm

Team Members

S. Milton (Team Leader)
L. Kula
D. Dow
S. Larsen
H. Lucero
V. Rothman

This property was included as a spillover from the adjacent property. Contamination was located in the southeast corner of the property and in the alley. These areas were investigated with deltas and boreholes.

Foundation exploration was prohibited by permanent surface materials. However, interior and exterior exposure rates near the founation did not indicate contamination.

The contamination in the southeast corner of the property appears to be remanent of a small pile of tailings. A horizontal delta beneath the sidewalk showed no elevated readings.

All team members were frisked before going to another site.

Revisit

Date: July 22, 1985

Team Members

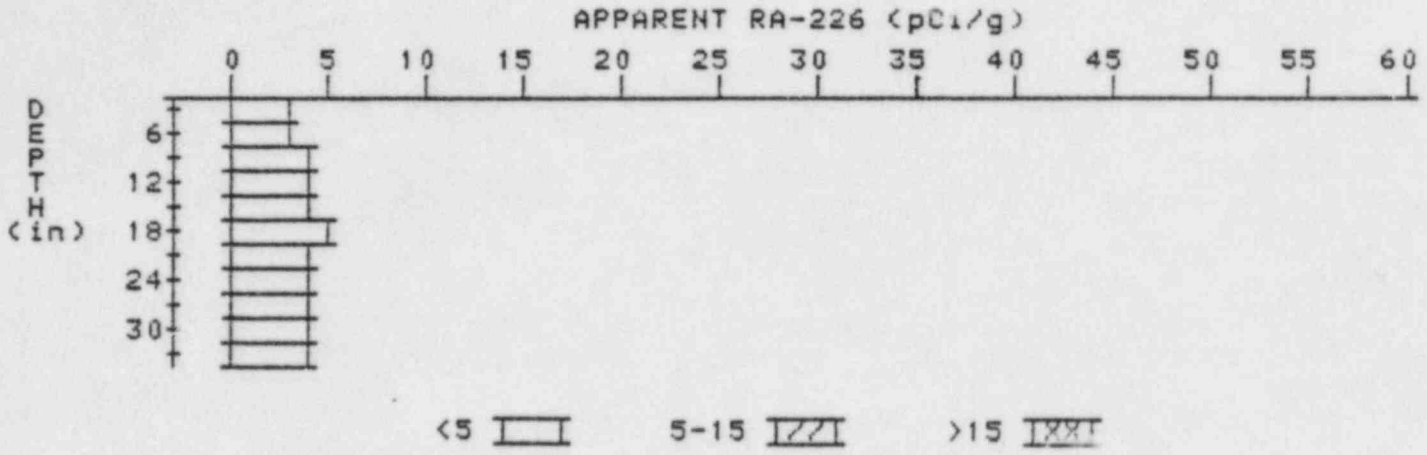
S. Milton
J. Johnson

A borehole was drilled adjacent to the located water line at this property. No contamination was noted.

DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

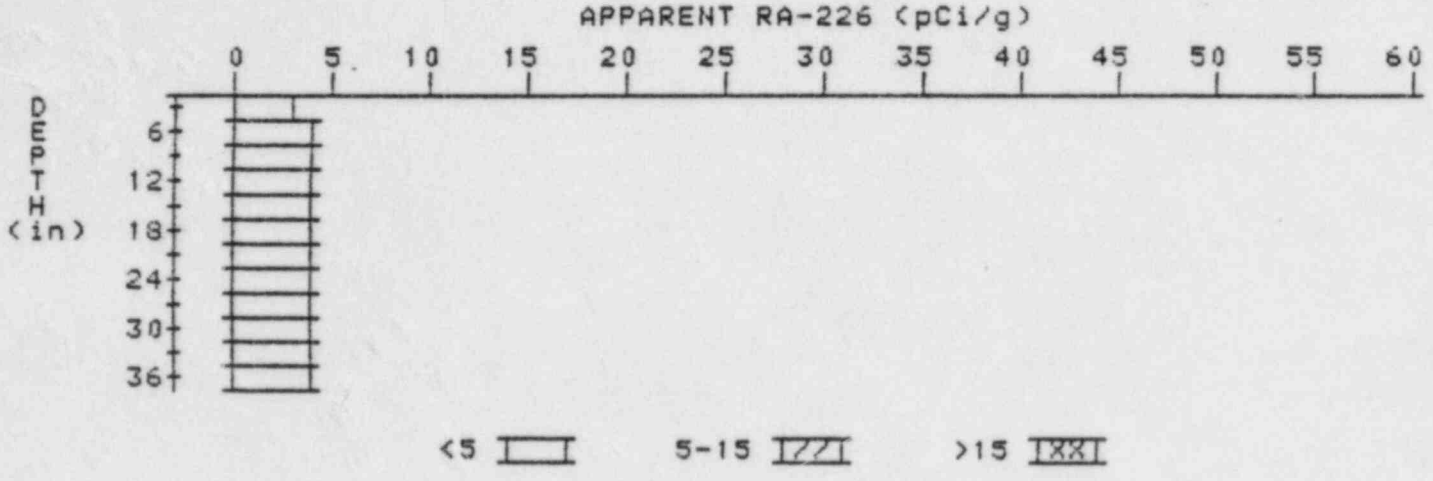
PROPERTY NUMBER: GJ-02246-RS
HOLE NUMBER: 1
LOCATION: 170255



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.1	3.1
6	3.4	3.4
9	3.7	3.9
12	3.9	4.3
15	3.9	3.5
18	4.1	4.6
21	4.0	3.8
24	4.0	4.0
27	4.0	3.8
30	4.1	4.3
33	4.1	4.1

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

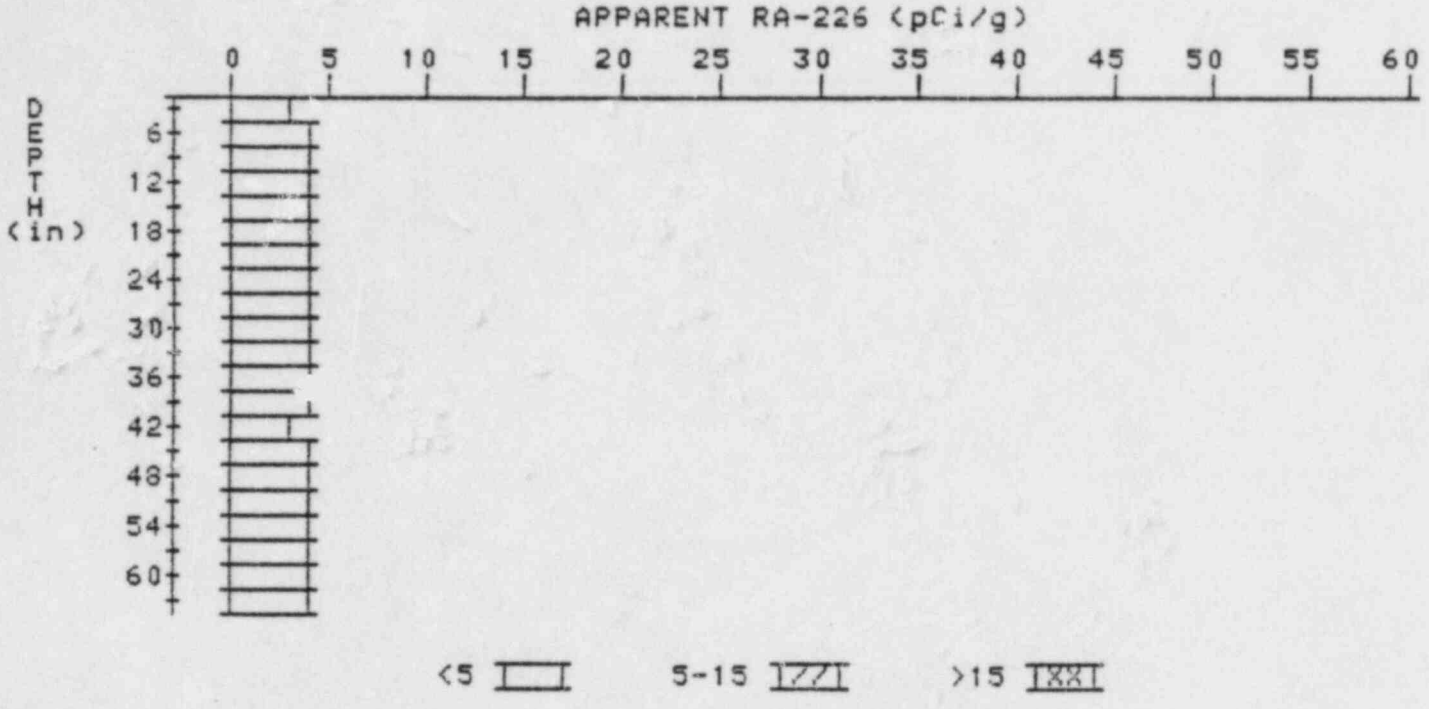
PROPERTY NUMBER: GJ-02246-RS
HOLE NUMBER: 3
LOCATION: 190271



Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.3	3.3
6	3.5	3.5
9	3.7	3.9
12	3.8	4.0
15	3.8	3.8
18	3.8	3.8
21	3.8	3.8
24	3.8	3.8
27	3.8	3.8
30	3.8	3.6
33	3.9	4.3
36	3.8	3.8

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH

PROPERTY NUMBER: GJ-02246-RS
HOLE NUMBER: 5
LOCATION: 220253



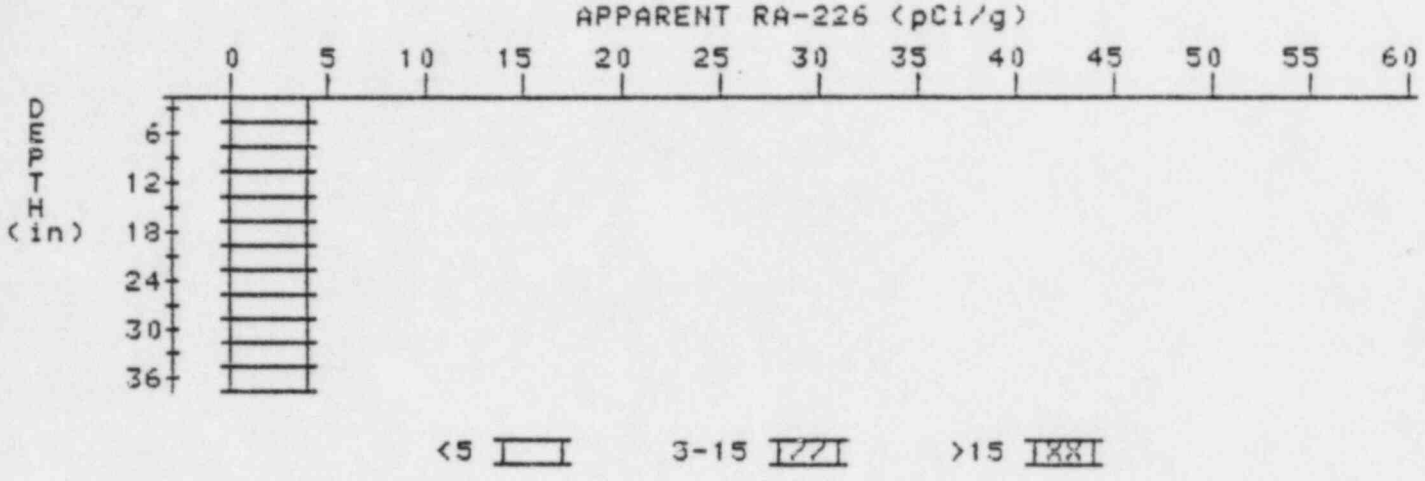
Depth (in)	Apparent Radium-226 (pCi/g) Undeconvolved	Apparent Radium-226 (pCi/g) Deconvolved
3	3.4	3.4
6	3.6	3.6
9	3.8	4.2
12	3.8	3.6
15	3.9	4.1
18	3.9	3.9
21	3.9	3.7
24	4.0	4.4
27	3.9	3.7
30	3.9	3.9
33	3.9	3.9
36	3.9	3.9
39	3.9	4.1
42	3.8	3.4
45	3.9	4.1
48	3.9	3.7
51	4.0	4.2

54	4.0	4.0
57	4.0	4.2
60	3.9	3.7
63	3.9	3.9

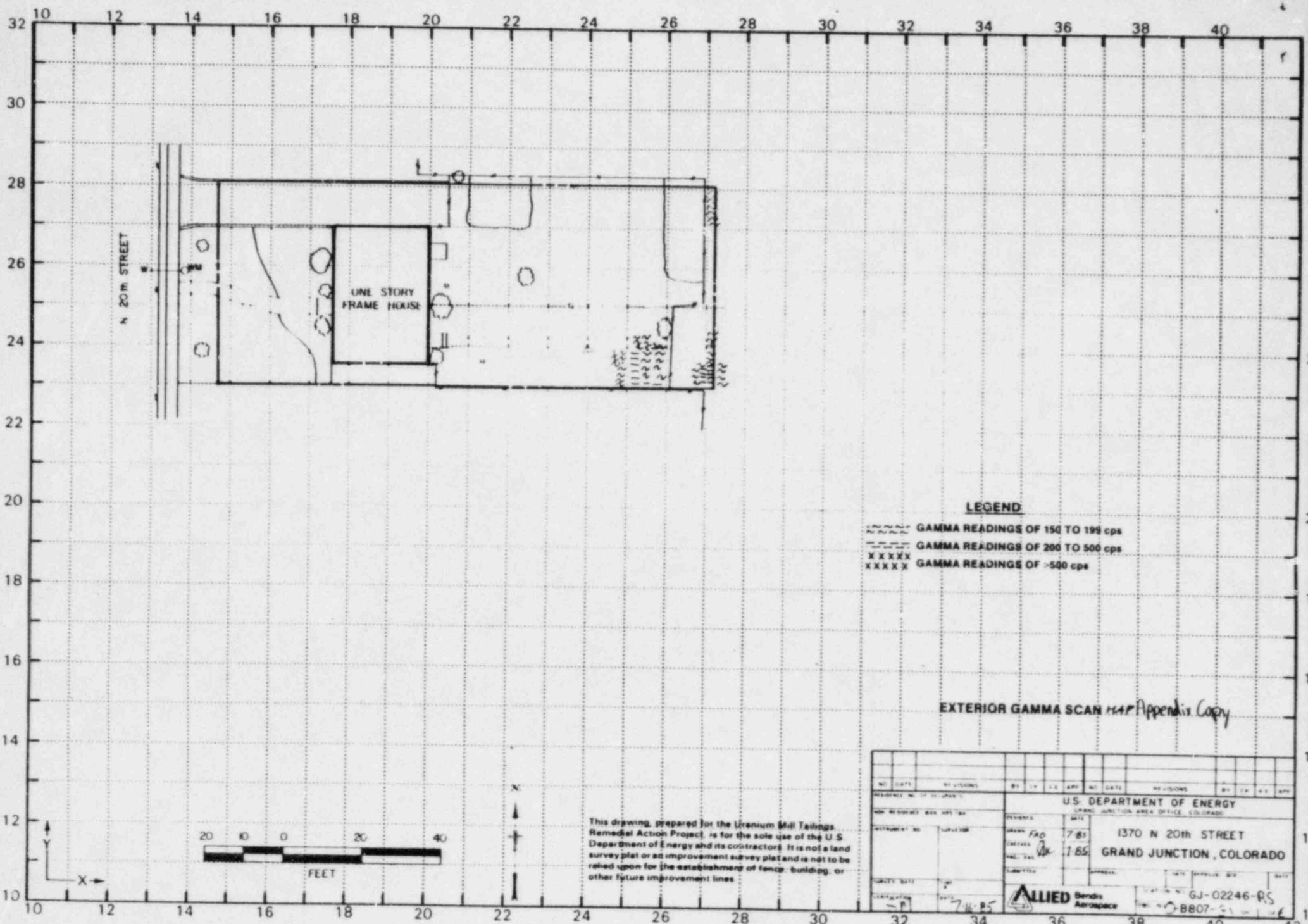
DECON V85.1<850524.0823>

APPARENT RADIUM-226 CONCENTRATION DECONVOLUTION GRAPH 6

PROPERTY NUMBER: GJ-02246-RS
HOLE NUMBER: 6
LOCATION: 240240



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


N 20th STREET
ONE STORY
FRAME HOUSE
LEGEND
GAMMA READINGS OF 150 TO 199 cps
GAMMA READINGS OF 200 TO 500 cps
GAMMA READINGS OF >500 cps
EXTERIOR GAMMA SCAN MAP Appendix Copy
20 10 0 20 40
FEET
Y
X
N
This drawing, prepared for the Uranium Mill Tailings Remedial Action Project, is for the sole use of the U S Department of Energy and its contractors. It is not a land survey plat or as-improvement survey plat and is not to be relied upon for the establishment of fence, building, or other future improvement lines.
U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION AREA OFFICE, COLORADO
1370 N 20th STREET
GRAND JUNCTION, COLORADO
ALLIED Bendix Aerospace
GJ-02246-PS
B807-