DEPARTMENT OF ENERGY
ALBUQUERQUE OPERATIONS OFFICE
CONTRACT NO. DE-AC04-83AL18796

Draft
Radiological and Engineering Assessment

Vicinity Property No. DUR 076

Remedial Actions
Contractor
for the
Uranium Mill Tailings
Remedial Actions
Project

MORRISON
KNUDSEN

Vicinity Property No. DUR 076

DRAFT

THE RADIOLOGICAL AND ENGINEERING ASSESSMENT AND FINAL DESIGN FOR DURANGO PROPERTY

DU-076

March 13, 1985

PREPARED FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

UNITED STATES DEPARTMENT OF ENERGY

PREPARED BY

MORRISON-KNUDSEN COMPANY, INC.

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

Property DU-076 is a residential property located at 390 East 12th Street, Durango, Colorado.

1.2 Evaluation and Recommendation

1.2.1 Residual Radioactive Material Involvement

There is one area of contamination located on this property.

1.2.2 Recommended Remedial Action Option

The recommended option is to remove the contaminated material.

1.2.3 Estimated Costs

The estimated cost for removal of the contaminated material and restoration of the property is $650.00.

1.2.4 Schedule

The estimated duration of the remedial action effort is 5 to 7 days.

2.0 ENGINEERING FIELD SURVEY

2.1 Property Description

2.1.1 Property Use and Occupancy

Property DU-076 is a residential property located at 390 East 12th Street and owned by Donald and Pauline Whalen. The house and apartment building on the property are rental units. The map in Figure 2.1 illustrates the property's vicinity location.

2.1.2 Legal Description

The legal description as recorded with the La Plata County Recorder's Office on Microfilm No. 415275 follows:

Lots 11, 12 and 13, Block 83, City of Durango, La Plata County, Colorado.

2.1.3 Bordering Properties

The lot is zoned R-2, multi-family residential. It is located in a residential area less than 1-1/2 miles northeast of the old Vanadium Corporation of America mill tailings site. The property is bounded on the north by 12th Street; on the east by East Fourth Avenue; on the south by a residence; and on the west by an alley.

2.2 Existing Facilities and Structures

2.2.1 Structures

The primary structure is a two-story apartment with a basement. The secondary structures consist of a detached single family dwelling, a detached two car metal garage, and a free standing metal carport. The apartment and single family dwelling are of wood frame construction with concrete foundations; the garage is constructed of corrugated metal siding on a concrete foundation. Adjacent to the garage is a wood fenced storage area which is the location of the contaminated material. The balance of the property is fully landscaped.

All structures on the property are less than 50 years old and therefore satisfy Stipulation I.a. of the Programmatic Memorandum of Agreement between the DOE, the Colorado State Historic Preservation Officer and the Advisory Council on Historic Preservation.

2.2.2 Utilities

Utilities are serviced to the property as follows:

Electric power - Overhead from the utility pole in the alley.

Telephone - Overhead from the utility pole in the alley.

Water - Underground from Fourth Avenue.

Gas - Underground from the alley.

Sewer - Underground from main in the alley.

2.2.3 Site Plan and Survey Data

See Figure 2.2 for a site plan of the property. Property survey data and photos are presented in Table 2.1 and Figure 2.3.

Table 2.1

PROPERTY SURVEY DATA

GENERAL:

Site Location: Durango

Property Address: 390 East 12th Street

Owner's Name: Donald F. & Pauline S. Whalen Address: 1911 Delwood Avenue

Lot No.: 11, 12, 13 Property Type: Residential-Apartmnt Bldg. & Rental House

Occupancy Group: Adults: N/A Children: N/A

Survey Completed By: R. Livengood/C. Sanders-Meena Date: 5-22-84

Property Description - Exterior:

Dwelling: Sq. Ft.: N/A

Levels: Single story house; two story apartment building

Construction Type: The house is wood framed stucco; the apartment is wood framed stucco

Foundation: The house is on conc. fdn.; Apt is on conc. basemt

Garage: Two car corrugated metal siding; Two car carport between garage and apartment building

Storage Bldg: Prefab: None

Other:

Improvement to Dwellings: Additions: None Porches: Covered conc entry to apartment on north side

Deck: None

Other:

Driveway: Concrete: Small pad on alley in front of garage doors

Gravel: As approach to carport

Sidewalks: Concrete/Paved: As noted on drawing

Other:

Fences/Gates: Wood: 6' high on north side of garage

Other: 30" wire mesh south of carport and north & east of apts.

Table 2.1 (cont'd)

PROPERTY SURVEY DATA

Site Location: Durango

Property Address: 390 East 12th Street

Grounds:
- Lawn: On south side of lot
- Trees: As noted on drawing
- Shrubs: As noted on drawing
- Garden: On terraces; on alley side of single story house
- Grading: 5% downward from east to west; 25% in terraced area
- Other: Scoria rock in NE corner of lot between ret wall & bld

Soil Type:

Existing Survey Plot: Yes

Property Description - Interior: No Interior Contamination

Room	Floor	Walls E	Walls W	Walls N	Walls S	Ceiling	Comments

Utilities:

Heating: Gas: X Electric:

Hot Water: Other:

Air Cond: Gas: Heat Pump:

Table 2.1 (cont'd)

PROPERTY SURVEY DATA

Site Location: Durango

Property Address: 390 East 12th Street

Electric Line Location: As Noted on drawing

Gas Line Location: Underground from alley

Water Line Location: Underground from 4th Avenue main

Sewage Line Location: Underground from main in alley

Telephone Line Location: As noted on drawing

Building Codes and Zoning:

Codes	Local	State	Federal
Building Work	UBC		
Plumbing			
HVAC			
Electrical			
Other			

Zoning District: City of Durango

Present Dwelling Zoning: R-2 Residence District

Setbacks: Front:

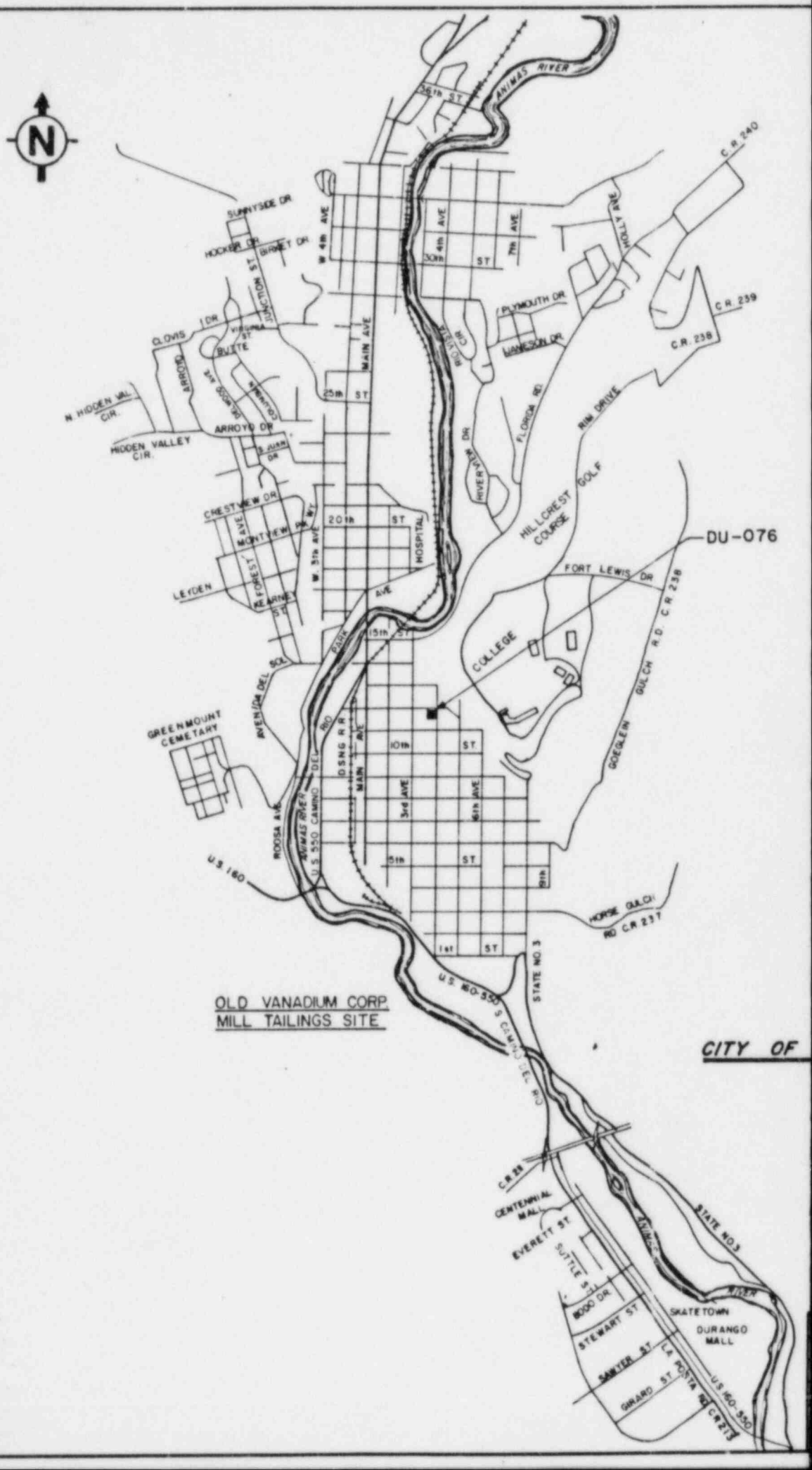
Rear:

Side:

Other:

Photographs:

Roll Frame	Description	Direction
1-6	Garage and Storage Area	Looking East
1-7	Fences Storage Area	Looking West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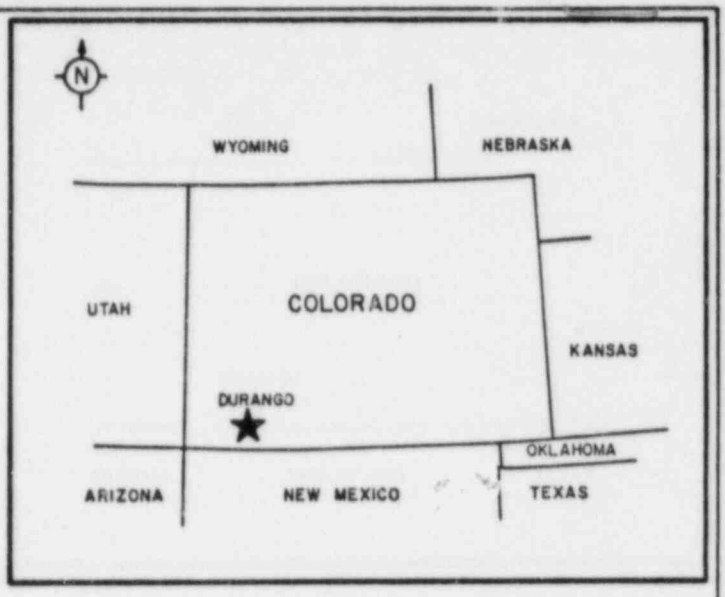
ANIMAS RIVER
36th ST
SUNNYSIDE DR
HOCKER DR
BARNETT DR
W 4th AVE
JUNCTION ST
MAIN AVE
30th ST
4th AVE
7th AVE
MOLLY TOWN AVE
C.R. 240
C.R. 239
C.R. 238
PLYMOUTH DR
LANE SON DR
FLORIDA RD
RIM DRIVE
RIVERVIEW DR
CLOVIS DR
VIRGINIA ST
BUTTE
ARROYO
ARROYO DR
N HIDDEN VAL CIR.
HIDDEN VALLEY CIR.
25th ST
CHESTNUT AVE
CHESTVIEW DR
MOUNTVIEW PK WY
W 3rd AVE
20th ST
HOSPITAL
HILLCREST GOLF COURSE
DU-076
LEYDEN
FOREST
KEARNEY ST
FORT LEWIS DR
15th ST
COLLEGE
GOEGLEIN GULCH RD C.R. 238
AVENIDA DEL SOL
GREENMOUNT CEMETARY
DSNG R.R.
MAIN AVE
10th ST
3rd AVE
10th AVE
ROOSA AVE
U.S. 550 CAMINO DEL RIO
U.S. 160
15th ST
HORSE GULCH RD C.R. 237
1st ST
STATE NO. 3
U.S. 160-550
OLD VANADIUM CORP.
MILL TAILINGS SITE
CITY OF
C.R. 23
CENTENNIAL MALL
EVERETT ST
SUTTLE ST
800 DR.
STEWART ST
SAWYER ST
GIRARD ST
LA PORTA RD C.R. 213
SKATETOWN
DURANGO MALL
U.S. 160-550



DURANGO, COLORADO

B507090442-01

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED	DRAWN
VDL	VDL

CHECKED
REVIEWED
RECOMMENDED

FIGURE 2.1

VICINITY MAP DU-076

DURANGO, COLORADO
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

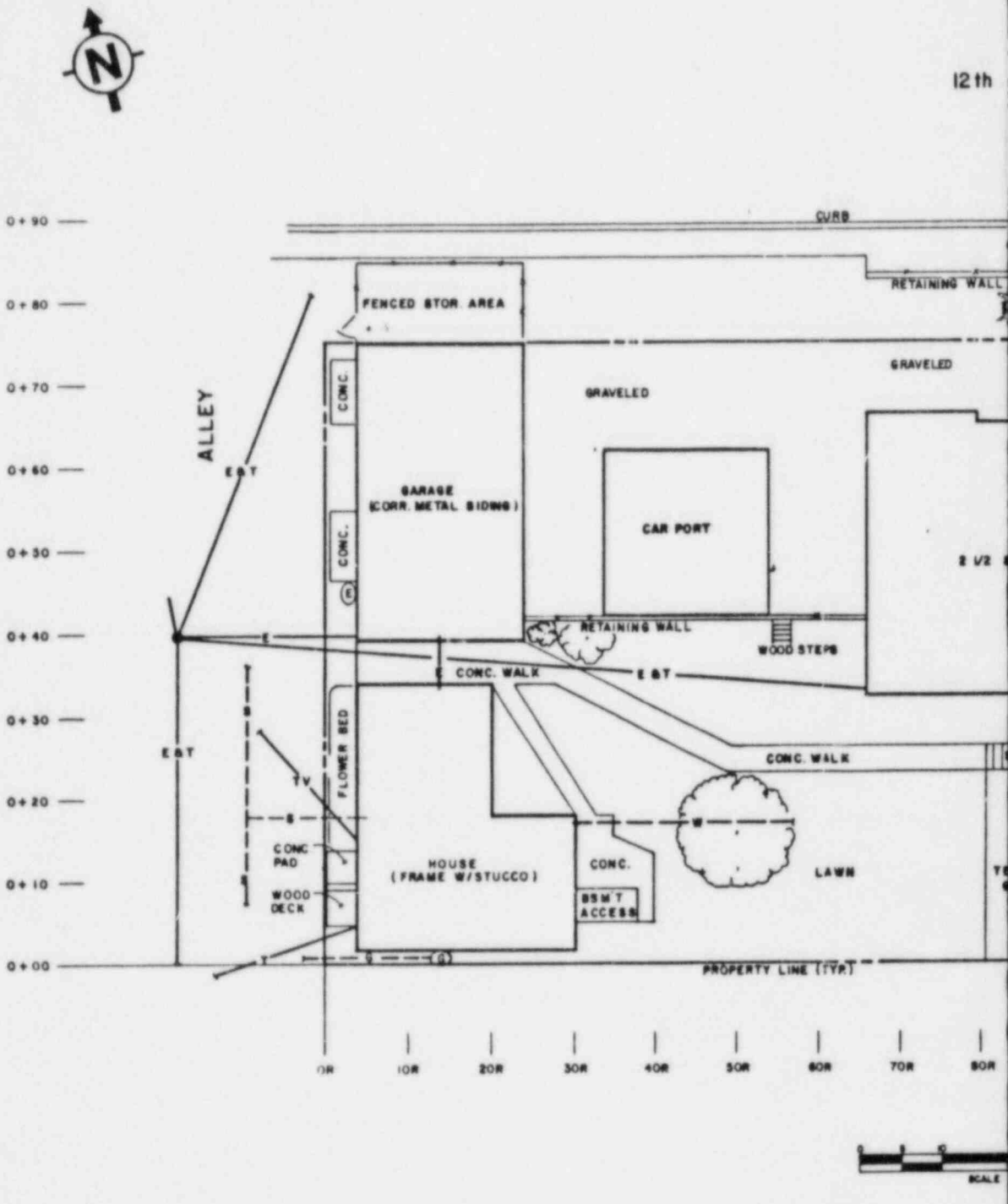
APPROVED	DATE	DOE PROJECT MANAGER	DATE	DOE PROJECT ENGINEER	DATE
NR		NR		NR	

MORRISON KNUDSEN

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. DU-076-005 REV. A

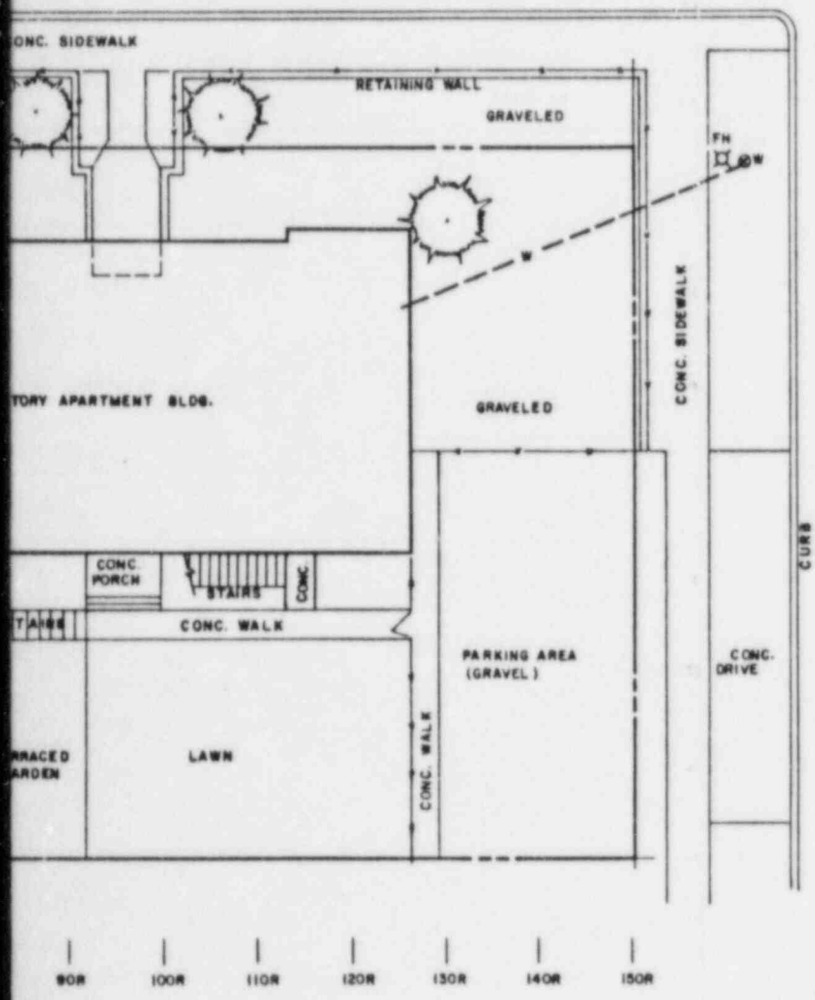
NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROVAL LOE	APPROVAL DH	PROJ ENG	APPROVAL DOE
A	2/3/95	FINAL REA SUBMITTAL	VDL	VCD	VCD		VCD	-


12th
0+90
0+80
0+70
0+60
0+50
0+40
0+30
0+20
0+10
0+00
CURB
RETAINING WALL
FENCED STOR. AREA
GRAVELED
ALLEY
E&T
CONC.
GARAGE
(CORR. METAL SIDING)
CAR PORT
RETAINING WALL
WOOD STEPS
E CONC. WALK
FLOWER BED
CONC. WALK
TV
CONC PAD
WOOD DECK
HOUSE
(FRAME W/STUCCO)
CONC.
BSMT ACCESS
LAWN
PROPERTY LINE (TYP.)
0R
10R
20R
30R
40R
50R
60R
70R
80R
SCALE

LEGEND

—W—	WATER LINE
—G—	GAS LINE
—GM—	GAS MAIN
—S—	SEWER LINE
—SM—	SEWER MAIN
—STM—	STORM SEWER
—E—	ELECTRICAL LINE
—T—	TELEPHONE LINE
—TV—	CABLE TV
— — —	PROPERTY LINE
—x—x—x—	FENCE LINE
G,W or E	METER
G or W	VALVE
	PROPERTY PIN
	POWER POLE

NOTE: OVERHEAD SERVICE DENOTED BY SOLID LINE. UNDERGROUND SERVICE DENOTED BY DASHED LINE.



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NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROVAL LOE	APPROVAL DH	PROJ ENG	APPROVAL DOE
A	[illegible]	FINAL REA SUBMITTAL	VDL	[illegible]	[illegible]	[illegible]	[illegible]	—

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED	DRAWN
VDL	GJW

CHECKED [illegible]
REVIEWED [illegible]
RECOMMENDED [illegible]

FIGURE 2.2
SITE PLAN DU-076
DURANGO, COLORADO
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

APPROVED	DATE	DOE PROJECT MANAGER	DATE	DOE PROJECT ENGINEER	DATE
NR		NR		NR	

MORRISON KNUDSEN

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. DU-076-010 REV. A

Garage and Storage Area Looking East

Fenced Storage Area Looking West

Figure 2.3 Property Photos

3.0 RADIOLOGICAL SURVEY AND ASSESSMENT

3.1 Gamma Exposure Rate Survey

3.1.1 Survey Method

The outdoor contaminated areas identified in the inclusion survey (Results of the Radiological Survey at Property DU-076, ORNL, March 1984) were surveyed in accordance with the RAC UMTRA Procedure 019. The survey was made on a 10' x 10' grid. A surface scan was made of the entire gridded property with a gamma scintillometer to identify the boundary of the contamination. The survey included measurements within one foot of all sides of each structure.

An indoor gamma survey was conducted inside the lower level of the apartment. This survey was not conducted on a grid.

3.1.2 Survey Results

Outdoor surface gamma readings on the property range from 14 to 350 micro R/hr (Table 3.1). This may be compared with the background for the Durango site of 14 micro R/hr. Table 3.1 lists surface gamma readings greater than 15 micro R/hr.

Indoor gamma readings range from 15 to 20 micro R/hr, as listed in Table 2. The maximum levels are in contact with concrete block and brick walls, which contain natural radioactivity.

3.2 Borehole Survey

3.2.1 Survey Method

A gasoline-powered hand auger was used to drill 4-inch diameter holes in and around the regions identified as contaminated during the gamma survey. The holes were surveyed in compliance with the RAC UMTRA Procedure 018. Shovel holes were dug in several locations where the rocky soil prevented augering. These holes were surveyed as nearly as possible in compliance with the RAC Procedure 018.

Auger holes were not placed deliberately near to utility lines or to buildings, since no evidence exists that contamination is near the structures, either from the inclusion survey or from the present survey.

3.2.2 Survey Results

Contamination was found in 2 of the 4 outdoor holes augered. The location and depth of the contamination is described in Table 3.3 and is shown in Figure 3.1. Contamination was also found in one of the 7 shovel holes. Table 4 describes the location and depth of the contamination and of all shovel holes; these holes are shown in Figure 3.1.

3.3. Radon/Radon Daughter Survey

No radon/radon daughter surveys were performed inside buildings at the property, since the inclusion survey reported that no contamination is present in or under the structures. The inclusion survey reported an instantaneous radon daughter measurement in the apartment building of 0.006WL.

3.4. Estimated Extent of Contamination

One area of contamination was identified in the survey. Large rocks prevented drilling deeper than 18 inches; contamination is present at least to that depth.

Table 3.1
OUTDOOR GAMMA SURVEY
Property DU-076

POINT	MICRO R/hr
0+75,00R	17
0+85,00R	20
0+40,40R	16
0+40,60R	16
0+00,80R	16
0+30,90R	16
0+70,90R	16
0+20,100R	17
0+70,100R	16
0+70,110R	17
0+75,110R	16
0+75,120R	16
0+50,130R	16
0+60,130R	16
0+75,130R	16
0+50,150R	16
0+60,150R	16
0+70,150R	16
0+75,150R	16
0+80,05R	350
0+80,15R	17
0+85,10R	17
0+85,20R	19

Table 3.2
INDOOR GAMMA SURVEY
Property DU-076

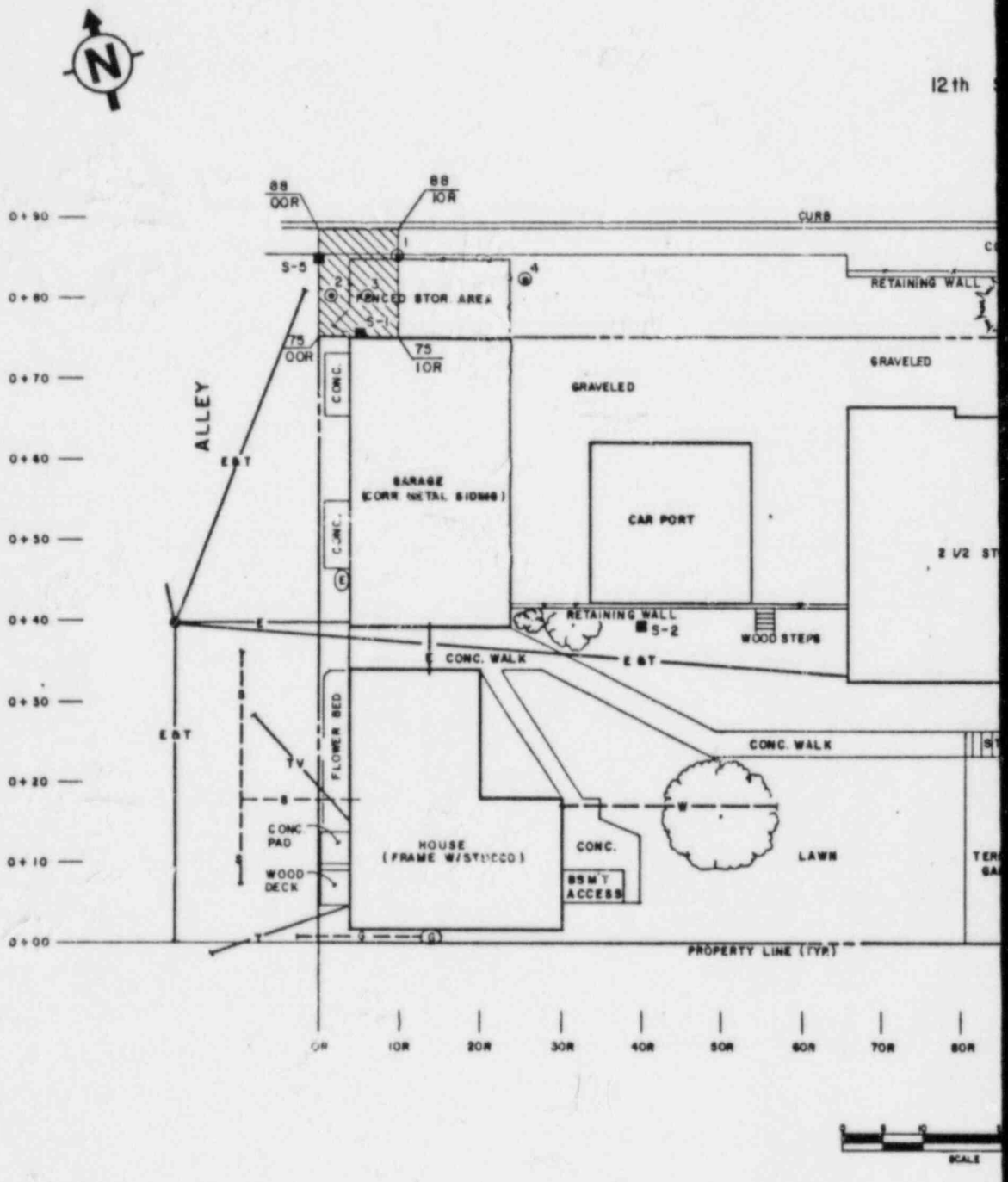
ROOM	LOCATION	MICRO R/hr
Laundry	SE	16
	SW	16
	NE	15
	NW	15
	Center	15
Storage I	SE	19
	NE	19
	SW	17
	Center	18
Sauna	Center	19
	SE	18
Storage II	Center	18
	E	19
Crawl Space	North of entry	17
	Front of entry	17
	South of entry	18
Sauna	Wall - 3 ft.	19
	Wall - 6 ft.	18
Storage II	Wall - 3 ft.	18
	Wall - 6 ft.	20

Table 3.3
BOREHOLE SURVEY
Property DU-076

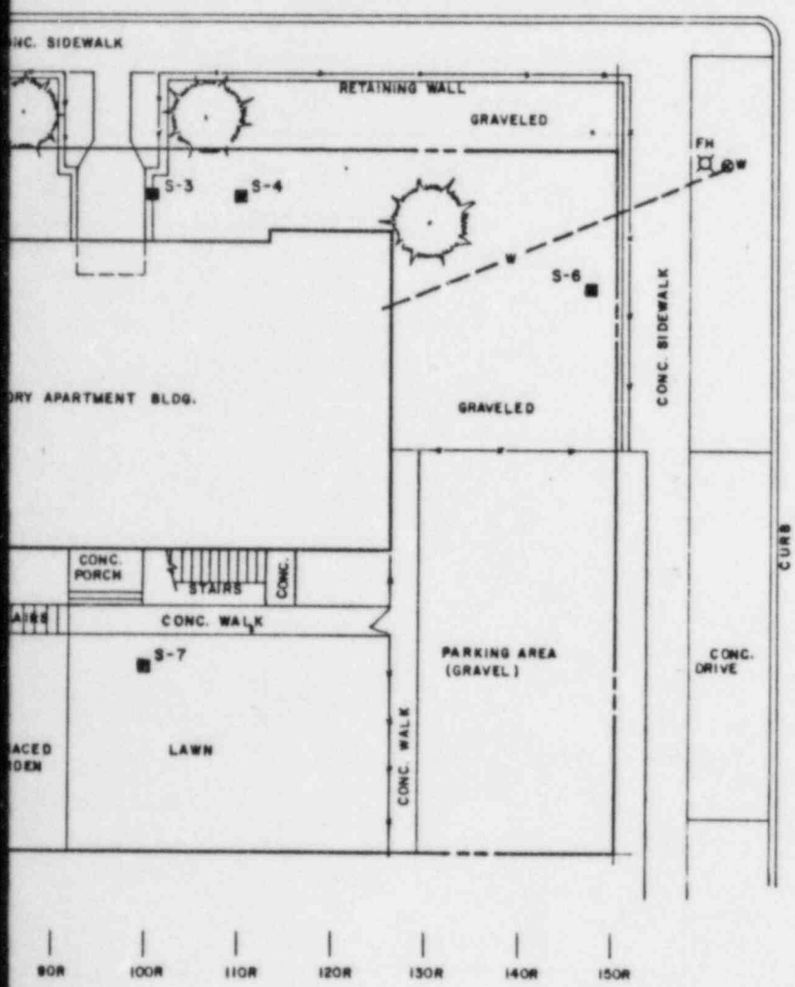
HOLE	LOCATION	CONTAMINATION DEPTH
1	(0+85,10R)	None
2	(0+80,02R)	0-6"
3	(0+80,6R)	0-18"+
4	(0+82,25R)	None

Table 3.4
SHOVEL HOLE SURVEY
Property DU-076

HOLE	LOCATION	CONTAMINATION DEPTH
S-1	(0+76,05R)	0-6"
S-2	(0+40,40R)	None
S-3	(0+70,100R)	None
S-4	(0+70,110R)	None
S-5	(0+85,00R)	None
S-6	(0+60,148R)	None
S-7	(0+20,100R)	None


12th
88
00R
88
10R
CURB
S-5
FENCED STOR AREA
RETAINING WALL
75
00R
75
10R
GRAVELED
GRAVELED
ALLEY
CONC.
EST
GARAGE
(CORR METAL SIDING)
CAR PORT
2 1/2 ST
RETAINING WALL
S-2
WOOD STEPS
E
E CONC. WALK
E&T
FLOWER BED
E&T
CONC. WALK
TV
S
CONC
PAD
WOOD
DECK
HOUSE
(FRAME W/STUCCO)
CONC.
BSMT
ACCESS
LAWN
PROPERTY LINE (TYP.)
0+90
0+80
0+70
0+60
0+50
0+40
0+30
0+20
0+10
0+00
0R
10R
20R
30R
40R
50R
60R
70R
80R
SCALE

STREET



LEGEND

$\odot^{2}$ AUGER HOLE DESIGNATION

$\blacksquare^{S-2}$ SHOVEL HOLE DESIGNATION

ESTIMATED DEPTH OF CONTAMINATION

18"

8507090442-03

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED	DRAWN
VDL	GJW
CHECKED	
REVIEWED	
RECOMMENDED	

FIGURE 3.1

RADIOLOGICAL SURVEY DATA DU-076

DURANGO, COLORADO
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

APPROVED	DATE	DOE PROJECT MANAGER	DATE	DOE PROJECT ENGINEER	DATE
NR		NR		NR	

MORRISON KNUDSEN

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. DU-076-015 REV. A

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROVAL LOE	APPROVAL DH	PROJ ENG	APPROVAL DOE
A	[illegible]	FINAL REA SUBMITTAL	VDL					

4.0 ENGINEERING ASSESSMENT

Engineering options were formulated and evaluated based on the radiological and engineering assessment for this property. Factors forming the basis of the evaluation were: the extent and location of the contamination, construction costs, and required demolition and constructibility for the various options. Results of the evaluation are detailed below.

4.1 Evaluation of Options

4.1.1 Options

Two options were evaluated for property DU-076:

Option 1 - No action should be taken.

Option 2 - Complete decontamination of the property including retrieval of the contaminated material and restoration of the property.

Contamination of this property is localized in the northwest corner of the property adjacent to the garage and is approximately eighteen to thirty inches in depth.

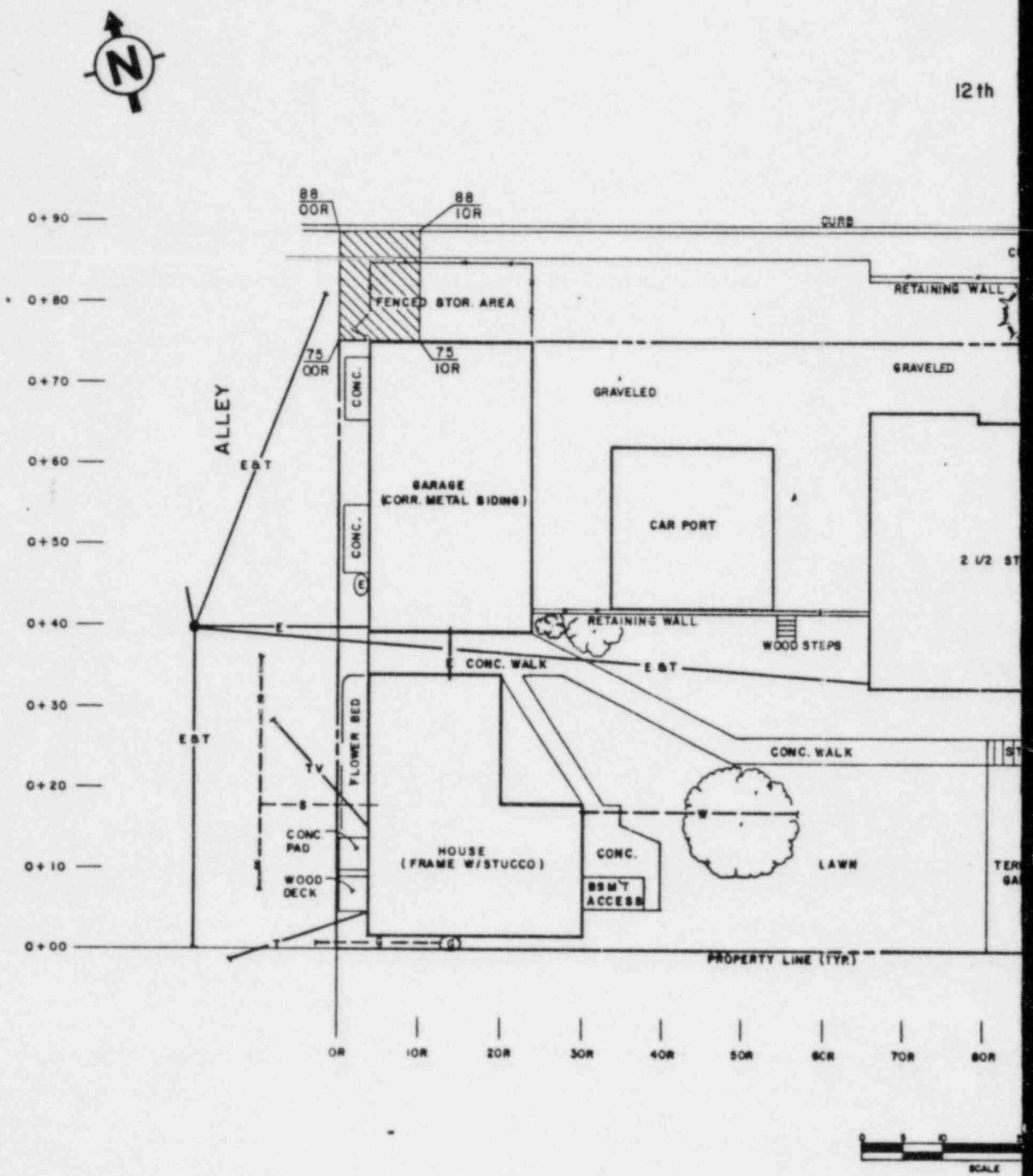
The remedial action for this property consists of the removal and salvage of the wooden fence, excavating the contaminated area to a depth of eighteen inches. Resurvey the area and excavate in six inch increments until the limits of contamination have been reached. Replace excavated material with clean backfill, reinstall wooden fence and clean up area.

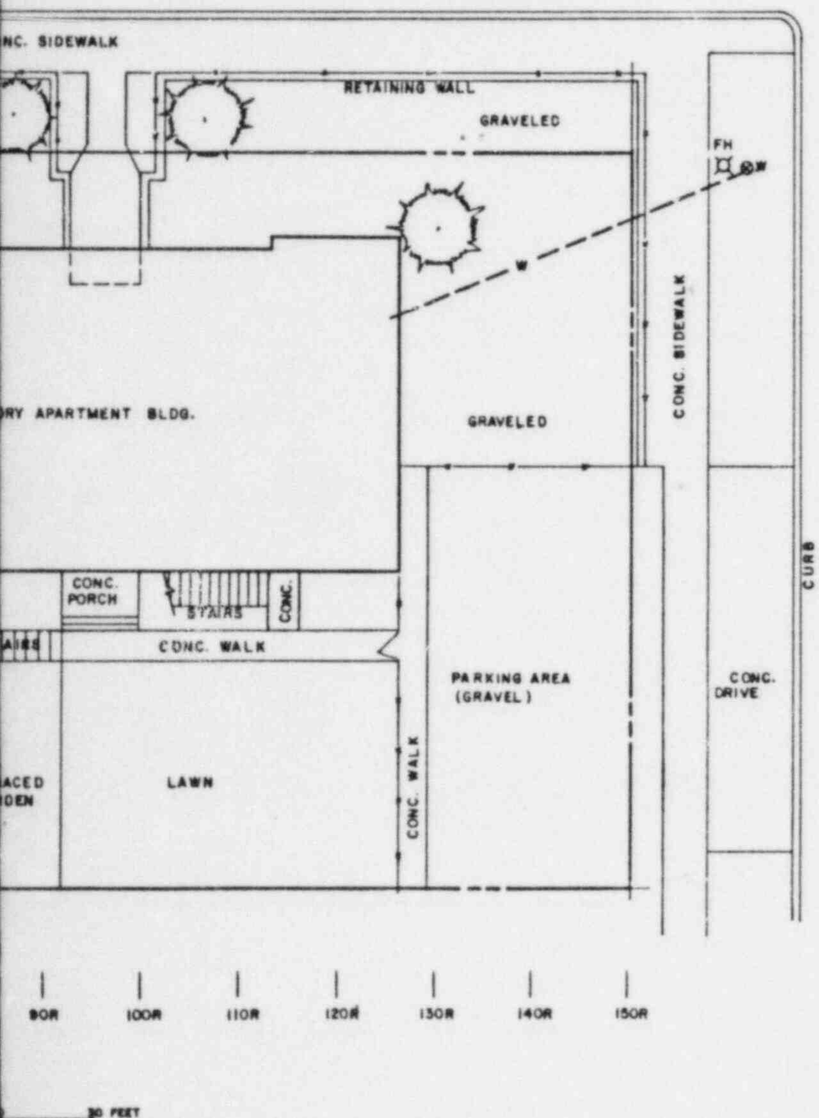
4.1.2 Costs

Estimated costs for the activities associated with Option 2 are detailed in Table 4.1. Costs include labor, insurance, material, equipment, supplies, overhead, profit, and contingency. All costs are listed in 1985 dollars. It is anticipated that the time required for the subcontractor to complete the work will be 5 to 7 days.

4.2 Recommendation

The limited cost and amount of remedial action work precluded evaluating any more than these two options. The results of the radiological assessment concluded that contamination levels on the property exceeded EPA guidelines. Therefore, based on these guidelines, it is recommended that Option 2, decontamination of the property, be pursued. The total estimated cost for Option 2 is $650.00.


12th
88
00R
88
10R
CURB
0+90
0+80
0+70
0+60
0+50
0+40
0+30
0+20
0+10
0+00
FENCED STOR. AREA
RETAINING WALL
75
00R
75
10R
CONC.
GRAVELED
ALLEY
E&T
GARAGE
(CORR. METAL SIDING)
CAR PORT
2 1/2 ST
RETAINING WALL
WOOD STEPS
E
CONC. WALK
E&T
FLOWER BED
TV
S
CONC. WALK
CONC.
PAD
WOOD
DECK
HOUSE
(FRAME W/STUCCO)
CONC.
BSMT
ACCESS
LAWN
W
PROPERTY LINE (TYP.)
0R
10R
20R
30R
40R
50R
60R
70R
80R
SCALE



LEGEND

——W——	WATER LINE
——G——	GAS LINE
——GM——	GAS MAIN
——S——	SEWER LINE
——SM——	SEWER MAIN
——STM——	STORM SEWER
——E——	ELECTRICAL LINE
——T——	TELEPHONE LINE
——TV——	CABLE TV
—— — — ——	PROPERTY LINE
——x——x——x——	FENCE LINE
G, W or E	METER
G or W	VALVE
	PROPERTY PIN
	POWER POLE

NOTE: OVERHEAD SERVICE DENOTED BY SOLID LINE. UNDERGROUND SERVICE DENOTED BY DASHED LINE.

NOTES:

1. THE LATEST REVISION OF THE FOLLOWING TECHNICAL SPECIFICATIONS APPLY TO THE REMEDIAL ACTION WORK REQUIRED FOR PROPERTY NO. DU-076.

   SECTION 02110
   CLEARING AND GRUBBING

   SECTION 02130
   CONTAMINATED MATERIAL REMOVAL

   SECTION 02200
   EXCAVATION AND BACKFILL

2. UTILITY LOCATIONS ARE FOR REFERENCE ONLY. ACTUAL LOCATIONS SHALL BE DETERMINED BY THE SUBCONTRACTOR PRIOR TO START OF CONSTRUCTION.

3. THE EXCAVATION LIMITS AND DEPTHS ARE BASED ON A LIMITED NUMBER OF BORINGS TAKEN DURING THE RADIOLOGICAL SURVEY OF THS PROPERTY. ADDITIONAL RADIOLOGICAL SURVEYS PERFORMED DURING REMEDIAL ACTION MAY REQUIRE MORE OR LESS EXCAVATION TO BE TAKEN FROM THE DESIGNATED AREAS. ALL CHANGES TO THE LIMITS AND DEPTHS OF EXCAVATION AS SHOWN ON THE DESIGN DRAWINGS SHALL BE AS DIRECTED BY THE CONTRACTOR'S REPRESENTATIVE.

SCOPE OF WORK:

- REMOVE AND SALVAGE WOOD FENCE.
- EXCAVATE AREA "A" TO A DEPTH OF 18 INCHES. CONTRACTOR'S REPRESENTATIVE TO RESURVEY. IF FURTHER CONTAMINATION EXISTS, EXCAVATE IN 6 INCH INCREMENTS AS DIRECTED BY CONTRACTOR'S REPRESENTATIVE.
- BACKFILL WITH COMMON FILL AND REGRADE TO ORIGINAL GRADE.
- SET FENCE POST IN CONCRETE AND REINSTALL WOOD FENCE.

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

DESIGNED VDL | DRAWN GJW
CHECKED V De Vane
REVISED
RECOMMENDED
APPROVED NR | DATE | DOE PROJECT MANAGER NR | DATE | DOE PROJECT ENGINEER NR | DATE

FIGURE 4.1

EXCAVATION & RESTORATION PLAN DU-076

DURANGO, COLORADO

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

MORRISON KNUDSEN

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. DU-076-020 | REV. A

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPRVL LDE	APPRVL DH	PROJ ENG	APPRVL DOE
A	5/30/85	FINAL REA SUBMITTAL	VDL	VeD	VeD	Jh	VeD	—

Table 4.1
OPTION 2 COSTS

Activity	Unit Price	Quantity	Estimated Cost
Decontamination			
Remove and Salvage Fence	2.75	20 lf	55.00
Excavation (machine)	8.30	14 cy	116.20
Restoration			
Backfill	7.20	14 cy	100.80
Re-install Fence	8.20	20 lf	164.00
Subtotal			436.00
5% Contractor Contingency			21.80
20% Contractor Overhead & Profit			87.20
Subtotal			545.00
15% Contingency			81.75
Total (Rounded)			650.00

5.0 TECHNICAL SPECIFICATIONS

Technical specifications applicable to this property are indexed in Table 5.1 . Specifications previously approved by the Department of Energy (DOE) are noted in the table. Also listed are specifications not previously submitted to the DOE which require approval. The text for these additional specifications follow the table.

Table 5.1
INDEX OF TECHNICAL SPECIFICATIONS

Description		Specifications Previously Approved	Specifications Requiring DOE Approval
Division 2 - Site Work			
SECTION 02110	CLEARING AND GRUBBING	X	
SECTION 02130	CONTAMINATED MATERIAL REMOVAL	X	
SECTION 02200	EXCAVATION AND BACKFILL	X	

6.0 CONSTRUCTION DRAWINGS

Listed below is an index of the construction drawings required for remedial action on this property.

Drawing Number	Drawing Title
DU-076-020	Excavation & Restoration Plan DU-076

APPENDIX A

SURVEY DATA LOGS

MORRISON KNUDSEN

OUTDOOR GAMMA SCREENING
SURVEY DATA SHEET

LOGGING CREW: E. COLICH
L. BENALLY, JR.
E. SCHULTZ

SHEET 1 OF 3 PAGE 1

DATE: JUNE 27, 1984

PROPERTY ID: DU-076

INSTRUMENT ID NO.: Ludlum 2220 # 319172 w/ 4410 # 16527

BACKGROUND CALCULATION:

#1 _____ + #2 _____ + #3 _____ = _____ ÷ 3 = 11,500 COUNTS/.1MIN

AREA:		AREA:		AREA:		AREA:	
POINT ID	READING COUNTS/.1MIN	POINT ID	READING COUNTS/.1MIN	POINT ID	READING COUNTS/.1MIN	POINT ID	READING COUNTS/.1MIN
0+60+60R	13410 / 12800	0+60+40R	13060 / 11370	0+00+70R	13870 / 12230	0+30+100L	11810 / 11170
0+10+60R	12640 / 12090	0+70+40R	13450 / 13150	0+10+70R	13900 / 12080	0+70+100R	18700 / 12500
0+20+60R	13110 / 12606	0+75+40R	13100 / 13290	0+20+70R	14340 / 13170	0+75+100R	15860 / 14390
0+30+60R	12870 / 11920	0+85+40R	14340 / 14260	0+30+70R	15500 / 14320	0+85+100R	13340 / 12420
0+40+60R	12740 / 11030	0+00+50R	13080 / 12770	0+70+70R	15480 / 13070	0+00+110R	13680 / 13120
0+50+60R	13280 / 12710	0+10+50R	13910 / 12600	0+75+70R	13610 / 12940	0+10+110R	13420 / 12080
0+60+60R	13630 / 13190	0+20+50R	13530 / 12150	0+85+70R	14010 / 12330	0+20+110R	13110 / 12830
0+70+60R	14930 / 24010	0+30+50R	14510 / 13450	0+00+80R	16010 / 16000	0+30+110R	14810 / 12680
0+75+60R	19490 / 51500	0+40+50R	15220 / 12560	0+10+80R	14160 / 12300	0+70+110R	26020 / 14590
0+85+60R	31280 / 65400	0+50+50R	13230 / 12100	0+20+80R	13760 / 13890	0+75+110R	18760 / 14980
0+20+30R	13780 / 12350	0+60+50R	13270 / 12700	0+30+80R	13390 / 13730	0+85+110R	13240 / 12370
0+30+30R	14050 / 12450	0+70+50R	13910 / 13650	0+70+80R	15850 / 14480	0+00+120R	15080 / 13100
0+40+30R	15680 / 13780	0+75+50R	13300 / 13830	0+75+80R	15190 / 13850	0+10+120R	14380 / 12060
0+50+30R	12140 / 14630	0+85+50R	13930 / 12820	0+85+80R	13160 / 11870	0+20+120R	13380 / 12460
0+60+30R	12490 / 12090	0+00+60R	15410 / 15560	0+00+90R	15070 / 13450	0+30+120R	13680 / 12050
0+70+30R	14250 / 14910	0+10+60R	15540 / 12680	0+10+90R	15410 / 18380	0+70+120R	15250 / 18920
0+75+30R	14790 / 15580	0+20+60R	13680 / 14030	0+20+90R	14510 / 12710	0+75+120R	16710 / 15080
0+85+30R	14650 / 17780	0+30+60R	14030 / 13940	0+30+90R	16600 / 15590	0+00+130R	14210 / 12790
0+00+40R	13220 / 13490	0+40+60R	16700 / 13560	0+70+90R	17450 / 15110	0+10+130R	12580 / 12350
0+10+40R	13260 / 11790	0+50+60R	13770 / 12100	0+75+90R	15640 / 14830	0+20+130R	15130 / 11620
0+20+40R	12930 / 12880	0+60+60R	13640 / 11470	0+85+90R	13250 / 14820	0+30+130R	13420 / 11800
0+30+40R	12070 / 12590	0+70+60R	13100 / 13370	0+00+100L	15710 / 12140	0+40+130R	13550 / 12880
0+40+40R	17000 / 12760	0+75+60R	14490 / 13550	0+10+100R	13110 / 12350	0+50+130R	17880 / 14810
0+50+40R	12630 / 9990	0+85+60R	14280 / 13200	0+20+100R	18930 / 12720	0+60+130R	17370 / 16030

REMARKS: ALL MEASUREMENTS ARE IN COUNTS PER MINUTE (CPM)
TOP- ARE CONTACT MEASUREMENTS
BOTTOM- MEASUREMENTS TAKEN 1 METER ABOVE GROUND LEVEL.

L. BENALLY, JR.

VP-044

MORRISON KNUDSEN

OUTDOOR GAMMA SCREENING
SURVEY DATA SHEET

LOGGING CREW: E. Couch
L. Benally, Jr.
E. Schultz

SHEET 2 OF 3 PAGE 2

DATE: June 27, 1984

PROPERTY ID: DLI-076

INSTRUMENT ID NO.: Ludlum 2220 #31972 w/ 4410 #16527

BACKGROUND CALCULATION:

#1 _____ + #2 _____ + #3 _____ = _____ ÷3 = 11,500 COUNTS/.1MIN

AREA:		AREA:		AREA:		AREA:	
POINT ID	READING COUNTS/.1MIN	POINT ID	READING COUNTS/.1MIN	POINT ID	READING COUNTS/.1MIN	POINT ID	READING COUNTS/.1MIN
0+70+130R	13920 / 15480	0+80+105R	78750 / 31020				
0+75+130R	17050 / 16210	0+80+15R	19230 / 38040				
0+85+130R	13030 / 12560	0+85+10R	20660 / 46750				
0+00+140R	14280 / 12660	0+85+20R	28130 / 40590				
0+10+140R	12310 / 11870						
0+20+140R	12090 / 10410	0+85+120R	12760 / 12720				
0+30+140R	12900 / 11520						
0+40+140R	14260 / 14320						
0+50+140R	16220 / 12240						
0+60+140R	15150 / 14060						
0+70+140R	15300 / 14820						
0+75+140R	16400 / 15270						
0+85+140R	13040 / 13030						
0+00+150R	13350 / 12300						
0+10+150R	13440 / 12480						
0+20+150R	13610 / 12740						
0+30+150R	13950 / 12190						
0+40+150R	14080 / 12770						
0+50+150R	17220 / 13910						
0+60+150R	18030 / 14260						
0+70+150R	17420 / 13950						
0+75+150R	18000 / 13850						
0+85+150R	15260 / 12390						
0+85+160R	13690 / 11870						

REMARKS: ALL MEASUREMENTS ARE IN COUNTS PER MINUTE (CPM)
TOP- ARE ALL CONTACT MEASUREMENTS
BOTTOM- MEASUREMENTS TAKEN 1 METER ABOVE GROUND LEVEL.
L. BENALLY, JR.

VP-04A

MORRISON KNUDSEN

BOREHOLE LOG

LOGGING CREW: E. CZICH, L. BENALLY, JR., E. SCHULTZ

SHEET 3 OF 3 PAGE 3

DATE: JUNE 27, 1984

PROPERTY ID: DH-076

INSTRUMENT ID NO. Ludlum 2220 # 31982 #/440 # 16528

AREA: DURANGO, COLORADO

NOTES: 1. ALL HOLES ARE 4"DIA. UNLESS OTHERWISE NOTED.
2. RECORD UNUSUAL CONDITIONS, SUCH AS THE PRESENCE OF WATER IN BOREHOLES AND DEPTH, CASING TYPE AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC., IN THE REMARKS SECTION.

(1)		(2)		(3)		(4)	
HOLE ID: 0185+10R		HOLE ID: 0180+02R		HOLE ID: 0180+16R		HOLE ID: 0182+25R	
TIME DRILLED:		TIME DRILLED:		TIME DRILLED:		TIME DRILLED:	
TIME LOGGED:		TIME LOGGED:		TIME LOGGED:		TIME LOGGED:	
SOIL TYPE:		SOIL TYPE:		SOIL TYPE:		SOIL TYPE:	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE		SURFACE		SURFACE	
0"	39400	0"	72330	0"	1483680	0"	17150
6"	26210	6"	27550	6"	1513560	6"	17700
12"	21360	12"	21070	12"	1294650	12"	20020
18"	20630	18"	22620	18"	726390	18"	20080
24" 22"	20780	24" 22"	21210	24"		24" 22"	20530
30"		30"		30"	Area =	30"	
36"		36"		36"	3' square	36"	
42"		42"		42"	encountered	42"	
48"		48"		48"	Yellow Cake!	48"	
54"		54"		54"		54"	
60"		60"		60"		60"	
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

REMARKS: BACKGROUND MEASUREMENT 23,000 CPM
ALL MEASUREMENTS ARE IN COUNTS PER MINUTE (CPM)
ALL HOLES WERE DRILLED UNTIL LARGE ROCKS WERE ENCOUNTERED AND PREVENTED FURTHER DRILLING.

MORRISON KNUDSEN

BOREHOLE LOG

Supplemental Data

LOGGING CREW: Ernest Couch
Edward Schultz
Julius Bitsilly

INSTRUMENT ID NO. WD2220 #3982 / 440 #16528

SHEET 1 OF 3 PAGE 1

DATE: October 16, 1984

PROPERTY ID: DU 076

AREA: Durango, Colorado

NOTES: 1. ALL HOLES ARE 4"DIA. UNLESS OTHERWISE NOTED.
2. RECORD UNUSUAL CONDITIONS, SUCH AS THE PRESENCE OF WATER IN BOREHOLES AND DEPTH, CASING TYPE AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC. IN THE REMARKS SECTION.

①		②		③		④	
HOLE ID: 0+76+5R		HOLE ID: 0+40+40R		HOLE ID: 0+70+100R		HOLE ID: 0+70+110R	
TIME DRILLED:		TIME DRILLED:		TIME DRILLED:		TIME DRILLED:	
TIME LOGGED:		TIME LOGGED:		TIME LOGGED:		TIME LOGGED:	
SOIL TYPE:		SOIL TYPE:		SOIL TYPE:		SOIL TYPE:	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE	17000	SURFACE	18700	SURFACE	20200
0"	60980	0"	14830	0"	14690	0"	16310
6"	34410	6"	17470	6"	16530	6"	17800
12"	23380	~~12"~~ 11	19000	12"	18390	12"	20270
~~18"~~ 16	20000	18"		18"		18"	
24"		24"		24"		24"	
30"		30"		30"		30"	
36"		36"		36"		36"	
42"		42"		42"		42"	
48"		48"		48"		48"	
54"		54"		54"		54"	
60"		60"		60"		60"	
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

REMARKS: Shovel Holes, shallow holes are due to rocky soil encountered. Background is 23000 cpm, all counts in CPM.

MORRISON KNUDSEN

INTERIOR SURVEY DATA LOG/HOT SPOT Supplemental Data

SURVEY CREW Ernest Couch
Edward Schultz
Julius Bitzilly

SHEET 2 OF 3 PAGE 2
DATE October 18, 1984
PROPERTY ID # DV-076
PROJECT

GAMMA SCINTLLATOR HOT SPOT DATA

2220 INSTRUMENT ID # #31785/4410 #16529 uR/h CONVERSION CURVE # _____ (ATTACHED)

NOTES: 1) RECORD SPOT ID LOCATIONS ON INTERIOR SURVEY SKETCH AND ATTACH COPY.
2) INCLUDE DISCUSSION OF ANOMALIES, SUGGESTIONS, OBSERVATIONS, MATERIAL SAMPLES, INFORMATION, SOURCES OF NATURAL RADIOACTIVITY, ETC., IN COMMENTS.

WALL 3'/6'

HOT SPOT ID #	COUNTS /0.1MIN	RATE uR/h
LOCATION: Laundry Room		
SE	15520/15570	16
SW	14540/13010	16
NE	13110/10770	15
NW	12940/11080	15
C	13590/10650	15
LOCATION: Storage Room W+LL 3'/6'		
C	21070/22480	18
E	24260/24840	25340/23670
	19	20/19
LOCATION:		

HOT SPOT ID #	COUNTS /0.1MIN	RATE uR/h
LOCATION: Storage Room		
SE	22270/22470	19
NE	22000/23710	17
SW	18810/16810	17
C	20000/1887	18
LOCATION: Sm Crawl Space		
N. of Entry	17400	17
Front of Entry	17730	17
S. of Entry	20250	18
all contact readings		
LOCATION:		

HOT SPOT ID #	COUNTS /0.1MIN	RATE uR/h
LOCATION: Sauna		
C	22220/22080	19
E		
E. WALL	19/18	24280/21870
LOCATION:		
LOCATION:		

COMMENTS: 3' and 6' reading were taken on walls in Sauna & Storage Rooms. Top readings are contact, lower readings are 1 meter distance, background is 11500, all counts in CPM. Note walls are concrete and brick which would account for the elevated readings

VP.028

MORRISON KNUDSEN

BOREHOLE LOG

Supplemental Data

LOGGING CREW: Ernest Couch
Edward Schultz
Julius Bitulli

INSTRUMENT ID NO. ESP 2220 #71982 / 44-10 #16528

SHEET 3 OF 3 PAGE 3

DATE: October 18, 1984

PROPERTY ID: DU-076

AREA: Durango, Colorado

NOTES: 1. ALL HOLES ARE 4"DIA. UNLESS OTHERWISE NOTED.
2. RECORD UNUSUAL CONDITIONS, SUCH AS THE PRESENCE OF WATER IN BOREHOLES AND DEPTH, CASING TYPE AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC., IN THE REMARKS SECTION.

(5) HOLE ID: 0+85+66R		(6) HOLE ID: 0+60+148R		(7) HOLE ID: 0+26+10R		HOLE ID:	
TIME DRILLED:		TIME DRILLED:		TIME DRILLED:		TIME DRILLED:	
TIME LOGGED:		TIME LOGGED:		TIME LOGGED:		TIME LOGGED:	
SOIL TYPE:		SOIL TYPE:		SOIL TYPE:		SOIL TYPE:	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE	16750	SURFACE		SURFACE	
0"	27670	0"	16380	0"	13250	0"	
6"	19360	6"	19070	6"	15920	6"	
~~12~~ 9	20170	12"	21160	12"	18990	12"	
18"		18"		18"		18"	
24"	TD	24"		24"		24"	
30"		30"		30"		30"	
36"		36"		36"		36"	
42"		42"		42"		42"	
48"		48"		48"		48"	
54"		54"		54"		54"	
60"		60"		60"		60"	
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"			
96"		96"		96"		96"	

REMARKS: Shovel Holes, shallow holes are due to rocky soil encountered, background is 23000 cpm, all counts in CPM.

MORRISON KNUDSEN

DOCUMENT TRANSMITTAL

MORRISON-KNUDSEN Co., Inc.
P.O. BOX 9136
ALBUQUERQUE, NEW MEXICO 87119

WM DOCKET CONTROL CENTER

'85 MAR 18 P3:56

Trans. No. MK-3050-DUR-0037c

Contract No. 3050

PROJECT: UMTRA
CLIENT: U.S. DEPARTMENT OF ENERGY

Date March 15, 1985

TO: Nuclear Regulatory Commission
7915 Eastern Avenue
Silver Spring, MD 20910

ATT: Mr. Claude Flory

APPROVED FOR CONSTRUCTION/FABRICATION	A
INFORMATION ONLY	B
APPROVAL ACTION REQUESTED	C
DISAPPROVAL-RESUBMIT	D
APPROVAL WITH COMMENTS	E

REMARKS Attached is one copy each of the Draft REA's with Final Design for DU-076 and DU-202. Please forward your comments to John D'Antonio of the DOE with a copy to this office by 3/25/85.

TRANSMITTED [X] HEREWITH [ ] UNDER SEPARATE COVER

DRAWING SPECIFICATION OR ITEM NUMBER	REV. NUMBER	NUMBER OF COPIES	TITLE OR DESCRIPTION	ACTION
DU-076 and DU-202	--	1 ea.	Draft REA's with Final Design	C
sh				
cc: w/o attachments:				
J. Themelis				
R. Sena				
			WM Record File WM Project 48	
			Docket No.	
			PDR ✓	
			LPDR	
			Distribution:	
			LGH DGiller	
			gGnugnoli/w/encl. DEM	
			(Return to WM, 623-SS) R.D. Smith, UMTRO	
			cc	

ADDRESSEE: SIGN & RETURN COPY NO. 2 TO ABOVE ADDRESS

MORRISON-KNUDSEN

BY: John Pepin

TITLE Vicinity Properties Manager

THE ABOVE LISTED DOCUMENTS HAVE BEEN RECEIVED BY:

COMPANY NAME USNRC

NAME & TITLE Cathy Cudd, Lic. Info. Asst.

DATE REC'D 3/18/85

Regular Mail Postmarked 3/15/85

COPY #1 (ORIG. TO ADDRESSEE) COPY #2 (RETURN COPY) COPY #3 (FILE COPY)

MORRISON-KNUDSEN COMPANY, INC.

UMTRA PROJECT OFFICE
P.O. BOX 9136
ALBUQUERQUE, NEW MEXICO 87119