

WM DOCKET CONTROL
CENTER

Trans. No. MK-3050-SLC-0210

Date April 12, 1985

REMARKS The Final REA with Final Design for SL-023 is transmitted herewith
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DEPARTMENT OF ENERGY
ALBUQUERQUE OPERATIONS OFFICE
CONTRACT NO. DE-AC04-83AL18796

Radiological and Engineering Assessment

Vicinity Property No. SLC 023

Remedial Actions
Contractor
for the
Uranium Mill Tailings
Remedial Actions
Project



MORRISON
KNUDSEN

Vicinity Property No. SLC 023

FINAL
THE RADIOLOGICAL AND ENGINEERING ASSESSMENT
AND FINAL DESIGN

FOR
SALT LAKE CITY PROPERTY

SL-023

April 8, 1985

PREPARED FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE
UNITED STATES DEPARTMENT OF ENERGY

PREPARED BY
MORRISON-KNUDSEN COMPANY, INC.

TABLE OF CONTENTS

1.0 Executive Summary

- 1.1 Introduction
- 1.2 Evaluation and Recommendation

2.0 Engineering Field Survey

- 2.1 Property Description
- 2.2 Existing Facilities and Structures

3.0 Radiological Survey and Assessment

- 3.1 Gamma Exposure Rate Survey
- 3.2 Borehole Survey
- 3.3 Radon/Radon Daughter Survey
- 3.4 Estimated Extent of Contamination

4.0 Engineering Assessment

- 4.1 Evaluation of Options
- 4.2 Recommendation

5.0 Technical Specifications

6.0 Construction Drawing

SL-023-120 Excavation & Restoration Plan SL-023

FIGURES

- 2.1 Vicinity Map SL-023
- 2.2 Site Plan SL-023
- 2.3 Property Photos
- 3.1 Radiological Survey Data SL-023
- 4.1 Excavation & Restoration Plan SL-023

TABLES

- 2.1 Property Survey Data
- 3.1 Outdoor Gamma Survey
- 3.2 Borehole Survey
- 4.1 Costs
- 5.1 Index of Technical Specifications

APPENDIX

- A. Survey Data Logs

1.0 EXECUTIVE SUMMARY

1.1 Introduction

Property SL-023 is a vacant lot owned by Great Basin Supply Company, located at 155.5 West 3300 South Street, Salt Lake City, Utah.

1.2 Evaluation and Recommendation

1.2.1 Residual Radioactive Material Involvement

One area of contamination was found on the property in the area of the entrance gate.

1.2.2 Recommended Remedial Action Option

The recommended option is to remove the contaminated material.

1.2.3 Estimated Costs

The estimated remedial action cost is \$600.00.

1.2.4 Schedule

The estimated remedial action duration is 3 to 4 days.

2.0 ENGINEERING FIELD SURVEY

2.1 Property Description

2.1.1 Property Use and Occupancy

Property SL-023 is a vacant lot located at 155.5 West 3300 South Street and owned by Great Basin Supply Company. The map in Figure 2.1 illustrates the property's vicinity location.

2.1.2 Legal Description

The legal description as recorded with the Salt Lake County Recorder's Office in Deed Book No. 1305, page 304 follows:

Commencing 407.375 feet west of the Northeast corner of Lot 10, Block 15, Ten Acre Plat "A", Big Field Survey, in the County of Salt Lake, State of Utah, and running thence South 343.2 feet; thence West 100 feet; thence North 343.2 feet; thence East 100 feet to the point of commencement.

2.1.3 Bordering Properties

The lot is zoned C-3, a commercial zone, which is located adjacent to a residential area and is located less than one mile east of the old Vitro mill tailings site. The property is bounded on the North by 3300 South Street; on the East by residential housing; on the South by residential housing; and on the West by an Auto Sales Lot.

2.2 Existing Facilities and Structures

2.2.1 Structures (None) A vacant lot enclosed with a chain link fence.

2.2.2 Utilities - Overhead along west boundary line of property.

2.2.3 See Figure 4.1 for a site plan of the property. Property survey data and photos are presented in Table 2.1 and Figure 2.2.

Table 2.1

PROPERTY SURVEY DATA

GENERAL:

Site Location: Salt Lake City

Property Address: 155.5 West 3300 South Street

Owner's Name: Great Basin Supply Co. Address: 155.5 West 3300 South Street

Lot No.: 4 Property Type: Open Lot (0.72 Acres)

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

Survey Completed By: R. Livengood Date: 3-21-84

Property Description - Exterior:

Dwelling: Sq. Ft.: N/A

Levels: _____

Construction Type: _____

Foundation: _____

Garage: N/A

Storage Bldg: Prefab: N/A

Other: _____

Improvement Additions: N/A Porches: _____

to Dwellings: Deck: _____ Patio: _____

Other: _____

Driveway: Concrete: _____ Paved: _____

Gravel: 80'x100' front of lot Other: _____

Sidewalks: Concrete/Paved: Along 3300 South Street Only

Other: _____

Fences/Gates: Wood: _____ Other: _____

Chain Link: North End 6'-0 high (80' x 100' Area) at front of lot and the entire property.

Radiological and Engineering Assessment: Property SL-023

Table 2.1 (cont'd)

PROPERTY SURVEY DATA

Site Location: Salt Lake City

Property Address: 155.5 West 3300 South Street

Grounds: Lawn: Mostly Cover with weeds

Trees: (2) on North end

Several along West Side

Shrubs: None

Garden: N/A

Grading: Rough (level Lot)

Other: N end sand/gravel, balance is loamy

Soil Type: _____

Existing Survey Plot: _____

Property Description - Interior:

Walls

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

N/A

Utilities: N/A

Heating: Gas: _____ Electric: _____

Hot Water: _____ Other: _____

Air Cond: Gas: _____ Heat Pump: _____

Radiological and Engineering Assessment: Property SL-023

Table 2.1 (cont'd)

PROPERTY SURVEY DATA

Site Location: Salt Lake City

Property Address: 155.5 W 3300 South Street

Electric Line Location: Overhead - West Side

Gas Line Location: _____

Water Line Location: North end along 3300 South Street

Sewage Line Location: _____

Telephone Line Location: _____

Building Codes and Zoning:

<u>Codes</u>	<u>Local</u>	<u>State</u>	<u>Federal</u>
<u>Building Work</u>	_____	_____	_____
<u>Plumbing</u>	_____	_____	_____
<u>HVAC</u>	_____	_____	_____
<u>Electrical</u>	_____	_____	_____
<u>Other</u>	_____	_____	_____

Zoning District: Salt Lake County

Present Dwelling Zoning: N/A

Setbacks: Front: _____

Rear: _____

Side: _____

Other: _____

Photographs:

<u>Roll Frame</u>	<u>Description</u>	<u>Direction</u>
<u>Fig. 2.2</u>	<u>Look So. Along E Side</u>	<u>South</u>
<u>Fig. 2.2</u>	<u>Look So. Along W Side</u>	<u>South</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____



2100 SOUTH FREEWAY

2100 SOUTH ST

3100 SOUTH ST

3500 SOUTH ST

4100 SOUTH ST

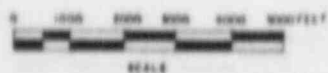
4700 SOUTH ST

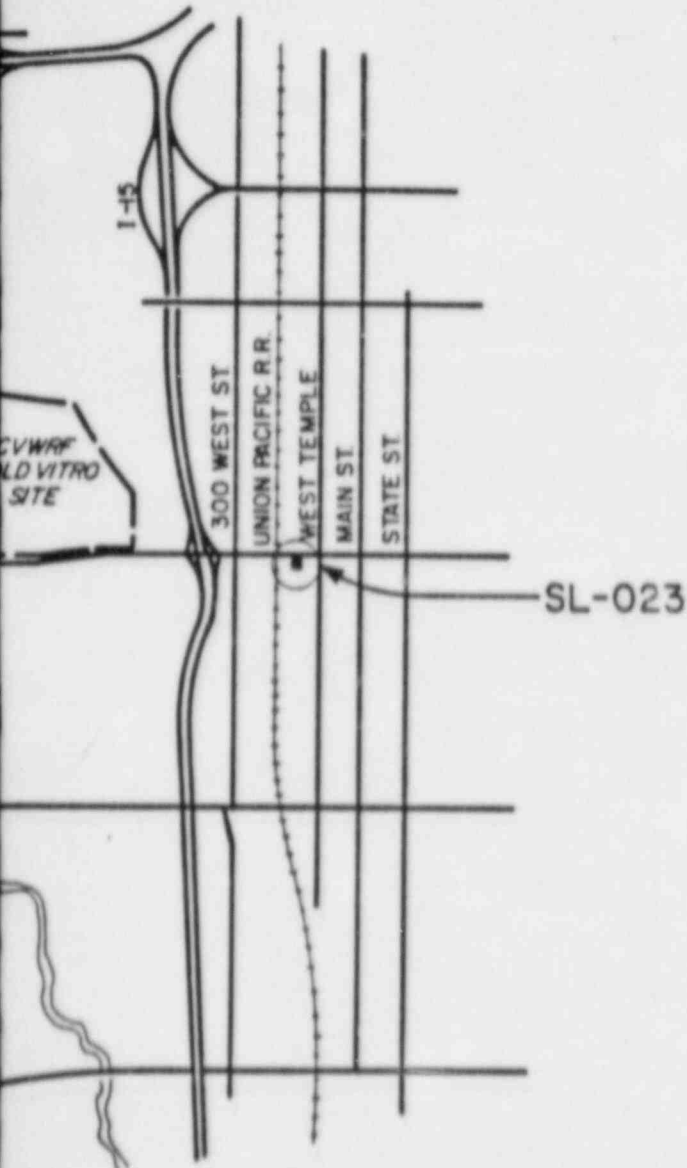
BELT ROUTE 1-215

REDWOOD ROAD

JORDAN RIVER

900 WEST ST





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CARD

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NOTE
PROPERTY LOCATED IN SALT LAKE COUNTY.

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

FIGURE 2.1

VICINITY MAP SL-023

SALT LAKE COUNTY, UTAH
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

NR

NR

NR



MORRISON
KNUDSEN

PROJECT NO.

DE-AC04-83AL18796

DRAWING NO.

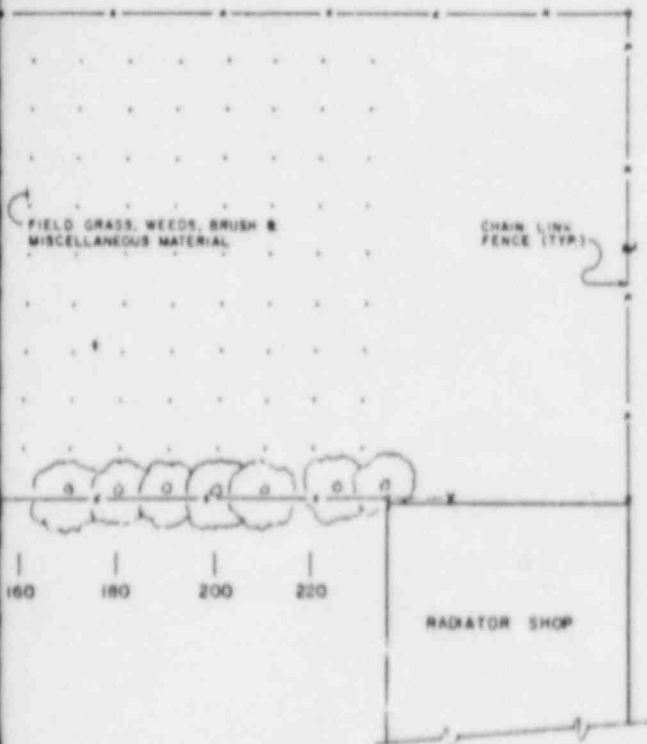
SL-023-005

REV

0

LEGEND

— W —	WATER LINE
— G —	GAS LINE
— SM —	GAS MAIN
— S —	SEWER LINE
— SM —	SEWER MAIN
— STM —	STORM SEWER
— E —	ELECTRICAL LINE
— T —	TELEPHONE LINE
— TV —	CABLE TV
— P —	PROPERTY LINE
— X — X — X —	FENCE LINE
⊙	METER
⊗	VALVE
⊙	PROPERTY PIN
●	POWER POLE



NOTES:

1. THERE ARE NO KNOWN UNDERGROUND UTILITIES ON THE PROPERTY.

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U. S. DEPARTMENT OF ENERGY ALBUQUERQUE, NEW MEXICO

FIGURE 2.2

SITE PLAN SL-023

SALT LAKE COUNTY, UTAH

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

DESIGNER
CHECKED
APPROVED
DATE

DATE PROJECT MANAGER DATE PROJECT ENGINEER DATE

NR

NR

NR



MORRISON
KNUDSEN

PROJECT NO.

DE-AC04-83AL18796

DRAWING NO.

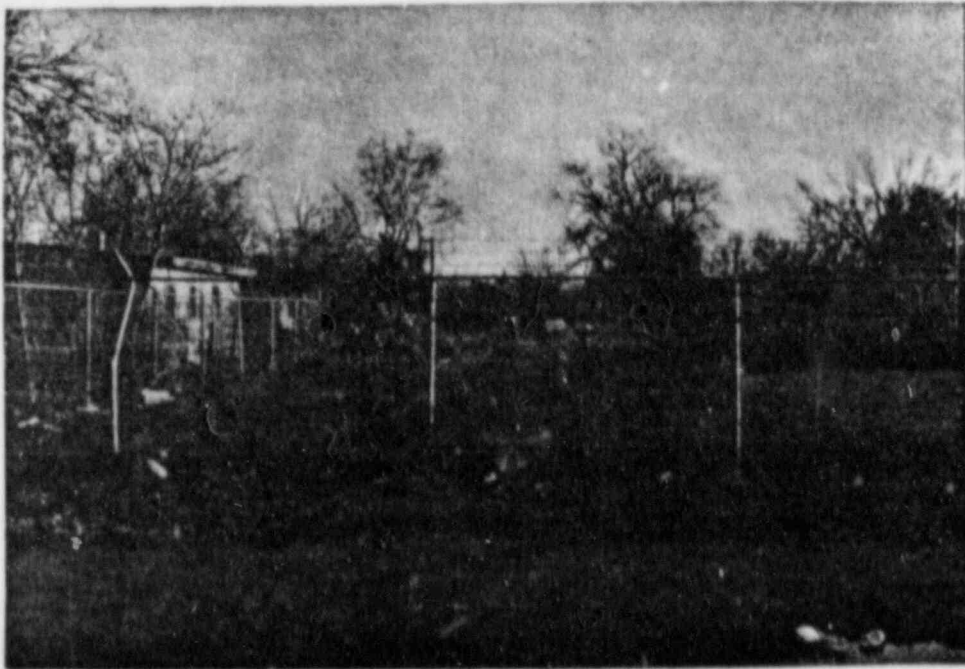
SL-023-015

REV
A

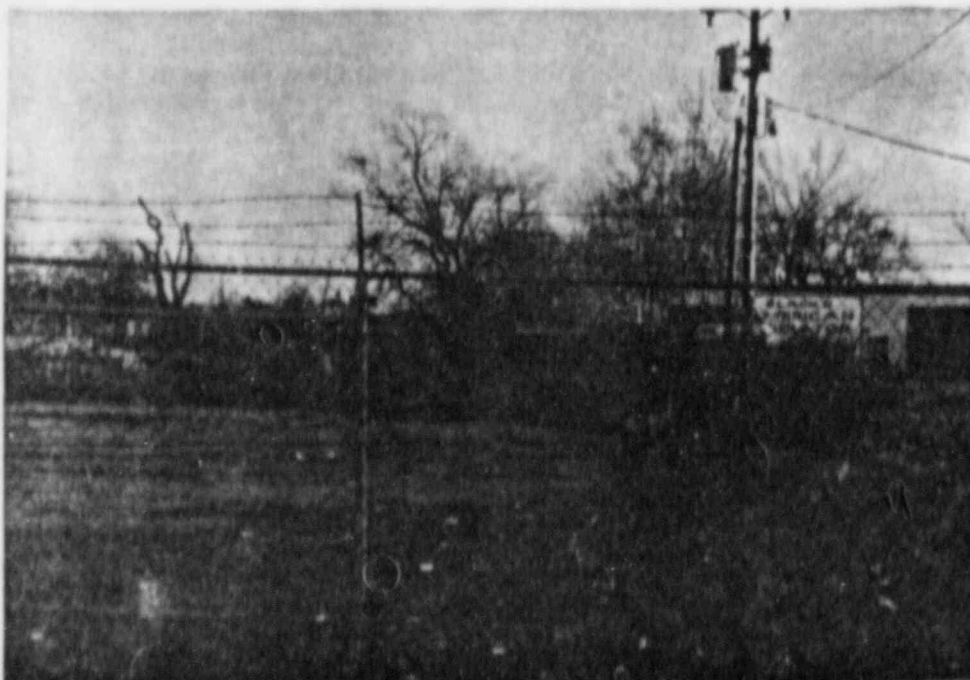
FINAL REV SUBMITTAL

REVISIONS

DATE BY 1.02 1.02 1.02 1.02



Northeast Corner of Property Looking South



Northwest Corner of Property Looking South

Figure 2.3 Property Photos

3.0 RADIOLOGICAL SURVEY AND ASSESSMENT

3.1 Gamma Exposure Rate Survey

3.1.1 Survey Method

An outdoor gamma scan was conducted in accordance with RAC UMTRA Procedure 019A.

There are no buildings on this property.

3.1.2 Survey Results

Surface gamma readings on the property, as shown in Table 3.1 range from 10 to 23 micro R/hr. This may be compared with the background for the Salt Lake City site of 10 micro R/hr.

3.2 Borehole Survey

3.2.1 Survey Method

A borehole survey was conducted in accordance with RAC UMTRA Procedure 018.

3.2.2 Survey Results

Contamination was found in 3 of the 18 outdoor holes augered. The location and depth of the contamination is described in Table 3.2 and is shown in Figure 3.1.

3.3 Radon/Radon Daughter Survey

No radon/radon daughter surveys were performed, since there are no buildings at the property.

3.4 Estimated Extent of Contamination

One area of contamination was identified in the survey as shown on Figure 3.1. The estimated depth of contamination is approximately 24 inches.

Two small patches were identified in the inclusion survey (Radiological Survey at Salt Lake City Site, Vicinity Property SL-023, ORNL, March 1983) as being contaminated. These areas, one on each side of the fence located about 90 feet south of the gate, were investigated. No evidence of contamination was found.

Table 3.1
OUTDOOR SURFACE GAMMA SURVEY
Property SL-023

POINT	Micro R/hr
(D-40)	13
(E-40)	13
(F-40)	13
(H-40)	13
(F-10)	13
(G+00)	23
(A+50)	13
(E+70)	14
(G+130)	13
(G+150)	13
(G+170)	13
(C+190)	13
(I+190)	13
(C+210)	13
(E+210)	13
(I+210)	13
(C+230)	13
(E+230)	13
(G+230)	13
(I+230)	13
(K+230)	15

*Note: Only points with readings greater than 12 micro R/hr are given.
(Refer to Appendix A for gamma scan data).

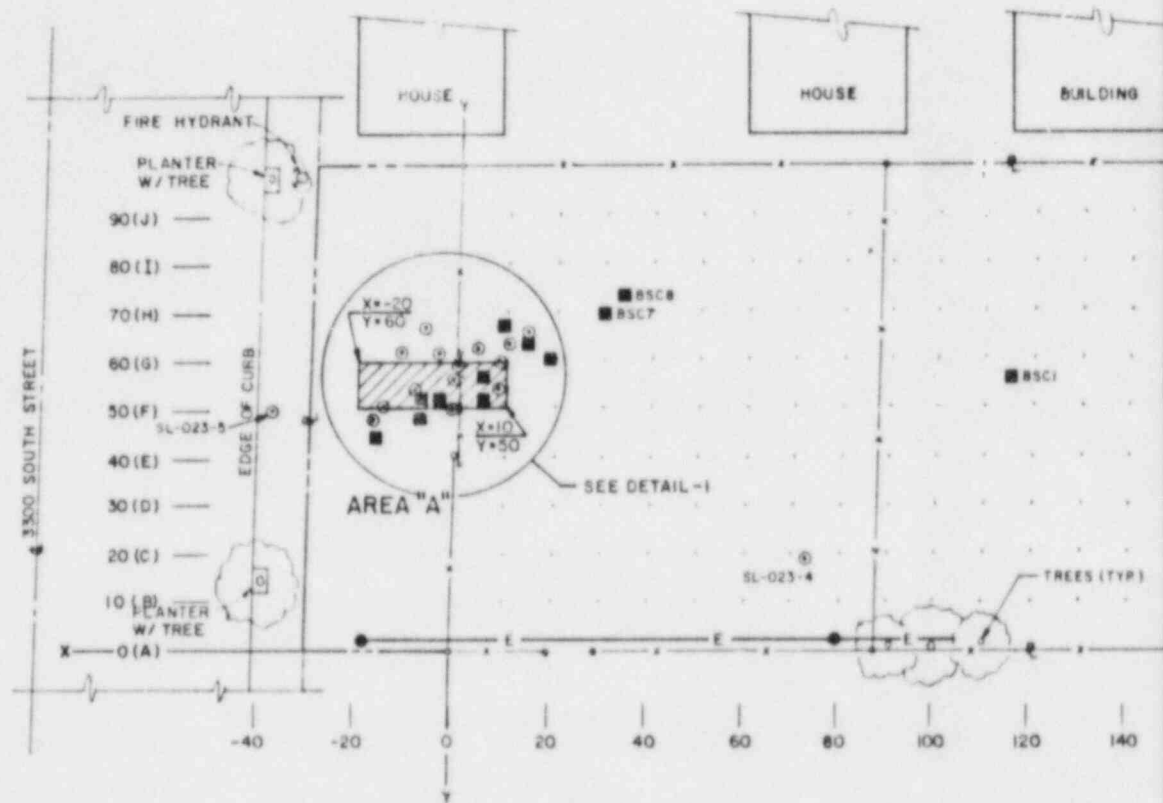
Table 3.1 - Cont'd.
OUTDOOR SURFACE GAMMA SURVEY
Property SL-023

POINT	Micro R/hr
(A+250)	15
(C+250)	14
(E+250)	14
(G+250)	14
(I+250)	14
(K+250)	14
(A+270)	15
(C+270)	14
(E+270)	13
(G+270)	14
(I+270)	14
(K+270)	15
(A+285)	15
(C+285)	13
(E+285)	14
(G+285)	13
(I+285)	14
(K+285)	13

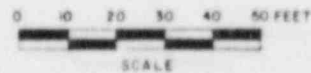
*Note: Only points with readings greater than 12 micro R/hr are given.
(Refer to Appendix A for gamma scan data).

Table 3.2
BOREHOLE SURVEY
Property SL-023

HOLE	LOCATION	CONTAMINATION DEPTH
SL-023-1	G.5+16	None
SL-023-2	E.6-16	None
SL-023-3	F.6+1	None
SL-023-4	B.9+74	None
SL-023-5	F.0-36	None
SL-023-6	I.4+183	None
SL-023-7	H.2+205	None
SL-023-8	F.2-13	0-24"
SL-023-9	F.3-8	0-18"
SL-023-10	F.1-1	None
SL-023-11	G.1-10	None
SL-023-12	G.1-2	None
SL-023-13	G.6-5	None
SL-023-14	F.8+2	0-12"
SL-023-15	G.2+6	None
SL-023-16	F.9+10	None
SL-023-17	F.3+11	None
SL-023-18	G.4+12	None

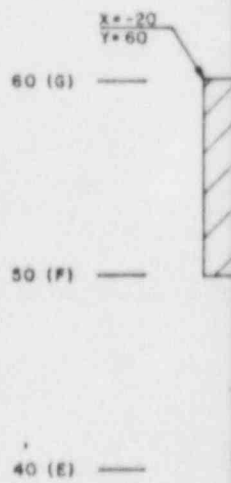


AUTO SALES LOT 70 (H)



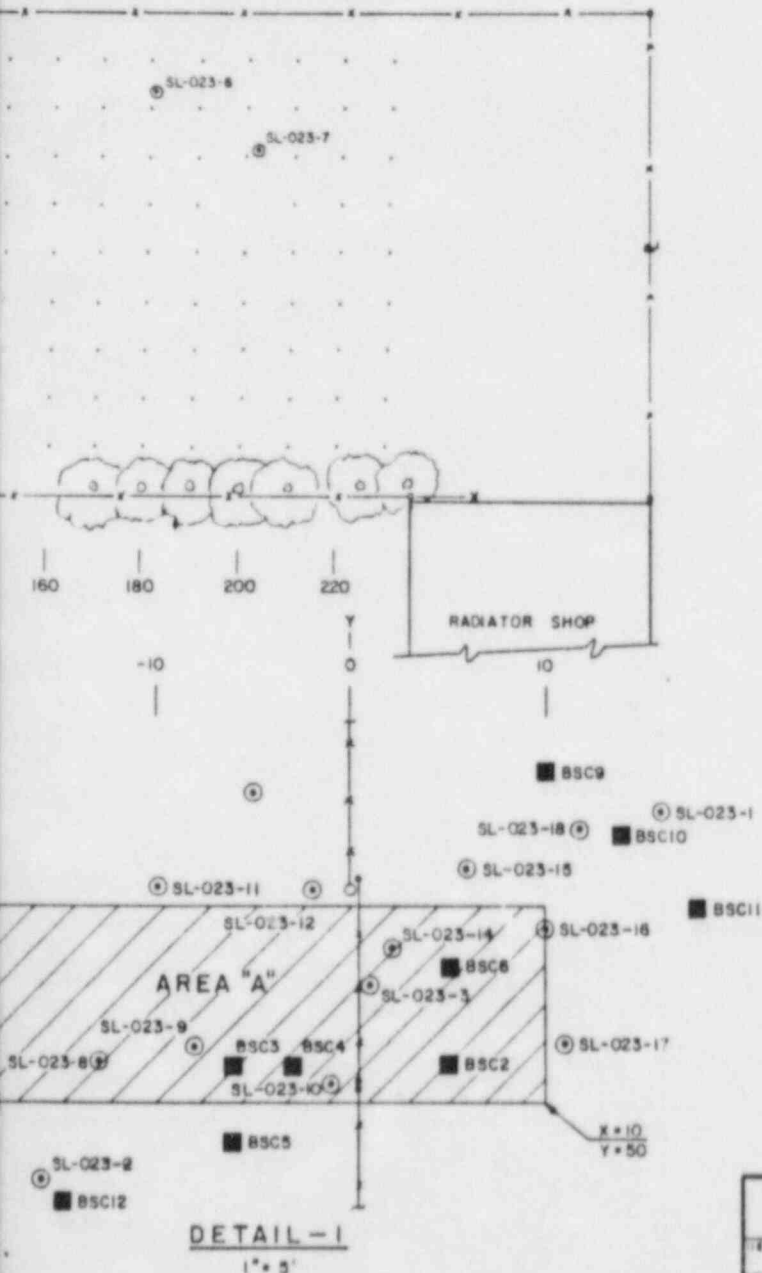
DEPTH OF ESTIMATED
CONTAMINATION
LEGEND

AREA "A"  = 24"



LEGEND

- BSC6 AUGER HOLES - BY "ORNL"
CONTRACT NO. W-7405-ENG-15
MARCH 1983
- ⊙ SL-023-6 AUGER HOLE DESIGNATION - BY "A.K."
GRID POINT



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U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

FIGURE 31

RADIOLOGICAL SURVEY SL-023

SALT LAKE COUNTY, UTAH

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

DESIGNED BY
CHECKED BY
REVIEWED BY
RECOMMENDED BY
APPROVED BY

DATE DATE DATE DATE DATE



PROJECT NO.
DE-AC04-83AL18796

DRAWING NO. SL-023-010

REV. A

72784 FINAL REA SUBMITTAL

R.R.

DATE REVISIONS BY BY CDR UN KNO DOE

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 SL-023:

Option 1 - No action should be taken.

Option 2 - Decontamination of the property including retrieval of the contaminated material and restoration of the property. This involves excavation of the contaminated fill material to a depth of 24" and the restoration of the same area with clean compacted backfill and surfacing with 6" of gravel.

4.1.2 Costs

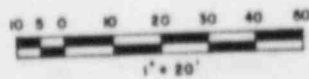
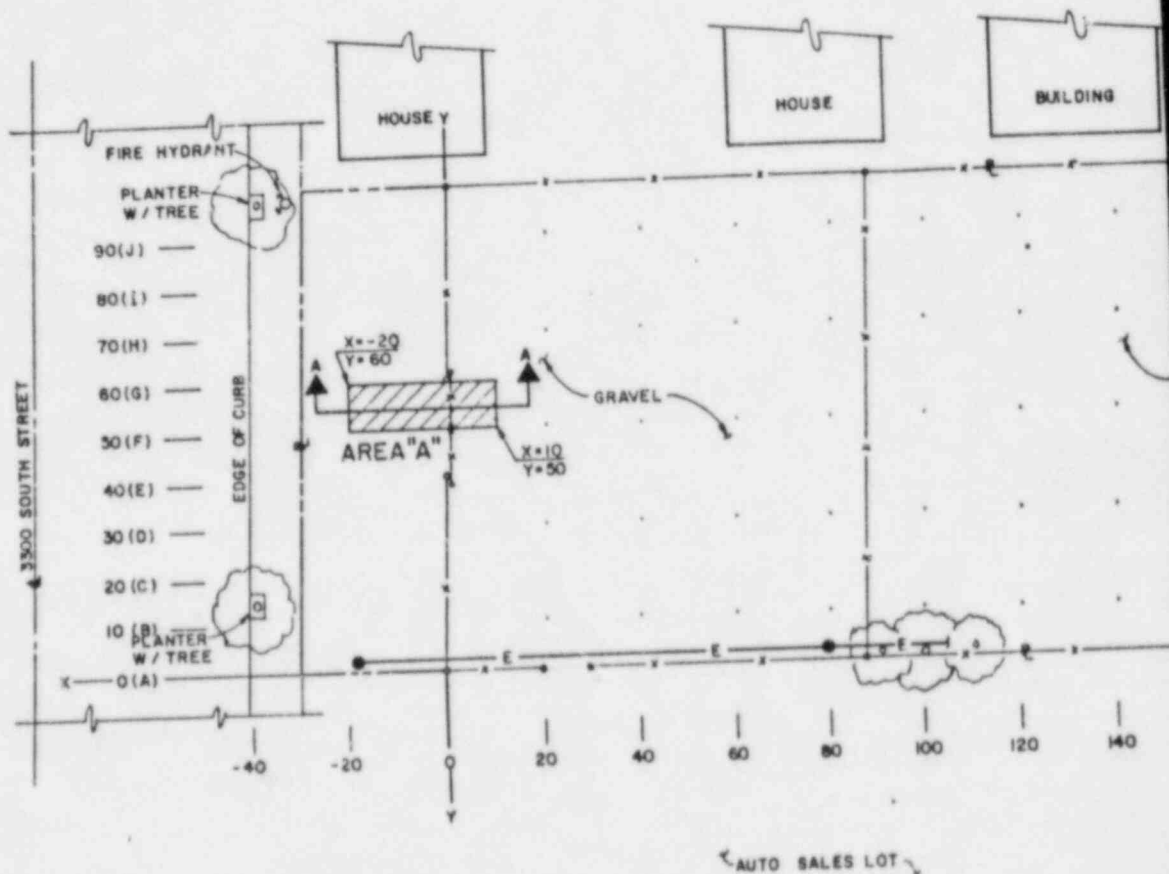
Estimated costs for the activities associated with Option 2 are detailed in Table 4.1. Costs include labor, material, equipment, supplies, excavation, removal, restoration, and contingency. All costs are escalated to 1985 dollars. It is anticipated that the time required for the subcontractor to complete the work will be 3 to 4 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 \$600.00.

Table 4.1
OPTION 2 COSTS

<u>Activity</u>	<u>Unit Price</u>	<u>Quantity</u>	<u>Estimated Cost</u>
Excavation	8.30	22 cy	183.00
Common Back Fill	7.20	16.5 cy	119.00
Gravel (Struct. Fill)	12.40	5.5 cy	68.00
Sub-Total Direct			370.00
5% Contractors Contingency			18.00
20% Overhead and Profit			<u>78.00</u>
Subtotal			466.00
20% Engineers Contingency			<u>94.00</u>
1985 Escalation			<u>28.00</u>
Rounded Total			600.00



DEPTH OF ESTIMATED
CONTAMINATION
LEGEND

AREA "A"  = 24"

LEGEND

— W —	WATER LINE
— S —	GAS LINE
— CM —	GAS MAIN
— S —	SEWER LINE
— CM —	SEWER MAIN
— STM —	STORM SEWER
— E —	ELECTRICAL LINE
— T —	TELEPHONE LINE
— TV —	CABLE TV
— C —	PROPERTY LINE
— X — X — X —	FENCE LINE
⊙	METER
⊙	VALVE
⊙	PROPERTY PIN
●	POWER POLE

NOTES:

1. THE LATEST REVISION OF THE FOLLOWING TECHNICAL SPECIFICATIONS APPLY TO THE REMEDIAL ACTION WORK REQUIRED FOR PROPERTY NO. SL-023.

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 SURVEYS OF THIS 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 CONTRACTORS REPRESENTATIVE.

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SCOPE OF WORK

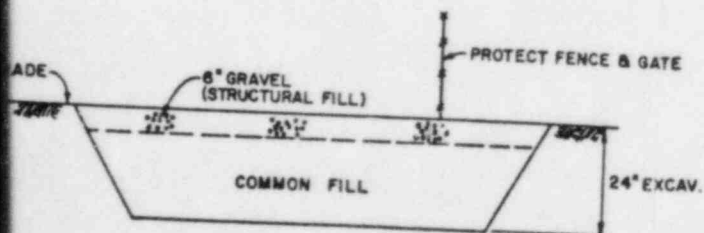
AREA "A"

- EXCAVATE CONTAMINATED MATERIAL
- PLACE AND COMPACT COMMON FILL
- PLACE 8 INCHES OF GRAVEL SURFACING (STRUCTURAL FILL)

8508010277-04

FIELD GRASS, WEEDS, BRUSH & MISCELLANEOUS MATERIAL

RADIATOR SHOP



SECTION A-A
NTS

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

EXCAVATION & RESTORATION

PLAN SL-023

Figure 4.1

SALT LAKE COUNTY, UTAH

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

DESIGNED BY
C. W. J. S. S.
CHECKED
H. J. J. S. S.
REVIEWED
R. L. J. S. S.
RECOMMENDED
V. J. J. S. S.
APPROVED

NR

DATE

DOE PROJECT MANAGER

DATE

DOE PROJECT ENGINEER

DATE

NR

NR

PROJECT NO.

DE-AC04-83AL18796

DRAWING NO.

SL-023-120

REV. 0



MORRISON
KNUDSEN

ISSUE FOR CONSTRUCTION

REVISIONS

NR	1	VCD	VCD	VCD	-
BY	BY	LOG	ON	ENG	DOE

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.

Table 5.1
INDEX OF TECHNICAL SPECIFICATIONS

Description		Specifications Previously Approved	Specifications Requiring DOE Approval
Division 2 - Site Work			
SECTION 02110	Clearing & Grubbing	X	
SECTION 02130	Contaminated Material Removal	X	
SECTION 02200	Excavation & Backfill	X	
SECTION 02500	Paving & Surfacing	X	

6.0 CONSTRUCTION DRAWINGS

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

<u>Drawing Number</u>	<u>Drawing Title</u>
SL-023-120	Excavation & Restoration Plan SL-023

APPENDIX A
SURVEY DATA LOGS

OUTDOOR GAMMA SCREENING SURVEY DATA SHEET

LOGGING CREW: Turner
Nelson
Manship

SHEET 1 OF 4 PAGE 1
DATE: 5-16-84
PROPERTY ID: SL-023

INSTRUMENT ID NO.: 26498 Pr. # 015809

BACKGROUND CALCULATION:

#1 669 + #2 653 + #3 668 = 1990 ÷ 3 = 663 COUNTS/1MIN

AREA: _____			AREA: _____			AREA: _____			AREA: _____		
POINT ID	READING 1 m. / Surf.		POINT ID	READING 1 m. / Surf.		POINT ID	READING 1 m. / Surf.		POINT ID	READING 1 m. / Surf.	
A+(-40)	977	870	A+(-20)	871	1006	A+0	940	929	A+20	961	936
B+(-40)	911	1002	B+(-20)	874	938	B+0	897	957	B+20	957	959
C+(-40)	898	1034	C+(-20)	830	953	C+0	864	923	C+20	874	869
D+(-40)	958	1104	D+(-20)	888	964	D+0	901	944	D+20	870	863
E+(-40)	922	1105	E+(-20)	821	874	E+0	924	890	E+20	871	934
F+(-40)	936	1127	F+(-20)	884	887	F+0	881	866	F+20	880	928
G+(-40)	895	1038	G+(-20)	783	925	G+0	1595	2918	G+20	905	943
H+(-40)	949	1098	H+(-20)	905	978	H+0	900	998	H+20	1044	1007
I+(-40)	969	1041	I+(-20)	897	914	I+0	785	836	I+20	988	974
J+(-40)	886	878	J+(-20)	861	948	J+0	837	911	J+20	902	1016
K+(-40)	905	937	K+(-20)	906	983	K+0	859	917	K+20	914	936
EP+(-40)	874	883	EP+(-20)	905	1000	EP+0	953	1051	EP+20	928	1232
EP+(-30)	925	955	EP+(-10)	903	1034	EP+10	995	972	EP+30	837	1113
K+(-30)	900	924	K+(-10)	849	880	K+10	927	872	K+30	860	871
J+(-30)	923	1018	J+(-10)	835	877	J+10	935	921	J+30	863	862
I+(-30)	930	870	I+(-10)	751	820	I+10	941	1058	I+30	1006	1085
H+(-30)	890	833	H+(-10)	723	862	H+10	882	963	H+30	921	1033
G+(-30)	684	750	G+(-10)	950	896	G+10	917	1044	G+30	888	868
F+(-30)	659	809	F+(-10)	1191	1108	F+10	872	851	F+30	909	973
E+(-30)	855	945	E+(-10)	880	900	E+10	899	876	E+30	889	867
D+(-30)	859	894	D+(-10)	931	1003	D+10	848	841	D+30	939	930
C+(-30)	958	893	C+(-10)	923	1041	C+10	923	946	C+30	935	966
B+(-30)	863	898	B+(-10)	976	1080	B+10	916	917	B+30	1064	1065
A+(-30)	853	971	A+(-10)	965	964	A+10	913	940	A+30	968	1008

REMARKS: _____

OUTDOOR GAMMA SCREENING SURVEY DATA SHEET

LOGGING CREW: Turner
Nelson
Manship

SHEET 2 OF 4 PAGE 2
 DATE: 5-16-84
 PROPERTY ID: SL-023

INSTRUMENT ID NO.: 26493 Pr# 015809

BACKGROUND CALCULATION:

#1 669 + #2 653 + #3 668 = 1990 ÷ 3 = 663 COUNTS/1MIN

AREA: _____			AREA: _____			AREA: _____			AREA: _____		
POINT ID	READING 1 m. / Surf.		POINT ID	READING 1 m. / Surf.		POINT ID	READING 1 m. / Surf.		POINT ID	READING 1 m. / Surf.	
A+40	1002	1017	A+60	981	1074	A+80	1057	999	EP+110	1034	1038
B+40	1009	979	B+60	1059	1066	B+80	1018	1081	K+110	1000	1033
C+40	943	981	C+60	992	1029	C+80	927	1038	I+110	989	1066
D+40	832	969	D+60	911	887	D+80	918	933	G+110	973	980
E+40	894	949	E+60	934	931	E+80	853	854	E+110	927	940
F+40	868	920	F+60	908	1020	F+80	891	853	C+110	941	916
G+40	891	958	G+60	904	869	G+80	889	916	A+120	893	927
H+40	848	915	H+60	937	926	H+80	847	836	A+130	837	860
I+40	834	901	I+60	930	882	I+80	937	913	C+130	968	978
J+40	912	889	J+60	908	942	J+80	978	1078	E+130	1013	1031
K+40	940	979	K+60	949	944	K+80	959	1007	G+130	1040	1235
EP+40	884	894	EP+60	891	952	EP+80	964	942	I+130	930	1010
EP+50	956	1274	EP+70	1040	1110	EP+90	935	1006	K+130	1033	1030
K+50	905	1016	K+70	992	1055	K+90	975	932	K+150	948	1062
J+50	993	900	J+70	936	899	J+90	903	996	I+150	1003	1032
I+50	928	999	I+70	885	914	I+90	891	963	G+150	1090	1118
H+50	909	960	H+70	915	907	H+90	884	886	E+150	910	948
G+50	884	900	G+70	935	911	G+90	944	885	C+150	964	1061
F+50	927	918	F+70	898	920	F+90	853	936	A+150	883	926
E+50	863	901	E+70	1109	1357	E+90	879	862	A+170	942	1003
D+50	933	881	D+70	972	909	D+90	917	911	C+170	994	1007
C+50	955	971	C+70	895	963	C+90	891	907	E+170	1040	1038
B+50	1060	1121	B+70	1026	1010	B+90	933	1026	G+170	1019	1162
A+50	973	1014	A+70	926	1022	A+90	1031	1066	I+170	1006	1037

REMARKS: _____

OUTDOOR GAMMA SCREENING SURVEY DATA SHEET

LOGGING CREW: Turner
Nelson
ManSHIP

SHEET 3 OF 4 PAGE 3

DATE: 5-16-84

PROPERTY ID: SL-023

INSTRUMENT ID NO.: 26498 Pr # 015809

BACKGROUND CALCULATION:

#1 669 + #2 653 + #3 668 = 1990 ÷ 3 = 663 COUNTS/1MIN

AREA: _____			AREA: _____			AREA: _____			AREA: _____		
POINT ID	READING 1 m. / Surf.		POINT ID	READING 1 m. / Surf.		POINT ID	READING 1 m. / Surf.		POINT ID	READING 1 m. / Surf.	
K+170	1030	1076	K+250	1357	1368						
K+190	1127	1240	K+270	1294	1489						
I+190	1135	1166	I+270	1236	1285						
G+190	1098	1057	G+270	1282	1331						
E+190	1048	1078	E+270	1146	1201						
C+190	987	1124	C+270	1248	1314						
A+190	979	944	A+270	1317	1426						
A+210	928	982	A+290	1201	1545						
C+210	1106	1151	C+290	1146	1204						
E+210	1085	1226	E+290	1172	1260						
G+210	1037	1071	G+290	1141	1237						
I+210	1122	1151	I+290	1248	1312						
K+210	1159	1240	K+290	1147	1175						
K+230	1279	1525									
I+230	1213	1221									
G+230	1238	1157									
E+230	1120	1229									
C+230	1161	1166									
A+230	984	945									
A+250	1305	1377									
C+250	1146	1324									
E+250	1190	1274									
G+250	1261	1314									
I+250	1289	1276									

REMARKS: A+250 near black wall

PROPERTY SURVEY SKETCH

Sheet 4 of 4

SITE LOCATION SALT LAKE CITY UTAH (SL 023)

ADDRESS 155.5 W. 3300 So (Great Basin)

PROPERTY TYPE Vacant Lot LOT NO. _____

OWNER _____

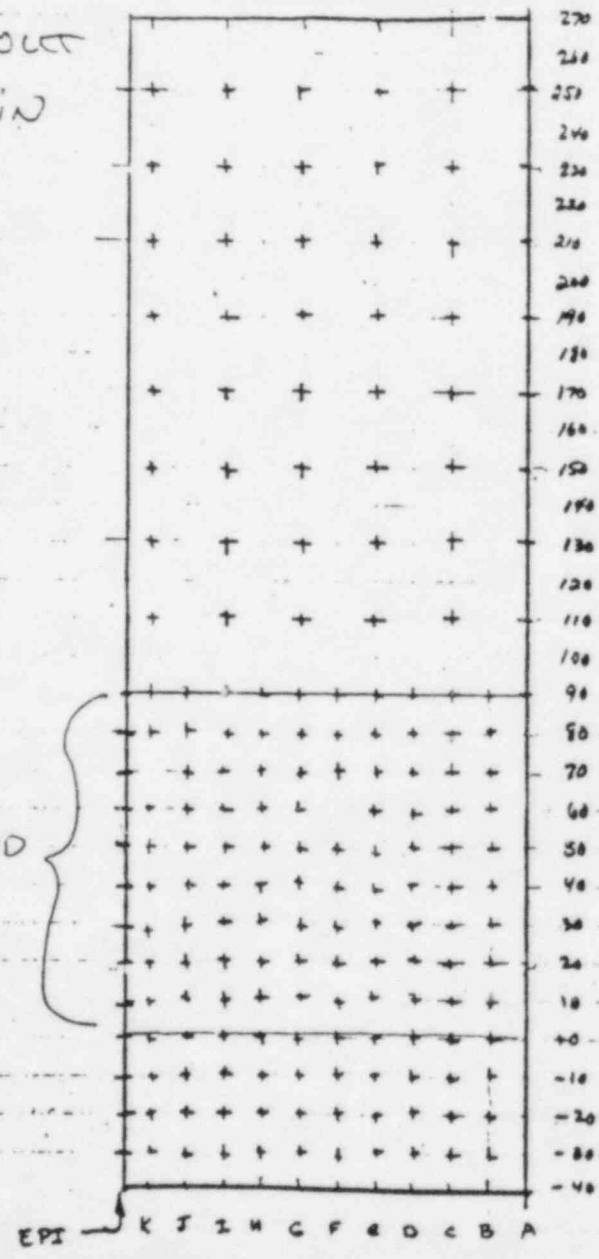
SKETCH COMPLETED BY RAY Nelson. DATE 5-18-84

GAMMA Survey

GRID LAYOUT
Great Basin
Property

North
↓

FENCED
Area



20 Foot
Grid
Area

10 Foot
Grid
Area

0 10' 20' 30' 40' 50'

EPI K J I H G F E D C B A

BOREHOLE LOG

Logging Crew: Jim Turner
Ray Nelson
Jeff Manship

Sheet 1 of 3 Page 5

Date: 5-17-84

Property ID: SL-023

Instrument CAN No. _____

Area: Great Basin

- 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.

Hole ID: <u>SL-023-1</u>		Hole ID: <u>SL-023-2</u>		Hole ID: <u>SL-023-3</u>		Hole ID: <u>SL-023-4</u>	
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/.min	Depth	Counts/.min	Depth	Counts/.min	Depth	Counts/.min
Surface	923	Surface	968	Surface	1139	Surface	986
0"		0"		0"		0"	
6"	1652	6"	1595	6"	1862	6"	1394
12"	2276	12"	2020	12"	2126	12"	1818
18"	2541	18"	2082	18"	1756	18"	1856
24"	2347	24"	2106	24"	1618	24"	1850
30"	2067	30"	1967	30"		30"	
36"	2092	36"	1868	36"		36"	
42"	2167	42"	2060	42"		42"	
48"	1972	48"	2001	48"		48"	
54"	1927	54"	1892	54"		54"	
60"	1900	60"	1852	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:

BOREHOLE LOG

Logging Crew: Jim Turner
Ray Nelson
Jeff Manship

Instrument CAN No. _____

Sheet 2 of 3 Page 6

Date: 5-17-84

Property ID: SL-023

Area: GREAT BASIN Property

- 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.

Hole ID: <u>SL-023-5</u>	Hole ID: <u>SL-023-6</u>	Hole ID: <u>SL-023-7</u>	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/.min	Depth	Counts/.min	Depth	Counts/.min	Depth	Counts/.min
Surface	868	Surface	1427	Surface	1231	Surface	
0"		0"		0"		0"	
6"		6"	1892	6"	1714	6"	
12"	1181	12"	1891	12"	1980	12"	
18"	1681	18"	1775	18"	1803	18"	
24"	1526	24"	1701	24"	1660	24"	
30"		30"	1830	30"	1662	30"	
36"		36"	1882	36"	1709	36"	
42"		42"	1801	42"	1671	42"	
48"		48"		48"	1572	48"	
54"		54"	1804	54"		54"	
60"		60"	1974	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:

PROPERTY SURVEY SKETCH

Sheet 3 of 3

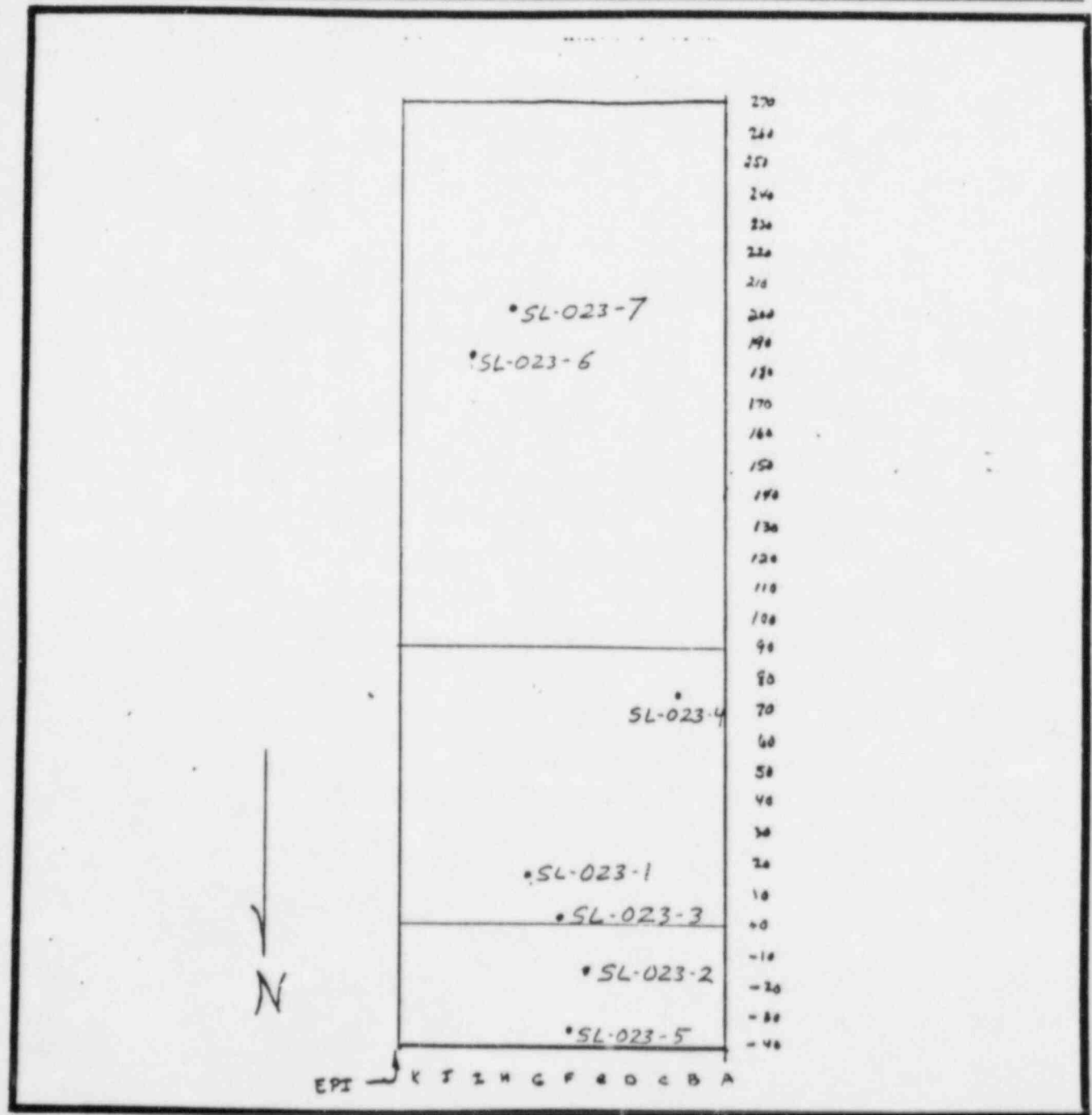
SITE LOCATION SL-023

ADDRESS 155.5 W. 3300 St. (Great Basin)

PROPERTY TYPE Vacant lot LOT NO. _____

OWNER _____

SKETCH COMPLETED BY Jeff Manship DATE 5-18-84



BOREHOLE LOG

LOGGING CREW: Nelson
Manship

SHEET 1 OF 3 PAGE

DATE: 7-9-84

PROPERTY ID: SL-023

INSTRUMENT ID NO. 26511 Pr # 015812

AREA: _____

- 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.

HOLE ID: <u>SL-023-8</u>		HOLE ID: <u>SL-023-9</u>		HOLE ID: <u>SL-023-10</u>		HOLE ID: <u>SL-023-11</u>	
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"	5304	0"	4822	0"	1017	0"	995
6"	20943	6"	14654	6"	1474	6"	1419
12"	24318	12"	16401	12"	1907	12"	1662
18"	9825	18"	7751	18"	1845	18"	1573
24"	7191	24"		24"	1598	24"	1624
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: _____

Background borehole average: 0"-60"
1503



BOREHOLE LOG

LOGGING CREW: Nelson

SHEET 2 OF 3 PAGE

DATE: 7-9-84

PROPERTY ID: SL-023

INSTRUMENT ID NO. 26511 Pr # 015812

AREA: _____

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.

HOLE ID: SL-023-12
TIME DRILLED: _____
TIME LOGGED: _____
SOIL TYPE: _____

HOLE ID: SL-023-13
TIME DRILLED: _____
TIME LOGGED: _____
SOIL TYPE: _____

HOLE ID: SL-023-14
TIME DRILLED: _____
TIME LOGGED: _____
SOIL TYPE: _____

HOLE ID: SL-023-15
TIME DRILLED: _____
TIME LOGGED: _____
SOIL TYPE: _____

DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE		SURFACE		SURFACE	
0"	1149	0"	1129	0"	7781	0"	1374
6"	1628	6"	1872	6"	6332	6"	2213
12"	1695	12"	1843	12"	4283	12"	2281
18"	1594	18"	1550	18"	2651	18"	1925
24"	1632	24"	1452	24"	2118	24"	1782
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: _____



BOREHOLE LOG

LOGGING CREW:

Nelson
Manship

SHEET

3 OF 3

PAGE

DATE: _____

7-9-84

PROPERTY ID:

56-023

INSTRUMENT ID NO.

26511

Pr # 015812

AREA:

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.

HOLE ID: <u>SL-023-16</u>		HOLE ID: <u>SL-023-17</u>		HOLE ID: <u>SL-023-18</u>		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		SURFACE		SURFACE	
0"	1454	0"	1066	0"	1043	0"	
6"	2074	6"	1492	6"	1387	6"	
12"	2904	12"	1645	12"	1736	12"	
18"	2086	18"	1773	18"	1481	18"	
24"	1798	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:

PROPERTY SURVEY SKETCH

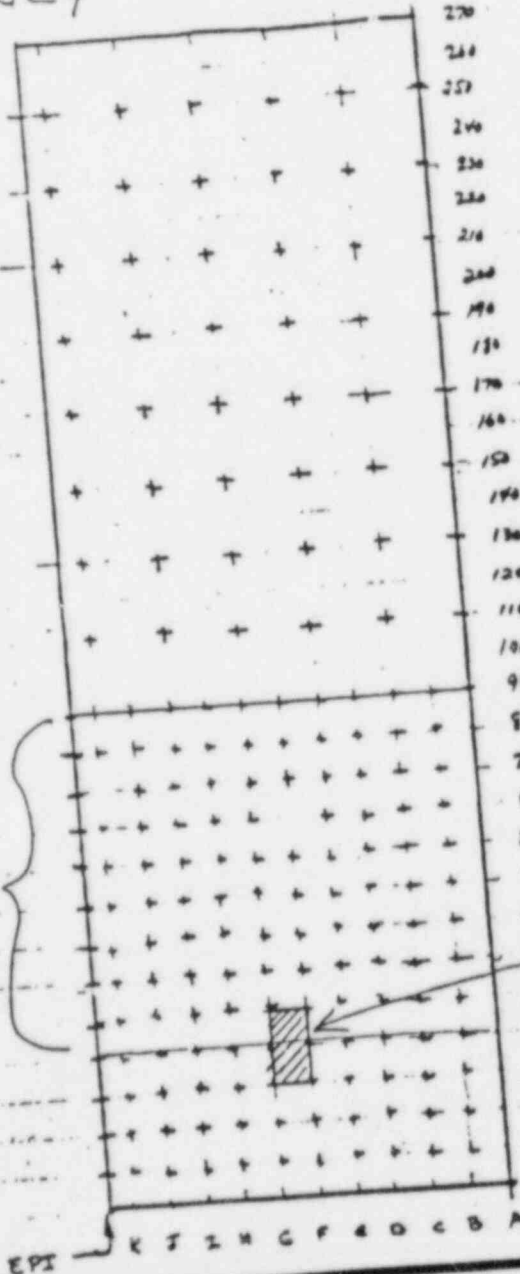
SITE LOCATION SALT LAKE City Lot 100 (SL 023) of _____
 ADDRESS _____
 PROPERTY TYPE _____ LOT NO. _____
 OWNER _____
 SKETCH COMPLETED BY RAY Nelson DATE 5-18-84

GAMMA SURVEY

GRID LAYOUT
 Great BASIN
 Property

North
↓

FENCED
Area



20 Foot
 Grid
 Area

10 Foot
 Grid
 Area

Area of
 Boreholes 8-18

0 10 20 30 40 50 60 70

EPI

PROPERTY SURVEY SKETCH

Sheet _____ of _____

SITE LOCATION SL-023

ADDRESS 155.5 W. 3300 So.

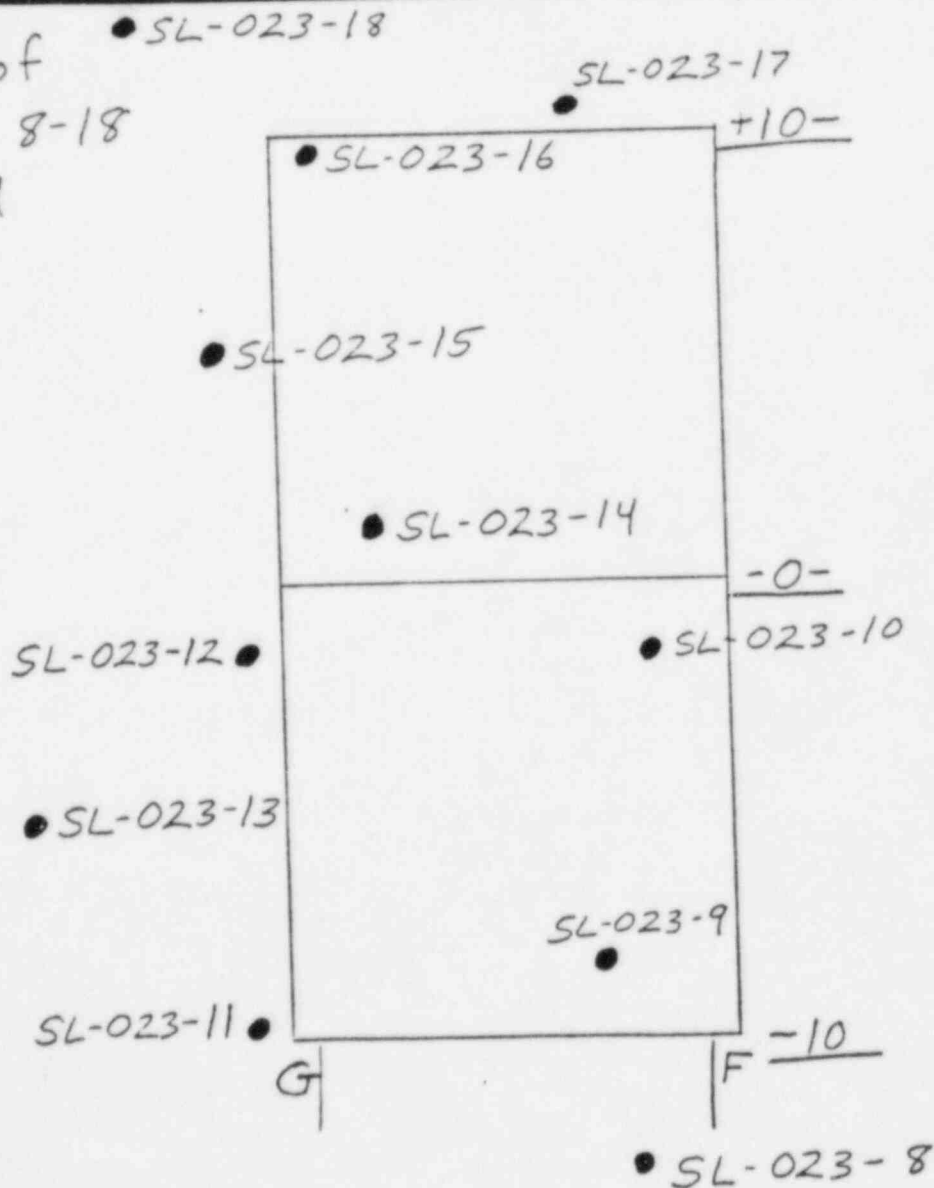
PROPERTY TYPE Vacant Lot

LOT NO. _____

OWNER _____

SKETCH COMPLETED BY Jeff Manship DATE 7-9-84

Area of
Boreholes 8-18
Enlarged





MORRISON-KNUDSEN COMPANY, INC.

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