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1.35.0
CA-318

74

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

Radiological and Engineering Assessment

Vicinity Property No. CAN 318

Remedial Actions
Contractor
for the
Uranium Mill Tailings
Remedial Actions
Project

MORRISON
KNUDSEN

FINAL

THE RADIOLOGICAL AND ENGINEERING ASSESSMENT AND FINAL DESIGN FOR CANONSBURG PROPERTY

CA-318

August 15, 1985

PREPARED FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

UNITED STATES DEPARTMENT OF ENERGY

PREPARED BY

MORRISON-KNUDSEN COMPANY, INC.

NOTE:

SUPPLEMENTAL STANDARDS

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

Property CA-319 is a commercial property owned by McGraw Edison Power Systems and located in Canonsburg, PA.

1.2 Evaluation and Recommendation

1.2.1 Residual Radioactive Material Involvement

There are six areas of contamination located in the vicinity of the railroad crossing on the south boundary of this property.

1.2.2 Recommended Remedial Action Option

It is recommended that Supplemental Standards, per 40 CFR 192(c) be implemented on this property due to the high cost of removing the contaminated material and due to the lack of a present or future health hazard.

1.2.3 Estimated Costs

The estimated cost for not invoking Supplemental Standards on this property is $49,700.00.

2.0 ENGINEERING FIELD SURVEY

2.1 Property Description

2.1.1 Property Use and Occupancy

Property CA-318 is a commercial property located at P. O. Box 440, Canonsburg, Pennsylvania and owned by McGraw Edison Power Systems. The map in Figure 2.1 illustrates the property's vicinity location.

2.1.2 Description

No deed is available for this property. The property is located in the borough of Canonsburg and is bounded by Adams Avenue on the west and Chartiers Creek on the south. The property is approximately 34 acres in size.

2.1.3 Bordering Properties

The lot is zoned I-2 Heavy Industrial. It is located in a commercial area less than 4 miles northeast of the old Vitro mill tailings site. The property is bounded on the north by residential properties; on the east by Cecil Township; on the south by Chartiers Creek; and on the west by Adams Avenue.

2.2 Existing Facilities and Structures

2.2.1 Structures

An industrial complex is located on the property. There is a three story brick administration building along Adams Avenue and numerous steel structures that make up the industrial complex. A large gravel and asphalt parking lot is located east of the complex. A security fence completely surrounds the complex with gates providing access to the parking lot and plant area at the east end of the complex and railroad access at the south end of the complex.

2.2.2 Utilities

Utilities are serviced to the property as follows:

Electric power - From substation at northeast corner of property.

Telephone - Unknown.

Water - Unknown.

Gas - Unknown.

Sewer - Unknown.

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 Figures 2.3 and 2.4.

Table 2.1

COMMERCIAL/INSTITUTIONAL

PROPERTY SURVEY DATA

GENERAL:

Facility Name: McGraw-Edison Power Systems

Address: P. O. Box 440, Canonsburg, Pennsylvania

Owner: McGraw-Edison

Occupancy: Employees/Occupants (Full Time:) _____

Employees/Occupants (Part Time:) _____

Remarks: McGraw-Edison is a large manufacturing facility with numerous employees.

Property Description:

Structure: (Identify) Administration Building

Sq. Ft.: 46,500 Levels 3

Construction Type: Brick

Foundation: Concrete

Remarks:

Structure: (Identify) Factory Complex - Multiple Buildings

Sq. Ft.: 1,017,800 Levels Varies

Construction Type: Steel Frame

Foundation: Concrete

Remarks: There are several large factory buildings side by side. Railroad access is provided to complex.

TABLE 2.1

COMMERCIAL/INSTITUTIONAL

PROPERTY SURVEY DATA

Facility Name: McGraw-Edison Power Systems

PROPERTY DESCRIPTION:

Driveway/Access: Concrete: _____ Asphalt: X Gravel: _____

Remarks: _____

_____

Sidewalks: Concrete: _____ Asphalt: _____

Remarks: _____

_____

Fences: Chain Link: Security Mesh: _____ Wood _____

Remarks: _____

_____

Grounds: Lawn: None

_____

Trees: None

_____

Shrubs: None

_____

Grading: Flat

_____

Soil Type: _____

_____

Remarks _____

_____

_____

Existing Survey Plot: No

TABLE 2.1

COMMERCIAL/INSTITUTIONAL

PROPERTY SURVEY DATA

Facility Name: McGraw-Edison Power Systems

UTILITIES: Heating: Gas _____ Electric _____ Oil _____

Hot Water _____ Other _____

Remarks: _____

_____

Electric Line Location: From substation located at northeast corner of property

Gas Line Location: Unknown

_____

Water Line Location: Unknown

_____

Sewer Line Location: Unknown

_____

Telephone Line Location: _____

_____

BUILDING CODES AND ZONING:

Building Code: UBC _____ BOCA XX

Remarks: _____

Zoning Jurisdiction: Borough of Canonsburg

Present Facility Zoning: I-2 Heavy Industrial

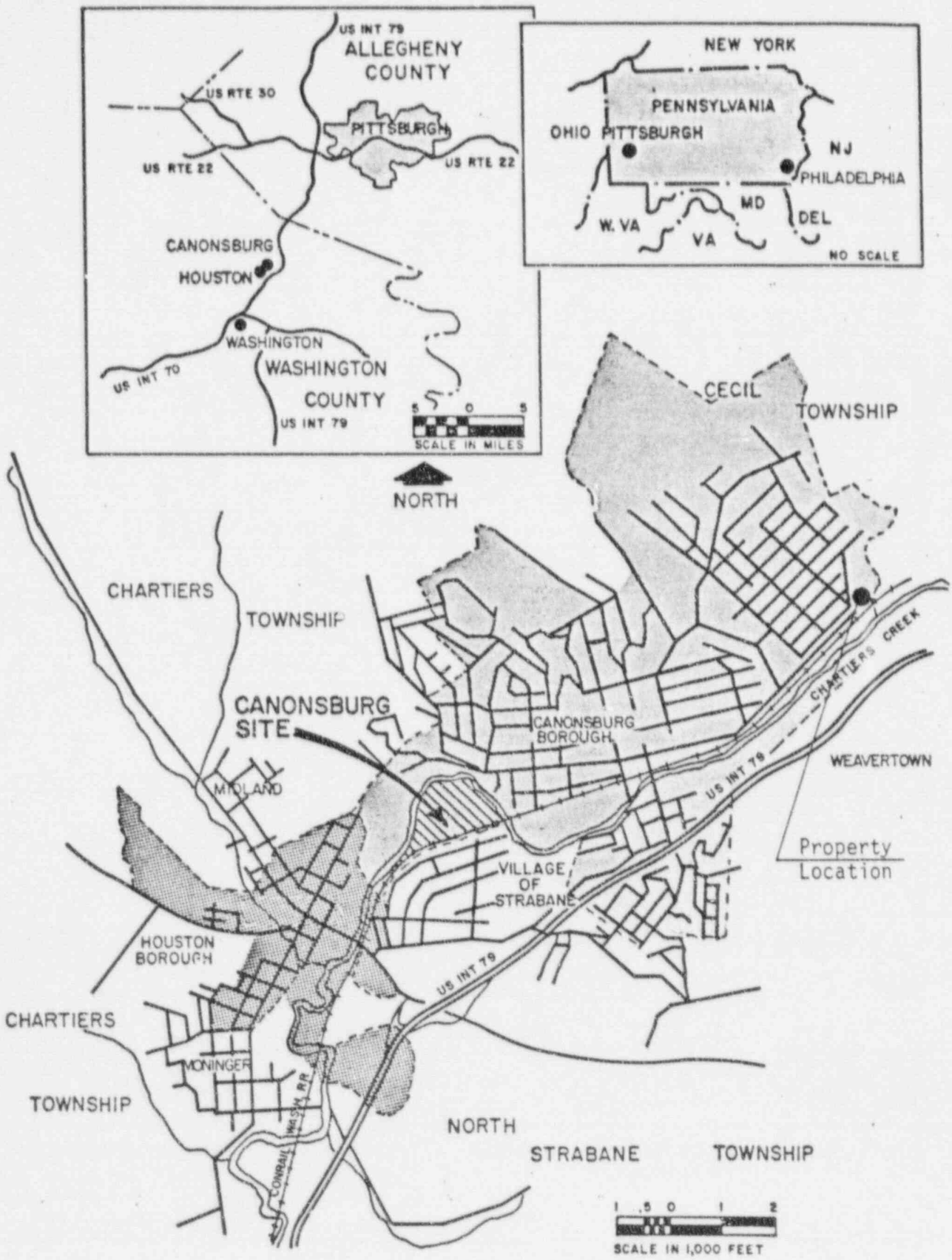
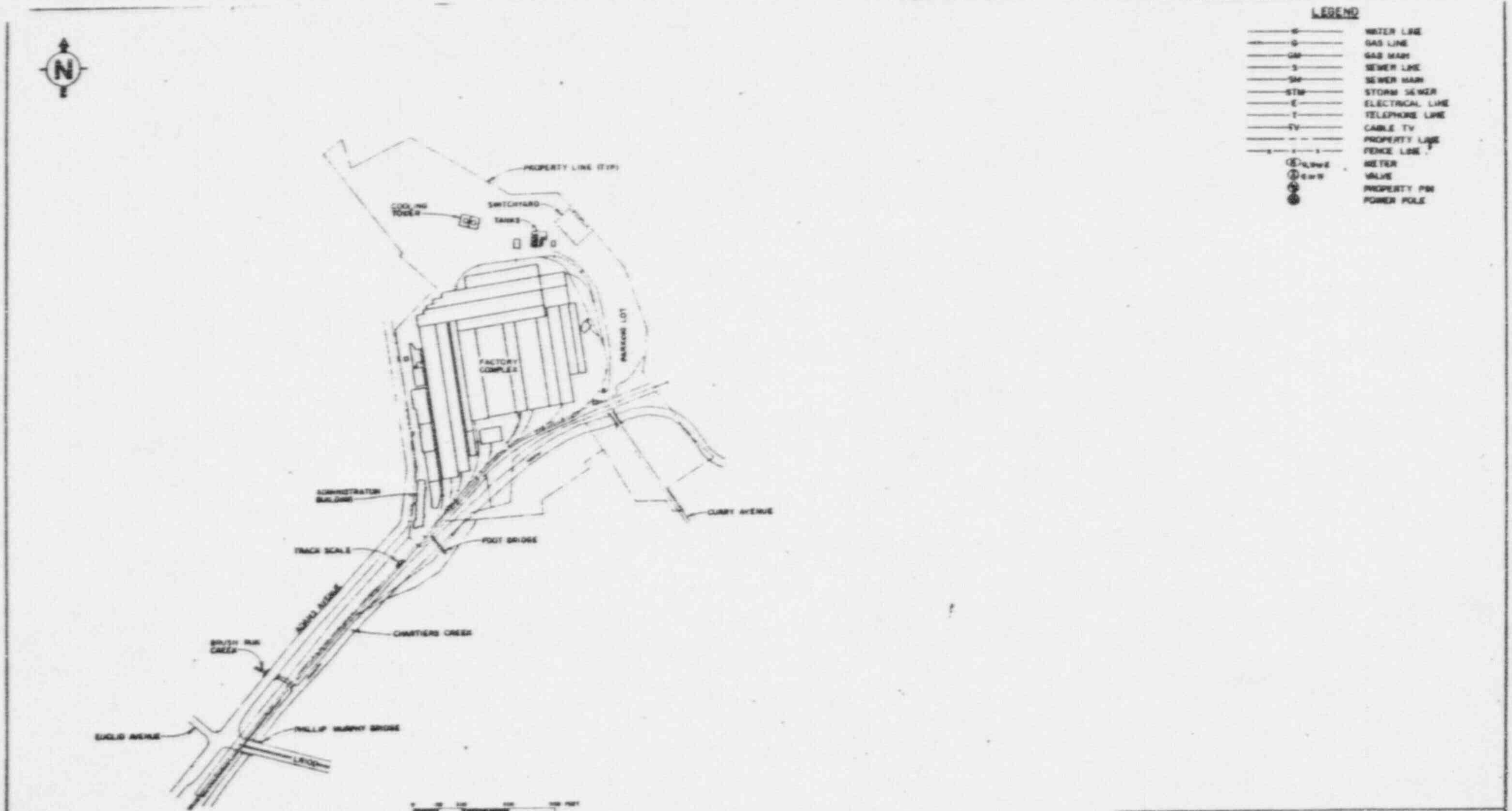


Figure 2.1 Vicinity Map - Canonsburg Site



U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

FIGURE 2.2
SITE PLAN CA-316
BOROUGH OF CANONSBURG, WASHINGTON COUNTY, PA
UMTRA VICINITY PROPERTY CLEANUP

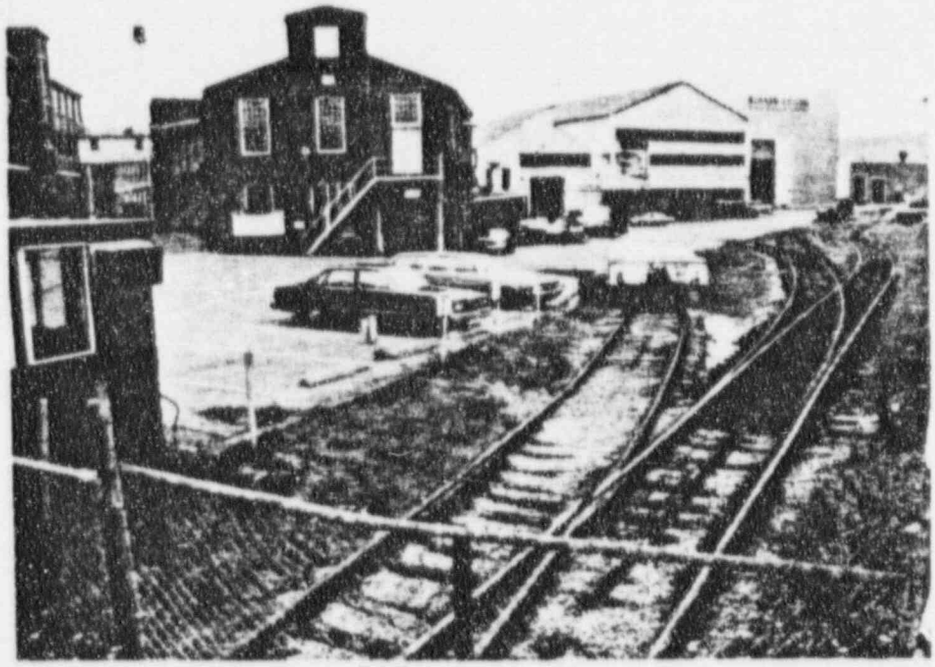
NR	NR	NR

MORRISON KNUDSEN

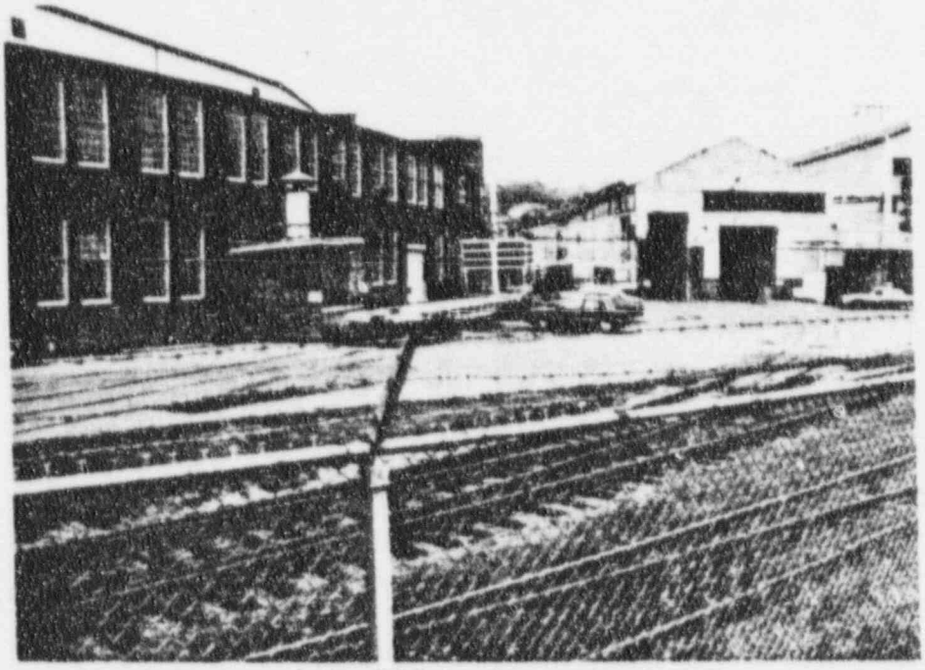
PROJECT NO DE-AC04-83AL18796

DRAWING NO CA-316-010 REV A

NO	DATE	REVISIONS
A		FINAL REA SUBMITTAL



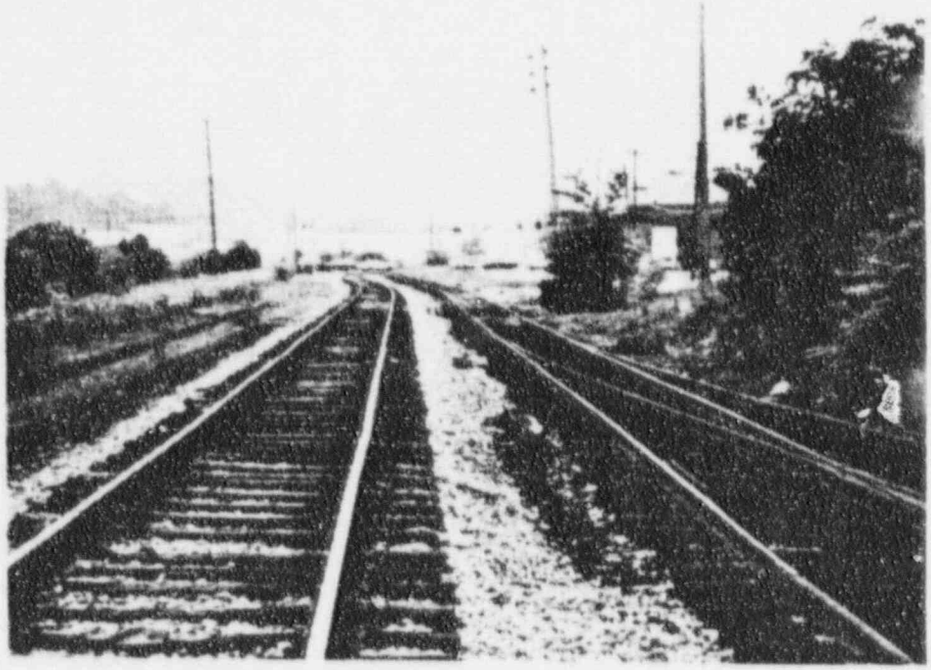
Area "A" Looking Northeast



Area "B" Looking North

Figure 2.3 Property Photos

Railroad Tracks from Complex Looking Southwest



Railroad Tracks Looking Southwest
Toward Brush Run Creek Bridge

Figure 2.4 Property Photos

3.0 RADIOLOGICAL SURVEY AND ASSESSMENT

3.1 Gamma Exposure Rate Survey

3.1.1 Survey Method

Outdoor and indoor gamma surveys were conducted by Oak Ridge National Laboratory. ORNL initially performed an inclusion survey and later returned to the property for a complete radiological survey. This action was taken to eliminate the need for a complete resurvey by Morrison-Knudsen Company, Inc.

3.1.2 Survey Results

Surface gamma readings on the property range from 7 to 260 micro R/hr (Table 3.1). This may be compared with the background for the Canonsburg site of 7 to 13 micro R/hr.

Indoor surface gamma readings range from 4 to 22 micro R/hr. Some elevated readings of 22 micro R/hr were detected but these readings were due to the natural radioactivity of the bricks. Aside from these elevated readings from the bricks, readings ranged from 4 to 9 micro R/hr inside the buildings.

3.2 Radon/Radon Daughter Survey

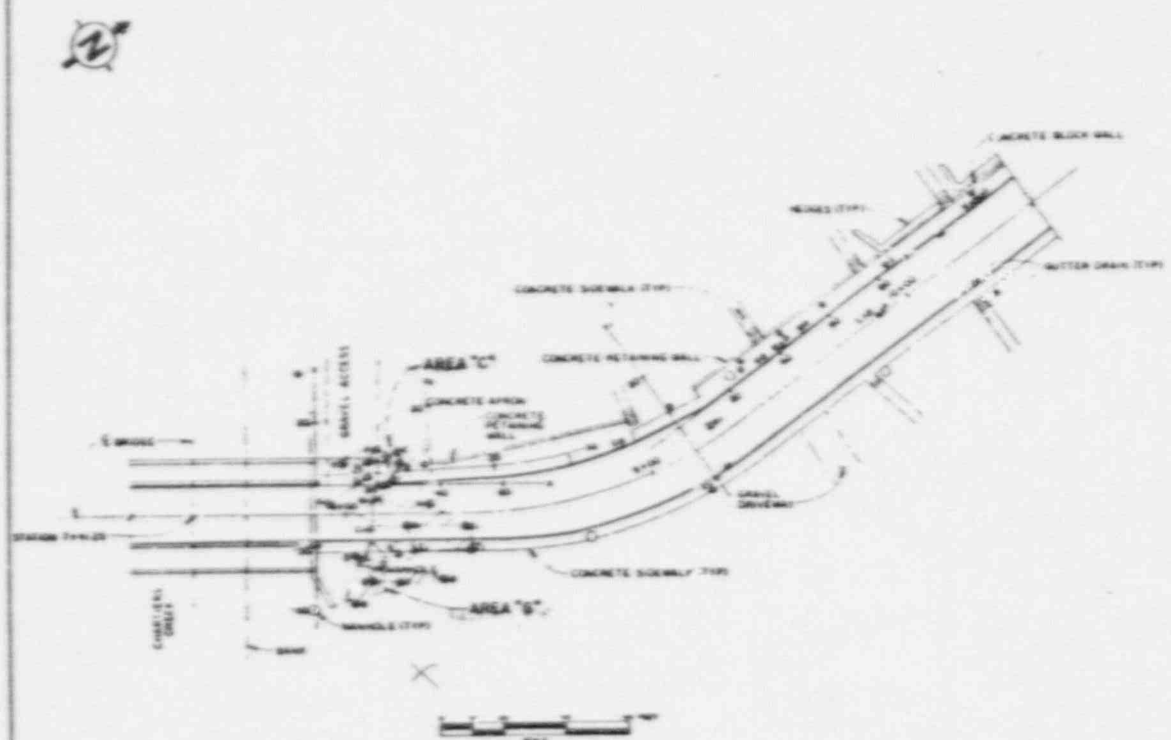
Radon/radon daughter surveys will be performed inside buildings at the property in compliance with the RAC Procedure 016 as soon as possible. The results will be forwarded to the property file.

3.3 Soil Samples

Nine surface soil samples (0-15cm.) and eight subsurface samples were taken. Concentrations of Ra-226 range from 1.5 pCi/g to 330 pCi/g. The soil samples are represented in Table 3.1 and shown in Figure 3.1.

3.4 Estimated Extent of Contamination

There are six areas of contamination on CA-318. They are all associated with portions of the railroad tracks crossing the south boundary of the property. The total area of these sections is approximately 32 square meters. Table 3.2 shows the approximate size of the areas of contamination.



LEGEND

- BACKGROUND HOLE
- AUGER HOLE DESIGNATION
- GAMMA SCAN COORDINATE
- GAMMA SCAN BOUNDARY
- AREA ABOVE 22,000 CPM (COUNT PER MINUTE)

A		FINAL, MCA SUBMITTAL						

U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

FIGURE 3.1

RADIOLOGICAL SURVEY DATA CA-400

BOROUGH OF CANONSBURG, WASHINGTON COUNTY, PA

URANIUM MILL TAILINGS PROPERTY CLEANUP

APPROVED: NR | NR | NR

MORRISON KNUDSEN

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. CA-400-015 REV. A

3.5 Supplemental Standards

Under the currently used railroad tracks it is highly unlikely that the tailings can be readily dispersed by man or natural forces. The likelihood of a structure being constructed on these areas is also very remote. Table 4.1 contains a cost estimate for removing the contamination. Additional costs would be incurred due to disrupting the current occupant's business. Detailed drawings of the contaminated areas from the ORNL inclusion survey show that any excavation of the tailings would disturb the railroad tracks.

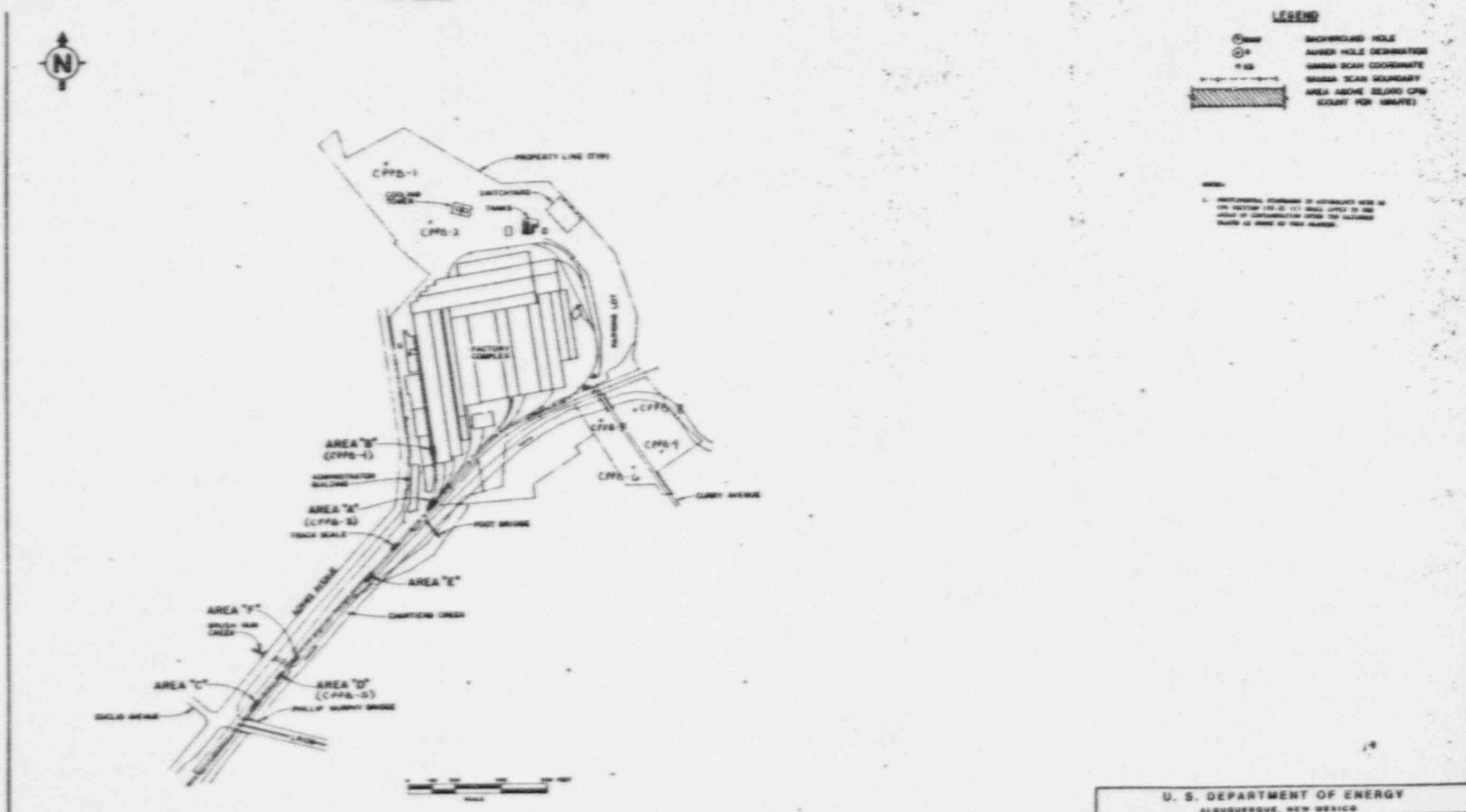
Due to the high cost of removing the contamination and because it presents no clear present or future hazard, we recommend implementation of Supplemental Standards, as set forth in Criterion C of 40 CFR 192.

Table 3.1
SOIL SAMPLES
Property CA-318

SOIL SAMPLE NUMBER	LOCATION	SAMPLE DEPTH (cm.)	RA-226 CONCENTRATION (pCi/g)
CPPB-1A	Parcel I, open field	0-15	2.0
CPPB-1B	Parcel I, open field	15-30	1.5
CPPB-2A	Parcel I, south of CPPB-1	0-15	1.5
CPPB-3A	At HOG, Region A	0-15	290.0
CPPB-3B	At HOG, Region A	15-30	65.0
CPPB-4A	Region B, railway between building	0-15	330.0
CPPB-4B	Region B, railway between building	15-30	110.0
CPPB-5A	Railroad tracks outside plant fence	0-15	73.0
CPPB-6A	W of Curry Ave. Parcel II	0-15	1.5
CPPB-6B	W of Curry Ave. Parcel II	15-30	3.4
CPPB-7A	W. of Curry Ave. Parcel II	0-15	1.5
CPPB-7B	W. of Curry Ave. Parcel II	15-30	1.5
CPPB-8A	E. of Curry Ave. Parcel II	0-15	1.5
CPPB-8B	E. of Curry Ave. Parcel II	15-30	1.5
CPPB-9A	E. of Curry Ave. Parcel II	0-15	1.5
CPPB-9B	E. of Curry Ave. Parcel II	15-30	1.5

Table 3.2
ESTIMATED SIZE OF CONTAMINATED AREAS
Property CA-318

AREA	SIZE (SQUARE METERS)
A	3
B	19
C	4
D	2
E	3
F	1
TOTAL	12



U. S. DEPARTMENT OF ENERGY

ALBUQUERQUE, NEW MEXICO

FIGURE 3.1

RADIOLOGICAL SURVEY DATA CA-318

BOROUGH OF CANONSBURG, WASHINGTON COUNTY, PA

UMTRA VICINITY PROPERTY CLEANUP

NR	NR	NR

MORRISON KNUDSEN

PROJECT NO. DE-AC04-83AL18796

DRAWING NO. CA-318-015 REV. A

A FINAL R&A SUBMITTAL

4.0 ENGINEERING ASSESSMENT

The radiological survey performed on this property by Oak Ridge National Laboratory (ORNL) indicated contamination under the railroad tracks. The tracks are active and performing remedial action will cause disruption to the property owner's business. Based on the location of the contamination and recommendation by ORNL in the inclusion report, supplemental standards in accordance with 40 CFR Section 192.21 (C) shall apply to the contamination on this property. Estimated costs for not applying Supplemental Standards are detailed in Table 4.1.

Table 4.1
COSTS FOR NOT APPLYING
SUPPLEMENTAL STANDARDS

Activity	Unit Price	Quantity	Estimated Cost
Excavation (Machine)	10.30	509 cy	5,243.00
Backfill (Track Ballast and Subballast)	21.91	509 cy	11,152.00
Remove and Replace Railroad Tracks	24.42	595 lf	14,530.00
Remove and Replace Track Switches	1,221.00	3 ea	3,663.00
Subtotal			$ 34,588.00
5% Subcontractor's Contingency			1,729.00
20% Overhead and Profit			6,917.00
Subtotal			43,234.00
15% Contingency			6,485.00
Total (Rounded)			49,700.00

APPENDIX A

ORNL INCLUSION SURVEY REPORT

MAY 1985

ORNL/RASA-85
(CA00318)

Health and Safety Research Division

REPORT OF INCLUSION SURVEY AT LOCATION CA00318
McGRAW-EDISON POWER SYSTEMS DIVISION
P.O. BOX 440
CANONSBURG, PENNSYLVANIA 15317

J. K. Williams
Information Resources Organization

Manuscript Completed - May 1985
Date of Issue - May 1985

Investigation Team

B. A. Berven - RASA Program Manager
C. A. Little - RASA/UMTRA Project Director
C. Clark, Jr. - Survey Field Supervisor

Work performed as part of the
RADIOLOGICAL SURVEY ACTIVITIES PROGRAM

Prepared by the
OAK RIDGE NATIONAL LABORATORY
Grand Junction Office
Grand Junction, Colorado 81501
operated by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under Contract No. DE-AC05-84OR21400

ACKNOWLEDGMENTS

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REPORT OF INCLUSION SURVEY AT LOCATION CA00318
McGRAW-EDISON POWER SYSTEMS DIVISION
P.O. BOX 440
CANONSBURG, PENNSYLVANIA 15317

INTRODUCTION

An inclusion radiological survey of location CA00318 was conducted on March 15-16, 1985, by Oak Ridge National Laboratory. The property consists of the McGraw-Edison power plant which includes numerous buildings on an irregularly shaped 91 acre lot. Figures 1, and Figs. 10 through 14 show several parcels of the property with contaminated regions and/or soil sampling locations. Several different views of the property are shown in Figs. 2 through 9.

RADIOLOGICAL RESULTS

A survey was conducted using methods as defined in the UMTRAP Vicinity Properties Management and Implementation Manual (June 1984). Survey results are summarized in Table 2. All measurements are gross readings; background has not been subtracted.

Outdoor Gamma Screening

Based on measurements taken in an uncontaminated region, the background gamma exposure rate is estimated to be 10 ± 3 μR/h, ranging from 7 to 13 μR/h. Elevated gamma levels ranged as follows in the regions indicated on Fig. 1: (A) 66 to 260 μR/h; (B) 22 to 150 μR/h; Fig. 10: (C) 55 to 66 μR/h; (D) 33 μR/h; (F) 33 μR/h, and Fig. 11: (E) 33 μR/h. The high outdoor gamma was measured in a 3 m^2 area north of the pedestrian foot bridge in parcel I at the southwest corner of the property. The total contaminated area equals ~32 m^2.

Indoor Gamma Screening

A complete gamma scan of the ground floor of the buildings showed a general range of exposure rates from 4 to 9 μR/h. The high indoor gamma (22 μR/) was measured on contact with interior brick walls of the buildings. These gamma elevations are due to natural radiation inherent in the brick material. All other gamma levels were within the background range.

Extended Measurements

Nine surface soil samples and eight subsurface samples were taken at the locations shown in Fig. 1. The ^{226}Ra concentrations in the surface samples from locations CPPB-1 through CPPB-9 ranged from 1.5 to 330 pCi/g. The ^{226}Ra concentrations in the subsurface samples from the same locations with the exception of CPPB-2, ranged from 1.5 to 110 pCi/g.

SIGNIFICANCE OF FINDINGS

The six contaminated regions found outdoors in various areas of the property as shown on Fig. 1., encompass ~32 m^2. The results of the radionuclide analyses demonstrate that the concentration of ^{226}Ra in both surface and subsurface soil in region B exceeds the respective inclusion criteria of 5 and 15 pCi/g above background when averaged over an area of 100 m^2. However, based on the location of the contamination, it is recommended that location CA00318 be included for further consideration by the UMTRA Project with the possible implementation of supplemental standards.

Location No.: CA00318
Survey Date: March 15-16, 1985

Table 1. Location Information

SITE LOCATION:	Mcgraw-Edison Power Systems Division P.O. Box 440 Canonsburg, Pennsylvania 15317
OCCUPANT/TENANT:	Mcgraw-Edison Power Systems Division
OWNER:	Mcgraw-Edison Power Systems Division
ADDRESS:	signed by R. G. Schwartz P.O. Box 440 Canonsburg, Pennsylvania 15317
PHONE:	(412) 926-8730 (Home) (412) 873-2284 (Business)
PROPERTY CLASSIFICATION:	Power plant
OCCUPANCY:	Undetermined
NUMBER OF STRUCTURES ON PROPERTY:	Multiple
STRUCTURE TYPE(S):	Brick buildings

Location No.: CA00318
Survey Date: March 15-16, 1985

Table 2. Radiological Survey Results

OUTDOOR SCREENING DATA

BACKGROUND EXPOSURE RATE:	10 ± 3 μR/h
BACKGROUND +1 STANDARD DEVIATION:	13 μR/h
BACKGROUND EXPOSURE RATE RANGE:	7-13 μR/h
EXPOSURE RATE RANGE IN CONTAMINATED AREAS:	A: 66-260 μR/h D: 33 μR/h B: 22-150 μR/h E: 33 μR/h C: 55-66 μR/h F: 33 μR/h
HOG:	260 μR/h
LOCATION OF HOG:	N of pedestrian foot bridge in parcel I (region A)
ESTIMATED AREA OF OUTDOOR CONTAMINATION:	A: 3 m^2 D: 2 m^2 B: 19 m^2 E: 3 m^2 C: 4 m^2 F: 1 m^2
TOTAL AREA:	~32 m^2

INDOOR SCREENING DATA

STRUCTURE DESCRIPTION OR NUMBER:	Brick buildings
BACKGROUND EXPOSURE RATE RANGE:	4-9 μR/h
EXPOSURE RATE RANGE IN CONTAMINATED AREAS:	11-22 μR/h
HIG:	22 μR/h
LOCATION OF HIG:	Indoor brick walls due to natural radiation of brick material
ESTIMATED AREA OF INDOOR CONTAMINATION:	None

EXTENDED MEASUREMENTS

SOIL SAMPLE NUMBER	LOCATION	SAMPLE DEPTH (cm)	^{226}RA CONCENTRATION (pCi/g)
CPPB-1A	Parcel I, open field	0-15	2.0
CPPB-1B	Parcel I, open field	15-30	1.5
CPPB-2A	Parcel I, south of CPPB-1	0-15	1.5
CPPB-3A	At HOG, region A	0-15	290.
CPPB-3B	At HOG, region A	15-30	65.
CPPB-4A	Region B, railway between bldg	0-15	330.
CPPB-4B	Region B, railway between bldg	15-30	110.
CPPB-5A	Railroad tracks outside plant fence	0-15	73.
CPPB-5B	Railroad tracks outside plant fence	15-30	26.
CPPB-6A	W of Curry Ave, parcel II	0-15	1.5
CPPB-6B	W of Curry Ave, parcel II	15-30	3.4
CPPB-7A	W of Curry Ave, parcel II	0-15	1.5
CPPB-7B	W of Curry Ave, parcel II	15-30	1.5
CPPB-8A	E of Curry Ave, parcel II	0-15	1.5
CPPB-8B	E of Curry Ave, parcel II	15-30	1.5
CPPB-9A	E of Curry Ave, parcel II	0-15	1.5
CPPB-9B	E of Curry Ave, parcel II	15-30	1.5

RECOMMENDATION

RECOMMENDED FOR: Inclusion with possible implementation of supplemental standards

RECOMMENDATION BASIS: Concentration of ^{226}Ra in surface soil is >5 pCi/g above background over an area 100 m^2;
Concentration of ^{226}Ra in subsurface soil is >15 pCi/g above background over an area 100 m^2

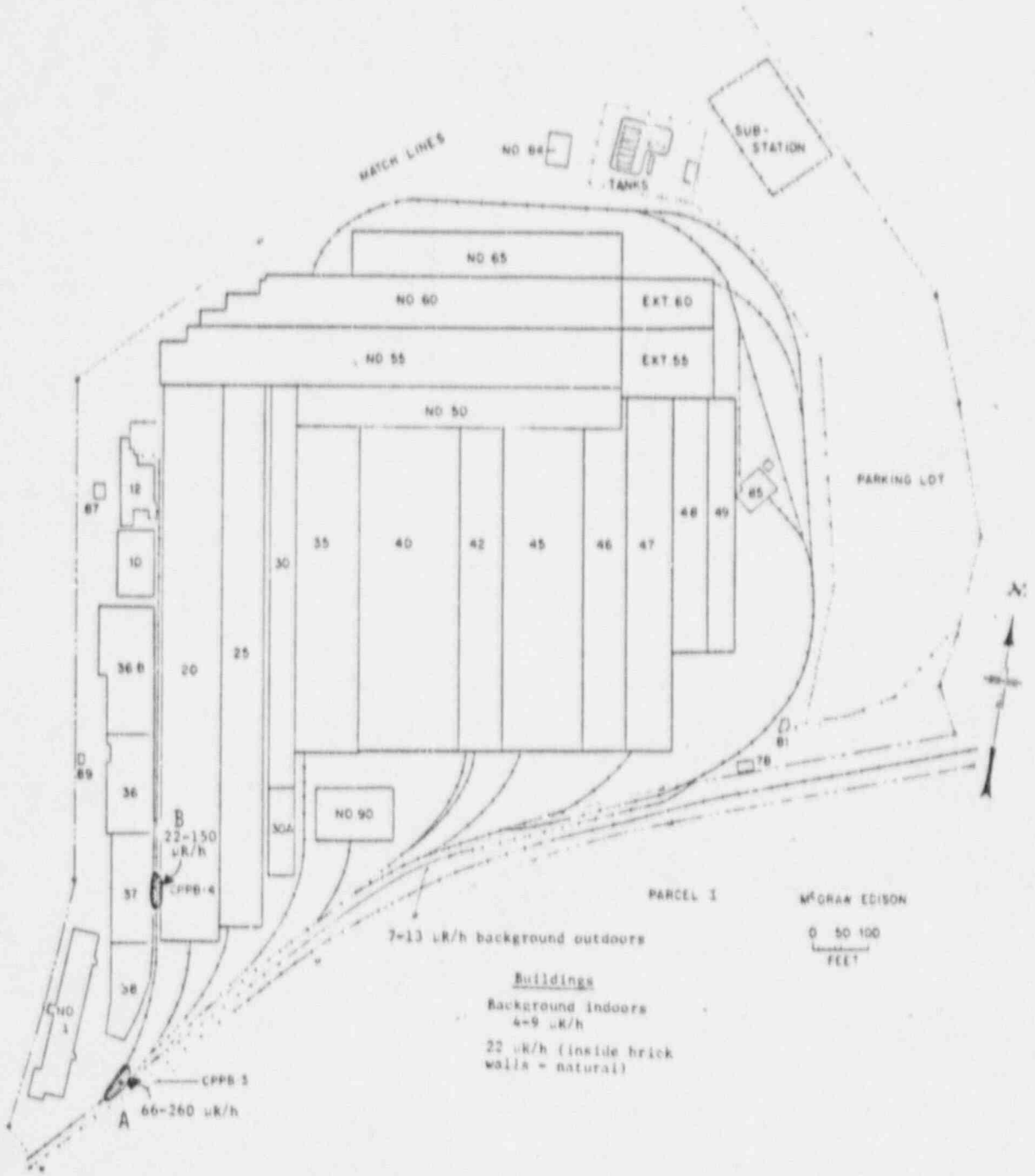

Fig. 1. Location CA00318 - McGraw-Edison Power Systems Division, P. O. Box 440, Canonsburg, Pennsylvania.

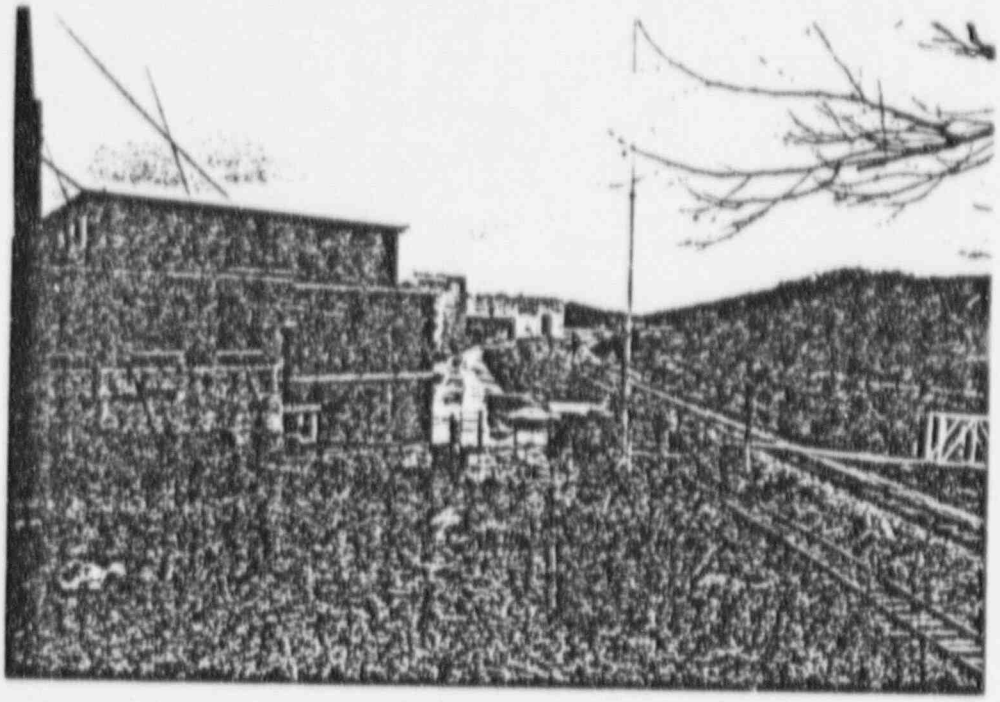

Fig. 2. Location CA00318 looking northeast at the side and rear of the property.

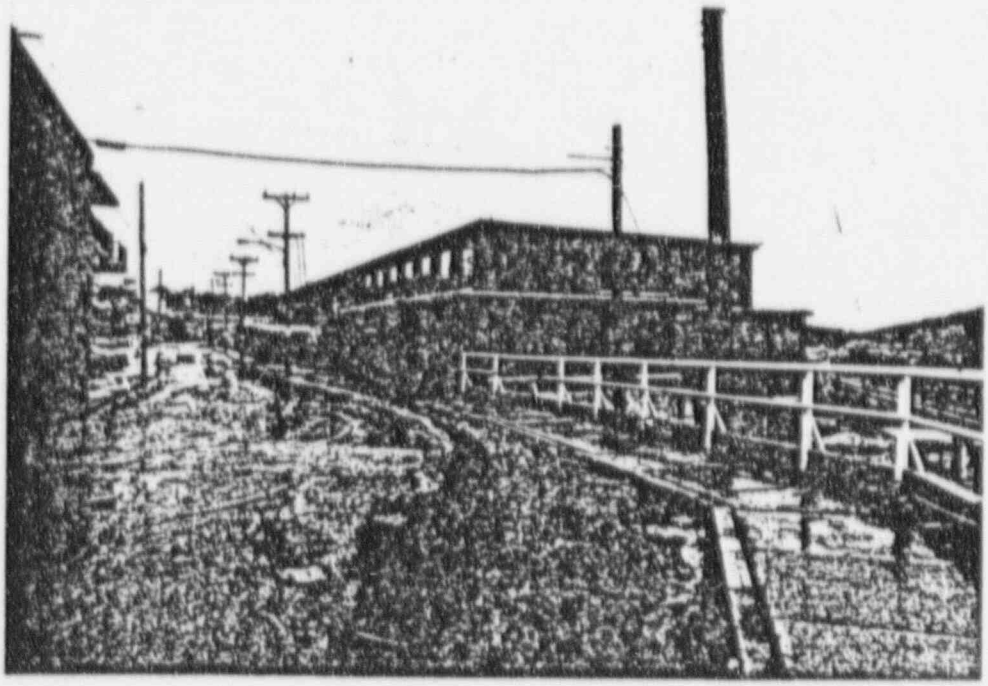

Fig. 3. Location CA00318 looking northeast at the front of the property.

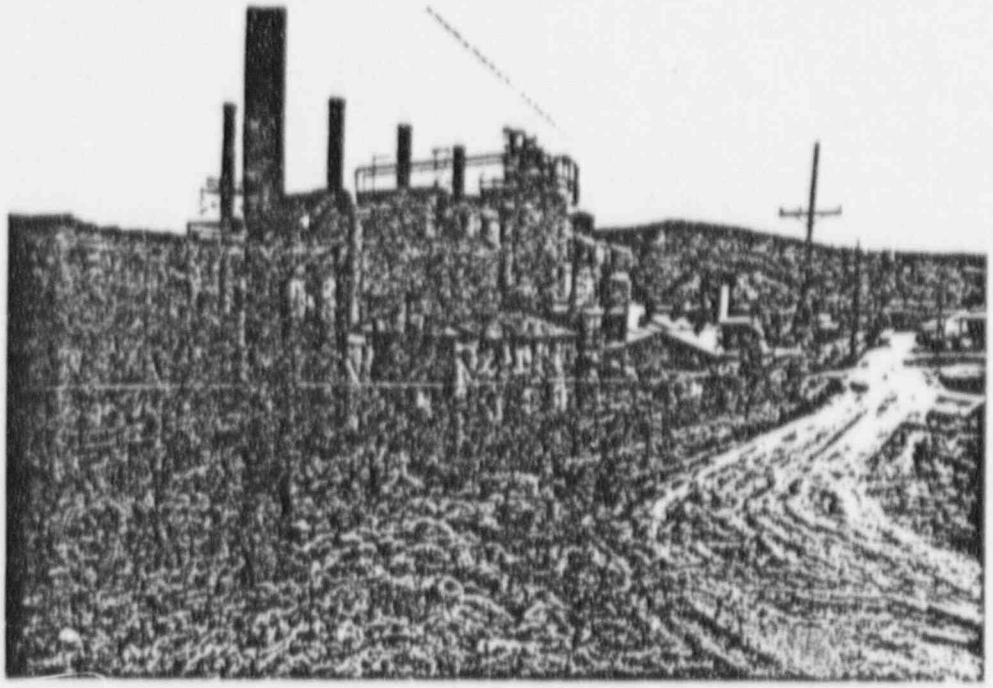

Fig. 4. Location CA00318 looking south at the northwest end of the property.

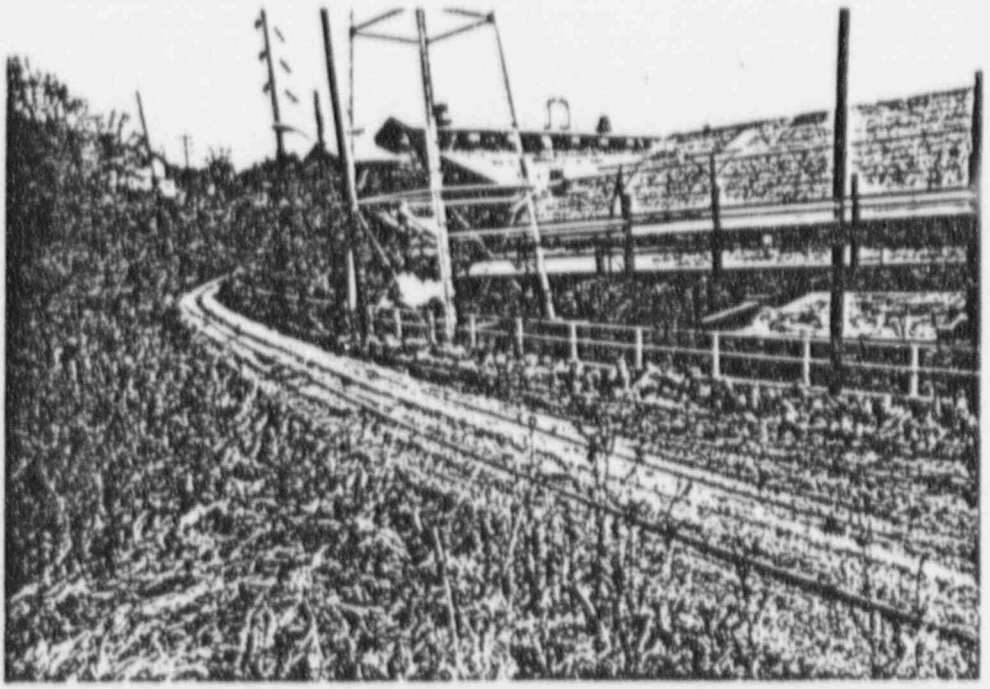

Fig. 5. Location CA00318 looking northeast at Perimeter Road.

Fig. 6. Location CA00318 looking south to fill area of McGraw-Edison from Fifth Street.

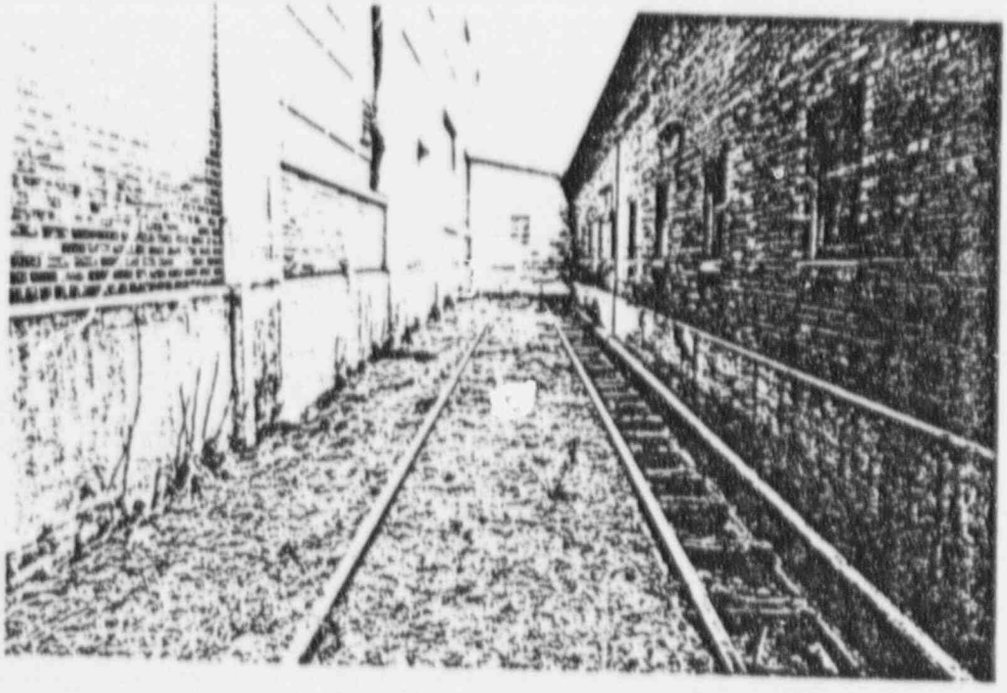

Fig. 7. Location CA00318 looking north between buildings #38 and #20.

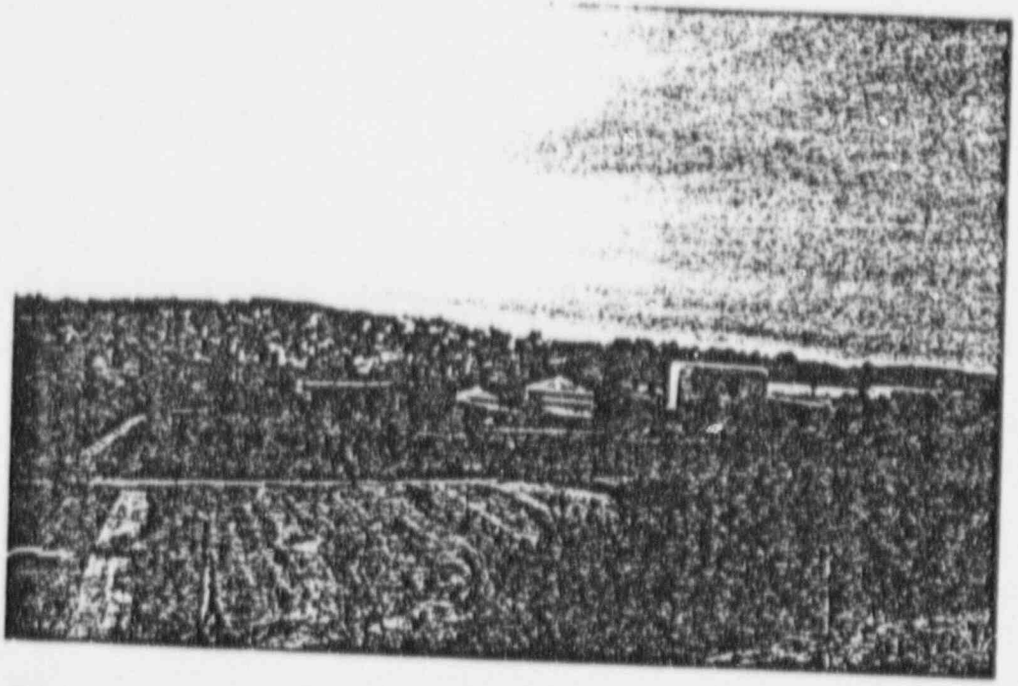

Fig. 8. Location CA00318 looking north from Pittsburg Road to McGraw-Edison.

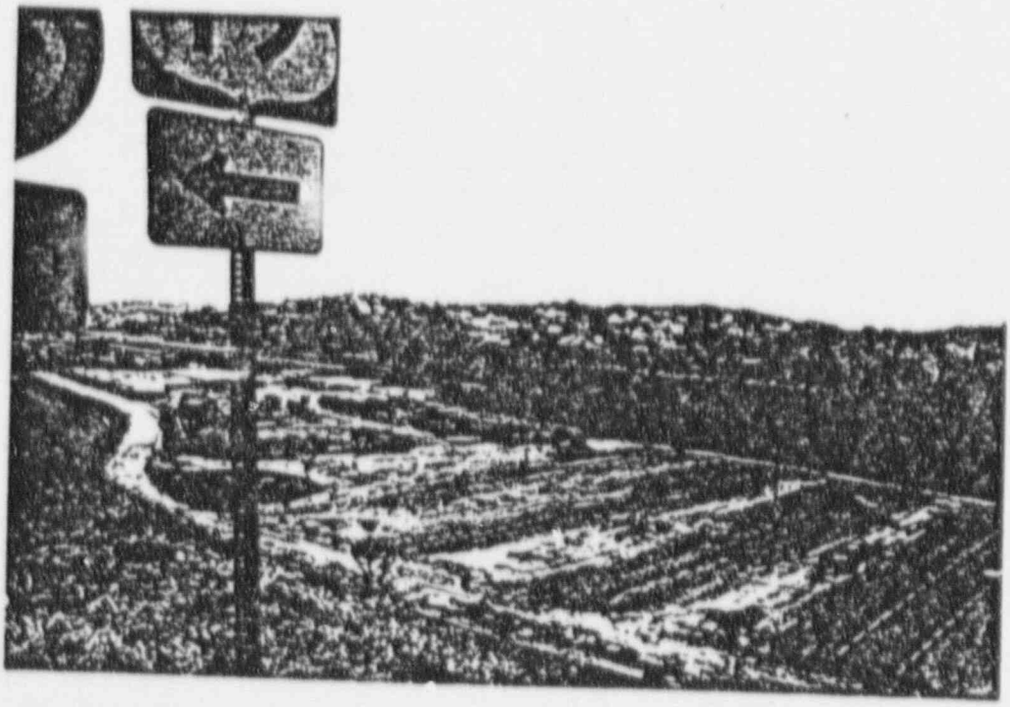

Fig. 9. Location CA00318 looking northwest at railroad to McGraw-Edison.

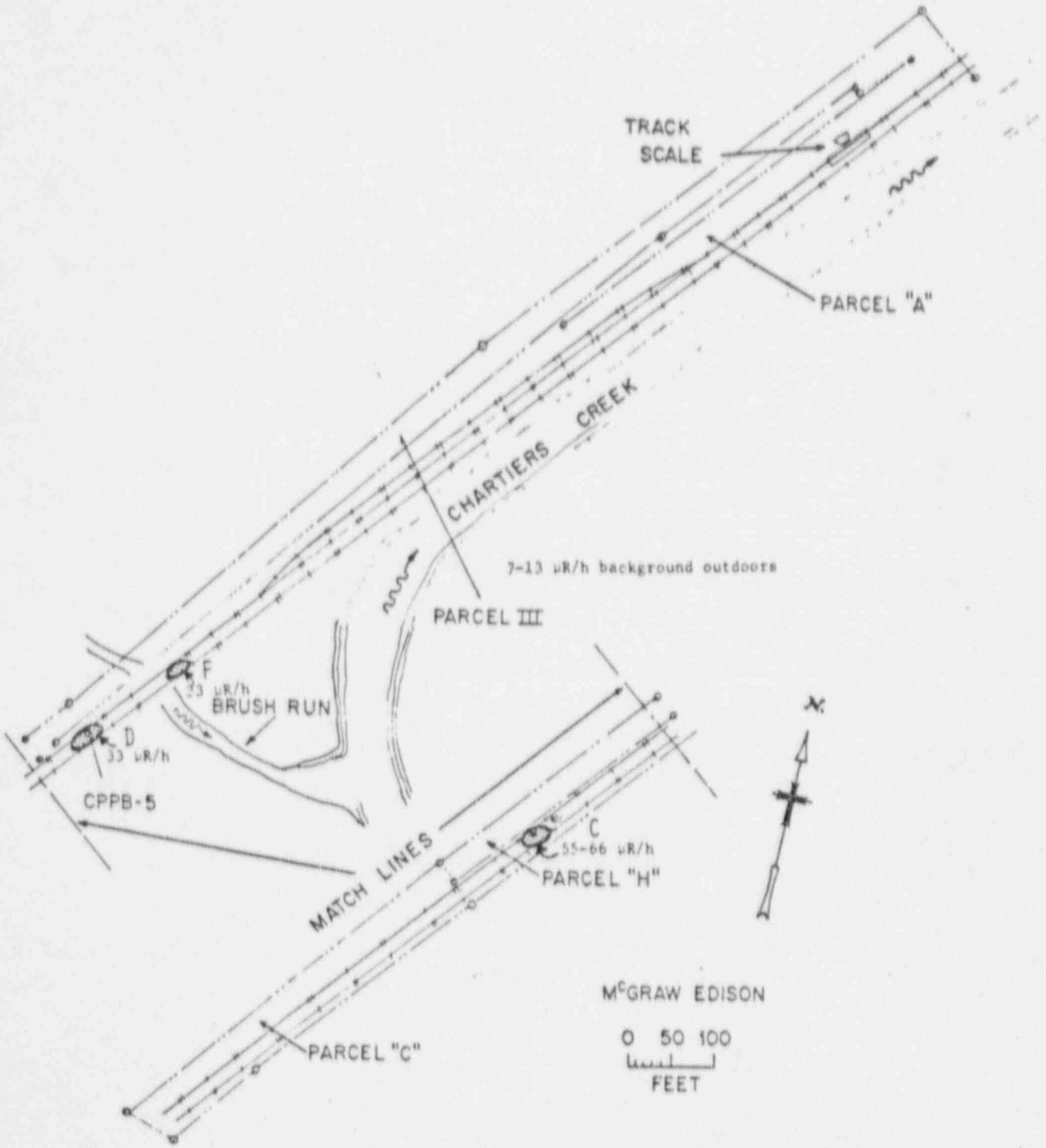

Fig. 10. Location CA00318 showing soil sampling location in Parcel III and contaminated areas in Parcel III and Parcel H.

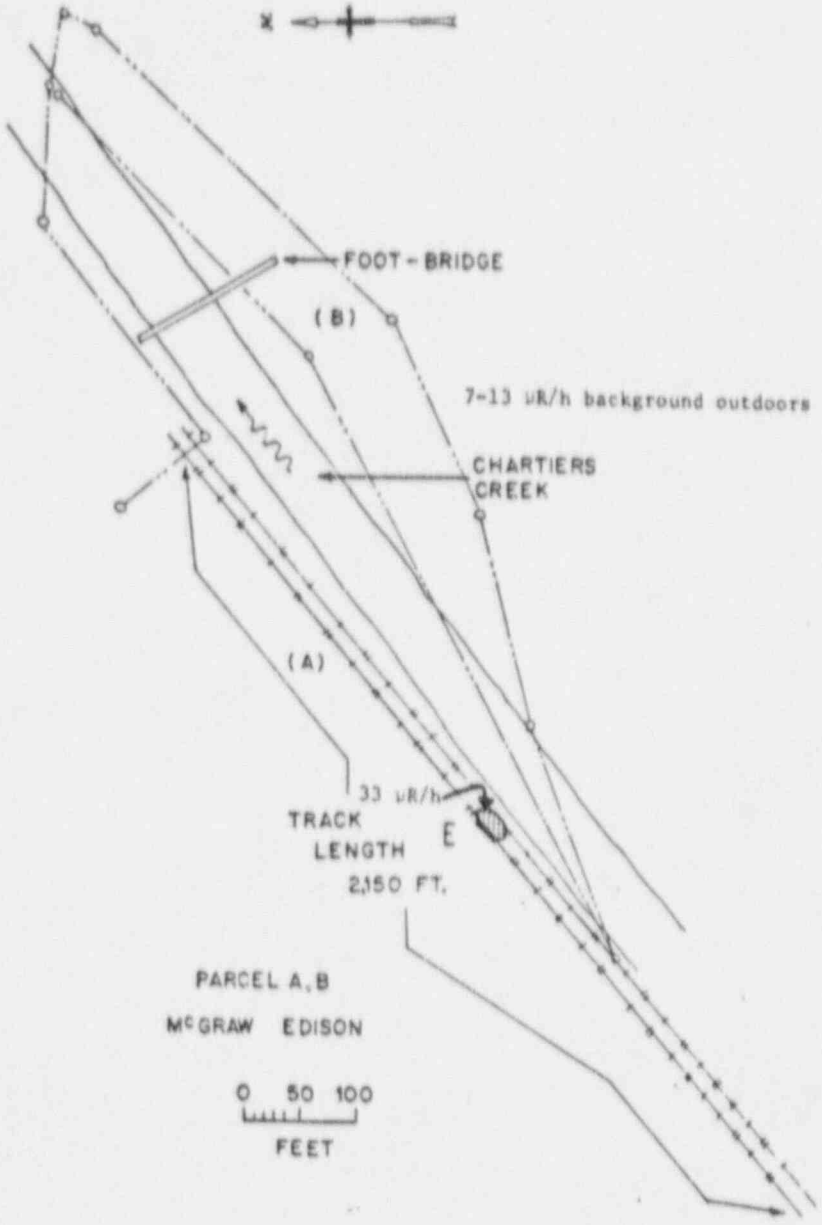

Fig. 11. Location CA00318 showing contaminated area in Parcel A.

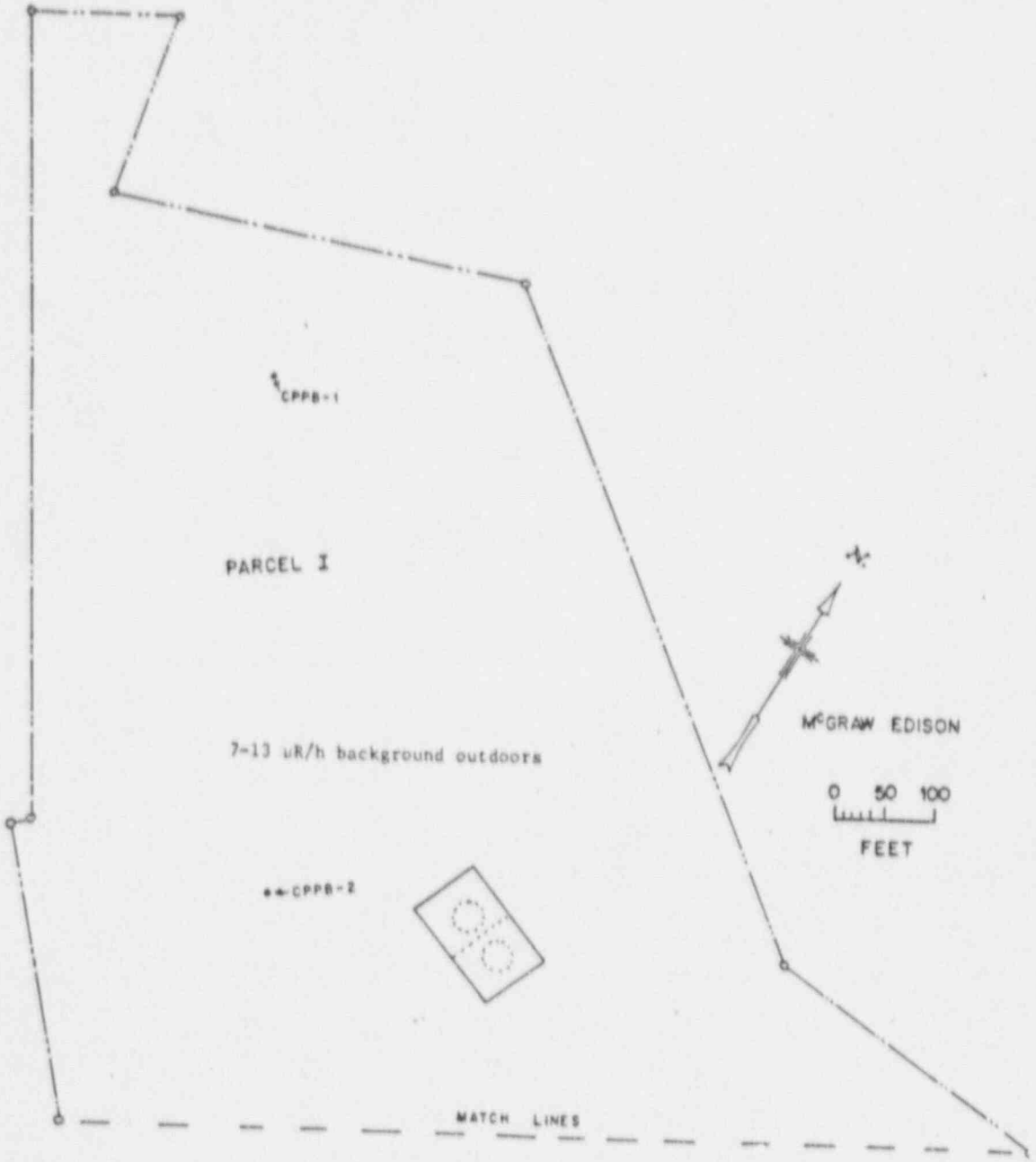

Fig. 12. Location CA00318 showing soil sampling locations in the northern region of Parcel I.

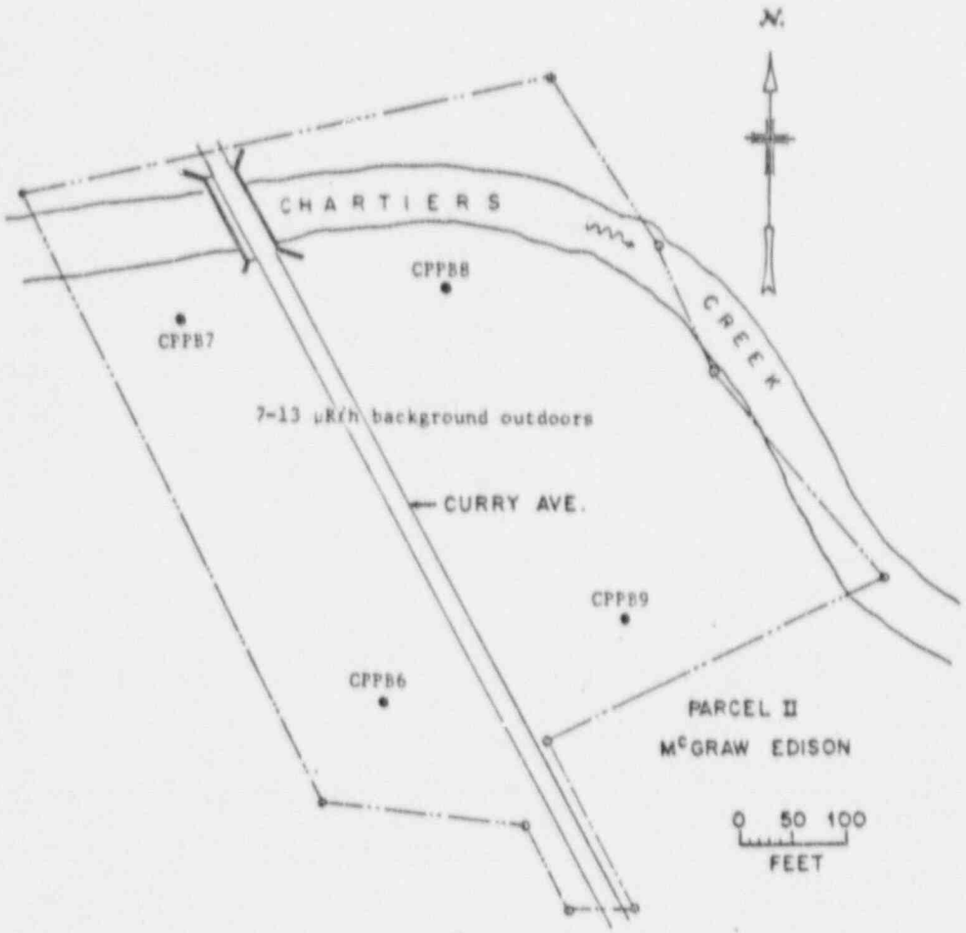

Fig. 13. Location CA00318 showing soil sampling locations in Parcel II.

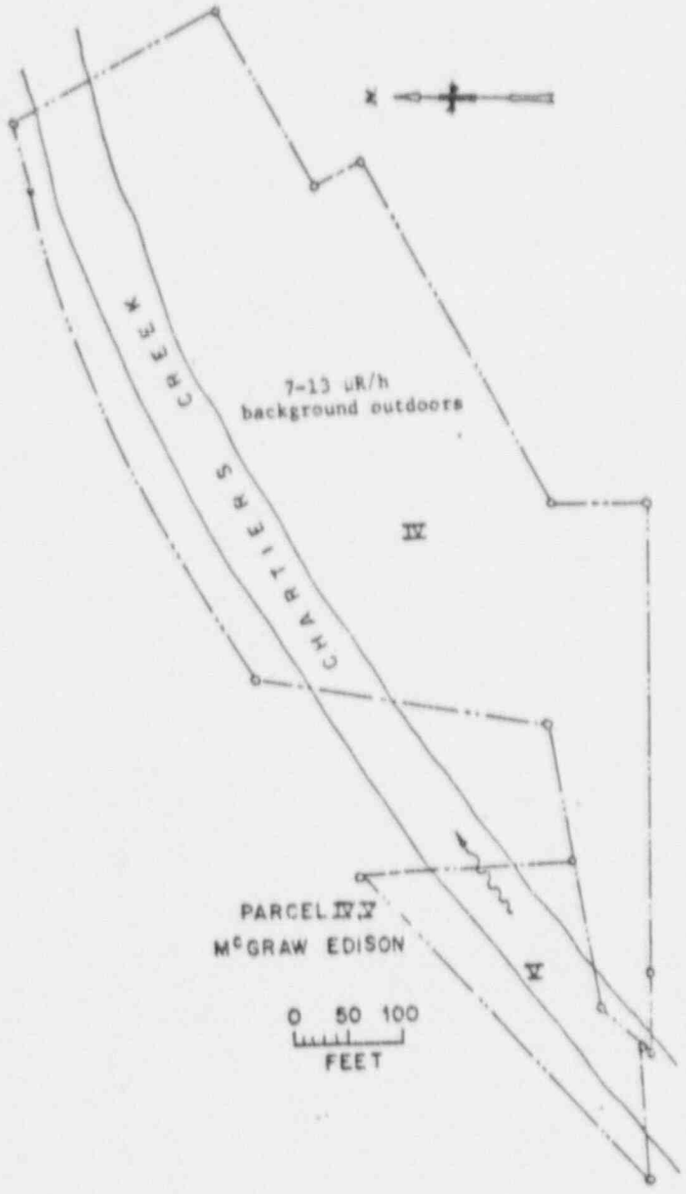

Fig. 14. Location CA00318 showing Parcels IV and V.

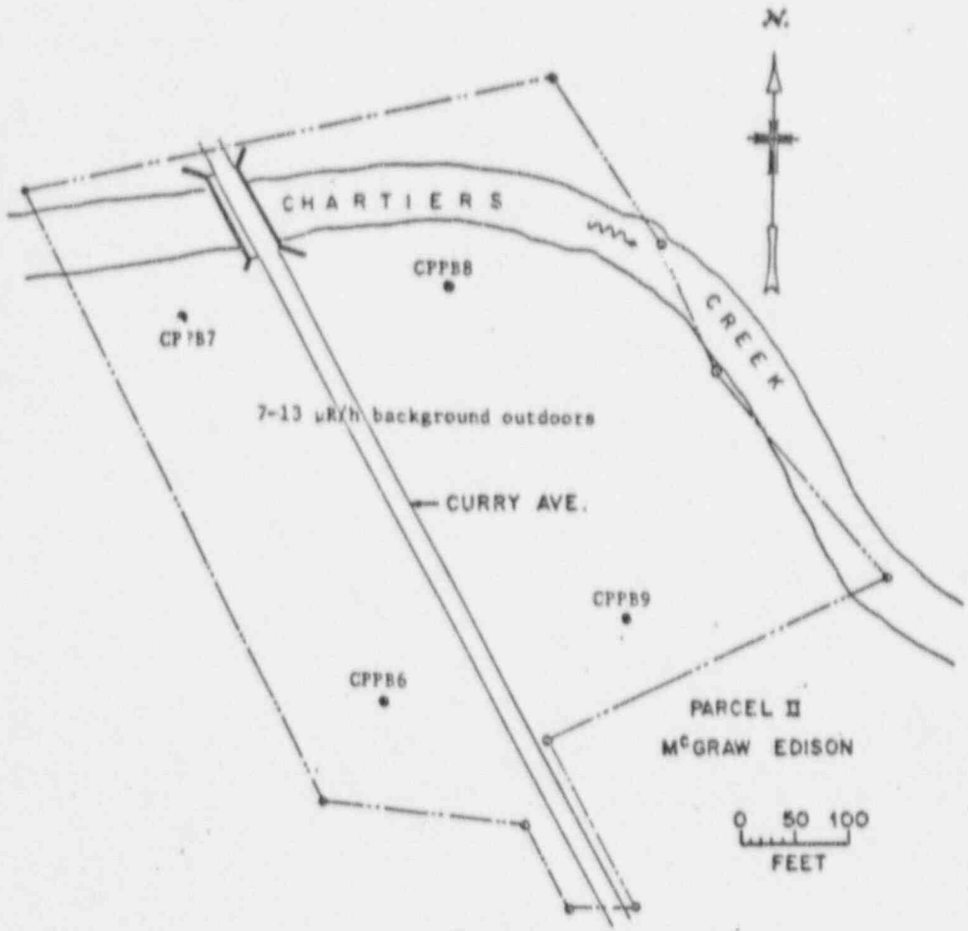

Fig. 13. Location CA00318 showing soil sampling locations in Parcel II.

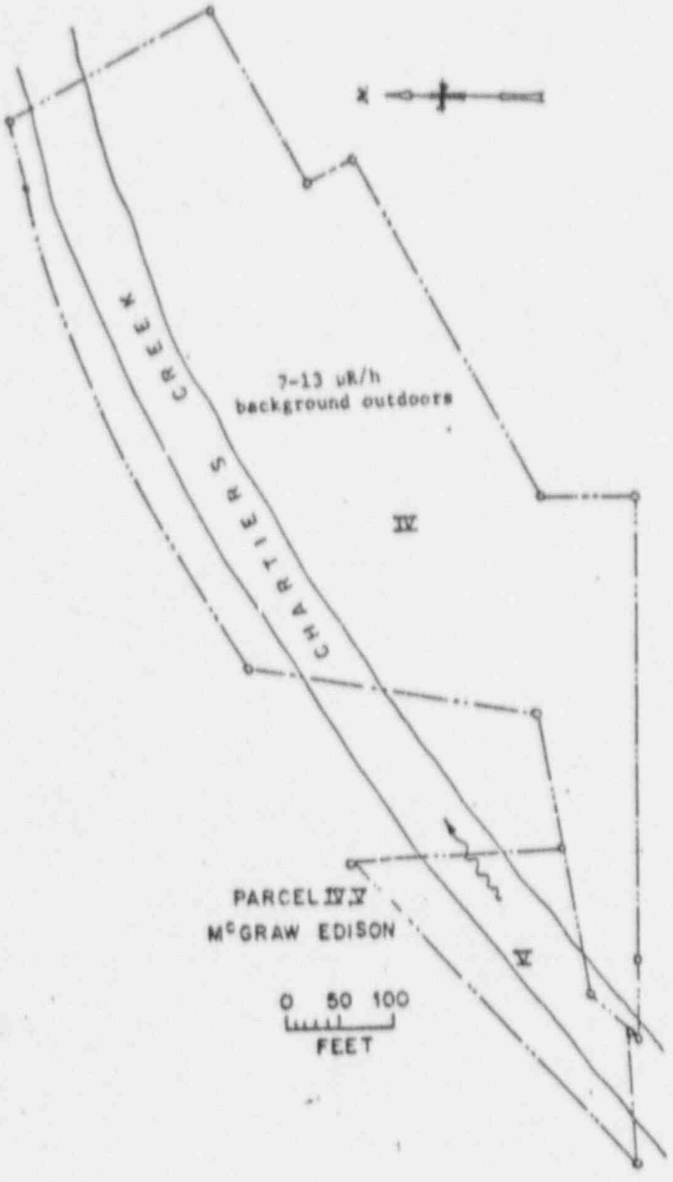

Fig. 14. Location CA00318 showing Parcels IV and V.

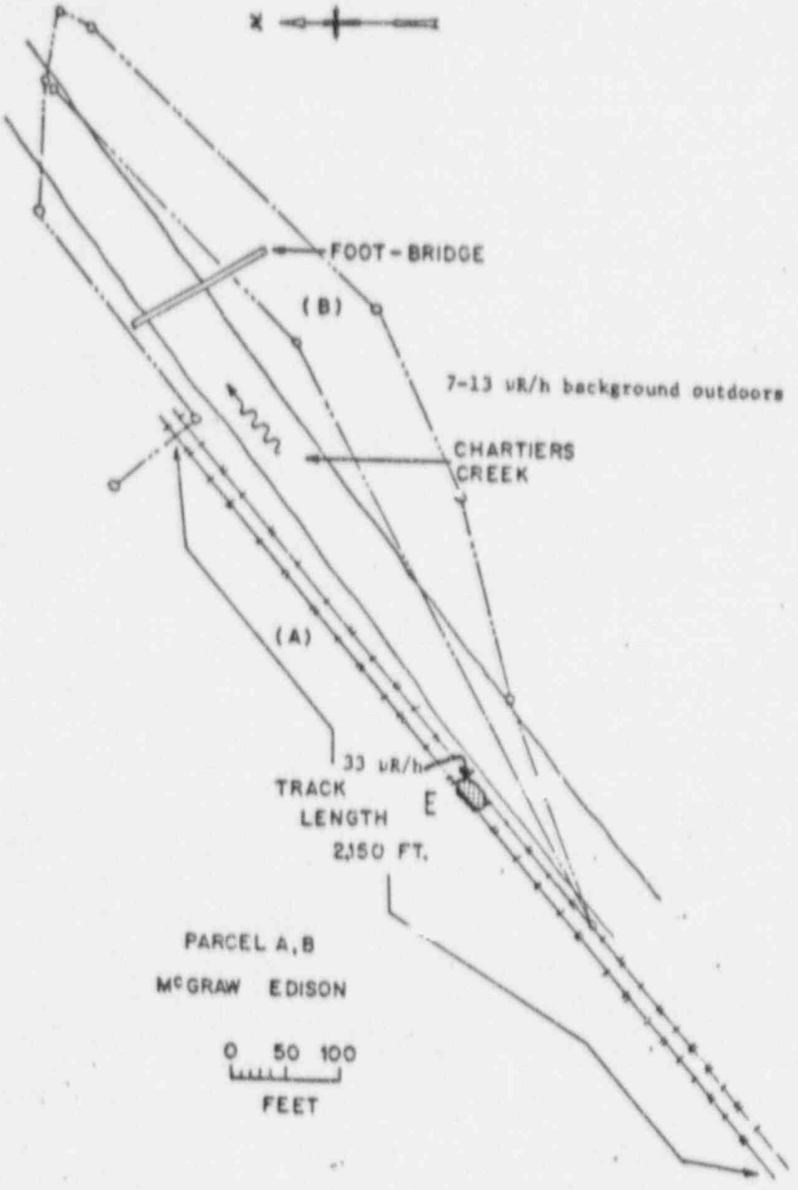

Fig. 11. Location CA00318 showing contaminated area in Parcel A.

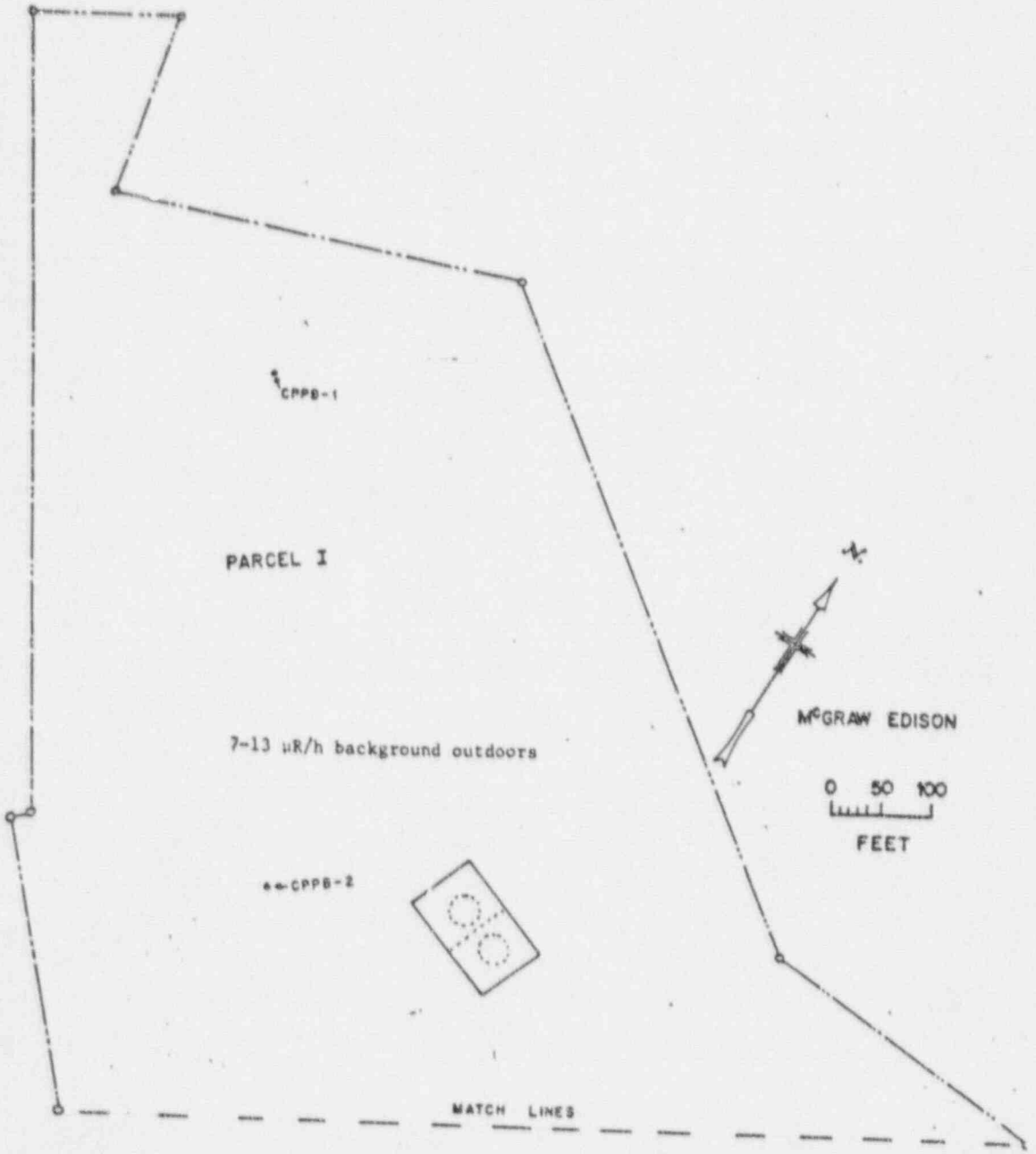

Fig. 12. Location CA00318 showing soil sampling locations in the northern region of Parcel I.

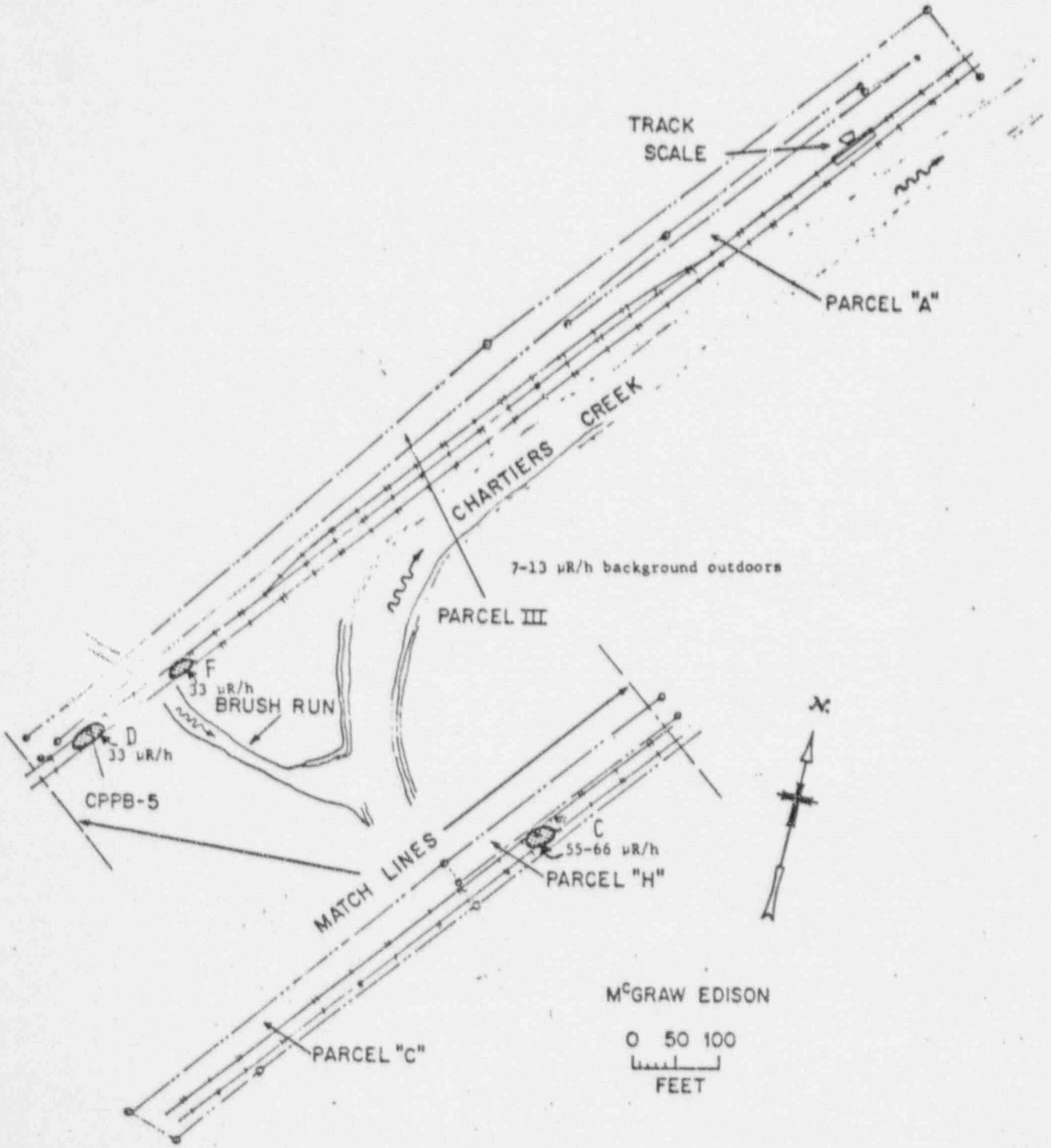

Fig. 10. Location CA00318 showing soil sampling location in Parcel III and contaminated areas in Parcel III and Parcel H.

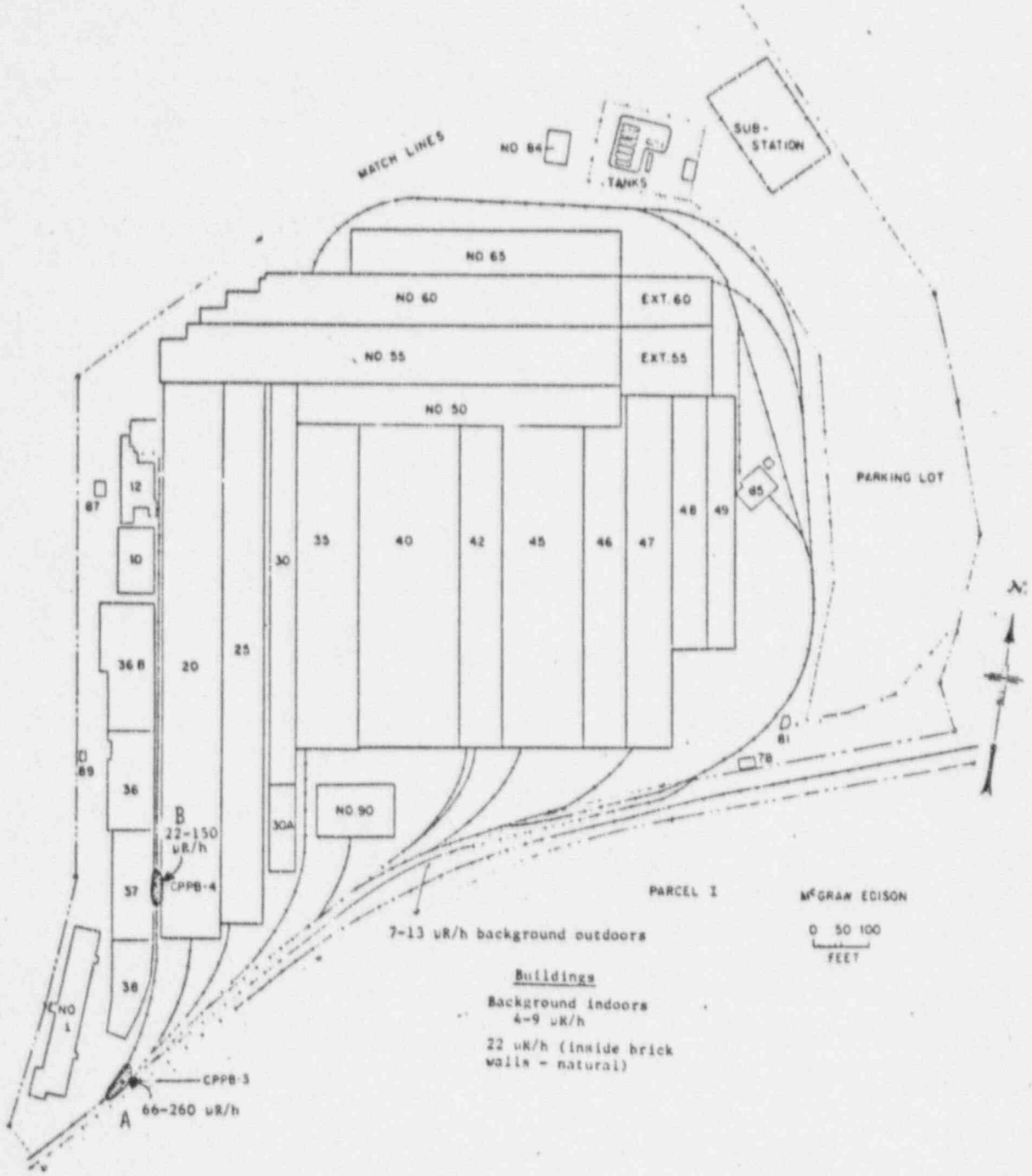

Fig. 1. Location CA00318 - McGraw-Edison Power Systems Division, P. O. Box 440, Canonsburg, Pennsylvania.