

PA, 15-6

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

**Vicinity Property
Completion Report**

**Remedial Actions
Contractor
for the
Uranium Mill Tailings
Remedial Actions
Project**



MK-FERGUSON COMPANY
A MORRISON KNUDSEN COMPANY

Vicinity Property No. CAN 401

VICINITY PROPERTY COMPLETION REPORT

AT

CA-401

MAYERS STREET

BRIDGEVILLE, PA 15017

JUNE 30, 1987

FOR

**URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE
ALBUQUERQUE OPERATIONS OFFICE
U.S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NM**

BY

**MK-FERGUSON COMPANY
AND
CHEM-NUCLEAR SYSTEMS, INC.**

MK-Ferguson Company has been granted authorization to perform remedial action under the Uranium Mill Tailings Radiation Control Act of 1978, Public Law 95-604. Remedial action was done in accordance to the EPA Standards for Cleanup of Lands and Buildings Contaminated with Residual Radioactive Material from Inactive Uranium Processing Sites, 40 CFR 192.12, 192.20-23.

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Vicinity Property No. CA-401

1.0 SUMMARY

PROPERTY NUMBER:	CA-401
PROPERTY ADDRESS:	MAYERS STREET BRIDGEVILLE, PA 15017
PROPERTY OWNER:	CYTEMP SPECIALTY STEEL DIVISION CYCLOPS CORPORATION P.O. BOX 518 TITUSVILLE, PA 16354
PROPERTY CATEGORY:	COMMERCIAL
REMEDIAL ACTION CONTRACTOR:	MK-FERGUSON COMPANY
CONSTRUCTION SUBCONTRACTOR:	SLUCIAK CONTRACTING, INC.
RADIOLOGICAL CONTRACTOR:	CHEM-NUCLEAR SYSTEMS, INC.
REA APPROVED:	JUNE 27, 1986
REMEDIAL ACTION STARTED:	AUGUST 26, 1986
REMEDIAL ACTION COMPLETED (APPENDIX C SIGNED):	SEPTEMBER 30, 1986
VOLUME OF MATERIAL REMOVED:	OUTDOOR: 752.6 CY INDOOR: N/A

1.0 SUMMARY

Remedial action was completed on Vicinity Property CA-401. A total of 752.6 cubic yards of material was removed from the property.

Radiological surveys conducted following removal of contaminated materials, but before property restoration, demonstrate that the property has been cleaned up to the EPA standards. This completion report recommends certification of the property as having been cleaned up to below the EPA standards.

2.0 OPERATIONS SUMMARY

2.1 Remedial Action Plan

The basic remedial action on this property was performed according to the Remedial Action Plan. A total of 752.6 cubic yards of material was removed from the property, compared with an estimated excavation of 280 cubic yards.

2.2 Previously Unidentified Contamination

Areas B, C, M, and N were larger than estimated, and Area N required excavation to greater depths than estimated.

2.3 Unanticipated Items During Remedial Action

No unanticipated items occurred during remedial action on this property.

3.0 VERIFICATION SUMMARY

3.1 Radiological Survey Data

All survey data were acquired according to approved procedures.

3.1.1 Pre-Remedial Action Survey

The results of the survey defining the contaminated area requiring remedial action are presented on Drawing CA-401-015.

3.1.2 Pre-Restoration Survey

Exterior:

After removal of contamination, and prior to backfilling, a soil sample survey was conducted in the excavated areas. Soil samples were aliquoted from each of the 25 verification grids and analyzed by gamma spectroscopy with the opposed crystal system in accordance with Health Physics Procedure 015. The radium concentrations in these soil samples ranged from less than 1.3 to 5.9 pCi/g, as described in Table 3.1.

Outdoor gamma readings in the excavated area ranged from 11 to 13 micro R/hr. The readings are given in Table 3.2. Drawings CA-401-020, CA-401-021, and CA-401-022 show the actual areas of excavation.

These results confirm that exterior contamination has been reduced to levels below the EPA standards for radium in soil. Background for the Canonsburg site is 8 to 11 micro R/hr and 1.2 pCi/g.

Interior:

Remedial action was performed indoors only in Building 14A on this property. A gamma scan in the excavated regions showed gamma levels up to a maximum of 12 micro R/hr, which is less than the EPA standard of background plus 20 micro R/hr. These results are described in Table 3.2.

"Grab" radon daughter concentration (RDC) measurements were made in 4 locations, as described in Table 3.4. These measurements were made under standard conditions as described in the VPHIM. Measurements were not made in Building 14A as close-up conditions cannot be met.

3.2 Recommendation for Certification

3.2.1 Exterior:

Fourteen areas of contamination were identified and removed. Soil samples after excavation and prior to backfilling indicate that the limits of 5 pCi/g in the surface 15 cm. and 15 pCi/g in any 15 cm. layer below the surface are not exceeded. Based on this information, we recommend that the exterior of this vicinity property be certified to be in compliance with EPA standards for the UMTRA Project.

3.2.2 Interior:

Remedial action was conducted in the structure. All gamma readings taken in the structure following remedial action were less than the 20 micro R/hr above background limit. Radon daughter concentrations are below the 0.01 WL limit for grab samples. Based on this information, we recommend that the interior be certified to be within the limits of the EPA standards for the UMTRA Project.



Building "14-A", Areas "J" and "K" Prior to Excavation
Looking Southeast



Area "J" Prior to Remedial Action Looking South



Area "K" Prior to Remedial Action Looking South

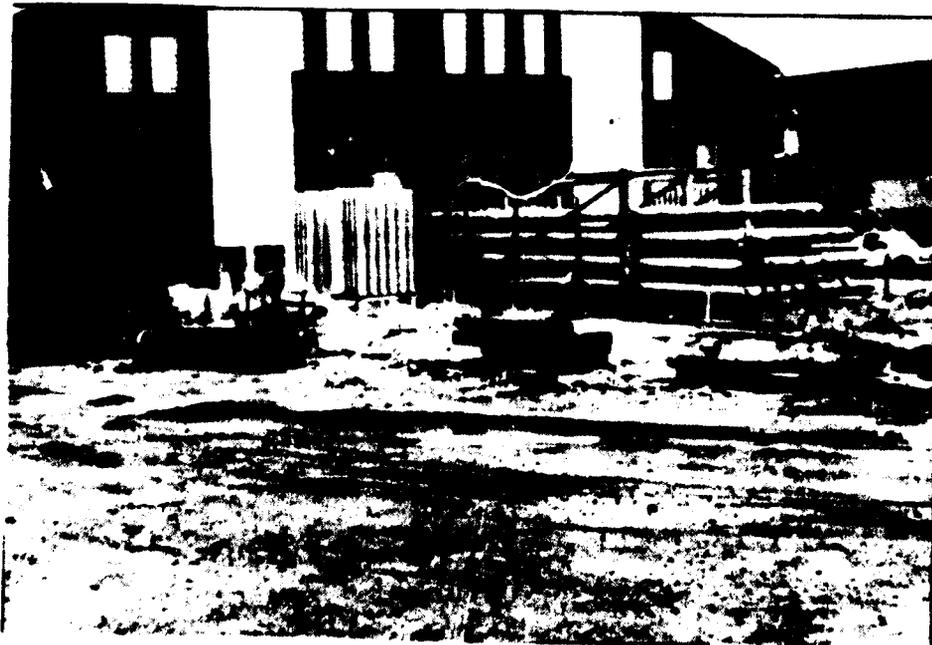


Area "L" Prior to Remedial Action Looking North

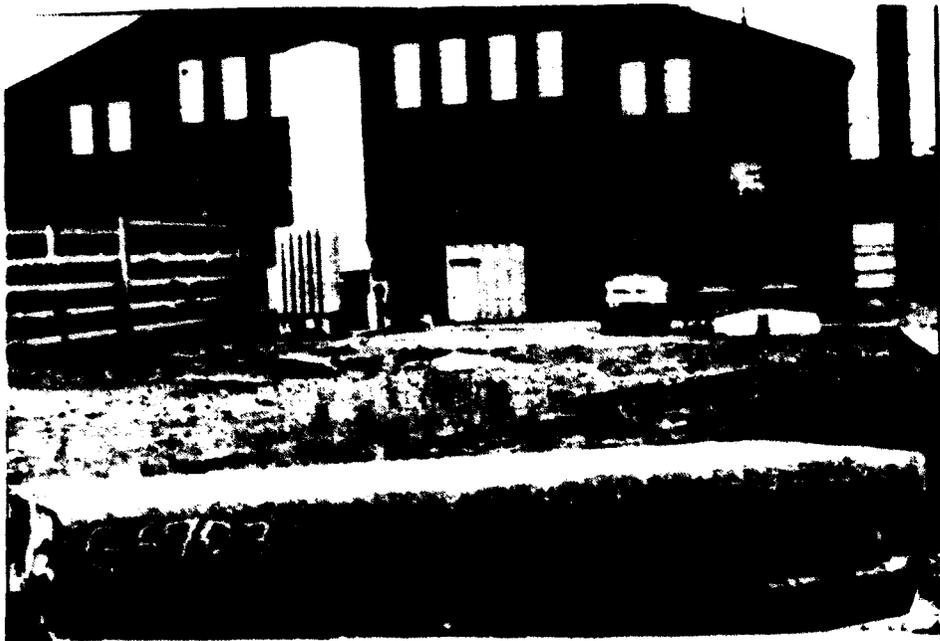
94u.051287.7



Area "M" Prior to Remedial Action Looking West



Area "M" Prior to Remedial Action Looking South



Area "N" Prior to Remedial Action Looking Southeast



Area "N" Prior to Remedial Action Looking North



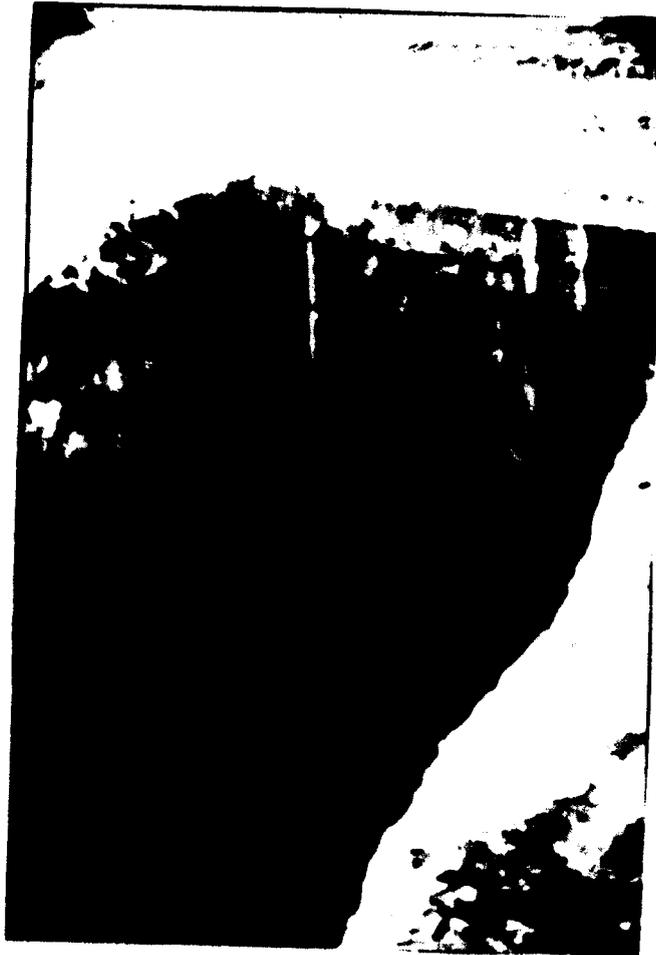
Area "C" During Excavation Looking Northwest



Areas "C-3" and "D" After Excavation



Area "E" After Remedial Action Looking North



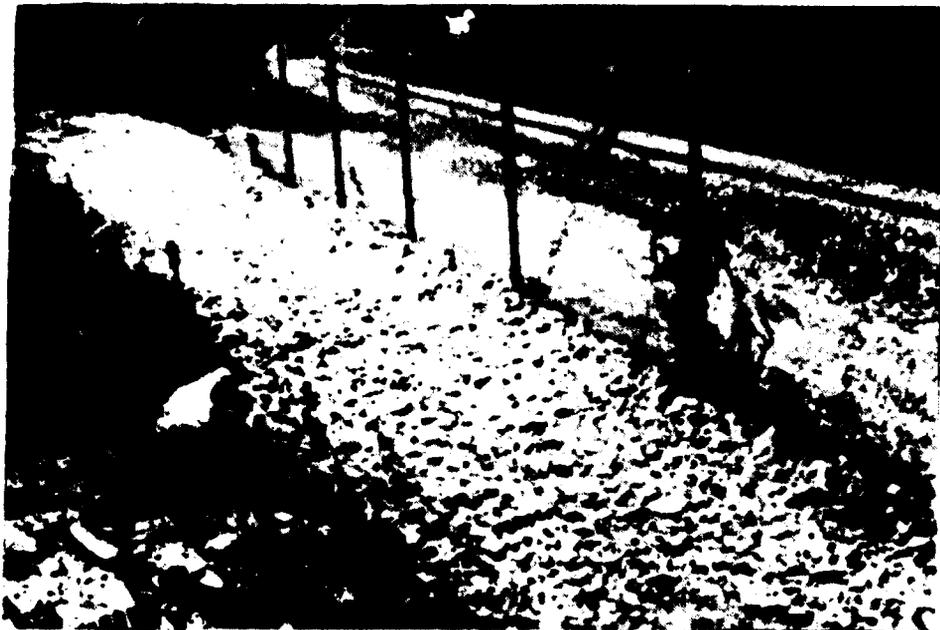
Area "J" Concrete Pit After Excavation Looking North



Area "G" During Backfill Looking Southeast



Area "L" During Backfill Looking North



Area "A" Limestone Backfill Looking Southwest

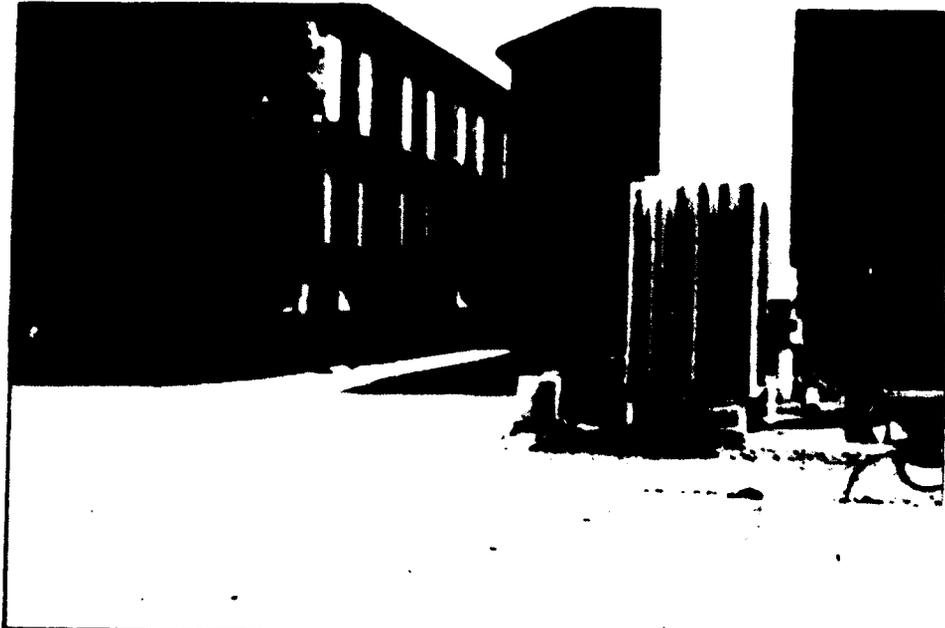


Areas "B" and "C" Limestone Backfill Looking East

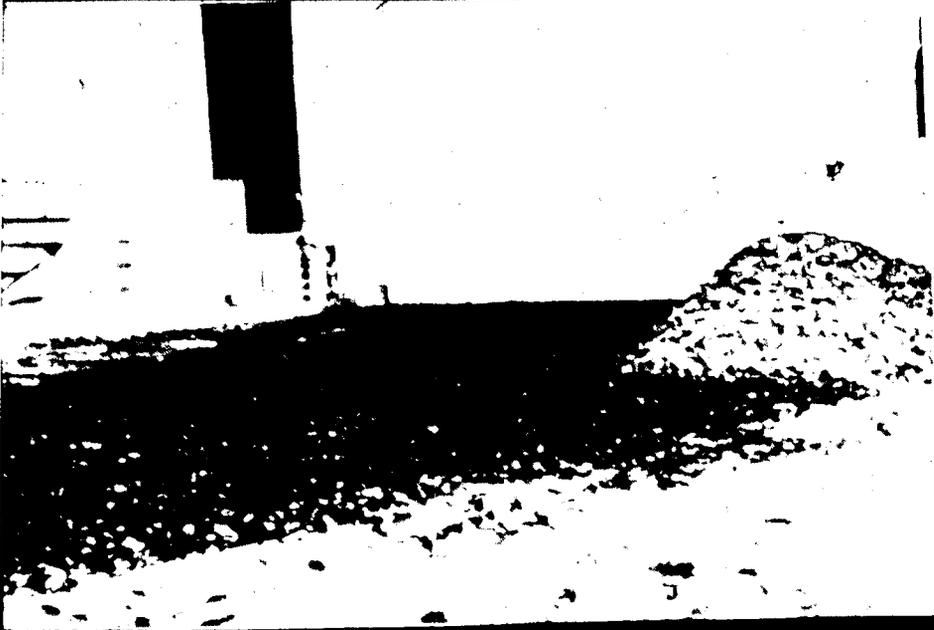
0794u.051287.15



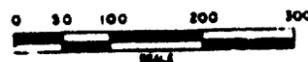
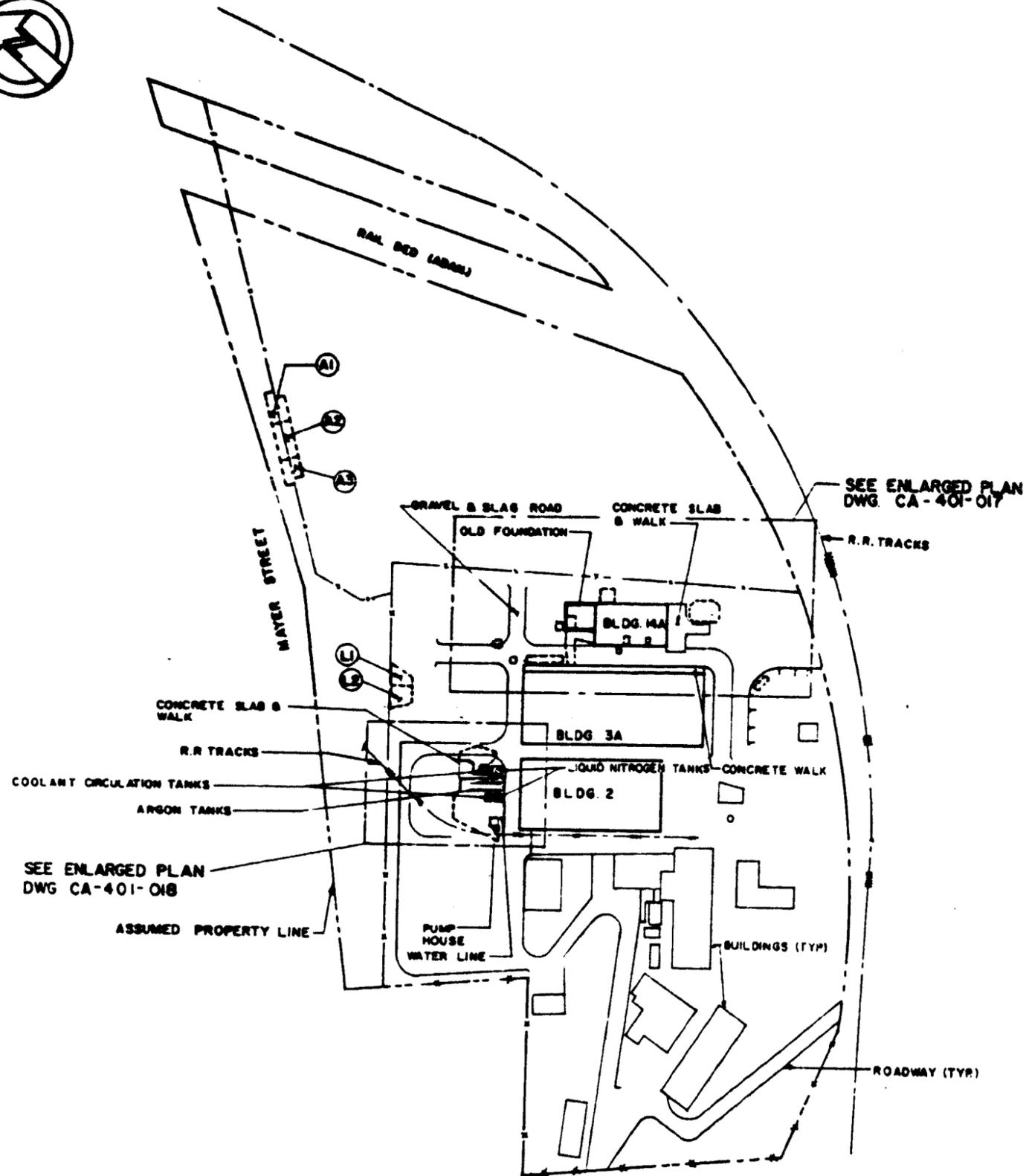
Area "H" Limestone Backfill Looking East



Area "M" Limestone Backfill Looking Southeast



Area "N" Limestone Backfill Looking East



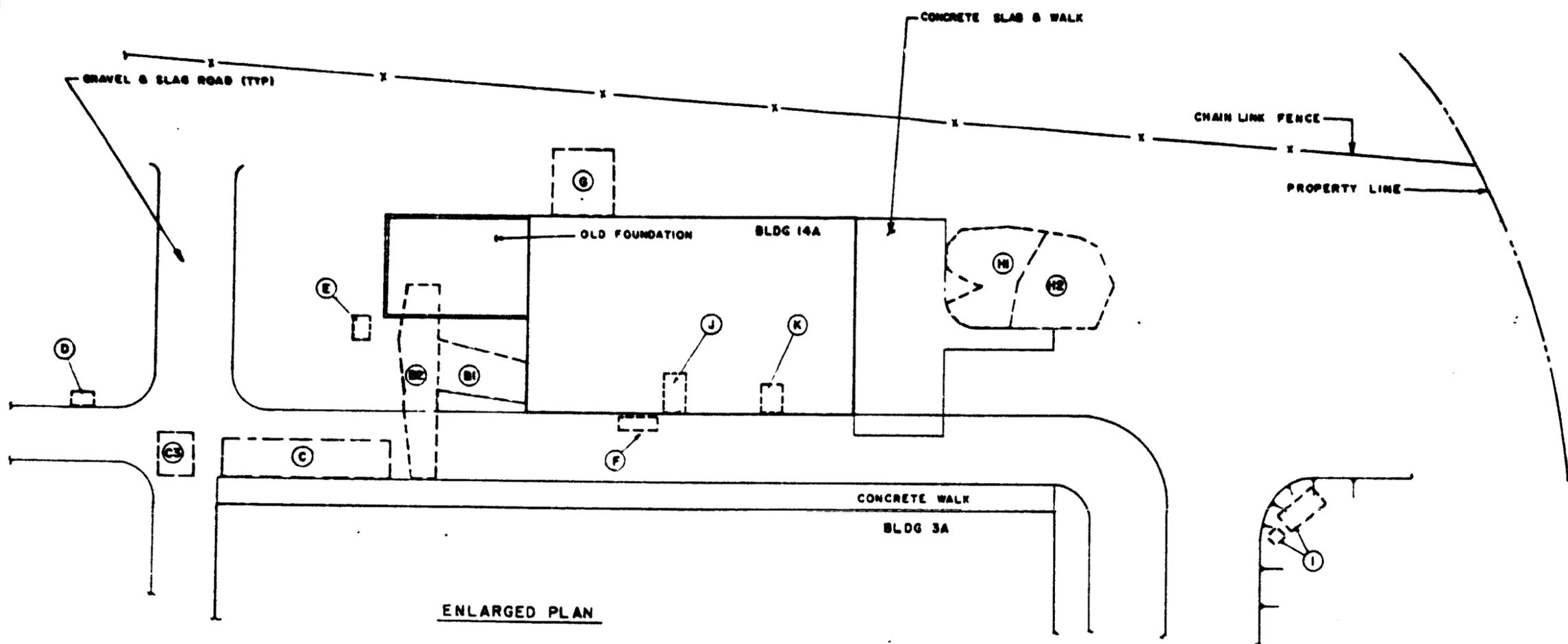
VERIFICATION SOIL SAMPLES

LOCATION	SOIL SAMPLE NUMBERS
A1	C-SV-CA-401-1541
A2	C-SV-CA-401-1542
A3	C-SV-CA-401-1543
L1	C-SV-CA-401-1539
L2	C-SV-CA-401-1540

NOTE: SEE DRAWINGS CA-401-017 AND CA-401-018 FOR ADDITIONAL VERIFICATION SOIL SAMPLE LOCATIONS.

U. S. DEPARTMENT OF ENERGY ALBUQUERQUE, NEW MEXICO			
APPROVED AK	CERTIFICATION RADIOLOGICAL PLAN CA-4		
REVIEWED	VILLAGE OF STRABANE		
DESIGNED	NORTH STRABANE TOWNSHIP, WASHINGTON COUNTY, N.M.		
PROJECTED	ULTRA VICINITY PROPERTY CLEANUP		
DATE	DATE PREPARED	DATE	DATE CHECKED
NR	NR	NR	NR
PROJECT NO. DE-ACO4-83AL18796		DRAWING NO. CA-401-018	
YORK-FERGUSON A HOKIEN COMPANY			

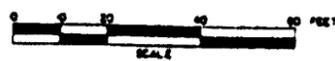
A	ISSUED FOR CERTIFICATION SURVEY	AK							
NO.	DATE	REVISIONS	BY	CHKD.	APP'D.	DATE	REASON		



VERIFICATION SOIL SAMPLES

LOCATION	SOIL SAMPLE NUMBERS
B1	C - SV - CA - 401 - 1537
B2	C - SV - CA - 401 - 1534
C	C - SV - CA - 401 - 1533
C3	C - SV - CA - 401 - 1548
D	C - SV - CA - 401 - 1549
E	C - SV - CA - 401 - 1550
F	C - SV - CA - 401 - 1551
G	C - SV - CA - 401 - 1538
H1	C - SV - CA - 401 - 1530
H2	C - SV - CA - 401 - 1531
I	C - SV - CA - 401 - 1532
J	SEE NOTE 1.
K	C - SV - CA - 401 - 1552

NOTE 1. CONTAMINATED MATERIAL WAS REMOVED FROM A CONCRETE LINED PIT AT LOCATION J. VERIFICATION SOIL SAMPLES COULD NOT BE COLLECTED AFTER REMEDIAL ACTION WAS COMPLETED. GAMMA READINGS WERE TAKEN ON CONCRETE SURFACES AFTER EXCAVATION TO CONFIRM COMPLIANCE.



U. S. DEPARTMENT OF ENERGY
ALBUQUERQUE, NEW MEXICO

CERTIFICATION RADIOLOGICAL PLAN CA-401-1537
VILLAGE OF STRABANE
NORTH STRABANE TOWNSHIP, WASHINGTON COUNTY, NEW MEXICO
UNITRA VICINITY PROPERTY CLEARUP

DESIGNED BY	AK
DRAWN BY	
REVIEWED BY	
APPROVED BY	NR

DATE	DATE	DATE

PROJECT NO. DE - ACO4-83AL16796
DRAWING NO. CA-401-017

NO.	DATE	REVISIONS
A	1-28-83	ISSUED FOR CERTIFICATION SURVEY





LEGEND
 REMEDIAL ACTION AREA

AREA "A"
 SEE ENLARGED PLAN
 THIS DRAWING

AREA "L"
 SEE ENLARGED PLAN
 THIS DRAWING

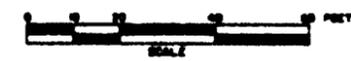
SEE ENLARGED PLAN
 DWG. CA-401-022

SEE ENLARGED PLAN
 DWG. CA-401-021

AREA "A"

CHAIN LINK FENCE

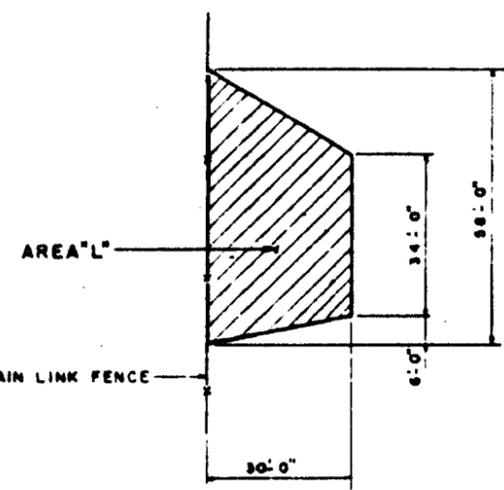
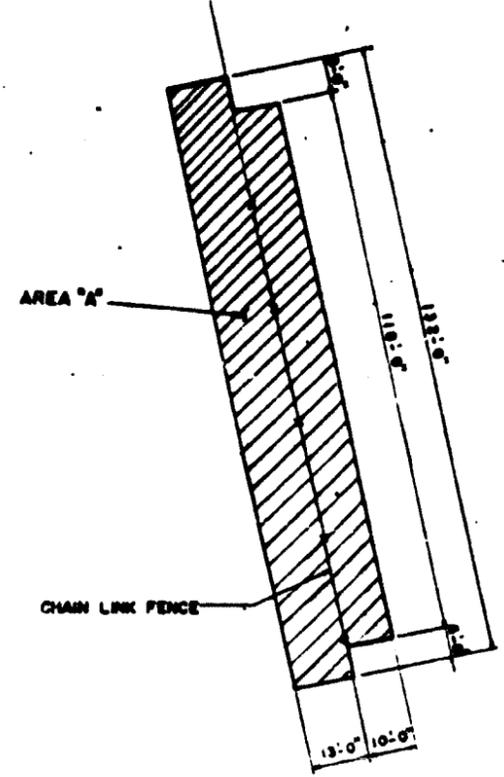
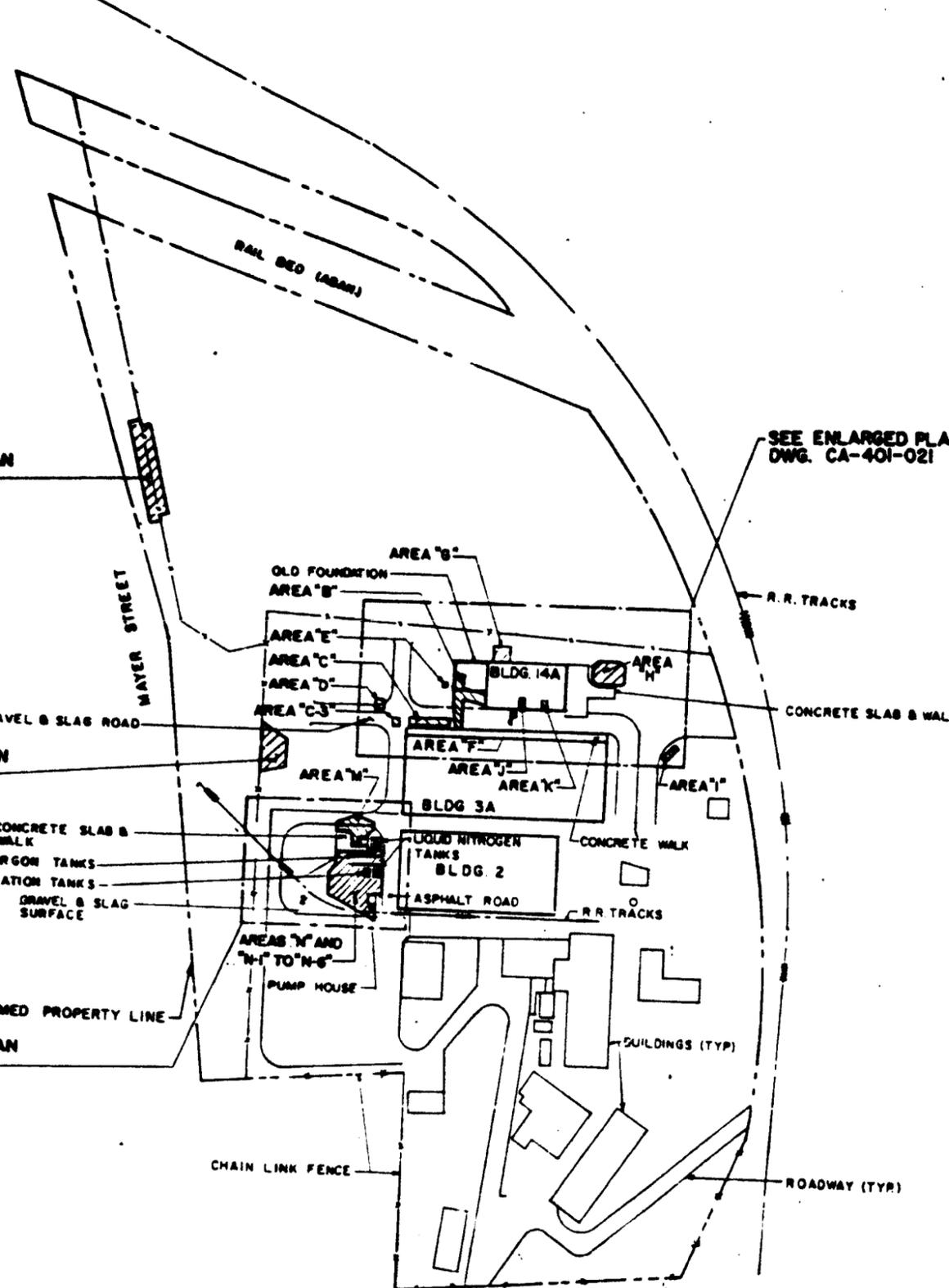
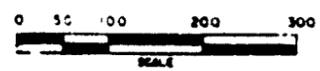
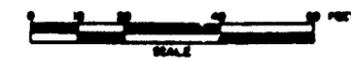
AREA "A"
 ENLARGED PLAN



AREA "L"

CHAIN LINK FENCE

AREA "L"
 ENLARGED PLAN



- NOTES:**
1. THE FOLLOWING TECHNICAL SPECIFICATIONS APPLIED FOR THE REMEDIAL ACTION WORK REQUIRED FOR PROPERTY NO. CA-401.
 SECTION 02130
 CONTAMINATED MATERIAL REMOVAL
 SECTION 02200
 EXCAVATION AND BACKFILL
 SECTION 02300
 PAVING AND SURFACING
 SECTION 03300
 CAST-IN-PLACE CONCRETE
 2. TEN LINEAR FEET OF CHAIN LINK FENCE WERE REMOVED TO PROVIDE ACCESS FOR EXCAVATION IN AREA "A". FENCING WAS REINSTALLED TO ORIGINAL LOCATION UPON COMPLETION OF OTHER WORK.
 3. AREA "A" WAS EXCAVATED TO DEPTHS VARYING FROM 9 INCHES TO 21 INCHES AND BACKFILLED WITH COMPACTED COMMON FILL.
 4. AREA "L" WAS EXCAVATED TO AN AVERAGE DEPTH OF 12 INCHES AND BACKFILLED WITH COMPACTED COMMON FILL AND 6 INCHES OF PENN. DEPARTMENT OF TRANSPORTATION TYPE 2-A Limestone.
 5. SEE DRAWINGS CA-401-021 AND CA-401-022 FOR OTHER EXCAVATION AREAS.

AS-BUILT DRAWING

U. S. DEPARTMENT OF ENERGY
 ALBUQUERQUE, NEW MEXICO

EXCAVATION AND RESTORATION PLAN
 CA-401
 VILLAGE OF STRABANE
 NORTH STRABANE TOWNSHIP, WASHINGTON COUNTY
 ULTRA VICINITY PROPERTY CLEANUP

APPROVED BY: [Signature]
 DATE: [Blank]
 NR

DATE PREPARED: [Blank] DATE FOR REVIEW: [Blank]

MK-FERGUSON
 A GEORGE EASTMAN COMPANY

PROJECT NO.
 DE-AC04-83AL187
 DRAWING NO.
 CA-401-0

NO.	DATE	REVISIONS	BY	CHKD.	APP'D.
0	10/97	AS-BUILT DRAWING	AK		

Vicinity Property No. CA-401

APPENDIX A
RADIOLOGICAL SURVEY DATA

Verification Soil Sampling
Opposed Crystal System

Date 8-30-86
By Diane Zoller

Sample # C-3V-1547

Location CA 401, Area A-2

Sample Date 8-29-86

Initial Counting Date 8-30-86

Second Counting Date 9-22-86

Sealed Date 8-30-86

Reseal Date 9-2-86

Sample Weight; wet 456 dry 397

Function 1 1.73E³ - Sample weight = 3.79 pCi/g

Initial Count

Corrected for Emanation 5.0 pCi/g

Function 1 2.22E³ - Sample weight = 5.6 pCi/g

Second Count

```

TAG NO. 1          SERIES 01          NO REP OF 01: 1000  PAGE
VERSION: 1.4      LIVE TIME= 1000 SECS  FILE TIME= 1000 SECS
COLLECT STARTED ON 08 SEP 86 AT 09:12:00
FUNCTION 1: 0.00000000-07.00000000
FUNCTION 2: 0.00000000-07.00000000
FUNCTION 3: 0.00000000-07.00000000
FUNCTION 4: 0.00000000-07.00000000
FUNCTION 5: 0.00000000-07.00000000
AMP: INPUT= 005  TRANS= 00000  GAIN= 1.0000
EQM: LLD= 0.0000  HLD= 100.00%
ADD: EMANATION CORRECT= 0  ISRC= 0%
      0.0000  CORRECT= 100% LT
      0.0000  CORRECT= 100% LT
      0.0000  CORRECT= 100% LT
      0.0000  CORRECT= 100% LT
  
```

Initial Wet
Count

REP	FROM CH	TO CH	INTEGRAL	AREAS/CH	FUNCTION
1	000	400	981	200	2.22000E 03
2	000	400	981	200	2.22000E 03
3	000	400	981	200	2.22000E 03
4	000	400	981	200	2.22000E 03
5	000	400	981	200	2.22000E 03
6	000	400	981	200	2.22000E 03
7	000	400	981	200	2.22000E 03
8	000	400	981	200	2.22000E 03

```

TAG NO. 1          SERIES 01          NO REP OF 01: 1000  PAGE
VERSION: 1.4      LIVE TIME= 1000 SECS  FILE TIME= 1000 SECS
COLLECT STARTED ON 08 SEP 86 AT 09:12:00
FUNCTION 1: 0.00000000-07.00000000
FUNCTION 2: 0.00000000-07.00000000
FUNCTION 3: 0.00000000-07.00000000
FUNCTION 4: 0.00000000-07.00000000
FUNCTION 5: 0.00000000-07.00000000
AMP: INPUT= 005  TRANS= 00000  GAIN= 5.0000
EQM: LLD= 0.0000  HLD= 100.00%
ADD: EMANATION CORRECT= 0  ISRC= 0%
      0.0000  CORRECT= 100% LT
      0.0000  CORRECT= 100% LT
      0.0000  CORRECT= 100% LT
      0.0000  CORRECT= 100% LT
  
```

Final Dry Count
After 20 days

REP	FROM CH	TO CH	INTEGRAL	AREAS/CH	FUNCTION
1	000	600	722	0	2.22000E 03
2	000	600	722	0	2.22000E 03

Verification Soil Sampling
Opposed Crystal System

Date 8-30-86
By Gene Zoller

Sample # C-3V-1542

Location CA 401, Area A-2

Sample Date 8-29-86

Initial Counting Date 8-30-86

Second Counting Date 9-22-86

Sealed Date 8-30-86

Reseal Date 9-2-86

Sample Weight; wet 456 dry 397

Function 1 1.73E³ - Sample weight = 3.79 pCi/g
Corrected for Emanation 8.0 pCi/g

Initial Count

Function 1 2.22E³ - Sample weight = 5.6 pCi/g

Second Count

```

TAP NO. 1          SERIES 01          20 SEC 00 00:00 00:00
REVERSE 1:4       LINE TIME= 1000 SECS  TUB TIME= 1000 SECS
COLLECT STARTED ON 08 SEP 86 AT 08:17:00
FUNCTION 1: 00:00:00-00:00:00 (0000)
FUNCTION 2: 00:00:00-00:00:00 (0000)
FUNCTION 3: 00:00:00-00:00:00 (0000)
FUNCTION 4: 00:00:00-00:00:00 (0000)
FUNCTION 5: 00:00:00-00:00:00 (0000)
AMP: INPUT= 003  OVERAGE= 0000  GAIN= 1.0000
EQE: LDE= 1.0000  WDE= 100.0%
ADD: BACKGROUND OFFSET= 0  ZERO= 0%
      000 000  PRESET= 10000 LT
      000 000  STABLE OFF
  
```

Initial Wet
Count

CHN	FROM CHN	TO CHN	INTEGRAL	AREASUM	FUNCTION
1	000	400	927	210	2.227026E 01
2	400	600	725	0	2.227026E 03

```

TAP NO. 1          SERIES 01          20 SEC 00 00:00 00:00
REVERSE 1:4       LINE TIME= 1000 SECS  TUB TIME= 1000 SECS
COLLECT STARTED ON 08 SEP 86 AT 08:17:00
FUNCTION 1: 00:00:00-00:00:00 (0000)
FUNCTION 2: 00:00:00-00:00:00 (0000)
FUNCTION 3: 00:00:00-00:00:00 (0000)
FUNCTION 4: 00:00:00-00:00:00 (0000)
FUNCTION 5: 00:00:00-00:00:00 (0000)
AMP: INPUT= 003  OVERAGE= 0000  GAIN= 1.0000
EQE: LDE= 1.0000  WDE= 100.0%
ADD: BACKGROUND OFFSET= 0  ZERO= 0%
      000 000  PRESET= 10000 LT
      000 000  STABLE OFF
  
```

Final Dry Count
After 20 days

CHN	FROM CHN	TO CHN	INTEGRAL	AREASUM	FUNCTION
1	000	400	921	210	2.227026E 01
2	400	600	725	0	2.227026E 03

Verification Soil Sampling
Opposed Crystal System

Date 9-2-86
By Dave Zoller

Sample # C-SV-1543

Location CA 401, Area A-3

Sample Date 8-29-86

Initial Counting Date 9-2-86

Second Counting Date 9-23-86

Sealed Date 9-2-86

Reseal Date 9-3-86

Sample Weight; wet 449 dry 395

Function 1 1.47E³ - Sample weight = 3.27 pCi/g Initial Count

Corrected for Emanation 6.9 pCi/g

Function 1 2.31E³ - Sample weight = 5.8 pCi/g Second Count

```

THE NO.      I      SERIES NO.      CT REP 00  DATE  PAGE 1
YEAR= 86      TIME TIME= 1000 SECS  TIME TIME= 1000 SECS
COLLECT STARTED IN CT REP 00 AT 12:15:40
FUNCTION 1 REP= 00 1000-10 100000
FUNCTION 2 REP= 00 1000-10 100000
FUNCTION 3 REP= 00 1000-10 100000
FUNCTION 4 REP= 00 1000-10 100000
FUNCTION 5 REP= 00 1000-10 100000
AMP: INTR= 000  TIMEFAST 301V= 3.125E
EGR: LDR= 10.00%  LDR= 100.0%
ADD: SLOW=1000  EFFECT= 0  ZERO= 0%
    P-A ADD  EFFECT= 100% LT
WPS: 40000  ON  STABLE OFF
    
```

Initial Wet
Count

CHN	FROM C-#	TO C-#	INTEGRA	AREAS/SEC	FRACTION
1	300	400	1007	217	2.310876E 03
2	500	600	259	59	2.310876E 03

Final Dry Count
After 20 Days

```

THE NO.      I      SERIES NO.      CT REP 00  DATE  PAGE 1
YEAR= 86      TIME TIME= 1000 SECS  TIME TIME= 1000 SECS
COLLECT STARTED IN CT REP 00 AT 12:15:40
FUNCTION 1 REP= 00 1000-10 100000
FUNCTION 2 REP= 00 1000-10 100000
FUNCTION 3 REP= 00 1000-10 100000
FUNCTION 4 REP= 00 1000-10 100000
FUNCTION 5 REP= 00 1000-10 100000
AMP: INTR= 000  TIMEFAST 301V= 3.125E
EGR: LDR= 10.00%  LDR= 100.0%
ADD: SLOW=1000  EFFECT= 0  ZERO= 0%
    P-A ADD  EFFECT= 100% LT
WPS: 40000  ON  STABLE OFF
    
```

CHN	FROM C-#	TO C-#	INTEGRA	AREAS/SEC	FRACTION
1	300	400	1007	217	2.310876E 03
2	500	600	259	59	2.310876E 03

Verification Soil Sampling
Opposed Crystal System

Date 8-28-86
By Gene Zoller

Sample # C-SV-1537

Location CA 401, Area B-1 @ 24"

Sample Date 8-28-86

Initial Counting Date 8-29-86

Second Counting Date 9-22-86

Sealed Date 8-29-86

Reseal Date 8-30-86

Sample Weight; wet 581 dry 500

Function 1 9.37E² - Sample weight = 1.4 pCi/g

Initial Count

Corrected for Emanation 3.4 pCi/g

Function 1 1.04E³ - Sample weight = 2.12 pCi/g

Second Count

```

TAG NO. 1          SERIES 01          20 SEP 86 1010  PAGE 1
*START TIME= 1000 SECS  *END TIME= 1000 SECS
COLLECT STARTED ON 20 SEP 86 AT 1010:00
FUNCTION  F0=01-01-0000-01 10000
AMPS INPUT= 000  TO=FAST  GAIN= 4.0000
EPC: LSC SYSTEM  LSC= 100000
AQA: 00000000 000000 0 0000 00
EPC: 000 000000 000000 000000
MVP0: 0000 00 000000 OFF
    
```

Initial Wet
Count

CH#	FROM CH#	TO CH#	INTERVAL	ARE-100%	FUNCTION
1	000	400	400	100	9.36501E 01
2	000	600	600	100	9.74501E 02
3	0000	1404	1404	2010	9.76501E 01
4	0000	1604	1604	0	9.76501E 02
5	0000	1800	1800	0	9.76501E 01
6	0000	2000	2000	1000	9.76501E 02
7	0000	2200	2200	0	9.76501E 01
8	0000	2400	2400	0	9.76501E 02

```

TAG NO. 1          SERIES 01          20 SEP 86 1010  PAGE 1
*START TIME= 1000 SECS  *END TIME= 1000 SECS
COLLECT STARTED ON 20 SEP 86 AT 1010:00
FUNCTION  F0=01-01-0000-01 10000
FUNCTION  F0=01-01-0000-01 10000
FUNCTION  F0=01-01-0000-01 10000
FUNCTION  F0=01-01-0000-01 10000
AMPS INPUT= 000  TO=FAST  GAIN= 4.0000
EPC: LSC SYSTEM  LSC= 100000
AQA: 00000000 000000 0 0000 00
EPC: 000 000000 000000 000000
MVP0: 0000 00 000000 OFF
    
```

Final Dry Count
After 20 days

CH#	FROM CH#	TO CH#	INTERVAL	ARE-100%	FUNCTION
1	000	400	400	100	1.05677E 03
2	000	600	600	100	1.05677E 03

Verification Soil Sampling
Opposed Crystal System

Date 8-26-86
By Gene Zoller

Sample # C-SV-1533

Location Area C @ 18" CA 401

Sample Date 8-26-86

Initial Counting Date 8-26-86

Second Counting Date 9-17-86

Sealed Date 8-26-86

Reseal Date 8-27-86

Sample Weight; wet 701 dry 591

Function 1 9.59E² - Sample weight = 1.34 pCi/g

Initial Count

Corrected for Emanation 2.8 pCi/g

Function 1 1.33E³ - Sample weight = 2.06 pCi/g

Second Count

```

THE NO. OF     SERIES NO.           AT 0000 00 0000  PAGE 1
VENTURE 100   LIVE TIME= 1000 SECS  TRUE TIME= 1000 SECS
COLLECT STARTED ON 26 08 55 AT 00000000
PLACED:  FE=FE 00000000-00000000
AMP:  INP= 000  TO=000  GAIN= 0.0000
SCA:  LDC= 000  LDC= 000.00
ADC:  SCA=0004  OFFSET= 0  GAIN= 00
      SCA=000  OFFSET= 0000  LDC= 00
MV=00  + 0000  ON  STABLE OFF
  
```

Initial Wet
Count

NO.	FROM CH	TO CH	INTEGRAL	AREAS/SEC	FUNCTION
1	000	400	000	000	9.59E02 00
2	500	600	000	00	9.59E02 02
3	1000	1200	000	0000	9.59E02 00
4	1000	1200	000	0	9.59E02 02
5	0000	0400	0000	0	9.59E02 00
6	0000	0400	0000	0000	9.59E02 02
7	0000	0400	0000	000	9.59E02 00
8	0000	0400	0000	00	9.59E02 02

```

THE NO. OF     SERIES NO.           AT 0000 00 0000  PAGE 1
VENTURE 100   LIVE TIME= 1000 SECS  TRUE TIME= 1000 SECS
COLLECT STARTED ON 17 00 00 AT 00000000
PLACED:  FE=FE 00000000-00000000
AMP:  INP= 000  TO=000  GAIN= 0.0000
SCA:  LDC= 0000  LDC= 000.00
ADC:  SCA=0004  OFFSET= 0  GAIN= 00
      SCA=000  OFFSET= 0000  LDC= 00
MV=00  + 0000  ON  STABLE OFF
  
```

Final Dry Count
After 20 days

NO.	FROM CH	TO CH	INTEGRAL	AREAS/SEC	FUNCTION
1	000	400	000	00	1.33E03 00
2	500	600	000	000	1.33E03 02

Verification Soil Sampling
Opposed Crystal System

Date 9-5-86
By Peter Jollard

Sample # C-SV-1548

Location CA 401, Area C-3

Sample Date 9-3-86

Initial Counting Date 9-5-86

Second Counting Date _____

Sealed Date 9-5-86

Reseal Date 9-6-86

Sample Weight; wet 577 dry 498

Function 1 6.94E⁻² - Sample weight = 1.30 pCi/g Initial Count
Corrected for Emanation 2.5 pCi/g

Function 1 8.66E⁻² - Sample weight = 1.74 pCi/g Second Count

```
TAE NO. 0 SERIES 10 05 SEP 86 11:45 PAGE 1
MEMORY: 100 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 05 SEP 86 AT 11:45:00
FUNCTION F1=05/1000-07/10000
FUNCTION F2=10/1000-12/10000
FUNCTION F3=15/1000-17/10000
FUNCTION F4=20/1000-22/10000
FUNCTION F5=25/1000-27/10000
AMP: INPLT= 00E TO=00E GAIN= 5.12E4
E24: LLD= 1.500% ULD= 110.0%
ADD: E24=1024 OFFSET= 0 ZERO= 00
PWA 001 PRESET= 1000E LT
HVPS: -1000V ON STABLE OFF
```

Initial Wet
Count

CH#	FROM CH#	TO CH#	INTEGRAL	AREAS:CH#	FUNCTION
1	000	400	63E	00	8.655491E 02
2	400	800	71E	00	8.655491E 02
3	1024	1424	542E	2240	8.655491E 02
4	1424	1824	310	0	8.655491E 02
5	2024	2424	466E	0	8.655491E 02
6	2424	2824	377E	2240	8.655491E 02
7	3404	3804	242E	0	8.655491E 02
8	3804	4204	155E	0	8.655491E 02

```
TAE NO. 0 SERIES 10 05 SEP 86 11:49 PAGE 1
MEMORY: 100 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 05 SEP 86 AT 11:49:00
FUNCTION F1=05/1000-07/10000
FUNCTION F2=10/1000-12/10000
FUNCTION F3=15/1000-17/10000
FUNCTION F4=20/1000-22/10000
FUNCTION F5=25/1000-27/10000
AMP: INPLT= 00E TO=00E GAIN= 5.112E4
E24: LLD= 1.500% ULD= 110.0%
ADD: E24=1024 OFFSET= 0 ZERO= 00
PWA 001 PRESET= 1000E LT
HVPS: -1100V ON STABLE OFF
```

Final Dry Count
After 20 Days

CH#	FROM CH#	TO CH#	INTEGRAL	AREAS:CH#	FUNCTION
1	000	400	63E	00	8.655491E 02
2	400	800	720	00	8.655491E 02
3	1024	1424	542E	2240	8.655491E 02
4	1424	1824	310	0	8.655491E 02
5	2024	2424	466E	0	8.655491E 02
6	2424	2824	377E	2240	8.655491E 02
7	3404	3804	242E	0	8.655491E 02
8	3804	4204	155E	0	8.655491E 02

Verification Soil Sampling
Opposed Crystal System

Date 9-5-86
By Dave Zolner

Sample # C-SV-1349

Location CA 401, Area D

Sample Date 9-3-86

Initial Counting Date 9-5-86

Second Counting Date 9-26-86

Sealed Date 9-5-86

Reseal Date 9-6-86

Sample Weight; wet 599 dry 521

Function 1 6.76E² - Sample weight = 1.13 pCi/g Initial Count
Corrected for Emanation 2.4 pCi/g

Function 1 1.09E³ - Sample weight = 2.1 pCi/g Second Count

TAG NO. 0 SERIES 10 25 SEP 86 10:57 PAGE 1
MEMORY= 1/1 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 25 SEP 86 AT 10:41:44
FUNCTION F1=F2/(13/1000-17/10000)
FUNCTION F2=(11/LT-17/10000-F3)*19529
FUNCTION F3=(12/LT-18/10000)*F5/F4
FUNCTION F4=16/1000-19/10000
FUNCTION F5=15/1000-17/10000
AMP: INPUT= POS TC=FAST GAIN= 8.0884
SCA: LLD= 1.500% ULD= 110.0%
ADC: GAIN=1024 OFFSET= 0 ZEP0= 0%
PHA ADD PRESET= 1000s LT
HVPS: +1000V ON STABLZ OFF

Initial Wet
Count

CH#	FROM CH#	TO CH#	INTEGRAL	AREA:38K6	FUNCTION
1	332	400	547	184	6.76000E 02
2	500	600	722	5	6.76000E 02
3	1356	1424	5424	2940	6.76000E 02
4	1524	1624	311	1	6.76000E 02
5	2380	2448	4761	0	6.76000E 02
6	2548	2648	6688	2824	6.76000E 02
7	3404	3472	3928	172	6.76000E 02
8	3572	3672	2668	1	6.76000E 02

TAG NO. 0 SERIES 10 25 SEP 86 10:58 PAGE 1
MEMORY= 1/1 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 25 SEP 86 AT 10:41:44
FUNCTION F1=F2/(13/1000-17/10000)
FUNCTION F2=(11/LT-17/10000-F3)*19529
FUNCTION F3=(12/LT-18/10000)*F5/F4
FUNCTION F4=16/1000-19/10000
FUNCTION F5=15/1000-17/10000
AMP: INPUT= POS TC=FAST GAIN= 21.074
SCA: LLD= 1.500% ULD= 110.0%
ADC: GAIN=1024 OFFSET= 0 ZEP0= 0%
PHA ADD PRESET= 1000s LT
HVPS: +1000V ON STABLZ OFF

Final Dry Co
After 20 Day:

CH#	FROM CH#	TO CH#	INTEGRAL	AREA:38K6	FUNCTION
1	332	400	790	318	1.089240E 03
2	500	600	398	111	1.089240E 03
3	1356	1424	5912	3176	1.089240E 03
4	1524	1624	382	0	1.089240E 03
5	2380	2448	4763	0	1.089240E 03
6	2548	2648	6688	4129	1.089240E 03
7	3404	3472	3928	374	1.089240E 03
8	3572	3672	2668	25	1.089240E 03

Verification Soil Sampling
Opposed Crystal System

Date 9-5-86
By Don J. Jellard

Sample # C-SV-1550

Location CA 401, Area E

Sample Date 9-3-86

Initial Counting Date 9-5-86

Second Counting Date 9-26-86

Sealed Date 9-5-86

Reseal Date 9-6-86

Sample Weight; wet 576, dry 499

Function 1 6.47E⁻² Sample weight = 1.12 pCi/g

Initial Count

Corrected for Emanation 0.4 pCi/g

Function 1 8.96E⁻² Sample weight = 1.8 pCi/g

Second Count

TAG NO. 0 SERIES 10 25 SEP 86 11:02 PAGE 1
MEMORY= 1/1 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 25 SEP 86 AT 10:59:14
FUNCTION F1=F2/(13/1000-17/10000)
FUNCTION F2=(11/LT-17/10000-F3)*19528
FUNCTION F3=(12/LT-18/10000)*F5/F4
FUNCTION F4=16/1000-18/10000
FUNCTION F5=15/1000-17/10000
AMP: INPUT= POS TC=FAST GAIN= 21.074
SCA: LLD= 1.50% ULD= 110.0%
ADC: GAIN=1024 OFFSET= 0 ZERO= 0%
PHA ADD PRESET= 1000s LT
HVPS= +1000V ON STABLZ OFF

Initial Wet
Count

ROI#	FROM CH#	TO CH#	INTEGRAL	AREA:3BK6	FUNCTION
1	332	400	732	249	8.961004E 02
2	500	600	393	90	8.961004E 02
3	1356	1424	5912	3176	8.961004E 02
4	1524	1624	382	0	8.961004E 02
5	2380	2448	4763	0	8.961004E 02
6	2548	2648	6688	4129	8.961004E 02
7	3404	3472	3928	374	8.961004E 02
8	3572	3672	2668	25	8.961004E 02

TAG NO. 0 SERIES 10 25 SEP 86 11:15 PAGE 1
MEMORY= 1/1 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 25 SEP 86 AT 10:59:14
FUNCTION F1=F2/(13/1000-17/10000)
FUNCTION F2=(11/LT-17/10000-F3)*19528
FUNCTION F3=(12/LT-18/10000)*F5/F4
FUNCTION F4=16/1000-18/10000
FUNCTION F5=15/1000-17/10000
AMP: INPUT= POS TC=FAST GAIN= 21.074
SCA: LLD= 1.50% ULD= 110.0%
ADC: GAIN=1024 OFFSET= 0 ZERO= 0%
PHA ADD PRESET= 1000s LT
HVPS: +1000V ON STABLZ OFF

Final Dry Count
After 20 Days

ROI#	FROM CH#	TO CH#	INTEGRAL	AREA:3BK6	FUNCTION
1	332	400	732	249	8.961004E 02
2	500	600	393	90	8.961004E 02
3	1356	1424	5912	3176	8.961004E 02
4	1524	1624	382	0	8.961004E 02
5	2380	2448	4763	0	8.961004E 02
6	2548	2648	6688	4129	8.961004E 02
7	3404	3472	3928	374	8.961004E 02
8	3572	3672	2668	25	8.961004E 02

Verification Soil Sampling
Opposed Crystal System

Date 9-5-86
By Dave Zollard

Sample # C-3V-1551

Location CA 401, Area F

Sample Date 9-3-86

Initial Counting Date 9-5-86

Second Counting Date 9-26-86

Sealed Date 9-5-86

Reseal Date 9-6-86

Sample Weight; wet 562 dry 452

Function 1 6.40E⁻² - Sample weight = 1.14 pCi/g Initial Count

Corrected for Emanation 2.4 pCi/g

Function 1 7.88E⁻² - Sample weight = 1.68 pCi/g Second Count

```

TAG NO.      0      SERIES 10      25 SEP 86 11:00 PAGE 1
MEMORY= 1/1  LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 25 SEP 86 AT 11:16:33
FUNCTION F1=F2/(13/1000-17/10000)
FUNCTION F2=(11/LT-17/10000-F3)*19528
FUNCTION F3=(12/LT-18/10000)*F5/F4
FUNCTION F4=15/1000-19/10000
FUNCTION F5=15/1000-17/10000
APP: INPUT= POS TC=FAST GAIN= 21.074
SCA: LLE= 1.500% ULD= 110.0%
ADC: GAIN=1024 OFFSET= 0 ZERU= 0%
    *MA ADD PRESET= 1000s LT
MVPS: +1000V ON STABLZ OFF
    
```

Initial Wet
Count

ROI#	FROM CH#	TO CH#	INTEGRAL	AREA:30K6	FUNCTION
1	332	400	710	77	7.90033E 02
2	500	600	418	199	7.90033E 02
3	1356	1424	5912	3176	7.90033E 02
4	1524	1624	382	0	7.90033E 02
5	2300	2440	4763	0	7.90033E 02
6	2540	2640	6680	4129	7.90033E 02
7	3404	3472	3920	374	7.90033E 02
8	3572	3672	2660	28	7.90033E 02

```

TAG NO.      0      SERIES 10      25 SEP 86 11:03 PAGE 1
MEMORY= 1/1  LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 25 SEP 86 AT 11:16:33
FUNCTION F1=F2/(13/1000-17/10000)
FUNCTION F2=(11/LT-17/10000-F3)*19528
FUNCTION F3=(12/LT-18/10000)*F5/F4
FUNCTION F4=15/1000-19/10000
FUNCTION F5=15/1000-17/10000
APP: INPUT= POS TC=FAST GAIN= 21.074
SCA: LLE= 1.500% ULD= 110.0%
ADC: GAIN=1024 OFFSET= 0 ZERU= 0%
    *MA ADD PRESET= 1000s LT
MVPS: +1000V ON STABLZ OFF
    
```

Final Dry Count
After 20 Days

ROI#	FROM CH#	TO CH#	INTEGRAL	AREA:30K6	FUNCTION
1	332	400	710	77	7.90033E 02
2	500	600	418	199	7.90033E 02
3	1356	1424	5912	3176	7.90033E 02
4	1524	1624	382	0	7.90033E 02
5	2300	2440	4763	0	7.90033E 02
6	2540	2640	6680	4129	7.90033E 02
7	3404	3472	3920	374	7.90033E 02
8	3572	3672	2660	28	7.90033E 02

Verification Soil Sampling
Opposed Crystal System

Date 8-29-86
By Dave Zoller

Sample # C-SU-1538

Location CA 401, Area G, > 4 1/2'

Sample Date 8-28-86

Initial Counting Date 8-29-86

Second Counting Date 9-22-86

Sealed Date 8-29-86

Reseal Date 8-30-86

Sample Weight; wet 601 dry 517

Function 1 3.92E² - Sample weight = 0.64 pCi/g

Initial Count

Corrected for Emanation 1.33 pCi/g

Function 1 9.63E² - Sample weight = 1.86 pCi/g

Second Count

```
TAG NO.      1      SERIES 01
MEMORY= 100      LIVE TIME= 1000 SECS      TRUE TIME= 1000 SECS
COLLECT STARTED ON 08 SEP 86 AT 10:12:15
FUNCTION 01=01-1000-100000000000
FUNCTION 02=01-1000-100000000000
FUNCTION 03=01-1000-100000000000
FUNCTION 04=01-1000-100000000000
FUNCTION 05=01-1000-100000000000
AMP: INPUT= 000      TO-PAST 0000= 4.0000
EPC: LLD= 1.0000%      LLD= 10.0000%
ADD: 0000=10000      OFFSET= 0      DEFB= 00
      000 000      000000= 100000 LT
MUSE: 000000 ON      STABLD OFF
```

Initial Wet
Count

CHN	FROM CHN	TO CHN	INTEGRAL	AREALTBKG	FUNCTION
1	000	400	801	00	0.000000E 00
2	000	800	307	4	0.000000E 02
3	1000	1000	4001	2000	0.000000E 00
4	1000	1000	207	1	0.000000E 02
5	2000	2000	4001	0	0.000000E 00
6	2000	2000	8001	1000	0.000000E 02
7	3000	3000	0001	0	0.000000E 00
8	3000	3000	0001	0	0.000000E 02

```
TAG NO.      1      SERIES 01
MEMORY= 100      LIVE TIME= 1000 SECS      TRUE TIME= 1000 SECS
COLLECT STARTED ON 20 SEP 86 AT 10:12:15
FUNCTION 01=01-1000-100000000000
FUNCTION 02=01-1000-100000000000
FUNCTION 03=01-1000-100000000000
FUNCTION 04=01-1000-100000000000
FUNCTION 05=01-1000-100000000000
AMP: INPUT= 000      TO-PAST 0000= 0.0000
EPC: LLD= 1.0000%      LLD= 10.0000%
ADD: 0000=10000      OFFSET= 0      DEFB= 00
      000 000      000000= 100000 LT
MUSE: 000000 ON      STABLD OFF
```

Final Dry Count
After 20 days

CHN	FROM CHN	TO CHN	INTEGRAL	AREALTBKG	FUNCTION
1	000	400	801	148	0.000000E 02
2	000	800	305	72	0.000000E 02

Verification Soil Sampling
Opposed Crystal System

Date 8-25-86
By Bob Zolner

Sample # C-SV-1531

Location Area G^{M-3} 23CA 40A

Sample Date 8-23-86

Initial Counting Date 8-25-86

Second Counting Date 9-16-86

Sealed Date 8-25-86

Reseal Date 8-26-86

Sample Weight; wet 620 dry 538

Function 1 1.32E³ - Sample weight = 2.13 pCi/g

Initial Count

Corrected for Emanation 4.5 pCi/g

Function 1 1.04E³ - Sample weight = 3.04 pCi/g

Second Count

```

THE NO. OF SAMPLES SERVICE IS 10 000 SEC 10000 SEC
MEMORY= 000 LINE TIME= 0000 SEC 1000 SEC 10000 SEC
COLLECT STARTED ON 08 AUG 86 AT 00:00:00
FUNCTION F0= 00000000000000000000
AMP: INP= 000 TOFRST= 0000 0.0000
SDR: LDR= 000 LDR= 000000
ADD: GRN= 0000 OFFERS= 0000 0.0000
PAC: ACC= 00000000 00000000
MVFS: - 0000 ON 000000 OFF
    
```

Initial Wet
Count

CHN	FROM 0-4	TO 0-4	INTERAL	OPERATIONS	FUNCTION
1	000	000	000	000	00000000 00
2	000	000	000	000	00000000 03
3	1000	1000	0000	0000	00000000 00
4	1000	1000	0000	0000	00000000 03
5	0000	0000	0000	0000	00000000 00
6	0000	0000	0000	0000	00000000 03
7	0000	0000	0000	0000	00000000 00
8	0000	0000	0000	0000	00000000 03

```

THE NO. OF SAMPLES SERVICE IS 10 000 SEC 10000 SEC
MEMORY= 000 LINE TIME= 0000 SEC 1000 SEC 10000 SEC
COLLECT STARTED ON 08 SEP 86 AT 00:00:00
FUNCTION F0= 00000000000000000000
AMP: INP= 000 TOFRST= 0000 0.0000
SDR: LDR= 00000000 00000000
ADD: GRN= 00000000 OFFERS= 00000000 0.0000
PAC: ACC= 00000000 00000000
MVFS: - 0000 ON 000000 OFF
    
```

Final Dry Count
After 20 days

CHN	FROM 0-4	TO 0-4	INTERAL	OPERATIONS	FUNCTION
1	000	000	000	000	00000000 00
2	000	000	000	000	00000000 03
3	1000	1000	0000	0000	00000000 00
4	1000	1000	0000	0000	00000000 03
5	0000	0000	0000	0000	00000000 00
6	0000	0000	0000	0000	00000000 03
7	0000	0000	0000	0000	00000000 00
8	0000	0000	0000	0000	00000000 03

VERIFICATION SOIL SAMPLING
Opposed Crystal System

By Gene Zolner

Sample # C-SV-1552

Location CA 401 Area K

Sample Date 9-3-86

Initial Counting Date 9-5-86

Second Counting Date 9-26-86

Sealed Date 9-5-86

Reseal Date 9-6-86

Sample Weight; wet 599 dry 556

Function 1 7.59E⁻² Sample weight = 1.27 pCi/g Initial Count

Corrected for Emanation 2.7 pCi/g

Function 1 9.75E⁻² Sample weight = 1.15 pCi/g Second Count

TAG NO. 0 SERIES 10 05 SEP 86 10:03 PAGE 1
MEMORY= 100 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 05 SEP 86 AT 09:44:09
FUNCTION F1=FE/100000-17/10000
FUNCTION F2=FE/LT-17/10000-F1*19528
FUNCTION F3=FE/LT-18/10000-F2*F4
FUNCTION F4=FE/1000-18/10000
FUNCTION F5=FE/1000-17/10000
AMP: INPUT= PCB TC=FAST GAIN= 5.0554
EQ: ULD= 1.500V ULD= 100.0%
ADD: GAIN=1024 OFFSET= 0 ZERO= 0%
PNA ADD PRESET= 1000s LT
HVPS: +1000V ON STABLE OFF

Initial Wet
Count

CH#	FROM CH#	TO CH#	INTEGRAL	AREA:CHAS	FUNCTION
1	300	400	441	77	7.555145E 02
2	500	600	288	171	7.555145E 02
3	1024	1424	3424	2640	7.555145E 02
4	1524	1624	170	0	7.555145E 02
5	2024	2448	4641	0	7.555145E 02
6	2548	2648	5553	3054	7.555145E 02
7	3072	3472	3701	170	7.555145E 02
8	3572	3672	2155	0	7.555145E 02

Final Dry Cou
After 20 Days

TAG NO. 1 SERIES 10 26 SEP 86 11:01 PAGE 1
MEMORY= 100 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 26 SEP 86 AT 11:01:10
FUNCTION F1=FE/100000-17/10000
FUNCTION F2=FE/LT-17/10000-F1*19528
FUNCTION F3=FE/LT-18/10000-F2*F4
FUNCTION F4=FE/1000-18/10000
FUNCTION F5=FE/1000-17/10000
AMP: INPUT= PCB TC=FAST GAIN= 5.1107
EQ: ULD= 1.500V ULD= 100.0%
ADD: GAIN=1024 OFFSET= 0 ZERO= 0%
PNA ADD PRESET= 1000s LT
HVPS: +1000V ON STABLE OFF

CH#	FROM CH#	TO CH#	INTEGRAL	AREA:CHAS	FUNCTION
1	300	400	714	170	9.746692E 02
2	500	600	319	57	9.746692E 02
3	1024	1424	5667	3240	9.746692E 02
4	1524	1624	310	0	9.746692E 02
5	2024	2448	4666	0	9.746692E 02
6	2548	2648	5552	3776	9.746692E 02
7	3072	3472	3473	0	9.746692E 02
8	3572	3672	1728	0	9.746692E 02

Verification Soil Sampling
Opposed Crystal System

Date 8-29-86
By Dave Zollar

Sample # C-3V-1539

Location CA 401, Area L-1 @ 12"

Sample Date 8-27-86

Initial Counting Date 8-29-86

Second Counting Date 9-22-86

Sealed Date 8-29-86

Reseal Date 8-30-86

Sample Weight; wet 590 dry 509

Function 1 5.43E² - Sample weight = 0.95 pCi/g

Initial Count

Corrected for Emanation 2.0 pCi/g

Function 1 9.18E² - Sample weight = 1.8 pCi/g

Second Count

```
TAG NO. 7 SERIES 10
MEMBER= 104 LIVE TIME= 1000 SECS TELE TIME= 1000 SECS
COLLECT STARTED ON 27 SEP 86 AT 10:17:10
FUNCTION F1=104/107-15/10000-17/10000
FUNCTION F2=104/107-15/10000-17/10000
FUNCTION F3=104/107-15/10000-17/10000
FUNCTION F4=104/107-15/10000-17/10000
AMP: INPUT= F08 TO=FAST GAIN= 4.0000
SCA: LDC= 1.0000 LAD= 100.0%
ADD: GAIN=100A OFFSET= 0 ZERO= 0
PHA ADD PRESET= 100% LT
MVPS: +1000V ON STABLE OFF
```

Initial Wet
Count

CH#	FROM CH#	TO CH#	INTEGRAL	AREA:DBKG	FUNCTION
1	300	400	670	68	ELECTRONIC 02
2	500	600	700	60	ELECTRONIC 02
3	1000	1400	1470	2010	ELECTRONIC 02
4	1000	1400	1470	2010	ELECTRONIC 02
5	1000	1400	1470	2010	ELECTRONIC 02
6	1000	1400	1470	2010	ELECTRONIC 02
7	1000	1400	1470	2010	ELECTRONIC 02
8	1000	1400	1470	2010	ELECTRONIC 02

```
TAG NO. 7 SERIES 10
MEMBER= 104 LIVE TIME= 1000 SECS TELE TIME= 1000 SECS
COLLECT STARTED ON 22 SEP 86 AT 10:17:10
FUNCTION F1=104/107-15/10000-17/10000
FUNCTION F2=104/107-15/10000-17/10000
FUNCTION F3=104/107-15/10000-17/10000
FUNCTION F4=104/107-15/10000-17/10000
AMP: INPUT= F08 TO=FAST GAIN= 5.0000
SCA: LDC= 1.0000 LAD= 100.0%
ADD: GAIN=100A OFFSET= 0 ZERO= 0
PHA ADD PRESET= 100% LT
MVPS: +1000V ON STABLE OFF
```

Final Dry Count
After 20 days

CH#	FROM CH#	TO CH#	INTEGRAL	AREA:DBKG	FUNCTION
1	300	400	670	68	9.181400E 02
2	500	600	700	151	9.181400E 02

Verification Soil Sampling
Opposed Crystal System

Date 8-29-86
By Dave Zoller

Sample # C-SV-1540

Location CA 401, Area 1-2 @ 12"

Sample Date 8-28-86

Initial Counting Date 8-29-86

Second Counting Date 9-22-86

Sealed Date 8-29-86

Reseal Date 8-30-86

Sample Weight; wet 540 dry 459

Function 1 6.53E² - Sample weight = 1.21 pCi/g

Initial Count

Corrected for Emanation 2.5 pCi/g

Function 1 9.16E² - Sample weight = 2.0 pCi/g

Second Count

```
TAB NO.      1      SERIES 01      20 SEP 86  10110  PAGE 1
MEMO: 014      LIVE TIME= 1000 SECS  TRUE TIME= 1000 SECS
COLLECT STARTED ON 20 SEP 86 AT 10:55:17
FUNCTION 1  F1=10 10110-10110
FUNCTION 2  F2=10 10110-10110
FUNCTION 3  F3=10 10110-10110
FUNCTION 4  F4=10 10110-10110
FUNCTION 5  F5=10 10110-10110
FUNCTION 6  F6=10 10110-10110
APP: INPUT= 000  TEST=000  GAIN= 4.0000
SCA: LDC= 1.0000  HLD= 100000
ADD: GAIN=1000  OFFSET= 0  SECS= 00
      FWD ADD  FREET= 10000  LT
      MVF= 10000  ON  STABLE OFF
```

Initial Wet
Count

TIME	FROM CH	TO CH	INTEGRAL	AREAS/SECS	FUNCTION
1	300	400	537	100	6.53045E 02
2	500	600	297	35	6.53045E 02
3	1000	1000	5970	2010	6.53045E 02
4	1000	1000	297	0	6.53045E 02
5	1000	1000	4970	0	6.53045E 02
6	1000	1000	5970	1555	6.53045E 02
7	1000	1000	2970	0	6.53045E 02
8	1000	1000	1970	0	6.53045E 02

```
TAB NO.      2      SERIES 01      20 SEP 86  10110  PAGE 1
MEMO: 014      LIVE TIME= 1000 SECS  TRUE TIME= 1000 SECS
COLLECT STARTED ON 20 SEP 86 AT 10:55:17
FUNCTION 1  F1=10 10110-10110
FUNCTION 2  F2=10 10110-10110
FUNCTION 3  F3=10 10110-10110
FUNCTION 4  F4=10 10110-10110
FUNCTION 5  F5=10 10110-10110
FUNCTION 6  F6=10 10110-10110
APP: INPUT= 000  TEST=000  GAIN= 3.0251
SCA: LDC= 1.0000  HLD= 100000
ADD: GAIN=1000  OFFSET= 0  SECS= 00
      FWD ADD  FREET= 10000  LT
      MVF= 10000  ON  STABLE OFF
```

Final Dry Count
After 20 days

TIME	FROM CH	TO CH	INTEGRAL	AREAS/SECS	FUNCTION
1	300	400	537	89	9.16247E 02
2	500	600	297	0	9.16247E 02

Verification Soil Sampling
Opposed Crystal System

Date 9-8-86
By Gene Zolard

Sample # C-SV-1540 "D"

Location CA 401, Area L-2 @ 12"

Sample Date 8-28-86

Initial Counting Date 9-8-86

Sealed Date 9-8-86

Sample Weight; wet 602 dry 532

*Extra Verif.
Soil Sample
in Area L-2*

Second Counting Date 9-29-86

Reseal Date 9-9-86

Function 1 5.03E² - Sample weight = 0.83 pCi/g Initial Count

Corrected for Emanation 1.75 pCi/g

Function 1 1.08E³ - Sample weight = 2.03 pCi/g Second Count

```
TAB NO. 0 SERIES 00 08 SEP 86 14:10 PAGE 1
MENDRY= 101 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 08 SEP 86 AT 10:41:00
FUNCTION F1=FD/1000-17/100000
FUNCTION F2=LD/1000-17/100000
FUNCTION F3=LD/1000-18/100000
FUNCTION F4=LD/1000-18/100000
FUNCTION F5=LD/1000-17/100000
FUNCTION F6=LD/1000-17/100000
AMP INPUT= PDS TO=FAST GAIN= 5.1125
SCA: LLD= 1.000% ULD= 100.0%
AQD: GAIN=1024 OFFSET= 0 ZERO= 0X
PWA ADD PRESET= 1000s LT
MVFB: +1000V ON STAB1Z OFF
```

TIME	FROM CH#	TO CH#	INTERVAL	AREA:CH#S	FUNCTION
1	300	400	500	0	5.01E+02 02
2	500	600	700	16	5.01E+02 02
3	1000	1200	800	280	5.01E+02 02
4	1200	1400	100	70	5.01E+02 02
5	1600	1800	1000	0	5.01E+02 02
6	1800	2000	800	2840	5.01E+02 02
7	2000	2200	700	200	5.01E+02 02
8	2200	2400	1000	0	5.01E+02 02

Initial Wet Count

```
TAB NO. 0 SERIES 00 08 SEP 86 16:15 PAGE 1
MENDRY= 101 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 08 SEP 86 AT 08:20:00
FUNCTION F1=FD/1000-17/100000
FUNCTION F2=LD/1000-17/100000
FUNCTION F3=LD/1000-18/100000
FUNCTION F4=LD/1000-18/100000
FUNCTION F5=LD/1000-17/100000
FUNCTION F6=LD/1000-17/100000
AMP INPUT= PDS TO=FAST GAIN= 5.1125
SCA: LLD= 1.000% ULD= 100.0%
AQD: GAIN=1024 OFFSET= 0 ZERO= 0X
PWA ADD PRESET= 1000s LT
MVFB: +1000V ON STAB1Z OFF
```

TIME	FROM CH#	TO CH#	INTERVAL	AREA:CH#S	FUNCTION
1	300	400	700	112	1.07E+03 03
2	500	600	300	78	1.07E+03 03
3	1000	1200	800	280	1.07E+03 03
4	1200	1400	300	0	1.07E+03 03
5	1600	1800	4800	0	1.07E+03 03
6	1800	2000	600	3880	1.07E+03 03
7	2000	2200	3400	0	1.07E+03 03
8	2200	2400	2000	0	1.07E+03 03

Final Dry Count After 20 Days

Verification Soil Sampling
Opposed Crystal System

Date 8-27-86
By Dave Zeller

Sample # C-SV-1535

Location CA 401, Area M-1 @ 1'

Sample Date 8-27-86

Initial Counting Date 8-27-86

Second Counting Date 9-18-86

Sealed Date 8-27-86

Reseal Date 8-28-86

Sample Weight; wet 537 dry 452

Function 1 1.86E¹ - Sample weight = 0.03 pCi/g
Corrected for Emanation 0.07 pCi/g

Initial Count

Function 1 5.59E² - Sample weight = 1.24 pCi/g

Second Count

TAG NO. 0000 SERIES 00 27 418 86 04166 PAGE 1
MEMO: 1/4 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 07 418 86 AT 04166
FUNCTION F1=000000-0000-07 10000
FUNCTION F2=000000-00 10000-00 100000
FUNCTION F3=000000-00 10000 100000
FUNCTION F4=000000-00 10000
FUNCTION F5=000000-07 10000
AMP: INPUT= POS TC=FAST GAIN= 5.0000
SCAN: LID= ON WLD= 100.00%
ADD: GAIN=1024 OFFSET= 0 SECS= ON
P4= 000 OFFSET= 00000 LT
WVPS: + 0000 ON STABLE OFF

Initial Wet
Count

ROI#	FROM C-#	TO C-#	INTEGRAL	AREAL/SEC	FUNCTION
1	300	400	827	100	5.887787E 01
2	500	600	700	40	5.887787E 01
3	1300	1400	8071	2700	5.887787E 01
4	1500	1600	878	0	5.887787E 01
5	2000	2100	8400	0	5.887787E 01
6	2500	2600	8100	2000	5.887787E 01
7	3400	3500	8470	877	5.887787E 01
8	3800	3900	8100	0	5.887787E 01

TAG NO. 0000 SERIES 00 27 418 86 04166 PAGE 1
MEMO: 1/4 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 07 418 86 AT 04166
FUNCTION F1=000000-0000-07 10000
FUNCTION F2=000000-00 10000-00 100000
FUNCTION F3=000000-00 10000 100000
FUNCTION F4=000000-00 10000
FUNCTION F5=000000-07 10000
AMP: INPUT= POS TC=FAST GAIN= 5.0000
SCAN: LID= ON WLD= 100.00%
ADD: GAIN=1024 OFFSET= 0 SECS= ON
P4= 000 OFFSET= 00000 LT
WVPS: + 0000 ON STABLE OFF

Final Dry Count
After 20 days

ROI#	FROM C-#	TO C-#	INTEGRAL	AREAL/SEC	FUNCTION
1	300	400	827	100	5.887787E 02
2	500	600	700	200	5.887787E 02

Verification Soil Sampling
Opposed Crystal System

Date 9-2-86
By Gene Zoller

Sample # C-SV-1544

Location CA 401, Area N-1

Sample Date 8-29-86

Initial Counting Date 9-2-86

Second Counting Date 9-23-86

Sealed Date 9-2-86

Reseal Date 9-3-86

Sample Weight; wet 493 dry 426

Function 1 7.43E⁻² - Sample weight = 1.51 pCi/g Initial Count

Corrected for Emanation 3.2 pCi/g

Function 1 4.26E⁻² - Sample weight = 1.47 pCi/g Second Count

```

TAG NO. 1 SERIES 00 02 SEP 86 11:20 PAGE 1
VOLUME= 100 LIVE TIME= 1000 SECS TAKE TIME= 1000 SECS
COLLECT STARTED ON 02 SEP 86 AT 11:07:14
FUNCTION FE=FE(1000-07/10000)
FUNCTION FE=FE(1000-07/10000)-FE(1000-07/10000)
FUNCTION FE=FE(1000-07/10000)-FE(1000-07/10000)
FUNCTION FE=FE(1000-07/10000)
FUNCTION FE=FE(1000-07/10000)
AMP: INP. = 005 GAIN= 4.155E
SCA: LDR= 0.0001 LDR= 100.0%
ADD: GAIN=1000 OFFSET= 0 ZERO= ON
P-A ADD PRESET= 1000e LT
HVPS: -1000V ON STABLE OFF
    
```

Initial Wet
Count

ROI#	FROM CH#	TO CH#	INTEGRAL	AREA:TS#G	FUNCTION
1	300	400	500	100	7.428591E 02
2	500	600	300	100	7.428591E 02
3	1000	1400	5000	1000	7.428591E 02
4	1500	1900	300	100	7.428591E 02
5	2000	2400	400	100	7.428591E 02
6	2500	2900	500	100	7.428591E 02
7	3000	3400	300	100	7.428591E 02
8	3500	3900	200	100	7.428591E 02

Final Dry Count
After 20 Days

```

TAG NO. 1 SERIES 00 23 SEP 86 08:54 PAGE 1
VOLUME= 100 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON 23 SEP 86 AT 08:17:14
FUNCTION FE=FE(1000-07/10000)
FUNCTION FE=FE(1000-07/10000)-FE(1000-07/10000)
FUNCTION FE=FE(1000-07/10000)-FE(1000-07/10000)
FUNCTION FE=FE(1000-07/10000)
FUNCTION FE=FE(1000-07/10000)
AMP: INP. = 005 GAIN= 5.0854
SCA: LDR= 0.0001 LDR= 100.0%
ADD: GAIN=1000 OFFSET= 0 ZERO= ON
P-A ADD PRESET= 1000e LT
HVPS: -1000V ON STABLE OFF
    
```

ROI#	FROM CH#	TO CH#	INTEGRAL	AREA:TS#G	FUNCTION
1	300	400	500	116	6.258480E 02
2	500	600	300	0	6.258480E 02

Verification Soil Sampling
Opposed Crystal System

Date 9-2-86
By David J. Jones

Sample # C-3V-1545

Location CA 401, Area N-2

Sample Date 8-29-86

Initial Counting Date 9-2-86

Second Counting Date 9-23-86

Sealed Date 9-2-86

Reseal Date 9-3-86

Sample Weight; wet 563 dry 499

Function 1 2.01E² - Sample weight = 1.43 pCi/g Initial Count

Corrected for Emanation 3.0 pCi/g

Function 1 2.74E² - Sample weight = 1.96 pCi/g Second Count

```

TAG NO.      1      SERIES NO
REVISED 000  LIVE TIME= 1000 SECS  23 SEP 86 09:10  PAGE 1
COLLECT STARTED ON 23 SEP 86 AT 08:54:29  TRUE TIME= 1000 SECS
FUNCTION F1=15-1000-17-10000
FUNCTION F2=15-1000-17-10000-PT 100000
FUNCTION F3=15-1000-17-10000 850.54
FUNCTION F4=15-1000-17-10000
FUNCTION F5=15-1000-17-10000
AFC: INPT= F02  TOFCST  GAIN= 5.0000
SCN: LLS= 1.5000  LLS= 100.00
AFC: GAIN=1000  OFFSET= 0  ZERO= 00
TAG NO  PRESET= 10000s LT
MODE: -1000V ON  STRESC OFF
    
```

Initial Wet
Count

TIME	FROM CH#	TO CH#	INTERVAL	AREA:30V6	FUNCTION
1	332	400	678	121	9.764944E 02
2	500	600	100	146	9.764944E 02

Final Dry Count
After 20 Days

```

TAG NO.      1      SERIES NO
REVISED 000  LIVE TIME= 1000 SECS  23 SEP 86 09:10  PAGE 1
COLLECT STARTED ON 23 SEP 86 AT 08:54:29  TRUE TIME= 1000 SECS
FUNCTION F1=15-1000-17-10000
FUNCTION F2=15-1000-17-10000-PT 100000
FUNCTION F3=15-1000-17-10000 850.54
FUNCTION F4=15-1000-17-10000
FUNCTION F5=15-1000-17-10000
AFC: INPT= F02  TOFCST  GAIN= 5.0000
SCN: LLS= 1.5000  LLS= 100.00
AFC: GAIN=1000  OFFSET= 0  ZERO= 00
TAG NO  PRESET= 10000s LT
MODE: -1000V ON  STRESC OFF
    
```

TIME	FROM CH#	TO CH#	INTERVAL	AREA:30V6	FUNCTION
1	332	400	678	121	9.764944E 02
2	500	600	100	146	9.764944E 02

Verification Soil Sampling
Opposed Crystal System

Date 9-2-86
By Rose Jellard

Sample # C-3V-1547

Location CA 401, Area N4

Sample Date 8-29-86

Initial Counting Date 9-2-86

Second Counting Date 9-23-86

Sealed Date 9-2-86

Reseal Date 9-3-86

Sample Weight; wet 520 dry 490

Function 1 1.97E³ - Sample weight = 1.59 pCi/g Initial Count

Corrected for Emanation 3.9 pCi/g

Function 1 9.52E² - Sample weight = 1.94 pCi/g Second Count

```

TSP: 1 000000 000000 000000 000000 000000 000000
COUNT RATE: 1000000 1000000 1000000 1000000 1000000 1000000
FUNCTION: 1.97E+03 1.97E+03 1.97E+03 1.97E+03 1.97E+03 1.97E+03
CORRECTED: 3.9 3.9 3.9 3.9 3.9 3.9
COUNT RATE: 1000000 1000000 1000000 1000000 1000000 1000000
FUNCTION: 9.52E+02 9.52E+02 9.52E+02 9.52E+02 9.52E+02 9.52E+02
CORRECTED: 1.94 1.94 1.94 1.94 1.94 1.94
  
```

Initial Wet
Count

Final Dry Count
After 20 Days

```

TSP: 1 000000 000000 000000 000000 000000 000000
COUNT RATE: 1000000 1000000 1000000 1000000 1000000 1000000
FUNCTION: 1.97E+03 1.97E+03 1.97E+03 1.97E+03 1.97E+03 1.97E+03
CORRECTED: 3.9 3.9 3.9 3.9 3.9 3.9
COUNT RATE: 1000000 1000000 1000000 1000000 1000000 1000000
FUNCTION: 9.52E+02 9.52E+02 9.52E+02 9.52E+02 9.52E+02 9.52E+02
CORRECTED: 1.94 1.94 1.94 1.94 1.94 1.94
  
```

CH	FROM CH	TO CH	INTEGRAL	AREA/CH	FUNCTION
1	300	400	657	158	9.524048E 02
2	500	600	728	8	9.524048E 02

Verification Soil Sampling
Opposed Crystal System

Date 9-8-86
By Steve Johnson

Sample # C-SV-1553

Location CA 401, Area N-5

Sample Date 9-6-86

Initial Counting Date 9-8-86

Second Counting Date 9-29-86

Sealed Date 9-8-86

Reseal Date 9-9-86

Sample Weight; wet 577 dry 493

Function 1 2.46³ - Sample weight = 3.47 pCi/g Initial Count

Corrected for Emanation 7.3 pCi/g

Function 1 8.86³ - Sample weight = 5.2 pCi/g Second Count

```
TAB NO. 1 SERIES 03 OF SEP 24 05:58 PAGE 1
REVISED 11/85 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON OF SEP 24 AT 08:28:00
FUNCTION 1 F1= 1000-17/10000
FUNCTION 2 F2= 1000-17/10000-FOURSECS
FUNCTION 3 F3= 1000-18/10000-850/P4
FUNCTION 4 F4= 1000-18/10000
FUNCTION 5 F5= 1000-17/10000
APR: INLET= 000 TUBE= 000000 GAIN= 5.1105
ERR: LLD= 1.500% HLD= 110.0%
ADD: BIAS= 0.00% OFFSET= 0 ZERO= 0
REV: 1000 11/85 1000'S LY
MVPS: 4000V ON STABLE OFF
```

Initial Wet
Count

CH#	FROM CH#	TO CH#	INTEGRAL	AREA:TRKS	FUNCTION
1	000	400	1140	404	2.558045E 03
2	500	600	363	97	2.558045E 03
3	1755	1824	5376	2985	2.558045E 03
4	1824	1824	307	0	2.558045E 03
5	2580	2448	4841	0	2.558045E 03
6	2548	2648	6254	3880	2.558045E 03
7	3474	3472	3429	0	2.558045E 03
8	3872	3872	2059	0	2.558045E 03

```
TAB NO. 1 SERIES 03 OF SEP 24 05:58 PAGE 1
REVISED 11/85 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COLLECT STARTED ON OF SEP 24 AT 08:28:00
FUNCTION 1 F1= 1000-17/10000
FUNCTION 2 F2= 1000-17/10000-FOURSECS
FUNCTION 3 F3= 1000-18/10000-850/P4
FUNCTION 4 F4= 1000-18/10000
FUNCTION 5 F5= 1000-17/10000
APR: INLET= 000 TUBE= 000000 GAIN= 5.1105
ERR: LLD= 1.500% HLD= 110.0%
ADD: BIAS= 0.00% OFFSET= 0 ZERO= 0
REV: 1000 11/85 1000'S LY
MVPS: 4000V ON STABLE OFF
```

Final Dry Count
After 20 Days

CH#	FROM CH#	TO CH#	INTEGRAL	AREA:TRKS	FUNCTION
1	000	400	1140	404	2.558045E 03
2	500	600	363	97	2.558045E 03
3	1755	1824	5376	2985	2.558045E 03
4	1824	1824	307	0	2.558045E 03
5	2580	2448	4841	0	2.558045E 03
6	2548	2648	6254	3880	2.558045E 03
7	3474	3472	3429	0	2.558045E 03
8	3872	3872	2059	0	2.558045E 03

Verification Soil Sampling
Opposed Crystal System

Date 9-8-86
By Steve Johnson

Sample # C-SV-1554

Location CA 401, Area N-6

Sample Date 9-6-86

Initial Counting Date 9-8-86

Second Counting Date _____

Sealed Date 9-8-86

Reveal Date 9-9-86

Sample Weight; wet 591 dry 513

Function 1 1.916² - Sample weight = 3.11 pCi/g

Initial Count

Corrected for Emanation 4.7 pCi/g

Function 1 1.876² - Sample weight = 3.1 pCi/g

Second Count

```

TAG NO. 0 SERIES 00 02 SEP 86 09:01 PAGE 1
VERSION 1.00 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COUNT STARTED ON 02 SEP 86 AT 09:02:40
FUNCTION F1=2000000000-07/100000
FUNCTION F2=2000000000-07/100000
FUNCTION F3=2000000000-07/100000
FUNCTION F4=2000000000-07/100000
FUNCTION F5=2000000000-07/100000
AREA: INLT= PIS TO=FAST SQM= 5.1139
SQM: LLD= 1.509E 03 ULD= 10.0%
AQI: SQM=1024 OFFSET= 0 ZERO= 0%
P-A 000 PRESET= 1000s LT
HWPE: -1000V ON STABLZ OFF
    
```

Initial Wet
Count

CH#	FROM CH#	TO CH#	INTEGRAL	AREA:ZKGS	FUNCTION
1	322	400	927	214	1.589283E 03
2	500	600	423	69	1.589283E 03
3	1256	1424	5576	2783	1.589283E 03
4	1524	1624	307	0	1.589283E 03
5	2280	2448	4841	0	1.589283E 03
6	2548	2648	6254	3990	1.589283E 03
7	3404	3472	3429	0	1.589283E 03
8	3572	3672	2059	0	1.589283E 03

```

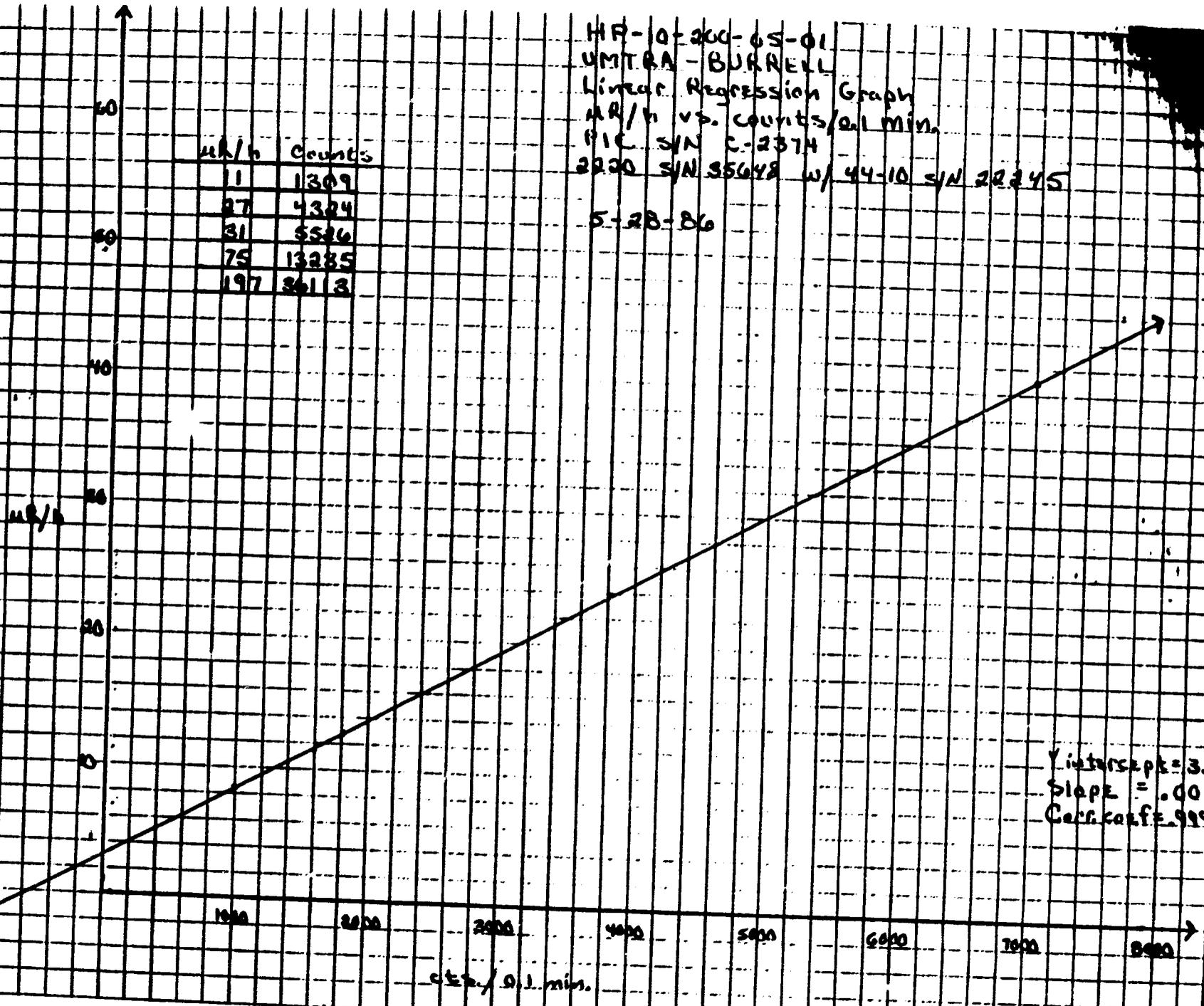
TAG NO. 0 SERIES 00 02 SEP 86 09:01 PAGE 1
VERSION 1.00 LIVE TIME= 1000 SECS TRUE TIME= 1000 SECS
COUNT STARTED ON 02 SEP 86 AT 09:02:40
FUNCTION F1=2000000000-07/100000
FUNCTION F2=2000000000-07/100000
FUNCTION F3=2000000000-07/100000
FUNCTION F4=2000000000-07/100000
FUNCTION F5=2000000000-07/100000
AREA: INLT= PIS TO=FAST SQM= 5.1139
SQM: LLD= 1.509E 03 ULD= 10.0%
AQI: SQM=1024 OFFSET= 0 ZERO= 0%
P-A 000 PRESET= 1000s LT
HWPE: -1000V ON STABLZ OFF
    
```

Final Dry Count
After 20 Days

CH#	FROM CH#	TO CH#	INTEGRAL	AREA:ZKGS	FUNCTION
1	322	400	927	214	1.589283E 03
2	500	600	423	69	1.589283E 03
3	1256	1424	5576	2783	1.589283E 03
4	1524	1624	307	0	1.589283E 03
5	2280	2448	4841	0	1.589283E 03
6	2548	2648	6254	3990	1.589283E 03
7	3404	3472	3429	0	1.589283E 03
8	3572	3672	2059	0	1.589283E 03

uR/h	Counts
11	1309
27	4324
31	5526
75	13285
197	36113

HF-10-200-05-01
 UMTRA - BURRELL
 Linear Regression Graph
 uR/h vs. counts/0.1 min.
 PIC SYN C-2374
 2220 SYN 35648 w/ 44-10 SYN 22345
 5-28-86



Y intercept = 3.25
 Slope = .0054
 Corr. coeff. .999

counts / 0.1 min.

David J. [unclear]



PROPERTY SURVEY DATA SHEET
FEDERAL VERIFICATION LOG

LOGGING CREW: A. Patricks

SHEET _____ OF _____ PAGE _____

DATE: 9-29-86

PROPERTY ID: CA-401

INSTRUMENT ID NO: 35648 W/22245

BACKGROUND CALCULATION:

#1 _____ + #2 _____ + #3 _____ = _____ - 3 = _____ COUNTS/LMIN

POINT	LOCATION	READING CFM	RATE uR/h	POINT	LOCATION	READING CFM	RATE uR/h
	<u>AREA A-1</u>				<u>L-3</u>		
<u>1</u>		<u>1626</u>	<u>12</u>	<u>1</u>		<u>1807</u>	<u>12</u>
<u>2</u>		<u>1546</u>	<u>12</u>	<u>2</u>		<u>1868</u>	<u>13</u>
<u>3</u>		<u>1788</u>	<u>12</u>	<u>3</u>		<u>1901</u>	<u>13</u>
	<u>A-2</u>				<u>AREA D</u>		
<u>1</u>		<u>1921</u>	<u>12</u>	<u>1</u>		<u>1644</u>	<u>12</u>
<u>2</u>		<u>1677</u>	<u>12</u>	<u>2</u>		<u>1681</u>	<u>12</u>
<u>3</u>		<u>1549</u>	<u>11</u>	<u>3</u>		<u>1736</u>	<u>12</u>
	<u>A-3</u>				<u>AREA E</u>		
<u>1</u>		<u>1912</u>	<u>13</u>	<u>1</u>		<u>2012</u>	<u>13</u>
<u>2</u>		<u>1866</u>	<u>13</u>	<u>2</u>		<u>1976</u>	<u>13</u>
<u>3</u>		<u>1878</u>	<u>13</u>	<u>3</u>		<u>1983</u>	<u>13</u>
	<u>AREA B-1</u>				<u>AREA F</u>		
<u>1</u>		<u>1544</u>	<u>11</u>	<u>1</u>		<u>1786</u>	<u>12</u>
<u>2</u>		<u>1568</u>	<u>11</u>	<u>2</u>		<u>1691</u>	<u>12</u>
<u>3</u>		<u>1722</u>	<u>12</u>	<u>3</u>		<u>1688</u>	<u>12</u>
	<u>B-2</u>				<u>AREA H</u>		
<u>1</u>		<u>1668</u>	<u>12</u>	<u>1</u>		<u>1706</u>	<u>12</u>
<u>2</u>		<u>1714</u>	<u>12</u>	<u>2</u>		<u>1757</u>	<u>12</u>
<u>3</u>		<u>1800</u>	<u>12</u>	<u>3</u>		<u>1862</u>	<u>13</u>
	<u>AREA L</u>						
<u>1</u>		<u>1926</u>	<u>13</u>				
<u>2</u>		<u>1974</u>	<u>13</u>				
<u>3</u>		<u>1888</u>	<u>13</u>				

REMARKS: _____



PROPERTY SURVEY DATA SHEET
SERIAL VERIFICATION LOG

LOGGING CREW: J. Patrick

SHEET _____ OF _____ PAGE _____

DATE: 9-29-86

PROPERTY ID: 1A-401

INSTRUMENT ID NO: 35648 W/22245

BACKGROUND CALCULATION:

01 _____ + 02 _____ + 03 _____ = _____ - 3 = _____ COUNTS/MIN

POINT	LOCATION	READING CPM	RATE uR/h	POINT	LOCATION	READING CPM	RATE uR/h
AREA H-1				H-2			
1		1745	12	1		1760	12
2		1988	13	2		1691	12
3		1976	13	3		1660	12
H-2				AREA M-1			
1		2010	13	1		1801	12
2		2260	15	2		1880	13
3		1867	13	3		1760	12
AREA I				M-2			
1		1686	12	1		1710	12
2		1712	12	2		1654	12
3		1505	11	3		1780	12
AREA J				AREA-N-1			
1		1660	12	1		1600	12
2		1542	11	2		1746	12
3		1678	12	3		1688	12
AREA K				N-2			
1		1677	12	1		1810	13
2		1694	12	2		1780	12
3		1706	12	3		1660	12
AREA-L-1				N-3			
1		1675	12	1		1906	13
2		1666	12	2		1888	13
3		1681	12	3		1762	12

REMARKS: Area J, unable to take soil sample. Concrete pit (see photos)



INTERIOR SURVEY DATA LOG/RADON DAUGHTER

SURVEY CREW J. Patrick

SHEET 1 OF 2 PAGE 1
DATE 11-12-86
PROPERTY ID # CA-401
PROJECT UMTEA

RADON DAUGHTER SURVEY

SURVEY METHOD: SHORT TERM INTEGRATED (I.E., 8 HR. INTEGRAL WITH WLM - 1)
(ATTACH PRINTOUT TAPES)

NOTE: TAPE ID NO. = INST. SERIAL NO. + PROPERTY ID NO.

TAPE ID NO.					
LOCATION					
SAMPLE INTERVAL					
SAMPLE QUANTITY					
AVERAGE WL					
THORON %					

SURVEY METHOD: GRAB (MINIMUM OF TWO REQUIRED)

LOCATION	Bldg. 3 SW → NW	Bldg. 3 NE → SW	Bldg. 3 SE → NW	Bldg. 3 NW → SE	
WL-1	.0004	.0005	.0009	.0006	
WL-2					
WL-3					
WL-4					
AVERAGE WL					

COMMENTS: _____

APPENDIX B
LEGAL DESCRIPTION

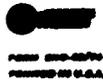
LEGAL DESCRIPTION

The property which is the subject of this Completion Report, and which is located in Bridgeville, Pennsylvania, is more particularly described in the Allegheny County Recorder's Office, in Deed Book 3322, page 143, as follows:

BEGINNING at a point on the Easterly side of Beram Street at the Southerly right-of-way line of the Pittsburgh and West Virginia Railroad, thence along the southerly right-of-way line of the Pittsburgh and West Virginia Railroad the following courses and distances: North $53^{\circ} 9'$ East 538.67 feet to a point; North $46^{\circ} 51'$ East 254.73 feet to a point; North $37^{\circ} 53'$ East 309.54 feet to a point on the Westerly right-of-way line of way line of the Pittsburgh, Chartiers and Youghiogheny Railroad South $9^{\circ} 27'$ East 772.45 thence along the Northerly right-of-way line of the P.C.C. and St. Louis Railroad; arc of a circle curving to the right having a radius of 925.37 feet fence distance of West 208.11 feet to a point on line of lands of the Flannery Bolt Company, acquired by deed of the Vanadium Corporation of America to the Flannery Bolt Company, dated May 21, 1942, and recorded in the Recorder's Office of Allegheny County in Deed Book Volume 3077, page 7; thence along line of lands of the Flannery Bolt Company South $85^{\circ} 25' 40''$ west 182.65 feet to a point; thence continuing along the same North $34^{\circ} 15' 20''$ West 337.70 of Rodgers Street North $58^{\circ} 45' 20''$ East 253.94 feet to a point on the Easterly side of Beram Street; thence along the Easterly side of Beram Street North $34^{\circ} 57' 40''$ west 251.50 feet to a point at the place of beginning.

BEING all of the property acquired by the Vanadium Corporation of America by Part 1 of deed of the Collier Land Company to the Vanadium Corporation of America dated November 30, 1923, and recorded in the Recorder's Office of Allegheny County in the Vanadium Corporation of America dated December 26, 1928, and recorded in the Recorder's Office of Allegheny County in Deed Book Volume 2362, page 572; a portion of property in deed of J.L. Replogle to the Vanadium Corporation of America, dated November 17, 1919, and recorded in the Recorder's Office of Allegheny County in Deed Book Volume 1970, two (2) deeds of the Collier Land Company to the Vanadium Corporation of America, both said deeds being dated March 12, 1924, and both to be recorded.

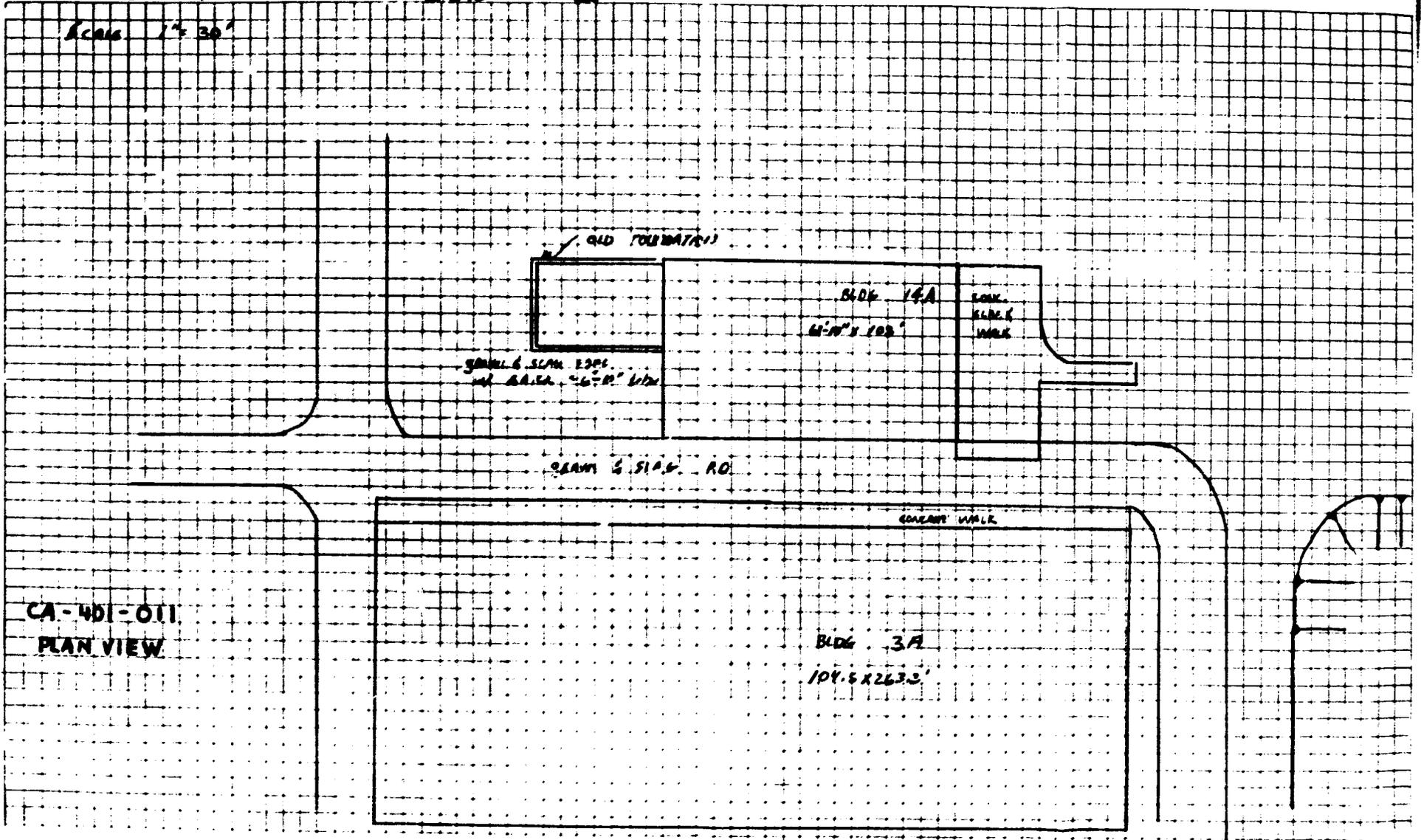
TOGETHER with that certain right of ingress, egress and regress, and that certain right of way for railroad siding leading to the Pittsburgh, Cincinnati, Chicago America, its successors and assigns, by Deed from Vanadium Corporation of America, to Flannery Bolt Company, dated May 21, 1942, and recorded in the Recorder's Office of said Allegheny County in Deed Book Volume 3077, page 7.



OPERATION CA-401
 BLDG 19A

PLAN NO. _____ SHEET _____ OF _____ PAGE _____
 JOB NUMBER _____
 DATE BY TV _____

SCALE 1" = 30'



CA-401-011
 PLAN VIEW

BLDG 3A
 104'-6" x 263'-0"

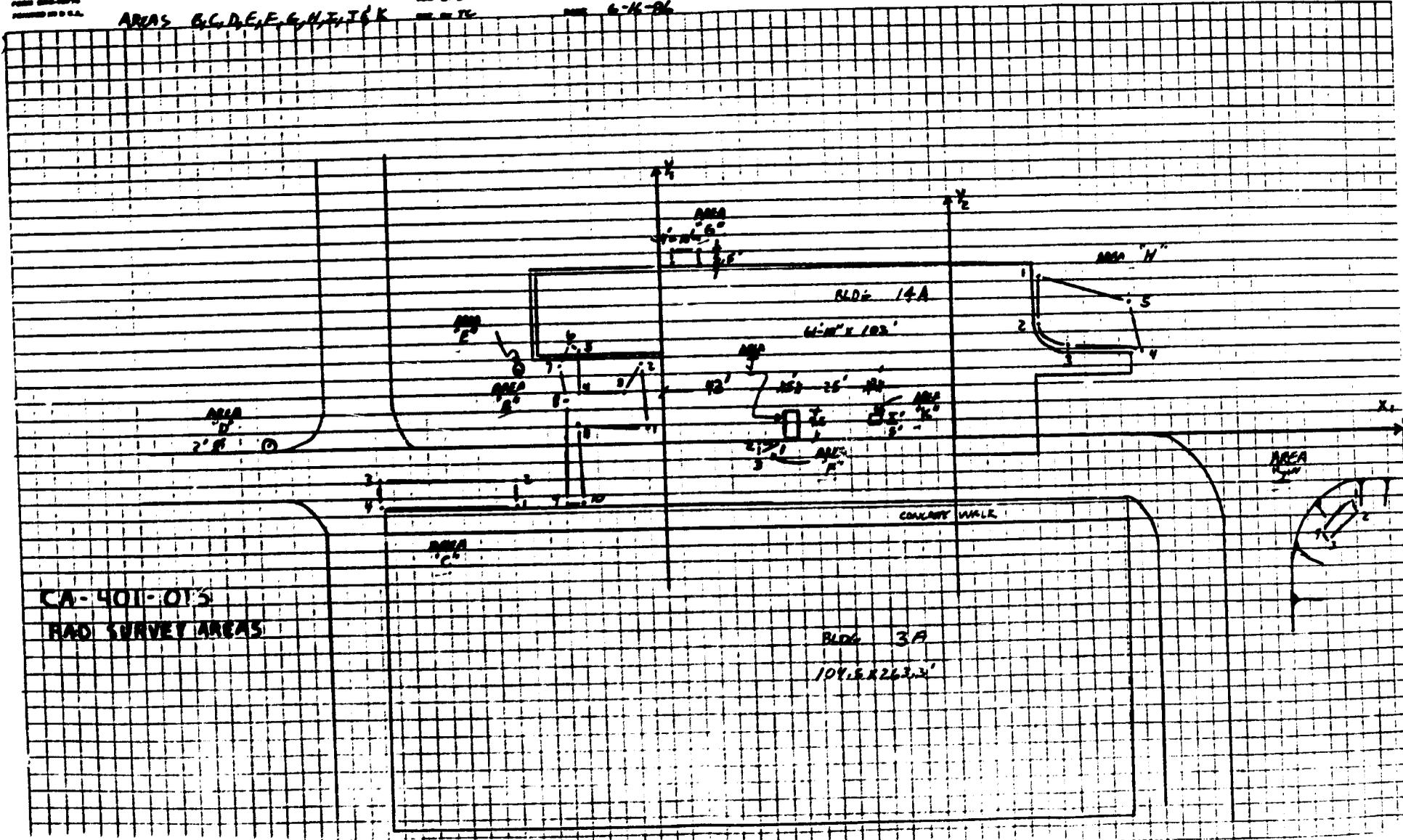


FORM 880-0070
PRINTED IN U.S.A.

OPERATION CA-401

AREAS B, C, D, E, F, G, H, I, J, K

FORM NO. _____ OF _____ PAGE _____
ISS. UNDER _____
ISS. BY TC _____ DATE 6-12-86



CA-401-01'S
HAD SURVEY AREAS

BLDG 3A
104'-8" x 226'-3"

CONCRETE WALK

AREA



OPERATION CA-401

MADE IN U.S.A.

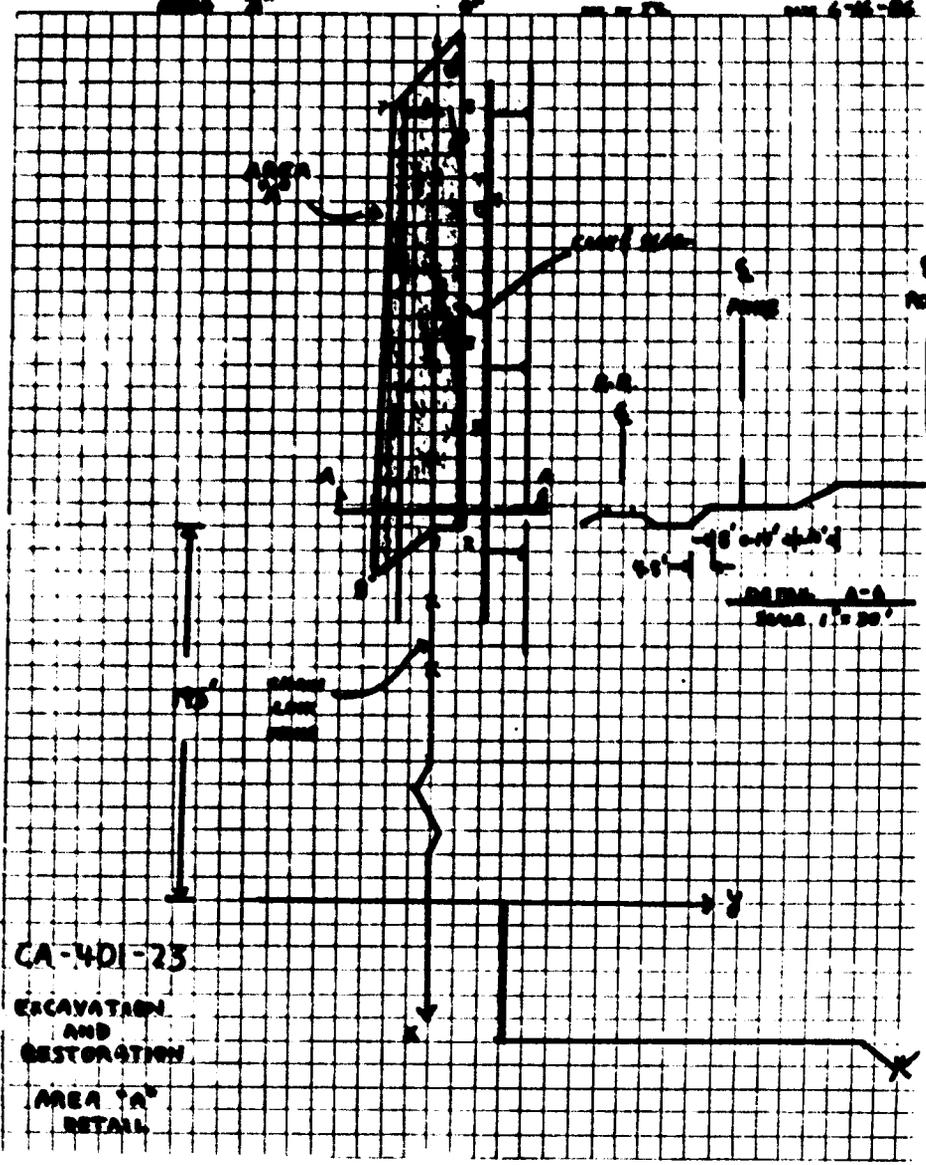
PLAN NO.

JOB NO.

DATE

SCALE

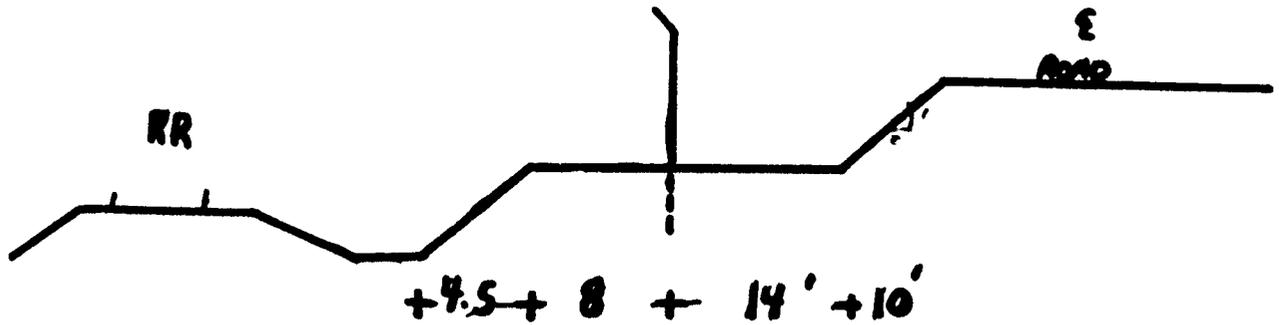
DATE



CA-401

Field Notes: Dimensions

DETAIL - AREA A
@ - 194

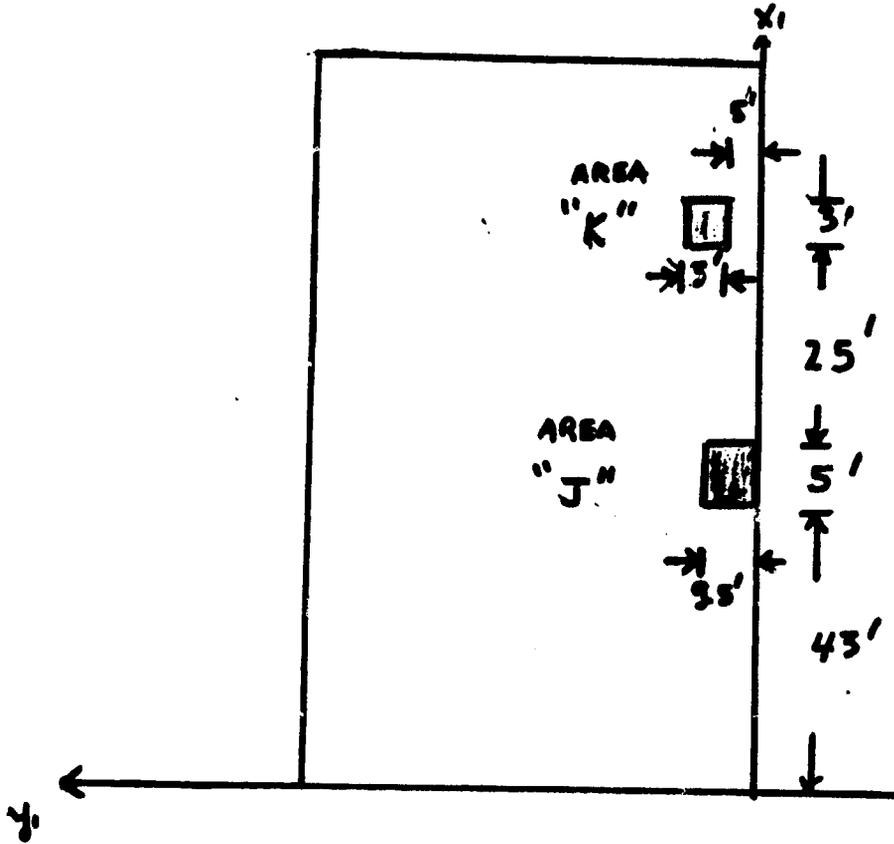


CA-401-019

AREA "A" DETAIL

CA-401

INSIDE BLDG 14 A



CA - 401 - 21

EXCAVATION AND
RESTORATION

BLDG 14A DETAIL





OPERATION CA-401

FORM ENG-02/74

PRINTED IN U.S.A.

ITEM NO.

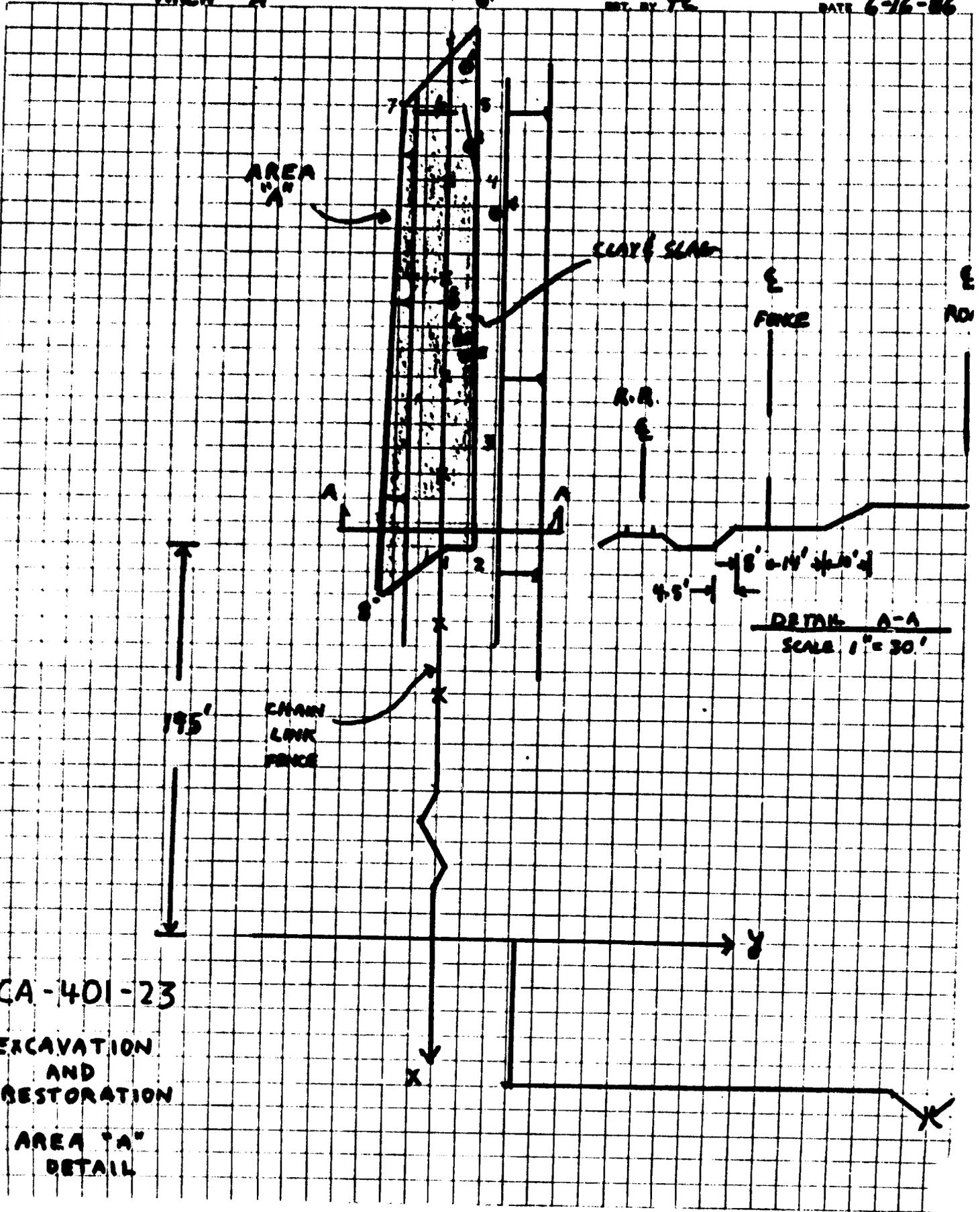
SHEET _____ OF _____ PA

JOB SMITRA

EST. BY T.E.

DATE 6-16-86

AREA "A"



CA-401-23

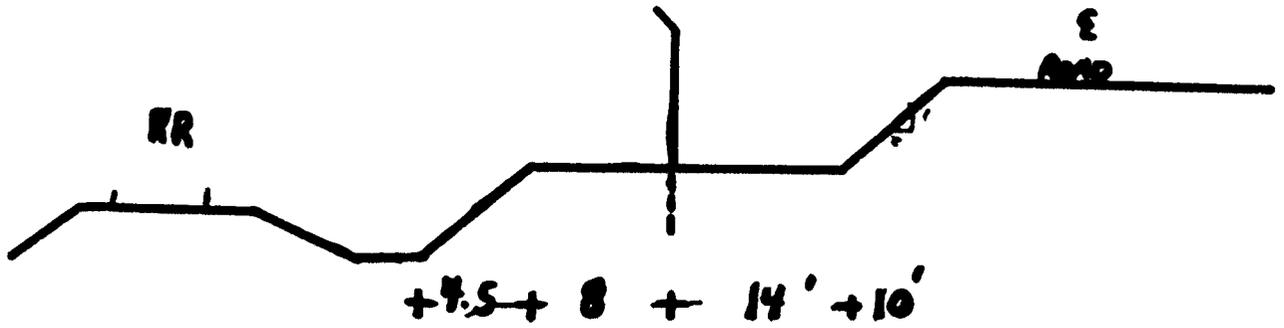
EXCAVATION AND RESTORATION

AREA "A" DETAIL

CA-401

Field Notes: Dimensions

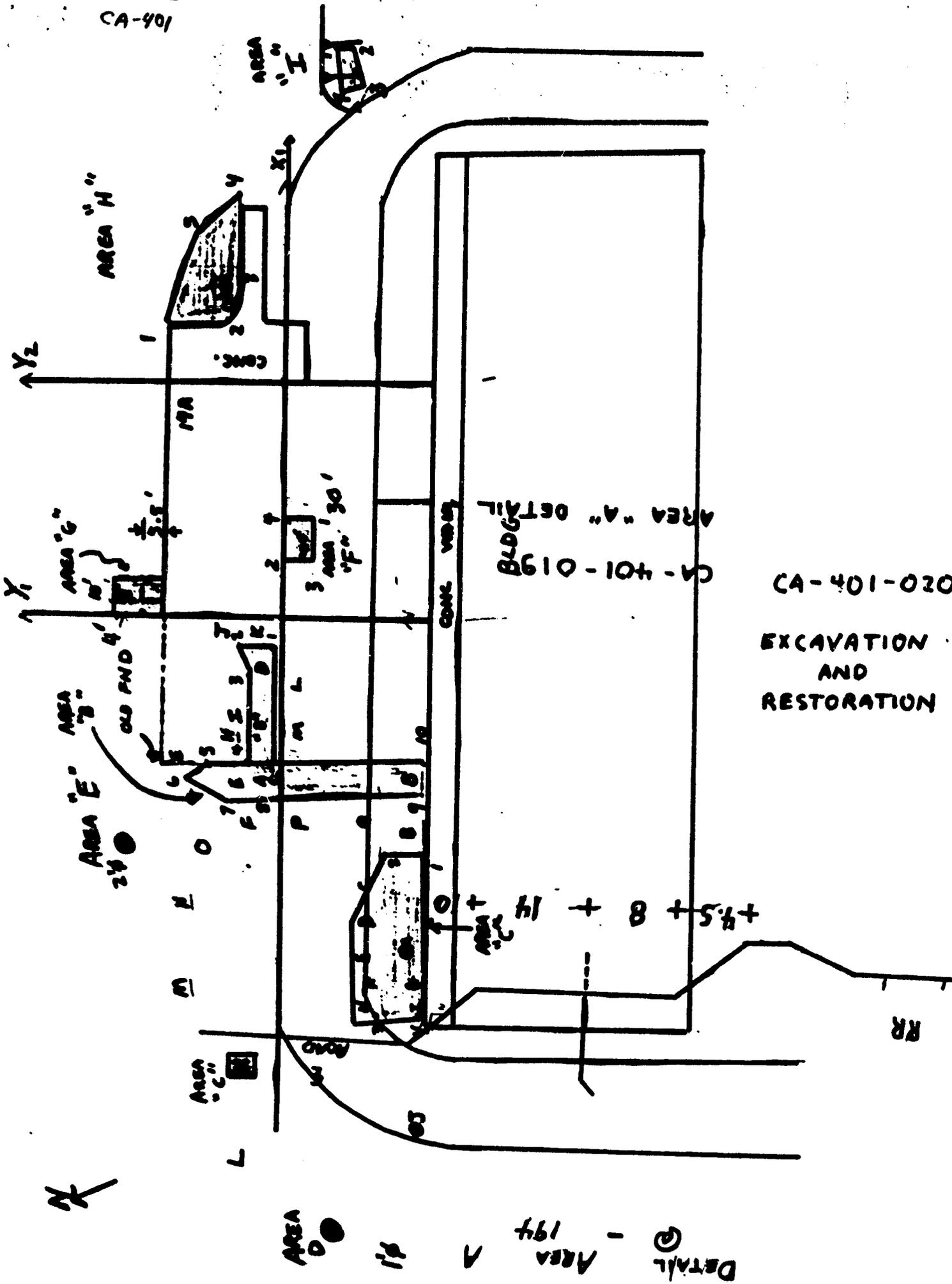
DETAIL @ - AREA A



CA-401-019

AREA "A" DETAIL

CA-401



CA-401-020

EXCAVATION
AND
RESTORATION

CA-401-019
BLDG. 'A' DETAIL

DETAIL
Area 194

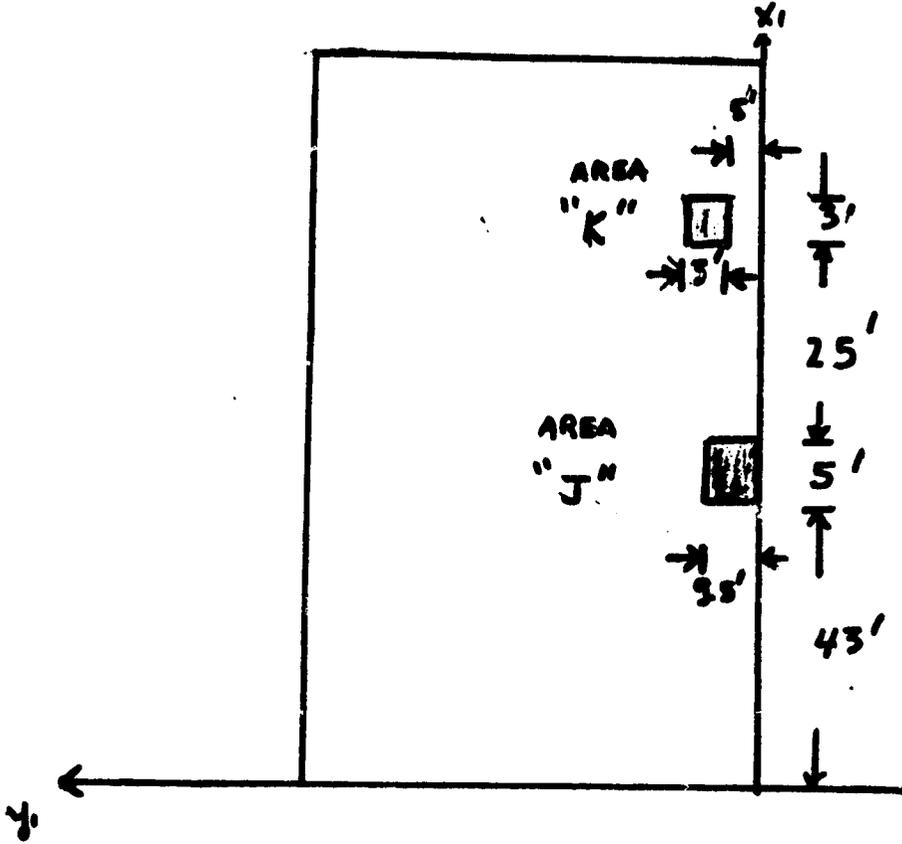
Area 194

Area 194

N

CA-401

INSIDE BLDG 14 A



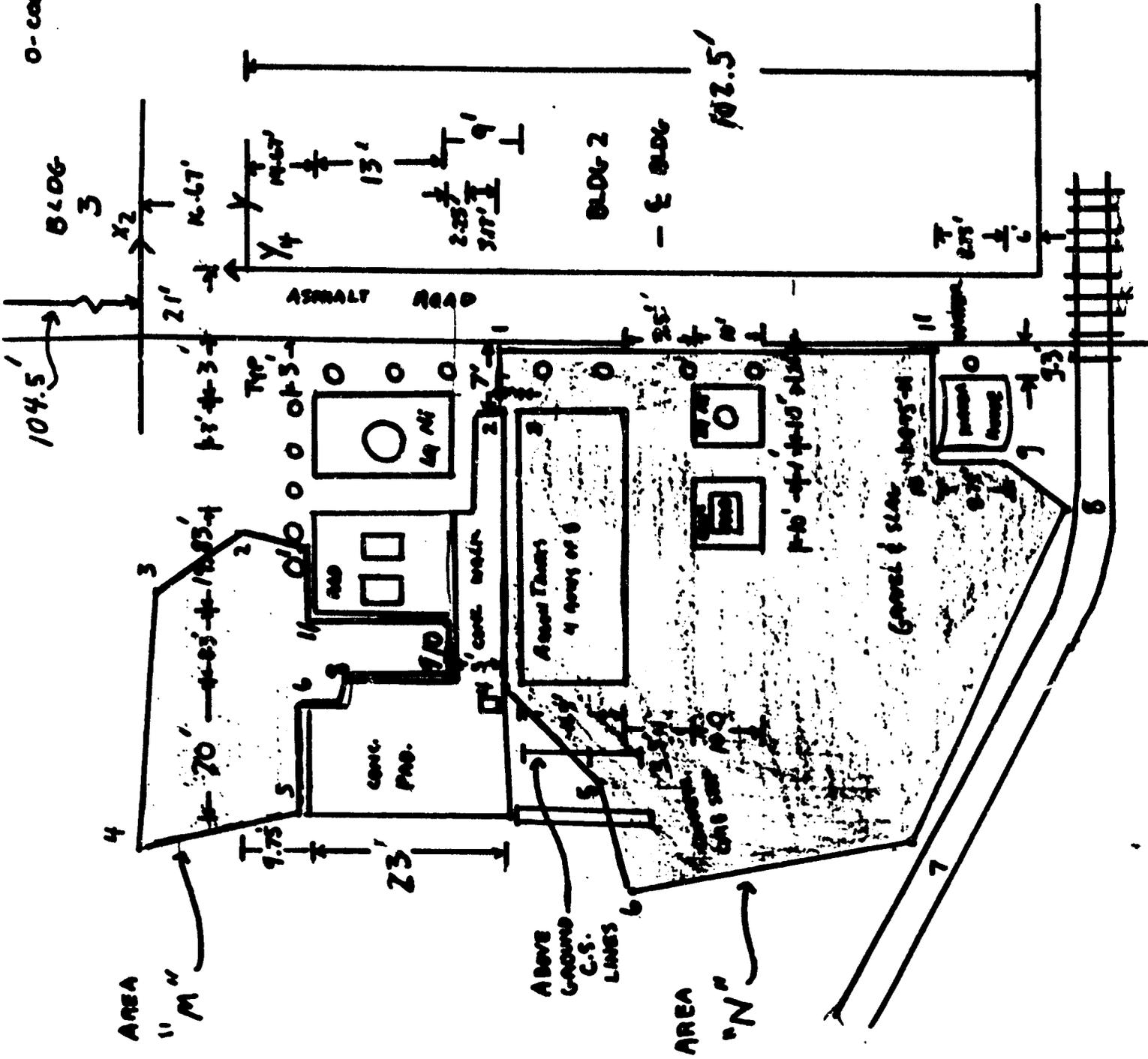
CA-401-21

EXCAVATION AND
RESTORATION

BLDG 14A DETAIL



CA-401



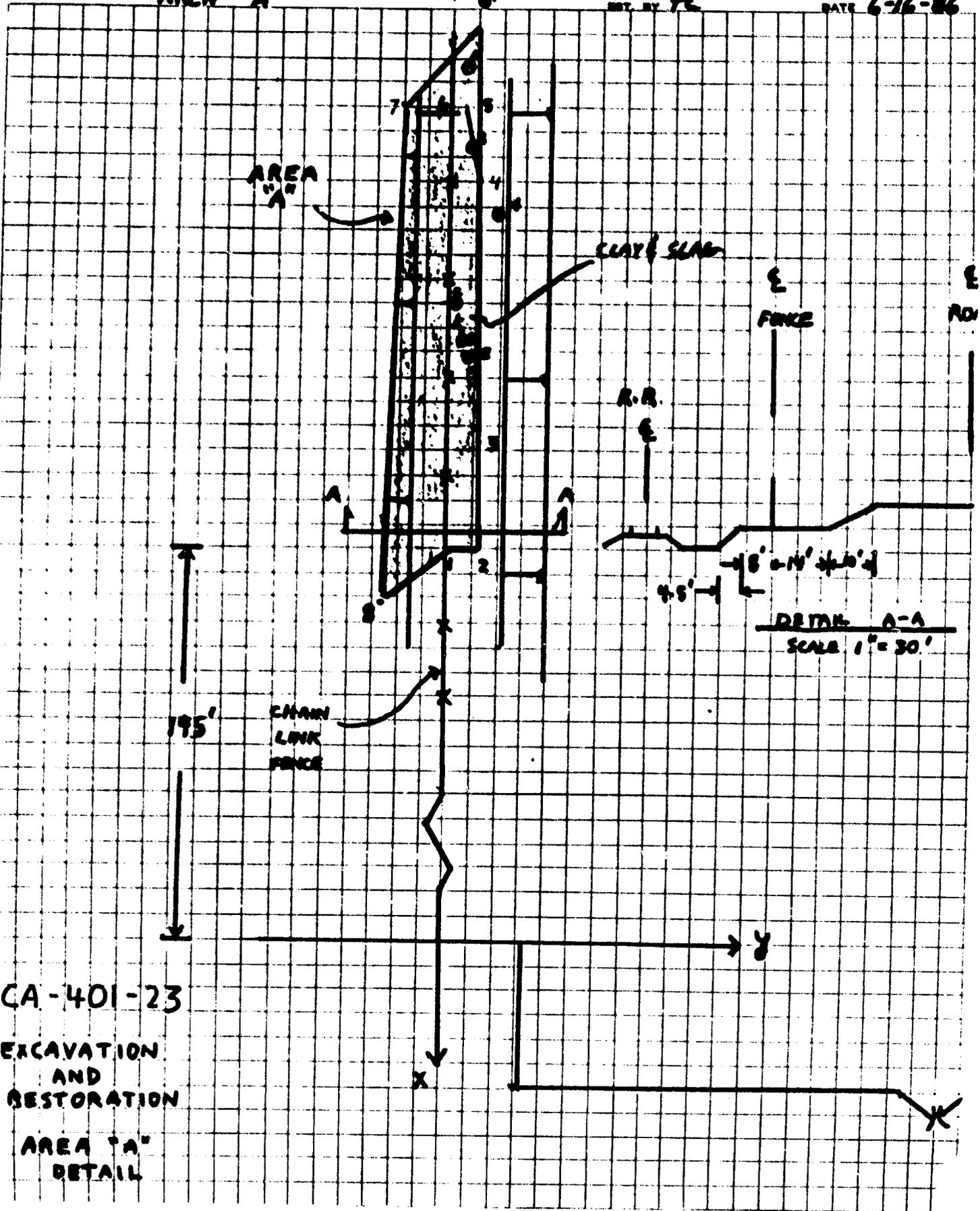
CA - 401 - 22

EXCAVATION AND RESTORATION

AREAS "M" AND "N" DETAIL



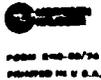
AREA "A"



CA-401-23

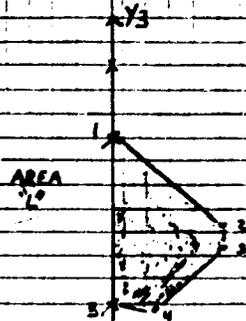
EXCAVATION
AND
RESTORATION

AREA "A"
DETAIL

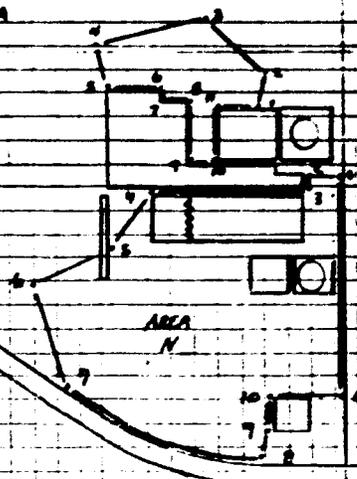


OPERATION CA-401
PLAN VIEW

ITEM NO. _____ SHEET _____ OF _____ PAGE _____
JOB UMTRA
DATE 6-16-96



AREA M



AREA
24

AREA
2

CA-401-024
EXCAVATION
AND
RESTORATION
AREA "L"
OETRII

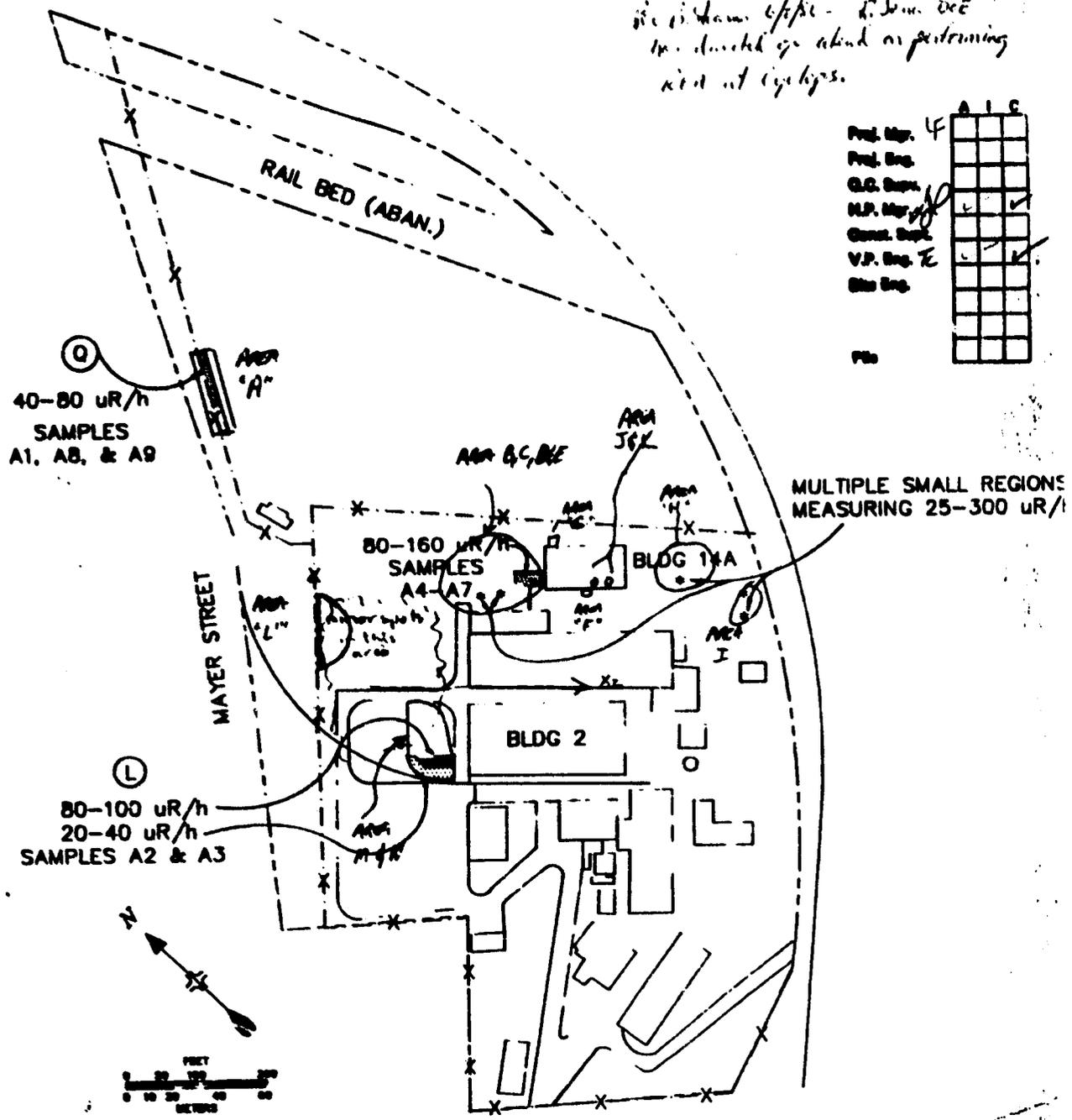
0101

Larry - the guy at the mill told me
 that winter earth-scraping etc takes
 place at irregular intervals. The area
 I peened in in blue stoned spots on our
 first survey, but not on our second visit.

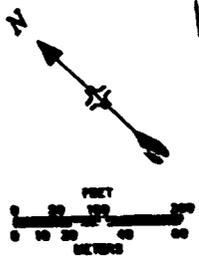
Ron Carter



the [unclear] [unclear] - [unclear] [unclear]
 he should go ahead on performing
 kind of [unclear].



Proj. Mgr.	4		
Proj. Eng.			
Q.C. Supv.			
M.P. Mgr.			
Comm. Supv.			
V.P. Eng.	E		
Site Eng.			



NOTE: Areas shown in
 approximate location
 see attached sketches
 for more detail

DAP 5/5/86



DOCUMENT TRANSMITTAL

MK-FERGUSON COMPANY
P.O. BOX 9136
ALBUQUERQUE, NEW MEXICO 87119

Trans. No. MKE-3050-CAN-0451

Contract No. 3080

Date November 3, 1986

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

TO: <u>Bureau of Rad. Protect. & Toxicol</u> <u>P.O. Box 2063</u> <u>Harrisburg, PA 17120</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>APPROVED FOR CONSTRUCTION/FABRICATION</td><td style="text-align: center;">A</td></tr> <tr><td>INFORMATION ONLY</td><td style="text-align: center;">B</td></tr> <tr><td>APPROVAL ACTION REQUESTED</td><td style="text-align: center;">C</td></tr> <tr><td>DISAPPROVAL-RESUBMIT</td><td style="text-align: center;">D</td></tr> <tr><td>APPROVAL WITH COMMENTS</td><td style="text-align: center;">E</td></tr> </table>	APPROVED FOR CONSTRUCTION/FABRICATION	A	INFORMATION ONLY	B	APPROVAL ACTION REQUESTED	C	DISAPPROVAL-RESUBMIT	D	APPROVAL WITH COMMENTS	E
APPROVED FOR CONSTRUCTION/FABRICATION	A										
INFORMATION ONLY	B										
APPROVAL ACTION REQUESTED	C										
DISAPPROVAL-RESUBMIT	D										
APPROVAL WITH COMMENTS	E										
ATT: <u>Mr. Donald J. McDonald</u>											

REMARKS Page 2 - Owner Acceptance Forms

TRANSMITTED HEREWITH UNDER SEPARATE COVER

DRAWING SPECIFICATION OR ITEM NUMBER	REV. NUMBER	NUMBER OF COPIES	TITLE OR DESCRIPTION	ACTION
DE-R004-85AL32184	--	1	Owner Acceptance - CA-265	B
DE-R004-85AL32271	--	1	Owner Acceptance - CA-276	B
DE-R004-85AL32185	--	1	Owner Acceptance - CA-283	B
DE-R004-85AL32192	--	1	Owner Acceptance - CA-304	B
DE-R004-86AL38169	--	1	Owner Acceptance - CA-401	B
DE-R004-86AL38155	--	1	Owner Acceptance - CA-405	B
DE-R004-86AL32273	--	1	Owner Acceptance - CA-A22	B
DE-R004-86AL32275	--	1	Owner Acceptance - CA-A25	B
DE-R004-86AL31853	--	1	Owner Acceptance - CA-A32	B
sh				
cc: w/ attachments:				
Document Control				

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

MK-FERGUSON COMPANY

BY: *JG King for J6P*
 TITLE John Pepin
Vicinity Properties Manager
4319F

THE ABOVE LISTED DOCUMENTS HAVE BEEN RECEIVED BY:

COMPANY NAME _____
 NAME & TITLE _____
 DATE REC'D. _____

Vicinity Property No. CA-401
DOE Agreement No. DE-2004-86AL38169
Commonwealth of Pennsylvania
Agreement No. _____
UNITA Project - Canonsburg

OWNER ACCEPTANCE FORM

The undersigned Owner(s) of the Vicinity Property subject to DOE Vicinity Property Remedial Action Agreement No. DE-2004-86AL38169 acknowledge(s) that the remedial action described in the Vicinity Property Remedial Action Plan (Appendix B) of said Agreement has been satisfactorily performed and the DOE and the State have no further obligation under said Agreement except:

1. DOE must officially certify, in accordance with DOE policy implementing Public Law 95-604, that remedial actions on the Vicinity Property are in compliance with applicable radiation standards promulgated by the U.S. Environmental Protection Agency for the protection of the public health, safety and environment.
2. DOE, for the benefit of the Owner(s), shall use its best efforts to enforce any warranties or guarantees, express or implied, which the Government or its prime contractors are entitled to in connection with failure of remedial action work caused by emission of materials, defective materials or poor workmanship, or improper workmanship.

OWNER: CYTECF SPECIALTY STEEL DIVISION
CYCLOPS CORPORATION

BY:

John E. Buser
JOHN E. BUSER, PRESIDENT

DATE:

9/12/86

DECLASSIFICATION GUIDE
CHANGED TO
AUTHORITY DERIVED FROM
DATE

ED:HY
M
R

Vitro Manufacturing Company
11 Broad Street
New York, New York.

Attention: Mr. Julian Leroy, President.

Gentlemen:

Confirming the conversation of 22 October 1943 between your
Mr. Leroy and Mr. Messart, and Captain Dovesbrock of this office, the
following information is submitted:

The grinding of the material in Lots 6-R and 7-R was initiated
on 21 October 1943 at the Vanadium Corporation of America plant at Bridge-
ville, Pennsylvania. All representatives were present at Bridgeville to
inspect the cleanliness of the machinery prior to grinding as well as to
witness the actual grinding of the material.

The material is being brought by truck from the Vitro Manufac-
turing Company plant at Canonsburg to Bridgeville under guard by this
office. As each drum of material is ground, it is placed in the same
drum. The drum is then covered with burlap; the burlap is wired securely
to the drum. This ground material is then returned to the Vitro plant
at Canonsburg, also under guard by this office. All open drums are removed
from the Vanadium Corporation of America plant at Bridgeville and tran-
ported to the Vitro Manufacturing Company plant at Canonsburg at the con-
clusion of each day.

According to present plans, Lots 6-R and 7-R will be ground
and will then be sampled and weighed at the Vitro Manufacturing Company
plant at Canonsburg. During the sampling of Lots 6-R and 7-R, no grinding
will be done at Bridgeville in order that all representatives may attend
the sampling. It is anticipated that the sampling of Lots 6-R and 7-R
will begin on about 29 October 1943.

At the conclusion of the sampling of Lots 6-R and 7-R the grind-
ing of Lots 1-R, 2-R and 5-R will commence. It is understood that you do
not desire to have a representative present at Bridgeville during the grind-
ing of Lots 1-R, 2-R and 5-R. During this grinding, however, a representa-
tive of this office will be present.

SECRET

...material will be...
...upon the...
...from the point of storage
...at Bridgeville.

...they will be sampled
...at the...
...this sampling will take place, if...
...representative will be present at that time.

AT-26-D

Area Engineer

Very truly yours,

The Area Engineer,
S. Engineer Office,
P. O. Box 42, Station B,
New York 16, N.Y.

CLASSIFIED
RECEIVED

G. W. RUSSELL, OCT 27 1943

Major, Corps of Engineers,

Attention: Lt. Col. John R. ... Assistant.

Gentlemen:

K-39
Boxes 30A, 30B and 31A
Box 31A

CLASSIFICATION CANCELLED

In any...
...BY...
...BY...
...DATE...



Very truly yours,

AMERICAN METALS CORPORATION

destroyed

Assistant to the President

- Copy 1 & 2- Addressee
- 3- Reading Files
- 4- Class. Files

- 2 -
SECRET

No suspense

PA. 16

CEW 400.22(Gen)

EIDM AT-6

23 October 1943

123
KEZ:1
aks

This document contains information affecting the national defense within the meaning of the Espionage Laws, Title 18, U.S.C., Sec. 793 and 794, and the transmission or revelation of its contents in any manner to an unauthorized person is prohibited by law.

5
PP
[Handwritten scribbles]

Mr. James A. Ellis
c/o Vanadium Corp., of America Plant
Bridgeville, Pennsylvania

Dear Sir:

There is being shipped to you this date in car IO 10731 via L&N Cincy PRR on Government Bill of Lading WE 883365 Lot 1, Group B, of Type A Material, consisting of forty-five (45) drums, numbered one (1) to forty-five (45) inclusive. Shipment is made by authority of Captain Lloyd Breveskracht.

Inclosed herewith is shipping memorandum, in triplicate, and bill of lading in duplicate. It is requested that the original of the shipping memorandum be signed and returned to this office and the signed duplicate forwarded to The Area Engineer, U. S. Engineer Office, Madison Square Area, P. O. Box 42, Station F, New York City, attention of Mr. E. W. Moscrip. Triplicate copy is for your files.

For the Area Engineer:

Yours very truly,

COPIED
K. Walter 6/15/79
B. Fritz DATE 10/21/83

Kenneth E. Zimmerman,
1st Lt., Corps of Engineers,
Assistant.

2 Incls.:

- # 1 Shipping Memo. (in trip.) (Not necessary to retain in C. Files.)
- # 2 B/L WE 883365 (in dup.) C. Files.)

Copy Dist.:

- 1 and 2 - Addressee
- 3 - Area Engr., New York, N. Y.
- 4 - Lt. Zimmerman Files.
- 5 and 6 - C. Files.



900

Dec 1, 1943

This document consists of 1 page
No. 4 of 4 copies, Section 2

~~CONFIDENTIAL~~

AMERICAN METALS CORPORATION

41 BROAD STREET

20 November 1943

NEW YORK, N.Y.

July - 24

(Duplicate)

December 1, 1943

100-100

JP

American Metals Corporation,
41 Broad Street,
New York, New York.

CLASSIFICATION CANCELLED
OR CHANGED TO
BY AUTHORITY OF Doc
BY KAW DATE 11/8/78

The Area Engineer
Attention: Mr. Julian Leroy, President.
Box 42, Station B.
Gettysburg, Pa.

With further regard to our letter of 25 October 1943 (MEMO 0-
118-0-22) in connection with the grinding and sampling of the material
in Lots Nos. 1A, 2A, 3A, 4A, 5A, 6A and 7A, please be advised that the
sampling of Lots 2A and 3A and the grinding and sampling of Lots 4A and
7A has now been completed. No doubt you have already been advised of
this fact by your representative in this matter, Lathrop and Company.

As you were advised in letter referred to above, Lot 1A was
shipped from the point of storage to the YCA plant at Bridgeville, Pa.
for grinding on 23 October 1943. This lot has now been ground and trans-
ported to the Vitre Manufacturing Company plant at Gettysburg, Pa. The
grinding of Lot 2A is in progress at the present time at Bridgeville,
this lot having been forwarded from the point of storage to Bridgeville
on 20 November 1943. Lot 3A is now in transit from the point of storage
to Bridgeville for grinding, this lot having been forwarded from the
point of storage on 25 November.

According to the original plan as set forth in letter first
referenced above, Lots 1A, 2A and 3A will be transported to Gettysburg
as each increment thereof is ground. These three lots will be sampled
at the same time at Gettysburg.

It is anticipated that sampling of Lots 1A, 2A and 3A will
take place some time during the period of 10-15 December. You will be
advised later when this date is definitely known.

CLASSIFIED BY
U. S. NATIONAL ARCHIVES
MANUSCRIPTS SECTION
DISPATCH

For the Area Engineer:

DEC 1 - 1943
Very truly yours,
7 8 9 10 11 12 1 2 3 4 5 6

53
RECEIVED
NOV 24 1943

G. W. RUSSELL,
Major, Corps of Engineers,
Assistant. 63

Copy No. 1 & 2 - Addresses
Corrected 2/12/54 WMO

No suspense

CONFIDENTIAL

...material will be available to you...
...is being shipped this date from the point of storage to the American Corporation of America plant at Bridgeville.

When Lots 1-2, 2-2 and 3-2 have been ground, they will be sampled at the Viro Manufacturing Company plant at Cazenovia and you will be advised in due course when this sampling will take place, if your representative will be present at that time.

AF-26-b

The Area Engineer,

Very truly yours,

The Area Engineer,
U. S. Engineer Office,
P. O. Box 42, Station B,
New York 15, N.Y.

CLASSIFIED
RECEIVED

G. W. RUSSELL, OCT 27 1943

Major, Corps of Engineers,

Attention: Lt. Col. John R. Kunkoff, Assistant.

Gentlemen:

K-89
Lots 20A, 30A and 31A
Lot 31A

CLASSIFICATION CANCELLED

In any...
BY...
BY...
DATE...



Very truly yours,

AMERICAN METALS CORPORATION

destroyed 11/7/46 H.B.

Assistant to the President

- Copy 1 & 2- Addressee
- 3- Reading Files
- 4- Class. Files

SECRET

No suspense

PA. 16

CEW 400.22(Gen)

EIDM AT-6

23 October 1943

KEZ: t

aks

This document contains information affecting the national defense within the meaning of the Espionage Laws, Title 18, U.S.C., Sec. 793 and 794, and the transmission or revelation of its contents in any manner to an unauthorized person is prohibited by law.

PA. 15
[Handwritten signature]

Mr. James A. Ellis
c/o Vanadium Corp., of America Plant
Bridgeville, Pennsylvania

Dear Sir:

There is being shipped to you this date in car IO 10731 via L&N Cincy PRR on Government Bill of Lading WE 883365 Lot 1, Group R, of Type A Material, consisting of forty-five (45) drums, numbered one (1) to forty-five (45) inclusive. Shipment is made by authority of Captain Lloyd Breveskracht.

Inclosed herewith is shipping memorandum, in triplicate, and bill of lading in duplicate. It is requested that the original of the shipping memorandum be signed and returned to this office and the signed duplicate forwarded to The Area Engineer, U. S. Engineer Office, Madison Square Area, P. O. Box 42, Station F, New York City, attention of Mr. E. W. Moscrip. Triplicate copy is for your files.

For the Area Engineer:

Yours very truly,

Kenneth E. Zimmerman,
1st Lt., Corps of Engineers,
Assistant.

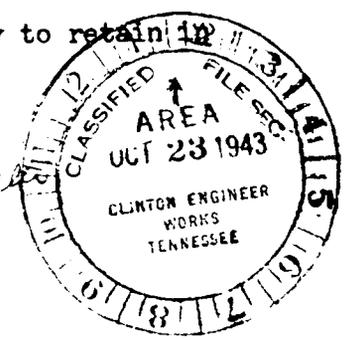
PROCESSED BY
K. Walter 6/15/79
B. Fritz DATE 10/21/83

2 Incls.:

- # 1 Shipping Memo. (in trip.) (Not necessary to retain in C. Files.)
- # 2 B/L WE 883365 (in dup.)

Copy Dist.:

- 1 and 2 - Addressee
- 3 - Area Engr., New York, N. Y. *sent file w/ #901*
- 4 - Lt. Zimmerman Files.
- 5 and 6 - C. Files.



900

med file
RAT 121
40-21-7

PA.15

EIDM O-24-c MS
NCN

11 March 1948

LCB:ge

CB
CHG

Mr. E. D. Bransome, President,
Vanadium Corporation of America,
420 Lexington Avenue,
New York, New York.

Dear Mr. Bransome:

We have your letter of 13 February 1948 referring to
the carnotite ores which were discussed with you.

The information which you have received to the effect
that Vitro Manufacturing Company will process these ores is
correct. This step was taken by us in view of the greater re-
coveries which could be guaranteed by processing at that point.

We appreciate your willingness to study the possibility
of processing these ores at Bridgeville.

For the Area Engineer:

Very truly yours,

PHILLIP L. MERRITT,
Major, Corps of Engineers,
Assistant.

Cy 1 Addressee
Cy 2 Class.

CLASSIFICATION CANCELLED OR
CHANGED TO *Unclassified*
BY AUTHORITY OF *J.R. Patton* 7/9/82
BY *M. Kabal* DATE *4/16/85*

~~SECRET~~

C O P Y

OFFICE MEMORANDUM

To: F.W. McQuiston, Washington Office
(THRU: Jesse C. Johnson) April 23, 1948

From: M.G. McGrath, Raw Materials Branch, Colorado Raw Materials Office

Subject: V.C.A. CONCENTRATION METHODS

Symbol: RM:MGM

The enclosed report of the V.C.A. milling practice and development for carnotite ores at Naturita and Mexican Hat has been written from the V.C.A. report submitted to your office, from personal notes and also personal observations during my term of service with the V.C.A.

I have endeavored to present an unbiased report and to present the data and observation in the best light possible. Many of the troubles and problems incidental to test work have not been mentioned and as nearly as possible the fiscal results of the V.C.A. work and developments presented.

I have drawn freely upon the technical reports you left in Grand Junction on scrubbers and their use in comparison of the Weinig scrubber with other known scrubbers.

It is my opinion that if the investment amounts mentioned by V.C.A. as being spent on the concentration process were compared with those stated in their concentration report, it would be found that a large proportion of the amount was invested in the form of rehabilitation of their salt roast-soda leach vanadium plant at Naturita which is being operated specifically for raw ore treatment.

Do you wish to have V.C.A.'s report returned to you in Washington?

/s/ M.G. McGrath

Encl.

VCA Report

SUMMARY OF MILLING OPERATIONS BY V.C.A.

The Vanadium Corporation of America conducted sand slime concentration tests at the Naturita plant from July, 1946 to May, 1947. The essentials of the method used were crushing carnotite ores, grinding the ore in pebble mills or rod mills, scrubbing the ground ores in an attrition machine developed by Mr. A.J. Weinig, separating the sands and slimes by conventional classification methods, settling the slimes and filtering the slimes. The above method used by the V.C.A. is commonly known as the sand-slime concentration of carnotite ores.

The Vanadium Corporation of America constructed and used two concentration plants using the sand-slime concentration method. The metallurgical results from both of these plants did not achieve the recoveries and ratios of concentration indicated by test work and pilot plant work.

The concentrator at Naturita treated both carnotite ores and roscoelite ores, and the metallurgical results were a 3:1 ratio of concentration with a 75% recovery of the vanadium. This concentrator was dismantled and the parts shipped to Mexican Hat, Utah where a similar concentrator was erected. The plant at Mexican Hat treated ores from the Navajo Reservation. The carnotite in this region occurs in the shinarump conglomerates which for efficient concentration require a modified treatment from that of the method used on the uniform size sand grain ores treated at Naturita. However, the plant at Mexican Hat is virtually a duplication of the Naturita plant. The metallurgical results from the Mexican Hat mill are approximately 60% recovery of the metal values at a 7:1 ratio of concentration. The work indicated an 80% recovery with a 10:1 ratio of concentration.

The scrubber as developed by the Vanadium Corporation was not used in any continuous operating mill. It was found in the plant scale testing to be restricted in its use, and the excessive wear on parts was not satisfactorily solved.

The Vanadium Corporation did not develop any new methods of sand-slime classification. Standard drag classifiers and Akins classifiers were used. The entire plant testing and operating mills were hampered by insufficient classifier capacity.

Standard slime settling equipment (Dorr type) was used. The flocculating reagent used was excessive amounts of lime. (15 lbs. of lime per ton of slime.) None of the highly effective flocculating reagents such as causticized starch were used.

The development of sand grain scrubbers has been summarized as a table, and a bibliography with abstracts is attached with this report.

The flow sheets of the plant testing work and of the two concentrators used by V.C.A. are attached.

REPORT OF CONCENTRATION METHODS FOR CARNOTITE AND ROSCOELITE

ORES USED BY V.C.A.

The V.C.A. Corporation conducted laboratory scale sand slime separation tests at Bridgeville, Pennsylvania from April, 1944 to December, 1945. The concentration tests consisted of carnotite ore scrubbing by continuous circulation through centrifugal laboratory pumps. Also, during this period, laboratory roasting and leaching tests were conducted on the slime concentrations to determine their amenability to the salt roast and soda ash leach process. The laboratory results obtained encouraged the V.C.A. Corporation to conduct experimental work for the development of a scrubber suitable for plant operation. This phase was carried on at the experimental plant of the Colorado School of Mines at Golden, Colorado under the direction of Messrs. Weinig and Sproul from April, 1944 to January, 1945. The result of this work was the development of the Weinig scrubber.

Three scrubbers, six inches in diameter, twelve inches in diameter, and twenty-four inches in diameter were developed. The scrubber that was developed consisted of two rubber discs, one of which is stationary, and the second fastened to a rotating shaft. The operation of the machine depends upon the admission of an ore pulp through the center of the stationary rubber disc. The ore pulp is then forced between the two rubber discs by centrifugal force and pumping action. The scrubber operates with many of the characteristics of a centrifugal pump.

Two types of machines were developed, a horizontal scrubber and a vertical scrubber. Both machines proved to behave metallurgically in a similar manner and with like power consumption (30-22 H.P. Hr. per ton). Difficulty was experienced in obtaining rubber scrubbing plates having a long life.

Minor alterations were made to the VCA Vanadium Plant at Naturita, Colorado, and a pilot plant was installed to extend the laboratory procedures, to determine the optimum concentration flow sheet, determine the auxiliary equipment required for full scale concentration, to test the Weinig scrubber to destruction, and establish a basis for concentration cost estimates.

Preliminary testing on a pilot scale was conducted at Naturita, July 3 to August 26, 1946. Batch testing of the Weinig scrubbers following a pebble mill grinding of carnotite ores was conducted from the period of August 29 to October 17, 1946. The behavior of a rubber covered rod mill as a grinding and scrubbing unit was investigated from October 6 to October 14, 1946. The use of pine poles as a grinding media was investigated from October 21 to October 22, 1946. The use of a vertical scrubber was investigated from October 26, to October 29, 1946.

The flow sheet in general for the pilot mill operation consisted of crushing the ore through a 10' x 16" jaw crusher, then feeding the ore through a 3' x 6' rod mill charged with 3" Danish pebbles. The discharge from the pebble mill was passed through a 20 mesh screen, the undersize was pumped to agitation tanks where it was held for scrubbing tests. The pulp after scrubbing was classified by means of standard drag classifier and Ekins classifier. The slime concentrates were thickened in 20' thickeners, and then dewatered on a 6' x 6' filter drum filter. The filter cake was dried in a pan drier, weighed and sampled, and hauled to storage bins. Throughout all of the pilot mill operation, the

pebble mill remained as the basic grinding unit while five scrubbing devices were tried. They were:

- (1) Horizontal scrubber with sleeve bearings.
- (2) Horizontal scrubber with ball bearings.
- (3) Vertical Scrubber.
- (4) Rubber covered rod mill.
- (5) Wilfley pump as a scrubber.

The pilot plant work determined that scrubbing efficiency is dependent upon the ore grind, coarser grinds requiring excessive amounts of scrubbing for reasonable recoveries. It was determined that the Wilfley pump was an efficient scrubber, and that it was possible to achieve 83% recovery by pebble mill grinding with the use of Wilfley pumps as scrubbers.

The rubber covered rod mill was used for a scrubbing unit and indicated that 82% recovery of vanadium could be achieved, and that in view of the performance of the Weinig scrubber that an additional increment of vanadium recovery might be obtained by restricted application of a single Weinig unit to the tailing of a rubber rod mill.

The use of pine poles as a grinding media yielded negative results. A comparison table of the results obtained on pilot plant concentration testing is included.

Throughout all of the test work, the V.C.A. report indicates insufficient classifier capacity.

Table No. (1) *
Summarized Metallurgical Balance
Naturita Experimental Plant

		<u>Horizontal</u>		<u>Rubber</u>	<u>Vertical</u>
		<u>Scrubber</u>		<u>Rod Mill</u>	<u>Scrubber</u>
		<u>Run No. 1</u>	<u>Run No. 2</u>		
Feed:	Dry Wt. Lbs.	232,913	121,060	104,890	69,520
	% V ₂ O ₅	1.84	2.02	2.00	1.95
	% U ₃ O ₈	0.28	0.279	0.273	0.28
Concentrate:	Dry Wt. Lbs.	70,321	30,921	27,778	19,960
	% V ₂ O ₅	5.02	5.28	6.09	5.89
	% U ₃ O ₈	0.82	0.83	0.86	0.88
Tailings:		.18	.27	.52	.34
		.025	.037	.062	.04
Ratio					
Concentration:		3.3 :1	3.9 :1	3.8 :1	3.5 :1
% Recovery	V ₂ O ₅	82.37	66.79	80.71	87.56
	U ₃ O ₈	88.42	76.01	83.27	89.95

* Extracted from Vanadium Corporation of America, "Report of Wet Scrubbing Concentration of Vanadium Ores," Page 24, as submitted to the Atomic Energy Commission.

The average ratio of concentration obtained by all batch testing was 3.6 :1. It is interesting to note that with the methods as used this ratio was not materially improved over the ratios of concentration reported by Siegfried Fisher in 1912. The average extraction for all batch pilot plant tests was 79.33% of the vanadium, and 84.41% of the U_3O_8 . The Standard Chemical Company reports a recovery of 88.6% of the U_3O_8 for the period of 1919 through 1922.

Continuous milling operations were started in January, 1947, and continued until April 30, 1947. For this continuous milling operation, the Weinig scrubber was not used. The flow sheet consisted of crushing the ore, grinding in a 3 x 6 rod mill charged with steel rods, and classifying with a drag classifier and Akins classifier in series, the classifier overflow was further classified in a 9' Callow cone. During the period of continuous operation, the average grade of concentrates was approximately 5% V_2O_5 , and the average recovery was approximately 75% V_2O_5 at a concentration ratio of 3 to 1. The mill was operated at a feed rate of thirty-five tons per day. Both carnotite and roscoelite ores were concentrated. The slime concentrates were laundered to settling ponds. After the milling program had been completed, the concentrates were allowed to settle and dry, and were then treated in the operating vanadium mill. It was found that the sodium carbonate added to the grind circuit improved the recovery of vanadium. It was thought that this was due to the deflocculation of the slimes during classification. The Standard Chemical Company, in 1919 determined also that the addition of soda ash to a slime-sand concentration circuit was beneficial. No data was gathered during the V.C.A. operations as to the affect of mill water temperatures upon recovery efficiencies.

The Wilfley pumps were included in the continuous concentration circuit as scrubbers, and are shown on the attached flow sheet. Each pump in the circuit indicated the affect of decreasing the vanadium value in the sands by 0.1% V_2O_5 approaching a limit of residual vanadium of 0.25% V_2O_5 .

The continuous concentration plant was shut down and dismantled in order to rehabilitate the salt roast plant for vanadium roasting operations. The concentrates obtained from the concentration pilot plant were later fed with a blend of carnotite and roscoelite ores, and treated at the rate of about ten tons of concentrates per day with seventy-five ores. No difficulties were experienced in the vanadium extraction plant due to the use of concentrates blended with ores. No data was obtained from plant practice regarding the treatment of concentrates alone.

A field concentrating unit was constructed at Mexican Hat, Utah by the V.C.A. Corporation for the treatment of Navajo Indian Reservation ores during the period of July and August, 1947. The plant was placed in operation during September, 1947. This plant consisted of one 10 x 10 jaw crusher, one belt feeder, one 3 x 6 rod mill, and one 3 x 14' drag classifier. The concentrate or slime was piped to settling ponds. The settled slimes were allowed to partially air dry and then were transferred by wheelbarrow to drying pans. The power was supplied to the unit by two Ford V-8 engines. The rod mill was in open circuit with a drag classifier, no scrubbing unit was used in this plant.

All of the mill equipment with the exception of two ore bins and two ore conveyors was used equipment from the pilot plant testing work at Naturita. Laboratory testing of the Mexican Hat ores indicated 75% to 80% recoveries of the vanadium and uranium in a slime concentrate, however, due to poor classification and poorly controlled grinding, the Mexican Hat concentrator of the V.C.A. has achieved recoveries in the order of 60% of the values. This concentrator was operated at a rate of forty-five tons of ore feed per day, the grinding media was 2½" diameter steel rods. The laboratory work indicated the proper media to be pebbles or small steel balls. The two continuous concentration plants evolved from all plant testing work at Naturita consisted in the final form of crushing the ore, grinding the crushed ore in an open circuit mill with steel rods, and classifying the ground ore with drag classifiers. No scrubbers other than Wilfley pumps were used in either the Naturita continuous plant or the Mexican Hat plant. The final flow sheets of these two concentrators therefore does not differ materially from the methods used in concentration units operating in this same field during the early 1900's.

/s/ M.G. McGrath

PA.15 4/4 RMB

C O P Y

OFFICE MEMORANDUM

To: F.W. McQuiston, Washington Office
 (THRU: Jesse C. Johnson) June 2, 1948

From: M.G. McGrath, Production Branch, Colorado Raw Materials Office

Subject: RESFAPCH AND OPERATING COSTS OF V.C.A. CONCENTRATION PROGRAM

Symbol: P:MGM

A study was made of the detailed costs for the V.C.A. research program on concentration methods during my visit to the V.C.A. offices in New York May 17, 1948.

The costs presented by the V.C.A. were grouped as laboratory research work, and experimental work at Golden, Colorado leading to the development of the Weinig scrubber, batch testing at Naturita, operation of the continuous concentrator at Naturita, and operation of the Mexican Hat concentrator. The grouping of the costs in this manner shows the amount spent on each phase of the work, and affords a clearer understanding than the summary table shown in Mr. Bransome's letter of March 19, 1948.

I have ^{re}arranged some of the costs, especially overhead expenses, to conform with the different phases of their research program. This was done in accordance with the attached letter received from Mr. Brand the V.C.A. comptroller. At the time of the visit to the New York offices of V.C.A., I did not ask for a further breakdown of costs other than the grouping as shown on the attached report, but it is my belief that this method of showing the costs is sufficiently accurate to establish the values of the work they have done on concentration.

While visiting the AEC offices in New York, Dr. Merritt advised me that similar negotiations had been conducted with the V.C.A. by the New York group some time previously, and that the New York Raw Materials group had rejected the V.C.A. proposal of the sale of their concentration process.

After compiling the breakdown of the V.C.A. costs, it is my opinion that the only true research work they conducted was that of the laboratory at Eridgeville, the experimental work at Golden, Colorado, and the batch tests at Naturita. The total cost of this work was approximately \$100,000.00, and approaches the guess that Mr. Bransome made of \$96,000.00 being a fair value for the work.

67.

/s/ M.G. McGrath

- 2 Encls.
- Exper. & Resrch Costs Rpt.
- Ltr. from Mr. Brand

EXPERIMENTAL AND RESEARCH COSTS

VANADIUM CORPORATION OF AMERICA

Vanadium Corporation of America operational and experimental costs for concentration of carnotite and roscoelite ores.

1. Laboratory research conducted at Bridgeville, Pennsylvania during period of July 1944 through September 1946.	Direct cost	\$ 5,492.31
2. Experimental work at Golden, Colorado with Dr. Weinig on development of the Weinig scrubber for period of July 1944 through January 1948.		27,195.26
3. Direct time and travel expense of Mr. H.E. Dunn and three assistants - period of June 22 to November 1, 1946.		5,025.04
4. Expense in connection with patent applications files as a result of the Weinig studies.		<u>4,572.09</u>
		\$42,284.70

The above items are the costs of laboratory research work and represent the cost of developing the Weinig scrubber and determining the amenability of concentrates to salt roast-soda leach treatment. According to the letter of Mr. Brand, 15 to 20% should be added to Item No. 1 for overhead expense.

Batch Testing of Concentration at Naturita to January 1947

1. Direct operating costs of batch testing including ore cost of \$13,244.	\$33,055.09
2. Cost of facilities existing	9,618.58
3. Cost of facilities abandoned	5,897.88
4. Moving and rearrangement of equipment	10,573.82
5. Overhead expense as proposed by letter of Mr. Brand, 15% of direct operating cost.	<u>4,958.26</u>
	Total \$64,100.63

PA.15 4/4 RMD

C O P Y

OFFICE MEMORANDUM

To: F.W. McQuiston, Washington Office June 2, 1948
 (THRU: Jesse C. Johnson)

From: M.G. McGrath, Production Branch, Colorado Raw Materials Office

Subject: RESEARCH AND OPERATING COSTS OF V.C.A. CONCENTRATION PROGRAM

Symbol: P:MGM

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ET

/s/ M.G. McGrath

2 Encls.
 Exper. & Resrch Costs Rpt.
 Ltr. from Mr. Brand

EXPERIMENTAL AND RESEARCH COSTS

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4. Moving and rearrangement of equipment	10,573.82
5. Overhead expense as proposed by letter of Mr. Brand, 15% of direct operating cost.	<u>4,958.26</u>
	Total \$64,100.63

Office Memorandum • UNITED STATES GOVERNMENT

4/4
F.M.TO : J.K. Gustafson, Director, Division of Raw
Materials

DATE: August 4, 1948

PA. 15

FROM : F.W. McEwen Jr., and M.G. McGrath

SUBJECT: CONCENTRATION OF CARNOTITE ORES BY VANADIUM CORPORATION OF AMERICA

Symbol: RM:FWM:MGM

The modern accepted laboratory research practice to develop the lowest cost and most efficient method of mineral dressing is, first, to attempt concentration of the ore minerals, with subsequent treatment of the concentrated product. It is only after thorough research efforts of concentration have failed that treatment of the total ore is considered. The benefits of concentration are several-fold and include lower plant initial capital investment and lower plant operating costs as the major achievements.

Problems related to the concentration of the Colorado Plateau uranium-vanadium ores should receive the same consideration that is normally awarded mineral dressing research efforts directed toward the concentration of any type of ore.

Concentration of the Colorado Plateau ores is not new, as an early study of the occurrence of the uranium and vanadium minerals disclosed the fact that concentration could be obtained by grinding the sandstone to individual grain size to liberate the uranium and vanadium minerals. Attrition grinding and scrubbing of the sand grains was found effective in liberating the vanadium and uranium and subsequent separation of the sands and slimes resulted in an appreciable concentration of the ore minerals in the slime portion.

From 1919 to 1923, approximately 22,000 tons of ore were intermittently milled in a 35 ton per day plant by wet grinding and classification. It is reported that initial recovery of the uranium was approximately 78%, with a 3:1 ratio of concentration. Retreatment of the weathered tailings from this operation yielded an additional 10.6% recovery, making an overall recovery of 88.6%. The high uranium recovery is a reflection of the high grade ore milled rather than the efficiency of method employed.

In recent years the Vanadium Corporation of America attempted development of a new method of mechanical concentration by the use of scrubbers on the ground ore pulp. This company should be awarded credit for reviving interest in concentration of these ores.

At a meeting in your office, Mr. Bransome, President of VCA, outlined the investigations his company had conducted to find a solution to efficiently concentrate these ores. It was suggested by us that the AEC would consider a plan whereby VCA would be reimbursed for expenses incurred in the development of its concentration project, providing a thorough investigation by the AEC proved such reimbursement justified. Further discussion of a general nature included the possibility of employing VCA to design, build, and operate a concentrator.

Office Memorandum • UNITED STATES GOVERNMENT

TO : J.K. Gustafson

DATE: August 4, 1948

FROM : F.W. McQuiston Jr., and M.G. McGrath

SUBJECT: CONCENTRATION OF CARNOTITE ORES BY VANADIUM CORPORATION OF AMERICA

Mr. Bransome telephoned this office from New York and said he was willing to send us a complete report covering all phases of investigations and the research work his company had performed. It was definitely stated that we could not accept this report if in so doing we were committed in any way. Mr. Bransome assured us that his company was completely covered through patent applications and that the Commission assumed no obligations through receiving this report.

The report sent by Mr. Bransome was accompanied by a letter showing an expenditure, related to the development of the VCA concentration project, of \$186,661.94. This report was thoroughly reviewed by both of us and the New York office of the Raw Materials Division. An investigation was made of available literature pertaining to this subject. The concentration work done by VCA can be broken down into the following divisions:

1. Research work at the Bridgeville, Pennsylvania laboratory. (July 1944 through September 1946.)
2. Research work at the Colorado School of Mines Experimental Station, under the direction of Mr. Arthur Weinig. (July 1944 through January 1948.)
3. Batch testing of concentration methods at Naturita to January 1947.
4. Operation of a 35-ton continuous pilot concentrator at Naturita. January 1947 thru April 1947.
5. Mixed concentrate-ore roasting operations on plant scale at Naturita.
6. Construction and operation of a 50-ton concentrator at Mexican Hat

VCA submitted to us a figure of \$252,452.43 for the total cost of their concentration program. A breakdown of these costs is attached to this memo. A review of the work done under the VCA concentration project quite definitely indicated that the work following batch testing at Naturita was not related to research work for the development of a concentration process. This phase of the work was not well directed and is not in the channel in which we are particularly interested. The research work done at Bridgeville and under the supervision of Weinig, together with the batch testing at Naturita, was well done. The actual cost for this work was as follows:

Office Memorandum • UNITED STATES GOVERNMENT

TO : J.K. Gustafson

-3-

DATE: August 4, 1948

FROM : F.W. McQuiston and M.G. McGrath

SUBJECT: CONCENTRATION OF CARNOTITE ORES BY VANADIUM CORPORATION OF AMERICA

1. Laboratory research conducted at Bridgeville, Pennsylvania under the direction of Mr. H.E. Dunn, during period July 1944 thru September 1946.	\$ 10,517.35
2. Experimental work at Golden, Colorado with Dr. Weinig on development of the Weinig scrubber for the period of July 1944 thru January 1948	27,195.26
3. Expense in connection with patent applications	<u>4,572.09</u>
	\$ 42,284.70
4. Batch testing of Concentration at Naturita to January 1947	<u>64,100.63</u>
Total	\$106,385.33

It is proposed that VCA be paid the sum of \$50,000 which is less than 50% of the actual cost of this work. Approximately \$27,000.00 was spent at the Colorado School of Mines under the supervision of Arthur Weinig. It is believed that this phase of work done for VCA was capably performed and probably at a lower cost than the AEC could have had it done.

The following proposition was discussed with Mr. Bransome in New York on June 3, 1948: In consideration of the sum of \$50,000.00 paid by the AEC to VCA for the work performed, VCA will sell to AEC certain patent rights, metallurgical results, "know-how", and all other data pertaining to the subject of mechanical concentration of carnotite and roscoelite ores.

It was rather difficult to appraise the money value of the VCA work, as it was indicated more emphasis should have been put on attrition grinding rather than on scrubbing; however, the Colorado School of Mines attempted to develop a scrubber for these ores, and as Mr. Weinig is an outstanding metallurgical engineer and has been a practicing metallurgist in the State of Colorado for over 40 years, he undoubtedly selected this method of concentration as presenting a more favorable solution than attrition grinding.

The offer of the VCA is liberal and we believe the AEC will be compensated for this expenditure by obtaining the VCA concentration report along with the "know-how" of its technical staff and through discussion with Mr. Weinig.

The proposed expenditure of \$50,000.00 appears to be justified by the obtaining of a substantial portion of a carnotite ore dressing program in the form of completed research work by a reputable company. The value of patents now held or possibly granted to VCA do not appear as important to the AEC as the "know-how" and results obtained from their concentration project.

Office Memorandum • UNITED STATES GOVERNMENT

TO : J.K. Gustafson

- 4 -

DATE: August 4, 1948

FROM : F.W. McQuiston and M.G. McGrath

SUBJECT: CONCENTRATION OF CARNOTITE ORES BY VANADIUM CORPORATION OF AMERICA

By the utilization of the ore concentration data and results of VCA, an AEC program for carnotite concentration would be advanced by possibly a year and should yield information which could be of immediate value.

It is anticipated that a carnotite ore dressing or concentration research program will be instituted by the AEC and that the VCA concentration methods and data will be used as the starting point to avoid repetition or back tracking.

cc:

Roland Anderson, Chief Patent Branch, Rm 50-c

W.A.W. Krebs, Rm 360

JCJ

EPW

M.G. McGrath, Colorado

FWM

2102



FILE

THE AEROSPACE CORPORATION

Suite 4000, 955 L'Enfant Plaza, S.W., Washington, D.C. 20024, Telephone: (202) 488-6000

7117-03.85.aw.44
6 August 1985

Mr. Arthur Whitman
Division of Remedial Action Projects, NE-24
U.S. Department of Energy
Germantown, Maryland 20545

Dear Mr. Whitman:

VANADIUM CORPORATION OF AMERICA PLANT
NEAR BRIDGEVILLE, PENNSYLVANIA

Enclosed please find a brief summary on the Former VCA vanadium plant in Bridgeville, Pennsylvania. This site was used under contract, during the MED era, to support activities at several UMTRAP sites.

In view of the relationship of this site to the UMTRAP sites, it is recommended that you evaluate it for consideration for inclusion as a vicinity property under UMTRAP. Aerospace will await your direction before conducting any additional site specific investigations.

Sincerely,

Andrew Wallo, III
Project Engineer
Environmental Controls and
Analysis Directorate
Government Support Division

AW/sb

Enclosure

cc: E. DeLaney
R. Lewis (w/o)
Whitman file

bcc: H. Bauer
F. Hoch
B. Fritz
T. Iura (w/o)
S. Jones
F. Newman (w/o)
C. Young



An Affirmative Action Employer

SUMMARY FOR THE VCA
(VANADIUM CORPORATION OF AMERICA)
PLANT, BRIDGEVILLE, PA

This site conducted work for the Manhattan Engineer District in the early to mid 1940's to support processing being performed at several sites covered under the uranium mill tailings Remedial Action program. These include Canonsburg, Naturita and Mexican Hat.

The facility was utilized to grind pitchblende ore being processed at Canonsburg. The material was trucked under guard from Vitro Canonsburg to the Bridgeville plant, was ground and generally returned the same day. Records suggest in at least one instance the material was stored at Bridgeville over night. The material was highgrade pitchblende (greater than 50% U_3O_8 and the uranium was in equilibrium with its daughters). It was processed in quantities of hundreds of tons at a time. The period of time the processing was performed is not known.

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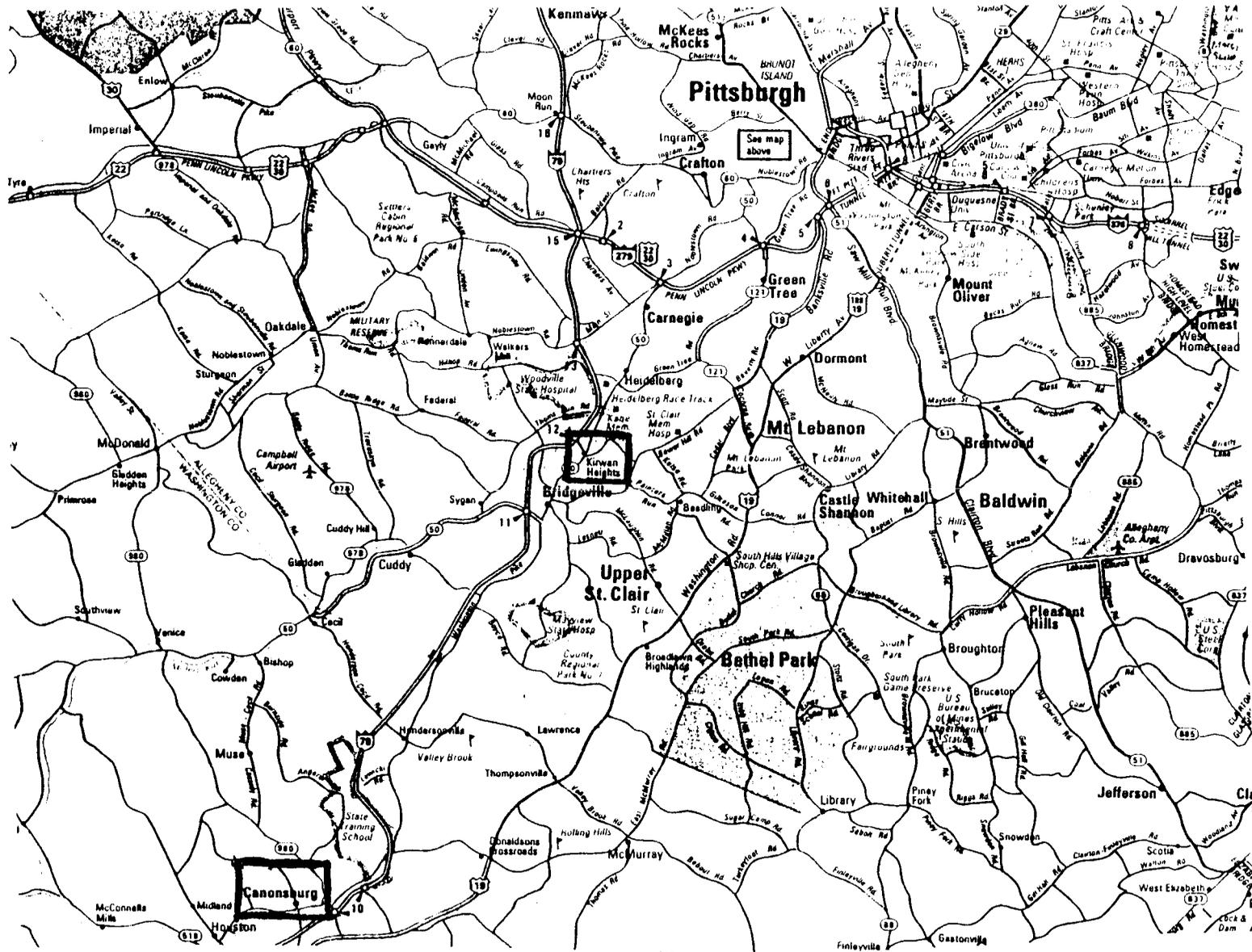


Figure 1. Location of Bridgeville Site in Respect to Canonsburg

SUMMARY FOR THE VCA
(VANADIUM CORPORATION OF AMERICA)
PLANT, BRIDGEVILLE, PA

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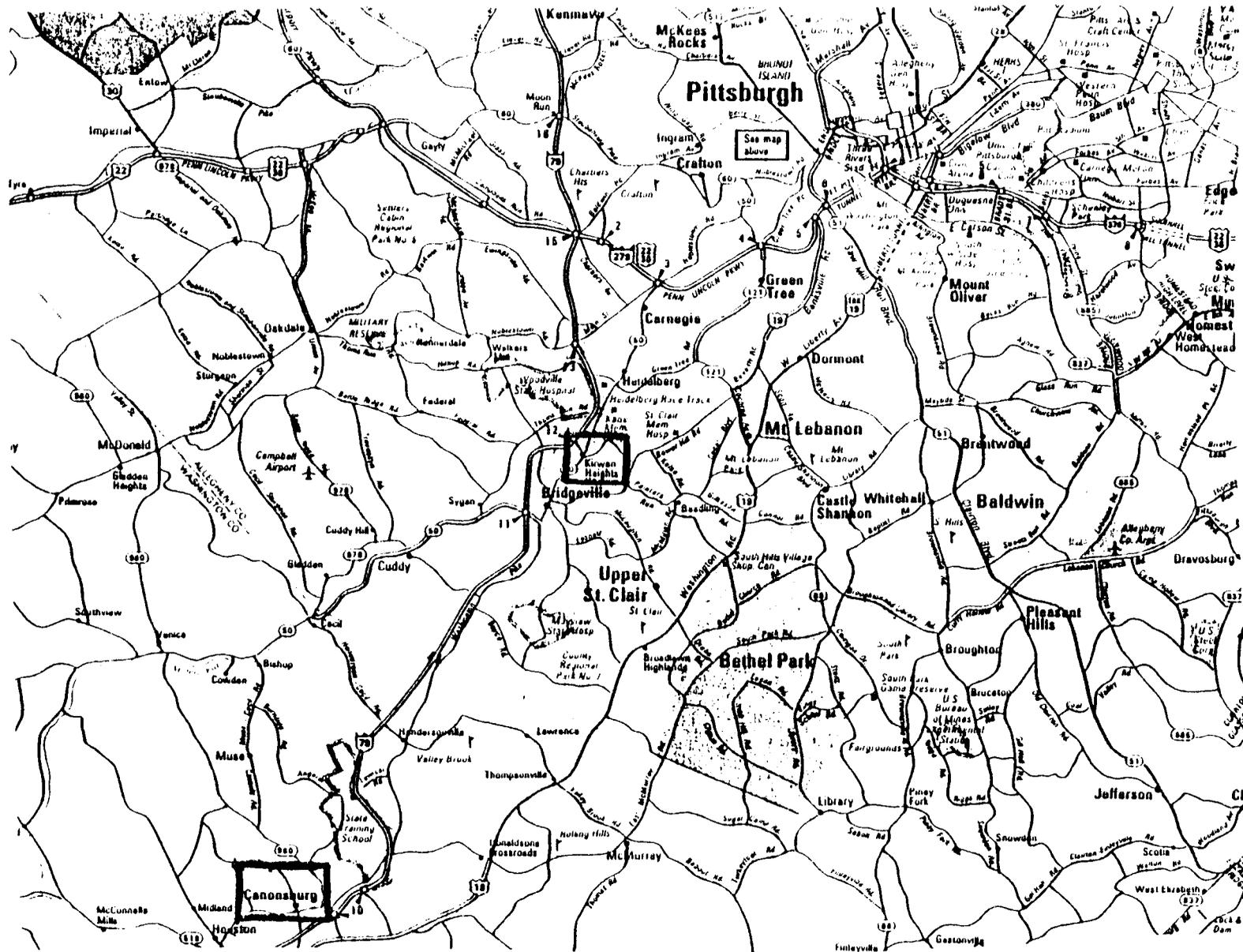


Figure 1. Location of Bridgeville Site in Respect to Canonsburg

DRAFT

PA.15

Location Number: (CA00401)

HEALTH AND SAFETY RESEARCH DIVISION

REPORT OF INCLUSION SURVEY AT LOCATION CA00401
MAYER STREET
BRIDGEVILLE, PENNSYLVANIA 15017

Investigation Team

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

John K. Williams

December 1985

WORK PERFORMED AS PART OF THE
RADIOLOGICAL SURVEY ACTIVITIES PROGRAM

Prepared by the
OAK RIDGE NATIONAL LABORATORY
Grand Junction Office
Grand Junction, Colorado 81502
operated by
MARTIN MARIETTA ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under Contract No. DE-AC-5-84OR21400

INTRODUCTION

An inclusion radiological survey of location CA00401 was conducted on September 27, 1985 by Oak Ridge National Laboratory. This property, located at Mayer Street, is classified as a commercial manufacturer. This survey was conducted using methods as defined in the Vicinity Properties Management and Implementation Manual, UMTRA-DOE/AL-050601 (June 1984) and the RASA UMTRA Procedures Manual (June 1985). General location information is provided in Table 1, radiological survey results are given in Table 2 and 3, and supporting graphics are provided in Figure 1. Different views of the property are provided in Figures 2 through 10. All measurements are gross readings; background has not been subtracted.

The conversion formula used is $y = x/CF$, where 'y' equals the exposure rate in $\mu\text{R/h}$, 'x' equals the scintillometer measurements in kcpm, and 'CF' equals the conversion factor determined in the field through a direct correlation between PIC and scintillometer measurements in kcpm/ $\mu\text{R/h}$. For this property, CF equals 2.

SIGNIFICANCE OF FINDINGS

The nineteen contaminated regions found outdoors in scattered areas about the vanadium parcel of the property as shown on Figure 1, encompass ~3600 m^2 . The high outdoor gamma (300 $\mu\text{R/h}$) was measured in a 965 m^2 area of the large parking lot northwest of the ore storage and shipping building (building #2), Region L. Regions C, D, L, and P, as noted on Figure 1, were found to exceed the outdoor gamma inclusion criterion of background plus 25 $\mu\text{R/h}$ when averaged over an area of 100 m^2 . Many of these regions had scattered contaminated material within its boundaries. Elevated gamma levels were also spotty in Regions A, K, and O, as noted on Figure 1. Elevated gamma levels ranging from 20 to 30 $\mu\text{R/h}$, found northwest of building #14A, are the result of natural radiation inherent in phosphate residues. In addition, gamma levels ranging from 16 to 30 $\mu\text{R/h}$, found in a slag dump west of Region D, are due to scattered pieces of ore in the pile; whereas, gamma levels south of Region P (14-18 $\mu\text{R/h}$), are the result of natural radiation inherent in gravel and rock material. Three point sources scanning 100, 80, and 70 $\mu\text{R/h}$, were found north of Region O, east of Region O, and north of Region M, respectively, as denoted by an asterisk on Figure 1. Indoor gamma scans were not conducted since outdoor contamination deemed the property includable.

The results of the radionuclide analyses demonstrate that the net area-weighted average concentration of ^{226}Ra in the surface soil at locations S15 (Region Q) and S16 (Region M), are 25 and 5 pCi/g, respectively. Furthermore, if the mean ^{226}Ra concentrations are calculated from surface samples taken in Regions A, D, L, and P, their respective net area-weighted averages are 20, 7.4, 54, and 14 pCi/g. These values exceed the surface soil inclusion criterion of 5 pCi/g above background when averaged over an area of 100 m^2 .

Based on these screening results, it is recommended that location CA00401 be included for further consideration by the UMTRA Project.

Location Number: CA00401

RECOMMENDATION

RECOMMENDED FOR: Inclusion

RECOMMENDATION BASIS: Outdoor gamma is $>25 \mu\text{R/h}$ above background
averaged over 100 m^2
 ^{226}Ra is $>5 \text{ pCi/g}$ above background in surface
15 cm soil layer averaged over 100 m^2

Location Number: CA00401

Table 1. Location Information

Property Information

LOCATION: Mayer Street
Bridgeville, PA 15017

OCCUPANT/TENANT: Universal-Cyclops
Cytemp Specialty Steel Division

TELEPHONE: Not given

Owner Information

OWNER: Cyclops Corporation

ADDRESS: 650 Washington Road
Pittsburgh, PA 15228

TELEPHONE: (412) 561-6300

PROPERTY CLASSIFICATION: Commercial, Vanadium Parcel

TOTAL AREA OF PROPERTY: ~90,000 m²

STRUCTURES ON PROPERTY: Numerous manufacturing buildings

Table 2. Radiological Screening Survey Results

OUTDOOR SCREENING DATA

BACKGROUND EXPOSURE RATE: 9 $\mu\text{R/h}$

BACKGROUND + 1 STANDARD DEVIATION: 12 $\mu\text{R/h}$

BACKGROUND EXPOSURE RATE RANGE: 8-10 $\mu\text{R/h}$

EXPOSURE RATE RANGE IN CONTAMINATED REGIONS: A: 30-100 $\mu\text{R/h}$ G: 14-20 $\mu\text{R/h}$ M: 16-20 $\mu\text{R/h}$
 B: 30-40 $\mu\text{R/h}$ H: 30 $\mu\text{R/h}$ N: 70 $\mu\text{R/h}$
 C: 18-50 $\mu\text{R/h}$ I: 20 $\mu\text{R/h}$ O: 16-20 $\mu\text{R/h}$
 D: 20-100 $\mu\text{R/h}$ J: 70 $\mu\text{R/h}$ P: 40-120 $\mu\text{R/h}$
 E: 20-40 $\mu\text{R/h}$ K: 12-16 $\mu\text{R/h}$ Q: 16-41 $\mu\text{R/h}$
 F: 20-40 $\mu\text{R/h}$ L: 40-300 $\mu\text{R/h}$ R: 20-30 $\mu\text{R/h}$
 S: 10-40 $\mu\text{R/h}$

HIGHEST OUTDOOR GAMMA (HOG) IN CONTAMINATED REGION: 300 $\mu\text{R/h}$

LOCATION OF HOG: Region L

POINT SOURCES*: *100, 80, \varnothing 70 $\mu\text{R/h}$

*Point source measurements are discussed in "Significance of Findings" section.

Table 2. Radiological Screening Survey Results (Continued)

OUTDOOR SCREENING DATA

ESTIMATED AREA OF OUTDOOR
CONTAMINATION BY REGION:

A: 28 m ²	G: 17 m ²	M: 281 m ²
B: 20 m ²	H: 1 m ²	N: 2 m ²
C: 454 m ²	I: 1 m ²	O: 160 m ²
D: 799 m ²	J: 1 m ²	P: 818 m ²
E: 1 m ²	K: 5 m ²	Q: 88 m ²
F: 2 m ²	L: 965 m ²	R: 15 m ²
		S: 2 m ²

NET ESTIMATED AREA-WEIGHTED
AVERAGE BY REGION**:

A: 16 μR/h	G: 1.4 μR/h	M: 9 μR/h
B: 5.2 μR/h	H: 0.2 μR/h	N: 1.2 μR/h
C: 25 μR/h	I: 0.1 μR/h	O: 9 μR/h
D: 51 μR/h	J: 0.6 μR/h	P: 71 μR/h
E: 0.2 μR/h	K: 0.2 μR/h	Q: 17 μR/h
F: 0.4 μR/h	L: 161 μR/h	R: 2.4 μR/h
		S: 0.3 μR/h

$$**\text{Formula used: } GAW = \frac{\sum_{i=1}^n G_i A_i}{100}$$

where:

- GAW = the area-weighted exposure rate in [μR/h]
- G_i = net average exposure rate in [μR/h]
(G_i = GGross - GBackground)
- A_i = area of region involved in [m²] and,
- 100 = threshold area in [m²]

Table 3. Extended Survey Results

Outdoor Extended Data

Soil Sample Summary

Soil Sample Number	Region Sampled	Sample Depth (cm)	226/Ra Concentration (pCi/g) (Canalysis)	Representative (Biased) Sampling Area m ²	Net Estimated Area-Weighted Average* (pCi/g, CAW)
S1A	A	0-15	2.8	28	0.4
S1Z	A	0-15	140.	28	38.
S2A	B	0-15	20.	20	4.0
S2B	B	15-30	20.	20	4.0
S3A	C	0-15	2.4	>100	1.2
S3B	C	15-30	5.2	>100	4.0
S4	C	0-15	5.0	>100	4.0
S5	Rep	0-15	4.0	>100	2.8
S6	D	0-15	8.6	>100	7.4
S7Z	D	0-15	4.3	>100	3.1
S8	D	0-15	13.	>100	12.
S9	P	0-15	1.2	>100	0.0
S10	P	0-15	26.	>100	24.
S11	P	0-15	18.	>100	16.
S12	L	0-15	154.	>100	152.
S13	L	0-15	5.3	>100	4.1
S14	L	0-15	5.2	>100	4.0
S15	Q	0-15	30.	88	25.
S16	M	0-15	6.0	>100	5.0
S17	N	0-15	12.	2	0.2
S18	K	0-15	3.1	5	0.1
S19	O	0-15	1.8	>100	0.6

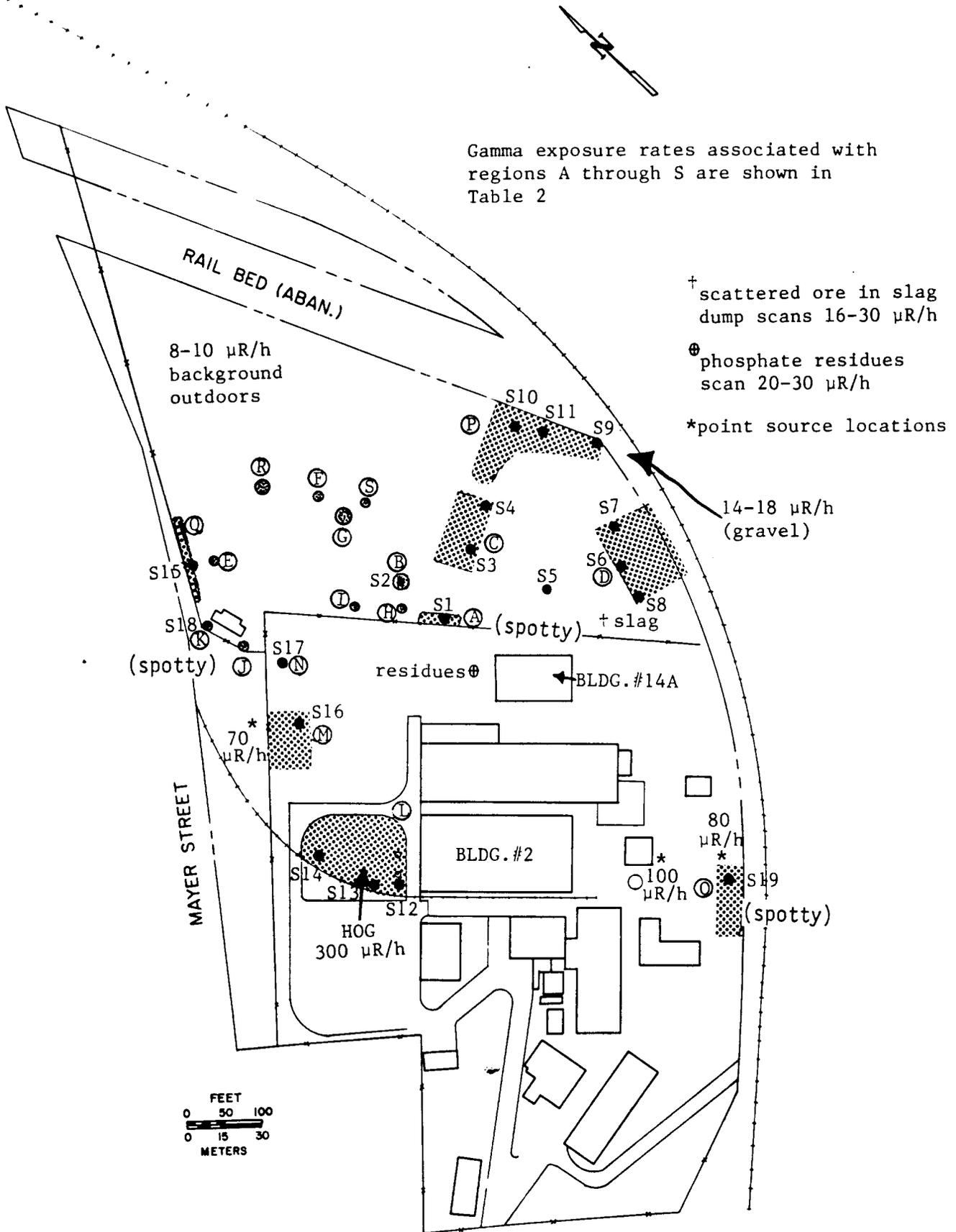
$$\text{*Formula used: CAW} = \frac{\sum_{i=1}^n C_i A_i D_i}{(100)(.15)}$$

where=

CAW = area-weighted 226Ra concentration in [pCi/g]

C_i = net 226Ra concentration in [pCi/g] and(C_i = Canalysis - Cbackground)A_i = area of region that sample represents in [m²]D_i = thickness of sample in [m]100 = threshold area in [m²], and

.15 = threshold thickness in [m]



CYTEMP SPECIALTY STEEL DIVISION (Vanadium Parcel)

Fig. 1. Location CA00401 - Mayer Street, Bridgeville, Pennsylvania.



Fig. 2. Location CA00401 looking north at Region Q.



Fig. 3. Location CA00401 looking east at Region A.



Fig. 4. Location CA00401 looking northeast at Region C.



Fig. 5. Location CA00401 looking northeast the side of pile in Region D.



Fig. 6. Location CA00401 looking south at Region L.



Fig. 7. Location CA00401 looking east at Region M.



Fig. 8. Location CA00401 looking south at Region O.



Fig. 9. Location CA00401 looking east at Region P.



Fig. 10. Location CA00401 looking east at Region R.

CONSENT FOR ACCESS TO CONDUCT SURVEYS
AND ENGINEERING STUDIES

VICINITY PROPERTY NO.: Cytemp Specialty Steel Division, Bridgeville Plant

PROPERTY ADDRESS: Mayer Street, Bridgeville, PA 15017

PROPERTY PARCEL NUMBER OR DESCRIPTION: Vanadium Parcel

I (We) acknowledge that I (We) own the property described above, and grant permission to employees, contractor and subcontractor personnel, and other representatives of the U.S. Department of Energy and the State of Pennsylvania to enter upon the property at a reasonable time or times during the next 12 months to conduct at its cost and expense radiation surveys to determine the nature and extent of any radioactive material that might be present. In addition, permission is given to perform at its cost and expense engineering assessments, if necessary, to evaluate the remedial measures that might be taken, as well as to evaluate the extent of the work required and the cost.

I (We) understand that DOE's and the State's responsibility for any damage or disturbance to my (our) property caused by its activities shall be any backfilling, seeding, sodding, landscaping, rebuilding or repair of the property required to restore it to a condition comparable to its apparent physical condition immediately prior to entry upon the property.

I (We) understand that the DOE and the State of Pennsylvania are not obligated to perform remedial action upon the property. I (We) understand that no remedial action shall be performed until the DOE, the State, and the property owner have entered into a separate written agreement setting forth terms, conditions, and plans for remedial action.

I (We) understand that the DOE and the State have the right to disclose to the public, in the form of technical data and reports, the results of its data-gathering on the above-described property.

- I grant access for the conduct of surveys and engineering studies as provided in this consent for access.

R. Miller
Signature of Owner(s)

September 26, 1985
Date

ASSISTANT SECRETARY

- I have decided not to participate in the UMTRA Project.

Signature of Owners (s)

Date

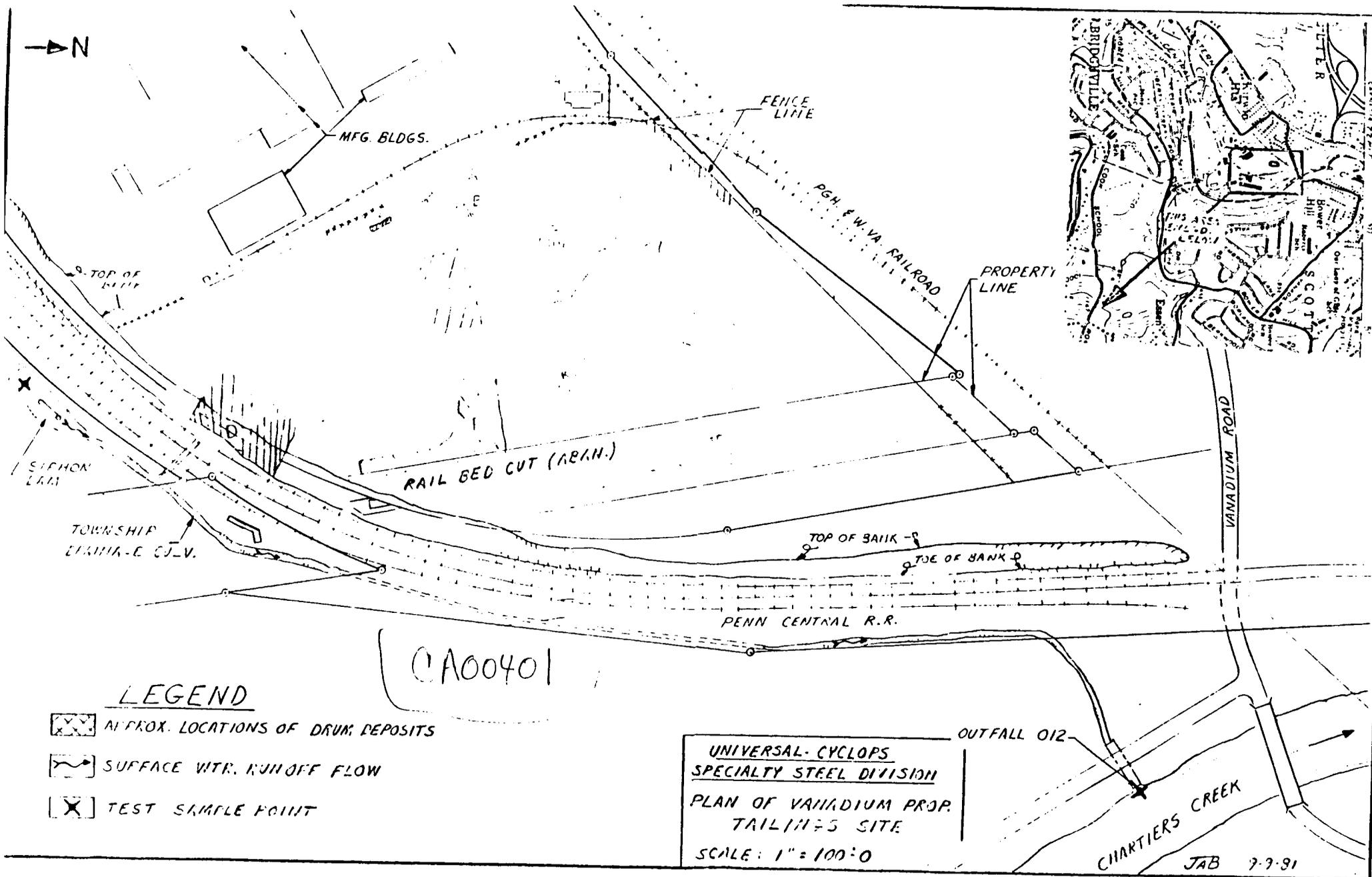
OWNER DATA:

Cyclops Corporation
Owner(s) Name

650 Washington Road, Pittsburgh, PA 15228
Owner(s) Address

Home Phone _____

Business Phone (412)561-6300



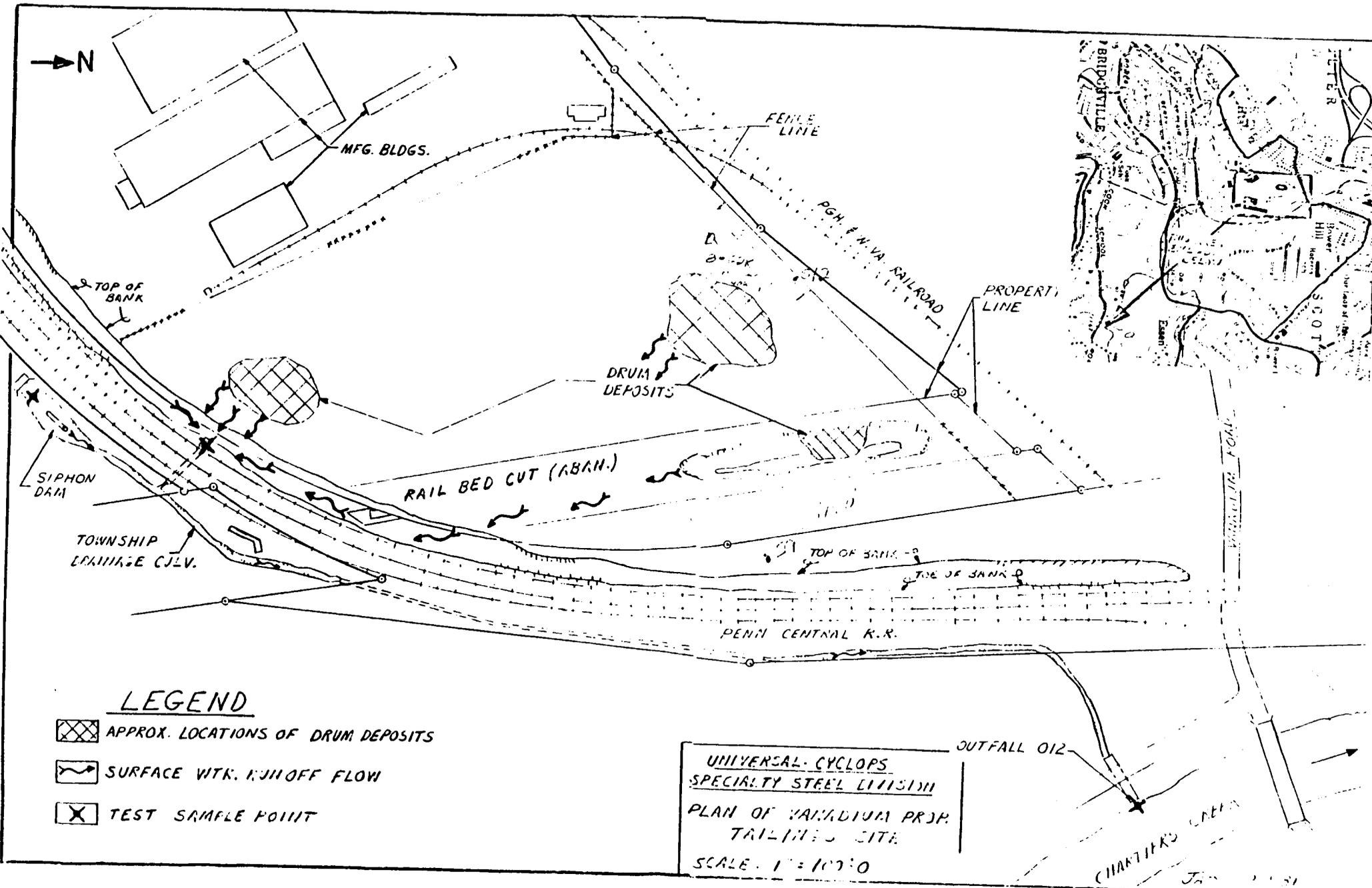
CA00401

LEGEND

-  APPROX. LOCATIONS OF DRUM DEPOSITS
-  SURFACE WTR. RUNOFF FLOW
-  TEST SAMPLE POINT

UNIVERSAL-CYCLOPS
 SPECIALTY STEEL DIVISION
 PLAN OF VANADIUM PROP.
 TAILINGS SITE
 SCALE: 1" = 100'-0"

JAB 7-9-91



LEGEND

-  APPROX. LOCATIONS OF DRUM DEPOSITS
-  SURFACE WITH RUNOFF FLOW
-  TEST SAMPLE POINT

UNIVERSAL CYCLOPS
 SPECIALTY STEEL DIVISION
 PLAN OF VANADIUM PROJ.
 TRILINES SITE
 SCALE: 1" = 100'

CHARLES CREEK
 Jan 1951

THE AEROSPACE CORPORATION



Suite 4000, 955 L'Enfant Plaza, S.W., Washington, D.C. 20024, Telephone: (202) 488-6000

7117-01.86.cdy.06
20 March 1986

Mr. L. C. Brazley, NE-22
Division of Uranium Mill Tailings Projects
U.S. Department of Energy
Germantown, Maryland 20545

Dear Mr. Brazley:

DETERMINATION OF AUTHORITY TO CONDUCT REMEDIAL ACTION
BRIDGEVILLE (VCA) SITE - BRIDGEVILLE, PENNSYLVANIA

The purpose of this letter is to provide an interim response to your request for Aerospace review of the Report of Inclusion Survey at Location CA0401, Mayer Street, Bridgeville, Pennsylvania, dated December 1985; and to examine the considerations necessary to determine if the Department has authority to conduct remedial action at the site of the former Vanadium Corporation of America (VCA) Bridgeville laboratory facility.

The results of the Inclusion Survey referenced above are sufficient to indicate that the levels of residual radioactive contamination on the site exceed the criteria requiring remedial action under both FUSRAP and UMTRAP. The question that must be resolved concerns the Department's authority to conduct remedial action at this site.

There are three scenarios that warrant consideration in determining if the Department has authority to conduct remedial action at the site. The first concerns work done by VCA at their Bridgeville facility in support of operations at the Canonsburg Site. Documents dated in October and November 1943 indicate that African ore was ground at the Bridgeville facility in preparation for processing at the Vitro plant in Canonsburg, PA. The ore, packaged in drums, was delivered from storage to the Bridgeville facility by truck, was ground and repackaged in the same drums. The drums were covered with burlap and delivered to the plant in Canonsburg the same day that the ore was ground. These actions were apparently carried out under guard and witnessed by several parties. Therefore, the propensity for loss of significant quantities of this material seems remote. Furthermore, it is reasonable to assume that any residual radioactive material from the processing of this high grade ore would be in the form of surface contamination which, over the years, may have mixed with soil, but it would not be expected to be in the form of a tailings pile. Approximately five lots of ore were known to have been ground. The quantity of ore ground is unknown except for indications that there were 45 drums in Lot 1.

The second indication of involvement between AEC and the work done at the Bridgeville facility is a research project carried out by VCA to improve methods for the mechanical concentration of carnotite ores. Although information is limited, it is apparent that the AEC was interested in obtaining the "know-how" of the VCA technical staff and the results from their concentration project so that the methods and data could be used as a starting point for an AEC carnotite ore dressing or concentration research program.

Research work on this project was carried out at the Bridgeville site during the period July 1944 through 1946. Experimental work and pilot plant testing of the methods developed was done at Golden, Colorado, and the VCA Mexican Hat and Naturita plants through late 1947. Compilation of costs incurred during the project indicate that less than 10% of the total project cost of approximately \$100,000.00 was attributed to work done at the Bridgeville facility. Therefore, if we accept the premise that only laboratory bench scale testing was done at Bridgeville, and use project cost as an indicator of the volume of material (ore and/or ore concentrates) processed, it is logical to assume that the quantity of residual radioactive material that might be attributed to the project would be small compared to the total volume of tailings deposited at the site over the years by VCA. Another factor pertinent to the consideration of AEC involvement is that their (AEC) interest in the work apparently did not materialize until the spring of 1948. Furthermore, the proposed AEC expenditure of \$50,000.00 was to obtain "...a substantial portion of a carnotite ore dressing program in the form of completed research work by a reputable company." There is no indication in the documents reviewed of any AEC involvement in the work until after the project was completed.

Although somewhat remote, there is a possibility that the Bridgeville site might have been used as a holding or storage area for VCA concentrates (50% slimes) from their Monticello and Naturita plants. It is known that all these concentrates were processed at Vitro Manufacturing Company's plant in Canonsburg. Available information would indicate that these concentrates were shipped directly from the western sites to the Canonsburg plant. However, it is possible that the VCA facility in Bridgeville, less than twenty road miles from the Canonsburg plant, could have been used as a holding area for these concentrates. As previously indicated, documentation to confirm this scenario has not been found.

Sufficient historical documentation has not been found to clearly define MED/AEC involvement in the operations at the Bridgeville site. Therefore, as has been discussed with you and with ORNL representatives, the only avenue available for determining if the Department has authority to conduct remedial action at this site is through laboratory analysis of the samples collected during the Inclusion Survey. The presence of significant quantities of highgrade pitchblende characteristic of the African ores or of ore/concentrates identifiable with the Monticello, Mexican Hat or Naturita sites would suggest authority for remedial action under UMTRAP. Absent a

Mr. L.C. Brazley

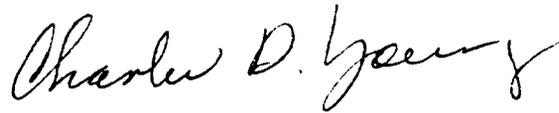
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20 March 1986

correlation between the laboratory analyses and the scenarios described above, the Department might consider referring the site to EPA for consideration as a candidate for the Superfund Program.

Further consideration of this matter by Aerospace will be held in abeyance until the results of the laboratory analyses are available. In the meantime, I would be happy to respond to any questions or comments you might have regarding the material presented herein.

Sincerely,



Charles D. Young
Environmental Controls and
Analysis Directorate
Government Support Division

CDY:smb

cc: E. DeLaney
S. Miller
J. Turi
R. Lewis

bcc: R. Johnson
S. Jones
F. Newman
A. Wallo

FileNo: PA.15 Pgm. under: ~~XXXXXX~~ *fusrap db* Last Contact W/Site or Owner:
RAD Survey: Dispn. Type: E PA.15

Site Name: Vanadium Corp. of America
Altname1:
Altname2:
Altname3:
Altname4:
Activity Dates:
Dates if lic.:

Summary: Conducted R&D for mill tailings site.

Contaminants:

Site: Original FUSRAP named Company, Location, etc. (see new owner if original company sold/renamed/etc.)

Site Contact:
Company Name: Vanadium Corp. of America
Street: Mayer Street
City: Bridgeville
State: PA ZIP: 15017

current owner
Armco, Inc.
300 Innerlace Pkwy
Parsippany, NJ
07054

Site: New or Most Recent Owner of FUSRAP listed company (may not require entry)

Owner Contact:
Company Name: *Cyclops Corporation - Specialty Steel Division*
Street: *650 Washington Road (1985)*
City: *Pittsburgh*
State: *PA ZIP: 15228*

*Universal - Specialties
unrelated to Cyclops*

(412) 564-6300 *323-8120* *761-7474 (disconnected)*

Local Jurisdiction----(Mayor, Town Manager, or similar)

Name Contact: *Donald K. Dolde, Mayor Bor*
Office Name:
Street: *425 Bower Hill Road*
City: *Bridgeville*
State: *PA ZIP: 15017*

*Collier
279-2825*

State Agency----(State Environmental Mgt., Health & Safety, or similar)

Name Contact:
State Office:
Street:
City:
State: PA ZIP:

A12-221-6012 (B-4)

*Stephen Milovich
Town Manager
2418 Hilltop Rd.
Presto, PA 15142
Collier Township*

library: (412) 257-3233

tax: 276-5277

*2 Konco Armco Stainless
& Alloy*

*Armco, Inc.
3006*

SUMMARY FOR THE VCA
(VANADIUM CORPORATION OF AMERICA)
PLANT, BRIDGEVILLE, PA

This site conducted work for the Manhattan Engineer District in the early to mid 1940's to support processing being performed at several sites covered under the uranium mill tailings Remedial Action program. These include Canonsburg, Naturita and Mexican Hat.

The facility was utilized to grind pitchblende ore being processed at Canonsburg. The material was trucked under guard from Vitro Canonsburg to the Bridgeville plant, was ground and generally returned the same day. Records suggest in at least one instance the material was stored at Bridgeville over night. The material was highgrade pitchblende (greater than 50% U_3O_8 and the uranium was in equilibrium with its daughters). It was processed in quantities of hundreds of tons at a time. The period of time the processing was performed is not known.

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Site Location

The site was located near Bridgeville, Pennsylvania off PA Route 50 near Interstate 79 about 6 miles southwest of Pittsburgh. It is located in Collier Township at Kirwan Heights. The plant is now owned by Cyclops Corporation and is in an industrial area near a General Electric glass plant. The location of the plant with respect to Canonsburg is shown in Figure 1.

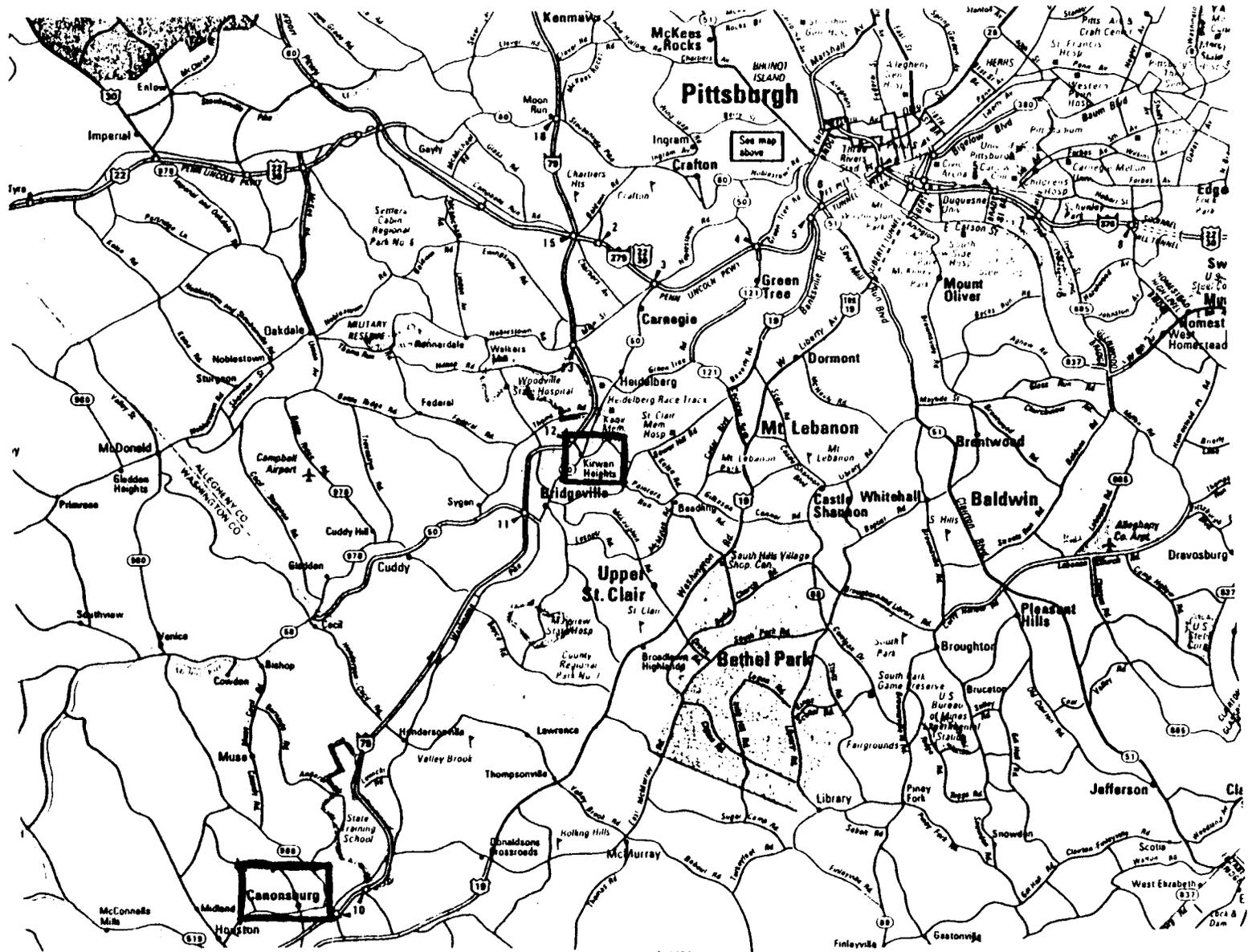


Figure 1. Location of Bridgeville Site in
Respect to Canonsburg

Company must find 'hot' slag

84320
Radioactive material was used to build homes, businesses and roads in Guernsey County.

By Scott Powers
Dispatch Environment Reporter

CAMBRIDGE, Ohio — Federal officials gave a company 30 days to find a way to locate, assess and clean up radioactive waste that the company apparently sold as construction fill in the 1980s.

The U.S. Nuclear Regulatory Commission made that demand to Cyprus Foote Mineral during a public meeting yesterday. It is the first step in dealing with radioactive slag that may have been used to build roads, driveways, businesses and houses in Guernsey County.

Mike McCann of the Nuclear Regulatory Commission's fuel facilities and decommissioning section said he expects Cyprus Foote to identify all places that might have buried radioactive slag, determine health risks and figure out how to eliminate those risks.

The commission does not believe the slag poses any short-term health threat because radioactivity levels of slag left on the plant grounds is not dangerously high. Officials would not speculate on long-term risks.

The commission began investigating reports last fall that some of the heaps of slag waste at the alloy-processing plant here was sold to the public as construction fill. The slag is contaminated with uranium-238 and thorium-232, byproducts of a smelting-process conducted from the



Mike Menden/Dispatch

Sherwood Bauman, left, watches as Ray Glinski, a radiation specialist for the U.S. Nuclear Regulatory Commission, packages a bag of slag taken from Bauman's property in Guernsey County. Also pictured is Mike McCann of the commission's fuel facilities and decommissioning section.

1950s to the 1970s.

Inspectors checked five locations last month and found that two of them, a business driveway and a house addition, had radioactive materials beneath them. They conducted a check yesterday at a sixth site — the home of Sherwood Bauman, a Guernsey County activist who helped spur the commission's actions.

Company officials agreed to cooperate yesterday but said little. They left early, avoiding a public question-and-answer session.

"Obviously, once the survey is conducted we will do what makes sense," said Stephen Hooper, Cyprus Foote's manager of technical services. "That may involve removal of materials that may have elevated radiation."

Cyprus Foote sold the plant to Shieldalloy Metallurgical in 1987. Shieldalloy did not sell slag, commission officials said.

Commission officials admitted they goofed by not paying attention while the slag was being sold. McCann said the company applied to terminate its nuclear license in 1975,

but the agency didn't respond until 1987, when Shieldalloy reminded the agency to terminate the license.

"It should not have been allowed," said Michael F. Weber, the commission's section leader for low-level waste management and decommissioning. "I can't stand here today and defend the NRC's allowing this material to be released off-site."

The commission is handling the sold slag as a separate case from the question of what should be done about the remaining slag heaps, which total 10 million cubic feet.

The commission expects to finish a report by the end of 1995 to determine what to do with the heaps.

But the commission may lose control of the site by then. The U.S. Environmental Protection Agency is assessing the grounds for the federal Superfund list and may assume command of the cleanup, Weber and Jennifer Wendel, of the U.S. EPA's Superfund program, each said.

Wendel said a preliminary assessment scored the property's environmental problems at 44.5 in the Superfund ranking, with 28.5 being the minimum to make the list.

PA.25	Koppers Co., Inc.	Pittsburgh	
PA.26	Philadelphia Naval Yard	Philadelphia	Koppers Co.
PA.27	Foote Mineral Co.	Philadelphia, Exton	
PA.28	Roberts & Manders Corp.	Hatboro	
PA.29	Sharples Corp.	Philadelphia	
PA.30	Minneapolis-Honeywell Regulator Co., Brown Instrument Div.	Philadelphia	
PA.31	Birdsboro Steel & Foundry	Birdsboro	
PA.32	Pennsylvania Ordnance Works	Williamsport	
PA.33	Palmerton Ore Buying Site [UMTRAP]	Palmerton	Mauchchunck; New Jersey Zinc Storage Site; Horsehead Resource Development Co.
PA.34	Landis Machine Tool Co.	Waynesboro	
PA.35	U. S. Steel Co., National Tube Div.	Mckeesport	U. S. Steel Co.
PA.36	Bureau of Mines	Bruceton	
PA.37	Curtis-Wright Corp.	Quehanno	
PA.38	Duriron		
PA.39	Beryllium Corp.	Reading	
PA.40	Catalytic Co.	Philadelphia	
PA.41	Nuclear Materials and Equipment Corp.	Apollo	Numec, Atlantic Richfield; Babcock & Wilcox
PA.42	Chambersburg Engineering Co.	Chambersburg	
PA.43	Pennsylvania Disposal Site	TBD	(proposed Palmerton, PA)
PA.44	Westinghouse Electric Co.	East Pittsburg	
PA.45	Babcox & Wilcox	Parks Township	
RHODE ISLAND			
RI.0	Rhode Island		
RI.1	Brown University	Providence	
RI.2	C. I. Hayes, Inc.	Cranston	
SOUTH CAROLINA			
SC.0	South Carolina		
SC.1	Savannah River Swamp	Aiken (Near)	
SOUTH DAKOTA			
SD.0	South Dakota		
SD.1	Edgemont Mill [UMTRAP]	Edgemont	
TENNESSEE			
TN.0	Tennessee		
TN.1	Parcel 228	Oak Ridge	
TN.2	Oak Ridge Gaseous Diffusion Plant	Oak Ridge	K-25
TN.3	Tennessee Eastman Corp.	Kingsport	
TN.4	Vitro	Chattanooga	
TN.5	W. R. Grace	Erwin	Davison Chemical
TN.6	Clinton Laboratories	Knoxville	
TN.7	Knoxville Iron Co.	Knoxville	
TN.8	Clarksville Foundry & Machine Co.		
TN.9	Elza Gate Warehouse	Oak Ridge	Melton Lake Industrial Park; Elza Gate Y-12
TN.10	Carbide and Carbon Corp.	Oak Ridge	
TEXAS			
TX.0	Texas		
TX.1	Pasadena Chemical Corp., Pilot Plant	Pasadena	(Olin Mathieson Chemical Co.); Mathieson Chemical Co.; Mobil Mining and Minerals Co.
TX.2	Texas City Chemicals, Inc.	Texas City	(The former Texas City Chemicals, Inc.); Borden, Inc.; American Oil Co.
TX.3	Pantex Sewage Reservoir	Amarillo	
TX.4	Falls City Uranium Mill [UMTRAP]	Falls City	Falls City Uranium Mill Ore Stockpile
TX.5	Kearns City		
TX.6	Kennedy		
TX.7	Three Rivers		
TX.8	AMCOT	Fort Worth	American Manufacturing Co. of Texas

OH.47	Brush Beryllium Co.	Lorain	
OH.48	Uniroyal Chemical Co.	Painesville	Uniroyal; Diamond Magnesium Co.; Lonza Chemical Co.
OH.49	Duriron Co.	Dayton	
OH.50	Charles Taylor and Sons	Cincinnati	
OH.51	Robbins & Myers Co.	Springfield	
OREGON			
OR.0	Oregon		
	• Lakeview Mill [UMTRAP]	Lakeview	
	• Oregon Metallurgical Corp.	Albany	
	• Wah Chang	Albany	
OR.1	Albany Research Center	Albany	ARC; U. S. Bureau of Mines; Albany Metallurgical Research Center
PENNSYLVANIA			
PA.0	Pennsylvania		
	• American Chain and Cable Co., Andrew Campbell Div.	Wilkes-Barre	
	• Bartol Research Foundation	Swathmore	
	• Meili & Worthington	Hatboro	
	• Paul & Beekman	Philadelphia	
	• University of Pennsylvania	Philadelphia	
	• University of Pittsburgh	Pittsburgh	
	• Hygrade Sylvania Corp.		
PA.1	Teledyne-Columbia-Summerville	Pittsburgh	Columbia Steel Co.; Summerville Tube; Columbia-Summerville
PA.2	Rohm & Haas Co.	Philadelphia	R & H
PA.3	Superior Steel Co.	Carnegie	
PA.4	Westinghouse Atomic Power Development Plant, East Pittsburgh Plant	Forest Hills, Pittsburgh	
PA.5	Canonsburg Industrial Park	Canonsburg	(The former Vitro Rare Metals Plant.); Vitro Manufacturing Co. (?); Uranium Processing Facility.
PA.6	Penn Central Transportation Co.	Blairsville	Pennsylvania Railroad Landfill; Burrell Township Property Landfill
PA.7	Aliquippa Forge	Aliquippa	Universal Cyclops, Inc.; (The former Vulcan Crucible Steel Co.)
PA.8	Philadelphia Navy Yard	Philadelphia	Abelson's Pilot Plant
PA.9	Carnegie-Mellon Cyclotron Facility	Saxonburg	Carnegie Institute of Technology
PA.10	Westinghouse Astronuclear	Cheswick	Advanced Reactor Div. (W-ARO)
PA.11	C. A. Schnorr & Co.	Springdale	Premier Manufacturing; Conviber, Inc.; C. H. Schuman
PA.12	Carpenter Steel Co.	Reading	Carpenter Technologies (?)
PA.13	Shippingport Atomic Power Station	Shippingport	Shippingport
PA.14	Try Street Terminal	Pittsburgh	
PA.15	Vanadium Corp. of America	Bridgeville	
PA.16	Westinghouse Atomic Power Div.	Homestead	Westinghouse Corp.
PA.17	Jessop Steel Co.	Washington	
PA.18	Babcox & Wilcox	Beaver Falls	Tubular Products Div.; Lone Star Tech.
PA.19	Heppanstell Co.	Pittsburgh	Tippins Co.; Tippins
PA.20	Penn Salt Co.	Chestnut Hill, Philadelphia	
PA.21	Frankford Arsenal		
PA.22	Aeroprojects, Inc.	West Chester	Sonabond Ultrasonics
PA.23	Aluminum Co. of America (Alcoa)	New Kensington	
PA.24	Summerill Tubing Co.	Bridgeport	

United States Government

John Newman
Department of Energy

memorandum

FEB 24 1995

DATE:

REPLY TO
ATTN OF: EM-421 (W. A. Williams, 427-1719)

SUBJECT: Records for the Vanadium Corporation of America Site

TO: The File

After review of the available records concerning the former Vanadium Corporation of America site in Bridgeville, Pennsylvania, I have determined that it is not necessary to transmit Department of Energy (DOE) records to the municipality to inform public officials of the activities at this site. The site is included in another DOE remedial action program.



W. Alexander Williams, PhD
Designation and Certification Manager
Off-Site/Savannah River Program Division
Office of Eastern Area Programs
Office of Environmental Restoration

Attachment



PA. 15

PENNSYLVANIA

PA.15

Current Site Owner: Armco, Inc.
300 Innerpace Pkwy
Parsippany, NJ 07054

Former name at site: Vanadium Corporation of America
Mayer Street
Bridgeville, PA 15017

William P. Dornsife, Director
Bureau of Radiation Protection
Pennsylvania Department of
Environmental Resources
400 Market Street - 13th Floor
Harrisburg, PA 17101

Stephen Milovich, Town Manager
Collier Township
2418 Hilltop Rd.
Presto, PA 15142