DRAFT FINAL
RCRA FACILITY INVESTIGATION REPORT
MAIN MANUFACTURING AREA
WATERVLIET ARSENAL,
Watervliet, New York

VOLUME II

U.S. Army Corps of Engineers
Baltimore, Maryland

Prepared by:

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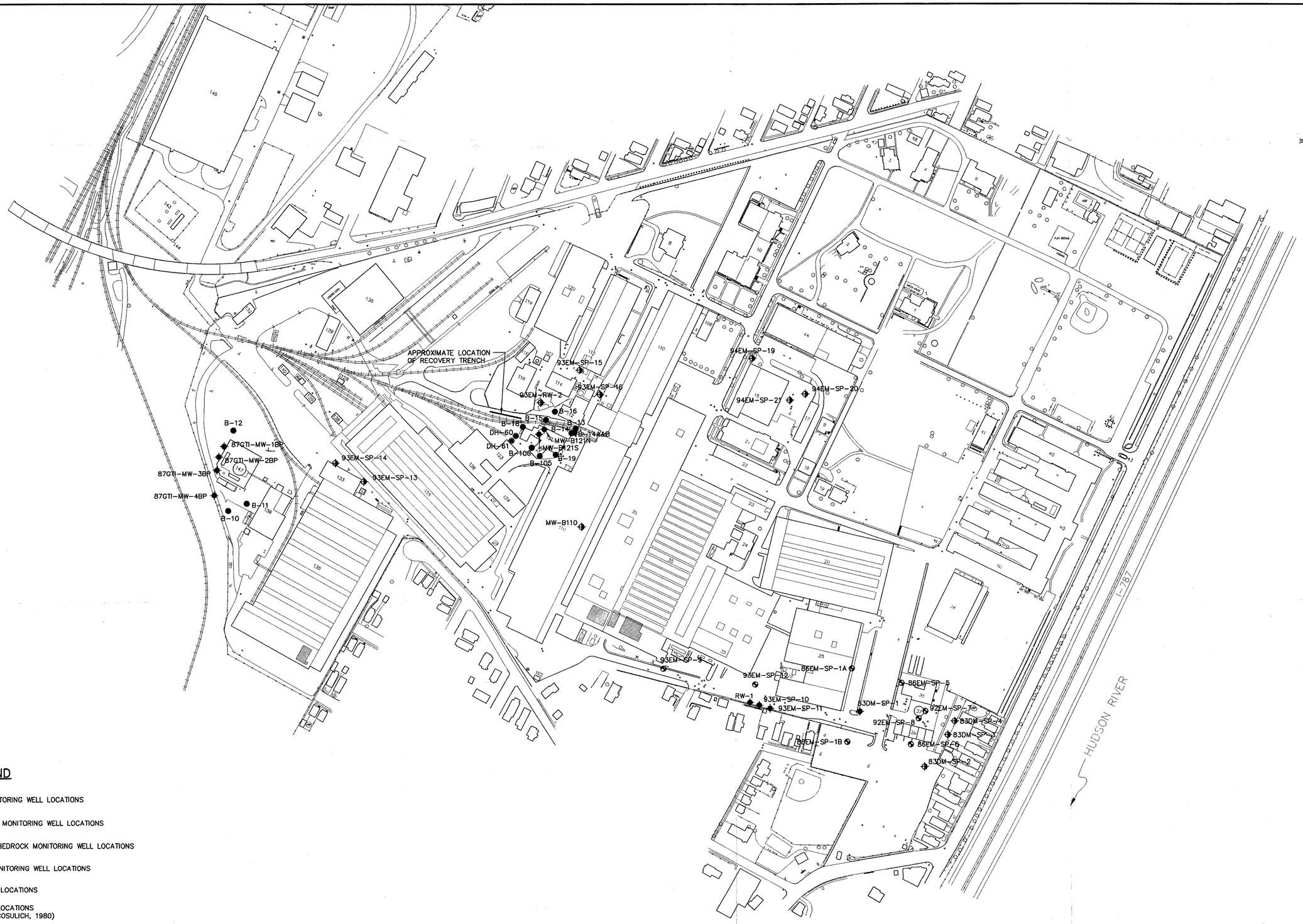
15 Cornell Road
Latham, New York 12110

US Army Corps
of Engineers
Baltimore District
DRIVEN BY A VISION...to be the BEST

August 1999
0285-587



LEGEND

- HYBRID MONITORING WELL LOCATIONS
- OVERBURDEN MONITORING WELL LOCATIONS
- WEATHERED BEDROCK MONITORING WELL LOCATIONS
- BEDROCK MONITORING WELL LOCATIONS
- SOIL BORING LOCATIONS
- DRILL HOLE LOCATIONS (WILLIAM F. COSULICH, 1980)
- PROCESS PITS

SCALE IN FEET
0 75 150 300

PLATE 1-1

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES CG
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

PRE-RFI SOIL BORING AND MONITORING WELL SAMPLING LOCATIONS

MALCOLM PIRNIE, INC.

DATE MARCH 1999
SHEET ____ OF ____
DWG. NO. 587-26

XREF: X587-01

/3508 3418002900 I:\ACAD\PROJ\0285\3579\DRAFT_FINAL\587-26 Scale: 1:1 Date: 06/09/1999 Time: 10:46

LEGEND

- CHROMIUM SEWER LINE (SWMU #20)
- CYANIDE SEWER LINE (SWMU #20)
- WASTE OIL SEWER LINE (SWMU #20)
- PROCESS PITS

NOTE:
SWMUs #2,3,18,22,23 AND 24 ARE NOT SHOWN BECAUSE THEY ARE LOCATED IN THE SIBERIA AREA AND WERE NOT INCLUDED IN THE ARSENAL WIDE INVESTIGATION.

PLATE 1-2

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

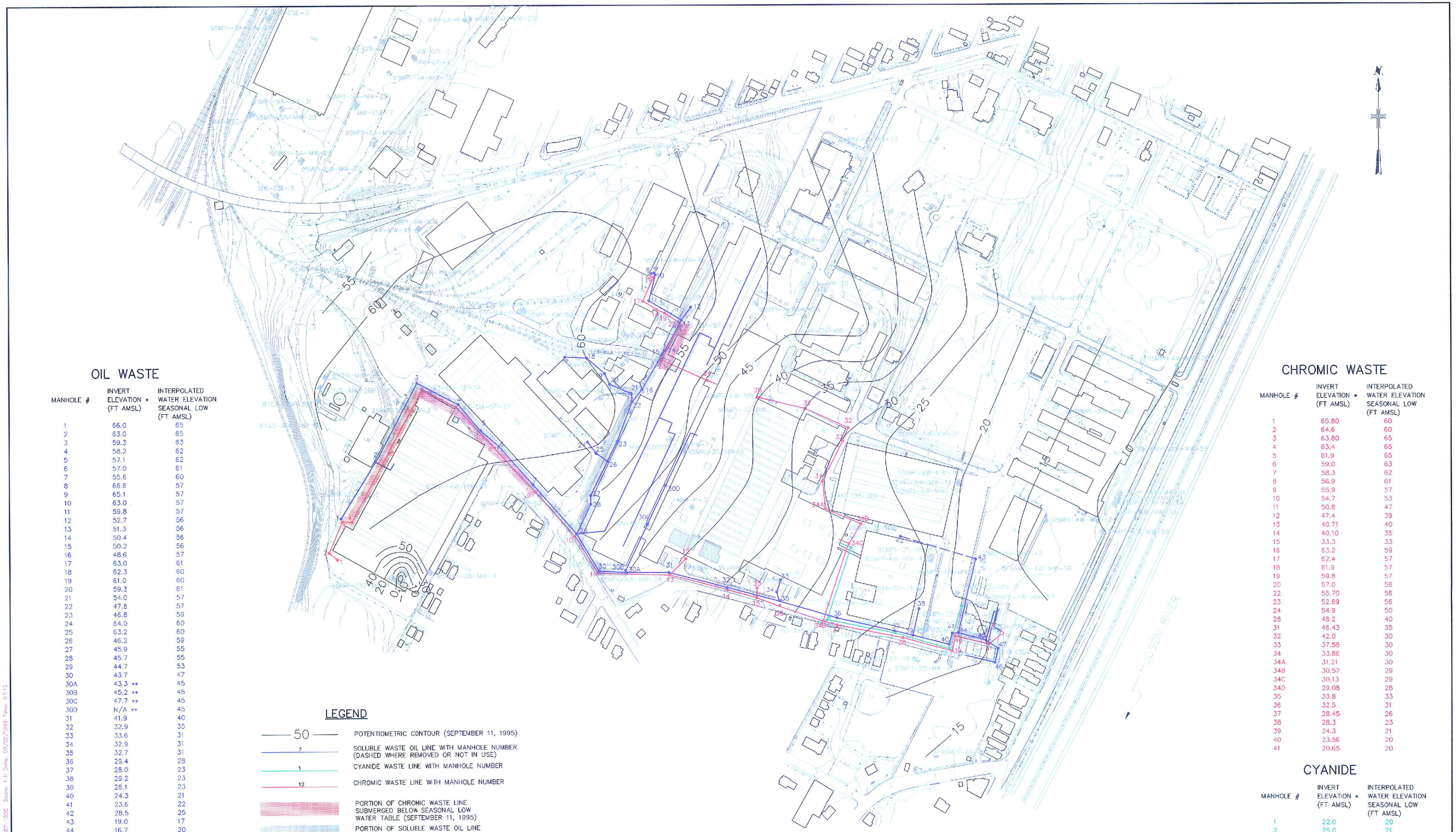
DES DCB
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

APPROXIMATE SWMU LOCATIONS

MALCOLM PIRNIE, INC.
DATE JUNE 1999
SHEET 1 OF 1
DWG. NO. 587-56

XREF: X587-01



OIL WASTE

MANHOLE #	INVERT ELEVATION * (FT AMSL)	INTERPOLATED WATER ELEVATION SEASONAL LOW (FT AMSL)
1	66.0	65
2	63.0	65
3	59.3	63
4	58.2	62
5	57.1	62
6	57.0	61
7	55.6	60
8	66.6	57
9	65.1	57
10	63.0	57
11	59.8	57
12	52.7	56
13	51.3	56
14	50.4	56
15	50.2	56
16	48.6	57
17	63.0	61
18	62.3	60
19	61.0	60
20	59.3	61
21	54.0	57
22	47.8	57
23	46.8	59
24	64.0	60
25	63.2	60
26	46.2	59
27	45.9	55
28	45.7	55
29	44.7	53
30	43.7	47
30A	43.3 **	45
30B	45.2 **	45
30C	47.7 **	45
30D	N/A **	45
31	41.9	40
32	32.9	35
33	33.6	31
34	32.9	31
35	32.7	31
36	29.4	28
37	28.0	23
38	29.2	23
39	26.1	23
40	24.3	21
41	23.6	22
42	28.5	25
43	19.0	17
44	16.7	20
45	16.6	20
46	17.8	19
47	17.4	19

CHROMIC WASTE

MANHOLE #	INVERT ELEVATION * (FT AMSL)	INTERPOLATED WATER ELEVATION SEASONAL LOW (FT AMSL)
1	65.80	60
2	64.6	60
3	63.80	65
4	63.4	65
5	61.9	65
6	59.0	63
7	58.3	62
8	56.9	61
9	55.9	57
10	54.7	53
11	50.8	47
12	47.4	39
13	40.71	40
14	40.10	35
15	33.3	33
16	63.2	59
17	62.4	57
18	61.9	57
19	59.8	57
20	57.0	56
22	55.70	56
23	52.69	56
24	54.9	50
28	48.2	40
31	46.43	35
32	42.0	30
33	37.58	30
34	33.86	30
34A	31.21	30
34B	30.57	29
34C	30.13	29
34D	29.08	28
35	33.8	33
36	32.5	31
37	28.45	26
38	28.3	23
39	24.3	21
40	23.56	20
41	20.65	20

CYANIDE

MANHOLE #	INVERT ELEVATION * (FT AMSL)	INTERPOLATED WATER ELEVATION SEASONAL LOW (FT AMSL)
1	22.0	20
2	25.0	21
3	28.5	24
4	31.1	28
5	33.14	30

LEGEND

- 50 — POTENTIOMETRIC CONTOUR (SEPTEMBER 11, 1995)
- 7 — SOLUBLE WASTE OIL LINE WITH MANHOLE NUMBER (DASHED WHERE REMOVED OR NOT IN USE)
- 1 — CYANIDE WASTE LINE WITH MANHOLE NUMBER
- 12 — CHROMIC WASTE LINE WITH MANHOLE NUMBER
- PORTION OF CHROMIC WASTE LINE SUBMERGED BELOW SEASONAL LOW WATER TABLE (SEPTEMBER 11, 1995)
- PORTION OF SOLUBLE WASTE OIL LINE SUBMERGED BELOW SEASONAL LOW WATER TABLE (SEPTEMBER 11, 1995)

NOTE: * INVERT ELEVATIONS TAKEN FROM AS-BUILT DRAWINGS OF SOLUBLE WASTE OIL COLLECTION SYSTEM, WILLIAM F. COSULICH ASSOCIATES, DECEMBER 1978.

** INVERT ELEVATIONS SURVEYED BY MALCOLM PIRNIE, INC., OCTOBER 1996.

SCALE IN FEET
0 75 150 300

SOURCE: WVA: GENERAL LIQUID WASTE DISPOSAL MAP, 1/87, DWG. #18-02-01

PLATE 1-3

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN JAP
CKD CG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

LIQUID WASTE LINES AND AREAS OF SUBMERGENCE

SCALE: AS SHOWN

MALCOLM PIRNIE, INC.

DATE JUNE 1999

SHEET 1 OF 1

DWG. NO. 587-105C

4671.028\587105 I:\ACAD\PROJ\028A\3679\DRAFT_FINAL\587-05C Scale: 1:1 Date: 08/02/1999 Time: 07:15

XREF: X587-01

LEGEND

- ▲ FORMER PCB CONTAINING CAPACITOR/TRANSFORMER
- ■ EXISTING NON-PCB (LESS THAN 50 PPM) CAPACITOR/TRANSFORMER
- ● EXISTING PCB CAPACITOR/TRANSFORMER (MARCH 1999)

SCALE IN FEET
0 75 150 300

PLATE 1-4

US Army Corps of Engineers	MALCOLM PIRNIE	REVISIONS: NO. / BY / DATE / REMARKS	DES ARV DWN SMH CKD KJG	WATERVLIET ARSENAL MAIN MANUFACTURING AREA USACE CONTRACT NO. DACA31-94-D-0017	LOCATIONS OF CURRENT AND FORMER TRANSFORMERS AND CAPACITORS	MALCOLM PIRNIE, INC. DATE JUNE 1999 SHEET 1 OF 1 DWG. NO. 587-141

XREF: X587-01

N
LEGEND
SOIL BORING LOCATIONS
GEOPROBE SOIL BORING LOCATIONS
HYBRID MONITORING WELL LOCATIONS
OVERBURDEN MONITORING WELL LOCATIONS
WEATHERED BEDROCK MONITORING WELL LOCATIONS
BEDROCK MONITORING WELL LOCATIONS
PROCESS PITS
SCALE IN FEET
0 75 150 300
PLATE 3-1
95MPI-SWMU-7-1
95MPI-SWMU-7-2
MW-ESE-4
95MPI-SA-MW-20
95MPI-SA-MW-21
95MPI-SA-MW-22
MW-DEC-1
MW-DEC-2
MW-ESE-8
95MPI-SA-MW-30
MW-DEC-3
MW-EA-8
MW-ESE-9
MW-EA-7
95MPI-SA-MW-32
MW-EA-5
MW-EA-6
95MPI-SA-MW-23
MW-ESE-3
95MPI-SA-MW-24
MW-GTI-1
MW-GTI-3
MW-GTI-2
MW-GTI-4
95MPI-SA-MW-35
95MPI-SA-MW-31
95MPI-SA-MW-25
95MPI-SA-MW-29
MW-ESE-1
MW-ESE-7
95MPI-SA-MW-26
MW-ESE-2
95MPI-SA-MW-28
95MPI-SA-MW-27
MW-ESE-5
95MPI-AW-MW-25
95MPI-AW-MW-26
95MPI-AW-MW-22
95MPI-AW-MW-41
97MPI-AW-MW-45
95MPI-AW-MW-23
95MPI-AW-MW-42
95MPI-AW-MW-27
WVA-AW-B3
WVA-AW-B2
WVA-AW-B1
WVA-AW-B4
95MPI-AW-MW-28
94-EM-MW-19
95MPI-SWMU-12-1
95MPI-SWMU-12-2
95MPI-AW-MW-21
97MPI-AW-MW-50
95MPI-AW-MW-40
95MPI-AW-MW-39
93-EM-SP-15
95MPI-SWMU-9-1
95MPI-SWMU-9-2
95MPI-SWMU-11-1
95MPI-SWMU-11-2
95MPI-AW-MW-24
93-EM-SP-16
94-EM-MW-20
94-EM-MW-21
93-EM-RW-2
97MPI-AW-MW-52
98MPI-AW-MW-64
MW-121-NORTH
MW-121-SOUTH
MPI-P-2
95MPI-AW-MW-20
87GTI-MW-1BP
87GTI-MW-2BP
87GTI-MW-3BP
87GTI-MW-4BP
93-EM-SP-14
93-EM-SP-13
95MPI-135-MW-3
95MPI-SWMU-8-1
95MPI-SWMU-8-2
95MPI-AW-MW-30
97MPI-AW-MW-54
95MPI-35-MW-7
MPI-P-1
95MPI-SWMU-10-1
95MPI-SWMU-10-2
MW-BLDG110
PW-1
95MPI-AW-MW-29
95MPI-35-MW-8
98MPI-AW-MW-60
95MPI-AW-MW-31
98MPI-AW-MW-59
95MPI-AW-MW-36
97MPI-AW-MW-48
95MPI-AW-MW-35
97MPI-AW-MW-55
98MPI-AW-MW-63
95MPI-135-MW-2
MPI-P-3
MPI-P-4
95MPI-35-MW-6
98MPI-AW-MW-61
97MPI-AW-MW-51
95MPI-AW-MW-34
95MPI-AW-MW-33
95MPI-SWMU-14-2
95MPI-SWMU-14-1
98MPI-AW-MW-62
98MPI-AW-MW-58
95MPI-25-MW-1
95MPI-25-MW-6
97MPI-AW-MW-49
95MPI-AW-MW-43
98MPI-AW-MW-56
95MPI-AW-MW-44
95MPI-AW-MW-37
95MPI-AW-MW-38
95MPI-35-MW-5
95MPI-SWMU-13-1
95MPI-SWMU-13-2
93-EM-SP-9
93-EM-SP-12
86EM-SP-1A
95MPI-25-MW-5
98MPI-AW-MW-57
86EM-SP-5
95MPI-135-MW-1
95MPI-135-MW-4
97MPI-AW-MW-53
83DM-SP-1
95MPI-25-MW-3
95MPI-AW-MW-2
WVA-B36-B3
WVA-B36-B2
WVA-B36-B1
RW-1
93-EM-SP-10
93-EM-SP-11
97MPI-AW-MW-46
92EM-SP-7
92EM-SP-8
83DM-SP-4
83DM-SP-3
97MPI-AW-MW-47
86EM-SP-1B
86EM-SP-6
95MPI-25-MW-4
83DM-SP-2
WVA-GP-14
WVA-GP-13
95MPI-AW-MW-32

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

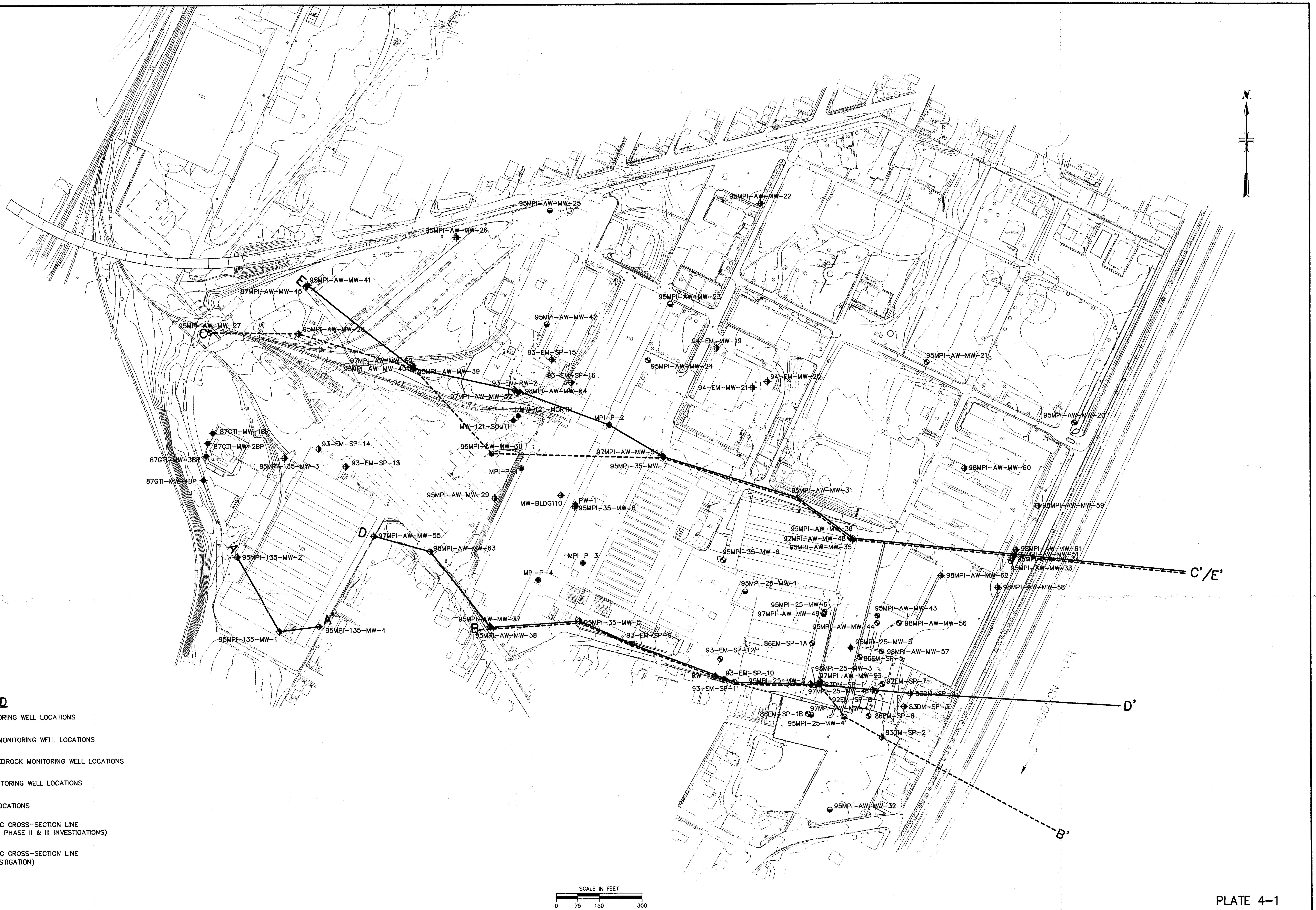
DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

MONITORING WELL/SOIL BORING LOCATION MAP

MALCOLM PIRNIE, INC.
DATE JUNE 1999
SHEET ___ OF ___
DWG. NO. 587-115

XREF: X587-01



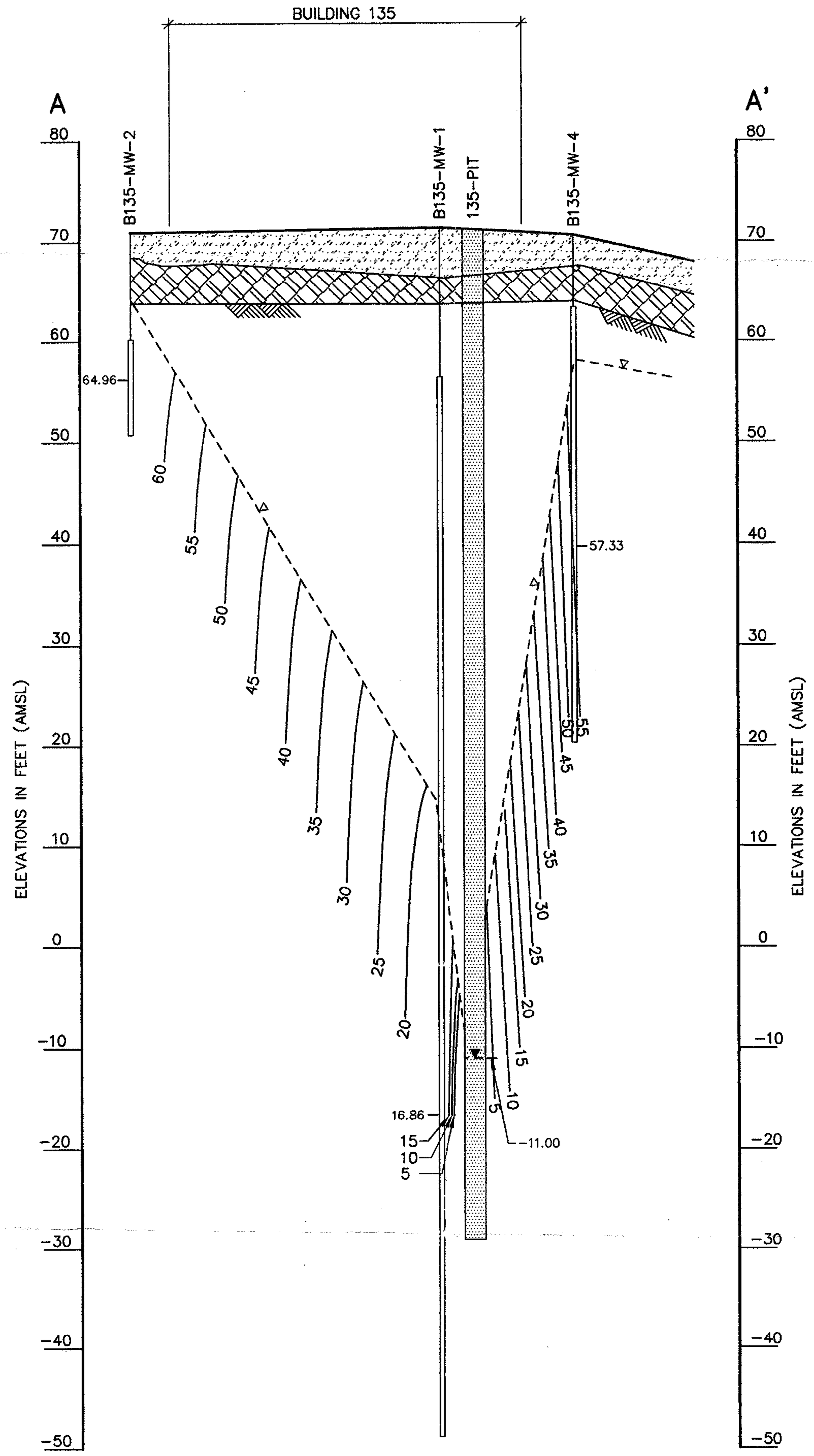
LEGEND

- HYBRID MONITORING WELL LOCATIONS
- OVERBURDEN MONITORING WELL LOCATIONS
- WEATHERED BEDROCK MONITORING WELL LOCATIONS
- BEDROCK MONITORING WELL LOCATIONS
- PIEZOMETER LOCATIONS
- E ——— E' HYDROGEOLOGIC CROSS-SECTION LINE (UPDATED FOR PHASE II & III INVESTIGATIONS)
- C - - - - - C' HYDROGEOLOGIC CROSS-SECTION LINE (PHASE I INVESTIGATION)
- PROCESS PITS

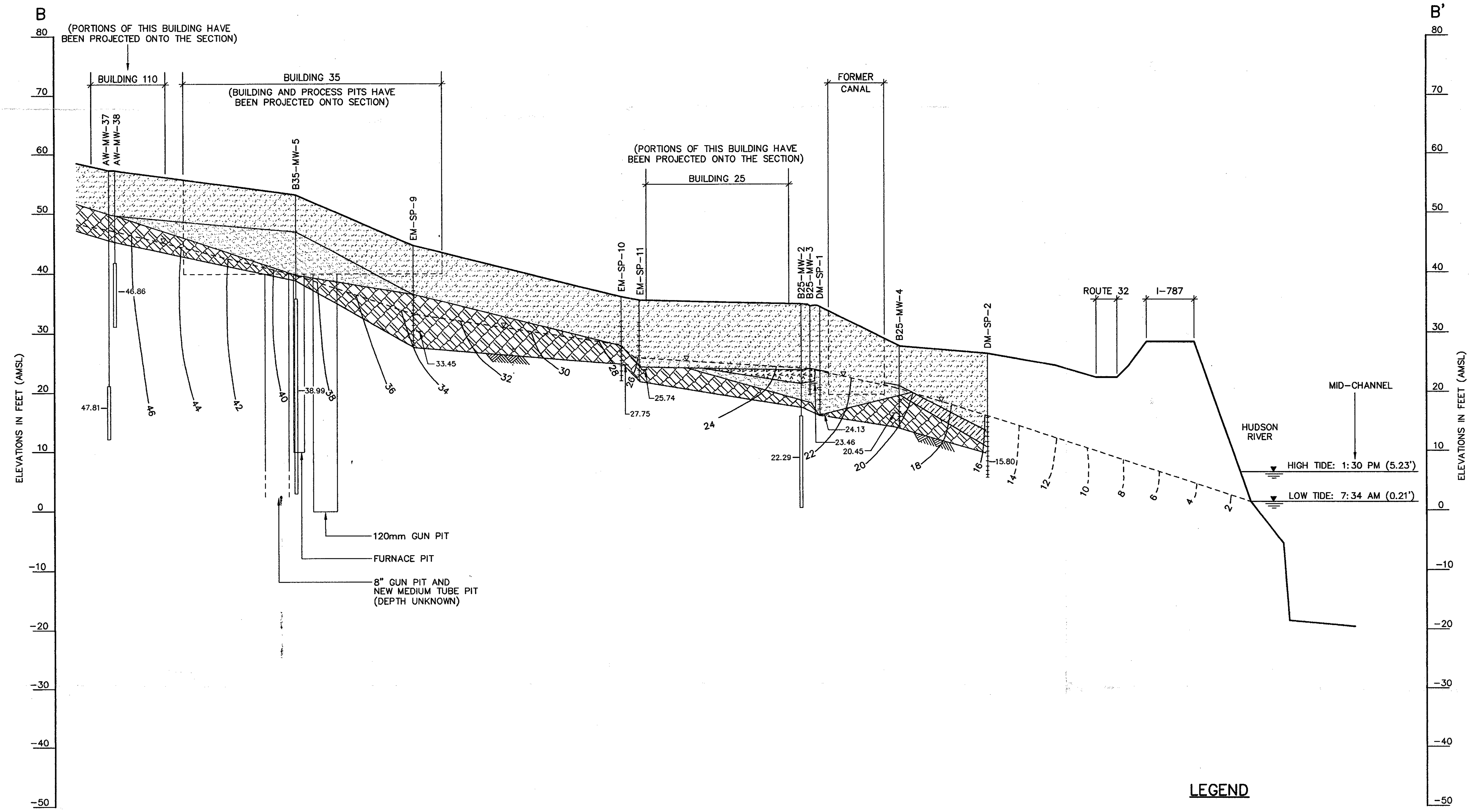
PLATE 4-1

US Army Corps of Engineers	MALCOLM PIRNIE	REVISIONS: NO. / BY / DATE / REMARKS	DES ARV DWN SMH CKD KJG	WATERVLIET ARSENAL MAIN MANUFACTURING AREA USACE CONTRACT NO. DACA31-94-D-0017	HYDROGEOLOGIC CROSS-SECTION LOCATIONS	MALCOLM PIRNIE, INC. DATE JUNE 1999 SHEET ___ OF ___ DWG. NO. 587-111

XREF: X587-01



SECTION A–A'
SCALE: HORZ. 1"=100'
VERT. 1"=10'



SECTION B–B'
SCALE: HORZ. 1"=100'
VERT. 1"=10'

LEGEND

- FILL
- FINE GRAINED ALLUVIUM
- TILL
- COARSE ALLUVIUM
- WEATHERED BEDROCK

GROUND SURFACE — WELL RISER, SCREENED INTERVAL; WELL RISER, OPEN INTERVAL

- 20.67 POTENTIOMETRIC HEAD
- POTENTIOMETRIC SURFACE
- 10 EQUIPOTENTIAL CONTOURS
- COMPETENT BEDROCK SURFACE

PLATE 4–2

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS

NO.	BY	DATE	REMARKS

DES DCB
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31–94–D–0017

HYDORGEOLOGIC CROSS–SECTIONS A–A' & B–B' (SEPTEMBER 11, 1995)

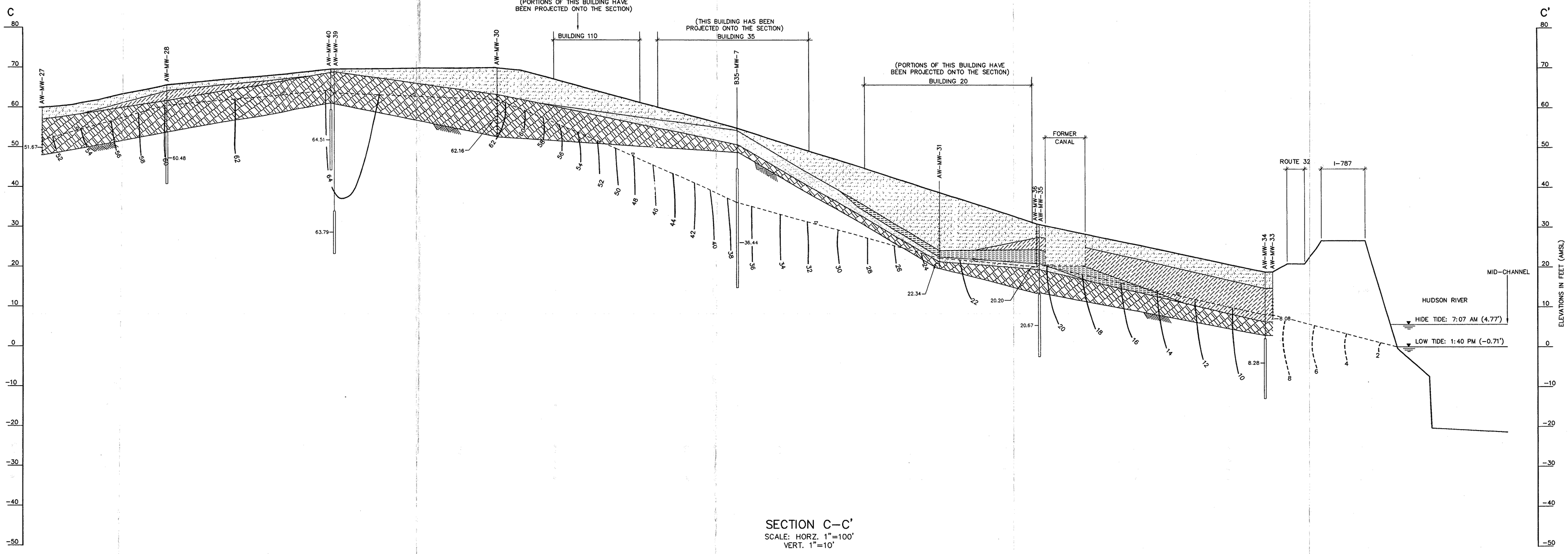
SCALE: AS SHOWN

MALCOLM PIRNIE, INC.

DATE JUNE 1999

SHEET ___ OF ___

DWG. NO. 587-74



SECTION C-C'
SCALE: HORZ. 1"=100'
VERT. 1"=10'

LEGEND

- FILL
- FINE GRAINED ALLUVIUM
- TILL
- COARSE ALLUVIUM
- WEATHERED BEDROCK

GROUND SURFACE
WELL RISER
SCREENED INTERVAL
WELL RISER
OPEN INTERVAL

20.67 POTENTIOMETRIC HEAD
POTENTIOMETRIC SURFACE
10 EQUIPOTENTIAL CONTOURS
COMPETENT BEDROCK SURFACE

PLATE 4-3

US Army Corps of Engineers

MALCOLM PIRNIE

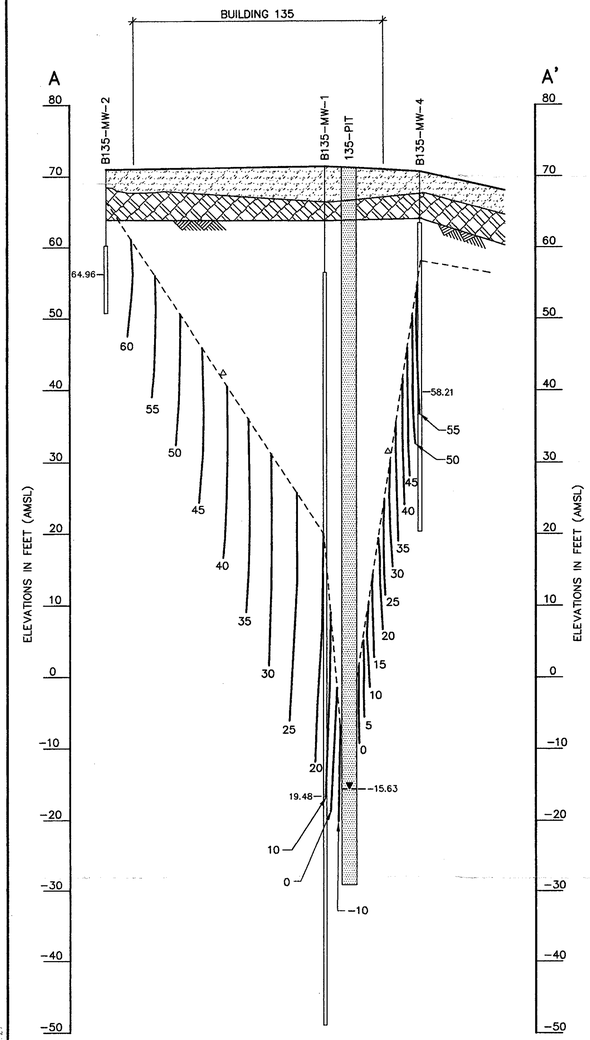
REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

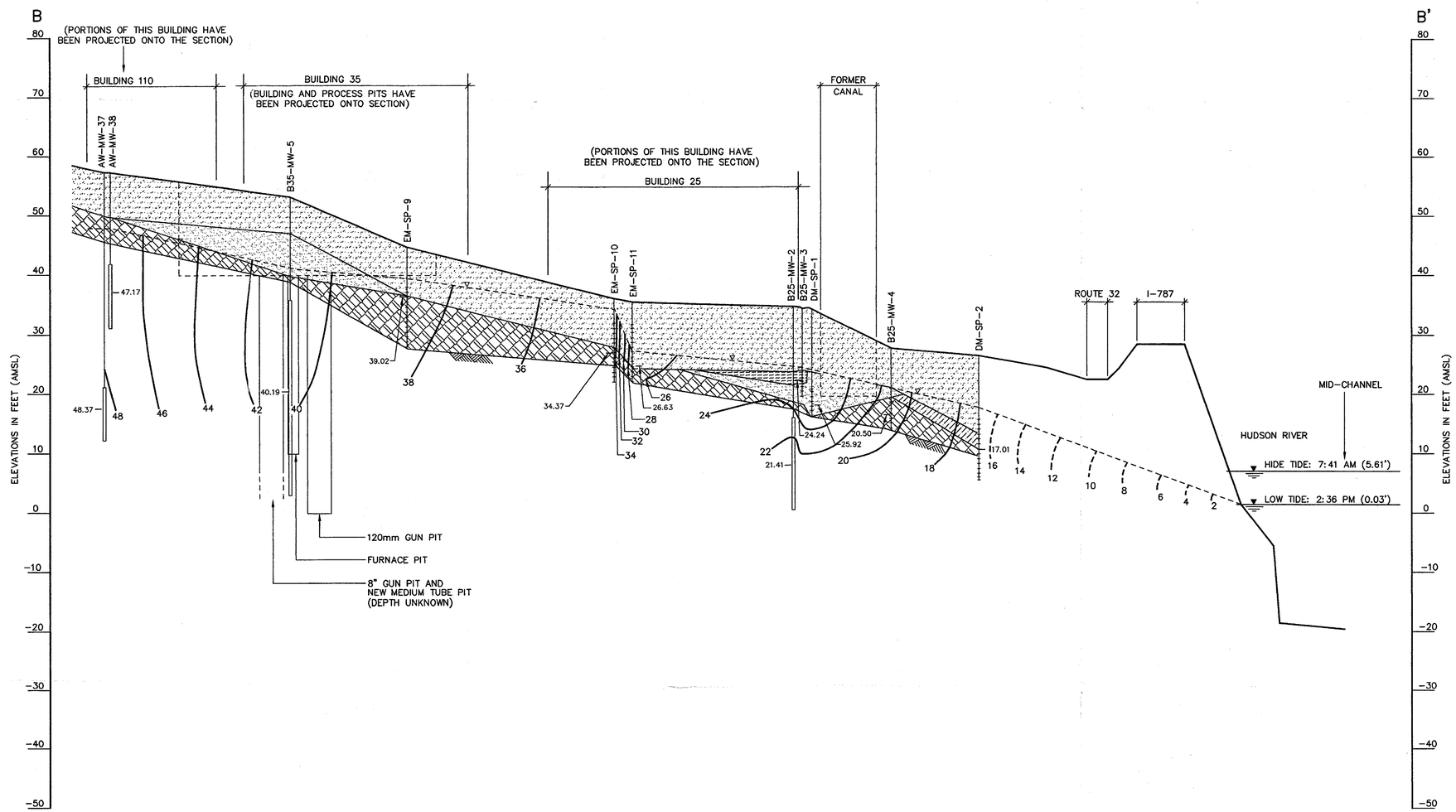
WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

HYDROGEOLOGIC CROSS-SECTION C-C'
(SEPTEMBER 11, 1995)
SCALE: AS SHOWN

MALCOLM PIRNIE, INC.
DATE JUNE 1999
SHEET ___ OF ___
DWG. NO. 587-143



SECTION A–A'
SCALE: HORZ. 1"=100'
VERT. 1"=10'



SECTION B–B'
SCALE: HORZ. 1"=100'
VERT. 1"=10'

LEGEND

- FILL
- FINE GRAINED ALLUVIUM
- TILL
- COARSE ALLUVIUM
- WEATHERED BEDROCK
- GROUND SURFACE
- WELL RISER
- SCREENED INTERVAL
- WELL RISER
- OPEN INTERVAL
- 20.67 — POTENTIOMETRIC HEAD
- POTENTIOMETRIC SURFACE
- 10 — EQUIPOTENTIAL CONTOURS
- COMPETENT BEDROCK SURFACE

PLATE 4-4

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

HYDROGEOLOGIC CROSS-SECTIONS A–A' & B–B' (MAY 20, 1996)

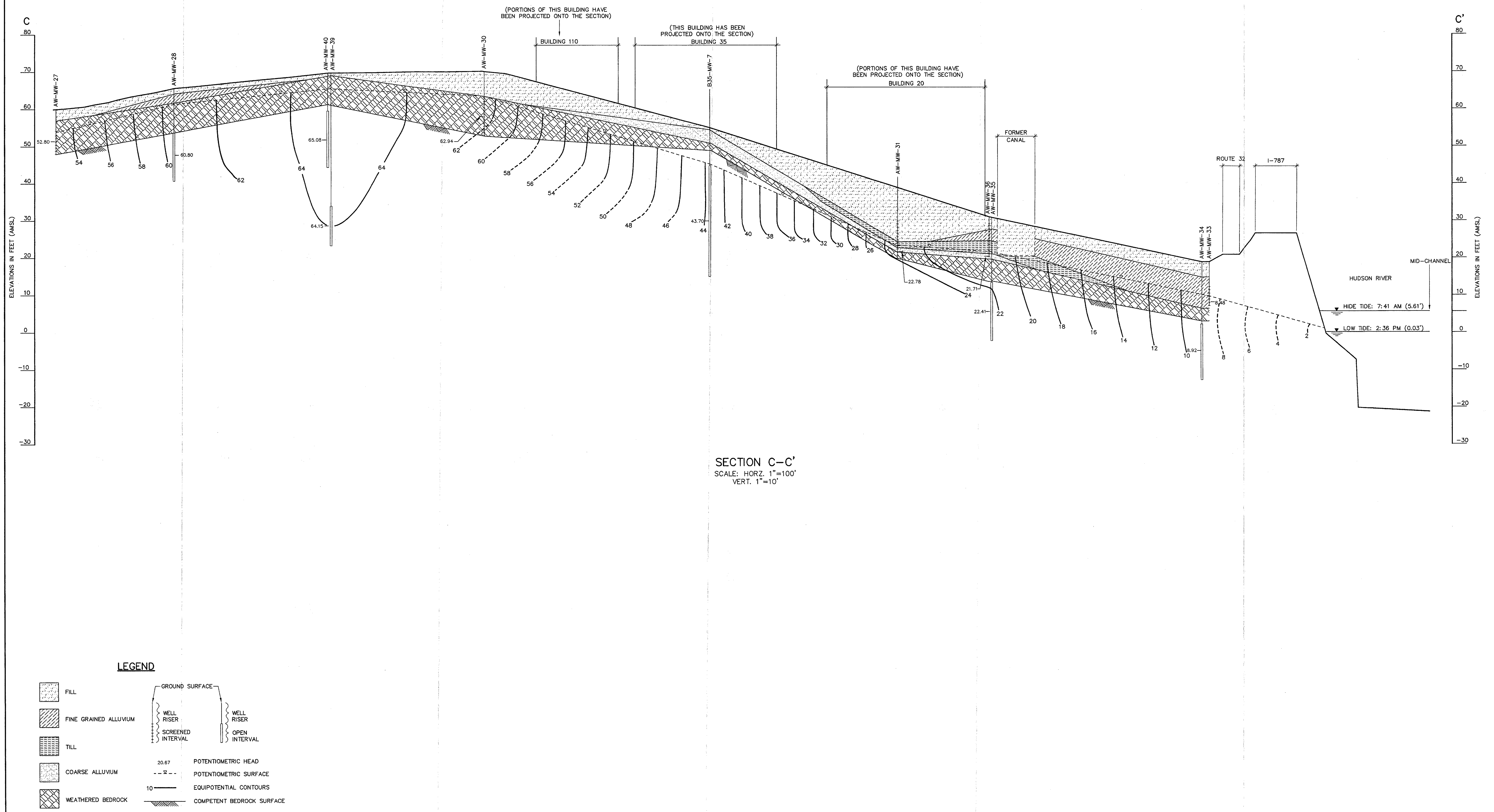
SCALE: AS SHOWN

MALCOLM PIRNIE, INC.

DATE JUNE 1999

SHEET ___ OF ___

DWG. NO. 587-110



SECTION C-C'
SCALE: HORZ. 1"=100'
VERT. 1"=10'

PLATE 4-5

US Army Corps of Engineers

MALCOLM PIRNIE

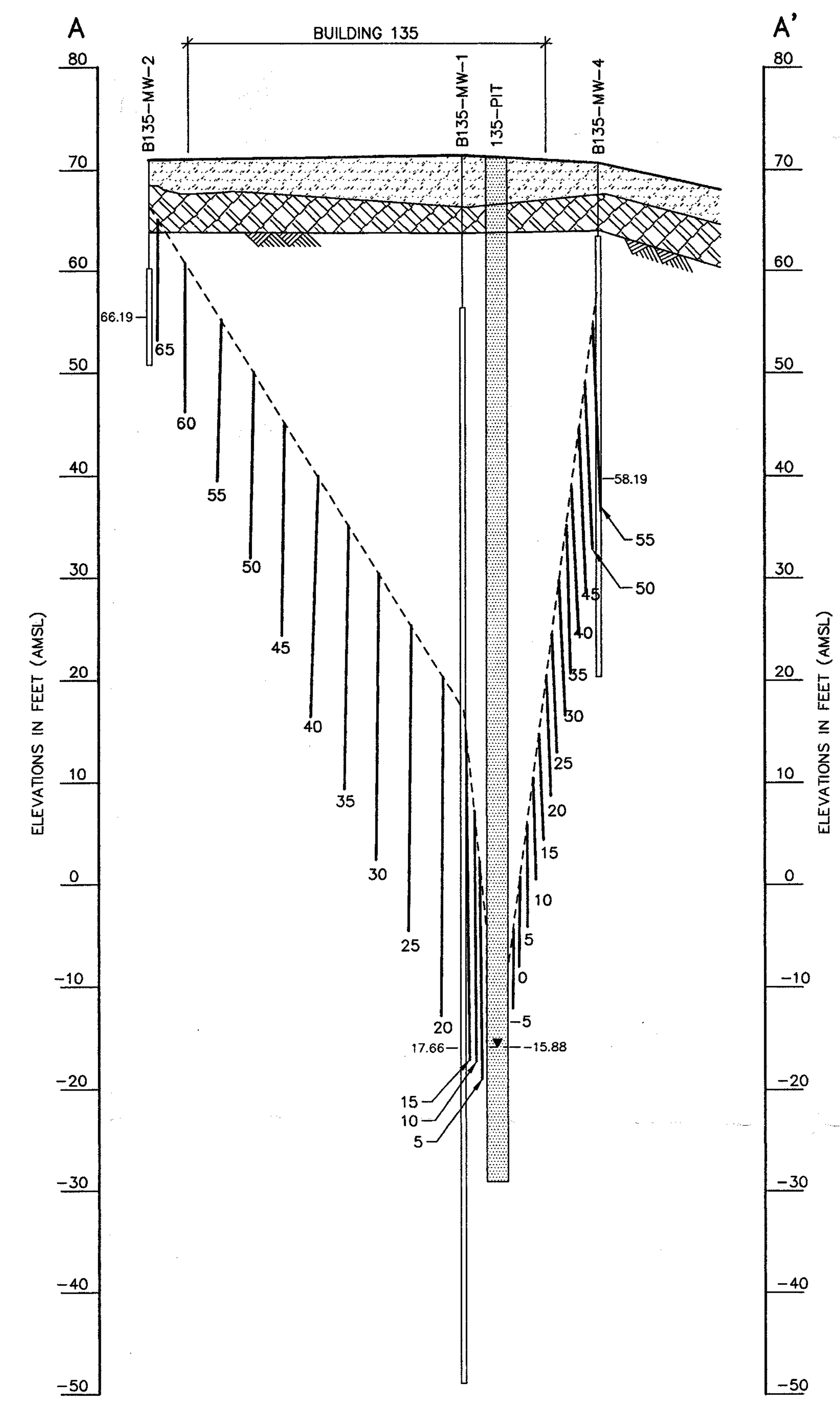
NO.	BY	DATE	REVISIONS REMARKS

DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

HYDROGEOLOGIC CROSS-SECTION C-C'
(MAY 20, 1996)
SCALE: AS SHOWN

MALCOLM PIRNIE, INC.
DATE JUNE 1999
SHEET ___ OF ___
DWG. NO. 587-108



SECTION A–A'
SCALE: HORZ. 1"=100'
VERT. 1"=10'

LEGEND

FILL
FINE GRAINED ALLUVIUM
TILL
COARSE ALLUVIUM
WEATHERED BEDROCK

GROUND SURFACE
WELL RISER
SCREENED INTERVAL
WELL RISER
OPEN INTERVAL

20.67 POTENTIOMETRIC HEAD
POTENTIOMETRIC SURFACE
10 EQUIPOTENTIAL CONTOURS
COMPETENT BEDROCK SURFACE

PLATE 4–6

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS

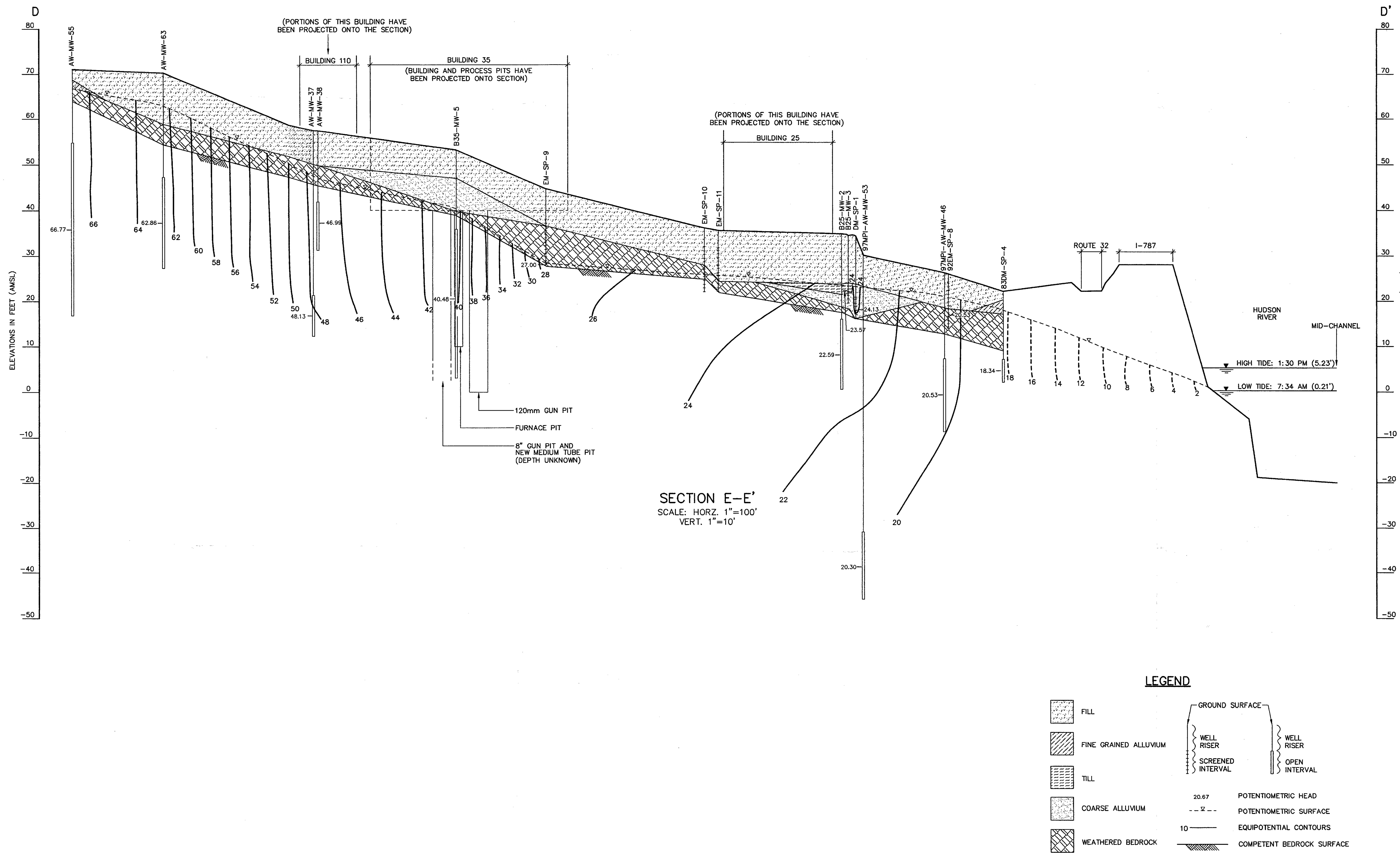
NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31–94–D–0017

HYDROGEOLOGIC CROSS SECTIONS
A–A' AND D–D' (FEBRUARY 11, 1999)
SCALE: AS SHOWN

MALCOLM PIRNIE, INC.
DATE JUNE 1999
SHEET 1 OF 2
DWG. NO. 587–140



D
D'
ELEVATIONS IN FEET (AMSL)
AW-MW-55
AW-MW-63
(PORTIONS OF THIS BUILDING HAVE BEEN PROJECTED ONTO THE SECTION)
BUILDING 110
BUILDING 35
(BUILDING AND PROCESS PITS HAVE BEEN PROJECTED ONTO SECTION)
AW-MW-37
AW-MW-38
B35-MW-5
EM-SP-9
EM-SP-10
EM-SP-11
(PORTIONS OF THIS BUILDING HAVE BEEN PROJECTED ONTO THE SECTION)
BUILDING 25
B25-MW-2
B25-MW-3
DM-SP-1
97MPI-AW-MW-53
97MPI-AW-MW-46
92EM-SP-8
83DM-SP-4
ROUTE 32
I-787
HUDSON RIVER
MID-CHANNEL
HIGH TIDE: 1:30 PM (5.23')
LOW TIDE: 7:34 AM (0.21')
66.77
62.86
46.99
48.13
40.48
27.00
24.13
23.57
22.59
20.53
18.34
20.30
120mm GUN PIT
FURNACE PIT
8" GUN PIT AND NEW MEDIUM TUBE PIT (DEPTH UNKNOWN)
SECTION E-E'
SCALE: HORZ. 1"=100'
VERT. 1"=10'
LEGEND
FILL
FINE GRAINED ALLUVIUM
TILL
COARSE ALLUVIUM
WEATHERED BEDROCK
GROUND SURFACE
WELL RISER
SCREENED INTERVAL
WELL RISER
OPEN INTERVAL
20.67 POTENTIOMETRIC HEAD
POTENTIOMETRIC SURFACE
10 EQUIPOTENTIAL CONTOURS
COMPETENT BEDROCK SURFACE

PLATE 4-6

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

HYDROGEOLOGIC CROSS-SECTIONS A-A' AND D-D' (FEBRUARY 11, 1999)

SCALE: AS SHOWN

MALCOLM PIRNIE, INC.
DATE JUNE 1999
SHEET 2 OF 2
DWG. NO. 587-116

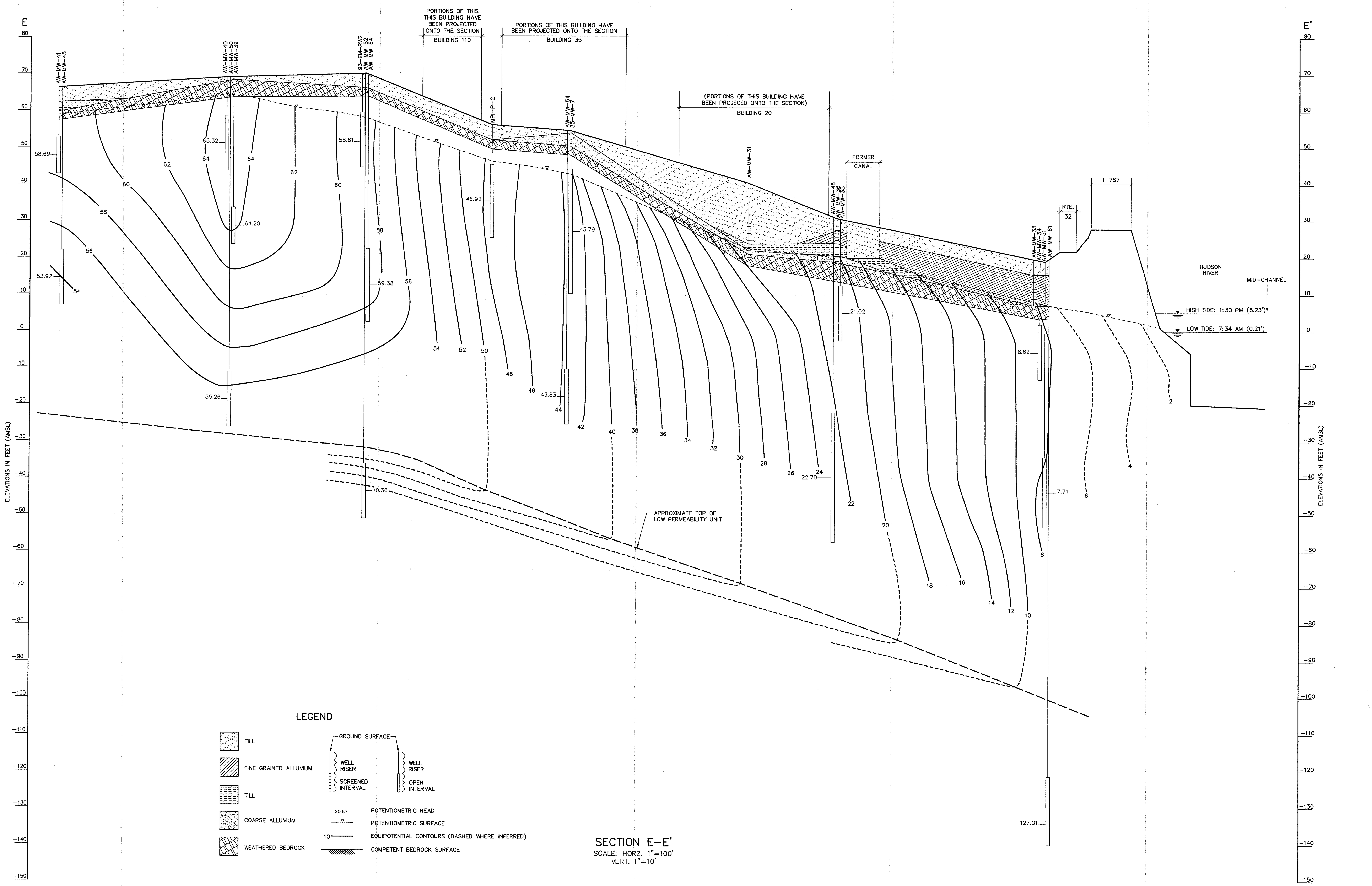

E
E'
ELEVATIONS IN FEET (AMSL)
PORTIONS OF THIS THIS BUILDING HAVE BEEN PROJECTED ONTO THE SECTION
BUILDING 110
PORTIONS OF THIS BUILDING HAVE BEEN PROJECTED ONTO THE SECTION
BUILDING 35
(PORTIONS OF THIS BUILDING HAVE BEEN PROJECED ONTO THE SECTION)
BUILDING 20
FORMER CANAL
RTE. 32
I-787
HUDSON RIVER
MID-CHANNEL
HIGH TIDE: 1:30 PM (5.23')
LOW TIDE: 7:34 AM (0.21')
AW-MW-41
AW-MW-45
AW-MW-40
AW-MW-50
AW-MW-39
93-EM-RW2
AW-MW-52
AW-MW-64
MPI-P-2
AW-MW-54
35-MW-7
AW-MW-31
AW-MW-48
AW-MW-36
AW-MW-35
AW-MW-33
AW-MW-34
AW-MW-51
AW-MW-61
APPROXIMATE TOP OF LOW PERMEABILITY UNIT
LEGEND
FILL
FINE GRAINED ALLUVIUM
TILL
COARSE ALLUVIUM
WEATHERED BEDROCK
GROUND SURFACE
WELL RISER
SCREENED INTERVAL
OPEN INTERVAL
20.67 POTENTIOMETRIC HEAD
POTENTIOMETRIC SURFACE
10 EQUIPOTENTIAL CONTOURS (DASHED WHERE INFERRED)
COMPETENT BEDROCK SURFACE
SECTION E-E'
SCALE: HORZ. 1"=100'
VERT. 1"=10'

PLATE 4-7

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN JAP
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

HYDROGEOLOGIC CROSS-SECTION E-E'
(FEBRUARY 11, 1999)
SCALE: AS SHOWN

MALCOLM PIRNIE, INC.
DATE JUNE 1999
SHEET ___ OF ___
DWG. NO. 587-120A

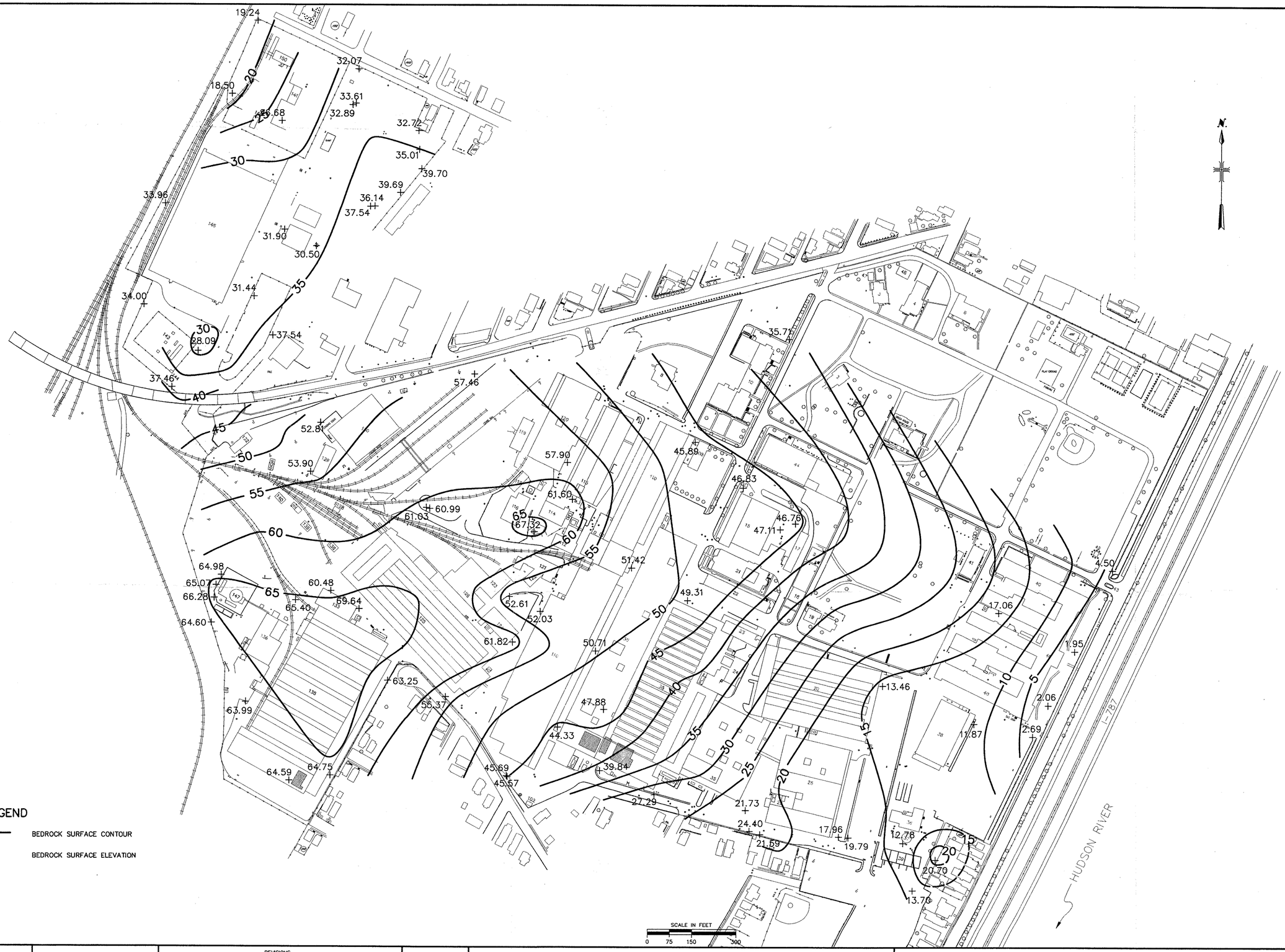


PLATE 4-8

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES DCB
DWN JAP
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

GENERALIZED BEDROCK SURFACE CONTOUR MAP

MALCOLM PIRNIE, INC.

DATE JUNE 1999

SHEET ___ OF ___

DWG. NO. 587-133

7508 3418002900 I:\ACAD\PROJ\0285\5579\DRAFT_FINAL\587-133 Scale: 1:1 Date: 06/08/1999 Time: 13:50

XREF| X587-01

LEGEND

- HYBRID MONITORING WELL LOCATIONS
- OVERBURDEN MONITORING WELL LOCATIONS
- WEATHERED BEDROCK MONITORING WELL LOCATIONS
- BEDROCK MONITORING WELL LOCATIONS

PLATE 4-9

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

FEATURE ORIENTATION MAPPING DATA

SCALE: AS SHOWN

MALCOLM PIRNIE, INC.

DATE MARCH 1999

SHEET ___ OF ___

DWG. NO. 587-113

XREF: X587-01

AW-MW-45
AW-MW-40
AW-MW-50
AW-MW-39
AW-MW-52
AW-MW-48
AW-MW-35
AW-MW-34
AW-MW-51
E
E'
ELEVATIONS IN FEET (AMSL)
PORTIONS OF THIS THIS BUILDING HAVE BEEN PROJECTED ONTO THE SECTION
BUILDING 110
PORTIONS OF THIS BUILDING HAVE BEEN PROJECTED ONTO THE SECTION
BUILDING 35
BEEN PROJECED ONTO THE SECTION)
BUILDING 20
FORMER CANAL
RTE. 32
I-787
HUDSON RIVER
MID-CHANNEL
HIGH TIDE: 1:30 PM (5.23')
LOW TIDE: 7:34 AM (0.21')
BEDDING FEATURES ONLY
LEGEND
FILL
FINE GRAINED ALLUVIUM
TILL
COARSE ALLUVIUM
WEATHERED BEDROCK
GROUND SURFACE
WELL RISER
SCREENED INTERVAL
OPEN INTERVAL
POTENTIOMETRIC SURFACE
COMPETENT BEDROCK SURFACE
FRACTURE ELEVATION (FEET, AMSL)
FRACTURE DIP DIRECTION (DEGREES)
FRACTURE DIP ANGLE (DEGREES)
NOTE:
ROSE DIAGRAMS PRESENT ALL FEATURES LOGGED DURING SURVEY IDLUDING BEDDING.
SECTION E-E'
SCALE: HORZ. 1"=100'
VERT. 1"=10'

PLATE 4-10

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

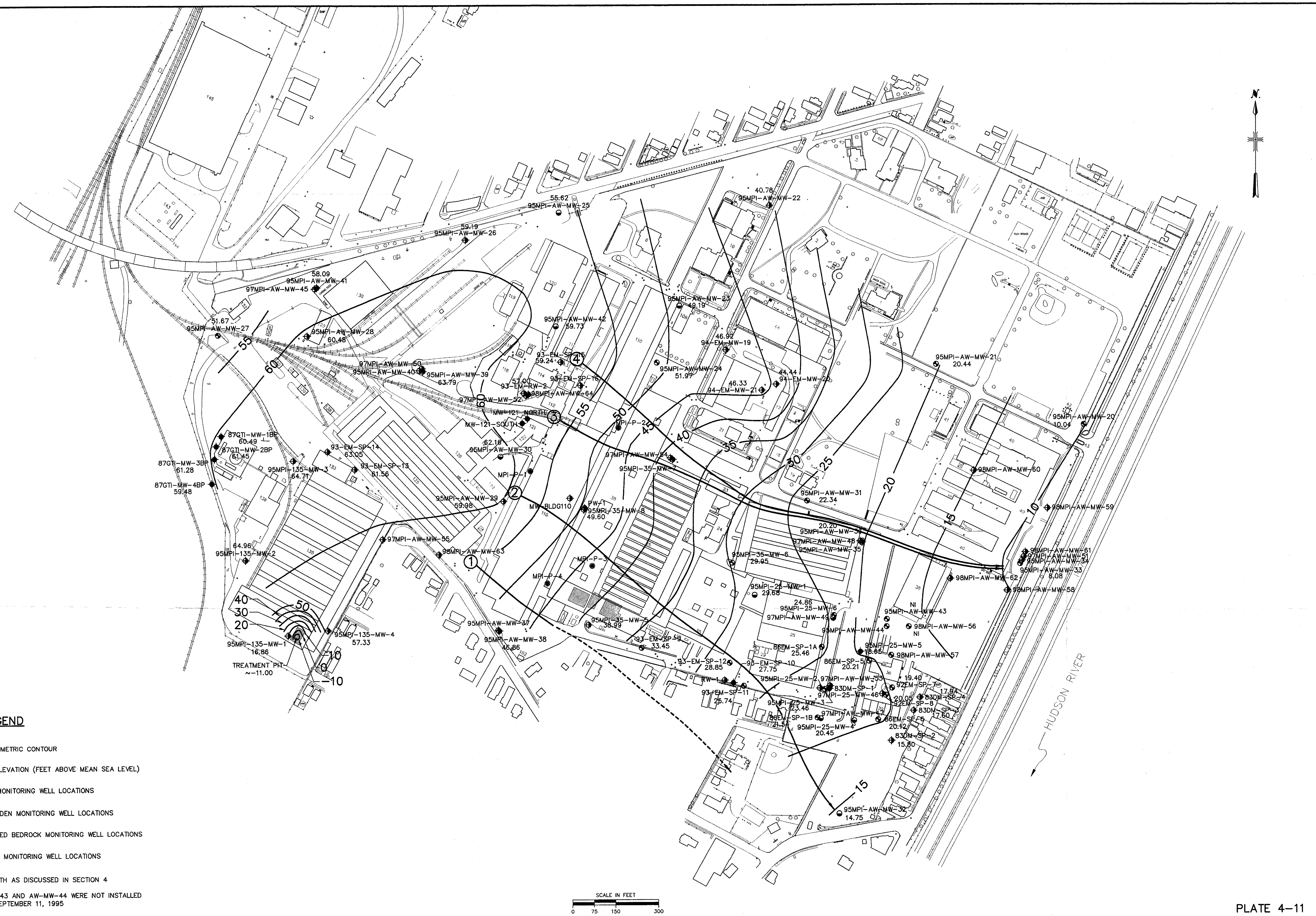
DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

ORIENTATION OF FRACTURES ALONG HYDROGEOLOGIC CROSS-SECTION E-E'

SCALE: AS SHOWN

MALCOLM PIRNIE, INC.
DATE JUNE 1999
SHEET ___ OF ___
DWG. NO. 587-147



LEGEND

—60—	POTENTIOMETRIC CONTOUR
49.60	WATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
◆	HYBRID MONITORING WELL LOCATIONS
⊗	OVERBURDEN MONITORING WELL LOCATIONS
⊖	WEATHERED BEDROCK MONITORING WELL LOCATIONS
✧	BEDROCK MONITORING WELL LOCATIONS
①→	FLOW PATH AS DISCUSSED IN SECTION 4
NI	AW-MW-43 AND AW-MW-44 WERE NOT INSTALLED AS OF SEPTEMBER 11, 1995

PLATE 4-11

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS

NO.	BY	DATE	REMARKS

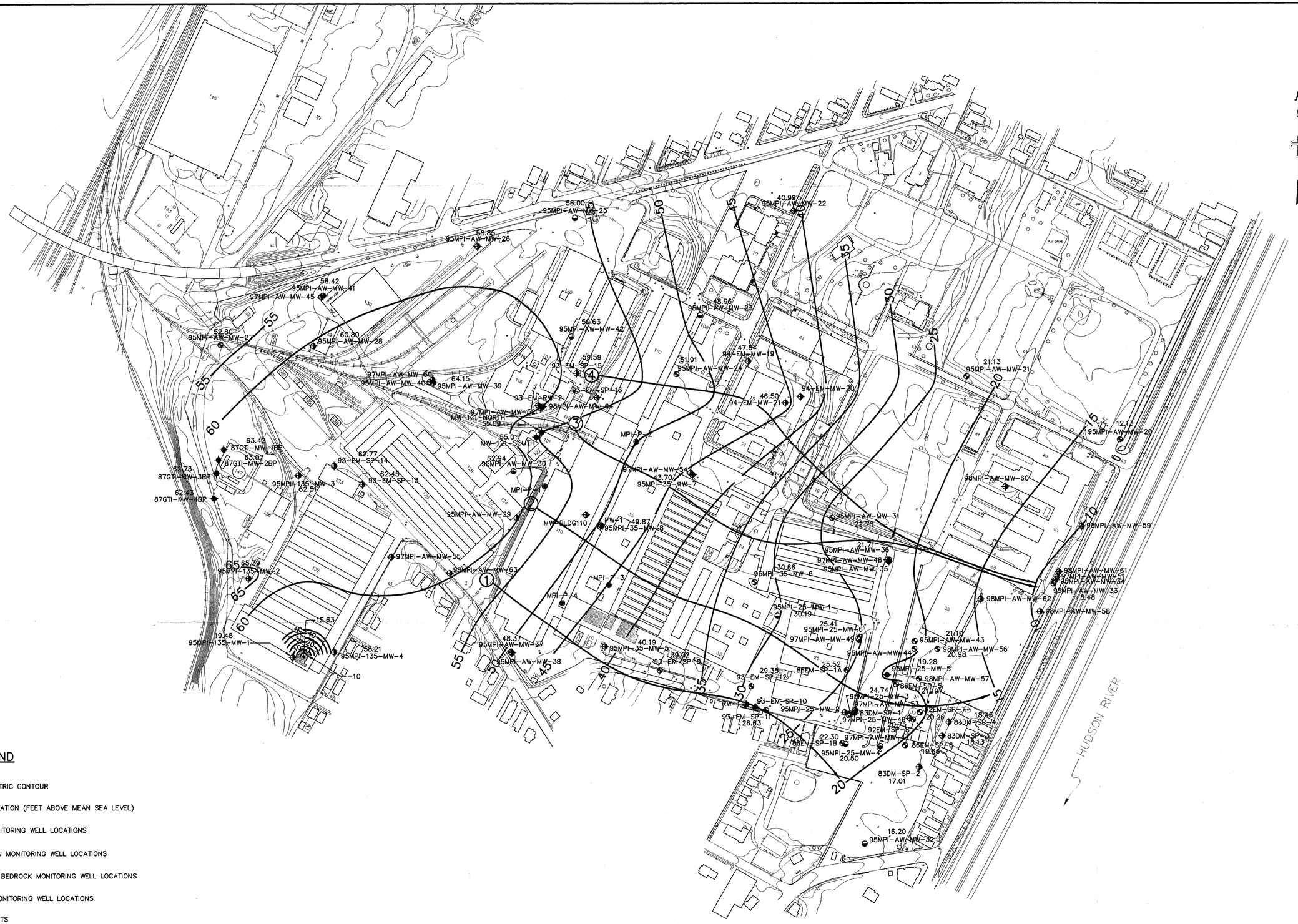
DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

SHALLOW POTENTIOMETRIC CONTOUR MAP (SEPTEMBER 11, 1995)

MALCOLM PIRNIE, INC.
DATE JUNE 1999
SHEET ___ OF ___
DWG. NO. 587-114

XREF: X587-01



LEGEND

- 60 — POTENTIOMETRIC CONTOUR
- 49.60 — WATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- HYBRID MONITORING WELL LOCATIONS
- OVERBURDEN MONITORING WELL LOCATIONS
- WEATHERED BEDROCK MONITORING WELL LOCATIONS
- BEDROCK MONITORING WELL LOCATIONS
- PROCESS PITS
- ① — FLOW PATH AS DISCUSSED IN SECTION 4

PLATE 4-12

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

SHALLOW POTENTIOMETRIC CONTOUR MAP (MAY 20, 1996)

MALCOLM PIRNIE, INC.

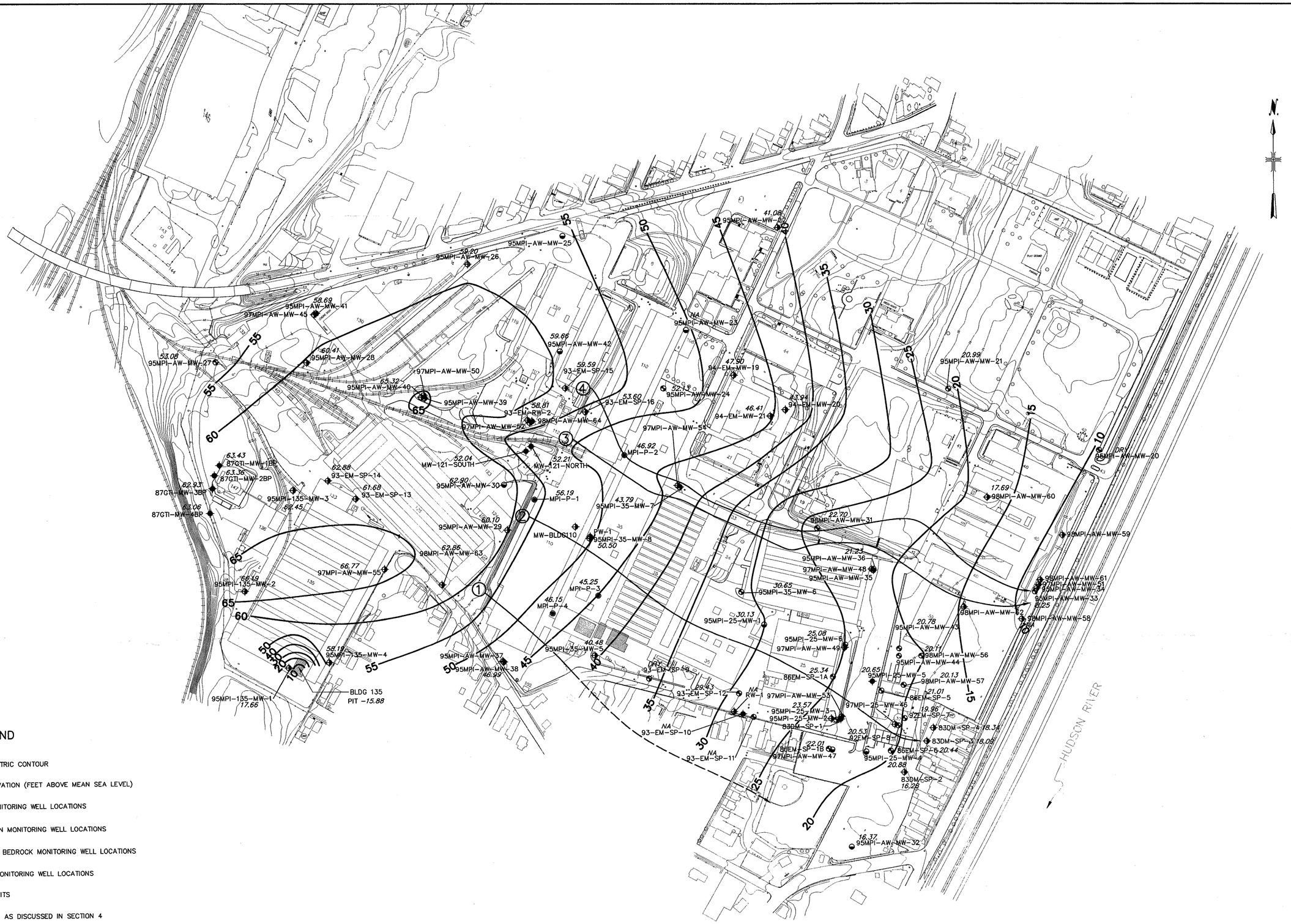
DATE JUNE 1999

SHEET ___ OF ___

DWG. NO. 587-112

XREF: X587-01

7808 3418002900 I:\ACAD\PROJ\0285\5879\04FT_FINAL\587-112 Scale: 1:1 Date: 05/08/1999 Time: 15:00



LEGEND

60	POTENTIOMETRIC CONTOUR
49.60	WATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
✦	HYBRID MONITORING WELL LOCATIONS
⊕	OVERBURDEN MONITORING WELL LOCATIONS
◒	WEATHERED BEDROCK MONITORING WELL LOCATIONS
◆	BEDROCK MONITORING WELL LOCATIONS
▒	PROCESS PITS
① →	FLOW PATH AS DISCUSSED IN SECTION 4
NA	NOT ACCESSIBLE

PLATE 4-13

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

SHALLOW POTENTIOMETRIC CONTOUR MAP (FEBRUARY 11, 1999)

MALCOLM PIRNIE, INC.

DATE JUNE 1999

SHEET ___ OF ___

DWG. NO. 587-132

XREF: X587-01

7808.3418002900 I:\ACAD\PROJ\0285\9879\DRAFT_FINAL\587-132 Scales: 1:1 Date: 06/09/1999 Time: 15:18

LEGEND

—— 60 ——	POTENTIOMETRIC CONTOUR
49.60	WATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
◆	HYBRID MONITORING WELL LOCATIONS
⊗	OVERBURDEN MONITORING WELL LOCATIONS
◓	WEATHERED BEDROCK MONITORING WELL LOCATIONS
◈	BEDROCK MONITORING WELL LOCATIONS
▨	PROCESS PITS
NA	NOT ACCESSIBLE

PLATE 4–14

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

INTERMEDIATE POTENTIOMETRIC CONTOUR MAP (FEBRUARY 11, 1999)

MALCOLM PIRNIE, INC.

DATE JUNE 1999

SHEET ____ OF ____

DWG. NO. 587-144

XREF: X587-01

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LEGEND

- PROCESS PITS
- APPROXIMATE LOCATIONS SANITARY CATCH BASINS
- APPROXIMATE LOCATIONS STORM CATCH BASINS
- APPROXIMATE LOCATIONS SANITARY MANHOLE
- APPROXIMATE LOCATIONS STORM MANHOLE
- APPROXIMATE LOCATIONS STORM PIPES
- APPROXIMATE LOCATIONS SANITARY PIPES

SOURCE: WVA-GENERAL SANITRY SEWER PLAN 11/88, DWG #18-04-01, WVA-GENERAL STORM DRAINAGE PLAN 11/88, DWG# 18-04-01

PLATE 4-15

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES CG
DWN JAP
CKD KJG

WATERVLIET ARSENAL
USACE CONTRACT NO. DACA31-94-D-0017

SANITARY AND STORM SEWER LINES

DATE JUNE 1999

SHEET ___ OF ___

DWG. NO. 587-104

XREF: X587-01

95MPI-SWMU-7-1 (8-10)	
Benzo(a)anthracene	32J
Benzo(b)fluoranthene	49J
Benzo(k)fluoranthene	51J
Benzo(a)pyrene	47J
bis(2-Ethylhexyl)phthalate	220J
Chrysene	41J
Diethylphthalate	8J
Di-n-butylphthalate	16.0J
Fluoranthene	100J
Phenanthrene	28J
Pyrene	75J
2-Butanone	5J
Chloroform	3J
Aldrin	1.9J
Heptachlor	2.1
Arsenic	4.2
Barium	47.9
Chromium	15.4
Lead	12.8
Selenium	1.9

95MPI-SWMU-7-2 (6-8)	
Di-n-butylphthalate	11J
Naphthalene	23J
2-Butanone	10J
Methylene Chloride	11
Arsenic	1.9J
Barium	106
Chromium	20.1
Lead	12.8
Selenium	2.3

95MPI-AW-MW27 (2-3)	
Diethylphthalate	10UJ
Di-n-butylphthalate	10UJ
Fluoranthene	4J
Pyrene	7J
Chrysene	5J
bis(2-Ethylhexyl)phthalate	470J
Benzo(ghi)perylene	6J
Carbon Disulfide	0.6J
1,1,1-Trichloroethane	4J
Toluene	44J
Arsenic	10.2
Barium	120
Chromium	26.2
Lead	22.6
Selenium	1.4

95MPI-AW-MW41 (0-2)	
Phenanthrene	37J
Fluoranthene	76J
Pyrene	62J
Chrysene	58J
Arsenic	12.2
Barium	110
Chromium	17.8
Lead	23.8J
Selenium	1.4

95MPI-AW-MW26 (0-2)	
Naphthalene	18J
2-Methylnaphthalene	23J
Acenaphthylene	15J
Phenanthrene	130J
Anthracene	23J
Di-n-butylphthalate	17UB
Fluoranthene	280J
Pyrene	270J
Benzo(a)anthracene	16B
Chrysene	200J
bis(2-Ethylhexyl)phthalate	1200B
Benzo(b)fluoranthene	240J
Benzo(k)fluoranthene	140J
Benzo(a)pyrene	190J
Indeno(1,2,3-cd)pyrene	130J
Dibenzo(a,h)anthracene	48J
Benzo(ghi)perylene	76J
Methylene Chloride	2UB
Benzene	0.6J
Toluene	1J
Arsenic	16.7
Barium	174
Chromium	22.8
Lead	83
Selenium	2

95MPI-AW-MW28 (3-5)	
2-Methylnaphthalene	170J
Phenanthrene	270J
Pyrene	140J
Chrysene	120J
Methylene Chloride	4B
1,1,1-Trichloroethane	2J
Toluene	3J
Ethylbenzene	3J
Xylene (total)	15
Arsenic	18.5
Barium	243
Chromium	30.7
Lead	50.5
Selenium	4

95MPI-AW-B3 (0-2)	
2-Methylnaphthalene	380J
Phenanthrene	930J
Fluoranthene	310J
Pyrene	260J
bis(2-Ethylhexyl)phthalate	370J
Vinyl Chloride	15J
Methylene Chloride	3J
Carbon Disulfide	3B
cis-1,2-Dichloroethene	13
2-Butanone	29
Tetrachloroethene	1J
Toluene	4J
Xylene (total)	2B
Arsenic	7.9
Barium	81
Cadmium	0.92
Chromium	14.3
Lead	14.2

95MPI-AW-B2 (2-4)	
Naphthalene	5J
2-Methylnaphthalene	11J
Diethylphthalate	12J
Phenanthrene	28J
Anthracene	6J
Di-n-butylphthalate	19UB
Fluoranthene	47J
Pyrene	47J
Benzo(a)anthracene	28J
Chrysene	32J
bis(2-Ethylhexyl)phthalate	26J
Di-n-octylphthalate	5J
Benzo(b)fluoranthene	33J
Benzo(k)fluoranthene	25J
Benzo(a)pyrene	27J
Indeno(1,2,3-cd)pyrene	11J
Carbon Disulfide	1J
cis-1,2-Dichloroethene	2J
2-Butanone	12
Benzene	3J
Tetrachloroethene	2J
Toluene	4J
Ethylbenzene	2J
Xylene (total)	5
Arsenic	12.3
Barium	133
Cadmium	0.4UB
Chromium	21.4
Lead	23.4

95MPI-AW-MW40 (0-2)	
Phenanthrene	39J
Anthracene	9J
Fluoranthene	56J
Pyrene	68J
Benzo(a)anthracene	22J
Chrysene	44J
bis(2-Ethylhexyl)phthalate	190UB
Benzo(b)fluoranthene	54J
Benzo(k)fluoranthene	36J
Benzo(a)pyrene	38J
Indeno(1,2,3-cd)pyrene	26J
1,1-Dichloroethene	1J
Arsenic	14.3
Barium	250
Chromium	33.1
Lead	62.2
Mercury	0.18N
Selenium	2.4

95MPI-AW-MW30 (2.5-4.5)	
Phenanthrene	25J
Anthracene	5J
Di-n-butylphthalate	15UB
Fluoranthene	50J
Pyrene	53J
Benzo(a)anthracene	29J
Chrysene	40J
bis(2-Ethylhexyl)phthalate	83UB
Benzo(b)fluoranthene	21J
Benzo(k)fluoranthene	21J
Benzo(a)pyrene	27J
Methylene Chloride	3J
Arsenic	111
Barium	751
Chromium	15
Lead	79.3
Mercury	0.15N
Selenium	0.7

95MPI-AW-B4 (0-2)	
Naphthalene	130J
2-Methylnaphthalene	300J
Acenaphthene	14J
Diethylphthalate	16J
Phenanthrene	320J
Anthracene	44J
Di-n-butylphthalate	30UB
Fluoranthene	380
Pyrene	700
Benzo(a)anthracene	210
Chrysene	300J
Benzo(b)fluoranthene	500J
Benzo(k)fluoranthene	280J
Benzo(a)pyrene	220J
Methylene Chloride	1J
Arsenic	11.5
Barium	104
Cadmium	1.5
Chromium	28.8
Lead	93.3
Mercury	0.14
Selenium	0.32B

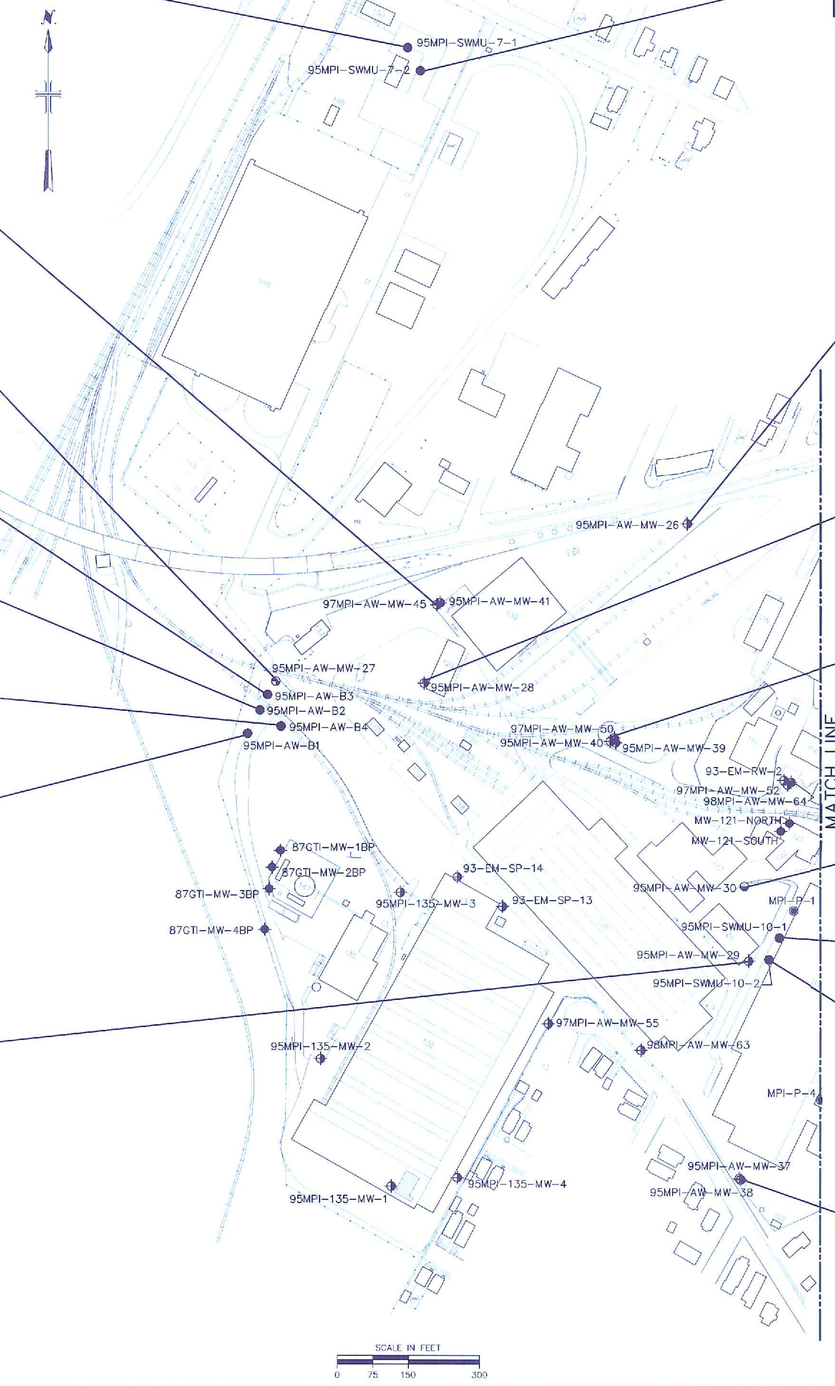
95MPI-AW-B1 (0-2)	
Acenaphthene	7J
Diethylphthalate	11J
Fluorene	15J
Phenanthrene	57J
Anthracene	5J
Di-n-butylphthalate	26.5B
Fluoranthene	23J
Pyrene	16J
Benzo(a)anthracene	8J
Chrysene	11J
bis(2-Ethylhexyl)phthalate	83J
Di-n-octylphthalate	6J
Benzo(b)fluoranthene	10J
Benzo(k)fluoranthene	8J
Benzo(a)pyrene	7J
Benzo(ghi)perylene	7J
Arsenic	7.9
Barium	167
Cadmium	1.5
Chromium	20.3
Lead	20.1

95MPI-AW-MW29 (0.5-2)	
Acenaphthene	21J
Fluorene	14J
Phenanthrene	220J
Anthracene	42J
Di-n-butylphthalate	14UB
Fluoranthene	450
Pyrene	330
Benzo(a)anthracene	210
Chrysene	230J
bis(2-Ethylhexyl)phthalate	56UB
Benzo(b)fluoranthene	220J
Benzo(k)fluoranthene	210J
Benzo(a)pyrene	220J
Indeno(1,2,3-cd)pyrene	85J
Benzo(ghi)perylene	46J
Methylene Chloride	2J
Toluene	2J
Arsenic	11.4
Barium	348
Chromium	19.2
Lead	21.3
Mercury	0.18N
Selenium	2.3

95MPI-SWMU-10-1 (3-5)	
Bis(2-Ethylhexyl)phthalate	480J
Aldrin	16J
Aroclor-1254	270J
Arsenic	4.9
Barium	44.8
Chromium	12
Lead	9.8
Selenium	1.9

95MPI-SWMU-10-2 (1-3)	
Bis(2-Ethylhexyl)phthalate	420H
Pyrene	75J
2-Butanone	7J
Chloroform	3J
Arsenic	4.4
Barium	65.5
Chromium	10.9
Lead	10.6
Selenium	1.4

95MPI-AW-MW38 (0-2)	
Acenaphthylene	48J
Phenanthrene	250J
Anthracene	64J
Fluoranthene	560
Pyrene	460
Benzo(a)anthracene	320
Chrysene	460
bis(2-Ethylhexyl)phthalate	660UB
Benzo(b)fluoranthene	680
Benzo(k)fluoranthene	360
Benzo(a)pyrene	300J
Indeno(1,2,3-cd)pyrene	210J
Dibenzo(a,h)anthracene	76J
Benzo(g,h,i)perylene	130J
Methylene Chloride	2J
Arsenic	23.9
Barium	163
Chromium	23.2
Lead	69
Mercury	0.12N
Selenium	2.4



LEGEND

- ND NON-DETECT
- SOIL BORING LOCATIONS
- HYBRID MONITORING WELL LOCATIONS
- OVERBURDEN MONITORING WELL LOCATIONS
- WEATHERED BEDROCK MONITORING WELL LOCATIONS
- BEDROCK MONITORING WELL LOCATIONS
- EXCEEDS TAGM 4046 RECOMMENDED SOIL CLEANUP OBJECTIVE
- PROCESS PITS

(UNITS FOR INORGANICS mg/kg, ALL OTHERS ug/kg)

PLATE 5-1

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

SUMMARY OF SOIL INDIVIDUAL PARAMETER RESULTS

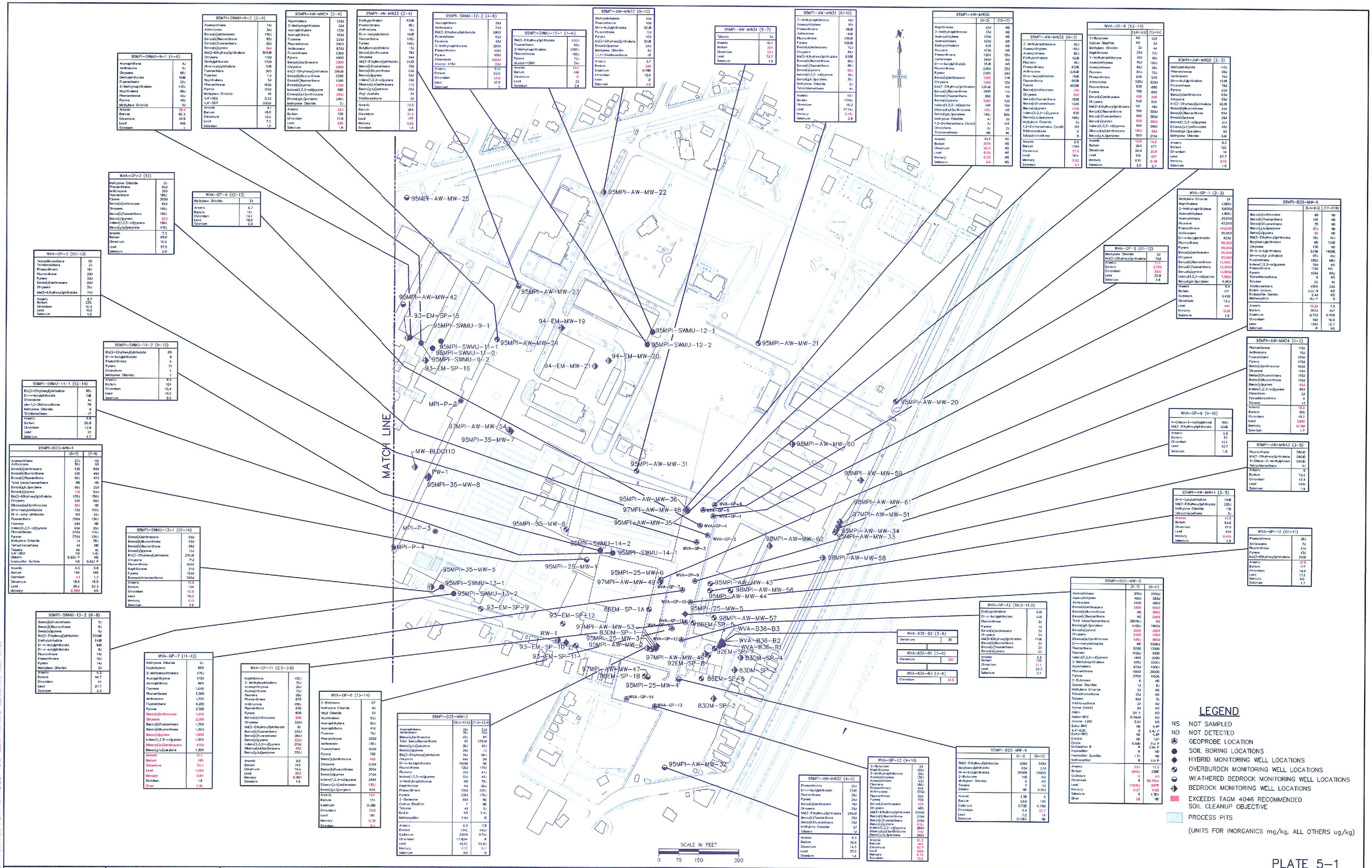
MALCOLM PIRNIE, INC.

DATE JUNE 1999

SHEET 1 OF 2

DWG. NO. 587-130C

XREF: X587-01



95MPI-SWMU-9-1 (4-6)	
Acenaphthene	4J
Anthracene	6J
Chrysene	66J
Diethylphthalate	10.8B
Fluoranthene	22J
2-Methylnaphthalene	14J
Naphthalene	96J
Phenanthrene	45J
Pyrene	45J
Methylene Chloride	4J
Arsenic	16.4
Barium	60.3
Chromium	10.9
Lead	109
Selenium	4

95MPI-SWMU-9-2 (2-4)	
Acenaphthene	14J
Anthracene	39J
Benzo(a)anthracene	130J
Benzo(b)fluoranthene	85J
Benzo(k)fluoranthene	82J
Benzo(a)pyrene	94J
Bis(2-Ethylhexyl)phthalate	3000B
Chrysene	110J
Diethylphthalate	17.8B
Di-n-butylphthalate	0.8B
Fluoranthene	260J
Fluorene	11J
Naphthalene	5J
Phenanthrene	160J
Pyrene	310J
Methylene Chloride	9J
4,4'-DDE	0.23
4,4'-DDT	0.62J
Arsenic	4.1
Barium	48.6
Chromium	10.6
Lead	7.2
Selenium	1.8

95MPI-AW-MW24 (2-4)	
Naphthalene	120J
2-Methylnaphthalene	53J
Acenaphthene	170J
Acenaphthylene	160J
Fluorene	230J
Phenanthrene	390J
Anthracene	630J
Fluoranthene	2300
Pyrene	4900
Benzo(a)anthracene	2300
Chrysene	2000
Benzo(b)fluoranthene	1900B
Benzo(k)fluoranthene	2200
Benzo(a)pyrene	1500
Indeno(1,2,3-cd)pyrene	1700
Dibenz(a,h)anthracene	340J
Benzo(g,h,i)perylene	1400
Methylene Chloride	2J
Arsenic	23.1
Barium	226
Chromium	17.9
Lead	220
Selenium	1.6

95MPI-AW-MW23 (2-4)	
Diethylphthalate	530B
Phenanthrene	80J
Anthracene	16J
Di-n-butylphthalate	16.8B
Fluoranthene	140J
Pyrene	140J
Butylbenzylphthalate	13J
Benzo(a)anthracene	78J
Chrysene	94J
bis(2-Ethylhexyl)phthalate	24.8B
Benzo(b)fluoranthene	70J
Benzo(k)fluoranthene	60J
Benzo(a)pyrene	53J
Indeno(1,2,3-cd)pyrene	43J
Dibenz(a,h)anthracene	17J
Benzo(g,h,i)perylene	25J
Vinyl Acetate	3J
Trichloroethene	3J
Arsenic	18.8
Barium	264
Chromium	21.2
Lead	177
Mercury	0.22
Selenium	1.6

95MPI-SWMU-12-2 (4-6)	
Acenaphthene	38J
Anthracene	24J
Bis(2-Ethylhexyl)phthalate	1360
Fluoranthene	92J
Fluorene	43J
2-Methylnaphthalene	280J
Phenanthrene	160J
Pyrene	180J
Aroclor-1254	230
Arsenic	8.1J
Barium	93.5
Chromium	23.6
Lead	17.5
Selenium	2

95MPI-SWMU-12-1 (4-6)	
Bis(2-Ethylhexyl)phthalate	4300
Fluoranthene	85J
2-Methylnaphthalene	1200J
Phenanthrene	100J
Pyrene	75J
Aroclor-1260	24J
Arsenic	10.7
Barium	100
Chromium	21
Lead	23
Selenium	2.6

95MPI-AW-MW22 (8-10)	
Diethylphthalate	14J
Phenanthrene	10J
Di-n-butylphthalate	33.8B
Fluoranthene	11J
Pyrene	17J
Bis(2-Ethylhexyl)phthalate	32.8B
Benzo(a)pyrene	24J
Methylene Chloride	5J
1,1,1-Trichloroethane	1.8
Arsenic	3.7
Barium	330
Cadmium	0.78B
Chromium	12.6
Lead	4.2
Selenium	1

95MPI-AW-MW31 (5-7)	
Toluene	3J
Arsenic	10.4
Barium	264
Chromium	23.1
Lead	72.7
Selenium	1.9

95MPI-AW-MW21 (6-10)	
2-Methylnaphthalene	16J
Acenaphthylene	16J
Phenanthrene	68.8J
Anthracene	14.8J
Fluoranthene	170.8J
Pyrene	120.8J
Benzo(a)anthracene	72J
Chrysene	84J
bis(2-Ethylhexyl)phthalate	930J
Benzo(b)fluoranthene	80J
Benzo(k)fluoranthene	86J
Benzo(a)pyrene	68J
Indeno(1,2,3-cd)pyrene	39J
Dibenz(a,h)anthracene	30J
Methylene Chloride	2J
Tetrachloroethene	4J
Arsenic	10.1
Barium	179B
Chromium	18.3
Lead	67.1J
Mercury	0.18J
Selenium	2.8

95MPI-AW-MW36		
	(0-2)	(10-12)
Naphthalene	25J	ND
2-Methylnaphthalene	33J	ND
Acenaphthylene	130J	ND
Acenaphthene	120J	ND
Diethylphthalate	6.4B	ND
Fluorene	120J	ND
Phenanthrene	1200	22J
Anthracene	340J	ND
Di-n-butylphthalate	15.8	ND
Fluoranthene	2000	22J
Pyrene	2200	24J
Benzo(a)anthracene	1200	11J
Chrysene	1300	12J
bis(2-Ethylhexyl)phthalate	2300J	8J
Benzo(b)fluoranthene	1500	11J
Benzo(k)fluoranthene	850	9J
Benzo(a)pyrene	1200	12J
Indeno(1,2,3-cd)pyrene	440	12J
Dibenz(a,h)anthracene	100	3J
Benzo(g,h,i)perylene	140J	8J
Methylene Chloride	4J	3J
1,2-Dichloroethene (total)	4J	11J
Trichloroethene	2J	2J
Tetrachloroethene	1J	4J
Arsenic	10.3	NS
Barium	209B	NS
Chromium	26.4	NS
Lead	813J	NS
Mercury	0.23	NS
Selenium	3.8	NS

95MPI-AW-MW35 (0-2)	
2-Methylnaphthalene	80J
Acenaphthylene	90J
Acenaphthene	63.8B
Fluorene	95J
Phenanthrene	830B
Anthracene	220.8B
Di-n-butylphthalate	11J
Fluoranthene	3000B
Pyrene	2400
Benzo(a)anthracene	750
Chrysene	690
Benzo(b)fluoranthene	1800
Benzo(k)fluoranthene	1500
Benzo(a)pyrene	1300
Indeno(1,2,3-cd)pyrene	830
Dibenz(a,h)anthracene	490J
Methylene Chloride	3J
1,2-Dichloroethene (total)	10J
Trichloroethene	9
Tetrachloroethene	5
Arsenic	8.9
Barium	174B
Chromium	37.5
Lead	181
Mercury	0.22
Selenium	4.1

WVA-GP-8 (13-14)		
	(0.0-3.0)	(12-14)
2-Butanone	ND	12J
Carbon Disulfide	ND	3J
Methylene Chloride	2J	4J
Naphthalene	25J	72J
2-Methylnaphthalene	28J	49J
Acenaphthylene	9.6J	15J
Acenaphthene	68J	58J
Fluorene	46J	73J
Phenanthrene	610	540
Anthracene	200J	220J
Fluoranthene	820	680
Pyrene	750	650
Benzo(a)anthracene	480	590
Chrysene	540	510
bis(2-Ethylhexyl)phthalate	ND	48J
Benzo(b)fluoranthene	390	500J
Benzo(k)fluoranthene	490	360J
Benzo(a)pyrene	550	380J
Indeno(1,2,3-cd)pyrene	490	240J
Dibenz(a,h)anthracene	190J	88J
Benzo(g,h,i)perylene	500	210J
Arsenic	13.8	14.2
Barium	269	177
Chromium	20.4	20.8
Lead	116	327
Mercury	0.11	0.48
Selenium	2.2	2.7

95MPI-AW-MW20 (2-3)	
Diethylphthalate	110J
Phenanthrene	55J
Anthracene	15J
Di-n-butylphthalate	12.8B
Fluoranthene	78J
Pyrene	93J
Benzo(a)anthracene	63J
Chrysene	59J
bis(2-Ethylhexyl)phthalate	42.8B
Benzo(b)fluoranthene	34J
Benzo(k)fluoranthene	55J
Benzo(a)pyrene	38J
Indeno(1,2,3-cd)pyrene	21J
Dibenz(a,h)anthracene	10J
Benzo(g,h,i)perylene	8J
Methylene Chloride	3.3B
Arsenic	8.3
Barium	123
Chromium	18
Lead	67.7
Mercury	0.16
Selenium	1.9

WVA-GP-2 (12)	
Methylene Chloride	3J
Phenanthrene	23J
Anthracene	19UJ
Fluoranthene	19UJ
Pyrene	20UJ
Benzo(a)anthracene	19UJ
Chrysene	19UJ
Benzo(b)fluoranthene	19UJ
Benzo(k)fluoranthene	19UJ
Benzo(a)pyrene	19UJ
Indeno(1,2,3-cd)pyrene	19UJ
Dibenz(a,h)anthracene	19UJ
Benzo(g,h,i)perylene	19UJ
Arsenic	7.2
Barium	85.0
Chromium	16.5
Lead	57.5
Selenium	2.8

WVA-GP-4 (12-13)	
Methylene Chloride	3J
Arsenic	8.7
Barium	101
Chromium	14.1
Lead	18.9
Selenium	2.9

WVA-GP-1 (2-3)	
Methylene Chloride	3J
Naphthalene	1,800J
2-Methylnaphthalene	8,600J
Acenaphthylene	1,800J
Acenaphthene	35,000
Fluorene	47,000
Phenanthrene	220,000
Anthracene	30,000
Di-n-butylphthalate	820J
Fluoranthene	58,000
Pyrene	58,000
Benzo(a)anthracene	30,000
Chrysene	27,000
Benzo(b)fluoranthene	11,000J
Benzo(k)fluoranthene	12,000J
Benzo(a)pyrene	14,000J
Indeno(1,2,3-cd)pyrene	7,900J
Benzo(g,h,i)perylene	5,900J
Arsenic	8.4
Barium	171
Cadmium	0.43B
Chromium	13.2
Lead	44
Mercury	0.28
Selenium	1.8

WVA-GP-3 (12-13)	
Tetrachloroethene	1J
Trichloroethene	3J
Phenanthrene	16J
Fluoranthene	28J
Pyrene	33J
Benzo(a)anthracene	20J
Chrysene	31J
bis(2-Ethylhexyl)phthalate	74J
Arsenic	8.7
Barium	229
Chromium	16.4
Lead	103
Selenium	1.8

WVA-GP-11 (2.5-3.0)	
Naphthalene	12UJ
2-Methylnaphthalene	26J
Acenaphthylene	75J
Fluorene	98J
Phenanthrene	870
Anthracene	150J
Fluoranthene	830
Pyrene	600
Benzo(a)anthracene	230
Chrysene	220J
bis(2-Ethylhexyl)phthalate	30
Benzo(b)fluoranthene	220J
Benzo(k)fluoranthene	260J
Benzo(a)pyrene	220J
Indeno(1,2,3-cd)pyrene	210J
Dibenz(a,h)anthracene	68J
Benzo(g,h,i)perylene	220J
Arsenic	9.8
Barium	113
Chromium	14.0
Lead	80J
Mercury	0.06J
Selenium	1.6

WVA-GP-12 (10.0-11.5)	
Diethylphthalate	6.6B
Di-n-butylphthalate	6.8B
Fluoranthene	2J
Pyrene	4J
Benzo(a)anthracene	2J
Chrysene	2J
bis(2-Ethylhexyl)phthalate	77.4J
Benzo(b)fluoranthene	2J
Benzo(k)fluoranthene	2J
Benzo(a)pyrene	2J
Arsenic	6.8
Barium	135
Chromium	21.1
Lead	25.3
Selenium	2.1

WVA-GP-5 (11-12)	
Methylene Chloride	3J
bis(2-Ethylhexyl)phthalate	78J
Arsenic	11.7
Barium	1,730
Chromium	20.0
Lead	23.8
Selenium	2.6

WVA-GP-8 (13-14)	
2-Butanone	67
Methylene Chloride	4J
Vinyl Chloride	3J
Naphthalene	53J
Acenaphthylene	60J
Acenaphthene	41J
Fluorene	75J
Phenanthrene	260J
Anthracene	130J
Fluoranthene	560J
Pyrene	700
Benzo(a)anthracene	480
Chrysene	530J
Benzo(b)fluoranthene	300J
Benzo(k)fluoranthene	370J
Indeno(1,2,3-cd)pyrene	240J
Dibenz(a,h)anthracene	130J
Benzo(g,h,i)perylene	66J
Arsenic	14.7
Barium	134
Cadmium	0.38B
Chromium	43.8
Lead	181
Mercury	0.76
Selenium	3.1

WVA-GP-13 (9-10)	
2-Butanone	24
Naphthalene	59J
2-Methylnaphthalene	130J
Acenaphthene	63J
Fluorene	160J
Phenanthrene	910
Anthracene	220J
Fluoranthene	860
Pyrene	720
Benzo(a)anthracene	420
Chrysene	480
bis(2-Ethylhexyl)phthalate	2500B
Benzo(b)fluoranthene	270J
Benzo(k)fluoranthene	210J
Toluene	2J
Arsenic	5.3
Barium	70.9
Chromium	14.3
Lead	37.9
Selenium	1.4

WVA-GP-9 (9-10)	
4-Chloro-3-methylphenol	160J
bis(2-Ethylhexyl)phthalate	93.8B
Arsenic	5.8
Barium	83
Chromium	13.1
Lead	12.7
Selenium	1.8

WVA-B36-B2 (3-6)	
Chromium	26

WVA-B36-B1 (3-6)	
Chromium	337

WVA-B36-B3 (3-6)	
Chromium	51.5

95MPI-SWMU-13-2 (6-8)	
Benzo(b)fluoranthene	9J
Benzo(k)fluoranthene	9J
Benzo(a)pyrene	9J
bis(2-Ethylhexyl)phthalate	230B
Diethylphthalate	14B
Di-n-butylphthalate	8J
Di-n-octylphthalate	14J
Fluoranthene	16J
Phenanthrene	16J
Pyrene	14J
Methylene Chloride	2J
Arsenic	6.2
Barium	44.7
Chromium	14
Lead	27.7
Selenium	2.2

95MPI-SWMU-13-1 (12-14)	
Benzo(a)anthracene	68J
Benzo(b)fluoranthene	93J
Benzo(k)fluoranthene	88J
Benzo(a)pyrene	78J
bis(2-Ethylhexyl)phthalate	270.8
Chrysene	71J
Fluoranthene	200J
Naphthalene	21J
Pyrene	160J
Bromodichloromethane	240J
Arsenic	11.2
Barium	134
Chromium	42.8
Lead	75.2
Mercury	0.11
Selenium	2.6

95MPI-SWMU-14-2 (9-12)	
Bis(2-Ethylhexyl)phthalate	69
Di-n-butylphthalate	9
Phenanthrene	6
Pyrene	21
Chloroform	4
Methylene Chloride	7
Arsenic	8.6
Barium	104
Chromium	15.4
Lead	19.2
Selenium	2.5

95MPI-SWMU-14-1 (12-14)	
Bis(2-Ethylhexyl)phthalate	95J
Di-n-butylphthalate	7.8B
Chloroform	4J
cis-1,2-Dichloroethene	78
Methylene Chloride	6
Trichloroethene	17
Arsenic	5.9
Barium	50.9
Chromium	13.9
Lead	12
Selenium	1.7

95MPI-AW-MW32 (4-6)	
Phenanthrene	22J
Di-n-butylphthalate	23.8B
Fluoranthene	28J
Pyrene	34J
Benzo(a)anthracene	18J
Chrysene	25J
bis(2-Ethylhexyl)phthalate	2400B
Benzo(b)fluoranthene	25J
Benzo(k)fluoranthene	20J
Methylene Chloride	2J
Toluene	1J
Arsenic	5.3
Barium	70.9
Chromium	14.3
Lead	37.9
Selenium	1.4

95MPI-B25-MW-1		
	(5-7)	(7-9)
Acenaphthene	27J	ND
Anthracene	56J	ND
Benzo(a)anthracene	130	60J
Benzo(b)fluoranthene	120	49J
Benzo(k)fluoranthene	65J	47J
Total benzofluoranthenes	NS	NS
Benzo(g,h,i)perylene	58J	35J
Benzo(a)pyrene	110	54J
Bis(2-Ethylhexyl)phthalate	170J	150J
Chrysene	120	58J
Dibenzo(a,h)anthracene	30J	ND
Di-n-butylphthalate	73J	110J
Di-n-octyl phthalate	ND	41J
Fluoranthene	210J	130J
Fluorene	29J	ND
Indeno(1,2,3-cd)pyrene	60J	29J
Phenanthrene	270J	110J
Pyrene	270J	120J
Methylene Chloride	1J	7B
Tetrachloroethene	4J	ND
Toluene	4J	1J
4,4'-DDD	ND	1.4J
Dieldrin	0.83J P	ND
Endosulfan Sulfate	ND	0.42J P
Arsenic	4.3	5.8
Barium	145	190
Cadmium	1.1	1.3
Chromium	18.8	18.5
Lead	38.2	23.3
Mercury	0.38M	ND

95MPI-B25-MW-2		
	(6.0-7.5)	(11.4-13.4)
Acenaphthene	34J	53J
Anthracene	36J	39J
Benzo(a)anthracene	43J	89
Total benzofluoranthenes	NS	175.4
Benzo(g,h,i)perylene	35J	46J
Benzo(a)pyrene	34J	73
Bis(2-Ethylhexyl)phthalate	34J	NDJ
Chrysene	64J	94
Di-n-butylphthalate	100UB	9B
Fluoranthene	120J	170J
Fluorene	33J	41J
Indeno(1,2,3-cd)pyrene	22J	43J
2-Methylnaphthalene	ND	78J
Naphthalene	ND	88J
Phenanthrene	120J	220J
Pyrene	120J	170J
2-Butanone	93J	ND
Carbon Disulfide	7	ND
Toluene	4J	3J
Endrin	ND	2.4J
Methoxychlor	6.6J	8
Arsenic	6.9	7.8
Barium	134J	442J
Cadmium	0.61B	3.7J
Chromium	17.1B	8
Lead	42.6J	56.6J
Mercury	0.17	0.7
Selenium	ND	8

95MPI-B25-MW-4		
	(1-3)	(9-11)
bis(2-Ethylhexyl)phthalate	308J	745J
Butylbenzylphthalate	65J	27J
Di-n-butylphthalate	2500B	1500B
2-Butanone	11B	ND
Methylene Chloride	6	ND
Toluene	7	0.36J
Arsenic	1.3B	5
Barium	309	140
Cadmium	0.72B	0.79B
Chromium	9.4	20.7
Lead	7.2	14
Selenium	0.72B	ND

95MPI-B25-MW-5		
	(5-7)	(9-11)
Acenaphthene	570J	2300J
Acenaphthylene	400J	880J
Anthracene	1600	4800
Benzo(a)anthracene	3800	8000
Benzo(b)fluoranthene	NS	3800
Benzo(k)fluoranthene	NS	2400
Total benzofluoranthenes	3800MJ	NS
Benzo(g,h,i)perylene	1400J	1900J
Benzo(a)pyrene	2000	3200
Chrysene	2400	4700
Dibenz(a,h)anthracene	680J	800J
Di-n-butylphthalate	ND	5500J
Fluoranthene	5300	13000
Fluorene	1100J	4000
Indeno(1,2,3-cd)pyrene	1400	2000
2-Methylnaphthalene	470J	1200J
Naphthalene	870J	1300J
Phenanthrene	9500	20000
Pyrene	5700	11000
2-Butanone	9	ND
Carbon Disulfide	1J	6J
Methylene Chloride	2J	ND
Tetrachloroethene	13J	ND
Toluene	40J	3J
Trichloroethene	2J	ND
Xylene (total)	5J	ND
Aldrin	3.9 X	ND
Alpha-BHC	0.543B	ND
Aroclor-1260	3.5J	ND
Beta-BHC	ND	4.4P
4,4'-DDE	8	2.4J P
Delta-BHC	ND	4.4P
Dieldrin	ND	12P
Endrin	6.9JN	31J P
Endosulfan II	8	3.9J P
Heptachlor	8	ND
Heptachlor Epoxide	1.3J	ND
Methoxychlor	8	11J P
Arsenic	53.1	17.3
Barium	291J	228E
Cadmium	3	6.1
Chromium	8	88.7DN
Lead	1760DJ	607E
Mercury	0.27	0.82
Selenium	8	1.3B+
Silver	28	ND

95MPI-AW-MW24 (0-2)	
Phenanthrene	110J
Anthracene	18J
Fluoranthene	650J
Pyrene	870J
Benzo(a)anthracene	400J
Chrysene	410J
Benzo(b)fluoranthene	410J
Benzo(k)fluoranthene	410J
Benzo(a)pyrene	410J
Indeno(1,2,3-cd)pyrene	130J
Dibenz(a,h)anthracene	41J
Benzo(g,h,i)perylene	110J
Arsenic	11.2
Barium	264
Chromium	14.9
Lead	17.1
Mercury	0.13
Selenium	1.7

95MPI-AW-MW43 (3-5)	
Fluoranthene	380J0
bis(2-Ethylhexyl)phthalate	190J0
4-Chloro-3-methylphenol	290J0
Tetrachloroethene	4J
Arsenic	6
Barium	73.5
Chromium	13.4
Lead	149J
Selenium	1.9

95MPI-AW-MW44 (3-5)	
Di-n-butylphthalate	10J0
bis(2-Ethylhexyl)phthalate	220J
Methylene Chloride	11J
Tetrachloroethene	3J
Arsenic	12.8
Barium	93.6
Chromium	19.9
Lead	41J
Mercury	0.41J
Selenium	2.6

WVA-GP-10 (10-11)	
Phenanthrene	38J
Anthracene	7J
Fluoranthene	17J
Pyrene	13J
bis(2-Ethylhexyl)phthalate	33J0
Arsenic	13.5
Barium	117
Chromium	14.9
Lead	17.1
Mercury	NJ
Selenium	1.7

95MPI-B25-MW-6		
	(6.3-8.0)	(17-17.9)
Benzo(a)anthracene	9J	ND
Benzo(b)fluoranthene	10J	ND
Benzo(k)fluoranthene	7J	ND
Benzo(g,h,i)perylene	31J	ND
Benzo(a)pyrene	8J	ND
Bis(2-Ethylhexyl)phthalate	78J	51J
Butylbenzylphthalate	ND	750B
Chrysene	13J	ND
Di-n-butylphthalate	320B	1900B
Di-n-octyl phthalate	97J	41J
Fluoranthene	180J	18J
Indeno(1,2,3-cd)pyrene	33J	ND
Phenanthrene	110J	ND
Pyrene	160J	ND
Tetrachloroethene	8	ND
Toluene	2J	4J
Trichloroethene	430J	25J
Aldrin	2.2J N	ND
Endrin Ketone	3.2J N	ND
Endosulfan Sulfate	2.4J	ND
Methoxychlor	11J P	8
Arsenic	11.2J	7.5
Barium	207J	197
Cadmium	0.77J	0.79B
Chromium	13J	16.9
Lead	13J	15.7
Selenium	8	NDJ

95MPI-AW-MW33 (0-2)	
Diethylphthalate	11J
Phenanthrene	55J
Anthracene	15J
Di-n-butylphthalate	12.8B
Fluoranthene	78J
Pyrene	93J
Benzo(a)anthracene	63J
Chrysene	59J
bis(2-Ethylhexyl)phthalate	42.8B
Benzo(b)fluoranthene	34J
Benzo(k)fluoranthene	55J
Benzo(a)pyrene	38J
Indeno(1,2,3-cd)pyrene	21J
Dibenz(a,h)anthracene	10J
Benzo(g,h,i)perylene	8J
Methylene Chloride	3.3B
Arsenic	8.3
Barium	123
Chromium	18
Lead	67.7
Mercury	0.16
Selenium	1.9

95MPI-AW-MW34 (0-2)	
Phenanthrene	110J
Anthracene	18J
Fluoranthene	650J
Pyrene	870J
Benzo(a)anthracene	400J
Chrysene	410J
Benzo(b)fluoranthene	410J
Benzo(k)fluoranthene	410J
Benzo(a)pyrene	410J
Indeno(1,2,3-cd)pyrene	130J
Dibenz(a,h)anthracene	41J
Benzo(g,h,i)perylene	110J
Chloroform	2J
Tetrachloroethene	6
Toluene	1J
Arsenic	13.2
Barium	264
Chromium	14.9
Lead	17.1
Mercury	0.13
Selenium	1.7

LEGEND

- NS NOT SAMPLED
- ND NOT DETECTED
- GEOPROBE LOCATION
- SOIL BORING LOCATIONS
- HYBRID MONITORING WELL LOCATIONS
- OVERBURDEN MONITORING WELL LOCATIONS
- WEATHERED BEDROCK MONITORING WELL LOCATIONS
- BEDROCK MONITORING WELL LOCATIONS
- EXCEEDS TAGM 4046 RECOMMENDED SOIL CLEANUP OBJECTIVE
- PROCESS PITS

(UNITS FOR INORGANICS mg/kg, ALL OTHERS ug/kg)

PLATE 5-1

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

SUMMARY OF SOIL INDIVIDUAL PARAMETER RESULTS

MALCOLM PIRNIE, INC.

DATE JUNE 1999

SHEET 2 OF 2

DWG. NO. 587-131C

XREF: X587-01

4871 028558700 I:\ARO\PROJ\028558\879\DRAFT_FINAL\587-131C Scale: 1:1 Date: 08/02/1999 Time: 07:05

95MPI-SWMU-7-1 (8-10)	
TOTAL VOLATILES	8
TOTAL CHLORINATED VOLATILES	3
TOTAL SEMI-VOLATILES	665

95MPI-SWMU-7-2 (6-8)	
TOTAL VOLATILES	28
TOTAL CHLORINATED VOLATILES	18
TOTAL SEMI-VOLATILES	34

95MPI-AW-MW-41 (0-2)	
TOTAL VOLATILES	ND
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	166

95MPI-AW-MW-28 (3-5)	
TOTAL VOLATILES	27
TOTAL CHLORINATED VOLATILES	6
TOTAL SEMI-VOLATILES	800

95MPI-AW-MW-27 (2-3)	
TOTAL VOLATILES	8.6
TOTAL CHLORINATED VOLATILES	4
TOTAL SEMI-VOLATILES	100

95MPI-AW-B-3 (0-2)	
TOTAL VOLATILES	142
TOTAL CHLORINATED VOLATILES	43
TOTAL SEMI-VOLATILES	2250

95MPI-AW-B-2 (2-4)	
TOTAL VOLATILES	28
TOTAL CHLORINATED VOLATILES	4
TOTAL SEMI-VOLATILES	382

95MPI-AW-B-1 (0-2)	
TOTAL VOLATILES	ND
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	310

95MPI-AW-B-4 (0-2)	
TOTAL VOLATILES	19
TOTAL CHLORINATED VOLATILES	9
TOTAL SEMI-VOLATILES	3324

95MPI-AW-MW-30 (2.5-4.5)	
TOTAL VOLATILES	2
TOTAL CHLORINATED VOLATILES	2
TOTAL SEMI-VOLATILES	291

95MPI-SWMU-10-1 (3-5)	
TOTAL VOLATILES	ND
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	490

95MPI-AW-MW-29 (0.5-2)	
TOTAL VOLATILES	5
TOTAL CHLORINATED VOLATILES	2
TOTAL SEMI-VOLATILES	2392

95MPI-SWMU-10-2 (1-3)	
TOTAL VOLATILES	10
TOTAL CHLORINATED VOLATILES	3
TOTAL SEMI-VOLATILES	690

95MPI-AW-MW-38 (0-2)	
TOTAL VOLATILES	2
TOTAL CHLORINATED VOLATILES	2
TOTAL SEMI-VOLATILES	3979

95MPI-SWMU-13-1 (12-14)	
TOTAL VOLATILES	240
TOTAL CHLORINATED VOLATILES	240
TOTAL SEMI-VOLATILES	1074

95MPI-SWMU-13-2 (6-8)	
TOTAL VOLATILES	3
TOTAL CHLORINATED VOLATILES	3
TOTAL SEMI-VOLATILES	214

95MPI-B25-MW-1	(0-7)	(7-9)
TOTAL VOLATILES	45	11
TOTAL CHLORINATED VOLATILES	5	7
TOTAL SEMI-VOLATILES	1895	993

95MPI-SWMU-14-1 (12-14)	
TOTAL VOLATILES	105
TOTAL CHLORINATED VOLATILES	105
TOTAL SEMI-VOLATILES	102

95MPI-AW-MW-26 (0-2)	
TOTAL VOLATILES	3.6
TOTAL CHLORINATED VOLATILES	2
TOTAL SEMI-VOLATILES	2051

95MPI-AW-MW-40 (0-2)	
TOTAL VOLATILES	1
TOTAL CHLORINATED VOLATILES	1
TOTAL SEMI-VOLATILES	516

95MPI-SWMU-9-1 (4-6)	
TOTAL VOLATILES	4
TOTAL CHLORINATED VOLATILES	4
TOTAL SEMI-VOLATILES	409

95MPI-SWMU-9-2 (2-4)	
TOTAL VOLATILES	10
TOTAL CHLORINATED VOLATILES	10
TOTAL SEMI-VOLATILES	1726

95MPI-AW-MW-23 (2-4)	
TOTAL VOLATILES	5
TOTAL CHLORINATED VOLATILES	3
TOTAL SEMI-VOLATILES	1394

95MPI-AW-MW-22 (8-10)	
TOTAL VOLATILES	23
TOTAL CHLORINATED VOLATILES	23
TOTAL SEMI-VOLATILES	140

95MPI-AW-MW-24 (2-4)	
TOTAL VOLATILES	2
TOTAL CHLORINATED VOLATILES	2
TOTAL SEMI-VOLATILES	26600

95MPI-SWMU-12-1 (4-6)	
TOTAL VOLATILES	ND
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	8257

95MPI-SWMU-12-2 (4-6)	
TOTAL VOLATILES	1800
TOTAL CHLORINATED VOLATILES	1800
TOTAL SEMI-VOLATILES	6077

95MPI-AW-MW-21 (8-10)	
TOTAL VOLATILES	6
TOTAL CHLORINATED VOLATILES	6
TOTAL SEMI-VOLATILES	1748

95MPI-AW-MW-31 (5-7)	
TOTAL VOLATILES	2
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	ND

95MPI-AW-MW-20 (2-3)	
TOTAL VOLATILES	3
TOTAL CHLORINATED VOLATILES	3
TOTAL SEMI-VOLATILES	678

95MPI-AW-MW36	(0-2)	(10-12)
TOTAL VOLATILES	11	168
TOTAL CHLORINATED VOLATILES	11	168
TOTAL SEMI-VOLATILES	13052	214

95MPI-AW-MW-35 (0-2)	
TOTAL VOLATILES	117
TOTAL CHLORINATED VOLATILES	117
TOTAL SEMI-VOLATILES	12730

95MPI-SWMU-14-2 (9-12)	
TOTAL VOLATILES	11
TOTAL CHLORINATED VOLATILES	11
TOTAL SEMI-VOLATILES	105

95MPI-AW-MW-34 (0-2)	
TOTAL VOLATILES	9
TOTAL CHLORINATED VOLATILES	9
TOTAL SEMI-VOLATILES	1077

95MPI-B25-MW-6	(6.5-8.5)	(17-17.8)
TOTAL VOLATILES	458	254
TOTAL CHLORINATED VOLATILES	436	250
TOTAL SEMI-VOLATILES	1697	2242

95MPI-AW-MW-43 (3-5)	
TOTAL VOLATILES	4
TOTAL CHLORINATED VOLATILES	4
TOTAL SEMI-VOLATILES	930

95MPI-AW-MW-44 (3-5)	
TOTAL VOLATILES	14
TOTAL CHLORINATED VOLATILES	14
TOTAL SEMI-VOLATILES	230

95MPI-B25-MW-5	(5-7)	(9-11)
TOTAL VOLATILES	68	90
TOTAL CHLORINATED VOLATILES	16	ND
TOTAL SEMI-VOLATILES	36820	62380

95MPI-B25-MW-4	(1-3)	(9-11)
TOTAL VOLATILES	24	10
TOTAL CHLORINATED VOLATILES	6	ND
TOTAL SEMI-VOLATILES	2617	2551

95MPI-B25-MW-2	(8.5-10.5)	(11.4-13.4)
TOTAL VOLATILES	9	30
TOTAL CHLORINATED VOLATILES	ND	ND
TOTAL SEMI-VOLATILES	1375	1706

95MPI-AW-MW-32 (4-6)	
TOTAL VOLATILES	3
TOTAL CHLORINATED VOLATILES	2
TOTAL SEMI-VOLATILES	439

95MPI-SWMU-1
95MPI-SWMU-2
95MPI-SWMU-3
95MPI-SWMU-4
95MPI-SWMU-5
95MPI-SWMU-6
95MPI-SWMU-7-1
95MPI-SWMU-7-2
95MPI-SWMU-8-1
95MPI-SWMU-8-2
95MPI-SWMU-9-1
95MPI-SWMU-9-2
95MPI-SWMU-10-1
95MPI-SWMU-10-2
95MPI-SWMU-11-1
95MPI-SWMU-11-2
95MPI-SWMU-12-1
95MPI-SWMU-12-2
95MPI-SWMU-13-1
95MPI-SWMU-13-2
95MPI-SWMU-14-1
95MPI-SWMU-14-2
95MPI-AW-MW-20
95MPI-AW-MW-21
95MPI-AW-MW-22
95MPI-AW-MW-23
95MPI-AW-MW-24
95MPI-AW-MW-25
95MPI-AW-MW-26
95MPI-AW-MW-27
95MPI-AW-MW-28
95MPI-AW-MW-29
95MPI-AW-MW-30
95MPI-AW-MW-31
95MPI-AW-MW-32
95MPI-AW-MW-33
95MPI-AW-MW-34
95MPI-AW-MW-35
95MPI-AW-MW-36
95MPI-AW-MW-37
95MPI-AW-MW-38
95MPI-AW-MW-39
95MPI-AW-MW-40
95MPI-AW-MW-41
95MPI-AW-MW-42
95MPI-AW-MW-43
95MPI-AW-MW-44
95MPI-B25-MW-1
95MPI-B25-MW-2
95MPI-B25-MW-3
95MPI-B25-MW-4
95MPI-B25-MW-5
95MPI-B25-MW-6
95MPI-B35-MW-1
95MPI-B35-MW-2
95MPI-B35-MW-3
95MPI-B35-MW-4
95MPI-B35-MW-5
95MPI-B35-MW-6
95MPI-B35-MW-7
95MPI-B35-MW-8
95MPI-B36-B1
95MPI-B36-B2
95MPI-B36-B3
95MPI-B36-B4
87GTI-MW-1BP
87GTI-MW-2BP
87GTI-MW-3BP
87GTI-MW-4BP
93EM-SP-9
93EM-SP-10
93EM-SP-11
93EM-SP-12
93EM-SP-13
93EM-SP-14
93EM-SP-15
93EM-SP-16
94EM-SP-19
94EM-SP-20
94EM-SP-21
86EM-SP-1A
86EM-SP-1B
86EM-SP-5
86EM-SP-6
92EM-SP-7
92EM-SP-8
83DM-SP-1
83DM-SP-2
83DM-SP-3
83DM-SP-4
MW-B121N
MW-B121S
MW-B110
RW-1
RW-2

N

SCALE IN FEET
0 75 150 300

HUDSON RIVER

LEGEND

- SOIL BORING LOCATIONS
- HYBRID MONITORING WELL LOCATIONS
- OVERBURDEN MONITORING WELL LOCATIONS
- WEATHERED BEDROCK MONITORING WELL LOCATIONS
- BEDROCK MONITORING WELL LOCATIONS
- ND NON-DETECT
- PROCESS PITS

(ALL UNITS ug/kg)

PLATE 5-2

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES DCB
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

SUMMARY OF SOIL SAMPLING RESULTS

MALCOLM PIRNIE, INC.

DATE JUNE 1999

SHEET 1 OF 1

DWG. NO. 587-66

XREF: X587-01

/dwg 3416002900 i:\ACAD\PROJ\0285\5879\DRAFT_FINAL\587-66 Scale: 1:40 Date: 06/09/1999 Time: 16:15

95MPI-AW-MW-27

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Vinyl Chloride	3J	4J	2J	NS
cis-1,2-Dichloroethene	1J	1J	2J	NS
delta-BHC	0.0025J	ND	ND	NS
	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Arsenic	3.1B / ND	176 / 2.5B	NA / NA	NS / NS
Barium	450 / 36.8	3020 / 87.2	NA / NA	NS / NS
Cadmium	1.1B / ND	29.2 / ND	NA / NA	NS / NS
Chromium	5.3B / 1.4B	557 / 3.2B	NA / NA	NS / NS
Lead	11.3 / 7.4	220 / ND	NA / NA	NS / NS
Selenium	ND / ND	6.6 / ND	NA / NA	NS / NS

97MPI-AW-MW-45

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Diethylphthalate	NI	NI	0.5B	NS
Di-n-butylphthalate	NI	NI	0.5J	NS
bis(2-Ethylhexyl)phthalate	NI	NI	0.5J	NS
	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Barium	NI / NI	NI / NI	2010 / 3450	NS / NS
Chromium	NI / NI	NI / NI	2.2B / ND	NS / NS
Silver	NI / NI	NI / NI	5.4 / 2*	NS / NS

95MPI-AW-MW-41

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Diethylphthalate	0.5J	0.2J	1J	NS
Di-n-butylphthalate	ND	0.6J	0.6J	NS
Trichloroethene	ND	ND	1J	NS
Endrin Aldehyde	0.0025J	ND	NA	NS
	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Arsenic	ND / ND	11 / NS	NA / NA	NS / NS
Barium	113B / 85.7B	255 / NS	NA / NA	NS / NS
Cadmium	ND / ND	8.7 / NS	NA / NA	NS / NS
Chromium	1.3B / ND	8.9 / NS	NA / NA	NS / NS
Lead	10.8 / 2B	28.4 / NS	NA / NA	NS / NS

95MPI-AW-MW-26

	ROUND 1	ROUND 2	ROUND 3
Diethylphthalate	ND	0.2JB	NA
Di-n-butylphthalate	0.4J	0.6JB	NA
Butylbenzylphthalate	ND	0.3J	NA
bis(2-Ethylhexyl)phthalate	ND	0.8J	NA
Toluene	2J	ND	ND
Chlorobenzene	4J	ND	ND
Xylene (total)	1J	ND	ND
	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Arsenic	ND / ND	13.9 / NS	NA / NA
Barium	167B / 126B	284B / NS	NA / NA
Cobalt	ND / ND	1.6 / NS	NA / NA
Chromium	7.5B / NR	12.6 / NS	NA / NA
Lead	12.8 / 9.2	71.9 / NS	NA / NA

93-EM-SP-14

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Di-n-butylphthalate	88J	NS	0.3J	NS
bis(2-Ethylhexyl)phthalate	1J	NS	0.5J	NS
Diethylphthalate	ND	NS	0.4JB	NS
Methylene Chloride	ND	NS	1JB	NS
Fenitrothion	.013P	NS	NA	NS
Endrin Ketone	.003JP	NS	NA	NS
gamma-Chlordane	.0006JP	NS	NA	NS
Aroclor-1254	.022JP	NS	NA	NS
	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Barium	2,750 / 1536	NS / NS	NA / NA	NS / NS
Chromium	29.6B / ND	NS / NS	NA / NA	NS / NS
Silver	1.6B / ND	NS / NS	NA / NA	NS / NS

95MPI-AW-MW-28 *

	ROUND 1	ROUND 2
Diethylphthalate	0.4J	0.2JB
Di-n-butylphthalate	0.3J	0.5JB
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Arsenic	ND / ND	26.1 / NA
Barium	194 / 62.3B	539 / NA
Cadmium	ND / 1.1B	2.2 / NA
Chromium	3.5B / ND	23.3 / NA
Lead	14.1 / 7.2	121 / NA

95MPI-B135-MW-3 *

	ROUND 1	ROUND 2
Di-n-butylphthalate	26J	0.3JB
Toluene	1J	ND
beta-BHC	.0024JP	ND
Aldrin	.0025JP	ND
Dieldrin	.0033JP	ND
4,4'-DDD	.0019JP	ND
4,4'-DDT	.0015JP	ND
alpha-Chlordane	.0017JP	ND
gamma-Chlordane	.0021JP	ND
Heptachlor Epoxide	.001JP	ND
Endosulfan I	.0017JP	ND
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Arsenic	10.1 / 10.1	ND / NA
Barium	176 B / 79.7B	120 / NA
Chromium	2B / 2.4B	3.9 / NA
Lead	ND / ND	3.5 / NA
Selenium	ND / ND	2.3 / NA

87GTI-MW-1BP *

	ROUND 1	ROUND 2
4,4'-DDE	0.0085J	NS
4,4'-DDT	0.011J	NS
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Arsenic	19 / ND	NS / NS
Barium	564 / 132B	NS / NS
Chromium	16.3 / 1.4B	NS / NS
Lead	38.9J / 3.2J	NS / NS
Selenium	2.7B / ND	NS / NS

87GTI-MW-2BP *

	ROUND 1	ROUND 2
Di-n-butylphthalate	0.8JB	NS
bis(2-Ethylhexyl)phthalate	1JB	NS
4,4'-DDE	0.012	NS
4,4'-DDT	0.016	NS
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Barium	178B / 172B	NS / NS
Chromium	1.6B / ND	NS / NS
Lead	5.4 / 2.9B	NS / NS

87GTI-MW-3BP *

	ROUND 1	ROUND 2
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Barium	83.1B / 66.1B	NS / NS
Chromium	4.3B / 1.1B	NS / NS
Lead	7.6 / 2.8B	NS / NS

87GTI-MW-4BP *

	ROUND 1	ROUND 2
Di-n-butylphthalate	0.6JB	NS
bis(2-Ethylhexyl)phthalate	0.6JB	NS
4,4'-DDE	0.0021J	NS
4,4'-DDT	0.0043J	NS
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Arsenic	23.6 / ND	NS / NS
Barium	311 / 65.7B	NS / NS
Chromium	23.2 / ND	NS / NS
Lead	28.6 / 2.4B	NS / NS
Selenium	3.4B / ND	NS / NS

97MPI-AW-MW-55

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Diethylphthalate	NI	NI	0.4JB	NS
Di-n-butylphthalate	NI	NI	0.3JB	NS
	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Arsenic	NI / NI	30 / ND	ND / NS	NS / NS
Barium	NI / NI	334 / 270	NS / NS	NS / NS
Chromium	NI / NI	2.4B / ND	NS / NS	NS / NS
Lead	NI / NI	6.4 / ND	NS / NS	NS / NS

95MPI-B135-MW-2 *

	ROUND 1	ROUND 2
Di-n-butylphthalate	ND	0.4JB
alpha-BHC	0.010J	ND
Fluotadilor	ND	0.34P
Aldrin	ND	0.0078
Dieldrin	ND	0.016
4,4'-DDE	ND	0.016
4,4'-DDT	R	ND
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Arsenic	15.7 / 8.8B	5.4 / NA
Barium	902 / 217	846 / NA
Cadmium	2.2 / ND	1.2 / NA
Chromium	24.9 / ND	12 / NA
Lead	22.9 / ND	10.2 / NA
Selenium	0.5J / ND	ND / NA
Silver	1.6 / ND	ND / NA

95MPI-B135-MW-1 *

	ROUND 1	ROUND 2
Di-n-butylphthalate	34J	0.5JB
bis(2-Ethylhexyl)phthalate	3J	1J
Bromodichloromethane	R/NJ	ND
Methylene Chloride	ND	0.6J
Aldrin	.0014JP	ND
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Arsenic	ND / ND	4.1 / ND
Barium	2,610 / 124Q	2069 / 1539
Chromium	58.5 / 1.6B	27.5 / ND
Lead	5.5 / ND	7.2 / ND

TREATMENT PIT (PW-1) *

	ROUND 1	ROUND 2
Fluorenthene	2J	ND
Pyrene	4J	ND
bis(2-Ethylhexyl)phthalate	9J	10B
Bromodichloromethane	2J	ND
Chloroform	6	ND
Toluene	1J	ND
alpha-BHC	0.018J	ND
beta-BHC	0.019J	ND
Heptachlor	R	ND
Aldrin	.0057J	ND
4,4'-DDE	ND	0.02J
4,4'-DDD	0.03J	ND
4,4'-DDT	0.009J	ND
Endrin Ketone	.003J	ND
Methoxychlor	0.10J	ND
Endosulfan II	R	ND
Aroclor-1254	.3JP	ND
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Barium	173B / 172B	64.6 / NA
Chromium	2.5B / 2.2B	ND / NA
Lead	R / R	ND / NA
Selenium	3.0J / ND	ND / NA

95MPI-B135-MW-4 *

	ROUND 1	ROUND 2
Di-n-butylphthalate	68J	0.4JB
bis(2-Ethylhexyl)phthalate	3J	ND
Heptachlor	.0051P	ND
Dieldrin	.0032JP	ND
Endrin Aldehyde	0.004	ND
Endrin Ketone	.0015JP	ND
alpha-Chlordane	.0024JP	ND
Endosulfan II	.0014JP	ND
Endosulfan I	.0022J	ND
Aroclor-1260	.10P	ND
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Arsenic	9.0J / ND	3.1 / NA
Barium	15,300 / 66A	571 / NA
Cadmium	3.5B / ND	12.6 / NA
Chromium	14.3B / ND	2.1 / NA
Lead	66.8 / 3.1	2.3 / NA
Selenium	ND / ND	1 / NA

97MPI-AW-MW-50

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Barium	NI / NI	NI / NI	444 / 196B	NS / NS
Chromium	NI / NI	NI / NI	24.6 / 1.7B	NS / NS
Lead	NI / NI	NI / NI	4.7* / ND	NS / NS

95MPI-AW-MW-40

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Di-n-butylphthalate	ND	0.3J	NA	NS
	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Barium	68.1B / 41.2B	49.6 / NS	NA / NA	NS / NS
Chromium	1.2B / ND	2.8 / NS	NA / NA	NS / NS
Lead	5.6 / 5.9	2 / NS	NA / NA	NS / NS

95MPI-AW-MW-39

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Di-n-butylphthalate	ND	0.3J	NA	NS
Di-n-octylphthalate	0.6J	ND	NA	NS
	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Barium	91B / 77.7B	86.7 / NS	NA / NA	NS / NS
Lead	6.4 / 6.4	2 / NS	NA / NA	NS / NS

93-EM-RW-2

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Fluorene	10J	ND	ND	NS
Phenanthrene	10J	2J	ND	NS
Pyrene	5J	1J	ND	NS
Chrysene	1J	ND	ND	NS
bis(2-Ethylhexyl)phthalate	6J	2J	ND	NS
Diethylphthalate	ND	ND	0.4JB	NS
Vinyl Chloride	4J	4J	ND	NS
Methylene Chloride	ND	0.5JB	1J	NS
1,1-Dichloroethene	ND	0.5J	ND	NS
cis-1,2-Dichloroethene	3J	3J	1	NS
Trichloroethene	4J	2J	1	NS
Benzene	1	0.5	ND	NS
trans-1,2-Dichloroethene	ND	0.7J	ND	NS
Chloroform	ND	ND	1B	NS
Bromodichloromethane	ND	ND	4J	NS
Dibromochloromethane	ND	ND	0.5J	NS
Tetrachloroethene	ND	ND	2J	NS
gamma-BHC (Lindane)	0.02	ND	NA	NS
	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Arsenic	6J / ND	5.8B / 5.4B	NA / NA	NS / NS
Barium	406B / 552	720 / 597	NA / NA	NS / NS
Cadmium	1.9B / ND	ND / ND	NA / NA	NS / NS
Chromium	45.6 / 1.3B	1.7B / ND	NA / NA	NS / NS
Lead	41.1 / 13.4B	ND / 8.7	NA / NA	NS / NS
Selenium	5.7 / ND	ND / ND	NA / NA	NS / NS

95MPI-AW-MW-64

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Tetrachloroethene	NI	NI	NI	720D
Trichloroethene	NI	NI	NI	550D
Vinyl Chloride	NI	NI	NI	170D

MW-121N *

	ROUND 1	ROUND 2
Acenaphthene	NS	1J
Fluorene	NS	0.7J
Di-n-butylphthalate	NS	0.6J
bis(2-Ethylhexyl)phthalate	NS	2J
Vinyl Chloride	NS	160J
cis-1,2-Dichloroethene	NS	140
Tetrachloroethene	NS	0.7J
trans-1,2-Dichloroethene	NS	7J
delta-BHC	NS	0.016J
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Barium	NS / NS	593 / NA
Cadmium	NS / NS	2.5 / NA
Chromium	NS / NS	3.8 / NA
Lead	NS / NS	19.5 / NA

MW-121S *

	ROUND 1	ROUND 2
Di-n-butylphthalate	NS	0.8J
bis(2-Ethylhexyl)phthalate	NS	1J
Vinyl Chloride	NS	4B
Methylene Chloride	NS	2.8J
cis-1,2-Dichloroethene	NS	8J
Trichloroethene	NS	1J
trans-1,2-Dichloroethene	NS	1J
Aldrin	NS	0.0053
4,4'-DDT	NS	0.0051J
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Barium	NS / NS	321 / NA
Cadmium	NS / NS	1 / NA
Chromium	NS / NS	1 / NA

95MPI-AW-MW-30 *

	ROUND 1	ROUND 2
bis(2-Ethylhexyl)phthalate	1B	0.8JB
Methylene Chloride	ND	2JB
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Barium	69.6B / 22.7B	88.4 / NA
Cadmium	ND / ND	1.9 / NA
Chromium	2.1B / ND	2.4 / NA
Lead	7.2 / 5.3	ND / NA

93EM-SP-13

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Acenaphthene	1J	ND	ND	NS
Fluorene	2J	ND	2J	NS
Phenanthrene	1.2	ND	2B	NS
Anthracene	1J	ND	2B	NS
Di-n-butylphthalate	12B	ND	ND	NS
Fluoranthene	1J	2J	65B	NS
Pyrene	1J	1J	55B	NS
Butylbenzylphthalate	2J	ND	ND	NS
Benzo(a)anthracene	3	ND	2B	NS
Chrysene	3	ND	3B	NS
bis(2-Ethylhexyl)phthalate	5J	2.8J	4B	NS
Benzo(b)fluoranthene	1J	ND	1B	NS
Benzo(k)fluoranthene	2J	ND	ND	NS
Benzo(a)pyrene	1J	ND	1.3B	NS
Methylene Chloride	ND	0.4J	ND	NS
Indeno (1,2,3-cd) pyrene	ND	ND	80	NS
Dibenzo (a,h) anthracene	ND	ND	4B	NS
Benzo (g,h,i) perylene	ND	ND	11B	NS
beta-BHC	.006P	ND	NA	NS
Heptachlor	.008P	ND	NA	NS
Aldrin	.0005P	ND	NA	NS
Dieldrin	.0044JP	ND	NA	NS
4,4'-DDE	.038P	ND	NA	NS
4,4'-DDT	.0035JP	ND	NA	NS
alpha-Chlordane	0.016	ND	NA	NS
gamma-Chlordane	.0149P	ND	NA	NS
Methoxychlor	.013JP	ND	NA	NS
Endosulfan II	0.01J	ND	NA	NS
Heptachlor Epoxide	.004P	ND	NA	NS
	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Arsenic	6.3B / ND	1.6 / ND	NA / NA	NS / NS
Barium	212 / 167B	204 / 176B	NA / NA	NS / NS
Chromium	7.5B / ND	4.7 / ND	NA / NA	NS / NS

95MPI-AW-MW-29 *

	ROUND 1	ROUND 2
Diethylphthalate	7J	ND
Di-n-butylphthalate	0.4J	ND
bis(2-Ethylhexyl)phthalate	1J	3JB
Methylene Chloride	ND	0.4JB
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Arsenic	4.9B / 4.6B	44.4 / NA
Barium	40B / 40B	68.0 / NA
Cadmium	1.2B / 1.2B	12.8 / NA
Chromium	14.5 / 14.5	66.9 / NA
Lead	15.3 / 15.3	76.3 / NA
Mercury	ND / ND	0.32 / NA

95MPI-AW-MW-63

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Diethylphthalate	NI	NI	NI	0.5JB
Di-n-butylphthalate	NI	NI	NI	0.3JB
bis(2-Ethylhexyl)phthalate	NI	NI	NI	0.6J

95MPI-AW-MW-37 *

	ROUND 1	ROUND 2
Di-n-butylphthalate	0.5JB	0.7JB
bis(2-Ethylhexyl)phthalate	5JB	ND
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Barium	119B / 120B	105 / NA
Chromium	2.2B / ND	ND / NA
Lead	4.7 / 3.6	ND / NA

95MPI-AW-MW-38 *

	ROUND 1	ROUND 2
Di-n-butylphthalate	ND	0.3JB
bis(2-Ethylhexyl)phthalate	30D	6J
Dieldrin	0.0018J	ND
Endrin	0.0018J	ND
	UNFILTERED / FILTERED	UNFILTERED / FILTERED
Barium	129B / 81.4B	65B / 40D
Cadmium	2.6B / 1.6B	ND / ND
Lead	12.8 / 10.7	3 / ND

LEGEND

- EXCEEDS NEW YORK STATE CLASS GA STANDARD
- HYBRID MONITORING WELL LOCATIONS
- OVERBURDEN MONITORING WELL LOCATIONS
- WEATHERED BEDROCK MONITORING WELL LOCATIONS
- BEDROCK MONITORING WELL LOCATIONS
- ND NOT DETECTED
- NS NOT SAMPLED
- NI NOT INSTALLED
- NA NOT ANALYZED
- * SAMPLED DURING ROUNDS 1 AND 2 ONLY
- PROCESS PITS
- (ALL UNITS ug/L)

MATCH LINE

SCALE IN FEET
0 75 150 300

PLATE 5-3

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

SUMMARY OF GROUNDWATER INDIVIDUAL PARAMETER RESULTS

MALCOLM PIRNIE, INC.

DATE JUNE 1999

SHEET 1 OF 3

DWG. NO. 587-123C

XREF: X587-01

95MPI-AW-MW-24	ROUND 1	ROUND 2	ROUND 3	ROUND 4
4-Chloro-3-methylphenol	R	ND	NA	NS
Di-n-butylphthalate	ND	0.6JB	NA	NS
bis(2-Ethylhexyl)phthalate	ND	0.9J	NA	NS
bis(2-Ethylhexyl)phthalate	ND	0.9J	0.9J	NS
gamma-BHC (Lindane)	R	ND	NA	NS

95MPI-AW-MW-24	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED	ROUND 3 UNFILTERED / FILTERED	ROUND 4 UNFILTERED / FILTERED
Arsenic	4.2B	ND	12.9	NA	NA	NS
Barium	538J	39B	493	NA	NA	NS
Chromium	6.1B	ND	10.1	NA	NA	NS
Lead	16.2J	4.7	24.8	NA	NA	NS

95MPI-AW-MW-25	ROUND 1	ROUND 2	ROUND 1	ROUND 2
Methylene Chloride	ND	2JB	ND	NS
Tetrachloroethene	ND	0.4J	ND	NS
Chloroform	ND	ND	1J	NS
Trichloroethene	ND	ND	1J	NS

95MPI-AW-MW-25	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED	ROUND 1 UNFILTERED / FILTERED	ROUND 2 UNFILTERED / FILTERED
Barium	100B	58.3B	136	NS	NA	NS
Chromium	2.7B	1.1B	2.3	NS	NA	NS
Lead	9.3	8.1	2.2	NS	NA	NS
Selenium	ND	2.3B	1.8	NS	NA	NS

95MPI-AW-MW-23 *	ROUND 1	ROUND 2
Diethylphthalate	0.5J	ND
Di-n-butylphthalate	0.7JB	0.2J
bis(2-Ethylhexyl)phthalate	0.6J	ND

95MPI-AW-MW-23 *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Arsenic	4.6B	ND	5.6	NA
Barium	409	180B	237	NA
Chromium	15.6	1.2B	3.5	NA
Lead	19.9	5.2	2.5	NA

94EM-SP-19 *	ROUND 1	ROUND 2
Diethylphthalate	7JB	ND
Di-n-butylphthalate	0.4J	0.5JB
bis(2-Ethylhexyl)phthalate	1J	ND

94EM-SP-19 *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Barium	85.1B	67.8B	92.4	NA
Chromium	3250	1.3B	1660	NA
Lead	4.7	4.5B	2	NA
Selenium	ND	ND	2.2	NA

95MPI-AW-MW-22 *	ROUND 1	ROUND 2
bis(2-Ethylhexyl)phthalate	ND	0.2J
Methylene Chloride	ND	2JB

95MPI-AW-MW-22 *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Barium	3320	2700	3910	NA
Cadmium	1.1B	ND	ND	NA
Chromium	ND	ND	1.9B	NA
Lead	9.2	7.1	6.7	NA

94EM-SP-21 *	ROUND 1	ROUND 2
Diethylphthalate	ND	0.5JB
Di-n-butylphthalate	0.5J	ND
bis(2-Ethylhexyl)phthalate	0.8J	ND
cis-1,2-Dichloroethene	2J	ND
gamma-BHC (Lindane)	0.013	ND
Dieldrin	0.02J	0.0094J
4,4'-DDT	0.0047J	ND

94EM-SP-21 *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Arsenic	ND	ND	1.9	ND
Barium	266	120B	77.6	94.5B
Chromium	2250	2.5B	2570	ND
Lead	13.4	3.2	ND	ND
Selenium	5.3	8.3	14	ND

94EM-SP-20 *	ROUND 1	ROUND 2
Di-n-butylphthalate	0.5J	0.4JB
Dieldrin	0.00082J	0.0017J
4,4'-DDE	0.0028J	0.0022J
4,4'-DDD	ND	0.01
4,4'-DDT	0.0025J	ND

94EM-SP-20 *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Arsenic	3.2B	ND	16.5	ND
Barium	380	412	352	280
Cadmium	1.2B	ND	2.9B	ND
Chromium	1170	1.8B	2270	ND
Lead	38.7	4.4	131E	5.8E

95MPI-AW-MW-21 *	ROUND 1	ROUND 2
Di-n-butylphthalate	ND	0.5JB
4,4'-DDE	0.0084J	0.00089J

95MPI-AW-MW-21 *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Arsenic	7.2B	ND	ND	ND
Barium	249	198B	99.9B	131B
Chromium	8.1B	ND	1.1B	ND
Lead	49	5.7	2.4B	ND
Selenium	2.1B	2.4B	4.9B	4.2B

95MPI-AW-MW-31 *	ROUND 1	ROUND 2
Diethylphthalate	ND	0.4JB
Di-n-butylphthalate	0.8J	0.3JB
Methylene Chloride	ND	0.4JB

95MPI-AW-MW-31 *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Arsenic	7.2B	ND	1.8	NA
Barium	95.4B	63.8B	76.4	NA
Chromium	6.8B	ND	1.5	NA
Lead	13.6	6.9	ND	NA

98MPI-AW-MW-60	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Methylene Chloride	NI	NI	NI	7

95MPI-AW-MW-20 *	ROUND 1	ROUND 2
Di-n-butylphthalate	NA	0.4JB
bis(2-Ethylhexyl)phthalate	NA	0.7J
4,4'-DDE	NA	0.0034J
4,4'-DDT	NA	0.0029J

95MPI-AW-MW-20 *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Arsenic	NA	NA	3.4	ND
Barium	NA	NA	129	219
Cadmium	NA	NA	4.3	ND
Chromium	NA	NA	9.2	ND
Lead	NA	NA	11.7	ND

98MPI-AW-MW-59	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Vinyl Chloride	NI	NI	NI	4J
Methylene Chloride	NI	NI	NI	1J
1,2-Dichloroethene	NI	NI	NI	120
Chloroform	NI	NI	NI	24
Bromodichloromethane	NI	NI	NI	2J

98MPI-AW-MW-61	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Vinyl Chloride	NI	NI	NI	2J
Methylene Chloride	NI	NI	NI	0.9J
Carbon Disulfide	NI	NI	NI	5
1,2-Dichloroethene	NI	NI	NI	190
Chloroform	NI	NI	NI	9
Trichloroethene	NI	NI	NI	2J
Tetrachloroethene	NI	NI	NI	4J

97MPI-AW-MW-51	ROUND 1	ROUND 2	ROUND 3	ROUND 4
cis-1,2-Dichloroethene	NI	NI	1200J	--
Trichloroethene	NI	NI	10,000	5300
Tetrachloroethene	NI	NI	110,000	24000
Chlorobenzene	NI	NI	660JB	ND
Vinyl Chloride	NI	NI	ND	160J
Methylene Chloride	NI	NI	ND	440J
1,2-Dichloroethene	NI	NI	--	22000

97MPI-AW-MW-51	ROUND 1 UNFILTERED / FILTERED	ROUND 2 UNFILTERED / FILTERED	ROUND 3 UNFILTERED	ROUND 3 FILTERED	ROUND 4 UNFILTERED / FILTERED
Arsenic	NI	NI	43.7	ND	NA
Barium	NI	NI	2230	539	NA
Chromium	NI	NI	155	1.2B	NA
Lead	NI	NI	256*	3.5*	NA

95MPI-AW-MW-34	ROUND 1	ROUND 2	ROUND 3	ROUND 4
4-Chloro-3-methylphenol	R	ND	NA	NA
Vinyl Chloride	69J	22J	24J	80J
Methylene Chloride	ND	48JB	ND	13J
cis-1,2-Dichloroethene	2000	1100	950	NA
Trichloroethene	250	100	150	200
Tetrachloroethene	350	120	120	240
trans-1,2-Dichloroethene	ND	10J	ND	--
2-Butanone	ND	ND	11J	ND
1,2-Dichloroethene	--	--	--	1700
4,4'-DDD	R	ND	NA	NA
4,4'-DDT	R	ND	I	I

95MPI-AW-MW-34	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED	ROUND 3 UNFILTERED / FILTERED	ROUND 4 UNFILTERED / FILTERED
Arsenic	5.7B	6.3B	ND	NA	NA	NA
Barium	1100	1200	642	NA	NA	NA

95MPI-AW-MW-33	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Di-n-butylphthalate	2JB	0.5JB	NA	NA
bis(2-Ethylhexyl)phthalate	2JB	ND	NA	NA
Methylene Chloride	ND	0.4JB	ND	ND
Tetrachloroethene	4J	2J	10B	ND
Trichlorofluoromethane	ND	2J	ND	ND
Cis-1,2-Dichloroethene	ND	ND	4J	ND
Trichloroethene	ND	ND	1J	ND
Dieldrin	0.016	NA	NA	NA
4,4'-DDE	0.002J	NA	NA	NA

95MPI-AW-MW-33	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED	ROUND 3 UNFILTERED / FILTERED	ROUND 4 UNFILTERED / FILTERED
Arsenic	NA	NA	1.9	NA	NA	NA
Barium	NA	NA	107	NA	NA	NA
Chromium	NA	NA	8.6	NA	NA	NA
Lead	NA	NA	6.3	NA	NA	NA
Selenium	NA	NA	2.7	NA	NA	NA

98MPI-AW-MW-58	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Tetrachloroethene	NI	NI	NI	2J
Trichlorofluoromethane	NI	NI	NI	4J

95MPI-AW-MW-42	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Di-n-butylphthalate	0.9J	0.3JB	NA	NS
Methylene Chloride	ND	1JB	ND	NS
Trichloroethene	0.7J	0.7J	2J	NS
Tetrachloroethene	ND	0.6J	ND	NS

95MPI-AW-MW-42	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED	ROUND 3 UNFILTERED / FILTERED	ROUND 4 UNFILTERED / FILTERED
Arsenic	6.4B	ND	ND	NS	NA	NS
Barium	226	55.3B	130	NS	NA	NS
Chromium	13.6	2.3B	1.1	NS	NA	NS
Lead	18.3	5.9	ND	NS	NA	NS
Mercury	0.42B	ND	ND	NS	NA	NS
Selenium	ND	ND	2.8	NS	NA	NS

94EM-SP-16 *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Barium	112B	80.4B	NS	NS
Chromium	927	6B	NS	NS
Lead	6.9	7.3	NS	NS

93EM-SP-15 *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Barium	113B	122B	NS	NS
Cadmium	1.8B	1.6B	NS	NS
Chromium	149	4.2B	NS	NS
Lead	6.1	6.6	NS	NS

97MPI-AW-MW-54	ROUND 1 UNFILTERED / FILTERED	ROUND 2 UNFILTERED / FILTERED	ROUND 3 UNFILTERED	ROUND 3 FILTERED	ROUND 4 UNFILTERED / FILTERED
Arsenic	NI	NI	21.9	3.1B	NS
Barium	NI	NI	2360	875	NS
Chromium	NI	NI	46.1	ND	NS
Lead	NI	NI	56.8	ND	NS

95MPI-B35-MW-7	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Di-n-butylphthalate	22B	0.4JB	NA	NS
Methylene Chloride	ND	0.7J	ND	NS
Carbon Disulfide	2J	ND	ND	NS
Trichloroethene	ND	2J	ND	NS

95MPI-B35-MW-7	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED	ROUND 3 UNFILTERED / FILTERED	ROUND 4 UNFILTERED / FILTERED
Arsenic	13.8	9.3B	ND	NA	NA	NS
Barium	10,000	594	3760	NA	NA	NS
Cadmium	1.6B	ND	ND	NA	NA	NS
Chromium	48.8	ND	2.4	NA	NA	NS
Lead	32.5	ND	2.6	NA	NA	NS
Silver	2.9B	2.6B	ND	NA	NA	NS

MW-B110 *	ROUND 1	ROUND 2
Naphthalene	NS	0.8J
bis(2-Ethylhexyl)phthalate	NS	3J
Methylene Chloride	NS	0.8J

MW-B110 *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Arsenic	NS	NS	2	NA
Barium	NS	NS	1190	NA
Chromium	NS	NS	4.4	NA
Lead	NS	NS	9.9	NA

98MPI-35-MW-8	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Phenanthrene	ND	9J	0.8J	NS
Pyrene	13J	21J	5J	NS
Benzo(a)anthracene	10J	18J	10	NS
Chrysene	14J	40	5	NS
Benzo(b)fluoranthene	ND	ND	4	NS
Benzo(a)pyrene	ND	ND	5	NS
Acenaphthylene	ND	16J	ND	NS
Acenaphthene	ND	12J	ND	NS
Diethylphthalate	ND	8JB	ND	NS
Fluoranthene	ND	22J	ND	NS
bis(2-Ethylhexyl)phthalate	ND	9JB	ND	NS
Tetrachloroethene	ND	ND	1J	NS
gamma-BHC	ND	0.15	NA	NS
Aldrin	ND	0.061	NA	NS
4,4'-DDE	ND	0.1	NA	NS
Endrin	0.15NJ	ND	NA	NS
alpha-Chlordane	0.036J	ND	NA	NS
gamma-Chlordane	0.022J	ND	NA	NS

98MPI-35-MW-8	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED	ROUND 3 UNFILTERED / FILTERED	ROUND 4 UNFILTERED / FILTERED
Arsenic	7.8J	6.5J	7.5B	NA	NA	NS
Barium	1760	1630	8220	NA	NA	NS
Arsenic	ND	ND	14.9	NA	NA	NS
Barium	2.2	ND	18.7	NA	NA	NS
Barium	ND	ND	71.8	NA	NA	NS

TREATMENT PIT (PW-2) *	ROUND 1	ROUND 2
Naphthalene	ND	R
4-Chloro-3-methylphenol	ND	R
Fluorene	1,600J	230J
Phenanthrene	2,600J	590J
Anthracene	ND	300J
Fluoranthene	6,900J	1700J
Pyrene	5,300J	1300J
Benzo(a)anthracene	ND	360J
Chrysene	ND	310J
bis(2-Ethylhexyl)phthalate	4,200J	400JB
Di-n-octylphthalate	ND	240J
Benzo(b)fluoranthene	ND	190J
Benzo(k)fluoranthene	ND	200J
Benzo(a)pyrene	ND	140J
Indeno(1,2,3-cd)pyrene	ND	88J
Heptachlor	6.6P	ND
4,4'-DDE	2.6P	ND
4,4'-DDD	14	ND
4,4'-DDT	3.9	ND
alpha-Chlordane	3P	ND
gamma-Chlordane	2P	ND

TREATMENT PIT (PW-2) *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Arsenic	55.9	ND	ND	NA
Barium	185B	92BE	112	NA
Cadmium	4.5B	ND	3.9	NA
Chromium	1,220	62.4	612	NA
Lead	130	14.6	124	NA
Selenium	ND	ND	3.4	NA
Silver	ND	ND	1.1	NA

TREATMENT PIT (PW-2), NAPL *	ROUND 1	ROUND 2
Naphthalene	ND	R
4-Chloro-3-methylphenol	ND	R
Dimethylphthalate	ND	R
Acenaphthylene	ND	R
Acenaphthene	ND	R
Diethylphthalate	ND	R
Fluorene	130,000J	130000J
Phenanthrene	190,000J	120000J
Anthracene	99,000J	69000J
Fluoranthene	530,000J	340000J
Pyrene	370,000J	290000
Benzo(a)anthracene	85,000J	93000J
Chrysene	87,000J	46000J
bis(2-Ethylhexyl)phthalate	100,000J	68000J
Di-n-octylphthalate	ND	5900J
Benzo(b)fluoranthene	ND	58000J
Benzo(k)fluoranthene	ND	28000J
Benzo(a)pyrene	ND	27000J
Indeno(1,2,3-cd)pyrene	ND	14000J
Dibenzo(a,h)anthracene	ND	6300J
Benzo(g,h,i)perylene	ND	12000J

TREATMENT PIT (PW-2), NAPL *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Barium	0.88B	NS	0.61	NA
Chromium	2	NS	2.2	NA
Lead	ND	NS	0.47	NA

TREATMENT PIT (PW-3) *	ROUND 1	ROUND 2
Dimethylphthalate	ND	0.8J
Phenanthrene	ND	0.9J
Di-n-butylphthalate	50B	0.7J
Fluoranthene	ND	0.6J
Pyrene	ND	0.3J
bis(2-Ethylhexyl)phthalate	2J	14
Di-n-octylphthalate	ND	1J
Bromodichloromethane	2J	ND
Chloroform	8	10
2-Butanone	5J	ND
beta-BHC	.0032JP	ND
Dieldrin	.0013JP	ND
4,4'-DDD	.0011JP	ND

TREATMENT PIT (PW-3) *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Barium	20.3B	16.8BE	24.2	NA
Chromium	41.4	64	14500	NA
Lead	2.6B	57.1	463	NA
Silver	ND	ND	2.2	NA

TREATMENT PIT (PW-4) *	ROUND 1	ROUND 2
Dimethylphthalate	1J	ND
Di-n-butylphthalate	80B	0.4J
Bromodichloromethane	4J	ND
Chloroform	15	ND
2-Butanone	17	ND
beta-BHC	.0061P	ND
Heptachlor	.0014J	ND
Endrin Aldehyde	.0015JP	ND
gamma-Chlordane	.0011JP	ND
Heptachlor Epoxide	.00073JP	ND
Endosulfan I	.0013JP	ND

TREATMENT PIT (PW-4) *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Barium	31.2B	22.78E	803	NA
Cadmium	ND	ND	4	NA
Chromium	19,600	14700	4010	NA
Lead	5,570	181	342E	NA
Silver	3.3B	ND	ND	NA

93EM-SP-9 *	ROUND 1	ROUND 2
Di-n-butylphthalate	ND	0.2J
Chloroform	ND	28
Toluene	1J	ND
alpha-BHC	.005UJ	ND

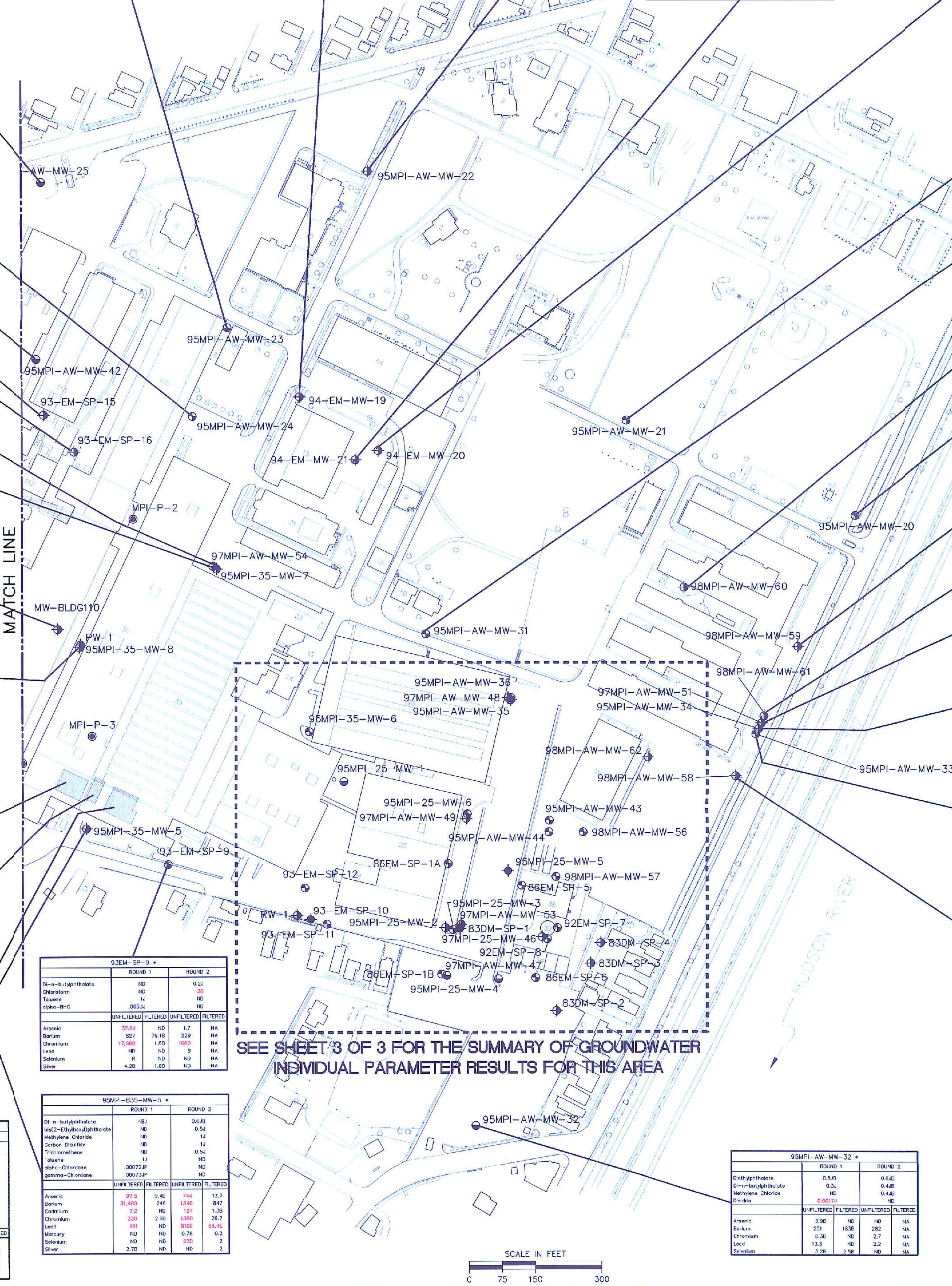
93EM-SP-9 *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Arsenic	37.6J	ND	1.7	NA
Barium	827	79.1B	229	NA
Chromium	17,600	1.8B	1060	NA
Lead	ND	ND	9	NA
Selenium	R	ND	ND	NA
Silver	4.2B	1.8B	ND	NA

95MPI-B35-MW-5 *	ROUND 1	ROUND 2
Di-n-butylphthalate	4BJ	0.6JB
bis(2-Ethylhexyl)phthalate	ND	0.5J
Methylene Chloride	ND	1J
Carbon Disulfide	ND	1J
Trichloroethene	ND	0.5J
Toluene	1J	ND
alpha-Chlordane	.00072JP	ND
gamma-Chlordane	.00073JP	ND

95MPI-B35-MW-5 *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Arsenic	97.5	9.4B	744	13.7
Barium	31,400	249	1340	847
Cadmium	7.2	ND	127	1.3B
Chromium	330	2.6B	1390	26.2
Lead	161	ND	810E	64.4E
Mercury	ND	ND	0.78	0.2
Selenium	ND	ND	23B	2
Silver	2.7B	ND	ND	2

95MPI-AW-MW-32 *	ROUND 1	ROUND 2
Diethylphthalate	0.5JB	0.6JB
Di-n-butylphthalate	0.3J	0.4JB
Methylene Chloride	ND	0.4JB
Dieldrin	0.0017J	ND

95MPI-AW-MW-32 *	ROUND 1 UNFILTERED	ROUND 1 FILTERED	ROUND 2 UNFILTERED	ROUND 2 FILTERED
Arsenic	3.9B	ND	ND	NA
Barium	251	183B	282	NA
Chromium	8.3B	ND	2.7	NA
Lead	13.3	ND	2.2	NA
Selenium	3.2B	2.5B	ND	NA



LEGEND

- EXCEEDS NEW YORK STATE CLASS GA STANDARD
- HYBRID MONITORING WELL LOCATIONS
- OVERBURDEN MONITORING WELL LOCATIONS
- WEATHERED BEDROCK MONITORING WELL LOCATIONS
- BEDROCK MONITORING WELL LOCATIONS
- ND NOT DETECTED
- NS NOT SAMPLED
- NI NOT INSTALLED
- NA NOT ANALYZED
- * SAMPLED DURING ROUNDS 1 AND 2 ONLY
- PROCESS PITS

(ALL UNITS ug/L)

PLATE 5-3

REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

US Army Corps of Engineers

MALCOLM PIRNIE

WATERVLIET ARSENAL MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

SUMMARY OF GROUNDWATER INDIVIDUAL PARAMETER RESULTS

MALCOLM PIRNIE, INC.
DATE JUNE 1999
SHEET 2 OF 3
DWG. NO. 587-122C

4871 0285587100 I:\ACAD\PROJ\0285\5879\DRAFT_FINAL\587-122C Scale: 1:1 Date: 08/02/1999 Time: 07:27

XREF: X587-01

95MPI-B25-MW-1

	ROUND 1		ROUND 2		ROUND 3		ROUND 4	
Di-n-butylphthalate	3BJ		0.3J		NA		NS	
Carbon Disulfide	4J		ND		ND		NS	
Aldrin	0.00095JP		ND		NA		NS	
4,4'-DDT	0.0026BJ		ND		NA		NS	
gamma-Chlordane	0.0013JP		ND		NA		NS	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	ND	ND	3.7	NA	NA		NS	
Barium	308E	20.59E	367	NA	NA		NS	
Cadmium	8.5	ND	6.9	NA	NA		NS	
Chromium	13.9	ND	19.2	NA	NA		NS	
Lead	20.8N	3.4N	21.3	NA	NA		NS	

86EM-SP-1A

	ROUND 1		ROUND 2		ROUND 3		ROUND 4	
Acenaphthene	38J		ND		NA		NS	
Methylene Chloride	ND		0.8J		ND		NS	
cis-1,2-Dichloroethene	ND		3J		3J		NS	
Chloroform	3000		ND		ND		NS	
Trichloroethene	190		14		19		NS	
Tetrachloroethene	ND		0.4J		ND		NS	
delta-BHC	0.0018J		ND		NA		NS	
4,4'-DDD	0.0021J		ND		NA		NS	
4,4'-DDT	0.0025J		ND		NA		NS	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	10.8	7.3B	1.8	NA	NA		NS	
Barium	306	75.2B	99.5	NA	NA		NS	
Chromium	15.3	2.7B	4.2	NA	NA		NS	
Lead	20.9	2.6B	5.9	NA	NA		NS	

WVA-GP-GW8 (2/98)

Isophorone	2J	
Acenaphthylene	0.2J	
Diethylphthalate	0.4JB	
Phenanthrene	0.7J	
Anthracene	0.3J	
Di-n-butylphthalate	0.2JB	
Fluoranthene	4J	
Pyrene	4J	
Butylbenzylphthalate	0.3J	
Benzo(a)anthracene	2	
Chrysene	2J	
bis(2-Ethylhexyl)phthalate	2J	
Benzo(b)fluoranthene	2J	
Benzo(k)fluoranthene	2J	
Benzo(a)pyrene	2	
	UNFILTERED	FILTERED
Arsenic	838	NA
Barium	7460	NA
Cadmium	99.4	NA
Chromium	1890	NA
Lead	10600	NA
Mercury	2.1	NA
Selenium	366	NA
Silver	22.7	NA

WVA-GP-GW11 (2/98)

1,2,4-Trichlorobenzene	0.2J	
Naphthalene	0.6J	
Diethylphthalate	0.3JB	
Phenanthrene	0.9J	
Di-n-butylphthalate	0.3JB	
Fluoranthene	0.4J	
Pyrene	0.2J	
bis(2-Ethylhexyl)phthalate	0.7J	
	UNFILTERED	FILTERED
Arsenic	116	NA
Barium	1210	NA
Chromium	176	NA
Lead	253	NA
Mercury	0.39	NA
Selenium	14.3	NA
Silver	1.3B	NA

93EM-SP-12

	ROUND 1		ROUND 2	
Di-n-butylphthalate	11B		0.3J	
Xylene (total)	2J		ND	
Dieldrin	.0033J		ND	
Endrin	.0035JP		ND	
4,4'-DDT	.0035BJP		ND	
Endrin Aldehyde	.0024JP		ND	
Endrin Ketone	.0011JP		ND	
gamma-Chlordane	.0012J		ND	
Endosulfan II	.0034JP		ND	
Aroclor-1260	.059JP		ND	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	ND	ND	3.9	NA
Barium	122B	60.9B	147	NA
Chromium	185E	ND	1440	NA
Lead	ND	ND	5.5	NA

RW-1

	ROUND 1		ROUND 2	
Di-n-butylphthalate	0.5J		0.6J	
bis(2-Ethylhexyl)phthalate	ND		1J	
Methylene Chloride	ND		0.8JB	
Carbon Disulfide	0.3J		ND	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	ND	ND	1.5B	NA
Barium	130B	62.7B	117B	NA
Cadmium	ND	1.4B	ND	NA
Chromium	94.9	2.2B	738	NA
Lead	6.6	32.3	13.3	NA

93EM-SP-10

	ROUND 1		ROUND 2	
Di-n-butylphthalate	6BJ		NS	
bis(2-Ethylhexyl)phthalate	1J		NS	
Dieldrin	.0011JP		NS	
4,4'-DDE	.003J		NS	
Endrin	.0034JP		NS	
Endrin Aldehyde	.0053JP		NS	
Endrin Ketone	.001JP		NS	
alpha-Chlordane	.0017JP		NS	
gamma-Chlordane	.001JP		NS	
Endosulfan II	.0029JP		NS	
Aroclor-1260	.065JP		NS	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Barium	84.8B	75.9B	NS	NS
Chromium	383E	38.4	NS	NS
Lead	3.3	ND	NS	NS

93EM-SP-11

	ROUND 1		ROUND 2	
Diethylphthalate	3JB		ND	
bis(2-Ethylhexyl)phthalate	0.5J		ND	
Methylene Chloride	ND		2JB	
Xylene (total)	2J		ND	
Trichlorofluoromethane	ND		4J	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	5.7B	3.8B	5.8B	NA
Barium	105B	87B	149	NA
Chromium	545	7B	1520	NA
Lead	3B	ND	9.6	NA

95MPI-B25-MW-2

	ROUND 1		ROUND 2	
Acenaphthene	5BJ		ND	
Methylene Chloride	ND		2JB	
1,1-Dichloroethane	ND		1J	
cis-1,2-Dichloroethene	ND		4J	
Trichloroethene	37		51	
trans-1,2-Dichloroethene	2 J		ND	
1,1-Dichloroethene	ND		0.8J	
1,1,1-Trichloroethane	21		20	
4,4'-DDE	0.0011BJP		ND	
4,4'-DDD	0.0022JP		ND	
4,4'-DDT	0.0028BJP		ND	
Endrin Ketone	ND		0.0045J	
gamma-Chlordane	0.0016JP		ND	
Heptachlor Epoxide	0.00072JP		ND	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Barium	1038E	70.1BE	79.5	NA
Chromium	1.6B	ND	ND	NA
Iron	880	ND	NA	NA
Silver	2.3B	ND	ND	NA

95MPI-B25-MW-3

	ROUND 1		ROUND 2	
bis(2-Ethylhexyl)phthalate	4J		ND	
1,1-Dichloroethane	4J		4J	
cis-1,2-Dichloroethene	ND		19	
Chloroform	3J		ND	
Trichloroethene	4100		310	
1,1-Dichloroethene	3J		2J	
1,1,1-Trichloroethane	100		82	
gamma-Chlordane	0.0013J		ND	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Barium	489J	115J	136	NA
Cadmium	2.1B	ND	ND	NA
Chromium	15.1	ND	5.2	NA
Cyanide	17900	NA	NS	NA
Lead	---	ND	2.9	NA
Silver	2.5B	ND	ND	NA
Selenium	R	ND	ND	NA

95MPI-B25-MW-6

	ROUND 1		ROUND 2		ROUND 3		ROUND 4	
Di-n-butylphthalate	28J		0.2JB		NA		NS	
Methylene Chloride	ND		2JB		4JB		NS	
1,1-Dichloroethane	ND		0.8J		ND		NS	
cis-1,2-Dichloroethene	ND		3J		2J		NS	
Trichloroethene	240		280		240		NS	
1,1,1-Trichloroethane	3J		6J		3J		NS	
Dieldrin	0.0014BJP		ND		NA		NS	
Endrin	0.0021J		ND		NA		NS	
4,4'-DDT	0.002BJP		ND		NA		NS	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	ND	ND	53.8S	NA	NA		NS	
Barium	156BE	40.3BE	756	NA	NA		NS	
Cadmium	427	ND	8.2	NA	NA		NS	
Chromium	21.5	ND	88.7	NA	NA		NS	
Lead	111N	ND	133	NA	NA		NS	
Mercury	0.33	0.23N	ND	NA	NA		NS	
Selenium	ND	ND	1.8	NA	NA		NS	
Silver	2B	ND	ND	NA	NA		NS	

97MPI-AW-MW-49

	ROUND 1		ROUND 2		ROUND 3		ROUND 4	
Trichloroethene	NI		NI		0.9J		NS	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Barium	NI	NI	NI	NI	422	252	NS	NS
Chromium	NI	NI	NI	NI	2.3B	ND	NS	NS
Lead	NI	NI	NI	NI	8.4	2.9B	NS	NS

95MPI-B35-MW-6

	ROUND 1		ROUND 2	
Di-n-butylphthalate	7BJ		0.5JB	
bis(2-Ethylhexyl)phthalate	ND		0.5J	
Chloroform	3J		ND	
Endrin Aldehyde	.003J		ND	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	22.4	5.8B	46.9	NA
Barium	874	96.3B	1400	NA
Cadmium	2.4B	ND	7.7	NA
Chromium	2.5B	3.6B	119	NA
Lead	85.1	ND	119	NA
Mercury	0.41	ND	0.45B	NA
Selenium	ND	ND	2.7BN	NA
Silver	2.4B	1.8B	ND	NA

97MPI-AW-MW-48

	ROUND 1		ROUND 2		ROUND 3		ROUND 4	
Diethylphthalate	NI		NI		0.5J		NS	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	NI	NI	NI	NI	6.2B	ND	NS	
Barium	NI	NI	NI	NI	550	218	NS	
Chromium	NI	NI	NI	NI	27.3	1.1B	NS	
Lead	NI	NI	NI	NI	19.4	ND	NS	

WVA-GP-GW3 (2/98)

	UNFILTERED	FILTERED
Arsenic	13.8	NA
Barium	797	NA
Chromium	27.9	NA
Lead	990	NA

WVA-GP-GW7 (2/98)

Acenaphthene	0.2J	
Diethylphthalate	0.3JB	
Phenanthrene	1J	
Anthracene	0.5J	
Fluoranthene	2J	
Pyrene	2J	
Benzo(a)anthracene	0.7J	
Chrysene	0.7J	
bis(2-Ethylhexyl)phthalate	0.7J	
Benzo(b)fluoranthene	0.4J	
Benzo(k)fluoranthene	0.4J	
Benzo(a)pyrene	0.4J	
Trichloroethene	2J	
	UNFILTERED	FILTERED
Arsenic	2.2B	NA
Barium	304	NA
Cadmium	2B	NA
Chromium	3.9B	NA
Lead	391	NA
Selenium	2.5B	NA

95MPI-AW-MW-36

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Diethylphthalate	NA	0.3JB	NA	NS
Di-n-butylphthalate	NA	0.6JB	NA	NS
Butylbenzylphthalate	NA	0.3J	NA	NS
bis(2-Ethylhexyl)phthalate	NA	0.4JB	NA	NS
Vinyl Chloride	32J	9J	28J	NS
Chloroethane	7J	ND	ND	NS
Methylene Chloride	ND	2JB	10JB	NS
cis-1,2-Dichloroethene	460	230	380	NS
Trichloroethene	200	52	12J	NS
Benzene	2J	ND	ND	NS
trans-1,2-Dichloroethene	10J	3J	4J	NS

95MPI-AW-MW-35

	ROUND 1		ROUND 2		ROUND 3		ROUND 4	
Diethylphthalate	ND		0.9JB		NA		NS	
Di-n-butylphthalate	0.5J		ND		NA		NS	
bis(2-Ethylhexyl)phthalate	0.5J		ND		NA		NS	
Butylbenzylphthalate	ND		0.3J		NA		NS	
cis-1,2-Dichloroethene	ND		16		19		NS	
Trichloroethene	ND		120		98		NS	
trans-1,2-Dichloroethene	ND		2J		2J		NS	
Vinyl Chloride	ND		ND		2J		NS	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	ND	ND	4.7	NA	NA		NS	
Barium	224	166B	196	NA	NA		NS	
Chromium	5.5B	ND	14.6	NA	NA		NS	
Lead	5.7	3.3	10.6	NA	NA		NS	

WVA-GP-GW6 (2/98)

Isophorone	1
Acenaphthylene	0.3J
Acenaphthene	0.3J
Diethylphthalate	1JB
Phenanthrene	5J
Anthracene	1J
Di-n-butylphthalate	0.6JB
Fluoranthene	9
Pyrene	9
Butylbenzylphthalate	3J
Benzo(a)anthracene	5
Chrysene	5
bis(2-Ethylhexyl)phthalate	57
Benzo(b)fluoranthene	4
Benzo(k)fluoranthene	4
Benzo(a)pyrene	4

WVA-GP-GW1 (2/98)

Acenaphene	0.9J	
Phenanthrene	2J	
Anthracene	0.1J	
Di-n-butylphthalate	0.4J	
bis(2-Ethylhexyl)phthalate	1J	
Xylene (total)	2J	
	UNFILTERED	FILTERED
Arsenic	16.2	NA
Barium	430	NA
Chromium	67.8	NA
Lead	656	NA
Mercury	0.28	NA
Selenium	6.2	NA

95MPI-AW-MW-43

	ROUND 1		ROUND 2	
4-Chloro-3-methylphenol	240		120	
Diethylphthalate	2J		ND	
Di-n-butylphthalate	ND		0.8JB	
bis(2-Ethylhexyl)phthalate	3J		1JB	
Methylene Chloride	ND		0.6JB	
1,1-Dichloroethane	22		12	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	8.9B	9.3B	11.4B	NA
Barium	247	232	338	NA
Chromium	2.7B	1.8B	6.3B	NA
Lead	10.8	ND	41.7	NA
Selenium	3.2B	ND	ND	NA

WVA-GP-GW2 (2/98)

Diethylphthalate	0.3JB	
Phenanthrene	0.5J	
Anthracene	0.1J	
Fluoranthene	0.6J	
Pyrene	0.5J	
Benzo(a)anthracene	0.3J	
Chrysene	0.4J	
bis(2-Ethylhexyl)phthalate	0.3J	
Benzo(b)fluoranthene	0.3J	
Benzo(k)fluoranthene	0.3J	
Benzo(a)pyrene	0.3J	
	UNFILTERED	FILTERED
Arsenic	184	NA
Barium	4900	NA
Chromium	426	NA
Lead	2510	NA
Mercury	0.37	NA
Selenium	17.8	NA
Silver	2.7B	NA

98MPI-AW-MW-62

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Methylene Chloride	NI	NI	NI	7

95MPI-AW-MW-44

	ROUND 1		ROUND 2	
Naphthalene	2J		ND	
4-Chloro-3-methylphenol	4		18	
Dimethylphthalate	2J		ND	
Diethylphthalate	4J		0.6JB	
Di-n-butylphthalate	0.3J		ND	
bis(2-Ethylhexyl)phthalate	0.3J		ND	
Methylene Chloride	ND		0.4JB	
1,1-Dichloroethane	7		6	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	7BN	4.9B	11.4B	NA
Barium	199B	149B	314	NA
Cadmium	1.7BN	2B	2.2B	NA
Chromium	3.3B	1.2B	23.6	NA
Lead	19N	ND	19.5	NA

WVA-GP-GW10 (2/98)

4-Chloro-3-Methylphenol	0.6J	
Diethylphthalate	0.2JB	
Di-n-butylphthalate	0.2JB	
bis(2-Ethylhexyl)phthalate	0.2J	
	UNFILTERED	FILTERED
Arsenic	8.8B	NA
Barium	310	NA
Chromium	8.9B	NA
Lead	13.7	NA
Selenium	2.8B	NA

WVA-GP-GW9 (2/98)

4-Chloro-3-Methylphenol	4	
Diethylphthalate	0.5JB	
Di-n-butylphthalate	0.4JB	
bis(2-Ethylhexyl)phthalate	2J	
	UNFILTERED	FILTERED
Arsenic	3.6B	NA
Barium	167B	NA
Cadmium	1.4B	NA
Chromium	4.0B	NA
Lead	2.9B	NA

98MPI-AW-MW-56

	ROUND 1	ROUND 2	ROUND 3	ROUND 4
Naphthalene	NI	NI	NI	2J
2-Methylnaphthalene	NI	NI	NI	2J
Diethylphalate	NI	NI	NI	0.5JB
Di-n-butylphthalate	NI	NI	NI	0.7JB
bis(2-Ethylhexyl)phthalate	NI	NI	NI	4J

95MPI-B25-MW-5

	ROUND 1		ROUND 2		ROUND 3		ROUND 4	
Di-n-butyphthalate	3BJ		ND		NA		NS	
1,1-Dichloroethane	ND		0.6J		0.8J		NS	
cis-1,2-Dichloroethene	ND		0.5J		1J		NS	
Trichloroethene	ND		ND		1J		NS	
4,4'-DDE	ND		0.0018J		NA		NS	
Endrin	0.0018J P		ND		NA		NS	
4,4'-DDD	ND		0.0015J		NA		NS	
gamma-Chlordane	0.00059J P		ND		NA		NS	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	ND	ND	15.4	NA	NA		NS	
Barium	694E	664E	1400	NA	NA		NS	
Cadmium	1.3B	ND	117	NA	NA		NS	
Chromium	ND	ND	53.2	NA	NA		NS	
Lead	3.3N	4N	114	NA	NA		NS	
Mercury	0.21	ND	ND	NA	NA		NS	
Selenium	6	ND	1.1	NA	NA		NS	
Silver	2.3B	3B	ND	NA	NA		NS	

86EM-SP-5

	ROUND 1		ROUND 2		ROUND 3		ROUND 4	
4-Chloro-3-methylphenol	690		310		NA		NS	
Chloroethane	7J		ND		ND		NS	
1,1-Dichloroethane	28		11		8		NS	
Tetrachloroethene	ND		ND		NA		NS	
beta-BHC	--		ND		NA		NS	
Dieldrin	--		ND		NA		NS	
4,4'-DDE	0.046		ND		NA		NS	
Endrin	--		ND		NA		NS	
4,4'-DDD	0.038		ND		NA		NS	
Endosulfan Sulfate	0.018J		ND		NA		NS	
Endosulfan II	--		ND		NA		NS	
Heptachlor Epoxide	0.022		ND		NA		NS	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	15.6	11.8	11.5	NA	NA		NS	
Barium	293J	311J	278	NA	NA		NS	
Chromium	ND	2.1B	1.2B	NA	NA		NS	
Lead	2.8J	ND	ND	NA	NA		NS	
Mercury	0.31	ND	ND	NA	NA		NS	

98MPI-AW-MW-57

	ROUND 1		ROUND 2		ROUND 3		ROUND 4	
Di-n-butylphthalate	NI		NI		NI		0.3JB	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	NI	NI	NI	NI	NI	NI	ND	2.4
Barium	NI	NI	NI	NI	NI	NI	186	311
Chromium	NI	NI	NI	NI	NI	NI	1.6	12.3
Lead	NI	NI	NI	NI	NI	NI	2.3	32.5
Silver	NI	NI	NI	NI	NI	NI	1.0	ND

WVA-GP-GW12

4-Chloro-3-Methylphenol	30	
Diethylphthalate	0.2JB	
Di-n-butylphthalate	0.2JB	
	UNFILTERED	FILTERED
Arsenic	81.5	NA
Barium	976	NA
Chromium	102	NA
Lead	187	NA
Selenium	10.4	NA
Silver	1.9B	NA

92EM-SP-7

	ROUND 1		ROUND 2		ROUND 3		ROUND 4	
4-Chloro-3-methylphenol	ND		1J		ND		NS	
Diethylphthalate	ND		0.6J		ND		NS	
N-Nitrosodiphenylamine (1)	ND		0.5J		ND		NS	
Phenanthrene	ND		0.4J		ND		NS	
Anthracene	ND		0.2J		ND		NS	
Di-n-butylphthalate	ND		1J		ND		NS	
Fluoranthene	ND		0.6J		ND		NS	
Pyrene	ND		1J		ND		NS	
Butylbenzylphthalate	ND		0.8J		ND		NS	
Benzo(a)anthracene	ND		0.8J		ND		NS	
Chrysene	ND		0.9J		ND		NS	
bis(2-Ethylhexyl)phthalate	0.7J		65		ND		NS	
Di-n-octylphthalate	ND		0.9J		ND		NS	
Benzo(b)fluoranthene	ND		0.9J		ND		NS	
Benzo(k)fluoranthene	ND		1J		ND		NS	
Benzo(a)pyrene	ND		0.7J		ND		NS	
1,1-Dichloroethane	ND		2J		ND		NS	
cis-1,2-Dichloroethene	ND		0.8J		ND		NS	
Chloroform	630		ND		ND		NS	
2-Butanone	ND		2J		ND		NS	
1,1-Dichloroethene	ND		ND		3J		NS	
cis-1,2-Dichloroethene	ND		ND		2J		NS	
Aldrin	0.015J		ND		ND		NS	
Dieldrin	R		ND		ND		NS	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Barium	82.8B	95B	80.8	98.5	ND		NS	
Cadmium	ND	1.5B	3.2	3.1	ND		NS	
Chromium	37.3	14	18.2	8.7	ND		NS	
Lead	6.9J	2.4J	ND	2.2	ND		NS	

97MPI-AW-MW-53

	ROUND 1		ROUND 2		ROUND 3		ROUND 4	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	NI	NI	NI	NI	7B	ND	NS	
Barium	NI	NI	NI	NI	1420	727	NS	
Chromium	NI	NI	NI	NI	63.3	1.2B	NS	
Lead	NI	NI	NI	NI	23.6	3.3	NS	

83DM-SP-4

	ROUND 1		ROUND 2	
Diethylphthalate	4J		ND	
Di-n-butylphthalate	0.9J		0.4JB	
Endosulfan Sulfate	0.0037J		ND	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	5.8B	5.8B	4.3B	NA
Barium	60.5B	59.5B	47.9B	NA
Chromium	5.4B	3.5B	ND	NA
Lead	2.8B	ND	ND	NA

92EM-SP-8

	ROUND 1		ROUND 2	
4-Chloro-3-methylphenol	110		15	
Di-n-butylphthalate	0.3J		0.5JB	
bis(2-Ethylhexyl)phthalate	ND		2J	
1,1-Dichloroethane	6		ND	
cis-1,2-Dichloroethene	3J		ND	
Aldrin	0.047J		ND	
4,4'-DDD	R		0.017	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	22.1	6.3B	5.5	NA
Barium	123B	55.5B	47.7	NA
Chromium	23.6	1.2B	30.9	NA
Lead	4.3	ND	ND	NA

83DM-SP-3

	ROUND 1		ROUND 2	
Diethylphthalate	4J		ND	
Di-n-butylphthalate	ND		0.4JB	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	3.9B	ND	ND	NA
Barium	132B	36.6B	26.2B	NA
Chromium	8.1B	1B	1.4B	NA
Lead	7.2	ND	ND	NA

86EM-SP-6

	ROUND 1		ROUND 2	
Di-n-butylphthalate	2BJ		0.7JB	
1,1-Dichloroethane	2J		ND	
beta-BHC	ND		0.007	
4,4'-DDE	0.0017JP		ND	
Endrin	0.00061JP		ND	
gamma-Chlordane	0.00071JP		ND	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	ND	ND	1.8B	NA
Barium	63.7BE	40.3BE	80.1B	NA
Cadmium	0.92B	ND	1.2B	NA
Chromium	22.4	11	9.3B	NA
Lead	6.5N	ND	4.5B	NA
Mercury	0.27	ND	ND	NA

83DM-SP-1

	ROUND 1		ROUND 2	
Di-n-butylphthalate	3BJ		0.5JB	
bis(2-Ethylhexyl)phthalate	2J		ND	
Methylene Chloride	ND		0.8J	
1,1-Dichloroethane	ND		0.7J	
cis-1,2-Dichloroethene	--		2J	
Chloroform	7		ND	
Trichloroethene	120		42	
Tetrachloroethene	ND		0.7J	
1,2-Dichloroethene	5		--	
1,1,1-Trichloroethane	33		9	
Dieldrin	0.0011JP		ND	
4,4'-DDE	0.0023JP		ND	
4,4'-DDD	0.0022JP		ND	
Endosulfan Sulfate	0.0039JP		ND	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Barium	379	66.7B	95.5	NA
Chromium	14.3	2.1B	3.3	NA
Lead	39.9	ND	3.7	NA
Selenium	ND	ND	3.2	NA

86EM-SP-1B

	ROUND 1		ROUND 2		ROUND 3		ROUND 4	
Di-n-butylphthalate	5BJ		ND		NA		NS	
Methylene Chloride	ND		0.7J		1JB		NS	
cis-1,2-Dichloroethene	--		0.3J		ND		NS	
Trichloroethene	16		2J		5		NS	
1,2-Dichloroethene	2J		--		--		NS	
delta-BHC	0.0012JP		ND		NA		NS	
Dieldrin	0.0021JP		ND		NA		NS	
4,4'-DDD	0.0013JP		ND		NA		NS	
4,4'-DDT	ND		0.013		NA		NS	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	26	10.5	8.4	NA	NA		NS	
Barium	805	131B	154	NA	NA		NS	
Cadmium	8.3	ND	1.1	NA	NA		NS	
Chromium	86.4	2.7B	13.5	NA	NA		NS	
Lead	149	ND	31.8	NA	NA		NS	
Mercury	0.04	ND	ND	NA	NA		NS	
Silver	3.5B	ND	ND	NA	NA		NS	

WVA-GP-GW14

Diethylphthalate	0.3JB	
Di-n-butylphthalate	0.2JB	
Fluoranthene	0.3J	
Pyrene	0.3J	
Benzo(a)anthracene	0.2J	
Chrysene	0.2J	
bis(2-Ethylhexyl)phthalate	1J	
Benzene	4	
	UNFILTERED	FILTERED
Arsenic	75.7	NA
Barium	1660	NA
Chromium	183	NA
Lead	707	NA
Mercury	1.4	NA
Selenium	10	NA

97MPI-AW-MW-47

	ROUND 1		ROUND 2		ROUND 3		ROUND 4	
Vinyl Chloride	NI		NI		2J		NS	
Methylene Chloride	NI		NI		2JB		NS	
cis-1,2-Dichloroethene	NI		NI		8		NS	
Trichloroethene	NI		NI		34		NS	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Barium	NI	NI	NI	NI	151B	255	NS	NS

WVA-GP-GW13

Naphthalene	0.8J	
Acenaphthylene	0.5J	
Acenaphthene	0.8J	
Diethylphthalate	0.4JB	
Phenanthrene	7J	
Anthracene	2J	
Di-n-butylphthalate	0.2JB	
Fluoranthene	12	
Pyrene	10	
Butylbenzylphthalate	0.3J	
Benzo(a)anthracene	6	
Chrysene	6	
bis(2-Ethylhexyl)phthalate	2J	
Benzo(b)fluoranthene	4	
Benzo(k)fluoranthene	4	
Benzo(a)pyrene	5	
	UNFILTERED	FILTERED
Arsenic	98	NA
Barium	1880	NA
Cadmium	1.5B	NA
Chromium	154	NA
Lead	3870	NA
Mercury	1.3	NA
Selenium	15.4	NA
Silver	5.3B	NA

95MPI-B25-MW-4

	ROUND 1		ROUND 2	
Di-n-butylphthalate	ND		0.3JB	
Endosulfan Sulfate	---		ND	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Arsenic	ND	ND	183	NA
Barium	683J	116J	3920	NA
Cadmium	2.5B	ND	24.2	NA
Chromium	57.1	ND	352	NA
Cyanide	57100	NA	NA	NA
Lead	--	4.2J	336	NA
Mercury	0.41	ND	0.49BN	NA
Selenium	--	ND	2.5BS	NA

97MPI-AW-MW-46

	ROUND 1		ROUND 2		ROUND 3		ROUND 4	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Barium	NI	NI	NI	NI	1180	125B	NS	NS
Chromium	NI	NI	NI	NI	29.7	1.3B	NS	NS
Lead	NI	NI	NI	NI	6.4	2.2B	NS	NS

83DM-SP-2

	ROUND 1		ROUND 2	
Diethylphthalate	ND		0.4J	
Di-n-butylphthalate	0.5J		0.4JB	
bis(2-Ethylhexyl)phthalate	96		ND	
	UNFILTERED	FILTERED	UNFILTERED	FILTERED
Barium	254	119B	116B	NA
Chromium	5B	2.2B	ND	NA
Lead	11.7	13	ND	NA
Selenium	4B	6.3	5.8N	NA

SCALE IN FEET

0 50 100 200

LEGEND

🟥 EXCEEDS NEW YORK STATE CLASS GA STANDARD

⊕ HYBRID MONITORING WELL LOCATIONS

◐ OVERBURDEN MONITORING WELL LOCATIONS

⊖ WEATHERED BEDROCK MONITORING WELL LOCATIONS

⊕ BEDROCK MONITORING WELL LOCATIONS

ND	NOT DETECTED
NS	NOT SAMPLED
NI	NOT INSTALLED
NA	NOT ANALYZED
*	SAMPLED DURING ROUNDS 1 AND 2 ONLY

▨ PROCESS PITS

(ALL UNITS ug/L)

PLATE 5-3

US Army Corps
of Engineers

MALCOLM
PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

SUMMARY OF GROUNDWATER
INDIVIDUAL PARAMETER RESULTS

MALCOLM PIRNIE, INC.

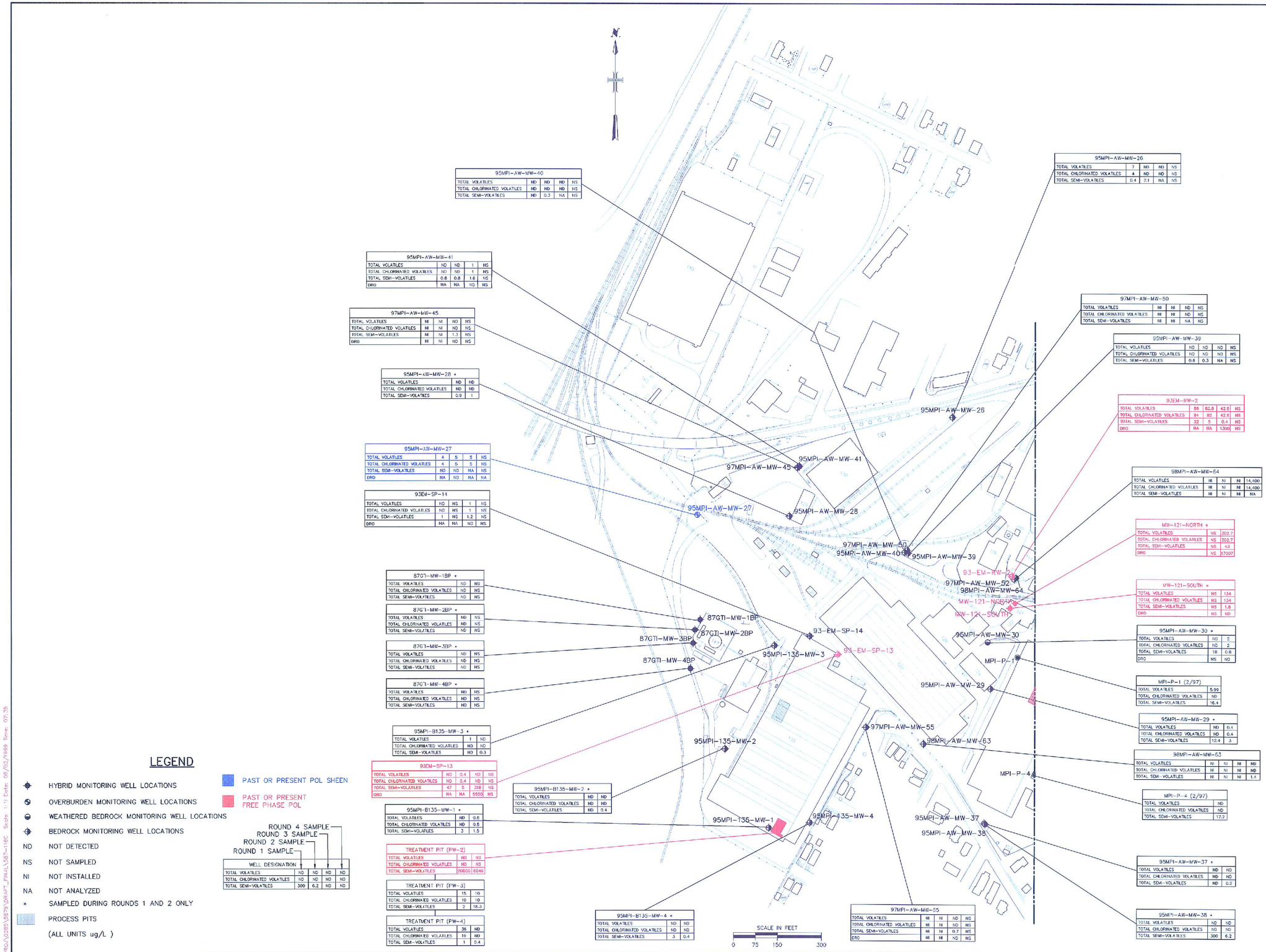
DATE MARCH 1999

SHEET 3 OF 3

DWG. NO. 587-124C

4871 026587100 f:\ACAD\PROJ\0285\5879\DRAFT_FINAL\587-124C Scale: 1:1 Date: 08/02/1999 Time: 07:28

XREF: X587-01



LEGEND

- HYBRID MONITORING WELL LOCATIONS
- OVERBURDEN MONITORING WELL LOCATIONS
- WEATHERED BEDROCK MONITORING WELL LOCATIONS
- BEDROCK MONITORING WELL LOCATIONS
- ND NOT DETECTED
- NS NOT SAMPLED
- NI NOT INSTALLED
- NA NOT ANALYZED
- * SAMPLED DURING ROUNDS 1 AND 2 ONLY
- PROCESS PITS (ALL UNITS ug/L)
- PAST OR PRESENT POL SHEEN
- PAST OR PRESENT FREE PHASE POL

ROUND 4 SAMPLE
ROUND 3 SAMPLE
ROUND 2 SAMPLE
ROUND 1 SAMPLE

WELL DESIGNATION				
TOTAL VOLATILES	ND	ND	ND	ND
TOTAL CHLORINATED VOLATILES	ND	ND	ND	ND
TOTAL SEMI-VOLATILES	300	6.2	ND	ND

PLATE 5-4

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

SUMMARY OF GROUNDWATER SAMPLING TOTAL ORGANIC COMPOUND RESULTS

MALCOLM PIRNIE, INC.

DATE MARCH 1999

SHEET 1 OF 3

DWG. NO. 587-118C

XREF: X587-01

4871 02B5587100 I:\ACAD\PROJ\02B5\5879\DRAFT_FINAL\587-118C Scale: 1:1 Date: 06/02/1999 Time: 07:35

95MPI-AW-MW-25				
TOTAL VOLATILES	ND	2.4	2	NS
TOTAL CHLORINATED VOLATILES	ND	2.4	2	NS
TOTAL SEMI-VOLATILES	ND	ND	NA	NS

95MPI-AW-MW-23 *		
TOTAL VOLATILES	ND	ND
TOTAL CHLORINATED VOLATILES	ND	ND
TOTAL SEMI-VOLATILES	1.1	0.2

95MPI-AW-MW-22 *		
TOTAL VOLATILES	ND	2
TOTAL CHLORINATED VOLATILES	ND	2
TOTAL SEMI-VOLATILES	ND	0.2

94EM-SP-19 *		
TOTAL VOLATILES	ND	ND
TOTAL CHLORINATED VOLATILES	ND	ND
TOTAL SEMI-VOLATILES	1.4	0.5

94EM-SP-21 *		
TOTAL VOLATILES	2	ND
TOTAL CHLORINATED VOLATILES	2	ND
TOTAL SEMI-VOLATILES	1.3	0.5

94EM-SP-20 *		
TOTAL VOLATILES	ND	ND
TOTAL CHLORINATED VOLATILES	ND	ND
TOTAL SEMI-VOLATILES	0.5	1.1

95MPI-AW-MW-24				
TOTAL VOLATILES	ND	ND	0.9	NS
TOTAL CHLORINATED VOLATILES	ND	ND	0.9	NS
TOTAL SEMI-VOLATILES	0.8	1.5	NA	NS
DRO	NA	ND	NA	NS

95MPI-AW-MW-42				
TOTAL VOLATILES	0.7	2.3	2	NS
TOTAL CHLORINATED VOLATILES	0.7	2.3	2	NS
TOTAL SEMI-VOLATILES	0.9	0.3	NA	NS

93EM-SP-15 *		
TOTAL VOLATILES	ND	NS
TOTAL CHLORINATED VOLATILES	ND	NS
TOTAL SEMI-VOLATILES	ND	NS

94EM-SP-16 *		
TOTAL VOLATILES	ND	NS
TOTAL CHLORINATED VOLATILES	ND	NS
TOTAL SEMI-VOLATILES	ND	NS

MPI-P-2 (3/97)	
TOTAL VOLATILES	ND
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	16.2

97MPI-AW-MW-54				
TOTAL VOLATILES	NI	NI	ND	NS
TOTAL CHLORINATED VOLATILES	NI	NI	ND	NS
TOTAL SEMI-VOLATILES	NI	NI	NA	NS

95MPI-B35-MW-7				
TOTAL VOLATILES	ND	2.7	ND	NS
TOTAL CHLORINATED VOLATILES	ND	2.7	ND	NS
TOTAL SEMI-VOLATILES	ND	0.4	NA	NS

MW-B110 *		
TOTAL VOLATILES	NS	0.8
TOTAL CHLORINATED VOLATILES	NS	0.8
TOTAL SEMI-VOLATILES	NS	3.8

95MPI-B35-MW-8				
TOTAL VOLATILES	ND	ND	ND	NS
TOTAL CHLORINATED VOLATILES	ND	ND	ND	NS
TOTAL SEMI-VOLATILES	37	115	40	NS
DRO	NA	NA	41000	NS

MPI-P-3 (3/97)	
TOTAL VOLATILES	12.5
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	91.2

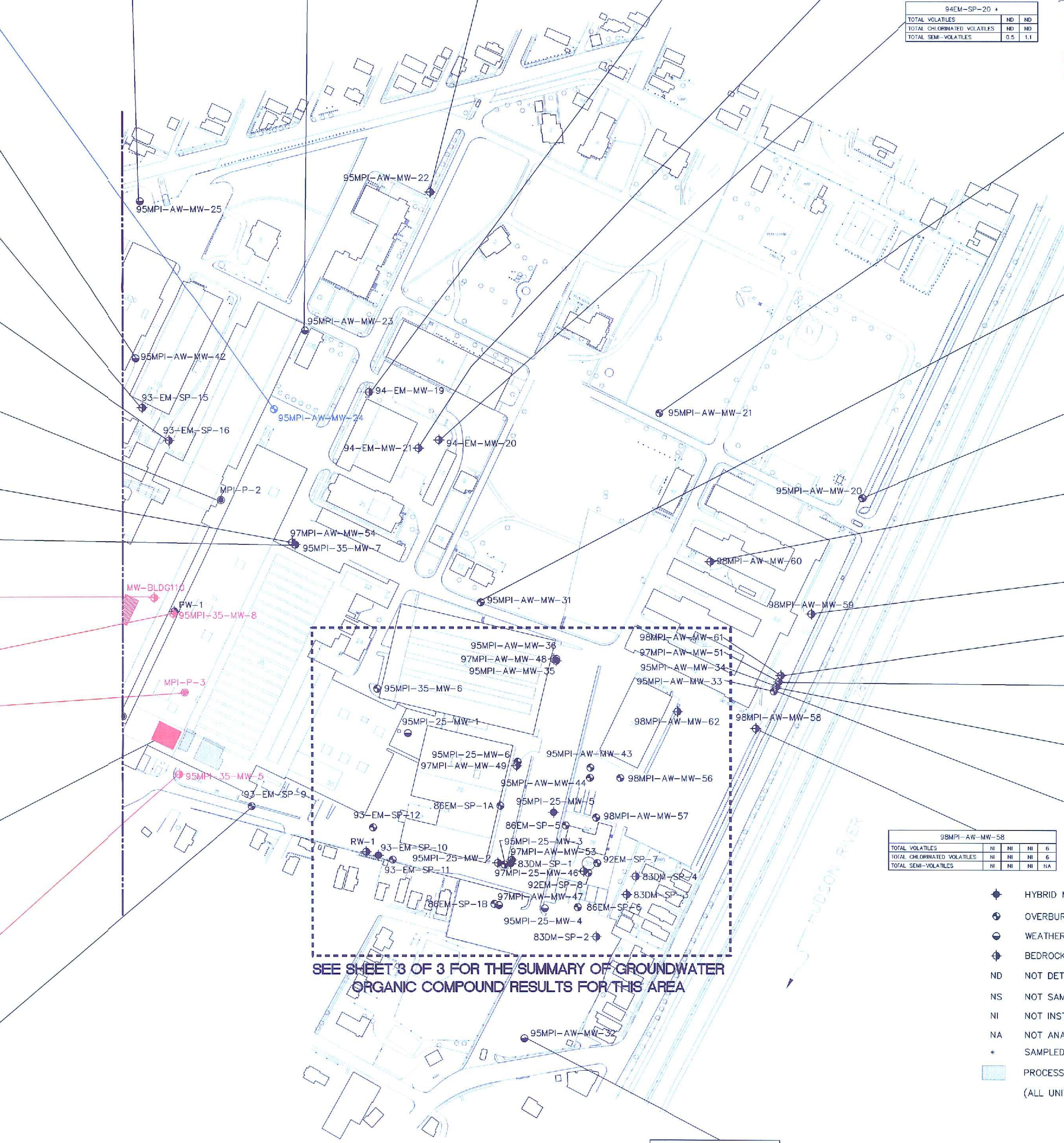
TREATMENT PIT (PW-2) *		
TOTAL VOLATILES	ND	ND
TOTAL CHLORINATED VOLATILES	ND	ND
TOTAL SEMI-VOLATILES	20600	6046

TREATMENT PIT (PW-3) *		
TOTAL VOLATILES	15	10
TOTAL CHLORINATED VOLATILES	10	10
TOTAL SEMI-VOLATILES	2	18.3

TREATMENT PIT (PW-4) *		
TOTAL VOLATILES	36	ND
TOTAL CHLORINATED VOLATILES	19	ND
TOTAL SEMI-VOLATILES	1	0.4

95MPI-B35-MW-5 *		
TOTAL VOLATILES	1	2.5
TOTAL CHLORINATED VOLATILES	ND	1.5
TOTAL SEMI-VOLATILES	ND	1.1

93EM-SP-9 *		
TOTAL VOLATILES	1	28
TOTAL CHLORINATED VOLATILES	ND	28
TOTAL SEMI-VOLATILES	ND	0.2



95MPI-AW-MW-21 *		
TOTAL VOLATILES	ND	ND
TOTAL CHLORINATED VOLATILES	ND	ND
TOTAL SEMI-VOLATILES	ND	0.5

95MPI-AW-MW-31 *		
TOTAL VOLATILES	ND	0.4
TOTAL CHLORINATED VOLATILES	ND	0.4
TOTAL SEMI-VOLATILES	0.8	0.7

95MPI-AW-MW-20 *		
TOTAL VOLATILES	ND	ND
TOTAL CHLORINATED VOLATILES	ND	ND
TOTAL SEMI-VOLATILES	NS	1.1

98MPI-AW-MW-60				
TOTAL VOLATILES	NI	NI	NI	7
TOTAL CHLORINATED VOLATILES	NI	NI	NI	7
TOTAL SEMI-VOLATILES	NI	NI	NI	NA

98MPI-AW-MW-59				
TOTAL VOLATILES	NI	NI	NI	151
TOTAL CHLORINATED VOLATILES	NI	NI	NI	151
TOTAL SEMI-VOLATILES	NI	NI	NI	NA

98MPI-AW-MW-61				
TOTAL VOLATILES	NI	NI	NI	212.9
TOTAL CHLORINATED VOLATILES	NI	NI	NI	212.9
TOTAL SEMI-VOLATILES	NI	NI	NI	NA

98MPI-AW-MW-51				
TOTAL VOLATILES	NI	NI	121,860	51,900
TOTAL CHLORINATED VOLATILES	NI	NI	121,860	51,900
TOTAL SEMI-VOLATILES	NI	NI	NA	NA

95MPI-AW-MW-34				
TOTAL VOLATILES	2689	1400	1255	2233
TOTAL CHLORINATED VOLATILES	2689	1400	1244	2233
TOTAL SEMI-VOLATILES	1	ND	NA	NA

95MPI-AW-MW-33				
TOTAL VOLATILES	4	4.4	15	ND
TOTAL CHLORINATED VOLATILES	4	4.4	15	ND
TOTAL SEMI-VOLATILES	ND	0.5	NA	NA

98MPI-AW-MW-58				
TOTAL VOLATILES	NI	NI	NI	6
TOTAL CHLORINATED VOLATILES	NI	NI	NI	6
TOTAL SEMI-VOLATILES	NI	NI	NI	NA

95MPI-AW-MW-32 *		
TOTAL VOLATILES	ND	0.4
TOTAL CHLORINATED VOLATILES	ND	0.4
TOTAL SEMI-VOLATILES	0.3	1

SCALE IN FEET

0 75 150 300

LEGEND

- HYBRID MONITORING WELL LOCATIONS
- OVERBURDEN MONITORING WELL LOCATIONS
- WEATHERED BEDROCK MONITORING WELL LOCATIONS
- BEDROCK MONITORING WELL LOCATIONS
- ND NOT DETECTED
- NS NOT SAMPLED
- NI NOT INSTALLED
- NA NOT ANALYZED
- * SAMPLED DURING ROUNDS 1 AND 2 ONLY
- PROCESS PITS

(ALL UNITS ug/L)

- PAST OR PRESENT POL SHEEN
- PAST OR PRESENT FREE PHASE POL

WELL DESIGNATION	ROUND 1 SAMPLE	ROUND 2 SAMPLE	ROUND 3 SAMPLE	ROUND 4 SAMPLE
TOTAL VOLATILES	ND	ND	ND	ND
TOTAL CHLORINATED VOLATILES	ND	ND	ND	ND
TOTAL SEMI-VOLATILES	300	6.2	ND	ND

PLATE 5-4

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS

NO.	BY	DATE	REMARKS

DES ARV

DWN SMH

CKD KJG

WATERVLIET ARSENAL MAIN MANUFACTURING AREA USACE CONTRACT NO. DACA31-94-D-0017

SUMMARY OF GROUNDWATER SAMPLING TOTAL ORGANIC COMPOUND RESULTS

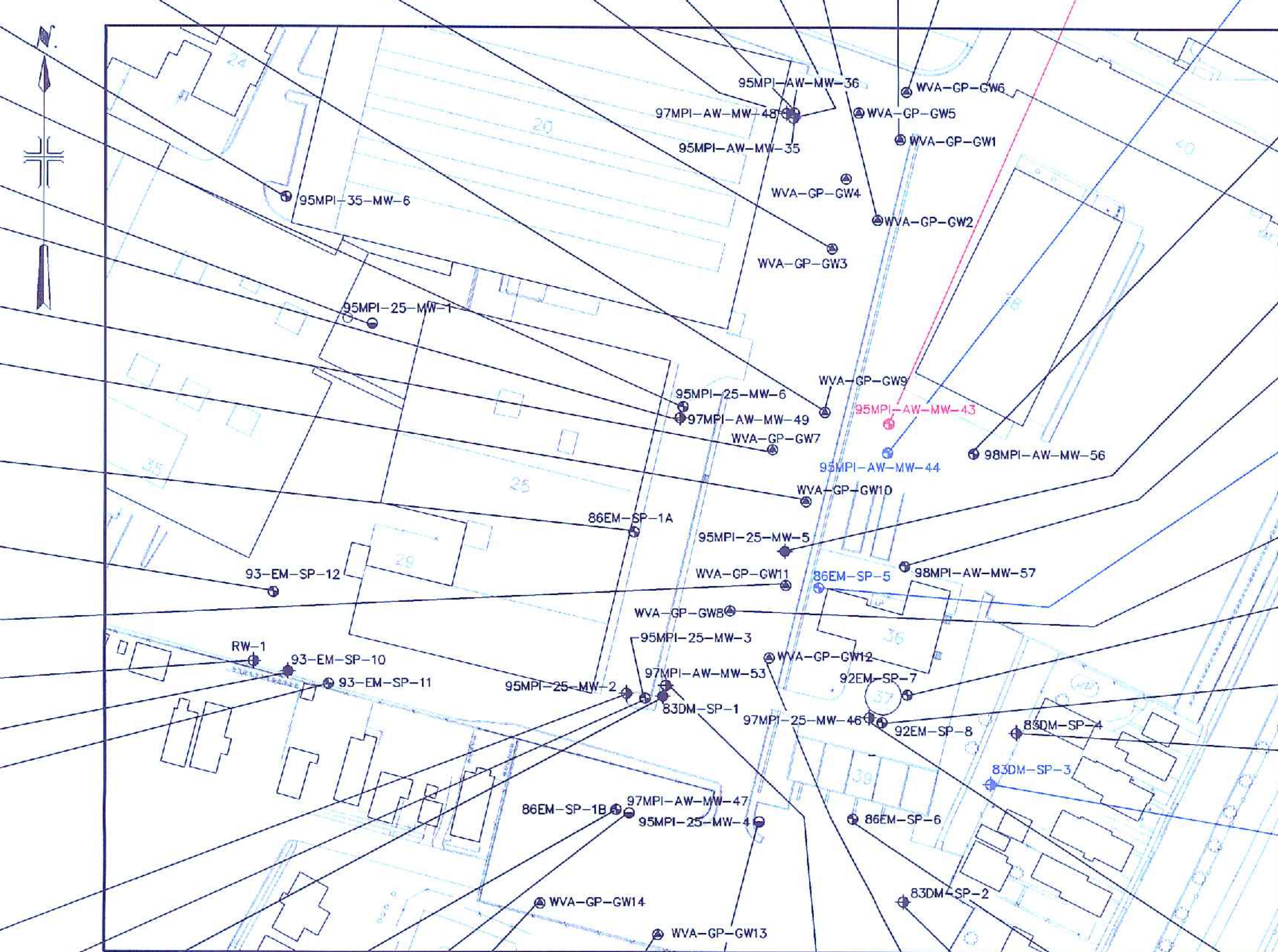
MALCOLM PIRNIE, INC.

DATE JUNE 1999

SHEET 2 OF 3

DWG. NO. 587-119C

XREF: X587-01



97MPI-AW-MW-48

TOTAL VOLATILES	NI	NI	ND	NS
TOTAL CHLORINATED VOLATILES	NI	NI	ND	NS
TOTAL SEMI-VOLATILES	NI	NI	0.5	NS
DRO	NI	NI	ND	NS

95MPI-AW-MW-35

TOTAL VOLATILES	ND	138	121	NS
TOTAL CHLORINATED VOLATILES	ND	138	121	NS
TOTAL SEMI-VOLATILES	1	0.9	NA	NS

WVA-GP-GW1 (2/98)

TOTAL VOLATILES	2
TOTAL CHLORINATED VOLATILES	2
TOTAL SEMI-VOLATILES	4.4

95MPI-AW-MW-43

TOTAL VOLATILES	22	12.6	16	NS
TOTAL CHLORINATED VOLATILES	22	12.6	16	NS
TOTAL SEMI-VOLATILES	245	121.8	NA	NS

98MPI-AW-MW-56

TOTAL VOLATILES	NI	NI	NI	ND
TOTAL CHLORINATED VOLATILES	NI	NI	NI	ND
TOTAL SEMI-VOLATILES	NI	NI	NI	9.2

WVA-GP-GW9 (2/98)

TOTAL VOLATILES	ND
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	6.9

WVA-GP-GW3 (2/98)

TOTAL VOLATILES	ND
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	ND

95MPI-AW-MW-36

TOTAL VOLATILES	801	296	414	NS
TOTAL CHLORINATED VOLATILES	799	296	414	NS
TOTAL SEMI-VOLATILES	NS	1.6	NA	NS

WVA-GP-GW2 (2/98)

TOTAL VOLATILES	ND
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	3.9

WVA-GP-GW6 (2/98)

TOTAL VOLATILES	ND
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	109.2

95MPI-AW-MW-44

TOTAL VOLATILES	7	6.4	6	NS
TOTAL CHLORINATED VOLATILES	7	6.4	6	NS
TOTAL SEMI-VOLATILES	12.6	18.6	NA	NS

95MPI-B35-MW-6 *

TOTAL VOLATILES	3	ND
TOTAL CHLORINATED VOLATILES	3	ND
TOTAL SEMI-VOLATILES	ND	0.5

95MPI-B25-MW-5

TOTAL VOLATILES	ND	1.1	2.8	NS
TOTAL CHLORINATED VOLATILES	ND	1.1	2.8	NS
TOTAL SEMI-VOLATILES	3	ND	NA	NS

95MPI-B25-MW-6

TOTAL VOLATILES	273	291.8	249	NS
TOTAL CHLORINATED VOLATILES	243	291.8	249	NS
TOTAL SEMI-VOLATILES	2	0.2	NA	NS

98MPI-AW-MW-57

TOTAL VOLATILES	NI	NI	NI	6
TOTAL CHLORINATED VOLATILES	NI	NI	NI	6
TOTAL SEMI-VOLATILES	NI	NI	NI	0.3

95MPI-B25-MW-1

TOTAL VOLATILES	4	ND	ND	NS
TOTAL CHLORINATED VOLATILES	ND	ND	ND	NS
TOTAL SEMI-VOLATILES	3	0.3	NA	NS

86EM-SP-5

TOTAL VOLATILES	33	11	8.7	NS
TOTAL CHLORINATED VOLATILES	33	11	8.7	NS
TOTAL SEMI-VOLATILES	890	310	NA	NS

97MPI-AW-MW-49

TOTAL VOLATILES	NI	NI	0.9	NS
TOTAL CHLORINATED VOLATILES	NI	NI	0.9	NS
TOTAL SEMI-VOLATILES	NI	NI	NA	NS

WVA-GP-GW7 (2/98)

TOTAL VOLATILES	2
TOTAL CHLORINATED VOLATILES	2
TOTAL SEMI-VOLATILES	9.3

WVA-GP-GW8 (2/98)

TOTAL VOLATILES	ND
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	24.1

WVA-GP-GW10 (2/98)

TOTAL VOLATILES	ND
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	1.2

86EM-SP-1A

TOTAL VOLATILES	319	18.4	22	NS
TOTAL CHLORINATED VOLATILES	319	18.4	22	NS
TOTAL SEMI-VOLATILES	3	ND	NA	NS

92EM-SP-7

TOTAL VOLATILES	630	4.8	5	NS
TOTAL CHLORINATED VOLATILES	630	2.8	5	NS
TOTAL SEMI-VOLATILES	0.7	76.3	NA	NS

93EM-SP-12 *

TOTAL VOLATILES	ND	ND
TOTAL CHLORINATED VOLATILES	ND	ND
TOTAL SEMI-VOLATILES	ND	0.3

WVA-GP-GW11 (2/98)

TOTAL VOLATILES	ND
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	3.6

92EM-SP-8

TOTAL VOLATILES	9	ND	10	NS
TOTAL CHLORINATED VOLATILES	9	ND	10	NS
TOTAL SEMI-VOLATILES	110.3	17.5	NA	NS

RW-1 *

TOTAL VOLATILES	0.3	0.8
TOTAL CHLORINATED VOLATILES	ND	0.8
TOTAL SEMI-VOLATILES	0.5	1.6

83DM-SP-4 *

TOTAL VOLATILES	ND	ND
TOTAL CHLORINATED VOLATILES	ND	ND
TOTAL SEMI-VOLATILES	4.9	0.4

93EM-SP-10 *

TOTAL VOLATILES	ND	NS
TOTAL CHLORINATED VOLATILES	ND	NS
TOTAL SEMI-VOLATILES	1	NS

83DM-SP-3 *

TOTAL VOLATILES	ND	ND
TOTAL CHLORINATED VOLATILES	ND	ND
TOTAL SEMI-VOLATILES	4	0.4

93EM-SP-11 *

TOTAL VOLATILES	2	6
TOTAL CHLORINATED VOLATILES	ND	6
TOTAL SEMI-VOLATILES	0.5	ND

95MPI-B25-MW-2

TOTAL VOLATILES	60	78.8	100	NS
TOTAL CHLORINATED VOLATILES	60	78.8	100	NS
TOTAL SEMI-VOLATILES	5	ND	NA	NS

97MPI-AW-MW-46

TOTAL VOLATILES	NI	NI	ND	NS
TOTAL CHLORINATED VOLATILES	NI	NI	ND	NS
TOTAL SEMI-VOLATILES	NI	NI	NA	NS

95MPI-B25-MW-3 *

TOTAL VOLATILES	556	417
TOTAL CHLORINATED VOLATILES	516	417
TOTAL SEMI-VOLATILES	7	ND

86EM-SP-6 *

TOTAL VOLATILES	2	ND
TOTAL CHLORINATED VOLATILES	2	ND
TOTAL SEMI-VOLATILES	2	0.7

83DM-SP-1

TOTAL VOLATILES	165	55.2	64	NS
TOTAL CHLORINATED VOLATILES	158	55.2	64	NS
TOTAL SEMI-VOLATILES	5	0.5	NA	NS

95MPI-B25-MW-4 *

TOTAL VOLATILES	ND	ND
TOTAL CHLORINATED VOLATILES	ND	ND
TOTAL SEMI-VOLATILES	1	0.3

83DM-SP-2 *

TOTAL VOLATILES	ND	ND
TOTAL CHLORINATED VOLATILES	ND	ND
TOTAL SEMI-VOLATILES	0.5	0.8

WVA-GP-GW14 (2/98)

TOTAL VOLATILES	4
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	2.5

86EM-SP-1B

TOTAL VOLATILES	18	3	6	NS
TOTAL CHLORINATED VOLATILES	18	3	6	NS
TOTAL SEMI-VOLATILES	5	ND	NA	NS

97MPI-AW-MW-47

TOTAL VOLATILES	NI	NI	46	NS
TOTAL CHLORINATED VOLATILES	NI	NI	46	NS
TOTAL SEMI-VOLATILES	NI	NI	NA	NS

97MPI-AW-MW-53

TOTAL VOLATILES	NI	NI	ND	NS
TOTAL CHLORINATED VOLATILES	NI	NI	ND	NS
TOTAL SEMI-VOLATILES	NI	NI	NA	NS

WVA-GP-GW13 (2/98)

TOTAL VOLATILES	ND
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	61

WVA-GP-GW12 (2/98)

TOTAL VOLATILES	ND
TOTAL CHLORINATED VOLATILES	ND
TOTAL SEMI-VOLATILES	30.4

SCALE IN FEET

0 50 100 200

LEGEND

- HYBRID MONITORING WELL LOCATIONS
- OVERBURDEN MONITORING WELL LOCATIONS
- WEATHERED BEDROCK MONITORING WELL LOCATIONS
- BEDROCK MONITORING WELL LOCATIONS
- ND NOT DETECTED
- NS NOT SAMPLED
- NI NOT INSTALLED
- NA NOT ANALYZED
- * SAMPLED DURING ROUNDS 1 AND 2 ONLY
- PROCESS PITS
- (ALL UNITS ug/L)
- PAST OR PRESENT POL SHEEN
- PAST OR PRESENT FREE PHASE POL

ROUND 4 SAMPLE
ROUND 3 SAMPLE
ROUND 2 SAMPLE
ROUND 1 SAMPLE

WELL DESIGNATION

TOTAL VOLATILES	ND	ND	ND	ND
TOTAL CHLORINATED VOLATILES	ND	ND	ND	ND
TOTAL SEMI-VOLATILES	300	6.2	ND	ND

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS

NO.	BY	DATE	REMARKS

DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

SUMMARY OF GROUNDWATER SAMPLING TOTAL ORGANIC COMPOUND RESULTS

MALCOLM PIRNIE, INC.
DATE JUNE 1999
SHEET 3 OF 3
DWG. NO. 587-121C

XREF: X587-01

LEGEND

- HYBRID MONITORING WELL LOCATIONS
- OVERBURDEN MONITORING WELL LOCATIONS
- WEATHERED BEDROCK MONITORING WELL LOCATIONS
- BEDROCK MONITORING WELL LOCATIONS
- PIEZOMETER LOCATIONS
- TETRACHLOROETHENE & BREAKDOWN PRODUCTS NOT DETECTED OR ≤ 1ug/L
- PROCESS PITS

VINYL CHLORIDE
DICHLOROETHENE
TETRACHLOROETHENE
TRICHLOROETHENE

DIAMETER = K + log (Total Chlorinated Volatiles)

NOTE:

RESULTS ARE MAXIMUM VALUE DETECTED.
PACKER SAMPLES NOT INCLUDED.

PLATE 6-1

US Army Corps of Engineers

MALCOLM PIRNIE

REVISIONS			
NO.	BY	DATE	REMARKS

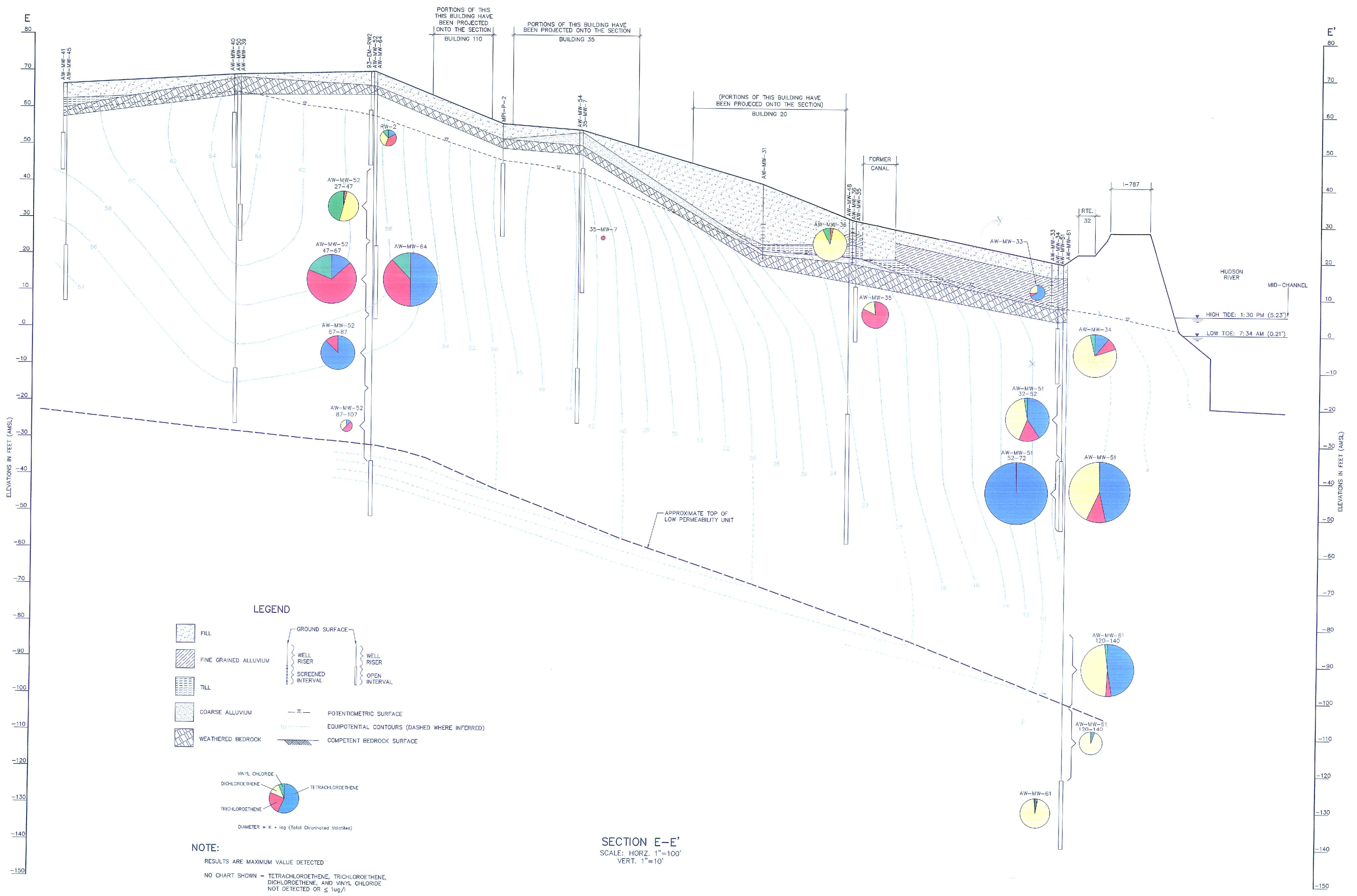
DES ARV
DWN SMH
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

DISTRIBUTION OF TETRACHLOROETHENE, TRICHLOROETHENE, DICHLOROETHENE, AND VINYL CHLORIDE IN GROUNDWATER
SCALE: AS SHOWN

MALCOLM PIRNIE, INC.
DATE JUNE 1999
SHEET ___ OF ___
DWG. NO. 587-107C

XREF: X587-01



US Army Corps of Engineers

MALCOLM PIRNIE

NO.	BY	DATE	REVISIONS REMARKS

DES ARV
DWN JAP
CKD KJG

WATERVLIET ARSENAL
MAIN MANUFACTURING AREA
USACE CONTRACT NO. DACA31-94-D-0017

VERTICAL DISTRIBUTION OF TETRACHLOROETHENE, TRICHLOROETHENE, DICHLOROETHENE, AND VINYL CHLORIDE

SCALE: AS SHOWN

PLATE 6-2

MALCOLM PIRNIE, INC.
DATE APRIL 1999
SHEET ___ OF ___
DWG. NO. 587-145