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RCRA PART B PERMIT APPLICATION SECTION I: CLOSURE PLAN VOLUME 8 OF 13
OCTOBER 31, 1991

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RCRA PART B PERMIT APPLICATION

October 31, 1991

SECTION I: CLOSURE PLAN

(Volume 8 of 13)

Fernald Environmental Management Project

U.S. EPA Identification No. 0H6890008976
Ohio EPA Permit No. 05-31-0681

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SECTION I - CLOSURE PLAN INFORMATION, POST CLOSURE PLAN INFORMATION, AND FINANCIAL REQUIREMENTS

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SECTION I:
CLOSURE PLANS

SECTION I - CLOSURE PLAN INFORMATION, POST-CLOSURE PLAN INFORMATION, AND FINANCIAL REQUIREMENTS

RCRA Part B Permit Application
Fernald Environmental Management Project
Fernald, Ohio

I-1 CLOSURE PLAN INFORMATION

This section of the permit application is submitted in response to the requirements of OAC 3745-50-44(A)(13), 3745-55-10 through 19, 3745-55-78, and 40 CFR 264.111 through 115, and 264.178 requiring closure plan information, and schedules for closure of operating container storage units.

There are seven active Hazardous Waste Management Units to be closed pursuant to this closure plan information. These include six storage warehouses and one 480,000 square foot storage pad. The Hazardous Waste Management Units are listed as follows:

1) KC-2 Warehouse (Building 63)
2) Plant 9 Warehouse (Building 81)
3) Plant 8 Warehouse (Building 80)
4) CP Storage Warehouse - Building 56 (Butler Building)
5) Plant 6 Warehouse (Building 79)
6) Pilot Plant Warehouse (Building 68)
7) Plant 1 Pad

This introduction provides an overview of the units to be closed, the proposed closure procedures, schedules for closure and related information. Figure I-1 is a map of the FEMP, which shows the location of each of these hazardous waste management units. A closure subsection has been written for each of these hazardous management units and is included in this section. This closure plan information identifies the steps

necessary to close each unit at any time. The FEMP's intention is to "clean" close the hazardous waste management units covered by this closure plan information. The FEMP will maintain a copy of the approved closure plan information with any revisions on-site. The FEMP will notify the OEPA at least 45 days prior to initiation of closure.

On November 28,1989, the FEMP was included on the National Priorities List (NPL) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The hazardous waste management units discussed in this section are included within one of the facility's operable units. Closure of RCRA units will be consistent with the final closure and remediation of the entire site under the CERCLA program.

Most hazardous waste generated and stored at the FEMP is also radioactive mixed waste. Mixed waste is defined as waste that contains both a hazardous waste component regulated under RCRA and a radioactive component consisting of source, special nuclear, or by-product material regulated under the Atomic Energy Act. This closure plan information is designed to address only the hazardous waste components of mixed waste. Procedures for handling radioactive wastes will be incorporated into closure activities where appropriate. Any information included in this section on the radioactive portion of mixed waste stored or generated at the FEMP is included for informational purposes only and is not intended to be part of the facility's RCRA permit.

Because of the mixed waste national treatment or disposal capacity limitations, it is anticipated that final closure of the entire facility cannot be completed within 180 days. Therefore, schedule for closure will be extended as discussed in Section I-1d. Due to the treatment or disposal limitations, hazardous waste generated during closure activities will be minimized by using the best available closure and decontamination procedures at the time of closure.

I-1a Closure Performance Standard

This closure plan information is designed to ensure that RCRA storage units will be closed in a manner that minimizes or eliminates further maintenance and controls, and that prevents post-closure escape of hazardous waste, hazardous waste constituents, leachate, runoff, or hazardous waste decomposition products to the ground water, surface water, atmosphere, or soils. To prevent threats to human health and the environment, the FEMP's intent is to utilize best management practices to minimize spills and releases throughout the life of the facility including closure. Good housekeeping will be continuously emphasized, and thus closure activities will be simplified to the extent possible.

Fugitive dust emissions during closure of the units will be controlled by vacuuming the area using equipment outfitted with High Efficiency Particulate Air (HEPA) filters. No demolition of unit structures is anticipated during closure. Washing and rinsing operations during decontamination will also serve to control particulate emissions. Berms will contain spills of liquid hazardous wastes, and, along with temporary dikes, will prevent the release of wash or rinse waters to the environment. Since hazardous wastes are containerized, the release of hazardous vapors during closure is not anticipated.

During closure of the units, applicable health and safety requirements and guidelines will be followed, including DOE orders governing management of mixed waste. Proper safety equipment will be worn by personnel engaged in closure activities in accordance with a Project/Task-Specific Health & Safety Plan that will be prepared prior to initiation of closure.

I-1a(1) RCRA Closure Standard

The FEMP's intention is to remove the hazardous wastes and "clean" close the permitted units included in this closure plan information. Clean determinations will be based on samples of rinseate from decontamination of secondary containment structures and samples of soils where releases may have occurred. The FEMP will consider the soils to be clean, if there are no indications of hazardous waste releases based on unit inspections, assessment of secondary containment, and review of operating records as discussed in Section I-1e(2)(b).

The secondary containment structures and equipment used in closure operations for the hazardous waste storage areas will be considered clean for RCRA closure if the final rinseate water samples meet the following criteria (as suggested by the OEPA "Closure Plan Review Guidance" dated May 1, 1991):

1) Fifteen times the public drinking water maximum contaminant level (MCL) for hazardous waste constituents as promulgated in OAC 3745-81-11 and 40 CFR 141.11 for inorganics, and OAC 3745-81-12 and 40 CFR 141.12 and for organics;

2) If an MCL is not available for a particular contaminant, fifteen times the maximum contaminant level goal (MCLG) as promulgated in 40 CFR 141.50 will be used as the clean standard; or

3) If the product of fifteen times the MCL or MCLG exceeds 1 mg/l or if neither an MCL nor an MCLG is available for

a particular contaminant, 1 mg/l will be used as the standard.

If soil sampling is required during closure of any of the units as discussed in Section I-1e(2)(b), soils associated with the unit will be considered clean for RCRA closure if the soil samples contain:

- concentrations of organic hazardous waste constituents of concern below the Method Detection Limits (MDL), and
- concentrations of each metal, less than or equivalent to the mean background concentration plus two standard deviations.

I-1b Partial Closure and Final Closure Activities

Partial closure of any of the hazardous waste storage units prior to final facility closure will be accomplished according to the procedures outlined in this closure plan information. If the FEMP decide to close any of the hazardous waste storage units prior to final facility closure, they will be closed according to the applicable sections of this closure plan information.

Closure of any hazardous waste management unit at the FEMP will be integrated into the CERCLA activities scheduled to complete final remediation of the entire site.

I-1b(1) Closure Certification

Upon completion of the closure of each unit, the FEMP will submit to OEPA a certification from both the owner and a qualified, independent, registered Professional Engineer that the hazardous waste management unit has been closed in accordance with the approved closure plan information. The

certifying Professional Engineer or his designated representative will be present for significant closure activities, such as decontamination and sampling. The FEMP will submit a closure certification report prepared by the owner and the Professional Engineer within 60 days of completing closure activities. The report will contain:

- a description of the hazardous waste management unit closed;
- owner certification statements.
- Professional Engineer certification.
- a brief description of the closure tasks performed;
- a chronological log of closure activities;
- an assessment of the analytical data; and
- type and volume of hazardous waste removed.

I-1c Maximum Waste Inventory

The determination of the maximum hazardous waste inventory for each storage unit has taken into consideration current operating practices including drum stacking heights, required aisle space, and unit dimensions. The maximum inventory capacity for each of the seven hazardous waste storage units is presented in Table I-1.

I-1d Schedule for Closure

Specific closure schedules at the FEMP may be impacted by on-site CERCLA activities and on-site storage requirements and capacity limitations for mixed radioactive and hazardous wastes. The storage capacity requirements will be determined by the actual volume of hazardous wastes that will be generated during RCRA closures, on-going site remediation activities and the amount of hazardous wastes that can be shipped to off-site treatment and disposal facilities.

Hazardous wastes removed or generated during remediation or closure of a hazardous waste management unit included in this closure plan information, will be sent to an approved treatment or disposal facility. Currently there is a lack of national capacity for approved treatment or disposal facilities to handle mixed wastes. Since the FEMP cannot predict when there will be an increase in capacity, it is anticipated that extended on-site storage will be required for mixed wastes that are currently stored on-site as well as any additional mixed wastes that will be generated during site remediation and RCRA closures.

Considering the unknown volume of wastes to be managed and the current limitations on approved off-site treatment and disposal options for mixed wastes, the exact timing and sequence for closure of the hazardous waste management units at the FEMP cannot be projected prior to closure. However, it is anticipated that the prioritized sequence of hazardous waste management unit closures will consider the capacity for additional hazardous waste storage in the unit, off-site capacity for treatment or disposal of mixed waste, and operational limitations and maintenance required on the units. Other considerations that may impact the final closure schedules include CERCLA activities near the units, a shortfall of approved laboratory capacity, and delays in funding approval.

Although the exact closure sequence and overall final facility closure schedule cannot be determined at this time, the FEMP currently anticipates that the Plant 1 Pad will be the last unit to be closed. Detailed schedules for closure activities at each storage unit are provided in Section I-1(e)(4). Each closure schedule assumes adequate alternative storage capacity exists for the hazardous waste being removed from the unit undergoing closure. This anticipated closure scheme allows each unit, except Plant 1 Pad, to be closed within 180 days. Hazardous waste inventory from

each unit will be either transported directly off-site for treatment/disposal, if capacity is available, or moved to an approved alternative storage area pending off-site transport.

I-1d(1) Time Allowed for Closure

Pursuant to OAC 3745-55-13 and 40 CFR 264.113, closure of the hazardous waste management units will be initiated within 90 days of the date of final receipt of hazardous wastes. Based on the operational requirements discussed in the previous section, the date of final receipt of hazardous wastes for a given storage unit at the FEMP will be the date on which the following conditions are met:

- The storage capacity is no longer required for storage of hazardous wastes being generated during RCRA closure actions or site remediation activities, and
- All hazardous wastes in the storage unit can be transferred to an approved storage area(s) on-site and/or to approved and contracted off-site treatment and disposal facilities.

I-1d(1)(a) Extension for Closure Time

Based on the size of the Plant 1 Pad (480,000 square feet), the large volume of hazardous waste expected to be in storage at the unit, and the possible use of the pad for storage of hazardous waste from other hazardous waste management units undergoing closure, the regulatory requirements for removing the hazardous wastes within 90 days of initiating closure, and completing closure within 180 days after receiving the final volume of hazardous wastes at this unit are not expected to be met. Closure activities for Plant 1 Pad

are expected to exceed the time allowed for closure by approximately 400 days.

The FEMP hereby requests an extension of time allowed for closure of the Plant 1 Pad to both exceed the 90 days allowed for removal of hazardous wastes [OAC 3745-55-13(A) and 40 CFR 264.113(a)] and the 180 days allowed to complete final closure of the unit [OAC 3745-55(B) and 40 CFR 264.113(b)]. This extension, required for closure of the Plant 1 Pad, has been incorporated into the schedule for closure of the unit provided in Section I-1(e)(4)(g). The Plant 1 Pad closure plan information [Section I - 1(e)(4)(g)] describes the steps that will be taken to prevent threats to human health and the environment during the extended closure period.

I-1e Closure Procedures

This section of the closure plan information addresses the procedures to be followed in closing the facility hazardous waste management units. This section addresses inventory removal, disposal or decontamination of secondary containment structures, equipment and residues, soil sampling, and ancillary activities related to closure of the units.

I-1e(1) Inventory Removal

Prior to initiating the procedures described in this closure plan information, an operational protocol will be developed to establish the appropriate hierarchy for closing any one unit or all hazardous waste storage units at the facility. This protocol will identify the sequence in which the units will be closed, and how stored hazardous waste will be managed. This

protocol will take into account the availability of both on and off-site treatment, storage and disposal facilities for mixed waste. In devising the operational protocol, the manager will consider the operational status of the unit and equipment, identify the type and quantities of hazardous wastes in current and past inventory, obtain spill records for the unit, develop an inventory management plan, and ensure that staff and resources are available to complete closure according to this plan. Inventory removal will be accomplished according to the established protocol.

I-1e(2) Disposal or Decontamination of Structures, Soil, Equipment, and Residues

The following sections provide a summary of the methods the FEMP will use to decontaminate structures and equipment, and conduct soil sampling during closure activities. Prior to initiation of closure, an inventory review will be conducted (as part of the operational protocol mentioned above) which will identify the hazardous wastes that have been stored in each unit undergoing closure.

With the exception of the Plant 1 Pad, samples collected in support of closure operations (including rinseate and soil samples) at the units will be analyzed for the hazardous waste constituents of the waste managed in the unit, as listed in OAC 3745-51 and 40 CFR Part 261 Appendix VII. Due to the large volume and diversity of hazardous wastes managed on the Plant 1 Pad, sampling at this unit will include analysis for hazardous constituents (as listed in Appendix IX from OAC 3745-54-98 and 40 CFR Part 264) associated with hazardous waste managed in the unit. Sampling and analysis, including analysis of tap water used for rinsing, will be conducted

according to the Sampling and Analysis Plan (Attachment I-1), the FEMP Waste Analysis Plan, and the FEMP Waste Determination Plan.

The decontamination procedures discussed in this section apply to closure activities for the hazardous waste storage units to be permitted. Detailed decontamination procedures for each unit are discussed in Section I-1e(4). An attempt will be made to decontaminate the secondary containment structures using methods described in this plan. If decontamination of these structures cannot be achieved, a revision to the closure plan information will be submitted to OEPA for approval. The revision will include alternative methods for decontaminating the secondary containment structures or provide for removal of the structures and disposal in accordance with applicable solid and hazardous waste requirements. The amount of hazardous waste generated will be minimized during decontamination using every practical technique available. However, it is estimated that up to 3,100 fifty-five gallon drums of hazardous waste (or mixed waste) could be generated during decontamination of the storage warehouses and the Plant 1 Pad.

I-1e(2)(a) Decontamination of Secondary Containment Structures

Following removal of the hazardous wastes, a Professional Engineer will inspect the hazardous waste container storage areas for any breaches in the secondary containment system. If a failure is noted or there are indications that hazardous waste may have contacted the soil beneath the concrete, soil samples will be collected as necessary and analyzed for the

hazardous waste constituents associated with the waste stored at the unit to determine the presence and extent of contamination. Plant 1 Pad analyses will be conducted for hazardous constituents. If analyses indicate no hazardous waste or constituents have escaped from the unit, the breach will be sealed and decontamination activity will continue in accordance with this plan. If the soil analysis results exceed the clean standard for soil verification sampling, the FEMP will notify OEPA of the unexpected event and submit revised closure plan information.

Decontamination will begin with vacuuming of the concrete secondary containment surface. This will be followed by one of the decontamination methods listed on Table I-2, depending upon the nature of the unit to be closed. Following the selected decontamination method, the concrete secondary containment structure will be rinsed with tap water to remove the decontamination residues. A sample will be taken from the final rinseates and analyzed for the hazardous waste constituents listed in OAC 3745-51 and 40 CFR Part 261 for the hazardous waste stored in the unit. The rinseate analyses will be used to demonstrate that decontamination has been accomplished in accordance with the closure performance standard of Section I-1(a)(1). In the case of Plant 1 Pad, rinseate analyses will include hazardous constituents as listed in Appendix IX from OAC 3745-54-98 and 40 CFR Part 264. Attempts at decontamination, followed by rinsing, will continue until either the "clean" closure criteria of Section I-1a(1) are achieved, or it is determined that decontamination cannot be achieved. If decontamination

of these structures cannot be achieved, a revision to the closure plan information will be submitted to OEPA for approval.

Additionally, concrete chip samples will be taken from discolored areas on the concrete secondary containment structure and from any areas where spills have been documented to have occurred. The concrete samples will also be analyzed for the hazardous waste constituents listed in OAC 3745-51 and 40 CFR Part 261 for those hazardous wastes determined from review of inventory records to have been stored in the unit (Plant 1 Pad analyses will be conducted for hazardous constituents listed in OAC 3745-54-98 and 40 CFR Part 264 Appendix IX).

I-1e(2)(b) Soil Sampling

Soil sampling is not anticipated for the six hazardous waste container storage warehouse units (Buildings 63, 81, 80, 56, 79, and 68) since the storage areas are located totally within enclosed buildings and have concrete floors. Because the Plant 1 Pad is partially uncovered, however, the FEMP anticipates that soil sampling will be conducted at this unit as discussed in Section I-1e(4)(g).

At the time of closure, spill records will be reviewed and an engineering assessment of the concrete secondary containment structures in the storage units will be conducted. If spills are documented to have occurred and resulted in potentially contaminated soils, or if the engineering assessment indicates that the secondary

containment structure has been breached, directed soil sampling will be conducted in areas of known or suspected contamination. The analytical parameters will be based on the hazardous waste constituents, listed in OAC 3745-51 and 40 CFR Part 261, for those hazardous wastes stored in the unit. In the case of Plant 1 Pad, analyses will be for hazardous constituents. If contamination is detected in directed soil sampling efforts, the FEMP will promptly notify the OEPA and submit revised closure plan information.

I-1e(2)(c) Decontamination of Equipment Used During the Closure Process

Equipment decontamination will be conducted on the equipment used in the closure of the hazardous waste management units. Any equipment used in hazardous waste activities and not previously decontaminated will be decontaminated at final facility closure.

Table I-2 lists the potential methods of equipment decontamination methods that may be used at the FEMP. The method selected at the time of closure and the setup for equipment decontamination will be designed to contain and minimize the hazardous waste generated, and minimize the potential for release of hazardous waste or constituents to the environment. Decontamination will be conducted over an impervious area located adjacent to the unit undergoing closure. Decontamination will not be attempted during adverse weather conditions.

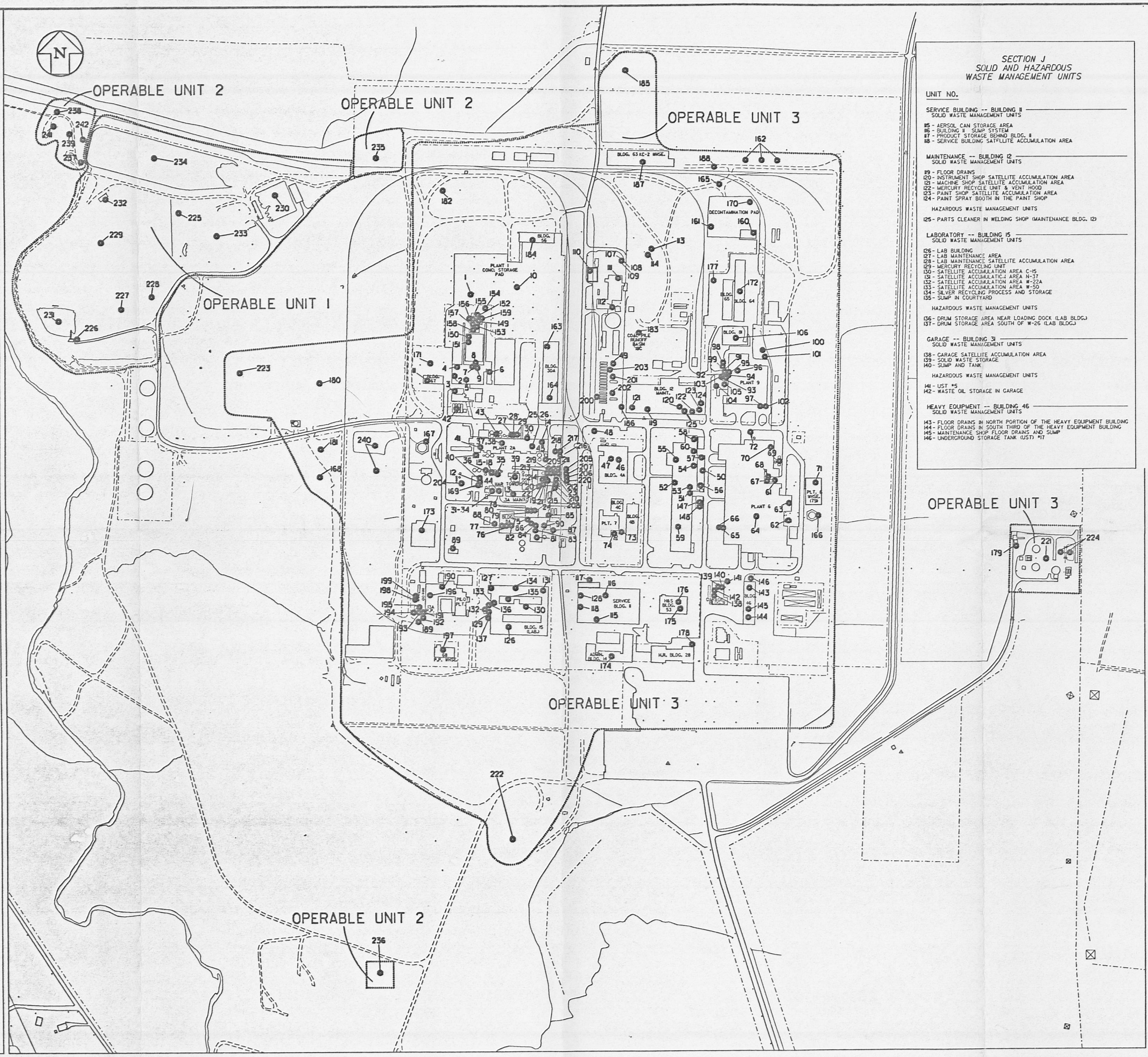
Equipment used for closure activities will be cleaned using one of the methods listed on Table I-2 and will be

rinsed with tap water. Runoff of liquids during decontamination will be prevented by temporary dikes. Liquids and other residues will be containerized and evaluated to determine if they are hazardous or solid waste. The final rinseate will be sampled and analyzed according to the Sampling and Analysis Plan (Attachment I-1), the FEMP Waste Analysis Plan, and the FEMP Waste Determination Plan to determine whether the equipment has been successfully decontaminated. The specific analytical parameters will be determined through a review of the inventory records of hazardous waste stored in the unit and potentially in contact with the equipment. The analytical parameters will be based on the hazardous waste constituents, listed in OAC 3745-51 and 40 CFR Part 261, for the hazardous wastes stored in the unit For the Plant 1 Pad, analyses will be for hazardous constituents. The acceptable "clean" concentration limits that will apply to the decontamination rinseate are the same as those described in Section I-1a(1).

I-1e(2)(d) Disposal of Decontamination Residues

All structures and equipment that cannot be decontaminated and expendable materials used in decontamination (rags, mops, sorbent pads, protective clothing, etc.) will be managed in a manner consistent with FEMP hazardous waste practices pending hazardous waste determinations.

All wash and rinse waters will be collected, managed in a manner consistent with hazardous waste management practices, and evaluated to determine if they are



SECTION J
SOLID AND HAZARDOUS WASTE MANAGEMENT UNITS

UNIT NO. OPERABLE UNIT 3

PLANT I -- SAMPLING PLANT
SOLID WASTE MANAGEMENT UNITS

1 - COPPER METAL SCRAP PILE
2 - MAGNESIUM FLUORIDE TITAN MILL
3 - PLANT I ORE SILOS
4 - PLANT I SAMPLE LINE
5 - PLANT I SUMP SYSTEM
6 - PLANT I THAW TUNNEL
7 - SAFE GEOMETRY DIGESTION SUMP
8 - SLOP STORAGE TANK

HAZARDOUS WASTE MANAGEMENT UNITS

9 - DETREX STILL
10 - PLANT I PAD
11 - PLANT I STORAGE BLDG. (BLDG. 67)

PLANT 2/3 -- REFINERY
SOLID WASTE MANAGEMENT UNITS

12 - INCINERATOR BUILDING SATELLITE ACCUMULATION AREA
13 - MAINTENANCE SHOP FLOOR DRAIN
14 - PLANT 2/3 SUMP SYSTEM
15 - RAFFINATE STORAGE TANK F1-400
16 - RAFFINATE STORAGE TANK F1-401
17 - RAFFINATE STORAGE TANK F1-402
18 - RAFFINATE STORAGE TANK F1-403
19 - REFINERY SUMP, FILTER WASH TANK F1-608
20 - REFINERY SUMP, FILTER WASH TANK F1-609
21 - REFINERY SUMP, FILTER WASH TANK F1-610
22 - REFINERY SUMP, FILTER WASH TANK F2E-601
23 - REFINERY SUMP, FILTER WASH TANK F2E-602
24 - REFINERY SUMP, THICKENER SLURRY TANK F1-612
25 - SATELLITE ACCUMULATION AREA (CURRENT)
26 - SATELLITE ACCUMULATION AREA (PRIOR)
27 - TRIBUTYL PHOSPHATE/KEROSENE HOLDING TANK 17A
28 - TRIBUTYL PHOSPHATE/KEROSENE HOLDING TANK 17B
29 - TRIBUTYL PHOSPHATE/KEROSENE HOLDING TANK 17C
30 - TRIBUTYL PHOSPHATE/KEROSENE HOLDING TANK F1-512
31 - UNH STORAGE TANK F1-310
32 - UNH STORAGE TANK F1-311
33 - UNH STORAGE TANK F1-312
34 - UNH STORAGE TANK F1-317
35 - URANYL NITRATE TANK F1-405
36 - URANYL NITRATE RAFFINATE TANK F3E-405
37 - WASTEWATER STORAGE TANK F1-25A
38 - WASTEWATER STORAGE TANK F1-26A

HAZARDOUS WASTE MANAGEMENT UNITS

39 - NAR SYSTEM COMPONENTS
40 - TRANE THERMAL LIQUID INCINERATOR
41 - URANYL NITRATE TANKS (DIGESTION AREA (2 LOCATIONS))
42 - URANYL NITRATE TANKS (NFS STORAGE AREA)
43 - URANYL NITRATE TANKS (NORTH OF PLANT 2)
44 - URANYL NITRATE TANKS (RAFFINATE BLDG.)
45 - URANYL NITRATE TANKS (SOUTHEAST OF PLANT 2)

PLANT 4 -- GREEN SALT PLANT
SOLID WASTE MANAGEMENT UNITS

46 - PLANT 4 SUMP SYSTEM

HAZARDOUS WASTE MANAGEMENT UNITS

47 - DRUMMED HF RESIDUE/ASSOCIATED STORAGE AREAS INSIDE PLANT 4
48 - DRUMMED HF RESIDUE/ASSOCIATED STORAGE AREAS N.W. OF PLANT 4
49 - DRUMMED HF RESIDUE/ASSOCIATED STORAGE AREAS S. OF COOLING TOWERS

PLANT 5 -- METALS PRODUCTION PLANT
SOLID WASTE MANAGEMENT UNITS

50 - HOFFMAN DUST COLLECTOR SYSTEM 101
51 - HOFFMAN DUST COLLECTOR SYSTEM 256
52 - HOFFMAN DUST COLLECTOR SYSTEM 258
53 - HOFFMAN DUST COLLECTOR SYSTEM 260
54 - HOFFMAN DUST COLLECTOR SYSTEM 261
55 - HOFFMAN DUST COLLECTOR SYSTEM 262
56 - MAINTENANCE SHOP FLOOR DRAIN AND SUMP
57 - MAINTENANCE SHOP STEAM BOOTH
58 - METALS PLANT SATELLITE ACCUMULATION AREA
59 - PLANT 5 SUMP SYSTEM

HAZARDOUS WASTE MANAGEMENT UNITS

60 - HILCO OIL RECOVERY

PLANT 6 -- METALS FABRICATION PLANT
SOLID WASTE MANAGEMENT UNITS

61 - ELECTROSTATIC DUST COLLECTOR SYSTEM, NORTH DC
62 - ELECTROSTATIC DUST COLLECTOR SYSTEM, SOUTH DC
63 - OPERATIONS AREA SATELLITE ACCUMULATION AREA
64 - PLANT 6 SUMP SYSTEM
65 - SPENT COOLING WATER FOR NU-SAL HEAT TREATMENT TANK #1
66 - SPENT COOLING WATER FOR NU-SAL HEAT TREATMENT TANK #2
67 - SPENT NITRIC ACID STORAGE TANK F6-3
68 - UNDERGROUND STORAGE TANK (UST) #14
69 - WASTEWATER STORAGE TANK F6E-700
70 - WATER TREATMENT SATELLITE ACCUMULATION AREA

HAZARDOUS WASTE MANAGEMENT UNITS

71 - PLANT 6 WAREHOUSE (BLDG. 79)
72 - STORAGE PAD NORTH OF PLANT 6

PLANT 7 -- URANIUM HEXAFLUORIDE REDUCTION PLANT
SOLID WASTE MANAGEMENT UNITS

73 - ABANDONED SUMP TANK 07 - UNDESIGNATED
74 - HYDROGEN FLUORIDE SCRUBBER AREA SUMP #0817

PLANT 8 -- SCRAP RECOVERY PLANT
SOLID WASTE MANAGEMENT UNITS

75 - EAST OLIVER FILTER
76 - EIMCO FILTER (EAST)
77 - EIMCO FILTER (WEST)
78 - FILTRATE TANK #08-A005-TNK
79 - FILTRATE TANK #08-A006-TNK
80 - FILTRATE TANK #08-A007-TNK
81 - OXIDATION FURNACE #2
82 - PLANT 8 SUMP SYSTEM
83 - ROTARY KILN
84 - ROTEX SCREENING UNIT

HAZARDOUS WASTE MANAGEMENT UNITS

85 - BOX FURNACE
86 - OXIDATION FURNACE #1
87 - PLANT 8 EAST DRUM STORAGE PAD
88 - PLANT 8 WEST DRUM STORAGE PAD
89 - PLANT 8 WAREHOUSE (BLDG. 80)
90 - PRIMARY CALCINER

PLANT 9 -- SPECIAL PRODUCTS PLANT
SOLID WASTE MANAGEMENT UNITS

91 - DILUTE HYDROFLUORIC ACID (DHF) DUMPSTER TANK (SPCC 21 EAST)
92 - FILTRATE WATER SUMP TANK - F1-1
93 - FILTRATE WATER SUMP TANK - F1-2
94 - FILTRATE WATER SUMP TANK - F1-3
95 - LIME SLURRY DUMPSTER TANK (SPCC 21 WEST)
96 - PLANT 9 SUMP SYSTEM
97 - SPENT NITRIC ACID TANK (SPCC 20A WEST)
98 - SPENT NITRIC ACID TANK (SPCC 44 TANK 1)
99 - SPENT NITRIC ACID TANK (SPCC 44 TANK 2)
100 - UNDERGROUND STORAGE TANK (UST) #7
101 - USED CUTTING OIL TANK (SPCC 25)
102 - WASTEWATER STORAGE TANK F-9NI-700
103 - WASTEWATER STORAGE TANK 2429 (SPCC 23)
104 - WATER TREATMENT AMMONIA TANK (SPCC 24)
105 - WEST PORTABLE OIL/WATER RESIDUE TANK (SPCC 15)

HAZARDOUS WASTE MANAGEMENT UNITS

106 - PLANT 9 WAREHOUSE (BLDG. 81)

BOILER PLANT -- BUILDING 10
SOLID WASTE MANAGEMENT UNITS

107 - ASH RECEIVING TANK, 10-B004A
108 - ASH RECEIVING TANK, 10-B004B
109 - ASH SYSTEM, AIR WASH SPRAYER, 10-B004C
110 - BOILER PLANT MAINTENENCE SATELLITE ACCUMULATION AREA
111 - BOILER PLANT SATELLITE ACCUMULATION AREA
112 - CHEMICAL FEED SUMP
113 - GRAPHITE BURNER
114 - OIL BURNER

SECTION J
SOLID AND HAZARDOUS WASTE MANAGEMENT UNITS

UNIT NO.

SERVICE BUILDING -- BUILDING 11
SOLID WASTE MANAGEMENT UNITS

115 - AERSOL CAN STORAGE AREA
116 - BUILDING 11 SUMP SYSTEM
117 - PRODUCT STORAGE BEHIND BLDG. 11
118 - SERVICE BUILDING SATELLITE ACCUMULATION AREA

MAINTENANCE -- BUILDING 12
SOLID WASTE MANAGEMENT UNITS

119 - FLOOR DRAINS
120 - INSTRUMENT SHOP SATELLITE ACCUMULATION AREA
121 - MACHINE SHOP SATELLITE ACCUMULATION AREA
122 - MERCURY RECYCLE UNIT & VENT HOOD
123 - PAINT SHOP SATELLITE ACCUMULATION AREA
124 - PAINT SPRAY BOOTH IN THE PAINT SHOP

HAZARDOUS WASTE MANAGEMENT UNITS

125 - PARTS CLEANER IN WELDING SHOP (MAINTENANCE BLDG. 12)

LABORATORY -- BUILDING 15
SOLID WASTE MANAGEMENT UNITS

126 - LAB BUILDING
127 - LAB MAINTENANCE AREA
128 - LAB MAINTENANCE SATELLITE ACCUMULATION AREA
129 - MERCURY RECYCLING UNIT
130 - SATELLITE ACCUMULATION AREA C-15
131 - SATELLITE ACCUMULATION AREA N-37
132 - SATELLITE ACCUMULATION AREA W-22A
133 - SATELLITE ACCUMULATION AREA W-50
134 - SILVER RECYCLING PROCESS AND STORAGE
135 - SUMP IN COURTYARD

HAZARDOUS WASTE MANAGEMENT UNITS

136 - DRUM STORAGE AREA NEAR LOADING DOCK (LAB BLDG.)
137 - DRUM STORAGE AREA SOUTH OF W-26 (LAB BLDG.)

GARAGE -- BUILDING 31
SOLID WASTE MANAGEMENT UNITS

138 - GARAGE SATELLITE ACCUMULATION AREA
139 - SOLID WASTE STORAGE
140 - SUMP AND TANK

HAZARDOUS WASTE MANAGEMENT UNITS

141 - UST #5
142 - WASTE OIL STORAGE IN GARAGE

HEAVY EQUIPMENT -- BUILDING 46
SOLID WASTE MANAGEMENT UNITS

143 - FLOOR DRAINS IN NORTH PORTION OF THE HEAVY EQUIPMENT BUILDING
144 - FLOOR DRAINS IN SOUTH THIRD OF THE HEAVY EQUIPMENT BUILDING
145 - MAINTENANCE SHOP FLOOR DRAINS AND SUMP
146 - UNDERGROUND STORAGE TANK (UST) #17

SECTION J
SOLID AND HAZARDOUS WASTE MANAGEMENT UNITS

UNIT NO.

MAIN SLAG BUILDING -- BUILDING 55-A
SOLID WASTE MANAGEMENT UNITS

147 - BUILDING 55 CONVEYOR, MAGNESIUM FLUORIDE RECOVERY UNIT
148 - BUILDING 55 CONVEYOR, DRUM-OUT STATION

BUILDING 66
SOLID WASTE MANAGEMENT UNITS

149 - AEROSOL CAN PUNCTURE UNIT
150 - COPPER SHREDDER
151 - COPPER SHREDDER BAGHOUSE
152 - DRUM BALER
153 - DRUM BALER SUMP
154 - DRUM BALER HYDRAULIC FLUID TANK, 66-D009A-TNK
155 - OVEN
156 - PAINT/SOLVENT STORAGE AREA
157 - PAINT SPRAY BOOTH

HAZARDOUS WASTE MANAGEMENT UNITS

158 - WHEELABRATOR - BLDG. 66
159 - WHEELABRATOR DUST COLLECTOR - BLDG. 66

DECONTAMINATION BUILDING -- BUILDING 69
SOLID WASTE MANAGEMENT UNITS

160 - DECONTAMINATION BUILDING FLOOR DRAINS
161 - DECONTAMINATION BUILDING SUMP
162 - WASTE PILES AND CLEAN/LOADOUT PAD

MISCELLANEOUS OU3 UNITS
SOLID WASTE MANAGEMENT UNITS

163 - CHEMICAL WAREHOUSE NORTHEASTERN AREA
164 - CHEMICAL WAREHOUSE SOUTHERN AREA
165 - FERROUS METAL SCRAP PILE
166 - GRIT BLAST STORAGE AREA, EAST TOWER
167 - GRIT BLAST STORAGE AREA, WEST TOWER
168 - K-65 AREA, HIGH LEVEL NITRATE STORAGE TANK 18-A010
169 - KELLY SOLID WASTE INCINERATOR
170 - OTHER SCRAP PILES/SALVAGE MATERIALS/AREAS
171 - PLANT 1 BUILDING 67 AREA
172 - RI/FS 90 DAY STORAGE
173 - RUST BUILDING SATELLITE ACCUMULATION AREA
174 - SATELLITE ACCUMULATION AREA - ADMINISTRATION BUILDING, EOC
175 - SATELLITE ACCUMULATION AREA - HEALTH AND SAFETY BUILDING, X-RAY/PHOTO
176 - SATELLITE ACCUMULATION AREA - HEALTH AND SAFETY BUILDING, INSTRUMENT SHOP
177 - SCRAP PILE WEST OF BUILDING 65
178 - SECURITY SOLID WASTE INCINERATOR
179 - SEWAGE TREATMENT PLANT INCINERATOR
180 - TEMPORARY STORAGE TANK 18-A004
181 - TEMPORARY STORAGE TANK 18-A005
182 - THIRD STREET WASTE PILE

HAZARDOUS WASTE MANAGEMENT UNITS

183 - COAL PILE RUNOFF BASIN
184 - CP STORAGE WAREHOUSE - BLDG. 56 (BUTLER BLDG.)
185 - FIRE TRAINING FACILITY
186 - HF TANK CAR
187 - KC-2 WAREHOUSE (BLDG. 63)
188 - NITRIC ACID RAIL CAR AND AREA

PILOT PLANT
SOLID WASTE MANAGEMENT UNITS

189 - PILOT PLANT CONTAINER STORAGE AREA
190 - PILOT PLANT SUMP SYSTEM
191 - SOLVENT TANK (SPCC #108 TANK 1)
192 - SOLVENT TANK (SPCC #108 TANK 2)
193 - WASTEWATER HOLDING TANK F-100
194 - WASTEWATER HOLDING TANK F-101

HAZARDOUS WASTE MANAGEMENT UNITS

195 - ABANDONED SUMP WEST OF PILOT PLANT
196 - BARIUM CHLORIDE SALT TREATMENT FACILITY
197 - PILOT PLANT WAREHOUSE STORAGE PAD (BLDG. 68)
198 - TANK FOR BULK STORAGE OF SOLVENTS, T-5
199 - TANK FOR BULK STORAGE OF SOLVENTS, T-6

TANK FARM
SOLID WASTE MANAGEMENT UNITS

200 - CONSTRUCTION WASTE STORAGE AREA
201 - TANK 17
202 - TANK 18

HAZARDOUS WASTE MANAGEMENT UNITS

203 - TANK FARM SUMP

WASTEWATER TREATMENT SYSTEM
SOLID WASTE MANAGEMENT UNITS

204 - BIODENITRIFICATION TREATMENT SYSTEM
205 - GENERAL SUMP, BOILDOWN WATER TANK F18-6A
206 - GENERAL SUMP, FILTERED WATER TANK F18-1
207 - GENERAL SUMP, FILTERED WATER TANK F18-6B
208 - GENERAL SUMP, LIME SLURRY TANK F3A-3
209 - GENERAL SUMP, NEUTRALIZED RAFFINATE TANK T-18X-2500
210 - GENERAL SUMP, RAFFINATE NEUTRALIZATION TANK F2E-603
211 - GENERAL SUMP, RECEIVING TANK F18E-2
212 - GENERAL SUMP, RECEIVING TANK F18E-3
213 - GENERAL SUMP, WATER TANK F18-2
214 - GENERAL SUMP, WATER TANK F18-3
215 - GENERAL SUMP, WATER TANK F18-4
216 - GENERAL SUMP, WATER TANK T-18X-1000
217 - GENERAL SUMP, WATER TANK T-18X-1100
218 - GENERAL SUMP, WATER TANK T-18X-1300
219 - GENERAL SUMP, WATER TANK T-18X-1500
220 - GENERAL SUMP, WATER TANK T-18X-2900
221 - SANITARY SEWAGE TREATMENT PLANT
222 - STORMWATER RETENTION BASINS

HAZARDOUS WASTE MANAGEMENT UNITS

223 - BIO-SURGE LAGOON
224 - SLUDGE DRYING BEDS

OPERABLE UNIT 1
SOLID WASTE MANAGEMENT UNITS

225 - BURN PIT
226 - K-65 SATELLITE ACCUMULATION AREA
227 - WASTE PIT NO. 1
228 - WASTE PIT NO. 2
229 - WASTE PIT NO. 3
230 - WASTE PIT NO. 6

HAZARDOUS WASTE MANAGEMENT UNITS

231 - CLEARWELL
232 - EXPERIMENTAL TREATMENT FACILITY (ETF)
233 - WASTE PIT NO. 4
234 WASTE PIT NO. 5

OPERABLE UNIT 2
SOLID WASTE MANAGEMENT UNITS

235 - SANITARY LANDFILL
236 - SOUTHFIELD DISPOSAL AREA

CERCLA REMEDIATION STORAGE AREA

237 - DECONTAMINATION PAD AND TANKS
238 - EMPTY DRUM STORAGE AREA
239 - OIL STORAGE SHED

HAZARDOUS WASTE MANAGEMENT UNITS

240 - LIME SLUDGE PONDS

CERCLA REMEDIATION STORAGE AREA

241 - EQUIPMENT STORAGE AREA
242 - WELL DRILLING STORAGE AREA

2495

0' 200' 400' 600'
SCALE

U.S. DEPARTMENT OF ENERGY

FIGURE J-1

FERNALD, OHIO

20

FILE NAME: ZFA1:[200,4]91HWMUMP.DGN

hazardous or solid wastes. If the final rinseate is below "clean" levels, it will be considered non-hazardous and managed as a solid waste. Hazardous wastes will be managed and disposed in accordance with applicable hazardous waste rules and regulations.

I-1e(3) Closure of Disposal Units/Contingent Closures

All container storage units at the FEMP are constructed and operated in a manner to prevent releases of hazardous wastes to the environment. None of the hazardous waste storage units are utilized for disposal of hazardous wastes. Since the units are designed for storage only, contingent post-closure plan information is not required.

I-1e(4) Closure of Containers

This section presents the specific closure procedures for each of the hazardous waste container storage units at the FEMP. Each of the following subsections present unit specific information concerning the hazardous waste management unit description, maximum hazardous waste inventory, schedule for closure, inventory removal, decontamination or disposal of structures and equipment, disposal of decontamination residues, and soil sampling, if necessary.

I-1e(4)(a) KC-2 Warehouse (Building 63) Closure Plan Information

Hazardous Waste Management Unit Description

The KC-2 Warehouse (Building 63) is currently operated as a hazardous waste container storage building for storage of hazardous waste with and without free liquids. Figure I-1 shows the location of the KC-2 Warehouse. The warehouse is a concrete block and sheet metal enclosed building. The dimensions of the KC-2 Warehouse are 82 feet wide by 346 feet long. Figures I-2A and I-2B present drawings of the KC-2 Warehouse. The interior is subdivided into eight containment areas (Bays 1 through 8). The concrete slab comprising the floor of the bays is approximately eight inches thick. Currently, Bays 5, 6, and 7 have six inch by six inch containment dikes overlaid with an eight foot wide access ramp. The concrete floor and dikes for Bays 5, 6, and 7 are coated with a durable epoxy polymer to create an impermeable surface. Each containment structure provides for the retention of at least 10 percent of the total hazardous waste volume being stored within the respective bay. Any spilled material in the containment area is removed, containerized, labeled and stored for disposal. Run-on and runoff is not a concern for this unit since it is completely covered and diked.

Bays 1, 2, 3, 4, and 8 currently have no concrete containment curbing between bays, and will therefore only be used to store hazardous waste without free liquids as determined by process knowledge or visual inspection. Any material spilled in these storage areas will be removed, containerized, labeled, and stored for

disposal.

Maximum Hazardous Waste Inventory

The maximum capacity of this unit is 234,520 gallons of hazardous wastes. The maximum number of drums that can be stored is 4,264. Hazardous wastes with and without free liquids are stored in the unit. Storage capacities for the eight bays are as follows:

- Bay 1 - 49,280 gallons (solids only)
- Bay 2 - 49,280 gallons (solids only)
- Bay 3 - 39,600 gallons (solids only)
- Bay 4 - 25,520 gallons (solids only)
- Bay 5 - 25,080 gallons (liquids and solids)
- Bay 6 - 25,520 gallons (liquids and solids)
- Bay 7 - 13,200 gallons (liquids and solids)
- Bay 8 - 7,040 gallons (solids only)

A complete list of hazardous wastes that have been stored at this unit along with the applicable OAC 3745-51 and 40 CFR Part 261 hazardous waste constituents of each waste, will be submitted to the OEPA following notification of closure.

Schedule for Closure

The FEMP will notify the OEPA at least 45 days prior to the initiation of closure activities. The FEMP intends to close the KC-2 Warehouse within 180 days of beginning closure. The schedule for closing this unit is detailed in Figure I-3. Meeting this schedule is contingent upon the availability of treatment, storage, or disposal facilities, laboratory capacity, and proper funding, as discussed in Section I-1d. If the closure cannot be

completed in 180 days, the FEMP will request an extension of time to complete closure. Any request for extension will be submitted as a modification to the closure plan information. Closure of this unit will be consistent with the final remediation and closure of the entire site under the CERCLA program.

Inventory Removal

As part of the operational protocol developed for integrated site wide closures, the closure manager will devise an operational protocol to ensure specific closure activities at the KC-2 Warehouse are accomplished within the closure schedule. The manager will consider the sequence of operations, resources required, and types and quantities of hazardous waste stored. In devising the operational protocol, the manager will develop an inventory reduction plan specifying how, when, and where each hazardous waste will be managed, and ensure that resources are available to complete the closure activities as scheduled.

At closure, the hazardous waste inventory from the KC-2 Warehouse will be directly transported off-site for treatment/disposal, if off-site capacity is available, or moved to Plant 1 Pad or another approved storage location. Inventory removal may be undertaken at any time, but will be completed within 90 days after the start of closure. Following inventory removal, an engineering assessment will be conducted to determine the condition and integrity of the secondary containment structure and concrete floor slab.

Decontamination of Structures and Equipment

Following the engineering integrity assessment, the KC-2 Warehouse secondary containment structures will be decontaminated. If decontamination of these structures cannot be achieved, a revision to the closure plan information will be submitted to OEPA for approval. Prior to decontamination, any breaches or structural defects noted in the integrity assessment will be evaluated for potential releases to the environment. If a possibility exists that hazardous waste or waste constituents may have migrated out of the unit through the breach, directed soil sampling in the area of the breach or crack will be conducted prior to attempts at decontamination.

The FEMP's objective is to "clean" close this unit while minimizing the amount of hazardous waste generated from closure activities. Before closing the unit, the FEMP will select an appropriate decontamination method to achieve "clean" closure. The decontamination method that is currently planned for the KC-2 Warehouse secondary containment structure and bay floors is detailed below. The procedures given apply separately to individual bays, and may be repeated as required.

1) The bays and any secondary containment structures will be vacuumed to remove the surface residue.

2) Temporary berms and/or sorbent pads will be placed around the perimeter of Bays 1, 2, 3, 4, and 8 to contain wash and rinse solutions.

3) An aqueous detergent solution will be used to

scrub the surface of the concrete containment structures. The waste detergent solution will be mopped or vacuumed from the containment structures.

4) The containment structures and bay floors will be rinsed with tap water. The rinseate will be mopped or vacuumed from each bay, collected in a clean sump, or pumped to an appropriate clean container and sampled to evaluate and confirm decontamination efforts, according to the Sampling and Analysis Plan (Attachment I-1), the FEMP Waste Analysis Plan and the FEMP Waste Determination Plan.

Decontamination will be verified by sampling and analyzing the final rinse. These samples will be analyzed for the hazardous waste constituents of the waste managed in the unit, as listed in OAC 3745-51 and 40 CFR Part 261. If the final rinse does not achieve the "clean" levels for rinseate as discussed in Section I-1a(1), the decontamination procedures described above will be repeated or a revision to this closure plan information will be submitted to the OEPA.

<u>Disposal of Decontamination Residues</u>

All structures and equipment that cannot be decontaminated and expendable materials used in decontamination (rags, mops, sorbent pads, protective clothing, etc.) will be stored and managed in a manner consistent with FEMP hazardous waste practices pending hazardous waste determinations.

All wash and rinse waters will be collected, stored and managed in a manner consistent with hazardous waste management practices and evaluated to determine if they are hazardous or solid wastes. If the final rinseate is below "clean" levels, it will be considered non-hazardous and managed as a solid waste. Hazardous wastes will be managed and disposed in accordance with applicable hazardous waste regulations.

Soil Sampling

It is not anticipated that soil sampling will be required for the KC-2 Warehouse. The unit is a totally enclosed building, and the containment areas containing free liquids are curbed. An engineering assessment will be performed at the time of closure to determine the integrity of the concrete floor and curbing. Spill records will also be reviewed. If spills are documented to have occurred and resulted in potentially contaminated soils, or if the engineering assessment indicates that the integrity of containment structures or floors of the bays may have been breached, directed soil sampling will be conducted prior to decontamination to determine if hazardous waste constituents have reached the soil surrounding or underlying the unit. If hazardous waste constituents are detected in the directed soil sampling efforts, a revision to the closure plan information including a revised closure schedule will be submitted to the OEPA.

I-1e(4)(b) Plant 9 Warehouse (Building 81) Closure Plan Information

Hazardous Waste Management Unit Description

The Plant 9 Warehouse (Building 81) is currently operated as a hazardous waste container storage building for wastes with and without free liquids. Figure I-1 shows the location of the Plant 9 Warehouse. The warehouse is a steel framed, sheet metal enclosed building. The dimensions of the Plant 9 Warehouse are 80 feet wide by 100 feet long. Figure I-4 presents a drawing of the Plant 9 Warehouse. The interior is subdivided into three containment areas (Bays A, B, and C) delineated by concrete curbing. The concrete curb height varies, with a minimum curb height of six inches. Each containment structure provides for the retention of at least 10 percent of the total hazardous waste volume being stored within the respective bay. The concrete slab comprising the floor of the bays is approximately six inches thick. The surface of the concrete floor and curbs was treated with a sealant. Construction and control joints were sealed with a flexible urethane compound. Any spilled material in the containment storage areas is removed, containerized, labeled, and stored for disposal. Run-on and runoff is not a concern for this unit since it is completely covered and diked.

Maximum Hazardous Waste Inventory

The maximum capacity of this unit is 83,160 gallons of hazardous wastes. The maximum number of drums that can be stored is 1,512 based on the storage of 55 gallon drums. The unit is used for storage of hazardous wastes

with and without free liquids. Bay A has the capacity to store 552 fifty-five gallon drums. Bay B has the capacity to store 900 fifty-five gallon drums. Bay C has the capacity to store 60 fifty-five gallon drums. A complete list of hazardous wastes that have been stored at this unit, along with the applicable OAC 3745-51 and 40 CFR Part 261 hazardous waste constituents of each waste, will be submitted to the OEPA following notification of closure.

Schedule for Closure

The FEMP will notify the OEPA at least 45 days prior to the initiation of closure activities. The FEMP intends to close the Plant 9 Warehouse within 180 days of beginning closure. The schedule for closing this unit is detailed in Figure I-5. Meeting this schedule is contingent upon the availability of treatment, storage, or disposal facilities, laboratory capacity, and proper funding as discussed in Section I-1d. If the closure cannot be completed in 180 days, the FEMP will request an extension of time to complete closure. Any request for extension will be submitted as a modification to the closure plan information. Closure of the unit will be consistent with the final closure and remediation of the entire site under CERCLA.

Inventory Removal

As part of the operational protocol developed for integrated site wide closures at the FEMP, the closure manager will devise an operational protocol to ensure specific closure activities at the Plant 9 Warehouse are accomplished within the closure schedule. The manager

will consider the sequence of operations, resources required, and types and quantities of hazardous waste stored. In devising the operational protocol, the manager will develop an inventory reduction plan specifying how, when, and where each hazardous waste will be managed, and ensure that resources are available to complete closure activities as scheduled.

At closure, the inventory from the Plant 9 Warehouse will be directly transported off-site for treatment/disposal, if off-site capacity is available, or moved to Plant 1 Pad or another approved storage location. Inventory removal may be undertaken at any time, but will be completed within 90 days after the start of closure. Following inventory removal, an engineering assessment will be conducted to determine the condition and integrity of the secondary containment structure.

Decontamination of Structures and Equipment

Following the engineering integrity assessment, the Plant 9 Warehouse secondary containment structure will be decontaminated. If decontamination of these structures cannot be achieved, a revision to the closure plan information will be submitted to OEPA for approval. Prior to decontamination, any breaches or structural defects noted in the integrity assessment will be evaluated for potential releases to the environment. If hazardous waste or waste constituents may have migrated out of the unit through the breach, directed soil sampling in the area of the breach or crack will be conducted prior to attempts at decontamination.

The FEMP's objective is to "clean" close this unit while minimizing the amount of hazardous waste generated from closure activities. Before closing the unit, the FEMP will select an appropriate decontamination method to achieve "clean" closure. The decontamination method that is currently planned for the Plant 9 Warehouse secondary containment structure is detailed below. The procedures given apply separately to individual bays, and may be repeated as required.

1) The secondary containment structures (bays) will be vacuumed to remove surface residue.
2) An aqueous detergent solution will be used to scrub the surface of the concrete containment structures. The waste detergent solution will be mopped or vacuumed from the containment structures.
3) The containment structures will be rinsed with tap water. The rinseate will be mopped or vacuumed from the containment structures, collected in a clean sump, or pumped to an appropriate clean container and sampled to evaluate and confirm decontamination efforts, according to the Sampling and Analysis Plan (Attachment I-1), the FEMP Waste Analysis Plan, and the FEMP Waste Determination Plan.

Decontamination will be verified by sampling and analyzing the final rinse. These samples will be analyzed for the hazardous waste constituents of the hazardous waste managed in the unit, as listed in OAC 3745-51 and 40 CFR Part 261. If the final rinse does not

achieve the "clean" levels for rinseate as discussed in Section I-1a(1), the decontamination procedures described above will be repeated or a revision to this closure plan information will be submitted to the OEPA.

Disposal of Decontamination Residues

All equipment that cannot be decontaminated and expendable materials used in decontamination (rags, mops, sorbent pads, protective clothing, etc.) will be stored and managed in a manner consistent with FEMP hazardous waste practices pending hazardous waste determinations.

All wash and rinse waters will be collected, stored and managed in a manner consistent with hazardous waste management practices and evaluated to determine if they are hazardous or solid wastes. If the final rinseate is below "clean" levels, it will be considered non-hazardous and managed as a solid waste. Hazardous wastes will be managed and disposed in accordance with applicable hazardous waste regulations.

Soil Sampling

It is not anticipated that soil sampling will be required for the Plant 9 Warehouse. The unit is a totally enclosed building with curbed containment areas. An engineering assessment will be performed at the time of closure to determine the integrity of the concrete floor and curbing. Spill records will also be reviewed. If spills are documented to have occurred and resulted in potentially contaminated soils, or if the engineering assessment indicates that the integrity of containment

structures may have been breached, directed soil sampling will be conducted prior to decontamination to determine if hazardous waste constituents have reached the soil surrounding or underlying the unit. If hazardous waste constituents are detected in the directed soil sampling efforts, a revision to the closure plan information will be submitted to the OEPA for approval. The revision will include a revised closure schedule.

I-1e(4)(c) Plant 8 Warehouse (Building 80) Closure Plan Information

Hazardous Waste Management Unit Description

The Plant 8 Warehouse (Building 80) is currently operated as a hazardous waste container storage building for hazardous wastes without free liquids. Figure I-1 shows the location of the Plant 8 Warehouse. The warehouse is a steel framed, sheet metal enclosed building. The dimensions of the Plant 8 Warehouse are 60 feet wide by 170 feet long. Figure I-6 presents a drawing of the Plant 8 Warehouse storage area. The interior storage area is not subdivided into bays. The concrete slab comprising the floor of the building is approximately 8 inches thick. Since there is no concrete curbing or other berms in the storage area, this warehouse is only used to store hazardous waste without free liquids. Any material spilled in the storage area is removed, containerized, labeled, and stored for disposal. Run-on and runoff is not a concern for this unit since it is completely enclosed.

Maximum Hazardous Waste Inventory

The maximum capacity of this unit is 139,260 gallons of hazardous wastes. The maximum number of drums that can be stored is 2,532 based on the storage of 55 gallon drums. Only hazardous wastes without free liquids are stored in fifty-five gallon drums in this unit. A complete list of hazardous wastes that have been stored at this unit, along with the applicable OAC 3745-51 and 40 CFR Part 261 hazardous waste constituents of each waste, will be submitted to the OEPA following

notification of closure.

Schedule for Closure

The FEMP will notify the OEPA at least 45 days prior to the initiation of closure activities. The FEMP intends to close the Plant 8 Warehouse within 180 days of beginning closure. The schedule for closing this unit is detailed in Figure I-7. Meeting this schedule is contingent upon the availability of treatment, storage, or disposal facilities, laboratory capacity, and proper funding, as discussed in Section I-1d. If the closure cannot be completed in 180 days, the FEMP will request an extension of time to complete closure. Any request for extension will be submitted as a modification to the closure plan information.

Inventory Removal

As part of the operational protocol developed for integrated site wide closures, the closure manager will devise an operational protocol to ensure specific closure activities at the Plant 8 Warehouse are accomplished within the closure schedule. The manager will consider the sequence of operations, resources required, and types and quantities of hazardous waste stored. In devising the operational protocol, the manager will develop an inventory reduction plan specifying how, when, and where each hazardous waste will be managed, and ensure that resources are available to complete closure activities as scheduled.

At closure, the inventory from the Plant 8 Warehouse will be directly transported off-site for

treatment/disposal, if off-site capacity is available, or moved to the Plant 1 Pad or another approved storage location. Inventory removal may be undertaken at any time, but will be completed within 90 days after the start of closure. Following inventory removal, an engineering assessment will be conducted to determine the condition and integrity of the concrete floor slab.

Decontamination of Structures and Equipment

Following the engineering integrity assessment, the Plant 8 Warehouse concrete floor slab will be decontaminated. If decontamination of this structure cannot be achieved, a revision to the closure plan information will be submitted to OEPA for approval. Prior to decontamination, any breaches or structural defects noted in the integrity assessment will be evaluated for potential releases to the environment. If hazardous waste or waste constituents may have migrated out of the unit through the breach, directed soil sampling in the area of the breach or crack will be conducted prior to attempts at decontamination.

The FEMP's objective is to "clean" close this unit while minimizing the amount of hazardous waste generated from closure activities. Before closing the unit, the FEMP will select an appropriate decontamination method to achieve "clean" closure. The decontamination method that is currently planned for the Plant 8 Warehouse area is detailed below. The procedures given may be repeated as required.

1) The warehouse floor will be vacuumed to remove

surface residue.

2) Temporary berms or sorbent pads will be placed around the perimeter of the storage area to contain wash and rinse solutions.

3) An aqueous detergent solution will be used to scrub the surface of the concrete floor. The waste detergent solution will be mopped or vacuumed from the floor of the storage area.

4) The storage area will be rinsed with tap water. The rinseate will be mopped or vacuumed from the floor, collected in a clean sump, or pumped to an appropriate clean container and sampled to evaluate and confirm decontamination efforts, according to the Sampling and Analysis Plan (Attachment I-1), the FEMP Waste Analysis Plan, and the FEMP Waste Determination Plan.

Decontamination will be verified by sampling and analyzing the final rinse. These samples will be analyzed for the hazardous waste constituents of the waste managed in the unit, as listed in OAC 3745-51 and 40 CFR Part 261. If the final rinse does not achieve the "clean" levels for rinseate as discussed in Section I-1a(1), a revision to this closure plan information will be submitted to OEPA.

<u>Disposal of Decontamination Residues</u>

All equipment that cannot be decontaminated and expendable materials used in decontamination (rags, mops, sorbent pads, protective clothing, etc.) will be stored and managed in a manner consistent with FEMP hazardous waste practices pending hazardous waste

determinations.

All wash and rinse waters will be collected, stored and managed in a manner consistent with hazardous waste management practices and evaluated to determine if they are hazardous or solid wastes. If the final rinseate is below "clean" levels, it will be considered non-hazardous and managed as a solid waste. Hazardous wastes will be managed and disposed in accordance with applicable hazardous waste regulations.

Soil Sampling

It is not anticipated that soil sampling will be required for the Plant 8 Warehouse. The unit is a totally enclosed building that stores hazardous wastes without free liquids. An engineering assessment will be performed at the time of closure to determine the integrity of the concrete floor and curbing. Spill records will also be reviewed. If spills are documented to have occurred and resulted in potentially contaminated soils, or if the engineering assessment indicates that the integrity of containment structures may have been breached, directed soil sampling will be conducted prior to decontamination to determine if hazardous waste constituents have reached the soil surrounding or underlying the unit. If hazardous waste constituents are detected in the directed soil sampling efforts, a revision to the closure plan information will be submitted to the OEPA for approval. The revision will include a revised closure schedule.

I-1e(4)(d) CP Storage Warehouse - Building 56 (Butler Building) Closure Plan Information

Hazardous Waste Management Unit Description

The CP Storage Warehouse (Building 56) is currently operated as a hazardous waste container storage building for the FEMP. Figure I-1 shows the location of the CP Storage Warehouse. The warehouse is a steel framed, sheet metal enclosed building. The dimensions of the CP Storage Warehouse are 50 feet wide by 180 feet long. The concrete slab comprising the floor of the building is approximately six inches thick. Figure I-8 presents a drawing of the CP Storage Warehouse. The CP Storage Warehouse has a total storage area of 8,464 square feet. The storage area is not divided into bays. Since there is no concrete curbing or other berms in the building, this warehouse is only used to store hazardous waste without free liquids. Any material spilled in the storage areas is removed, containerized, labeled, and stored for disposal. Run-on and runoff is not a concern for this unit since it is completely enclosed.

Maximum Hazardous Waste Inventory

The maximum capacity of this unit is 127,345 gallons of hazardous wastes. The maximum number of drums that can be stored is 2,317 based on the storage of 55 gallon drums. Hazardous wastes without free liquids are stored in this unit. A complete list of hazardous wastes that have been stored at this unit, along with the applicable OAC 3745-51 and 40 CFR Part 261 hazardous waste constituents for each waste, will be submitted to the OEPA following notification of closure.

Schedule for Closure

The FEMP will notify the OEPA at least 45 days prior to the initiation of closure activities. T%he FEMP intends to close the CP Storage Warehouse within 180 days of beginning closure. The schedule for closing this unit is detailed in Figure I-9. Meeting this schedule is contingent upon the availability of treatment, storage, or disposal facilities, laboratory capacity, and proper funding as discussed in Section I-1d. If the closure cannot be completed in 180 days, the FEMP will request an extension of time to complete closure. Any request for extension will be submitted as a modification to the closure plan information.

Inventory Removal

As part of the operational protocol developed for integrated site wide closures, the closure manager will devise an operational protocol to ensure specific closure activities at the CP Storage Warehouse are accomplished within the closure schedule. The manager will consider the sequence of operations, resources required, and types and quantities of hazardous waste stored. In devising the operational protocol, the manager will develop an inventory reduction plan specifying how, when, and where each hazardous waste will be managed, and ensure that resources are available to complete closure activities as scheduled.

At closure, the hazardous waste inventory from the CP Storage Warehouse will be directly transported off-site for treatment/disposal, if off-site capacity is available, or moved to Plant 1 Pad or another approved storage location. Inventory removal may be undertaken

at any time, but will be completed within 90 days after the start of closure. Following inventory removal, an engineering assessment will be conducted to determine the condition and integrity of the concrete floor slab.

Decontamination of Structures and Equipment

Following the engineering integrity assessment, the CP Storage Warehouse concrete floor slab will be decontaminated. If decontamination of this structure cannot be achieved, a revision to the closure plan information will be submitted to OEPA for approval. Prior to decontamination, any breaches or structural defects noted in the integrity assessment will be evaluated for potential releases to the environment. If hazardous waste or waste constituents may have migrated out of the unit through the breach, directed soil sampling in the area of the breach or crack will be conducted prior to attempts at decontamination.

The FEMP's objective is to "clean" close this unit while minimizing the amount of hazardous waste generated from closure activities. Before closing the unit, the FEMP will select an appropriate decontamination method to achieve "clean" closure. The decontamination method that is currently planned for the CP Storage Warehouse storage area is detailed below. The procedures may be repeated as required.

1) The warehouse floor will be vacuumed to remove surface residue.
2) Temporary berms and/or sorbent pads will be placed around the perimeter of the storage area to contain wash and rinse solutions.

3) An aqueous detergent solution will be used to scrub the surface of the storage area floor. The waste detergent solution will be mopped or vacuumed from the floor.

4) The storage area will be rinsed with tap water. The rinseate will be mopped or vacuumed from the floor, collected in a clean sump, or pumped to an appropriate clean container and sampled to evaluate and confirm decontamination efforts, according to the Sampling and Analysis Plan (Attachment I-1), the FEMP Waste Analysis Plan, and the FEMP Waste Determination Plan.

Decontamination will be verified by sampling and analyzing the final rinse. These samples will be analyzed for the hazardous waste constituents of the waste managed in the unit, as listed in OAC 3745-51 and 40 CFR Part 261. If the final rinse does not achieve the "clean" levels for rinseate as discussed in Section I-1a(1), revised closure plan information will be submitted to OEPA.

Disposal of Decontamination Residues

All equipment that cannot be decontaminated and expendable materials used in decontamination (rags, mops, sorbent pads, protective clothing, etc.) will be stored and managed in a manner consistent with FEMP hazardous waste practices pending hazardous waste determinations.

All wash and rinse waters will be collected, stored and managed in a manner consistent with hazardous waste management practices and evaluated to determine if they

are hazardous or solid wastes. If the final rinseate is below "clean" levels, it will be considered to be non-hazardous and managed as a solid waste. Hazardous wastes will be managed and disposed in accordance with applicable hazardous waste regulations.

Soil Sampling

It is not anticipated that soil sampling will be required for the CP Storage Warehouse. The unit is a totally enclosed building for storage of hazardous wastes without free liquids. An engineering assessment will be performed at the time of closure to determine the integrity of the concrete floor. Spill records will also be reviewed. If spills are documented to have occurred and resulted in potentially contaminated soils, or if the engineering assessment indicates that the integrity of the concrete floor has been breached, directed soil sampling will be conducted prior to decontamination to determine if hazardous waste constituents have reached the soil surrounding or underlying the unit. If hazardous waste constituents are detected in the directed soil sampling efforts, a revision to the closure plan information will be submitted to the OEPA for approval. The revision will include a revised closure schedule.

I-1e(4)(e) Plant 6 Warehouse (Building 79) Closure Plan Information

Hazardous Waste Management Unit Description

The Plant 6 Warehouse (Building 79) is currently operated as a hazardous waste container storage building for hazardous waste with and without free liquids. Figure I-1 shows the location of the Plant 6 Warehouse. The warehouse is a steel framed, sheet metal enclosed building. The dimensions of the Plant 6 Warehouse are 100 feet wide by 170 feet long. Figure I-10 presents a drawing of the Plant 6 Warehouse. The interior is subdivided into three containment areas (Bays A, B and C) delineated by concrete curbing. The concrete curb height varies, with a minimum curb height of six inches. Each containment structure provides for the retention of at least 10 percent of the total hazardous waste volume being stored within the respective bay. The concrete slab comprising the floor of the bays is approximately 8 inches thick. The surface of the concrete floor and curbs has been treated with a sealant. Construction and control joints were sealed with a flexible urethane compound. Any spilled material in the containment area is removed, containerized, labeled and stored for disposal. Run-on and runoff is not a concern for this unit since it is completely covered and diked.

Maximum Hazardous Waste Inventory

The maximum capacity of this unit is 202,620 gallons of hazardous wastes. The maximum number of drums that can be stored is 3,684 based on the storage of 55 gallon drums. Hazardous wastes with and without free liquids can be stored in the unit. Bay A has the capacity to

store 1,536 fifty-five gallon drums. Bay B has the capacity to store 1,104 fifty-five gallon drums. Bay 3 has the capacity to store 1,044 fifty-five gallon drums. A complete list of hazardous wastes that have been stored at this unit, along with the OAC 3745-51 and 40 CFR Part 261 hazardous waste constituents listed for each waste, will be submitted to the OEPA following notification of closure.

Schedule for Closure

The FEMP will notify the OEPA at least 45 days prior to the initiation of closure activities. The FEMP intends to close the Plant 6 Warehouse within 180 days of the beginning of closure. The schedule for closing this unit is detailed in Figure I-11. Meeting this schedule is contingent upon the availability of treatment, storage, or disposal facilities, laboratory capacity, and proper funding as discussed in Section I-1d. If the closure cannot be completed in 180 days, the FEMP will request an extension of time to complete closure. Any request for extension will be submitted as a modification to the closure plan information.

Inventory Removal

As part of the operational protocol developed for integrated site wide closures at the FEMP, the closure manager will devise an operational protocol to ensure specific closure activities at the Plant 6 Warehouse are accomplished within the closure schedule. The manager will consider the sequence of operations, resources required, and types and quantities of hazardous waste stored. In devising the operational protocol, the manager will develop an inventory reduction plan

specifying how, when, and where each hazardous waste will be managed, and ensure that resources are available to complete closure activities.

At closure, the inventory from the Plant 6 Warehouse will be directly transported off-site for treatment/disposal, if off-site capacity is available, or moved to Plant 1 Pad or another approved storage location. Inventory removal may be undertaken at any time, but will be completed within 90 days after the start of closure. Following inventory removal, an engineering assessment will be conducted to determine the condition and integrity of the secondary containment structure.

Decontamination of Structures and Equipment

Following the engineering integrity assessment, the Plant 6 Warehouse secondary containment structure will be decontaminated. If decontamination of these structures cannot be achieved, a revision to the closure plan information will be submitted to OEPA for approval. Prior to decontamination, any breaches or structural defects noted in the integrity assessment will be evaluated for potential releases to the environment. If hazardous waste or waste constituents may have migrated out of the unit through the breach, directed soil sampling in the area of the breach will be conducted prior to attempts at decontamination.

The FEMP's objective is to "clean" close this unit while minimizing the amount of hazardous waste generated from closure activities. Before closing the unit, the FEMP will select an appropriate decontamination method to

achieve "clean" closure. The decontamination method that is currently planned for the Plant 6 Warehouse secondary containment structure is detailed below. The procedures given apply separately to individual bays, and may be repeated as required.

1) The secondary containment structures (bays) will be vacuumed to remove surface residue.
2) An aqueous detergent solution will be used to scrub the surface of the concrete containment structures. The waste detergent solution will be mopped or vacuumed from the containment structures.
3) The containment structures will be rinsed with tap water. The rinseate will be mopped or vacuumed from the containment structures, collected in a clean sump, or pumped to an appropriate clean container and sampled to evaluate and confirm decontamination efforts, according to the Sampling and Analysis Plan (Attachment I-1), the FEMP Waste Analysis Plan, and the FEMP Waste Determination Plan.

Decontamination will be verified by sampling and analyzing the final rinse. These samples will be analyzed for the hazardous waste constituents of the waste managed in the unit, as listed in OAC 3745-51 and 40 CFR Part 261. If the final rinse does not achieve the "clean" levels for rinseate [see Section I-1a(1)], a revision to this closure plan information will be submitted to OEPA.

Disposal of Decontamination Residues

All equipment that cannot be decontaminated and expendable materials used in decontamination (rags, mops, sorbent pads, protective clothing, etc.) will be stored and managed in a manner consistent with FEMP hazardous waste practices pending hazardous waste determinations.

All wash and rinse waters will be collected, stored and managed in a manner consistent with hazardous waste management practices and evaluated to determine if they are hazardous or solid wastes. If the final rinseate is below "clean" levels, it will be considered to be non-hazardous and managed as a solid waste. Hazardous wastes will be managed and disposed in accordance with applicable hazardous waste regulations.

Soil Sampling

It is not anticipated that soil sampling will be required for the Plant 6 Warehouse. The unit is a totally enclosed building with curbed containment areas. An engineering assessment will be performed at the time of closure to determine the integrity of the concrete floor and curbing. Spill records will also be reviewed. If spills are documented to have occurred and resulted in potentially contaminated soils, or if the engineering assessment indicates that the integrity of containment structures may have been breached, directed soil sampling will be conducted prior to decontamination to determine if hazardous waste constituents have reached the soil surrounding or underlying the unit. If hazardous waste constituents are detected in the directed soil sampling efforts, a revision to the

closure plan information will be submitted to the OEPA for approval. The revision will include a revised closure schedule.

I-1e(4)(f) Pilot Plant Warehouse (Building 68) Closure Plan Information

Hazardous Waste Management Unit Description

The Pilot Plant Warehouse (Building 68) is a pre-engineered metal fabricated building which is totally enclosed and covered by metal roofing. Figure I-1 shows the location of the Pilot Plant Warehouse.

The major portion of the building is used for storage of thorium materials. In addition, drums of hazardous waste without free liquids are stored on Herculite sheeting in a bermed area in the Pilot Plant Warehouse. Figure I-12A presents a drawing of the Pilot Plant Warehouse building. A sketch showing the location of the RCRA storage area is presented in Figure I-12B.

The Pilot Plant Warehouse building is 50 feet wide and 100 feet long. The concrete slab comprising the floor of the building is constructed of a eight inch thick crushed granular sub-base topped with eight inches of steel-bar reinforced class E concrete. The RCRA storage area, for which an operating permit is being sought, comprises an area approximately 75 feet by 7 feet. The area is bounded by a four inch by four inch wooden dike covered with Herculite sheeting to provide an impermeable barrier to contain spills.

Since there are no concrete curbs or other berms in the building capable of containing liquids, this warehouse is only used to store hazardous waste without free liquids.

Run-on and runoff is not a concern for this unit since it is completely enclosed.

Maximum Hazardous Waste Inventory

The maximum capacity of this unit is 9,900 gallons of hazardous wastes. The maximum number of drums that can be stored is 180 based on the storage of 55 gallon drums. Only hazardous wastes without free liquids are stored in the unit. A complete list of hazardous wastes that have been stored at this unit, along with the applicable OAC 3745-51 and 40 CFR Part 261 hazardous waste constituents for each waste, will be submitted to the OEPA following notification of final closure.

Schedule for Closure

The FEMP will notify the OEPA at least 45 days prior to the initiation of closure activities. The FEMP intends to close the Pilot Plant Warehouse within 180 days of beginning closure. The schedule for closing this unit is detailed in Figure I-13. Meeting this schedule is contingent upon the availability of treatment, storage, or disposal facilities, laboratory capacity, and proper funding, as discussed in Section I-1d. If the closure cannot be completed in 180 days, the FEMP will request an extension of time to complete closure. Any request for extension will be submitted as a modification to the closure plan information.

Inventory Removal

As part of the operational protocol developed for integrated site wide closures, the closure manager will devise an operational protocol to ensure specific closure activities at the Pilot Plant Warehouse are

accomplished within the closure schedule. The manager will consider the sequence of operations, resources required, and types and quantities of hazardous waste stored. In devising the operational protocol, the manager will develop an inventory reduction plan specifying how, when, and where each hazardous waste will be managed, and ensure that resources are available to complete closure activities as scheduled.

At closure, the hazardous waste inventory from the Pilot Plant Warehouse will be directly transported off-site for treatment/disposal, if off-site capacity is available, or moved to Plant 1 Pad or another approved storage location. The Herculite sheeting and wooden berms will also be placed into appropriate containers and managed for disposal as a hazardous waste. Inventory removal may be undertaken at any time, but will be completed within 90 days after the start of closure. Following inventory removal, an engineering assessment will be conducted to determine the condition and integrity of the concrete floor slab.

Decontamination of Structures and Equipment

Following the engineering integrity assessment, the Pilot Plant Warehouse concrete floor slab in the hazardous waste storage area will be decontaminated. If decontamination of the floor cannot be achieved, a revision to the closure plan information will be submitted to OEPA for approval. Prior to decontamination, any breaches or structural defects noted in the integrity assessment will be evaluated for potential releases to the environment. If hazardous waste or waste constituents may have migrated out of the

unit through the breach, directed soil sampling in the area of the breach or crack will be conducted.

The FEMP's objective is to "clean" close this unit while minimizing the amount of hazardous waste generated from closure activities. Before closing the unit, the FEMP will select an appropriate decontamination method to achieve "clean" closure. The decontamination method that is currently planned for the Pilot Plant Warehouse hazardous waste storage area is detailed below. The procedures given may be repeated as required.

1) The warehouse floor will be vacuumed to remove surface residue.
2) Temporary berms and/or sorbent pads will be placed around the perimeter of the storage area to contain wash and rinse solutions.
3) An aqueous detergent solution will be used to scrub the surface of the storage area floor. The waste detergent solution will be mopped or vacuumed from the floor.
4) The storage area will be rinsed with tap water. The rinseate will be mopped or vacuumed from the floor, collected in a clean sump, or pumped to an appropriate clean container and sampled to evaluate and confirm decontamination efforts, according to the Sampling and Analysis Plan (Attachment I-1), the FEMP Waste Analysis Plan and the FEMP Waste Determination Plan.

Decontamination will be verified by sampling and analyzing the final rinse. These samples will be analyzed for the hazardous waste constituents of the

waste managed in the unit, as listed in OAC 3745-51 and 40 CFR Part 261. If the final rinse does not achieve the "clean" levels for rinseate as discussed in Section I-1a(1), a revision to this closure plan information will be submitted to OEPA.

Disposal of Decontamination Residues

All equipment that cannot be decontaminated and expendable materials used in decontamination (rags, mops, sorbent pads, protective clothing, etc.) will be stored and managed in a manner consistent with FEMP hazardous waste practices pending hazardous waste determinations.

All wash and rinse waters will be collected, stored and managed in a manner consistent with hazardous waste management practices and evaluated to determine if they are hazardous or solid wastes. If the final rinseate is below "clean" levels, it will be considered non-hazardous and managed as a solid waste. Hazardous wastes will be managed and disposed in accordance with applicable hazardous waste regulations.

Soil Sampling

It is not anticipated that soil sampling will be required for the Pilot Plant Warehouse, RCRA storage area. The unit is a totally enclosed building, and stores hazardous wastes without free liquids. An engineering assessment will be performed at the time of closure to determine the integrity of the concrete floor. Spill records will also be reviewed. If spills are documented to have occurred and resulted in potentially contaminated soils, or if the engineering

assessment indicates that the integrity of containment structure may have been breached, directed soil sampling will be conducted prior to decontamination to determine if hazardous waste constituents have reached the soil surrounding or underlying the unit. If hazardous waste constituents are detected in the directed soil sampling efforts, a revision to the closure plan information will be submitted to the OEPA for approval. The revision will include a revised closure schedule.

I-1e(4)(g) Plant 1 Pad Closure Plan Information

[**NOTE:** This section of the closure plan information describing the closure of the Plant 1 Pad was prepared prior to the actual upgrade of the unit; however, it is written in a tense as if the upgrade had already occurred in accordance with the Plant 1 Pad Continuing Release, Removal Action Work Plan dated June 1991. This approach is consistent with Section D, Process Information, which describes operation of the upgraded unit. The Plant 1 Pad Continuing Release, Removal Action Plan was submitted to comply with the provisions of the Consent Decree and its proposed amendments requesting the submittal of closure plan information, data, and a schedule for the Plant 1 Pad.]

Hazardous Waste Management Unit Description

The Plant 1 Pad is located at the northwest corner of the production area. Figure I-1 shows the location of the unit at the FEMP. Figure I-14 shows the original construction of this unit. The original pad comprised approximately 400,000 square feet. This pad was originally designed as a storage area for incoming materials for processing. The materials were sampled to assay their uranium content, then used in the uranium production process. Process residues and waste materials were returned to the Plant 1 Pad to await further processing, or final disposal. Hazardous wastes and mixed wastes have been stored on the Plant 1 Pad.

The original pad was constructed on an eight inch sub-base of crushed stone. The sub-base was topped with eight inches of class "E" concrete that was reinforced

with steel bars. Joints were sealed with a bituminous compound. The original pad was an unbermed structure that did not provide roof cover for the drums, or controls for run-on/runoff. Figure I-15 displays the topography of the original Plant 1 Pad area.

In 1953 a large area of concrete had settled, creating numerous cracks. These cracks were repaired using high early strength concrete and hot bitumen to fill joints between the old and new concrete. Many areas of the pad had deteriorated and were repaired using concrete or asphalt prior to the pad upgrade.

Due to the deteriorating condition of the pad, and since the original pad did not provide controls for run-on/runoff, a major upgrade of the pad was approved in 1991. Figure I-16 is the construction drawing for this upgrade. The upgrade consisted of the following activities:

- A new pad of approximately 100,000 square feet was built adjacent to the northwest corner of the current pad. The new pad area overlays approximately 20,000 square feet of the original pad area. The new pad was constructed with compacted clean granular fill that was covered with a 12 mil polyethylene film vapor barrier, and topped with 8 inches of reinforced class "C" concrete.

- During the upgrade the original pad was capped with a polyethylene barrier and a four inch layer of reinforced class "C" concrete. New wearing surfaces were covered with an 86 mil thickness of

chemically resistant polyurethane. A six inch reinforced concrete berm was constructed on the perimeter of the new pad and upgraded pad. A small part of the original pad was not upgraded, and remains outside of the bermed, upgraded area (shown as cross hatched areas in Figure I-16. This outer pad will not be used for management of liquid hazardous wastes.

- Two 40,000 square foot tension structures and one 22,500 square foot tension structure were constructed on the upgraded pad to provide covered storage for drums.

- Existing storm sewer inlets remained within the former pad area. These catch basins empty into the FEMP waste water treatment plant. Each tension structure has an interior trench drain to collect spills. These drains are blind sumps, and are not connected to the storm sewer system. In the event of a spill, the trench drain within the building will be pumped to remove any waste that it collects. The waste will be managed in accordance with FEMP procedures and applicable regulations.

The final area of the Plant 1 Pad including the upgraded area will be approximately 480,000 square feet. The upgraded Plant 1 Pad will be operated as a hazardous waste container storage pad for the FEMP.

Maximum Hazardous Waste Inventory

The maximum capacity of this unit, including the three

tension structures, is 10,892,200 gallons of hazardous wastes. The maximum number of drums that can be stored is 198,040 based on the storage of 55 gallon drums. The three tension structures have a maximum capacity to store 825,000 gallons under cover. Therefore, the maximum capacity of uncovered storage on the Plant 1 Pad is 10,067,200 gallons. Hazardous wastes with and without free liquids are stored on the Plant 1 Pad. A complete list of hazardous wastes that have been stored at this unit will be submitted to the OEPA following notification of closure.

Schedule For Closure

The FEMP will notify the OEPA at least 45 days prior to initiation of closure activities. The FEMP has estimated that approximately 580 days will be required to close the Plant 1 Pad. The schedule for closing this unit is detailed in Figure I-17. Meeting this schedule is contingent upon the availability of treatment, storage, or disposal facilities for mixed wastes, laboratory availability, and proper funding as discussed in Section I-1d. If the closure cannot be completed in 580 days, the FEMP will request an extension of time to complete closure. The request for extension will be submitted as a modification to the closure plan information. Closure of this unit will be consistent with the final closure and remediation of the entire site under CERCLA.

Inventory Removal

As part of the operational protocol developed for integrated site wide closures, the closure manager will devise an operational protocol to ensure specific

closure activities on the Plant 1 Pad are accomplished within the closure schedule. The manager will consider the sequence of operations, resources required, and types and quantities of hazardous waste stored. In devising the operational protocol, the manager will develop an inventory reduction plan specifying how, when, and where each hazardous waste will be managed, and ensure that resources are available to complete closure activities as scheduled. The inventory from the Plant 1 Pad will be removed from the pad before closure activities commence.

Closure Procedures

The FEMP's objective is to "clean" close this unit while minimizing the amount of hazardous waste generated from closure activities. If clean closure cannot be achieved, a revision to the closure plan information will be submitted to OEPA for approval. A general description of the closure tasks is detailed below. These closure procedures will be conducted both on the outer, non-upgraded portion of the original pad, and on the upgraded pad and containment structures.

1) After removal of final inventory, the secondary containment structures will be dry swept and/or vacuumed to remove surface residue.

2) An engineering assessment will be conducted to determine the condition and integrity of the containment structure, storm drains, berms, and sumps. The assessment will include both a review of operational records and a visual inspection of the containment structures (including trenches,

sumps, and berms). The assessment will determine the areas where spills may have occurred, and locate any breaches through the containment structure. This information will be used to designate the locations for the directed sampling. The assessment also will review the construction drawings to determine the location of the underground utilities. These will be clearly marked on the pad.

3) Grab samples of concrete chips and if necessary, soil from the zero to six inch depth interval will be collected from the directed sample locations according to the procedures outlined in the Sampling and Analysis Plan (see Attachment I-1). These samples will be analyzed for the hazardous constituents listed in OAC 3745-54-98 and 40 CFR 264, Appendix IX using appropriate USEPA SW-846 methods. Appendix IX hazardous constituents were selected for analysis for Plant 1 Pad samples because of the large volume and diversity of wastes that have been managed on the pad.

4) In addition to the directed samples, concrete and samples of soil below the pad will be collected and analyzed to determine if any contamination from past operation of the unit has reached the environmental media below the unit. A 100 feet by 100 feet grid will be laid out and marked on the pad. This grid will be used to locate the areas where the samples will be collected. The surface of the grid sampling locations will be

re-cleaned by vacuuming prior to sampling. Although sampling activities will not be attempted during adverse weather conditions, sampling areas will be diked to prevent the possibility of run-on/runoff. The samples will be collected from the approximate center of each grid. If the grid overlaps the margin of the pad, the sample will be collected from the approximate center of the portion of the grid that remains on the pad. Figure I-18 displays the proposed sampling locations. Prior to sampling, the concrete will be removed using an approved method. The method may include dry coring, dry sawing, drilling with a drill rig, or jackhammering the concrete. In addition to approved methods, appropriate health and safety procedures will be used during unit closure to ensure protection of worker health and minimize the potential for spread of contamination. For example, a vacuum with HEPA filter would be used in conjunction with any dry cutting of concrete. Grab samples of the concrete chips and sub-base will be collected and analyzed for the hazardous constituents listed in OAC 3745-54-98 and 40 CFR 264, Appendix IX according to the procedures outlined in the Sampling and Analysis Plan, the FEMP Waste Analysis Plan, and the FEMP Waste Determination Plan.

5) Sufficient concrete and sub-base will be removed to permit soil sampling under the pad. A grab sample of the soil underlying the pad will be taken from a depth of zero to six inches

according to the soil sampling procedures in the Sampling and Analysis Plan.

6) Samples of the soil surrounding the pad also will be collected approximately five feet from the margins of the pad at the following locations in accordance with the soil sampling procedures in the Sampling and Analysis Plan:

- North Boundary - every 100 feet
- East Boundary - every 50 feet
- West Boundary - every 50 feet
- South Boundary (where unpaved) - every 100 feet

All soil samples will be analyzed for the hazardous constituents listed in OAC 3745-54-98 and 40 CFR 264, Appendix IX according to the procedures outlined in the Sampling and Analysis Plan, the FEMP Waste Analysis Plan, and the FEMP Waste Determination Plan.

7) After the samples have been taken, the holes through the pad will be filled to the top of the pad's surface with cement or concrete.

8) The resulting analytical data will be evaluated. If the soil is clean as defined in Section I-1a(1), the pad will be decontaminated following the procedures outlined in the following section. If the concrete, sub-base or soil is determined to be contaminated as discussed in Section I-1a(1), revised closure plan information will be

submitted.

Decontamination of Containment Structure

If the soil underlying and surrounding the pad does not indicate the presence of contamination as defined in Section I-1a(1), the surface of the pad and containment structures will be decontaminated. The decontamination method that will be used for the Plant 1 Pad secondary containment structures is detailed below.

1) The secondary containment structures will be dry swept or vacuumed to remove surface residue using a hand or truck mounted sweeper/vacuum.

2) Minor structural defects will be sealed, if necessary, to prevent migration of rinseate out of the containment area.

3) An aqueous detergent solution will be used to decontaminate the pad and structures. A sweeper will scrub the surface of the pad. The waste detergent solution will be mopped or vacuumed from the pad, containerized, and stored in accordance with applicable regulations pending waste determination.

4) Following the detergent wash, the containment structures will be rinsed with tap water. The rinseate will be mopped or vacuumed from the pad, collected in a clean sump, or pumped to an appropriate clean container. A sample of the final rinseate will be collected and analyzed for the hazardous constituents listed in OAC 3745-54-

98 and 40 CFR 264, Appendix IX according to the procedures outlined in the Sampling and Analysis Plan in Attachment I-1, the FEMP Waste Analysis Plan, and the FEMP Waste Determination Plan.

If the analytical results of the final rinseate exceed the RCRA closure standard as discussed in Section I-1a(1), the decontamination procedure may be repeated. A revision to the closure plan information will be submitted to the OEPA for approval, if the pad cannot be decontaminated.

Disposal of Decontamination Residues

All equipment that cannot be decontaminated and expendable materials used in decontamination (rags, mops, sorbent pads, protective clothing, etc.) will be stored and managed in a manner consistent with FEMP hazardous waste practices pending hazardous waste determinations.

All wash and rinse waters will be collected, stored and managed in a manner consistent with hazardous waste management practices and evaluated to determine if they are hazardous or solid wastes. If the final rinseate is below "clean" levels, it will be considered non-hazardous and managed as a solid waste. Hazardous wastes will be managed and disposed in accordance with applicable hazardous waste regulations.

I-1e(5) Closure of Tanks

The FEMP is not seeking a permit for operation of hazardous waste tanks.

I-1e(6) Closure of Waste Piles

The FEMP is not seeking a permit for operation of hazardous waste piles.

I-1e(7) Closure of Surface Impoundments

The FEMP is not seeking a permit for operation of hazardous waste surface impoundments.

I-1e(8) Closure of Incinerators

The FEMP is not seeking a permit for operation of hazardous waste incinerators.

I-1e(9) Closure of Landfills

The FEMP is not seeking a permit for operation of hazardous waste landfills.

I-1e(10) Closure of Land Treatment Facilities

The FEMP is not seeking a permit for operation of hazardous waste land-treatment facilities.

I-1e(11) Closure of Miscellaneous Units

The FEMP is not seeking a permit for operation of miscellaneous units.

I-2 POST CLOSURE PLAN INFORMATION/CONTINGENT POST-CLOSURE

All hazardous waste storage units to be permitted are intended to attain clean closure, therefore no post-closure activities are anticipated. Container storage units at the FEMP are constructed and operated in a manner to prevent releases of hazardous wastes to the environment. Since the units are designed for storage only, contingent post-closure plan information is not required.

Since any required post-closure activities will be conducted pursuant to final site remediation under the CERCLA program, the FEMP intends to seek an exemption to post-closure requirements for the operating units.

I-3 NOTICES REQUIRED FOR DISPOSAL FACILITIES

The FEMP is not seeking a permit for operation of hazardous waste disposal facilities.

I-4 CLOSURE COST ESTIMATE

A closure cost estimate is not submitted with this closure plan information because the FEMP is a federal facility owned by the U.S. Department of Energy, and is thereby excluded from financial requirements under OAC 3745-66-40(C).

I-5 FINANCIAL ASSURANCE MECHANISM FOR CLOSURE

A financial assurance mechanism is not submitted with this closure plan information because the FEMP is a federal facility owned by the U.S. Department of Energy, and is thereby excluded from financial requirements under OAC 3745-66-40(C).

I-6 POST CLOSURE COST ESTIMATE

A post-closure cost estimate is not submitted with this closure plan information because the hazardous waste storage units are expected to attain clean closure.

Since any required post-closure activities will be conducted pursuant to final site remediation under the CERCLA program, the FEMP intends to seek an exemption to post-closure requirements for the operating units.

I-7 FINANCIAL MECHANISM FOR POST CLOSURE CARE

A financial assurance mechanism for post-closure care is not submitted with this closure plan information because the storage units are expected to attain clean closure.

Since any required post-closure activities will be conducted pursuant to final site remediation under the CERCLA program, the FEMP intends to seek an exemption to post-closure requirements for the operating units.

I-8 LIABILITY REQUIREMENTS

The FEMP is a federal facility owned by the U.S. Department of Energy, and is thereby excluded from financial and liability requirements under OAC 3745-66-40(C).

I-9 USE OF STATE REQUIRED MECHANISM

Proof of liability coverage by a State required financial mechanism is not submitted with this closure plan information because the FEMP is a federal facility owned by the U.S. Department of Energy, and is thereby excluded from financial and liability requirements under OAC 3745-66-40(C).

SECTION I - CLOSURE PLAN INFORMATION

Table I-1

Hazardous Waste Management Storage Units Maximum Inventory

Hazardous Waste Management Unit	Maximum Capacity (Gal.)
KC-2 Warehouse (Bldg. 63)	234,520
Plant 9 Warehouse (Bldg. 81)	83,160
Plant 8 Warehouse (Bldg. 80)	139,260
CP Storage Warehouse - Bldg. 56 (Butler Bldg)	127,435
Plant 6 Warehouse (Bldg. 79)	202,640
Pilot Plant Warehouse (Bldg. 68)	9,900
Plant 1 Pad	10,892,200

SECTION I - CLOSURE PLAN INFORMATION

TABLE I-2

ALTERNATIVE DECONTAMINATION METHODOLOGIES

Area or Item to Decontaminate	Methods for Decontamination						
	High pressure wash	High pressure wash with steam	Floor Scrubber	Scrub by hand[1]	Wipe with absorbent pads[2]	Detergent Wash	Other[3]
Concrete Pads	X[4]	X	X	X		X	X
Concrete Floors	X	X	X	X	X	X	X
Concrete Walls	X	X		X	X	X	X
Equipment	X	X		X	X	X	X

---

1 Using a non-phosphate soap with brushes and/or brooms and mops.

2 Pads may be saturated with an approved solvent to aid in the removal of contaminants. If solvent pads are used, the item will also be wiped with dry pads to remove solvent.

3 Other methodologies may be considered and used during closure, based on technologies available at the time of closure. These methods include, but are not limited to: vacuum sweeping, dry ice blasting, mechanical surface abrasion, etc.

4 X denotes that this area/item may be decontaminated using the method listed above.

SECTION I:
FIGURES

SECTION I:
TABLES

N

N 492,784.678
E 1,376,578.563

S.R. 126

NORTH ACCESS ROAD

CONSTRUCTION ACCESS ROAD

PADDY'S RUN

BUTLER CO.
HAMILTON CO.

KC-2 WAREHOUSE (BLDG.63)

PIT #5

PIT #6

PIT #4

PIT #3

PIT #2

PIT #1

CLEAR WELL

SURGE LAGOON

CP STORAGE WAREHOUSE (BLDG.56 BUTLER BLDG.)

PLANT 1 STORAGE AREA

PLANT 9 WAREHOUSE (BLDG.81)

PLANT 6 WHSE. (BLDG.79)

PLANT 8 WHSE. (BLDG.80)

PILOT PLANT WHSE. (BLDG.68) STORAGE AREA

PADDY'S RUN ROAD

STORM WATER RETENTION BASIN

STORM WATER RETENTION BASIN EXPANSION

S.W.R.B. OUTFALL E.P.A. NUMBER 002

TRIBUTARIES FEEDING PADDY'S RUN CREEK

SOUTH ACCESS ROAD

WILLEY ROAD

WIND DIRECTION AND SPEED OCCURRENCES
BASED ON 10 METER WIND OBSERVATIONS FOR 1987-1990 AT THE FEED MATERIALS PRODUCTION CENTER

DATE: 7/25/91
REVISION NOW

N 4.0% 2.7 MPH
4.0% 2.7 MPH
4.6% 2.5 MPH
7.4% 2.3 MPH
4.2% 1.5 MPH
1.3% 2.4 MPH
1.9% 1.4 MPH
2.6% 1.8 MPH
4.3% 2.3 MPH
9.2% 2.6 MPH
S
12.4% 2.3 MPH
11.3% 2.0 MPH
10.9% 2.1 MPH
W
9.2% 2.1 MPH
6.9% 2.1 MPH
4.8% 2.3 MPH
E
FMPC

GRID NORTH
(U.S.G.S. & O.S.P.) TRUE NORTH
MAGNETIC NORTH
1°28' 26 MILS
1° 18 MILS

300' 0' 300' 600' 900'
SCALE

2482

U.S. DEPARTMENT OF ENERGY

FIGURE I-1

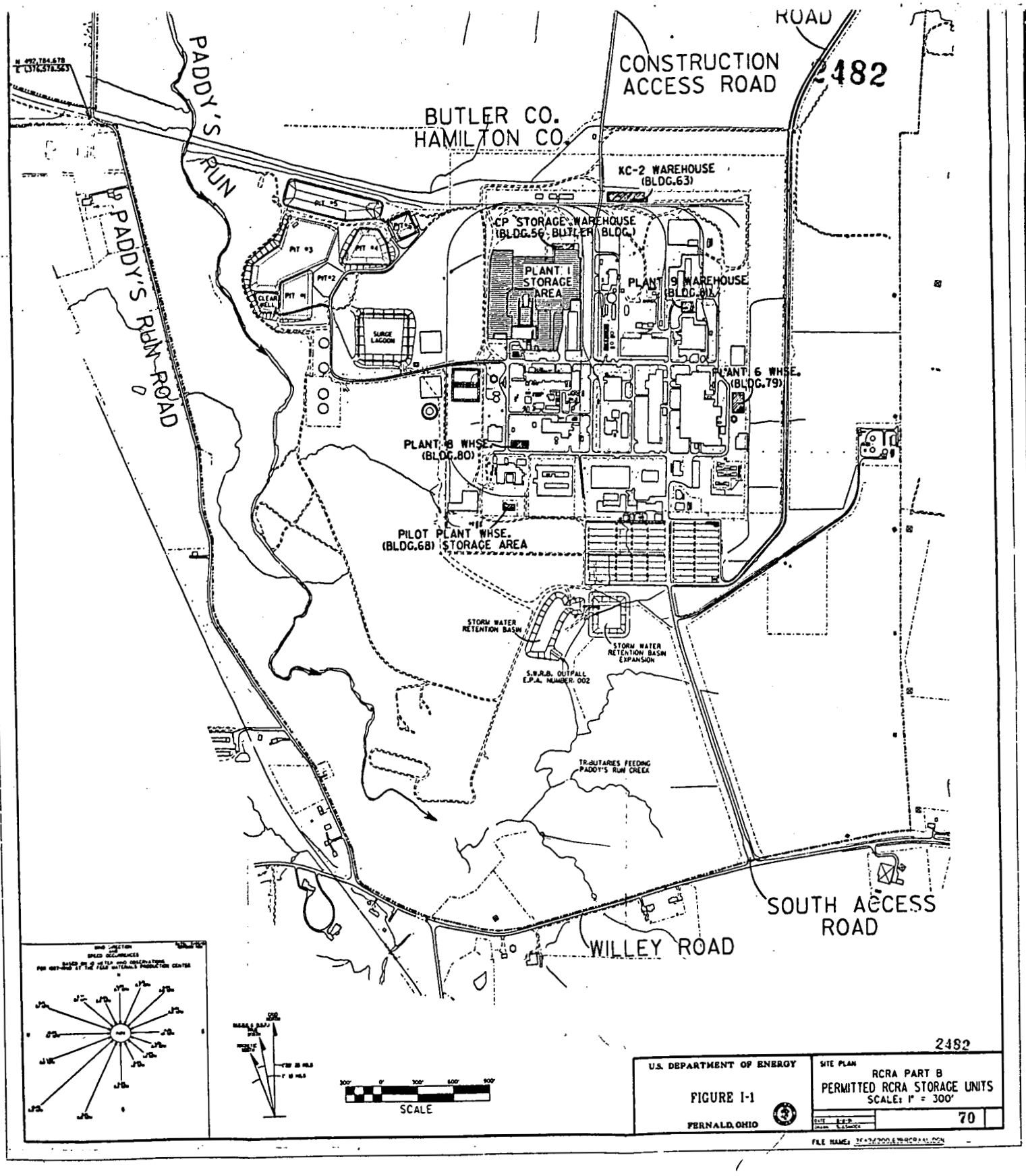
FERNALD, OHIO

SITE PLAN
RCRA PART B
PERMITTED RCRA STORAGE UNITS
SCALE: 1" = 300'

DATE 8-8-91
DRAWN S.J.SMOCK

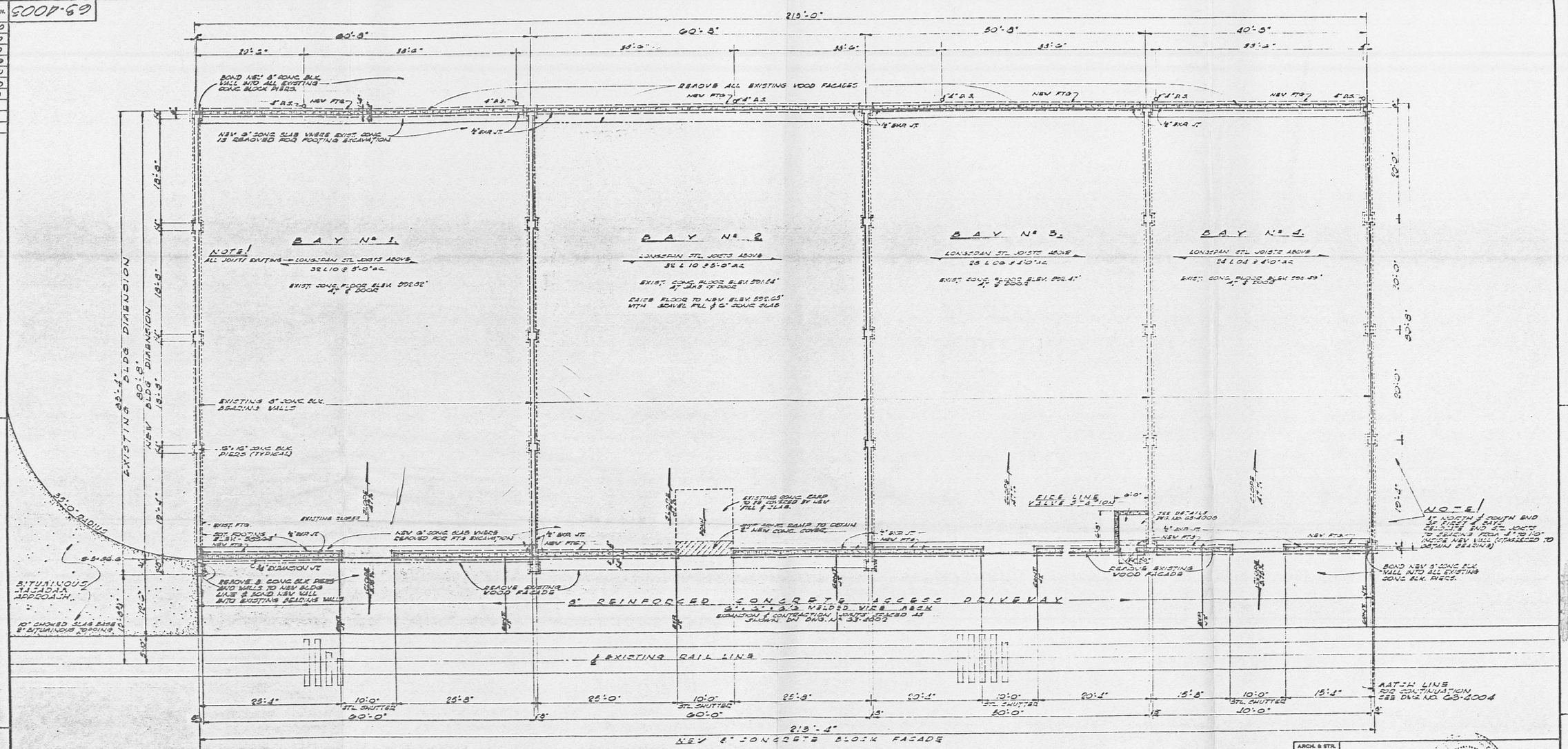
70

FILE NAME: ZFA2:[200,639]RCRAAL.DGN


ROAD
CONSTRUCTION ACCESS ROAD
2482
BUTLER CO.
HAMILTON CO.
PADDY'S RUN
PADDY'S RUN ROAD
KC-2 WAREHOUSE (BLDG.63)
CP STORAGE WAREHOUSE (BLDG.56, BUTLER BLDG.)
PLANT 1 STORAGE AREA
PLANT 9 WAREHOUSE (BLDG.81)
PLANT 6 WHSE. (BLDG.79)
PLANT 8 WHSE. (BLDG.80)
PILOT PLANT WHSE. (BLDG.68) STORAGE AREA
PIT #5
PIT #3
PIT #4
PIT #2
PIT #1
CLEAR WELL
SURGE LAGOON
STORM WATER RETENTION BASIN
STORM WATER RETENTION BASIN EXPANSION
S.W.R.B. OUTFALL E.P.A. NUMBER 002
TRIBUTARIES FEEDING PADDY'S RUN CREEK
SOUTH ACCESS ROAD
WILLEY ROAD
SCALE
U.S. DEPARTMENT OF ENERGY
FIGURE I-1
FERNALD, OHIO
SITE PLAN
RCRA PART B
PERMITTED RCRA STORAGE UNITS
SCALE: 1" = 300'
70

PRINTED	REV.
2-28-57	0
2-28-57	0
8-1-57	0
8-8-57	0
8-12-57	0
10-25-57	0
7-16-58	1

63-4003



NOTE: FOAM ROOFING HAS BEEN INSTALLED

INDEX CODE			
FL. & DR.	CONC.	CL.	SEQ. NO.
63X	5500	A	00006

DESIGN APPROVAL

DIVISION	SIGNATURE	DATE
HEALTH & SAFETY		6-28
PRODUCTION		
TECHNICAL		
MAINTENANCE		
PROCUREMENT		7/63

DO NOT SCALE REDUCED DRAWING

REF. DWG. NO.	REF. DWG. TITLE
63-4003	RICE LINE VALVE STA. DETAIL
63-4002	FLOOR PLAN - EAST HALF

NO.	REVISIONS	DATE	BY
1	ADDED NOTE	7-15-58	

ARCH. & STR.
MECHANICAL 8/14/57
ELECTRICAL
CHEMICAL
PROJ. ENGR. 7/3/57

8/28/1912482

NATIONAL LEAD COMPANY OF OHIO
FEED MATERIALS PRODUCTION CENTER
FERNALD, OHIO

U.S. ATOMIC ENERGY COMMISSION

KC-2 WAREHOUSE
ARCHITECTURAL
FLOOR PLAN - WEST HALF

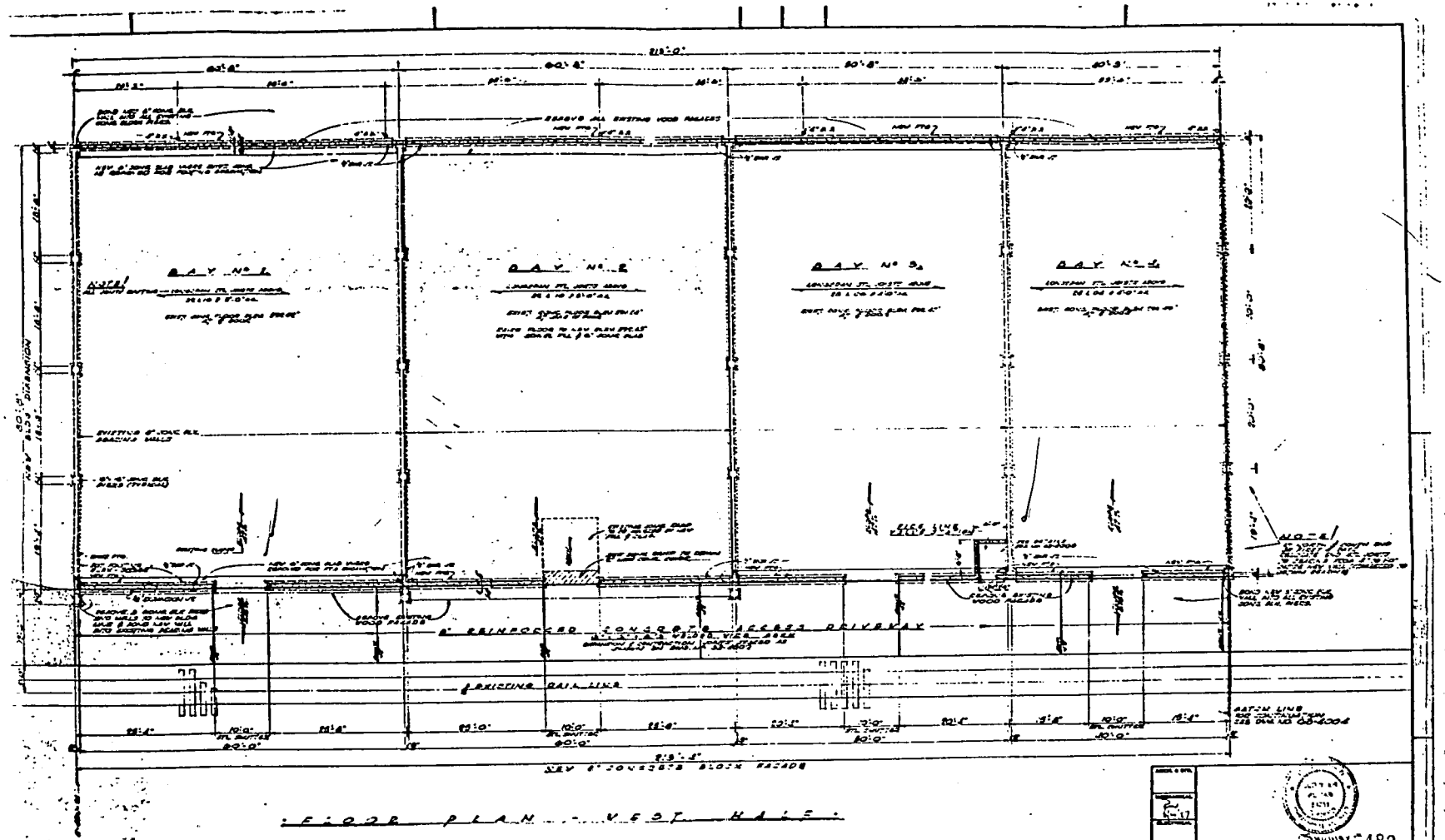
DEPARTMENT PROCUREMENT
PROJECT NO. 63-1 CP-F- 56-76
DRAWN TRACED HANDLEY CHECKED APPROVED 7-3-57
DATE 4-28-57
SCALE 3"=1'-0"
DWG. NO. 63-4003
REV. 1

U.S. DEPARTMENT OF ENERGY

FIGURE I-2A

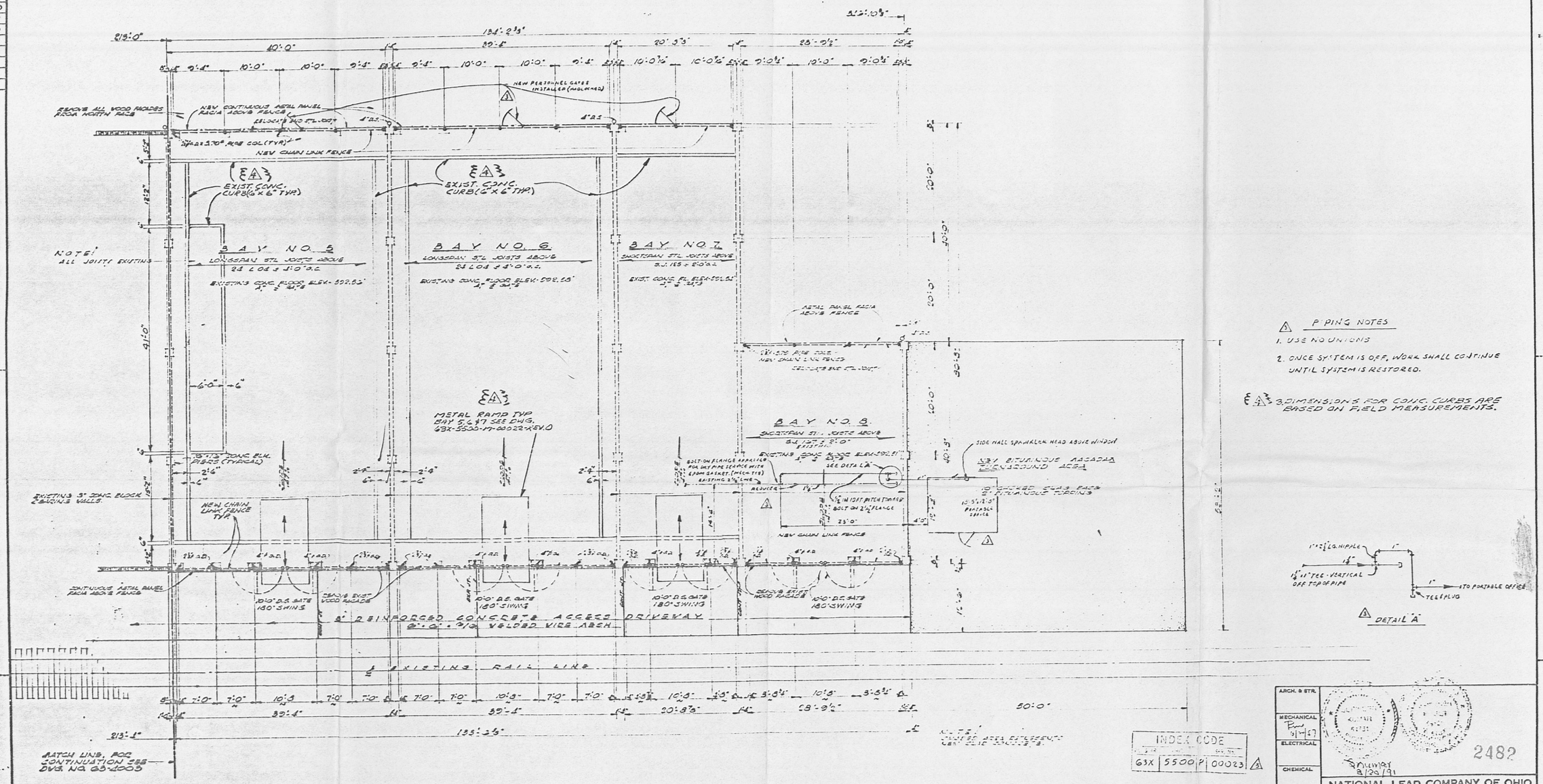
FERNALD, OHIO

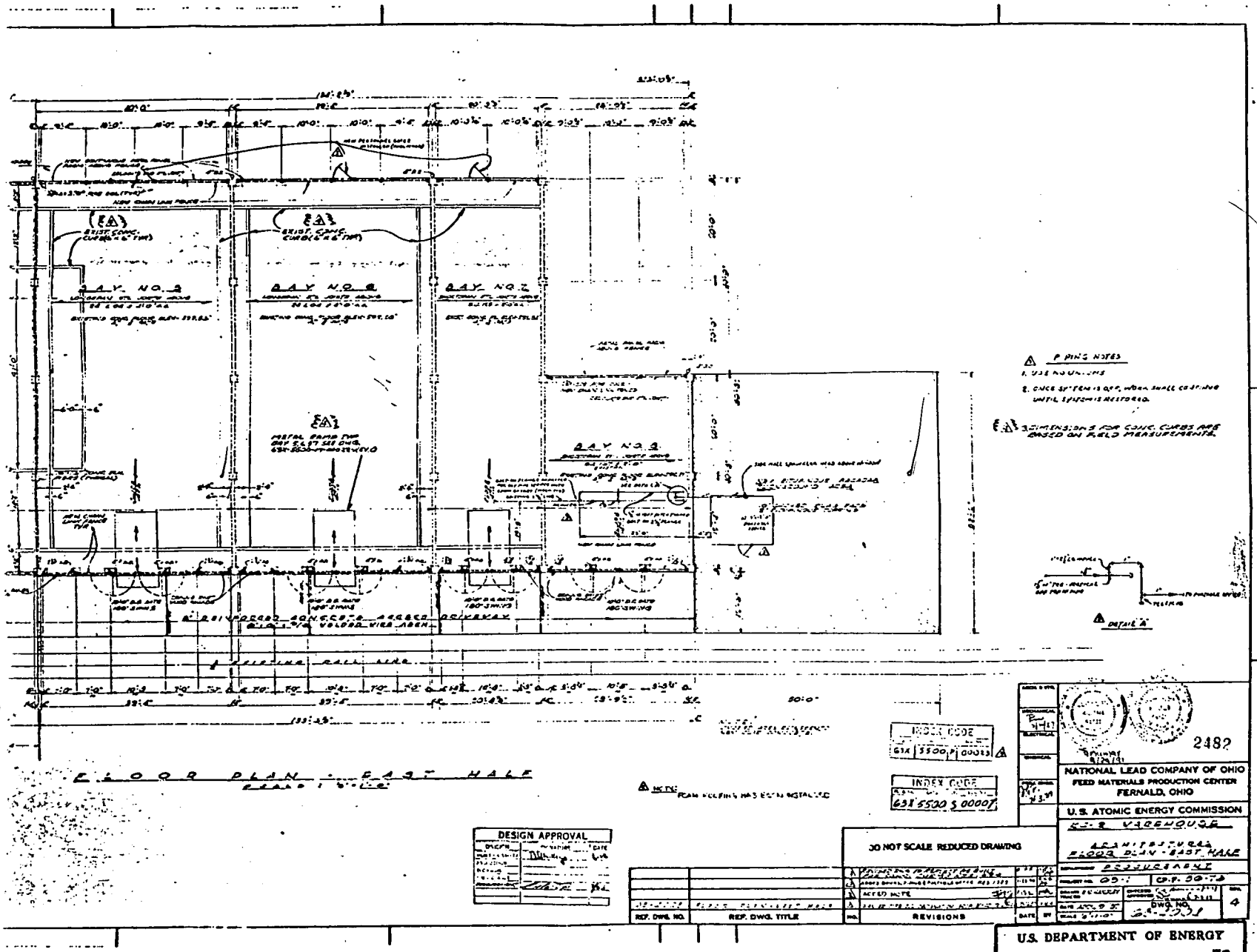
71


BAY No. 1
BAY No. 2
BAY No. 3
BAY No. 4
8" REINFORCED CONCRETE ACCESS DRIVEWAY
EXISTING RAIL LINE
NEW 8" SOUNDED BLOCK FACADE
FLOOR PLAN - WEST HALF
NOTE: FOAM ROOFING HAS BEEN INSTALLED
INDEX CODE
651.5500 A 00006
DESIGN APPROVAL
DO NOT SCALE REDUCED DRAWING
NATIONAL LEAD COMPANY OF OHIO
FEED MATERIALS PRODUCTION CENTER
FERNALD, OHIO
U.S. ATOMIC ENERGY COMMISSION
KG-2 WAREHOUSE
RECEIPT & THREE
FLOOR PLAN - WEST HALF
DECONTAMINATION
DWG. NO. 35-2003
REVISIONS
REF. DWG. NO.
R.L.P. DWG. TITLE
U.S. DEPARTMENT OF ENERGY
FIGURE I-2A
FERNALD, OHIO

PRINTED	REV.
7-22-57	0
7-7-57	0
8-1-57	0
8-8-57	0
8-12-57	0
10-25-57	1
7-12-85	2

D007-69



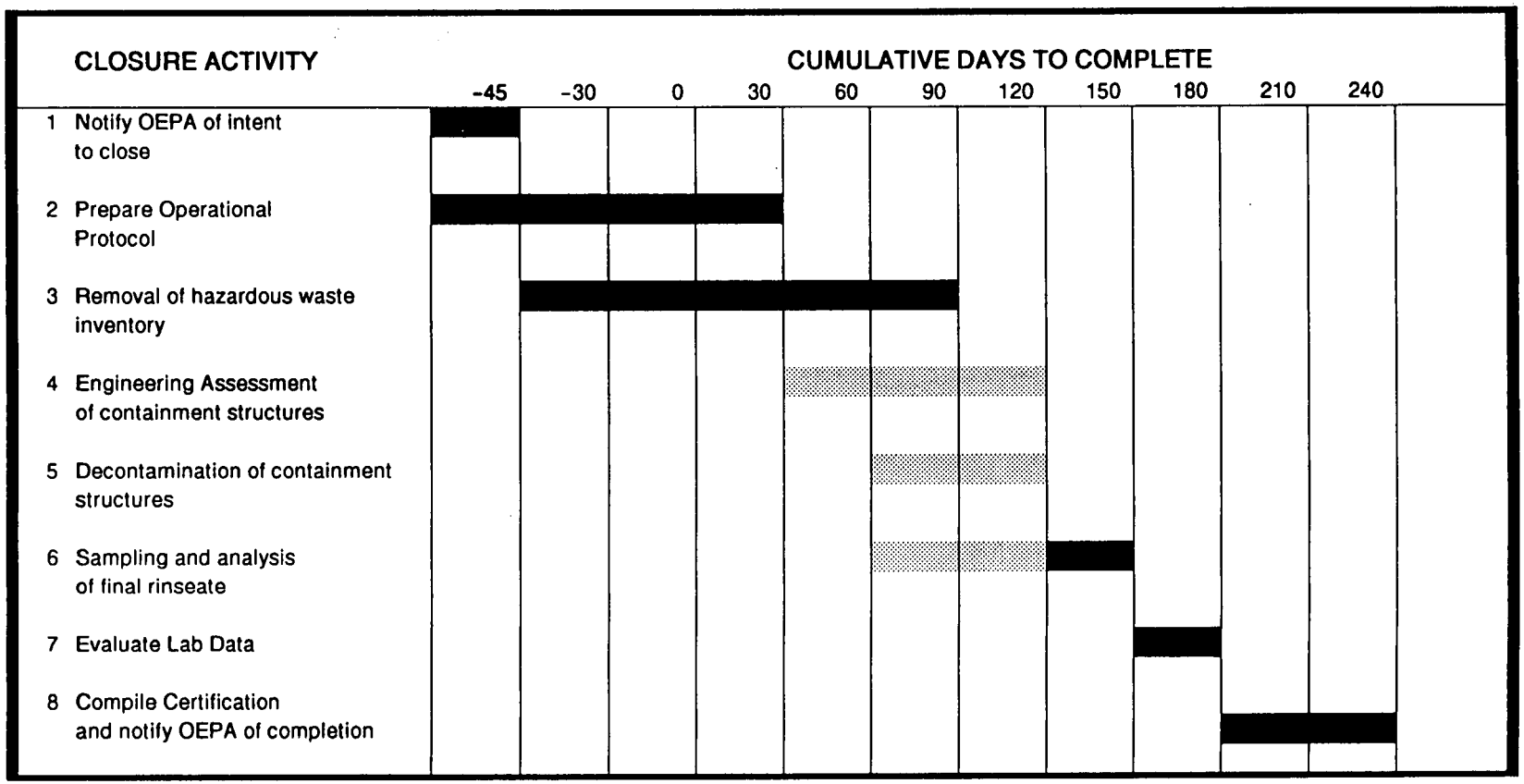


U.S. DEPARTMENT OF ENERGY

FIGURE I-2B

FERNALD, OHIO

2482

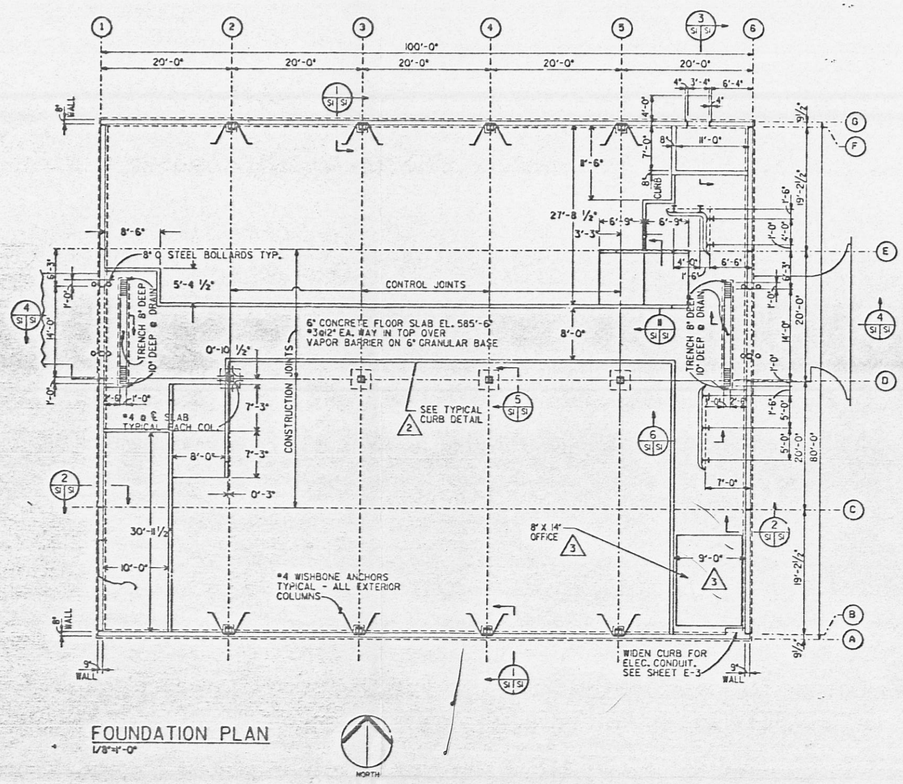


Notes:

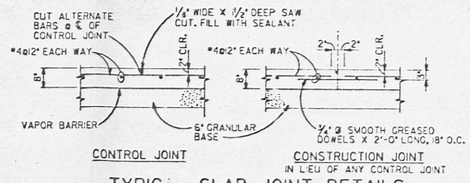
Indicates critical activity when an independent, qualified, registered, professional engineer or his representative should be present on site.

FIGURE I-3

KC-2 WAREHOUSE SCHEDULE FOR CLOSURE



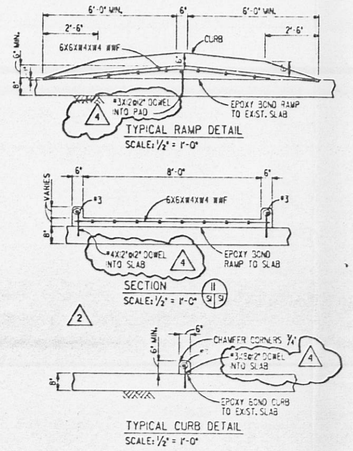
FOUNDATION PLAN
1/8"=1'-0"



CONTROL JOINT

CONSTRUCTION JOINT
IN LIEU OF ANY CONTROL JOINT

TYPICAL SLAB JOINT DETAILS



NOTES

ALL ANCHOR BOLTS ARE TO BE FURNISHED BY PRE ENGINEERED BUILDING CONTRACTOR.

PIERS AND ANCHOR BOLTS MUST ACCOMMODATE COLUMN BASE PLATES PROVIDED BY THE MANUFACTURER OF THE BUILDING SYSTEM PURCHASED. THE CONTRACTOR IS TO VERIFY PIER AND ANCHOR BOLT SIZE AND LOCATION FROM CERTIFIED DRAWINGS OF THE BUILDING SYSTEM PURCHASED BEFORE INSTALLING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

FOOTINGS ARE DESIGNED FOR MAXIMUM SOIL BEARING OF 3500 P.S.F.

CONCRETE TO HAVE THE FOLLOWING 28 DAY COMPRESSIVE STRENGTHS: FC = 4000 P.S.I. FOR SLABS, CURBS, & RAMPS
FC = 3000 P.S.I. FOR OTHERS

CURBS AND RAMPS TO HAVE 3"-5" SLUMP AND 02-3% ENTRAINED AIR. 2

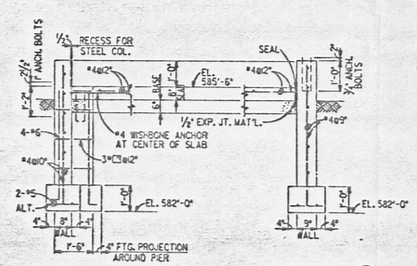
ALL CONCRETE WHICH WILL BE EXPOSED TO WEATHER TO BE AIR ENTRAINED.

ALL REINFORCING STEEL TO BE ASTM A615 GRADE 60, EXCEPT GRADE 40 MAY BE USED FOR PIER TIES. ALL WALL CORNERS TO HAVE CORNER BARS IN OUTSIDE FACE TO MATCH GREATER HORIZONTAL WALL REINFORCEMENT. LAP SPLICES OR EMBEDMENT LENGTHS TO CONFORM TO TABLE 20. ACI MANUAL SP-17, CLASS B SPLICE.

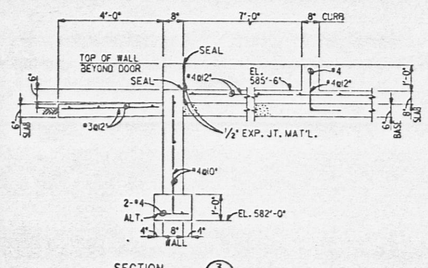
INSTALL CURB CONTROL JOINTS ON SLAB CONTROL JOINTS. SEAL JOINTS WITH A FLEXIBLE JOINT SEALER (URETHANE). DO NOT RUN REBAR THROUGH CONTROL JOIN..

FOR EPOXY BOND USE (2) COMPONENT, 100% SOLIDS, EPOXY RESIN, AMINE CURED, EUCLID 10.463, OR EQUAL. CONFORM TO ACI 503.2

ENTIRE FLOOR SLAB, INCLUDING SURFACE OF CURBS, SHALL BE TREATED WITH CONCRETE SEALANT, SURETREAT CORP., OR APPROVED EQUAL. 4

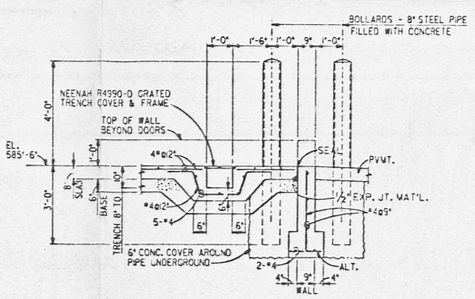


SIDEWALL & PIER 1 S1 S2
SCALE: 1/2" = 1'-0"

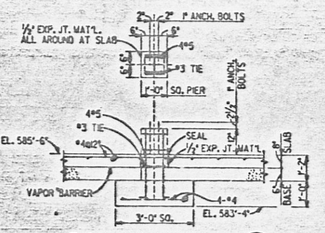


END WALLS 2 S1 S2
SCALE: 1/2" = 1'-0"

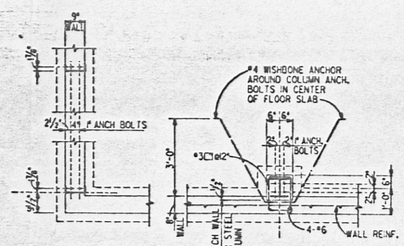
SECTION 3 S1 S2
SCALE: 1/2" = 1'-0"



SECTION 4 S1 S2
SCALE: 1/2" = 1'-0"

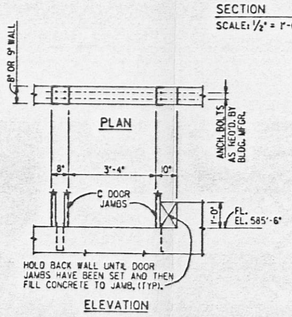


TYPICAL INTERIOR FOOTING 5 S1 S2
SCALE: 1/2" = 1'-0"

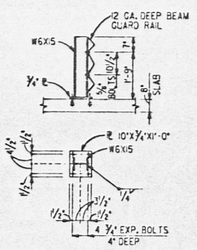


CORNER & END WALL
SCALE: 1/2" = 1'-0"

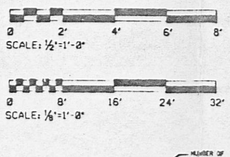
SIDE WALL PIERS
SCALE: 1/2" = 1'-0"

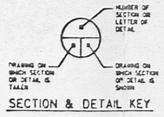


DOOR JAMBS DETAIL



SECTION 6 S1 S2
SCALE: 1/2" = 1'-0"





SECTION & DETAIL KEY

DO NOT SCALE REDUCED DRAWING

2482

TO CORRELATE REFERENCED * AMK SHEET No's * TO FMPC DRAWING NUMBERS, SEE FMPC DRAWING No.: 81X-4445-X-00021

REV. NO.	REVISION PURPOSE - DESCRIPTION	DRAWN	DATE	CHK'D	APP'D
4	REVISED DOWEL SPACING, & FLOOR SEALANT NOTE, RFS 1515	JM-MGK	5-29-90		
3	REVISED DEMINSIONS PER FRANK BEAL RFS 1515	JM-MGK	11-10-90		
2	ADDED CURBS, RAMPS, DETAILS, & NOTES. RFS 1515	JM-MGK	8-29-89		
1	AS-BUILT	LMP	5-12-89		
0	CFC	LMP	3-23-88		

UNITED STATES
DEPARTMENT OF ENERGY
FEED MATERIALS PRODUCTION CENTER

THIS DRAWING PREPARED BY
A. M. KINNEY, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

AMCO SUBCONTRACT NO. W-7707 — A-E PROJECT NO. 02982

PROJECT NAME: ENVIRONMENTAL, HEALTH & SAFETY IMPROVEMENTS

DRAWING TITLE: WAREHOUSE - PLANT 9
FOUNDATION PLAN & DETAILS

DRAWN BY	DATE	DESIGNED BY	DATE	CHECKED BY	DATE
MEC	2-7-88	CW	2-7-88	LMP	2-15-88

PLANT/BLDG. NO.	FLOOR	SCALE	CLASS
81	—	AS NOTED	

SUBMITTED - OR OF TOWN	APPROVAL RECOMMENDED	DESIGNER APPROVED
DATE	OPERATING CONTRACTOR DATE	JOB DATE

A.E. PROJECT NO.	OPERATION-FUNCTION NO.	DRAWING NO.	REV. NO.
87-0-159	0087502 WBS1.1.3.2.03	81X-4445-S-00003	S-1 | 4

U.S. DEPARTMENT OF ENERGY

FIGURE I-4

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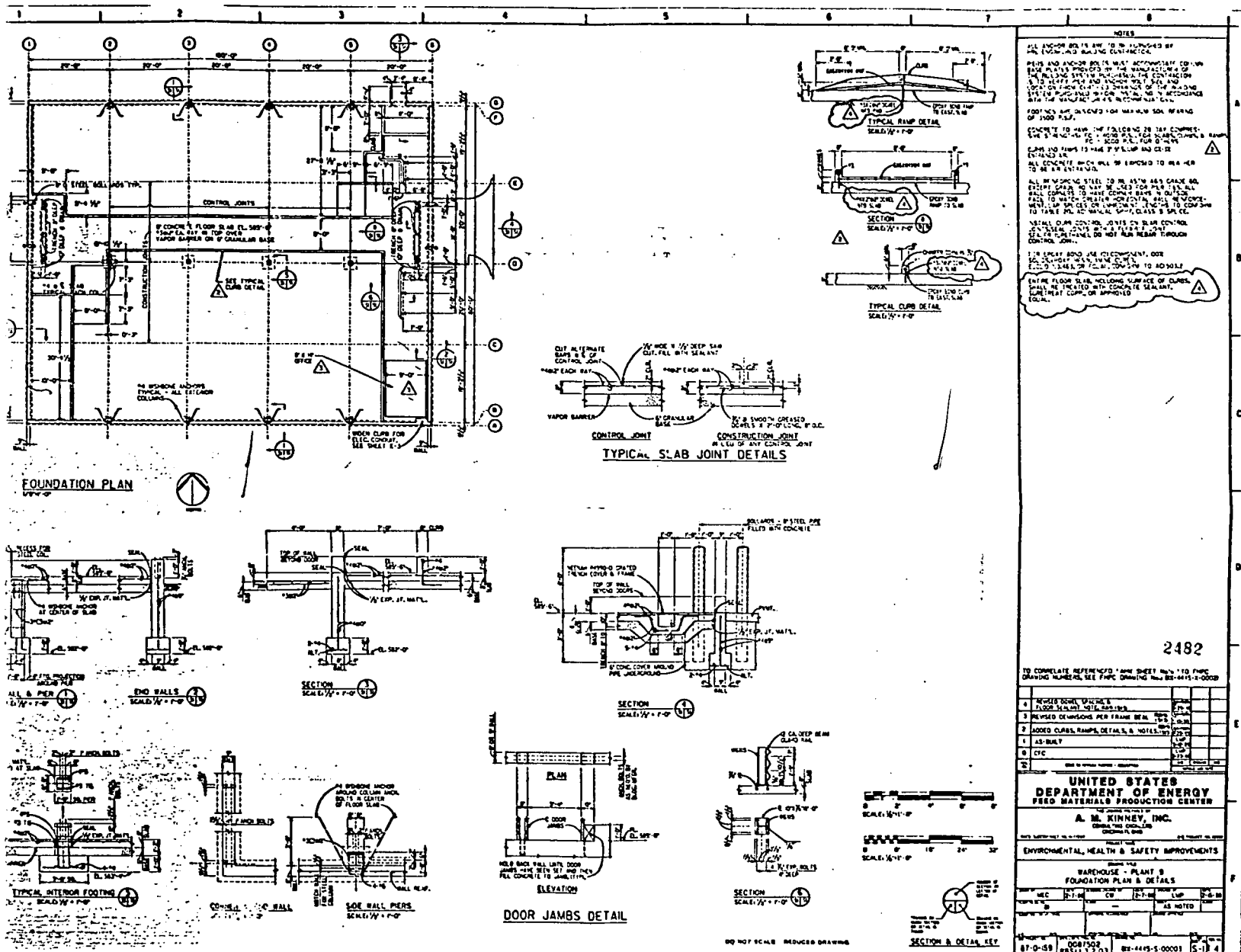
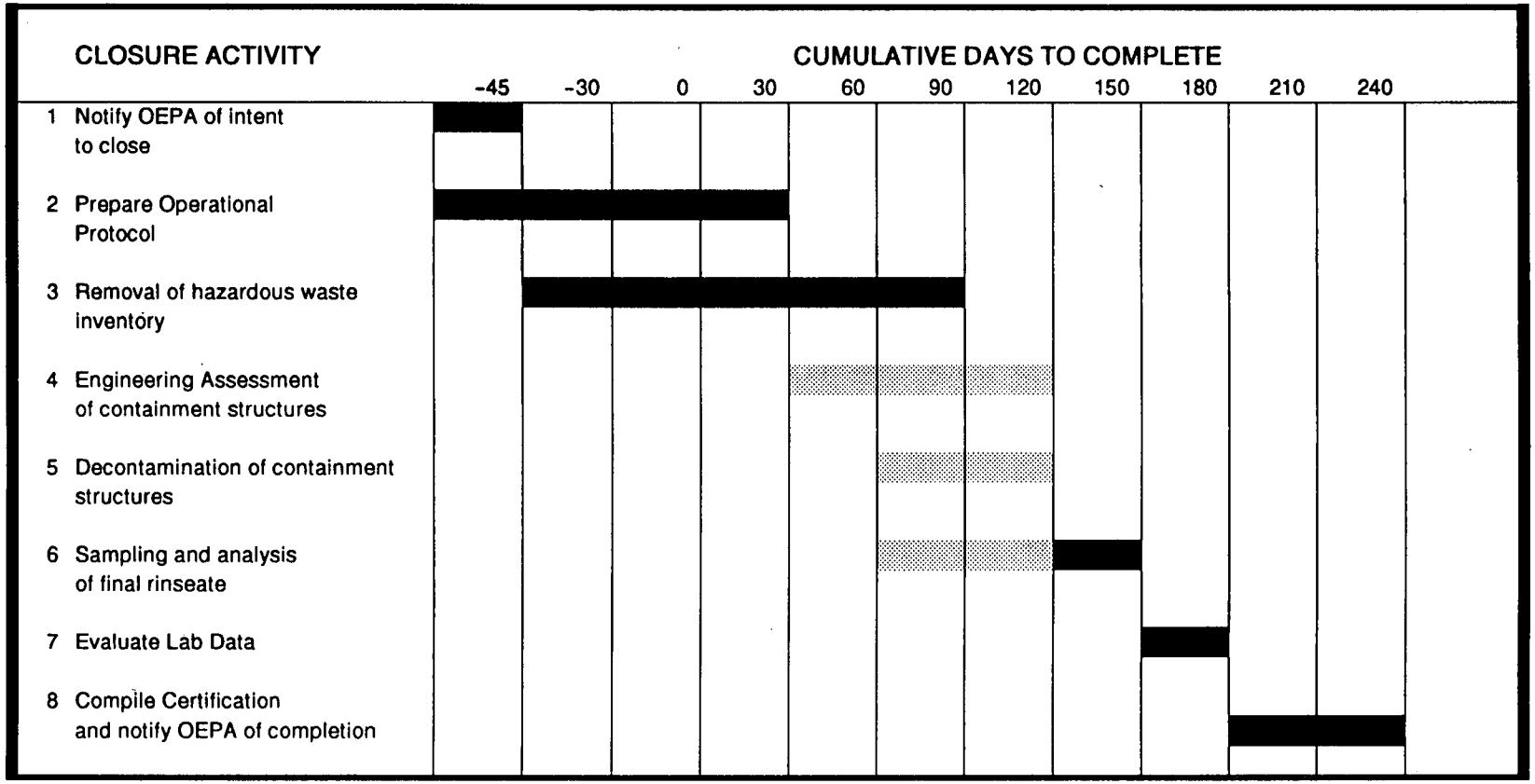
FERNALD, OHIO


FOUNDATION PLAN
TYPICAL SLAB JOINT DETAILS
CONTROL JOINT
CONSTRUCTION JOINT
TYPICAL RAMP DETAIL
TYPICAL CURB DETAIL
SECTION
END WALLS
SECTION
SECTION
TYPICAL INTERIOR FOOTING
SOE WALL PIERS
ELEVATION
DOOR JAMBS DETAIL
SECTION
SECTION & DETAIL KEY
DO NOT SCALE REDUCED DRAWING
NOTES
2482
UNITED STATES
DEPARTMENT OF ENERGY
FEED MATERIALS PRODUCTION CENTER
A. M. KINNEY, INC.
ENVIRONMENTAL, HEALTH & SAFETY IMPROVEMENTS
WAREHOUSE - PLANT 9
FOUNDATION PLAN & DETAILS
AS NOTED
U.S. DEPARTMENT OF ENERGY
FIGURE I-4
FERNALD, OHIO

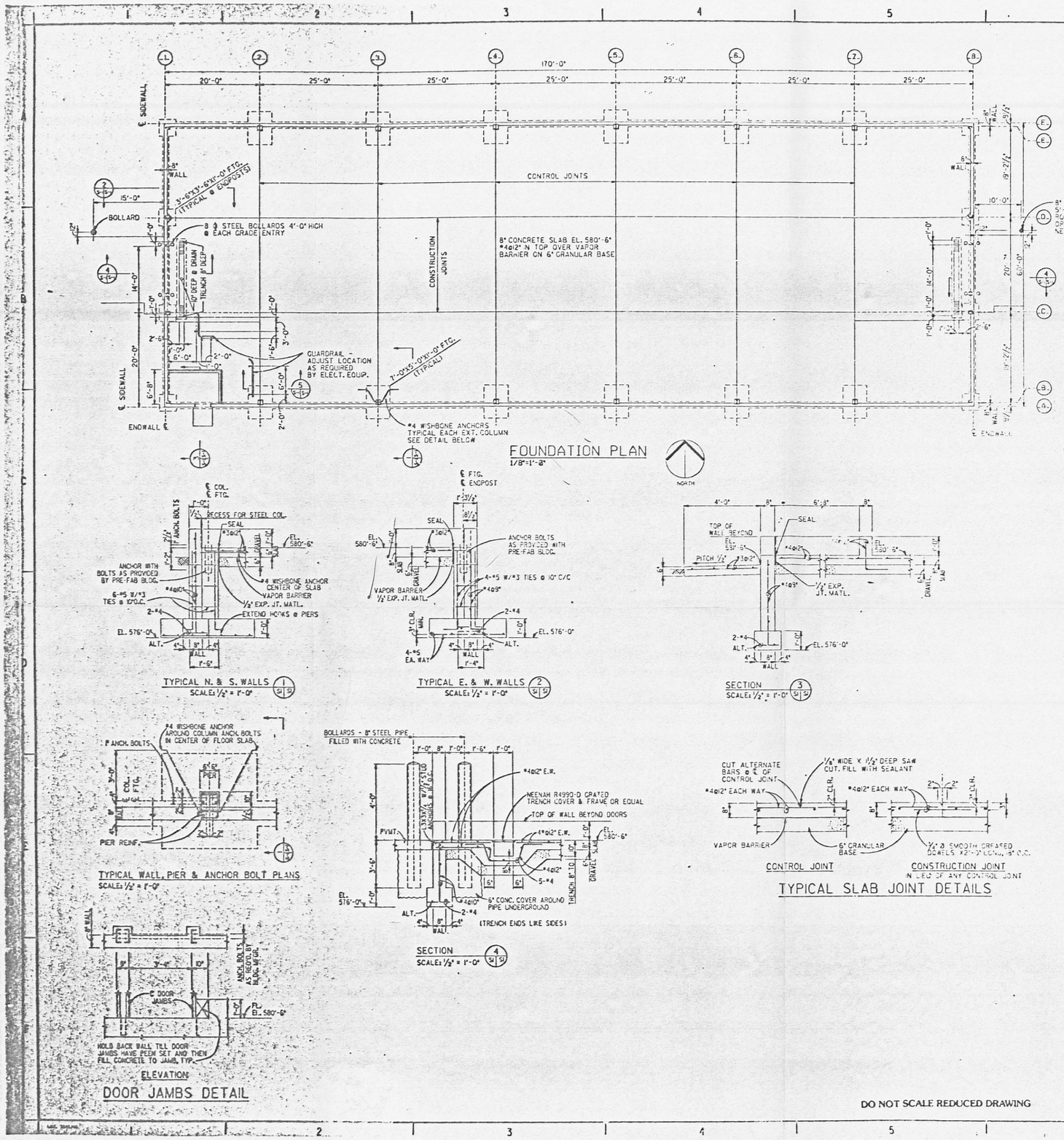


Notes:

Indicates critical activity when an independent, qualified, registered, professional engineer or his representative should be present on site.

FIGURE I-5

PLANT 9 WAREHOUSE SCHEDULE FOR CLOSURE

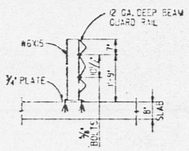


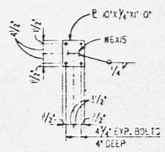
FOUNDATION PLAN
1/8"=1'-0"

TYPICAL N. & S. WALLS (1)
SCALE: 1/2" = 1'-0"

TYPICAL E. & W. WALLS (2)
SCALE: 1/2" = 1'-0"

SECTION (3)
SCALE: 1/2" = 1'-0"





SECTION (5)
SCALE: 1/2" = 1'-0"

TYPICAL WALL, PIER & ANCHOR BOLT PLANS
SCALE: 1/2" = 1'-0"

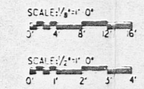
SECTION (4)
SCALE: 1/2" = 1'-0"

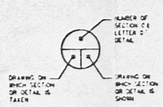
CONTROL JOINT

CONSTRUCTION JOINT
IN LIEU OF ANY CONTROL JOINT

TYPICAL SLAB JOINT DETAILS

ELEVATION
DOOR JAMBS DETAIL





SECTION & DETAIL KEY

DO NOT SCALE REDUCED DRAWING

NOTES

ALL ANCHOR BOLTS ARE TO BE FURNISHED BY FOUNDATION CONTRACTOR.

PIERS AND ANCHOR BOLTS MUST ACCOMODATE COLUMN BASE PLATES PROVIDED BY THE MANUFACTURER OF THE BUILDING SYSTEM PURCHASED. THE CONTRACTOR IS TO VERIFY PIER AND ANCHOR BOLT SIZE & LOCATION FROM CERTIFIED DRAWINGS OF THE BUILDING SYSTEM PURCHASED BEFORE FABRICATING AND INSTALLING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

FOOTINGS ARE DESIGNED FOR MAXIMUM SOIL BEARING OF 4000 P.S.F.

CONCRETE TO HAVE THE FOLLOWING 28 DAY COMPRESSIVE STRENGTHS: FC = 4000 P.S.I. FOR SLABS
FC = 3000 P.S.I. FOR OTHERS

ALL CONCRETE WHICH WILL BE EXPOSED TO WEATHER TO BE AIR ENTRAINED.

ALL REINFORCING STEEL TO BE ASTM A615 GRADE 60, EXCEPT GRADE 40 MAY BE USED FOR PIER TIES. ALL WALL CORNERS TO HAVE CORNER BARS IN OUTSIDE FACE TO MATCH GREATER HORIZONTAL WALL REINFORCEMENT. LAP SPLICES OR EMBEDMENT LENGTHS TO CONFORM TO TABLE 201 ACI MANUAL SP-17 CLASS B SPLICE.

2482

STATE OF OHIO
L. M. POCKRAS
20092
REGISTERED
PROFESSIONAL ENGINEER

TO CORRELATE REFERENCED "AMK SHEET NO." TO FMPC DRAWING NO., SEE FMPC DRAWING NO. 80X-4445-X-00021

1	AS-BUILT	LMP 5-12-87		
0	CFC	LMP 3-25-88		
REV. NO.	ISSUE OR REVISION PURPOSE - DESCRIPTION	A-E	CHECKED	DATE

UNITED STATES
DEPARTMENT OF ENERGY
FEED MATERIALS PRODUCTION CENTER

THIS DRAWING PREPARED BY
A. M. KINNEY, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

PMCO SUBCONTRACT NO. N-17707 — A.E. PROJECT NO. 02882

PROJECT NAME: ENVIRONMENTAL, HEALTH & SAFETY IMPROVEMENTS

DRAWING TITLE: WAREHOUSE PLANT 8 FOUNDATION PLAN & DETAILS

DRAWN BY	DATE	DESIGNED BY	DATE	CHECKED BY	DATE
MEC		RDS	1-18-88	LMP	3-25-88

PLANT NO. 8 — FLOOR — SCALE: AS NOTED — SEAL

CONTRACT FOR APPROVAL — APPROVAL AS CONSTRUCTED — DRAWING APPROVED

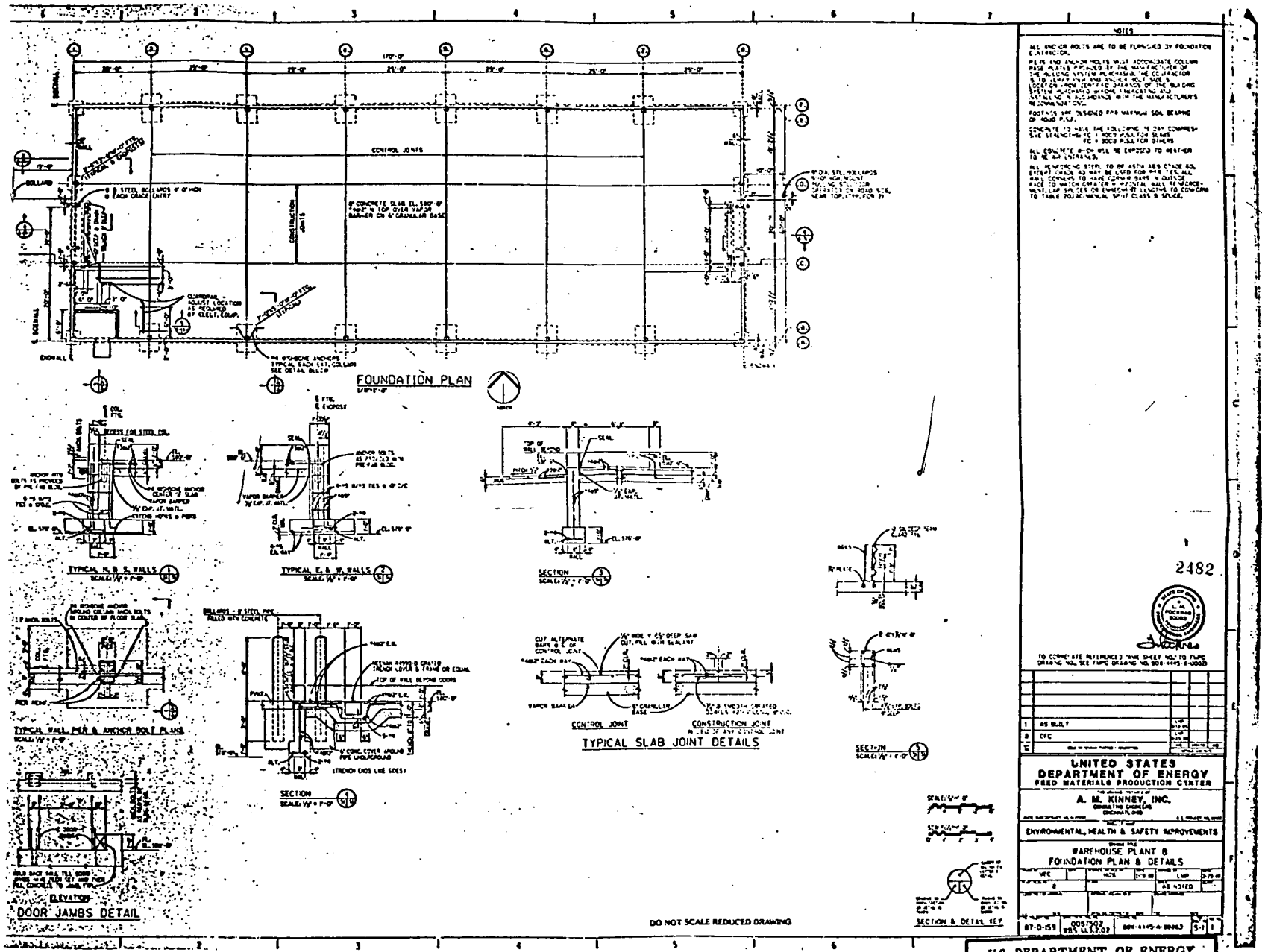
F.E. PROJECT NO.	DATE	SPECIFICATION NO.	DATE	PROJECT NO.	DATE	DATE	REV. NO.
87-D-159		0087502 WBS L1.3.2.02		80X-4445-A-20003			S-1 1

U.S. DEPARTMENT OF ENERGY

FIGURE I-6

FERNALD, OHIO

76

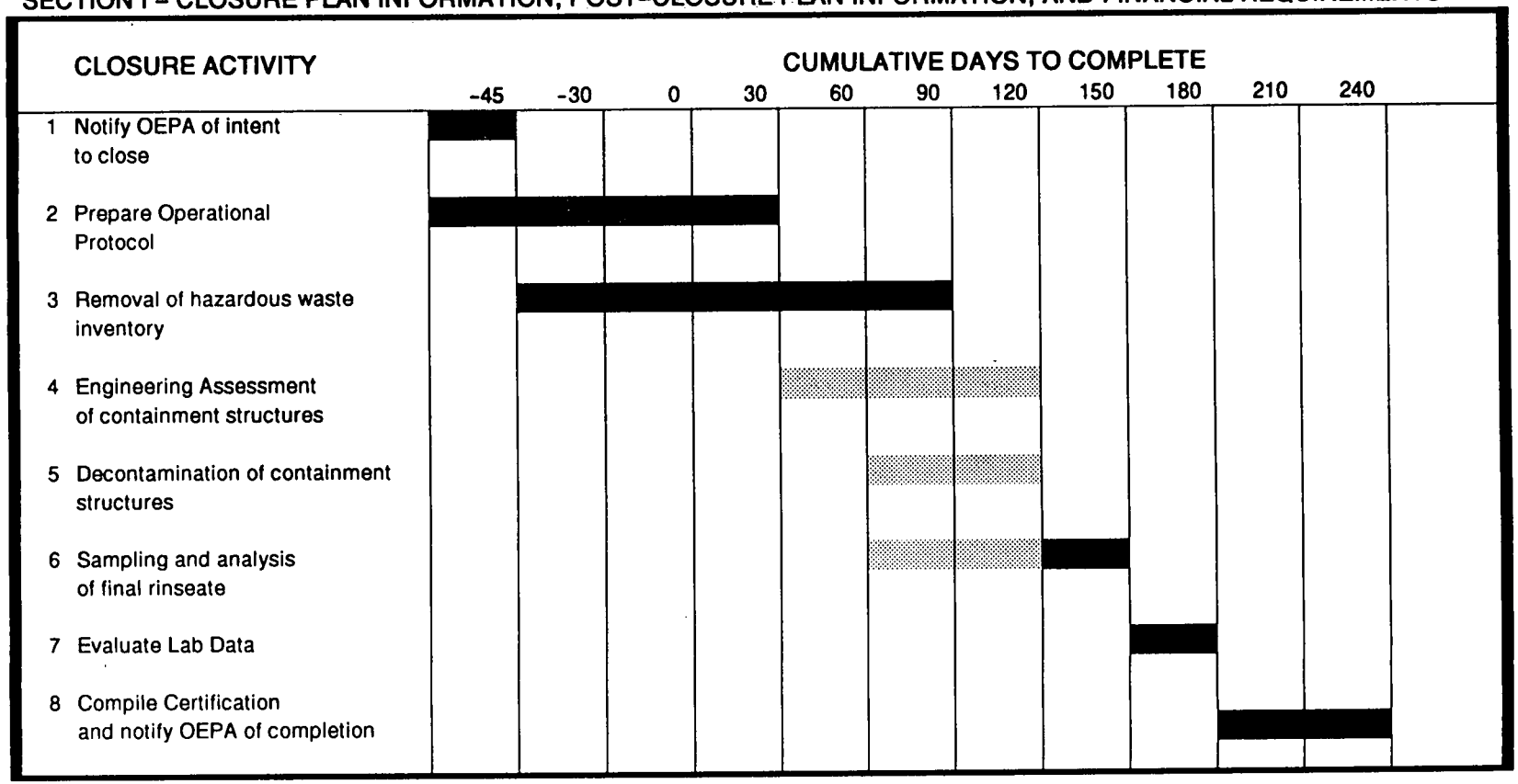


U.S. DEPARTMENT OF ENERGY

FIGURE I-6

FERNALD, OHIO

2482



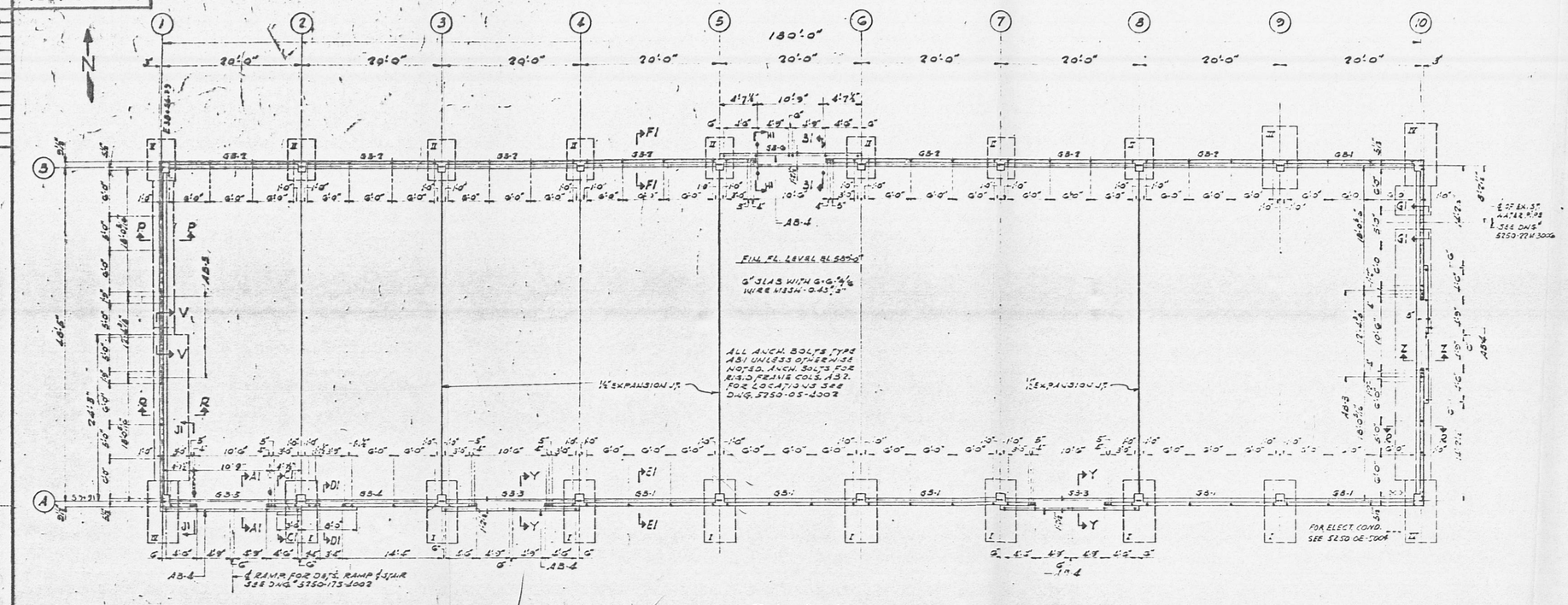
Notes:

Indicates critical activity when an independent, qualified, registered, professional engineer or his representative should be present on site.

FIGURE I-7

PLANT 8 WAREHOUSE SCHEDULE FOR CLOSURE

1007-50-0929



PLAN
SCALE: 1/8"=1'-0"

ANCHOR BOLT SCHEDULE					
MARK	A	B	C	D	E	F
AB-1	1½"	1"	1"	2"	6"	2"
AB-2	3/4"	1½"	1½"	3"	1'-6"	SEE DWG. 5250-05-4002
AB-3	3/4"	1½"	1½"	3"	1'-0"	8"
AB-4	1½"	3½"	3½"	9"	6"	SEE PLAN
AB-5	3/4"	SEE SECTION	3"	3"	2'-0"	

ANCHOR BOLT DETAILS

SECTION A1-A1
SECTION B1-B1
SCALE: 1/2"=1'-0"

SECTION C1-C1
SCALE: 1/2"=1'-0"

SECTION D1-D1
SCALE: 1/2"=1'-0"

SECTION Y-Y
SECTION Z-Z
SCALE: 1/2"=1'-0"

SECTION E1-E1
SCALE: 1/8"=1'-0"

SECTION F1-F1
SCALE: 1/8"=1'-0"

SECTION G1-G1
SCALE: 1/8"=1'-0"

GENERAL NOTES

1. ALL FOOTINGS SHALL BE CARRIED TO UNDISTURBED VIRGIN SOIL AT MINIMUM ELEVATIONS INDICATED ON PLAN. WHERE DEPTH OF FOOTINGS IS INCREASED, DESIGN SHALL BE REVISED AS DIRECTED BY THE ARCHITECT-ENGINEER. MAX. SOIL PRESSURE 3000 LBS. PER SQ. FT.
2. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DIMENSIONS OF EXISTING STRUCTURES, UTILITIES, ETC. BEFORE PROCEEDING WITH EXCAVATIONS AND DETAILING.
3. CONCRETE SHALL BE TYPE A - f'c = 3000 PSI
4. REINFORCEMENT SHALL BE DEFORMED BARS OF RAIL STEEL OR INTERMEDIATE GRADE BILLET STEEL SECURELY HELD IN POSITION DURING POURING.
5. SPLICES, WHERE REQUIRED, SHALL LAP 30 DIA'S. WHERE POSSIBLE ADJACENT SPLICE SHALL BE STAGGERED. AVOID LOCATING SPLICES AT POINTS OF MAXIMUM STRESS.
6. THE CONTRACTOR SHALL INSTALL ALL PIPE SLEEVES, ANCHOR BOLTS AND OTHER INSERTS REQUIRED FOR THE VARIOUS TRADES.
7. FLOOR TO BE LEVEL AND TO HAVE A STEEL TROWELED FINISH.
8. THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL ANCHOR BOLTS FROM CERTIFIED VENDOR'S PRINTS OF BUILDINGS, DOORS, ETC.
9. VERTICAL CONSTRUCTION JOINTS IN WALLS SHALL BE USED ONLY WHEN UNAVOIDABLE, AND SHALL BE LOCATED AT LEAST 4'-0" FROM ANY SUPPORTING COLUMN OR WALL OPENING.
10. BACKFILL AROUND ALL WALLS AND GRADE BEAMS SHALL BE PLACED ALTERNATELY ON EACH SIDE, SO THAT THE DIFFERENCE IN GRADE OF INSIDE AND OUTSIDE FILLS SHALL AT NO TIME EXCEED 2'-0" UNTIL LOWEST FINISHED GRADE IS REACHED DURING CONSTRUCTION. TEMPORARY BRACING SHALL BE USED IF DIRECTED BY THE ARCHITECT-ENGINEER.
11. CONCRETE HAS BEEN DESIGNED IN ACCORDANCE WITH ACI BUILDING CODE 318-51.
12. SEE SPECIFICATIONS FOR PROJECT 5250-30
13. FLOOR SLAB TO BE POURED IN ALTERNATE SECTIONS.
14. FOR SECTIONS & DETAILS NOT SHOWN SEE DWG. 5250-05-4002

2487

TEMP. STORAGE BUILDING - POWER, SIGNAL & LIGHTING LAYOUT	5250-05-5004

DRAWING NO. 5250-05-4001 REV. 3

REFERENCE DRAWING	NO.
TEMP. STOR. FAC. - FDNS. & 1st FL. DETS.	5250-05-4002
PLAN - TEMP. STOR. FAC.	5250-05-4002
GEN. STOR. PAVED AREA PLOT PLAN	5250-175-4002
YARD PIPING - TEMP. STOR. FAC. - S.W.	5750-2745-5006
CHEM. WHSE ADDITION - FDN. PLAN	5250-303-4002
BILL OF MATERIAL REF.	
SPECIFICATION REF.	PROJ. 5750-30

U. S. ATOMIC ENERGY COMMISSION

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
420 LEXINGTON AVE. NEW YORK 17, N.Y.

NATIONAL LEAD COMPANY OF OHIO
OPERATING CONTRACTOR OF
FEED MATERIALS PRODUCTION CENTER
FERNALD, OHIO

TEMPORARY STORAGE FACILITIES
FOUNDATION PLAN

DEPT. CHECK	
ARCH	JMB
CHEM.	RLS
ELEC.	DJV
MECH.	HJB
STRUCT.	

APPROVED		DATE
S & B	TITLE	1-21-55
N. L. CO.	NAME TITLE	1-25-55
A. E. C.	NAME TITLE	1-25-55
DRAWN JM HIGGINS	CHECKED WJK	1-21-55
DATE 1-21-55	DWG. NO. 5250-05-4001	REV. 3
SCALE AS SHOWN		

8/26/91

INDEX CODE			
PL. & AR.	CIV.	CL	SER. NO.
56X	7000	A	00001

DO NOT SCALE REDUCED DRAWING

REVISION 0 - APPROVED FOR CONSTRUCTION - 1-25-55

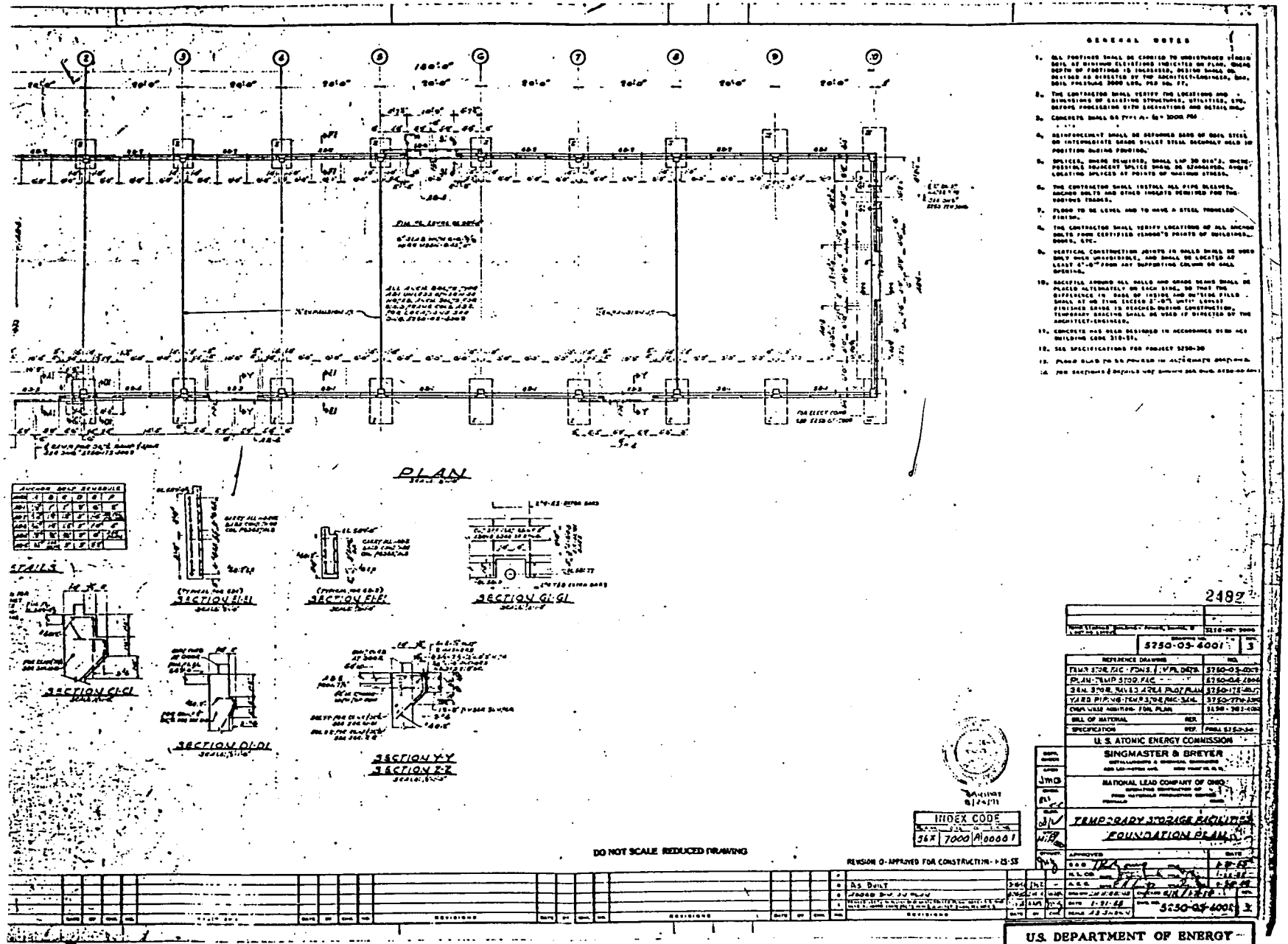
NO.	REVISIONS	DATE	BY	CHK.
4				
3	AS BUILT	3-15-56	SHZ	-
2	ADDED DIM. JJ PLAN	3-24-55	LHK	WJK
1	REVISED SECTS. IN MECH. DWG. SHEET. REVISED PLAN. BAYS 1-5 & DIM. HERE IN. ADDED CONN. SECTS. HERE & IN MECH. DWGS. ELEC. NOTE 3	1-25-55	AAM	

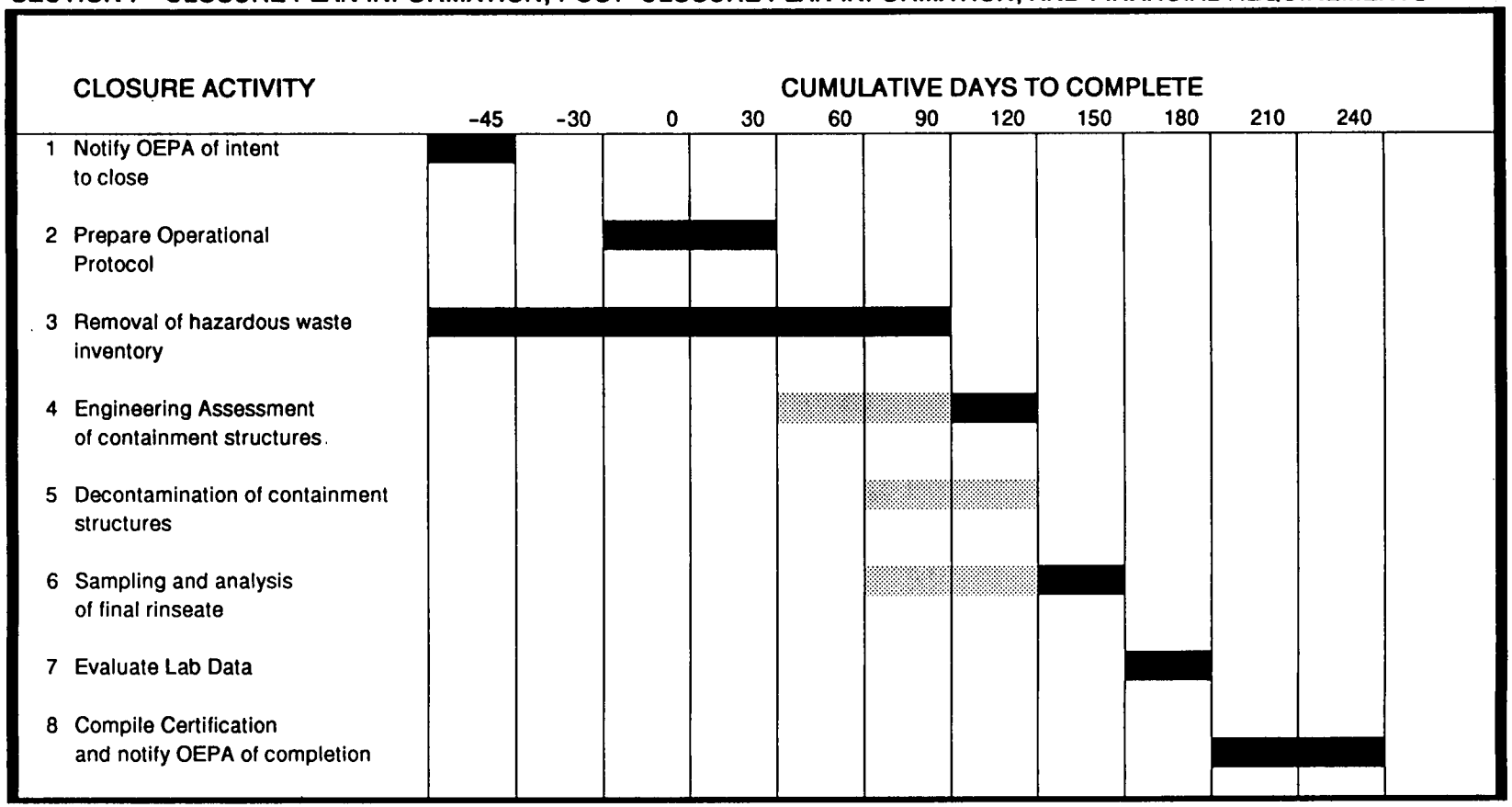
U.S. DEPARTMENT OF ENERGY

FIGURE I-8

FERNALD, OHIO

78


GENERAL NOTES
PLAN
SECTION E-E
SECTION F-F
SECTION G-G
SECTION C-C
SECTION D-D
SECTION Y-Y
SECTION Z-Z
INDEX CODE
DO NOT SCALE REDUCED DRAWING
REVISION 0-APPROVED FOR CONSTRUCTION-1-13-55
2482
5750-03-4001
U. S. ATOMIC ENERGY COMMISSION
SINGMASTER & BREYER
NATIONAL LEAD COMPANY OF OHIO
TEMPORARY STORAGE FACILITIES
FOUNDATION PLAN
U.S. DEPARTMENT OF ENERGY
FIGURE I-8
FERNALD, OHIO
78

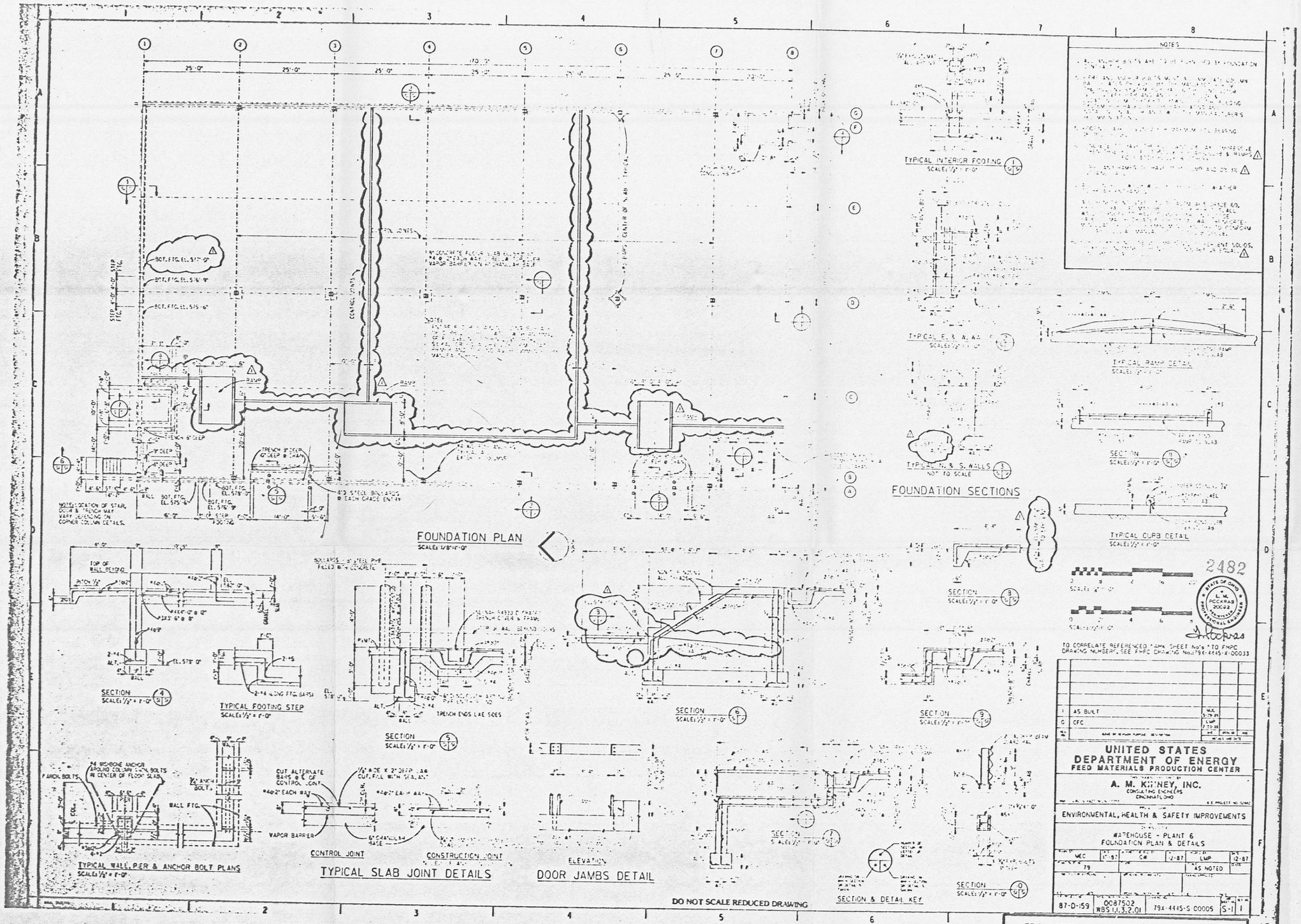


Notes:

Indicates critical activity when an independent, qualified, registered, professional engineer or his representative should be present on site.

FIGURE I-9

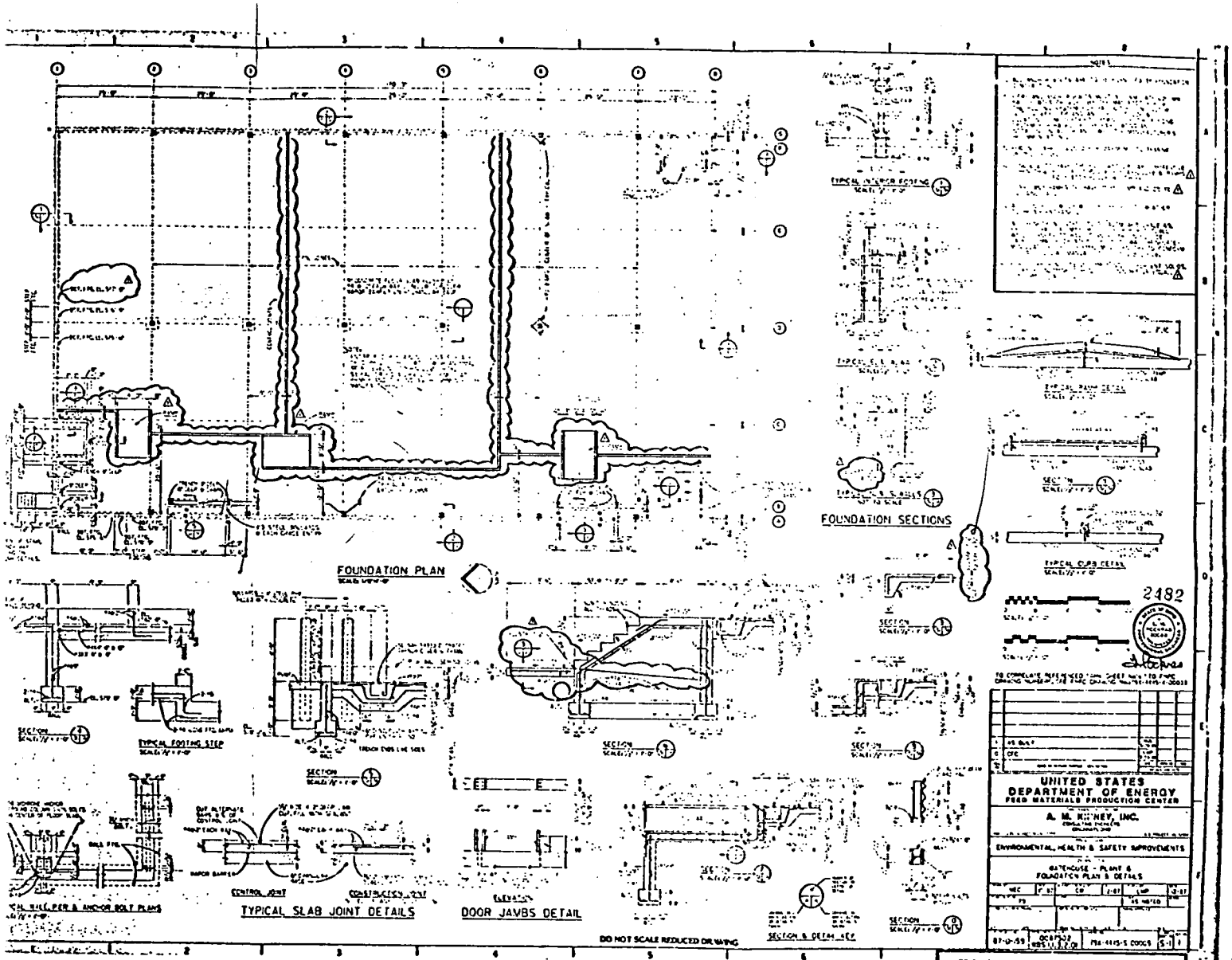
CP STORAGE WAREHOUSE - BUILDING 56 (BUTLER BUILDING) SCHEDULE FOR CLOSURE



U.S. DEPARTMENT OF ENERGY

FIGURE I-10

FERNALD, OHIO



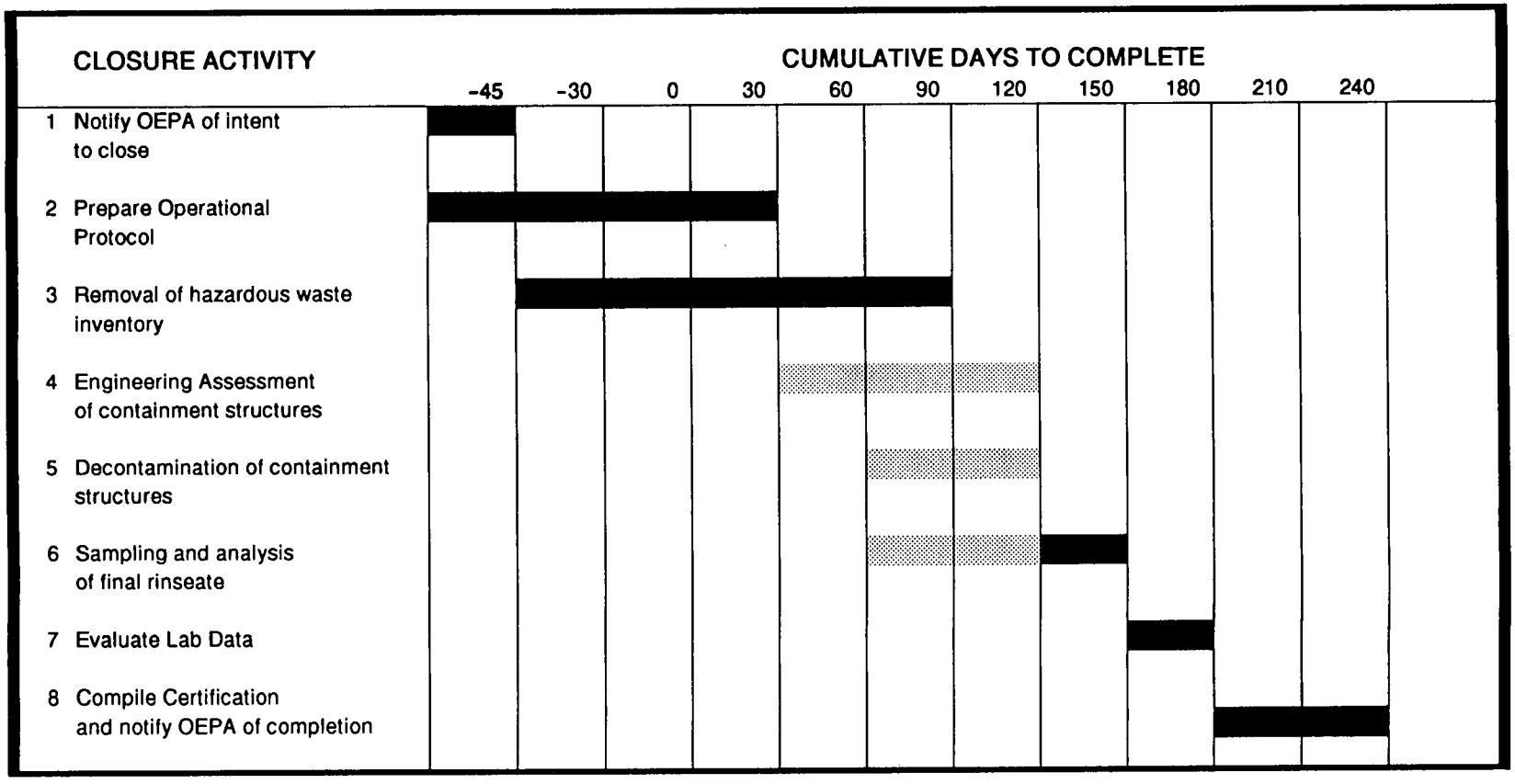
U.S. DEPARTMENT OF ENERGY

FIGURE I-10

FERNALD, OHIO

80

2482



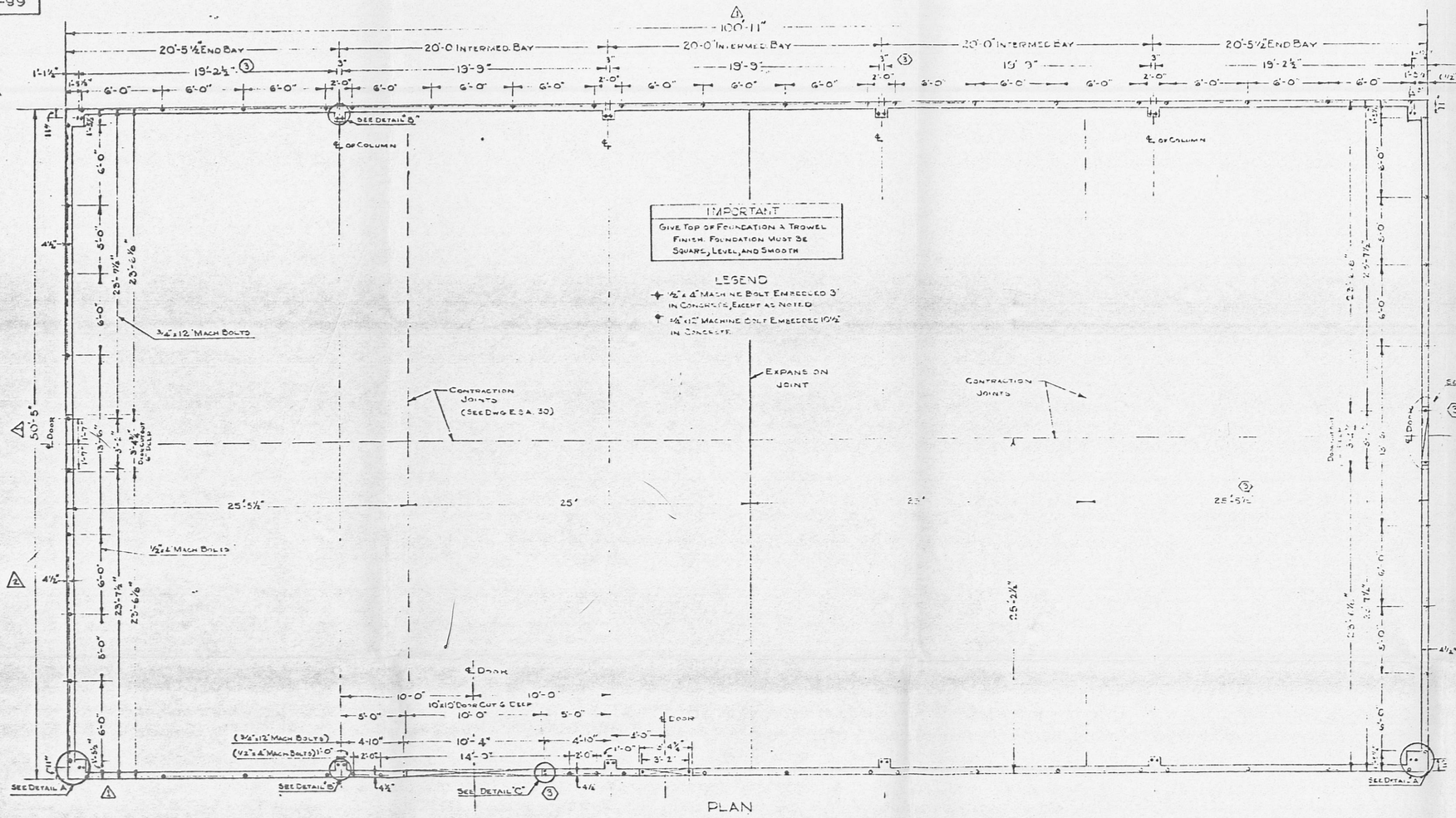
Notes:

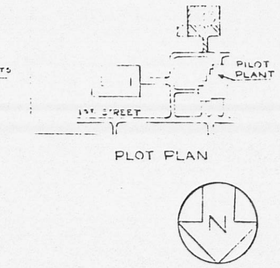
Indicates critical activity when an independent, qualified, registered, professional engineer or his representative should be present on site.

FIGURE I-11

PLANT 6 WAREHOUSE SCHEDULE FOR CLOSURE

68-4002



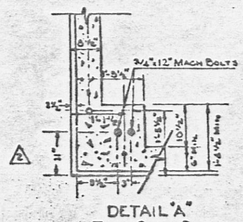


PLOT PLAN

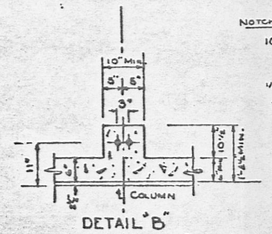
GENERAL NOTES

1. All Excavation for Footings shall be Carried to the Elevations Indicated on the Plan, if at these Elevations Undisturbed Soil does not Exist, Additional Excavation shall be Approved & Designated only by the Contractor's Engineer.
2. The Sub-Contractor shall Verify the Locations and Dimensions of Existing Structures, Utilities, etc. before Proceeding with Excavation & Detailing.
3. Concrete to be 3000 PSI @ 28 Day Type C for Floor Slab, Foundation Walls & Footings.
4. Reinforcement shall be Deformed Bars of Rail Steel or Intermediate Grade Billet Steel Securely Held in Position during Pouring.
5. Splices where Required, shall Lap 40 Dia's, where Possible. Adjacent Splices shall be Staggered. Avoid Locating Splices at Points of Maximum Stress.
6. The Sub-Contractor shall Install all Pipe Sleeves, Anchor Bolts and other Inserts Required for the Various Trades.
7. Floor to be Level and to have a Steel Troweled Finish.
8. The Sub-Contractor shall Verify Size & Location of All Anchor Bolts from Certified Vendors Prints of Buildings, Doors, etc.
9. Vertical Construction Joints in Walls shall be used only when Unavoidable, and shall be Located at Least 4'-0" from any Supporting Column or Wall Opening.
10. Roadway Concrete to be 4000 PSI @ 28 Day, Type "E".
11. Slab for Bldg. & Roadway to be 8" Concrete, Reinforced with 6" x 6" #6 Wire Mesh.
12. Give Top of Foundation a Trowel Finish. Foundation must be Square, Level, & Smooth.
13. If Earth is Used for Footing Forms, Allow an additional 2" Clearance Each Side.
14. Dummy Contraction Joints to form 25' Squares in Warehouse Floor (See Dwg. E.S.A. 30)

2482

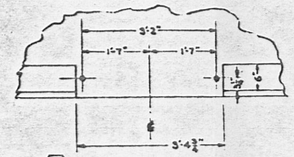


DETAIL "A"
Typical Corner Detail

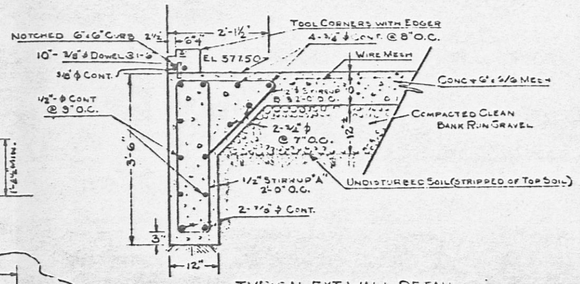


DETAIL "B"

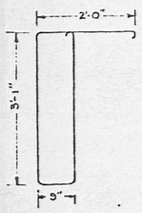
DETAIL "C"
Bolt Layout @ 10'-10' Door



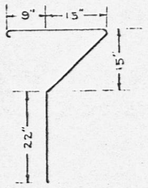
DETAIL "D"
Typical Bolt Layout @ Door



TYPICAL EXT. WALL DETAIL



STIRRUP "A"
½" ϕ @ 2'-0" O.C.



STIRRUP "B"
½" ϕ @ 2'-0" O.C.

INDEX CODE
68X5500 500007

DESIGN APPROVAL

Division	Signature	Date
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	12/11/55

DO NOT SCALE REDUCED DRAWING

REF. DWG. NO.	REF. DWG. TITLE	NO.	REVISIONS	DATE	BY
		3	Added Details C-D - Only As Changed	11/8/55	J.F.P.
		2	Wall Dimensions Changed	11/3/55	J.F.P.
7-407GF-A	Foundation Plan - Butler Mfg. Co.	1	Corner & Overall Dimensions Changed	10/10/55	J.F.P.

[illegible]
8/29/41

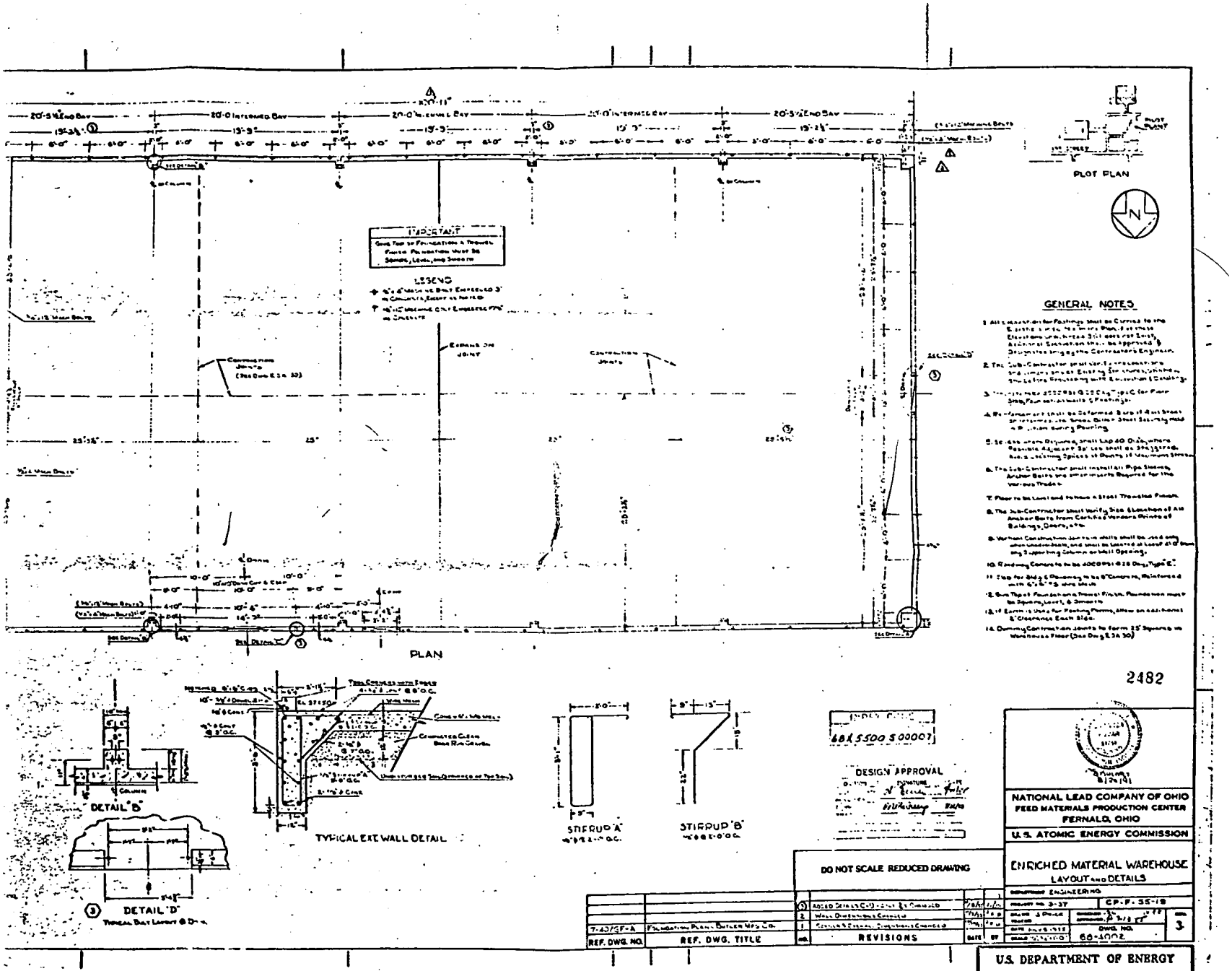
NATIONAL LEAD COMPANY OF OHIO
FEED MATERIALS PRODUCTION CENTER
FERNALD, OHIO

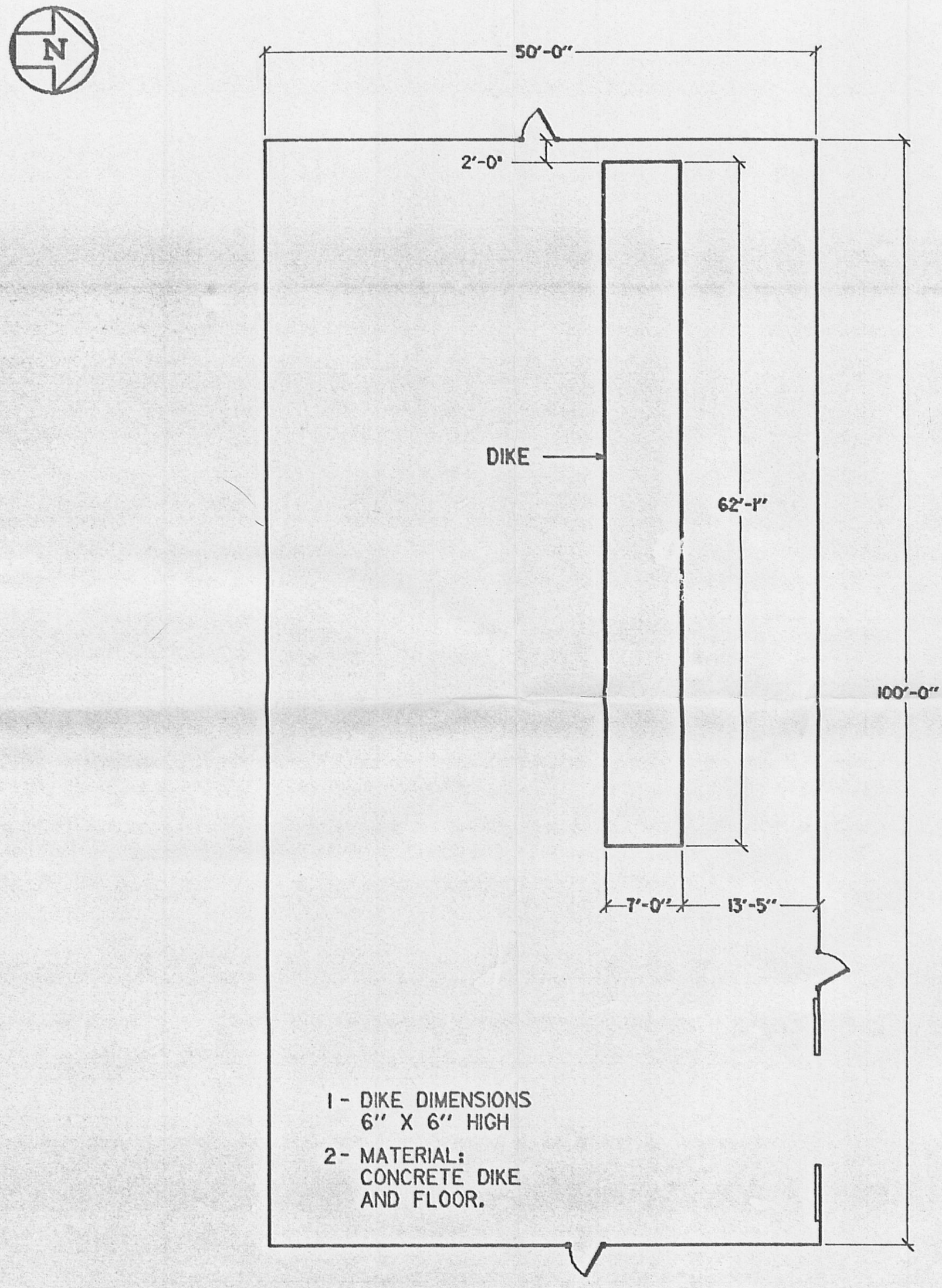
U.S. ATOMIC ENERGY COMMISSION

ENRICHED MATERIAL WAREHOUSE
LAYOUT AND DETAILS

Department Engineering			
Project No. G-37	CP-F-55-18		
Drawn J. Price / Traced	Checked / Approved		Rev. 3
Date July 6, 1955	DWG. NO. 68-4002		
Scale ¼" = 1'-0"			

U.S. DEPARTMENT OF ENERGY
82
I-12A
FERNALD, OHIO


PLAN
PLOT PLAN
GENERAL NOTES
LEGEND
IMPORTANT
DETAIL "B"
DETAIL "D"
TYPICAL EXT. WALL DETAIL
STIRRUP "A"
STIRRUP "B"
DESIGN APPROVAL
DO NOT SCALE REDUCED DRAWING
REVISIONS
REF. DWG. NO.
REF. DWG. TITLE
NATIONAL LEAD COMPANY OF OHIO
FEED MATERIALS PRODUCTION CENTER
FERNALD, OHIO
U.S. ATOMIC ENERGY COMMISSION
ENRICHED MATERIAL WAREHOUSE
LAYOUT AND DETAILS
U.S. DEPARTMENT OF ENERGY
I-12A
FERNALD, OHIO
2482
82



PILOT PLANT WAREHOUSE
(BUILDING 68) RCRA STORAGE AREA

2482

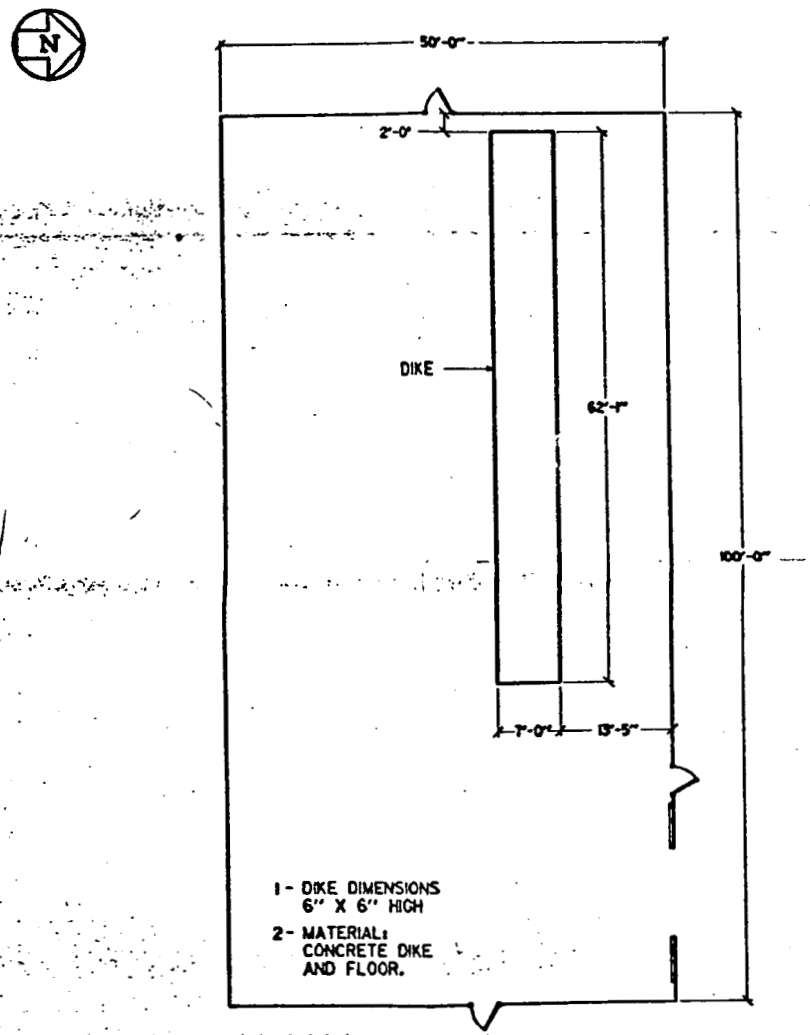
U.S. DEPARTMENT OF ENERGY

83

FIGURE 1-12B

FERNALD, OHIO

RCRA
D.J.HUFF 08-16-91
zfal:[200,4]figd21.dgn



1 - DIKE DIMENSIONS
6" X 6" HIGH

2 - MATERIAL:
CONCRETE DIKE
AND FLOOR.

PILOT PLANT WAREHOUSE
(BUILDING 68) RCRA STORAGE AREA

2482

U.S. DEPARTMENT OF ENERGY

83

FIGURE 1-12B

FERNALD, OHIO

RCRA
D.J.JUFF 08-15-91
z:fcl:[200.4]:figd21.dgn

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SHANDON QUADRANGLE
OHIO
7.5 MINUTE SERIES (TOPOGRAPHIC)

Mapped, edited, and published by the Geological Survey
in cooperation with the Defense Mapping Agency
Revised in cooperation with State of Ohio agencies

Control by USGS, NOS/NOAA, and City of Cincinnati

Topography by photogrammetric methods from aerial photographs taken 1954. Field checked 1955. Revised 1965

Polyconic projection. 10,000-foot grid ticks based on Ohio coordinate system, south zone. 1000-meter Universal Transverse Mercator grid ticks, zone 16, shown in blue. 1927 North American Datum. To place on the predicted North American Datum 1983 move the projection lines 3 meters south and 5 meters west as shown by dashed corner ticks

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

Area west of the Great Miami River lies within the Miami River Survey Area east of the Great Miami River lies within the Between the Miamis Land lines based on the Great Miami River Base. Dotted land lines established by private subdivision of the Symmes Purchase

There may be private inholdings within the boundaries of the National or State reservations shown on this map

UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
(MN, GN; 2½° / 44 MILS; 1°28′ / 26 MILS)

SCALE 1:24 000

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

Revisions shown in purple and woodland compiled in cooperation with State of Ohio agencies from aerial photographs taken 1979 and other sources. This information not field checked. Map edited 1981

ROAD CLASSIFICATION

Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
U. S. Route — State Route

SHANDON, OHIO

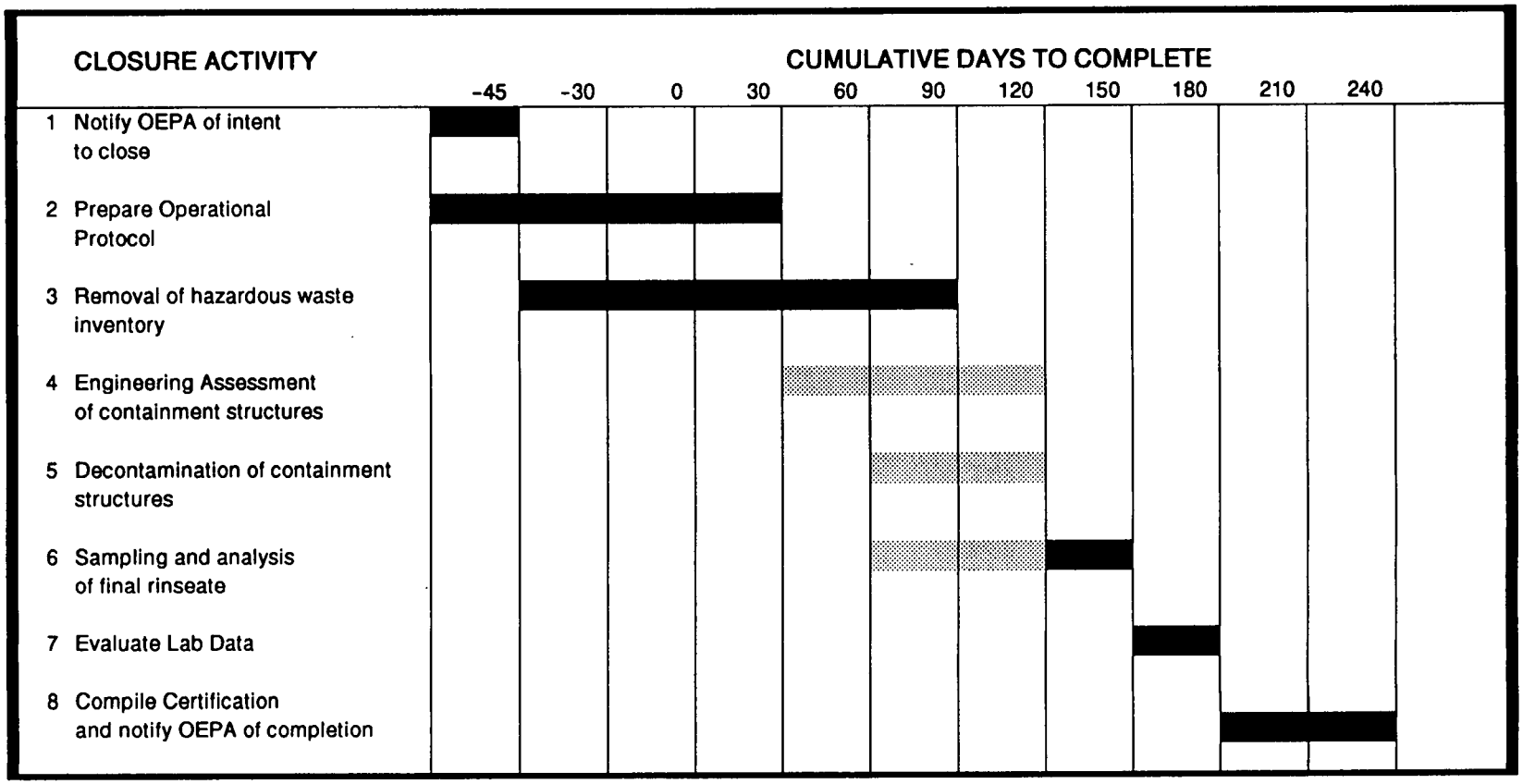
N3915—W8437.5/7.5

1965
PHOTOREVISED 1981
DMA 4062 I SW—SERIES V852

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1982

2494

84

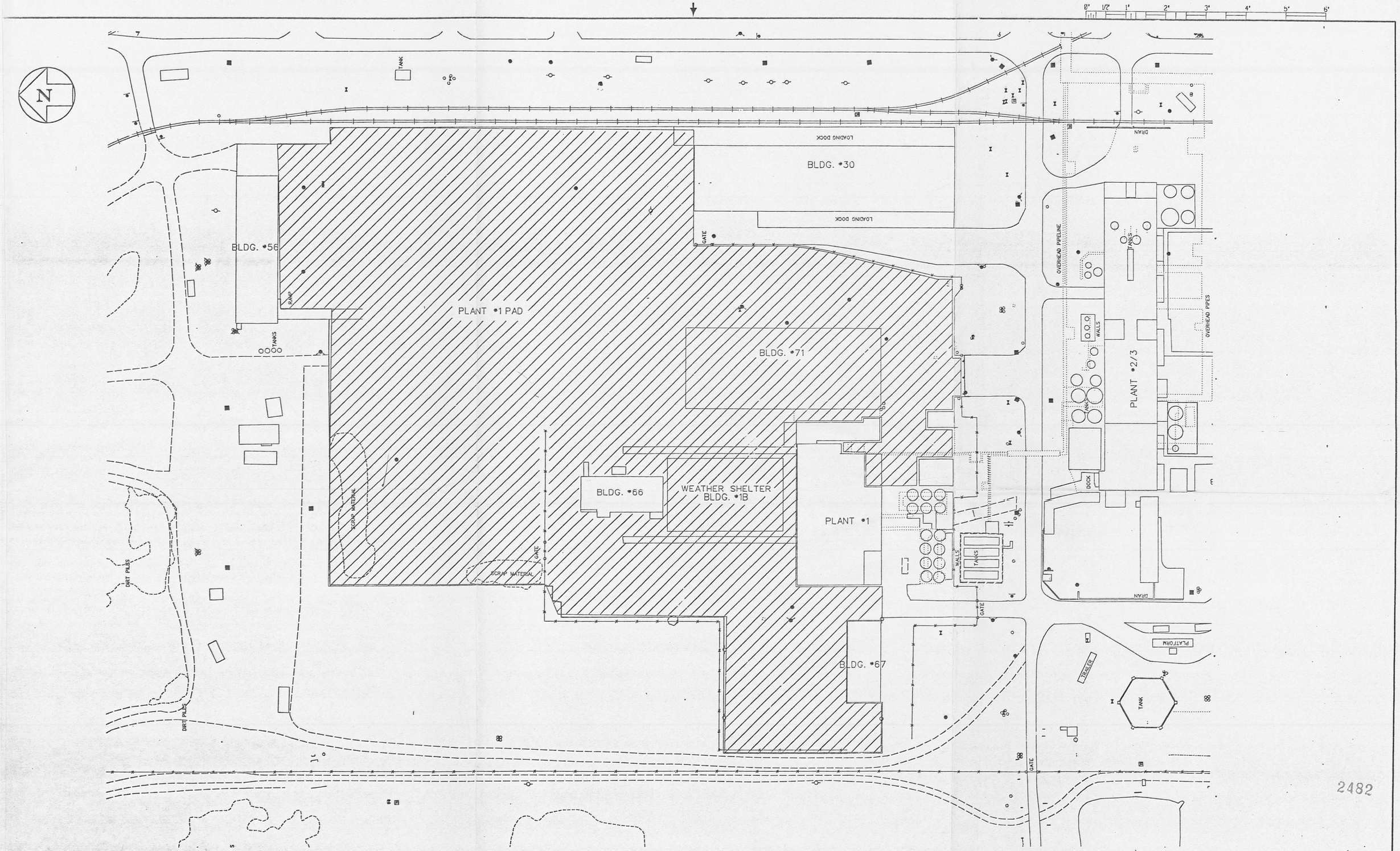


Notes:

Indicates critical activity when an independent, qualified, registered, professional engineer or his representative should be present on site.

FIGURE I-13

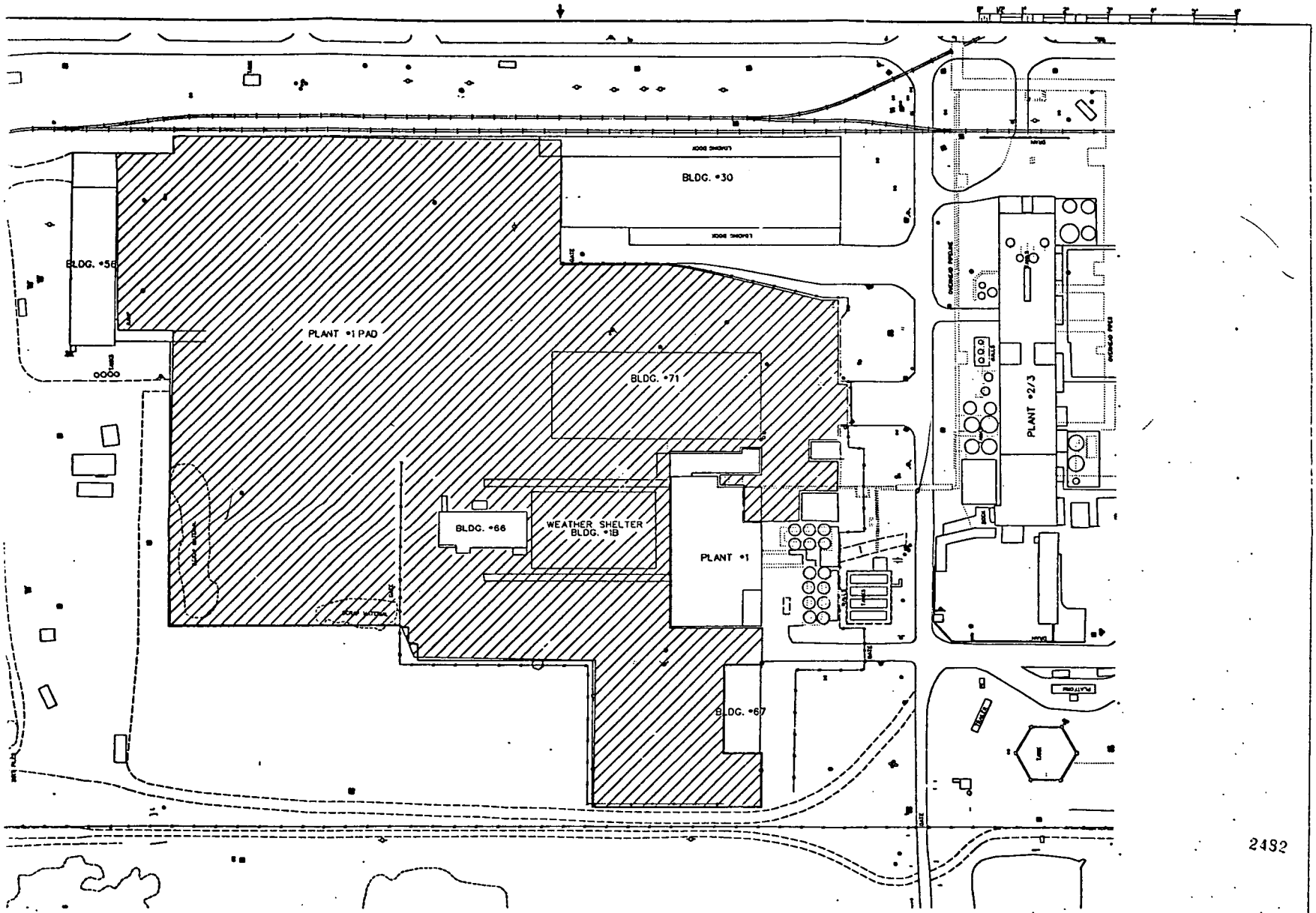
PILOT PLANT WAREHOUSE SCHEDULE FOR CLOSURE



2482

U.S. DEPARTMENT OF ENERGY	PLAN VIEW OF PLANT 1 PAD
FIGURE I-14	
FERNALD, OHIO	85

FILE NAME: /usr/williams/08940012.dgn



U.S. DEPARTMENT OF ENERGY

FIGURE 1-14

FERNALD, OHIO

PLAN VIEW OF PLANT 1 PAD

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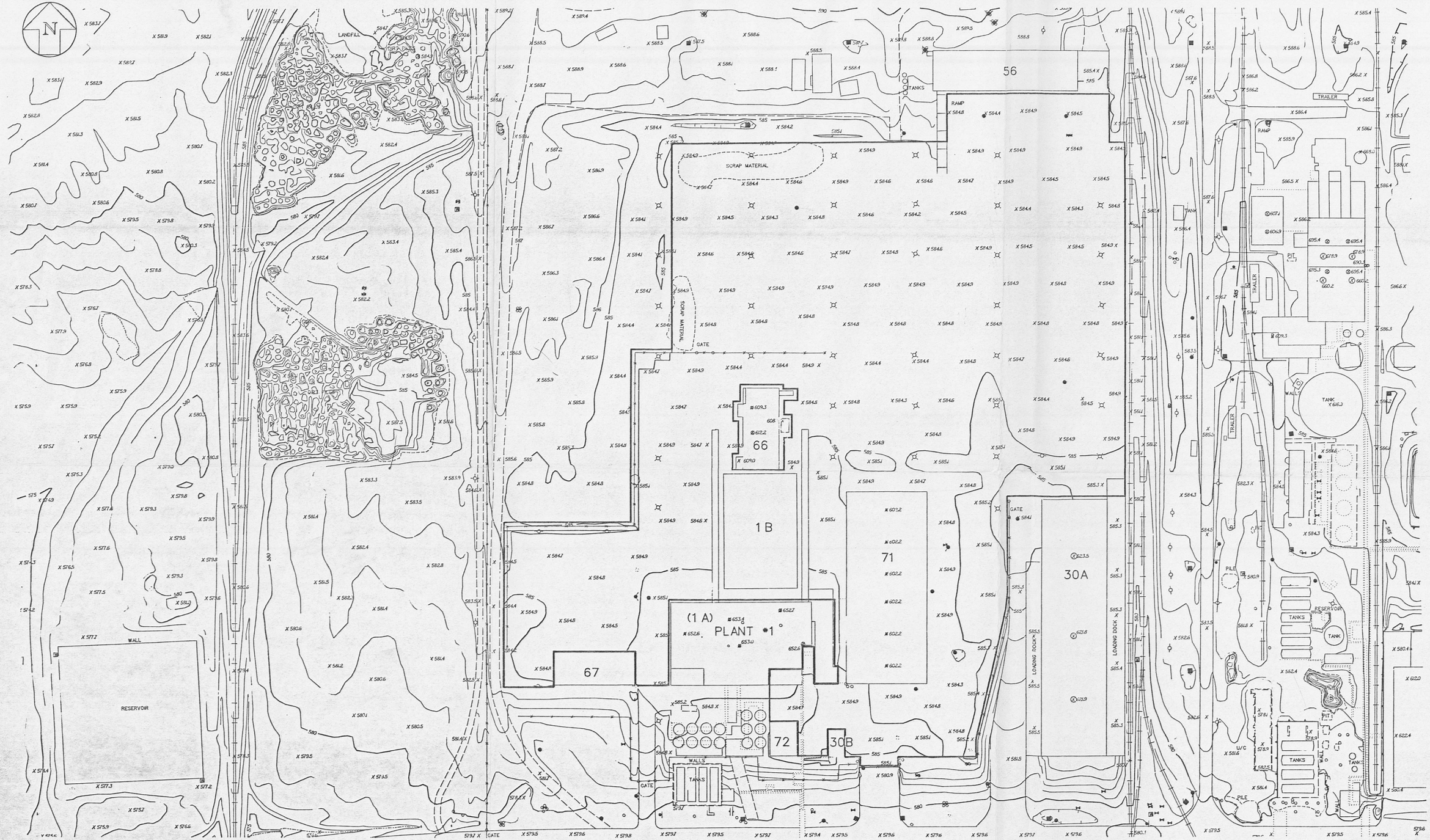

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U.S. DEPARTMENT OF ENERGY	PLANT 1 PAD AREA
FIGURE I-15	TOPOGRAPHIC CONTOUR MAP OF THE PLANT 1 PAD AREA
FERNALD, OHIO	

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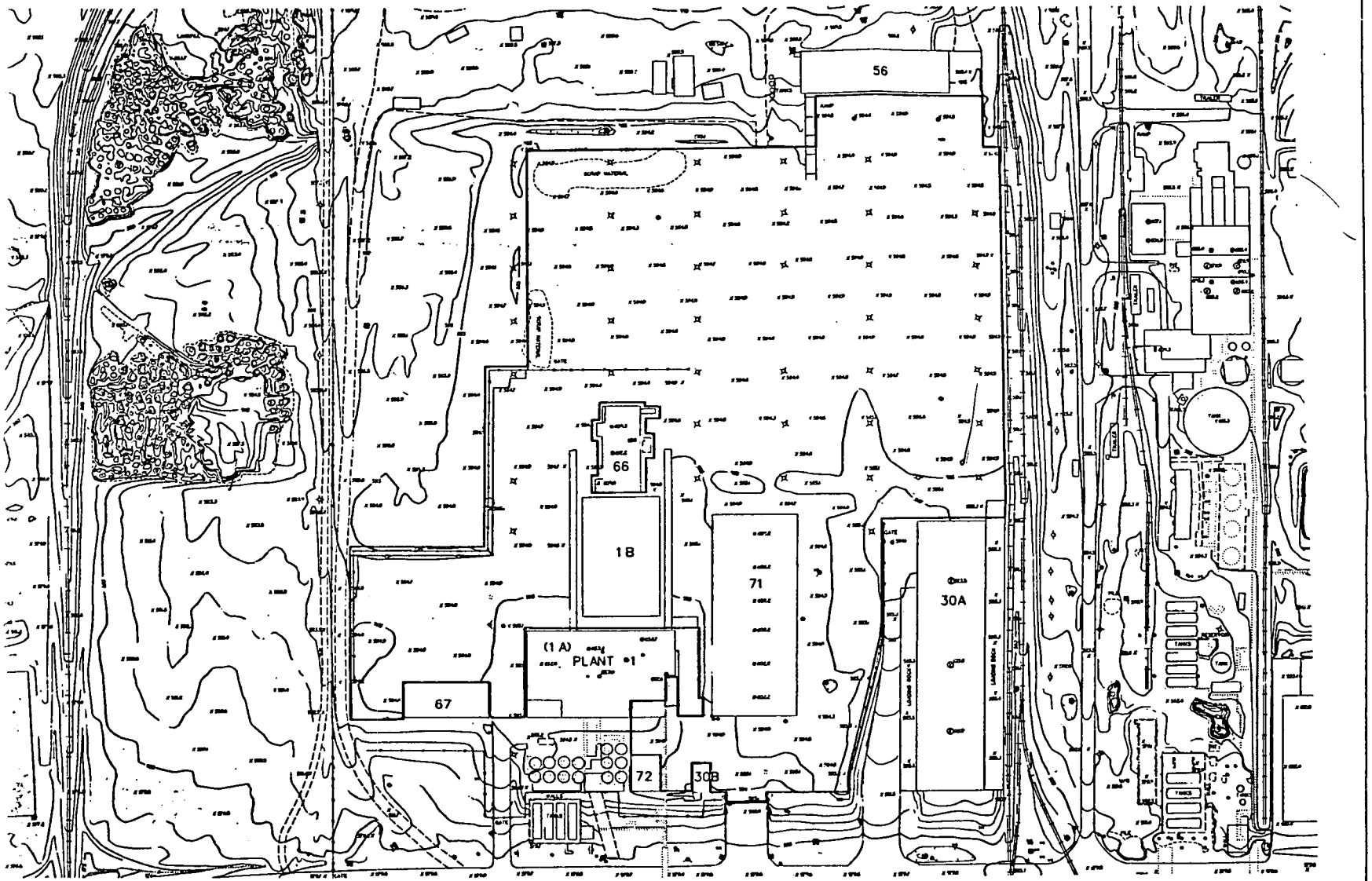

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FIGURE 1-15

FERNALD, OHIO

PLANT 1 · PAD AREA

TOPOGRAPHIC CONTOUR MAP OF THE PLANT 1 PAD AREA

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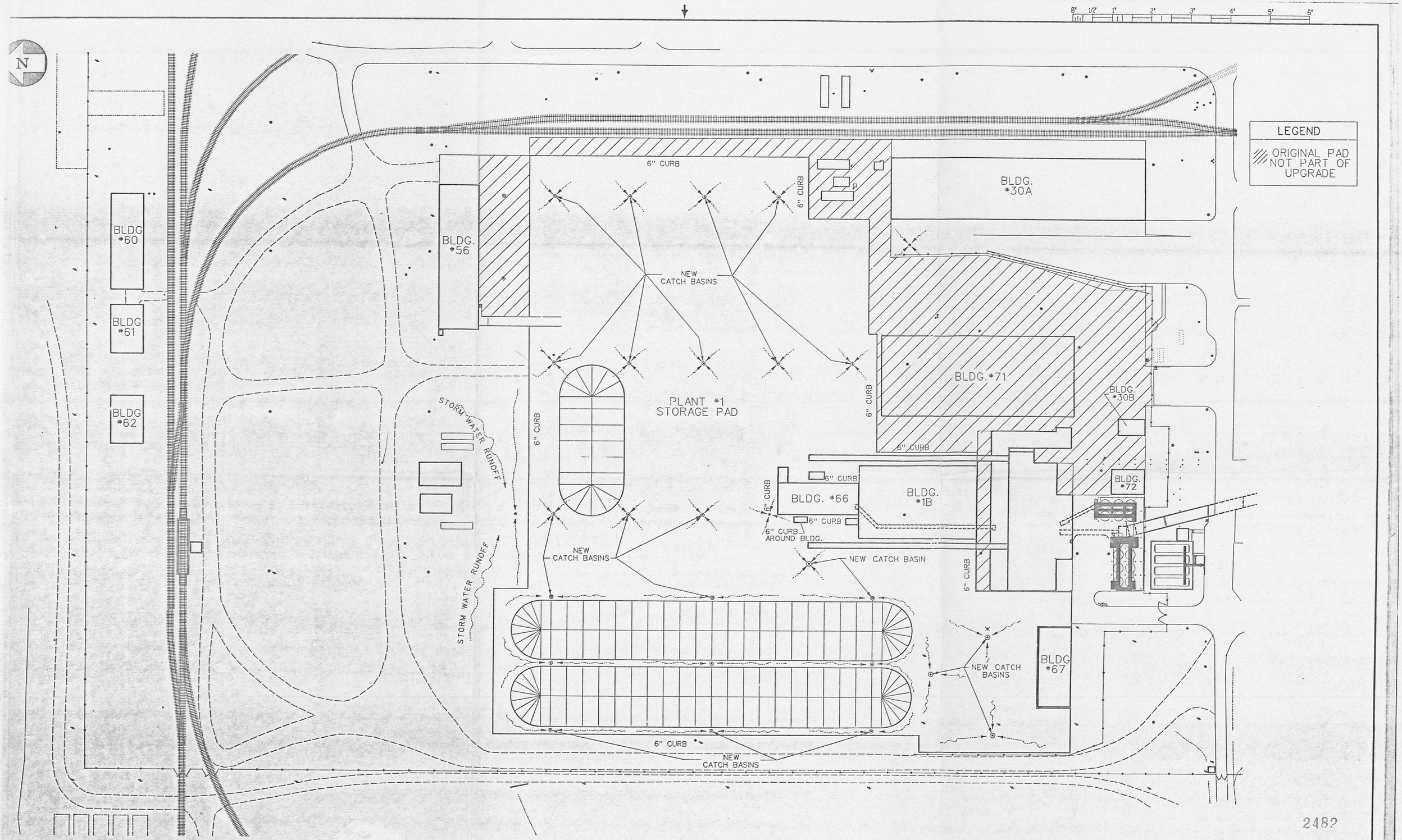

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FIGURE I-16

FERNALD, OHIO

PLANT #1 STORAGE AREA

PLANT 1 STORAGE PAD LAYOUT AFTER UPGRADE

SCALE - 1" = 50'-0"

FILE NAME: /usr/williams/08940010.dgn

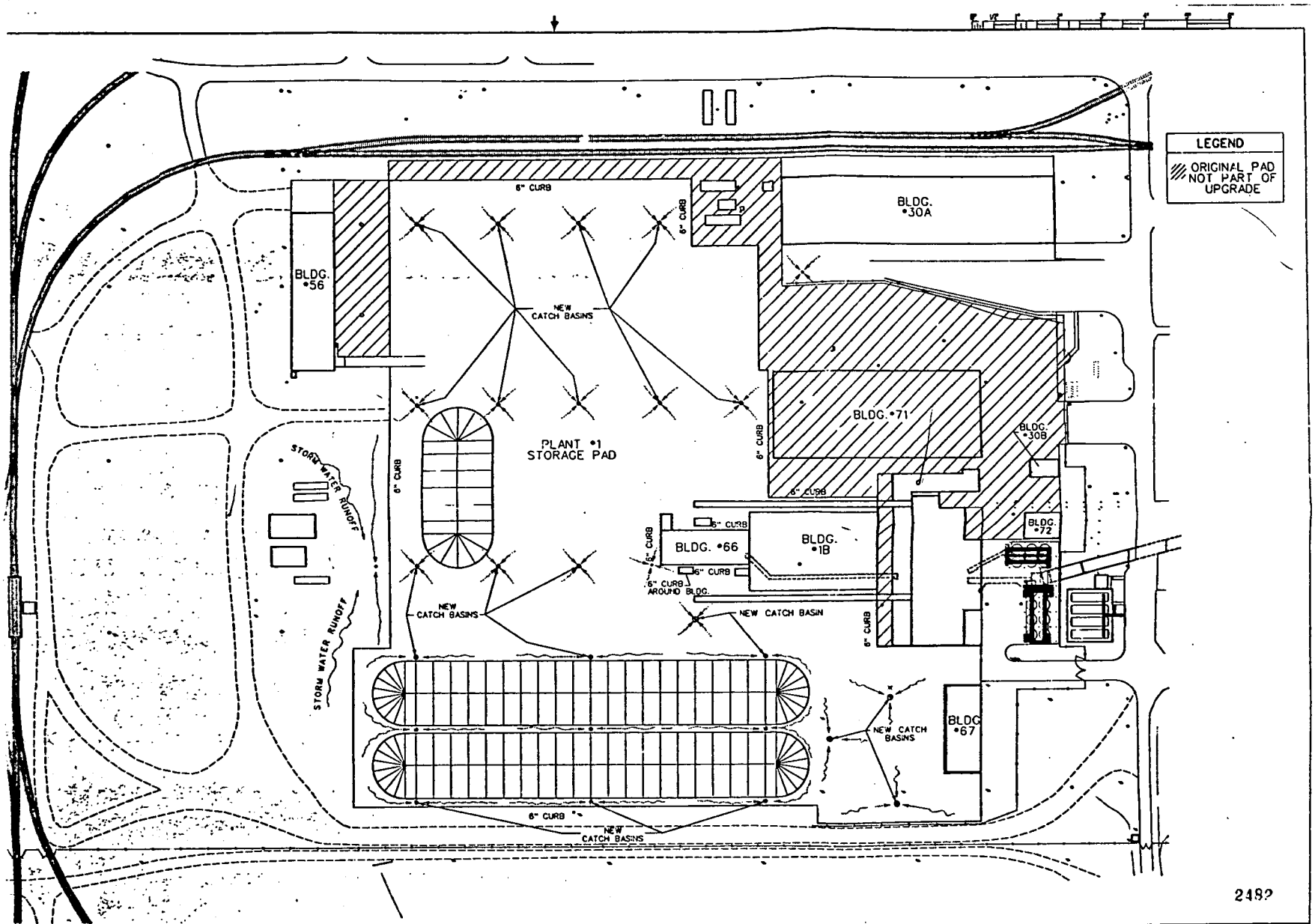

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FIGURE 1-16

FERNALD, OHIO

PLANT •1 STORAGE AREA

PLANT 1 STORAGE PAD LAYOUT AFTER UPGRADE

SCALE - 1" = 50'-0"

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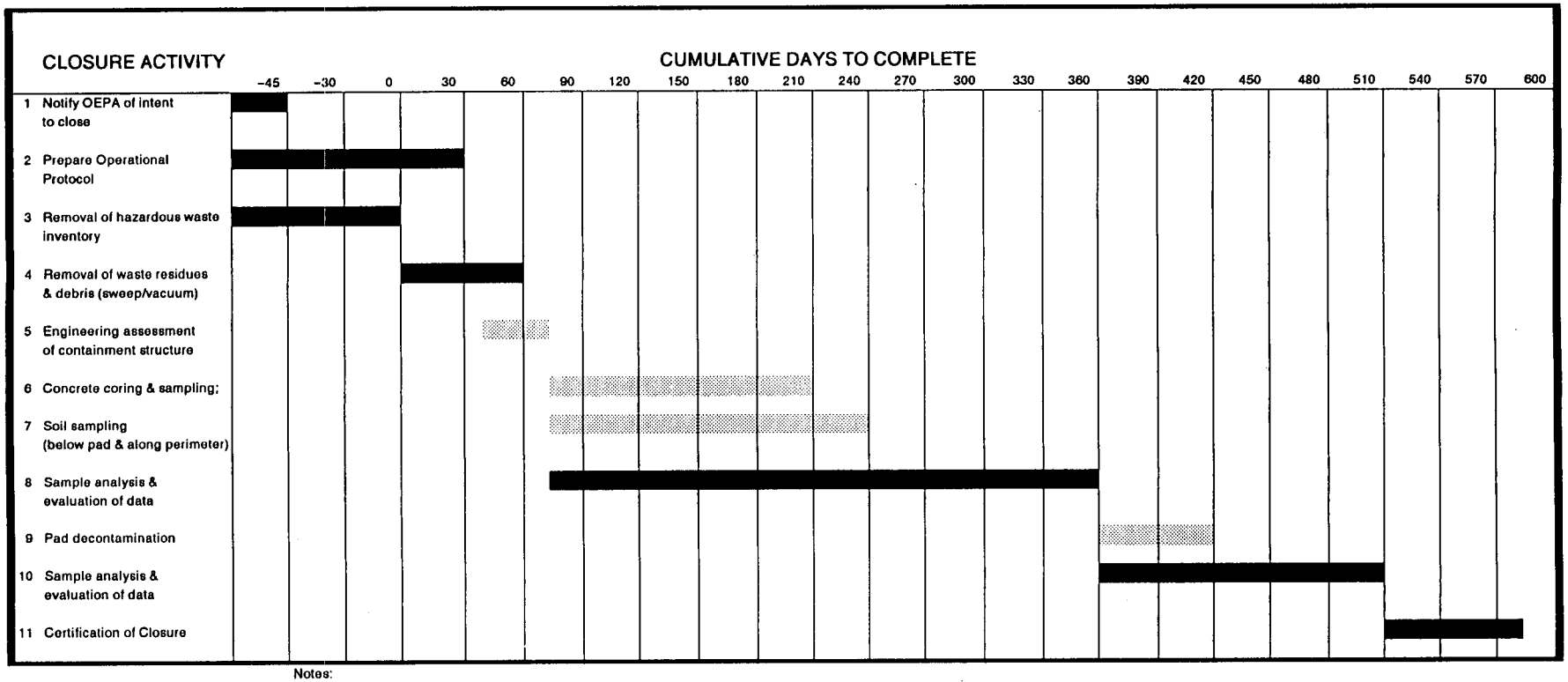
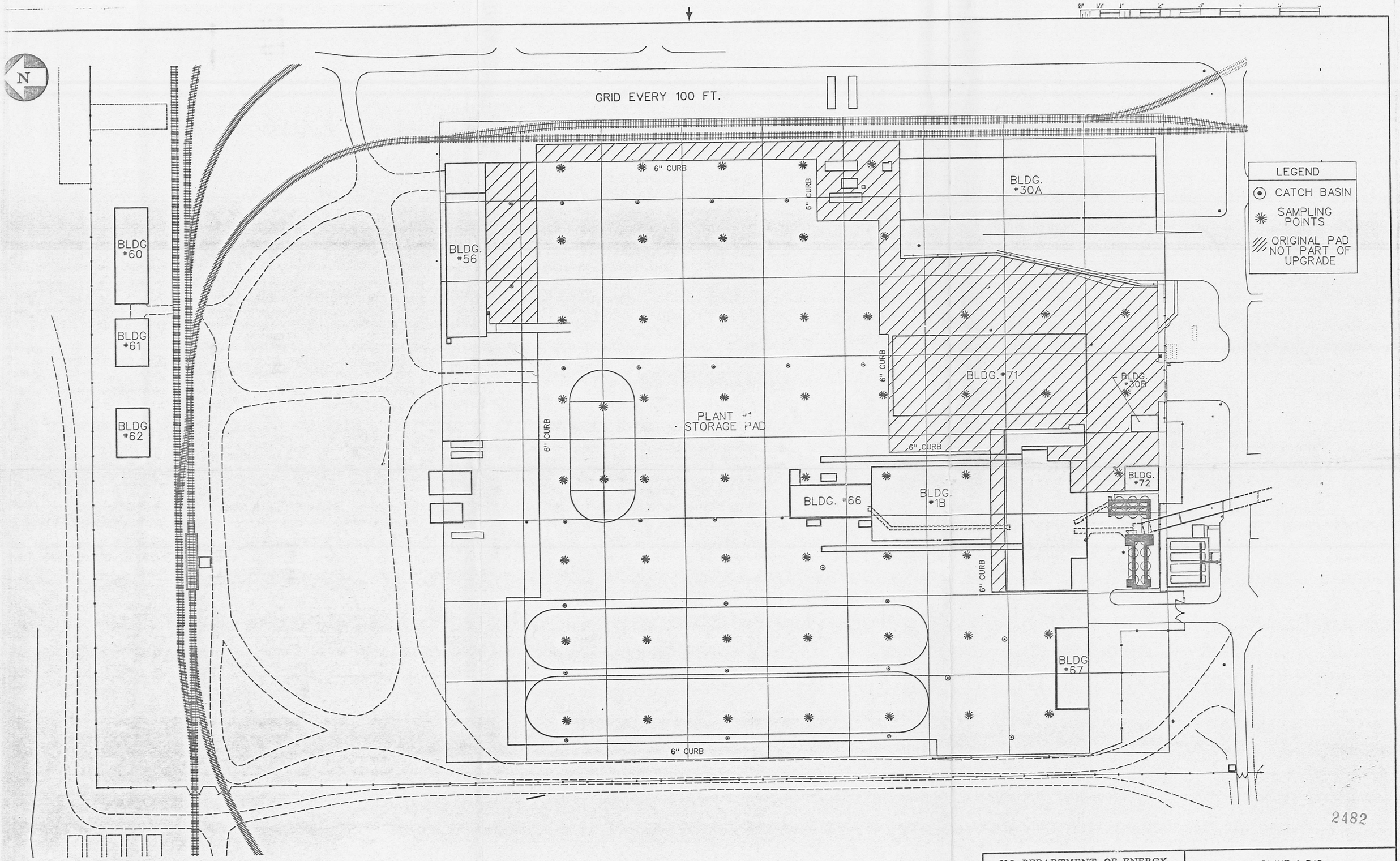


Notes:

Indicates critical activity when an independent, qualified, registered, professional engineer or his representative should be present on site.

FIGURE I-17

PLANT 1 PAD SCHEDULE FOR CLOSURE



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U.S. DEPARTMENT OF ENERGY

FIGURE 1-18

FERNALD, OHIO

PLANT 1 PAD
SAMPLING LOCATIONS
100' GRID
SCALE - 1" = 50'-0"

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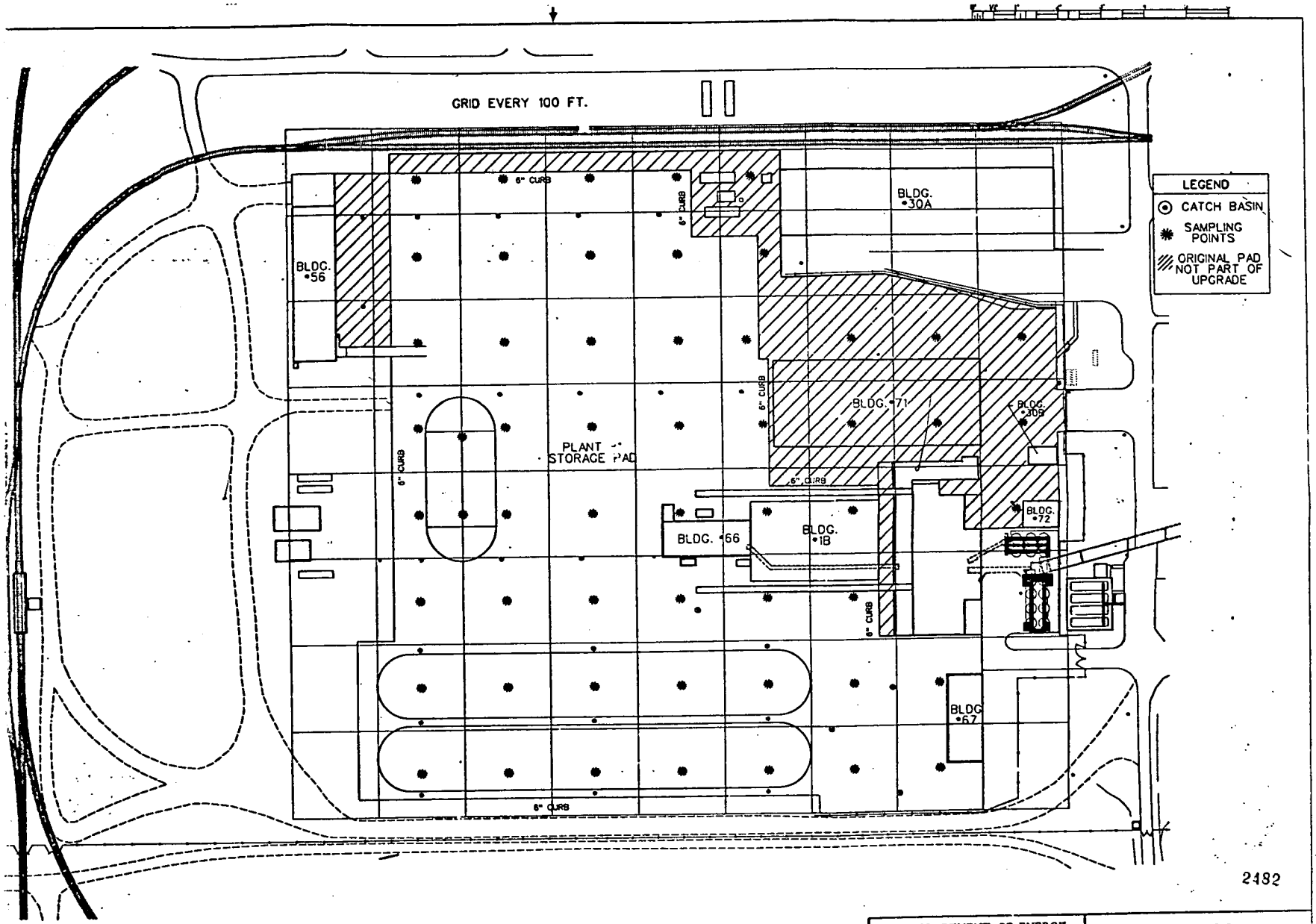

U.S. DEPARTMENT OF ENERGY

FIGURE 1-18

FERNALD, OHIO

PLANT 1 PAD
SAMPLING LOCATIONS
100' GRID
SCALE - 1" = 50'-0"

FILE NAME: /usr/williams/08940009.dgn

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ATTACHMENT I-1

ATTACHMENT I-1
SAMPLING AND ANALYSIS PLAN
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1.0 INTRODUCTION

Hazardous waste rules and regulations, under OAC 3745-55-12(B)(4) and 40 CFR 264.112(b)(4), require that closure plan information establish closure performance standards. The performance standards must define clean up goals and decontamination or removal requirements for completion of partial and final closure of Hazardous Waste Management Units (HWMUs). The closure plan information must also provide detailed descriptions of how the established performance standards will be met.

The sample types, sample locations, and number of samples to be collected during HWMU closures are identified in Section I-1(e)(4) of the RCRA Part B Permit Application. This Sampling and Analysis Plan (SAP) describes the sample collection procedures, identifies analytical methods, and specifies the quality assurance/quality control procedures required to obtain valid analytical results. All closure sampling and analyses will follow the procedures discussed in this Sampling and Analysis Plan. The analytical results from closure sampling will be used to evaluate closure performance, as discussed in Section I-1(e)(2) of the RCRA Part B Permit Application.

1.1 Sampling Objectives and Types of Samples

Sampling in support of RCRA closure actions will be performed to:

1) Confirm decontamination and/or removal of contaminated materials.

2) Identify environmental contamination resulting from hazardous waste management practices associated with the HWMU being closed.

3) Characterize waste materials generated during RCRA closures.

Waste characterizations and determinations referenced in this Sampling and Plan will be conducted in accordance with the Fernald Environmental Management Project (FEMP) Waste Analysis Plan and Waste Determination Plan approved by the Ohio EPA.

All wastes and materials being held for RCRA determinations will be managed in a manner consistent with hazardous waste management practices. Wastes determined to be hazardous waste will be managed and disposed in accordance with applicable hazardous waste rules and regulations.

The RCRA Part B Permit Application Section I-1(e)(4) specifies the sampling required to identify contamination and/or confirm decontamination or removal of contaminated surfaces and materials. All closure sampling activities will be conducted according to this SAP.

1.2 Sample Analyses

When closure of a HWMU is initiated, a hazardous waste inventory and record review will be conducted to identify and confirm hazardous wastes that have been managed in the unit. To evaluate HWMU closure performance, samples collected during RCRA closures will be analyzed for selected target analytes. With the exception of the Plant 1 Pad which will use the hazardous constituent list from 40 CFR 264 Appendix IX, the selected target analytes for each HWMU will be the RCRA 40 CFR 261 Appendix VII hazardous waste constituents (and their degradation products) associated with the hazardous wastes that were managed in the HWMU. The analyses will be conducted based on the SW-846 analytical methods, as applicable, for analyses of target analytes identified during the hazardous waste inventory review. Radiological analyses to evaluate and/or determine radioactive

characteristics will follow the methods listed in Table I-1.

2.0 SAMPLE COLLECTION PROCEDURES

The following sections discuss the procedures that will be used for sampling in support of RCRA closures as specified in Section I-1(e)(4) of the RCRA Part B Permit Application.

Prior to sampling, the laboratory(ies) identified to conduct the analyses will be contacted to confirm their availability to provide analyses within the holding times required by the analytical method(s) for analytical parameters specified.

2.1 Sampling Equipment

The following equipment may be used for collection of closure samples at the FEMP:

- Bucket or hand auger (stainless steel)
- Jackhammer, concrete saw, or concrete coring device
- Chisel
- Hand driven core sampler (stainless steel)
- Soil core sample cylinders (6 or 12 inch stainless steel)
- Bowls or pans (stainless steel)
- Scoops or trowels (stainless steel or other suitable material)
- Coliwasa samplers (glass)
- Weighted bottle samplers (glass)
- Glass tubes
- Plastic ground cloths
- Pipettes and aspirators
- Spatulas (stainless steel, glass)
- Sample bottles for liquid and solid samples
- Thermal coolers and freezer packs

- Portable pumps
- Tygon tubing
- Sample labels
- Waterproof marking pen
- Field sampling log book and field data forms
- Chemical resistant gloves
- Polyethylene or Teflon sheeting

This list is not comprehensive and may be modified as judged appropriate by a trained, qualified sampling supervisor or manager.

2.2 Soil and Concrete Sampling

Soil samples will be taken to evaluate potential hazardous waste releases whenever:

- The secondary containment floor, berms, or dikes for storage areas are suspected or found to have been breached, or
- there are records, reports, or indications of hazardous waste spills outside of the containment area.

Before initiating any soil sampling or any related concrete coring operations, site blueprints will be reviewed with the facility engineer to determine if there are any known underground utilities, pipes, wires or other similar structures. Areas where sampling is restricted because of underground structures will be identified and marked at the unit.

2.2.1 Soil Sampling Procedures

Where required, soil borings will be made for collection of samples in accordance with the following procedures:

1) Clean polyethylene or Teflon sheeting will be placed on

the ground to protect sampling equipment from potential contamination.

2) A clean stainless steel bucket auger or soil core sampler will be used to advance the soil boring to extract a six inch soil sample.

3) As necessary, a spatula (stainless steel or other suitable material), will be used to remove the soils from the auger and place them into a stainless steel bowl. If a soil core sampler is used, remove the soil core cylinder. A clean plastic, Teflon or other suitable cover will be placed over the bowl (or unused soil core sample cylinders) to minimize potential contamination while extracting soils.

4) The spatula will be used to transfer a grab sample from the bowl into the appropriate sample containers (or, if using a soil core sampler, cap the sample cylinder). See Table I-2 to identify the appropriate type of sample containers, preservation methods, and holding times applicable for the sample analyses required.

5) The container management procedures in Section 2.4 will be followed after the sample has been collected.

6) Sampling equipment will be decontaminated (see Section 2.5) or clean sampling equipment (e.g., bowl, augers, and soil core sampler) will be selected prior to advancing the hole for additional sampling.

7) Steps 3, 4, and 5, respectively, will be repeated to collect a second sample from a soil sample depth of six

to eighteen inches.

8) Steps 6 and 3, 4, and 5, respectively, will be repeated for collection of a third sample from a soil sample depth of 18 inches to thirty 30 inches.

9) A minimum of one duplicate sample will be collected for every 20 samples collected. If less than 20 samples are taken, at least one duplicate will be collected for each sampling event.

10) Upon completion of sampling at a location, all sampling equipment that was used will be decontaminated. Equipment that cannot be decontaminated will be managed in a manner consistent with FEMP hazardous waste management practices pending RCRA determination.

NOTE: Characterization and disposal of waste will be conducted in accordance with the FEMP Waste Analysis Plan and Waste Determination Plan.

11) Sample coolers will be sealed and transferred to the designated FEMP sample receiving/shipping area.

2.2.2 Concrete Coring and Sampling Procedures

Where concrete chip sampling is used to evaluate potential contamination of the secondary containment surface, samples will be collected using a hammer and chisel. Approximately one cup of concrete will be collected for each sample. A stainless steel spatula will be used to place samples into the appropriate containers. The samples will be managed in accordance with approved sample handling procedures. The

sample will be analyzed for the target analytes identified for the HWMU being closed [see Section I-1e(4) of the RCRA Part B Permit Application].

When required to sample both the containment structures and the soils below the reinforced concrete pads or floors, the FEMP proposes to use a jack hammer, concrete coring machine, concrete saw, drill rig or other approved method to core through the concrete as discussed in the following procedures:

1) A hole will be cut through the concrete, cutting through reinforcement bars and obstructions in the concrete.

2) The concrete will be cored until the sub-base gravel is reached (the gravel below the concrete but above the underlying soil).

3) Once the sub-base is reached, all concrete chips will be removed from the hole. Where possible, scoops or trowels (stainless steel or other suitable material) will be used to remove all material from the hole.

4) A grab sample of the concrete chips will be collected from each bore hole into a stainless steel bowl for distribution into individual sample containers.

5) A spatula will be used to transfer samples from the bowl into the appropriate sample containers. See Table I-2 to identify the appropriate sample containers, preservation methods, and holding times applicable for the sample analyses required.

6) The container management procedures in Section 2.4 will

be followed after the sample has been collected.

7) A minimum of one duplicate sample of the concrete chips will be collected for every 20 samples. If less than 20 samples are taken, at least one duplicate sample will be collected for each sampling event.

8) The remaining concrete chips and other materials produced as a result of the coring operation will be collected for characterization and disposal following the FEMP Waste Analysis Plan and Waste Determination Plan.

9) Loose concrete and sub-base materials will be completely removed from the hole through the concrete to expose the underlying soils.

10) A soil sample will be collected following soil sampling procedures in steps 1 through 4 from Section 2.2.1.

11) The container management procedures in Section 2.4 will be followed after the sample has been collected.

12) A minimum of one duplicate sample will be collected for every 20 samples collected. If less than 20 samples taken, at least one duplicate sample will be collected for each sampling event.

13) Upon completion of sampling at a location, all sampling equipment that was used will be decontaminated. Equipment that cannot be decontaminated will be managed in a manner consistent with FEMP hazardous waste management practices pending RCRA determination.

14) Sample coolers will be sealed and transferred to the designated FEMP sample receiving/shipping area.

2.3 HWMU Decontamination Rinseate Sampling Procedures

Sampling of decontamination rinseates is used to confirm decontamination of the secondary containment surfaces and ancillary structures and equipment in a HWMU. Decontamination rinseate evaluations require collection and sampling of the final rinse after cleaning by an appropriate method. Section I-1(e)(4) of the RCRA Part B Permit Application discusses decontamination methods applicable to each HWMU.

The final rinse water will be collected in a clean sump or pumped to an appropriate clean container and sampled using the following procedures:

1) A sampler (Coliwasa, bailer, or glass tube) will be slowly lowered into the liquid to the desired depth. Parts of the sampler that are in contact with the liquid will not be handled.

2) The sampler will be slowly withdrawn from the liquid and put into the appropriate sample container. See Table I-2 to identify the appropriate sample containers, preservation methods, and holding times applicable for the sample analyses required.

3) At a minimum, two grab samples will be collected from the final rinse of the area or equipment being decontaminated.

4) The sample container management procedures in Section 2.4 will be followed after the sample is collected.

5) Upon completion of sampling at a location, sampling equipment will be decontaminated using the procedures discussed in Section 2.5. Equipment that cannot be decontaminated will be managed in a manner consistent with FEMP hazardous waste management practices pending RCRA determination.

NOTE: Characterization and disposal of waste will be conducted following the FEMP Waste Analysis Plan and Waste Determination Plan.

6) Sample coolers will be sealed and transferred to the designated FEMP sample receiving/shipping area.

2.4 Sample Container Management

Once a sample has been placed inside a sample container it should be managed as follows:

1) Each sample will be preserved as required (see Table I-2), closed, and labelled (see Figure I-1).

2) Sample and container information will be recorded in the field sampling logbook and on a sample Analysis Request/ Custody Record form (see example Figure I-2).

3) Sample containers will be immediately placed into a sample cooler that has been chilled to 4° C.

4) All transfers of sample custody will be recorded on the Analysis Request/Custody Record form (see example Figure I-2).

5) To maintain chain-of-custody, access to all samples will be controlled. This requires the sample collector or designated

sample custodian to:

- have constant direct physical control,
- use a locked limited access area under his/her control, or
- affix signed container custody seals on samples or sample coolers.

2.5 Sampling Equipment Decontamination

All sampling equipment used must be clean. Before beginning any decontamination procedures, all personnel will inspect their clothing to insure that clean clothing or clean disposable outer coveralls are used. Clean chemical resistant gloves will be used during the decontamination process, and when handling any clean equipment. Sampling equipment decontamination procedures are discussed in the following sections.

2.5.1 Decontamination Supplies

Decontamination supplies will vary based on the media being sampled and the type of contamination encountered. The following list of supplies may be modified, as necessary, by a trained, qualified supervisor or manager:

- Laboratory grade non-phosphate detergent solutions
- Long-handled scrapers (stainless steel, glass)
- Long-handled, soft bristled brushes
- Portable low-pressure water sprayers
- Potable tap water
- Deionized water
- Polyethylene, Teflon, or other suitable sheeting
- Drums, cans, and heavy duty plastic bags
- Absorbent materials, socks, and pads

- Wash/Rinse tubs, buckets, or other suitable containers

2.5.2 Decontamination Procedures

All reusable sampling equipment will be decontaminated after each use. If decontamination is not practical, the sampling equipment will be managed in a manner consistent with FEMP hazardous waste management practices pending RCRA determination. The following procedures will be used to decontaminate sampling equipment:

1) A decontamination area will be established in a location that is protected from potential contamination. A double thickness of 6-mil polyethylene or other suitable sheeting will be used to line the decontamination area, including containment dikes or berms for control of run on and run off.

2) Appropriate containers for containment, handling, and collection of wastes will be provided. Wastes with free liquids will be collected in a heavy duty plastic bag, 55-gallon drum, or other suitable container. Liquid wastes will be collected in buckets and/or placed into 55-gallon drums or other suitable liquid storage containers.

NOTE: All wastes and materials being held for RCRA determinations will be managed in a manner consistent with hazardous waste management practices. Wastes determined to be hazardous waste will be managed and disposed in accordance with applicable hazardous waste rules and regulations.

3) Visible residues and stains will be removed by scraping, scrubbing, and washing with an aqueous detergent solution.

4) The equipment will be rinsed three times with deionized water.

5) When applicable, the procedures in Section 4.1 will be followed to collect a deionized water QC rinse sample after the final rinse.

6) After the equipment has been properly decontaminated, it will be placed on a clean sheet of plastic, Teflon or other suitable material to air dry. While air drying, the equipment will be loosely covered with another clean piece of sheeting to minimize the potential for contamination.

2.5.3 Sampling Equipment Decontamination Wastes

Wastes without free liquids and waste waters collected during sampling equipment decontamination and miscellaneous wastes such as plastic sheeting, brushes, disposable protective clothing, and etc.) will be managed in a manner consistent with FEMP hazardous waste practices pending RCRA determinations.

Waste characterizations and determinations will be conducted for the materials following the FEMP Waste Analysis Plan and Waste Determination Plan approved by the Ohio EPA.

Based on the RCRA determinations wastes will be managed and disposed of in accordance with all applicable hazardous and

solid waste rules and regulations.

3.0 FIELD SAMPLE DOCUMENTATION AND HANDLING PROCEDURES

Sample documentation and handling procedures will conform to FEMP procedures applicable when closure actions are initiated. The information in the following sections presents basic elements to be included in any field sample handling procedures developed.

3.1 Field Logbook

An up-to-date field logbook will document all information pertinent to the RCRA closure sampling activities. The logbook will be bound with consecutively numbered pages. At a minimum, the entries in the logbook will include the following information:

- Name of supervisor(s) responsible for HWMU management
- Name of the FEMP closure project manager
- Maps, drawings, or photographs of the sampling site
- Purpose of sampling such as verification of decontamination
- Description and location of sampling points
- Documentation of deviations from approved closure requirements (specified in Section I-1(e)(4) of the RCRA Part B Permit Application)
- Description of sampling methods and field sampling activities such as containers, types of samples, etc.
- Documentation of any deviations from this Sampling and Analysis Plan.
- Weather conditions at the time samples are collected
- Number, type, and volume of sample taken
- Date and time of collection
- Collector's sample identification number(s)
- Names of sampling personnel
- Date and time of transfer to sample receiving/shipping area

- Field observations such as spills or other activities nearby
- Any field measurements made such as pH, specific conductance
- Signatures of persons responsible for maintaining the logbook

The logbook will record sufficient information so anyone can reconstruct the sampling without reliance on the collector's memory. Also, the logbook will be stored in accordance with FEMP document control procedures.

3.2 On-Site Handling/Processing Procedures

Sample coolers, along with the signed and completed sample Analysis Request/Custody Record form will be taken to the designated FEMP sample receiving/shipping area. Each person who takes possession of the samples or sample coolers will sign the Custody Record and record the date and time of transfer.

The FEMP will characterize radiation levels to determine where, when, and how samples will be sent for analyses.

3.3 Shipping Procedures

Samples that are to be shipped will be packaged and labeled at the designated FEMP sample receiving/shipping area. Samples will be shipped using the following procedures:

1) All samples will be prepared for shipment following DOT packaging and shipping procedures.

2) If samples are to be delivered by a carrier service, the carrier will be contacted to confirm pick up can be made within 24 hours.

3) The name of the carrier and date of shipment will be indicated on the accompanying sample Analysis Request/Custody Record form (see example Figure I-2). Before packaging for shipment, the form will be sealed inside a waterproof plastic bag and taped to the inside lid of the sample shipping containers. All shipping papers (e.g., bill of lading and carrier shipping forms) become part of the Custody Record. The FEMP will instruct the laboratory to attach the signed shipping papers to the sample Analysis Request/Custody Record form.

4) Sample shipping container lids and openings will be sealed with a custody seal. All custody seals will be signed and dated.

5) Sample shipments, along with all required paper work, will be placed in a designated carrier pick up area.

6) The off-site analytical laboratory will contact the manager of the designated FEMP sample receiving/shipping area to confirm receipt of the shipment. If the off-site analytical laboratory does not call, a representative from the designated FEMP sample receiving/shipping area will call and confirm receipt of shipment.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

Quality Assurance/Quality Control (QA/QC) procedures are required to identify, evaluate, and control conditions and activities that can affect the quality and validity of the analytical data obtained from sampling and analyses. Validation of data collection requires accurate records to document activities and conditions. At a minimum, QA/QC procedures will include:

- a field sampling logbook,
- sample labels,
- collection of field and laboratory QA/QC samples, and
- completed sample Analysis Request/Custody Record forms.

The field sampling logbook is discussed in Section 3.1. An example of the sample labels to be used is provided in Figure I-1. Sampling activities conducted during RCRA closures will be consistent with applicable FEMP QA/QC procedures. The following sections discuss field QA/QC, laboratory QA/QC, and sample Analysis Request/Custody Record forms.

4.1 Field QA/QC Procedures

To prevent cross-contamination between samples and locations only clean sampling equipment will be used for sample collection. When sampling equipment is decontaminated, grab samples of the deionized equipment rinseates will be collected to confirm that decontamination is effective and to evaluate the potential for cross-contamination. For every media being sampled, at least one rinseate sample of sampling equipment rinseate will be collected per day using the following procedure:

1) Deionized water will be poured over a piece of sampling equipment that has been decontaminated following the procedures in Section 2.5.2.

2) Using a clean pair of chemical resistant gloves, the deionized water rinse will be poured into a clean glass or stainless steel beaker or bowl.

3) A glass pipette will be used to transfer samples to the appropriate sample containers. See Table I-2 to identify the appropriate sample containers, preservation methods, and holding times applicable for the sample analyses required.

4) The container management procedures in Section 2.4 will be followed after the sample has been collected.

Solutions used to preserve samples or clean sampling equipment in the field will also be evaluated as a source of potential contamination. At a minimum, the following QC samples will be collected for each sampling event:

- one field trip blank (obtained from the designated FEMP sample receiving/shipping area) for each sample shipment to be sent to the off-site analytical laboratory.
- one grab sample of the clean water/detergent solution used.
- one grab sample of the deionized rinse water supply.
- one grab sample from the supply of each of the different reagent/solutions used to preserve samples.

To evaluate the impact of field sampling activities on analytical precision (i.e., repeatability of results), field duplicate samples will be collected. A minimum of one duplicate sample will be collected for every 20 samples collected from each media. If less than 20 samples are collected, then a minimum of one duplicate will be taken for each sampling event. If requested, additional duplicate samples will be collected for QC confirmation by an independent laboratory.

Quality assurance procedures will include:

1) Only clean sample containers will be used.

2) Clean chemical resistant gloves will be used whenever contact is made with a sample or the sampling equipment.

3) Sampling containers and collection equipment will be handled, stored, and maintained in a manner that prevents cross-contamination.

4) Any field conditions, events, or activities that may affect analytical results will be documented in the field sampling log book (see Section 3.1).

4.2 Laboratory QA/QC Procedures

The laboratory(ies) used by the FEMP for analyses of closure samples will use approved USEPA SW-846 methods. Analytical methods proposed for radiological analyses are listed in Table I-1. In addition, the laboratory will demonstrate that it has a quality assurance/quality control plan for all parameters, consistent with SW-846 guidance.

The laboratory conducting the analyses will document the use and results of laboratory quality control samples and analyses (to be included in the laboratory analytical report). Laboratory samples for quality control (QC) include:

- laboratory equipment blanks to detect residual contamination of analytical equipment that may affect results,
- matrix spike, matrix spike duplicates and method surrogate compounds to evaluate the accuracy (i.e., the efficiency of the methods used to recover and detect analytes) and precision,

- duplicate samples prepared in the laboratory to evaluate the precision (i.e., the ability to reproduce analytical results) achieved by the methods used.

All pertinent information concerning problems and conditions which may affect the validity of the analytical data must be clearly identified for each sample. In addition to laboratory QC sample and analyses, information to be provided by the laboratory conducting the analyses includes:

- Name of person receiving the sample
- Date and time of sample receipt
- Laboratory sample number
- Date and time of sample analyses
- Signature of the laboratory supervisor

Conditions outside the control of the laboratory which could affect sample quality and validity of laboratory analyses will also be documented. These conditions may include:

- Discrepancies between sample shipping records, sample analytical requests, custody records and the sample shipments as received by the laboratory.
- Sample containers and packaging problems, such as broken containers, loose lids, and broken custody seals.

To reduce any laboratory bias, field duplicate samples will not be identifiable from labels or sample numbering. Field sample duplicates will be noted in the field book for use in FEMP QA/QC review of analytical reports.

4.3 Sample Analyses Request/Chain-Of-Custody Procedures

An Analysis Request/Custody Record form will be filled out and accompany every sample and shipment (see example Figure I-2). The

Custody Record (including any shipping papers) will document sample possession from the time of collection through receipt by the off-site analytical lab conducting the analyses.

Each sample container will be labeled (see example Figure I-1) with the sample number and identification that is consistent with the sample Analysis Request/Custody Record form (see example Figure I-2). A sample Request/Custody Record form and sample label will accompany all samples throughout the sample handling and process.

Records of any custody seals used on shipping containers will also be maintained. The laboratory will be instructed to document in writing the condition of any custody seals on containers that they receive.

The completed sample Request/Custody Record form will be signed by the laboratory and returned with the analytical report for the samples identified on the form(s).

Sample analyses results and reports will be returned to:

FEMP RCRA Programs
Post Office Box 398704
Cincinnati, Ohio 45239-8704

4.4 Disposition of Analytical Samples

Where applicable, the FEMP will instruct the laboratory to retain samples for further reference or use. The FEMP reserves the right to have the samples shipped to another laboratory (with the proper chain-of-custody) for confirmation analyses. Prior to final disposal/disposition of samples, the analytical laboratory will contact the FEMP for concurrence with waste disposal or treatment

methods and facilities to be used. Samples for which acceptable disposal and treatment alternatives are unavailable will be returned to the FEMP.

5.0 HEALTH AND SAFETY

As discussed in Section I-1(a) of the RCRA Part B Permit Application, a Project/Task Specific Health and Safety Plan will be prepared to reflect site and area conditions and health and safety requirements at the time of closure. All sampling activities will be conducted in accordance with the Project/Task Specific Health and Safety Plan.

TABLE I-1: RADIOLOGICAL ANALYTICAL TEST METHODS

Analytical Parameter	Measurement Technique	Method No. [1]
RADIOACTIVITY:		
Gross Alpha and Gross Beta	Tennelac low background Alpha/Beta counting system	RSL-308
Gross Gamma	To be determined	
Total Uranium and Isotopic Uranium 235	Alpha Spectrometer and Nuclear data computer-based Gamma Spectrometer Model ND9900 (Data Systems Only)	RSL-304 and RSL-201
Total Thorium & Isotopic Thorium 228	Alpha Spectrometer and Nuclear data computer-based Gamma Spectrometer Model ND9900 (Data Systems Only)	RSL-304 and RSL-201
Radium 226	Alpha Spectrometer and/or Nuclear data computer-based Gamma Spectrometer Model ND9900 (Data Systems Only)	RSL-309 RSL-201
Radium 228	Tennelac low background Alpha/Beta counting system	RSL-309 and RSL-201

[1] Methods as referenced in the Remedial Investigation and Feasibility Study, Feed Materials Production Center Volume V: Quality Assurance Project Plan.

TABLE I-2: SUMMARY OF SAMPLE CONTAINER, PRESERVATION, AND HOLDING TIME LIMITS

Parameters	Container Type [1] (Glass or Polyethylene)	Matrix	Preservation Methods	Holding Times
Total Metals	Glass	Solids	Cool to 4° C	6 months[2]
Total Metals	Glass or Polyethylene	Liquid	Cool to 4° C, HNO_3 to <2 pH	6 months [2]
Volatile Organics	Widemouth glass with Teflon liner	Solids	Cool to 4° C Minimize Headspace	14 days
Volatile Organics	Glass with Teflon-lined septum caps	Liquid	Cool to 4° C, Zero Headspace	14 days
Semi-Volatile Organics	Widemouth glass Teflon-lined cap	Solids	Cool to 4° C	14 days
Semi-Volatile Organics	Glass with Teflon liner	Liquid	Cool to 4° C;	14 days
Radiological	Glass or Polyethylene	Liquid	N. A.	6 months
Radiological	Glass or Polyethylene	Solids	N. A.	6 months

[1] Sample volume and number of containers will depend upon parameters and methods for analysis.

[2] Holding time for Mercury is 28 days.
Holding time for Hexavalent Chromium is 24 hours.

FEMP ON-SITE ENVIRONMENTAL MEDIA
CHARACTERIZATION & SURVEILLANCE

SAMPLE NUMBER: _____

DATE: _____ TIME: _____

PROJECT NAME: _____

SAMPLE POINT: _____

FIGURE I-1: EXAMPLE OF SAMPLE LABEL

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

P.O. BOX 398704, CINCINNATI, OHIO 45239-8704

Control #:

ANALYSES REQUEST / CUSTODY RECORD

Page of

PROJECT:	CLIENT:	TECHNICIAN/EXT:
PROJECT #:	CLIENT CONTRACT:	CHARGE #:
PE/PM:	PHONE:	LOT MARK CODE:

SAMPLE IDENTIFICATION

SAMPLE NUMBER	CUSTOMER NUMBER	DESCRIPTION	MATRIX	DATE/TIME COLLECTED	CONTAINER PRESERVATIVE	# CONT VOLUME	ANALYSIS REQUESTED

Copy To: 1

ITEM/REASON	RELINQUISHED BY	RECEIVED BY	DATE	TIME	ITEM/REASON	RELINQUISHED BY	RECEIVED BY	DATE	TIME

FIGURE I-2: EXAMPLE OF AN REQUEST/CUSTODY RECORD FORM