



DEPARTMENT OF THE NAVY

CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
300 HIGHWAY 361
CRANE, INDIANA 47522-5000

IN REPLY REFER TO:

5090
Ser 095/9220

02 DEC 1999

U.S. Environmental Protection Agency, Region V
Waste, Pesticides, & Toxics Division
Waste Management Branch
Illinois, Indiana, and Michigan Section
Attn: Mr. Peter Ramanauskas (DW-8J)
77 West Jackson Blvd.
Chicago, IL 60604

Dear Mr. Ramanauskas:

Crane Division, Naval Surface Warfare Center (NAVSURFWARCENDIV Crane) submits for review and approval, per your comments, a copy of Appendix E4 - Revised Soil Excavation Plan for Rockeye (RKI) of the Final Full Scale Operational Plan for the Bioremediation Project as enclosure (1). Enclosure (2) is the required certification statement.

NAVSURFWARCENDIV Crane point of contact is
Ms. Christine D. Freeman, Code 09511, telephone 812-854-4423.

Sincerely,

A handwritten signature in black ink, appearing to read "James M. Hunsicker".

JAMES M. HUNSICKER, DIRECTOR
ENVIRONMENTAL PROTECTION DEPARTMENT
BY DIRECTION OF THE COMMANDER

Encls:

- (1) Revised Appendix E4 - RKI Excavation Plan
- (2) Certification Statement

Copy to: (w/o encls)
ADMINISTRATIVE RECORD
SOUTHNAVFACENCOM (Code 1864)
TOLTEST CRANE

RESPONSES TO USEPA COMMENTS
ON THE
DRAFT APPENDIX E-4: SOIL EXCAVATION PLAN FOR SWMU 10/15
ROCKEYE
FULL-SCALE OPERATIONAL PLAN FOR SOILS BIOREMEDIATION FACILITY

COMMENT 1: Under "List of Figures" on pg. E4-3, "Rockeye" is misspelled.

RESPONSE 1: The spelling has been corrected.

COMMENT 2: In Section 1.2, Site Assessment, are there any previous soil borings results data that can be added as a table?

RESPONSE 2: Results from the ACOE 1998 study have been summarized and tabulated.

COMMENT 3: In Section 4.5, Soil Transportation, why would soil be transported to Mine Fill A and then to the Bioremediation Facility instead of directly to the Biofacility?

RESPONSE 3: The reason for this wording is unclear. The reference to transporting soil to Mine Fill A has been removed.

COMMENT 4: In Section 5.2, Pre-Excavation Soil Sampling, why is only one grab sample collected from the center of the grid block vs. center and corners?

RESPONSE 4: The grab samples collected for explosives and metals analysis from the center and corners of each grid are combined into one composite sample for each of the two sampling depths (0-12 inches and 24-36 inches). Only one grab sample is obtained for VOC analysis from each grid unless PID field screening indicates additional grab samples should be obtained. These procedures are described in Section 4 and Field SOP QAPP-1.0 of the Soils Bioremediation Facility QAPP for Full-Scale Operation.

COMMENT 5: In the title for Section 5.4, the word "sampling" is missing. Also, I assume that the figures will show the grid layouts?

RESPONSE 5: The word "sampling" has been added to the title of Section 5.4. Figures E4-3 and E4-4 show initial grid layouts.

COMMENT 6: Section 1.2, pg E4-6: it is stated that Figure E4-1 shows drainage ditches. I do not have Figure E4-1. Figure E4-3 shows only buildings, sumps, and roads.

RESPONSE 6: Figure E4-1, taken from ACOE 1998, is included with the plan. Several drainage ditches leading from the sumps are depicted on this figure.

COMMENT 7: Section 1.2, Section 4.2, & Attachment E4-4 refer to a General Plot Plan for Rockeye (Drawing No. 538126). I do not have this drawing. I received Figure E4-3 (Drawing No 37324-01) and Figure E4-4 (Drawing No. 37324-02) from Crane with cover letter dated October 21, 1999. Please supply the General Plot Plan drawing. Also make the name references to this drawing consistent between sections.

RESPONSE 7: Drawing No. 538126 is included with the plan. The references to this drawing have been made consistent between sections.

COMMENT 8: Section 4.5, pg. E4-13: Please provide Figure E4-2 – Transportation route from Rockeye to Bioremediation Facility.

RESPONSE 8: This figure is included in the plan.

**APPENDIX E4
SWMU-10/15, ROCKEYE SOIL EXCAVATION PLAN
FOR FULL-SCALE OPERATIONS**

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
1.0 INTRODUCTION	E4-4
1.1 PURPOSE.....	E4-4
1.2 SITE ASSESSMENT.....	E4-4
2.0 MOBILIZATION	E4-8
3.0 SEDIMENT AND EROSION CONTROL	E4-9
4.0 EXCAVATION AND SCREENING OF CONTAMINATED SOIL.....	E4-10
4.1 PERMITS	E4-10
4.2 SOIL EXCAVATION.....	E4-10
4.3 SOIL SCREENING AND MANAGING OVERSIZED MATERIALS.....	E4-11
4.3.1 Soil Screening	E4-11
4.3.2 Disposition of Oversized Materials	E4-11
4.4 SOIL STOCKPILING.....	E4-12
4.5 SOIL TRANSPORTATION.....	E4-12
5.0 SAMPLING.....	E4-15
5.1 SAMPLING AREAS	E4-15
5.2 PRE-EXCAVATION SOIL SAMPLING.....	E4-15
5.3 MARKING GRID BLOCKS FOR EXCAVATION	E4-15
5.4 IN-PROCESS EXCAVATION SOIL SAMPLING	E4-18
5.5 POST-EXCAVATION SOIL SAMPLING	E4-18
6.0 DECONTAMINATION.....	E4-20
6.1 EXCAVATION DECONTAMINATION FACILITY	E4-20
6.2 EQUIPMENT DECONTAMINATION.....	E4-20
6.3 ROCK DECONTAMINATION.....	E4-21
7.0 SITE CLEANUP AND DEMOBILIZATION.....	E4-22
8.0 BACKFILLING AND SITE RESTORATION.....	E4-23
9.0 REFERENCES	E4-24

LIST OF FIGURES

<u>FIGURE</u>	<u>PAGE</u>
E4-1 Boring and Monitoring Well Locations	E4-7
E4-2 Transportation Route from ROCKEYE to BIOFACILITY.....	E4-14
E4-3 Grid Sampling Area	E4-16
E4-3 Initial Grid Layout.....	E4-17

ATTACHMENTS

<u>ATTACHMENT</u>	<u>PAGE</u>
E4-A ROCKEYE DRAWING No. 538126 General Plot Plan	

1.0 INTRODUCTION

The scope of work includes sampling, excavating, screening, and transporting explosives-contaminated soils from areas of SWMU-10/15, Rockeye, to the Bioremediation Facility, and backfilling and restoring the excavated area with non-contaminated backfill material and/or treated compost. An estimated 18,000 cubic yards of explosives-contaminated soil is expected to be excavated and transported for bioremediation.

1.1 PURPOSE

The purpose of this Plan is to provide methods and controls for excavation, screening, transporting, and storage of explosives-contaminated soils during full-scale bioremediation operations. This Plan may be modified, amended, or revised, with the approval of the United States (U.S.) Navy and the U.S. Environmental Protection Agency (U.S. EPA) Region 5, to optimize system performance throughout the full-scale operation activities.

1.2 SITE ASSESSMENT

Rockeye is located in the northeastern portion of NSWC Crane as shown in Figure 1-1 of the Full-Scale Operational Plan. The layout of Rockeye is provided in NSWC Crane Drawing No. 538126 General Plot Plan (see Attachment E4-A). Rockeye is located at the intersection of Highways H-161 and H-45. Rockeye is an NSWC operating unit that was formerly a press-loading operation for 3-inch projectiles and was later converted to a case-filling operation for cluster bombs. Wastewater produced by the operation is collected in sumps, pre-treated through activated carbon filtration in Bldg. 3044, and transported to the sanitary sewer. Residues from the sumps are periodically trucked to Ammunition Burning Grounds for disposal [ACOE 1998].

A RCRA Facility Investigation was conducted by the Army Corps of Engineers (ACOE 1998) in which 127 surface soil samples and 25 subsurface soil samples were obtained. All but one of the surface soil samples were obtained from drainage ditches just outside the perimeter of the facility in areas A through G (identified on Figure E4-3). One surface sample (identified as Area 14 in the ACOE report) was obtained adjacent to the vent between buildings 2733 and 2734 (see Figure E4-4). The 13 soil borings from which the 25 subsurface samples were obtained are illustrated in Figure E4-1 (this figure is actually Figure 6 from ACOE 1998). Table 1 below summarizes the results of explosives analysis from this report.

Table 1
ACOE 1998 Summary Data
Results in ppm

Surface Samples				
Area	n	TNT	RDX	HMX
A	20	ND	ND	ND
B	20	ND	ND	5.37
C	19	ND	ND	ND
D	30	ND	ND	ND
E	30	0.15j	0.51j	2.36
F	3	ND	ND	0.45j
G	4	0.75	0.14j	1960.0
14	1	295.0	3350.0	10400.0
Subsurface Samples				
Area	n	TNT	RDX	HMX
1	1	ND	ND	ND
2	2	ND	0.65j	0.31j
3	1	ND	ND	ND
4	1	ND	ND	ND
5	1	ND	ND	ND
6	1	ND	0.46j	0.48j
7	1	ND	0.37j	11.4
8	1	ND	ND	0.15J
9	1	ND	ND	ND
10	4	ND	ND	0.86j
11	4	ND	0.06j	0.62j
12	4	1.4	ND	42.7
13	3	ND	ND	ND

Notes:

ND = Not Detected.

J = Analyte detected at concentrations below statistical quantitation limits.

n = Number of soil samples taken.

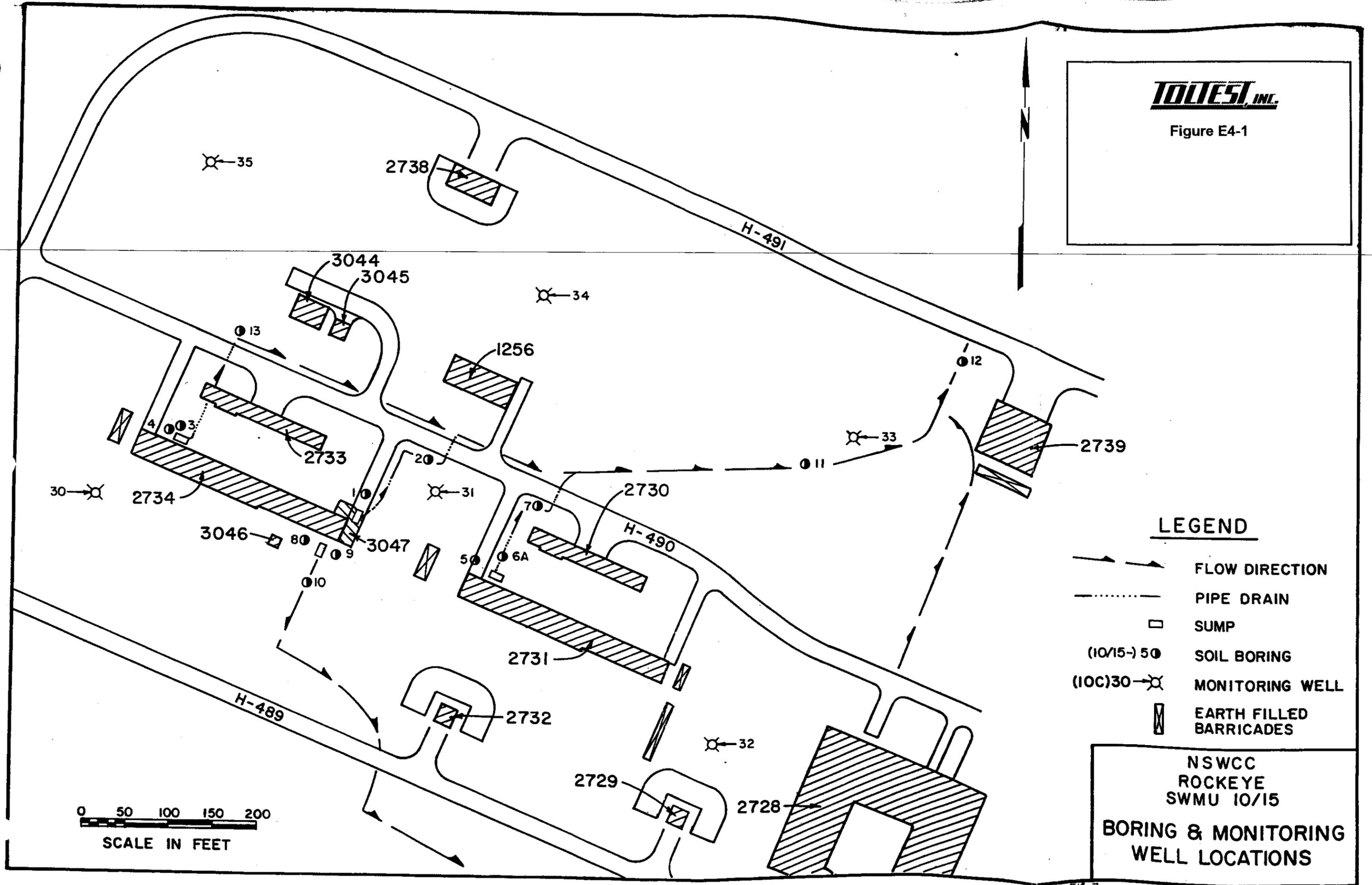
Based on available site assessment data and generator's knowledge of past process operations, the areas of sampling and excavation (if required based on analytical results) will be near or around Buildings 2730, 2731, 2733, 2734, 3045 (i.e. areas with sumps), and drainage ditches leading from these areas to off-site streams. The buildings and drainage ditches are depicted in Figure E4-1. The building numbers and title are listed below:

<u>Building #</u>	<u>Title</u>
2730	Separator and Hydraulic Pump B
2731	Loading and Drilling B
2733	Separator and Hydraulic Pump A
2734	Loading and Drilling A
2735	Receiving and Painting
3045	Sump

NSWC Crane has provided an unexploded ordnance (UXO) survey clearance for work to proceed. A copy is provided in Appendix E1, Attachment E1-A of the Full-Scale Operational Plan. The excavation crew personnel have obtained awareness training in the associated hazards of potential UXO existing in subsurface soils. All work activities will stop if visual observations indicate potential UXO is encountered in the area. The NSWC Crane Environmental Protection Department (EPD) representative will be contacted and a surface UXO survey will be performed to identify and remove any unexploded ordnance prior to resuming work actions. Digging permits will be obtained for all site activities prior to mobilization.

TOLLEST, INC.

Figure E4-1



LEGEND

- FLOW DIRECTION
- PIPE DRAIN
- SUMP
- (10/15-) 50 SOIL BORING
- (10C)30 MONITORING WELL
- EARTH FILLED BARRICADES

NSWCC
ROCKEYE
SWMU 10/15
**BORING & MONITORING
WELL LOCATIONS**

11/30/99

2.0 MOBILIZATION

Prior to mobilization of excavation equipment, the work area configuration, the Exclusion Zone (EZ), Contamination Reduction Zone (CRZ), and Support Zone (SZ), soil screener location, stockpile area, etc. will be located as directed by NSWC Crane EPD. The work area configuration is composed of the EZ boundary, the CRZ with appropriate decontamination stations, the SZ, run-on and run-off controls, and vehicle access routes. Tools, equipment, and supplies will be delivered to the site, barricades installed, and personnel mobilized.

The Contractor will inspect the equipment for the presence of dirt, oils, and grease prior to arrival on-site. The general condition of the equipment will be inspected and tested to ensure that all safety systems and alarms are functional. Equipment performance will be tested to determine if the equipment can perform the required tasks.

A pre-excavation meeting will be held to review pertinent information including the excavation plan, figures, building foundation, area utility, and service drawings. All personnel scheduled to work in the Rockeye area will attend the meeting and be briefed on the hazards and safety issues expected during the excavation activities.

3.0 SEDIMENT AND EROSION CONTROL

Storm-water and erosion control measures will be implemented to control storm-water run-on/ run-off and to prevent erosion. Straw bales will be placed along the edges of exclusion zones in sloped areas so that potential run-on and run-off are diverted in a manner that prevents surface water entry or exit from the excavation. During periods of precipitation, open excavations will be covered to prevent contact waters from forming. Potentially contaminated storm-water that may collect in the excavation will be either sent directly to the Rockeye contaminated water pre-treatment system or containerized and sampled to determine its disposition according to NSWC Crane EPD procedures.

4.0 EXCAVATION AND SCREENING OF CONTAMINATED SOIL

4.1 PERMITS

A statement of clearance for safe access, based on the removal or absence of unexploded ordnance in the work zone, has been obtained and is included in Appendix E1, Attachment E1-A of the Full-Scale Operational Plan. Prior to initiating any excavation, a Digging Permit will be obtained from the NSWC Crane Public Works Department (PWD).

4.2 SOIL EXCAVATION

Explosives-contaminated soil will be excavated by a backhoe/loader or tracked excavator (trackhoe). Particular attention will be paid to the areas near and around buildings and utilities. Excavation will proceed cautiously due to the potential of unknown buried utilities and piping. The NSWC Crane Drawing No. 538126 General Plot Plan is located in Attachment E4-A of this plan. Copies of this drawing will be available in the office trailer at the Bioremediation Facility.

Large rocks, stones, and vegetation waste (tree roots, lumber pieces, sod, Yucca plants, etc.) will be removed during excavation using the excavator and managed per Section 4.3.2. of this plan.

Based on the pre-excavation characterization sample results, grids that are determined to exceed the industrial cleanup levels will be excavated until confirmation sample results indicate that cleanup goals have been met. However, the maximum depth of excavation will not exceed three feet. If cleanup goals have not been met and the area requires excavation in excess of three feet, NSWC Crane EPD will provide further direction. In areas of shallow bedrock (less than 3'), excavation will cease upon bedrock contact.

Open excavations and work areas will be identified and barricaded for personnel protection as described in the Site-Specific Safety and Health Plan, Appendix A2 of the Full-Scale Operational Plan. Open excavations will be covered during periods of predicted precipitation to prevent water accumulation.

4.3 SOIL SCREENING AND MANAGING OVERSIZED MATERIALS

4.3.1 Soil Screening

Contaminated soil will be screened at the excavation site to remove oversized material (1½" or larger). The excavated soil will be loaded into the soil screening equipment using a backhoe/loader, excavator, or trackhoe. The screening will be performed in accordance with Field Standard Operating Procedure (SOP) 1.0 (Appendix D of the Full-Scale Operational Plan) using a screen with a minimum 50 ton/hr capacity. The screener details are provided in Section 9.0 of the Full-Scale Operational Plan. The screening unit will be located in a bermed lined area to prevent run-off and cross contamination of the surrounding area.

The screened material will be dropped from the fines stacking conveyor into a yard conveyor for direct loading into the live-bottom semi-tractor trailers or dump trucks/tractors for transport to the Bioremediation Facility per Section 4.5 of this Plan.

The oversized material (larger than 1½ inches) that is screened out will be separated into stockpiles, i.e., rocks, wood waste, and soil clods. The stockpiles will be located in bermed and lined storage areas adjacent to the site to prevent run-off from the piles. Each storage area will be a minimum of 10 feet by 10 feet, constructed of 10-mil or greater high-density polyethylene (HDPE) liner and will be located in a grid area of existing contaminated soil. Prefabricated bins or pans may be placed on the lined area for containment of rejected material. All stockpiled material will be covered with plastic during periods of precipitation.

The soil clods will be spread out within the EZ in a four to six inch thick layer on a planned excavation area and allowed to dry sufficiently prior to pulverizing by the excavating equipment. This soil will be covered during rain events to prevent saturation of the soil thereby increasing the drying time. The soil will then be cycled through the screener again.

4.3.2 Disposition of Oversized Materials

Wood wastes, such as tree roots, lumber pieces etc., will be stockpiled in a covered, lined, and bermed area for use as a potentially contaminated bulking material. This material will be used in future full-scale operations or will be taken to the Ammunition Burning Grounds for flashing. Rocks larger than 1½ inches in diameter will be decontaminated as described in Section 6.0 of this plan which was modified by Field Clarification Request (FCR) FS014 Rev. 1.

Potentially contaminated vegetation waste such as sod and Yucca plants will be transported to the Bioremediation Facility, shredded if necessary, and incorporated into the compost piles.

Should other materials be found during excavation activities, the NSWC Crane EPD will be notified for disposition.

4.4 SOIL STOCKPILING

Stockpiling of soil in a building at the Bioremediation Facility may be performed during the winter months and inclement weather. The soil will be placed in the building no closer than 30 feet from the open ends. The soil will not be stockpiled in such a manner as to have soil in contact with the metal siding. The slope of the pile will be limited to contact at one foot below the top of the concrete wall.

Portions of the stockpile not in use will be tarped or covered with plastic and weights to prevent dust from being transported out of the building during windy conditions. The coverings will also limit the potential of leachate generation during heavy rainfall with high winds blowing into the building.

Should covering of the contaminated soil prove to be insufficient during periods of high winds or heavy rainfall, a contingency plan to possibly enclose one or both ends of the building will be created. This plan will be approved by the NSWC Crane EPD prior to implementation. The contingency plan includes providing retractable mesh or solid fabric curtains covering the entire width of the building openings. The eaves of the building ends may remain open to aid in air circulation through the building.

4.5 SOIL TRANSPORTATION

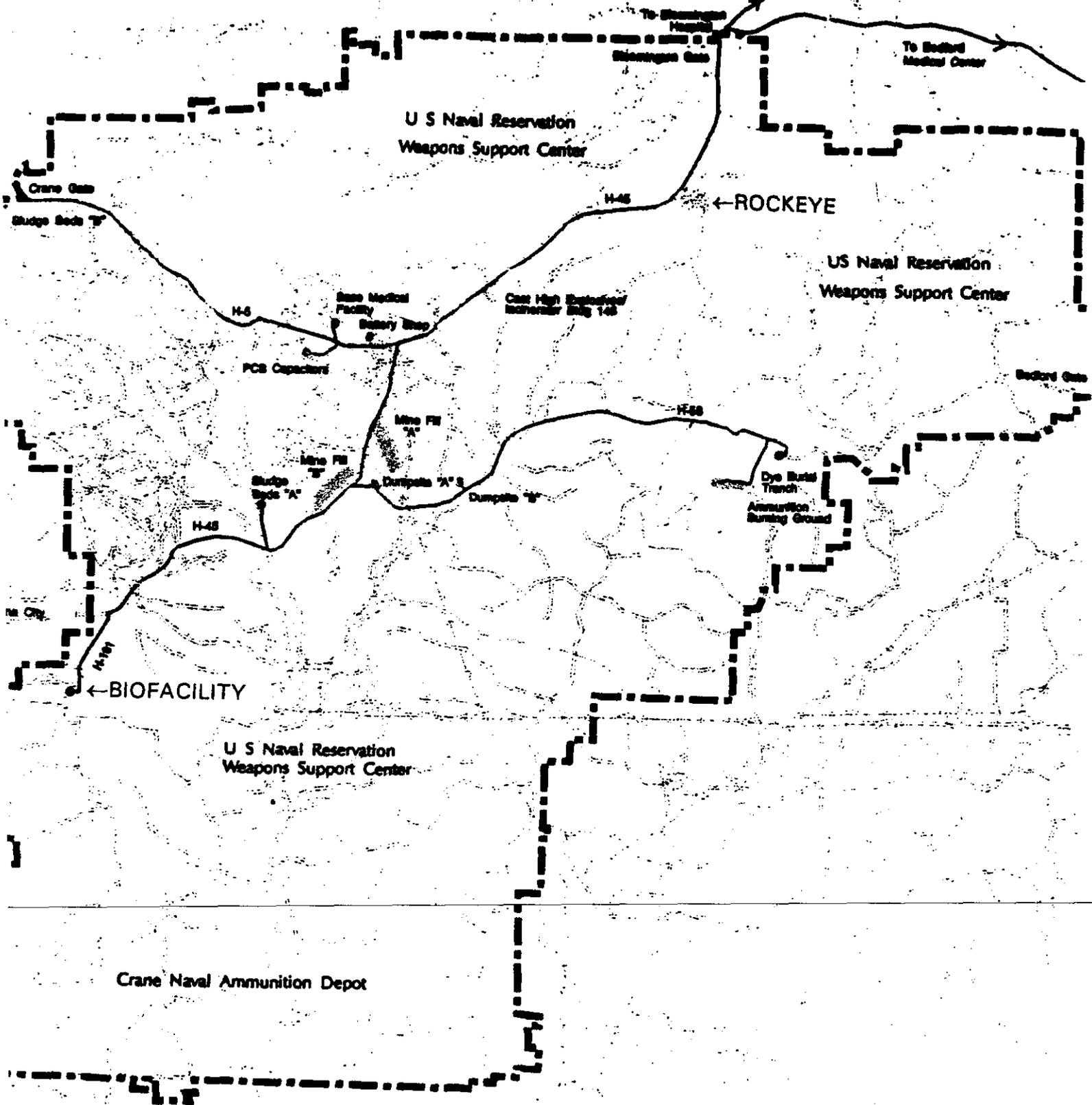
The transportation route from Rockeye to the Bioremediation Facility is provided in Figure E4-2 and described as follows:

The vehicles will exit the Rockeye facility by turning left onto Highway 45 (H-45). Travel south on H-45 for approximately eight miles and turn left on Highway 161 (H-161). Continue on H-161 past the golf course, and turn right onto the NSWC landfill entrance road. The Bioremediation Facility is immediately on the left.

Prior to leaving the excavation site, all truck wheels and wheel wells will be decontaminated as described in Section 6.0 of this Plan. Loose soil on the truck bed exterior will be broomed or brushed off and placed back in the truck bed. The truck bed containing excavated soil will be covered with a tarp prior to transportation to the Bioremediation Facility.

Each truckload of soil will be weighed to determine and record the quantity and weight of soil entering the Bioremediation Facility. The trucks will be weighed at the truck scale at the entrance to the Bioremediation Facility access road as described in Field SOP 2.0 in Appendix D of the Full-Scale Operational Plan.

Figure E4-2
Transportation Route from ROCKEYE to the BIOFACILITY



5.0 SAMPLING

All sampling for waste, pre-excavation, in-process, and post-excavation characterization will be in accordance with the approved Quality Assurance Project Plan (QAPP) for Full-Scale Operations [MK, 1998].

5.1 SAMPLING AREAS

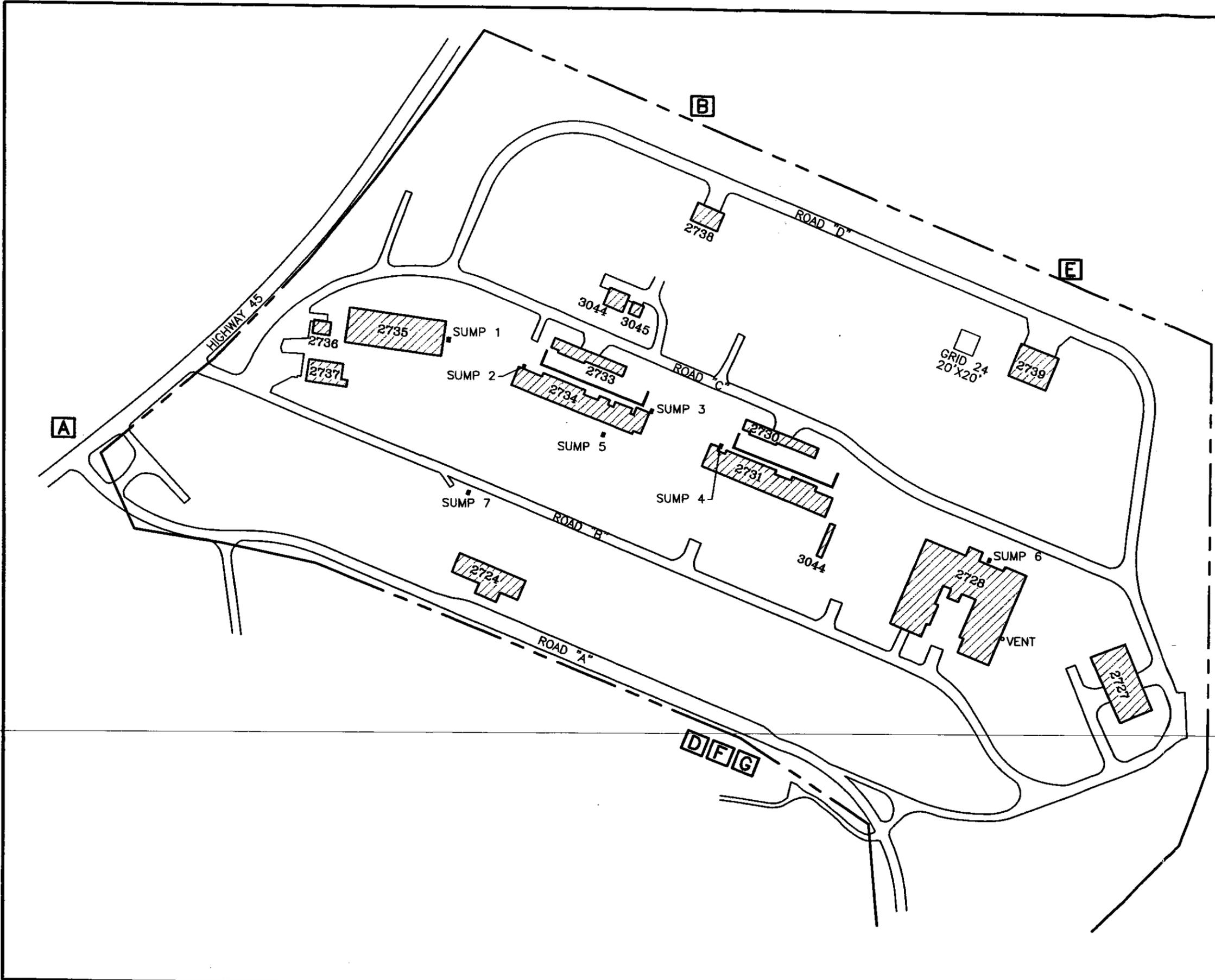
Grid blocks will be approximately 20 feet by 20 feet or equivalent size and are not expected to be perfect squares (particularly those in the berms). Grid layout and boundaries will be affected by the presence of buildings, utilities, etc. Grid borders will be flagged in the field, and areas will be chosen which will be accessible by heavy equipment (i.e., individual grid blocks will not be placed in the midst of heavy utilities or surface structures). The sampling areas and initial grid layout are illustrated in Figures E4-3 and E4-4. The grid layout will be approved by NSWC Crane EPD prior to sampling activities.

5.2 PRE-EXCAVATION SOIL SAMPLING

Pre-excavation soil sampling will be performed in accordance with Section 4.0 of the approved QAPP for Full-Scale Operations [ToITest, 1999]. A total of two composite samples, one from the surface to 12-inch depth and one from the two-foot to three-foot depth, will be collected per grid block. One grab sample will be collected from the center of the grid block at 12 inches below ground surface using an Encore sampler and analyzed for site-specific volatile organic compounds (VOCs). Each composite sample will be analyzed for site-specific explosives and metals. Analysis for semi-volatile organic compounds (SVOC) will be performed on composite samples as directed the EPD. Analytical parameters for pre-excavation and post-excavation confirmation sampling for excavations are provided in Section 1.3.1 of the Full-Scale Operational Plan.

5.3 MARKING GRID BLOCKS FOR EXCAVATION

Analytical results will be used to determine which grids require excavation. If analysis indicates a grid is contaminated (i.e., off-site laboratory results showing greater than cleanup goals in Table 1-2 of the Full-Scale Operational Plan) to a depth of three feet, the grid will be marked for excavation to a depth of three feet. If a grid is contaminated at the one-foot depth, the grid will be marked for excavation to a depth of one foot. If a grid is not contaminated at the one-foot or three-foot depth, the grid shall not be marked for excavation.



A - ACOE 1998 SURFACE SAMPLING AREAS

**FIGURE E4-3
SITE PLAN
NSWC
CRANE, INDIANA**

DRAWN WBR/8-13-99	CHECKED
REVISED MRC/10-13-99	APPROVED
JOB NO.: 37324.01	TOUEST, INC.
DRAWING NUMBER 37324-01	

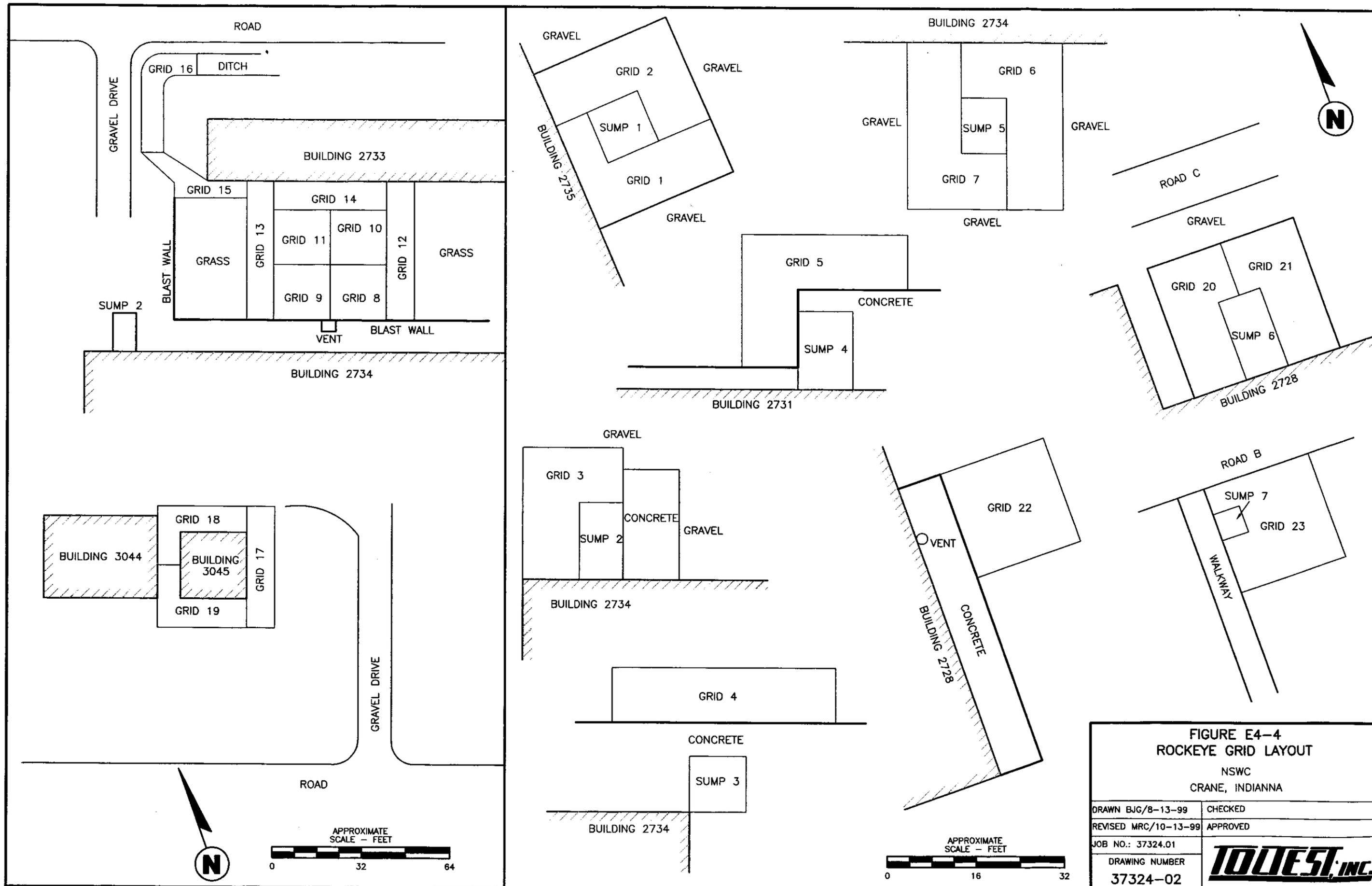


FIGURE E4-4
ROCKEYE GRID LAYOUT
 NSWC
 CRANE, INDIANNA

DRAWN BJK/8-13-99	CHECKED
REVISED MRC/10-13-99	APPROVED
JOB NO.: 37324.01	TOLQUEST, INC.
DRAWING NUMBER 37324-02	

5.4 IN-PROCESS EXCAVATION SOIL SAMPLING

After initial excavation activities are complete in each grid, the horizontal and vertical extent of remaining contaminants will be determined by using colorimetric field test kits for RDX. This method is described in Section 4.0 of the approved QAPP Full-Scale Operations [ToITest, 1999]. A sampling grid will be laid out along the base of the excavation(s), using a nodal spacing used during the pre-excavation sampling or based on site conditions observed during excavation. Each grid will be sampled using procedures described in the approved QAPP for Full-Scale Operations [ToITest, 1999] for in-process excavation sampling. Composite samples will be collected from the four corners and center of the grid block, from surface to six inches below ground and analyzed for RDX by field test kits.

Pin flags will be placed every 20 feet along sidewalls greater than one foot in depth. Samples will be collected at each pin flag location. One sample will be collected from 0-6 inches into the sidewall surface at the midpoint between the surface and bottom of excavation. The sample will be analyzed for RDX (field test kits).

After the soil is excavated to a depth where field screening indicates acceptable concentrations of explosives remain in the soil, post-excavation soil samples will be collected for analysis by an approved laboratory.

5.5 POST-EXCAVATION SOIL SAMPLING

The purpose of post-excavation sampling of the excavation is to determine the level of contamination remaining with respect to site-specific contaminants described in Section 1.3.1 of the Full-Scale Operational Plan. A sampling grid will be laid out along the base of the excavation(s), using a nodal spacing used during the pre-excavation sampling. Post-excavation soil sampling will be performed in accordance with Section 4.0 of the approved QAPP for Full-Scale Operations [ToITest, 1999].

One composite sample and one grab sample will be collected from each grid. The composite sample will be collected from the surface to six-inch interval in a manner similar to pre-excavation samples and analyzed for totals of site-specific metals, explosives, and SVOCs (if applicable). The grab sample will be collected from the center of the grid block, six inches below ground surface, using three Encore samplers and analyzed for site-specific VOCs.

Pin flags will be placed every 20 feet along sidewalls greater than one foot in depth. Samples will be collected at each pin flag location. One grab sample will be collected from 0-6 inches into the sidewall at the midpoint between the surface and bottom of excavation. This sample will be analyzed for site-specific metals, explosives, and SVOCs (if applicable). A grab sample will be obtained from six inches with three Encore samplers and analyzed for site-specific VOCs.

6.0 DECONTAMINATION

6.1 EXCAVATION DECONTAMINATION FACILITY

The equipment decontamination facility will be constructed of a single sheet of 60-mil (HDPE) as the floor, polyvinyl chloride (PVC) drain pipes for the side walls (the HDPE liner will be draped over the PVC pipe), and a container to collect decontamination water. If the ground is too soft to support the decontamination pad, plywood may be used as a base for support. The decontamination facility will be clearly delineated with temporary construction fence, wire and signs, or equivalent.

The liner will be visually inspected on a daily basis to detect possible failures of the liner material. Inspection of the decontamination facility will be performed using the checklist provided in Appendix F of the Full-Scale Operational Plan. The inspection process will consist of checking for the following:

- Evidence of tears and holes.
- Evidence of seepage.
- The sheeting is adequately fastened to the sidewalls.
- The liner adequately covers the sandbags or berms at the end section.

If the liner is damaged, it will be repaired or replaced before further use of the facility. Any soil beneath the liner in the area of the breach will be sampled and analyzed for contaminants of concern.

Records will be maintained specifying facility construction material and methods, disposition of liquids and solids, daily inspections, and any repairs and/or breaches of liner integrity.

All decontamination fluids collected in the sump will be containerized at the end of each shift during periods of predicted precipitation. The collected fluids will be pumped out and brought to the Biofacility for use on the active windrows. If precipitation is predicted, the decontamination pad will be covered to prevent accumulation of storm-water.

6.2 EQUIPMENT DECONTAMINATION

Prior to exiting the excavation site, loaded trucks will be inspected for exterior cleanliness. In case of spillage of contaminated soil onto the truck exterior or if the truck is driven over a contaminated area, the decontamination process will take place at the excavation site decontamination facility. The equipment decontamination

procedure is described in detail in Field SOP 7.0 provided in Appendix D of the Full-Scale Operational Plan.

6.3 ROCK DECONTAMINATION

Periodically, large rocks will be excavated and rejected at the soil screener. The need for washing of rocks will occur when excavating in roadway areas, near building foundations, or rocky terrain. These rocks will be loaded onto a dump truck and transported to the Biofacility for decontamination as described in Field SOP 7.0, Section 3.3.2.

7.0 SITE CLEANUP AND DEMOBILIZATION

As equipment is no longer required in the EZ it will be decontaminated and moved to the SZ. After all contaminated materials are containerized, the remaining equipment will be decontaminated and moved to the SZ. The decontamination equipment will then be cleaned and the work zone barriers removed. After all equipment has been decontaminated, the decontamination facility will be dismantled. All decontamination fluids will be collected and transported to the Biofacility for use on the windrows as moisture amendment. The contaminated materials will be managed according to NSWCC Crane EPD requirements.

After the decontamination facility has been dismantled and removed, the underlying surface will be visually inspected. Visibly contaminated material will be removed and managed as a potentially affected material, according to NSWCC Crane EPD management procedures.

8.0 BACKFILLING AND SITE RESTORATION

The extent of any excavation and the points at which post-excavation samples were taken will be surveyed to determine the volume of the excavation, record the extent of the excavation, and record the location of the post-excavation samples. The excavation will be backfilled with non-contaminated backfill material (from an on-site NSWCrane EPD-approved borrow source) and/or treated compost at the end of the excavation period.

If an excavation is to remain open for an extended period of time due to equipment down time, berms will be placed around the excavation and the excavation will be covered to prevent run-on or run-off during a rain event.

The backfill material may be placed in 12-inch lifts or lifts based on use of the area as approved by NSWCrane EPD. Backfilled areas may be covered with a minimum of three inches of topsoil, seeded with native grasses, fertilized, and watered as approved by NSWCrane EPD. Compost may only be used according to the approved remedial goals outlined in Section 1.3 of the Full-Scale Operational Plan. Erosion control measures, if used, will be maintained until the growth of grass is sufficient to prevent erosion.

If any utilities and/or other structures are destroyed during excavation, they will be restored to acceptable condition as approved by NSWCrane EPD and Navy ROICC.

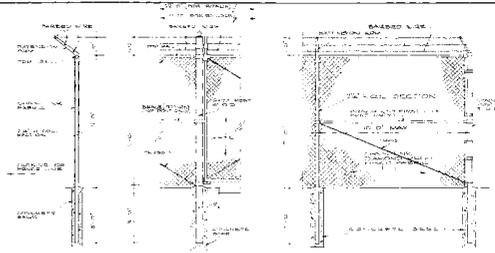
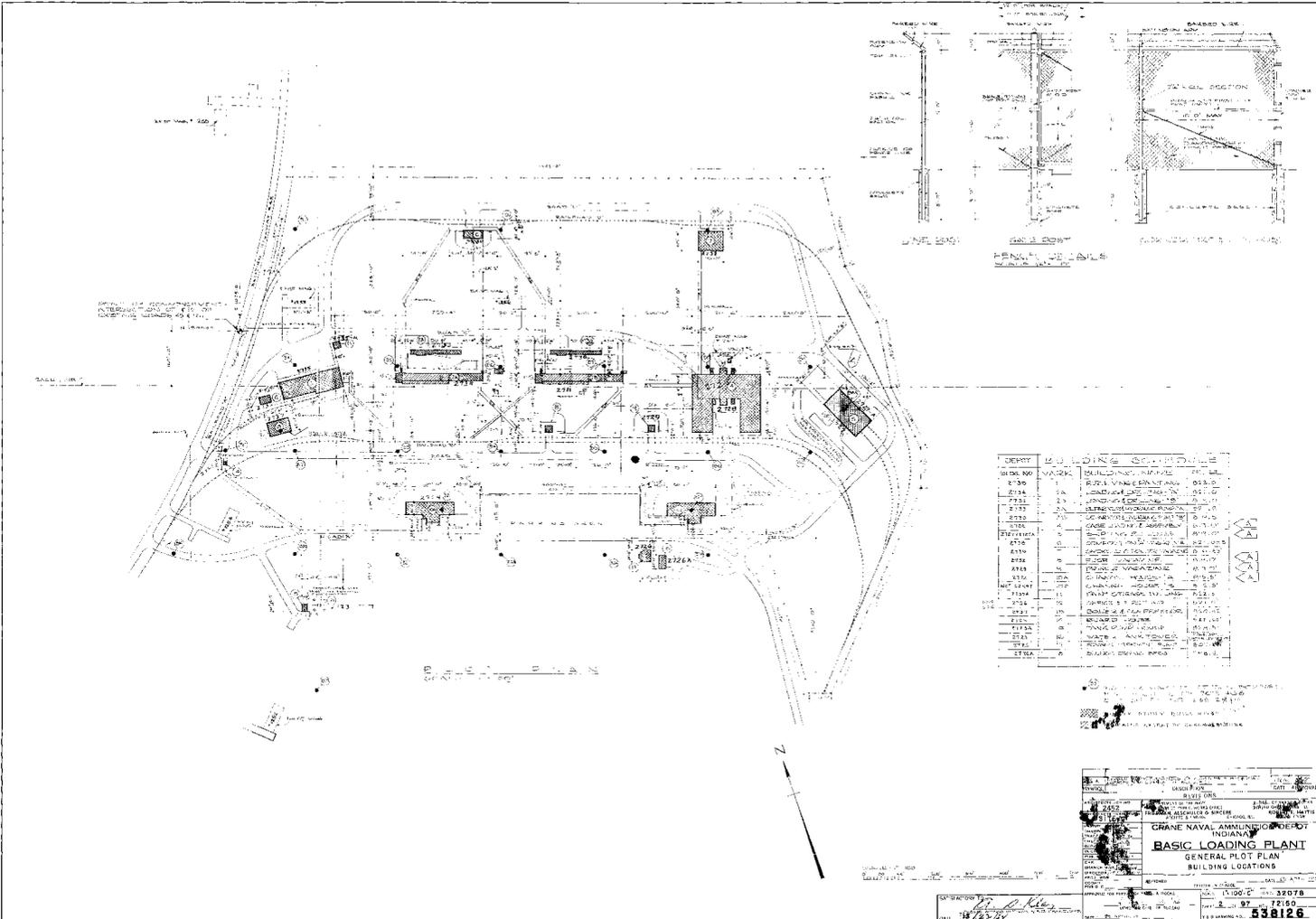
9.0 REFERENCES

ACOE, 1998. Final Report: RCRA Facility Investigation for Phase II, Soil Release Characterization, SWMU 10/15 Rockeye, Naval Surface Warfare Center Crane, Indiana. U.S. Army Corps of "Engineers, Waterways Experimental Station. September 1998.

MK, 1998. *Quality Assurance Project Plan (QAPP) For Full-Scale Operations at the Soils Bioremediation Facility at NSWC Crane, Crane, Indiana, Delivery Order No. 0009, Contract No. N62467-93-D-1106. March 1998.*

**ATTACHMENT E4-A
ROCKEYE DRAWING NO. 538126 GENERAL PLOT PLAN**

THIS DRAWING WILL BE AVAILABLE IN THE OFFICE TRAILER AT THE
BIOREMEDIATION FACILITY.



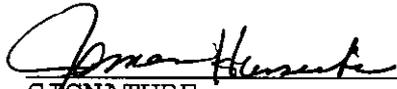
SYMBOL	DESCRIPTION	REFERENCE
1	REAR WAREHOUSE	013.0
2	REAR WAREHOUSE	013.0
3	REAR WAREHOUSE	013.0
4	REAR WAREHOUSE	013.0
5	REAR WAREHOUSE	013.0
6	REAR WAREHOUSE	013.0
7	REAR WAREHOUSE	013.0
8	REAR WAREHOUSE	013.0
9	REAR WAREHOUSE	013.0
10	REAR WAREHOUSE	013.0
11	REAR WAREHOUSE	013.0
12	REAR WAREHOUSE	013.0
13	REAR WAREHOUSE	013.0
14	REAR WAREHOUSE	013.0
15	REAR WAREHOUSE	013.0
16	REAR WAREHOUSE	013.0
17	REAR WAREHOUSE	013.0
18	REAR WAREHOUSE	013.0
19	REAR WAREHOUSE	013.0
20	REAR WAREHOUSE	013.0
21	REAR WAREHOUSE	013.0
22	REAR WAREHOUSE	013.0
23	REAR WAREHOUSE	013.0
24	REAR WAREHOUSE	013.0
25	REAR WAREHOUSE	013.0
26	REAR WAREHOUSE	013.0
27	REAR WAREHOUSE	013.0
28	REAR WAREHOUSE	013.0
29	REAR WAREHOUSE	013.0
30	REAR WAREHOUSE	013.0
31	REAR WAREHOUSE	013.0
32	REAR WAREHOUSE	013.0
33	REAR WAREHOUSE	013.0
34	REAR WAREHOUSE	013.0
35	REAR WAREHOUSE	013.0
36	REAR WAREHOUSE	013.0
37	REAR WAREHOUSE	013.0
38	REAR WAREHOUSE	013.0
39	REAR WAREHOUSE	013.0
40	REAR WAREHOUSE	013.0
41	REAR WAREHOUSE	013.0
42	REAR WAREHOUSE	013.0
43	REAR WAREHOUSE	013.0
44	REAR WAREHOUSE	013.0
45	REAR WAREHOUSE	013.0
46	REAR WAREHOUSE	013.0
47	REAR WAREHOUSE	013.0
48	REAR WAREHOUSE	013.0
49	REAR WAREHOUSE	013.0
50	REAR WAREHOUSE	013.0

GRANE NAVAL AMMUNITION DEPOT
 INDIANAPOLIS, INDIANA
BASIC LOADING PLAN
 GENERAL PLOT PLAN
 BUILDING LOCATIONS

DRAWN BY: [Signature]
 CHECKED BY: [Signature]
 DATE: 12/15/57

538126

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



SIGNATURE
JAMES H. HUNSICKER

Director, Environmental Protection Department

By direction of
the Commander

TITLE

12/2/99
DATE