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Environmental Restoration Program

Release Block J, Potential Release Site 18

# FIRE FIGHTING TRAINING AREA RESPONSE ACTION ON SCENE COORDINATOR (OSC) REPORT

MOUND PLANT
MIAMISBURG, OHIO

February 1996

FINAL

(Revision 0)

**Department of Energy**
**Ohio Field Office**

Environmental Restoration Program
EG&G Mound Applied Technologies

ENVIRONMENTAL RESTORATION PROGRAM

RELEASE BLOCK J

POTENTIAL RELEASE SITE 18

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# ON-SCENE COORDINATOR REPORT

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U.S. Department of Energy

EG&G Mound Applied Technologies

FINAL

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# EXECUTIVE SUMMARY

**SITE:** EG&G Mound

**LOCATION:** Miamisburg, Ohio

**PROJECT DATES:** February 6, 1994 - October 31, 1995

**INCIDENT DESCRIPTION:** The Mound Plant site is a 306-acre Department of Energy (DOE) research and development facility on the border of the City of Miamisburg in Montgomery County, Ohio. The USEPA placed the Mound Plant in Miamisburg, Ohio on the National Priorities List (NPL), as listed in 40 CFR Part 300, Appendix B, by publication in the Federal Register on 21 November 1989.

The Mound Plant initiated a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) program in 1984 to assess over 400 potential release sites (PRS). A release of petroleum hydrocarbons into the environment occurred sometime between 1978 and 1989 at the Fire Fighting Training Area (FFTA) site, PRS No. 18, as part of normal operations during training exercises. On the basis of this consideration, the provisions of the NCP and CERCLA were implemented by the U.S. Department of Energy, Miamisburg Area Office (MB), Miamisburg, Ohio.

**ACTIONS:** A Removal Site Evaluation (RSE) provided an assessment and basis for a removal action of the FFTA site to mitigate potential petroleum hydrocarbon contaminant exposure to human or animal populations. The Action Memorandum/Removal Site Evaluation (AM/RSE) quantified the contamination present at the FFTA Site based on a Limited Field Investigation (LFI) conducted in 1992 and recommended that the contamination should be removed and treated by ex-situ biological remediation. A request for an Implementation Plan was submitted to contractors on 26 October 1993. A construction sub-contractor was hired on 25 May 1994 and construction began on 8 June 1994. Construction of the FFTA Remedial Action was completed on 30 June 1995.

Actual excavation extended beyond the limits defined in the AM/RSE due to the presence of total petroleum hydrocarb (TPH). Excavation was terminated when sample results showed TPH levels below the removal criteria stated in the AM/RSE and NCP. Thus the potential for exposure as defined in the AM/RSE is no longer present. Approximately 170 cubic yards of excavated soils

were placed on the treatment pads. In August 1995, results of TPH sample analysis showed concentrations in two of sixteen samples to be above 40 ppm but below 105 ppm. In September 1995, samples were taken from the treatment pads for Benzene, Toluene, Ethyl Benzene, Xylene, (BTEX) analysis, and from the storage pile for TPH and BTEX. All BTEX results were below the action level. All TPH results were below 105 ppm, the revised action level agreed to be DOE and Ohio EPA.

Arthur Kleinrath 3/13/96

*Arthur Kleinrath, OSC*
*U.S. Department of Energy*
*Miamisburg, Ohio*

Timothy J Fischer 3/27/96

*Tim Fischer*
*U.S. EPA*

*Brian Nickel*
*Ohio EPA*

# I. SUMMARY OF EVENTS

## A. Site Conditions and Background

### 1. Initial Situation

The Mound Plant is a 306-acre Department of Energy (DOE) research and development facility on the border of the City of Miamisburg in Montgomery County, Ohio (Figure 1). The facility, approximately 10 miles south-southwest of Dayton and 45 miles north of Cincinnati, historically studied the chemical and metallurgical properties of various radiological materials in support of DOE. The area surrounding the plant is light residential and rural farm land. Past releases of radioactive materials have occurred at the facility. The Fire Fighting Training Area (FFTA) is one of over 400 potential release sites identified at the Mound Plant (DOE 1993a).

FFTA is located in the west-central portion of the Mound Plant and occupies an area of approximately one-sixth of an acre with exterior dimensions of seventy feet in the north-south direction and one hundred feet in the east-west direction. It is bounded by Building 34 to the north-northwest, the Overflow Pond to the southwest, the Training Fire Pit area to the east and the Overflow Pond spillway to the west. See Figure 2.

### 2. Location of Hazardous Substances

Other potential release sites in the vicinity of FFTA are (DOE 1993a):

- Area C, Lithium Burn Area. Approximately 100 feet to the northeast.
- Oil Burn Structure. Approximately 100 feet to the west-northwest.
- Historical FFTA. Approximately 150 feet to the northwest.
- Aviation Fuel Storage Tank, related to the Oil Burn Structure and removed in November 1990 (DOE 1992).

- Plant Drainage Ditch. Approximately 150 feet to the north.
- Overflow Pond (storm-water retention pond). Approximately 75 feet to the southwest.
- Drilling Mud Drum Storage Area (1 of 3 locations). Approximately 150 feet to the northeast.

### 3. Cause of Release

The FFTA consisted of two concrete pits; one approximately 10 feet by 10 feet by 1 foot deep, the second approximately 10 feet by 20 feet by 2 feet deep. These pits were used to conduct fire-fighting training operations for Mound Plant personnel. The concrete slab floors in both pits were cracked and broken in various locations, and partially covered with sediment.

In past operation, diesel fuel was pumped from a 500-gallon above ground storage tank through a 3/4 inch underground line to the fire-fighting training pits to create demonstration fires. The storage tank was located approximately fifty feet east of the smaller pit. The construction of the fire-fighting training pit and installation of the storage tank and associated underground piping occurred around 1977. The training area was in use from 1978 until 1989. Approximately 300 gallons of diesel fuel were used in the training pits per year at a rate of three to five gallons per demonstration.

During routine training exercises at the FFTA petroleum hydrocarbons were released into the environment. Undetermined amounts of pure petroleum hydrocarbon product and residues from incomplete combustion of the diesel fuel were released into the soils due to cracks in the floor of the FFTA pits.

## Figure 1
## Physical Location of the Mound Plant

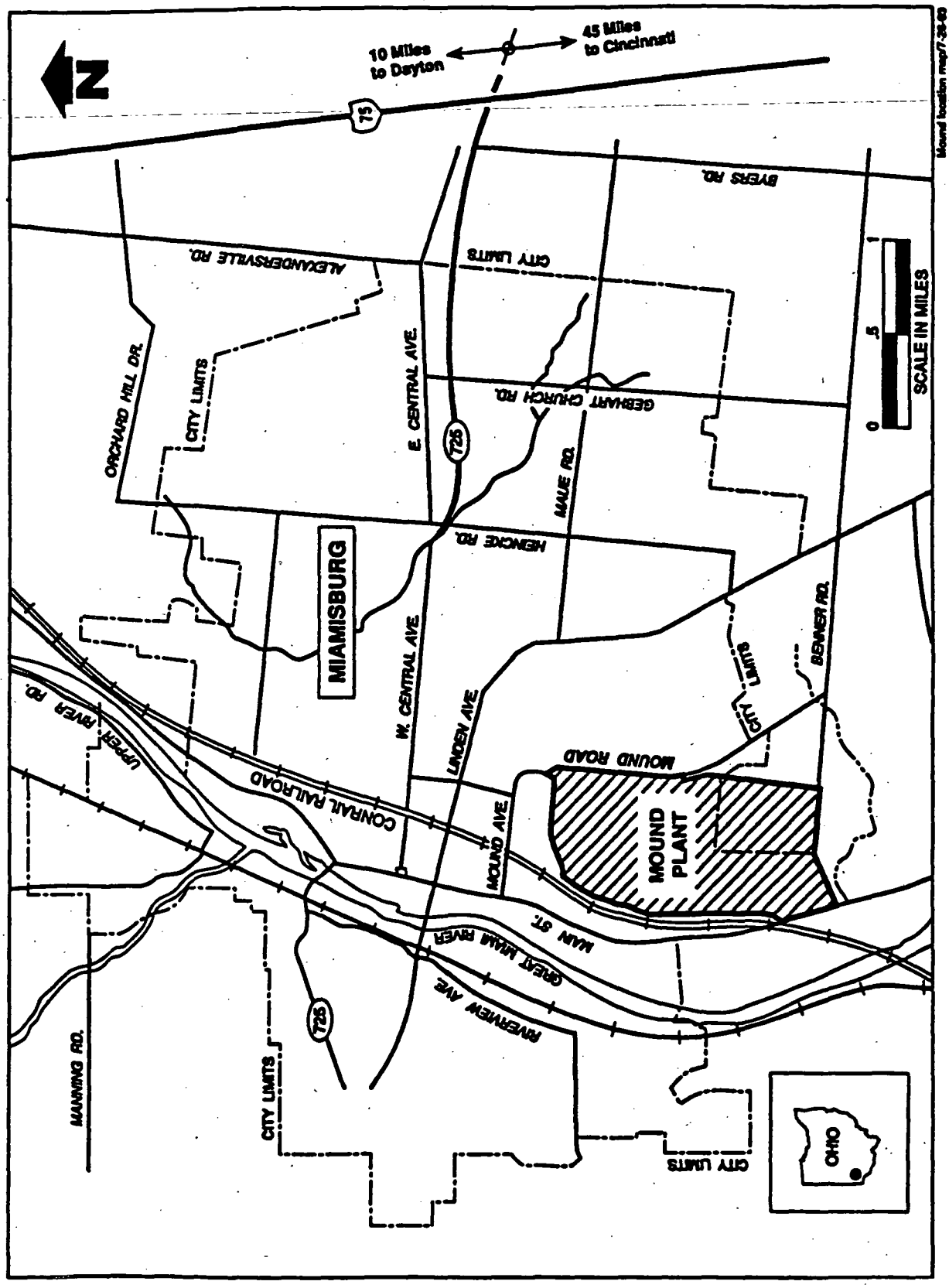
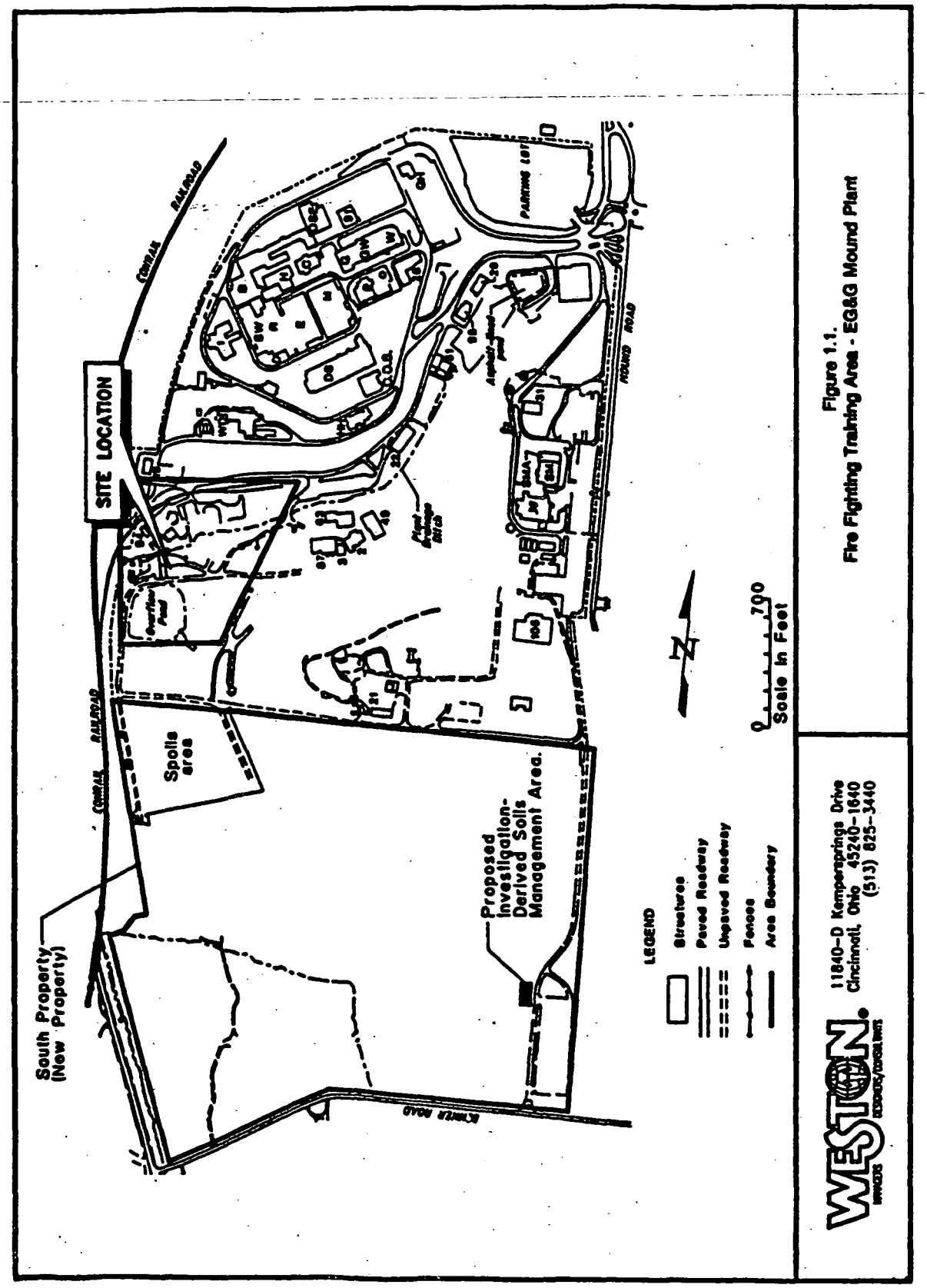



Figure 1.1. Location of Mound Plant, Miamisburg, Ohio.

## Figure 2
## FFTA Site Location



### 4. Efforts to Locate and Obtain Response from Responsible Parties (RP)

Since the Mound Plant is the sole party responsible for the releases of petroleum hydrocarbons, no other Potentially Responsible Parties (PRPs) were contacted to clean up the site.

## B. Organization of Response

Table 1 lists the groups responding to the Action, and their responsibilities.

**Table 1**
**Organization of the Response**

| Names and Addresses | Contact | Brief Description of Duties |
|---|---|---|
| U.S. Department of Energy<br>Miamisburg Area Office<br>P.O. Box 66<br>Miamisburg, OH 45343-00086<br>(513) 865-3597 | Arthur Kleinrath, On-scene Coordinator | Responsible for oversight of removal action. |
| EG&G Mound Applied Technologies<br>P.O. Box 3000<br>Miamisburg, OH 45343-3000<br>(513) 865-4543 | Monte Williams, ER Program Manager | Responsible for overall site management. |
| EG&G Mound Applied Technologies<br>P.O. Box 3000<br>Miamisburg, OH 45343-3000<br>(513) 865-3859 (Spesard)<br>(513) 865-3867 (Coons) | Gary Coons, ER Project Manager | Responsible for general site administration. |
| EG&G Mound Applied Technologies<br>P.O. Box 3000<br>Miamisburg, OH 45343-3000<br>(513) 865-4020 | Keith McMahan, Field Engineer<br>Dennis Gault, Field Engineer | Provided field support for contractors when dealing with Mound Plant operations. |
| EG&G Mound Applied Technologies<br>P.O. Box 3000<br>Miamisburg, OH 45343-3000<br>(513) 865-4020 | Joyce Giesler, Construction Inspector | Located underground utilities and ensured conformance with project specifications. |
| EG&G Mound Applied Technologies<br>P.O. Box 3000<br>Miamisburg, OH 45343-3000<br>(513) 865-4020 | Ray Moss, Health Physics Supervisor | Coordinated and ensured that Health Physics support during earth disturbing activities. |

**Table 1**
**Organization of the Response**

| Names and Addresses | Contact | Brief Description of Duties |
|---|---|---|
| EG&G Mound Applied Technologies<br>P.O. Box 3000<br>Miamisburg, OH 45343-3000<br>(513) 865-4020 | Tom Beal, Safety Coordinator | Ensured that Mound Plant safety procedures and policies were followed. |
| U.S. Environmental Protection Agency<br>HSRM-6J<br>77 West Jackson Street<br>Chicago, IL. 60604<br>(312) 886-5787 | Tim Fischer, USEPA Project Manager | Provided federal agency review of site documents. |
| CH2M Hill<br>411 East Wisconsin Avenue, Suite 1600<br>Milwaukee, WI. 53202-4421<br>(414) - | Regina Bayer | Provided federal agency site overview (contractor monitoring). |
| Ohio Environmental Protection Agency<br>401 East Fifth Street<br>Dayton, OH 45402-2911<br>(513) 285-6468 | Brian Nickel, OEPA Project Manager | Provided state agency review of site documents. |
| Ohio Environmental Protection Regional Air Pollution Control Agency<br>401 East Fifth Street<br>Dayton, OH 45402-2911<br>(513) 285-6456 | Phil Hinrich and Tim Wilson | Provide state agency review of Permit to Install (PTI) and Permit to Operate (PTO) application for biological treatment system. |
| Roy F. WESTON, Inc.<br>11840-D Kempersprings Drive<br>Cincinnati, OH 45240<br>(513) 825-3440 | Gordon Horn P.E., Project Manager | Responsible for WESTON management and overview of FFTA removal. |
| Roy F. WESTON, Inc.<br>11840-D Kempersprings Drive<br>Cincinnati, OH 45240<br>(513) 825-3440 | Andrew Fandozzi, Project Superintendent<br>Ralph Johnson, Project Superintendent<br>Eric Kemper, Project Superintendent<br>Windle McDonald, Project Superintendent | Managed general on-site activities and subcontractors. Site contact for EG&G Mound. |
| Roy F. WESTON, Inc.<br>11840-D Kempersprings Drive<br>Cincinnati, OH 45240<br>(513) 825-3440 | Andy Sperry, Site Safety Officer | Conducted daily site safety meetings and air monitoring. Responsible for overall site safety. |
| ETG Environmental, Inc.<br>4900 Olympic Boulevard<br>Erlanger, KY 41018<br>(606) 282-6137 | Rick Warwick, Project Manager | Removal contractor project manager responsible for subcontractors and for providing labor and equipment for removal action. |

**Table 1**
**Organization of the Response**

| Names and Addresses | Contact | Brief Description of Duties |
|---|---|---|
| ETG Environmental, Inc.<br>445 Earlwood Avenue<br>Oregon OH 43616<br>(419) 693-9900 | Craig Duston, Project Manager | Removal contractor project manager responsible for subcontractors and for providing labor and equipment for removal action. |
| ETG Environmental, Inc.<br>445 Earlwood Avenue<br>Oregon OH 43616<br>(419) 693-9900 | Eli Clevenger, Project Superintendent | Field manager for the labor and equipment and subcontractors used during the removal action. |

## C. Injury or Possible Injury to Natural Resources

### 1. Content and Time of Notice to Natural Resource Trustees

Not applicable

### 2. Trustee Damage Assessment and Restoration Activities

Not applicable

## D. Chronological Narrative of Removal Activities

### 1. Threat Abatement Actions Taken

The following is a chronological narrative of events, as they occurred for the FFTA Removal Action, derived from communication memoranda, phone conversation logs, photo documentation, and site logs.

8 February 1994: Final Action Memorandum / Remedial Site Evaluation (AM/RSE) for the OU5 FFTA Removal Action.

| | |
|---|---|
| 10 March 1994: | GeoProbe sampling conducted along a grid layout to determine area of contamination in the FFTA Remedial Action Area. See Appendix C1. |
| 22 March 1994: | USEPA responds to AM/RSE. |
| 14 April 1994: | Public meeting on FFTA Remedial Action Plan held at the Miamisburg Civic Center. |
| 27 May 1994: | Kick-off meeting for FFTA Removal Action. |
| 8 June 1994: | Excavation of treatment pads begin. |
| 23 June 1994: | Treatment Pad Background samples collected. See Appendix C2. |
| 25 July 1994: | Mound submitted a request to Ohio EPA and the Regional Air Pollution Control Agency for a temporary exemption from the requirements for a permit to install (PTI) and permit to operate (PTO). |
| 27 July 1994: | Contractor began excavation of contaminated soils from the training pit area. |
| 4 August 1994: | Pit Closure Sampling–soil samples were collected from the open excavation to determine if all contaminated soil had been removed. See Appendix C3. |
| 31 August 1994: | Contractor began placement of initial clay liner. The Regional Air Pollution Control Agency granted a |

temporary exemption from the requirements for a PTI and PTO for the FFTA treatment system.

10 January 1995: Additional Closure Sampling samples taken from under Training Pit #2 and where contamination was found outside the excavation shoring. See Appendix C4.

18 January 1995: All contaminated soils had been excavated and stockpiled adjacent to the excavation.

1 August 1995: Mound conducted initial inoculation of the soil on both treatment pads with microbes.

15 August 1995: Contractor conducted sampling of soils from both treatment pads to determine the status of the bioremediation. See Appendix C5.

14 September 1995 DOE requests concurrence from OEPA and USEPA to change treatment level for TPH to 105 ppm. This would be equal to the most stringent BUSTR TPH requirement. See Appendix D1.

28 September 1995: Sampling of both the pads and staged soil was completed to check if bio-treatment had reached completion. See Appendix C6.

3 October 1995: Ohio EPA approves a change in the proposed clean-up criteria of petroleum hydrocarbon contaminated soils from 40 ppm of Total Petroleum Hydrocarbons (TPH) to 105 ppm TPH. The change reflects existing regulatory guidelines for the clean-up criteria for

petroleum contaminated soils in the State of Ohio. See Appendix D2.

30 October 1995: Based on the 28 September sampling results the soils from both the staging area and the two treatment piles met the Ohio EPA clean-up criteria for petroleum contaminated soils. The soils were transported and disposed of in the Mound Spoils Area.

## 2. Treatment, Disposal, Alternative Technology Approaches Pursued and Followed

The FFTA Site Remediation involves the remediation of petroleum hydrocarbon contaminated soils. The contamination was detected through soil sampling and analyses conducted at the FFTA as part of an OU-3 Limited Field Investigation (LFI). Based on the results of the LFI several remedial technologies were considered including the following: ex-situ biological remediation, in-situ biological remediation, off-site disposal, and administrative controls. Based on cost for treatment of the existing contaminated soil and potential for future use, an ex-situ treatment facility, including two treatment pads, was constructed.

Under OAC 3745-31-03 (A) (1) (nn), remedial activities conducted in compliance with CERCLA Section 121 (e) are granted a permanent exemption from all Federal, state, and local permits. As per the Federal Facilities Agreement (FFA), Mound would comply with the substantive requirements of all permits.

Two permit applications, a Permit To Install (PTI) and a Permit To Operate (PTO), for the biological remediation of petroleum contaminated soil are required by the Ohio EPA for construction and operation of the treatment pads. The remedial effort conducted at the treatment pads may cause the release to the atmosphere of VOCs and SVOCs. A PTI, as required by Ohio Administrative Code (ACO) 3745-31-02, must be obtained for the installation of a process which creates a new air

contaminant source unless the process is specifically exempted or granted a discretionary exemption. Therefore, a letter indicating exemption from the PTI was prepared and submitted to OEPA and its local representative, the Regional Air Pollution Control Agency (RAPCA), with all the substantive required information.

A PTO, as required by OAC 3745-35-02, must be obtained for the operation of a process which creates a new air contaminant source. As stated above, the remedial effort may cause the release of VOCs and SVOCs to the atmosphere. There are no exemptions or variances identified in OAC 3745-35-03 and 3745-35-05 for CERCLA removal actions as is the case for a PTI. However, there is a rule for pollution control devices such that if the emission is under 15 pounds per hour of VOCs for pollution control devices a PTO is not required. Based on calculations for the rate of emission, the FFTA facility is exempt. However, as previously stated under the FFA, it was agreed that Mound would comply with the substantive requirements of all permits. In accordance with directives contained within the FFA, information required for the submission of a PTO application, including an air emission estimation in accordance with USEPA guidelines, was submitted to OEPA and its local representative RAPCA indicating intentions to comply with the substantive requirements of the PTO.

Based on information provided by Mound, the OEPA and RAPCA agreed that a PTI/PTO for the FFTA treatment pads is not required.

Site preparation activities were conducted prior to excavation and included a horizontal and vertical construction survey; installation of silt fences and hay bales; and other erosion and sedimentation control facilities. A decontamination area was established on an existing concrete pad and all required safety equipment was mobilized to the FFTA Site. The temporary soil staging area for excavated soil was constructed. Building 34 electrical system was upgraded and extended to the treatment pad area. An existing potable water source in Building 34 was accessed and extended to the treatment pad area.

Removal activities included removal of pit sediments within both concrete pits and relocation of soils to the temporary soil staging area. Concrete from both pits were scarified to remove petroleum hydrocarbon contamination that might have adhered to the surface. The scarified material was removed and staged with other potentially-contaminated soil and sediment. The concrete pits were then dismantled and disposed of off-site as construction debris at a municipal landfill.

Underground fuel supply and drain lines associated with the FFTA pit operations were decontaminated prior to being removed. Soil excavated in order to facilitate removal of the underground lines was staged at the temporary soil staging area. Decontaminated piping was segregated and disposed of off-site as construction debris at a municipal landfill.

Contaminated soil associated with FFTA Pit #2 operations were removed. Field screening and subsequent excavation was performed on the base and side walls of the excavation until total petroleum hydrocarbon (TPH) field screening results indicated that the cleanup criteria was achieved as defined in the AM/RSE. When the field screening level was reached and prior to backfill, verification samples were collected to verify that the 40 ppm (laboratory analysis) cleanup criteria has been achieved. Backfill and compaction to grade of the pit and excavated drain lines was accomplished with standard construction fill obtained from an off-site approved source.

Potentially-contaminated soil, sediment, and scarification materials were placed in the temporary staging area. Prior to relocation of staged materials to the treatment pads, samples were collected and analyzed to determine the amount of microbial material and nutrients required for treatment.

Two monolithically combined treatment pads, including a roof structure and facilities for stormwater run-off and leachate collection, were constructed on the hillside north of temporary staging area.

To achieve a one percent slope for drainage and obtain adequate surface area for the bioremediation piles, the hillside was terraced into two levels at a difference in elevation of approximately eight (8) feet.

After the cut and fill operations were completed, final grading prior to construction of the treatment pads took place. The exposed sub-grade was scarified to a depth of at least 6 inches and compacted to 95 percent of standard proctor (ASTM D 698), maximum dry density. A nuclear density gauge was used to measure compaction of the soil. This surface provided a firm, unyielding foundation with no sharp changes or abrupt breaks in grade. Standing water or excessive moisture was not allowed. Samples of the existing soil were taken and analyzed for TPH and BTEX to establish background levels prior to adding any contaminated soil.

In order to minimize accumulation of precipitation on treatment pads and to facilitate the bioremediation process, a permanent roof structure was constructed to cover both treatment pads. Stormwater on the roof is diverted into piping and discharged into a nearby drainage ditch which was upgraded to handle the additional run-off. Run-on and run-off at the treatment pads was effectively minimized by the use of diversion structures. Stormwater collection and diversion swales were constructed upgradient of the treatment area and will discharge into an improved drainage ditch located south of the treatment area. An earthen berm constructed around the treatment pads also reduces runon.

The treatment pads were sloped for liquids collection and constructed using a two-liner clay construction, separated by a permeable leachate collection layer. The easternmost (upper) treatment pad (Treatment Pad #1) has approximate dimensions of 75 feet by 45 feet (3,375 square feet) and the westernmost (lower)

treatment pad (Treatment Pad #2) has approximate dimensions of 60 feet by 45 feet (2,700 square feet). At a depth of nine inches, approximately 94 cubic yards of capacity is available on Treatment Pad #1 and approximately 75 cubic yards of capacity is available on Treatment Pad #2, totaling approximately 169 cubic yards.

The treatment pads have a secondary clay liner and a primary liner separated by leachate collection system. The purpose of the secondary liner is to protect subsurface soil and groundwater in the event of seepage penetrating the primary liner. Liquids penetrating the primary liner will be diverted to a leachate collection piping and discharge into a designated sump. The leachate collection system serves as a leak detector of the primary liner.

The secondary liner was constructed of a 6-inch thick layer of clay compacted to 100 percent standard proctor density (ASTM D 698) maximum dry density, at 2% to 4% above optimum moisture content. The clay used for both the primary and secondary liner was classified by the Unified Soil Classification System as inorganic clay with a CL, CH, or CL-ML grouping and was obtained from an Mound-approved offsite source. A sheepsfoot vibratory roller was used to facilitate required compaction. After compaction was verified by the use of a nuclear density gauge, three undisturbed samples were collected from each of the primary and secondary liners and submitted to a qualified laboratory for hydraulic conductivity analysis. A permeability of $1 \times 10^{-8}$ cm/sec was achieved.

A leachate/leak detector system consisting of a geotextile liner, a two inch diameter, Schedule 80, perforated leachate collection pipe at the down gradient edge of each treatment pad, and an eight inch thick layer of drainage sand compacted to 100 percent standard proctor density was installed between the primary and secondary liners. The geotextile liner prohibits mixing of the clay and sand liner. The perforated pipe lies in a northeast to southwest orientation and span the entire length of each pad. Leachate collection piping drains into one of

two precast concrete sumps. To prevent clogging of the drainage pipe with fine sand particles, a geotextile liner was wrapped around the perforated piping.

The primary liner was constructed using a twelve inch thick layer of clay. The primary liner was constructed, compacted, and tested as described above for the secondary liner. The purpose of the primary liner is to direct run-off from the treatment pads into the run-off collection system and protect surrounding area by preventing potentially-contaminated water from uncontrolled run-off.

The OEPA recommends that a system be installed to collect any precipitation that comes in contact with the soil being treated. A run-off collection system was also installed between the primary liner and the soils being treated to allow for the collection and diversion of liquids passing through or over the treatment areas. The run-off collection system consisted of a four inch diameter, Schedule 80, perforated pipe installed at the down gradient edge of each treatment pad. A six inch thick layer of 3/4-inch crushed gravel was placed at the uppermost layer of each treatment pad. To prevent infiltration and blockage caused by the crushed gravel layer, geotextile liner was wrapped around the perforated piping. Run-off collection piping was sloped and piped to drain into a dedicated second precast concrete sump.

Both concrete sumps (run-off and leachate collection) were installed at the southeast corner of Treatment Pad #2. Because of availability and installation requirements, a standard size precast concrete manhole was used for the purpose of a sump. Inside dimensions of each sump measures five feet in diameter and nine feet deep. Allowing for two feet of freeboard and the installation of a sump pump, each sump has the capacity of approximately 1000 gallons (137 cubic feet).

The sump pump is electrically powered and will start the pumping process once the water level reaches midpoint within the sump. A high-water alarm will activate if the water level reaches the top of the freeboard. With a design capacity of 120

gallons per minute (gpm), the pump is sized for an approximate cycle time of eight minutes before shutting off with a minimum depth of seven inches left in the sump for minimum pump submergence. The pump will force water through a check valve and into one of two 2000-gallon storage tanks that are located northwest of the sump. The penetrations of the drainage pipes into the sump are sealed with leak-proof connections.

Operation and maintenance of the treatment system, including promotion of the bioremediation process, sampling to determine progress and confirmation of remediation, and maintenance of the treatment structures, commenced in early summer 1995 after mechanical problems associated with the sumps were repaired.

Treatment of the soils began by adding nutrients, in the form of nitrogen and phosphorous fertilizer, to better promote bioremediation. After adding the layer of contaminated soil and spreading it on the pad, the soil was inoculated with microbe cultures and their nutrients. The microorganisms used for the treatment of the petroleum contaminated soils were supplied by Sybron Chemicals, Inc. (Sybron), an international company that supplies chemical specialties and related technologies. The microorganisms supplied by Sybron biologically break down the petroleum contaminated wastes in the soil into harmless components. Approximately 50 pounds of microbes and 600 pounds of nutrients were added to the soil. The nutrients were added to the soil as follows:

- Approximately 600 pounds of Sybron II nutrient spread evenly over entire area.
- Till soil evenly.
- Approximately 50 pounds of Sybron diesel microbe mix hydrated and spread evenly over the entire treatment area.
- Till soil evenly.

The soil, nutrients, and microbes are mixed on the treatment pads. The soil has a maximum thickness of nine inches.

Aeration and tilling is accomplished utilizing a tractor-drawn rototiller capable of a nine inch deep cut. The contaminated soils are tilled until a homogeneous mix can be observed. At the completion of the bioremediation cycle, soil samples are collected to verify that the treatment criteria have been achieved. Treated soils are then be transported to the Mound Spoils Area for final disposition.

A watering device installed as part of the treatment system functions automatically or manually to maintain adequate moisture for the bioremediation process to occur.

### 3. Public Information and Community Relations Activities Taken

The intent of the removal action (Fire Fighting Training Area Response Action) was described during a public information meeting held on 14 April 1994 at the Mound Action Committee meeting in the Miamisburg Civic Center. The AM/RSE was issued for public comment from 21 February 1994 through 23 March 1994.

## E. Resources Committed

A Removal Site Evaluation was prepared as specified in Section 300.410 of the NCP (40 CFR 300.410) and incorporated into the Action Memorandum. The AM/RSE provided an assessment of the potential exposure to petroleum hydrocarbon contaminants from known on-site contaminated source areas. The RSE provided a basis for the need for a removal action to mitigate potential contaminant exposure to human or animal populations. The RSE concluded that a threat of potential exposure existed and that a removal action was warranted.

Since this was a non-Fund Federal lead action and authorization of Superfund money was not required, conceptual cost estimates were not included in the RSE. Costs based on the contract award and change orders resulting from changed conditions in the field totaled $1,064,634 for preliminary investigation, excavation of contaminated soils, construction of the FFTA treatment pads and facilities, and treatment of contaminated soil.

# II. EFFECTIVENESS OF THE REMOVAL

## A. Actions Taken by Potentially Responsible Parties (PRP' s)

DOE conducted the removal. There were no other PRPs.

## B. Actions by State and Local Agencies

Ohio EPA provided state agency review of site documents. Ohio EPA and RAPCA address the PTI/PTO. There was no local agency mobilized in the removal action.

## C. Actions Taken by Federal Agencies and Special Teams

The Department of Energy was responsible for the removal action and provided review of site documents. Ohio EPA and US EPA were kept informed of progress on the work.

## D. Actions Taken by Contractors, Private Groups, and Volunteers

Mound acted as prime contractor on the FFTA Project, overseeing the construction subcontractor and other second tier subcontractors to verify conformity to the construction drawings and specifications. WESTON confirmed that all health and safety protocols were observed. WESTON also acted as an intermediary between the various subcontractors and Mound. ETG Environmental, Inc. was the general construction subcontractor responsible for completion of all construction activities in conformance with the design drawings and specifications. ETG Environmental, Inc. completed all excavation of contaminated soils and construction of treatment pads. The construction of the pads included initial grading of area and installation of clay and geotextile liners and final grading at completion of project. Radius Construction Co., Inc. was the contractor responsible for design, fabrication and delivery of treatment pad structure. Fryman-Kuck, Inc., a second tier subcontractor, completed all concrete footer placement for the FFTA structure,

installation of pilings around contaminated soils at the fire fighting training pits, and assembly of FFTA treatment structure. Other subcontractors to WESTON included Shaw, Weiss, and DeNaples, Inc. which conducted all pre-construction and as-built surveys, and Bowser-Morner which conducted all concrete and geophysical testing.

# III. DIFFICULTIES ENCOUNTERED

## A. Items that Affected the Response

Problems encountered prior to and during the construction of the FFTA treatment system included:

- Shoring along the road (south side of excavation) appeared to have moved during excavation. Bracing was installed to support the shoring so that additional excavation could be completed within all established safety guidelines.

- As excavation of the contaminated soils progressed additional petroleum hydrocarbon contaminated soils were encountered beyond the original limits determined in pre-excavation sampling. The volume of contaminated soils increased from the predicted 330 cubic yards to over 400 cubic yards.

- Due to the increased volume of contaminated soil encountered during excavation additional temporary storage pads had to be constructed.

- Problems were encountered with the concrete used in the construction of the footers for the treatment pad structures. The ultimate strength of the concrete did not meet the strength as required in the specifications. Cores were taken from the footers and tested to determine the in place condition of the concrete. Test results revealed that the concrete in the footers was within ASTM standards for meeting the specified strength.

Constant communication between the WESTON representative, the Mound Project Manager, DOE, Ohio EPA, USEPA, and stakeholders helped to eliminate potential problems and to minimize the effect of the problems encountered.

## B. Issues of Intergovernmental Coordination

Intergovernmental coordination efforts between federal and state parties were successful for this removal action.

## C. Difficulties Interpreting, Complying With, or Implementing Policies and Regulations

No difficulties in interpreting, complying with, or implementing policies and regulations were encountered during this removal action.

# IV. RECOMMENDATIONS

## A. Means to Prevent a Recurrence of the Discharge or Release

Since the FFTA treatment structure was designed to mitigate any future release problems, no recommendations apply.

## B. Means to Improve Removal Activities

There are no recommendations to improve removal activities at this site.

## C. Proposals for Changes in Regulations and Response Plans

There are no proposals for changes in regulations and response plans as they pertain to this site.

## LIST OF SUPPLEMENTAL DOCUMENTS

The following list contains titles of additional reports and documents concerning the Mound FFTA Remedial Action.

Contact Arthur Kleinrath, On-Scene Coordinator for the Mound FFTA Site at (513) 865-3597 to request access to these supplemental documents.

### DOCUMENTS

Action Memorandum/Removal Site Evaluation

Construction Specifications

Health and Safety Plan and amendments

O&M Manual

# Glossary of Abbreviations and Definitions

| | |
|---|---|
| AM/RSE | Action Memorandum/Removal Site Evaluation |
| BTEX | Benzene, Toluene, Ethylbenzene, and Xylene |
| CEARP | Comprehensive Environmental Assessment and Response Program |
| CERCLA | Comprehensive Environmental Response, Compensation and Liability Act |
| DAO | Dayton Area Office |
| D&D | Decontamination and Decommissioning |
| DOE | U.S. Department of Energy |
| EPA | U.S. Environmental Protection Agency |
| ER | Environmental Restoration (Program) |
| FFA | Federal Facility Agreement |
| FS | Feasibility Study |
| HASP | Health and Safety Plan |
| NEPA | National Environmental Policy Act |
| NCP | National Oil and Hazardous Substance Pollution Contingency Plan |
| NPL | National Priorities List |
| OAC | Ohio Administrative Code |
| OEPA | Ohio Environmental Protection Agency |
| OSHA | Occupational Health and Safety Administration |
| OU | Operable Unit |
| PA | Preliminary Assessment |
| pCi/g | picocurie per gram |
| PID | Photo-ionization Detector |
| ppb | parts per billion |
| PPE | Personnel Protective Equipment |
| PRP | Potentially Responsible Party |
| PSI | Pounds per square inch |
| QAPP | Quality Assurance Project Plan |
| RA | Remedial Action |

| | |
|---|---|
| RA | Removal Action |
| RCRA | Resource Conservation and Recovery Act |
| RD | Remedial Design |
| RI/FS | Remedial Investigation/Feasibility Study |
| RSE | Removal Site Evaluation |
| SARA | Superfund Amendments and Reauthorization Act of 1986 |
| SOP | Standard Operating Procedure |
| SOW | Statement of Work |
| TPH | Total Petroleum Hydrocarbons |
| WESTON | Roy F. Weston, Inc. |
| WD | Waste Disposal |

# APPENDICES

**Appendix A**

**Site Location Map and Site Drawings**

**Appendix B**

**Photograph Documentation**

**Appendix C**

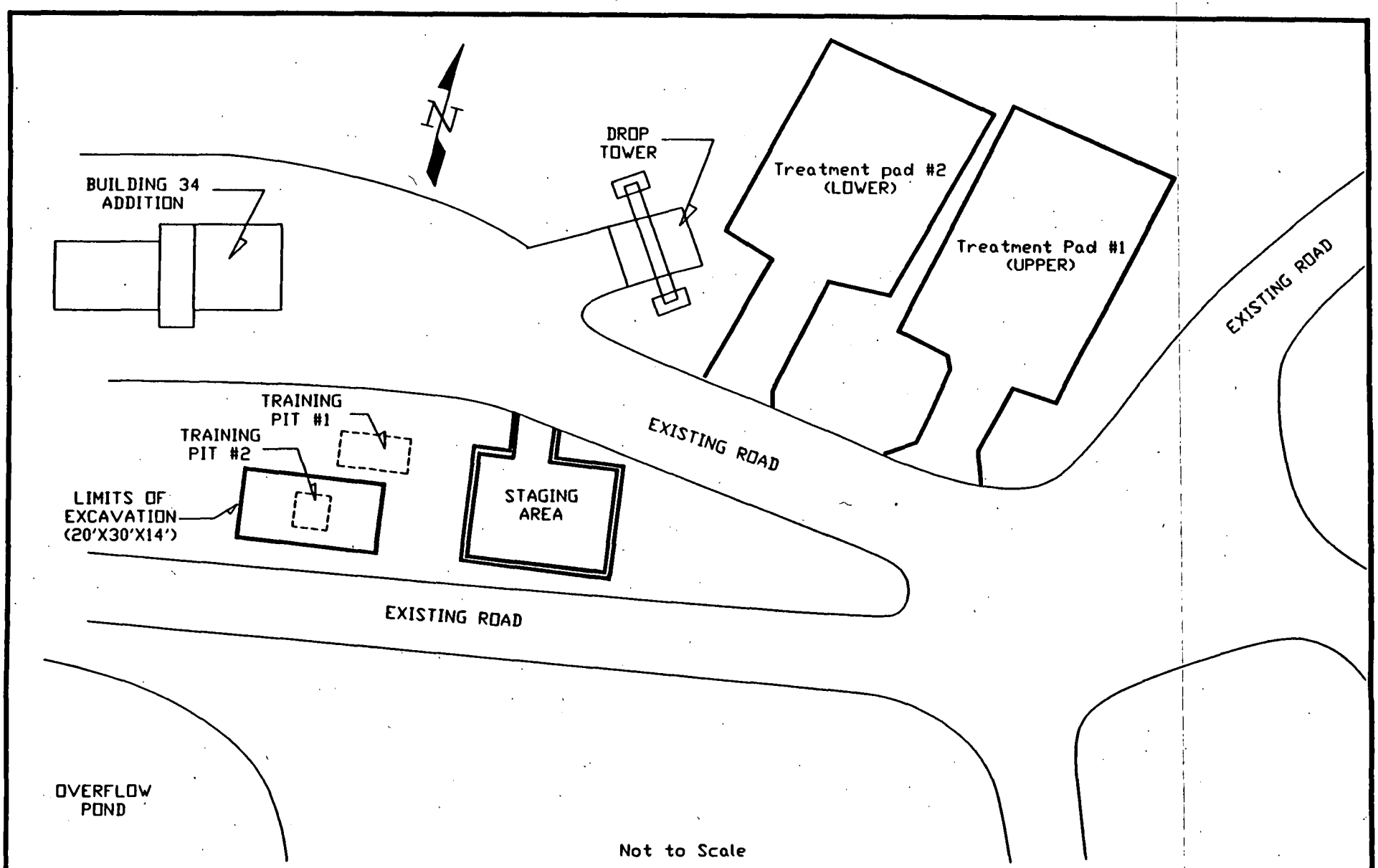
**Sample Results**

**Appendix D**

**Treatment Level Modification**

# APPENDIX A

# SITE LOCATION MAP AND SITE DRAWINGS

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(513) 825-3440

**Figure 3.2.**

**Site Plan**

G:\SKETCH3\MOUND\FFTA\FFTASITE

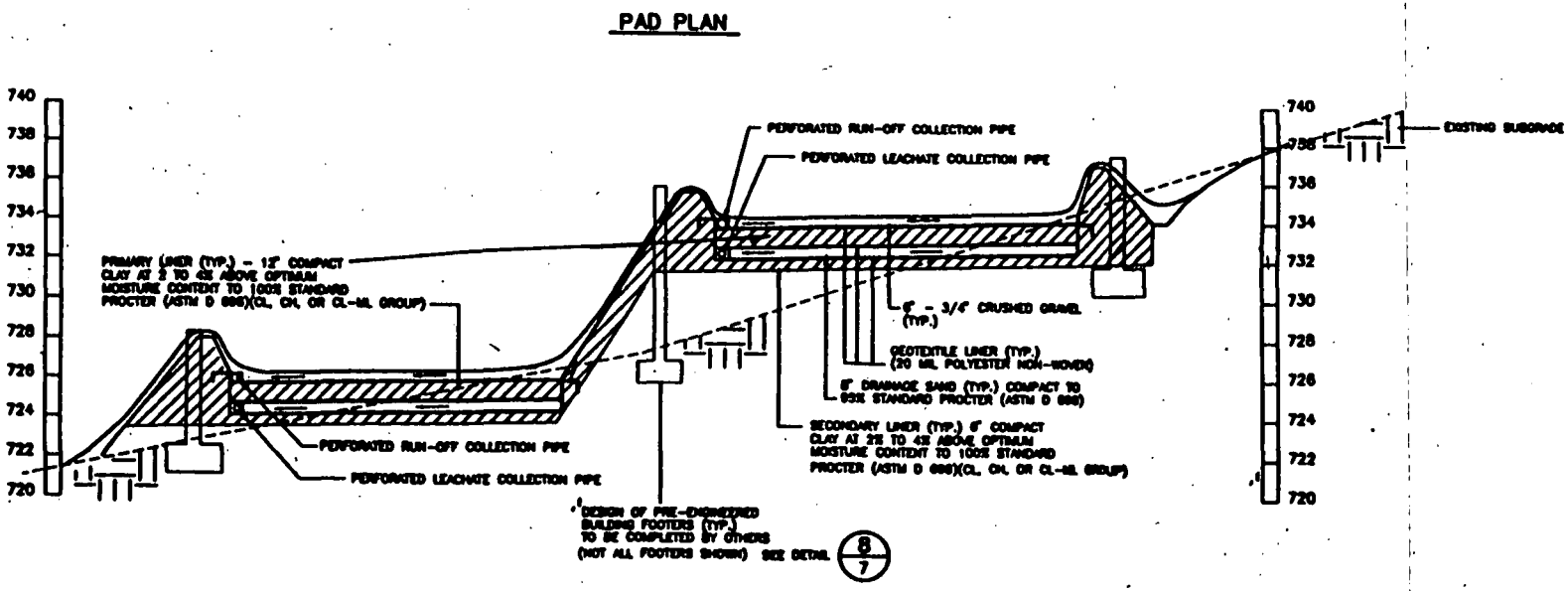


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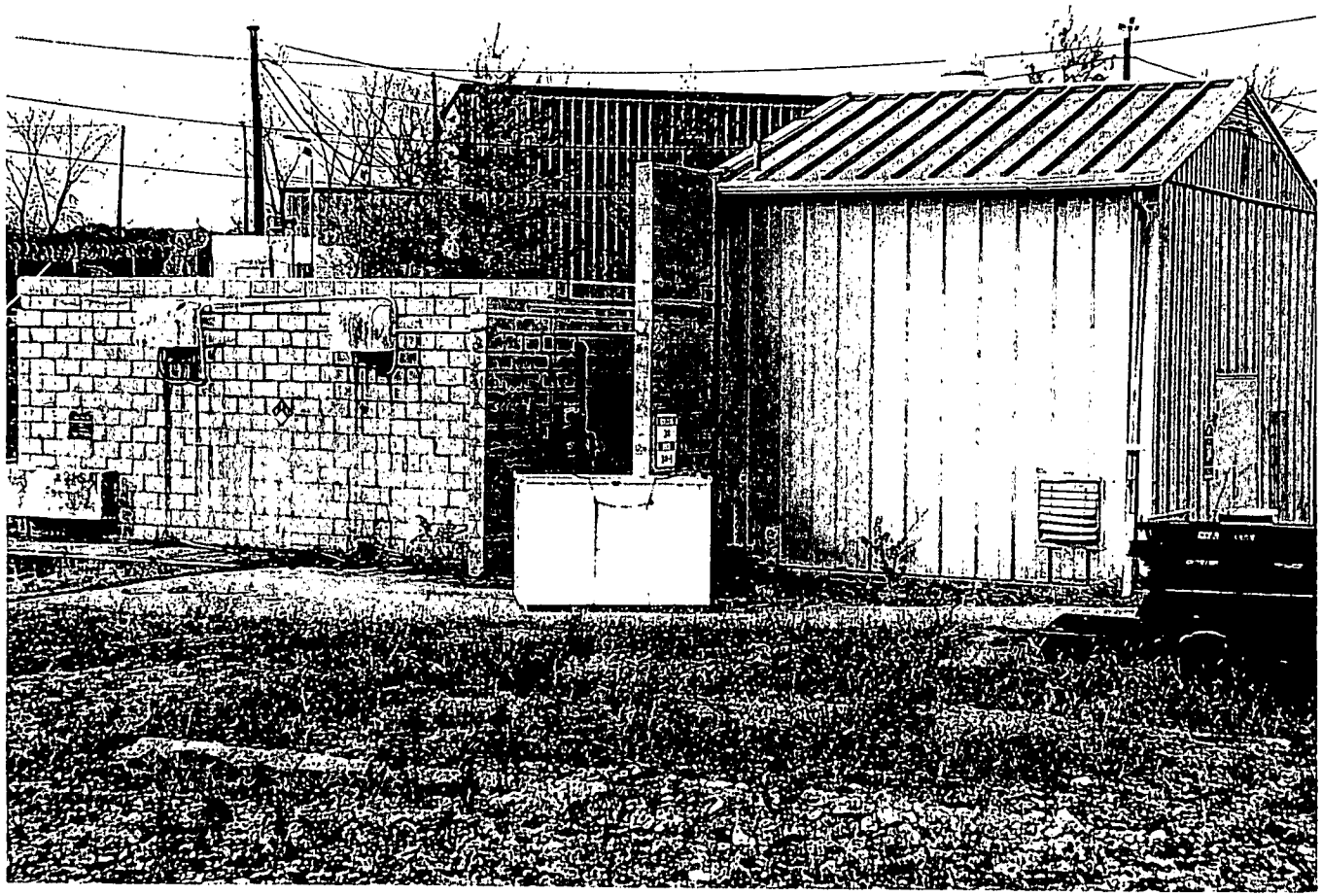
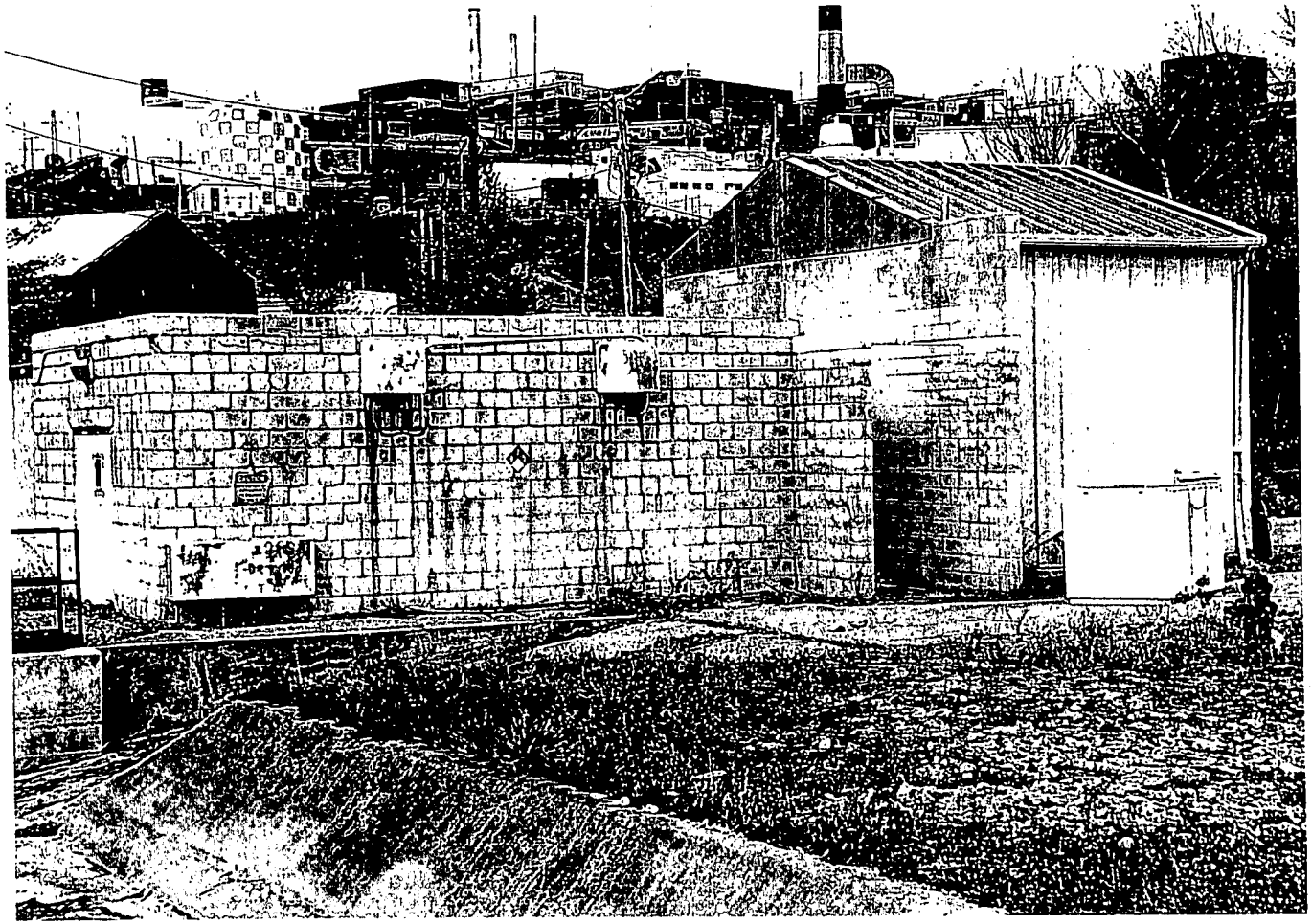
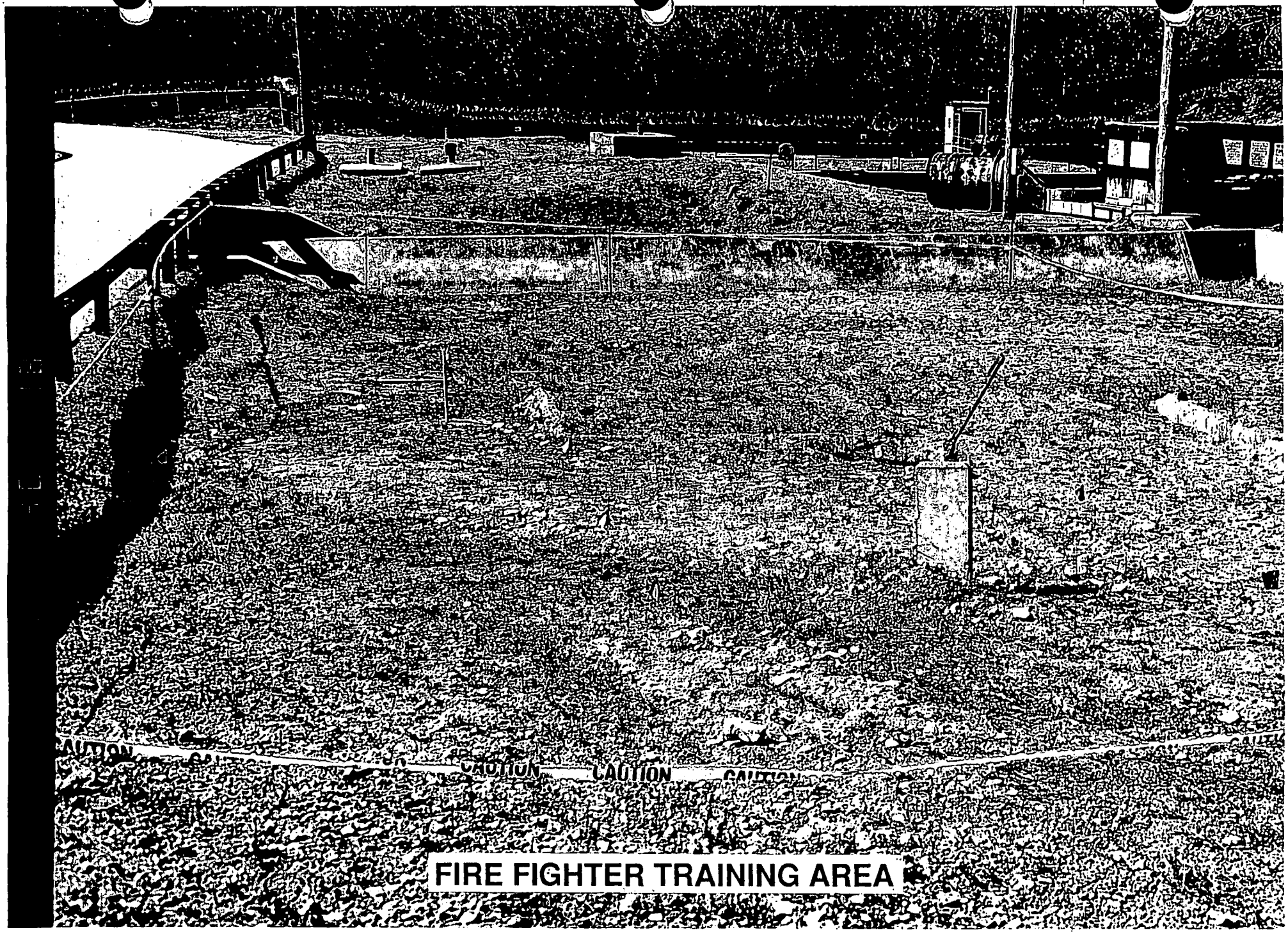
**Figure 3.3.**
**Treatment Pad Cross Section**

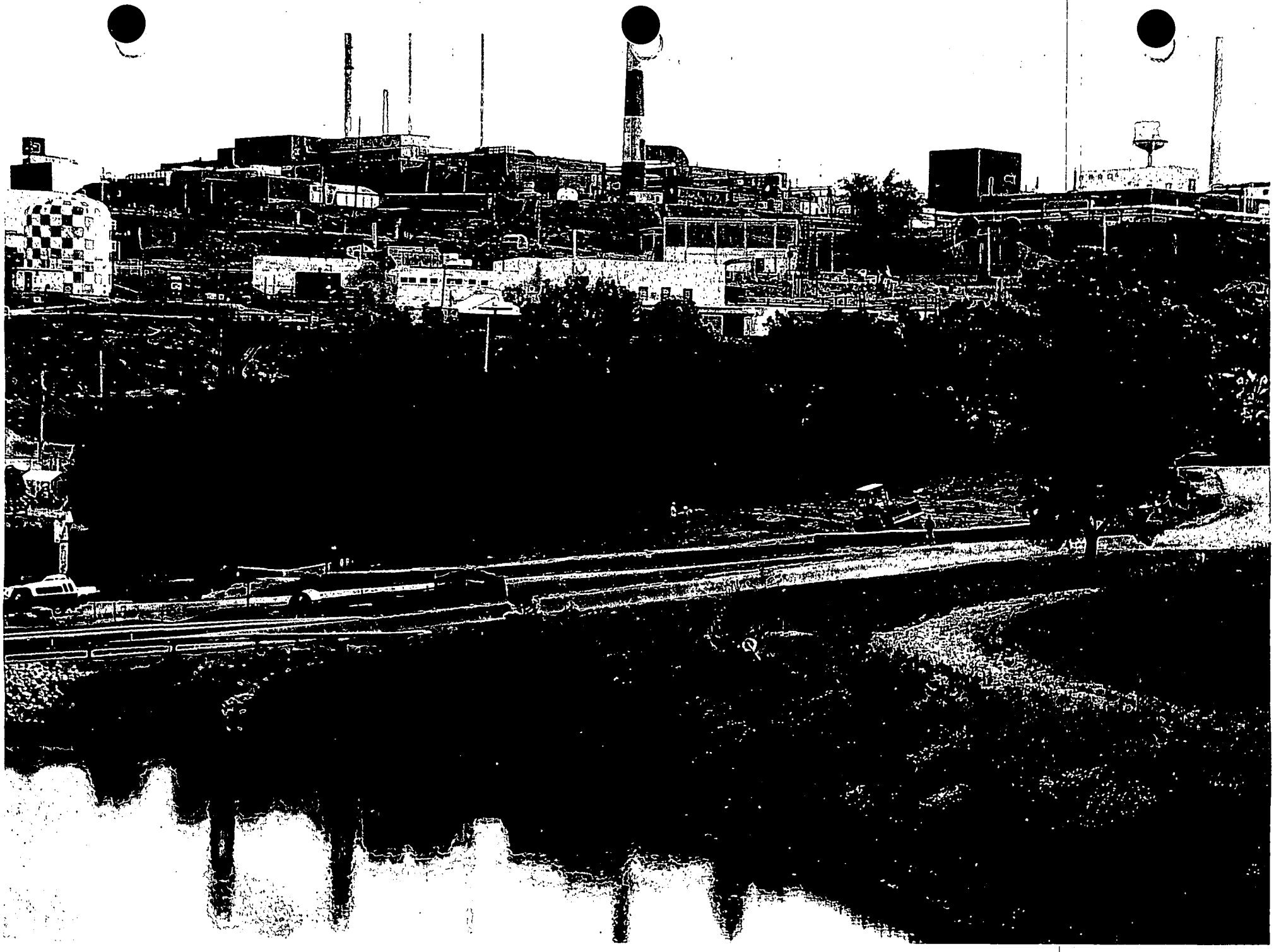
# APPENDIX B

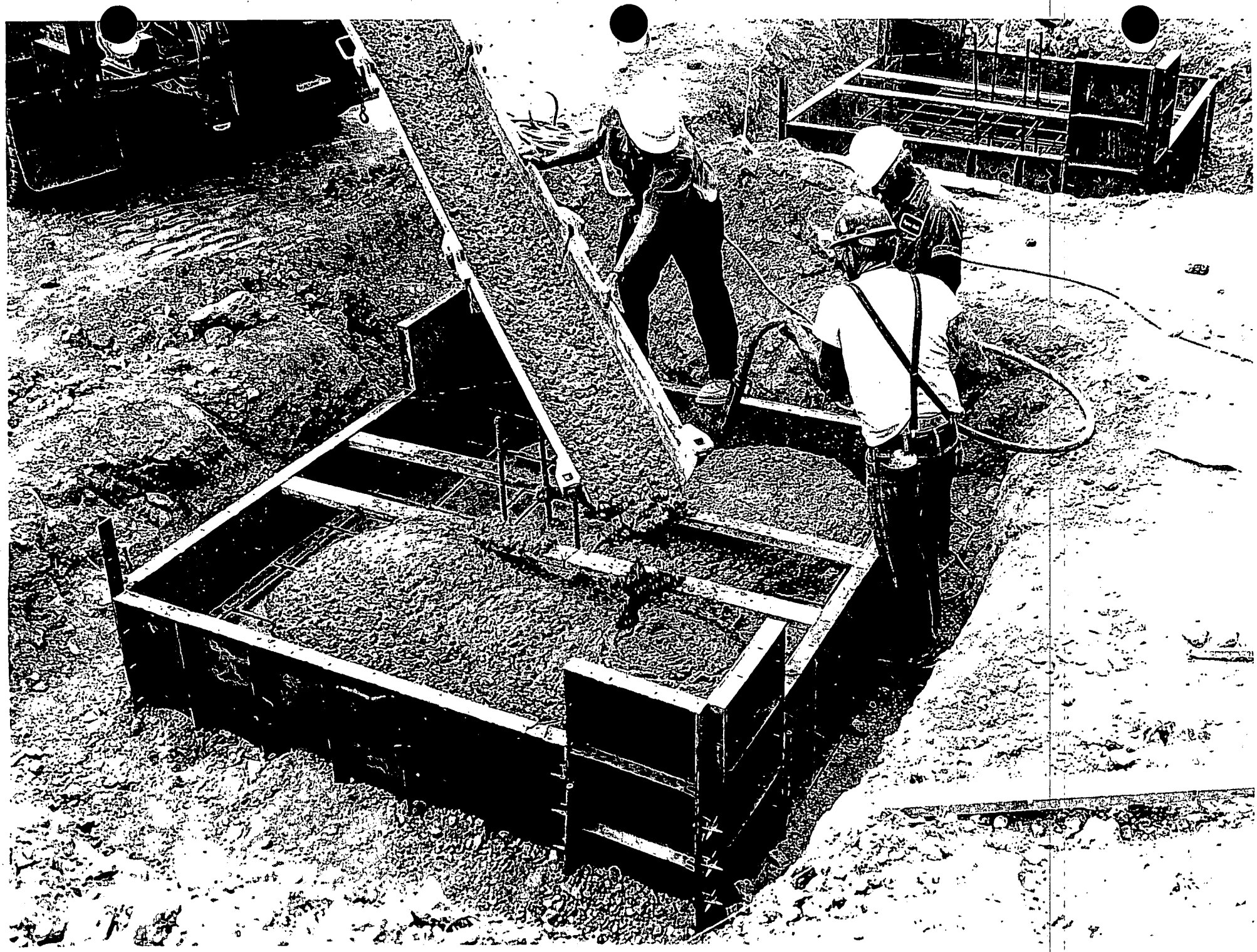
# PHOTOGRAPH DOCUMENTATION

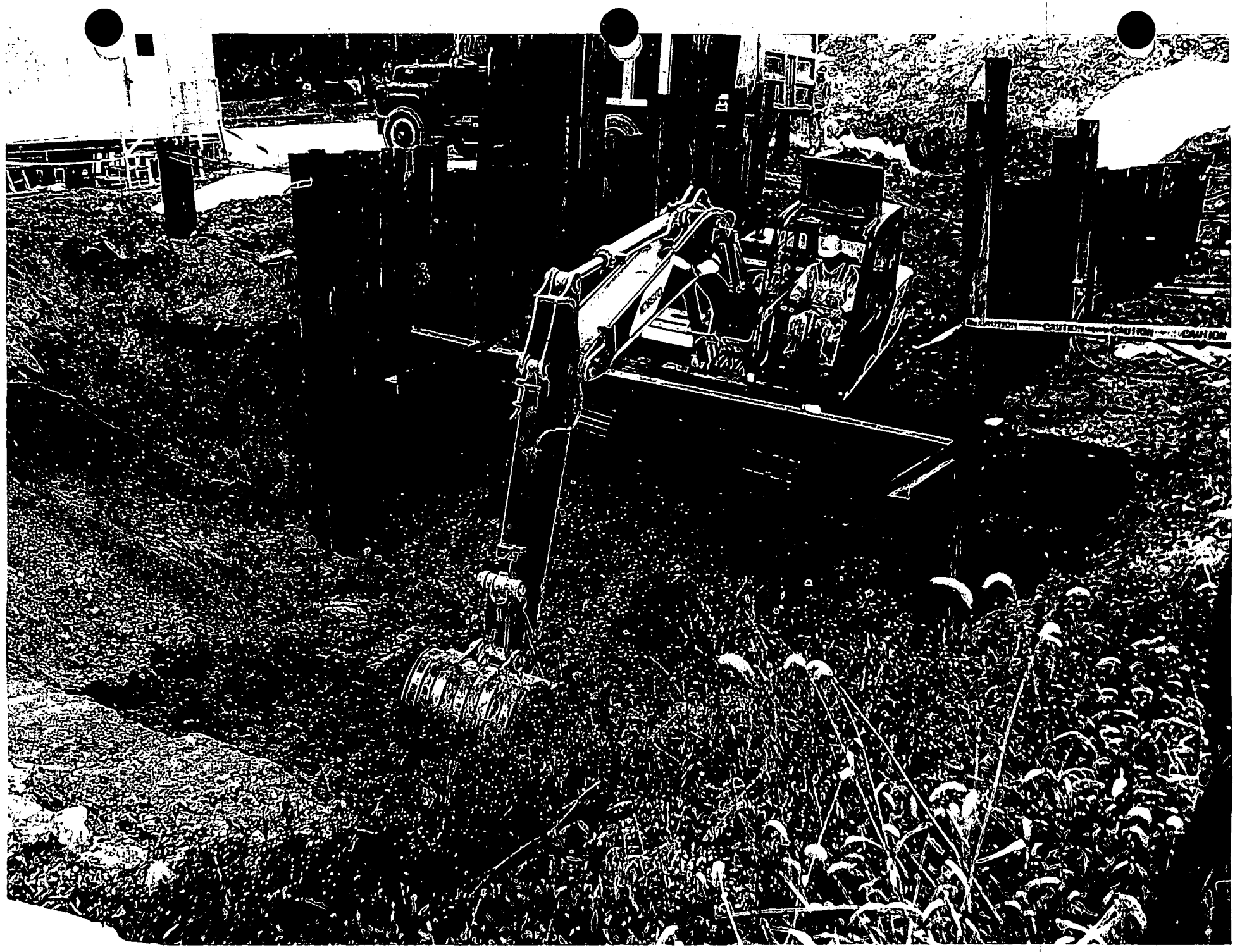





CAUTION
CAUTION
FIRE FIGHTER TRAINING AREA






CAUTION
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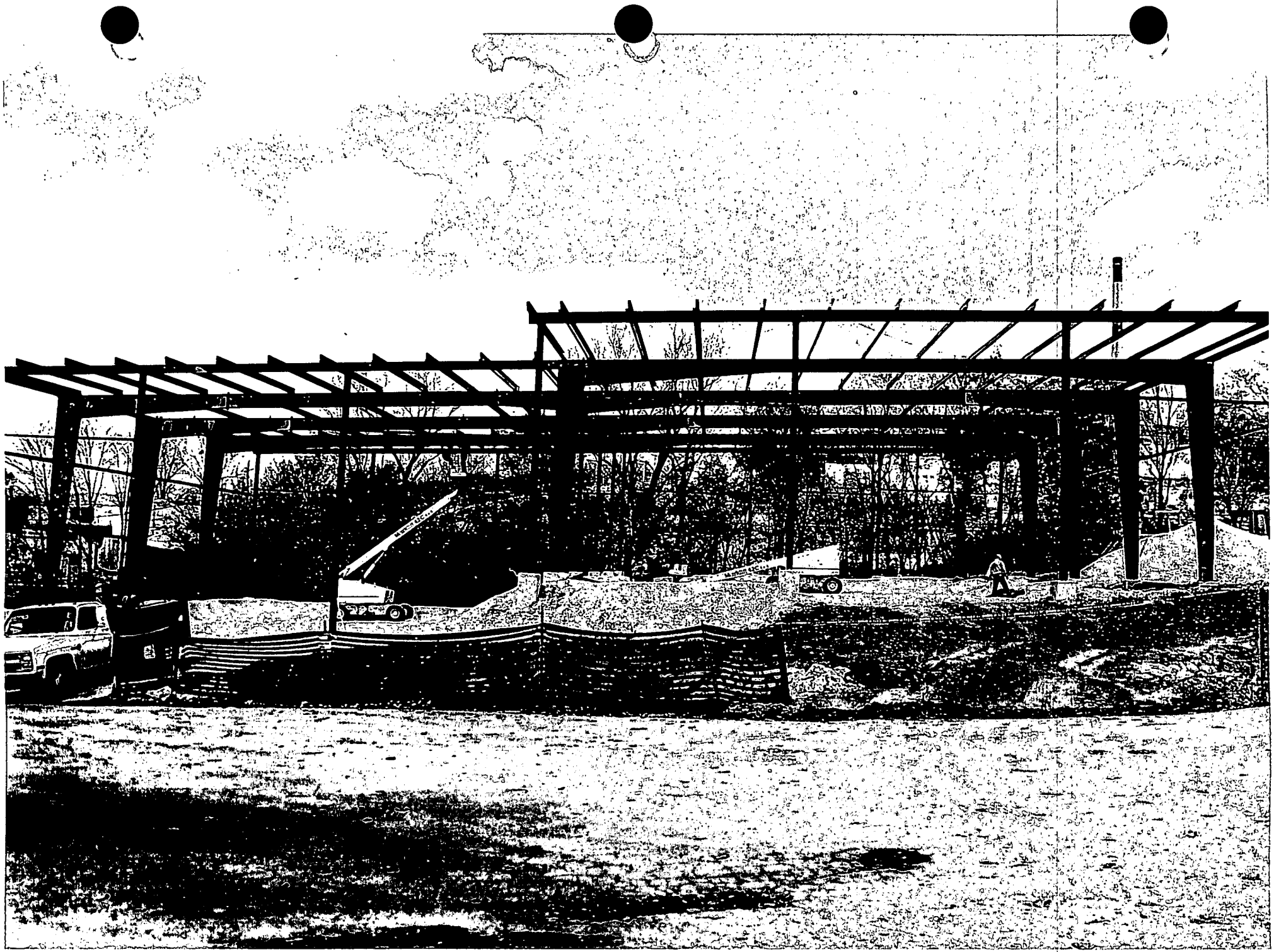
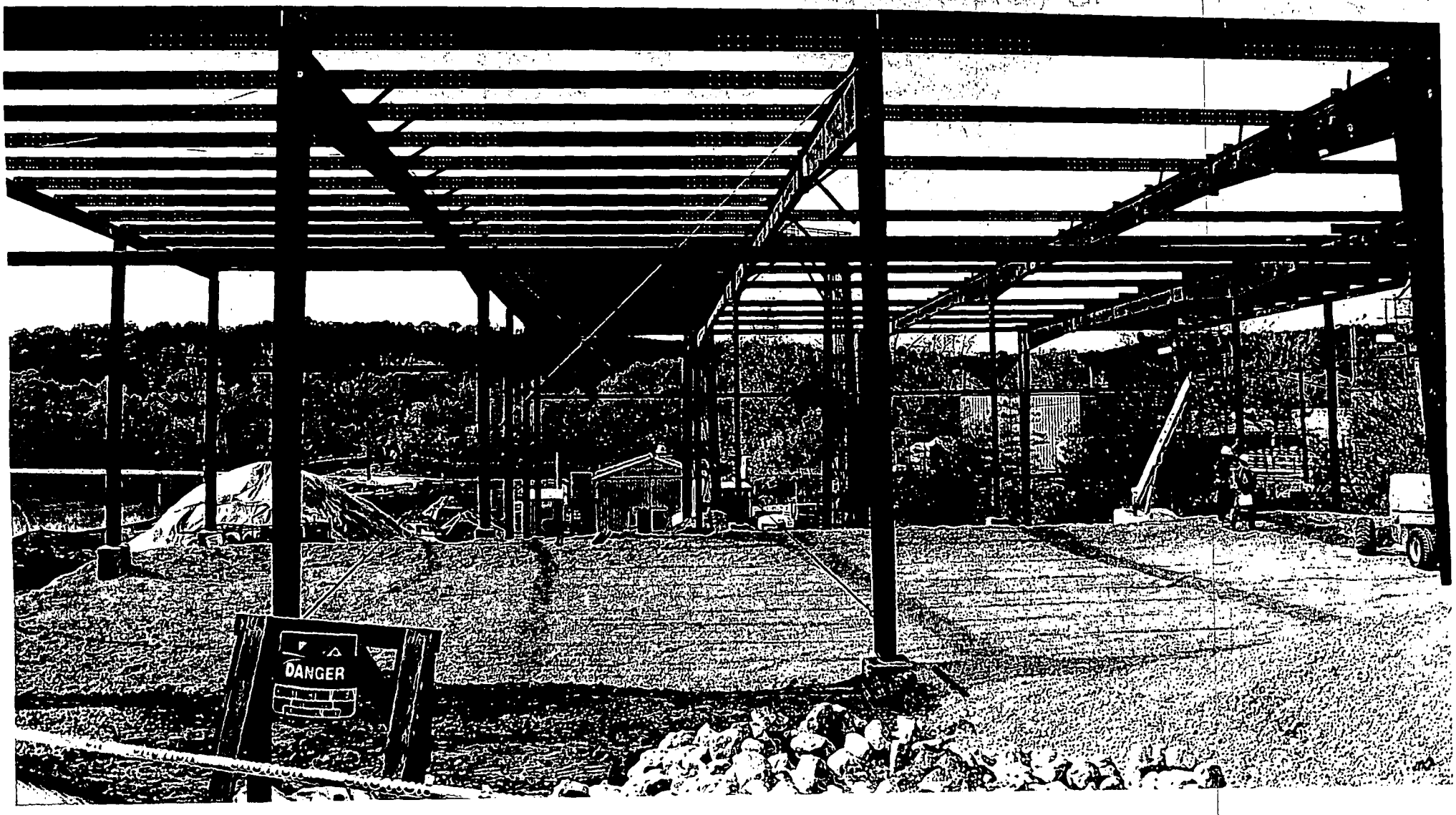
CAUTION




DANGER

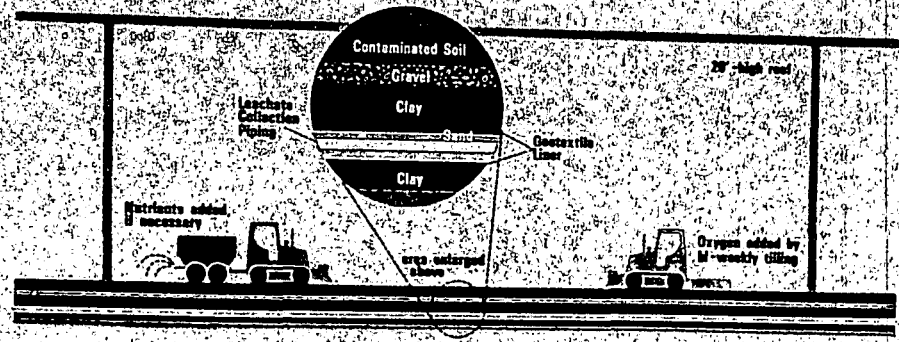
# MOUND ENVIRONMENTAL RESTORATION PROGRAM

## CERCLA OPERABLE UNIT 5 - BIOREMEDIATION TREATMENT FACILITY

## ARTHUR W. KLEINRATH, D.O.E. ON-SCENE COORDINATOR

MOUND

Environmental Restoration Program



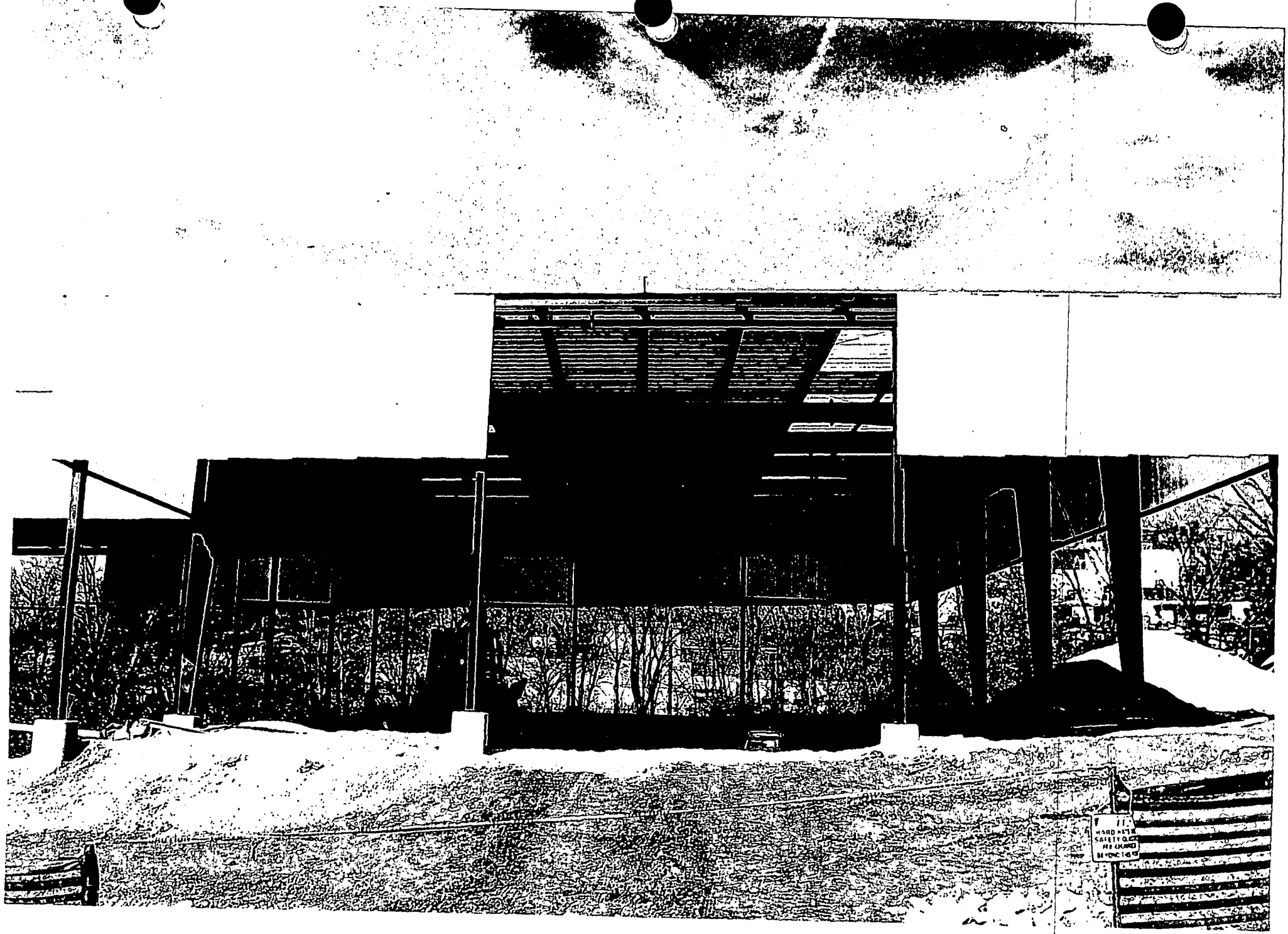

## The Process:

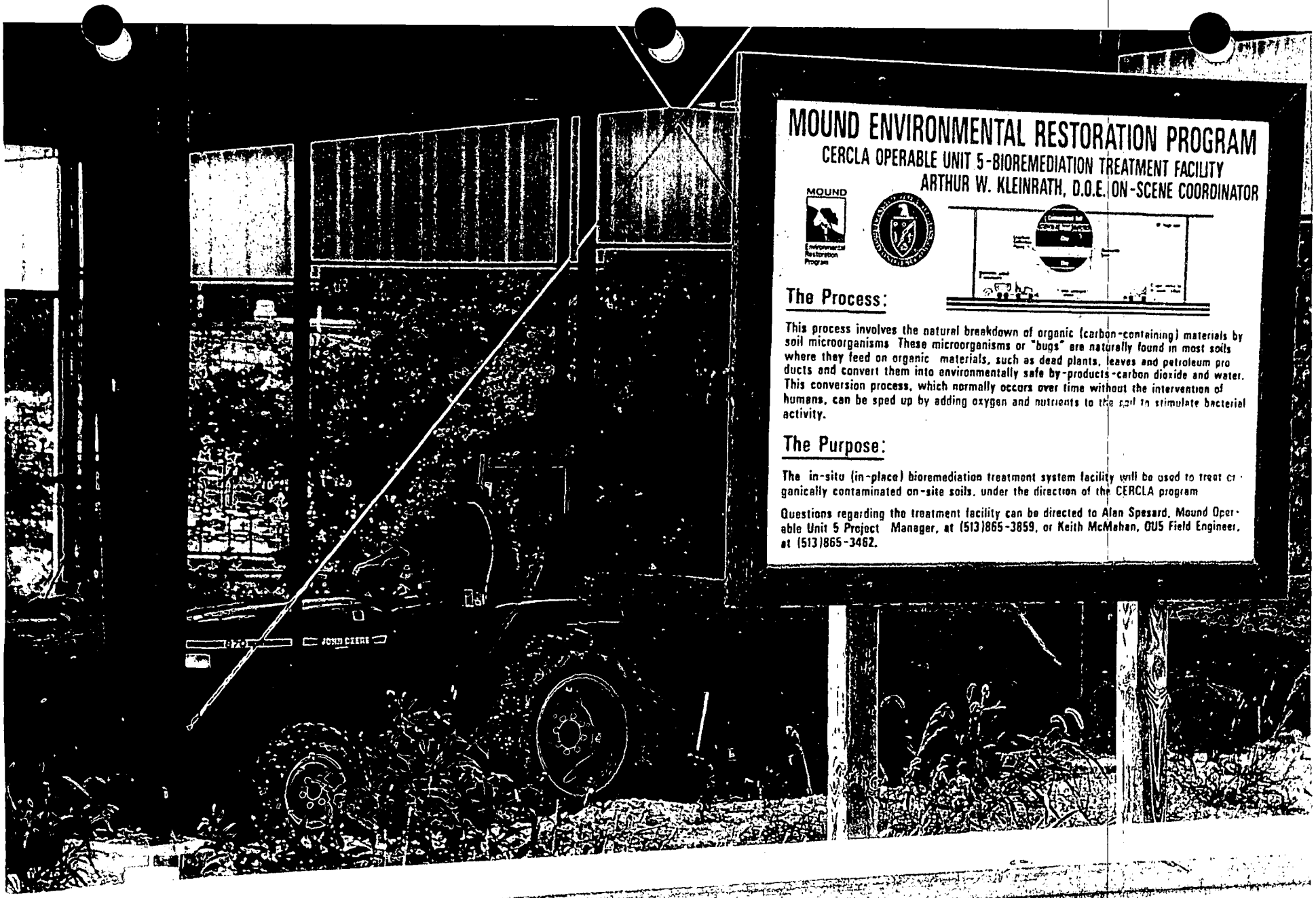
This process involves the natural breakdown of organic (carbon-containing) materials by soil microorganisms. These microorganisms or "bugs" are naturally found in most soils where they feed on organic materials, such as dead plants, leaves and petroleum products and convert them into environmentally safe by-products-carbon dioxide and water. This conversion process, which normally occurs over time without the intervention of humans, can be sped up by adding oxygen and nutrients to the soil to stimulate bacterial activity.

## The Purpose:

The in-situ (in-place) bioremediation treatment system facility will be used to treat organically contaminated on-site soils, under the direction of the CERCLA program.

Questions regarding the treatment facility can be directed to Alan Spesard, Mound Operable Unit 5 Project Manager, at (513)865-3859, or Keith McMahan, OU5 Field Engineer, at (513)865-3462.




MOUND ENVIRONMENTAL RESTORATION PROGRAM
CERCLA OPERABLE UNIT 5-BIOREMEDIATION TREATMENT FACILITY
ARTHUR W. KLEINRATH, D.O.E. ON-SCENE COORDINATOR
MOUND
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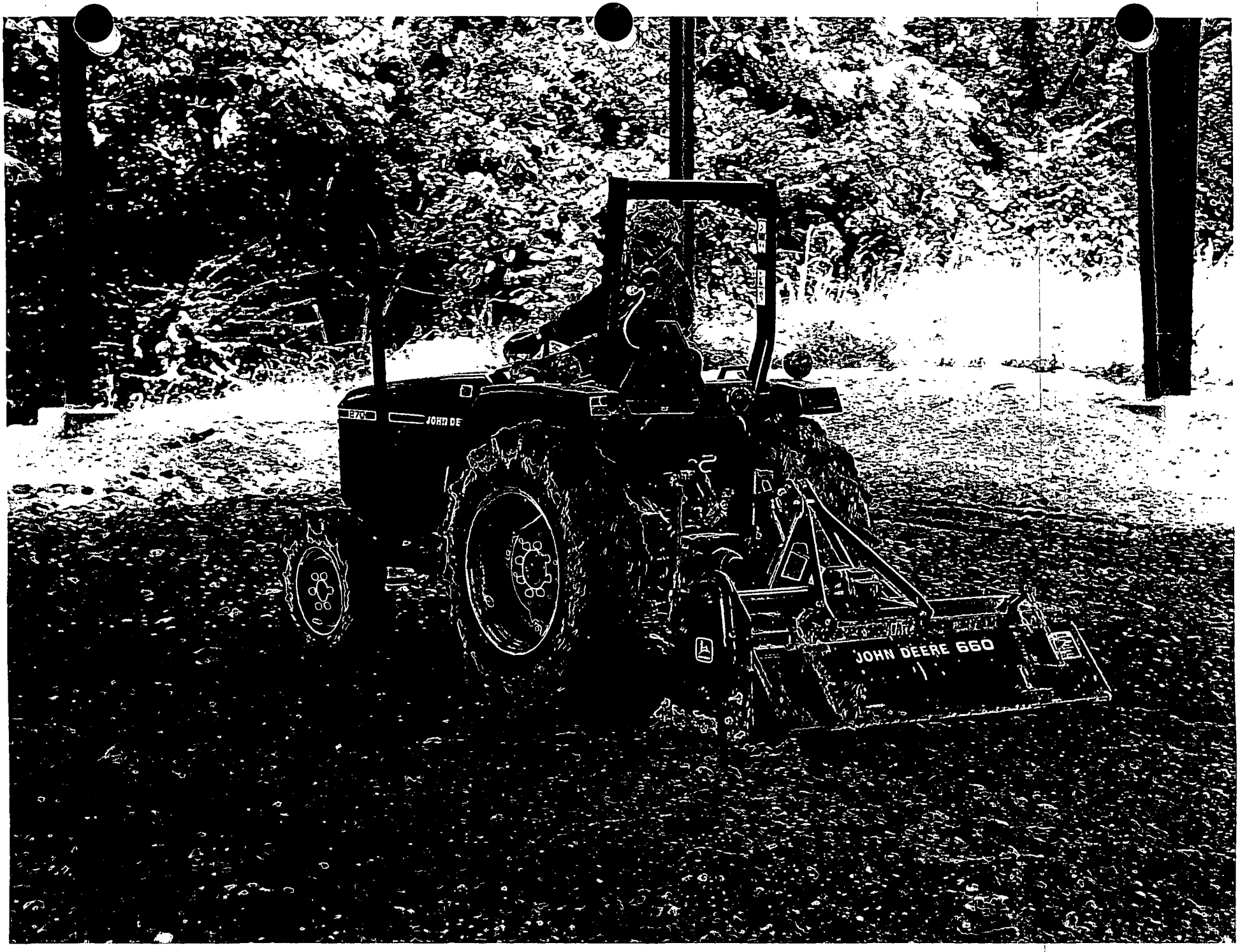
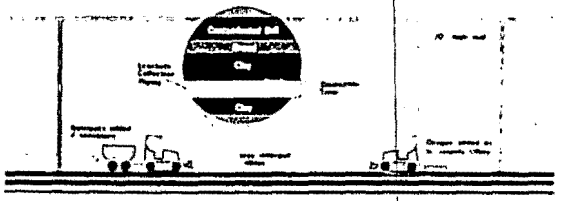
JOHN DEERE


JOHN DE
JOHN DEERE 660

# MOUND ENVIRONMENTAL RESTORATION PROGRAM

## CERCLA OPERABLE UNIT 5-BIOREMEDIATION TREATMENT FACILITY

### ARTHUR W. KLEINRATH, D.O.E. ON-SCENE COORDINATOR



## The Process:

This process involves the natural breakdown of organic (carbon-containing) materials by soil microorganisms These microorganisms or "bugs" are naturally found in most soils where they feed on organic materials, such as dead plants, leaves and petroleum products and convert them into environmentally safe by-products-carbon dioxide and water. This conversion process, which normally occurs over time without the intervention of humans, can be sped up by adding oxygen and nutrients to the soil to stimulate bacterial activity.

## The Purpose:

The in-situ (in-place) bioremediation treatment system facility will be used to treat organically contaminated on-site soils, under the direction of the CERCLA program.

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# APPENDIX C

# SAMPLE RESULTS

C1: GeoProbe Sampling Results along Grid Layout (10 March 1994)

C2: Treatment Pad Background Sample Results (23 June 1994)

C3: Pit Closure Sampling Results (4 August 1994)

C4: Addition Closure Soil Sampling Results (10 January 1995)

C5: Treatment Status Sample Results (15 August 1995)

C6: Treatment Pad and Staged Soil Sampling Results (28 September 1995)

# APPENDIX C1

## GeoProbe Sampling Results along Grid Layout (10 March 1994)

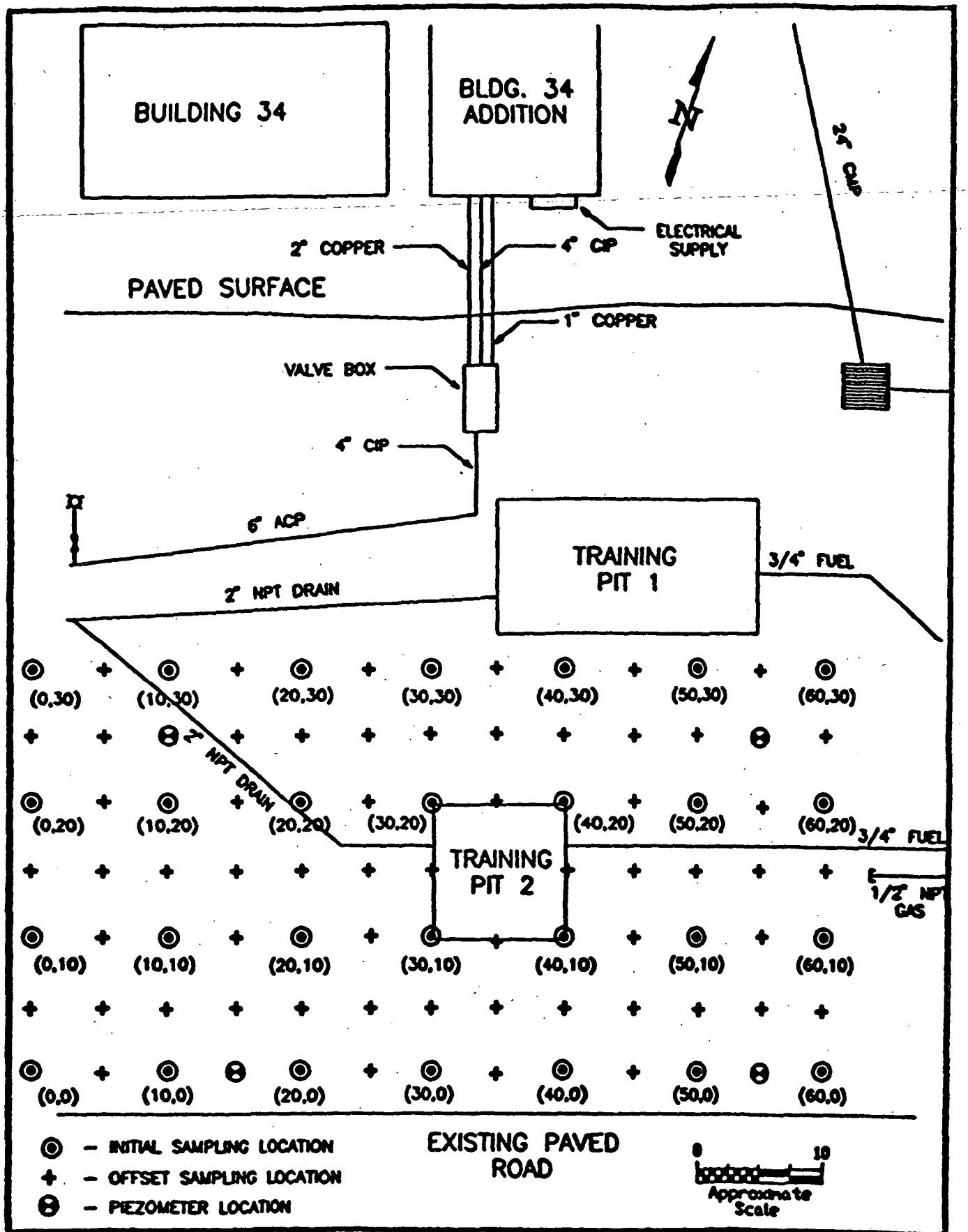


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Figure 2.1.

FFTA Sampling Locations

# TABLE III.1
# FFTA SAMPLE SCREENING RESULTS
# (RESULTS BY COORDINATES)

| COORDINATE | DEPTH (FT) | DATE | TIME | TPH |
|---|---|---|---|---|
| 35,10 | 0–2' | 7 MAR 94 | 1230 | 36 / 34.5 |
| 35,10 | 2–4' | 7 MAR 94 | 1255 | 89 / 97 |
| 35,10 | 4–6' | 7 MAR 94 | 1315 | >150 \ >300 |
| 35,10 | 6–8' | 7 MAR 94 | 1345 | 146 |
| 35,10 | 8–10' | 7 MAR 94 | 1400 | >150 \ >300 \ 600* |
| 35,10 | 10–12' | 7 MAR 94 | 1545 | >150 |
| 35,10 | 12–14' | 7 MAR 94 | 1605 | 15 |
| 35,10 | 14–16' | 7 MAR 94 | 1630 | 6 |
| 35,10 | 16–18' | 7 MAR 94 | 1645 | 9 |
| 35,10 | 18–20' | 7 MAR 94 | 1710 | 7 |
| 35,0 | 14–16' | 7 MAR 94 | 1700 | 7 |
| 35,0 | 12–14' | 7 MAR 94 | 1715 | 7 |
| 35,0 | 10–12' | 7 MAR 94 | 1730 | 6 |
| 35,0 | 8–10' | 7 MAR 94 | 1740 | 8 |
| 35,0 | 6–8' | 7 MAR 94 | 1750 | 7 |
| 35,0 | 12–14' | 7 MAR 94 | 1810 | 8 |
| 35,0 | 4–6' | 7 MAR 94 | 1820 | 9 |
| 35,0 | 0–2' | 8 MAR 94 | 745 | 35 |
| 35,20 | 2–4' | 7 MAR 94 | 1830 | 9 |
| 35,20 | 10–12' | 8 MAR 94 | 800 | 33 |
| 35,20 | 8–10' | 8 MAR 94 | 815 | 16 |
| 35,20 | 6–8' | 8 MAR 94 | 845 | 16 |
| 35,20 | 4–6' | 8 MAR 94 | 850 | 111 |
| 35,20 | 2–4' | 8 MAR 94 | 900 | >150 |
| 35,20 | 0–2' | 8 MAR 94 | 907 | 39 |
| 35,30 | 0–2' | 8 MAR 94 | 925 | 22 |
| 35,30 | 12–14' | 8 MAR 94 | 1015 | 13 |
| 35,30 | 14–16' | 8 MAR 94 | 1055 | 9 |
| 35,30 | 10–12' | 8 MAR 94 | 1100 | 13 |
| 35,30 | 2–4' | 8 MAR 94 | 1105 | 10 |
| 35,30 | 6–8' | 8 MAR 94 | 1125 | 10 |
| 35,30 | 8–10' | 8 MAR 94 | 1135 | 12 |
| 35,30 | 4–6' | 8 MAR 94 | 1140 | 5 |
| 20,10 | 0–2' | 8 MAR 94 | 1150 | 1 |
| 20,10 | 2–4' | 8 MAR 94 | 1200 | 10 |
| 20,10 | 4–6' | 8 MAR 94 | 1205 | 1 |
| 20,10 | 10–12' | 8 MAR 94 | 1220 | 1 |
| 20,10 | 16–18' | 8 MAR 94 | 1230 | 2 |
| 20,10 | 14–16' | 8 MAR 94 | 1230 | 6 |
| 20,10 | 6–8' | 8 MAR 94 | 1245 | 7 |
| 20,10 | 8–10' | 8 MAR 94 | 1305 | 1 |
| 20,10 | 12–14' | 8 MAR 94 | 1310 | 16 |

# TABLE III.1
# FFTA SAMPLE SCREENING RESULTS
# (RESULTS BY COORDINATES)
## Continued

| COORDINATE | DEPTH (FT) | DATE | TIME | TPH |
|---|---|---|---|---|
| 20,20 | 0–2' | 8 MAR 94 | 1430 | 0 |
| 20,20 | 2–4' | 8 MAR 94 | 1435 | 0 |
| 20,20 | 14–16' | 8 MAR 94 | 1440 | 0 |
| 20,20 | 4–6' | 8 MAR 94 | 1445 | 1 |
| 20,20 | 6–8' | 8 MAR 94 | 1450 | 1 |
| 20,20 | 8–10' | 8 MAR 94 | 1455 | 0 |
| 20,20 | 10–12' | 8 MAR 94 | 1500 | 0 |
| 20,20 | 12–14' | 8 MAR 94 | 1505 | 0 |
| 50,20 | 4–6' | 8 MAR 94 | 1510 | 6 |
| 50,20 | 0–2' | 8 MAR 94 | 1525 | 5 |
| 50,20 | 2–4' | 8 MAR 94 | 1530 | 1 |
| 50,20 | 8–10' | 8 MAR 94 | 1535 | 0 |
| 50,20 | 6–8' | 8 MAR 94 | 1540 | 1 |
| 50,20 | 10–12' | 8 MAR 94 | 1620 | 4 |
| 50,10 | 14–16' | 8 MAR 94 | 1730 | 6 |
| 50,10 | 12–14' | 8 MAR 94 | 1740 | 6 |
| 50,10 | 10–12' | 8 MAR 94 | 1750 | 4 |
| 50,10 | 8–10' | 8 MAR 94 | 1810 | 12 |
| 50,10 | 6–8' | 8 MAR 94 | 1820 | 6 |
| 50,10 | 4–6' | 8 MAR 94 | 1830 | 0 |
| 50,10 | 2–4' | 8 MAR 94 | 1840 | 4 |
| 50,10 | 0–2' | 8 MAR 94 | 1900 | 2 |
| 41,4 | 0–2' | 9 MAR 94 | 1000 | 18 |
| 41,4 | 2–4' | 9 MAR 94 | 1010 | 7 |
| 41,4 | 4–6' | 9 MAR 94 | 1015 | 6 |
| 41,4 | 6–8' | 9 MAR 94 | 1020 | 6 |
| 41,4 | 14–16' | 9 MAR 94 | 1025 | 6 |
| 41,4 | 12–14' | 9 MAR 94 | 1030 | 6 |
| 41,4 | 10–12' | 9 MAR 94 | 1040 | 6 |
| 41,4 | 8–10' | 9 MAR 94 | 1045 | 6 |
| 50,0 | 0–2' | 9 MAR 94 | 1115 | 6 |
| 50,0 | 2–4' | 9 MAR 94 | 1120 | 6 |
| 41,26 | 0–2' | 9 MAR 94 | 1210 | 18 |
| 41,26 | 2–4' | 9 MAR 94 | 1220 | 12 |
| 41,26 | 4–6' | 9 MAR 94 | 1225 | 9 |
| 41,26 | 6–8' | 9 MAR 94 | 1235 | 7 |
| 41,26 | 8–10' | 9 MAR 94 | 1250 | 7 |
| 41,26 | 10–12' | 9 MAR 94 | 1300 | 7 |
| 41,26 | 12–14' | 9 MAR 94 | 1310 | 8 |
| 41,26 | 14–16' | 9 MAR 94 | 1320 | 9 |
| 41,26 | 16–18' | 9 MAR 94 | 1325 | 10 |
| 41,26 | 18–20' | 9 MAR 94 | 1335 | 6 |

# TABLE III.1
# FFTA SAMPLE SCREENING RESULTS
# (RESULTS BY COORDINATES)
## Continued

| COORDINATE | DEPTH (FT) | DATE | TIME | TPH |
|---|---|---|---|---|
| 35,25 | 6–8' | 9 MAR 94 | 1535 | 2 |
| 35,25 | 8–10' | 9 MAR 94 | 1540 | 0 |
| 35,25 | 10–12' | 9 MAR 94 | 1550 | 0 |
| 35,25 | 12–14' | 9 MAR 94 | 1555 | 0 |
| 35,25 | 14–16' | 9 MAR 94 | 1600 | 0 |
| 35,25 | 0–2' | 9 MAR 94 | 1635 | 5 |
| 35,25 | 2–4' | 9 MAR 94 | 1640 | 2 |
| 35,25 | 4–6' | 9 MAR 94 | 1645 | 2 |
| 35,5 | 14–16' | 9 MAR 94 | 1525 | 2 |
| 35,5 | 0–2' | 9 MAR 94 | 1610 | 16 |
| 35,5 | 2–4' | 9 MAR 94 | 1605 | 6 |
| 35,5 | 4–6' | 9 MAR 94 | 1610 | 3 |
| 35,5 | 6–8' | 9 MAR 94 | 1615 | 2 |
| 35,5 | 8–10' | 9 MAR 94 | 1700 | 4 |
| 35,5 | 10–12' | 9 MAR 94 | 1710 | 0 |
| 35,5 | 12–14' | 9 MAR 94 | 1715 | 0 |
| 25,10 | 12–14' | 9 MAR 94 | 1705 | 17 |
| 25,10 | 10–12' | 9 MAR 94 | 1720 | 15 |
| 25,10 | 8–10' | 9 MAR 94 | 1730 | 6 |
| 25,10 | 6–8' | 9 MAR 94 | 1740 | 6 |
| 25,10 | 4–6' | 9 MAR 94 | 1750 | 4 |
| 25,10 | 2–4' | 9 MAR 94 | 1800 | 5 |
| 25,10 | 0–2' | 9 MAR 94 | 1810 | 14 |
| 25,10 | 14–16' | 9 MAR 94 | 1820 | 6 |
| 25,20 | 0–2' | 10 MAR 94 | 1245 | 10 |
| 25,20 | 2–4' | 10 MAR 94 | 1245 | >150 |
| 25,20 | 4–6' | 10 MAR 94 | 1300 | 8 |
| 25,20 | 6–8' | 10 MAR 94 | 1305 | 8 |
| 25,20 | 8–10' | 10 MAR 94 | 1310 | 3 |
| 25,20 | 10–12' | 10 MAR 94 | 1315 | 8 |
| 25,20 | 12–14' | 10 MAR 94 | 1320 | 4 |
| 25,20 | 14–16' | 10 MAR 94 | 1321 | 4 |
| 25,27 | 0–2' | 10 MAR 94 | 1322 | 19 |
| 25,27 | 2–4' | 10 MAR 94 | 1325 | 9 |
| 25,27 | 4–6' | 10 MAR 94 | 1327 | 2 |
| 25,27 | 6–8' | 10 MAR 94 | 1330 | 3 |
| 25,27 | 8–10' | 10 MAR 94 | 1332 | 3 |
| 25,27 | 10–12' | 10 MAR 94 | 1334 | 3 |
| 25,27 | 12–14' | 10 MAR 94 | 1335 | 2 |
| 25,27 | 14–16' | 10 MAR 94 | 1337 | 0 |

# TABLE III.1
# FFTA SAMPLE SCREENING RESULTS
# (RESULTS BY COORDINATES)
## Continued

| COORDINATE | DEPTH (FT) | DATE | TIME | TPH |
|---|---|---|---|---|
| 25,15 | 0–2' | 10 MAR 94 | 1339 | 15 |
| 25,15 | 2–4' | 10 MAR 94 | 1340 | 106 |
| 25,15 | 4–6' | 10 MAR 94 | 1342 | 9 |
| 25,15 | 6–8' | 10 MAR 94 | 1345 | 5 |
| 25,15 | 8–10' | 10 MAR 94 | 1450 | 6 |
| 25,15 | 10–12' | 10 MAR 94 | 1500 | 7 |
| 25,15 | 12–14' | 10 MAR 94 | 1500 | 0 |
| 25,3 | 0–2' | 10 MAR 94 | 1640 | 15 |
| 25,3 | 2–4' | 10 MAR 94 | 1740 | 4 |
| 25,3 | 4–6' | 10 MAR 94 | 1800 | 0 |
| 25,3 | 6–8' | 10 MAR 94 | 1810 | 0 |
| 25,3 | 8–10' | 10 MAR 94 | 1825 | 0 |
| 25,3 | 10–12' | 10 MAR 94 | 1840 | 0 |
| 25,3 | 12–14' | 10 MAR 94 | 1850 | 0 |
| 25,3 | 14–16' | 10 MAR 94 | 1900 | 0 |
| 41,4 | 0–2' | 10 MAR 94 | 2010 | 11 |
| 35,10 | 10–12' | 10 MAR 94 | 2025 | 2 |
| 20,20 | 2–4' | 10 MAR 94 | 2030 | 1 |
| 25,20 | 2–4' | 10 MAR 94 | 2035 | 90 |
| 35,10 | 6–8' | 10 MAR 94 | 2055 | 90 |
| 50,20 | 10–12' | 11 MAR 94 | 935 | 0 |
| 35,5 | 8–10' | 11 MAR 94 | 1010 | 5 |
| 25,15 | 2–4' | 11 MAR 94 | 1035 | 330* |
| Tmg Pit #1 | | 11 MAR 94 | 1025 | 14 |
| Tmg Pit #2 | | 11 MAR 94 | 1030 | 61 |
| Tmg Pit #2 | | 11 MAR 94 | 1035 | 115 |
| LOG_BOOK.WK3 | | | | |

* – Estimated Value

TABLE III.2

EG&G MOUND FIRE FIGHTING TRAINING AREA

SUMMARY OF LABORATORY SOIL CONFIRMATION ANALYSES

| SITE LOCATION | Benzene (µg/Kg) | Toluene (µg/Kg) | Ethylbenzene (µg/Kg) | Xylene (µg/Kg) | TPH mg/Kg |
|---|---|---|---|---|---|
| FFTA (41,4) 0-2' | 6U | 1J | 6U | 6U | 46 |
| FFTA (25,20) 2-4' | 6U | 6U | 6U | 6U | 41 |
| • FFTA (35,10) 10-12' | 6U | 6U | 6U | 6U | 17 |
| • FFTA (35,10) 6-8' | 4J | 5J | 4J | 20 | 130 |
| • FFTA (20,20) 2-4' | 6U | 6U | 6U | 6U | 7.9 |
| • FFTA (50,20) 10-12' | 6U | 2J | 6U | 6U | 24 |
| • FFTA (35,5) 8-10' | 6U | 180 | 31 | 130 | 37 |
| • FFTA (25,15) 2-4' | 6U | 3J | 6U | 4J | 22 |
| Training Pit #1 | 6U | 6U | 6U | 6U | 57 |
| Training Pit #2 | 6U | 6U | 6U | 6U | 1300 |

• - Internal standard outside criteria.

U - Result not detected at reported limit.

J - Estimated value (below reporting limit).

TABLE III.3

EG&G MOUND FIRE FIGHTING TRAINING AREA

SUMMARY OF LABORATORY WATER CONFIRMATION ANALYSES

| SITE LOCATION | Benzene µg/L | Toluene µg/L | Ethylbenzene µg/L | Xylene µg/L | TPH mg/L |
|---|---|---|---|---|---|
| FFTA (55,0) GW | 5U | 5U | 5U | 5U | — |
| FFTA (25,15) GW | 5U | 15 | 5U | 5U | — |

• Safe Drinking Water Standard: Toluene (MCL) = 1000 µg/L

WELLS IN VICINITY OF FFTA

(FROM PREVIOUS INVESTIGATIONS)

| WELL | TCE µg/L | FCE µg/L | CCL4 µg/L |
|---|---|---|---|
| 125 | 1.2U | 0.3U | 1U |
| 151 | 1.2U | 1U | 1U |
| 316 | DRY | DRY | DRY |
| 379 | 2.8 | 2.7 | 3.4 |
| 380 | 1.2U | 0.3U | 1U |
| MCL | 5 | 5 | 5 |

U - Less than detection limit listed

# APPENDIX C2

## Treatment Pad Background Sample Results
## (23 June 1994)

## Table VI. Background Level of Native Soil

| Date | Background | ug/Kg B | T | E | X | mg/Kg TPH | % Solids |
|---|---|---|---|---|---|---|---|
| 6/23/94 | MND55-TPC1-0001 | 5u | 5u | 5u | 5u | 3.4u | 96.9 |
| | MND55-TPC2-0001 | 5u | 5u | 5u | 5u | 34.1 | 97.5 |

Background

A disposable scoopula was used to collect background soil samples from compacted subgrade at the center of each treatment pad location prior to construction of the pads. These samples were labeled MND55-TPC1-0001 and MND55-TPC2-0001 for pads 1 and 2 respectively. The soil samples were analyzed for baseline BTEX and TPH concentrations. Results have been tabulated. Rinsate from the scoopula (MND55-TPC2-4001) and a trip blank (MND55-TPC1-2001) were also analyzed.

# APPENDIX C3

## Pit Closure Sampling Results (4 August 1994)

WOODWARD-CLYDE

SHEET 1 OF 1

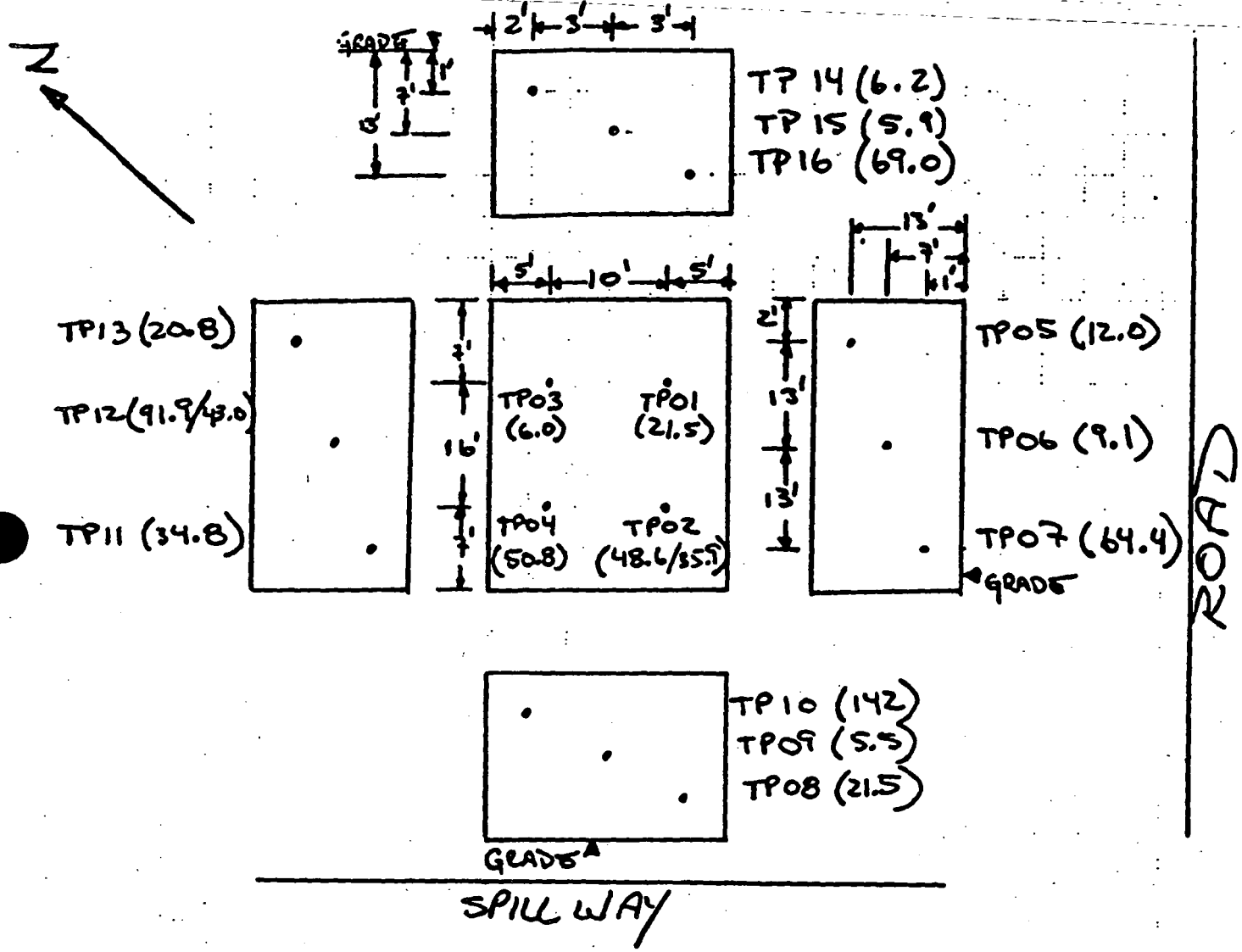
CLIENT/SUBJECT FPTA W.O. NO. 05336-045-002

TASK DESCRIPTION CLOSURE SAMPLING RESULTS TASK NO. 0400

PREPARED BY GBH DEPT ____ DATE 8/24/94 | APPROVED BY

MATH CHECK BY ____ DEPT ____ DATE ____

METHOD REV. BY ____ DEPT ____ DATE ____ | DEPT ____ DATE ____




LEGEND

TPXX (XXXX)

SAMPLE NUMBER — CONCENTRATION (MG/KG)

SAMPLES > 40

TP02
TP04
TP07
TP12
TP16
TP10

## Table I. Pit Closure

| Date | Sample ID | ug/Kg B | ug/Kg T | ug/Kg E | ug/Kg X | mg/Kg TPH | % Solids |
|---|---|---|---|---|---|---|---|
| 08/04/94 | MND55-TP01-0014 | 6u | 6u | 6u | 6u | 21.5 | 92.5 |
| | MND55-TP02-0014 | 6u | 6u | 6u | 6u | 48.6 | 88.0 |
| | MDN55-TP02-1014 | 6u | 6u | 6u | 6u | 35.9 | 85.3 |
| | MND55-TP03-0014 | 5u | 5u | 5u | 5u | 6.0 | 90.4 |
| | MND55-TP04-0014 | 6u | 6u | 6u | 6u | 50.8 | 86.1 |
| | MND55-TP05-0013 | 6u | 6u | 6u | 6u | 12.0 | 91.9 |
| | MND55-TP06-0007 | 6u | 6u | 6u | 6u | 9.1 | 90.4 |
| 08/08/84 | MND55-TP07-0001 | 6u | 6u | 6u | 6u | 64.4 | 93.3 |
| | MND55-TP08-0001 | 5u | 5u | 5u | 5u | 21.5 | 91.4 |
| | MND55-TP09-0007 | 6u | 6u | 6u | 6u | 5.5 | 88.8 |
| | MND55-TP10-0013 | 6u | 6u | 6u | 6u | 142 | 95.9 |
| | MND55-TP11-0013 | 6u | 6u | 6u | 6u | 34.8 | 93.2 |
| | MND55-TP12-0007 | 6u | 6u | 6u | 6u | 91.9 | 91.1 |
| | MND55-TP12-1007 | 6u | 6u | 6u | 6u | 43.0 | 91.8 |
| | MND55-TP13-0001 | 6u | 6u | 6u | 6u | 20.8 | 89.7 |
| | MND55-TP14-0001 | 6u | 6u | 6u | 6u | 6.2 | 90.1 |
| | MND55-TP15-0007 | 6u | 6u | 6u | 6u | 5.9 | 88.5 |
| | MND55-TP16-0013 | 6u | 6u | 6u | 6u | 69.0 | 88.0 |

Pit Closure

Pit Closure data defines the level of BTEX and TPH contamination in soil samples taken from the walls and floor of the post-excavation training pit. The "u" which appears in the data indicates that the contaminant listed is in concentrations below the adjoining detection limit. All BTEX concentrations were below detection limits. Any TPH values below the maximum closure concentration limit of 40 ppm (mg/kg) indicates "clean" soil requiring no further excavation. Attached is a sketch of walls and floor of the excavation which identifies the locations of soil samples taken for analysis.

B-Benzene
T-Toluene
E-Ethyl Benzene
X-Xylene
TPH-Total Petroleum Hydrocarbons
% - percent

# APPENDIX C4

## Pit Closure Sampling Results (4 August 1994)

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 12/13/94

CLIENT: EG & G MOUND FFTA

WESTON BATCH #: 9412L293

WORK ORDER: 05376-045-002-0400-02

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -001 | MND55 TP-02A | % Solids | 91.8 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 29.0 | MG/KG | 3.6 | 1.0 |
| -002 | MND55 TP-02B | % Solids | 89.9 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 11.2 | MG/KG | 3.7 | 1.0 |
| -003 | MND55 TP-04A | % Solids | 90.8 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 9.9 | MG/KG | 3.7 | 1.0 |
| -004 | MND55 TP-04B | % Solids | 91.7 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 9.0 | MG/KG | 3.6 | 1.0 |
| -005 | MND55 TP-10A | % Solids | 92.0 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 9.8 | MG/KG | 3.6 | 1.0 |
| -006 | MND55 TP-10B | % Solids | 91.3 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 13.8 | MG/KG | 3.7 | 1.0 |

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 12/06/94

CLIENT: EG & G MOUND FFTA

WESTON BATCH # 94111184

WORK ORDER: 05376-045-002-0400-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -001 | TP 16 A R | % Solids | 90.8 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 33.3 | MG/KG | 3.7 | 1.0 |
| -002 | TP 16 B L | % Solids | 90.3 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 23.5 | MG/KG | 3.7 | 1.0 |

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 01/18/95

CLIENT: EG&G-MOUND WESTON BATCH #: 95011612

WORK ORDER: 05376-045-002-0400-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -001 | MMD55-0007-0005 | % Solids | 90.4 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 24.2 | MG/KG | 3.7 | 1.0 |
| -002 | MMD55-0017-0008 | % Solids | 89.1 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 20.2 | MG/KG | 3.7 | 1.0 |
| -003 | MMD55-0018-0008 | % Solids | 89.3 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 4.1 | MG/KG | 3.7 | 1.0 |
| -004 | MMD55-0018-1008 | % Solids | 90.1 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 6.8 | MG/KG | 3.7 | 1.0 |
| -005 | MMD55-0018-3008 | % Solids | 89.7 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 5.2 | MG/KG | 3.7 | 1.0 |
| -006 | MMD55-0018-4008 | Petroleum Hydrocarbons | 1.1 u | MG/L | 1.1 | 1.0 |

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 01/13/95

CLIENT: EG&G-MOUND WESTON BATCH #: 95011590

WORK ORDER: 05376-045-002-0400-005

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -001 | MND 55 TP-12 | % Solids | 88.6 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 22.8 | MG/KG | 3.8 | 1.0 |
| -002 | MND 55 TP-17 | % Solids | 91.2 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 11.9 | MG/KG | 3.7 | 1.0 |
| -003 | MND 55 TP-18 | % Solids | 90.1 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 8.8 | MG/KG | 3.7 | 1.0 |

# APPENDIX C5

## Treatment Status Sample Results
## (15 August 1995)

WESTON.

SHEET ____ of ____

CLIENT/SUBJECT FPTA TREATMENT PADS W.O. NO. ____

TASK DESCRIPTION O&M SAMPLING LOCATIONS TASK NO. ____

PREPARED BY ____ DEPT ____ DATE ____

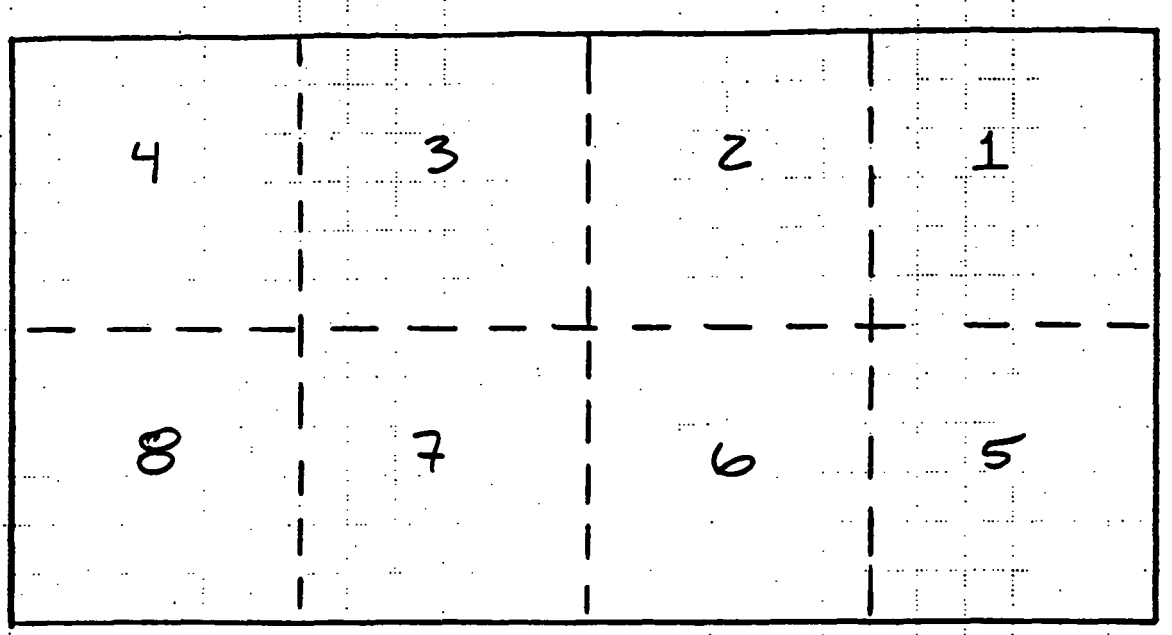
MATH CHECK BY ____ DEPT ____ DATE ____

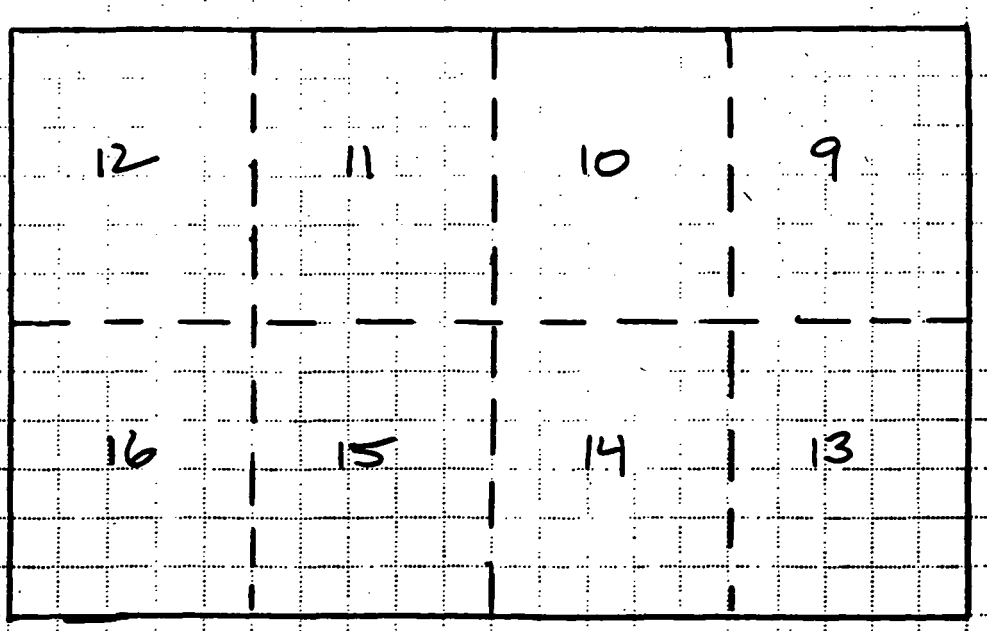
METHOD REV. BY ____ DEPT ____ DATE ____

APPROVED BY

DEPT ____ DATE ____

N



ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 08/21/95

CLIENT: EG&G-MOUND/FFTA WESTON BATCH #: 9508L924

WORK ORDER: 05376-045-002-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|---|
| -001 | MMDS5-TRTP-0201 | % Solids | 95.6 | | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 7.2 | | MG/KG | 3.5 | 1.0 |
| -002 | MMDS5-TRTP-0202 | % Solids | 94.9 | | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 23.8 | | MG/KG | 3.5 | 1.0 |
| -003 | MMDS5-TRTP-0203 | % Solids | 94.1 | | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 26.7 | | MG/KG | 3.5 | 1.0 |
| -004 | MMDS5-TRTP-0204 | % Solids | 93.6 | | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 13.8 | | MG/KG | 3.6 | 1.0 |
| -005 | MMDS5-TRTP-0205 | % Solids | 91.4 | | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 8.3 | | MG/KG | 3.6 | 1.0 |
| -006 | MMDS5-TRTP-0206 | % Solids | 91.4 | | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 24.0 | | MG/KG | 3.6 | 1.0 |
| -007 | MMDS5-TRTP-0207 | % Solids | 90.0 | | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 3.7 | u | MG/KG | 3.7 | 1.0 |
| -008 | MMDS5-TRTP-0208 | % Solids | 91.5 | | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 3.6 | u | MG/KG | 3.6 | 1.0 |
| -009 | MMDS5-TRTP-0209 | % Solids | 93.5 | | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 18.1 | | MG/KG | 3.6 | 1.0 |
| -010 | MMDS5-TRTP-0210 | % Solids | 89.7 | | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 39.2 | | MG/KG | 3.7 | 1.0 |
| -011 | MMDS5-TRTP-0211 | % Solids | 94.6 | | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 27.7 | | MG/KG | 3.5 | 1.0 |
| -012 | MMDS5-TRTP-0212 | % Solids | 94.4 | | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 10.3 | | MG/KG | 3.5 | 1.0 |

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 08/21/95

CLIENT: EG&G-MOUND/FFTA WESTON BATCH #: 9508L924

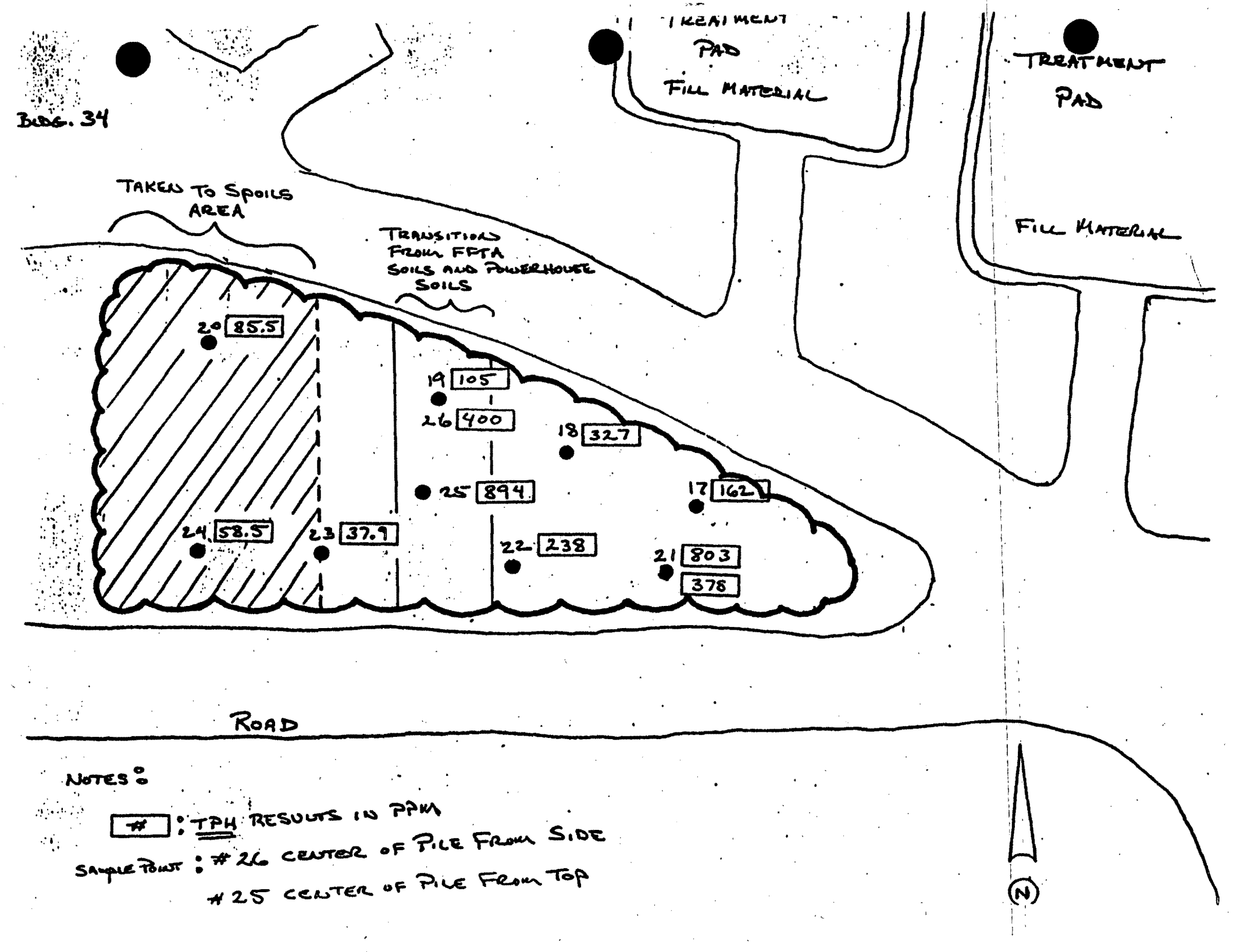
WORK ORDER: 05376-045-002-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -013 | MND55-TRTP-0213 | % Solids | 89.8 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 17.2 | MG/KG | 3.7 | 1.0 |
| -014 | MND55-TRTP-0214 | % Solids | 91.1 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 74.7 | MG/KG | 3.7 | 1.0 |
| -015 | MND55-TRTP-0215 | % Solids | 90.1 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 5.2 | MG/KG | 3.7 | 1.0 |
| -016 | MND55-TRTP-0216 | % Solids | 91.5 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 49.8 | MG/KG | 3.6 | 1.0 |

# APPENDIX C6

## Treatment Pad and Staged Soil Sampling Results

## (28 September 1995)


BLDG. 34
TREATMENT PAD
FILL MATERIAL
TREATMENT PAD
FILL MATERIAL
TAKEN TO SPOILS AREA
TRANSITIONED FROM FPTA SOILS AND POWERHOUSE SOILS
20 85.5
19 105
26 400
18 327
25 894
17 162
24 58.5
23 37.9
22 238
21 803
378
ROAD
NOTES:
[#]: TPH RESULTS IN PPM
SAMPLE POINT: #26 CENTER OF PILE FROM SIDE
#25 CENTER OF PILE FROM TOP
N

WESTON

SHEET ___ of ___

CLIENT/SUBJECT EG&G W.O. NO. ___

TASK DESCRIPTION FFTA O&M SAMPLING TASK NO. ___

PREPARED BY ___ DEPT ___ DATE 10/6/95

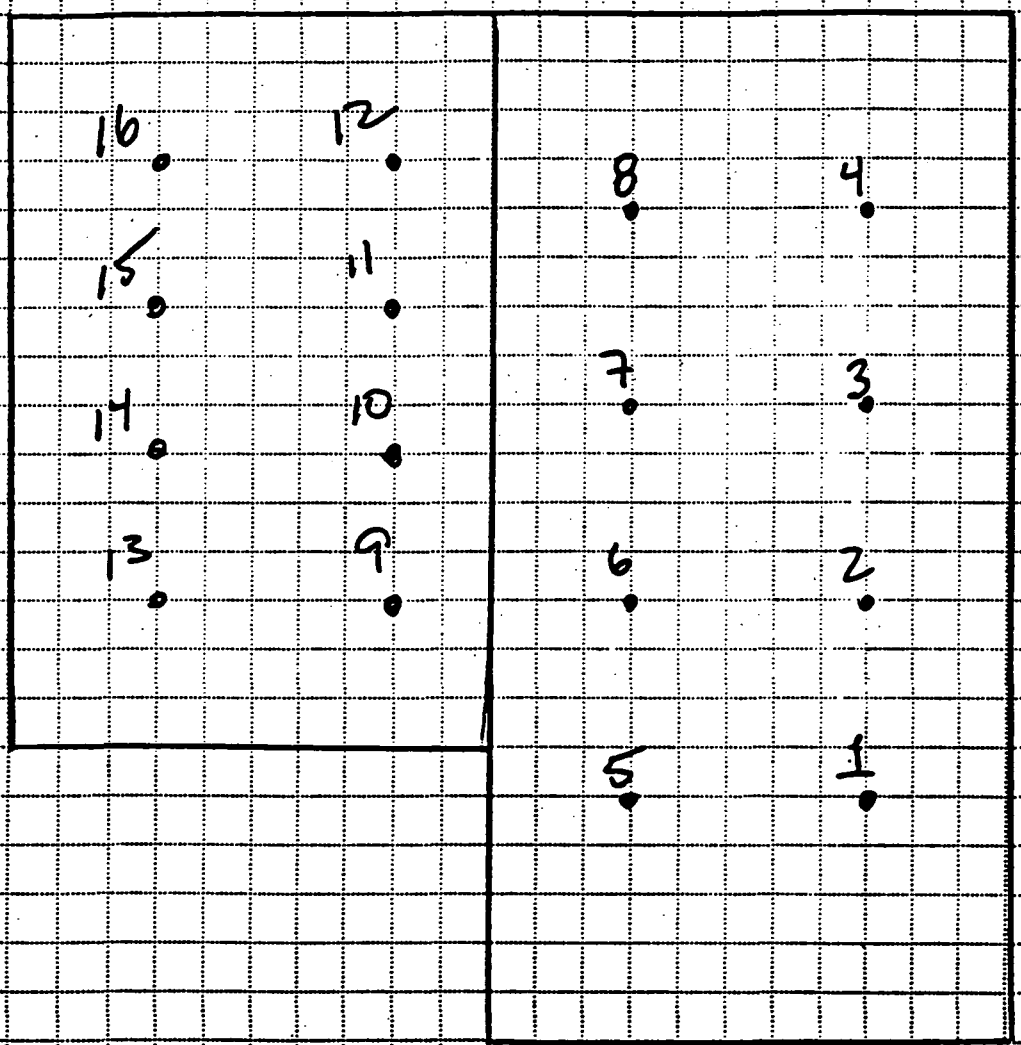
MATH CHECK BY ___ DEPT ___ DATE ___

METHOD REV. BY ___ DEPT ___ DATE ___

APPROVED BY ___

DEPT ___ DATE ___

TREATMENT PADS



ROY F. WESTON INC.

THERMATICS DATA SUMMARY REPORT 10/05/95

CLIENT: BOAO-MOUND/FFEA WESTON BATCH #: 95091398

WORK ORDER: 05376-048-002-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -001 | MND5S-TRTP-0301 | % Solids | 98.0 | % | 0.10 | 1.0 |
| -004 | MND5S-TRTP-0302 | % Solids | 97.7 | % | 0.10 | 1.0 |
| -005 | MND5S-TRTP-1302 | % Solids | 97.6 | % | 0.10 | 1.0 |
| -006 | MND5S-TRTP-0303 | % Solids | 98.0 | % | 0.10 | 1.0 |
| -007 | MND5S-TRTP-0304 | % Solids | 98.8 | % | 0.10 | 1.0 |
| -008 | MND5S-TRTP-0305 | % Solids | 99.2 | % | 0.10 | 1.0 |
| -009 | MND5S-TRTP-0306 | % Solids | 99.8 | % | 0.10 | 1.0 |
| -010 | MND5S-TRTP-0307 | % Solids | 98.1 | % | 0.10 | 1.0 |
| -011 | MND5S-TRTP-0308 | % Solids | 97.7 | % | 0.10 | 1.0 |
| -012 | MND5S-TRTP-0309 | % Solids | 99.5 | % | 0.10 | 1.0 |
| -013 | MND5S-TRTP-0310 | % Solids | 99.0 | % | 0.10 | 1.0 |
| -014 | MND5S-TRTP-0311 | % Solids | 98.4 | % | 0.10 | 1.0 |
| -015 | MND5S-TRTP-1311 | % Solids | 98.9 | % | 0.10 | 1.0 |
| -017 | MND5S-TRTP-0312 | % Solids | 98.3 | % | 0.10 | 1.0 |
| -018 | MND5S-TRTP-0313 | % Solids | 99.8 | % | 0.10 | 1.0 |
| -019 | MND5S-TRTP-0314 | % Solids | 99.2 | % | 0.10 | 1.0 |
| -020 | MND5S-TRTP-0315 | % Solids | 98.8 | % | 0.10 | 1.0 |

MND5S-TRTP-0301

match to location on map

TPH analyzed for samples 1-16 (Treatment pad)

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 10/05/95

CLIENT: EG&G-MOUND/FFDA WESTON BATCH #: 9509L198

WORK ORDER: 05376-048-002-9999-00

| SAMPLE | SITE ID | ANALYTE | RESULT | UNITS | REPORTING LIMIT | DILUTION FACTOR |
|---|---|---|---|---|---|---|
| -021 | MWD6S-TRIP-0316 | % Solids | 99.1 | % | 0.10 | 1.0 |
| -022 | MWD6S-TRIP-0317 | % Solids | 93.0 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 142 | MG/KG | 2.6 | 1.0 |
| -023 | MWD6S-TRIP-0318 | % Solids | 93.8 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 327 | MG/KG | 7.1 | 2.0 |
| -024 | MWD6S-TRIP-0319 | % Solids | 90.9 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 106 | MG/KG | 1.7 | 1.0 |
| -025 | MWD6S-TRIP-0320 | % Solids | 89.3 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 85.5 | MG/KG | 1.7 | 1.0 |
| -026 | MWD5S-TRIP-0321 | % Solids | 92.2 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 803 | MG/KG | 18.1 | 5.0 |
| | MWD5S-TRIP-1321 | % Solids | 92.4 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 378 | MG/KG | 7.2 | 2.0 |
| -028 | MWD6S-TRIP-4321 | Petroleum Hydrocarbons | 1.1 B | MG/L | 1.1 | 1.0 |
| -029 | MWD5S-TRIP-0322 | % Solids | 95.5 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 238 | MG/KG | 7.8 | 2.0 |
| -030 | MWD5S-TRIP-0323 | % Solids | 91.7 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 37.9 | MG/KG | 3.6 | 1.0 |
| -031 | MWD6S-TRIP-0324 | % Solids | 94.1 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 58.5 | MG/KG | 3.5 | 1.0 |
| -032 | MWD6S-TRIP-0325 | % Solids | 99.0 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 894 | MG/KG | 14.0 | 4.0 |
| -033 | MWD6S-TRIP-0326 | % Solids | 91.6 | % | 0.10 | 1.0 |
| | | Petroleum Hydrocarbons | 400 | MG/KG | 7.3 | 2.0 |

Roy F. Weston, Inc. - [illegible]ionville Laboratory

Preliminary Report for : Volatiles By [illegible] 8, Special List  Report Date: 10/05[illegible] 17:01

RFW [illegible] Number: 9509L398  Client: EG&G-MOUND/FE[illegible]  Work Order: 05376045002  Page: 1a

MATCH THIS # TO MAP LOCATION

| | Cust ID: | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 |
|---|---|---|---|---|---|---|---|
| | | 301 | 301 | 301 | 301 | 301 | 302 |
| Sample | RFW#: | 001 | 001 MS | 001 MSD | 002 | 003 | 004 |
| Information | Matrix: | SOIL | SOIL | SOIL | WATER | WATER | SOIL |
| | D.F.: | 0.962 | 0.980 | 1.00 | 1.00 | 1.00 | 1.04 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/L | UG/L | UG/KG |
| | Toluene-d8 | 108 % | 100 % | 101 % | 100 % | 99 % | 165 * % |
| Surrogate | Bromofluorobenzene | 92 % | 88 % | 83 % | 100 % | 110 % | 109 % |
| Recovery | 1,2-Dichloroethane-d4 | 91 % | 94 % | 90 % | 106 % | 97 % | 157 * % |
| | | fl | fl | fl | fl | fl | fl |
| Benzene | | 5 U | 125 % | 126 % | 5 U | 5 U | 6 U |
| Toluene | | 5 U | 123 % | 125 % | 5 U | 5 U | 6 U |
| Ethylbenzene | | 5 U | 113 % | 110 % | 5 U | 5 U | 6 U |
| Xylene (total) | | 5 U | 116 % | 112 % | 5 U | 5 U | 6 U |

| | Cust ID: | MMD55-TRTP-0 | MMD55-TRTP-1 | MMD55-TRTP-1 | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 |
|---|---|---|---|---|---|---|---|
| | | 302 | 302 | 302 | 303 | 303 | 304 |
| Sample | RFW#: | 004 | 005 | 005 | 006 | 006 | 007 |
| Information | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.04 | 1.00 | 1.00 | 1.02 | 1.02 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |
| | | REPREP | | REPREP | | REPREP | |
| | Toluene-d8 | 142 * % | 118 * % | 137 * % | 135 * % | 139 * % | 150 * % |
| Surrogate | Bromofluorobenzene | 95 % | 75 % | 102 % | 99 % | 97 % | 109 % |
| Recovery | 1,2-Dichloroethane-d4 | 146 * % | 115 % | 137 * % | 144 * % | 128 * % | 148 * % |
| | | fl | fl | fl | fl | fl | fl |
| Benzene | | 6 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Toluene | | 6 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Ethylbenzene | | 6 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Xylene (total) | | 6 U | 5 U | 1 J | 5 U | 5 U | 1 J |

*= Outside of EPA CLP QC limits.

MS - matrix spike
MSD - matrix spike duplicate
REPREP - lab re-prepared & analyzed

| | Cust ID: | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 |
|---|---|---|---|---|---|---|---|
| | | 304 | 305 | 305 | 306 | 306 | 307 |
| Sample | RFW#: | 007 | 008 | 008 | 009 | 009 | 010 |
| Information | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.02 | 1.00 | 1.02 | 1.02 | 1.02 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |
| | | REPREP | | REPREP | | REPREP | |
| | Toluene-d8 | 129 * % | 138 * % | 147 * % | 132 * % | 134 * % | 125 * % |
| Surrogate | Bromofluorobenzene | 89 % | 97 % | 101 % | 97 % | 82 % | 76 % |
| Recovery | 1,2-Dichloroethane-d4 | 124 * % | 140 * % | 142 * % | 125 * % | 125 * % | 112 % |
| | | fl | fl | fl | fl | fl | fl |
| Benzene | | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Toluene | | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Ethylbenzene | | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Xylene (total) | | 5 U | 5 U | 1 J | 5 U | 5 U | 5 U |

| | Cust ID: | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 |
|---|---|---|---|---|---|---|---|
| | | 308 | 308 | 309 | 309 | 310 | 310 |
| Sample | RFW#: | 011 | 011 | 012 | 012 | 013 | 013 |
| Information | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 0.962 | 0.980 | 1.00 | 1.00 | 0.980 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |
| | | | REPREP | | REPREP | | REPREP |
| | Toluene-d8 | 176 * % | 203 * % | 154 * % | 138 * % | 176 * % | 145 * % |
| Surrogate | Bromofluorobenzene | 107 % | 116 % | 101 % | 80 % | 123 * % | 86 % |
| Recovery | 1,2-Dichloroethane-d4 | 165 * % | 179 * % | 148 * % | 153 * % | 168 * % | 146 * % |
| | | fl | fl | fl | fl | fl | fl |
| Benzene | | 5 U | 5 U | 5 U | 5 U | 5 U | 5 U |
| Toluene | | 5 U | 5 U | 2 J | 5 U | 1 J | 5 U |
| Ethylbenzene | | 5 U | 5 U | 1 J | 5 U | 1 J | 5 U |
| Xylene (total) | | 0.9 J | 5 U | 3 J | 5 U | 2 J | 5 U |

*= Outside of EPA CLP QC limits.

Roy F. Weston, Inc. - Lionville Laboratory

Preliminary Report for : Volatiles By [redacted] 8, Special List  Report Date: 10/0[redacted] 17:01

RFW [redacted]h Number: 9509L398  Client: KG&G-MOUND/F[redacted]  Work Order: 05376045002  Page: 3a

| | Cust ID: | MMD55-TRIP-0 | MMD55-TRIP-0 | MMD55-TRIP-1 | MMD55-TRIP-1 | MMD55-TRIP-4 | MMD55-TRIP-0 |
|---|---|---|---|---|---|---|---|
| | | 311 | 311 | 311 | 311 | 311 | 312 |
| Sample | RFW#: | 014 | 014 | 015 | 015 | 016 | 017 |
| Information | Matrix: | SOIL | SOIL | SOIL | SOIL | WATER | SOIL |
| | D.F.: | 0.980 | 1.04 | 0.962 | 1.00 | 1.00 | 0.980 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/L | UG/KG |
| | | | REPREP | | REPREP | | |
| | Toluene-d8 | 131 * % | 124 * % | 131 * % | 135 * % | 99 % | 122 * % |
| Surrogate | Bromofluorobenzene | 80 % | 66 * % | 97 % | 65 * % | 108 % | 62 * % |
| Recovery | 1,2-Dichloroethane-d4 | 116 % | 123 * % | 138 * % | 127 * % | 108 % | 120 % |
| | | fl | fl | fl | fl | fl | fl |
| Benzene | | 5 U | 6 U | 5 U | 5 U | 5 U | 5 U |
| Toluene | | 5 U | 6 U | 1 J | 5 U | 5 U | 5 U |
| Ethylbenzene | | 5 U | 6 U | 5 U | 5 U | 5 U | 5 U |
| Xylene (total) | | 5 U | 6 U | 1 J | 5 U | 5 U | 5 U |

| | Cust ID: | MMD55-TRIP-0 | MMD55-TRIP-0 | MMD55-TRIP-0 | MMD55-TRIP-0 | MMD55-TRIP-0 | MMD55-TRIP-0 |
|---|---|---|---|---|---|---|---|
| | | 313 | 313 | 314 | 314 | 315 | 316 |
| Sample | RFW#: | 017 | 018 | 019 | 019 | 020 | 021 |
| Information | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 0.980 | 1.04 | 1.02 | 1.00 | 1.04 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |
| | | REPREP | | | REPREP | | |
| | Toluene-d8 | 123 * % | 111 % | 132 * % | 123 * % | 117 % | 116 % |
| Surrogate | Bromofluorobenzene | 89 % | 86 % | 115 % | 105 % | 84 % | 100 % |
| Recovery | 1,2-Dichloroethane-d4 | 119 % | 112 % | 112 % | 108 % | 92 % | 98 % |
| | | fl | fl | fl | fl | fl | fl |
| Benzene | | 5 U | 5 U | 5 U | 5 U | 6 U | 5 U |
| Toluene | | 5 U | 5 U | 5 U | 5 U | 6 U | 5 U |
| Ethylbenzene | | 5 U | 5 U | 5 U | 5 U | 6 U | 5 U |
| Xylene (total) | | 5 U | 5 U | 5 U | 5 U | 6 U | 5 U |

*= Outside of EPA CLP QC limits.

Roy F. Weston, Inc. - Lionville Laboratory

Preliminary Report for : Volatiles By [redacted] 8, Special List Report Date: 10/05[redacted] 17:01

RFW [redacted]n Number: 95091398 Client: [redacted] Work Order: 05376045002 Page: 4a

| | Cust ID: | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 |
|---|---|---|---|---|---|---|---|
| | | 317 | 317 | 317 | 318 | 319 | 320 |
| Sample | RFW#: | 022 | 022MS | 022MSD | 023 | 024 | 025 |
| Information | Matrix: | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL |
| | D.F.: | 1.04 | 0.962 | 0.980 | 1.00 | 1.00 | 1.02 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG | UG/KG |
| Surrogate Recovery | Toluene-d8 | 87 % | 96 % | 87 % | 101 % | 104 % | 121 * % |
| | Bromofluorobenzene | 81 % | 87 % | 81 % | 94 % | 85 % | 78 % |
| | 1,2-Dichloroethane-d4 | 80 % | 88 % | 84 % | 94 % | 79 % | 89 % |
| | | fl | fl | fl | fl | fl | fl |
| Benzene | | 6 U | 119 % | 114 % | 6 U | 6 U | 6 U |
| Toluene | | 6 U | 117 % | 113 % | 6 U | 6 U | 6 U |
| Ethylbenzene | | 6 U | 108 % | 107 % | 6 U | 6 U | 6 U |
| Xylene (total) | | 6 U | 109 % | 107 % | 6 U | 6 U | 6 U |

| | Cust ID: | MMD55-TRTP-0 | MMD55-TRTP-1 | MMD55-TRTP-4 | MMD55-TRTP-0 | MMD55-TRTP-0 | MMD55-TRTP-0 |
|---|---|---|---|---|---|---|---|
| | | 321 | 321 | 321 | 322 | 323 | 324 |
| Sample | RFW#: | 026 | 027 | 028 | 029 | 030 | 031 |
| Information | Matrix: | SOIL | SOIL | WATER | SOIL | SOIL | SOIL |
| | D.F.: | 1.04 | 1.00 | 1.00 | 1.00 | 1.02 | 0.962 |
| | Units: | UG/KG | UG/KG | UG/L | UG/KG | UG/KG | UG/KG |
| Surrogate Recovery | Toluene-d8 | 97 % | 100 % | 98 % | 109 % | 105 % | 96 % |
| | Bromofluorobenzene | 89 % | 83 % | 110 % | 104 % | 90 % | 78 % |
| | 1,2-Dichloroethane-d4 | 91 % | 97 % | 108 % | 101 % | 115 % | 92 % |
| | | fl | fl | fl | fl | fl | fl |
| Benzene | | 6 U | 6 U | 5 U | 6 U | 6 U | 5 J |
| Toluene | | 6 U | 6 U | 5 U | 6 U | 6 U | 5 J |
| Ethylbenzene | | 6 U | 6 U | 5 U | 6 U | 6 U | 5 U |
| Xylene (total) | | 6 U | 6 U | 5 U | 6 U | 6 U | 5 U |

*= Outside of EPA CLP QC limits.

| | Cust ID: | MBD55-TRIP-0 325 | MBD55-TRIP-0 326 | VBLKMI | VBLKMI BS | VBLKVE | VBLKWB |
|---|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 032 | 033 | 95LVW217-MB1 | 95LVW217-MB1 | 95LVK209-MB1 | 95LVK211-MB1 |
| | Matrix: | SOIL | SOIL | SOIL | SOIL | WATER | WATER |
| | D.F.: | 0.980 | 1.02 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/L | UG/L |
| Surrogate Recovery | Toluene-d8 | 109 % | 107 % | 98 % | 90 % | 97 % | 100 % |
| | Bromofluorobenzene | 92 % | 78 % | 98 % | 94 % | 94 % | 108 % |
| | 1,2-Dichloroethane-d4 | 111 % | 107 % | 91 % | 86 % | 90 % | 104 % |
| | | fl | fl | fl | fl | fl | fl |
| Benzene | | 5 U | 6 U | 5 U | 111 % | 5 U | 5 U |
| Toluene | | 5 U | 6 U | 5 U | 106 % | 5 U | 5 U |
| Ethylbenzene | | 5 U | 6 U | 5 U | 107 % | 5 U | 5 U |
| Xylene (total) | | 5 U | 6 U | 5 U | 108 % | 5 U | 5 U |

| | Cust ID: | VBLKWG | VBLKWK | VBLKWJ | VBLKWK | VBLKVP |
|---|---|---|---|---|---|---|
| Sample Information | RFW#: | 95LVQ277-MB1 | 95LVQ278-MB1 | 95LVQ279-MB1 | 95LVQ280-MB1 | 95LVW216-MB1 |
| | Matrix: | SOIL | SOIL | SOIL | SOIL | WATER |
| | D.F.: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| | Units: | UG/KG | UG/KG | UG/KG | UG/KG | UG/L |
| Surrogate Recovery | Toluene-d8 | 116 % | 109 % | 113 % | 104 % | 95 % |
| | Bromofluorobenzene | 106 % | 105 % | 109 % | 98 % | 96 % |
| | 1,2-Dichloroethane-d4 | 111 % | 116 % | 119 % | 104 % | 91 % |
| | | fl | fl | fl | fl | fl |
| Benzene | | 5 U | 5 U | 5 U | 5 U | 5 U |
| Toluene | | 5 U | 5 U | 5 U | 5 U | 5 U |
| Ethylbenzene | | 5 U | 5 U | 5 U | 5 U | 5 U |
| Xylene (total) | | 5 U | 5 U | 5 U | 5 U | 5 U |

*= Outside of EPA CLP QC limits.

# APPENDIX D
# TREATMENT LEVEL MODIFICATION

**D1: Request by DOE**

**D2: Approval from Ohio EPA and U.S. EPA**

# APPENDIX D1

## Request by DOE

MIAMISBURG AREA OFFICE

Department of Energy
Ohio Field Office
Miamisburg Area Office
P.O. Box 66
Miamisburg, Ohio 45343-0066

SEP 14 1995

Mr. Tim Fischer
U.S. EPA
HSRM-6J
77 W. Jackson Blvd.
Chicago, Illinois 60604

Mr. Brian Nickel
Ohio EPA
401 E. Fifth Street
Dayton, Ohio 45402-2911

Dear Mr. Fischer and Mr. Nickel:

RE: OU5 - FFTA and Fuel Oil Tank Removal Biotreatment for TPH and BTEX

DOE is requesting concurrence from the OEPA and USEPA concerning treating soils generated from the FFTA and Fuel Oil Storage Removal Actions to a TPH value of 105 ppm.

The Department of Energy previously proposed cleaning up the Fire Fighting Training Area soils, which are currently stockpiled awaiting bio-treatment, to a Total Petroleum Hydrocarbon (TPH) value of 40 ppm. This proposed value was written into the soil treatment work plan based upon a proposed 40 ppm TPH value that OEPA was considering. Based upon the February 4, 1993, Ohio EPA letter to "Interested Parties" from Donald R. Schregardus, Director, Ohio EPA DRS, the 40 ppm TPH value should be increased to 105 ppm. This change affects the interim final policy PP 01 03 200 on petroleum contaminated soils. This is the same as the most stringent BUSTR TPH-Ax requirements.

DOE will now treat all soils from the FFTA and the Fuel Oil Tank Removal in accordance with the interim final policy to a TPH LEVEL OF 105 ppm. DOE recognizes that the appropriate testing methods are EPA Method 8015 for gasolines and EPA Method 418.1 for all other fuels or oils. In addition, DOE recognizes that the levels of BTEX remains the same at:

| | |
|---|---|
| Benzene | 0.006 ppm |
| Tolulene | 4.0 ppm |
| Ethylbenzene | 6.0 ppm |
| Xylene | 28.0 ppm |

In a related issue, DOE is clarifying the operating procedures for sampling to verify that soils from the bioremediation treatment pads are below the cleanup criteria. The original procedures did not recognize that soil may have been sampled for TPH and BTEX prior to staging for eventual treatment. If original sampling indicates that TPH is below 105 ppm, and BTEX is below the criteria outlined above, and the sampling meets the attached, proposed guidance for spoil pile sampling protocols; then bioremediation treatment would not be necessary.

Should you have any questions on the above, please contact Alan Spesard at (513) 865-3859 of me at (513) 865-3597.

Sincerely,

Arthur W. Kleinrath
Project Engineer Team Leader

Enclosure

cc w/enclosure:
John Sands, DOE-HQ
Gary Coons, EG&G
Lisa Anderson, OEPA
Jim Zahora, EG&G
Alec Bray, EG&G

# Sampling Procedure
## of
## Staged Soils at the Bioremediation Facility for TPH & BTEX

1. Determine the volume of the soils to be sampled

   A. If available, use records generated during the excavation of the soils

   B. If records do not exist, measure and calculate the volume

      1. Rectangular shaped stockpile

         Volume = Length x Width x Height

         $Ft.^3$ = Ft. x Ft. x Ft.

         $Yd.^3$ = $Ft.^3$ / 27

      2. Conical shaped stockpile

         Volume = 1.047 x (radius at base)$^2$ x (height)

         $Ft.^3$ = 1.047 x $Ft.^2$ x Ft.

         $Yd.^3$ = $Ft.^3$ / 27

2. Determine the minimum number of soil smples to collect using the volume of soil and the table below

Table 1

| $Yd.^3$ of Soil | 0 - 25 | 26 - 100 | 101 - 500 | 501 - 1000 | 1001 - 2000 | > 2000 |
|---|---|---|---|---|---|---|
| Min. # of grab samples | 2 | 6 | 8 | 10 | 13 | 13 + 3 per additional 500 $Yd.^3$ |

3. Detremine locations of samples to be collected

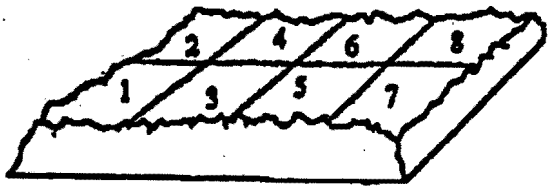
A. Visually divide the stockpile into sections equal to the number of soil samples required in the above table

B. Collect samples from the center of each section at a minimum depth of 12 inches below the surface of the stockpile

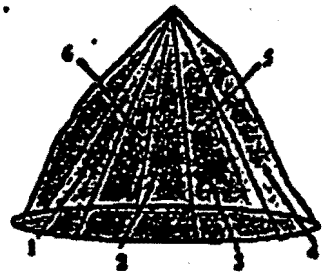
C. In addition to the minimum number of samples, two more samples should be collected for conical stockpiles, if practicable

1. From the top of the pile, hand auger down to as close to the middle of the stockpile as possible and obtain a sample from that depth

2. Hand auger into the side of the plie as close to the center as possible and sample




Volume = 300 cubic yards




Volume = 46 cubic yards

4. Sample handling and analysis methods shall be in accordance with those identified in the FFTA Quality Assurance Project Plan contained within the FFTA Removal Action Work Plan

# APPENDIX D2

## Approval from Ohio EPA and U.S. EPA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

October 13, 1995

HSF-5J

Mr. Arthur Kleinrath
U.S. Department of Energy
Dayton Area Office
P.O. Box 66
Miamisburg, OH 45343-0066

RE: U.S. DOE Mound Plant
Operable Unit #5
Fire Fighter Training Area
Soil Cleanup Levels and Sampling Procedure

Dear Mr. Kleinrath:

The United States Environmental Protection Agency (U.S. EPA) has received your correspondence dated September 14, 1995 concerning the treatment of soils generated from the Fire Fighter Training Area (FFTA) and Fuel Oil Storage Removal Actions. Your letter states that DOE plans to treat all soils in these areas to a Total Petroleum Hydrocarbon (TPH) concentration of 105 parts per million (ppm) instead of the previously proposed level of 40 ppm.

U.S. EPA has determined that the 105 ppm cleanup level is consistent with the most stringent BUSTR action level in the BUSTR corrective action rule. Therefore, U.S. EPA concurs with the 105 ppm cleanup goal for TPH in soils from the FFTA and Fuel Oil Storage Removal Action. In addition, U.S. EPA agrees that the cleanup levels for BTEX remain as they are stated in your September 14, 1995 letter.

U.S. EPA concurs with the sampling methods for TPH and BTEX as proposed in your September 14, 1995, correspondence. In addition, U.S. EPA concurs that soils sampled prior to staging for treatment with TPH concentrations below 105 ppm and BTEX concentrations below the criteria specified in your September 14, 1995, letter would not require bioremedation treatment.

If you have any questions, please call me at (312) 886-5787.

Sincerely,

Timothy J. Fischer
Remedial Project Manager

OhioEPA
State of Ohio Environmental Protection Agency
Southwest District Office
401 East Fifth Street
Dayton, Ohio 45402-2911
(513) 285-6357
FAX (513) 285-6249

George V. Voinovich
Governor

October 3, 1995

RE: DOE MOUND
OU5 FFTA AND FUEL OIL TANK
REMOVAL TPH LEVEL AND
SAMPLING PROCEDURE

Arthur W. Kleinrath
DOE Miamisburg Area Office
P.O. Box 66
1 Mound Road
Miamisburg, Ohio 45343-0066

Dear Mr. Kleinrath:

The Ohio Environmental Protection Agency (Ohio EPA) has received your correspondence dated September 14, 1995, concerning the treatment of soils generated from the Fire Fighter Training Area (FFTA) and Fuel Oil Storage Removal Actions. This correspondence states that DOE will now treat all soils from the FFTA and the fuel oil tank removal to a Total Petroleum Hydrocarbon (TPH) value of 105 parts per million (ppm) instead of the previously proposed value of 40 ppm.

The correspondence references a letter from Donald R. Schregardus, Director, Ohio EPA, to "Interested Parties" dated February 4, 1993, concerning the interim final Ohio EPA Policy PP 01 03 200 *Petroleum Contaminated Soils.* The policy lists in Table II, "Analytical Evaluation of the Contaminated Soil or Post-Treatment Residual to Determine Status as a Non-Regulated Material" the concentration limit of 40.0 ppm for TPH, as per analytical methods EPA Method 8015 for gasolines and EPA Method 418.1 for all other fuels. This level is now 105 ppm for TPH as per Director Schregardus' letter, in which it states the policy is now consistent with BUSTR's Class I (most stringent) action level in BUSTR's corrective action rule. Therefore, Ohio EPA acknowledges that DOE will now treat all soils from the FFTA and fuel oil tank removal in accordance with the policy to a level of 105 ppm TPH, using the required analytical methods stated above. DOE is correct in recognizing that the levels of BTEX remain the same, as per its September 14, 1995 correspondence.

DOE also discusses a clarification of its operating procedures for sampling the soils stockpiled next to the bioremediation treatment pads. DOE proposes that soils sampled for TPH and BTEX prior to placement on the treatment pads be omitted from bioremediation treatment if TPH is less than 105 ppm and BTEX levels are below the criteria referenced in the September 14, 1995 correspondence. Ohio EPA concurs with this clarification when the sampling of these soils meets

the "Sampling Procedure of Staged Soils at the Bioremediation Facility for TPH & BTEX" as attached to DOE's September 14, 1995 letter and as discussed with Mr. Alan Spesard of your staff on Tuesday, October 3, 1995.

Please give me a cal l if there are any questions or comments at (513) 285-6468.

Sincerely,

Brian Nickel
Mound Project Manager
Office of Federal Facilities Oversight

cc: T. Fischer, USEPA Region V
A. Spesard, DOE MB
M. Williams, EG&G
J. Zahora, EG&G
G. Coons, EG&G
A. Bray, EG&G
R. Beaumier, OEPA/DERR
R. Vandegrift, ODH/BRH