5885

AREA 9, PHASE III
ABANDONED OUTFALL LINE

EXCAVATION PLAN
PART THREE

FERNALD CLOSURE PROJECT
FERNALD, OHIO

MARCH 2005

U.S. DEPARTMENT OF ENERGY

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LIST OF ACRONYMS AND ABBREVIATIONS

BAT	Best Available Technology
bcy	bank cubic yards
CDL	Certification Design Letter
CG&E	Cincinnati Gas and Electric
CWW	Cincinnati Water Works
DOE	U.S. Department of Energy
EMS	Excavation Monitoring System
FCP	Fernald Closure Project
FRL	Final Remediation Level
HPGe	High-Purity Germanium Detector
HDPE	high density polyethylene
MH	manhole
NPDES	National Pollutant Discharge Elimination System
ODOT	Ohio Department of Transportation
OSDF	On-Site Disposal Facility
OSHA	Occupational Safety and Health Administration
OU5	Operable Unit 5
pCi/g	picoCuries per gram
ppb	parts per billion
ppm	parts per million
TSS	total suspended solids
WAC	Waste Acceptance Criteria
WAO	Waste Acceptance Organization

1.0 INTRODUCTION

1.1 BACKGROUND

In early 1950's, construction began on the Feed Materials Production Center in Hamilton and Butler Counties in southwestern Ohio to convert uranium ore into uranium metal and to fabricate uranium metal into target elements for reactors that produced plutonium and tritium. In 1951, a 16-inch cast iron outfall sewer line was installed from the Feed Materials Production Center to the Great Miami River (see Figure 1-1). There were two wastewater streams that where discharged through the 16-inch cast iron outfall sewer line. One was a treated effluent wastewater stream from the production area that was carried through a 12-inch treated effluent line. The other was a treated sanitary wastewater stream from the site's Sewage Treatment Plant that was carried through a 10-inch treated sanitary sewer line. Both wastewater streams entered the 16-inch cast iron outfall sewer line at manhole (MH) 175 near the eastern edge of the Fernald Closure Project (FCP) site.

The 16-inch cast iron outfall sewer line was designed partially as a pressurized system. Originally, there were six manholes installed off-property (MH's 177, 178, 179, 180, 181, and 182). MHs 178 through 182 were installed as pressurized manholes made of reinforced concrete vaults with gaskets and bolted pressure-tight manhole lids and rings. MH 175, 176, and 177 were installed as non-pressurized manholes.

Originally MH 182 was placed approximately 140 feet from the discharge end of the pipeline west of the riverbank; however due to strong erosion, the west riverbank of the Great Miami River had eroded so that during a flood in 1965, MH 182 toppled into the river and the pipeline was severed so that it no longer discharged into the main channel. It is probable that sections of the pipeline near the end became detached as the riverbank eroded westward between the early 1950's and 1965.

A construction project was started in 1966 to rebuild the outfall. The pipeline was encased in sheet piling, bank run gravel and concrete. The discharge point was approximately 30 feet out from the bottom of the west riverbank and 90 feet from the top of the west riverbank. By 1968, the riverbank was becoming badly eroded again. Broken concrete was dumped along the riverbank in the general vicinity of the outfall structure. This concrete was obtained from a construction project on North Bend Road in Hamilton County and was not obtained from the FCP.

By 1973, floodwaters had eroded the riverbed around the outfall structure such that approximately 20 feet of sheet piling that extended out into the river was washed out and the end of the pipeline was severed. As such, part of the outfall structure was rebuilt by replacing some of the existing sheet piling in the river,

raising and resetting the sewer pipe in crushed stone, and installing riprap to protect the outfall structure from erosion. Crossties where installed at the top of the rebuilt section that tied the sheet piling on both sides of the pipeline together. Contaminated concrete from the FCP was also placed in the river to protect the rebuilt outfall structure and along the upper riverbank to prevent damage during periods of flooding.

In April 1989, MH 180 was observed to overflow storm water onto the surrounding ground. It was discovered during repairs to the manhole that no gasket existed under the manhole cover.

In the early 1990's, a 24-inch High Density Polyethylene (HDPE) outfall sewer line was installed from the FCP (originally know as the Feeds Material Production Center) to the Great Miami River approximately 50 feet to the south of the original outfall line (see Figure 1-1). At that time, the original outfall line was taken out of service and abandoned in place, henceforth referred to as the abandoned outfall line. The manholes designations for the abandoned outfall line where changed by adding an "S" at the beginning and an "A" at the end (e.g., MH 181 became SMH 181A). The 24-inch HDPE outfall sewer line is currently active and discharging into the Great Miami River.

In 1999, the sewage treatment plant area was remediated. As part of this remediation, the on-property portion of the abandoned outfall line was removed from SMH 175A (formerly MH 175) to SMH 176A and placed in the On-Site Disposal Facility (OSDF).

1.2 PURPOSE

Remediation of the abandoned outfall line is included in Area 9, Phase III as shown in Figure 1-2. The remediation of the abandoned outfall line is planned in three parts. Part One includes the remediation of the abandoned outfall line from just inside the FCP property line approximately at Station 0+00 to just west of the State Route 128 right of way approximately at Station 21+00. This excludes approximately 85 feet of pipe and MH 177A between Station 2+32 and Station 3+17 located in the vicinity of the crude oil pipeline owned by the Mid Valley Pipeline Company.

Part Two includes the remediation of the abandoned outfall line at the discharge structure (also know as the outfall structure) along the west bank of the Great Miami River and the restoration of the riverbank at the discharge structure.

Part Three includes the remediation of the abandoned outfall line from Station 21+00 to the outfall structure approximately at Station 37+56, including the remediation of manholes MH 177A and MH 181A, abandoned outfall line underneath State Route 128, and the remediation of the section of

abandoned outfall line under the crude oil pipeline owned by the Mid Valley Pipeline Company. The Excavation Plan Part One submittal (DOE 2004a) governs the remediation of Part One and was conditionally approved by the U.S. Environmental Protection Agency on August 12, 2004, and approved by the Ohio Environmental Protection Agency on August 17, 2004. The Excavation Plan Part Two submittal (DOE 2004b) governs the remediation of Part Two and was transmitted to the agencies for review on September 3, 2004.

This document represents the Excavation Plan Part Three submittal and governs the Part Three remediation of the abandoned outfall line.

The remedial actions addressed in this Part Three Excavation Plan include removing an estimated 980 bank cubic yards (bcy) of impacted soil, 20 bcy of debris, and 1,741 linear feet of pipe for disposal as discussed in Section 3.3. It is estimated that 3.2 cubic feet of lead will also be removed from the pipe joints and segregated for off-site disposal.

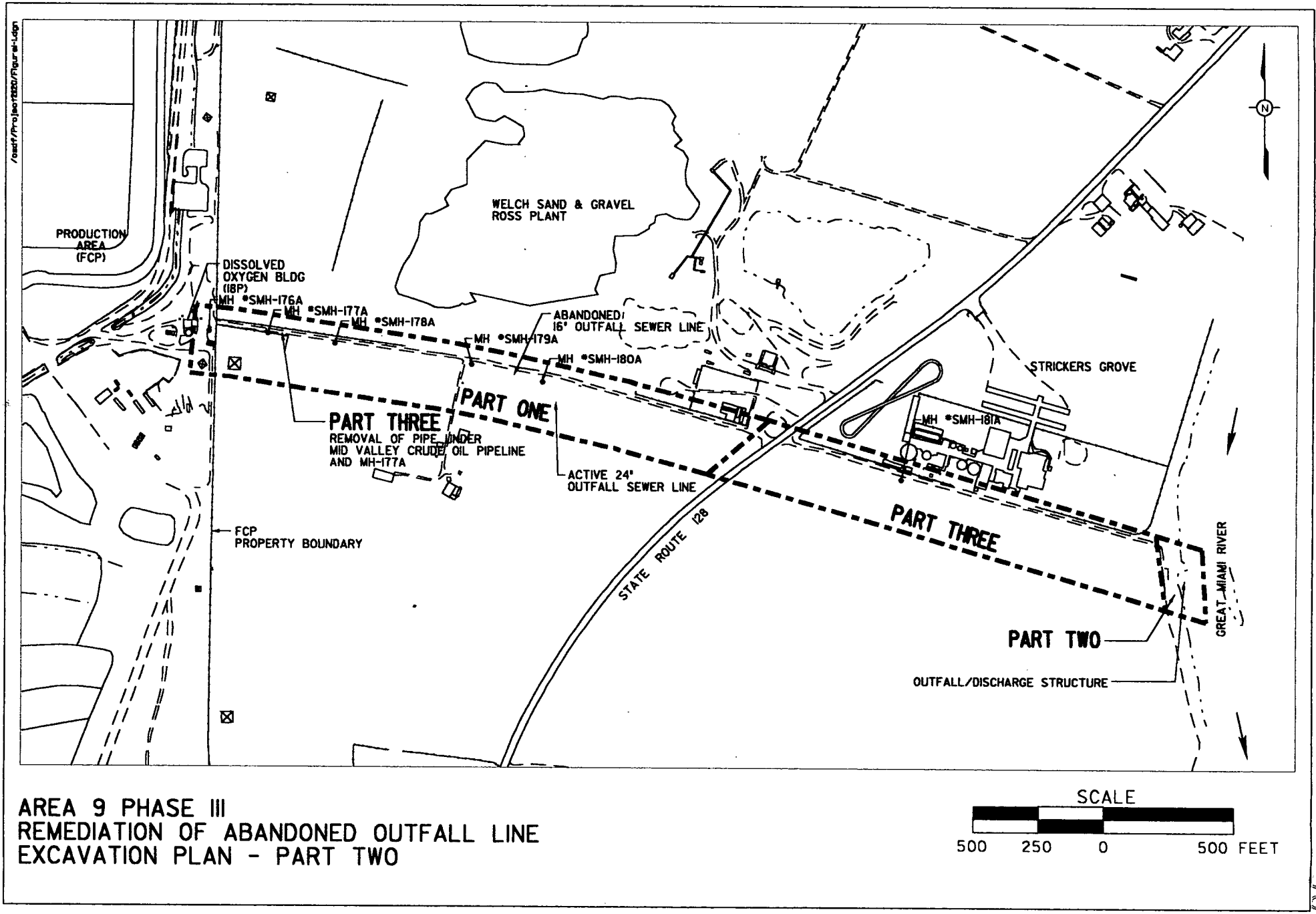
Most of this remedial action will take place off property (not on the FCP property). For purposes of this document, references to "on-site" will mean on the FCP property and references to "off-site" will mean off the FCP property.

1.3 EXCLUSIONS

Active 24-inch HDPE outfall sewer line and a nearby 4-inch abandoned gas line are excluded from this document.

1.4 PROTECTION OF CULTURAL RESOURCES

Historic and prehistoric archaeological sites are present in the areas around the abandoned outfall line project area. Consultation with the Ohio Historic Preservation Office has occurred to ensure that historic and prehistoric sites in the area are protected during the project. The area to be excavated has been surveyed for cultural resources in the past. The project area has also been significantly disturbed during installation of the abandoned and new outfall lines. Care will be taken to ensure project activities stay within the easement so that any sites in adjacent areas are not disturbed. Monitoring of the excavation will occur to ensure that cultural resources are not discovered during removal of the line. Although the project area has been disturbed, cultural resources (e.g., prehistoric artifacts) may still be present in the disturbed soil. Any cultural resources discovered will be managed as an unexpected discovery per EP-0003, "Unexpected Discovery of Cultural Resources".



AREA 9 PHASE III
REMEDIATION OF ABANDONED OUTFALL LINE
EXCAVATION PLAN - PART TWO

FIGURE 1-1 SITE PLAN

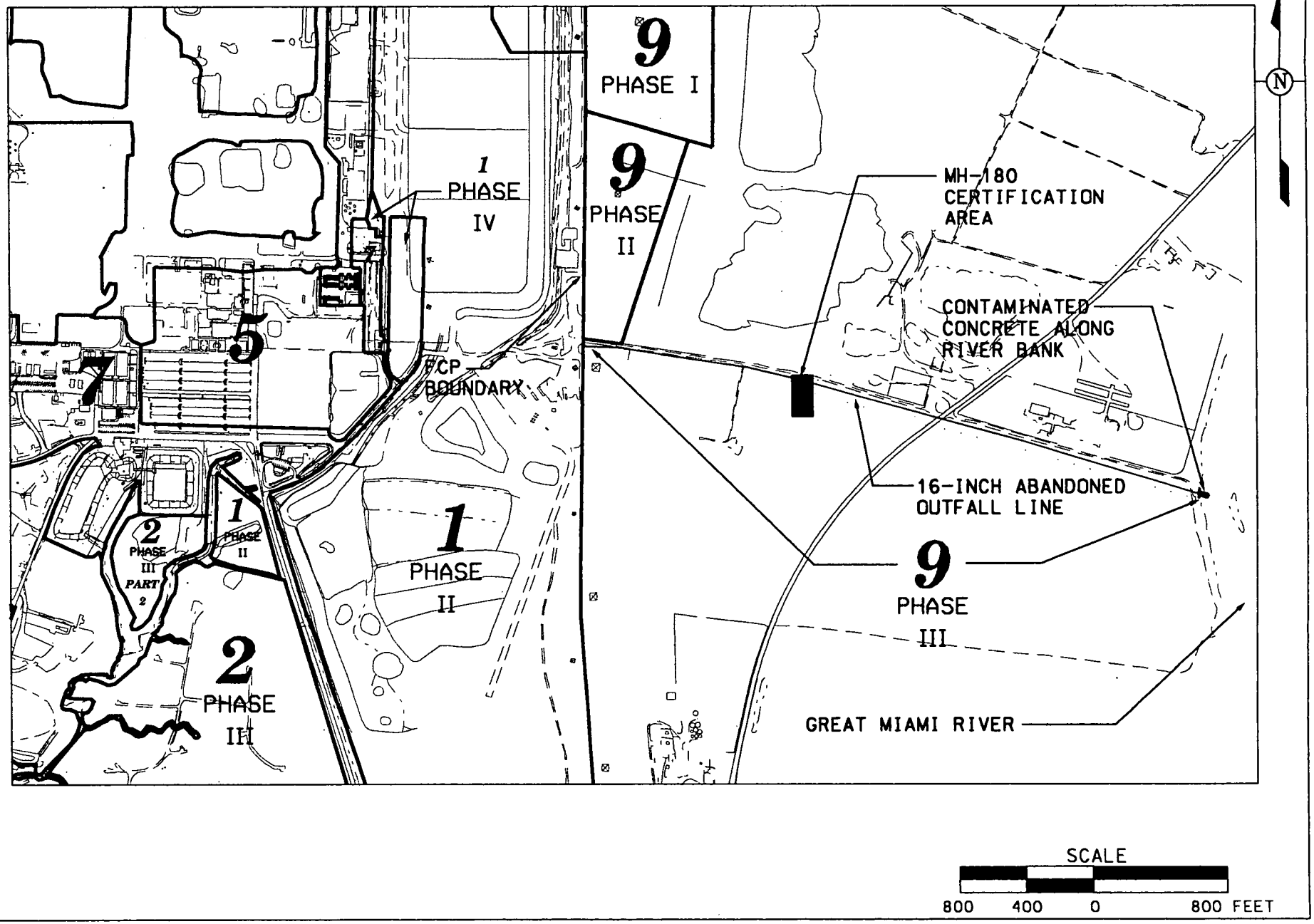


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FIGURE 1-2. AREA 9 PHASE III INDEX MAP

2.0 PREDESIGN INVESTIGATION AND CHARACTERIZATION DATA

2.1 SUMMARY OF HISTORICAL AND PREDESIGN INVESTIGATIONS

2.1.1 Historical Investigations

In May 1989, characterization soil samples were taken in the areas surrounding each manhole along the abandoned outfall line. The results of that characterization effort revealed that none of the samples collected in the area surrounding the only manhole (MH 181) found in Area 9, Phase III – Part Three exceeded the adopted criteria for soil removal for the site area at that time. The criteria identified for this removal action was 52 parts per million (ppm) total uranium and/or 46 ppm total thorium. These action levels were established and used prior to the development of the Operable Unit 5 (OU5) off-site soil final remediation levels (FRLs) (DOE 1996). The results of these historical samples collected within the project boundary of Area 9, Phase III – Part Three were later compared to the OU5 off-site soil FRLs during the preparation of Area 9, Phase III Predesign Investigation (DOE 2004c), and revealed four borings that had FRL exceedances. These borings are MH 181-4, MH 181-6, 1530, and 1532. The off-site soil FRL for technetium-99 [1.0 picoCuries per gram (pCi/g)] was exceeded at borings MH 181-4 (1.6 pCi/g), MH 181-6 (1.5 pCi/g). The off-site soil FRL for cesium-137 (0.82 pCi/g) was exceed at borings 1530 (2.57 pCi/g) and 1532 (1.0 pCi/g). The historical data is presented in Appendix B (Table B-1 and associated figures) of this plan.

2.1.2 Predesign

As discussed above, each of four historical borings had one FRL exceedance. Confirmation samples were collected during the Area 9, Phase III Predesign Investigation. The confirmation samples did not confirm the presence of cesium-137 at either historical boring; however, the presence of technetium-99 was confirmed at historical boring MH-181-4, but not at historical boring MH 181-6. Listed below are the historical borings and the results of their biased predesign samples:

- Boring 1530 had an above-FRL result of (2.57 pCi/g) for cesium-137 in the 6.5 to 7-foot interval. Cesium-137 was below-FRL (not detected) in the corresponding confirmatory predesign boring/interval (A9P3-MH181-1)

- Boring 1532 had an above-FRL result of (1.0 pCi/g) for cesium-137 in the 11.5 to 12-foot interval. Cesium-137 was below-FRL (not detected) in the corresponding confirmatory predesign boring/interval (A9P3-MH181-16)

- Boring MH 181-4 had an above-FRL result of (1.6 pCi/g) for technetium-99 in the 0.5 to 1-foot interval. Technetium-99 was above-FRL (1.1 pCi/g) in the corresponding confirmatory predesign boring/interval (A9P3-MH181-2)

- Boring MH 181-6 had an above-FRL result of (1.5 pCi/g) for technetium-99 in the 0 to 0.5-foot interval. Technetium-99 was below-FRL (0.738 pCi/g) in the corresponding confirmatory predesign boring/interval (A9P3-MH181-17).

Because the above-FRL contamination is associated with technetium-99, which is likely to be the most mobile contaminant, predesign bounding samples were collected to define the extent of the contamination using this constituent of concern. The contamination was laterally bound in the cardinal directions at borings A9P3-MH181-2N2 (north), A9P3-MH181-2S2 (south), A9P3-MH181-2E2 (east), and A9P3-MH181-2W4 (west) to a depth of 5 feet. The contamination boundaries extend laterally to the north to boring A9P3-MH181-2N4 and to the east to boring A9P3-MH181-2E3 to a depth of 2 feet. The entire contamination area is 40 feet by 41 feet, and the 5-foot deep excavation, which is located in the southwest corner of the area, is 16 feet by 26 feet with the remaining area being excavated to 2 feet deep. The predesign sampling data is reported in Appendix B (Table B-2 and associated figures).

Lastly, in an attempt to gain information of the bedding material beneath the pipe that is committed to be sent as above-waste acceptance criteria (WAC) material, Geoprobe core samples have been taken at each of the manhole locations where depth and location of the pipe can be physically determined, which demonstrate that the bedding material is well below WAC.

2.2 ABOVE-FRL/IMPACTED MATERIAL EXCAVATION BOUNDARIES

Historical OU5 off-site FRL exceedances were investigated with biased predesign samples to confirm the presence of impacted soil. The predesign sampling data was evaluated to determine if there are any OU5 off-site soil FRL exceedances.

As discussed above in Section 2.1.2, there is an area that is 5 feet deep, which is bound laterally by borings A9P3-MH181-2W4, A9P3-MH181-2E2, A9P3-MH181-2N2, and A9P3-MH181-2S2 that will be excavated. There is also a 2-foot deep excavation, which extends north from the 5-foot deep excavation to boring A9P3-MH181-2N4 and east to boring A9P3-MH181-2E3, that will be excavated. The overall excavation is a minimum of 2 feet deep with the southwestern quadrant being excavated to a depth of 5 feet. The footprint of this excavation will be certified prior to trenching to remove the abandoned outfall line.

Although samples of the bedding material have been collected prior to excavation, and demonstrated that the material is below-WAC, the bedding material and soil underneath the bedding material will be committed to above-WAC. The pipe, bedding material, and soil underneath the bedding material will be dispositioned in the SP-7 stockpile area.

3.0 REMEDIAL APPROACH

3.1 INTRODUCTION

Part Three remediation of the abandoned outfall line will consist of four primary activities: site preparation, remedial excavation, certification, and restoration.

3.2 SITE PREPARATION

Site preparation activities associated with this work include but are not limited to: protection of utilities, establishing site boundaries and controls, surveying, site layout, construction fencing and signage, traffic controls, sediment controls, storm water and construction water management systems, and establishing support facilities, site access and haul route. Site preparation activities are scheduled to begin in October 2004. Detail description for site preparation activities are provided in the following text and in referenced design drawings and technical specifications (Appendix A).

3.2.1 Protection of Existing Utilities

There are a number of utilities located within or near the work area for Part Three remediation of the abandoned outfall line. Underground utilities within or near the work area will be surveyed and marked in the field prior to the initiation of site preparation activities. These include, Cincinnati Gas and Electric (CG&E) overhead transmission and power lines, CG&E underground gas lines, Cincinnati Water Works (CWW) water main, Cincinnati Bell telephone line, Mid Valley crude oil pipeline, and 24-inch HDPE Outfall Sewer Line.

3.2.1.1 CG&E Overhead Transmission and Power Lines

CG&E overhead transmission lines are located directly over a portion of the haul route at approximately Station 1+10 of the abandoned outfall line. In addition, overhead electrical power lines run parallel to both sides of State Route 128 and are positioned over a portion of the Part Three haul route. Equipment will be chosen so that safe working distances will be maintained between the operating height of the equipment and the CG&E overhead transmission lines.

An unoccupied farmhouse is located approximately 500 feet south of the abandoned outfall line Station 11+00 and is outside the work area; however, an overhead electrical power line runs from State Route 128 to the farmhouse. These wires where de-energized during site preparation for Part One and may be re-energized at the end of Part Three and the conclusion of the project at the discretion of the landowner.

3.2.1.2 CG&E Underground Gas Lines

An active CG&E underground gas line runs parallel to State Route 128 and intersects the abandoned outfall line at approximately Station 21+80. This line will be protected during the entire duration of the remediation and restoration of the abandoned outfall line. The primary hazard to this pipeline includes remediation work performed near and underneath the gas line. This line should already have sufficient cover, as required for crossing of construction equipment allowed on State highways. Approximately 120 feet northeast of the excavation location, haul trucks from the Welch Sand and Gravel's gravel pit drive over the CG&E gas line many times each work day. As part of Part One site preparation, the entrance drive off of State Route 128 was upgraded over the CG&E gas main prior to the commencement of construction activities in accordance with requirements of CG&E.

The CG&E gas line will be protected during site preparation, remedial excavation, installation of a casing pipe around the abandoned outfall line, and restoration (see Section 3.3.7).

An abandoned 4-inch CG&E gas line that once provided natural gas to the FCP is located approximately 35 to 40 feet south of the abandoned outfall line between the site property boundary and State Route 128. A CG&E technician blocked this line by inserting a "paddle" between the flanges to physically obstruct the flow to the 4-inch gas line. The line is physically isolated from the gas main that runs parallel to State Route 128 in accordance with CG&E requirements.

3.2.1.3 CWW Water Main

An active Cincinnati Water Works (CWW) underground water main runs parallel to State Route 128 and crosses the abandoned outfall line at approximately Station 22+17. This water main will be protected during the entire duration of the site preparation, sheeting and bracing, remediation, excavation, and restoration of the abandoned outfall line. The primary hazard to this pipeline includes remediation work performed near and underneath the water main. This water main should already have sufficient cover, as required for crossing of the haul route over the line.

3.2.1.4 Mid Valley Pipeline

At approximately Station 2+80, a crude oil pipeline owned by Mid Valley Pipeline Company crosses over the alignment for the abandoned outfall line. This line is a 20-inch diameter welded steel pipe and is used to transfer crude oil under pressure. This line will be protected during the entire duration of the remedial excavation and restoration of the abandoned outfall line.

The primary hazard to this pipeline during Part Three remediation is contact with the Mid Valley crude oil pipeline during remediation of the abandoned outfall line underneath. See Section 3.3.6 for methodology for removing the abandoned outfall line underneath the Mid Valley crude oil pipeline.

Another potential hazard to the pipeline is the hauling of construction and impacted materials and equipment over the pipe. To eliminate or minimize this hazard, a protective covering was constructed over this pipeline as part of the site preparation for Part One of the abandoned outfall line in accordance with Mid Valley Pipeline Company requirements.

3.2.1.5 Underground Telephone Line

An underground telephone line runs from State Route 128 to the unoccupied farmhouse discussed in Section 3.2.1.1 and is not in the vicinity of remedial excavation included in Part Three.

3.2.2 Surveying

Prior to site preparation and excavation activities, the remediation area will be surveyed to establish temporary benchmarks, locate existing utilities, easements, and property boundaries, and layout construction fence, abandoned outfall line, centerline of haul road, and excavation limits.

3.2.3 Construction Fencing

3.2.3.1 Construction Fence/Access Control

Construction safety fence will be installed around the work area prior to removal of topsoil in accordance with design drawings 99X-5500-G-00800 and 99X-5500-G-00801. The work area will be of sufficient size to allow for the work to be performed safely and stockpiling of topsoil and overburden within the fenced in area. An access point has been established through the FCP perimeter fence near the Dissolved Oxygen Building (18P) to allow direct access from the work area to a designated above-WAC area within the FCP site boundaries. Currently, the SP-7 stockpile area is designated for disposition of above-WAC impacted material. Construction safety fence installed around the work area will be removed after completion of Part Three remediation.

An access control (posts with removable cable) is installed at the FCP property boundary and similar access control will be installed east of the State Route 128 crossing. An existing gate on the gravel drive west of State Route 128 will be utilized to control access from State Route 128. Access control at the FCP property boundary and the existing gate at State Route 128 will to be closed whenever project personnel are not present within the work area (e.g., during lunch breaks and at the end of shift).

3.2.3.2 Work Area Entry Requirements

Whenever the access control at the FCP property boundary is opened, personnel within the off-site work area must wear a site access badge. This requirement will not apply during construction activities within the off-site work area provided the site boundary access control is secured.

3.2.4 Erosion and Sediment Controls

Prior to topsoil removal and before start of excavation, silt fence will be installed downstream of the proposed locations of stockpiling of topsoil and overburden material. Topsoil and overburden material will be stockpiled at several locations during excavation within the construction safety fence limits. See design drawing 99X-5500-G-00778 for silt fence installation detail. Silt fence will also be installed to control runoff from the on-site impacted material stockpile areas, as required.

3.2.5 Construction Water Systems

Construction water includes subsurface water, storm runoff, effluent water in the existing 16-inch sewer line, and water used during construction other than water (rinsate) used to clean the abandoned outfall line. In order to effectively contain construction water during the excavation to allow time for sampling and a determination of proper disposal of that water, water must be held within the excavation/work area. The abandoned outfall line was made to discharge directly to the Great Miami River; however during Part Two remediation of the line, the section of pipeline at the river outfall was removed and the line was plugged at approximately 37+56 west of the riverbank. During Part One remediation of the abandoned outfall line, the line was plugged on the downstream side of SMH 181A to control construction water collected from the upstream side of the manhole and prevent river water from infiltrating the bottom of the excavation through the pipeline. During pipeline excavation, water can be sampled from the manhole and excavation area downstream of manhole SMH 181A prior to pumping so that proper disposition can be determined. Disposition of construction water will be as described in Section 3.3.9.

A portable gasoline powered pump and approximately 500 linear feet of flexible hose will be procured during site preparation activities for excavation dewatering.

3.2.6 Haul Road

An existing off-site gravel drive that runs from the west of the Great Miami River to the FCP site, and on-site roads will be used to haul excavated impacted material to the SP-7 stockpile area located on site west of the OSDF (see Figure 3-1). Improvement to an existing off-site gravel drive including the construction of protection over the Mid Valley crude oil pipeline, the construction of a new gravel haul road connector at the FCP property boundary and existing on-site haul route/roadways were completed

during site preparation activities for excavation plans Parts One and Two. This haul route crosses State Route 128.

The haul road to be used during the remediation of the abandoned outfall line will be operated as a "clean" haul route and a portion will go through a certified area. To ensure the integrity of the certified areas are met, a controlled loading process will be utilized. This assures the load in the haul trucks, including roll-off box trucks, will be placed below the sideboards, and that side rails and tailgates will be scraped cleaned prior to hauling. If materials are spilled during the loading process it will be cleaned up prior to the trucks exiting the loading and dumping zones. Trucks must be visibly clean prior to exiting these buffer zones. Haul trucks will be equipped with load covers and employ Best Available Technology (BAT) methods to ensure that no airborne materials are emitted from the haul truck bed or load. Automatic load covers will be extended to cover the truck beds, whether full or empty, during equipment movement. The dumping process will require that the trucks be staged in a clean buffer area and dump hauled materials into the contamination area via an elevated ramp or platform that prevents the dumped material from spilling back against the tires. Trucks will have to be scraped clean and wheel washed prior to leaving the clean buffer area and returning to the excavation site.

Figure 3-1 shows the on-site haul route to allow for direct haul of impacted material from the off-site work area to the SP-7 stockpile area.

3.2.7 Off-Site Backfill and Topsoil Sources

Backfill material, if required, will be borrowed from off-site sources. Sand may be used as supplemental general fill material and may be obtained from nearby sand and gravel pits. Topsoil may also be borrowed from an off-site source with input from the property owner.

3.2.8 Pre-Excavation Sampling

Prior to the initiation of excavation, sediment/residue samples were taken from the bottom of the abandoned outfall line manholes. These residues were analyzed for various constituents to determine if pipe residues are likely to meet or exceed radiological and chemical WAC. The results of the residue sampling demonstrated that the sediments in manholes are above-WAC. Results of the sediment sample identified as A9P3-MH181^1S-R are presented in Appendix B (Table B-2).

3.2.9 Traffic Controls

Traffic controls in accordance with Ohio Department of Transportation (ODOT) will be installed along State Route 128 before start of remedial excavation. Signage in right-of-way shall be in accordance with the ODOT requirements. Flaggers will be present to facilitate trucks crossing State Route 128.

3.3 REMEDIAL EXCAVATION

Remedial excavation activities associated with this work include clearing and grubbing, topsoil removal and stockpiling, overburden removal and stockpiling, removal of abandoned outfall line, manholes, excavation of impacted soil, usage of the SP-7 stockpile area, usage of the haul routes, excavation dewatering, real-time monitoring and certification sampling, backfill the excavation, radio and cell phone communications, dust control and restoring the work area. Remedial excavation activities are scheduled to start in October 2004.

3.3.1 Clearing and Grubbing

Clearing may be required if work is performed in any area where the off-site landowner has not harvested his crops. Since the current land usage in the work area for Part Three excavation includes crop growing and cattle grazing, no grubbing will be associated with the Part Three remediation of the abandoned outfall line. Any ground cover and subsurface root mass in-place when site preparation activities begin will be mixed in with the topsoil when the topsoil is removed and stockpiled.

3.3.2 Topsoil Removal and Stockpiling

Except in the area of surface remedial excavation, approximately the top 2 feet of soil will be stripped and stockpiled in the immediate trench excavation area prior to trench excavation. In addition, any locations to be used for the stockpiling of overburden materials (see Section 3.3.3) will also be stripped of 6-inch topsoil. Topsoil stockpiles will be placed and managed to cause minimal interference with work activities. Erosion and sediment controls will be established in accordance with Section 3.2.4 and Technical Specification Section 02275.

3.3.3 Overburden Removal and Stockpiling

After removal of topsoil, overburden soil up to the top of the existing abandoned outfall line pipe will be removed and stockpiled within the work area in locations where erosion and sediment controls have been established for stockpiles. The Construction Manager and Waste Acceptance Organization (WAO) will observe the excavation and cease the excavation of overburden soil when the top of the pipe is encountered.

3.3.4 Removal of Abandoned Outfall Line and Impacted Soil

As described in Section 2.2, technetium-99 was found to be above-FRL in an isolated area on the eastern side of MH 181A. This area is horizontally and vertically bound, and will be excavated to remove the impacted soil. This area is bounded to the north by boring location A9P3-MH181-2N4, to the south by A9P3-MH181-2S2, to the west by A9P3-MH181-2W4, and to the east by boring location A9P3-MH181-2E3. This area is 40 feet by 41 feet. In the southwestern quadrant of the area, there is a 5-foot deep excavation, which is 16 feet by 26 feet with the remaining area being excavated to 2 feet deep. The excavation is required to remove the contaminated soil that is above-FRL for technetium-99 (see Figure 3-2). This soil is not above the WAC for the OSDF; therefore, this material will be sent to the OSDF for disposal. Once this material has been excavated, certification samples will be taken to verify that all above-FRL material has been removed. Excavation of the abandoned outfall line will not proceed in the vicinity of MH 181A until the certification sample results have been evaluated. If certification sample results confirm that contaminated materials have been successfully removed from the area around the excavation of MH 181A, then the excavation of the abandoned outfall line can proceed through this area.

Removal of the abandoned outfall line includes removal of the pipeline approximately from Station 2+30 to Station 3+15 under the Mid Valley crude oil pipeline including manhole SMH 177A and approximately from Station 21+00 to Station 37 +56 including the abandoned outfall line under State Route 128 and manhole SMH 181A. The abandoned outfall pipeline consists of a 16-inch diameter cast iron pipe. The pipe sections are connected with bell and spigot joints packed with hemp and filled with molten lead or lead substitute. To the extent possible, the pipe will be removed from the trench intact by pipe length and will not be crushed in the trench. Lead from the pipe joints will be removed from the pipes and segregated for disposition to Envirocare.

Manholes consist of both pre-cast and cast-in-place concrete. Manhole SMH 177A is a pre-cast and are non-pressure type manholes. Manhole SMH 181A is a cast-in-place pressure type manhole. Residue samples taken from the manholes prior to excavation (see Section 3.2.8) confirmed that the above-WAC process residues are located within the manholes. Therefore, manholes and the pipe will be considered above-WAC and hauled to the SP-7 stockpile area for disposition at an off-site location. Manholes and pipe will be size reduced at SP-7 stockpile area to meet the off-site disposal criteria.

Removal of impacted soil includes soil from the top of pipe to the top of bedding material, bedding material below the pipe, and soil below the bedding material and along the bedding material sidewalls. At a minimum, six inches of soil beneath the bedding material will be removed. Once this soil has been

removed, certification samples will be collected from the bottom of the excavation. To simplify the overall excavation control process, and to further support the safe trenching activities, this excavated impacted soil, though below-WAC, will be hauled to SP-7 stockpile area for disposition at an off-site location.

If either real-time monitoring or certification sampling show soils at the bottom of the trench to exceed OU5 off-site FRLs after the bedding material and soil has been removed, then additional soil will be excavated until FRLs are met.

The excavated abandoned outfall pipeline including manholes and impacted soil will be hauled to SP-7 stockpile area by haul trucks and roll-off boxes. Loading methods should minimize soil in buckets to ensure no spillage during the loading. Trucks should be loaded so that material is below the side rails of the trucks. Materials should be wetted prior to transport to ensure no visible emissions. The haul trucks will also be equipped with automatic load covers. If materials are spilled during the loading process they will be shoveled back into the load and the area monitoring prior to trucks leaving the buffer area.

3.3.5 Excavation Methods

Open trench, trencher, or trench box excavation method may be used to remove the pipeline, manholes, bedding material, overburden and impacted soil. Additional requirements will be employed for removal of pipe under the Mid Valley crude oil pipeline and State Route 128. Dust control will be provided during remedial excavation activities in accordance with FCP practices, as required.

3.3.5.1 Open Trench

This method includes an open trench excavation using a backhoe excavator. This method requires the excavated slopes stay stable during excavation of soil during the excavation, removal, sampling, and backfilling operations. If the excavation slopes do not stay stable and do not meet safety requirements, no personnel will be allowed to enter the excavated trench and that the trench do not stay open for more than 72 hours.

Excavated overburden will be stockpiled within the work area with erosion and sediment controls established in accordance with Section 3.2.4. Stockpiles must have a sufficient setback distance from the excavated trench as instructed by the project's competent person to assure trench stability. The pipe will be removed intact by pipe length to extent possible, within the trench and hauled to the SP-7 stockpile area for subsequent disposition at an off-site location. In some cases, where pipe extends into a manhole,

it may be difficult to remove pipe lengths intact, and may require breaking the pipe outside of the manhole wall.

This method prohibits personnel from entering the excavation unless the walls have been shored or laid back in accordance with U. S. Occupational Safety and Health Administration (OSHA) requirements as determined by the project's competent person.

3.3.5.2 Trencher

This method is essentially the same as the open trench method, except that a trencher will be used to remove the overburden soil. The pipe, bedding material, and associated soil would be removed per Section 3.3.4.

3.3.5.3 Trench Box

In the event that personnel need to enter the excavation, the trench will be improved in accordance with OSHA requirements. This may include widening the trench excavation to allow the installation of a trench box. Widening of the trench excavation for trench box installation, if required, will be designed based on the subsurface soil condition and construction approved.

3.3.6 Open Trench Method for Removal of Pipe Under Mid Valley Crude Oil Pipeline

The plan for remediation of the portion of the abandoned outfall line under the Mid Valley crude oil pipeline is to remove it by open trench excavation method (see Figure 3-3). Open trench excavation will be performed in accordance with the Mid Valley Pipeline Company requirements, including supporting the existing crude oil pipeline during excavation, excavation methodology, and backfilling requirements.

The following is the excavation approach for removal of abandoned outfall line under the Mid Valley crude oil pipeline by open trench method:

a. Obtain approval from Mid Valley crude oil pipeline for removal of the abandoned outfall line by open trench method (refer to Appendix C for correspondence with Mid Valley Pipeline Company).

b. Notify Mid Valley Pipeline Company prior to performing any excavation within the Mid Valley crude oil pipeline right-of-way.

c. Prepare Penetration Permit for excavation within Mid Valley crude oil pipeline right-of-way.

d. Install erosion and sediment controls before start of excavation as specified in the technical specifications.

e. Manage construction water during excavation as described in Section 3.3.9.

f. Restrict equipment crossing at Mid Valley crude oil pipeline. Heavy equipment will not cross the Mid Valley crude oil pipeline except at the access ramp constructed earlier during performance of Abandoned Outfall Line Excavation Plan Part One unless otherwise approved by Mid Valley Pipeline Company.

g. Remove overburden soil (varies approximately from 18 to 30 inches over Mid Valley crude oil pipeline) above the Mid Valley crude oil pipeline within 3 to 5 feet laterally north and south of the abandoned outfall line crossing as per the special requirements of the Penetration Permit in the presence of a Mid Valley Pipeline Company representative. See drawing 99X-5500-G-00797 for profile of existing cover over the Mid Valley crude oil pipeline.

h. To meet the Mid Valley Pipeline's requirements that no more than 20 feet of the exposed Mid Valley crude oil pipeline will be spanning the abandoned outfall line trench crossing, the trench width under the Mid Valley crude oil pipeline will not exceed 15 feet.

i. After Mid Valley crude oil pipeline is exposed, hand excavate approximately 1 foot under the exposed Mid Valley crude oil pipeline for approximately 3 to 5 feet laterally north and south of abandoned outfall line crossing to install rigging straps around the Mid Valley crude oil pipeline.

j. Hold Mid Valley crude oil pipeline in place by use of rigging straps and construction equipment or by other method approved by the Construction Manager, unless otherwise waived by the Mid Valley Pipeline Company representative.

k. After the Mid Valley crude oil pipeline is held in place, excavate and remove the abandoned outfall line east of the Mid Valley crude oil pipeline crossing. After real-time monitoring and certification sampling is performed, backfill the trench as per the typical trench detail shown on construction drawing to within 2 feet under the Mid Valley crude oil pipeline.

l. After removal of abandoned outfall line east of Mid Valley crude oil pipeline crossing, excavate abandoned outfall line west of the Mid Valley pipeline crossing and the existing Manhole SMH 177A. After real-time monitoring and certification sampling is performed, backfill the manhole excavation and trench as per typical trench detail shown on construction drawing to within 2 feet under the Mid Valley crude oil pipeline.

m. After trench backfill is completed to within 2 feet under the Mid Valley Pipeline, backfill remaining trench below the Mid Valley crude oil pipeline with sand to 1 foot above the Mid Valley crude oil pipeline.

n. Place 2 feet +/- of topsoil as described in this section and as shown on the typical trench detail. Grade to match adjacent existing grade.

o. Perform restoration as described in this section.

p. Excavated abandoned outfall line including pipe and impacted soil will be hauled to SP-7 for stockpiling in accordance with Section 3.3.4.

3.3.7 Excavation Method for Removal of Pipe Under State Route 128 by Installation of Casing Pipe

Excavation method selected for removal of abandoned outfall line 16-inch pipe under the State Route 128 is by installation of 54-inch casing pipe (refer to construction drawing No. 99X-5500-G-00822). Following is the excavation approach:

CONSTRUCTION ACTIVITIES BEFORE PIPE REMOVAL

Before removal of abandoned outfall line 16-inch pipe under State Route 128 perform following construction activities:

a. Revise Abandoned Outfall Line Excavation Plan Part Three Traveler to include scope of work related to the removal of abandoned outfall line pipe under the State Route 128 by installation of casing pipe.

b. Review and approve Safe Work Plan prepared by the casing pipe Subcontractor (hereafter called as "Subcontractor") for installation of 54-inch casing pipe.

c. Contact "OUPS" for locating existing utilities within the construction area.

d. Notify ODOT and utility companies before start of construction activities.

e. Install traffic control signs conforming to ODOT requirements.

f. Install "Jersey Barrier" east and west of State Route 128 pipe crossing as per ODOT requirements.

g. Install construction safety fence and radiological fence as shown on the construction drawing.

h. Install erosion and sediment controls as specified in technical specifications.

i. Review technical submittals prepared by Subcontractor for casing pipe, pipe joints, and pipe welding before procurement of the casing pipe material.

j. Procure and deliver 54-inch casing pipe (steel pipe, wall thickness 0.625-inch) and associated accessories to the project site (by Subcontractor).

k. Remove abandoned outfall line 16-inch cast iron pipe east and west of State Route 128 pipe crossing up to the limits of proposed 54-inch casing pipe and haul to SP-7. Plug/grout east and west ends of the remaining 16-inch pipe under State Route 128. Survey location and bottom elevation of abandoned outfall line 16-inch pipe at both ends.

l. Perform radiological survey, precertification sampling, and certification sampling during removal of pipe.

m. Excavate equipment (main pit) and receiving pits at east and west of the State Route 128 with stable side slopes. Minimum pit sizes and pit bottom elevations will be as required by the Subcontractor. Pits will be excavated to meet safety requirements for the personnel access.

n. Stabilize pit bottoms with crushed rock.

o. Manage construction water during excavation as described in this Section 3.3.9.

p. Prepare State Route 128 side slopes for jacking/ramming of 54-inch casing pipe as required by the Subcontractor.

ALTERNATIVES FOR PIPE REMOVAL

Alternatives for removal of abandoned outfall line 16-inch pipe are based on two possible field conditions:

1. **ALTERNATIVE 1** - Removal of abandoned outfall line 16-inch pipe if the annular space between the existing abandoned outfall line 16-inch pipe and 26-inch steel/24-inch vitrified clay encasement pipe is not grouted and is open.

2. **ALTERNATIVE 2** - Removal of 26-inch steel/24-inch vitrified clay encasement pipe and abandoned outfall line 16-inch pipe if the annular space between the existing abandoned outfall line 16-inch pipe and 26-inch steel/24-inch vitrified clay encasement pipe is grouted.

ALTERNATIVE 1 - REMOVAL OF ABANDONED OUTFALL LINE 16-INCH PIPE UNDER STATE ROUTE 128

Basis: Alternative 1 is based on possible field condition that the annular space between abandoned outfall line 16-inch pipe and 26-inch steel/24-inch vitrified clay encasement pipe is NOT grouted and is open. Under this alternative, activities related to the removal of abandoned outfall line 16-inch pipe would be as follows:

a. Mobilize and set-up pipe jacking/ramming equipment in the main pit (by Subcontractor) and perform safety check (by Subcontractor and Fluor Fernald).

b. Jack/ram 54-inch casing pipe (approximately 90 LF) around 26-inch steel pipe/24-inch vitrified clay pipe encasement under State Route 128 (by Subcontractor). Periodically check casing pipe alignment and elevation during jacking/ramming of 54-inch pipe (to be performed by Subcontractor). Set the 54-inch casing pipe approximately 14 inches below the bottom of abandoned outfall line 16-inch pipe.

c. After completion of jacking/ramming of 54-inch casing pipe, perform radiological survey at the end of 54-inch casing pipe in the receiving pit.

d. Remove the soil between the 16-inch pipe and 54-inch pipe at both ends to approximate length of 6 to 8 feet and haul to SP-7. Do not stockpile soil removed in the pit area outside the 54-inch casing pipe. Control the spread of contamination during removal, loading and hauling of soil. This activity will require appropriate PPE and confined entry space permit. First remove soil on top of 16-inch pipe inside the 54-inch pipe. During the soil removal, if abandoned outfall line pipe joints are found outside the encasement pipe, remove the abandoned outfall line pipe segment outside the encasement pipe before removing the underlying soil. Perform radiological

survey and collect soil samples for certification sampling during the soil removal activity. Contain lead seals from joints.

e. Perform radiological survey of outside surface of pipe length removed from encasement pipe. If any radiological contamination is detected above the free release limits on the outside of the removed sections of abandoned outfall line, then the 26-inch steel/24-inch vitrified clay encasement pipes will also be removed.

f. Unplug 16-inch abandoned outfall line pipe and insert 9 to 12-inch SDR 11 HDPE pipe. Before inserting HDPE pipe, plug both ends of HDPE pipe. During insertion of HDPE pipe, lay HDPE liner in front and under the abandoned outfall line 16-inch pipe outlet/inlet to collect sediment, if any, from the abandoned outfall line pipe. Perform radiological survey and haul collected sediment to SP-7.

g. After inserting HDPE pipe unplug both ends of HDPE pipe. After unplugging ends, Subcontractor shall insert threaded shaft through the entire length of HDPE pipe by screwing one shaft segment (approximately 13 feet in length) to the next segment. Install end steel plate (approximately same dimension as CI pipe bell ID) at the end of the threaded shaft before pulling operation.

h. With hydraulic pull equipment in main pit, pull 16-inch pipe from the encasement pipe and haul to SP-7 (by Subcontractor). Based on the existing drawing it is assumed that the encasement pipe is not grouted with concrete or sand. During the pulling operation, cut HDPE pipe length and remove threaded shaft lengths, as required. Perform radiological survey of outside surface of the 16-inch pipe and shaft lengths removed. If any radiological contamination is detected above the free release limits on the outside of the removed sections of abandoned outfall line, then the 26-inch steel/24-inch vitrified clay encasement pipes will also be removed.

i. After removal of 16-inch pipe and soil in 54-inch casing pipe up to both ends of 26-inch encasement pipe, clean 26-inch encasement pipe and perform radiological survey of the inner surface of the 26-inch encasement pipe. Also collect soil samples for certification sampling during the soil removal activity and haul soil to SP-7.

j. If both the inside of the 26-inch steel/24-inch vitrified clay encasement pipes and the outside of outside of the removed sections of abandoned outfall line from within the encasement pipe pass the "free release" criteria as described in this Excavation Plan, the encasement pipes will be grouted with concrete.

k. If either the inside of the 26-inch steel/24-inch VC encasement pipes or the outside of the removed sections of abandoned outfall line from within the encasement pipe fail the "free release" criteria, the encasement pipe will be removed from the 54-inch casing pipe and hauled to SP-7 for subsequent off-site disposition. If it is determined that the encasement pipes are to be removed, the Subcontractor will jack/ram or push/pull 26-inch steel/24-inch vitrified clay encasement pipes.

l. If 26-inch encasement pipe is removed, remove soil inside 54-inch casing pipe (soil between 26-inch encasement pipe and 54-inch casing pipe) and haul to SP-7. Collect soil samples for certification sampling at representative spacing during the soil removal activity. After removal of soil, perform radiological survey of inner surface of the 54-inch casing pipe.

m. Grout both ends of 54-inch casing pipe and backfill within State Route 128 right-of-way in accordance with Item 203 of ODOT Construction and Material Specifications. If wall thickness of the casing pipe is less than 0.5-inch, grout entire length of the casing pipe under State Route 128.

n. Perform restoration as described in this section.

ALTERNATIVE 2 - REMOVAL OF 26-INCH STEEL/24-INCH VITRIFIED CLAY PIPE ENCASEMENT AND ABANDONED OUTFALL LINE 16-INCH PIPE UNDER STATE ROUTE 128

Basis: Alternative 2 is based on possible field condition that the annular space between the existing abandoned outfall line 16-inch pipe and 26-inch steel/24-inch vitrified clay encasement pipe is grouted. Under this alternative, activities related to the removal of abandoned outfall line 16-inch pipe and 26-inch steel/24-inch vitrified clay encasement pipe will be as follows:

a. Perform activities a. through e. described in Alternative 1 above.

b. Mobilize and set up equipment in the main pit (by Subcontractor) to push out 26-inch encasement/abandoned outfall line 16-inch pipe. Prepare main pit as required by the Subcontractor before set-up of pipe pushing equipment. Perform safety check (by Subcontractor and Fluor Fernald).

c. Push-out 26-inch encasement/abandoned outfall line 16-inch pipe together from the main pit (by Subcontractor) and haul to SP-7. Place HDPE liner on the receiving pit bottom at the opposite end of 54-inch casing pipe to receive pushed out pipe and to control spread of contamination.

d. Remove soil from 54-inch casing pipe and haul to SP-7. Collect soil samples for certification sampling at representative spacing during the soil removal activity. After removal of soil, perform radiological survey of inner surface of the 54-inch casing pipe.

e. After removal of soil, perform radiological survey of inner surface of the 54-inch casing pipe.

f. Grout both ends of 54-inch casing pipe and backfill within State Route 128 right-of-way in accordance with Item 203 of ODOT Construction and Material Specifications. If wall thickness of the casing pipe is less than 0.5-inch, grout entire length of the casing pipe under State Route 128.

g. Perform restoration as described in this section.

3.3.8 Haul Route

The haul route will traverse from the excavation site to the SP-7 stockpile area along the improved off-site gravel drive, a newly constructed gravel haul road connector located near the Dissolved Oxygen Building (18P), the relocated North Entrance Road, the OSDF Construction Laydown Area Haul Road north of the OSDF, and through the OSDF Material Transfer Area Access Control Area. From the SP-7

stockpile area, pipe, bedding material and soil will be loaded for disposition at an off-site location.

3.3.9 Excavation Dewatering

Construction water will be collected in manhole SMH181A (see Section 3.2.5) or within open trench excavations. The points of disposition for water collected within the excavation or manhole not requiring treatment will be the Great Miami River via the active 24-inch HDPE outfall line. The point of disposition for water collected within the excavation or manhole requiring treatment will be the FCP's Wastewater Treatment System. The testing standard to be used to determine the selection of disposition will be total uranium, however, total suspended solids (TSS) will be checked to meet the National Pollutant Discharge Elimination System (NPDES) requirements. If the excavation water does not exceed the NPDES TSS requirement and 30 ppb total uranium, then the water will be pumped to the Great Miami River via the 24-inch HDPE outfall line as accessed through manholes SMH 182B or SMH 183. If the total uranium concentration in the excavation water exceeds 30 parts per billion (ppb), then the water will be pumped and trucked back to the FCP for treatment. Volume of water discharged to the river via the 24-inch HDPE outfall line or delivered on site for treatment, will be recorded.

To control sediments in the construction water, a sump will be excavated at the down-gradient end of the open trench before the end of the day's excavation activities. If the water discharged from this sump fails to meet NPDES requirements for total suspended solids, other methods, such as installation of a plywood sheet in front of the open end of the pipe to increase sump volume, or placement of aggregate to filter sediment, may be employed.

3.3.10 Backfill

Once the excavation is complete and preliminary analysis and real-time monitoring has confirmed the absence of contaminated soil in an excavated section of trench, that section of trench will be backfilled using the stockpiled overburden soil or material borrowed from the off-site source. Generally the backfill material will be compacted in-place as noted on drawing 99X-5500-G-00778. This backfill material will be placed up to 6-inch below the surrounding existing grade (the grade after the topsoil was stripped from the surface). Since material was removed from the excavation, there may be a deficit of backfill material. Sand may be used as supplemental backfill material and may be obtained from obtained from nearby sand and gravel pits.

Topsoil will be procured from an off-site source with input from the landowner.

Backfill within the Mid Valley crude oil pipeline right-of way will be placed and compaction in accordance with the Mid Valley Pipeline Company's requirements. Backfill within the State Route 128

right-of way will be placed and compaction in accordance with ODOT requirements.

3.3.11 Topsoil

After the completion of backfill, 2 feet of topsoil will be placed to approximately pre-excavation ground elevation within the trench excavation and will be graded to match adjacent existing grade. Additional topsoil, if required, will be procured from an off-site source with input from the landowner. For topsoil placement detail, see design drawing 99X-5500-G-00778.

3.3.12 Communications

A site radio or cell phone will be available within the on and off-site work areas to provide communications with the site for emergencies, severe weather notices and heat-stress stay time information.

3.4 PRECERTIFICATION AND CERTIFICATION SAMPLING

Due to impacted material removal at MH 181A, this area will require precertification and certification activities prior to trenching for the abandoned outfall line. Note that all data will be returned within approximately one week except for radium-226. To gain appropriate information relative to radium-226, the entire surface of the excavation will be scanned using the real time HPGe detectors with a detection limit lower than the off-property FRL. Once the data is returned demonstrating passing conditions for certification, the outfall line excavation will resume.

After removal of the pipeline, bedding material and over excavation of soil, in accordance with the typical trenching and backfilling detail shown on design drawing 99X-5500-G-00778, the excavator will periodically retrieve a bucket load of soil from the bottom of the excavation at every 25 feet of linear trench, so that real-time monitoring can be performed. Soil samples for certification will be taken on the remaining soil as described in the Certification Design Letter (CDL). This way the monitoring and sampling can be performed at the surface so that workers will not have to enter the trench excavation. HPGe tripod measurements will be utilized to perform the real-time monitoring in lieu of the excavator mounted system (EMS) due to the lack of availability of the EMS, which is being fully utilized in the above-WAC areas of the production area. Each bucket-load of material will be placed next to the trench to form a circular pad no less than 6 feet in diameter and 6 inches in thickness for HPGe measurements at a 15-cm detector height. The HPGe tripod measurement over the formed circular pad will determine if this soil is less than three times FRLs for uranium, thorium-232, and radium-226. If these results indicate less than three times FRLs for uranium, thorium-232, and radium-226, then the trench will be backfilled with the overburden material described above. If these results indicate more than three times FRLs for uranium, thorium-232, and radium-226, then the circular pad and underlying soil will be excavated for

disposal and additional material will be excavated from the bottom of the trench until HPGe measurements confirm soil to contain uranium, thorium-232 and radium-226 at less than three times FRLs.

Certification samples will also be collected for chemical and radiological analysis from the excavator bucket that has retrieved soil from the bottom of the excavation as described above. The location of each sample point will be surveyed and recorded as documented in the associated CDL (DOE 2004d). In addition to the pre-defined locations, during excavation of the pipe and bedding material, a flag will be posted along the northern construction fence line at the easting corresponding to any stained soil, and/or broken, cracked, or disjointed piping. As discussed in the CDL for Area 9, Phase III - Part Three, biased samples will be collected at each of these flagged locations from the floor, and both the north and south sidewall approximately one foot from the floor of the excavation. The complete certification approach is described in detail in the CDL and associated Certification Sampling Project Specific Plan (DOE 2004e) that will be submitted along with this plan.

3.5 RESTORATION

Restoration will consist of re-establishing the work area to a similar condition the land was in prior to the remediation. Topsoil will be restored within the off-site work area at approximately the pre-excavation elevations. Any restoration performed in the 100-year Floodplain of the Great Miami River must not raise the surface elevation above the pre-work elevations. Restoration activities are scheduled to start in November 2004. Seeding of disturbed areas outside of cropped areas may be performed in November/December 2004. Cropped areas will not be seeded per the landowner's request. The off-site haul route will be left in place for the landowner's use.

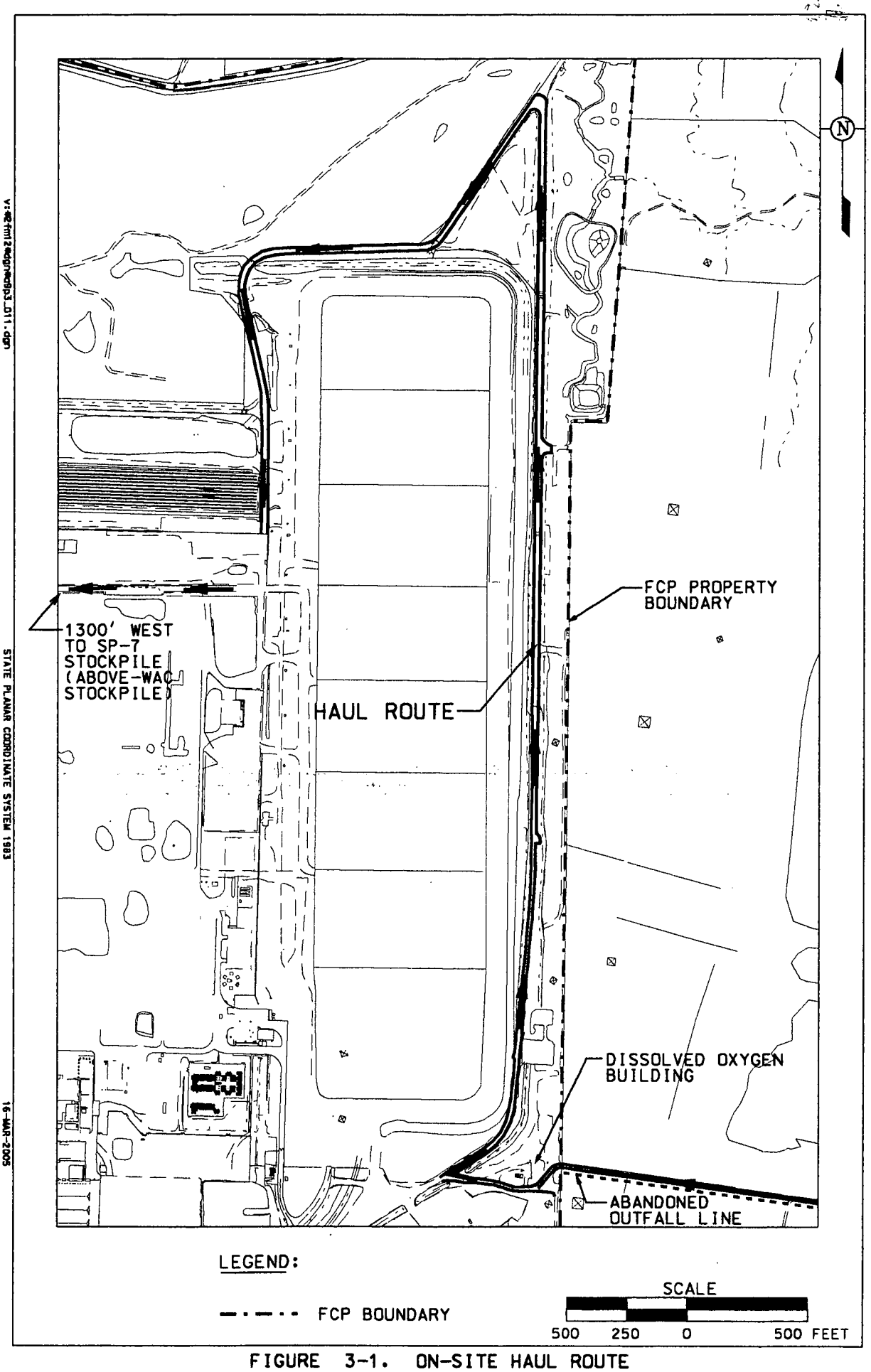
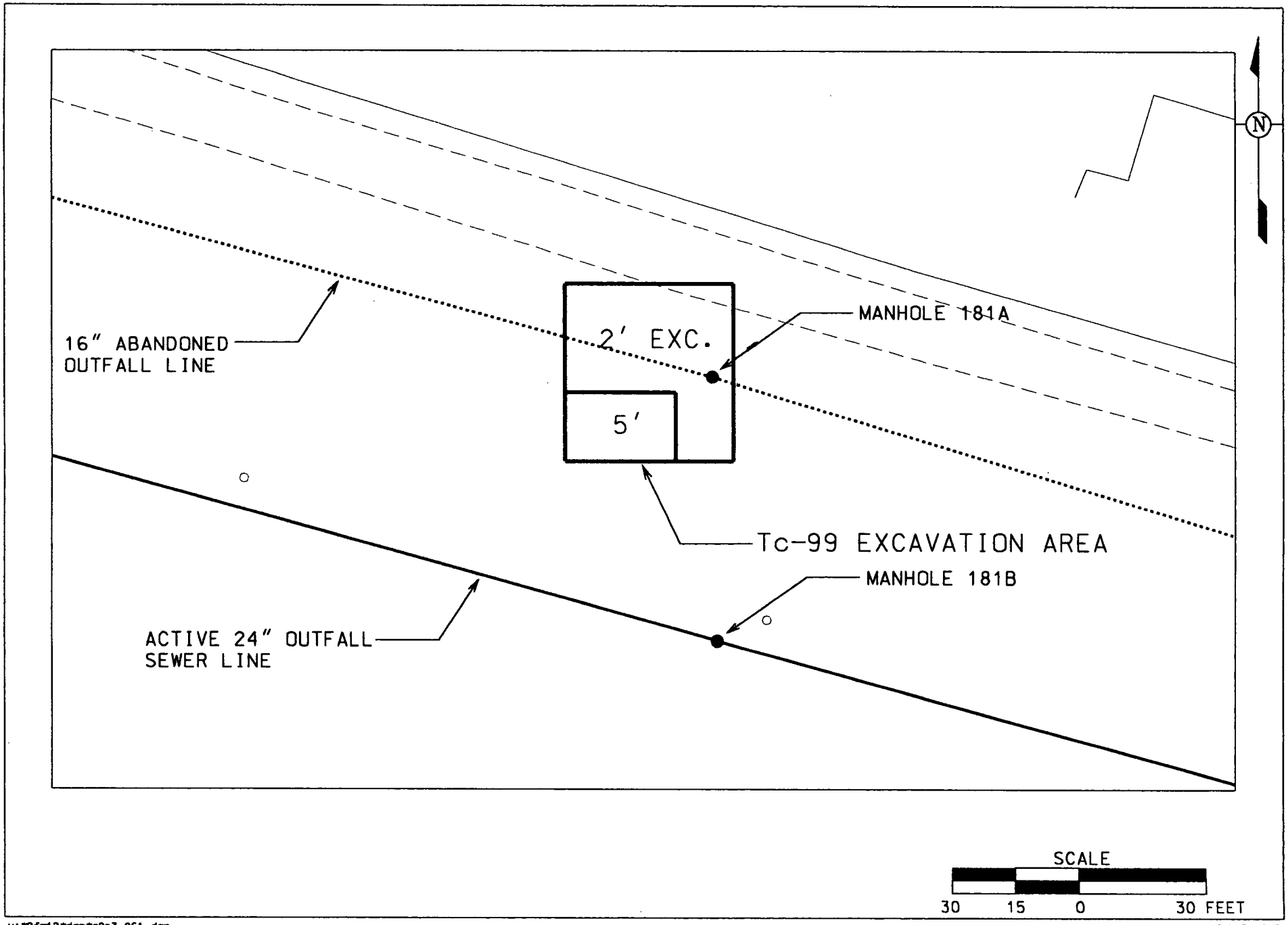


FIGURE 3-1. ON-SITE HAUL ROUTE



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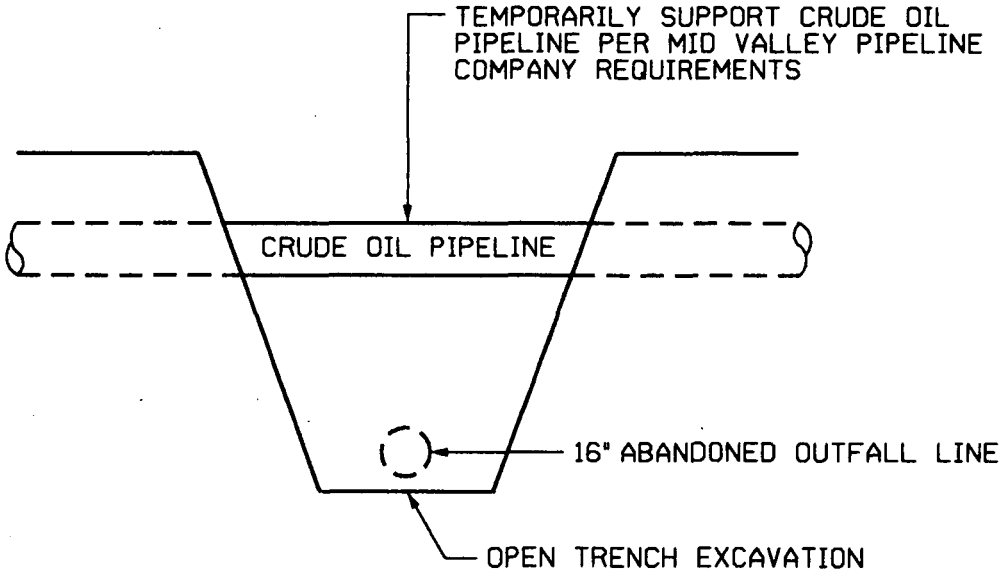
STATE PLANAR COORDINATE SYSTEM 1983

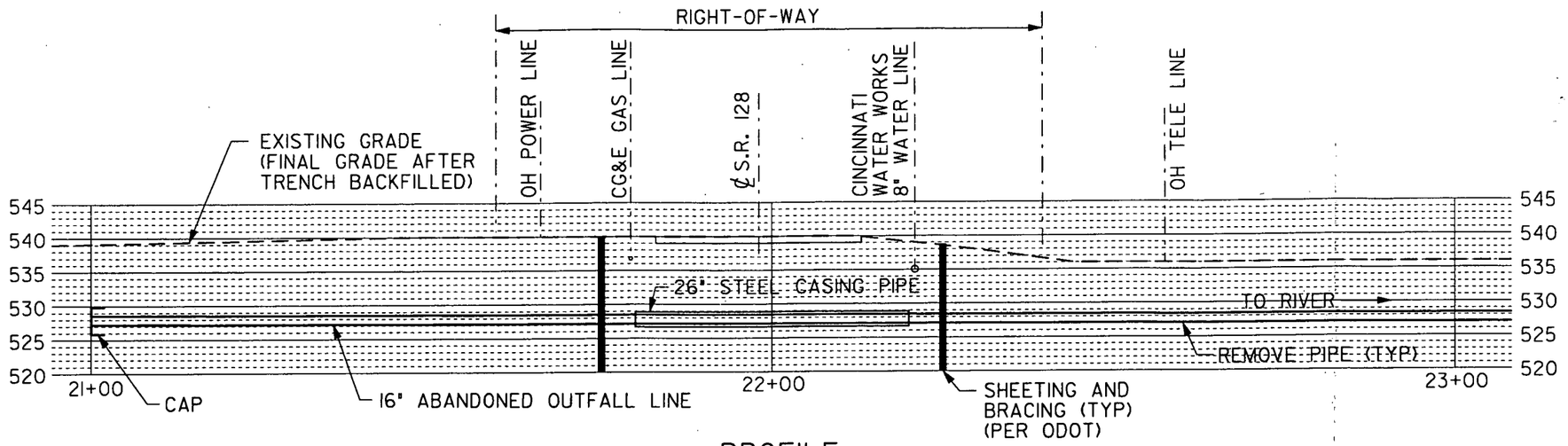
FIGURE 3-2. TC-99 ABOVE-FRL EXCAVATION AREA

16-MAR-2005



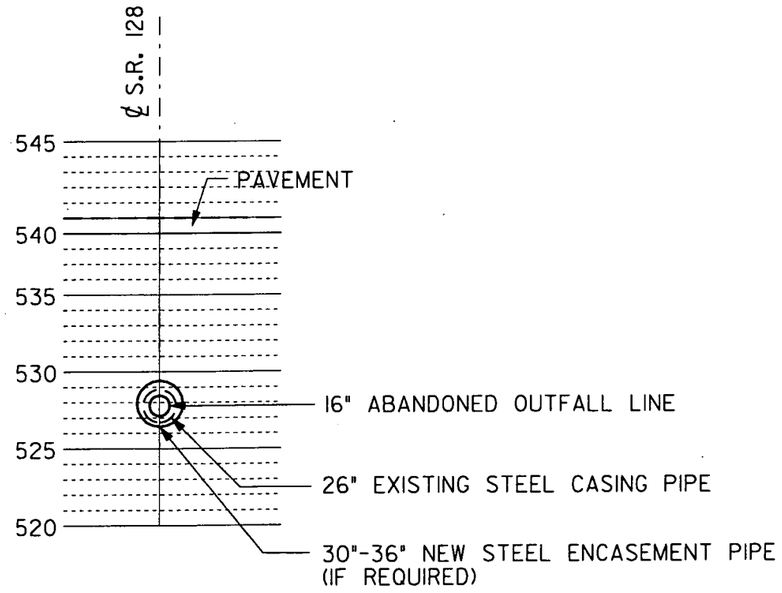
AOL PART THREE
PIPE LINE REMOVAL UNDER
MID VALLEY CRUDE OIL PIPELINE
FIGURE 3-3

/osdf/Project21120/figure3-3.dgn



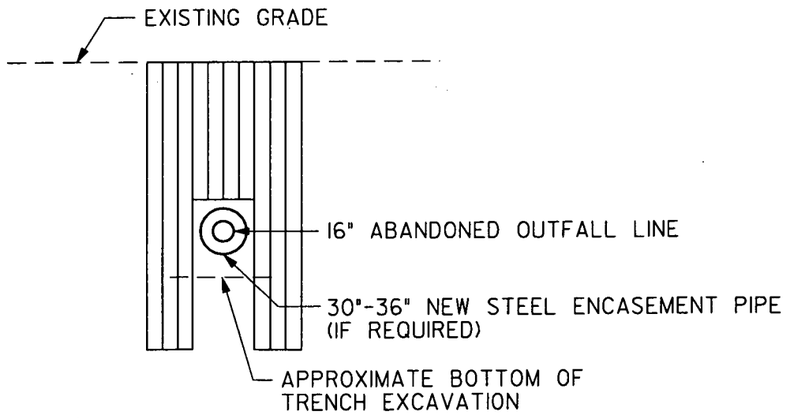
PROFILE

SCALE: 1"=20'



CROSS SECTION

SCALE: 1"=10'



SHEETING/BRACING DETAIL

SCALE: 1"=10'

NOTES:

1. PLACE SHEETING/BRACING AFTER TRAFFIC CONTROLS ARE IN PLACE.
2. REMOVE SHEETING/BRACING AFTER CASING PIPE IS GROUTED AND TRENCH BACKFILLED. FILL VOID WITH SAND OR GROUT.

AOL PART THREE PIPE LINE REMOVAL AT STATE ROUTE 128 CROSSING FIGURE 3-4

/osdf/Project2ll20/roadsection.dgn

REFERENCES

U.S. Department of Energy, 1996, "Record of Decision for Remedial Actions at Operable Unit 5," Final, Fernald Environmental Management Project, DOE, Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2004a, "Area 9, Phase III Abandoned Outfall Line Excavation Plan Part One," Final, Fernald Closure Project, DOE Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2004b, "Area 9, Phase III Abandoned Outfall Line Excavation Plan Part Two," Final, Fernald Closure Project, DOE Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2004c, "Project Specific Plan for Area 9, Phase III Outfall Ditch Predesign Investigation," Revision 0, Fernald Closure Project, DOE Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2005a, "Certification Design Letter for Area 9, Phase III Abandoned Outfall Line – Part Three," Final, Fernald Closure Project, DOE Fernald Area Office, Cincinnati, Ohio.

U.S. Department of Energy, 2005b, "Project Specific Plan for Area 9, Phase III Certification Sampling Abandoned Outfall Line – Part Three," Revision 0, Fernald Closure Project, DOE Fernald Area Office, Cincinnati, Ohio.

APPENDIX A

LIST OF DRAWINGS AND TECHNICAL SPECIFICATIONS

APPENDIX A
LIST OF DRAWINGS AND TECHNICAL SPECIFICATIONS

Design Drawings	Rev.	
Drawing 99X-5500-G-00775	2	Remediation of Abandoned Outfall Line Master Layout Plan
Drawing 99X-5500-G-00800	A	Remediation of Abandoned Outfall Line, Part Three (Sheet 1 of 2)
Drawing 99X-5500-G-00801	A	Remediation of Abandoned Outfall Line, Part Three (Sheet 2 of 2)
Drawing 99X-5500-G-00797	2	Remediation of Abandoned Outfall Line, Haul Road Plan and Detail
Drawing 99X-5500-G-00778	1	Remediation of Abandoned Outfall Line Details
Drawing 99X-5500-G-00809	1	Remediation of Abandoned Outfall Line Part Two and Three Details
Drawing 99X-5500-G-00802	0	Remediation of Abandoned Outfall Line St. Rt. 128 Crossing Traffic Plan
Drawing 99X-5500-G-00822	A	Remediation of Abandoned Outfall Line Pipe Removal Under St. Rt. 128

Technical Specifications

Excavation for Remediation Technical Specifications (20300-TS-0001, Rev. 1*)

01215	Traffic Control
02205	Impacted Material Excavation
02206	Earthwork for Remediation
02275	Surface Water Management and Erosion Control for Remediation

* Technical Specification Section 2207 is not applicable to this project scope.

OSDF Technical Specifications (partial of 20105-TS-0001, Rev. 1)

02100	Surveying
02200	Earthwork
02230	Road Construction
02270	Surface Water Management and Erosion Control
02714	Geotextile
02930	Vegetation

REMEDIATION OF ABANDONED OUTFALL LINE

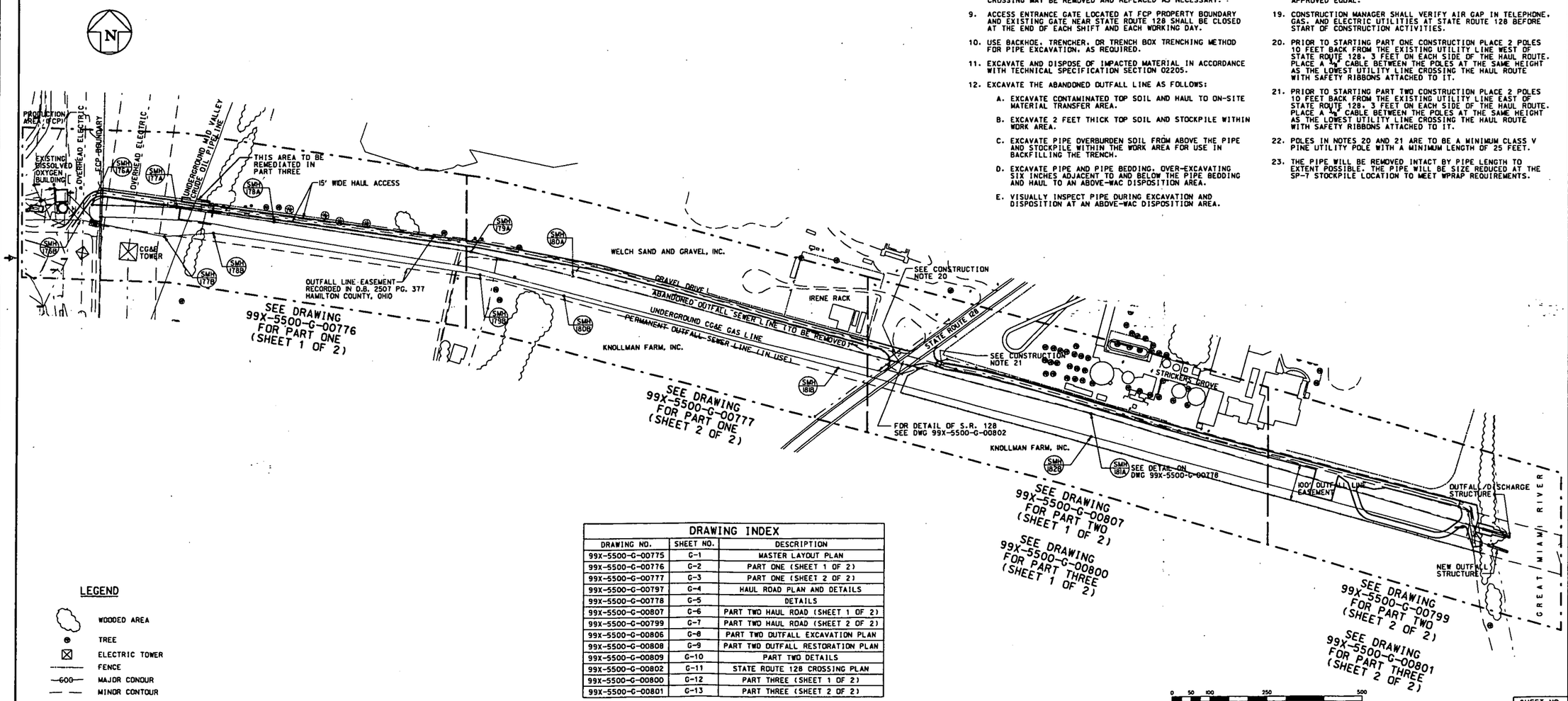
5885

GENERAL NOTES

1. HORIZONTAL CONTROLS SHOWN ARE BASED UPON NORTH AMERICAN DATUM 1983 (NAD 83).
2. VERTICAL CONTROLS SHOWN ARE BASED UPON NATIONAL GEODETIC VERTICAL DATUM 1929 (NGVD 29).
3. DIMENSIONS SHOWN TAKE PRECEDENCE OVER SCALED DIMENSIONS.
4. PROTECT UNDERGROUND AND OVERHEAD UTILITIES DURING EXCAVATION OF THE ABANDONED OUTFALL LINE.
5. TECHNICAL SPECIFICATIONS GOVERNING THIS ACTIVITY ARE THE LATEST REVISION OF TECHNICAL SPECIFICATIONS FOR SOIL AND DISPOSAL FACILITY PROJECT - EXCAVATION FOR REMEDIATION (DOCUMENT NO. 20300-TS-0001) AND OSDF PHASE V TECHNICAL SPECIFICATIONS (DOCUMENT NO. 20105-TS-0001).
6. EXISTING SURFACE ELEVATIONS WILL NOT BE RAISED WITHIN THE 100 YEAR FLOOD PLAIN OF THE GREAT MIAMI RIVER.

CONSTRUCTION NOTES

1. GALVANIZED WOVEN WIRE FABRIC CONSTRUCTION FENCE MATERIAL AND INSTALLATION SHALL BE IN ACCORDANCE WITH OSDF TECHNICAL SPECIFICATION 02200. LOCATE CONSTRUCTION FENCE AS SHOWN ON THE DRAWINGS.
2. SOIL EROSION AND SEDIMENT CONTROL MATERIAL AND INSTALLATION SHALL BE IN ACCORDANCE WITH OSDF TECHNICAL SPECIFICATION 02270.
3. BEFORE START OF EXCAVATION, PLUG DOWNSTREAM SIDE OF MANHOLE SMH181A WITH MECHANICAL PLUG AND CONCRETE TO CONTROL CONSTRUCTION WATER FROM UPSTREAM PHASE I EXCAVATION AND PREVENT BACKFLOW FROM GREAT MIAMI RIVER. SEE DRAWING FOR PLUG DETAIL.
4. ALL UTILITIES SHALL BE LOCATED IN THE FIELD PRIOR TO SITE PREPARATION ACTIVITES.
5. ESTABLISH CONSTRUCTION SIGNAGE IN APPROPRIATE LOCATION. SIGNAGE IN RIGHT-OF-WAY OF STATE ROUTE 128 SHALL BE IN ACCORDANCE WITH THE OHIO DEPARTMENT OF TRANSPORTATION.
6. IMPROVE EXISTING HAUL ROAD ROUTE ADJACENT TO TRENCHING AREA AS SHOWN ON DRAWINGS.
7. PROTECT MID VALLEY PIPELINE COMPANY CRUDE OIL PIPELINE WITH RAMP AS SHOWN ON DRAWINGS.
8. EXISTING UNDERGROUND TELEPHONE CONDUIT AT TRENCH CROSSING MAY BE REMOVED AND REPLACED AS NECESSARY.
9. ACCESS ENTRANCE GATE LOCATED AT FCP PROPERTY BOUNDARY AND EXISTING GATE NEAR STATE ROUTE 128 SHALL BE CLOSED AT THE END OF EACH SHIFT AND EACH WORKING DAY.
10. USE BACKHOE, TRENCHER, OR TRENCH BOX TRENCHING METHOD FOR PIPE EXCAVATION, AS REQUIRED.
11. EXCAVATE AND DISPOSE OF IMPACTED MATERIAL IN ACCORDANCE WITH TECHNICAL SPECIFICATION SECTION 02205.
12. EXCAVATE THE ABANDONED OUTFALL LINE AS FOLLOWS:
    - A. EXCAVATE CONTAMINATED TOP SOIL AND HAUL TO ON-SITE MATERIAL TRANSFER AREA.
    - B. EXCAVATE 2 FEET THICK TOP SOIL AND STOCKPILE WITHIN WORK AREA.
    - C. EXCAVATE PIPE OVERBURDEN SOIL FROM ABOVE THE PIPE AND STOCKPILE WITHIN THE WORK AREA FOR USE IN BACKFILLING THE TRENCH.
    - D. EXCAVATE PIPE AND PIPE BEDDING. OVER-EXCAVATING SIX INCHES ADJACENT TO AND BELOW THE PIPE BEDDING AND HAUL TO AN ABOVE-WAC DISPOSITION AREA.
    - E. VISUALLY INSPECT PIPE DURING EXCAVATION AND DISPOSITION AT AN ABOVE-WAC DISPOSITION AREA.
    - F. AFTER EXCAVATION, PERFORM REAL TIME AND CERTIFICATION SAMPLING AT APPROXIMATELY 25 FOOT INTERVALS ALONG THE TRENCH BOTTOM. BASED ON RESULTS FROM REAL TIME SAMPLING, IF TRENCH BOTTOM FOUND CONTAMINATED, PERFORM SUPPLEMANTAL OVER-EXCAVATION AND PERFORM REAL TIME AND CERTIFICATION SAMPLING.
    - G. USING STOCKPILED OVERBURDEN SOIL AND TOP SOIL. BACKFILL THE TRENCH EXCAVATION AS SHOWN IN TYPICAL TRENCH DETAIL.
13. NOT USED 3
14. DO NOT STAGE CONSTRUCTION EQUIPMENT WITHIN 10 FEET OF THE TOP OF THE TRENCH EXCAVATION.
15. PERFORM SUPPLEMENTAL OVEREXCAVATION AS DIRECTED BY THE CONSTRUCTION MANAGER.
16. DISTURBED AREAS WILL BE RESTORED TO ORIGINAL ELEVATIONS PRIOR TO SEEDING ACTIVITIES.
17. VEGETATE THE DISTURBED AREAS USING SEED MIX AS APPROVED BY PROPERTY LAND OWNER.
18. GROUT USED TO SEAL ABANDONED OUTFALL LINE IN DESIGNATED AREAS SHALL BE IN ACCORDANCE WITH ODOT 705.22 OR APPROVED EQUAL.
19. CONSTRUCTION MANAGER SHALL VERIFY AIR GAP IN TELEPHONE, GAS, AND ELECTRIC UTILITIES AT STATE ROUTE 128 BEFORE START OF CONSTRUCTION ACTIVITIES.
20. PRIOR TO STARTING PART ONE CONSTRUCTION PLACE 2 POLES 10 FEET BACK FROM THE EXISTING UTILITY LINE WEST OF STATE ROUTE 128, 3 FEET ON EACH SIDE OF THE HAUL ROUTE. PLACE A 7/8" CABLE BETWEEN THE POLES AT THE SAME HEIGHT AS THE LOWEST UTILITY LINE CROSSING THE HAUL ROUTE WITH SAFETY RIBBONS ATTACHED TO IT.
21. PRIOR TO STARTING PART TWO CONSTRUCTION PLACE 2 POLES 10 FEET BACK FROM THE EXISTING UTILITY LINE EAST OF STATE ROUTE 128, 3 FEET ON EACH SIDE OF THE HAUL ROUTE. PLACE A 7/8" CABLE BETWEEN THE POLES AT THE SAME HEIGHT AS THE LOWEST UTILITY LINE CROSSING THE HAUL ROUTE WITH SAFETY RIBBONS ATTACHED TO IT.
22. POLES IN NOTES 20 AND 21 ARE TO BE A MINIMUM CLASS V PINE UTILITY POLE WITH A MINIMUM LENGTH OF 25 FEET.
23. THE PIPE WILL BE REMOVED INTACT BY PIPE LENGTH TO EXTENT POSSIBLE. THE PIPE WILL BE SIZE REDUCED AT THE SP-7 STOCKPILE LOCATION TO MEET WRAP REQUIREMENTS.



DRAWING INDEX

DRAWING NO.	SHEET NO.	DESCRIPTION
99X-5500-G-00775	G-1	MASTER LAYOUT PLAN
99X-5500-G-00776	G-2	PART ONE (SHEET 1 OF 2)
99X-5500-G-00777	G-3	PART ONE (SHEET 2 OF 2)
99X-5500-G-00797	G-4	HAUL ROAD PLAN AND DETAILS
99X-5500-G-00778	G-5	DETAILS
99X-5500-G-00807	G-6	PART TWO HAUL ROAD (SHEET 1 OF 2)
99X-5500-G-00799	G-7	PART TWO HAUL ROAD (SHEET 2 OF 2)
99X-5500-G-00806	G-8	PART TWO OUTFALL EXCAVATION PLAN
99X-5500-G-00808	G-9	PART TWO OUTFALL RESTORATION PLAN
99X-5500-G-00809	G-10	PART TWO DETAILS
99X-5500-G-00802	G-11	STATE ROUTE 128 CROSSING PLAN
99X-5500-G-00800	G-12	PART THREE (SHEET 1 OF 2)
99X-5500-G-00801	G-13	PART THREE (SHEET 2 OF 2)

LEGEND

- WOODED AREA
- TREE
- ELECTRIC TOWER
- FENCE
- 600 MAJOR CONTOUR
- MINOR CONTOUR
- STORM MANHOLE
- VALVE
- FIRE HYDRANT
- RAILROAD
- EASEMENT LINE

NO.	REVISIONS	DATE	DWN. BY	APPD.
3	REMOVE NOTE 13	7/26/05		
2	ADDED MANHOLE NUMBERS TO ABANDONED AND NEW OUTFALL LINES, REVISED PHASE I, II AND III TO PART ONE, PART TWO AND PART THREE, REVISED PART TWO AND THREE LIMITS AND DRAWING INDEX	9/23/04	RML	GEP
1	REVISED NOTE 12 AND ADDED NOTE 23.	7/2/04	RML	GEP
0	ISSUED CERTIFIED FOR CONSTRUCTION	6/14/04	RML	GEP

REF. DWG. NO.

NOTE: FLUOR FERNALD CADD DRAWING. DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING

C. VAN ARSDALE 6/14/04 COGNIZANT ENGINEER DATE

APPROVALS					
CIVIL & STR.	A. SHOCK	6/14/04	SAFETY ENG.	E. JOHNSON	6/14/04
ELECTRICAL			MAINTENANCE		
ENGINEER			FIRE PROTECT.		
INSTRUMENT			WASTE MANAGE.		
MECHANICAL			SECURITY	B. HIMES	6/14/04
WAO	L. BARLOW	7/1/04	PROJECTS		
CHECKED	G. KUNTZMAN	6/14/04	CONSTRUCTION	R. ZEIBIG	6/14/04
APPROVED	K.E. PAUL	6/14/04	CHARACTERIZATION	F. MILLER	6/14/04
			QA	A. SCHEPER	6/14/04

Fernald Closure Project

FLUOR FERNALD, INC.

U.S. DEPARTMENT OF ENERGY

AREA 9 PHASE III
REMEDIATION OF ABANDONED OUTFALL LINE
MASTER LAYOUT PLAN

PROJECT 2920 | DATE 3/08/2004 | DRAWN R.M. LINDGREN | 99X-5500-G-00775 | 3

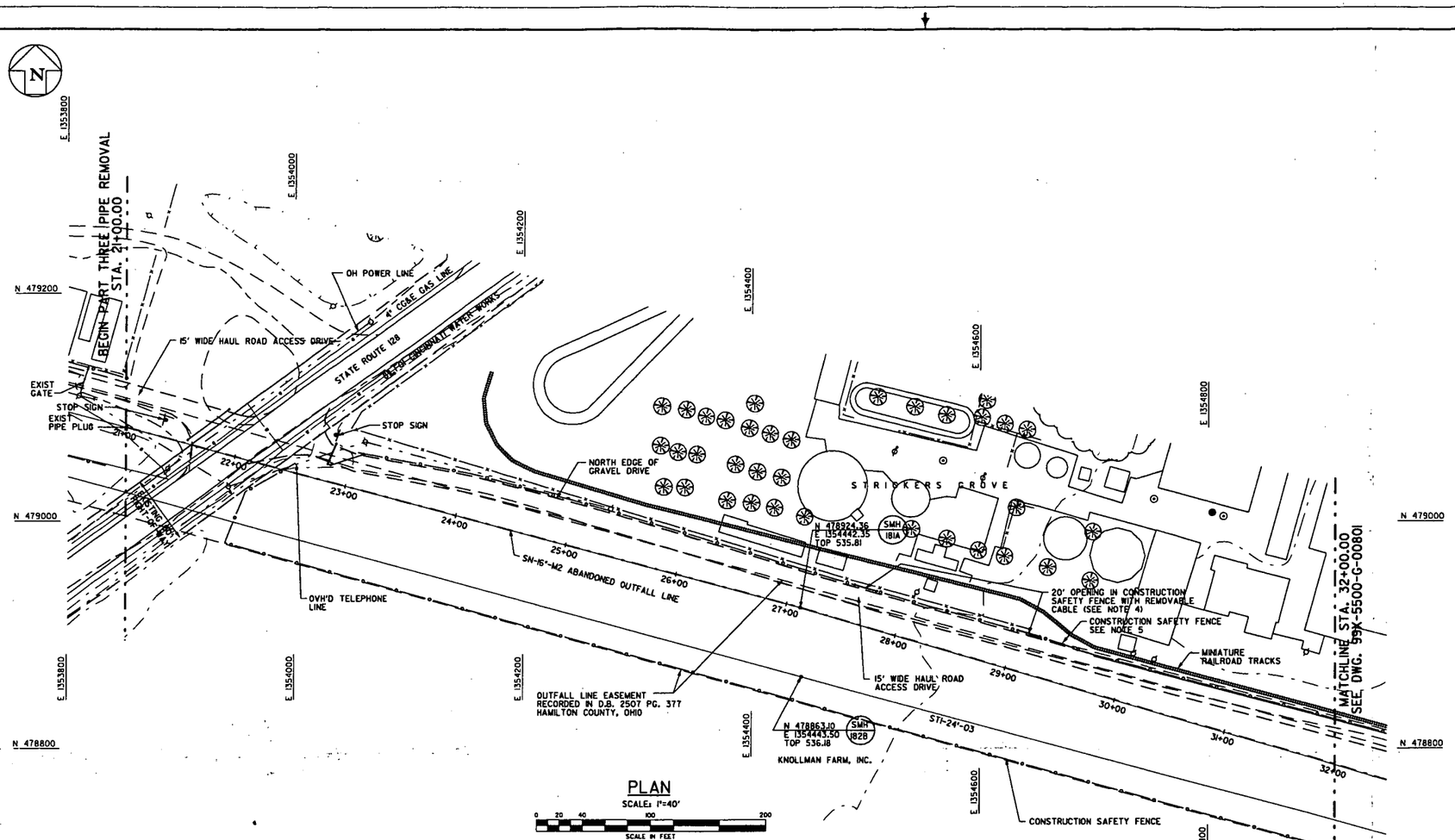
SHEET NO. G-1

FILE NAME: /osdf/Project2120/99xg0775.dgn

FDPS.DGN 5/30/03

GENERAL NOTES

1. SEE DRAWING 99X-5500-G-00775 FOR GENERAL AND CONSTRUCTION NOTES.
2. SEE DRAWING 99X-5500-G-00778 FOR TRENCHING DETAILS.
3. SEE DRAWING 99X-5500-G-00797 FOR HAUL ROAD CROSS SECTION, ROUTE AND DETAILS.
4. LOCATION OF GATE OPENINGS IN CONSTRUCTION SAFETY FENCE TO BE SELECTED BY ADJACENT LAND OWNER.
5. CONSTRUCTION SAFETY FENCE SHALL BE LOCATED SOUTH OF MINIATURE RAILROAD TRACK RAIL AND AS CLOSE TO EDGE OF HAUL ROAD ACCESS DRIVE AS POSSIBLE.

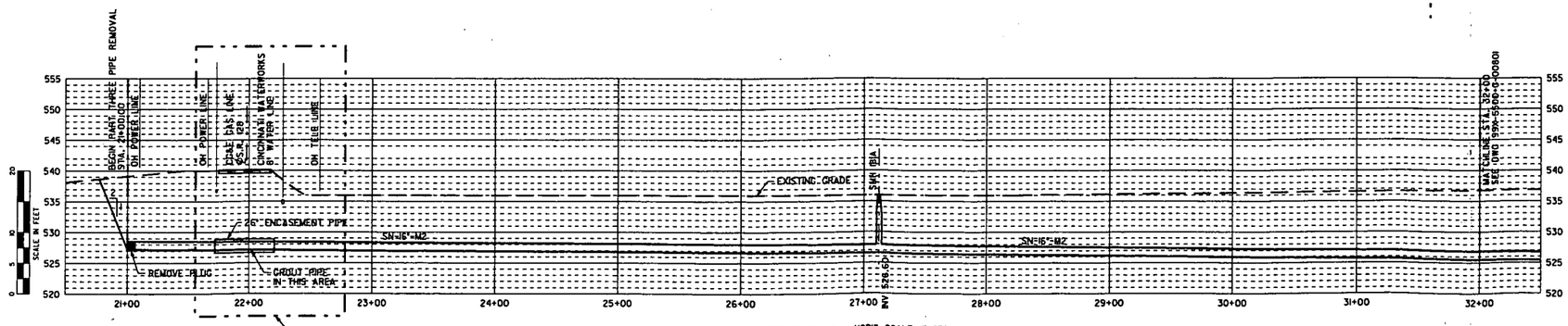


PLAN

SCALE: 1"=40'

0 20 40 100 200

SCALE IN FEET



PROFILE

HORIZ SCALE: 1"=40'
VERT SCALE: 1"=5'

0 20 40 100 200

SCALE IN FEET

NO.	REVISIONS	DATE	DWN. BY	APPD.	NO.	REVISIONS	DATE	DWN. BY	APPD.	REF. DWG. NO.

NOTE: FLUOR FERNALD CADD DRAWING. DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING — EXISTING ATTACHED AS COMPOSITE DRAWING ON CONFIGURATION MANAGEMENT CONTROL LIST (CML)

COGNIZANT ENGINEER DATE

APPROVALS			
CIVIL & STR.		SAFETY ENG.	
ELECTRICAL		MAINTENANCE	
ENGINEER		FIRS. PROJECT.	
INSTRUMENT		WASTE MANAGE.	
MECHANICAL		SECURITY	
		PROJECTS	
CHECKED		CONSTRUCTION	
APPROVED		CHARACTERIZATION	

Fernald Closure Project

FLUOR FERNALD, INC.

U.S. DEPARTMENT OF ENERGY

AREA 9 PHASE III
REMEDIATION OF ABANDONED OUTFALL LINE
PART THREE (SHEET 1 OF 2)

PROJECT: 2920
DATE: 6/24/2004
DRAWN:

99X-5500-G-00800 A

PRELIMINARY
NOT FOR CONSTRUCTION

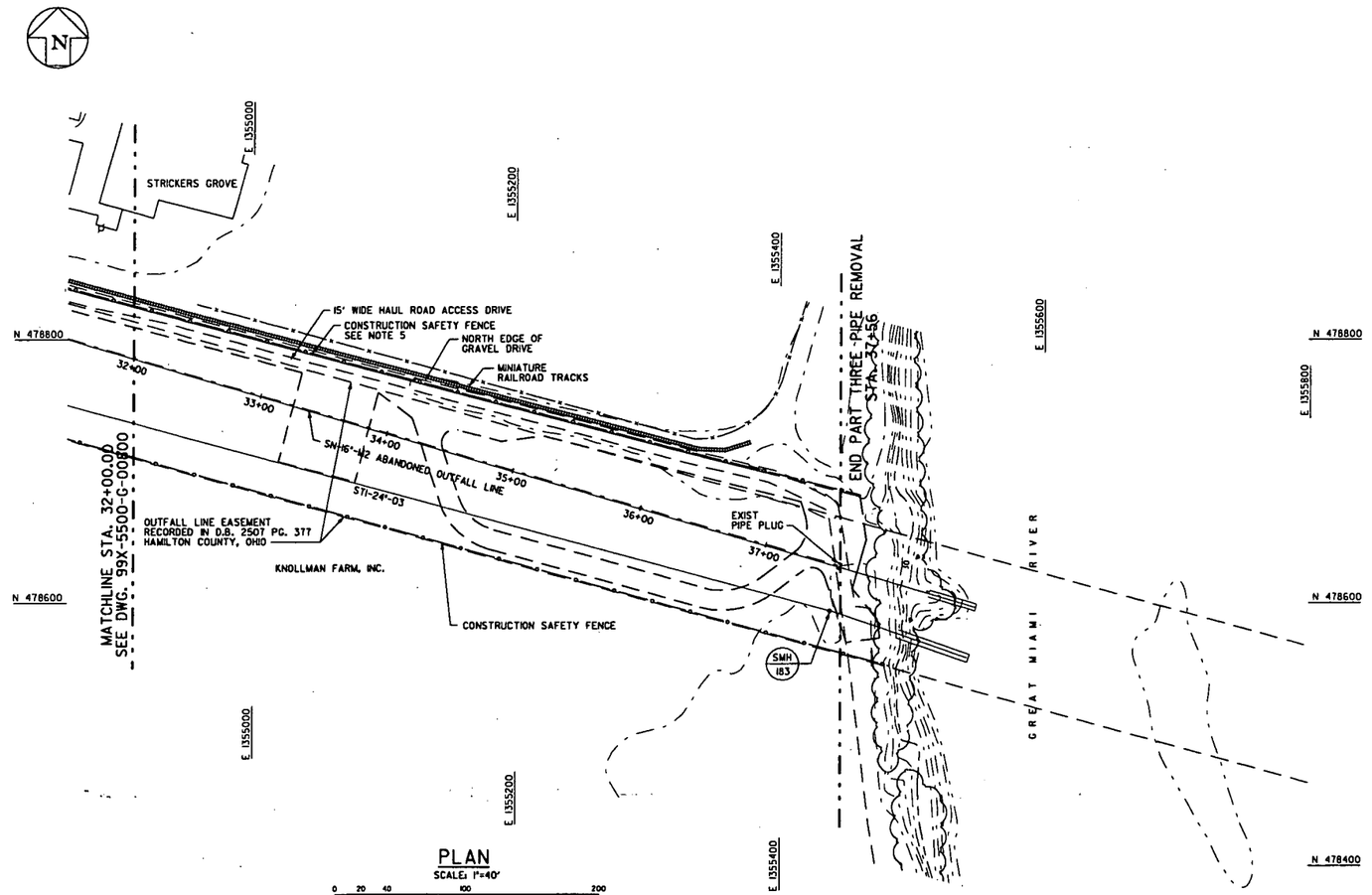
SHEET NO. G-12

FILE NAME: /oscf/Project2120/99xg0800.dgn

FOPS.DGN 5/30/03

GENERAL NOTES

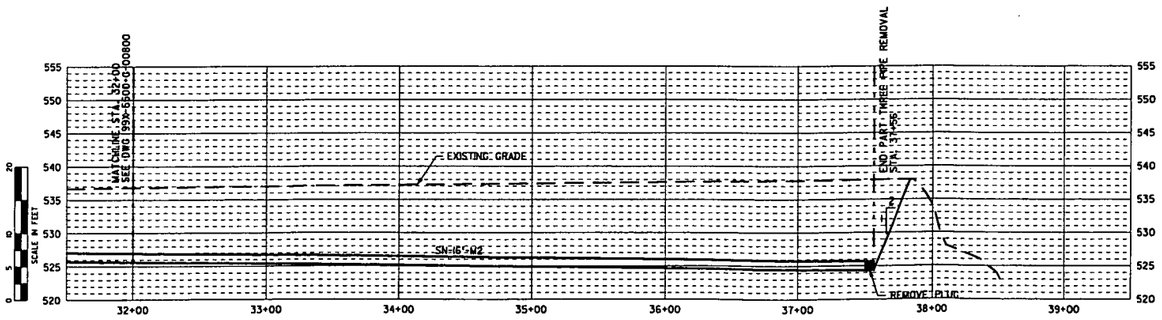
1. SEE DRAWING 99X-5500-G-00775 FOR GENERAL AND CONSTRUCTION NOTES.
2. SEE DRAWING 99X-5500-G-00778 FOR TRENCHING DETAILS.
3. SEE DRAWING 99X-5500-G-00797 FOR HAUL ROAD CROSS SECTION, ROUTE AND DETAILS.
4. LOCATION OF GATE OPENINGS IN CONSTRUCTION SAFETY FENCE TO BE SELECTED BY ADJACENT LAND OWNER.
5. CONSTRUCTION SAFETY FENCE SHALL BE LOCATED SOUTH OF MINIATURE RAILROAD TRACK RAIL AND AS CLOSE TO EDGE OF HAUL ROAD ACCESS DRIVE AS POSSIBLE.



PLAN

SCALE: 1"=40'

0 20 40 100 200
SCALE IN FEET



PROFILE

HORIZ SCALE: 1"=40'
VERT SCALE: 1"=5'

0 20 40 100 200
SCALE IN FEET

NO.	REVISIONS	DATE	DWN. BY	APPD.	NO.	REVISIONS	DATE	DWN. BY	APPD.	REF. DWG. NO.

NOTE: FLUOR FERNALD CADD DRAWING. DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING — CHECK / IND

SYSTEMS, ATTRIBUTES OR CONFIGURATION ITEMS AFFECTED BY THIS REVISION CONTROL SEE NOTES.

COGNIZANT ENGINEER — DATE

APPROVALS			
CIVIL & STR.		SAFETY ENG.	
ELECTRICAL		MAINTENANCE	
ENGINEER		FIRE PROTECT.	
INSTRUMENT		WASTE MANAGE	
MECHANICAL		SECURITY	
		PROJECTS	
CHECKED		CONSTRUCTION	
APPROVED		CHARACTERIZATION	

PRELIMINARY
NOT FOR CONSTRUCTION

SHEET NO. G-13

Fernald Closure Project
FLUOR FERNALD, INC.
U.S. DEPARTMENT OF ENERGY

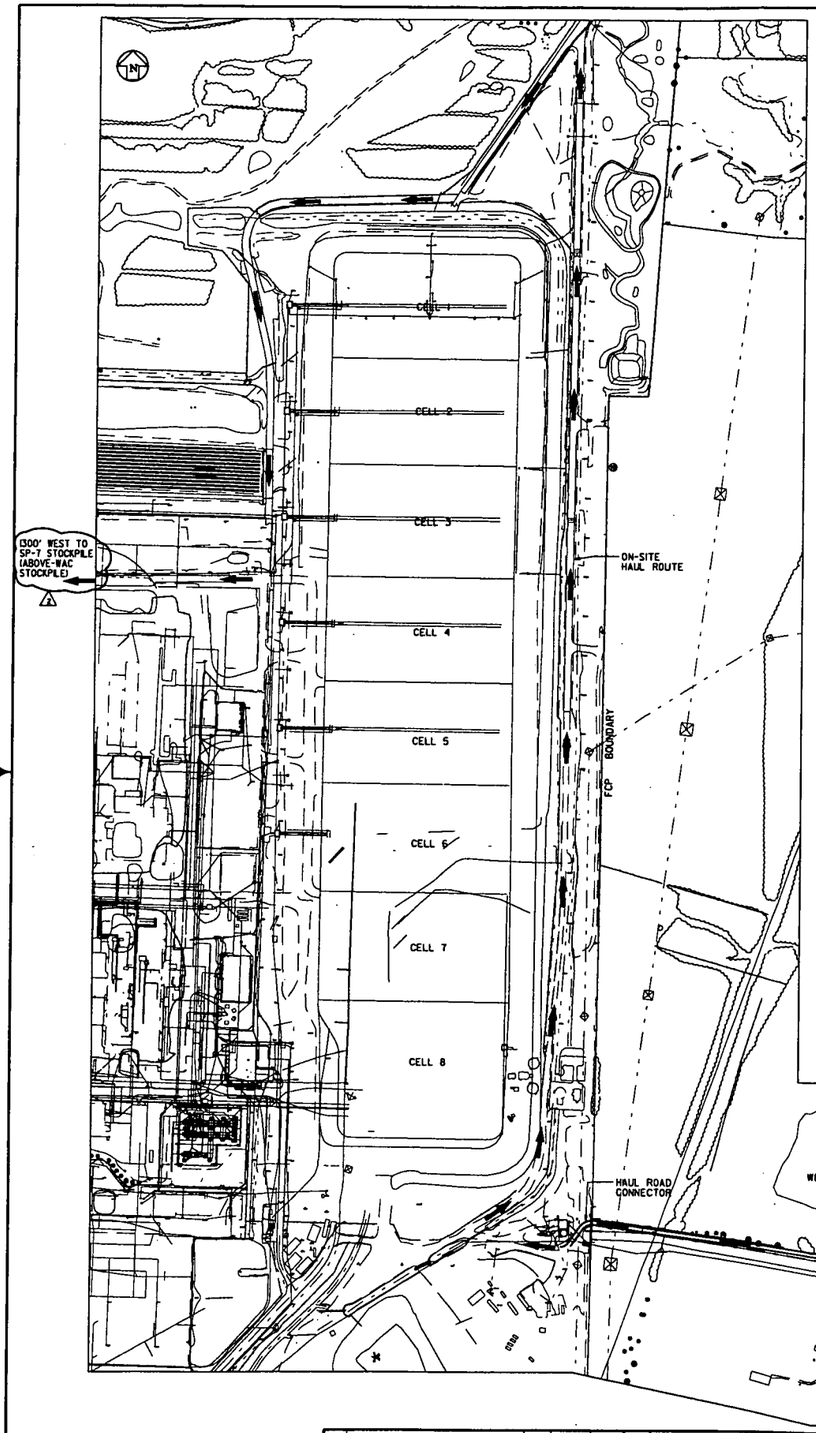
AREA 9 PHASE III
REMEDIATION OF ABANDONED OUTFALL LINE
PART THREE (SHEET 2 OF 2)

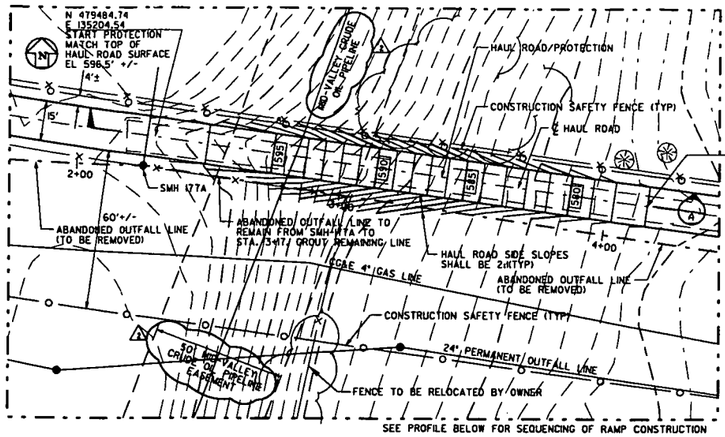
PROJECT: 2120
DATE: 6/14/2004
DRAWN:

99X-5500-G-00801 | A

FILE NAME: /osdf/Project2120/99xg0801.dgn

FCPSLOGN 5/30/03

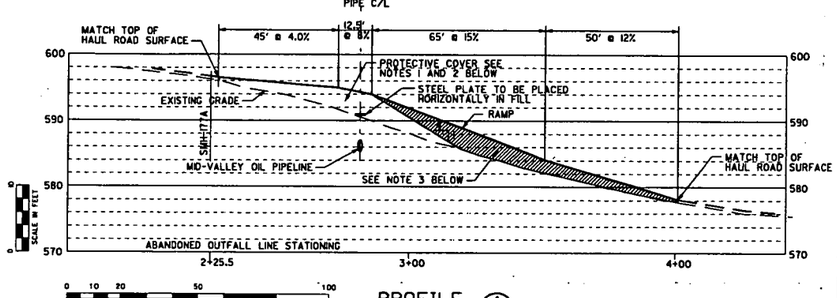




PROTECTION OVER MID-VALLEY CRUDE OIL PIPELINE

PLAN VIEW

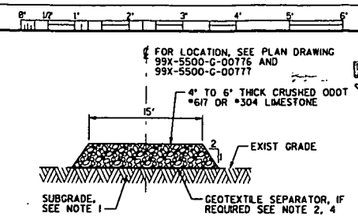
0 10 20 50 100
SCALE IN FEET



PROFILE (A)

NOTES:

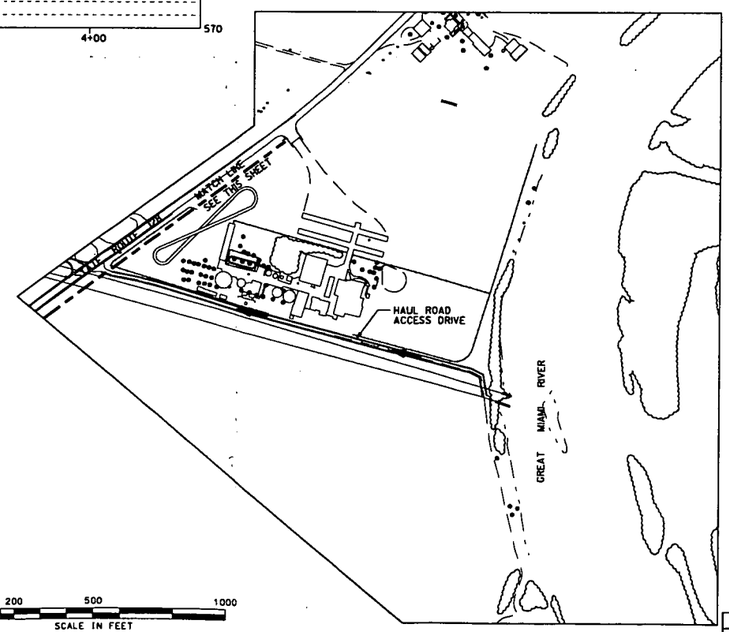
1. PRIOR TO TRENCH EXCAVATION, CONSTRUCT PROTECTIVE COVER OVER MID-VALLEY CRUDE OIL PIPELINE. PROTECTIVE COVER SHALL BE CONSTRUCTED IN ACCORDANCE WITH MID-VALLEY PIPELINE COMPANY REQUIREMENTS.
2. FILL MATERIAL FOR PROTECTIVE COVER SHALL BE #57 CRUSHED ANGULAR STONE UNLESS APPROVED OTHERWISE BY MID-VALLEY PIPELINE COMPANY.
3. CONSTRUCT RAMP AFTER REMOVAL OF ABANDONED OUTFALL LINE AND BACKFILL OF TRENCH FROM APPROXIMATELY STATION 3+17 TO STATION 4+00.



TYPICAL HAUL ROAD CROSS SECTION

NOTES:

1. USE ODOT TYPE "D" DUMPED ROCK OR AASHTO #2 STONE TO IMPROVE UNSUITABLE EXISTING SUBGRADE.
2. GEOTEXTILE SEPARATOR SHALL BE IN ACCORDANCE WITH OSDF TECHNICAL SPECIFICATION 02714.
3. CROSS SECTION APPLIES TO HAUL ROAD ACCESS DRIVE, CONNECTOR, AND TRUCK TURN AROUND.
4. GEOTEXTILE SEPARATOR MAY BE USED IN AREAS WHEN WARRANTED BY SUBGRADE CONDITIONS.



NO.	REVISIONS	DATE	DWN. BY	APP'D.
2	REVISED MID-VALLEY FUEL OIL PIPELINE TO MID-VALLEY CRUDE OIL PIPELINE. REVISED NOTE AT END.	1/2/06	RML	GEP
1	REVISED HAUL ROAD CROSS SECTION, NOTE AT END.	1/2/06	RML	GEP
0	ISSUED CERTIFIED FOR CONSTRUCTION	6/24/04	RML	GEP

REF. DWG. NO.

NOTE: FLUOR FERNALD CADD DRAWING. DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING

SYSTEMS AFFECTED BY CONFIGURATION MANAGEMENT CONTROL: SEE NOTES

C. VAN HOOK 6/24/04
COGNIZANT ENGINEER DATE

APPROVALS					
			SAFETY ENG.	C. JOHNSON	1/24/06
CIVIL & STR.	A. SHOCK	1/24/06	MAINTENANCE		
ELECTRICAL			FIRE PROTECT.		
ENGINEER			WASTE MANAGE.		
INSTRUMENT			SECURITY	S. ELMS	1/24/06
MECHANICAL			PROJECTS		
WAC	L. BARLOW	1/24/06	CONSTRUCTION	S.S. HOOPER	1/24/06
CHECKED	N. KUNTHEUR	1/24/06	CHARACTERIZATION	T. MILLER	1/24/06
APPROVED	K.E. PAUL	1/25/06	QUALITY CONTROL	N. SOKEYO	1/24/06

Fernald Closure Project

FLUOR FERNALD, INC.

U.S. DEPARTMENT OF ENERGY

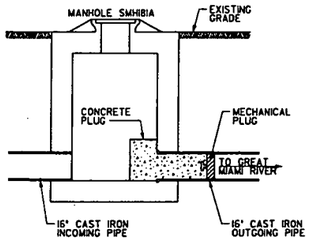
AREA 9 PHASE III
REMEDIATION OF ABANDONED OUTFALL LINE
HAUL ROAD PLAN AND DETAIL

PROJECT 2120	99X-5500-G-00797	2
DATE 5/27/2004		
DRAWN R.M. LINDGREN		

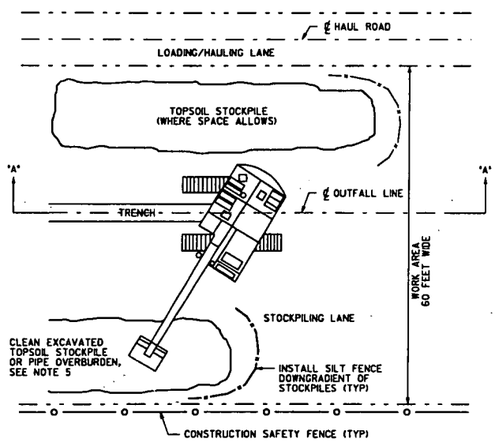
SHEET NO. G-4

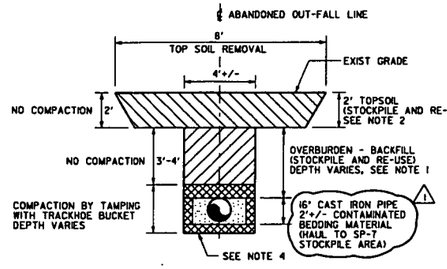
FILE NAME: /osdf/Project2120/99xg0797.dgn

FCPS.DGN 5/30/03

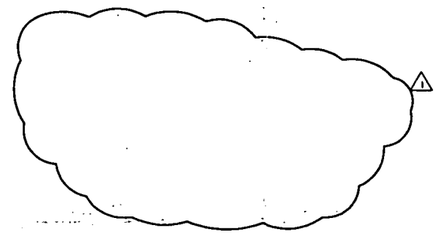


MECHANICAL PLUG
NOT TO SCALE



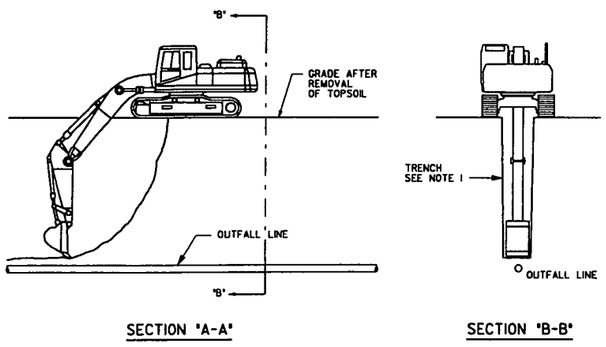


TYPICAL TRENCHING AND BACKFILL DETAIL
NOT TO SCALE



NOTES:

1. AFTER PRELIMINARY ANALYSIS OF SOIL SAMPLES AND REAL-TIME SCANNING OF THE EXCAVATION HAS BEEN PERFORMED, THE SOIL STOCKPILED WITHIN THE WORK AREA (NOT INCLUDING TOPSOIL) WILL BE USED AS BACKFILL FOR THE TRENCH EXCAVATION AND COMPACTED AT DEPTHS BELOW 5 TO 6 FEET. ADDITIONAL TRENCH BACKFILL REQUIRED TO REPLACE REMOVED MATERIAL WILL BE PURCHASED FROM A COMMERCIAL VENDOR.
2. THE STOCKPILED TOPSOIL WILL BE BACKFILLED IN THE TOP TWO FOOT OF THE WORK AREA. ADDITIONAL TOPSOIL AS REQUIRED WILL BE PURCHASED FROM A COMMERCIAL VENDOR. TOPSOIL WILL BE SPREAD AND ROLLED USING THE CONSTRUCTION EQUIPMENT WITH NO COMPACTION IN ACCORDANCE WITH THE LAND OWNERS REQUIREMENTS. TOPSOIL WILL BE GRADED TO MATCH THE EXISTING ADJACENT GRADES.
3. ALL AREAS OUTSIDE THE CROP AREA SHALL BE RESTORED TO ORIGINAL CONDITIONS.
4. OVEREXCAVATE 6 INCHES OF SOIL BELOW AND ALONG SIDES OF BEDDING MATERIAL AND HAUL TO SP-7 STOCKPILE AREA. (1)
5. EXCAVATE TOP 6 INCHES OF TOPSOIL AT LOCATION OF PIPE OVERBURDEN STOCKPILE, REPLACE TOPSOIL WHEN STOCKPILE IS DEPLETED.



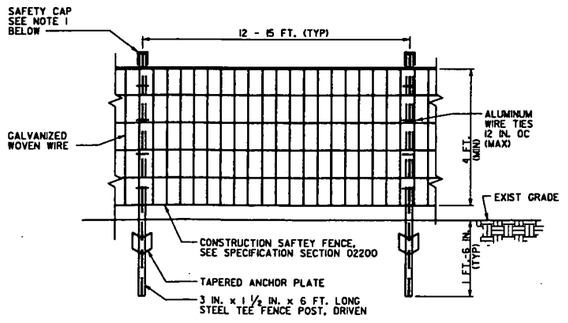
SECTION "A-A"

SECTION "B-B"

TYPICAL WORKING AREA DETAIL
NOT TO SCALE

NOTES:

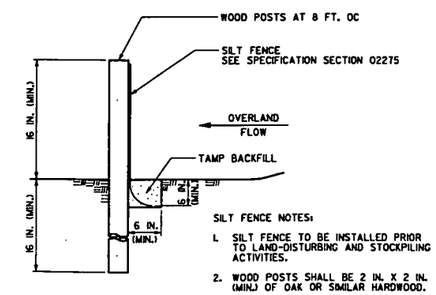
1. A TRENCH BOX MAY BE USED AS NECESSARY.



NOTES:

1. INSTALL SAFETY CAPS ON T-POSTS THAT ARE LESS THAN 4 FEET IN HEIGHT ABOVE-GRADE.

CONSTRUCTION SAFETY FENCE DETAIL
NOT TO SCALE



SILT FENCE NOTES:

1. SILT FENCE TO BE INSTALLED PRIOR TO LAND-DISTURBING AND STOCKPILING ACTIVITIES.
2. WOOD POSTS SHALL BE 2 IN. X 2 IN. (MIN.) OF OAK OR SIMILAR HARDWOOD.
3. BACKFILL MATERIAL IN ACCORDANCE WITH SPECIFICATION SECTION 02200.

SILT FENCE DETAIL
NOT TO SCALE

NO.	REVISIONS	DATE	DWN. BY	APPD.
1	REVISE NOTE 4, REVISE TRENCHING AND BACKFILL DETAIL, REMOVE PIPE GROUTING DETAIL.	1/2/04	RML	GEP
0	ISSUED CERTIFIED FOR CONSTRUCTION	6/4/04	RML	GEP

REF. DWG. NO.

NOTE: FLUOR FERNALD CADD DRAWING. DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING — EXISTING STRUCTURES OR CONDITIONS SHOWN ON THIS DRAWING ARE NOT SUBJECT TO CONFIGURATION MANAGEMENT CONTROL.

C. VAN ARSDALE 6/4/04 COGNIZANT ENGINEER DATE

APPROVALS						
CIVIL & STR.	L. SHEETS	6/4/04	SAFETY ENG.	S. JOHNSON	6/4/04
ELECTRICAL			MAINTENANCE		
ENGINEER			FIRE PROTECT.		
INSTRUMENT			WASTE MANAGE.		
MECHANICAL			SECURITY		
WAO	L. BARLOW	7/2/04	PROJECTS		
CHECKED	H. GUNTHNER	6/4/04	CONSTRUCTION	S.R. HOOVER	6/4/04
APPROVED	R.E. PIKE	6/25/04	CHARACTERIZATION	F. MILLER	6/4/04
			QUALITY CONTROL	R. SCHEYER	6/4/04

Fernald Closure Project

FLUOR FERNALD, INC.

U.S. DEPARTMENT OF ENERGY

AREA 9 PHASE III
REMEDIATION OF ABANDONED OUTFALL LINE
DETAILS

PROJECT: 2920
DATE: 5/20/2004
DRAWN: RM LINDGREN

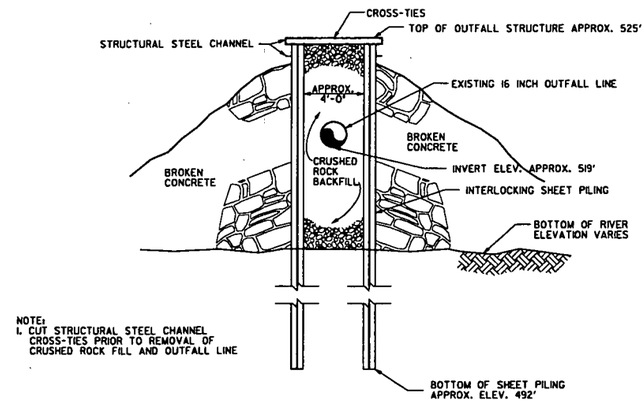
99X-5500-G-00778 | 1

SHEET NO. G-5

FILE NAME: /osdf/Project2120/99xg0778.dgn

SCALE: 1=30'

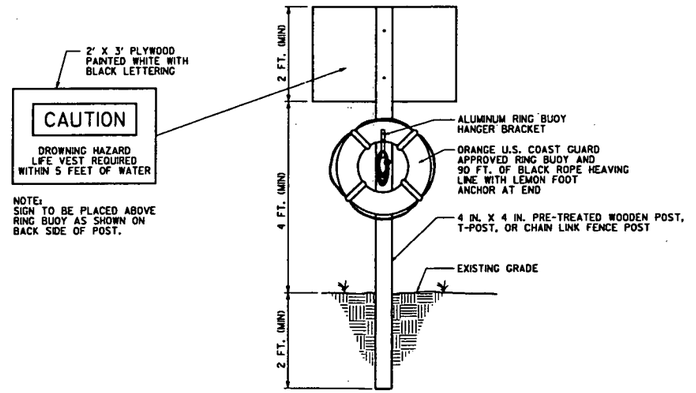
FCP4.DGN 6/30/03



NOTE:
1. CUT STRUCTURAL STEEL CHANNEL CROSS-TIES PRIOR TO REMOVAL OF CRUSHED ROCK FILL AND OUTFALL LINE

TYPICAL SHEETPILE TRENCHING DETAIL

NOT TO SCALE



NOTE:
SIGN TO BE PLACED ABOVE RING BUOY AS SHOWN ON BACK SIDE OF POST.

TYPICAL RING BUOY STATION DETAIL

NOT TO SCALE

NO.	REVISIONS	DATE	DWN. BY	APPD.
0	ISSUED CERTIFIED FOR CONSTRUCTION	9/23/04	RML	GEP

NOTE:
FLUOR FERNALD CADD DRAWING. DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING
C. VAN ARSDALE 9/28/04
COGNIZANT ENGINEER DATE

APPROVALS					
			SAFETY ENG.	C. JOHNSON	9/15/04
CIVIL & STR.	A. SHEER	9/15/04	MAINTENANCE		
ELECTRICAL			FIRE PROTECT.		
ENGINEER			WASTE MANAGE.		
INSTRUMENT			SECURITY		
MECHANICAL			PROJECTS		
WAO			CONSTRUCTION	J. MCCORMICK	9/15/04
CHECKED	S. RUSSELL	9/15/04	CHARACTERIZATION	F. MILLER	9/15/04
APPROVED	K.E. PAUL	9/15/04	QUALITY CONTROL	B. FIRDS	9/15/04

Fernald Closure Project
FLUOR FERNALD, INC.
U.S. DEPARTMENT OF ENERGY

AREA 9 PHASE III
REMEDIATION OF ABANDONED OUTFALL LINE
PART TWO DETAILS

PROJECT: 2120	99X-5500-G-00809	0
DATE 8/09/2004		
DRAWN RM LINDGREN		

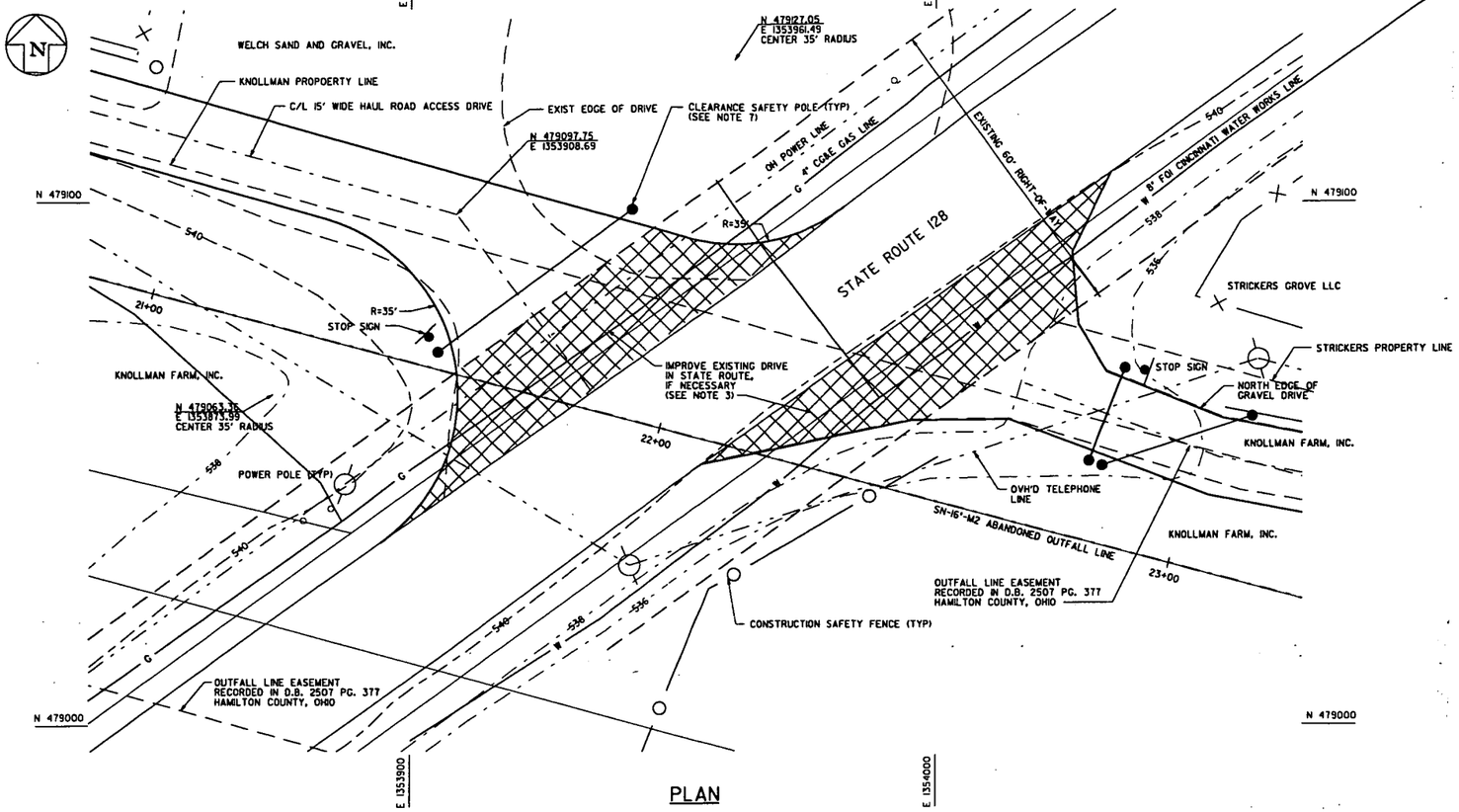
SHEET NO. G-10

FILE NAME: /osdf/Project2120/99xg0809.dgn

FCP5.DGN 5/30/03

GENERAL NOTES

1. SEE DRAWING 99X-5500-G-00775 FOR GENERAL AND CONSTRUCTION NOTES.
2. SEE DRAWING 99X-5500-G-00778 FOR WORKING AREA AND TRENCHING DETAILS.
3. SEE DRAWING 99X-5500-G-00797 FOR HAUL ROAD CROSS SECTION. ROUTE AND DETAILS.
4. DO NOT OPERATE TRACK EQUIPMENT ON STATE ROUTE. CROSS STATE ROUTE WITH TRACK EQUIPMENT AFTER ROAD PROTECTION MEASURES (PLYWOOD, RUBBER MATTING, ETC.) ARE PLACED OVER THE ROAD.
5. INSTALL TRAFFIC SIGNS "ROAD WORK AHEAD" AND "TRUCK CROSSING" ALONG STATE ROUTE 128 BOTH DIRECTIONS AT 1000 FEET AND 500 FEET RESPECTIVELY FROM THE HAUL ROAD CROSSING. COVER OR TAKE DOWN SIGNS NIGHTLY AFTER EACH DAYS WORK.
6. EQUIPMENT WHICH MAY CROSS STATE ROUTE 128 INCLUDE:
   - 30 TON ARTICULATING TRUCK
   - ROLL-OFF BOX TRUCK
   - CAT 330 TRACK HOE OR EQUAL
   - CAT D6 BULLDOZER
   - CAT IT25 LOADER
   - 2000-3000 GALLON WATER TRUCK
7. INSTALL SAFETY POLES WITH WIRE PLACED ACROSS POLES AT A MINIMUM CLEARANCE HEIGHT OF 16.30 FEET. INSTALL STRINGERS ON WIRE.
8. FLAGGER SHALL BE UTILIZED TO STOP HIGHWAY TRAFFIC IN BOTH DIRECTIONS. TRUCKS CARRYING CONTAMINATED MATERIALS CROSS STATE ROUTE 128.



PLAN

SCALE: 1"=10'

0 5 10 25 50

SCALE IN FEET

NO.	REVISIONS	DATE	DWN. BY	APPD.
0	ISSUED CERTIFIED FOR CONSTRUCTION	9/30/04	RML	GEP

REF. DWG. NO.

NOTE: FLUOR FERNALD CADD DRAWING. DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING

E. VAN ANTWERP 9/30/04
COGNIZANT ENGINEER DATE

APPROVALS					
			SAFETY ENG.	G. JOHNSON	9/30/04
CIVIL & STR.	A.C. SHEEN	9/30/04	MAINTENANCE		
ELECTRICAL			FIRE PROTECT.		
ENGINEER			WASTE MANAGE	L. BARLOW	9/30/04
INSTRUMENT			SECURITY		
MECHANICAL			PROJECTS		
QUALITY CONTROL	R. FRISBY	9/30/04	CONSTRUCTION	J. MCCORMACK	9/30/04
CHECKED	B. RUSSELL	9/30/04	CHARACTERIZATION	F. MILLER	9/30/04
APPROVED	K.J. PAUL	9/30/04			

Fernald Closure Project

FLUOR FERNALD, INC.

U.S. DEPARTMENT OF ENERGY

AREA 9 PHASE III
REMEDIATION OF ABANDONED OUTFALL LINE
ST. RT. 128 ROAD CROSSING TRAFFIC PLAN

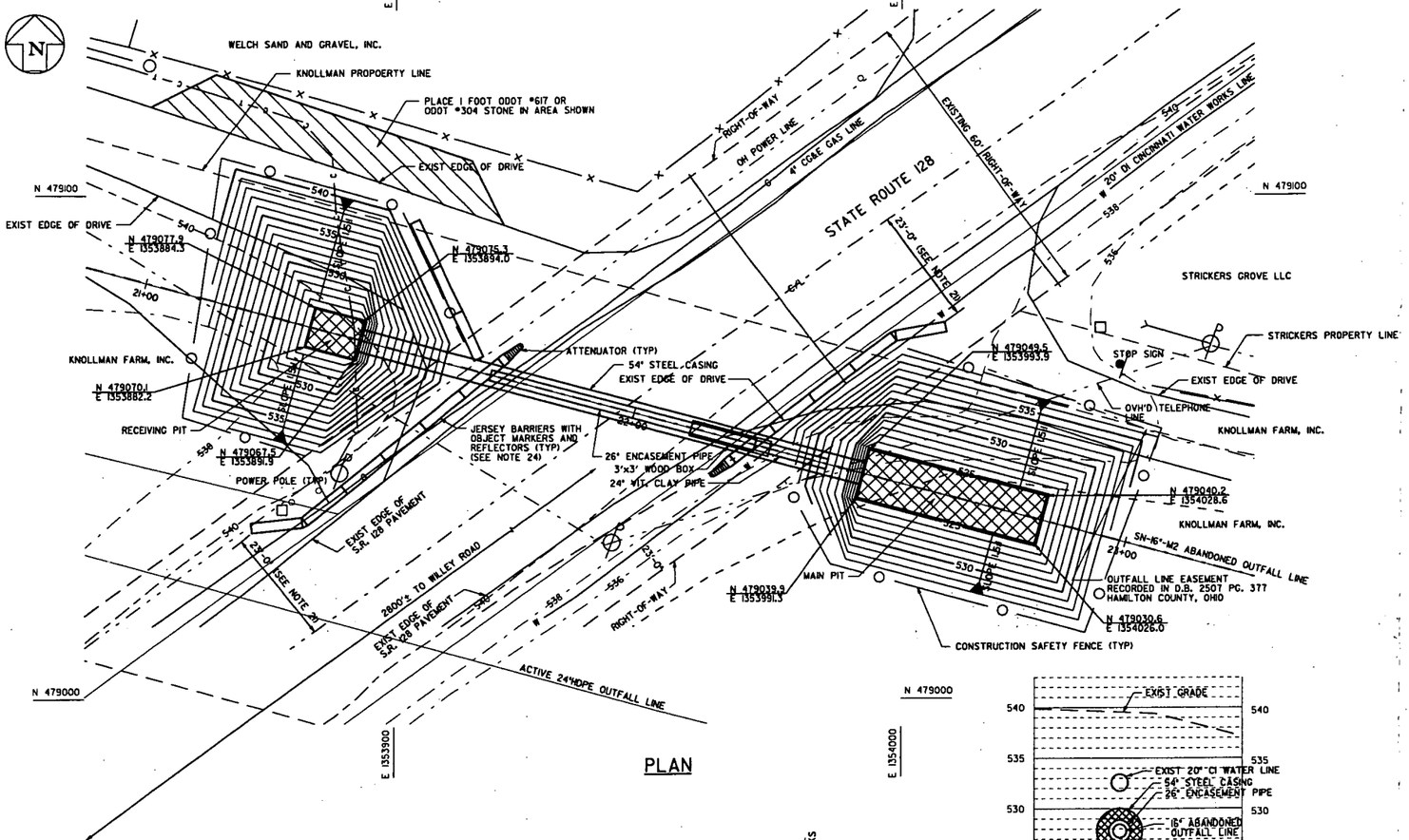
PROJECT: 2120	99X-5500-G-00802	0
DATE: 6/21/2004		
DRAWN: R.M. LINDGREN		

SHEET NO. G-11

FILE NAME: /osdf/Project2120/99xg0802.dgn

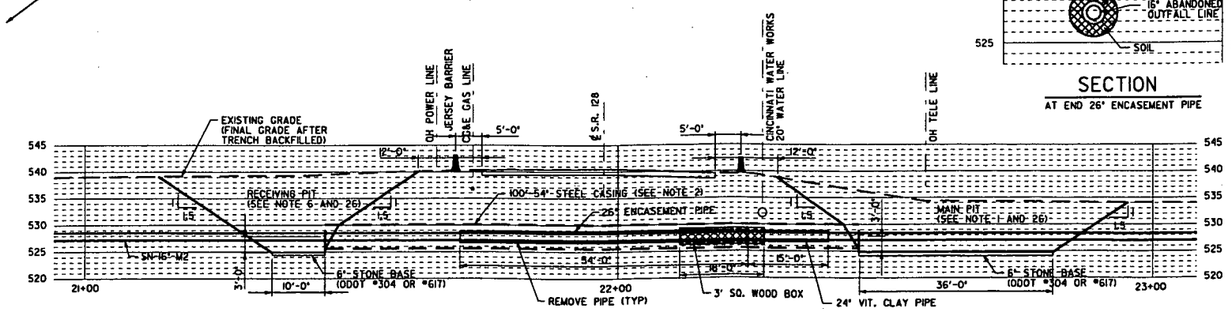
FORM 9/30/03

CROSBY TOWNSHIP, HAMILTON COUNTY, OHIO



PLAN

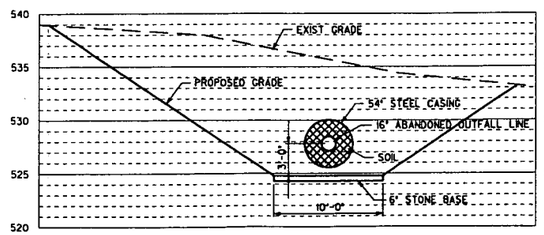
SECTION
AT END 26" ENCASEMENT PIPE



PROFILE

SCALE: 1"=10'

SCALE IN FEET



SECTION
AT BEGINNING 54" STEEL CASING

GENERAL NOTES

1. THE MAIN PIT SHALL BE A MINIMUM OF 10 FOOT WIDE BY 36 FOOT LONG AND BE EXCAVATED TO ACCOMMODATE AN AIR POWERED PIPE RAMMER.
2. STEEL CASING SHALL BE 54 INCH DIAMETER MEETING ASTM A-139, GRADE B SPECIFICATIONS, AND BE A MINIMUM THICKNESS OF 0.50 INCH IN ACCORDANCE WITH ODOT ITEM 748.06.
3. THE STEEL CASING WILL BE FURNISHED IN 20 FOOT LENGTHS. AS EACH 20 FOOT SECTION IS ADVANCED ALONG THE BORE PATH, CASING WILL BE WELDED ON AND ADVANCED.
4. STEEL CASING WILL BE CENTERED AROUND THE 16" ABANDONED OUTFALL LINE.
5. THE STEEL CASING WILL HAVE A CUTTING SHOE WELDED TO THE LEADING EDGE.
6. RECEIVING PIT SHALL BE A MINIMUM OF 10 FOOT LONG BY 8 FOOT WIDE AND WILL BE EXCAVATED TO ACCOMMODATE REMOVAL OF CUTTING SHOE WELDED TO STEEL CASING.
7. REMOVE 16 INCH ABANDONED OUTFALL LINE PIPE TO THE LIMITS OF THE PROPOSED 54 INCH STEEL CASING AND HAUL TO STOCKPILE SP-7.
8. PLUG, GROUT, AND SURVEY EAST AND WEST ENDS OF 16 INCH ABANDONED OUTFALL LINE.
9. RAM 54 INCH PIPE CASING AROUND 16 INCH ABANDONED OUTFALL LINE AND 26 INCH STEEL CASING.
10. AFTER COMPLETION OF 54 INCH CASING RAMMING, PERFORM RADIOLOGICAL SURVEY AT END OF 54 INCH CASING IN RECEIVING PIT.
11. REMOVE THE SOIL BETWEEN THE 16 INCH PIPE AND 54-INCH PIPE AT BOTH ENDS TO APPROXIMATE LENGTH OF 6 TO 8 FEET AND HAUL TO ON-SITE STOCKPILE SP-7. THIS ACTIVITY WILL REQUIRE APPROPRIATE PPE AND CONFINED ENTRY SPACE PERMIT. FIRST REMOVE SOIL ON TOP OF 16 INCH PIPE IN SIDE THE 54 INCH PIPE, DURING THE SOIL REMOVAL, IF PIPE JOINT/(S) IS/(ARE) FOUND OUTSIDE THE ENCASEMENT PIPE, REMOVE THE LENGTH OF PIPE OUT SIDE THE ENCASEMENT PIPE BEFORE REMOVING THE SOIL UNDERNEATH THE 16 INCH PIPE. PERFORM RADIOLOGICAL SURVEY DURING THE SOIL REMOVAL ACTIVITY. ALSO PERFORM PRE-CERTIFICATION AND CERTIFICATION SAMPLING DURING SOIL REMOVAL. AS REQUIRED.
12. PERFORM RADIOLOGICAL SURVEY OF OUTSIDE SURFACE OF PIPE LENGTH REMOVED FROM OUTSIDE OF ENCASEMENT PIPE.
13. UNPLUG 16 INCH AOL PIPE AND INSERT 12 INCH SDR 11 HDPE PIPE. BEFORE INSERTING HDPE PIPE, PLUG BOTH ENDS OF HDPE PIPE.
14. AFTER INSERTING HDPE PIPE UNPLUG BOTH ENDS. AFTER UNPLUGGING END, SUBCONTRACTOR SHALL INSERT THREADED SHAFT (SHAFT LENGTH 13 FT +/-, THREADED SHAFT CONNECTION) IN HDPE PIPE AND INSTALL END STEEL PLATE (APPROX. SAME DIMENSION AS CI PIPE BELL ID) AT THE END OF THE THREADED SHAFT BEFORE PULLING OPERATION.
15. WITH HYDRAULIC PULL EQUIPMENT, PULL 16 INCH PIPE FROM THE ENCASEMENT PIPE AND HAUL TO ON-SITE STOCKPILE SP-7. EQUIPMENT WILL BE IN MAIN PIT EASTSIDE (BY SUBCONTRACTOR). BASED ON THE EXISTING DRAWING IT IS ASSUMED THAT THE ENCASEMENT PIPE IS NOT GROUTED WITH CONCRETE OR SAND. DURING THE PULLING OPERATION, CUT HDPE PIPE LENGTH AND REMOVE THREADED SHAFT LENGTHS, AS REQUIRED.
16. AFTER REMOVAL OF 16 INCH PIPE AND SOIL IN 54-INCH CASING PIPE UP TO BOTH ENDS OF 26 INCH ENCASEMENT PIPE, PERFORM RADIOLOGICAL SURVEY OF INNER SURFACE OF THE 26 INCH ENCASEMENT PIPE.
17. IF 26 INCH ENCASEMENT PIPE PASSES THE "FREE RELEASE" CRITERIA, GROUT THE ENCASEMENT PIPE WITH CONCRETE.
18. IF 26 INCH ENCASEMENT PIPE DO NOT PASS THE "FREE RELEASE" CRITERIA, JACK/RAM OR PUSH/PULL 26-INCH ENCASEMENT PIPE AND REMOVE SOIL (BY SUBCONTRACTOR) AND HAUL TO ON-SITE STOCKPILE SP-7 (BY FF).
19. AFTER REMOVAL OF 26 INCH PIPE AND REMOVAL OF SOIL INSIDE 54 INCH CASING PIPE, PERFORM RADIOLOGICAL SURVEY OF INNER SURFACE OF THE 54 INCH CASING PIPE.
20. GROUT BOTH ENDS OF 54-INCH CASING PIPE AND BACKFILL SR 128 SIDE SLOPES AS SHOWN ON CONSTRUCTION DRAWING (TO BE VERIFIED WITH OHIO-ODT). BACKFILLING WITHIN STATE ROUTE 128 RIGHT-OF-WAY SHALL BE IN 8 INCH LOOSE LIFTS COMPACTED TO AT LEAST 98% OF STANDARD PROCTOR MAX-DRY DENSITY IN ACCORDANCE WITH ODOT ITEM 203.06 AND 203.07.
21. JERSEY BARRIERS ARE EXTENDED OUTSIDE OF THE 23 FEET CLEAR ZONE AS DESCRIBED IN ODOT DRAWING MT-95-41.
22. INSTALL TRAFFIC SIGN "ROAD WORK AHEAD" (48" SQUARE) ALONG STATE ROUTE 128 IN BOTH DIRECTIONS AT 1000 FEET FROM JERSEY BARRIERS.
23. DO NOT OPERATE TRACK EQUIPMENT ON STATE ROUTE 128, UNLESS PROTECTION MEASURES (PLYWOOD, RUBBER, MATTING, ETC.) ARE PLACED OVER THE PAVEMENT. PARKING WITHIN STATE ROUTE 128 RIGHT-OF-WAY IS NOT PERMITTED.
24. JERSEY BARRIERS ALONG STATE ROUTE 128 SHALL BE CONNECTED MECHANICALLY. THE OBJECT MARKERS SHALL BE IN ACCORDANCE WITH ODOT ITEM 720.05 AND REFLECTORS IN ACCORDANCE WITH ODOT ITEM 626 AND 720.04.
25. DISTURBED AREA IN RIGHT-OF-WAY SHALL BE RESEEDED IN ACCORDANCE WITH ODOT ITEM 659. USE CLASS 3B LOW GROWING SLOPE MIXTURE IN ACCORDANCE WITH ODOT TABLE 659.09-1. IF SEEDING IS PERFORMED IN WINTER (PRIOR TO MARCH 1) USE CLASS 7 ANNUAL RYEGRASS TEMPORARILY AND THEN CLASS 3B SEEDED IN SPRING.
26. CONSTRUCTION WATER DURING AND AFTER EXCAVATION OF MAIN PIT AND RECEIVING PIT SHALL BE DISCHARGED TO THE ACTIVE 24" HDPE OUTFALL LINE. IF TREATMENT IS NOT REQUIRED OR DISCHARGE TO FERNALD CLOSURE PROJECT WASTEWATER TREATMENT SYSTEM. IF TREATMENT IS REQUIRED.

NO.	REVISIONS	DATE	DWN. BY	APPD.
0	ISSUED CERTIFIED FOR CONSTRUCTION	9/3/05	RML	

NOTE: FLUOR FERNALD CADD DRAWING. DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING: YES / NO

APPROVALS

CIVIL & STR.		SAFETY ENG.	
ELECTRICAL		MAINTENANCE	
ENGINEER		FIRE PROTECT.	
INSTRUMENT		WASTE MANAGE	
MECHANICAL		SECURITY	
QUALITY CONTROL		PROJECTS	
CHECKED		CONSTRUCTION	
APPROVED		CHARACTERIZATION	

COGNIZANT ENGINEER DATE

Fernald Closure Project

FLUOR FERNALD, INC.

U.S. DEPARTMENT OF ENERGY

AREA 9 PHASE III
REMEDIATION OF ABANDONED OUTFALL LINE
PIPE REMOVAL UNDER ST. RT. 128

PROJECT: 2520 | 99X-5500-G-00822 | 0
DATE: 10/28/2004
DRAWN: R.M. LINDGREN

SHEET NO. G-14

FILE NAME: /osdf/Project2120/99xg0822.dgn

FCPSLOGN 5/30/03

APPENDIX B

ABANDONED OUTFALL LINE HISTORICAL AND PREDESIGN DATA

APPENDIX B
TABLE B-1
PREDESIGN DATA FOR A9PIII ABANDONED OUTFALL LINE PART THREE

Boring ID	Sample ID	Top Depth (in feet)	Bottom Depth (in	Parameter	Result	Qualifier	Units
A9P3-MH181	A9P3-MH181^1S-R	0	0.5	Cesium-137	1.03	-	pCi/g
A9P3-MH181	A9P3-MH181^1S-R	0	0.5	Radium-226	83.5	J	pCi/g
A9P3-MH181	A9P3-MH181^1S-R	0	0.5	Radium-228	9.08	-	pCi/g
A9P3-MH181	A9P3-MH181^1S-R	0	0.5	Technetium-99	388	-	pCi/g
A9P3-MH181	A9P3-MH181^1S-R	0	0.5	Thorium-228	11.2	-	pCi/g
A9P3-MH181	A9P3-MH181^1S-R	0	0.5	Thorium-232	9.08	-	pCi/g
A9P3-MH181	A9P3-MH181^1S-R	0	0.5	Uranium, Total	832	-	mg/kg
A9P3-MH181-1	A9P3-MH181-1^1-R	0	0.5	Cesium-137	0.144	-	pCi/g
A9P3-MH181-1	A9P3-MH181-1^1-R	0	0.5	Radium-226	1.14	-	pCi/g
A9P3-MH181-1	A9P3-MH181-1^1-R	0	0.5	Radium-228	0.789	-	pCi/g
A9P3-MH181-1	A9P3-MH181-1^1-R	0	0.5	Technetium-99	0.293	U	pCi/g
A9P3-MH181-1	A9P3-MH181-1^1-R	0	0.5	Thorium-228	0.812	-	pCi/g
A9P3-MH181-1	A9P3-MH181-1^1-R	0	0.5	Thorium-232	0.789	-	pCi/g
A9P3-MH181-1	A9P3-MH181-1^1-R	0	0.5	Uranium, Total	5.55	-	mg/kg
A9P3-MH181-1	A9P3-MH181-1^14-R	6.5	7	Cesium-137	0.0492	U	pCi/g
A9P3-MH181-10	A9P3-MH181-10^1-R	0	0.5	Cesium-137	0.0462	-	pCi/g
A9P3-MH181-10	A9P3-MH181-10^1-R	0	0.5	Radium-226	0.759	-	pCi/g
A9P3-MH181-10	A9P3-MH181-10^1-R	0	0.5	Radium-228	0.671	-	pCi/g
A9P3-MH181-10	A9P3-MH181-10^1-R	0	0.5	Technetium-99	0.252	U	pCi/g
A9P3-MH181-10	A9P3-MH181-10^1-R	0	0.5	Thorium-228	0.666	-	pCi/g
A9P3-MH181-10	A9P3-MH181-10^1-R	0	0.5	Thorium-232	0.671	-	pCi/g
A9P3-MH181-10	A9P3-MH181-10^1-R	0	0.5	Uranium, Total	4.16	-	mg/kg
A9P3-MH181-11	A9P3-MH181-11^1-R	0	0.5	Cesium-137	0.105	-	pCi/g
A9P3-MH181-11	A9P3-MH181-11^1-R	0	0.5	Radium-226	0.645	-	pCi/g
A9P3-MH181-11	A9P3-MH181-11^1-R	0	0.5	Radium-228	0.497	-	pCi/g
A9P3-MH181-11	A9P3-MH181-11^1-R	0	0.5	Technetium-99	0.245	U	pCi/g
A9P3-MH181-11	A9P3-MH181-11^1-R	0	0.5	Thorium-228	0.507	-	pCi/g
A9P3-MH181-11	A9P3-MH181-11^1-R	0	0.5	Thorium-232	0.497	-	pCi/g
A9P3-MH181-11	A9P3-MH181-11^1-R	0	0.5	Uranium, Total	3.42	-	mg/kg
A9P3-MH181-12	A9P3-MH181-12^1-R	0	0.5	Cesium-137	0.0727	-	pCi/g
A9P3-MH181-12	A9P3-MH181-12^1-R	0	0.5	Radium-226	0.708	-	pCi/g
A9P3-MH181-12	A9P3-MH181-12^1-R	0	0.5	Radium-228	0.625	-	pCi/g
A9P3-MH181-12	A9P3-MH181-12^1-R	0	0.5	Technetium-99	0.267	U	pCi/g
A9P3-MH181-12	A9P3-MH181-12^1-R	0	0.5	Thorium-228	0.633	-	pCi/g
A9P3-MH181-12	A9P3-MH181-12^1-R	0	0.5	Thorium-232	0.625	-	pCi/g
A9P3-MH181-12	A9P3-MH181-12^1-R	0	0.5	Uranium, Total	3.16	-	mg/kg
A9P3-MH181-13	A9P3-MH181-13^1-R	0	0.5	Cesium-137	0.0819	-	pCi/g
A9P3-MH181-13	A9P3-MH181-13^1-R	0	0.5	Radium-226	0.916	-	pCi/g
A9P3-MH181-13	A9P3-MH181-13^1-R	0	0.5	Radium-228	0.787	-	pCi/g
A9P3-MH181-13	A9P3-MH181-13^1-R	0	0.5	Technetium-99	0.246	U	pCi/g
A9P3-MH181-13	A9P3-MH181-13^1-R	0	0.5	Thorium-228	0.823	-	pCi/g
A9P3-MH181-13	A9P3-MH181-13^1-R	0	0.5	Thorium-232	0.787	-	pCi/g
A9P3-MH181-13	A9P3-MH181-13^1-R	0	0.5	Uranium, Total	4.59	-	mg/kg
A9P3-MH181-14	A9P3-MH181-14^1-R	0	0.5	Cesium-137	0.0516	U	pCi/g
A9P3-MH181-14	A9P3-MH181-14^1-R	0	0.5	Radium-226	0.762	-	pCi/g
A9P3-MH181-14	A9P3-MH181-14^1-R	0	0.5	Radium-228	0.639	-	pCi/g
A9P3-MH181-14	A9P3-MH181-14^1-R	0	0.5	Technetium-99	0.244	U	pCi/g
A9P3-MH181-14	A9P3-MH181-14^1-R	0	0.5	Thorium-228	0.656	-	pCi/g

APPENDIX B
TABLE B-1
PREDESIGN DATA FOR A9PIII ABANDONED OUTFALL LINE PART THREE

Boring ID	Sample ID	Top Depth (in feet)	Bottom Depth (in	Parameter	Result	Qualifier	Units
A9P3-MH181-14	A9P3-MH181-14^1-R	0	0.5	Thorium-232	0.639	-	pCi/g
A9P3-MH181-14	A9P3-MH181-14^1-R	0	0.5	Uranium, Total	2.73	-	mg/kg
A9P3-MH181-15	A9P3-MH181-15^1-R	0	0.5	Cesium-137	0.0863	-	pCi/g
A9P3-MH181-15	A9P3-MH181-15^1-R	0	0.5	Radium-226	0.57	-	pCi/g
A9P3-MH181-15	A9P3-MH181-15^1-R	0	0.5	Radium-228	0.493	-	pCi/g
A9P3-MH181-15	A9P3-MH181-15^1-R	0	0.5	Technetium-99	0.263	U	pCi/g
A9P3-MH181-15	A9P3-MH181-15^1-R	0	0.5	Thorium-228	0.519	-	pCi/g
A9P3-MH181-15	A9P3-MH181-15^1-R	0	0.5	Thorium-232	0.493	-	pCi/g
A9P3-MH181-15	A9P3-MH181-15^1-R	0	0.5	Uranium, Total	3.18	-	mg/kg
A9P3-MH181-16	A9P3-MH181-16^1-R	0	0.5	Cesium-137	0.0988	-	pCi/g
A9P3-MH181-16	A9P3-MH181-16^1-R	0	0.5	Radium-226	0.626	-	pCi/g
A9P3-MH181-16	A9P3-MH181-16^1-R	0	0.5	Radium-228	0.592	-	pCi/g
A9P3-MH181-16	A9P3-MH181-16^1-R	0	0.5	Technetium-99	0.247	U	pCi/g
A9P3-MH181-16	A9P3-MH181-16^1-R	0	0.5	Thorium-228	0.602	-	pCi/g
A9P3-MH181-16	A9P3-MH181-16^1-R	0	0.5	Thorium-232	0.592	-	pCi/g
A9P3-MH181-16	A9P3-MH181-16^1-R	0	0.5	Uranium, Total	3.37	-	mg/kg
A9P3-MH181-16	A9P3-MH181-16^24-R	11.5	12	Cesium-137	0.0543	U	pCi/g
A9P3-MH181-17	A9P3-MH181-17^1-R	0	0.5	Technetium-99	0.738	-	pCi/g
A9P3-MH181-2	A9P3-MH181-2^1-R	0	0.5	Cesium-137	0.223	-	pCi/g
A9P3-MH181-2	A9P3-MH181-2^1-R	0	0.5	Radium-226	0.848	-	pCi/g
A9P3-MH181-2	A9P3-MH181-2^1-R	0	0.5	Radium-228	0.75	-	pCi/g
A9P3-MH181-2	A9P3-MH181-2^1-R	0	0.5	Technetium-99	0.679	-	pCi/g
A9P3-MH181-2	A9P3-MH181-2^1-R	0	0.5	Thorium-228	0.761	-	pCi/g
A9P3-MH181-2	A9P3-MH181-2^1-R	0	0.5	Thorium-232	0.75	-	pCi/g
A9P3-MH181-2	A9P3-MH181-2^1-R	0	0.5	Uranium, Total	6.22	-	mg/kg
A9P3-MH181-2	A9P3-MH181-2^2-R	0.5	1	Technetium-99	1.1	-	pCi/g
A9P3-MH181-2	A9P3-MH181-2^3-R	1	1.5	Technetium-99	0.89	NV	pCi/g
A9P3-MH181-2	A9P3-MH181-2^3-R	1	1.5	Technetium-99	1.02	NV	pCi/g
A9P3-MH181-2	A9P3-MH181-2^9-R	4	4.5	Technetium-99	1.29	NV	pCi/g
A9P3-MH181-2	A9P3-MH181-2^9-R	4	4.5	Technetium-99	1.4	NV	pCi/g
A9P3-MH181-2	A9P3-MH181-2^10-R	4.5	5	Technetium-99	0.84	NV	pCi/g
A9P3-MH181-2	A9P3-MH181-2^13-R	6	6.5	Technetium-99	0.51	NV	pCi/g
A9P3-MH181-2	A9P3-MH181-2^15-R	7	7.5	Technetium-99	0.17	UNV	pCi/g
A9P3-MH181-2E	A9P3-MH181-2E^2-R	0.5	1	Technetium-99	1.45	NV	pCi/g
A9P3-MH181-2E2	A9P3-MH181-2E2^2-R	0.5	1	Technetium-99	1.6	NV	pCi/g
A9P3-MH181-2E2	A9P3-MH181-2E2^9-R	4	4.5	Technetium-99	0.85	NV	pCi/g
A9P3-MH181-2E2	A9P3-MH181-2E2^4-R	1.5	2	Technetium-99	0.831	NV	pCi/g
A9P3-MH181-2E3	A9P3-MH181-2E3^2-R	0.5	1	Technetium-99	0.91	NV	pCi/g
A9P3-MH181-2N	A9P3-MH181-2N^2-R	0.5	1	Technetium-99	1.6	NV	pCi/g
A9P3-MH181-2N	A9P3-MH181-2N^2-R	0.5	1	Technetium-99	1.71	NV	pCi/g
A9P3-MH181-2N2	A9P3-MH181-2N2^2-R	0.5	1	Technetium-99	1.5	NV	pCi/g
A9P3-MH181-2N2	A9P3-MH181-2N2^9-R	4	4.5	Technetium-99	0.47	UNV	pCi/g
A9P3-MH181-2N2	A9P3-MH181-2N2^4-R	1.5	2	Technetium-99	0.604	NV	pCi/g
A9P3-MH181-2N3	A9P3-MH181-2N3^2-R	0.5	1	Technetium-99	1.7	NV	pCi/g
A9P3-MH181-2N3	A9P3-MH181-2N3^9-R	4	4.5	Technetium-99	0.485	UNV	pCi/g
A9P3-MH181-2N3	A9P3-MH181-2N3^4-R	1.5	2	Technetium-99	0.253	NV	pCi/g
A9P3-MH181-2S	A9P3-MH181-2S^2-R	0.5	1	Technetium-99	1.44	NV	pCi/g
A9P3-MH181-2S2	A9P3-MH181-2S2^2-R	0.5	1	Technetium-99	0.26	UNV	pCi/g

APPENDIX B
TABLE B-1
PREDESIGN DATA FOR A9PIII ABANDONED OUTFALL LINE PART THREE

Boring ID	Sample ID	Top Depth (in feet)	Bottom Depth (in	Parameter	Result	Qualifier	Units
A9P3-MH181-2S2	A9P3-MH181-2S2^9-R	4	4.5	Technetium-99	0.41	UNV	pCi/g
A9P3-MH181-2W	A9P3-MH181-2W^2-R	0.5	1	Technetium-99	1.26	NV	pCi/g
A9P3-MH181-2W2	A9P3-MH181-2W2^2-R	0.5	1	Technetium-99	1.2	NV	pCi/g
A9P3-MH181-2W2	A9P3-MH181-2W2^9-R	4	4.5	Technetium-99	0.63	NV	pCi/g
A9P3-MH181-2W3	A9P3-MH181-2W3^2-R	0.5	1	Technetium-99	1.1	NV	pCi/g
A9P3-MH181-2W4	A9P3-MH181-2W4^2-R	0.5	1	Technetium-99	0.206	UNV	pCi/g
A9P3-MH181-2N4	A9P3-MH181-2N4^2-R	0.5	1	Technetium-99	0.358	UNV	pCi/g
A9P3-MH181-3	A9P3-MH181-3^1-R	0	0.5	Cesium-137	0.143	-	pCi/g
A9P3-MH181-3	A9P3-MH181-3^1-R	0	0.5	Radium-226	1.01	-	pCi/g
A9P3-MH181-3	A9P3-MH181-3^1-R	0	0.5	Radium-228	0.604	-	pCi/g
A9P3-MH181-3	A9P3-MH181-3^1-R	0	0.5	Technetium-99	0.283	U	pCi/g
A9P3-MH181-3	A9P3-MH181-3^1-R	0	0.5	Thorium-228	0.626	-	pCi/g
A9P3-MH181-3	A9P3-MH181-3^1-R	0	0.5	Thorium-232	0.604	-	pCi/g
A9P3-MH181-3	A9P3-MH181-3^1-R	0	0.5	Uranium, Total	4.68	-	mg/kg
A9P3-MH181-4	A9P3-MH181-4^1-R	0	0.5	Cesium-137	0.16	-	pCi/g
A9P3-MH181-4	A9P3-MH181-4^1-R	0	0.5	Radium-226	0.982	-	pCi/g
A9P3-MH181-4	A9P3-MH181-4^1-R	0	0.5	Radium-228	0.725	-	pCi/g
A9P3-MH181-4	A9P3-MH181-4^1-R	0	0.5	Technetium-99	0.299	U	pCi/g
A9P3-MH181-4	A9P3-MH181-4^1-R	0	0.5	Thorium-228	0.719	-	pCi/g
A9P3-MH181-4	A9P3-MH181-4^1-R	0	0.5	Thorium-232	0.725	-	pCi/g
A9P3-MH181-4	A9P3-MH181-4^1-R	0	0.5	Uranium, Total	5.19	-	mg/kg
A9P3-MH181-5	A9P3-MH181-5^1-R	0	0.5	Cesium-137	0.0147	U	pCi/g
A9P3-MH181-5	A9P3-MH181-5^1-R	0	0.5	Radium-226	0.397	-	pCi/g
A9P3-MH181-5	A9P3-MH181-5^1-R	0	0.5	Radium-228	0.304	-	pCi/g
A9P3-MH181-5	A9P3-MH181-5^1-R	0	0.5	Technetium-99	0.236	U	pCi/g
A9P3-MH181-5	A9P3-MH181-5^1-R	0	0.5	Thorium-228	0.294	-	pCi/g
A9P3-MH181-5	A9P3-MH181-5^1-R	0	0.5	Thorium-232	0.304	-	pCi/g
A9P3-MH181-5	A9P3-MH181-5^1-R	0	0.5	Uranium, Total	0.67	U	mg/kg
A9P3-MH181-6	A9P3-MH181-6^1-R	0	0.5	Cesium-137	0.146	-	pCi/g
A9P3-MH181-6	A9P3-MH181-6^1-R	0	0.5	Radium-226	0.994	-	pCi/g
A9P3-MH181-6	A9P3-MH181-6^1-R	0	0.5	Radium-228	0.758	-	pCi/g
A9P3-MH181-6	A9P3-MH181-6^1-R	0	0.5	Technetium-99	0.27	U	pCi/g
A9P3-MH181-6	A9P3-MH181-6^1-R	0	0.5	Thorium-228	0.768	-	pCi/g
A9P3-MH181-6	A9P3-MH181-6^1-R	0	0.5	Thorium-232	0.758	-	pCi/g
A9P3-MH181-6	A9P3-MH181-6^1-R	0	0.5	Uranium, Total	6.07	-	mg/kg
A9P3-MH181-7	A9P3-MH181-7^1-R	0	0.5	Cesium-137	0.102	-	pCi/g
A9P3-MH181-7	A9P3-MH181-7^1-R	0	0.5	Radium-226	1.1	-	pCi/g
A9P3-MH181-7	A9P3-MH181-7^1-R	0	0.5	Radium-228	0.742	-	pCi/g
A9P3-MH181-7	A9P3-MH181-7^1-R	0	0.5	Technetium-99	0.302	U	pCi/g
A9P3-MH181-7	A9P3-MH181-7^1-R	0	0.5	Thorium-228	0.738	-	pCi/g
A9P3-MH181-7	A9P3-MH181-7^1-R	0	0.5	Thorium-232	0.742	-	pCi/g
A9P3-MH181-7	A9P3-MH181-7^1-R	0	0.5	Uranium, Total	4.13	-	mg/kg
A9P3-MH181-8	A9P3-MH181-8^1-R	0	0.5	Cesium-137	0.17	-	pCi/g
A9P3-MH181-8	A9P3-MH181-8^1-R	0	0.5	Radium-226	0.895	-	pCi/g
A9P3-MH181-8	A9P3-MH181-8^1-R	0	0.5	Radium-228	0.548	-	pCi/g
A9P3-MH181-8	A9P3-MH181-8^1-R	0	0.5	Technetium-99	0.236	U	pCi/g
A9P3-MH181-8	A9P3-MH181-8^1-R	0	0.5	Thorium-228	0.706	-	pCi/g
A9P3-MH181-8	A9P3-MH181-8^1-R	0	0.5	Thorium-232	0.548	-	pCi/g

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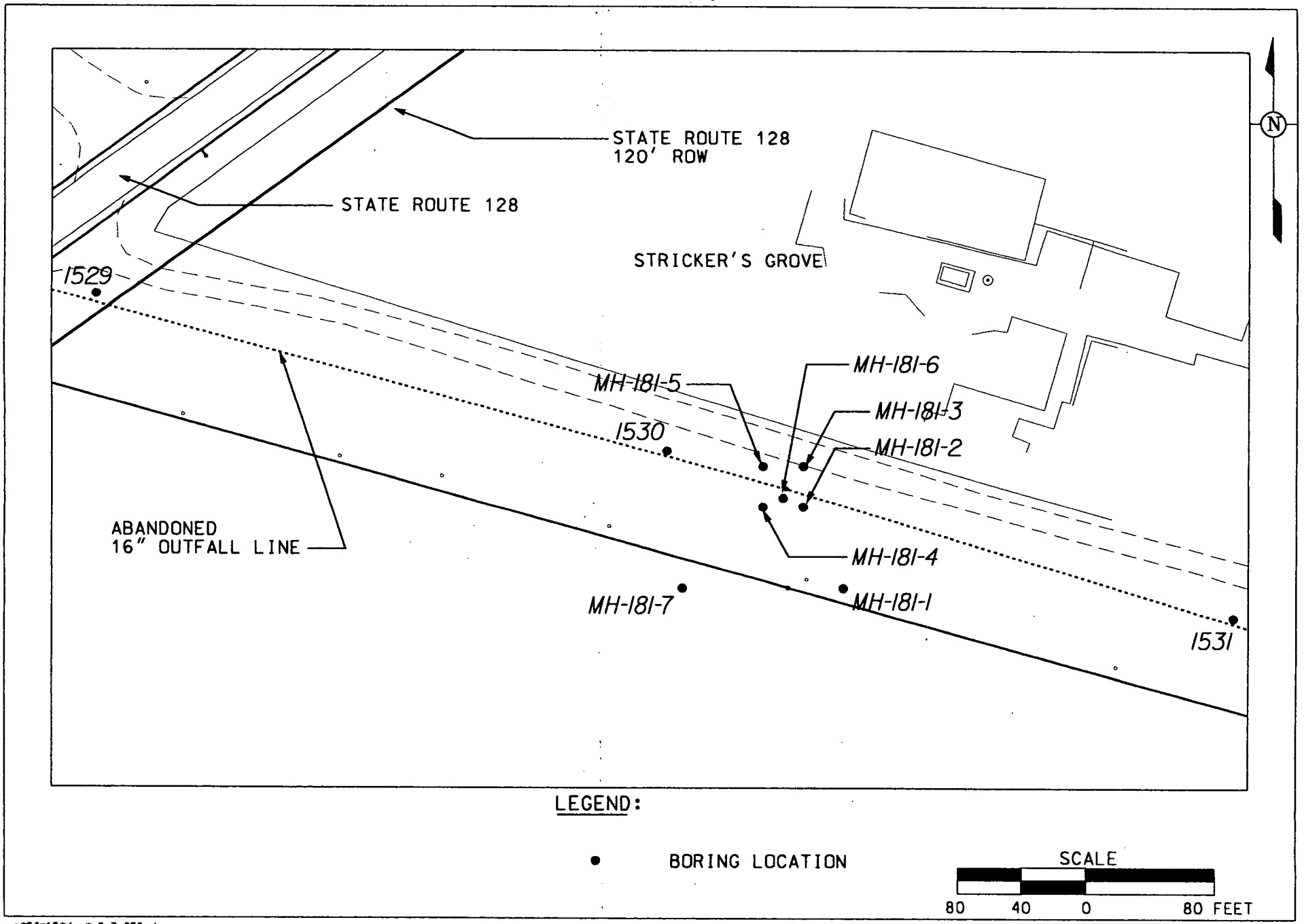
APPENDIX B
TABLE B-1
PREDESIGN DATA FOR A9PIII ABANDONED OUTFALL LINE PART THREE

Boring ID	Sample ID	Top Depth (in feet)	Bottom Depth (in	Parameter	Result	Qualifier	Units
A9P3-MH181-8	A9P3-MH181-8^1-R	0	0.5	Uranium, Total	3.14	-	mg/kg
A9P3-MH181-9	A9P3-MH181-9^1-R	0	0.5	Cesium-137	0.0904	-	pCi/g
A9P3-MH181-9	A9P3-MH181-9^1-R	0	0.5	Radium-226	0.861	-	pCi/g
A9P3-MH181-9	A9P3-MH181-9^1-R	0	0.5	Radium-228	0.612	-	pCi/g
A9P3-MH181-9	A9P3-MH181-9^1-R	0	0.5	Technetium-99	0.273	U	pCi/g
A9P3-MH181-9	A9P3-MH181-9^1-R	0	0.5	Thorium-228	0.653	-	pCi/g
A9P3-MH181-9	A9P3-MH181-9^1-R	0	0.5	Thorium-232	0.612	-	pCi/g
A9P3-MH181-9	A9P3-MH181-9^1-R	0	0.5	Uranium, Total	4.15	-	mg/kg
A9P3-MH181-BM	A9P3-MH181-BM^19-L			1,1-Dichloroethene	1	UJ	ug/kg
A9P3-MH181-BM	A9P3-MH181-BM^19-RM			Boron	13	U	mg/kg
A9P3-MH181-BM	A9P3-MH181-BM^19-RM			Cadmium	0.37	J	mg/kg
A9P3-MH181-BM	A9P3-MH181-BM^19-RM			Cesium-137	0.0357	U	pCi/g
A9P3-MH181-BM	A9P3-MH181-BM^19-RM			Chromium	11.9	J	mg/kg
A9P3-MH181-BM	A9P3-MH181-BM^19-RM			Radium-226	1.15	-	pCi/g
A9P3-MH181-BM	A9P3-MH181-BM^19-RM			Radium-228	0.314	-	pCi/g
A9P3-MH181-BM	A9P3-MH181-BM^19-RM			Silver	0.046	J	mg/kg
A9P3-MH181-BM	A9P3-MH181-BM^19-RM			Technetium-99	1.14	-	pCi/g
A9P3-MH181-BM	A9P3-MH181-BM^19-L			Tetrachloroethene	1.5	J	ug/kg
A9P3-MH181-BM	A9P3-MH181-BM^19-RM			Thorium-228	0.311	-	pCi/g
A9P3-MH181-BM	A9P3-MH181-BM^19-RM			Thorium-232	0.314	-	pCi/g
A9P3-MH181-BM	A9P3-MH181-BM^19-RM			Uranium, Total	1.39	U	mg/kg



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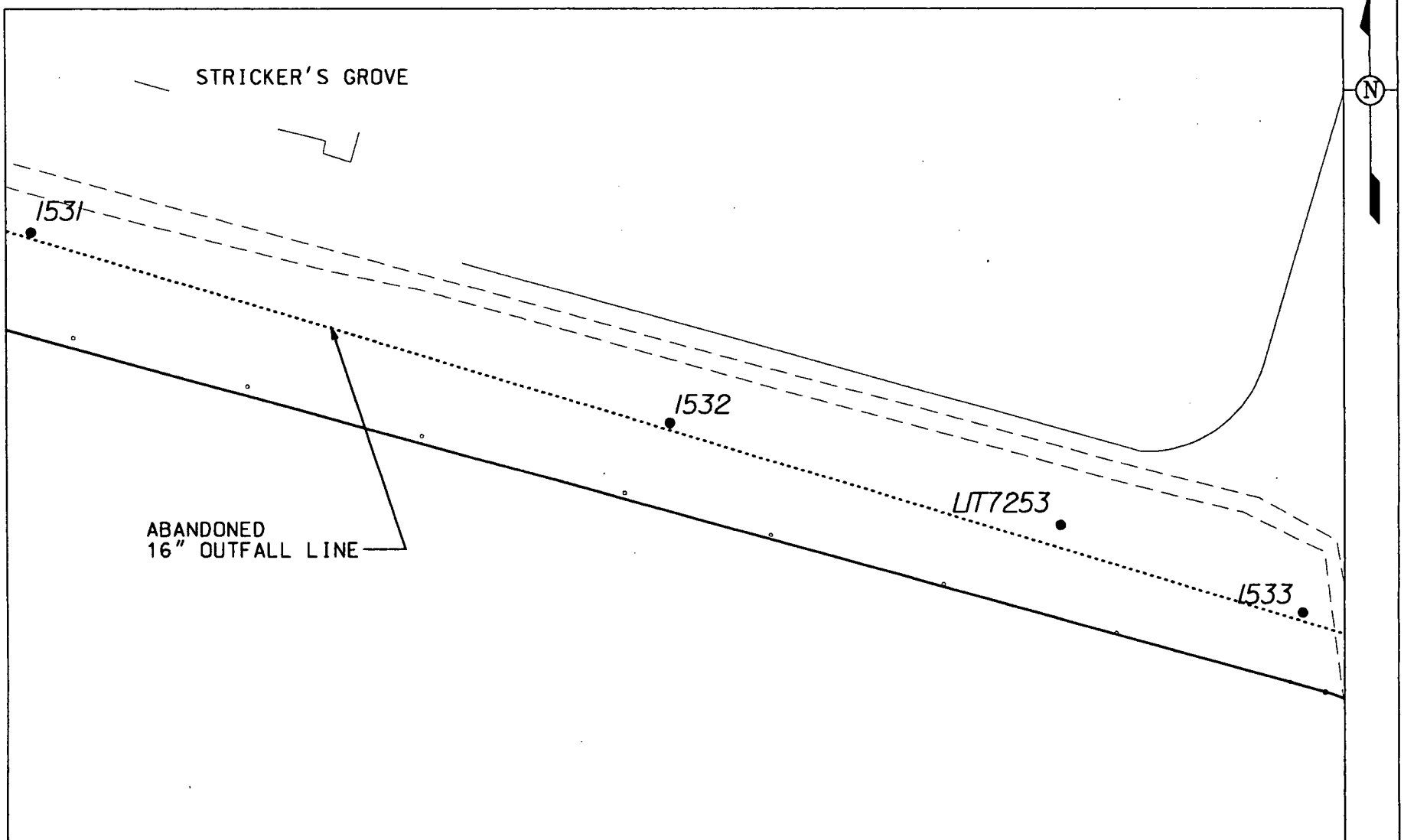
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE B1-1. HISTORICAL SAMPLE LOCATIONS (PART THREE - WEST)

16-MAR-2005



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STATE PLANAR COORDINATE SYSTEM 1983

FIGURE B1-2. HISTORICAL SAMPLE LOCATIONS (PART THREE - EAST)

16-MAR-2005

APPENDIX B
TABLE B-2
HISTORICAL DATA FOR A9PIII ABANDONED OUTFALL LINE PART THREE

Boring ID	Sample ID	Top Depth (in feet)	Bottom Depth (in feet)	Parameter	Result	Qualifier	Units
1529	000481	6	6.5	Cesium-137	0.2	R	pCi/g
1529	000481	6	6.5	Ruthenium-106	1	R	pCi/g
1529	000481	6	6.5	Technetium-99	0.9	U	pCi/g
1529	000481	6	6.5	Thorium, Total	4	J	mg/kg
1529	000481	6	6.5	Uranium, Total	9.41	R	mg/kg
1529	000484	7.5	8	Cesium-137	0.2	U	pCi/g
1529	000484	7.5	8	Ruthenium-106	1	U	pCi/g
1529	000484	7.5	8	Technetium-99	0.9	U	pCi/g
1529	000484	7.5	8	Thorium, Total	5	J	mg/kg
1529	000484	7.5	8	Uranium, Total	8.88	-	mg/kg
1529	000488	9.5	10	Cesium-137	0.2	R	pCi/g
1529	000488	9.5	10	Ruthenium-106	1	R	pCi/g
1529	000488	9.5	10	Technetium-99	0.9	U	pCi/g
1529	000488	9.5	10	Thorium, Total	3	J	mg/kg
1529	000488	9.5	10	Uranium, Total	10.8	R	mg/kg
1530	000491	5	5.5	Cesium-137	0.2	R	pCi/g
1530	000491	5	5.5	Ruthenium-106	1.1	R	pCi/g
1530	000491	5	5.5	Technetium-99	0.9	U	pCi/g
1530	000491	5	5.5	Thorium, Total	7	J	mg/kg
1530	000491	5	5.5	Uranium, Total	11.8	R	mg/kg
1530	000494	6.5	7	Cesium-137	2.57	J	pCi/g
1530	000494	6.5	7	Ruthenium-106	1.1	UJ	pCi/g
1530	000494	6.5	7	Technetium-99	0.9	U	pCi/g
1530	000494	6.5	7	Thorium, Total	6	J	mg/kg
1530	000494	6.5	7	Uranium, Total	15.6	J	mg/kg
1530	000498	8.5	9	Cesium-137	0.2	R	pCi/g
1530	000498	8.5	9	Ruthenium-106	1	R	pCi/g
1530	000498	8.5	9	Technetium-99	0.9	U	pCi/g
1530	000498	8.5	9	Thorium, Total	8	J	mg/kg
1530	000498	8.5	9	Uranium, Total	6.27	R	mg/kg
1530	000501	10	10.5	Cesium-137	0.2	UJ	pCi/g
1530	000501	10	10.5	Ruthenium-106	1	UJ	pCi/g
1530	000501	10	10.5	Technetium-99	0.9	U	pCi/g
1530	000501	10	10.5	Thorium, Total	3	J	mg/kg
1530	000501	10	10.5	Uranium, Total	8.37	J	mg/kg
1531	000505	8.5	9	Cesium-137	0.2	UJ	pCi/g
1531	000505	8.5	9	Ruthenium-106	1	UJ	pCi/g
1531	000505	8.5	9	Technetium-99	0.9	U	pCi/g
1531	000505	8.5	9	Thorium, Total	4	UJ	mg/kg
1531	000505	8.5	9	Uranium, Total	9.22	J	mg/kg
1531	000507	9.5	10	Cesium-137	0.2	R	pCi/g
1531	000507	9.5	10	Ruthenium-106	1	R	pCi/g
1531	000507	9.5	10	Technetium-99	0.9	U	pCi/g
1531	000507	9.5	10	Thorium, Total	4	J	mg/kg
1531	000507	9.5	10	Uranium, Total	9.72	R	mg/kg
1531	000510	11	11.5	Cesium-137	0.2	UJ	pCi/g
1531	000510	11	11.5	Ruthenium-106	1	UJ	pCi/g
1531	000510	11	11.5	Technetium-99	0.9	U	pCi/g

APPENDIX B
TABLE B-2
HISTORICAL DATA FOR A9PIII ABANDONED OUTFALL LINE PART THREE

Boring ID	Sample ID	Top Depth (in feet)	Bottom Depth (in feet)	Parameter	Result	Qualifier	Units
1531	000510	11	11.5	Thorium, Total	3	J	mg/kg
1531	000510	11	11.5	Uranium, Total	8.19	J	mg/kg
1531	000513	12.5	13	Cesium-137	0.2	UJ	pCi/g
1531	000513	12.5	13	Ruthenium-106	1	UJ	pCi/g
1531	000513	12.5	13	Technetium-99	0.9	U	pCi/g
1531	000513	12.5	13	Thorium, Total	4	J	mg/kg
1531	000513	12.5	13	Uranium, Total	7.46	J	mg/kg
1532	000531	9	9.5	Cesium-137	0.2	U	pCi/g
1532	000531	9	9.5	Radium-226	0.66	NV	pCi/g
1532	000531	9	9.5	Ruthenium-106	1	U	pCi/g
1532	000531	9	9.5	Technetium-99	0.9	U	pCi/g
1532	000531	9	9.5	Thorium, Total	6	J	mg/kg
1532	000531	9	9.5	Uranium, Total	9.54	-	mg/kg
1532	000533	10	10.5	Cesium-137	1.04	R	pCi/g
1532	000533	10	10.5	Radium-226	0.76	NV	pCi/g
1532	000533	10	10.5	Radium-228	0.88	NV	pCi/g
1532	000533	10	10.5	Ruthenium-106	1	R	pCi/g
1532	000533	10	10.5	Technetium-99	0.9	U	pCi/g
1532	000533	10	10.5	Thorium, Total	3	J	mg/kg
1532	000533	10	10.5	Uranium, Total	15.32	R	mg/kg
1532	000536	11.5	12	Cesium-137	1	-	pCi/g
1532	000536	11.5	12	Radium-226	0.78	NV	pCi/g
1532	000536	11.5	12	Radium-228	0.99	NV	pCi/g
1532	000536	11.5	12	Ruthenium-106	1	U	pCi/g
1532	000536	11.5	12	Technetium-99	0.9	U	pCi/g
1532	000536	11.5	12	Thorium, Total	12	J	mg/kg
1532	000536	11.5	12	Uranium, Total	31.21	-	mg/kg
1532	000539	13	13.5	Cesium-137	1.11	R	pCi/g
1532	000539	13	13.5	Radium-226	0.51	NV	pCi/g
1532	000539	13	13.5	Radium-228	0.5	NV	pCi/g
1532	000539	13	13.5	Ruthenium-106	1	R	pCi/g
1532	000539	13	13.5	Technetium-99	0.9	U	pCi/g
1532	000539	13	13.5	Thorium, Total	6	J	mg/kg
1532	000539	13	13.5	Uranium, Total	11.48	R	mg/kg
1533	000559	11	11.5	Cesium-137	0.2	R	pCi/g
1533	000546	11	11.5	Cesium-137	0.2	U	pCi/g
1533	000546	11	11.5	Radium-226	0.774	NV	pCi/g
1533	000559	11	11.5	Radium-228	0.67	NV	pCi/g
1533	000559	11	11.5	Ruthenium-106	1	R	pCi/g
1533	000546	11	11.5	Ruthenium-106	1	U	pCi/g
1533	000559	11	11.5	Technetium-99	0.9	U	pCi/g
1533	000546	11	11.5	Technetium-99	0.9	U	pCi/g
1533	000559	11	11.5	Thorium, Total	5	J	mg/kg
1533	000546	11	11.5	Thorium, Total	6	J	mg/kg
1533	000546	11	11.5	Uranium, Total	8.6	-	mg/kg
1533	000559	11	11.5	Uranium, Total	8.67	R	mg/kg
1533	000547	11.5	12	Cesium-137	0.2	R	pCi/g
1533	000560	11.5	12	Cesium-137	0.2	U	pCi/g

APPENDIX B
TABLE B-2
HISTORICAL DATA FOR A9PIII ABANDONED OUTFALL LINE PART THREE

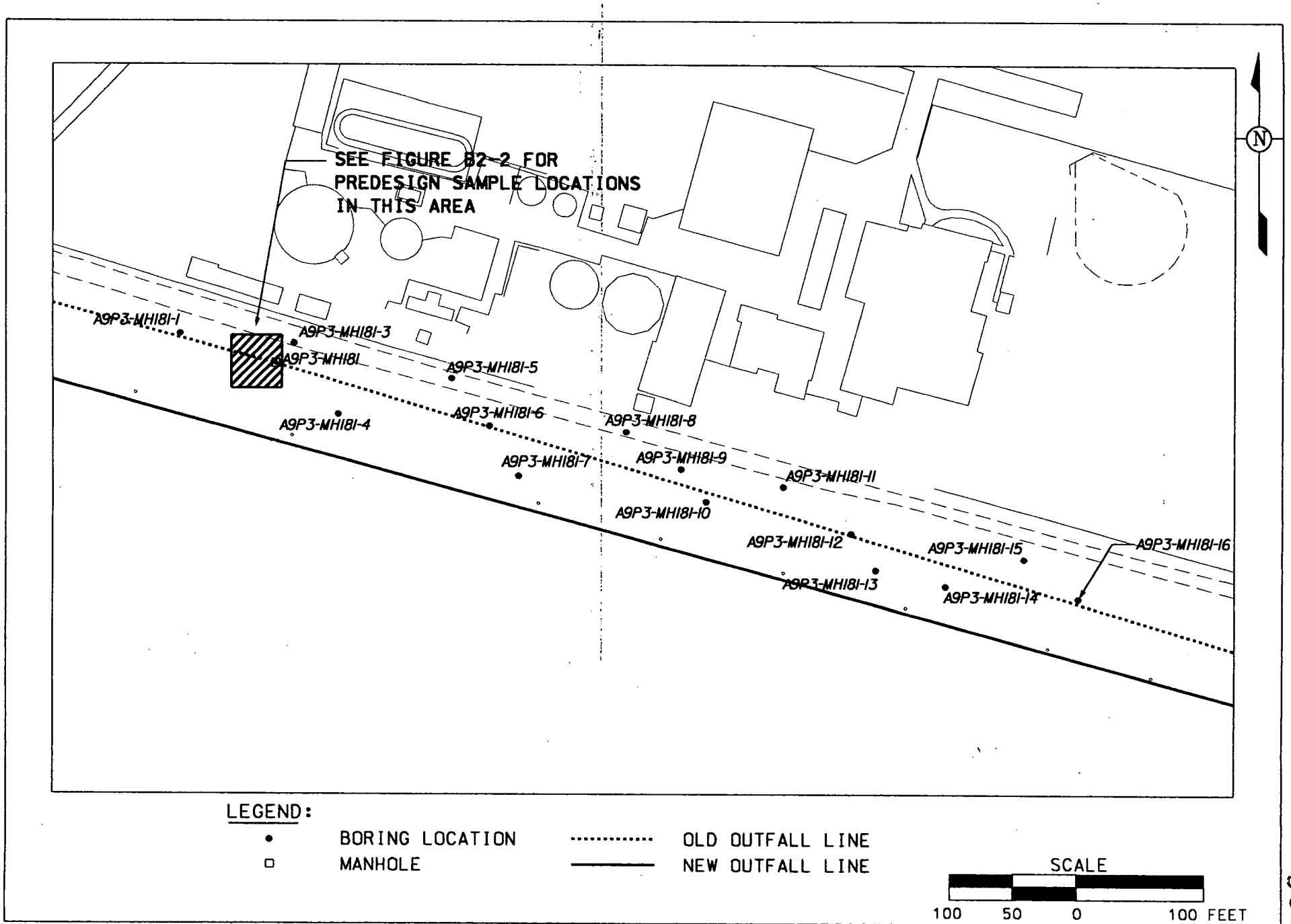
Boring ID	Sample ID	Top Depth (in feet)	Bottom Depth (in feet)	Parameter	Result	Qualifier	Units
1533	000547	11.5	12	Radium-228	0.671	NV	pCi/g
1533	000560	11.5	12	Ruthenium-106	1	U	pCi/g
1533	000547	11.5	12	Ruthenium-106	1.2	R	pCi/g
1533	000547	11.5	12	Technetium-99	0.9	U	pCi/g
1533	000560	11.5	12	Technetium-99	0.9	U	pCi/g
1533	000547	11.5	12	Thorium, Total	5	J	mg/kg
1533	000560	11.5	12	Thorium, Total	6	J	mg/kg
1533	000560	11.5	12	Uranium, Total	10.3	-	mg/kg
1533	000547	11.5	12	Uranium, Total	15.2	R	mg/kg
1533	000562	12.5	13	Cesium-137	0.2	U	pCi/g
1533	000562	12.5	13	Ruthenium-106	1	U	pCi/g
1533	000562	12.5	13	Technetium-99	0.9	U	pCi/g
1533	000562	12.5	13	Thorium, Total	4	J	mg/kg
1533	000562	12.5	13	Uranium, Total	13.57	-	mg/kg
1533	000550	13	13.5	Cesium-137	0.2	U	pCi/g
1533	000550	13	13.5	Radium-226	0.64	NV	pCi/g
1533	000550	13	13.5	Ruthenium-106	1	U	pCi/g
1533	000550	13	13.5	Technetium-99	0.9	U	pCi/g
1533	000550	13	13.5	Thorium, Total	4	UJ	mg/kg
1533	000550	13	13.5	Uranium, Total	7.71	-	mg/kg
1533	000564	13.5	14	Cesium-137	0.2	R	pCi/g
1533	000564	13.5	14	Radium-226	0.3	NV	pCi/g
1533	000564	13.5	14	Ruthenium-106	1	R	pCi/g
1533	000564	13.5	14	Technetium-99	0.9	U	pCi/g
1533	000564	13.5	14	Thorium, Total	4	UJ	mg/kg
1533	000564	13.5	14	Uranium, Total	6.45	R	mg/kg
1533	000552	14	14.5	Cesium-137	0.2	R	pCi/g
1533	000552	14	14.5	Ruthenium-106	1	R	pCi/g
1533	000552	14	14.5	Technetium-99	0.9	U	pCi/g
1533	000552	14	14.5	Thorium, Total	4	UJ	mg/kg
1533	000552	14	14.5	Uranium, Total	4.48	R	mg/kg
LIT7253	SS0526	0	0.167	Uranium, Total	4.43579	NV	mg/kg
LIT7253	SS0526	0	0.167	Uranium-234	1.43122	NV	pCi/g
LIT7253	SS0526	0	0.167	Uranium-235	0.10103	NV	pCi/g
LIT7253	SS0526	0	0.167	Uranium-238	1.4649	NV	pCi/g
MH-181-1	066321	0	0.5	Thorium, Total	23	UNV	mg/kg
MH-181-1	066321	0	0.5	Uranium, Total	11	UNV	mg/kg
MH-181-1	066319	0.5	1	Thorium, Total	23	UNV	mg/kg
MH-181-1	066319	0.5	1	Uranium, Total	11	UNV	mg/kg
MH-181-1	066320	1	1.5	Thorium, Total	23	UNV	mg/kg
MH-181-1	066320	1	1.5	Uranium, Total	11	UNV	mg/kg
MH-181-2	066315	0	0.5	Thorium, Total	23	UNV	mg/kg
MH-181-2	066315	0	0.5	Uranium, Total	11	UNV	mg/kg
MH-181-2	066313	0.5	1	Thorium, Total	23	UNV	mg/kg
MH-181-2	066313	0.5	1	Uranium, Total	11	UNV	mg/kg
MH-181-2	066314	1	1.5	Thorium, Total	23	UNV	mg/kg
MH-181-2	066314	1	1.5	Uranium, Total	11	UNV	mg/kg
MH-181-3	066306	0	0.5	Thorium, Total	23	UNV	mg/kg

APPENDIX B
TABLE B-2
HISTORICAL DATA FOR A9PIII ABANDONED OUTFALL LINE PART THREE

Boring ID	Sample ID	Top Depth (in feet)	Bottom Depth (in feet)	Parameter	Result	Qualifier	Units
MH-181-3	066306	0	0.5	Uranium, Total	11	UNV	mg/kg
MH-181-3	066304	0.5	1	Thorium, Total	23	UNV	mg/kg
MH-181-3	066304	0.5	1	Uranium, Total	11	UNV	mg/kg
MH-181-3	066305	1	1.5	Thorium, Total	23	UNV	mg/kg
MH-181-3	066305	1	1.5	Uranium, Total	11	UNV	mg/kg
MH-181-4	066312	0	0.5	Thorium, Total	23	UNV	mg/kg
MH-181-4	066312	0	0.5	Uranium, Total	11	UNV	mg/kg
MH-181-4	066408	0.5	1	Technetium-99	1.6	NV	pCi/g
MH-181-4	066408	0.5	1	Thorium, Total	8.5	NV	mg/kg
MH-181-4	066310	0.5	1	Thorium, Total	23	UNV	mg/kg
MH-181-4	066408	0.5	1	Thorium-228	1	NV	pCi/g
MH-181-4	066408	0.5	1	Thorium-230	2	NV	pCi/g
MH-181-4	066408	0.5	1	Thorium-232	0.9	NV	pCi/g
MH-181-4	066408	0.5	1	Uranium, Total	6.9	NV	mg/kg
MH-181-4	066310	0.5	1	Uranium, Total	11	UNV	mg/kg
MH-181-4	066408	0.5	1	Uranium-234	2.2	NV	pCi/g
MH-181-4	066310	0.5	1	Uranium-234	2.8	NV	pCi/g
MH-181-4	066310	0.5	1	Uranium-235	0.17	NV	pCi/g
MH-181-4	066408	0.5	1	Uranium-235/236	0.6	UNV	pCi/g
MH-181-4	066310	0.5	1	Uranium-236	0.04	NV	pCi/g
MH-181-4	066408	0.5	1	Uranium-238	2.3	NV	pCi/g
MH-181-4	066310	0.5	1	Uranium-238	3.6	NV	pCi/g
MH-181-4	066311	1	1.5	Thorium, Total	23	UNV	mg/kg
MH-181-4	066311	1	1.5	Uranium, Total	11	UNV	mg/kg
MH-181-5	066303	0	0.5	Thorium, Total	23	UNV	mg/kg
MH-181-5	066303	0	0.5	Uranium, Total	11	UNV	mg/kg
MH-181-5	066301	0.5	1	Thorium, Total	23	UNV	mg/kg
MH-181-5	066301	0.5	1	Uranium, Total	11	UNV	mg/kg
MH-181-5	066302	1	1.5	Thorium, Total	23	UNV	mg/kg
MH-181-5	066302	1	1.5	Uranium, Total	11	UNV	mg/kg
MH-181-6	066407	0	0.5	Technetium-99	1.5	NV	pCi/g
MH-181-6	066407	0	0.5	Thorium, Total	6.4	NV	mg/kg
MH-181-6	066309	0	0.5	Thorium, Total	23	UNV	mg/kg
MH-181-6	066407	0	0.5	Thorium-228	1.1	NV	pCi/g
MH-181-6	066407	0	0.5	Thorium-230	2	NV	pCi/g
MH-181-6	066407	0	0.5	Thorium-232	0.7	NV	pCi/g
MH-181-6	066407	0	0.5	Uranium, Total	11.9	NV	mg/kg
MH-181-6	066309	0	0.5	Uranium, Total	11	UNV	mg/kg
MH-181-6	066407	0	0.5	Uranium-234	3.5	NV	pCi/g
MH-181-6	066407	0	0.5	Uranium-235/236	0.6	UNV	pCi/g
MH-181-6	066407	0	0.5	Uranium-238	4	NV	pCi/g
MH-181-6	066307	0.5	1	Thorium, Total	23	UNV	mg/kg
MH-181-6	066307	0.5	1	Uranium, Total	16	NV	mg/kg
MH-181-6	066307	0.5	1	Uranium-234	4.9	NV	pCi/g
MH-181-6	066307	0.5	1	Uranium-235	0.24	NV	pCi/g
MH-181-6	066307	0.5	1	Uranium-236	0.07	NV	pCi/g
MH-181-6	066307	0.5	1	Uranium-238	5.3	NV	pCi/g
MH-181-6	066308	1	1.5	Thorium, Total	23	UNV	mg/kg

APPENDIX B
TABLE B-2
HISTORICAL DATA FOR A9PIII ABANDONED OUTFALL LINE PART THREE

Boring ID	Sample ID	Top Depth (in feet)	Bottom Depth (in feet)	Parameter	Result	Qualifier	Units
MH-181-6	066308	1	1.5	Uranium, Total	11	UNV	mg/kg
MH-181-7	066318	0	0.5	Thorium, Total	23	UNV	mg/kg
MH-181-7	066318	0	0.5	Uranium, Total	11	UNV	mg/kg
MH-181-7	066316	0.5	1	Thorium, Total	23	UNV	mg/kg
MH-181-7	066316	0.5	1	Uranium, Total	11	UNV	mg/kg
MH-181-7	066317	1	1.5	Thorium, Total	23	UNV	mg/kg
MH-181-7	066317	1	1.5	Uranium, Total	11	UNV	mg/kg



v:\#2fm12#dgn#a9p3_057.dgn
STATE PLANAR COORDINATE SYSTEM 1983

FIGURE B2-1. PREDESIGN SAMPLE LOCATIONS (A9PIII PART THREE)

29-MAR-2005

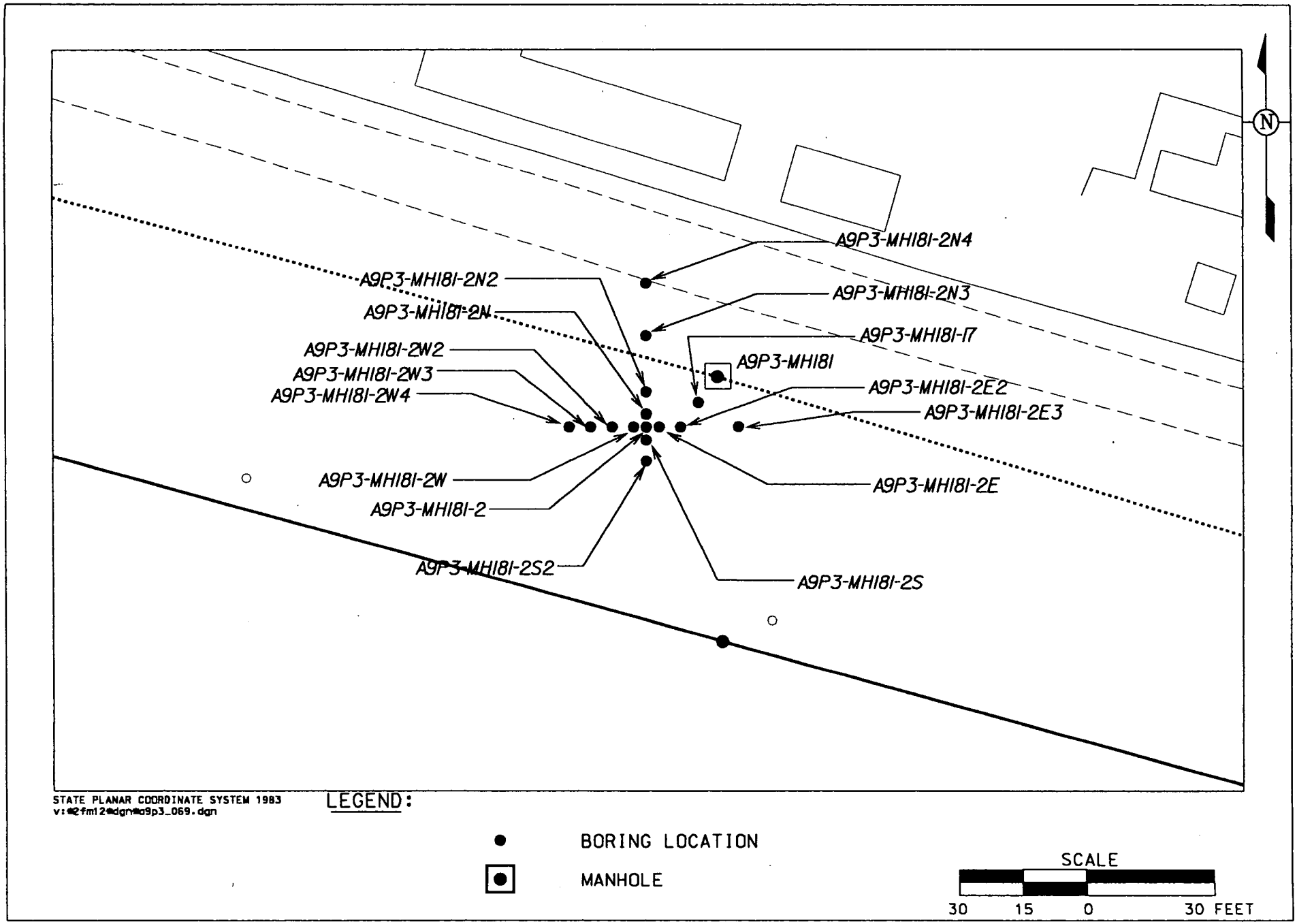


FIGURE B2-2. PREDESIGN SAMPLE LOCATIONS (A9PIII PART THREE - NEAR MH181)

APPENDIX C

CORRESPONDENCE WITH MID VALLEY PIPELINE

APPENDIX C Page 1 of 2

arsdale, Chuck

m: Vanarsdale, Chuck
t: Friday, November 05, 2004 10:25 AM
Kumthekar, Uday; McCormack, John; Neumann, Christopher; Snider, Anthony; Johnson, Gregg
c: Vanarsdale, Chuck
ubject: AOL under MidVAlley pipeline

5885

Gentlemen:

I spoke to Dan Harden of MidValley pipeline today, 11/5/04. He stated that either Option of removing the pipeline described in an e-mail sent on 10/26/04 is acceptable. Option 1 is the open trench method and Option 2 is jacking a pipe around the existing 16" pipe. I told MidValley that Fluor Fernald prefers the open trench method to remove the pipe under the MidValley pipeline. He requests that we notify him at least one week in advance prior to performing any work. A representative of MidValley pipeline will be present during the excavation and pipe removal.

Chuck Van Arsdale

sdale, Chuck

Vanarsdale, Chuck
Tuesday, October 26, 2004 2:50 PM
Ed Harden (E-mail)
Kumthekar, Uday; McCormack, John; Neumann, Christopher; Snider, Anthony; Vanarsdale, Chuck; Johnson, Gregg
bject: Pipe extraction under MidValley pipeline

Mr. Harden,

After further review of the abandoned outfall line pipe removal under the MidValley pipeline, we have determined that two methods are the most feasible.

OPTION 1:

An open trench will be excavated on each side of the MidValley pipeline. The trench will be 5 feet wide at the bottom and approx. 15 foot wide at the top of the trench. Fluor Fernald will contact MidValley pipeline prior to any excavation near the MidValley pipeline. The earth will be removed above the pipe by mechanical means to within 1 foot of the the top of pipeline. The MidValley pipeline will be exposed by hand tools to remove all overburden soil in the presence of a MidValley pipeline representative. The abandoned outfall line is approximately 7 to 10 feet below the MidValley pipeline. Fluor Fernald anticipates using an excavator with a 5 foot width bucket to remove the abandoned outfall line, and backfill the trench. The excavator will have sufficient arm length to reach the abandoned outfall line under the MidValley pipeline and remain a safe distance away from the MidValley pipeline. If required, Fluor Fernald can support the exposed MidValley pipeline in the trench by placing a steel beam on the existing ground at the top of the trench directly above the MidValley pipeline. The pipe can be supported by rigging straps around the MidValley pipe line and tieing it off around the steel beam.

A similar option was used when the permanent outfall line was installed in the early 1990s.

OPTION 2:

A contractor will hammer a 30" steel casing through the soil around the 16" abandoned outfall line. Approximately 70 linear feet of casing is proposed to be hammered around the abandoned outfall line. This would require excavating a pit approximately 10 foot wide by 36 feet long to allow space for the hammer machine and a 6 foot wide by 6 foot long receiving pit on the other side. The depth of the pit would be approximatley 15 foot deep. These pits would be approx. 40 feet east and west of the MidValley pipeline crossing. Once the 30" steel pipe is hammered from one end to the other, the abandoned outfall line shall be removed from the inside of the new 30" casing. If required, the 30" casing will be grouted shut, equipment removed, and the pits backfilled.

This option allows little or no contact with the MidValley pipeline. The vibrations from the hammer may need to be considered.

When you return from your travels, please contact us, so we can discuss further.

Chuck Van Arsdale
Fluor Fernald
513-648-5116

APPENDIX D

DETAILED APPROACH FOR RADIOLOGICAL MONITORING (SURVEY) OF THE EXISTING ABANDONED OUTFALL LINE ENCASEMENT PIPE UNDER STATE ROUTE 128

5885

APPENDIX D
DETAILED APPROACH FOR RADIOLOGICAL MONITORING (SURVEY) OF THE EXISTING ABANDONED OUTFALL LINE ENCASEMENT PIPE UNDER STATE ROUTE 128

Detailed approach for full radiological monitoring (survey) of inside surface the existing abandoned outfall line 26-inch steel/24-inch vitrified clay encasement pipe under State Route 128 will be as follows:

A. Existing Abandoned Outfall Line Encasement:

The length of the existing abandoned outfall line encasement pipe under State Route 128 is approximately 70 feet. Based on the reference drawing for the 16-inch abandoned outfall line, existing encasement pipe is connected together by two pipes: a 54-foot long 26-inch steel pipe [inside diameter (I.D.) between 25 and 25.375-inch and outside diameter (O.D.) 26-inch], and a 16-foot long 24-inch vitrified clay pipe (I.D. 24-inch and O.D. 26-inch +/-). The connection between these two pipes is made by forming a wooden box around the connection and is filled with concrete/grout. The inside diameters of two pipes do not match at the connection, and therefore require additional consideration for full radiological survey at the pipe connection.

B. Approach for Radiological Monitoring/Survey:

The approach for full radiological monitoring/survey of the existing abandoned outfall line encasement pipe will be based on limitation of monitoring equipment, length of encasement pipe, and access to the monitoring surface (e.g., vertical face of the encasement pipe at pipe connection between steel pipe and vitrified clay pipe). Based on these limitations, full radiological monitoring/survey of the encasement pipe including 24-inch vitrified clay pipe, 26-steel pipe, and pipe connection between these pipes will be performed as follows:

1. 24-inch Vitrified Clay Pipe:

Radiological monitoring/survey of the inner surface of the16-foot +/- long 24-inch I.D. vitrified clay pipe will be performed by standard monitoring equipment from east end of the encasement pipe (see construction drawing 99X-5500-G-00822). The entire inner surface of the 24-inch vitrified clay pipe will be accessible by monitoring equipment with 20-foot rod and 20-foot frisker cord from east end of the encasement pipe.

2. 26-inch Steel Pipe and Pipe Connection:

Radiological monitoring/survey of the inner surface of the 54-foot +/- long 25 to 25.375-inch I.D. steel pipe will be performed from west end of the encasement pipe (see construction drawing 99X-5500-G-00822). The entire inner surface of the 26-inch steel pipe and inner vertical surface

at pipe connection will be accessible by monitoring equipment with a 60-foot rod and 60-foot frisker cord from west end of the encasement pipe. To accomplish full radiological monitoring/ survey of 26-inch steel pipe and pipe connection, a monitoring assembly is being fabricated as shown on the attached Sketch-1. A 60-foot frisker cord will be used for radiological monitoring/ survey and will be attached to the monitoring assembly as shown on sketch. Calibration of the frisker using a 60-foot cord will be performed conforming to the Radiological Control Procedures.

The monitoring assembly as shown on Sketch-1 consists of a 24.25 to 24.75-inch diameter 36-inch +/- long metal or plastic pipe "Plunger" mounted on a 1-inch diameter metal rod. The rod will have couplers at both ends for connecting to the 1-inch diameter tubular extendable metal rod (total extended length of 60-foot or longer). The frisker for radiological monitoring will be clamped at the end of the plunger as shown on Sketch-1. To provide horizontal stability during the radiological monitoring, additional support may be inserted approximately at middle of the rod length as shown on the sketch.

For radiological monitoring, the frisker clamped to the plunger and the frisker cord attached to the rod will be pushed into the encasement pipe with a threaded rod and coupler. The length of rod inserted in the encasement pipe will be measured with the markings on the rod. For monitoring the inner surface of the 26-inch steel encasement pipe, the frisker will be clamped horizontal facing up at the end of plunger. For monitoring the vertical inner surface at the pipe connection, the frisker will be clamped facing vertical out at the end of the plunger. The 60-feet frisker cable in both cases will be attached to the rod and will run from the plunger to the operating handle of the rod. After the plunger is completely pushed in the encasement pipe, radiological monitoring/survey of inner surface of encasement pipe will be performed in accordance with the Fernald Radiological Control Procedure. After radiological monitoring/survey of inside surface of the existing encasement pipe is complete, the plunger, frisker and frisker cord, and rod will be monitored/surveyed for any radiological contamination.

C. Free Release justification:

As the 16-inch abandoned outfall line pipe is being removed, Radiological Control Technicians will monitor the outside surface of abandoned outfall line pipe for contamination. This data along with the survey of the inside surface of the encasement pipe and any physical sampling or real time data will be utilized in the free release justification process.

The radiological monitoring criteria that the encasement pipe will be monitoring to, will be in accordance with 10 CFR 835 Appendix D, DOE Order 5400.5, and Site Radiological Control Procedure RP-0025. The isotopes of concern that have been identified and that are associated with the abandoned outfall line are radium-226 and uranium-238.

Free release criteria for abandoned outfall line encasement pipe is as follows:

1. Uranium-238 1000 dpm/100 cm^2 removable and 5000 dpm/100 cm^2 fixed plus removable.
2. Radium-226 is 20 dpm 100 cm^2 removable and 500 dpm/100 cm^2 fixed plus removable.

If contamination is found to be above the free release criteria as stated above during the radiological monitoring process, the abandoned outfall line encasement pipe will be considered contaminated and will not be free released.

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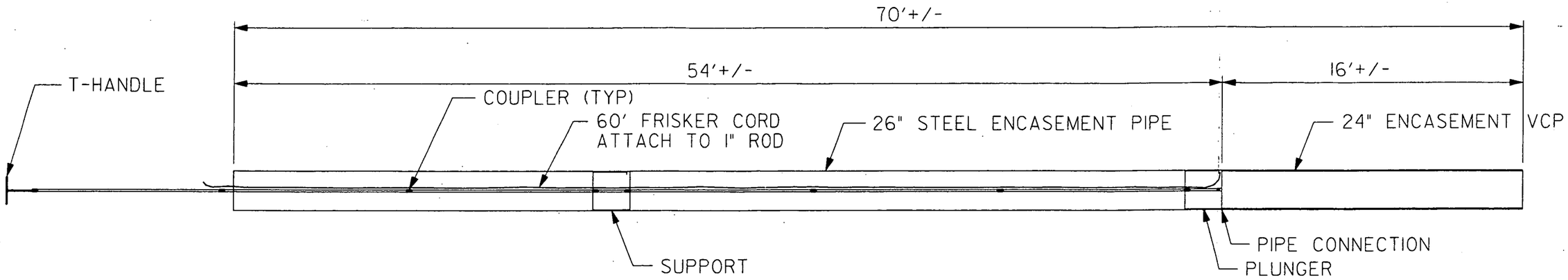
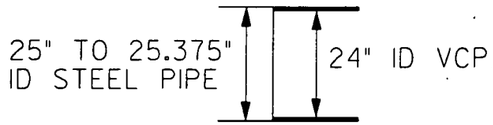
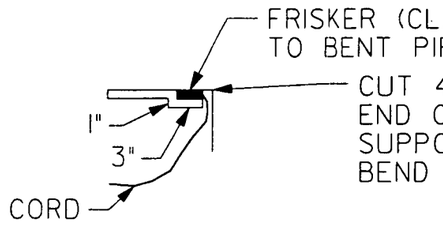
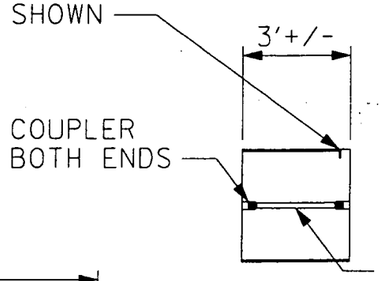


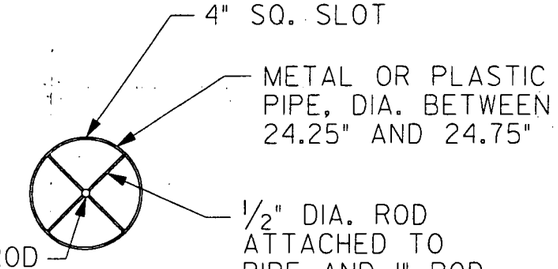


DETAIL AT PIPE CONNECTION

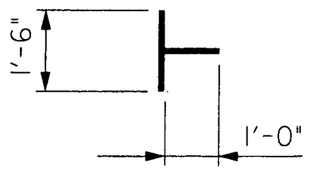


DETAIL FOR FRISKER INSTALLATION



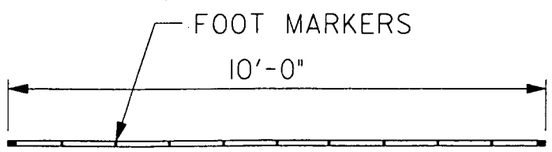


PLUNGER OR SUPPORT



THREADED T-HANDLE

THREADED COUPLER



1" ROD 10' LONG
THREADED AT BOTH ENDS

APPENDIX D
AOL ENCASEMENT PIPE
RADIOLOGICAL MONITORING/SURVEY ASSEMBLY
PLAN AND DETAILS

REV. A, DATE: JANUARY 10, 2005

SKETCH 1

/osdf/project2ll20/Figure5.dgn