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SOUTH GROUNDWATER CONTAMINATION PLUME REMOVAL ACTION PART I ALTERNATE WATER SUPPLY WORK PLAN FEMP OCTOBER 1992

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SOUTH GROUNDWATER CONTAMINATION PLUME

REMOVAL ACTION

PART 1

ALTERNATE WATER SUPPLY

WORK PLAN

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

October 1992
Revision 2

Prepared by:

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For:

The United States Department of Energy
Fernald Site Office

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I. INTRODUCTION

Operable Unit 5 - Environmental Media, of the Fernald Environmental Management Project (FEMP) Remedial Investigation/Feasibility Study (RI/FS), includes those environmental media that serve as migration pathways and/or environmental receptors of radiological or chemical releases from the FEMP. Important elements of this operable unit are the affected areas of the regionally important Great Miami Aquifer that exhibit elevated levels of uranium. Because of the location of portions of the uranium contaminated plume within sparsely developed areas south of the FEMP and the associated potential threat to human health, the Department of Energy (DOE) has initiated a removal action to address this area or "south plume". The removal action is being conducted in a manner consistent with the implementation of the final remedial action for Operable Unit 5.

The 1990 Consent Agreement, as amended in 1991, under Section 106 and 120(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, (CERCLA) requires a work plan be submitted for implementation of the selected alternative for the South Groundwater Contamination Plume Removal Action. The removal action has been divided into five parts:

Part 1 - Alternate Water Supply
Part 2 - Pumping and Discharge System
Part 3 - Interim Advanced Wastewater Treatment System
Part 4 - Groundwater Monitoring and Institutional Controls
Part 5 - Groundwater Modeling and Geochemical Investigation

This work plan addresses the implementation of Part 1: the action involving the construction of an alternate water supply to selected receptors in the south plume area. All activities performed under this work plan will be in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and consistent with OSWER Directive 9360.0-03B, Superfund Removal Procedures, Rev.3.

A Removal Site Evaluation (RSE) has been generated and approved by the DOE consistent with the requirements of the 40 CFR 300.410. ~~Provided as an attachment to the Work Plan is~~ A Health and Safety Plan has been completed pursuant to the requirements of the Consent Agreement and 29 CFR 1910.120 and will be available to government agencies and subcontractors upon written request to DOE-FN.

II. DESCRIPTION

1.0 Removal Action

An Engineering Evaluation/Cost Analysis (EE/CA) has been prepared, in accordance with 40 CFR 300.415, to evaluate removal action alternatives and recommend the preferred alternative. The National Environmental Policy Act of 1969 (NEPA) requires that federal agencies include in their decision making processes appropriate and careful consideration of all environmental effects of proposed actions. The EE/CA was prepared to integrate the requirements of both the CERCLA and NEPA, and will be used by the United States Environmental Protection Agency (USEPA) and the DOE as the basis for remedy selection and implementation.

The preferred alternative, identified in the EE/CA, includes an alternate water supply to two currently affected industrial users, pumping with discharge to the Great Miami River, an interim advanced wastewater treatment system, enhanced monitoring, and institutional controls, and groundwater modeling and geochemical investigation. Providing an alternate water supply to two industrial users, Delta Steel and Albright & Wilson Americas Inc., (AWA) in the south plume area is Part 1 of the removal action. Subsequent to the agreement for Part 1, the public water supply became a viable alternative to the well field for Delta Steel. It was then proposed to the U.S. EPA that Delta Steel be deleted from Part 1 of the removal action, an instead be connected to the public water supply when it becomes available. Part 2 of the removal action will be the design, construction, and operation of a recovery well field pumping system to extract uranium contaminated groundwater from the South Plume and discharge to the Great Miami River. The location of the recovery well field is proposed to be north of the industrial users (AWA and Ruetgers-Nease Chemical Co. Inc.) associated with the Paddys Run Road Site (PRRS). Part 3 of the removal action includes the installation of an interim advanced wastewater treatment system with a capacity to reduce the uranium in FEMP wastewater discharge to a level not to exceed 1700 pounds per year. Part 4 of the removal action is being implemented through the existing FEMP groundwater monitoring program in the south plume area. Part 5 of the removal action includes the geochemical field investigation (including hydropunching, soil vapor survey, additional monitoring wells installation, and monitoring well sampling) and groundwater modeling of the area adjacent and south of the recovery well field.

This work plan includes the plans for implementation of only the alternate water supply (Part 1) of the South Groundwater Contamination Plume Removal Action. The details of Parts 2, 3, 4, and 5 are discussed in separate documents and work plans. The fundamental objective of Part 1 is to protect public health by limiting access to and use of groundwater with uranium concentrations exceeding the derived concentration of 30 micrograms per liter (μg/l). To meet this objective, water supply wells and associated delivery systems, as outlined in Section III-4.0, will be provided to ~~Delta Steel and~~ AWA.

2.0 Related Actions

The following paragraphs include related actions other than those actions planned for implementation in Parts 2, 3, 4, and 5 of the South Groundwater Contamination Plume Removal Action. As mentioned previously, the details of Parts 2, 3, 4, and 5 are discussed in separate documents.

A storm water retention basin (SWRB) was constructed and placed into operation in October 1986 to intercept contaminated runoff from the FEMP production area. This runoff had previously flowed to Paddy's Run via the storm sewer outfall ditch. Construction of an additional chamber to the SWRB was completed in December of 1988. The expanded SWRB is designed to retain the runoff from a 10-year/24-hour rainfall event and therefore greatly reduces the contribution of storm water from the FEMP Production Area to Paddy's Run. This flow is estimated to be the major source of uranium contamination to the South Groundwater Contamination Plume.

The potentially responsible parties (PRP) of the PRRS, AWA, Ruetgers-Nease Chemical Co., Inc., and Mobil Mining and Minerals Co., have entered into an Administrative Consent Order with the State of Ohio to perform a RI/FS. Recent remedial investigation soil boring samples at the PRRS have shown high concentrations of various organic and inorganic compounds in addition to above background concentrations of the radioactive isotope potassium-40. The underlying groundwater has been determined during the PRRS RI/FS to be contaminated with inorganic and organic chemical compounds.

The additional following actions have been taken to date:

The public has been notified of the South Groundwater Contamination Plume. Well and cistern sampling in the south plume area has been performed by the Ohio Department of Health and the DOE.

An alternate water supply has been provided to a private residential well located along Willey Road in the northern portion of the plume.

An on-going groundwater monitoring program is being conducted for a number of wells in the south plume area. The results of the groundwater analysis are being reported to the well owners and the public.

Runoff from most of the surface of the FEMP waste storage area is collected and sent to the FEMP waste water treatment system. The remaining surface and perimeter runoff flows west and southwest to Paddy's Run. A separate removal action, Waste Pit Area Runoff Control, is currently underway by the DOE to address this remaining contaminated runoff and prevent it from flowing to Paddy's Run.

Integration of the RI/FS efforts has been initiated between the DOE and the PRPs to determine the contaminant levels of the PRRS in the area where the Part 1 pipelines will be located.

3.0 Integration with the Remedial Action

~~Each~~ The alternate water supply system will be operational during implementation of the remedial action for Operable Unit 5. The removal action will contribute to the efficient performance of the final remediation to the extent practicable. All design and construction activities associated with the removal action will be reviewed, and approved, by the Operable Unit 5 DOE Manager to assure consistency with the final remedial program.

III. Method of Accomplishment

1.0 Roles of the Participants

The DOE, as lead agency, will coordinate and execute this removal action.

The U.S. EPA reviewed and approved the EE/CA document pertaining to this action identifying the selected removal alternative for the South Groundwater Contamination Plume. U.S. EPA will review and approve this Work Plan. The Ohio Environmental Protection Agency (Ohio EPA) provides

guidance and participates in the development and review of the EE/CA and Work Plan. The Ohio EPA will inspect and approve the alternate water supply well field in accordance with Ohio EPA guidelines prior to installing the test well and will independently analyze water samples from the test well. The Ohio EPA will also review and approve the water permit to install for the wells with no impact to the schedule.

The U.S. Army Corps of Engineers (COE), through an Interagency Agreement with the DOE, will obtain easements and property for the construction of an alternate water supply to an ~~two~~ affected industrial user. The COE will also conduct an archaeological and historical resource survey for the areas affected by Part 1 for review and approval by the Ohio State Historic Preservation Officer.

Advanced Sciences Incorporated (ASI), as a contractor to DOE, is conducting the RI/FS program including activities such as groundwater sampling and development of a groundwater flow model for the south plume. ASI is also providing analytical support and groundwater modeling through their subcontractor, International Technology (IT) Corporation. ASI/IT will install the test well and perform the pump test and sampling and analysis required to verify the technical requirements of the selected well field.

Westinghouse Environmental Management Company of Ohio (WEMCO), as the FEMP Operations and Maintenance contractor, is responsible to implement this removal action in a manner consistent with DOE and regulatory guidance.

A.M. Kinney, Inc. (AMK), as a contractor to WEMCO, is providing project design for Part 1 of the removal action.

Rust Engineering, as a contractor to WEMCO, will provide construction management for Part 1 of the removal action.

The contractor for Part 1 installation will be determined through the DOE bid and award process. As identified in the selected alternative, Part 1 will provide an alternate water supply to ~~two industrial users, Delta Steel and~~ AWA. ~~These two~~ This industrial user will be a key participant during the implementation of the removal action.

The PRRS PRPs (AWA, Ruetgers-Nease Chemical Co. Inc., and Mobil Mining and Minerals Co.) will integrate the available PRRS RI/FS data with the DOE to be incorporated in Part 1, if deemed necessary.

2.0 Additional Studies/Data Requirements

The specific water supply well locations for the alternate water supply to ~~Delta Steel and~~ AWA will be defined prior to completing the detailed design. A test well will be installed at the selected site to verify the technical requirements for the water supply.

3.0 Planning Activities

Activities that will be undertaken prior to the actual site work are

planning, training, design, and management of the removal actions. These activities are required to render the area reasonably free of hazard to personnel and the environment until the RI/FS process has been completed and to determine if further action is required.

The following distinct engineering phases will be performed to provide the necessary definition for development of accurate scope, cost, and schedule documents:

a. Project Planning

Included in this activity will be the preparation of detailed task listings and delineation of responsibilities to support the Level IV schedule. The proposed project operation date has been revised to December 7, 1992 because acquisition of private property parcels has required a lengthy condemnation process.~~is 126 calendar days after procurement of construction easements (excluding a 60 calendar day performance acceptance period), July 14, 1992, if no condemnation is required and the test well meets the stated technical requirements described in Section 4.0 of this document.~~

b. Access to Private Property

The FEMP will be required to obtain the necessary easements for the rights to private property to complete the alternate water supplies. The revised project operation date is ~~contingent~~ based upon ~~negotiation for~~ acquisition, by condemnation, of the easement rights for certain property parcels.~~with the involved property owners.~~ Figure 1 illustrates the proposed route for the piping from a proposed location of the water supply well locations to ~~Delta Steel and~~ AWA.

c. Design of Removal Action

Definitive design documents will be prepared for the removal action construction work.

d. Training of Personnel

All personnel working the construction phase of Part 1 of the removal action, will be trained in accordance with the Occupational Safety and Health Administration (OSHA) standards found in 29 CFR 1910.120.

e. Construction

All bid and award documents will be prepared for the removal action construction work along with the procurement of all equipment, materials and subcontractors necessary to complete the removal action construction work.

4.0 Field Actions

After the specific well locations for the alternate water supply ~~for Delta Steel and~~ AWA are defined, a test well will be installed and a pump test

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performed to verify that the well field has the quality of water and hydraulic capacity to meet the technical requirements. After the well field has been determined to be acceptable, ~~one alternate water supply well will be installed for Delta Steel and~~ two alternate water supply wells will be installed for AWA. The new water supply wells are proposed to be located northeast of the intersection of Willey and Crosby Roads in an area with the approximate dimensions of 820 feet by 1250 feet. The dimensions of the well field have been selected based on Ohio EPA's standards for minimum isolation radius for each well. ~~The well casing for Delta Steel shall be sized to supply 150 gallons per minute (gpm).~~ Each of the two wells for AWA shall be sized to supply 175 gpm for single operation and 250 gpm when both pumps are operating in parallel. Each well will have an inlet screen whose depth, length, and size requirements will be determined during the initial testing of a test well used to confirm the quality of water and hydraulic capacity of the entire water supply well field. The top portion of the screen, at minimum, will be installed such that it will remain submerged during drawdown. Each well shall have a permanently mounted pump. ~~Two~~ An underground water supply pipelines will run along the north side of Willey Road heading east from the well field, thence southeast along and just outside the western property line of the CSX railroad, thence south along the western edge of Paddy's Run Road to ~~the locations of Delta Steel and~~ AWA.

The AWA water supply system will operate for a period of 60 calendar days prior to the DOE turning over the system to AWA. This 60 day "initial testing period" will include confirmation of the system performance by AWA. ~~The Delta Steel well and water supply pipeline will continue to be owned and operated by the FEMP until other future arrangements are agreed to by the parties involved.~~

5.0 Operations and Maintenance

An Operations and Maintenance Manual for ~~Delta Steel and~~ AWA will be prepared. Following the initial testing period of the AWA portion of the alternate water supply system, AWA will assume responsibility for operation, routine maintenance, and routine monitoring. As such, AWA will then be responsible for meeting all requirements set by the state of Ohio.

~~As stated above, the FEMP will continue to operate and maintain the Delta Steel portion of the alternate water supply system. The DOE will be responsible for meeting all the requirements set by the state of Ohio for the operation and maintenance of the Delta Steel system.~~

IV. SAMPLING AND ANALYSIS PLAN

SOIL

The pre-excavation field screening and soil sampling and analysis program for the monitoring of soils which will be disturbed in the suspect areas during construction is presented in Attachment I.

EXCESS EXCAVATED SOILS

Soils will be returned to the excavation from which they originate. Excess excavated soils at the AWA facility and associated drainage ditch will be the responsibility of the PRRS to manage and determine the appropriate disposal criteria. Excess excavated soils at the Paddys Run crossing will be the responsibility of the DOE to manage according to pertinent FEMP procedures.

WATER

At present, the FEMP Groundwater Monitoring Program monitors wells in the south plume area. ~~The Delta Steel water supply well installed in Part 1 of the removal action will be added to the Monitoring Program.~~

OTHER INFORMATION

The additional sampling process for the alternate water supply will be in accordance with the FEMP Analytical Laboratories Quality Assurance Plan L.C.N. (QAP), October 1987, and its implementing procedures, and the Quality Assurance Program ~~Project~~ Plan (QAPP) approved as part of the RI/FS Work Plan. The certified laboratory results obtained from the QAPP sampling process will become part of the Administrative Record (AR).

The following table summarizes the sampling frequency and type of analysis during the Part 1 activities ~~well siting~~. Well siting is the point after which the test well has been drilled and the field hydraulic capacity test has been completed. The initial testing period is the first sixty days of operation of the systems. The continuous operations phase is the on-going period of time following the initial testing period. The table also reflects Ohio EPA involvement in the well siting sampling process:

Activity ~~Siting~~	~~Users~~	Frequency	Plan	Analysis
Well Siting	~~A,B~~	Once/test well	QAPP	Table 1 HSL, RAD
Well Siting	~~A,B~~	Once/test well	OEPA	SDWA
Init. Testing	~~A,B~~	Daily	QAP	Table 1
Init. Testing	~~A,B~~	Monthly	QAPP	Table 1
Cont. Oper.	~~A,B~~	State Requirements	OEPA	SDWA

NOTE: ~~1) User "A" is Delta Steel, User "B" is AWA~~
1) SDWA = Safe Drinking Water Act
2) RAD = Radiological
3) HSL = Hazardous Substance List

The samples taken during the initial testing period will be in compliance with the QAP. These samples will also be in compliance with the approved WEMCO Environmental Compliance/Monitoring Procedures and sent to the FEMP Laboratory for analysis. Results will be included in the FEMP Annual Environmental Monitoring Report. This report will be available for review in the Public Environmental Information Center. As stated in the Consent Agreement, if the DOE determines that any activities or work being implemented under this part of the removal action which may create an

imminent threat to human health or the environment from the release or threat of release of a hazardous substance, pollutant, contaminant, or hazardous constituent, it may stop any work or activities for such period of time as needed to respond and take whatever action is necessary to abate the danger.

V. HEALTH AND SAFETY PLAN

The work to be performed will be consistent with the Health and Safety Plan prepared for this removal action. The plan identifies, evaluates, and controls all safety and health hazards. In addition, it provides for emergency response for hazardous operations. The plan is consistent with 29 CFR 1910.120 and the FEMP Site Health and Safety Plan. Safety documentation will be prepared according to FMPC-2116 Topical Manual "Implementing FEMP Policies and Procedures for System Safety Analysis and Review System" and DOE/OR-901 Guidance for Preparation of Safety Analysis Reports.

VI. QUALITY ASSURANCE

The South Groundwater Contaminated Plume Removal Action will be conducted according to requirements of the overall quality assurance program at the FEMP which is described in the site Quality Assurance Plan, FEMP 2139. The Quality Assurance Plan is based on the criteria specified in ASME NQA-1, Federal EPA Guideline QAMS-005/80 and DOE Orders 5700.6 and 5400.1. Specific quality assurance requirements will be incorporated into written and approved procedures and into personnel training. The FEMP will conduct periodic surveillance to verify compliance with QAP.

VII. PERMITS AND REGULATORY CONSTRAINTS

Ohio EPA will approve the well siting and will verify water quality of the test well.

The DOE will obtain a nationwide permit if required by the U.S. Army Corps of Engineers pursuant to 33 CFR Part 330 for Part 1 stream crossings. The DOE will register the alternate water supply wells with the Ohio Department of Natural Resources, Division of Water in regard to water well facilities with the capacity to withdraw more than 100,000 gpd as stated in Ohio Revised Code 1521.16.

The DOE will obtain a Water Permit to Install for the alternate water supply systems from the State.

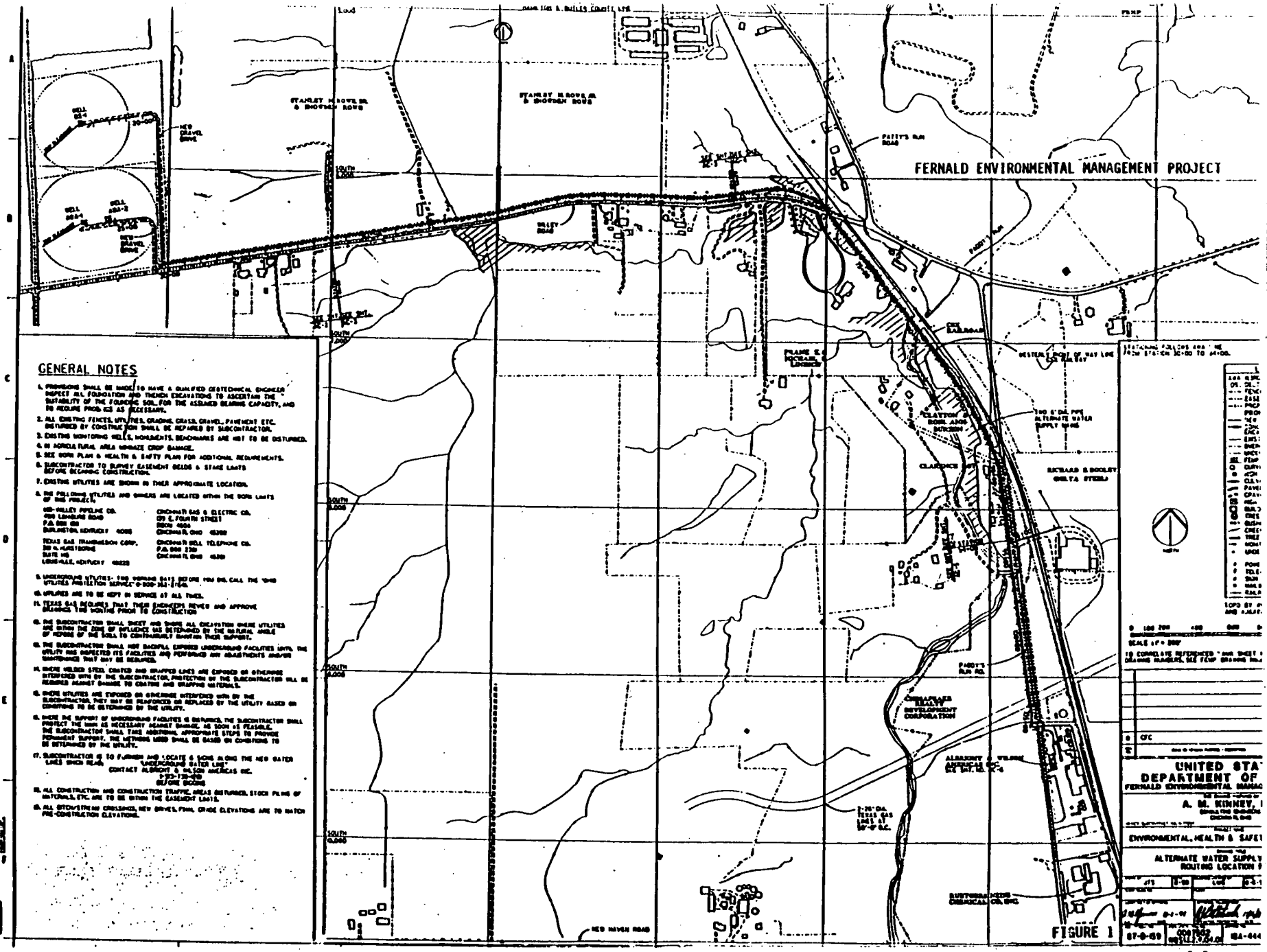
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
GENERAL NOTES
1. PROVISIONS SHALL BE MADE TO HAVE A QUALIFIED GEOTECHNICAL ENGINEER INSPECT ALL FOUNDATION AND TRENCH EXCAVATIONS TO ASCERTAIN THE SUITABILITY OF THE FOUNDING SOIL FOR THE ASSUMED BEARING CAPACITY, AND TO REQUIRE PROBICS AS NECESSARY.
2. ALL EXISTING FENCES, UTILITIES, GRADING, GRASS, GRAVEL, PAVEMENT ETC. DISTURBED BY CONSTRUCTION SHALL BE REPAIRED BY SUBCONTRACTOR.
3. EXISTING MONITORING WELLS, MONUMENTS, BENCHMARKS ARE NOT TO BE DISTURBED.
4. IN AGRICULTURAL AREA MINIMIZE CROP DAMAGE.
5. SEE WORK PLAN & HEALTH & SAFETY PLAN FOR ADDITIONAL REQUIREMENTS.
6. SUBCONTRACTOR TO SURVEY EASEMENT BOUNDS & STAKE LIMITS BEFORE BEGINNING CONSTRUCTION.
7. EXISTING UTILITIES ARE SHOWN IN THEIR APPROXIMATE LOCATION.
8. THE FOLLOWING UTILITIES AND OWNERS ARE LOCATED WITHIN THE WORK LIMITS OF THIS PROJECT:
MID-VALLEY PIPELINE CO.
4900 LOUISVILLE ROAD
P.O. BOX 659
BURLINGTON, KENTUCKY 41005
TEXAS GAS TRANSMISSION CORP.
300 S. HURSTBORNE
SUITE 115
LOUISVILLE, KENTUCKY 40222
CINCINNATI GAS & ELECTRIC CO.
139 E. FOURTH STREET
ROOM 1404
CINCINNATI, OHIO 45202
CINCINNATI BELL TELEPHONE CO.
P.O. BOX 2301
CINCINNATI, OHIO 45201
9. UNDERGROUND UTILITIES: THE WORKING DAY BEFORE YOU DIG, CALL THE OHIO UTILITIES PROTECTION SERVICE 1-800-362-2764.
10. UTILITIES ARE TO BE KEPT IN SERVICE AT ALL TIMES.
11. TEXAS GAS REQUIRES THAT THEIR ENGINEERS REVIEW AND APPROVE DRAWINGS TWO MONTHS PRIOR TO CONSTRUCTION
12. THE SUBCONTRACTOR SHALL SHEET AND SHORE ALL EXCAVATION WHERE UTILITIES ARE WITHIN THE ZONE OF INFLUENCE AS DETERMINED BY THE NATURAL ANGLE OF REPOSE OF THE SOILS TO CONTINUALLY MAINTAIN THEIR SUPPORT.
13. THE SUBCONTRACTOR SHALL NOT BACKFILL EXPOSED UNDERGROUND FACILITIES UNTIL THE UTILITY HAS INSPECTED ITS FACILITIES AND PERFORMED ANY REALIGNMENTS AND/OR MAINTENANCE THAT MAY BE REQUIRED.
14. WHERE WELDED STEEL, COATED AND WRAPPED LINES ARE EXPOSED OR OTHERWISE INTERFERED WITH BY THE SUBCONTRACTOR, PROTECTION BY THE SUBCONTRACTOR WILL BE REQUIRED AGAINST DAMAGE TO COATING AND WRAPPING MATERIALS.
15. WHERE UTILITIES ARE EXPOSED OR OTHERWISE INTERFERED WITH BY THE SUBCONTRACTOR, THEY MAY BE REINFORCED OR REPLACED BY THE UTILITY BASED ON CONDITIONS TO BE DETERMINED BY THE UTILITY.
16. WHERE THE SUPPORT OF UNDERGROUND FACILITIES IS DISTURBED, THE SUBCONTRACTOR SHALL PROTECT THE WORK AS NECESSARY AGAINST DAMAGE, AS SOON AS FEASIBLE, THE SUBCONTRACTOR SHALL TAKE ADDITIONAL APPROPRIATE STEPS TO PROVIDE PERMANENT SUPPORT. THE METHODS USED SHALL BE BASED ON CONDITIONS TO BE DETERMINED BY THE UTILITY.
17. SUBCONTRACTOR IS TO FURNISH AND LOCATE 6 SIGNS ALONG THE NEW WATER LINES SHOWN READ: "UNDERGROUND WATER LINE" CONTACT ALBRIGHT & WILSON AMERICAS INC. 1-513-738-4111 BEFORE DIGGING
18. ALL CONSTRUCTION AND CONSTRUCTION TRAFFIC, AREAS DISTURBED, STOCK PILING OF MATERIALS, ETC. ARE TO BE WITHIN THE EASEMENT LIMITS.
19. ALL BITCH/STREAM CROSSINGS, NEW DRIVES, FINAL GRADE ELEVATIONS ARE TO MATCH PRE-CONSTRUCTION ELEVATIONS.
STANLEY HOVER DR. & SHOWDEN ROAD
NEW GRAVEL DRIVE
WELL 404-1
WELL 404-2
SOUTH 4,000
PATTY'S RUN ROAD
PATTY'S RUN
FRANK & MICHAEL LINDER
CLAYTON & BOBBI ANNE BURSON
CLARENCE
RICHARD & DOOLEY DELTA STEEL
WESTERN BOUND OF RAY LINE
NEW 6" DIA. PIPE ALTERNATE WATER SUPPLY MAIN
PATTY'S RUN RD.
CHARLES REALTY DEVELOPMENT CORPORATION
ALBRIGHT & WILSON AMERICAS INC.
BUSTRIMAX WOOD CHEMICAL CO. INC.
NEW HAVEN ROAD
FIGURE 1
UNITED STA
DEPARTMENT OF
FERNALD ENVIRONMENTAL MANAG
A. M. KINNEY,
ENVIRONMENTAL, HEALTH & SAFET
ALTERNATE WATER SUPPLY
ROUTING LOCATION
87-0-69

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TABLE 1

Chemical Parameters for Part 1

Water Quality

Analysis of the samples taken in support of Part 1 will include the following chemical parameters:

Uranium	Total Iron
Specific Conductance	Sodium
Sulfate and Sulfite	Total Phosphate
Chloride	Total Silica
Total Hardness	Alkalinity
Calcium Hardness	Water Quantity
Magnesium Hardness	Water Pressure
Total Copper	Water Temperature
pH	

Attachment I

PRE-EXCAVATION FIELD SCREENING
AND
SOIL SAMPLING AND ANALYSIS PLAN

SOUTH GROUNDWATER CONTAMINATION PLUME REMOVAL ACTION
PART 1 - ALTERNATE WATER SUPPLY

REVISION 3
October, 1992

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

ATTACHMENT I

Pre-Excavation Field Screening & Soil Sampling and Analysis Plan

1.0 Introduction

As part of the Engineering Evaluation and Cost Analysis (EE/CA), an alternate water supply will be provided to two affected industrial users, Delta Steel and Albright & Wilson Americas Inc. (AWA), located within the South Groundwater Contamination Plume (South Plume) area. (Subsequently, the alternate water supply for Delta Steel has been deleted and Delta Steel will be connected to a future public water supply.) A total of two groundwater supply wells and two piezometers are proposed to be installed in a well site (approximate dimensions of 820 feet by 1250 feet) located northeast of the intersection of Willey and Crosby Roads. Groundwater will be pumped from this well site through an underground supply pipeline to AWA. The supply pipeline will be installed in a trench approximately five feet deep, parallel to and on the north side of Willey Road heading east from the well site, thence southeast along and outside the western boundary of a railroad easement, thence south along the western edge of Paddy's Run Road to AWA.

Pre-excavation soil sampling, field screening, and analysis is proposed to identify contaminants in areas where personnel may be exposed to hazardous substances during construction activities, so that appropriate health and safety measures can be taken to protect the workers. The data may also later be used to aid in the characterization of soils in the South Plume area and excess excavated soils.

2.0 Sample Areas/Identification of Contaminants

The alternate water supply system will be constructed in non-suspect areas (from the well site to the northwest bank of Paddy's Run and the southeast bank of Paddy's Run to the AWA Facility property boundary) and in suspect areas (Paddy's Run streambed, the AWA facility property, and localities exhibiting evidence of distressed vegetation, stains, or dumping/fill), see Figure I-1. Soils in the non-suspect areas are expected to be free of contamination. Soils in the Paddy's Run streambed are suspect as a result of contaminant migration by stormwater runoff from the Fernald Environmental Management Project (FEMP) to Paddy's Run. Also, a variety of chemical (volatiles, semi-volatiles, pesticides/herbicides), inorganic, and metal contaminants are suspected to be present in the soils as a result of past activities by the potentially responsible parties (PRPs) - namely AWA, Mobil Mining and Minerals Co., and Ruetgers Nease Chemical Co., Inc. - for the Paddy's Run Road Site (PRRS).

3.0 Sample Extraction and Analysis

Sample point locations will be established along the pipeline easement centerline as follows: 1) at 500-foot intervals within the non-suspect

areas, 2) adjacent to the northwest and southeast banks of Paddy's Run (two locations as indicated on Figure I-1), and 3) on the AWA facility property (three locations as indicated on Figure I-1). The centerline for the pipeline trench excavation will be approximately three feet and parallel to the centerline of the pipeline easement.

At each sample point location soil samples will be collected, using a stainless steel hand auger, at one-foot intervals from the ground surface to an approximate total depth of five feet below surface grade ~~at each sample point location~~. Each soil sample will be field-screened for qualitative determinations of volatile organic and radiological contaminant concentrations. There are two screening criteria being used to determine whether a sample is sent to the laboratory for further analysis. These criteria are based on 1) PID/FID readings for the organics and 2) alpha, beta, and gamma readings for the radiological constituents.

A portion of each soil sample will be retained in clean glass jars sealed with aluminum foil lids for field screening of volatile organic compounds using a photoionization detector (PID) or a flame-ionization detector (FID). This will be accomplished by placing the soil material in the jar at a capacity of approximately one-half of the bottle volume. A piece of aluminum foil is placed over the mouth of the bottle. The bottle lid is gently emplaced over the aluminum foil to ensure that the foil is not punctured. The soil samples will be retained at 60-80 degrees Fahrenheit for a period of 15 minutes for volatilization of the organic compounds prior to PID or FID measurement. Subsequent to equilibrium of the volatile compounds in the bottle headspace, the bottle lid is removed and the probe of the PID device is inserted through the aluminum sheet to evacuate the headspace contents. This procedure will remain consistent for all samples.

The organic criteria for sampling and analysis is based on the PID/FID readings. If the PID/FID readings are greater than five meter units above background, then a separate sample will be sent to the laboratory for analysis. Also, if physical evidence such as odor, color, or oily sheen show that contamination may exist, a sample will be collected and analyzed.

The radiological screen for sampling and analysis is based on alpha, beta, and gamma readings. If there are detectable alpha readings or beta/gamma readings of greater than 100 counts per minute above background, then a sample will be collected and sent to the laboratory for analysis.

If warranted, based on field screening data as described above, selected soil samples will be retained for laboratory analyses to quantify volatile organic and radiological contaminant concentrations for selection of the appropriate personal protective equipment (PPE) during construction activities. A maximum of one sample per location will be sent to the laboratory for analysis. If screening levels of organic or radiological parameters exceed the above criteria at several depths at one location, a separate sample will be collected at the depth that exhibits the highest readings.

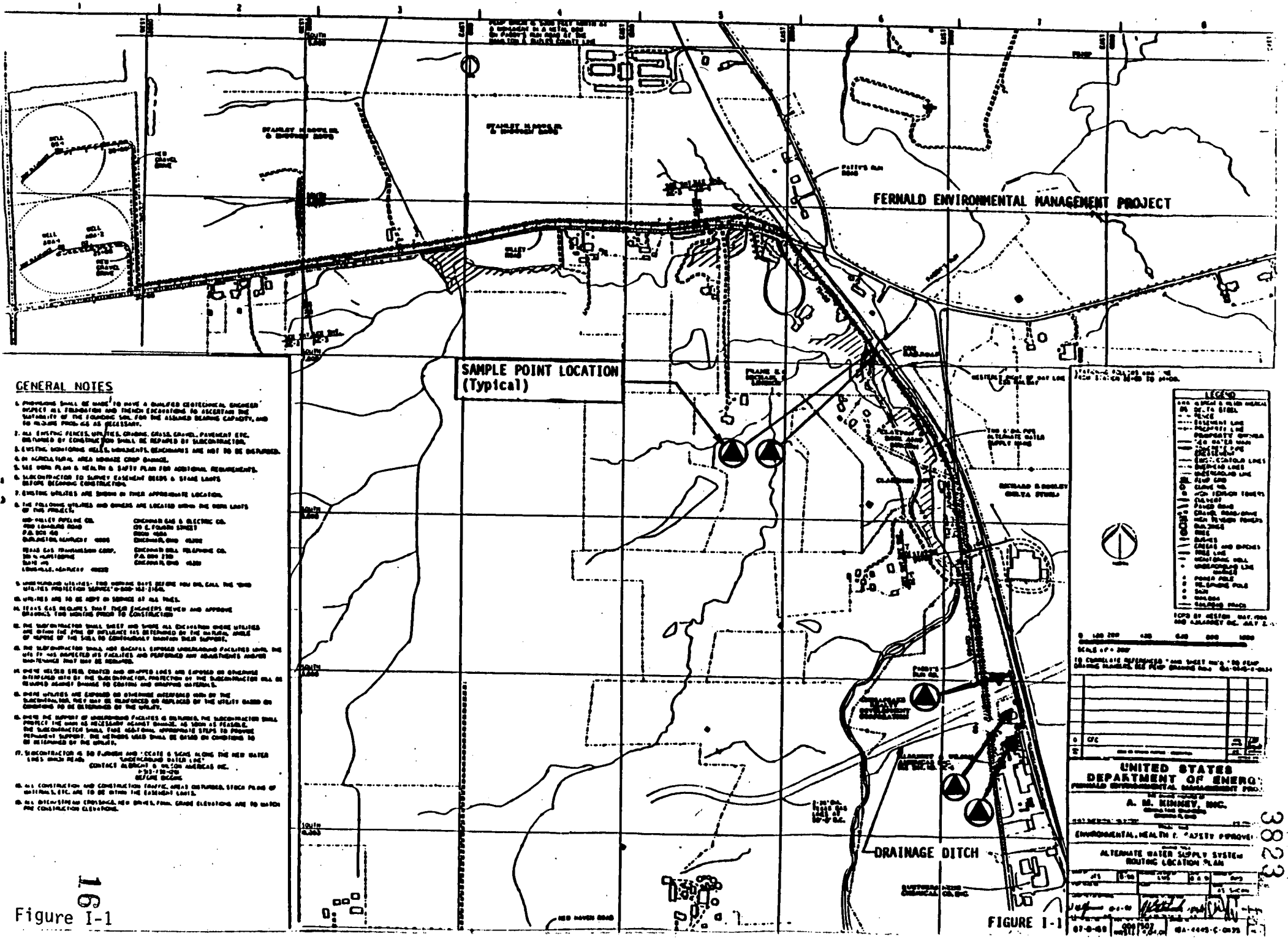
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
SAMPLE POINT LOCATION
(Typical)
DRAINAGE DITCH
GENERAL NOTES
LEGEND
UNITED STATES
DEPARTMENT OF ENERGY
A. M. KINNEY, INC.
ENVIRONMENTAL, HEALTH & SAFETY APPROVED
ALTERNATE WATER SUPPLY SYSTEM
ROUTING LOCATION PLAN
FIGURE I-1

Figure I-1

At the Paddy's Run suspect area, one or more samples will be analyzed for HSLs and Total Radiological Parameters, regardless of field-screen results. Also a few samples from non-suspect areas will be analyzed for potential pesticide/herbicide contamination.

Following is a list of parameters for laboratory analyses, if warranted by field screening. The list was derived from process knowledge of FEMP and the surrounding agricultural and industrial activities. Attached is a complete list of constituents in each category and the SW 846 test methods that will be followed.

Non-Suspect Areas

Total Volatiles - Benzene, Ethylbenzene, Toluene, and Xylenes.
Total Semi-Volatiles - all analytes for this category.
Total Pesticides/Herbicides - all analytes for this category.
Total Metals - Arsenic, Barium, Chromium, and Lead.
Total Radiological Parameters- all analytes listed for this category.

Suspect Area - Paddy's Run Streambed

HSL Volatiles - Benzene, Ethylbenzene, Toluene, Xylenes, 1,1,1-Trichloroethane, 1,1-Dichloroethane, and 1,2-Dichloroethane.
HSL Semi-Volatiles - all analytes listed for this category.
HSL Inorganics - Arsenic, Barium, Chromium, Lead, Sodium, and Potassium.
HSL Pesticides/PCBs - all analytes listed for this category.
Total Radiological Parameters - all analytes listed for this category.

Suspect Area - AWA Facility and Drainage Ditch *

HSL Semi-Volatiles - all analytes listed for this category.
HSL Inorganics - Arsenic, Sodium, and Potassium.
HSL Pesticides/PCBs - all analytes listed for this category.
Additional Analytes - Ammonia, Phosphates, and Sulfates.
Total Radiological Parameters - all analytes listed for this category.

* Note: Based on information supplied by ERM-Midwest, consultant to the PRRS facilities.

Analytical data to be used for evaluation of worker health and safety will be obtained in the most expedient manner possible (i.e., would not require full CLP sampling/analytical protocols).

If soil analyses are warranted, trip and rinsate blanks will be collected for Quality Assurance/Quality Control (QA/QC) purposes. Trip and rinsate blanks will accompany each set of samples shipped to the appropriate designated laboratory. Duplicate soil samples and rinsate blanks will be taken at a frequency of one for every ten samples, or for each sampling event, whichever is more frequent. The QA/QC samples will be analyzed for the respective analytes previously mentioned. Sampling and analyses for characterization not associated with worker health and safety will be done in accordance with the RI/FS QAPP.

Excess soil boring cuttings will be returned to their respective sample point location borehole in non-suspect areas. The remainder of the borehole annulus will be backfilled with bentonite slurry with the use of a tremie pipe. Boreholes in suspect areas will be backfilled with bentonite slurry only. The location of the borehole will be noted.

The work to be performed, as described in this plan, will be accomplished in accordance with the Health and Safety Plan for the South Groundwater Contamination Plume Removal Action, Part 1.

Attachment I-1

Categories of Analytical Constituents

PRE-EXCAVATION FIELD SCREENING
and
SOIL SAMPLING AND ANALYSIS PLAN

SOUTH GROUNDWATER CONTAMINATION PLUME REMOVAL ACTION
PART 1 - ALTERNATE WATER SUPPLY

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

HSL Volatiles

Volatile	CAS Number	Detection Limits Low Water[a] ug/L	Detection Limits Low Soil/Sediment[b] ug/L
1. Chloromethane	74-87-3	10	10
2. Bromomethane	74-83-9	10	10
3. Vinyl Chloride	75-01-4	10	10
4. Chloroethane	75-00-3	10	10
5. Methylene Chloride	75-09-2	5	5
6. Acetone	67-64-1	10	10
7. Carbon Disulfide	75-15-0	5	5
8. 1,1-Dichloroethene	75-35-4	5	5
9. 1,1-Dichloroethane	75-35-3	5	5
10. trans-1,2-Dichloroethene	156-60-5	5	5
11. Chloroform	67-66-3	5	5
12. 1,2-Dichloroethane	107-06-2	5	5
13. 2-Butanone	78-93-3	10	10
14. 1,1,1-Trichloroethane	71-55-6	5	5
15. Carbon Tetrachloride	56-23-5	5	5
16. Vinyl Acetate	108-05-4	10	10
17. Bromodichloromethane	75-27-4	5	5
18. 1,1,2,2-Trichloroethane	79-34-5	5	5
19. 1,2-Dichloropropane	78-87-5	5	5
20. trans-1,3-Dichloropropene	10061-02-6	5	5
21. Trichloroethene	79-01-6	5	5
22. Dibromochloromethane	124-48-1	5	5
23. 1,1,2-Trichloroethane	79-00-5	5	5
24. Benzene	71-43-2	5	5
25. cis-1,3-Dichloropropene	10061-01-5	5	5
26. 2-Chloroethyl Vinyl Ether	110-75-8	10	10
27. Bromoform	75-25-2	5	5
28. 2-Hexanone	591-78-6	10	10
29. 4-Methyl-2-pentanone	108-10-1	10	10
30. Tetrachloroethene	127-18-4	5	5
31. Toluene	108-88-3	5	5
32. Chlorobenzene	108-90-7	5	5
33. Ethyl Benzene	100-41-4	5	5
34. Styrene	100-42-5	5	5
35. Total Xylenes		5	5

[a]Medium Water Contract Required Detection Limits (CRDL) for Volatile HSL Compounds are 100 times the individual Low Water CRDL.

[b]Medium Soil/Sediments Contract Required Detection Limits (CRDL) for Volatile HSL Compounds are 100 times the individual Low Soil/Sediment CRDL

HSL Semi-Volatiles

Semi-Volatile	CAS Number	Detection Limits Low Water[a] ug/L	Low Soil/Sediment[a] ug/Kg
36. Phenol	104-95-2	10	330
37. bis(2-Chloroethyl) ether	111-44-4	10	330
38. 2-Chlorophenol	95-57-6	10	330
39. 1,3-Dichlorobenzane	541-73-1	10	330
40. 1,4-Dichlorobenzene	104-44-7	10	330
41. Benzyl Alcohol	100-51-6	10	330
42. 1,2-Dichlorobenzene	95-50-1	10	330
43. 2-Methylphenol	95-48-7	10	330
44. bis(2-Chloroisopropyl) ether	39638-32-9	10	330
45. 4-Nethylphenol	104-44-5	10	330
46. H-Kitroso-Dipropylamine	621-64-7	10	330
47. Hexachloroethane	67-72-1	10	330
48. Nirtobenzene	98-95-3	10	330
49. Isophorone	78-59-1	10	330
50. 2-Kitrophenol	88-75-5	10	330
51. 2,4-Dimethylphenol	105-67-9	10	330
52. Benzoic Acid	65-85-0	50	1600
53. bis(2-Chloroethoxyl) methane	111-91-1	10	330
54. 2,4-Dichlorophenol	120-63-2	10	330
55. 1,2,4-Trichlorobenzene	120-62-1	10	330
56. Naphthalene	91-20-3	10	330
57. 4-Chloroaniline	106-47-8	10	330
58. Hexachlorobutadiene	87-68-3	10	330
59. 4-Chloro-3-methyphenol (para-chloro-meta-cresel)	59-50-7	10	330
60. 2-Methylnaphthalene	91-57-6	10	330
61. Hexachlorocyclopentadiene	77-47-4	10	330
62. 2,4,6-Trichlorophenol	88-06-2	10	330
63. 2,4,5-Trichlorophenol	95-95-4	50	1600
64. 2-Chloronaphthalene	91-58-7	10	330
65. 2-Nitaniline	88-74-4	50	1600
66. Dimethyl Phthalate	131-11-3	10	330
67. Acenaphthylene	208-96-8	10	330
68. 3-Nitroaniline	99-09-2	50	1600
69. Acenapthene	83-32-8	10	330
70. 2,4-Disitrophenol	51-28-5	50	1600
71. 4-Nitrophenol	100-02-7	50	1600
72. Dibenzofuras	132-64-9	10	330

73. 2,4-Dimitrotoluene	121-14-2	10	330
74. 2,6-Dinitrotoluene	606-20-2	10	330
75. Diethylphthalate	84-66-2	10	330
76. 4-Chlorophenyl Phenyl ether	7005-72-3	10	330
77. Fluorene	86-73-7	10	330
78. 4-Nitroaniline	100-01-6	50	1600
79. 4,6-Dinitro-2-methylphenol	534-52-1	50	1600
80. H-nitrosodiphenylamine	86-30-6	10	330
81. 4-Bromophenyl Phenyl ether	101-55-3	10	330
82. Hexachlorobenzene	118-74-1	10	330
83. Pentachlorophenol	87-86-5	60	1600
84. Phenanthrene	85-01-6	10	330
85. Anthracene	120-12-7	10	330
86. Di-n-butylphthalate	84-74-2	10	330
87. Fluoranthene	206-44-0	10	330
88. Pyrene	129-00-0	10	330
89. Butyl Benzyl Phthalate	85-68-7	10	330
90. 3,3-Dichlorobenzidine	91-94-1	20	660
91. Benzo(a)anthracene	56-55-3	10	330
92. bis(2-ethylheyl)phthalate	117-81-7	10	330
93. Chrysene	218-01-9	10	330
94. Di-n-cotyl Phthalate	117-84-0	10	330
95. Benzo(b)fluoranthene	205-99-2	10	330
96. Benzo(k)fluoranthene	207-08-9	10	330
97. Benzo(a)pyrene	50-32-8	10	330
98. Indeno(1,2,3-cd)pyrene	193-39-5	10	330
99. Dibenz(a,h)anthracene	53-70-3	10	330
100. Benzo(g,h,i)perylene	191-24-2	10	330

[c]Medium Water Contract Required Detection Limits (CRDL) for Volatile HSL Compounds are 100 times the individual Low Water CRDL.

[d]Medium Soil/Sediments Contract Required Detection Limits (CRDL) for Volatile HSL Compounds are 100 times the individual Low Soil/Sediment CRDL

HSL Pesticides

Pesticides	CAS Number	Detection Limits Low Water* ug/L	Low Soil/Sediment' ug/Kg
101. alpha-BHC	319-84-6	0.05	8.0
102. beta-BHC	319-85-7	0.05	8.0
103. delta-BHC	319-86-8	0.05	8.0
104. gamma-BHC (Lindane)	58-89-9	0.05	8.0
105. Heptachlor	76-44-8	0.05	8.0
106. Aldrin	309-00-2	0.05	8.0
107. Heptachlor Epoxide	1024-57-3	0.05	8.0
108. Endosulfan I	959-98-8	0.05	8.0
109. Dieldrin	60-57-1	0.10	16.0
110. 4,4'-DDE	72-55-9	0.10	16.0
111. Endrin	72-20-8	0.10	16.0
112. Endosulfan II	33213-65-9	0.10	16.0
113. 4,4'-DDD	72-54-8	0.10	16.0
114. Endosulfan Sulfate	1031-07-8	0.10	16.0
115. 4,4'-DDT	50-29-3	0.10	16.0
116. Endrin Ketone	53494-70-5	0.10	16.0
117. Methoxychlor	72-43-5	0.5	80.0
118. Chlordane	57-74-9	0.5	80.0
119. Toxaphene	8001-35-2	1.0	160.0
120. AROCLOR-1016	12674-11-2	0.5	80.0
121. AROCLOR-1221	11104-28-2	0.5	80.0
122. AROCLOR-1232	11141-16-5	0.5	80.0
123. AROCLOR-1242	53469-21-9	0.5	80.0
124. AROCLOR-1248	12672-29-6	0.5	80.0
125. AROCLOR-1254	11097-69-1	1.0	160.0
126. AROCLOR-1260	11096-82-5	1.0	160.0

*Medium Water Contract Required Detection Limits (CRDL) for Pesticide HSL Compounds are 100 times the individual Low Water CRDL.

'Medium Soil/Sediment Contract Required Detection Limits (CRDL) for Pesticide HSL compounds are 15 times the individual Low Soil/Sediment CRDL.

'Detection limits listed for soil/sediment are based on wet weight. The detection limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, as required by the contract, will be higher.

HSL INORGANICS

Analyte	Contract Required Detection Limit (ug/L)
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Cyanide	10
Iron	100
Lead	5
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20

ANALYSIS REQUESTS

NOTE: THE METHOD NUMBERS THAT ARE LISTED ARE ONLY SUGGESTED METHODS FOR SW-846 ANALYSES.

Full TCLP (1311)

Metals
Arsenic (7060)
Barium (6010)
Cadmium (6010)
Chromium (6010)
Lead (6010)
Mercury (7470)
Selenium (7740)
Silver (6010)

Semi-Volatiles (8270)
1,4-Dichlorobenzene
2,4-Dinitroluene
Hexachlorobenzene
Hexachloroethane
Hexachloro-1,3-butadiene
Nitrobenzene
Pentachlorophenol
Pyridine
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
O-Cresol
m-Cresol
p-Cresol

Volatiles (8240)
Benzene
Carbon Tetrachloride
Chlorobenzene
Chloroform
2-Butane
1,2-Dichloroethane
1,1-Dichloroethylene
Tetrachloroethylene
Trichlotoethylene
Vinyl Chloride

Pesticides (8080)
Chlordane
Endrin
Heptachlor
Heptachlor Epoxide
Lindane
Methoxychlor
Toxaphene

Herbicides (8150)
2,4-D
2,4,5-TP (Silvex)

TCLP Metals (1311)

Arsenic (6010)
Barium (6010)
Cadmium (6010)
Chromium (6010)
Lead (6010)
Mercury (7470)
Selenium (6010)
Silver (6010)

Total Metals

Arsenic (6010)
Barium (6010)
Cadmium (6010)
Chromium (6010)
Lead (6010)
Mercury (7470)
Selenium (6010)
Silver (6010)

TCLP Volatile Organic Analysis (1311, 8240)

1,1-Dichloroethylene
1,2-Dichloroethane
2-Butane
Benzene
Carbon Tetrachloride
Chlorobenzene
Chloroform
Tetrachloeothylene
Trichloroethylene
Vinyl Chloride

Total Volatile Organic Analysis (8240)

1,1,1-Trichloroethane
1,1,2-Trichloro-
  1,2,2-trifluoroethane
1,1,2-Trichloroethane
Acetone
Benzene
Carbon Tetrachloride
Carbon Disulfide
Chlorobenzene
Cyclohexanone
Ethyl Acetate
Ethyl Benzene
Ethyl Ether
Methyl Ethyl Ketone
Methyl Isobutyl Ketone
Methylene Chloride
Tetrachloroethylene
Toluene
Total Xylenes
Trichloeothylene
Trichlorofluoro-
  methane

Total Alcohols (8015)

2-Ethoxy ethanol
Isobutanol
Methanol
n-Butyl alcohol

TCLP Semi-Volatiles (1311, 8270)

1,4-Dichlorobenzene
2,4-Dinitrotoluene
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
Hexachloro-1,3-butadiene
Hexachlorobenzene
Hexachloroethane
m-Cresol
Nitrobenzene
O-Cresol
p-Cresol
Pentachlorophenol
Pyridine

Total Semi-Volatiles (8270)

1,4-Dichlorobenzene
2,4-Dinitrotoluene
2,4,5-Trichlorophenol
2,4,6-Trichlorophenol
Hexachloro-1,3-butadiene
Hexachlorobenzene
Hexachloroethane
m-Cresol
Nitrobenzene
O-Cresol
p-Cresol
Pentachlorophenol
Pydidine

TCLP Pestidides (1311,8080)

Chlordane
Endrin
Heptachlor
Heptachlor Epoxide
Lindane
Methoxychlor
Toxaphene

Total Pesticides (8080)

Chlordane
Endrin
Heptachlor
Heptachlor Epoxide
Lindane
Methoxychlor
Toxaphene

Total Herbicides (8150)

2,4-D 2,4,5-TP (Silvex)

RADIONUCLIDES

U-233,234,235,236,238

Ra-226,228

Th-228,230,232

Th-234

Pu-238,239,Total Pu

Np-237

Tc-99

Cs-137

Potassium-40

Alpha, beta, gamma
Semi-quant, ID