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FINAL WORK PLAN FOR THE REMEDIAL INVESTIGATION REPORT AND FEASIBILITY STUDY

MOSS-AMERICAN
Milwaukee, Wisconsin

WA 15-5LM7/Contract 68-W8-0040

January 30, 1989

Engineers
Planners
Economists
Scientists

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GLT779/56

Section 1
INTRODUCTION

This work plan defines the scope of activities for accomplishing work assignment 15-5LM7 under ARCS V (Contract No. 68-W8-0040) which authorizes CH2M HILL to complete the remedial investigation (RI) and perform the feasibility study (FS) for the Moss-American site in Milwaukee, Wisconsin. This work plan represents a continuation of the RI begun under work assignment 5-5LM7-0 under REM IV (Contract No. 68-01-7251). The work plan includes the tasks described in the ARCS V Interim Work-Plan Authorization Memorandum dated October 28, 1988. It does not include the tasks already completed under the REM IV contract.

Existing data evaluations and the work plan rationale used in scoping the RI and FS tasks are presented in the Final Work Plan, RI/FS for the Moss-American site dated July 23, 1987.

SITE DESCRIPTION

The Moss-American Superfund site is in the northwestern part of the City of Milwaukee, one-quarter mile east of 107th Street (State Highway 100) on Brown Deer Road. It is in the northwest 1/4 of Section 8, Township 8 North, Range 21 East, which is covered by the Menomonee Falls, Wisconsin USGS 7½-minute quadrangle map (Figure 1-1). The site boundaries are roughly the Chicago and Northwestern Railroad and Brown Deer Road to the north, the Wisconsin and Southern Railroad to the south, the west edge of the Chicago and Northwestern Railroad automobile storage lot to the west, and a north-south line approximately 3,500 feet east of 107th Street. The site area is approximately 88 acres. The site also includes about 5 miles of the Little Menomonee River between Brown Deer Road and the confluence with the Menomonee River. Figure 1-2 shows some of the historical features of the site.

SITE HISTORY

A wood preserving plant was established on the site by the T.J. Moss Tie Company in 1921. The plant preserved wooden railroad ties, poles, and fence posts with creosote. Kerr-McGee purchased the T.J. Moss facility in 1963 and the American Creosote Co. in 1964. The two companies were consolidated in 1965 and became known as the Moss-American Company. The name was changed to the Kerr-McGee Chemical Corporation--Forest Products Division in 1974. Operations at the site ceased in June 1976, and all buildings and equipment were subsequently dismantled and removed.

A series of ditches collected spilled oil and creosote and rainwater and snowmelt runoff. The ditches discharged directly

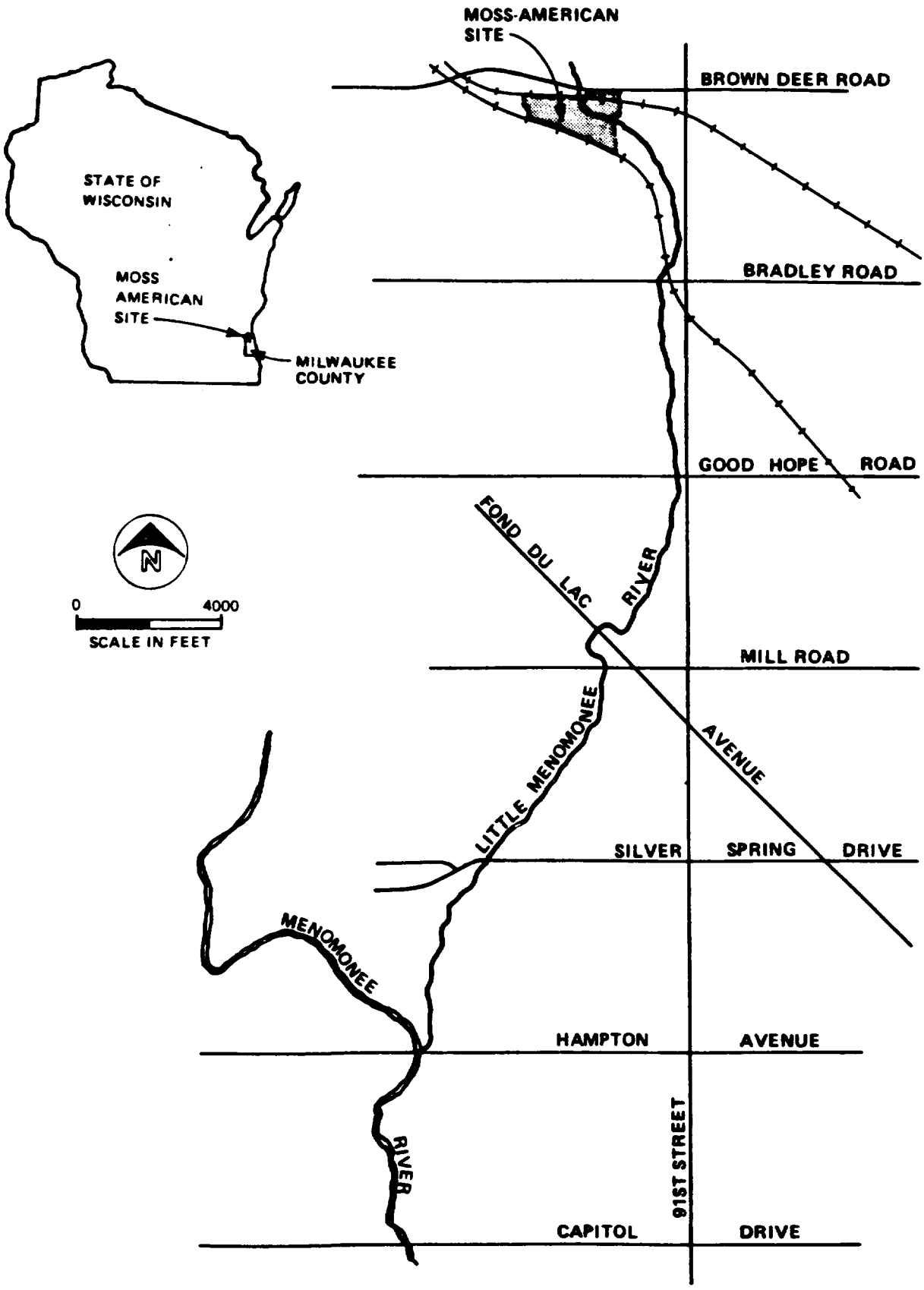
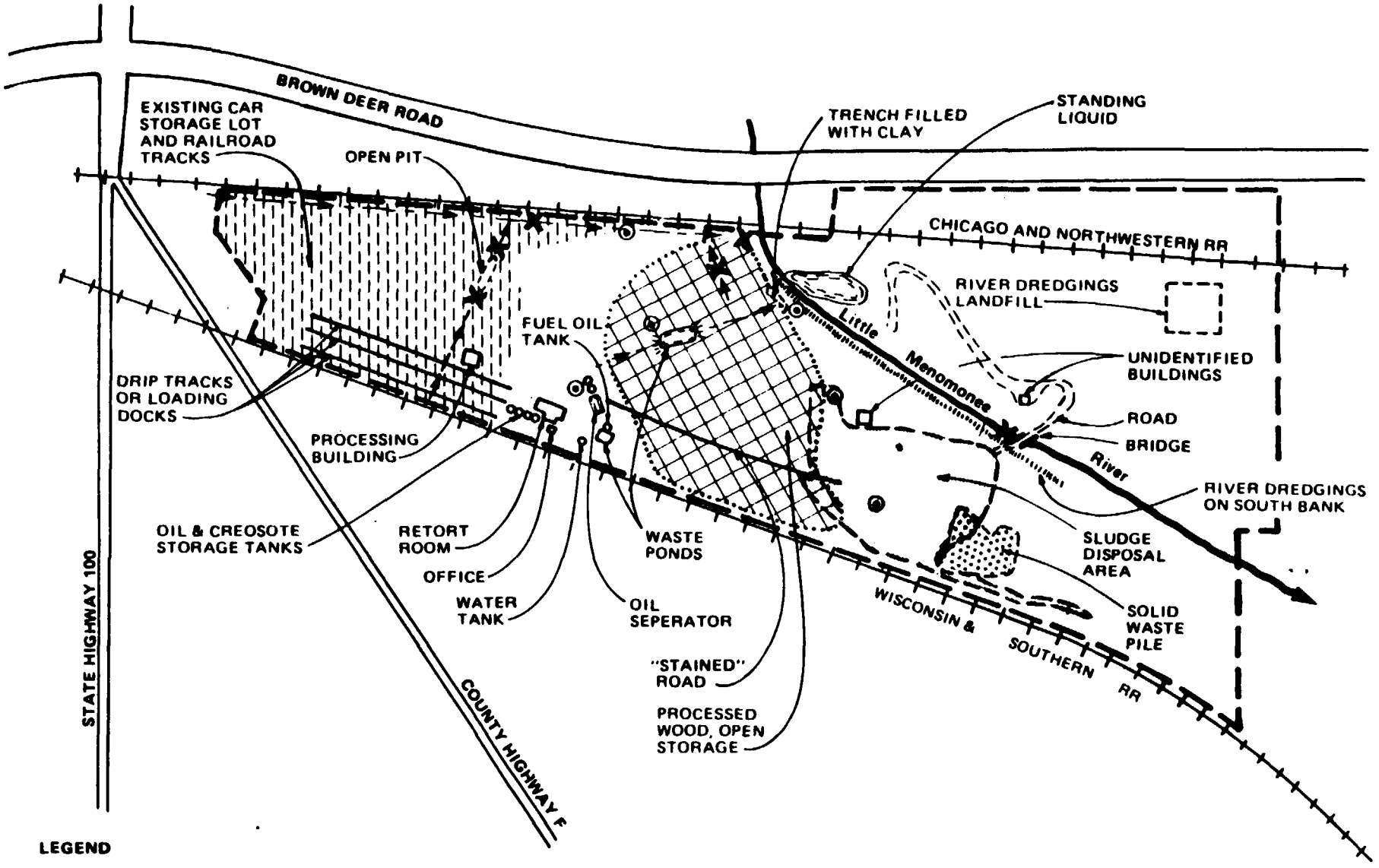


FIGURE 1-1
LOCATION MAP
MOSS-AMERICAN WORKPLAN



NOTE: This is a composite map of features that at one time had been on the site. Many of these have since been dismantled or covered.

FIGURE 1-2
SITE MAP
MOSS-AMERICAN WORKPLAN

into the river. Sometime before 1941, the ditch system was modified to include a series of settling ponds and an oil separator system. In 1952, the plant yard was resurfaced. About 20 acres were covered with gravel and were used to store untreated wood. Another 10 acres were covered with cinders and were used to store the treated wood products. Subsurface drain tiles under the newly surfaced yard emptied into an open ditch which eventually emptied into the Little Menomonee River. Bales of straw were added as oil filters at the request of the City of Milwaukee in 1954. No major changes were made to the treatment system until 1966 when the Milwaukee Sewerage Commission advised Moss-American to repair a pond that was leaking oil to the Little Menomonee River.

The site received attention in 1968 when a dump upstream of the site burned out of control for over a year. Water poured on the fire caused the Little Menomonee River to become anaerobic. Subsequent studies by EPA found that the effluent discharged to the river from the Moss-American site was of undesirable quality. The City of Milwaukee ordered a cleanup and Moss-American complied by installing coke filters to pretreat the waste. In 1971, all the liquid industrial and domestic wastes from the Moss-American facilities were diverted into the Milwaukee Metropolitan sewerage system.

State and national attention was brought to the site in 1971 when a group of young people received chemical burns while cleaning debris from a stretch from the Little Menomonee River more than 3 miles downstream of the Moss-American site. Subsequent studies by EPA determined that creosote originating at the Moss-American facilities was the cause of the chemical burns. As a result of these findings, Kerr-McGee dredged and backfilled eight interconnected waste ponds with clean fill. These were located in series along the drainage ditch running from the process area to the Little Menomonee River. Additionally, 1,700 feet of river were dredged and the contaminated sediment removed and placed along the embankment or in a small landfill in the northeast corner of the site. An underground clay wall was constructed between the ponds and the river.

In 1972, EPA awarded contracts to Rexnord, Inc., and Biotest, Inc., for demonstration of removal and treatment of creosote from the river bottom. The demonstration by Rexnord was conducted near the site. The other demonstration by Biotest was conducted 1½ miles downstream near Calumet Road. The Rexnord method was selected for continued use. About 4,000 feet of river bottom sediment extending south from the Chicago and Northwestern Railroad bridge were handled before funding ran out.

In 1974, EPA filed suit against Kerr-McGee, seeking recovery of costs incurred for the experimental projects and cleanup

of the entire river as well as civil penalties. The suit was dropped as a result of falsification of data in one study by an EPA investigator. In 1978, the County of Milwaukee agreed to accept ownership of a portion of the site in return for dropping its lawsuit against Kerr-McGee.

Little happened regarding the site until 1983 when the site was added to the National Priorities List under CERCLA. The U.S. EPA began planning work at the site in 1985 by asking past and present owners, who are potentially responsible for the contamination, to participate in the investigations. All potentially responsible parties (PRP's) declined the request. The remedial investigation started in 1986.

GLT779/57

Section 2
RI/FS TASKS

The scope of the RI/FS work has been divided into tasks based on the existing data evaluation and work plan rationale presented in the Final Work Plan for the RI/FS dated July 23, 1987 and additional RI data review and technology screening performed during ARCS V interim authorization.

RI/FS TASKS

The following tasks have been identified for the completion of the RI/FS under ARCS V. These tasks and subtasks follow the draft CH2M HILL ARCS V Management Plan.

- Task PP--Project Planning
  - Subtask WP--Work Plan
  - Subtask PM--Project Management
  - Subtask QC--Quality Control
  - Subtask AT--Technology Screening
  - Subtask AA--ARARs Evaluation
- Task FI--Field Investigation
  - Subtask FS--Sediment Sampling
- Task SA--Sample Analysis/Validation
  - Subtask DV--Data Validation
- Task DE--Data Evaluation
  - Subtask DE--Data Evaluation
- Task AR--Assessment of Risk
  - Subtask PH--Public Health and Environmental Assessment
- Task RI--Remedial Investigation Report
  - Subtask R2--Agency Draft RI Report
  - Subtask R3--Final RI Report
  - Subtask PM--Project Management
  - Subtask QC--Quality Control
- Task AD--Remedial Alternatives Screening
  - Subtask AT--Technology Screening
  - Subtask AD--Alternative Development and Screening
- Task AE--Alternatives Evaluation
- Task FS--Feasibility Study Report
  - Subtask R4--Draft FS Report
  - Subtask R5--Final FS Report
  - Subtask QC--Quality Control
  - Subtask PM--Project Management

- Task PS--Post RI/FS Support
  - Subtask RS--Responsiveness Summary
  - Subtask RD--ROD Support
  - Subtask R7--Conduct Remedial Predesign and Prepare Report
  - Subtask PC--Project Closeout
  - Subtask PM--Project Management
  - Subtask QC--Quality Control

- Task CR--Community Relations
  - Subtask CR Community Relations Implementation

PLANNING

TASK PP--PROJECT PLANNING

The following project planning subtasks were identified in the interim authorization memorandum.

Subtask PP.WP--Work Plan

Preparation of the draft and final work plan for the RI/FS occurs under this task. This work includes developing and describing the tasks and subtasks necessary, preparing budgets, and preparing schedules for implementing the tasks.

Subtask PP.PM--Project Management

Project management activities will include preparation of monthly reports to keep the EPA informed of technical, financial, and schedule status of the project. Other responsibilities include controlling budgets and schedules; selecting, coordinating, and scheduling staff for task assignments; maintaining project quality control and quality assurance programs; and outlining the scope of work for any additional investigations. Contact will be maintained with the U.S. EPA Remedial Project Manager.

Subtask PP.QC--Quality Control

A review team will examine project files, project deliverables, and project progress. The team will consist of up to four professionals from appropriate disciplines with experience related to the problems and investigations at the site.

Subtask PP.AT--Technology Screening

Treatment technology screening for the Moss-American site was done under interim authorization for treatment of contaminated soil, sediment, and groundwater to facilitate timely identification of the need for bench-scale treatability testing and identification of Applicable or Relevant and Appropriate

Requirements (ARARs). Results of the screening were discussed with WDNR and U.S. EPA and will be presented in the ARAR memorandum discussed under Task PP.AA.

Subtask PP.AA--Alternatives Array

An Alternatives Array and a list of potential ARARs will be prepared. Treatment technologies and process options identified during Subtask PP.AT will be used to develop the list of potential action-specific ARARs. The results of the field investigation will be used to develop potential chemical and location specific ARARs.

An Alternatives Array memorandum listing preliminary remedial actions and each potential ARAR with brief comments describing applicability to the site will be submitted to EPA for distribution to appropriate agencies to solicit suggestions and to identify more stringent state and local ARARs.

REMEDIAL INVESTIGATION TASKS

TASK FI--FIELD INVESTIGATION

SUBTASK FI.FS--SEDIMENT Samples

Fourteen sediment samples will be collected at the tentatively identified locations shown in Figure 2-1. In addition to the samples, 1 duplicate and 1 field blank will be submitted for a total of 16 analyses. The sampling objectives are as follows:

- To establish background PAH levels in the Little Menomonee River sediments upstream of the site
- To establish typical urban PAH levels in sediments in the Menomonee River watershed. One sample will be collected from a different watershed, but from a similar urban setting to the Little Menomonee River.
- To determine whether PAH contamination is above background in a limited number of samples from the Menomonee River downstream from the confluence of the Little Menomonee River

Two sediment samples were previously collected from the Little Menomonee River upstream from the site. PAH compounds were detected in one of them, but it was collected close to a railroad bridge, which may have affected the sample. Three additional samples are proposed upstream from the site and away from roads and railroads to establish PAH levels in river sediments above the site.

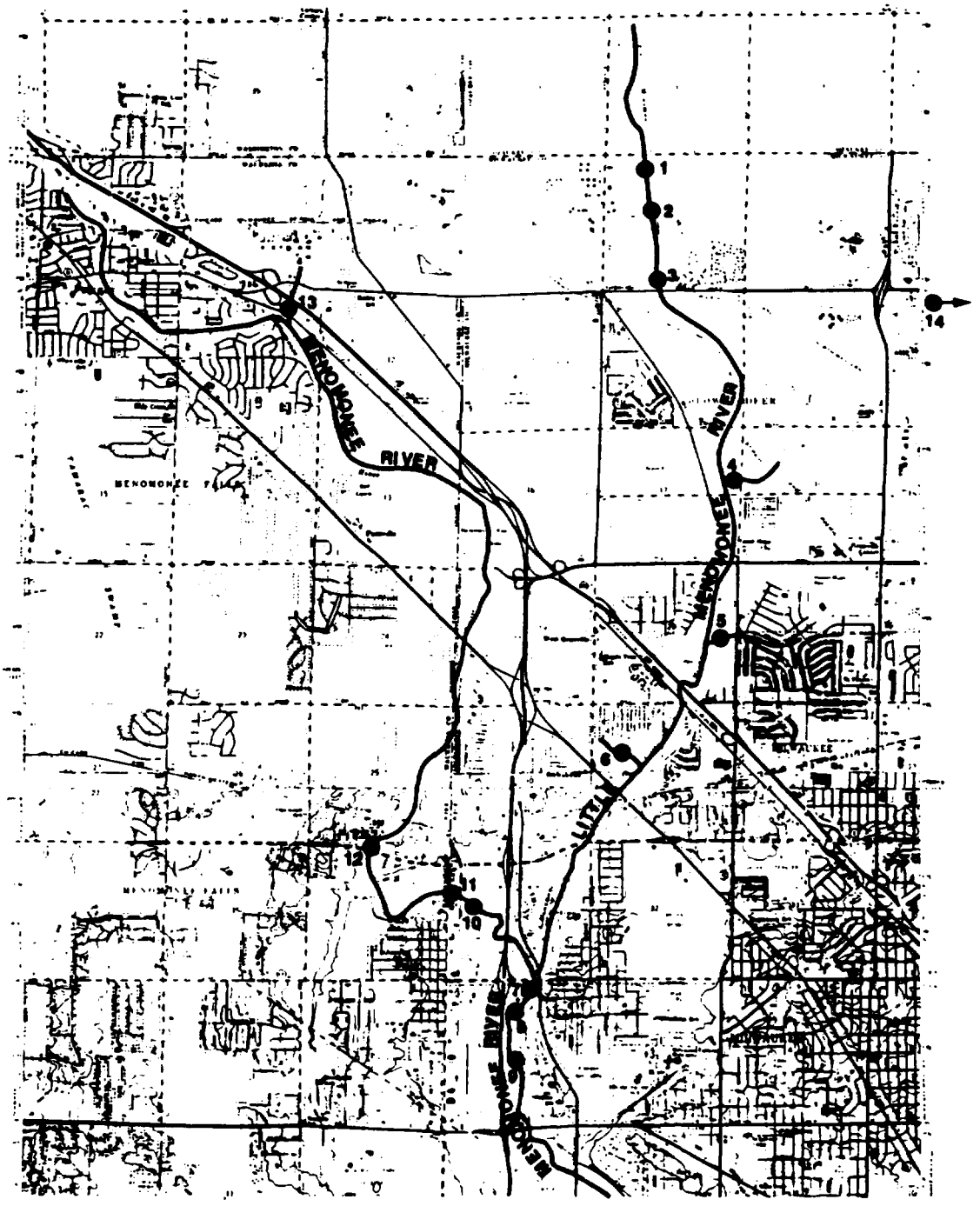


FIGURE 2-1
PROPOSED SEDIMENT SAMPLE LOCATIONS
MOSS AMERICAN WORKPLAN

PAH concentrations in sediments in urban settings in the vicinity of the Little Menomonee River have not been established by the sampling to date and additional sampling will be performed to address this issue. This will be an important factor in establishing remedial action levels for the sediment. Three sediment samples will be collected from the Menomonee River upstream from the confluence of the Little Menomonee River. An additional three samples will be collected from the sediments of tributaries to the Little Menomonee River. In both cases, samples will be collected far enough upstream to be outside of potential Little Menomonee River contamination deposited during high water conditions.

The data already collected for the RI indicate detectable PAH concentrations in the Little Menomonee River sediments extending from the Moss-American site to the Menomonee River. No sampling has been performed in the Menomonee River below the confluence of the Little Menomonee River. Three sediment samples will be collected in areas of sediment deposition below the confluence. Also, a visual survey will be performed by walking stream banks (or from a small boat) from the confluence to approximately 1/2 mile downstream. It was found during the RI investigations that creosote contaminated sediments produced a visible sheen on the water when disturbed. The survey will include stirring sediments with a rod in areas of suspected deposition and noting whether a sheen occurs.

Actual sampling site locations will be determined in the field. Field personnel will select low flow velocity areas where sedimentation is likely to occur. The presence of soft sediment will be verified before attempting to collect a sample.

Samples will be collected in accordance with procedures specified in the sampling plan and QAPP prepared for Moss-American RI under the REM IV contract, dated October 15, 1987. The Health and Safety Plan developed under the REM IV RI contract will be updated and followed.

Sample analysis will be limited to PAH compounds on the Target Compound List. Analysis will be performed according to procedures described in the QAPP by CH2M HILL's laboratory in Montgomery, Alabama.

TASK SA--SAMPLE ANALYSIS/VALIDATION

Subtask SA.DV--Data Validation

CH2M HILL will conduct quality assurance reviews of analytical data received from the EPA Central Regional Laboratory (CRL), CH2M HILL's Montgomery laboratory, and the site close support laboratory. The appropriate use of the analytical data for RI/FS purposes will be determined based on this evaluation and QA/QC comments received from the laboratories and the EPA.

This task will also consist of the entry of analytical data into the RI database and independent verification of the data entries.

TASK DE--DATA EVALUATION

Subtask DE.DE--Data Evaluation

Remedial investigation data will be summarized and evaluated. An appropriate database will be used for data comparisons and sorting on the basis of sample type, location, chemical characteristics, and physical characteristics. RI data quality objectives will be reviewed to determine if the data gathered provide the specific information required by each task. Additional data needs will be identified if required. The data will be evaluated to determine:

- Hydraulic gradients in the fill and weathered surficial material
- Vertical hydraulic gradients
- Recharge and discharge areas
- A site water balance
- The nature and extent of groundwater contamination
- The nature and extent of surface water contamination
- The nature and extent of contaminated sediments in the Little Menomonee River
- The background PAH concentrations in the Menomonee River watershed
- The nature and extent of soil contamination
- Contaminant transport pathways and receptors
- Contaminant loading in the Little Menomonee River from groundwater discharge, surface soil loss, and runoff

TASK AR--ASSESSMENT OF RISK

Subtask AR.PH--Public Health/Environmental Assessment

RI and relevant pre-RI data will be evaluated to estimate the potential threat to public health, welfare, and the environment under the no-action alternative and future site development situations. The risk assessment will be consistent with

U.S. EPA methods for estimating the health risks of environmental pollutants, Office of Emergency Remedial Response (OERR) guidelines for Superfund Public Health Evaluations, and Office of Waste Programs Enforcement (OWPE) guidelines for Endangerment Assessments.

The results of the assessment will be included as a chapter in the RI Report. Supporting risk, transport, and fate calculations will be appended and references sited.

TASK RI--REMEDIAL INVESTIGATION REPORTS

Subtask RI.R2--Draft RI Report

A draft RI report summarizing RI activities, results, and conclusions will be prepared. Six copies will be submitted to the EPA and three copies to the Wisconsin Department of Natural Resources (WDNR) in Madison and Milwaukee for review. The draft report will provide documentation of data obtained for Phase I RI tasks, as well as data evaluation and identification of additional tasks and information needs. Phase II RI investigations may be recommended if it is determined that additional data are necessary. Examples of additional data needs are:

- Discovery of an environmental or health risk needing further clarification
- Determination that certain areas require more specific delineation to develop cost-effective remedial technologies
- To support selection of remedial technologies

Subtask RI.R3--Final RI Report

This subtask includes preparation of the final RI Report.

The final RI report will be issued following receipt of review comments on the draft RI report. Fifteen copies will be submitted to the EPA and five to the WDNR and one copy to the designated repository. The report is assumed to be 400 pages.

Subtask RI.PM--Project Management

This subtask includes project management activities, as previously described, during RI tasks.

Subtask RI.QC--Quality Control

This subtask includes quality control activities, as previously described, during RI tasks.

Operable Unit #1
FY 89 Third Qtr.

FEASIBILITY STUDY

TASK TS--TREATABILITY STUDIES

Treatability study tasks presented below are not included in the work plan budget. They are presented here because they may be necessary during the course of the FS or predesign. If a later decision is made to perform these tasks a WPRR will be submitted.

Subtask TS.QS--QAPP/FSP

will be done 9-12/89

If either the biological treatment treatability study or the leachability testing subtasks are to be performed a Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP) will be prepared. A QAPP will be developed and submitted for agency review, and a final copy incorporating review comments submitted for approval.

Task dropped 8/1/89 meeting

The FSP will indicate proposed sampling locations, procedures, and equipment for sampling and testing. An agency draft will be submitted for review, and a final FSP submitted for approval.

The Site Safety Plan prepared under the REM IV RI will be updated and used for the field sampling activities. The anticipated budget and LOE for this subtask are $30,000 and 535 hours.

Subtask TS.BT--Biological Treatment Treatability Study

The need for the biological treatment treatability study will be decided during the development and evaluation of alternatives. A meeting with U.S. EPA and WDNR will be held to discuss the need for the treatability study. If it is decided to proceed the objectives and schedule will also be discussed.

Several technologies involving biological treatment of PAH's in soil and sediments survived the screening of technologies performed during Subtask PP.AT. A summary of the technology evaluation is presented here followed by the scope of work for the treatability study.

Several studies have shown that bioremediation can be an effective method for treating creosote-contaminated waste. Although the degree of total PAH degradation may be high, the degradation of PAHs with four or more aromatic rings can be much lower, varying from 20 to 80 percent in reported studies.

Three studies were reviewed specifically to determine what kind of degradation rates could be expected for the four and five aromatic ring PAHs (2-1). While the data from these studies show that rates above 70 percent are possible, the rates vary widely and are highly dependent on several factors.

$36,000 - QAPP

1. Land farming
2. bioreactors

We not need a QAS approved QAPP

The type of soil, moisture content, loading rate, and nutrient and oxygen addition are among the factors which can affect the rate of degradation. For this reason, it is necessary to conduct site-specific bench-scale tests to determine if biotreatment is feasible.

Two biotreatment technologies will be investigated; a soil slurry bioreactor and landfarming. The treatability tests will be performed at the CH2M HILL Corvallis, Oregon laboratory. The objectives of the bench-scale treatability tests will be to determine:

- The optimum conditions (moisture content, loading rate, etc.) for degradation of the heavier PAHs for treatment in a slurry bioreactor and for landfarming treatment
- The reaction rates and estimated percent reduction achievable for each of the PAH's present in each of the biotreatment technologies
- The lowest practical PAH residual levels achievable

These objectives may best be addressed by two types of bench-scale experiments. Aerobic shake-flask studies produce near-optimum conditions for bacterial growth and activity and emulate, to some degree, the slurry bioreactor process. Soil pan studies are designated to simulate land farming.

Shake flask studies consist of Erlenmeyer flasks or large tubes containing a soil/water slurry which are incubated with continuous mixing (e.g., on a shaker table). The following experiments using four different treatments will be done:

- No amendments
- Nitrogen and phosphorus amended
- Anoxic; nitrate, nitrogen, and phosphorus amended
- Sterile controls

Pan studies consist of the thin layer (approximately 10 cm) of soil in pans open to the atmosphere, which is tilled daily and moistened as necessary to maintain a relatively constant moisture content. Pan microcosms are sampled at time intervals by collecting several subsamples from different areas of the pan. Subsamples are composited for analysis. These experiments using three different treatments will be done:

- Nonamended
- Nitrogen and phosphorus amended
- Poisoned controls

Two different soil samples and two different sediment samples from the site will be used for each set of experiments. PAH

concentrations from the shake flask and pan studies will be determined by gas chromatography (Method 8100) at intervals of 2 weeks for a total time period of 3 months. A total of 200 samples are included in the budget for PAH analysis.

To further characterize the raw soil and sediment, volatile petroleum hydrocarbons (GC Method 8015) will be measured (4 samples analyzed), and oil and grease (Method 418.1) in soils will be measured at the beginning and end of experiments (24 samples analyzed). Other analyses include soil characterization tests (moisture content, organic carbon, pH, particle size), ion chromatography measurement of nitrate and nitrite levels in the denitrifing systems, and dissolved oxygen measurement in aerobic flasks. The budget and LOE for this task are $52,000 and 560 hours.

Subtask TS.LT--Leachability Testing - dropped 3/9/84

The objectives for conducting leachability testing for the creosote-contaminated wastes at the Moss-American site are:

- To obtain sufficient information to prepare a RCRA no-migration petition (as described in 40CFR268.6) for disposal of untreated soil or sediment in a RCRA landfill

- To evaluate the migration behavior of contaminants in soil or sediment remaining onsite

The no-migration petition may be necessary if the waste at this site is determined to be a "first third" waste that is restricted from land disposal without prior treatment. To obtain an exemption from this requirement, a no-migration petition must be approved by EPA.

Some of the remedial action alternatives being considered require that the waste itself or treatment residues thereof be left onsite. The long-term effects of these alternatives can be better evaluated if the leaching potential of the PAH compounds, especially the four and five aromatic ring compounds, is better known. BTX compounds are present at low concentrations in soil and sediment and will also be investigated.

A decision to perform the leachability tests will be made following U.S. EPA and WDNR evaluation of ARAR's. In particular if the soils and sedimenits are not considered to be listed RCRA hazardous waste the no-migration petition would not be necessary. The second objective, evaluation of the migration behavior of contaminants in soil and sediment will be addressed using literative soil/water partioning values (Kd's). This would result in a higher degree of uncertainty in the calculated migration rates compared to the leachability test results.

The leachability tests would measure the extent and rate of leaching of BTX and PAH compounds using soil or sediment packed columns to simulate onsite and landfill leaching conditions (2-2). Three soil and three sediment samples from different locations and one clean soil sample would be collected for use in the columns. These samples would be analyzed for PAH and BTX compounds prior to starting the leachability experiments. The columns would be packed with mostly clean soil representative of site soils topped with contaminated soil.

Acidified water solution (as in the TCLP test) would be pumped through the columns to simulate landfill leaching. Deionized water could be used to simulate natural precipitation at the site. These solutions would be pumped through the columns at a rate simulating natural precipitation for a period of 3 months. Composite leachate water would be collected and analyzed for PAH and BTX compounds. A total of 15 leachate samples is assumed in the budget. Soils in the columns could be analyzed for PAH and BTX compounds at intervals of 25 cm beginning at the top of the columns and proceeding downward until these compounds are not detected. A total of 50 soil samples to be analyzed is assumed in the budget. The budget and LOE for this task would be $34,000 and 335 hours.

TASK AD--REMEDIAL ALTERNATIVES SCREENING

Subtask AD.AT--Technology Screening

Following completion of the RI, the technology screening performed under Task PP.AT will be revised. Remedial action objectives will be re-assessed, general response actions listed and remedial technologies identified and screened. The screening will be based on effectiveness, implementability, and where necessary, to distinguish between technologies and cost. Summary lists of both applicable and inapplicable remedial technologies and explanations for the rejection of the inapplicable technologies will be provided.

Subtask AD.AD--Alternative Development and Screening

Using the remaining general response actions and technologies, alternatives will be developed with the concept of "permanence" as a guide. Emphasis will be placed on treatment alternatives which reduce toxicity, mobility, or volume of contaminated media. A list of alternatives ranging from permanent, low maintenance, or management solution to less permanent solutions requiring more long term management will be developed. Innovative technologies having the potential for better treatment performance, implementability, or lesser adverse effects than other available approaches will be carried through the screening process.

Developed alternatives will be screened using criteria of effectiveness, implementability, and cost. Cost will be used to discriminate between treatment alternatives that provide similar levels of protection but will not be used as a criterion for comparing treatment to nontreatment alternatives.

TASK AE--ALTERNATIVES EVALUATION

The purpose of this task is to perform a detailed analysis of those alternatives that passed through the screening process. These remaining alternatives will be analyzed in greater detail with the criteria of short-term effectiveness, long-term effectiveness, reduction of toxicity, mobility or volume, implementability, cost, compliance with ARAR's, and overall protection of human health and the environment.

Cost analysis of alternatives will include a present worth analysis. The capital and operation and maintenance cost estimates will be order-of-magnitude estimates and are expected to be accurate within a range of plus 50 and minus 30 percent. A cost sensitivity analysis will be performed. A matrix table presenting the analysis of the criteria for each alternative will be developed.

TASK FS--FEASIBILITY STUDY REPORT

Subtask FS.R4--Draft Feasibility Study Report

An agency review draft FS report summarizing the results of the feasibility study will be prepared. Copies of the draft report will be submitted to the U.S. EPA and WDNR (Madison and Milwaukee) for review.

Subtask FS.R5--Final FS Report

This subtask includes preparation of the Final FS Report. Upon receipt of comments on the draft FS report, a final FS report will be prepared. The budget assumes 30 copies of the final FS report will be made.

Subtask FS.QC--Quality Control

This subtask encompasses quality control review throughout the feasibility study and specifically for the internal review of draft or final deliverables, before being submitted for agency review.

Subtask FS.PM--Project Management

Day-to-day management of the feasibility study will be accomplished under this subtask, which will include staffing, project team coordination, scheduling and budgeting, and agency communication.

TASK PS--POST RI/FS SUPPORT

Following completion of the FS, additional efforts include preparation of the Responsiveness Summary, support for preparation of the ROD, preparation of a predesign report and work assignment closeout activities.

Subtask PS.RS--Responsiveness Summary

Following the close of the FS public comment period, a Responsiveness Summary will be prepared to address public comments and questions concerning the RI and FS. CH2M HILL will prepare a draft Responsiveness Summary Memorandum and submit it to the U.S. EPA and WDNR for review. Transcripts of comments from the public meeting and copies of written comments will be attached to the memorandum.

The cost estimate for this subtask assumes that one person can complete the memorandum in a 2-week period. An additional effort may be required if a large number of public comments require technical evaluations.

Subtask PS.RD--Rod Support

After completing the FS, CH2M HILL will provide technical support to the U.S. EPA in its Record of Decision (ROD) or Enforcement Decision Document (EDD). This would include clarification of the FS, reviewing technical content of ROD documents, and assisting U.S. EPA regional staff in preparing briefing materials or visual art. Costs for additional technical analyses or evaluations of alternatives have not been budgeted.

Subtask PS.R7--Conduct Remedial Predesing and Prepare Report

At the EPA's request, CH2M HILL will conduct a remedial predesign of the selected remedial action. The objective of the predesign task is to describe engineering parameters and institutional concerns and to provide pertinent project information for transferring the project to the lead design party.

The results of the predesign effort will be presented in a formal report. The following elements will be included in the draft predesign report:

- Site description
- Description of remedy and rationale for selection
- Preliminary layouts of preferred remedy
- Preliminary design criteria and rationale
- Preliminary process diagrams
- General operation and maintenance requirements
- Long-term environmental monitoring requirements
- Potential design/implementation problems

- Additional engineering data required
- Permit and regulatory requirements
- Access, easements, and right-of-way requirements
- Health and safety requirements
- Community relations needs
- Implementation order-of-magnitude cost estimate
- Preliminary project schedule (design, construction, permits, and access)

The draft report will be prepared and submitted to the U.S. EPA and WDNR for review. A meeting will be held to discuss review comments to the report. The agencies will submit their review comments to CH2M HILL before the meeting. To promote project continuity from predesign to design, the design agency or firm should also be present at the meeting. The predesign report will incorporate the U.S. EPA's and WDNR's review comments. The final predesign report will be submitted to the U.S. EPA and WDNR following the review meeting.

The cost estimate for this subtask assumes that only data from the RI/FS will be used to develop the predesign report. No new data will be collected or additional analyses performed. Cost estimates will be based directly on the costs developed in the FS.

Subtask PS.PC--Project Closeout

This subtask includes activities to complete or close out the technical and financial aspects of the project. The cost estimate for this subtask includes the following activities:

- Organizing file records
- Indexing files to be microfilmed
- Closing out project subcontracts
- Completing the work assignment close out request (WACR)

Subtask PS.PM--Project Management

Project management activities for post-FS support will be similar to activities described in Subtask FI.PM. The cost estimate for this subtask assumes that project management activities for the FS will occur over a 6-month period. The cost estimate also includes monthly review meetings at the EPA's Region V office in Chicago.

Subtask PS.QC--Quality Control

The review team described under Subtask FS.QC will conduct periodic reviews of post-FS activity and project deliverables. The level of effort for this subtask assumes that the review team will review the following deliverables:

- o Draft and Final Responsiveness Summary
- o Draft and Final Predesign Reports

TASK CR--COMMUNITY RELATIONS

Subtask CR.CR--Community Relations Implementation

This subtask includes technical support for community relations activities that may be requested by EPA, up to the amount budgeted for the subtask. This subtask includes (but is not limited to):

- o Attendance at public meetings
- o Preparation of two fact sheets including one for the proposed plan
- o Distribution of documents
- o Updating mailing lists

SCHEDULES

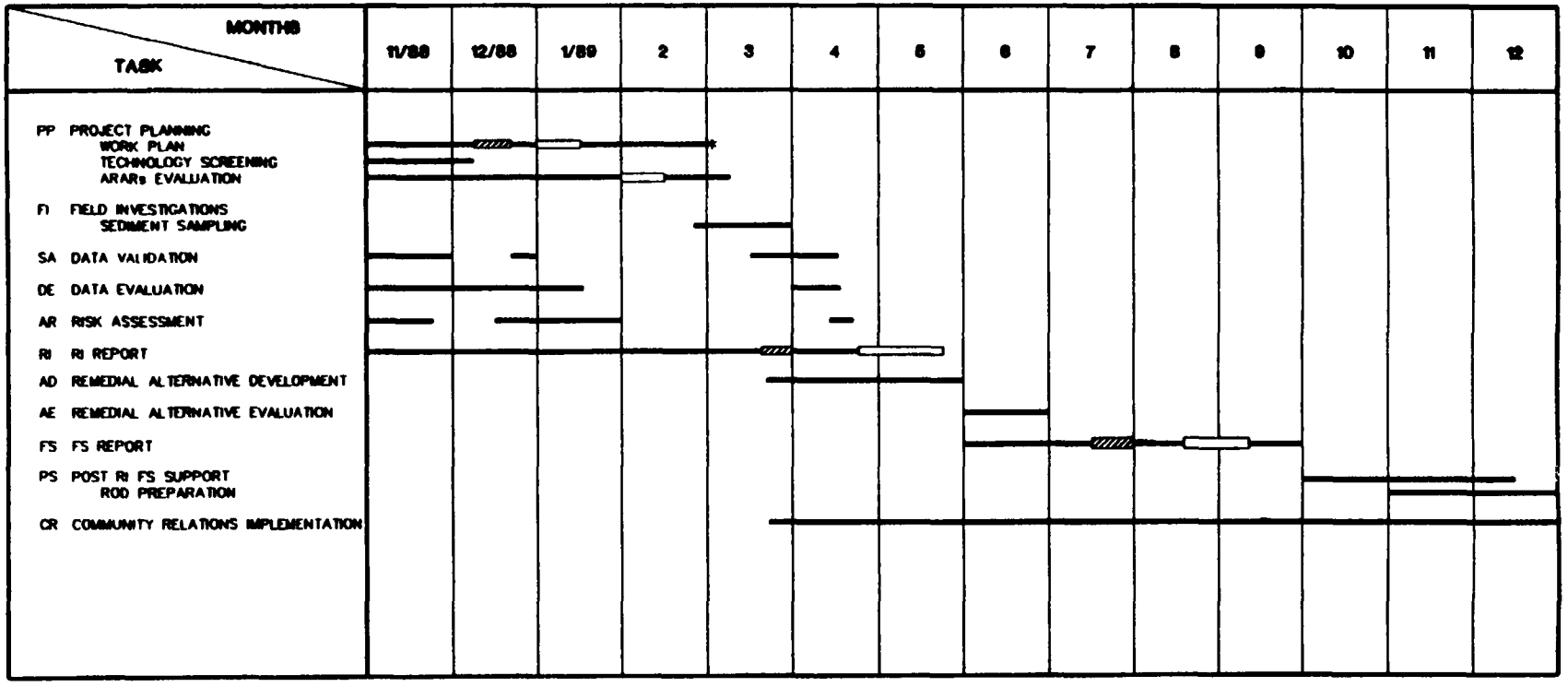
The schedule for the tasks described in this interim work plan memorandum is given in Figure 2-2.

BUDGET

The estimated budget for completion of the work described in this work plan is given in the attached PRJ200 report.

GLT779/58

L85564.PP\FIG2-2 1/30/89



LEGEND

INTERNAL REVIEW/BID PREPARATION

AGENCY REVIEW

* WORK PLAN APPROVAL/QAPP APPROVAL

FIGURE 2-2
MOSS-AMERICAN
RI/FS SCHEDULE
MOSS-AMERICAN WP

REFERENCES

2-1 McGinnis, Gary D. Potential for Migration of Hazardous Wood Treating Chemicals During Land Treatment Operations. Technical Completion Report, Project G1234-03. Water Resources Research Institute, Mississippi State. July, 1987.

Sims, Ronald C., Darwin L. Sorenson, William J. Doucette, and Lauren L. Hastings. Waste/Soil Treatability Studies for Four Complex Industrial Wastes: Methodologies and Results-Volume 2. Utah Water Research Laboratory, Utah State University Project CR-810979. October, 1986.

Confidential client.

2-2 Symons, Brian D., Ronald C. Sims, and William J. Gronney Fate and Transport of Organics in Soil: Model Predictions and Experimental Results. Journal of the Water Pollution Control Federation, Vol. 60, No. 9. September, 1988.

GLT779/058

Client Proj No.: 15-5LM7.0
Master Project: 6556400

Micro Workplan
Project Summary (Includes Fee)
Moss American
JOHNSON D W

Report PRJ200
Page 1
Run Date: 02/03/89
Run Time: 09:55:56
As Of: 12/88

T A S K Code	Description	Status	-Project To Date- Prof. Hours	Total Cost	-Est To Complete- Prof. Hours	Total Cost	-Est At Complete- Prof. Hours	Total Cost	-----Budget--- Prof. Hours	Total Cost
Remedial Alternatives Eval: 65564AE										
ZZ	General	A	0	0	0	0	0	0	0	0
AE	Alternatives - Evaluation	P	0	0	600	34300	600	34300	0	0
		Total	0	0	600	34300	600	34300	0	0
Assessment of Risks: 65564AR										
PH	Public Health/Environmental Assessment	A	276	13816	140	10384	416	24200	402	24691
		Total	276	13816	140	10384	416	24200	402	24691
Remedial Alternatives Screen: 65564AS										
ZZ	General	A	0	0	0	0	0	0	0	0
AT	Alternatives - Technology Screening	P	0	0	100	6266	100	6266	0	0
AD	Alternatives - Development & Screening	P	0	0	940	54873	940	54873	0	0
		Total	0	0	1040	61139	1040	61139	0	0
COMMUNITY RELATIONS: 65564CR										
CS	Community Relations Technical Support	A	0	0	0	0	0	0	155	13992
CR	Community Relations Implementation	P	0	0	298	22584	298	22584	0	0
ZZ	General	A	0	0	0	0	0	0	0	0
		Total	0	0	298	22584	298	22584	155	13992
Data Evaluation: 65564DE										
D	Data Evaluation	A	258	10397	60	4290	318	14687	160	8915
ZZ	General	A	0	92	0	6	0	98	0	0
		Total	258	10489	60	4296	318	14785	160	8915
Field Investigation: 65564FI										
FW	Fieldwork - Surface Water/Sediment	P	0	0	74	7010	74	7010	0	0
ZZ	General	A	0	0	0	0	0	0	0	0
		Total	0	0	74	7010	74	7010	0	0

Internal Projects, Tasks, Milestones Excluded.
‡ With invoiced fee only (see PRJ090 for Total with estimated full fee).

Client Proj No.: 15-SLM7.0
Master Project: 6556400

Micro Workplan
Project Summary (Includes Fee)
Moss American
JOHNSON D W

Report PRJ200
Page 2
Run Date: 02/03/89
Run Time: 09:56:08
As Of: 12/88

T A S K Code	Description	Status	-Project To Date- Prof. Hours	Total Cost	-Est To Complete- Prof. Hours	Total Cost	-Est At Complete- Prof. Hours	Total Cost	-----Budget--- Prof. Hours	Total Cost
Feasibility Study RIFS Report: 65564FS										
R4	Report - FS	P	0	0	820	55358	820	55358	0	0
PM	Project Management	P	0	0	228	17235	228	17235	0	0
QC	Quality Control	P	0	0	105	9583	105	9583	0	0
ZZ	General	A	0	0	0	0	0	0	0	0
		Total	0	0	1153	82176	1153	82176	0	0
Project Planning - RIFS: 65564PP										
\	Project Planning General	A	0	3	0	0	0	3	0	0
QC	Quality Control	A	23	1632	60	5571	83	7203	120	11087
WP	EPA Workplan	A	433	24796	176	13868	609	38664	280	20058
ZZ	General	A	0	547	0	37	0	584	0	0
PM	Project Management	A	286	17876	56	5872	342	23748	276	20249
AT	Alternatives - Technology Screening	A	145	8525	120	8290	265	16815	180	10482
AA	ARARs Evaluation	A	175	9930	240	15511	415	25441	200	10759
		Total	1062	63309	652	49149	1714	112458	1056	72635
Post RIFS Support: 65564PS										
ZZ	General	A	0	0	0	0	0	0	0	0
RS	Responsiveness Summary	P	0	0	120	10525	120	10525	0	0
PC	Project Closeout Procedures	P	0	0	40	3091	40	3091	0	0
RD	ROD/EDD Assistance	P	0	0	80	6371	80	6371	0	0
R7	Report - Predesign	P	0	0	240	16185	240	16185	0	0
PM	Project Management	P	0	0	144	10680	144	10680	0	0
Q	Quality Control	P	0	0	24	2357	24	2357	0	0
		Total	0	0	648	49209	648	49209	0	0
Remedial Investigation Reports: 65564RI										
R2	Report - 1st Draft RI Report	A	190	8720	677	42499	867	51219	800	48591
R3	Report - Subsequent Draft(s)/Final RI Rp	A	0	0	140	14388	140	14388	140	14476
ZZ	General	A	0	0	0	0	0	0	0	0
MG	Meetings (External)	A	0	0	0	0	0	0	88	5017

Internal Projects, Tasks, Milestones Excluded.
$ With invoiced fee only (see PRJ090 for Total with estimated full fee).

T A S K Code	Description	Status	-Project To Date- Prof. Hours	Total Cost	-Est To Complete- Prof. Hours	Total Cost	-Est At Complete- Prof. Hours	Total Cost	-----Budget--- Prof. Hours	Total Cost
Remedial Investigation Reports: 65564RI (con't)										
PM	Project Management	P	0	0	40	3802	40	3802	0	0
QC	Quality Control	P	0	0	90	8190	90	8190	0	0
		Total	190	8720	947	68879	1137	77599	1028	68084
Sample Analysis/Validation: 65564SA										
DV	Data Validation	A	287	10429	40	2727	327	13156	276	11683
ZZ	General	A	0	0	0	0	0	0	0	0
		Total	287	10429	40	2727	327	13156	276	11683
Treatability Study/Pilot Test: 65564TS										
ZZ	General	A	0	0	0	0	0	0	0	0
		Total	0	0	0	0	0	0	0	0
		Master Project Total	2073	106763#	5652	391853	7725	498616	3077	200000

Internal Projects, Tasks, Milestones Excluded.
With invoiced fee only (see PRJ090 for Total with estimated full fee).