

**Work Plan for the Preparation of
Interim Remedial Measure Design Report
and Preliminary Remedial Design for Area 1**

**Sunnyside Yard
Queens, New York**

ROUX Associates, Inc.

ENVIRONMENTAL CONSULTING & MANAGEMENT

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**Work Plan for the Preparation of
Interim Remedial Measure Design Report
and Preliminary Remedial Design for Area 1**

**Sunnyside Yard
Queens, New York**

June 27, 1994

Prepared for:

**National Railroad Passenger Corporation
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1.0 INTRODUCTION

Roux Associates, Inc. (Roux Associates) and Remedial Engineering, P.C. (Remedial Engineering), on behalf of the National Railroad Passenger Corporation (AMTRAK) have prepared this Work Plan for the Preparation of an Interim Remedial Measure Design Report and a Preliminary Remedial Design for Area 1 at the Sunnyside Yard, Queens, New York (Work Plan).

This work is necessary for the construction and related dewatering activities of the Proposed High-Speed Rail Service Facility at the Sunnyside yard, Queens, New York (Yard). The dewatering and construction activities will result in the recovery of separate-phase petroleum, the removal of soils, and the remediation of ground water in Area 1 at the Yard.

Because the work is focused on allowing construction to progress, the evaluation of alternatives will focus on alternatives that remediate the areas of proposed construction and are highly implementable and consistent with proposed construction. Important in the selection of any ground-water treatment system for implementation in Area 1 is the determination of the rate of ground-water flow and water quality that must be handled as part of any dewatering or extraction system. As such, a critical element of this proposal is the preparation of a ground-water model of the area to allow for the simulation of various alternatives.

The tasks included in this scope of work are listed below:

- **Task 1** - Review of Background Data and Collection of Limited Pre-Design Data;
- **Task 2** - Ground-Water Modeling;
- **Task 3** - Preparation of IRM Design Report; and
- **Task 4** - Preparation of Preliminary Remedial Design.

The preparation of both the IRM Design Report and the Preliminary Remedial Design will be performed by Remedial Engineering, a New York professional service corporation organized solely for the purpose of providing engineering services for clients of Roux Associates. This structure was established to comply with New York State legal

requirements regarding the practice of engineering in the corporate form. In order to maintain the level of services to clients of Roux Associates, there is an agreement in place which entitles Remedial Engineering unrestricted access to all resources of Roux Associates.

A description of the scope of work for each task is presented in Section 2.0 of this Work Plan and Section 3.0 presents a preliminary project schedule for implementation of the work.

It is important to note, that, based upon the findings of this project at the completion of Task 3.0, the proposed construction activities may not be performed and, as a result, the IRM may not be implemented.

2.0 TECHNICAL SCOPE OF WORK

Brief descriptions of the work proposed for Tasks 1 through 4 are provided below.

2.1 Task 1 - Review of Background Data and Collection of Limited Pre-Design Data

As part of this task, Roux Associates will review existing environmental quality data from previous sampling and monitoring activities within Area 1 and identify additional data needs. This includes the review of analytical data from the performance of the Phase I and II Remedial Investigations (RI), and the addendum to the Phase II RI. It should be noted that Roux Associates has a substantial database of environmental data for the Yard. However, additional data must be obtained for all suspected compounds in the ground water, as required for sewer discharge permitting by the New York City Department of Environmental Protection (NYCDEP).

Once the existing data has been reviewed, Roux Associates will collect limited field data from Area 1 to address any data needs. This task will develop supplemental information for the evaluation of the alternatives and preparation of the preliminary design. In general, based upon a preliminary review of existing data, the collection of field data will focus on data required to establish influent ground-water quality and discharge standards.

At a minimum, the following pre-design data will be required:

- collection of four ground-water samples within Area 1 for conventional discharge parameters included in the local Publicly Owned Treatment Works (POTW) and NYSDEC surface water discharge standards, such as pH, total suspended solids, biological oxygen demand (BOD), chemical oxygen demand (COD), oil and grease and metals; and
- performance of up to three pump tests (as described in Task 2).

2.2 Task 2 - Ground-Water Modeling

As part of this task, Roux Associates will perform ground-water modeling to support the ground-water treatment system design. Ground-water modeling will assist in developing the following critical design parameters:

- an estimate of the rate of ground-water flow and the volume of water that may require treatment as part of the proposed interim remedial measures (IRM) facility design; and

- an assessment of the impact of different interim remedial measures on water levels, and the migration and recovery rate of the separate-phase petroleum accumulation.

Both of these results will provide critical design input to establish the ultimate feasibility, size and cost of alternative IRM facilities. Ground-water modeling will be performed as two subtasks. Subtask 2A will consist of performance of pumping (aquifer) tests and slug tests on existing monitoring wells in Area 1 to provide yard-specific hydraulic data necessary for input into a ground-water model. Subtask 2B will consist of the creation, calibration, and running of numerical model simulations of ground-water flow conditions beneath the Yard and specifically Area 1, as a result of implementation of feasible IRM extraction scenarios. The subtasks are summarized below.

2.2.1 Subtask 2A: Aquifer testing

Site-specific hydrogeologic data will be required to create and calibrate a ground-water model that is a representation of the ground-water flow system beneath the Yard. Since only limited hydrogeologic data for Area 1 were obtained by performance of slug testing during the Phase I RI, additional slug testing will be performed to supplement the data obtained from the proposed pumping tests. The pumping tests are designed to provide an assessment of the behavior of the ground-water flow system in response to actual pumping stresses.

Up to 10 slug tests are proposed in Area 1 in the vicinity of the construction. Due to the variable densities and thicknesses of the separate-phase petroleum, no slug tests will be performed within the area of the petroleum accumulation. Analysis of the slug test data will yield hydraulic conductivity data for the aquifer beneath Area 1.

Two pumping tests are tentatively proposed: a step-drawdown test and constant-rate test. The tests will be performed at a monitoring well location in the vicinity of the proposed High-Speed Rail Service Facility. Prior to performance of the pumping tests, the well to be tested will be re-developed to ensure that a proper hydraulic connection exists between the well and the aquifer. Up to six temporary piezometers will be installed in the vicinity of the constant-rate test to provide water-level drawdown monitoring locations. During the tests,

drawdown of water levels in response to pumping will be measured by monitoring water levels in the pumping well and in surrounding monitoring wells and piezometers for the duration of the tests. Analysis of the drawdown data will yield hydraulic conductivity and transmissivity data for the aquifer.

During the step test, the monitoring well will be pumped in steps, with each step consisting of pumping at an incrementally higher rate than the previous step, for a period of up to 1.5 hours per step. A typical step test consists of three to four steps.

The constant rate pumping test will consist of pumping the monitoring well at a constant rate until a quasi-steady state is achieved (i.e., the rate of change in water levels in the pumping well and surrounding monitoring wells and piezometer versus time begins to level off). It is estimated that a quasi-steady state condition will be reached after approximately eight to twelve hours of pumping.

The estimated pumping rate for the pump tests is assumed to range from approximately 25 to 100 gallons per minute (gpm). Water generated during these tests is assumed to be discharged to the local City of New York Water Pollution Control facility via the existing on-site sewer system without treatment. Should direct discharge not be allowed by the NYCDEP or the NYSDEC, on-site storage can be provided. If on-site storage is determined to be necessary during the pump test, it is anticipated that up to 80,000 gallons of storage will be required.

2.2.2 Subtask 2B: Ground-Water Modeling

The above-mentioned data will be incorporated into a three-dimensional numerical computer model of the Yard that will be concentrated in Area 1. The computer model that will be employed, MODFLOW (McDonald and Harbaugh 1988), is an industry-accepted and tested numerical model that is widely-used for ground-water flow simulation.

The ground-water modeling will consist of the following:

- creation of a three-dimensional model grid (i.e., computer-generated representation) to represent the aquifer beneath Yard;
- calibration of the model to be representative of measured pumping and non-pumping hydraulic conditions (i.e., measured water levels in Yard monitoring wells will be compared to water levels generated by the model);
- performance of model simulations using various pumping/extraction scenarios; and
- preparation of model output for presentation in the report showing the response of the aquifer under the selected scenario.

2.3 Task 3 - Preparation of IRM Design Report

Roux Associates will prepare an IRM Design Report for Area 1 based upon a review of background data and the findings of the proposed Pre-Design field data collection and ground-water modeling. The IRM Design Report will address potential IRM activities within Area 1 to include the remediation of ground water, the recovery of separate-phase petroleum, and the removal of soil within the confines of the area of construction.

Specifically, the IRM Design Report will:

- evaluate the potential for pre-construction remediation;
- evaluate various methods of hydraulic containment and physical isolation of the construction area;
- evaluate recovery well system options and preferred locations (well cluster vs. single well recovery system);
- identify and evaluate ground water treatment and discharge alternatives;
- identify ground-water treatment system operation and maintenance requirements;
- identify and evaluate separate-phase petroleum removal, temporary storage and off-site disposal alternatives;
- develop soil removal and off-site disposal alternatives;
- review regulatory permitting requirements for various alternatives;

- provide feasibility study level capital and operation and maintenance (O & M) costs (+50%/-30%) for all alternatives;
- evaluate effectiveness of various alternatives, and select most feasible alternatives, and make recommendations; and
- provide time schedules for implementation of the selected alternatives.

The report will also contain overall descriptions of the proposed alternatives, including an outline of system components, system flow schematic, and a timetable for proposed system implementation of each alternative. This report will not include final engineering design plans and specifications. Both the ground water and separate-phase petroleum evaluations will consider the short and long term goals for Area 1 remediation.

At the completion of the preparation of the design report, the report will be reviewed by AMTRAK to determine the feasibility of project implementation in light of the coordination required between implementation of the feasible IRM and the proposed construction. Roux Associates has allotted four weeks for IRM Design Report preparation. Upon completion of the IRM Design Report, Roux Associates will present the results of the IRM Design Report to the NYSDEC for review and approval.

2.4 Task 4 - Preparation of Preliminary Remedial Design

Upon completion of the IRM Design Report and selection of the preferred alternatives, a Preliminary Remedial Design will be prepared for the selected alternative associated with each of the three media of concern within Area 1 of the Yard. This document will provide the preliminary design of each element of the selected alternative which is assumed to include ground-water extraction, treatment and discharge systems, separate-phase petroleum removal, temporary storage and disposal, and soil excavation and removal requirements within the construction area.

This preliminary design will be presented in a design memorandum which will identify the process units to be used, preliminary unit sizings and process layout, preliminary capital, and projected O&M costs (+15%/-15%) for the facility and a detailed schedule for design and implementation. This memorandum will be submitted for review and approval to AMTRAK and the NYSDEC and will establish the basis for the preparation of detailed plans and specifications for construction.

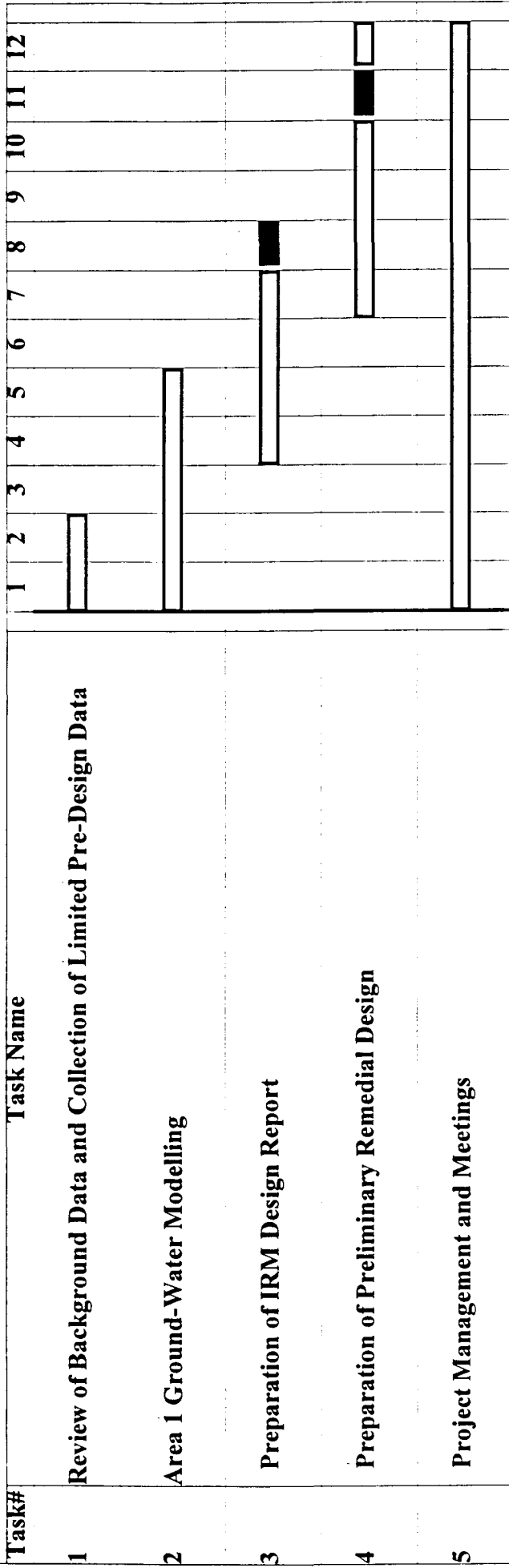
Roux Associates has allotted four weeks for Preliminary Remedial Design preparation after approval of the IRM Design Report.

3.0 PRELIMINARY PROJECT SCHEDULE

The project schedule proposed for this work is included in Figure 1. This schedule assumes that the total project timeframe is twelve weeks and that week one begins upon approval of the NYCDEP regarding the final disposition of the pump test water. It also assumes that AMTRAK and the NYSDEC complete the review of both the IRM Design Report and the Preliminary Remedial Design within two (2) one-week periods.

FIGURES

Figure 1. Preparation of Interim Remedial Measure Design Report and Preliminary Remedial Design of Area 1



■ -Amtrak and NYSDEC Review



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June 24, 1994

Mr. Richard Gardineer, P.E.
Regional Hazardous Waste Engineer
New York State Department of Environmental Conservation
47-40 21st Street
Long Island City, New York 11101

Re: Work Plan for the Preparation of an Interim Remedial Measure Design Report and a Preliminary Remedial Design for Area 1, Sunnyside Yard, Queens, New York

Dear Mr. Gardineer:

Roux Associates, Inc. (Roux Associates) and its affiliated design firm, Remedial Engineering, P.C. (Remedial Engineering), on behalf of the National Railroad Passenger Corporation (AMTRAK) have prepared the attached Work Plan for the Preparation of an Interim Remedial Measure Design Report and a Preliminary Remedial Design of Area 1 at the Sunnyside Yard, Queens, New York (Work Plan) for your review.

The above-mentioned work is necessary to support the proposed construction activities of the anticipated High-Speed Rail Facility at Sunnyside Yard, Queens, New York (Yard), which is to be part of the Federal Government's \$1.5 billion investment for improving passenger rail service between New York City and Boston. At this time the citing of the Facility at the Yard is not definite. The outcome of the above-mentioned remedial design work may show that the construction of the Facility at the Yard is not feasible and, as a result, the IRM may not be implemented.

This IRM design report will focus on options for remediation that will be accomplished through the dewatering of the area to be excavated (which results in significant ground-water remediation), the containment and recovery of separate-phase petroleum (also a substantive remedial measure), and the removal of soils. In addition, since a Remedial Investigation/Feasibility Study (RI/FS) is currently being performed for the entire Yard, long-term remedial goals will also be evaluated in an attempt to integrate our efforts.

The proposed scope of work has been divided into the following four major tasks.

- **Task 1 - Review of Background Data and Collection of Limited Pre-Design Data;**
- **Task 2 - Ground-Water Modeling;**

- Task 3 - Preparation of IRM Design Report; and
- Task 4 - Preparation of Preliminary Remedial Design.

As discussed in more detail in the attached Work Plan, a critical element of the IRM design will be the determination of the volume and quality of the water to be treated. Multiple design alternatives will be evaluated (i.e., substantial pre-construction remediation, hydraulic containment, and physical isolation of the construction area). As a result, Task 2 - Ground-Water Modeling is required. It is important to note that at the completion of this work, the ground-water model will continue to be utilized as a decision making tool regarding potential final remedial designs for the entire Yard and to evaluate the potential effects of the proposed subway dewatering activities adjacent to the Yard.

At the completion of Task 3, an evaluation will be made as to the cost effectiveness of the feasible alternatives. This will enable AMTRAK to make a decision on whether to continue with implementation of the High-Speed Rail Program at Sunnyside Yard.

Roux Associates looks forward to responding to any questions that you may have and would be pleased to meet with you to further discuss this work. If you have any questions or require additional information, please contact either Joseph Duminuco or Peter Gerbasi at (516) 232-2600.

Sincerely,

ROUX ASSOCIATES, INC.



Joseph D. Duminuco
Principal Hydrogeologist

REMEDIAL ENGINEERING, P.C.



Peter J. Gerbasi, P.E.
Principal Engineer

Attachment

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