Occidental Chemical Corporation

Olin CORPORATION

GEOTECHNICAL SAMPLING AND TESTING PLAN

102nd Street Landfill Site
Niagara Falls, New York

OCCIDENTAL CHEMICAL CORPORATION

OLIN CORPORATION

GEOTECHNICAL SAMPLING AND TESTING PLAN

102nd STREET LANDFILL SITE

NIAGARA FALLS, NEW YORK

MAY 5, 1992

FLUOR DANIEL, INC.

PHILADELPHIA OPERATIONS CENTER

MARLTON, NEW JERSEY

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1.0 INTRODUCTION

1.1 PURPOSE

This Geotechnical Sampling and Testing Plan (GSTP) has been prepared to describe the field work to be conducted during the Predesign Field Activities for the Remedial Design of the 102nd Street Landfill Site (Site). This plan will make use of protocols set forth in the Site Operations Plan (SOP) and Quality Assurance Plan (QAP) where appropriate; and the Health and Safety Plan (HASP) and its Addendum, prepared for this program.

The data collected during the Predesign Field Activities will be the basis of the design of the selected remedy as described in the Remedial Design (RD) Work Plan for this site. The elements of that remedy and a description of the Site can be found in the Work Plan. The findings of the geotechnical sampling and testing will be summarized in the Predesign Field Activities Report (PFAR).

1.1 PURPOSE (Cont'd)

The primary objectives of the GSTP are to collect geotechnical samples which will:

- Confirm the alignment of the perimeter slurry wall and verify the absence of NAPL in the southern perimeter borings.

- Provide additional stratigraphic information to determine the design depths of the slurry wall.

- Provide grain size distributions of the fill and alluvial soils throughout the perimeter of the Site to support the design of the slurry wall.

- Provide grain size data and stratigraphic information to support the design of the Aqueous Phase Liquid (APL) collection system and the Non-Aqueous Phase Liquid (NAPL) collection system.

- Provide consolidation and strength parameters of the clay and alluvial sediments in the embayment area to support design of the river front soil erosion barrier.

1.2 SUMMARY OF THE SAMPLING AND TESTING PROGRAM

In order to support the remedial design activities, as described in the RD Work Plan, geotechnical samples will be collected and analyzed, and design criteria will be developed from test results. This GSTP provides the procedures and methods that will be used for sample collection and sample testing.

It is anticipated that a number of site sampling and testing events will take place concurrently. The general sequence of events will be as follows:

1. Drilling on the northern, eastern and western perimeters of the site to collect geotechnical samples and determine the soil stratigraphy and grain size along the alignment of the slurry wall.

2. Drilling within the embayment area of the Niagara River along the proposed alignment of the slurry wall on the southern perimeter. Disturbed and undisturbed samples will be collected for geotechnical testing. The absence of NAPL will be verified.

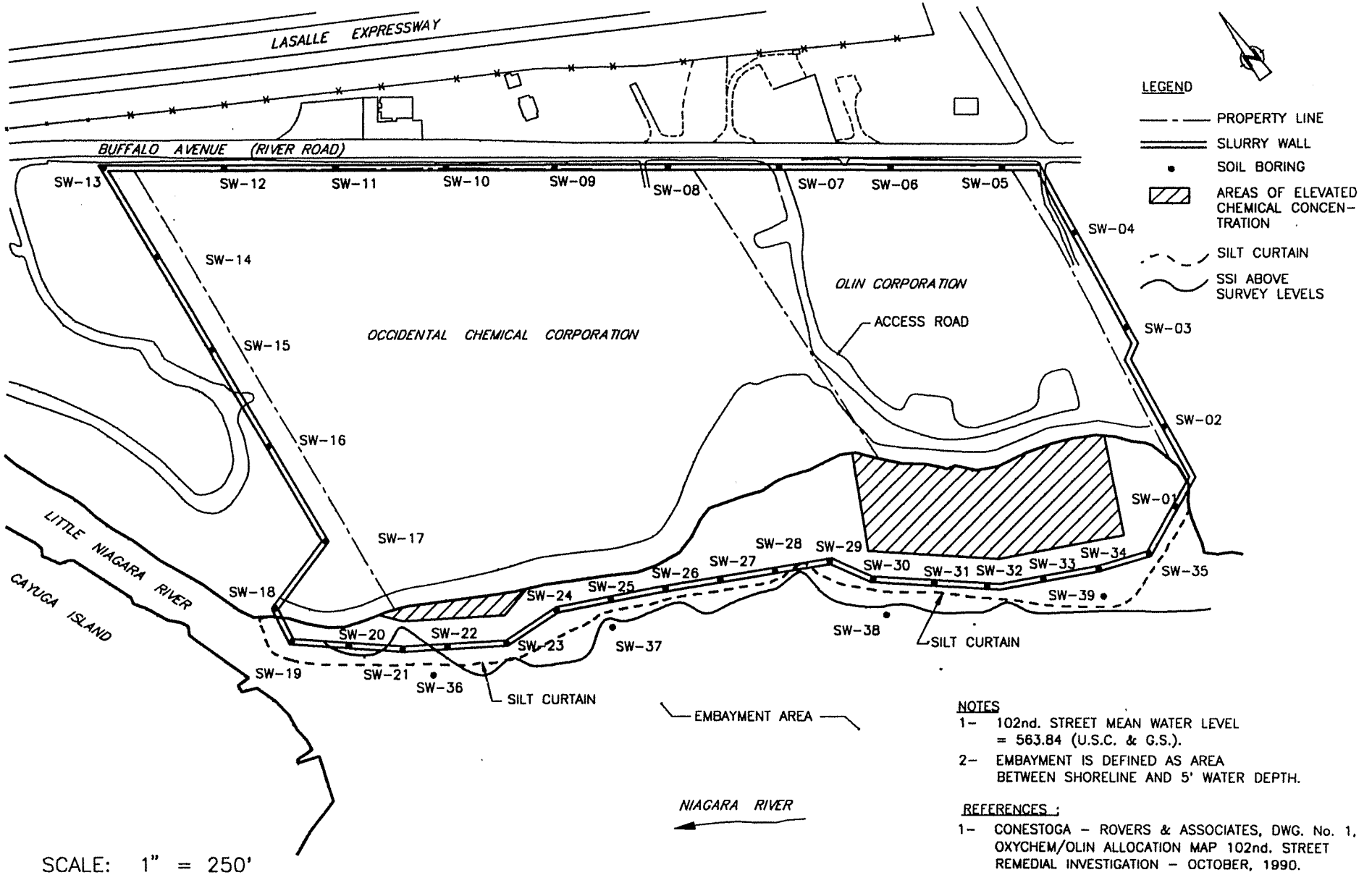
1.2 SUMMARY OF THE SAMPLING AND TESTING PROGRAM (Cont'd)

3. Performance of consolidation and compression tests of embayment clay and alluvial sediments to determine geotechnical parameters.

4. Perform or obtain grain size distribution tests on select off-site soils for potential use as slurry wall backfill material.

Figure 1-1 shows the planned location of each of the 39 borings to be drilled at the Site during the predesign field activities. The majority of the borings will be located along the proposed alignment of the slurry wall. As shown, a total of 35 perimeter borings are planned. In the river embayment area, in addition to the slurry wall alignment borings, four borings will be drilled further south of the slurry wall alignment to collect geotechnical data to support design of a cofferdam/bulkhead. The locations of these borings (SW-36 through SW-39) are shown on Figure 1-1.

Split-spoon samples will be collected from each of the soil borings, over the full length of the boring, on the perimeter of the Site. Select samples, representative of the soil fill and the alluvial sediments will be submitted for grain size distribution



NOTES

1- 102nd. STREET MEAN WATER LEVEL = 563.84 (U.S.C. & G.S.).

2- EMBAYMENT IS DEFINED AS AREA BETWEEN SHORELINE AND 5' WATER DEPTH.

REFERENCES :

1- CONESTOGA - ROVERS & ASSOCIATES, DWG. No. 1, OXYCHEM/OLIN ALLOCATION MAP 102nd. STREET REMEDIAL INVESTIGATION - OCTOBER, 1990.

Figure 1-1

BORING LOCATION PLAN

REMEDIAL DESIGN

DATE: 5-13-92

REV: F

PROJECT No: 23594000

OXYCHEM/OLIN

102nd Street Landfill Site

FLUOR DANIEL

CAD FILE: 102_1_1R.DWG

1.2 SUMMARY OF THE SAMPLING AND TESTING PROGRAM (Cont'd)

testing, atterberg limits determination and specific gravity tests. The specific samples to be tested and testing methodology are discussed in the following sections.

In addition, visual assessments will be made to ascertain the presence or absence of NAPL in each of the samples collected during the river embayment (southern boundary) drilling program. The identification of NAPL in a boring will require the relocation outward of the slurry wall alignment. Incremental outward or offshore distances will be determined by the companies' on-site representative with the concurrence of the EPA/State representative. Supplementary borings will then be drilled further offshore during this program until NAPL is not detected.

Undisturbed samples of the clay and alluvial sediments will be collected from borings SW-36 through SW-39 and from selected borings along the slurry wall alignment within the embayment area. These samples will be tested to determine consolidation and strength properties. These properties are required for the design of the bulkhead to be placed in the river embayment area.

1.2 SUMMARY OF THE SAMPLING AND TESTING PROGRAM (Cont'd)

Table 1-1 summarizes the sampling and testing to be done during the predesign field program. Table 1-1 lists the types and number of samples that will be selected for laboratory testing from the both the land-based drilling program and the river embayment drilling program, as well as additional testing of off-site sources of backfill material.

Drilling and sampling will be conducted in accordance with procedures and methodologies set forth by ASTM standards, and as contained in the SOP and QAP where applicable.

TABLE 1-1
SOIL SAMPLING PLAN
SUMMARY OF SAMPLES AND GEOTECHNICAL TESTS

TEST	NO. OF SAMPLES	MATRIX
Grain Size Distribution	35	Perimeter Soils, Embayment Soils/Sediments
Atterberg Limits Test	30	Perimeter Soils, Embayment Soils/Sediments
Specific Gravity Test	31	Perimeter Soils, Embayment Soils/Sediments
Consolidation Test	3	Embayment Clays
Consolidated, Undrained Triaxial Test	10	Embayment Clay and Alluvial Sediments
Unconsolidated, Undrained Triaxial Test	10	Embayment Clay and Alluvial Sediments
Grain Size Distribution	12	Potential Off-site Sources of Backfill Material

2.0 SOIL SAMPLING PLAN

The following discussion presents the methods and techniques applicable to the planned boring and soil sampling activities at the 102nd Street Landfill Site.

A drilling program will be conducted to obtain stratigraphic information and to provide soil samples for geotechnical testing from borings along the slurry wall perimeter. The borings located within the river embayment area are addressed separately due to the variations in drilling equipment and techniques that must be employed. The river embayment borings will also be used to determine the absence of NAPL along the southern boundary.

2.1 LAND-BASED DRILLING PROCEDURES

The drilling program will be conducted on the perimeter of the Site along the proposed alignment of the slurry wall. The borings will be advanced using hollow-stem auger techniques and will be located at a maximum separation of 200 feet along the west, east, and north sides of the Site, as shown on Figure 1-1.

2.1 LAND-BASED DRILLING PROCEDURES (Cont'd)

Each boring will be advanced to a maximum depth of 5 feet into the underlying confining layer of clay or till stratum, and continuous split spoon sampling will be conducted in all borings. The samples will be geologically logged according to the procedures in Section 21 of the SOP. Samples will be placed in Clean Soil Record Containers and held for secure storage as described in Section 9.3 of the SOP.

Any water brought to the surface during the drilling and sampling operations will be contained and collected in accordance with the SOP. Equipment decontamination and waste handling procedures are described in Section 4.

Table 2-1 presents information for the samples that will undergo geotechnical testing. The table provides soil sampling locations, identification numbers and the planned tests for the selected samples.

2.2 RIVER EMBAYMENT DRILLING PROCEDURES

A total of 23 borings will be drilled in the embayment of the Niagara River. The locations of these borings are shown on Figure 1-1. The borings are to be drilled on 100-foot centers along the proposed alignment of the slurry wall.

These borings will be advanced using rotary drilling techniques or by driving and washing techniques. The drilling technique will depend upon field conditions and upon the requirements necessary to minimize site disturbance. The boreholes will be drilled by skid-mounted drill rigs mounted on a shallow-draft pontoon barge. A tripod may be used to supplement the drilling effort. Maximum draft of the barge, when loaded with drill rig and tools should not exceed 18 inches.

Prior to the commencement of drilling activities in the field, a silt barrier will be installed to prevent migration of any sediments that may be disturbed by the boring activities. The silt barrier will be comprised of a floating absorbent boom connected to a geotextile fabric. The geotextile fabric will be a minimum of 48 inches in height. The bottom of the geotextile will be weighted.

2.2 RIVER EMBAYMENT DRILLING PROCEDURES (Cont'd)

The pontoon barge for the drilling program will be loaded and launched from the public launch facilities located in Griffon Park, immediately west of the Site. The barge will be moved from drilling location to drilling location by means of cables or ropes and pulleys anchored or attached to the shoreline.

The barge will be anchored at each drilling location by vertical pipes of 2 inch to 4 inch diameter which will be pushed vertically into the sediments and locked into place.

At each drilling location, a steel surface casing of 18 to 24 inch diameter will be pushed into the sediments and extend a minimum of 6 inches above the surrounding water level to seal the borehole and isolate it from the river waters. A second surface casing of 6 inch diameter will be used inside the outercasing. The borehole will be advanced using rotary drilling techniques or by driving and washing casing, as appropriate. Potable water will be used as the drilling fluid, where required.

Upon completion of the borehole it will be grouted back to ground surface. All drilling fluids and waters within the large surface casing will be contained and

2.2 RIVER EMBAYMENT DRILLING PROCEDURES (Cont'd)

transferred to a holding tank. The six-inch interior casing will be extracted during the grouting procedure. The outer casing will be left in place for a minimum of 24 hours after the grouting of the borehole.

2.2.1 NAPL DETECTION

In the course of conducting the offshore boring program, all split spoon samples will be examined for visual and olfactory evidence of NAPL. Should NAPL be encountered at any boring location, the boring will be grouted prior to relocation. An additional boring will be made at a new point further offshore from the previous location and away from the Site. The exact distance will be determined by the companies' on-site representative. Samples from the additional boring will be similarly inspected for the presence of NAPL.

This procedure will be continued until NAPL is not observed or detected. The alignment and design of the slurry trench will be adjusted as required based upon the results of these field assessments in order to encompass any identified NAPL.

2.3 SOIL SAMPLING PROCEDURES

The soil sampling procedures described in this section are common to both the land-based drilling program and the river embayment drilling program.

2.3.1 Split Spoon Sampling

Samples will be collected in accordance with ASTM D 1586 - Standard Method for Penetration Test and Split-Barrel Sampling of Soils and in accordance with the SOP. Standard Penetration Tests will be taken as the split spoons are driven to collect the sample. Once the sampler is brought to the surface and opened, the percent recovery or the length of sample recovered is recorded. The description of the soil sample recovered is then recorded according to NYDOT procedures in Section 21 of the SOP. Southern boundary samples will be examined for the presence or absence of NAPL. A representative portion of the sample is then placed into the sample jars.

The split spoon sample will then be transported to an approved geotechnical testing laboratory or to secure storage at the site according to the procedures of the SOP.

2.3.1 Split Spoon Sampling (Cont'd)

All sampling equipment will then be cleaned according to the procedures outlined in Section 4.1 of this plan.

To enhance the recovery of disturbed samples within the embayment area it may become necessary to employ a piston sampler as described in Section 7.2 of the SOP and modified according to the SOP Addendum, dated March 30, 1987.

2.3.2 Undisturbed Sampling

Collection of undisturbed samples using Shelby Tubes or a Dennison Sampler will be carried out in accordance with ASTM D 1587 - Standard Practice for Thin-Walled Sampling of Soils. After sample collection, each tube will be sealed for transport in accordance with ASTM D 4220 - Practices for Preserving and Transporting Soil Samples, such that the integrity and moisture content of the sample are preserved.

2.3.2 Undisturbed Sampling (Cont'd)

All boreholes will be grouted to ground surface upon completion of the borehole. The grout will consist of a cement-bentonite mixture as described in Section 9.1 of the SOP. The grout will be tremied to the bottom of the borehole.

2.4 GEOTECHNICAL SAMPLE LOCATIONS

2.4.1 Soil Characterization Testing

As indicated in Figure 1-1, one boring on both the east and west Site perimeter, and two borings on the north Site perimeter (SW-03, 07, 10, 15) have been planned to provide samples for grain size distribution tests, atterberg limits and specific gravity testing. At each of these four boring locations, soil samples will be collected with a split spoon sampler/hollow-stem auger at depths of 5, 10, 15 and 25 feet. If an insufficient sample is collected from the sampler, additional samples will be collected from the nearest depth interval until an adequate sample is acquired. All samples will be tested to determine grain size distribution by sieve and hydrometer analysis; and each sample will be tested to determine the atterberg limits of liquid limit, plastic limit and natural moisture content of the soils.

2.4.1 Soil Characterization Testing (Cont'd)

Grain size distribution testing will also be done on samples collected from two borings (SW-23, 30) in the river embayment at depths of 5, 10, 15 and 20 feet. Additionally, in conjunction with the strength tests of the embayment soils, grain size distribution tests and atterberg limits will be completed on samples from seven additional borings in the embayment area. Table 2-1 provides specific boring locations and depths.

2.4.2 Consolidation and Strength Testing

Soil samples will be taken from seven borings (SW-22, 27, 33, 36-9) located in the river embayment area for consolidation and shear strength testing. These samples will be collected as undisturbed samples using a thin-walled sampling device or a Dennison-type sampler. The locations of the borings for collection of undisturbed samples is shown in Figure 1-1 and in Table 2-1.

2.4.2 Consolidation and Strength Testing (Cont'd)

Three borings are located along the slurry wall alignment in the embayment and four of the borings will be located approximately 30 feet outboard of the proposed slurry wall alignment. The sample schedule for the strength and consolidation testing is shown in Table 2-1.

TABLE 2-1
SOIL SAMPLING PLAN
SAMPLE IDENTIFICATION AND GEOTECHNICAL TESTS

BORING NUMBERS	SAMPLE IDENTIFICATION	NUMBER OF SAMPLES	LABORATORY TESTS
SW-03,07,10,15	-01	5 feet,	G.S., A.L., S.G.
	-02	10 feet, 16	G.S., A.L., S.G.
	-03	15 feet, TOTAL	G.S., A.L., S.G.
	-04	25 feet	G.S., A.L., S.G.
SW-23,30	-01	5 feet,	G.S.
	-02	10 feet, 8	G.S.
	-03	15 feet, TOTAL	G.S.
	-04	20 feet	G.S.
SW-22,27,33	-01	5 ft- Alluvial/Clay	CU, UU, G.S., A.L.
	-02	10 ft-Alluvial/Clay	CU, UU
	-03	Clay (if present)	Consolidation, A.L.
	-04	Clay (if present)	CU
SW-36,37,38,39	-01	Clay	Consolidation, A.L.
	-02	Alluvial/Clay	CU, UU, G.S., A.L.

CU = Consolidated, Undrained Triaxial Test
UU = Unconsolidated, Undrained Triaxial Test
G.S. = Grain Size Distribution Test
A.L. = Atterberg Limits Test
S.G. = Specific Gravity Determination

3.0 FIELD DOCUMENTATION

A bound field notebook will be maintained by the companies' site representative to provide daily records of significant events, observations, and measurements during field activities. This notebook will be kept as a permanent record.

Information in the field notebook will include but not be limited to the following items.

- Names and affiliations of personnel on site
- General description of each day's field activities
- Documentation of weather conditions during sampling
- Location of sampling (station number as description)
- Name of companies' site representative (in cover of logbook)
- Description of accidents involving field personnel on site
- Records of field equipment malfunction and repair
- Type of sample matrix
- Date and time of collection
- Sample identification number
- Sample distribution

3.0 FIELD DOCUMENTATION (Cont'd)

- Observations of sample or collection environment, if needed
- Sampler's name
- Sample type (split spoon, Shelby tube, etc.)

4.0 SITE MANAGEMENT

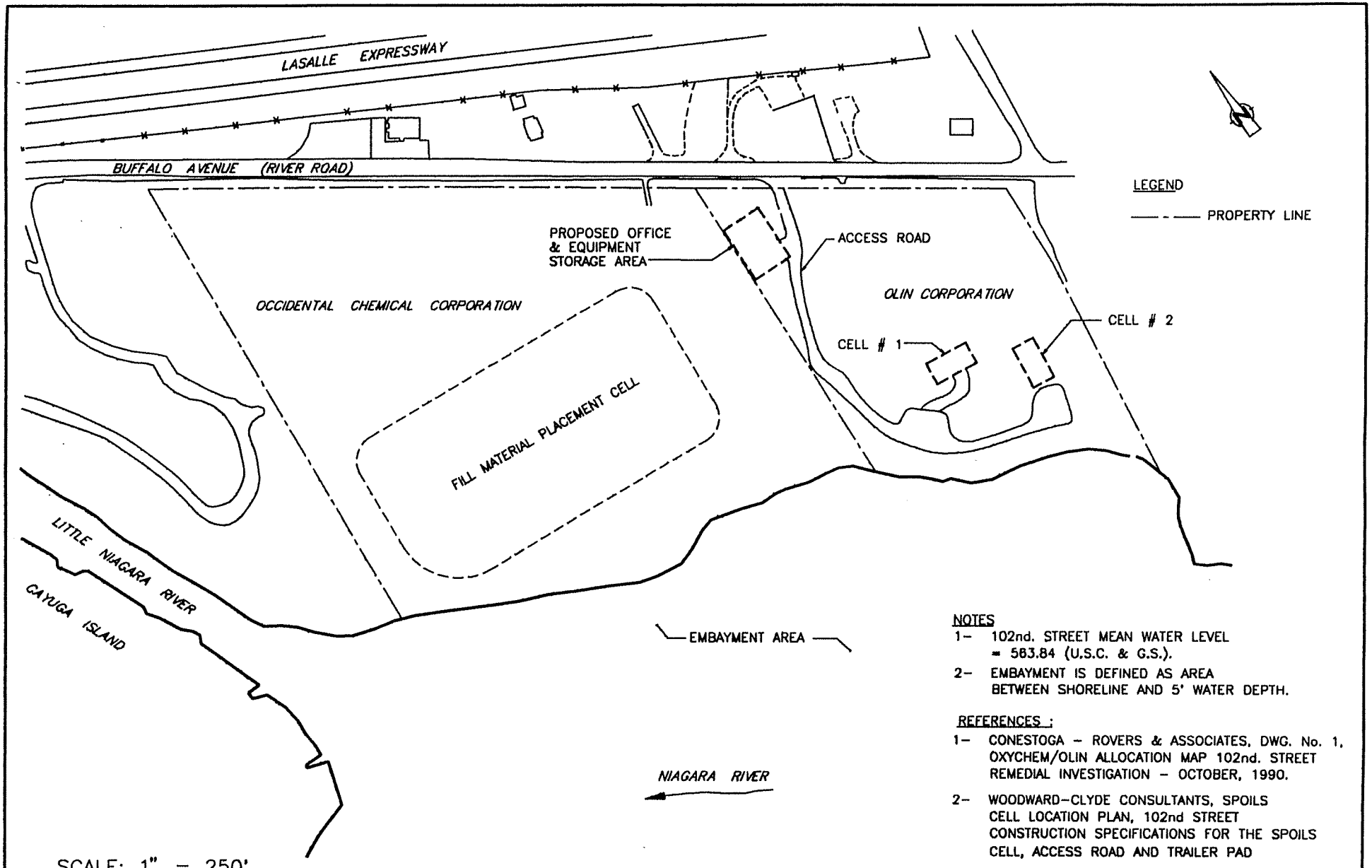
The following sub-sections outline specific functions of site management which are pertinent to the field activities supporting the Remedial Design process for the 102nd Street Landfill Site project.

The companies' site representative is also responsible for advising EPA representatives of on-going operations. All health and safety practices will be followed in strict accordance with the project Health and Safety Plan (HASP). The updated HASP Key Personnel list is appended to this Plan.

See Figure 4-1 for proposed site facilities location.

4.1 SAMPLING EQUIPMENT DECONTAMINATION PROCEDURES

Soil samples collected during the Remedial Design field program will not be submitted for chemical analysis; therefore, sampling equipment does not require extensive decontamination procedures. Soil samples will be used to determine grain



NOTES

1- 102nd. STREET MEAN WATER LEVEL = 563.84 (U.S.C. & G.S.).

2- EMBAYMENT IS DEFINED AS AREA BETWEEN SHORELINE AND 5' WATER DEPTH.

REFERENCES :

1- CONESTOGA - ROVERS & ASSOCIATES, DWG. No. 1, OXYCHEM/OLIN ALLOCATION MAP 102nd. STREET REMEDIAL INVESTIGATION - OCTOBER, 1990.

2- WOODWARD-CLYDE CONSULTANTS, SPOILS CELL LOCATION PLAN, 102nd STREET CONSTRUCTION SPECIFICATIONS FOR THE SPOILS CELL, ACCESS ROAD AND TRAILER PAD

Figure 4-1	PROPOSED SITE FACILITIES REMEDIAL DESIGN	DATE: 5-5-92 REV: C PROJECT No: 23594000	OXYCHEM/OLIN 102nd Street Landfill Site FLUOR DANIEL

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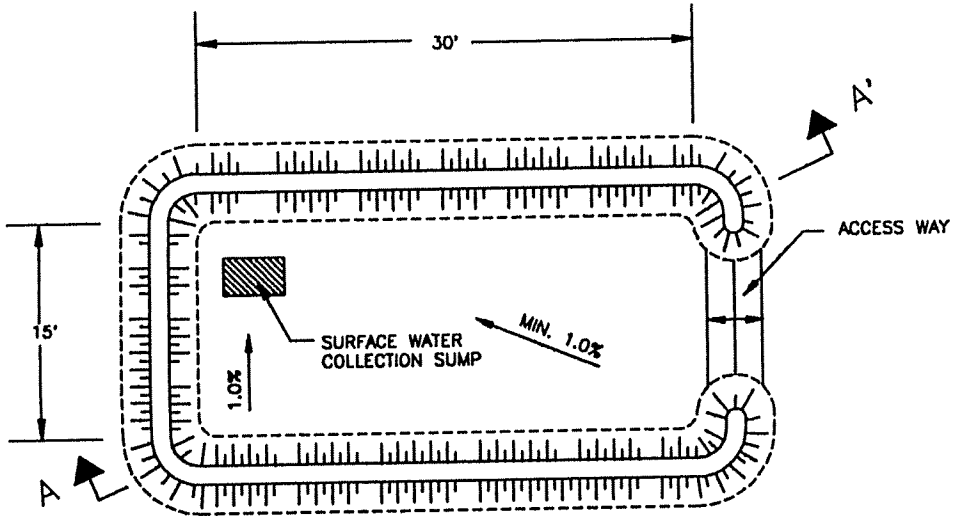
4.1 SAMPLING EQUIPMENT DECONTAMINATION PROCEDURES (Cont'd)

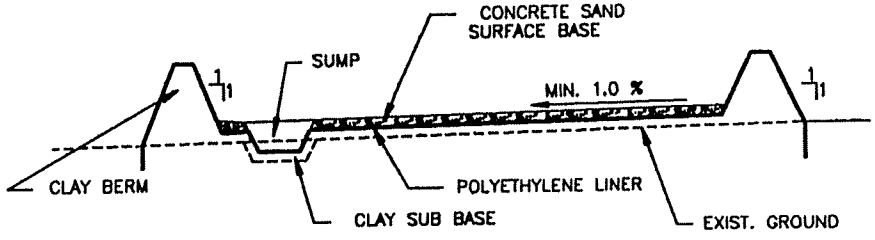
size characteristics and provide stratigraphic data. Split spoon samplers will be washed between samples using a detergent and tap water and employing a stiff brush to remove soil particles.

Before entering the Site, all drill rigs and support vehicles will be cleaned. The equipment will be inspected to ensure that it is suitably cleaned and that there are no fluid leaks.

The truck-mounted drill rig and drilling tools will be steam cleaned between each boring. The river embayment drill rig tools will be steam cleaned between each boring.

Drill rigs and drilling tools will be cleaned at a temporary decontamination pad constructed on site. See Figure 4-2 for the arrangement of the decontamination facility. All drill rigs and tools will be decontaminated using a powered steam system. Detergent (Alconox) solutions may be used as necessary to properly clean equipment. Any collected water will be stored in the existing on site bulk tank.





SECTION A – A'

N.T.S.

Figure 4–2	TYPICAL TEMPORARY DECONTAMINATION FACILITY REMEDIAL DESIGN	DATE: 4–13–92 REV: A PROJECT No: 23594000	OXYCHEM/OLIN 102nd Street Landfill Site FLUOR DANIEL

CAD FILE:

4.2 SURVEY OF SITE SAMPLING POINTS

Prior to the commencement of soil borings and sampling, the sampling points will be surveyed and flagged. Drilling locations will be surveyed and the elevations of each boring location will be established.

4.3 HANDLING PROCEDURES FOR PROGRAM-DERIVED WASTES

All solid wastes derived from the field program will be containerized in 55 gallon drums, and disposed of in an on-site cell. Cells as specified in Figure 4-1 will be utilized to dispose of solid waste materials and drill spoil generated during this field program.

As solid wastes are generated, e.g. drill cuttings, used personnel protective equipment and solids from the decontamination pad, they will be transported to a cell for disposal. Drums used for transportation will be crushed and placed within the cell.

5.0 TESTING PROCEDURES

Soil samples collected during the field program will be sent to Huntington Analytical Services, Middleport, New York for testing. Specific samples of alluvial soil and fill will undergo testing to determine grain size distribution. The samples of river alluvium and clay from the embayment area will be tested for consolidation characteristics and strength properties. Laboratory testing will be conducted in accordance with the appropriate ASTM and API standard procedures. These procedures are summarized in Table 5-1.

5.1 GRAIN SIZE ANALYSIS

Selected samples of alluvial soils and fill from the slurry wall alignment borings will be tested to determine grain size distribution. The related samples are identified in Table 2-1. The testing will be conducted in accordance with ASTM D 422 - Standard Method for Particle-Size Analysis of Soils. The testing will include sieve analysis and hydrometer analysis as necessary.

5.1 GRAIN SIZE ANALYSIS (Cont'd)

In addition, off-site soils identified by the Owners as potential sources of backfill material for the slurry wall will be collected and tested for particle size distribution as described above.

Results of the tests will be presented in graphical form demonstrating the distribution of particle sizes within each sample tested.

5.2 ATTERBERG LIMITS

Determinations of the liquid limit, plastic limit (Atterberg Limits) and natural moisture content of the cohesive soils and sediments of the Site will be undertaken. The samples to be tested are identified in Table 2-1. The testing will be conducted in accordance with the procedures of ASTM D 4318, Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

5.3 SPECIFIC GRAVITY TESTS

Determinations of specific gravity of selected soil samples will be undertaken. The samples to be tested are shown in Table 2-1. The tests will be conducted in accordance with ASTM D 854, Standard Test Method for Specific Gravity of Soils.

5.4 CONSOLIDATION TESTS

Consolidation tests will be conducted on samples of clay collected from select borings completed in the embayment and fill areas as indicated in Table 2-1.

The testing will be conducted in accordance with ASTM D4186 - Standard Test Method for One-Dimensional Consolidation Properties of Soils Using Controlled-Strain Loading. Samples will also be tested for natural moisture content (Method D 2216), specific gravity (Method D 854) and Atterberg Limits as a part of the consolidation test method.

5.5 TRIAXIAL COMPRESSION TESTS

Undrained shear strength parameters for the alluvial sediments and clays of the embayment area will be determined. Triaxial compression tests will be conducted on consolidated (CU) and unconsolidated (UU) samples of the embayment soils. Tests will be performed in conformance with ASTM D 2850 - Test Method for Unconsolidated, Undrained Compressive Strength of Cohesive Soils in Triaxial Compression and ASTM D 4767 - Test Method for Consolidated-Undrained Triaxial Compression Test on Cohesive Soils.

Related sample locations are indicated in Table 2-1. Shear strength parameters will be used to perform stability calculations on the embayment bulkhead.

TABLE 5-1

SUMMARY OF TESTING PROCEDURES

TEST NO.	TITLE
ASTM D422	Standard Method for Particle Size Analysis for Soils
ASTM D4318	Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils
ASTM D854	Standard Test Method for Specific Gravity of Soils
ASTM D4186	Standard Test Method for One-Dimensional Consolidation Properties of Soils Using Controlled-Strain Loading
ASTM D2850	Test Method for Unconsolidated, Undrained Compression Strength of Cohesive Soils in Triaxial Compression
ASTM D4767	Test Method for Consolidated-Undrained Triaxial Compressive Test on Cohesive Soils

6.0 REPORTING

Results of the geotechnical sampling and testing will be presented in the Predesign Field Activity Report (PFAR). The report will include the data collected from the drilling programs, a summary of samples collected and the results of geotechnical laboratory tests.

The PFAR will include the following basic elements:

- Final as-built locations of borings;
- A description of variations in methods, quantities or locations from the program described in the GSTP;
- A description of the soils encountered during the drilling program;
- A discussion of the presence of NAPL in any southern perimeter boring and a description of the efforts which determined the outlying extent of it, including additional borings;
- A presentation of the results of the geotechnical testing and a discussion of the significance of the results for the Remedial Design;
- A presentation of the results of the potential backfill soil grain site distribution;

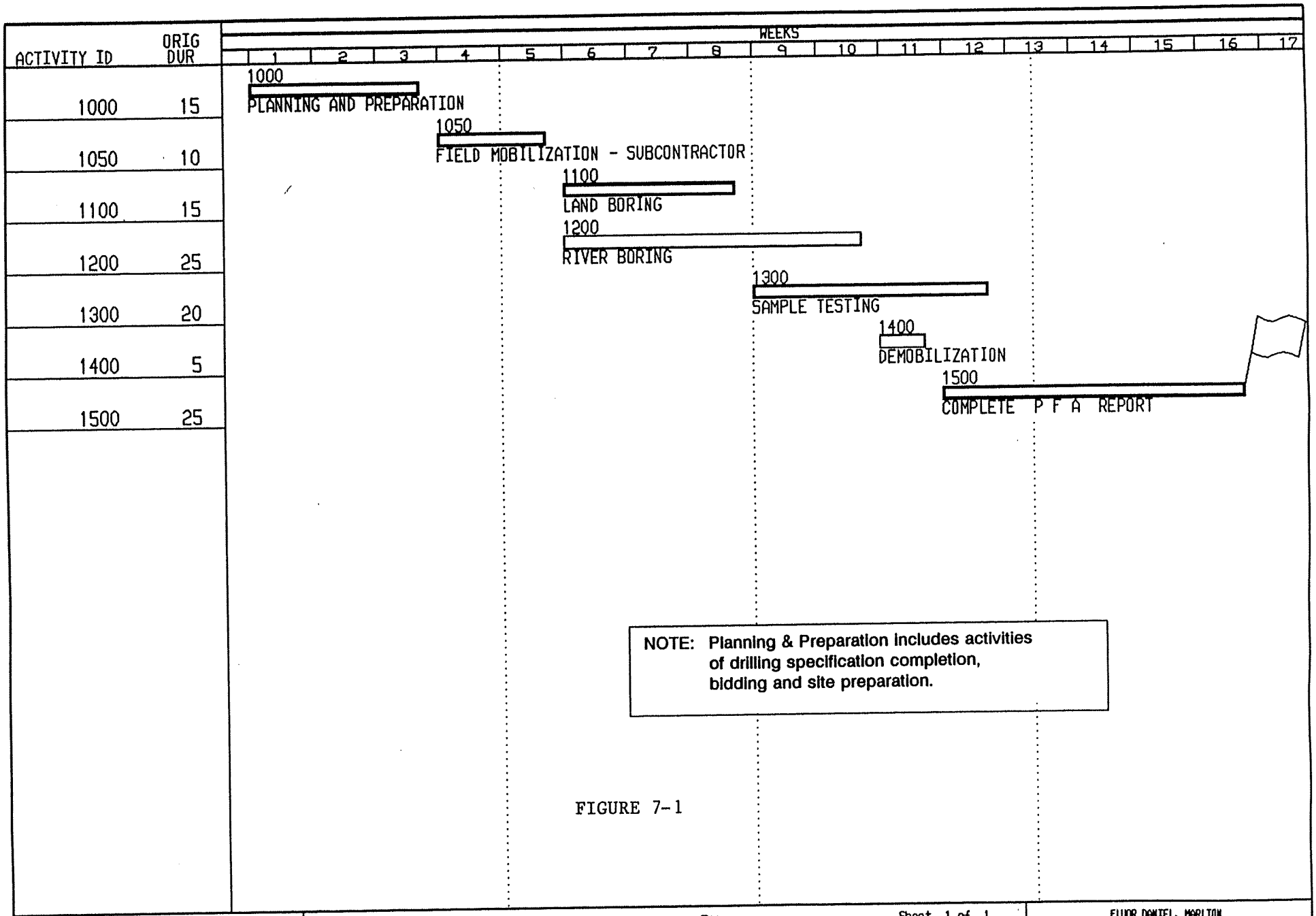
6.0 REPORTING (Cont'd)

- Appendices containing boring logs and laboratory tests data;
- Profile drawings showing depth to clay for the purpose of indicating potential slurry wall depth.

7.0 SCHEDULE

Figure 7-1 depicts the schedule of planned predesign field activities.

After the approval of the GSTP, the planning and preparation activity will begin. Field activities will not occur during adverse weather or seasonal conditions (winter).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PLANNING AND PREPARATION
1050
FIELD MOBILIZATION - SUBCONTRACTOR
1100
LAND BORING
1200
RIVER BORING
1300
SAMPLE TESTING
1400
DEMOBILIZATION
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COMPLETE P F A REPORT
NOTE: Planning & Preparation includes activities of drilling specification completion, bidding and site preparation.
Activity Bar/Early Dates
Critical Activity
Progress Bar
Primavera Systems, Inc. 1984-1991
OXYCHEM/OLIN
102nd STREET LANDFILL SITE
P F A SCHEDULE
Sheet 1 of 1
Project Start : 110CT91
Project Finish: 23APR93
Data Date: 1JAN93
Plot Date: 14APR92
FLUOR DANIEL, MARLTON
Date
Revision
Checked
Approved

FIGURE 7-1

APPENDIX A

HEALTH AND SAFETY ADDENDUM

KEY PERSONNEL

HEALTH AND SAFETY ADDENDUM

KEY PERSONNEL

Key personnel for this project include the individuals listed below.

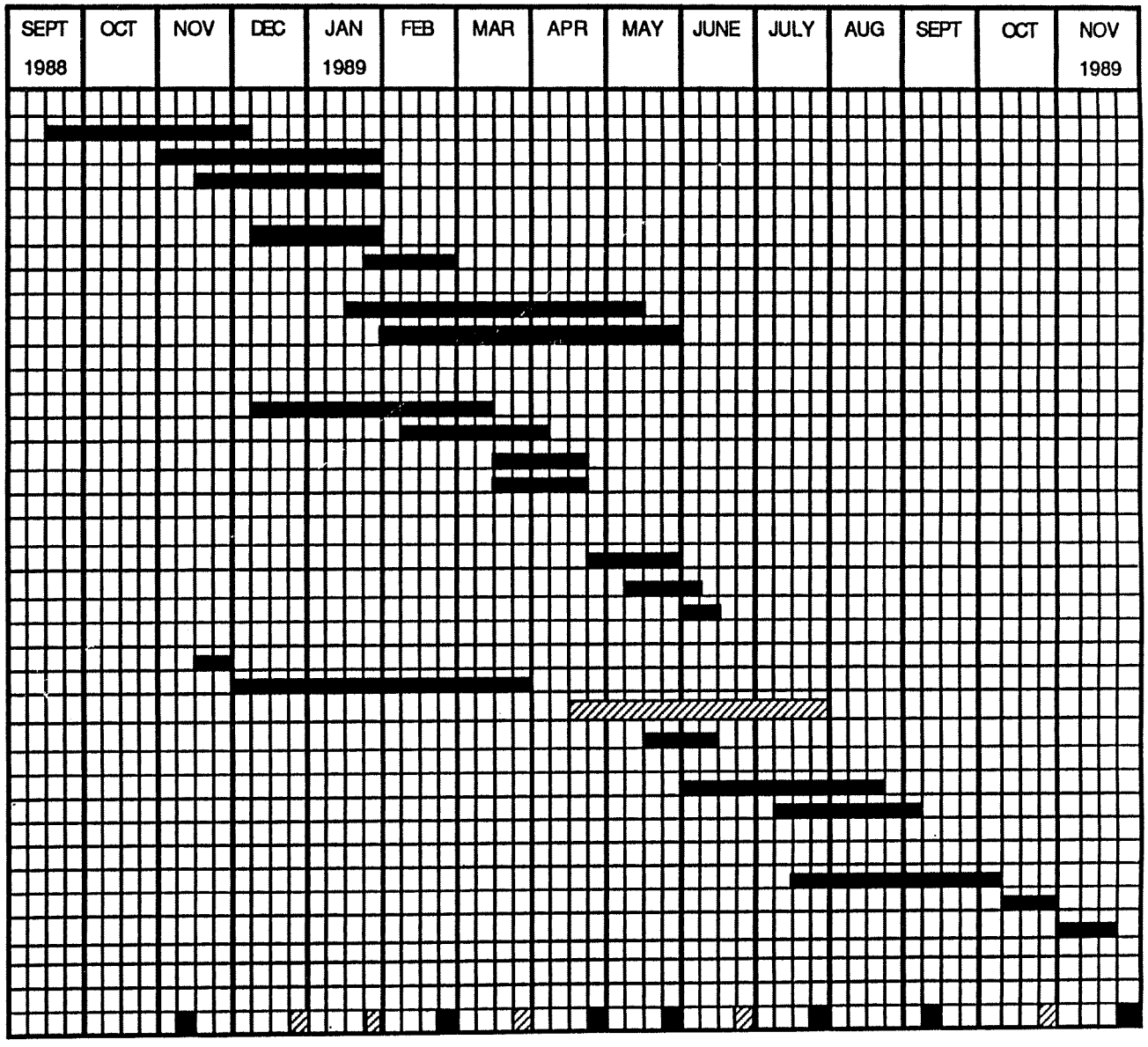
Assigned Role	Individuals from Engineer
Project Manager	Al Guillen, P.E.
Lead Hydrogeologist	Gordon Burnett
Field Manager (*)	William Shannon
Health and Safety Representative (*)	Cliff Florczak, CIH

(*) Field personnel

Emergency Contacts

Contact	Telephone #
Ron Ganguly Owner's OxyChem Project Manager	716-286-3669 (Work) 716-636-0535 (Home)
Robert Guillory Owner's Olin Project Manager	615-336-4503 (Work) 615-472-3223 (Home)
Donald Woods Engineer's, Health & Safety Manager	312-368-3905 (Work)
Al Guillen Engineer's Project Manager	609-985-4923 (Work) 609-985-1620 (Home)
Cliff Florczak Engineer's Health & Safety Representative	312-268-3675 (Work)
Dave Herrington Engineer's Daniel Regional Safety	609-985-4839 (Work)
Paul Olivo EPA Region II Project Manager	212-264-6477 (Work)
Thomas Christoffel State Representative	518-457-5636 (Work)

Final Schedule
Feasibility Study - 102nd Street Landfill



1.0 RI Review and Analysis (Task 1)
- 1.1 Review RI Results
- 1.2 Finalize Operable Units
- 1.3 Finalize Objectives of FS

2.0 Develop Preliminary ARARs
- 2.1 Chemical/Location - specific
- 2.2 Agency Input

3.0 Baseline Risk Assessments
- 3.1 Public Health Assessment (Task 2)
- 3.2 Env. Endangerment Assessment (Task 3)

PRP Review

4.0 Identification of Remedial Alternatives
- 4.1 Formulation of Potential Technologies (Task 5)
- 4.2 Screening of Technologies (Task 6)
- 4.3 Formulation of Remedial Alternatives (Task 7)
- 4.4 Action - specific ARARs (Task 4)

PRP Review

5.0 Development of Remedial Alternatives
- 5.1 Refinement of Alternatives (Task 8)
- 5.2 Initial Screening of Alternatives (Task 9)
- 5.3 Selection Remedial Alternatives (Task 10)

6.0 Post-screening Field Investigations
- 6.1 Finalize Sampling Program
- 6.2 Assessment Chemical Monitoring
- 6.3 Supplemental Data (if required) (Task 11)

7.0 Final Review of ARARs by EPA/State

8.0 Final Screening of Alternatives (Task 12)
- 8.1 Detailed Analysis of Alternatives
- 8.2 Comparative Analysis of Alternatives

PRP Review

9.0 FS Report (Task 13)
- 9.1 Draft FS Report
- 9.2 PRP Review
- 9.3 Second Draft FS Report
- 9.4 EPA/State Review Point

10.0 Public Comment

11.0 Final FS Report (Task 14)

12.0 Technical Meetings

■ Schedule Based on EPA/State Review

▨ If Necessary

REC'D: 4-26-91

COST SUMMARY DATE: 04/12/91
HOOKER 102ND ST., NY (SSID = 2 09)
Prepared: / /

(Analysis Time Frame: 10/01/69 to 09/3 /90)

EPA EXPENDITURES

REGIONAL PAYROLL EXPENSES	$	183599.37
REGIONAL TRAVEL EXPENSES		17724.29
EPA INDIRECT COST		425991.00
HEADQUARTERS PAYROLL EXPENSES		40356.74
HEADQUARTERS TRAVEL EXPENSES		3873.41

ALTERNATIVE REMEDIAL CONTRACT SUPPORT (ARCS)

- TAMS CONSULTANT, INC. (68-S9-2001)	82491.65

CONTRACT LAB PROGRAMS (CLP)

- CAMBRIDGE ANALYTICAL ASSOC (CAMBRG) (68-01-6874)	2867.52
- ENSECO CORPORATION/ERCO (ENSECO) (68-01-7476)	637.26
- S-CUBED (S3) (68-01-7261)	10845.12
- SOUTHWEST RESEARCH INSTITUTE (SWRI) (68-01-7167)	967.16
- VIAR (68-01-7253)	158500.29

FIELD INVESTIGATION TEAM (FIT) CONTRACT

- ECOLOGY AND ENVIRONMENT (68-01-6056)	262614.31
- NUS (68-01-6699)	56806.68

INTERAGENCY AGREEMENTS (IAG)

- DEPARTMENT OF JUSTICE (DW15240101)	24978.64
- DEPARTMENT OF JUSTICE (DW15341501)	24026.80

(Analysis Time Frame: 10/01/69 to 09/30/90)

EPA EXPENDITURES

- DEPARTMENT OF JUSTICE (DW15365401)	7939.99

MISCELLANEOUS EXPENDITURES (MIS)

- (0C68042032)	604.09
- (680041NASA)	810.00
- (980034NASA)	13.49

NATIONAL ENFORCEMENT INVESTIGATION (NEI) CENTER EXPENSES

- TECHLAW (68-01-6838)	8323.51
- TECHLAW-REAT REGIONAL EVIDENCE AUDIT TEAM (68-01-7104)	2353.83
- TECHLAW-CONTRACT EVIDENCE AUDIT TEAM (68-01-7369)	162.51

OTHER EXPENDITURES

- GEO TRANS, INC. (68-01-7270)	149357.52
- ECOLOGY AND ENVIRONMENT (68-01-7271)	81010.97
- GRADIENT CORPORATION (68-01-7336)	310382.04
- GANNETT FLEMING WATER RES.ENGINEERS INC. (68-01-7337)	5216.26
- DEPARTMENT OF JUSTICE (AD15F2A090)	162.66

REMEDIAL (REM) CONTRACT

- NUS (68-01-6699)	761263.19
- EBASCO (68-01-7250)	2502.50

STATE COOPERATIVE AGREEMENTS (SCA)

(Analysis Time Frame: 10/01/69 to 09/30/90)

EPA EXPENDITURES

- NEW YORK (264187)	305728.00

TECHNICAL ASSISTANCE TEAM (TAT) CONTRACT

- ROY F. WESTON (68-01-6669)	6948.03
- ROY F. WESTON (68-01-7367)	538.92

TECHNICAL ENFORCEMENT SUPPORT (TES) CONTRACT

- ALLIANCE/GCA (68-01-6769)	1340.55
- PLANNING RESEARCH CORPORATION (68-01-7037)	413.03
- ALLIANCE TECHNOLOGIES CORPORATION (68-W9-0003)	106355.55
TOTAL EPA EXPENDITURES	3047706.88

COST SUMMARY DATE: 04/12/91
HOOKER 102ND ST., NY (SSID = 2 09)
Prepared: / /
Cost Data From 10/01/69 To 09/30/90

STATE COOPERATIVE AGREEMENT (SCA)

STATE: NEW YORK (NY)

STATE COOPERATIVE AGREEMENT NUMBER: 264187

SUMMARY OF SERVICE:

TOTAL SCA COST: $ 305728.00

DOCUMENTATION: Copies of Applicable Paid Vouchers and Treasury Schedules

VOUCHER NUMBER	VOUCHER DATE	VOUCHER AMOUNT	TREASURY SCHEDULE NUMBER AND	TRANSACTION DATE	SITE AMOUNT	UPD ID.	ACT CODE	REC NO.
146013200	12/07/88	320000.00	LC024	12/08/88	143000.00	A	P	2050
146013200	12/20/88	260000.00	LC027	12/21/88	31000.00	A	P	2051
146013200	01/04/89	130000.00	LC033	01/05/89	60000.00	A	P	2052
146013200	11/09/89	114110.00	LC029	11/10/89	71728.00	A	P	2053

COST SUMMARY DATE: 04/12/91
Prepared: / /

NARRATIVE SUMMARY/STATEMENT OF FACTS - COSTS FOR HOOKER 102ND ST., NY (2 09)

(Analysis Time Frame: 10/01/69 to 09/30/90)

1. The United States Environmental Protection Agency has incurred costs of at least $ 82491.65 for Alternative Remedial Contract Support contract expenditures. The total represents the amount spent under the TAMS CONSULTANT, INC. Contract.

2. The United States Environmental Protection Agency has incurred costs of at least $ 2867.52 for CONTRACT LAB PROGRAMS (CLP) contract expenditures. The total represents the amount spent under the CAMBRIDGE ANALYTICAL ASSOC (CAMBRG) Contract.

3. The United States Environmental Protection Agency has incurred costs of at least $ 637.26 for CONTRACT LAB PROGRAMS (CLP) contract expenditures. The total represents the amount spent under the ENSECO CORPORATION/ERCO (ENSECO) Contract.

4. The United States Environmental Protection Agency has incurred costs of at least $ 10845.12 for CONTRACT LAB PROGRAMS (CLP) contract expenditures. The total represents the amount spent under the S-CUBED (S3) Contract.

5. The United States Environmental Protection Agency has incurred costs of at least $ 967.16 for CONTRACT LAB PROGRAMS (CLP) contract expenditures. The total represents the amount spent under the SOUTHWEST RESEARCH INSTITUTE (SWRI) Contract.

6. The United States Environmental Protection Agency has incurred costs of at least $ 158500.29 for CONTRACT LAB PROGRAMS (CLP) contract expenditures. The total represents the amount spent under the VIAR Contract.

7. The United States Environmental Protection Agency has incurred costs of at least $ 262614.31 for Field Investigation Team contract expenditures. The total represents the amount spent under the ECOLOGY AND ENVIRONMENT Contract.

8. The United States Environmental Protection Agency has incurred costs of at least $ 56806.68 for Field Investigation Team contract expenditures. The total represents the amount spent under the NUS Contract.

9. The United States Environmental Protection Agency has incurred costs of at least $ 24978.64 for Interagency Agreement contract expenditures. The total represents the amount spent under the DEPARTMENT OF JUSTICE Contract.

10. The United States Environmental Protection Agency has incurred costs of at least $ 24026.80 for Interagency Agreement contract expenditures. The total represents the amount spent under the DEPARTMENT OF JUSTICE Contract.

NARRATIVE SUMMARY/STATEMENT OF FACTS - COSTS FOR HOOKER 102ND ST., NY (2 09)

(Analysis Time Frame: 10/01/69 to 09/30/90)

11. The United States Environmental Protection Agency has incurred costs of at least $ 7939.99 for Interagency Agreement contract expenditures. The total represents the amount spent under the DEPARTMENT OF JUSTICE Contract.

12. The United States Environmental Protection Agency has incurred costs of at least $ 604.09 for Miscellaneous contract expenditures. The total represents the amount spent under the Contract.

13. The United States Environmental Protection Agency has incurred costs of at least $ 810.00 for Miscellaneous contract expenditures. The total represents the amount spent under the Contract.

14. The United States Environmental Protection Agency has incurred costs of at least $ 13.49 for Miscellaneous contract expenditures. The total represents the amount spent under the Contract.

15. The United States Environmental Protection Agency has incurred costs of at least $ 8323.51 for National Enforcement Investigations Center contract expenditures. The total represents the amount spent under the TECHLAW Contract.

16. The United States Environmental Protection Agency has incurred costs of at least $ 2353.83 for National Enforcement Investigations Center contract expenditures. The total represents the amount spent under the TECHLAW-REAT REGIONAL EVIDENCE AUDIT TEAM Contract.

17. The United States Environmental Protection Agency has incurred costs of at least $ 162.51 for National Enforcement Investigations Center contract expenditures. The total represents the amount spent under the TECHLAW-CONTRACT EVIDENCE AUDIT TEAM Contract.

18. The United States Environmental Protection Agency has incurred costs of at least $ 149357.52 for Other contract expenditures. The total represents the amount spent under the GEO TRANS, INC. Contract.

19. The United States Environmental Protection Agency has incurred costs of at least $ 81010.97 for Other contract expenditures. The total represents the amount spent under the ECOLOGY AND ENVIRONMENT Contract.

20. The United States Environmental Protection Agency has incurred costs of at least $ 310382.04 for Other contract expenditures. The total represents the amount spent under the GRADIENT CORPORATION Contract.

COST SUMMARY DATE: 04/12/91
Prepared: / /

NARRATIVE SUMMARY/STATEMENT OF FACTS - COSTS FOR HOOKER 102ND ST., NY (2 09)

(Analysis Time Frame: 10/01/69 to 09/30/90)

21. The United States Environmental Protection Agency has incurred costs of at least $ 5216.26 for Other contract expenditures. The total represents the amount spent under the GANNETT FLEMING WATER RES.ENGINEERS INC. Contract.

22. The United States Environmental Protection Agency has incurred costs of at least $ 162.66 for Other contract expenditures. The total represents the amount spent under the DEPARTMENT OF JUSTICE Contract.

23. The United States Environmental Protection Agency has incurred costs of at least $ 761263.19 for Remedial contract expenditures. The total represents the amount spent under the NUS Contract.

24. The United States Environmental Protection Agency has incurred costs of at least $ 2502.50 for Remedial contract expenditures. The total represents the amount spent under the EBASCO Contract.

25. The United States Environmental Protection Agency has incurred costs of at least $ 305728.00 for State Cooperative Agreement contract expenditures. The total represents the amount spent under the NEW YORK Contract.

26. The United States Environmental Protection Agency has incurred costs of at least $ 6948.03 for Technical Assistance Team contract expenditures. The total represents the amount spent under the ROY F. WESTON Contract.

27. The United States Environmental Protection Agency has incurred costs of at least $ 538.92 for Technical Assistance Team contract expenditures. The total represents the amount spent under the ROY F. WESTON Contract.

28. The United States Environmental Protection Agency has incurred costs of at least $ 1340.55 for Technical Enforcement Support contract expenditures. The total represents the amount spent under the ALLIANCE/GCA Contract.

29. The United States Environmental Protection Agency has incurred costs of at least $ 413.03 for Technical Enforcement Support contract expenditures. The total represents the amount spent under the PLANNING RESEARCH CORPORATION Contract.

30. The United States Environmental Protection Agency has incurred costs of at least $ 106355.55 for Technical Enforcement Support contract expenditures. The total represents the amount spent under the ALLIANCE TECHNOLOGIES CORPORATION Contract.

COST SUMMARY DATE: 04/12/91
Prepared: / /

NARRATIVE SUMMARY/STATEMENT OF FACTS - COSTS FOR HOOKER 102ND ST., NY (2 09)

(Analysis Time Frame: 10/01/69 to 09/30/90)

31. The United States Environmental Protection Agency has incurred costs of at least $ 183599.37 for regional payroll expenses.

32. The United States Environmental Protection Agency has incurred costs of at least $ 17724.29 for regional travel expenses.

33. The United States Environmental Protection Agency has incurred costs of at least $ 425991.00 for EPA indirect costs.

34. The United States Environmental Protection Agency has incurred costs of at least $ 40356.74 for headquarters payroll expenses.

35. The United States Environmental Protection Agency has incurred costs of at least $ 3873.41 for headquarters travel expenses.

Total EPA expenditures on this site are at least $ 3047706.88