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February 8, 1990

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RE: Final Supplemental Feasibility Study

Dear Sirs:

Enclosed for your review is the final Supplemental Feasibility Study with complete appendices. This document is intended to supersede the text (Volume 1) your office received on February 2, 1990.

Additionally, we request on behalf of Conklin, Ltd. that this report and its contents be kept confidential and be protected from disclosure pursuant to Article 6 of the Public Officers Law.

If you have any questions or comments regarding this document, please feel free to contact me at (518) 458-8931.

Sincerely,

Thomas M. Johnson

Thomas M. Johnson
Associate Hydrogeologist

TMJ:ce
enclosures

cc: E. Sullivan
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SUPPLEMENTAL FEASIBILITY STUDY
FOR SITE #734048
SYRACUSE, NEW YORK

VOLUME 1 of 2

Prepared by:

Dunn Geoscience Corporation

Report Contributors:
Whiteman, Osterman & Hanna
John P. Stopen Engineering, P.C.

Date: February, 1990

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INTRODUCTION

SUPPLEMENTAL FEASIBILITY STUDY

This Supplemental Feasibility Study has been prepared to respond to the issues raised in Edward Sullivan's letter to Bruce Kenan, dated January 5, 1990 and to Richard J. Brazell's letter to Bruce Kenan, et al dated January 3, 1990. This report is divided into seven sections and is intended to provide the New York State Department of Environmental Conservation ("Department" or "NYSDEC") with a description of the overall site conditions and the proposed remediation plan, and the regulatory, environmental and health implications of site remediation and redevelopment.

The purpose of this report is to provide the Department with the information necessary to approve the proposed Interim Remedial Plan. The Carousel project is the first step towards the redevelopment of the Onondaga Lakefront area of Syracuse, New York. An expedited remedial action is critical for the timely redevelopment of that area. To date, Conklin,Ltd. ("Conklin") has spent millions of dollars to investigate the environmental conditions at the site and to conduct a pilot study program. A Remedial Investigation Report and a Feasibiliy Study have previously been provided to the Department. Conklin has also conducted a Pilot Study to determine the effectiveness of the soil gas extraction as a treatment alternative for the impacted soils. The current plan represents accumulation of over two -and one-half (2-1/2) years of investigation and millions of dollars of private investment. Conklin acknowledges the cooperation of the NYSDEC and respectfully requests the Department's timely response to the comprehensive proposal described herein.

This Feasibility Study has been prepared in cooperation with Conklin's environmental Counsel Whiteman, Osterman and Hanna, Dunn Geoscience Corporation, John Stopen Engineers and Terra Vac System, Inc. These firms have addressed the legal, environmental and health and safety issues regarding the proposed excavation of soil and have rendered the following opinions:

WHITEMAN, OSTERMAN & HANNA

"It is the opinion of Conklin's special environmental counsel, Whiteman, Osterman and Hanna, that the on-site storage and excavation of contaminated soil pursuant to an order on consent and in compliance with the substantive applicable rules and regulations of the NYSDEC can be legally authorized without a formal NYSDEC permit for the remedial activities proposed herein."

DUNN GEOSCIENCE

"Dunn has determined that excavation of the contaminated soil from the site will facilitate treatment of the contaminated soil, permit continued construction and completion of Carousel Center and further redevelopment efforts in the City of Syracuse. Soil meeting the criteria described in Section 5.3.2 will be excavated and removed to the area on site proposed for treatment."

Additionally, Dunn conducted a Risk Evaluation and based on that evaluation concluded:

"In the opinion of Dunn, given the numerous design features, only a complete failure of the design characteristics could allow air and water from beneath or adjacent to the building to enter the garage. In the event of a catastrophic failure of the foundation design features, and based on the occupational exposure limits of the modeled compounds, there will be no significant risk associated with exposure to these compounds.

TERRA VAC

"It is Terra Vac's opinion that soil gas extraction will be enhanced in a treatment facility/tank and the overall level of VOC contamination will be more effectively reduced in a shorter time period due to the:

(i) isolation in the cell of more highly contaminated soils.

(ii) more uniform permeability of soil.

(iii) elimination of groundwater recharging of the soils."

The remediation plan identified herein consists of the following:

1. The excavation and isolation of contaminated soil;
2. Storing and treating the contaminated soil in a *treatment tank at the Carousel Center site;
3. Conducting a Supplemental Feasibility Study to confirm that soil gas extraction is the appropriate long-term treatment method and/or identifying an alternative treatment technology.

Any contaminated groundwater which may remain underneath the building will be contained within a slurry wall, containment wall, or other appropriate structure, then pumped and treated. The water will be isolated from the guilding by

- o 24" concrete foundation
- o Paraseal system waterproofing*
- o sheet pile wall containment
- o groundwater control system
- o air ventilation system
- o design features eliminating potentially completed pathways.

The building design (which includes a surrounding slurry wall) accomplishes containment in collection of any such contaminated groundwater.

A. Carousel Center Site

The Carousel Center site is located about two miles northwest of the central business district of Syracuse, New York and consists of approximately 60 acres. The site is bounded by Hiawatha Boulevard, the New York State Barge Canal and Interstate Highway 81 and Onondaga Lake located to the west of the site. Figure 1 provides a map of the regional

1*the treatment tank is designed to contain contamination and will include a system to treat VOCs and prevent the migration of contaminants.

1* for purposes of this document, waterproof shall be defined as a coefficient of permeability of 3.7×10^{-10} cm/sec

The site has been used for mixed purposes, including a salvage area for scrap metal, a concrete batch plant and oil storage tanks.

The shopping center will consist of a steel framed structure with a poured in place concrete basement approximately 24 inches thick. The contaminated soil is entirely within the confines of the proposed location of the building. That portion of the basement located over the contaminated area is to be used as a garage and will consist of two stories above grade.

In the area proposed for the building, preconstruction grade varies from about 10 - 15 feet above the City of Syracuse elevation. The finished ground floor level of the shopping center will be at El. +18.0 feet. The finished basement floor level will be at El. +1.0 foot.

The basement floor slab is a 24-inch thick reinforced structural compensated mat that also serves as the building foundation. Building column loads are supported directly on the concrete mat, which in turn transfers those loads to the subsoil at a nearly uniform bearing pressure over the entire building area.

To construct the building, soil must be excavated to a depth of 13 to 15 feet. Based upon the most recent data through February 8, 1990, including soil borings on the Hess property, the amount of excavated soil will be approximately 20,000 cubic yards. This report identifies the maximum extent of contaminated soil, the health and safety and air monitoring program to be implemented during excavation, and the proposed storage interim treatment technology.

B. Summary of the Groundwater and Soil Investigation

An exhaustive environmental investigation has been conducted at the Carousel Center site dating back to 1987. A preliminary investigation determined that a small portion of the site located near the former Clark and Hess property border (VOC Area) contain soil and groundwater that are contaminated with volatile organic compounds (VOCs). Dunn Geoscience Corporation ("Dunn") was retained by Conklin to quantify the nature and extent of contamination and to determine and implement a remedial program for the impacted area. Section One describes the Pilot Study using soil gas extraction to treat the contaminated soils in-situ. Section One also identifies the results from the investigation conducted on the Hess property and identifies the investigation currently being completed.

This section continues identifying and summarizing the soil sampling that has been conducted to date. Figure 3 identifies the approximate source area of VOCs. Data presented in this section indicate that the vertical extent of contamination has also been sufficiently defined using these detection criteria. The foundation will be enclosed with a slurry wall or other isolating structure to an appropriate depth. As previously discussed, the portion of the plume underneath the building will be contained by the slurry wall, pumped and treated.

C. Impact of Construction and Remediation

Section Two describes in detail the Project location and design. All of the contaminated soil is located in the area identified for the Project construction, presently surrounded by a containment wall and slurry wall which will be replaced in the future with sheetpile to enhance excavation. The foundation of the Carousel complex will be a 24 inch concrete floor spanning the entire area of the building, and the basement floor will be approximately 5 feet below the design water table. The foundation will be enclosed with a slurry wall, or other isolating structure, to an approximate depth of 25 feet. In order to prevent infiltration of water, the concrete will be coated with Paraseal, a waterproof construction material. The foundation will be enclosed with an isolating structure to an appropriate depth. As previously discussed, the portion of the plume underneath the building will be contained by the isolating structure, pumped and treated, if necessary. A second isolating structure will be constructed around the area previously identified as the areal extent of the contaminated groundwater plume (i.e., a second slurry wall within the foundation slurry wall) in order to minimize the amount of groundwater that must be treated for the long term removal of volatile organic compounds. Any contaminated groundwater will be pumped separately from the unimpacted water and mixed with that water or treated separately and discharged pursuant to applicable requirements.

D. Legal and Regulatory Requirements

Section Three identifies the legal and regulatory requirements applicable to the implementation of the interim remedial plan. In addition, Section Three identifies the scope of the Department's policy regarding its authority to authorize the implementation of remedial actions pursuant to an Order on Consent and the applicability of that policy to the remedial plan proposed herein. In the past, in order to avoid the delay associated with administrative permit proceedings and to assure timely and expeditious remediations, the Department's policy has been to require remedial actions that take place on-site or in areas contiguous to the site necessary for the implementation of the remedial plan to meet the substantive requirements of the regulations in lieu of a permit. That policy is consistent with EPA's interpretation of its authority under CERCLA 121(e) to allow the implementation of remedial plans without the delay of the administrative proceedings associated with a permit proceeding.

E. Groundwater Control and Treatment

Section Four identifies the design features which will allow continual control over the groundwater system on the Carousel Center site.

F. Risk Assessment

Section Five evaluates the potential risks associated with the extremely remote possibility of a release of VOCs to the atmosphere into the garage above the VOC area. That section concludes that in the absence of a catastrophic failure of the basement floor, there are no direct routes for air and water contaminants to enter the parking garage. Moreover, if a catastrophic failure of the basement floor were to occur, the ventilation system within the garage is more than adequate to address the volatile organic emissions that could result if a portion of the garage were to be flooded with groundwater containing VOCs at the concentration measured in the deep monitoring wells at the site.

G. Excavation Protocol and Impacts

Section Six evaluates the potential health risks associated with the standards of 1 ppm for any volatile organic constituent and 5 ppm for total volatile organic constituents for purposes of excavation.

This section also identifies the health and safety plan for the protection of the on-site workers during excavation. It also identifies the air monitoring program to be implemented during excavation to protect against any unacceptable off-site impacts from air emissions.

H. Storage/Treatment Tank

Section Seven identifies the design of the storage/treatment tank. Conklin proposes to store and treat the contaminated soil in a lined treatment tank on the Carousel Center site approximately 200 yards west of the contaminated area. The contaminated soil will be covered with an impermeable cap and will be treated by soil gas extraction or other technology determined appropriate as a result of the supplemental feasibility study. A supplemental feasibility study will be conducted to confirm that soil gas extraction is the appropriate treatment technology and/or to identify an appropriate long-term treatment/disposal method.

1.0 SUMMARY OF SITE DATA

1.1 Introduction

An exhaustive environmental investigation has been conducted at the Carousel Center Site dating back to 1987. The preliminary investigations determined that a small portion of this site, located near the former Clark and Hess property borders, contains soil and groundwater that are contaminated with VOCs. Realizing that there was a need to more clearly ascertain the levels and extent of the contamination, Conklin has to present voluntarily expended millions of dollars for on-site sampling and investigation and a Pilot Study. The contaminated area that has been identified in and will be referred to herein as the "VOC Area".

Dunn was retained in February, 1988, after preliminary investigations suggested the presence of contaminants on the site. Dunn's primary goal was, and is, to quantify the nature and extent of contamination, and to determine and implement a remedial program for the VOC Area. As a result of months of field investigations, Dunn prepared a "Report on Hydrogeologic Conditions on the Clark Property" which detailed the results of the investigation and characterized the environmental conditions on the Clark Property. The report was submitted to the NYSDEC in October, 1988. Numerous monitoring wells and test borings were installed (seven DGC wells and eleven TB soil borings) for the purposes of determining the precise nature and extent of the chemical substances present. VOCs, including trichloroethene, toluene, 1,1,1-trichloroethane and acetone (in order of decreasing concentrations) were discovered, along with their respective degradation products.

The soil and groundwater investigation effectively identified and delineated the extent of contamination found on the Clark site ("the VOC area"). Based on all available data and analysis presented, the Department determined that this area was eligible for listing on the New York State Registry of inactive hazardous waste site. It was assigned site number 734048 and designated as a Class 2 inactive hazardous waste site pursuant to the NYSDEC classification system.

Since that point in time the following steps have been taken to address the environmental concerns on the VOC Area in cooperation with NYSDEC.

DATE

October 1987	Preliminary investigations of Carousel Center site conducted by environmental consultants.
November 1987	Carousel Center Draft Environmental Impact Statement.
March 1988	Carousel Center Final Environmental Impact Statement.
November 1988	Vacuum Extraction System construction on-site as a potential remediation alternative. NYSDEC approval is sought to conduct a Pilot Study using the Vacuum Extraction System.
January 1989	Dunn issues "Hydrogeological Conditions on Proposed Carousel Center Mall."
March 1989	Carousel Center Supplemental Environmental Impact Statement.
April 1989	Remedial Investigation submitted to NYSDEC for review.
June 1989	Agreement and Determination is executed between NYSDEC and Conklin to conduct a Remedial Investigation Feasibility Study.
Sept.-Oct. 1989	The Pilot Study is implemented and modified according to previously approved documents. A containment wall is installed to facilitate the vacuum extraction system, dewatering operations, including trenching, pumping and water treatment is commenced.
Oct.-Dec. 1989	IRM work plan is submitted to NYSDEC for approval. An ex-situ treatment cell is constructed and soil and groundwater are treated via the vacuum extraction system. The vacuum extraction system continues to operate throughout the in-situ area. Contaminated groundwater is treated by the vacuum extraction system.
November 1989	The Supplemental RI Work Plan is submitted to NYSDEC for approval.
December 1989	Environmental testing of the soil and groundwater is provided which indicates that the portion of the VOC Area on the Hess property contains levels of contamination in soil samples less than 1 ppm, except one boring which indicated a level of approximately 25 ppm. NYSDEC approves additional remedial investigation and Pilot Study of Vacuum extraction system. Environmental Oil conducts sampling of the VOC Area; results show that levels of contamination were less than originally measured. Dunn initiates field work regarding the Supplemental Remedial Investigation (SRI).

January 1990 The Pilot Study regarding the vacuum extraction system continues to operate.

Vertical in-situ system: Vacuum extraction system functional with five extraction wells on the VOC site.

Water treatment: Pursuant to the Pilot Study/Vacuum Extraction System water is being treated.

Horizontal in-situ: The Horizontal in-situ system has decreased the levels of contaminants at the VOC Area.

As part of the Supplemental RI, Dunn developed the scope of work to be undertaken with respect to the Hess portion of the VOC Area.

Dunn, in a letter to the NYSDEC dated January 18, 1990, has described the scope of work to be undertaken for purposes of defining the lateral and vertical extent of contaminants on the Hess portion of the VOC Area. The scope of work consists of two phases. The first phase will determine the lateral extent of contamination of the VOC Area presently owned by Hess, while the second phase will determine the vertical extent of known contaminants in soil and groundwater on that portion of the VOC Area. Since the investigation will focus on previously identified contaminants in the VOC Area, only VOCs will be analyzed via Contract Laboratory Protocol (CLP) for the soil and groundwater samples collected during the Hess investigation. The first phase has been completed as described below (1.2.3) and the second phase is expected to be completed in the near future.

Based upon the most recent analytical data on the VOC Area (including a recent report by Environmental Products & Services, Inc., dated 1/10/90) and analytical data obtained in the field (and currently being confirmed in the laboratory), Dunn has concluded that the center of the contaminated plume is very near the former Clark and Hess property lines.

The treatment plan for the VOC Area will be consistent with the Pilot Study and will be implemented as soon as possible.

1.2 Supplemental Remedial Investigation - Results

In December 1989, Dunn began the Supplemental RI of the VOC Area. The objective of the Supplemental RI sampling was to locate the horizon at which soil meets the "1 and 5" criteria (i.e., no single VOC greater than 1 ppm and total VOC's not greater than 5 ppm) for determining the plume. Several shallow borings (SBs) were installed outside the VOC Area to determine the lateral extent of contamination, and several more deep borings (TB soil borings and DGC wells) were installed to determine the vertical extent of contamination (Figure 4).

A summary of the results of this sampling conducted from December 1989 through January 1990 is shown on Table 1. The laboratory analytical results for the samples collected during the Supplemental RI are presented in Appendix A. These results indicate that samples from the monitoring wells and soil borings are clean according to NYSDEC guidelines and adequately define the extent of the plume on the Clark property.

1.2.2 Pilot Study Results

In September 1989, following months of review, the Pilot Study was implemented. The Study was designed to evaluate the effectiveness of soil gas extraction in the VOC Area by first dewatering the site and then removing contaminants via soil gas extraction. As an integral part of this system, activated carbon is utilized to effectively remove contaminants prior to discharge of any groundwater and/or vapor.

Current results provided by Terra Vac indicate that the system has successfully removed over 7,818 pounds of contaminants from the soil vapor and groundwater treated at the site. Additionally, over 2,296,000 gallons of water have been removed and treated as part of the Pilot Study. The environmental benefit of the Pilot Study is evident from the concentrations of trichloroethylene, toluene, 1,2-dichloroethene and acetone in the BC (before carbon) water samples from the water treatment system which currently are as follows:

trichloroethylene	70 ppm
toluene	35 ppm
1,2-dichloroethene	6.7 ppm
acetone	4.1 ppm

1.2.3 Additional VOC Area Data

In November 1989, a subsurface investigation was performed by Environmental Products and Services, Inc. for the Amerada Hess Property. Results of the study indicate an absence of several individual VOC discovered in Dunn's 1988 "Report on Hydrogeological Conditions on the Clark Property". Additionally, the total levels as a whole were substantially lower than those found on the VOC Area described in the above-referenced report.

Numerous borings and wells were installed and tested in the vicinity of the Clark Property boundary to analyze soil, water, and vapor from the Hess Property (see Figure 4). Groundwater and soil analysis included EPA Method 624 and 625, PCBs, and metals. Soil vapor analysis included 1,1-dichloroethane, trichloroethylene, toluene, and xylenes. The collection of vapor, soil and water samples was performed to identify and characterize potential contaminants in all phases: as dissolved in groundwater, as adsorbed in the soil matrix, or as vapor in the unsaturated zone. Initial sampling points characterized the area closest to the northern Hess dike wall adjacent to the property boundary. Subsequent sampling took place progressively further from the property boundary to assess the extent of parameters which were detected. Thus, soil, groundwater, and vapor quality was assessed areally. The collection of soil samples from varying depths established soil quality vertically.

The soil vapor results show concentrations of <0.5 ppb for the chemical parameters listed above. Relatively low concentrations of previously detected parameters were detected in soil or groundwater samples collected in borings B-2, B-3, B-5 and B-6. Contaminants were notably absent in the samples collected from all monitoring wells 1 through 5, boring 1 and boring 4.

Three shallow borings (SB-6, SB-7 and SB-8) have been completed by Dunn on the Hess portion of the VOC Area as shown on Figure 4. Field results by GC analysis of samples collected from these borings are shown on Table 1 and indicate levels of contaminants below the 1 and 5 criteria set by the NYSDEC to define the plume boundary.

1.3 Conclusions

Information gathered to date on the VOC Area has enabled Dunn to more fully define the extent and chemical characteristics of the plume. Concentrations greater than the 1 and 5 criteria are not present below depths of approximately 23 to 25 feet in the VOC area. Additionally, the higher concentration of contaminants in the VOC Area are generally located at a depth of 10-18 feet. The results of the Amerada Hess data indicate that the center of the plume is essentially located on the former Hess and Clark property boundaries. The plume does not extend much further than the area immediately adjacent to the dike wall along the Clark property. Additionally, the chemical concentrations of the Hess portion of the VOC Area is significantly lower in magnitude than that previously found on the Clark portion.

The VES process is proving to be an effective remediation technology in removing volatile organics from the soil. It is actively removing contaminants utilizing both in-situ and ex-situ applications. Information provided by Terra Vac indicates that over 7,818 pounds of contaminants have been removed from the site and over 2,296,000 gallons of water have been treated. Information and data regarding the soil and groundwater conditions on the Clark portion of the VOC Area indicate that the VES process is successfully remediating the full extent of the plume.

2.0 FOUNDATION CONSTRUCTION

Throughout the designing phase of the Carousel Center, numerous highly qualified consultants were conferred with including Warren-George, Inc., Jersey City, New Jersey; Muesar-Rutledge Engineers, New York City; Dr. Bengt Fellenius, University of Ottawa; Pile Contractors, Inc., Cleveland, Ohio; (Professor Van Weele, Holland, Dr. M.T. Davisson, Illinois). Subsequent to initial consultations John P. Stopen Engineering Partnership ("Stopen") has been the lead firm, particularly in designing the structural foundation for Carousel Center.

The information below is based on a letter report prepared by John P. Stopen Engineering Partnership ("Stopen") to describe the compensated mat foundation approach and pertinent aspects of the foundation design. That letter report is attached as Appendix B.

As a result of extensive field investigation and historical surveys, it was determined that, in the area south of the existing slurry wall, the Carousel Center site is underlain by compressible soils approximately 150 feet deep which are normally consolidated. Placement of stress on these soils would result in primary consolidation and settlement of undesirable magnitudes.

Stopen has designed the center using a compensated mat foundation. This approach is based on the premise that primary consolidation and excessive settlement can be avoided by unloading existing subgrade through excavation of existing fill and organic natural subgrade and by managing the permanent water table within the building area so that the proposed development reduces the effective stress in the compressible soils to values below preconstruction levels.

The shopping center will consist of a steel-framed superstructure and will have a poured-in-place concrete substructure. The potentially contaminated area is located in an area where the building will consist of two stories above grade. A basement in this area designed for use as a parking garage and a finished ground floor level will be at elevation +18.0 feet. Finished basement floor level will be at elevation +1.0 feet. The basement floor consists of a 24-inch thick waterproof reinforced structure concrete mat that also serves as the building foundation. Below that will be an 18"-24" thick layer of drainage fill placed on an overlapping layer of geotextile fabric. Water table level will be maintained at or near elevation +6 feet.

Utilization of the compensated mat foundation approach at Carousel Center requires that the soils to be excavated be dewatered, that approximately 12-15 feet of soil be excavated, that the mat foundation and perimeter building walls be sealed, and that the long-term water table level be maintained at about elevation +6 feet.

Certain design features of the foundation that have been incorporated into the area north of the existing slurry wall (see above discussion) will be modified or eliminated from the VOC Area. The VOC Area beneath the building will be hydraulically isolated from the rest of the area beneath the building through a slurry or other cutoff wall.

Water table level controls will still be necessary. Artesian conditions have been documented at this site, resulting in an upward and continual water flow within the area to be hydaulically isolated. The water table level for this hydraulically isolated area will be independently controlled by pumping from a wet well connected directly to the foundation underdrain in this area. Additionally, the wet well utilized to pump water will be located outside, rather than inside the building area.

2.1 Waterproofing of Substructures

Since the permanent water table is to be located 5 feet above the basement floor, the mat foundation and perimeter building walls require waterproofing. The building will be waterproofed by means of a Paraseal system, a product used to waterproof structures above and below grade. It is particularly utilized for use on split slab parking, plaza decks and poured and block foundation walls. It has outstanding performance when used under conditions of high water head and installed prior to the concrete pour, such as lagging and under floor. Paraseal is composed of a layer of thick tough high density polyethylene laminated to approximately one pound per square foot layer of quality bentonite. These two materials act in harmony to produce a selfsealing product which will, in the presence of water, seal tightly to itself and to the surface to which it is connected. The Paraseal system will form a continuous membrane for the basement walls or slab.

Below the water table, there will be only one penetration through the waterproofing within the VOC Area. It would be for a 1-inch diameter PVC standpipe piezometer. The upper end of the piezometer will be sealed with an air-tight locking cap. Details of waterproofing around this penetration are shown on Figure 5.

Penetrations of the waterproofing membrane will be required above the water table near the VOC Area where underground utilities enter the building. These penetrations will be flashed and sealed with rubber compression donuts that are used to provide a waterproof pressure seal.

3.0. PERMIT AND REGULATORY REQUIREMENTS

Executive Summary

It is the opinion of Conklin's special environmental counsel, Whiteman, Osterman and Hanna, that the on-site storage and excavation of contaminated soil pursuant to an order on consent and in compliance with the substantive applicable rules and regulations of the NYSDEC can be legally authorized without a formal NYSDEC permit for the remedial activities proposed herein.

3.1. Permit Requirements

Conklin, while not the source of the hazardous constituents at the site, has volunteered to remediate the site at its own expense as part of its shopping center development and to further the efforts of the City of Syracuse to redevelop the Lakefront area. While there is no specific statutory or regulatory guidance governing volunteer remediation, Conklin on its own accord entered into a binding Order on Consent regarding Site #734048.

Section 27-1313 of the Environmental Conservation Law authorizes the NYSDEC to order the owner of an "inactive hazardous waste disposal site" to implement an "inactive hazardous waste disposal site remedial program." The term "remedial program" includes, but is not limited to, the construction and implementation of treatment facilities. (See ECL 27-1301(3)).

In implementing remedial programs in the past, it has been NYSDEC's practice to require a remediator to meet the substantive requirements of permit regulations which would normally apply to activity undertaken on site, yet not require that the actual permits themselves be obtained. See Memorandum of Langdon Marsh, Executive Deputy Commissioner, to Norman Nosenchuck, dated July 13, 1984. The Department asserts prosecutorial discretion as its authority for waiving permits. See, NYSDEC Declaratory Ruling, 72-3; See also, Gaybor v. Rockefeller, 15 N.Y.2d 120, 131-32 (1965); ECL 71-0507(1)(c); Exec. Law 63(15).

In the past, the NYSDEC has permitted and encouraged remedial activity conducted either on-site or in geographically contiguous areas which are needed for implementation of the remedial activity to proceed in the interest of protecting public health and the environment without requiring issuance of a permit. This department policy has been illustrated in, In the Matter of the Development and Implementation of an Inactive Hazardous Waste Disposal Site Remedial Program Pursuant to Article 23, Title 13 Environmental Conservation Law of the State of New York ("ECL") by Union Fork and Hoe Company, Index No. T122486, where the Department brought an administrative enforcement action against the Union Fork and Hoe Company relating to an alleged spill of spent solvents at an area labeled as the "spill area". The Approved Remedial Program for that site consisted of the excavation of the impacted soil, the construction of a treatment area on a clean portion of the property, and the land farming of the impacted soil to remove volatile organic compounds. The Department permitted the treatment to proceed without a permit but required the applicant to meet the substantive requirements that would otherwise have been embodied in a permit issued by the Department. (See, Decision and Order, executed by Commissioner Henry G. Williams, dated February 3, 1987).

Similarly, in the State of New York v. Harris Corporation, Index No. 86-CV-649, the State brought an action against Harris Corporation ("Harris") seeking a judgment requiring Harris to remediate a site in West Chazy, New York known as the Brault Lagoon Site, where hazardous wastes were allegedly disposed of in two septage lagoons. The Approved Remedial Program consisted of the installation of eleven recovery wells, the construction of two air stripping towers and approximately forty monitoring wells. One tower was constructed on a parcel of property owned by Harris, located several hundred yards from the Brault site lagoons. The second tower was constructed on property owned by a local farmer also several hundred yards from the Brault site lagoons. In the construction and operation of the two air stripping towers, Harris was required to meet the substantive requirement of Articles 17 and 19 of the ECL, but was not otherwise required to obtain a permit. (See, Consent Judgment, approved by United States District Court Judge Thomas J. McAvoy, dated February 28, 1987). In both cases, the treatment area was established in close proximity to the alleged land disposal area but was separate and distinct from the alleged disposal area.

In recognition of the potential delay in effectively remediating contamination that could result from permit proceedings, Congress enacted Section 121(e)(1) of CERCLA which provides as follows:

> No federal, state, or local permit shall be required for the portion of any removal or any remedial action conducted on-site, where such remedial action is carried out in compliance with this section.

42 U.S.C.A. 9621(e)(1) (1984).

EPA interprets the term "on-site" for purposes of determining the need for a permit as including the "areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action." In a Federal Register notice dated December 21, 1988, in the preamble to proposed amendments and additions to the National Contingency Plan, EPA stated as follows:

> EPA proposes to state that on-site permits are not required for response actions taken by EPA, other Federal agencies, States, or private parties pursuant to CERCLA sections 104, 106, or 122. For the purposes of implementing this section, EPA has proposed to define the term 'on-site' in 300.400(e)(1) to include the 'areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action.'
>
> **********
>
> The definition of 'on-site' is intended to address the following types of situations. First, remedial actions frequently involve treatment systems that require significant land area for construction. For example, an incinerator cannot be placed on top of contaminated soil but may require some area adjacent to the area of contamination. Situations have arisen where the contamination is in a lowland marshy area and it is not possible to locate an incinerator or construction staging area in the marshy area but it is possible to do so in an uncontaminated upland area in very close proximity. Moreover, the 'areal extent of contamination' is intended to include sites where areas of contamination are discrete rather than continuous but are within reasonable close proximity to one another. The decision document should describe the boundaries of the site. A second situation is where a containment structure or a slurry wall to contain contaminated material must be built adjacent to the contaminated material, not in the contaminated area. Third, a groundwater plume may extend several miles from the source of contamination or the source may not even be defined at the time of response. If the remedy selected is to intercept the plume and treat the groundwater upgradient of a drinking water supply, the

> treatment facility must be placed near the point of interception. EPA's interpretation of CERCLA section 121(e) is that each of these situations falls under the purview of that section and that permits are not required for the activities. For this reason, EPA has proposed a flexible definition of the 'on-site' that can be tailored to specific cases.

(53 Fed. Reg. 51394, 51498 December 21, 1988).

As its justification for providing a flexible definition of "on-site", EPA expresses its concern that the administrative processes associated with obtaining a permit could otherwise delay or ultimately prevent implementation of a response action for several months or years thus allowing contamination to continue unchecked. In New York State, where the permit procedure provides for an adjudicatory hearing, as compared to a public legislative hearing, the delay caused by the administrative processes is typically much longer than several months. Moreover, if the remedial activity involves the storage, treatment or disposal of hazardous waste requiring a hazardous waste treatment, storage and disposal permit under 6 NYCRR Part 373, the remedial activity is likely to be delayed several years. As a practical matter, the delay inherent in a hazardous waste permitting process will result in the elimination of all non-commercial ex-situ treatment technology from consideration as a remedial alternative. The elimination of such ex-situ treatment technologies from consideration as remedial alternatives will severely impede the State's progress in achieving its goal of remediating inactive hazardous waste sites by the year 2000. As the RCRA Land Disposal Ban takes full effect, contaminated soil from a remedial site must be treated prior to being disposed of in an off-site commercial land disposal facility. Unless ex-situ treatment is permitted to proceed under an administrative order, due to the lack of commercial treatment capacity, the only near-term feasible treatment alternatives are likely to be some form of in-situ treatment which may or may not be effective and/or cost feasible at a particular site. This restriction on remedial alternatives will decrease incentives for parties to voluntarily remediate contaminated sites.

The State's and EPA's flexible approach to the definition of "on-site" for purposes of determining the need for a permit is necessary to (1) quickly address and contain areas of environmental concern; (2) to protect the public to the greatest extent possible with the limited funds available during remediation review; (3) to encourage the development and implementation of innovative treatment technologies; (4) to minimize reliance on off-site disposal facilities; (5) to encourage in-state management of hazardous wastes; (6) to avoid unnecessary transportation of hazardous wastes; (7) to conserve scarce administrative resources associated with permit review; (8) to remediate rather than create new sites; and (9) to encourage redevelopment of contaminated property. This approach allows the contaminated area to be developed while the impacted soil is being treated elsewhere on the property. A flexible approach is absolutely necessary to address the state and federal preference of remedial alternatives involving treatment and detoxification rather than encapsulation and/or off-site disposal.

In summary, the past practice of the Department has been to allow treatment of contaminated media pursuant to an administrative order as opposed to the permitting process, where the treatment of the contaminated soil or groundwater occurs on the site of contamination or on geographically contiguous areas necessary for implementation of the remedial activity. That practice is consistent with EPA's interpretation of CERCLA 121(e) and should be applied in this matter. This allows for (1) substantive protection of the public health, safety and the environment and (2) the expeditious cleanup of contaminants alleged at this site.

3.2. Regulatory Requirements

This section identifies the substantive requirements applicable to the remedial activity proposed for the site.

The remedial program consists of the excavation and ex-situ treatment of contaminated soil. For purposes of excavation, contaminated soil is defined as any soil meeting the following specifications: (a) total volatile organic compound concentration exceeds 5 parts per million ("ppm"); or (b) the concentration of any one constituent volatile organic compound exceeds 1 ppm.

3.2.1. Classification of Excavated Soils Under the Hazardous Waste Regulations

A critical issue in identifying the substantive regulatory requirements is the classification of the excavated soil as a hazardous waste. For the soil to be a hazardous waste, it must possess either one of the characteristics of hazardous waste under 6 NYCRR 371.3 (i.e., ignitable, corrosive, reactive or EP toxic) or be mixed with a "listed" waste under 6 NYCRR 371.4.

Based upon extensive testing done at the impacted area, the following chemicals, among others, have been detected: toluene, trichloroethane, 1,1,1-trichloroethane and acetone. These chemicals, when released spent solvent (provided the spent solvent was from a mixture/blend which was comprised of at least 10 percent of the pure listed chemical) are listed hazardous wastes found in the "F" series of the hazardous waste regulations (6 NYCRR 371.4) and, when released or spilled pure chemical product, are listed in the "U" series of the hazardous waste regulations (6 NYCRR 371.4(c)(6)). When these chemicals are released from other sources (e.g., a spilled chemical product that is a mixture or blend of solvents), the resulting contaminated soil is not listed as hazardous wastes.

Based upon a review of the historic documents available regarding the activities and operations on the site, the source of the solvents found in the soil is not known. The historical records indicate that wastes from the Solvay Process Company were disposed of on the site between 1907-1910 and 1924-1930; these wastes were a mixture of calcium carbonate, calcium chloride and calcium oxide. Subsequent to the Solvay operation, the site was used as a cement dispatch plant by the Clark Concrete Company. No records have been identified relating to the use or disposal of solvents on the site at any time. Despite numerous, extensive investigations which indicate that the contamination is limited to the site and did not occur due to the migration of any off-site source, Conklin has been unable to ascertain the specific source of the site contaminants.

In the absence of documentation establishing that wastes are listed hazardous wastes, it should not be assumed that the wastes are listed hazardous wastes. In the preamble to the proposed amendments to the National Contingency Plan, the EPA states that it is necessary to "know the source" of the waste to determine whether it is a listed hazardous waste. See 53 Fed. Red. 51444 (Dec. 21, 1988).

In particular, EPA stated as follows:

> To determine whether a waste is a listed waste under RCRA, it is often necessary to know the source. However, at many CERCLA sites no information exists on

> the source of the wastes nor are references available citing the date of disposal. The lead agency should use available site information, manifests, storage records and vouchers in an effort to ascertain the source of these contaminants. When this documentation is not available, the lead agency may assume that the wastes are not listed RCRA hazardous wastes unless further analysis or information becomes available which allows the lead agency to determine that the wastes are listed RCRA hazardous wastes. If the lead agency assumes the wastes are not listed RCRA hazardous wastes and it is determined that the wastes are not characteristic wastes under RCRA (see discussion below, 17.i.) RCRA requirements would not be applicable to CERCLA actions, but may be relevant and appropriate if the CERCLA action involves treatment, storage or disposal and/or if the wastes are similar or identical to RCRA hazardous wastes.

53 Fed. Reg. 51444 (Dec. 21, 1988).

As indicated above, if the source is not known, the lead agency must then determine if the waste is a characteristic hazardous waste. If the waste is not a characteristic hazardous waste (e.g. the soils are neither reactive, ignitable, corrosive or E.P. toxic), the substantive requirements of the State hazardous waste regulations and the federal Resource Conservation and Recovery Act of 1976 ("RCRA") would not apply to the remedial action but may be relevant and appropriate to the remedial action.

Under the existing state and federal hazardous waste regulations, the solvent-contaminated soils found on the site are not characteristic hazardous waste. However, on June 13, 1986 EPA proposed, at 51 Fed. Reg. 21648, a major revision to the toxicity characteristic that would add numerous constituents (including toluene, 1,1,1-trichloroethane, benzene and vinyl chloride) and adopt the toxicity characteristic leaching procedure ("TCLP") in lieu of the E.P. extraction procedure. EPA has indicated that it intends to publish the final rule in the spring of 1990. Based upon a recent draft of the final rule informally released by EPA in 1989, a portion of the solvent-contaminated soils proposed to be excavated may be reclassified as characteristic hazardous wastes in the future by virtue of the toxicity characteristic leaching procedure ("TCLP") test. Notwithstanding that the soils are currently not a hazardous waste, any storage, treatment or disposal facility to be used on an ongoing basis at the site will meet the substantive requirements of the hazardous waste regulations.

In summary, based upon the lack of information currently available about the source of the chemical, the soil can not now be classified as a hazardous waste. Nonetheless, for purposes of the remainder of the regulatory discussion, it will be assumed that hazardous waste regulations are relevant and appropriate to the treatment area and potential remedial activities.

3.2.2. Storage of Contaminated Soil

As an interim remedial measure, the current plans call for the impacted soil to be excavated and stored in an NYSDEC-approved tank while it is being treated by soil gas extraction. Plans for such a facility will be submitted to NYSDEC for review. The storage tank will be located in close proximity to the excavated area on the Carousel Center site. The storage tank will be designed and constructed in accordance with the substantive requirements of 6 NYCRR 373-2.

3.2.3. Soil Gas Extraction

While the contaminated soil is being stored awaiting completion of a supplemental feasibility study, the contaminant level in the soil will be reduced through treatment by soil gas extraction. The emissions from the soil gas extraction process must meet the substantive requirements of the New York State air quality control regulations. The applicable requirements are set forth in Table 2 to 6 NYCRR Part 212. That regulation classifies contaminants based upon their toxicity into one of four categories, (i.e., "A" through "D"). The control requirements vary depending upon the classification of the contaminant and its potential emission rate.

3.2.4 Use of Uncontaminated Soil as Fill Material

As previously indicated, all contaminated soil that is excavated will be properly stored while it undergoes treatment by soil gas extraction. As determined necessary, the uncontaminated soil will be used as fill material elsewhere to facilitate construction of the shopping center. For purposes of excavation, "uncontaminated soil" is defined as soil meeting the following specifications:

a. soil which does not contain any one VOC chemical constituent in a concentration greater than 1 ppm; and

b. the total concentration of VOC in the soil is not greater than 5 ppm.

Uncontaminated soil will be excavated in order to construct the foundation and to develop the grades necessary to construct the shopping center and will be taken to an off-site area of common ownership. Current plans call for the use of uncontaminated soil to be used as fill material in an area of common ownership and covered with an asphalt or concrete cover.

Because the uncontaminated soil excavated as part of the foundation construction is not a hazardous waste, or solid waste, neither the hazardous waste regulations nor the solid waste regulations would apply to the use of this material on the construction site as fill material.

3.2.5. Solid Waste Regulations

A solid waste storage permit under 6 NYCRR Part 360 will not be required for the storage/treatment of the contaminated soils. The State's solid waste regulations (6 NYCRR 360- 1.7(b)(4)) exempt from the permit requirements of Part 360 a storage/treatment facility located at an industrial/commercial facility and used exclusively for the storage or treatment of waste generated at that location.

3.2.6. Land Disposal Ban

RCRA prohibits the continued land disposal of hazardous waste beyond certain specified dates, unless the waste meets certain treatment standards or contaminant levels. Standards were established to set levels or methods of treatment to substantially diminish the toxicity of the waste or restrict its migration so that short-term and long-term threats to human health or the environment are minimized. Wastes that meet treatment standards are not subject to land disposal prohibitions.

Until the EPA promulgates a final rule adopting the TCLP test for characterizing hazardous wastes and then establishes treatment standards for those TCLP wastes, the land disposal ban does not apply to the contaminated soils at this site because, for the reasons discussed above, the soils are not a hazardous waste under existing regulations.

During the supplemental feasibility study, Conklin will continue to treat the contaminated soil in the storage/ treatment tank. Once the soil is fully remediated, it will be used accordingly. Assuming that soil gas extraction is successful as fully remediating the soil, it will be used as fill material.

. 3.2.7. Groundwater Control

As previously described, all of the contaminated soil is located in the area proposed for the location of the shopping center. The groundwater underneath the building and the portion of the parking lot will be contained by the installation of a slurry wall or other isolating structure to an appropriate depth. Because there is an upward groundwater gradient beneath the building, current plans are to periodically or continuously pump the groundwater from underneath the building to maintain a consistent water level, and treated prior to discharge. The discharge of the collected groundwater is subject to the requirements of Article 17 of the Environmental Conservation Law and its implementing regulations.

4.0 GROUNDWATER CONTROL AND TREATMENT

As the geotechnical and structural engineer of record, Stopen has proposed and designed a compensated mat foundation for supporting building loads for Carousel Center. This approach requires that, after completion of building construction, the major portion of the building load supported by groundwater buoyancy. The effect being that the portion of the building load supported by the subgrade will cause a level of effective soil stress under the building that is lower than that existing prior to construction.

In order to meet the requirements of the compensated mat foundation approach, it will be necessary that the water table under and adjacent to the building area be maintained at about El. +6 ft. To do so, a groundwater collection system has been incorporated into the foundation design utilizing a series of underdrains.

Contaminated groundwater may be present in the natural soil beneath the completed building foundation. A system to collect and remove groundwater has been developed as part of the building design and underdrain system. This system involves only minor modification to the underdrain system which is currently being installed beneath the compensated mat foundation. The effectiveness of the underdrain system in controlling groundwater levels is evident by the successful dewatering of the foundation areas which are currently under construction. Groundwater is currently being removed from these areas using the underdrain system beneath the foundation.

In areas where contaminated groundwater may be present beneath the foundation, a hydraulic barrier (i.e., slurry wall or other isolating structure) will be installed during the excavation to contain any contaminated groundwater. The hydraulic barrier will extend upward from the excavation to isolate a corresponding section of the foundation underdrain system. Groundwater will continue to discharge through the soil beneath the foundation into the hydraulically isolated underdrain system as a result of documented artesian conditions at the site. Furthermore, no flow is expected across the hydraulic barrier wall due to its low permeability.

In order to accomplish the desired subgrade isolation of certain portions of the building area, features of the compensated mat foundation used to accomplish this necessary construction and permanent groundwater control will be utilized to facilitate withdrawal of contaminated groundwater. To this end, the following steps will be taken to hydraulically isolate areas of subgrade contamination:

1. Install a series of secondary cutoff walls that will extend between perimeter cutoff wall and that will isolate the area of contamination by extending the secondary cutoff walls to the underside of mat foundation and by making the underdrain system and perimeter drain discontinuous at isolation boundaries.

2. Design and construct the underdrain system and waterproofing for mat foundation as specified and detailed on Site Preparation SP-1 or modify as necessitated by special requirements.

Isolation of groundwater in the area of contamination can be maintained with water table at the same elevation north and south of the secondary cutoff wall. This is based on our opinion that underseepage beneath building areas enclosed by perimeter seepage cutoff walls is essentially upward as a result of the artesian condition in the lower water-bearing unit. It is feasible to inject and simultaneously withdraw water from the isolated underdrain system. More detailed design information is included in Appendix C in a letter to Dunn from Stopen dated January 15, 1990.

Groundwater collected from the isolated underdrain system will be pumped to an appropriate treatment facility. A compliance monitoring program for the water treatment system was implemented as part of the Pilot Study. A summary of the results of the water samples collected during the compliance monitoring program are provided in Appendix D. These results have demonstrated that treatment by activated carbon and air stripping (sparging) are both effective in removing VOCs from the water.

5.0 REMEDIAL EXCAVATION

5.1 Executive Summary

Dunn has determined that excavation of the contaminated soil from the site will facilitate treatment of the contaminated soil, permit continued construction and completion of Carousel Center and further redevelopment efforts in the City of Syracuse. Soil meeting the criteria described in Section 5.3.2 will be excavated and removed to the area on site proposed for treatment.

Through a combination of containment, soil gas extraction, excavation and post-excavation treatment, the soil will provide no adverse risk to human health and safety. Furthermore, the design of the Carousel Center will avoid or minimize risk from exposure to potentially contaminated groundwater and vapor which may remain below the building foundation. (See Appendix B & E). Dunn, in conjunction with Stopen, has identified potential exposure pathways and identified modifications to the foundation design as appropriate to eliminate exposure pathways.

Risk controlling design features have been incorporated into the foundation design. It is extremely unlikely, if not impossible, that any or all of these features will fail. Even utilizing an extremely conservative assumption that all the risk-controlling features simultaneously fail, it is the opinion of Dunn that acceptable TLV levels will be maintained thus minimizing unacceptable exposure risks within the scope of the Study contained in Appendix E.

5.2 Potential Exposure Pathways

In order for there to be a risk to public health from exposure to a particular contaminant, there must be a completed pathway for exposure to the contaminant. A completed exposure pathway consists of four elements: 1) a source and mechanism of chemical release, 2) a retention or transport medium, 3) a point of potential human contact with the contaminated medium, and 4) an exposure route (e.g., ingestion or inhalation) at the contact point. Therefore, the presence of a contaminant source does not necessarily pose a risk to public health, unless there is a completed exposure pathway for human intake of the contaminant.

The baseline risk assessment identified the following completed exposure pathways for identified contaminants:

(a) Direct contact with contaminated soils (e.g., during excavation and construction)

(b) Inhalation of volatile contaminants from contaminated soils or groundwater.

The potential for direct contact and inhalation exposures during excavation and construction activities can be identified and prevented through implementation of an effective health & safety plan (see Section 6.0). NYSDEC, however, has expressed its primary concern to be that of completed pathways and the potential for human exposure to contaminants after the building has been constructed. Therefore, the following discussion will focus on the potential for exposure to contaminants inside the completed building.

5.2.1 Foundation

As previously discussed in Section 2.0, the building is, as designed and constructed, waterproof. Design characteristics representing possible migration pathways into the foundation have been eliminated in the portion of the foundation located above potentially contaminated soil. These mitigating design features include the following:

(a) The open piezometer to be installed will be sealed with air tight caps that will be removed occasionally for monitoring and immediately replaced.

(b) Wells required to maintain groundwater levels beneath the building as part of the pump system will be located outside the building foundation, but within the slurry wall. Figure 6 illustrates additional design characteristics which enhance the safety features of the project. The fact that the well is outside the structure eliminates a potential exposure pathway to the interior of the building.

(c) Overflow pipes will not be installed above potentially contaminated areas.

(d) The area beneath the expansion joints will be double lined with the Paraseal waterproof liner, which will extend beneath the entire foundation and to the top of the side walls.

(e) Conduits for the utility lines will be located above the water table and sealed at the points where they intersect the basement wall.

These measures will adequately prevent the potential for groundwater infiltration to the basement of the building, thereby preventing exposure to contaminants which may be present in the groundwater.

5.2.2 Excavated Soil

Analytical data collected from the site will be utilized to segregate soil which contains contaminants not greater than 1 ppm for any single volatile organic compound and not greater than 5 ppm total volatile organics. Soil which is identified as uncontaminated based upon this criteria will be used as fill or for other useful construction purpose (e.g., sealed beneath asphalt paving, thereby eliminating a completed exposure pathway and its corresponding risk).

Soil which exceeds this criteria will be removed from the site for disposal at a secure landfill, or placed in the storage/ treatment tank to be constructed at the Carousel site as described in Section 7.0. This tank will be designed in accordance with applicable state rules and regulations. Vapors from the soil gas extraction system will be treated to comply with applicable limits. The design of the tank will eliminate potential exposure routes and therefore mitigate risk to the environment or to public health.

6.0 EXCAVATION PROTOCOL

6.1 Health and Safety Issues

Excavation and relocation of soils may introduce potentials for employee exposure beyond those anticipated in the existing NYSDEC-approved health and safety plan. This will warrant revision to the existing monitoring program and may require protective equipment upgrades to Level "B". The revised plan is presented in Appendix F.

6.2 Air Emissions - Monitoring

The planned excavation activities increase the potential for generation of emissions of airborne chemicals. An on-site monitoring program and feasible emission suppression strategies will be utilized to closely monitor and control emissions.

The following chemicals are those most likely to be present in airborne emissions as a result of excavation activities: Trichloroethylene, Toluene, 1,1,1-Trichloroethane and Xylene.

Real-time exposure monitoring will be conducted rather than indirect monitoring methods because real-time monitoring allows for exposure intervention and control. Indirect monitoring may be more accurate but is not useful as a preventative tool due to the time lag between sample collection and analysis.

Real-time monitoring of employee breathing zones at the source of emissions will be performed using a photoionization detector calibrated according to manufacturer's specifications. Calibrations will include appropriate instrument adjustments to enable accurate detection of Trichloroethylene.

Proposed work site action levels include protective equipment upgrades at work zone exposures of 5 ppm (Level C) and 50 ppm (Level B). The threshold limit values (TLVs)for the parameters of concern are shown on Table 2.

Prior to the initiation of excavation for the foundation, background concentrations will be established. Detection of work zone concentrations at greater than 5 ppm above background will trigger property perimeter monitoring using the photoionization detector. Detection of property perimeter readings 5 ppm above background will activate investigation and implementation of emission control measures (e.g., ground cover, vapor suppression foams, temporary work stoppage) until these perimeter levels decrease to below 5 ppm above background. In addition, work zone levels greater than 5 ppm above background will trigger monitoring for vinyl chloride and benzene to assure emissions remain below threshold limit values as shown on Table 2. Concentrations of vinyl chloride and benzene have historically been well below 50 ppm above backward (airborne PID measurement); a 5 ppm above background threshold will provide more than adequate health and safety protection.

7.0 ON-SITE STORAGE/TREATMENT TANK

Currently Conklin intends to utilize a tank for the storage/ treatment of the contaminated soil excavated at the site. The tank will be constructed in accordance with the substantive requirements of NYSDEC rules and regulations, and will prevent any migration of wastes or accumulated liquids out of the system to the soil, groundwater or surface waters.

The tank will be located on the Carousel Center site approximately 200 yeards west of the VOC Area. This location, shown on Figure 2, is in close proximity to the excavated area and the nearest suitable location consistent with the site redevelopment plan.

TABLES

TABLE 1

VOLATILES SUMMARY DATA
SOIL SAMPLES
SUPPLEMENTAL R.I.
12/89 - 1/90

DEPTH (ft.)	SB-1	SB-1A	SB-2	SB-3	SB-4
0 - 2	---	S-1 HNU=NA GC=0.6 LAB=0.05	---	S-1 HNU=0.2 GC=NA	S-1 HNU=NA GC=<0.5
2 - 4	S-1 HNU=NA GC=NA	S-2 HNU=NA GC=20.3 LAB=0.01	S-1 HNU=NA GC=1.0 LAB=0.87	S-2 HNU=0 GC=<0.5 LAB=0.06	S-2 HNU=NA GC=<0.5 LAB=0.03
4 - 6	S-2 HNU=NA GC=NA	S-3 HNU=NA GC=0.2 LAB=0.12	S-2 HNU=NA GC=0.7 LAB=3.13	S-3 HNU=0.6 GC=<0.5 LAB=0.04	S-3 HNU=NA GC=<0.5 LAB=0.04
6 - 8	S-3 HNU=NA GC=NA	S-4 HNU=NA GC=0.2	S-3 HNU=NA GC=0.8 LAB=2.33	S-4 HNU=0 GC=<0.5 LAB=0.05	S-4 HNU=NA GC=<0.5 LAB=ND
8 - 10	S-4 HNU=NA GC=5.6 LAB=6.81	S-5 HNU=NA GC=0.6 B.O.B.	B.O.B.	S-5 HNU=0.8 GC=NA B.O.B.	B.O.B.
10 - 12	S-5 HNU=NA GC=1.4 * LAB=3.41				
12 - 14	S-6 HNU=NA GC=3.0 * LAB=1.53				
14 - 16	B.O.B.				

See notes at end of table.

TABLE 1 (cont.'d)

VOLATILES SUMMARY DATA
SOIL SAMPLES
SUPPLEMENTAL R.I.
12/89 - 1/90

DEPTH (ft.)	TB-4C	TB-6B	TB-9B	TB-11B	DGC-14D	DGC-15D	DGC-16D	DGC-17D
0 - 2	S-1 HNU=1 GC=NA	---	---	---	---	S-1 HNU=0 GC=NA	S-1 HNU=10-20 GC=NA	S-1 HNU=3 GC=NA
2 - 4	S-2 HNU=0 GC=NA	---	---	---	---	S-2 HNU=0 GC=NA	S-2 HNU=500-700 GC=NA	S-2 HNU=2 GC=NA
4 - 6	S-3 HNU=0 GC=NA	---	---	---	---	S-3 HNU=0 GC=NA	S-3 HNU=500-600 GC=NA	S-3 HNU=2 GC=NA
6 - 8	S-4 HNU=3 GC=3.9 *	---	---	---	---	S-4 HNU=2.0 GC=NA	S-4 HNU=500 GC=531	S-4 HNU=1 GC=NA
8 - 10	S-5 HNU=5 GC=NA	---	---	---	---	S-5 HNU=2.0 GC=NA	S-5 HNU=500 GC=NA	S-5 HNU=5-20 GC=32.7
10 - 12	S-6 HNU=0 GC=6.9	---	S-1 HNU=50-100 GC=NA	S-1 HNU=150 GC=NA	---	S-6 HNU=0.5 GC=NA	S-6 HNU=500 GC=NA	S-6 HNU=5-10 GC=NA
12 - 14	S-7 HNU=40 GC=11.3	---	S-2 HNU=50-100 GC=NA	S-2 HNU=250 GC=114.5	---	S-7 HNU=4 GC=NA	S-7 HNU=500 GC=536	S-7 HNU=5-12 GC=0.7
14 - 16	S-8 HNU=70 GC=25.6	---	S-3 HNU=300-500 GC=197.4	S-3 HNU=200 GC=NA	---	S-8 HNU=3 GC=NA	S-8 HNU=300-500 GC=2350	S-8 HNU=1-7 GC=3.4 *
16 - 18	S-9 HNU=15 GC=23.9	S-1 HNU=200 GC=NA	S-4 HNU=200-300 GC=NA	S-4 HNU=200 GC=6.3	---	S-9 HNU=3.5 GC=NA	S-9 HNU=300-600 GC=1150	S-9 HNU=7-12 GC=2.8 *
18 - 20	S-10 HNU=1 GC=0.1 LAB=0.01	S-2 HNU=150 GC=NA	S-5 HNU=200-300 GC=NA	S-5 HNU=50 GC=20.7	---	---	S-10 HNU=115 GC=NA	S-10 HNU=7 GC=<0.5
20 - 22	S-11 HNU=1 GC=<0.5 LAB=0.06	S-3 HNU=15 GC=19	S-6 HNU=70-150 GC=136.1	S-6 HNU=10 GC=<0.5	S-1 HNU=20 GC=NA	---	S-11 HNU=50-150 GC=3.9 *	S-11 HNU=15 GC=<0.5

See notes at end of table.

TABLE 1 (cont.'d)

VOLATILES SUMMARY DATA
SOIL SAMPLES
SUPPLEMENTAL R.I.
12/89 - 1/90

DEPTH (ft.)	TB-4C	TB-6B	TB-9B	TB-11B	DGC-14D	DGC-15D	DGC-16D	DGC-17D
22 - 24	S-12 HNU=1 GC=1.7 * B.O.B.	S-4 HNU=50 GC=<0.5	S-7 # HNU=30-70 GC=40.3	S-7 HNU=13 GC=143.5	S-2 HNU=15 GC=NA	S-10 HNU=5 GC=NA	S-12 HNU=15-100 GC=2.4 *	S-12 HNU=NA GC=<0.5
24 - 26		---	S-9 HNU=5-15 GC=1.5*	S-8 HNU=7 GC=<0.5 LAB=0.05	S-3 HNU=15 GC=NA	---	S-13 HNU=15 GC=<0.5	S-13 HNU=NA GC=NA
26 - 28		S-5 HNU=10 GC=0.5	S-10 HNU=5-15 GC=<0.5	S-9 HNU=7 GC=<0.5 LAB=0.07	S-4 HNU=15 GC=NA	---	S-14 HNU=NA GC=<0.5	S-14 HNU=NA GC=NA
28 - 30		S-6 HNU=10 GC=0.5 LAB=1.49	S-11 HNU=NA GC=<0.5 LAB=0.09	B.O.B.	S-5 HNU=10 GC=NA	---	S-15 HNU=NA GC=0.3 LAB=0.14	S-15 HNU=NA GC=NA
30 - 32		S-7 HNU=10 GC=0.6 LAB=0.33	S-12 HNU=NA GC=<0.5 LAB=0.16		S-6 HNU=15 GC=NA	S-11 HNU=1.5 GC=NA	S-16 HNU=NA GC=0.6 LAB=0.09	S-16 HNU=NA GC=<0.5
32 - 34		S-8 HNU=5 GC=<0.5 LAB=0.10	S-13 HNU=NA GC=<0.5 LAB=0.09		S-7 HNU=15 GC=<0.5	---	S-17 HNU=NA GC=<0.5 LAB=0.02	S-17 HNU=NA GC=<0.5 B.O.B.
34 - 36		B.O.B.	B.O.B.		S-8 HNU=15 GC=<0.5	S-12 HNU=0 GC=<0.5	---	
36 - 38					B.O.B.	S-13 HNU=0 GC=<0.5	S-18 HNU=NA GC=<0.5	
38 - 40						S-14 HNU=0 GC=<0.5	S-19 HNU=NA GC=0.4	
40 - 42						B.O.B.	S-20 HNU=NA GC=0.2	
42 - 44							S-21 HNU=NA GC=NA B.O.B.	

See notes at end of table.

TABLE 1 (cont.'d)

VOLATILES SUMMARY DATA TABLE
SOIL SAMPLES
SUPPLEMENTAL R.I.
1-2/90

DEPTH (ft.)	SB-6	SB-7	SB-8	DGC-18D
0 - 2	S-1 HNU=7 GC=0.5 LAB=0.12	S-1 HNU=0.5 GC=0.8 LAB=0.27	S-1 HNU=8 GC=0.4 LAB=0.15	S-1 HNU=BKGD GC=NA
2 - 4	S-2 HNU=3 GC=0.5 LAB=0.19	S-2 HNU=1 GC=1.9 * LAB=0.27	S-2 HNU=6 GC=0.8 LAB=0.27	S-2 HNU=1.8 GC=NA
4 - 6	S-3 HNU=100 GC=2.2 * LAB=0.34	S-3 HNU=1 GC=1.3 * LAB=0.17	S-3 HNU=1 GC=0.6 LAB=0.32	S-3 HNU=4.4 GC=NA
6 - 8				S-4 HNU=7.8 GC=NA
8 - 10				S-5 HNU=BKGD GC=NA
10 - 12				S-6 HNU=BKGD GC=2.4 *
12 - 14				S-7 HNU=3 GC=4.4 *
14 - 16				S-8 HNU=1.1 GC=4.4 *
16 - 18				S-9 HNU=3 GC=NA

* NOTE: This result is below the NYSDEC limit of 5 ppm for total compounds, but above the NYSDEC limit of 1 ppm for one compound.

NOTE: TB-9B S-7 is at depth 22-23 feet. TB-9B S-8 is at depth 23-24 feet with the following data: HNU=5-10 and GC=4.4*.

All readings are in ppm.
B.O.B. = Bottom of Boring
NA = Not Analyzed
ND = Not Detected

TABLE 2

THRESHOLD LIMIT VALUES

COMPOUND	THRESHOLD LIMIT VALUE
1,1,1 Trichloroethane	350 ppm
Trichloroethylene	50 ppm
Toluene	100 ppm
Xylene	100 ppm
Acetone	750 ppm
Vinyl Chloride	1 ppm
Benzene	1 ppm/5 ppm

FIGURES

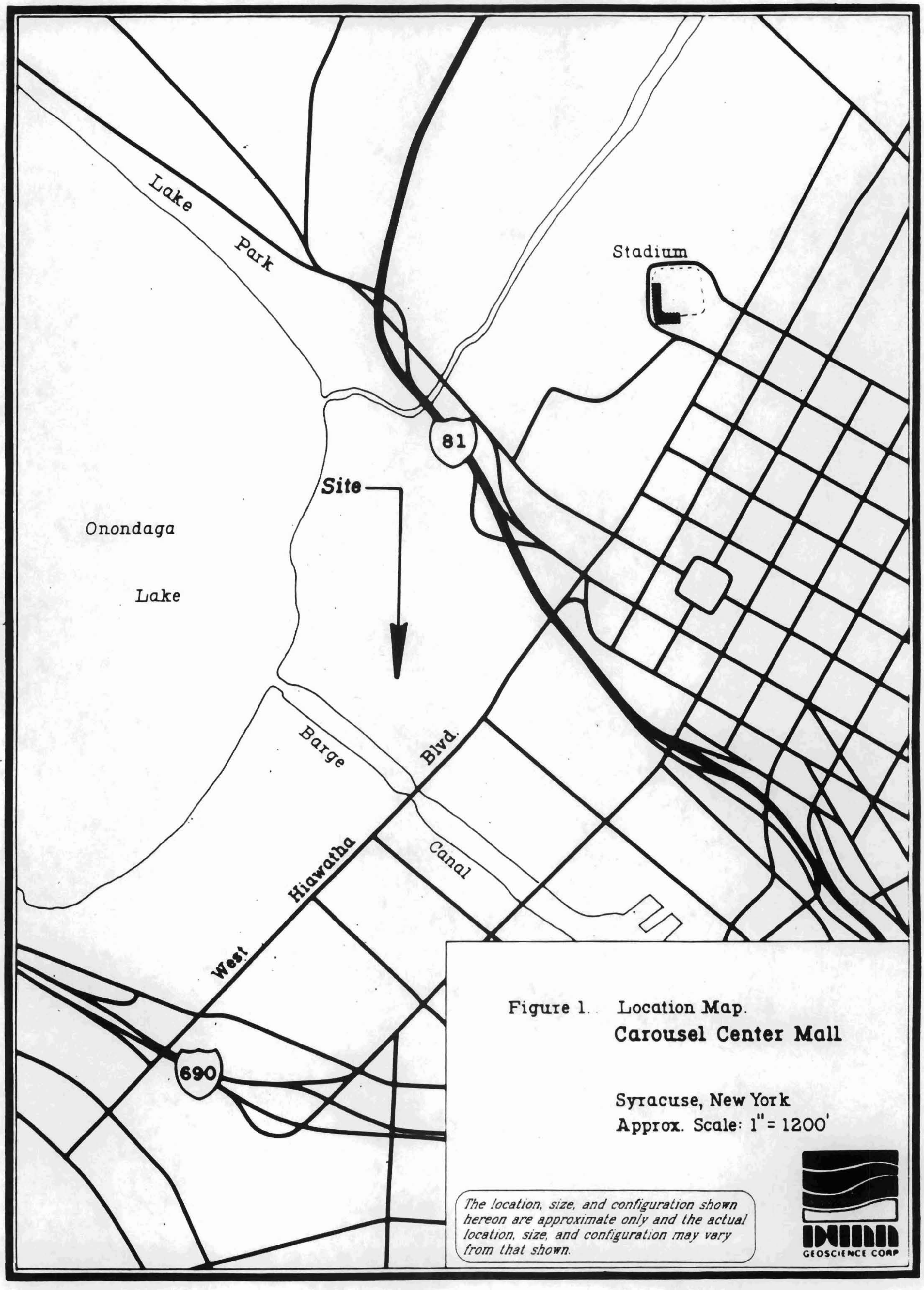
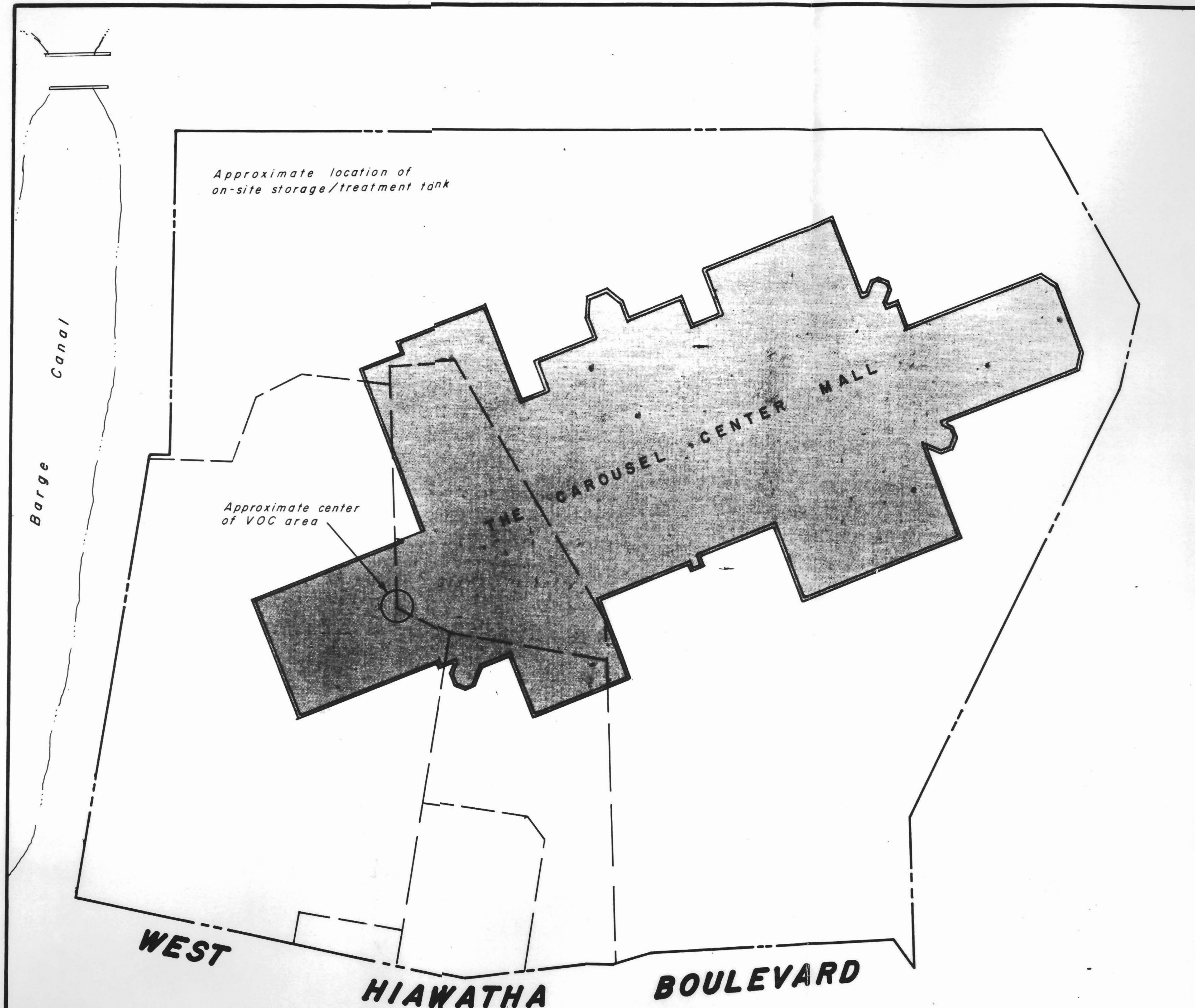


Figure 1. Location Map.
Carousel Center Mall

Syracuse, New York
Approx. Scale: 1" = 1200'

The location, size, and configuration shown hereon are approximate only and the actual location, size, and configuration may vary from that shown.



The location, size, and configuration shown hereon are approximate only and the actual location, size, and configuration may vary from that shown.

FIGURE 2

SITE MAP

CAROUSEL CENTER MALL

CITY OF SYRACUSE, NEW YORK

PROJECT NO.: 2371-01-455 | DATE: January 24, 1990

DUNN GEOSCIENCE CORPORATION
12 Metro Park Road
Albany, N.Y. 12205

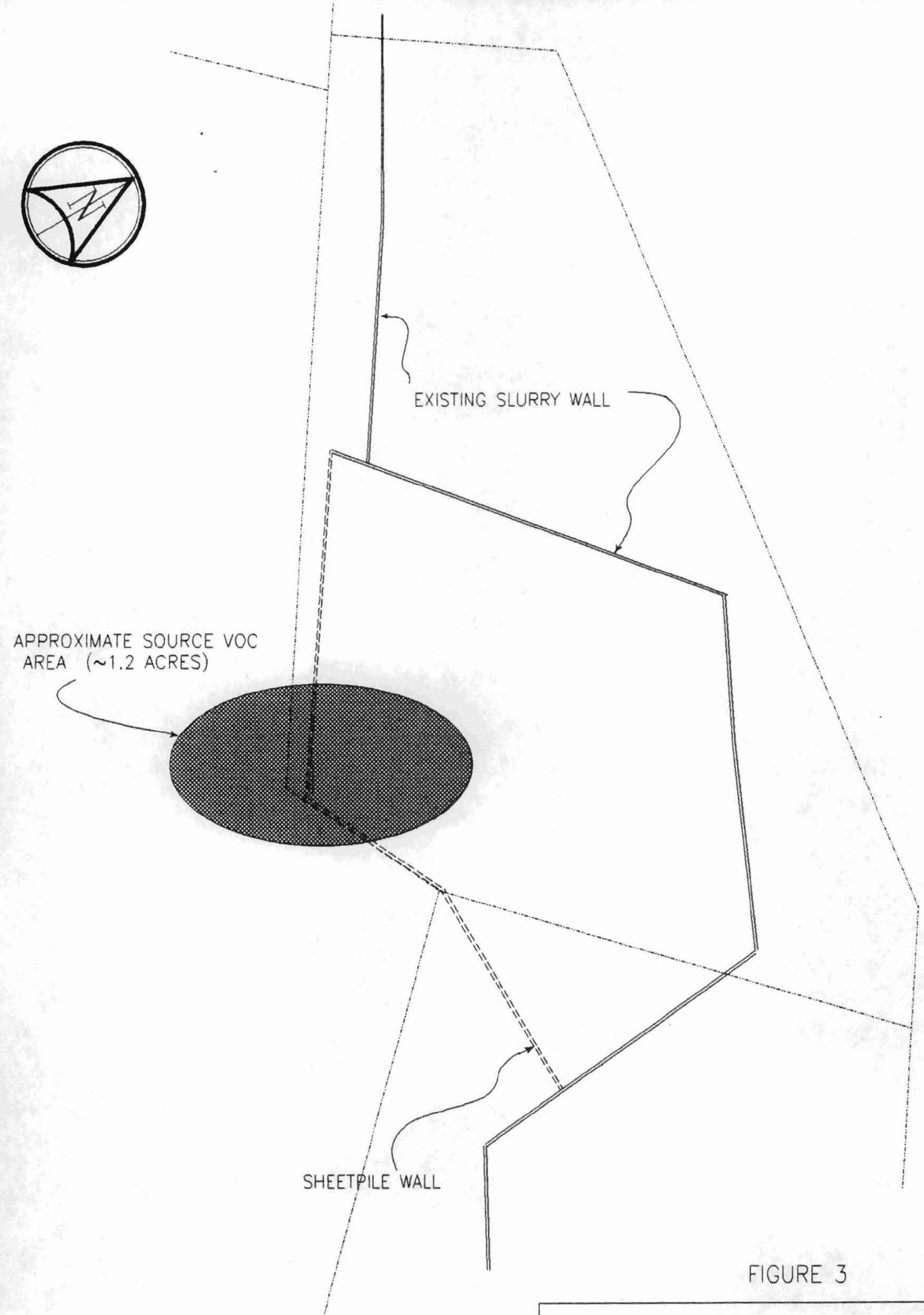


FIGURE 3

VOC AREA – SOURCE

DUNN GEOSCIENCE CORPORATION
12 METRO PARK ROAD
ALBANY, N.Y. 12205

The location, size, and configuration shown hereon are approximate only and the actual location, size, and configuration may vary from that shown.

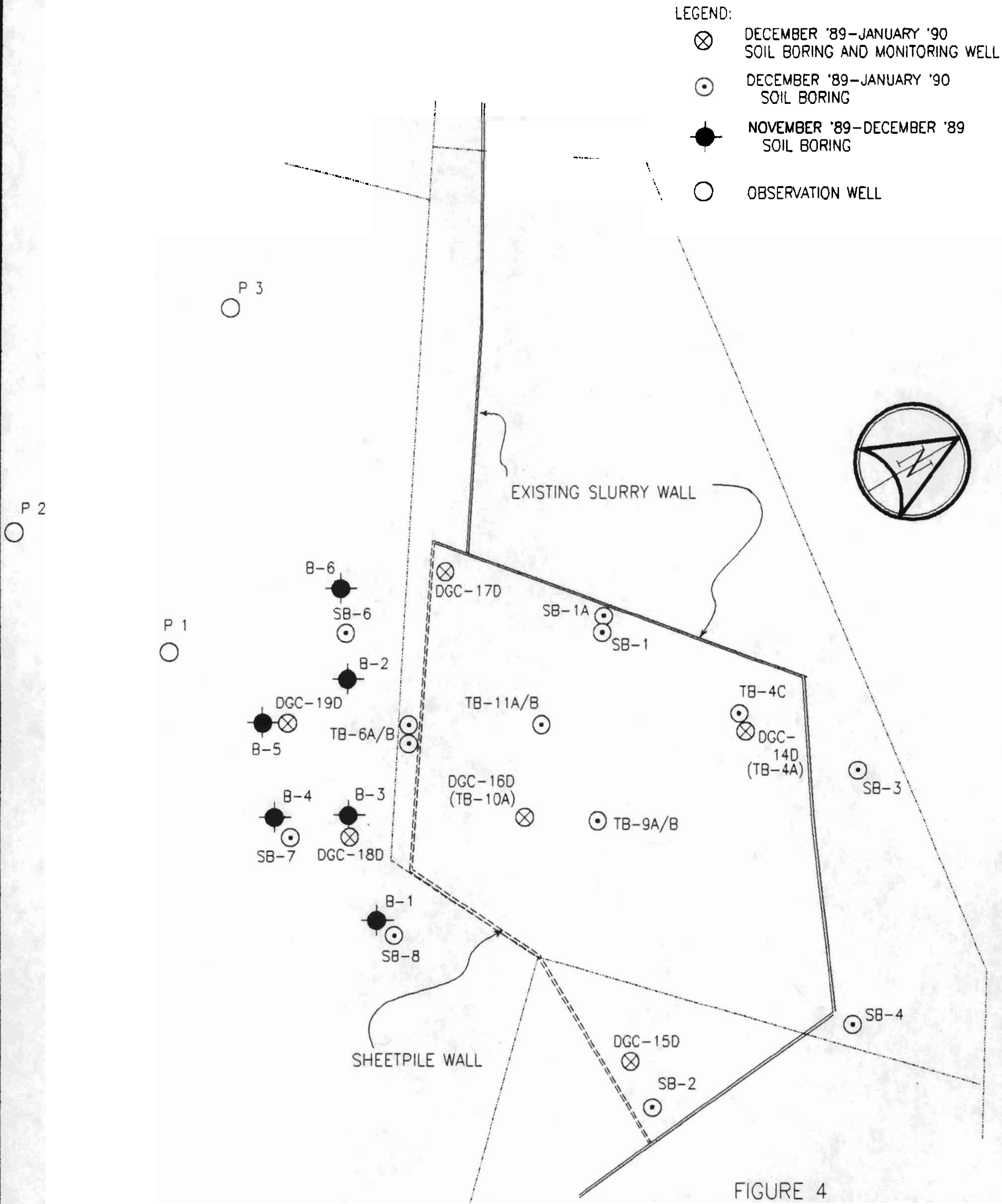
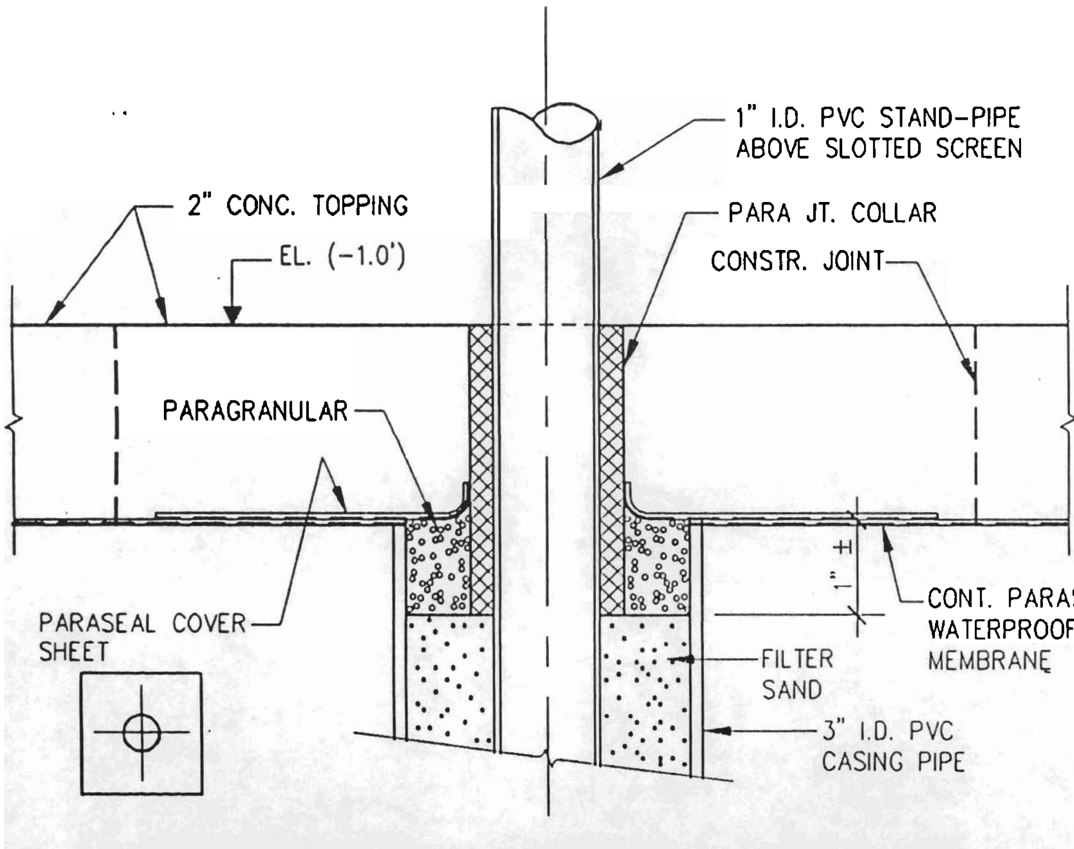


FIGURE 4

SAMPLE LOCATIONS

The location, size, and configuration shown hereon are approximate only and the actual location, size, and configuration may vary from that shown.

DUNN GEOSCIENCE CORPORATION
12 METRO PARK ROAD
ALBANY, N.Y. 12205



SEQUENCE OF CONSTRUCTION

1. INSTALL CASING PIPE IN ACCORDANCE WITH DETAIL 4/SP-1.
2. COMPLETE FINE GRADING AND INSTALL PARASEAL MEMBRANE.
3. COVER STANDPIPE WITH 12"x12" MIN. 2" THK. STYROFOAM PANEL.
4. CONSTRUCT CONCRETE TOPPING.
5. REMOVE STYROFOAM PANEL AND CUT MEMBRANE ALONG INSIDE FACE OF CASING PIPE.
6. INSTALL SLOTTED SCREEN & STANDPIPE INSIDE CASING PIPE.
7. FILL ANNULAR SPACE WITH FILTER SAND TO EXTENT SHOWN ON DRAWING.
8. INSTALL PARA JOINT COLLAR AROUND STANDPIPE.
9. PLACE PARA GRANULAR AS INDICATED.
10. PULL PARASEAL COVER SHEET OVER STANDPIPE & PARA JOINT COLLAR.
11. COMPLETE CONCRETE TOPPING AROUND STANDPIPE.

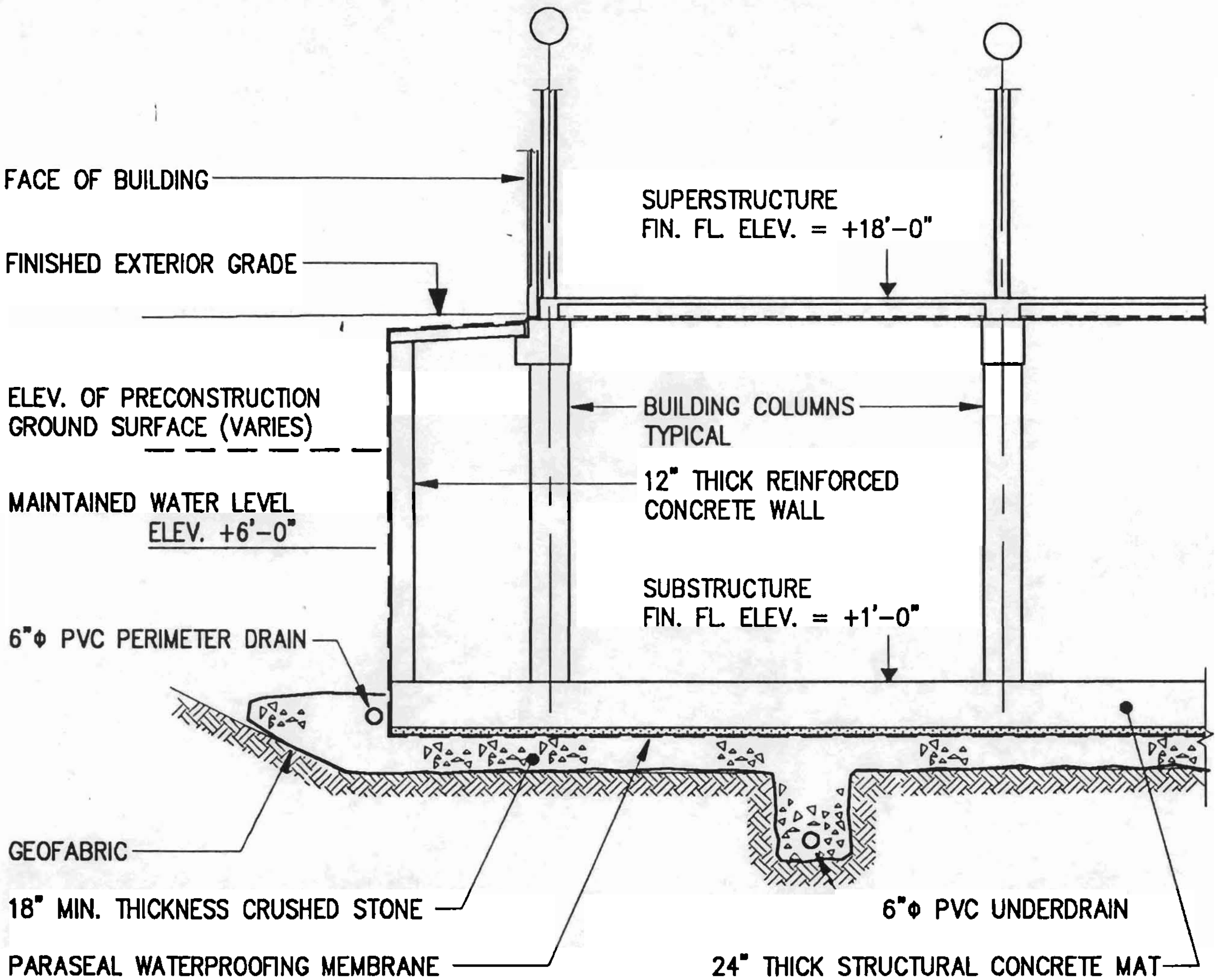
D: SPSECT13
9900124.0940

WATERPROOFING OF INTERIOR OBSERVATION WELL

6" = 1'-0"

SHEET WP-3

FIGURE 5



FOUNDATION CONCEPT

1/8"=1'-0"

FIGURE 6