REMEDIAL INVESTIGATION PLAN

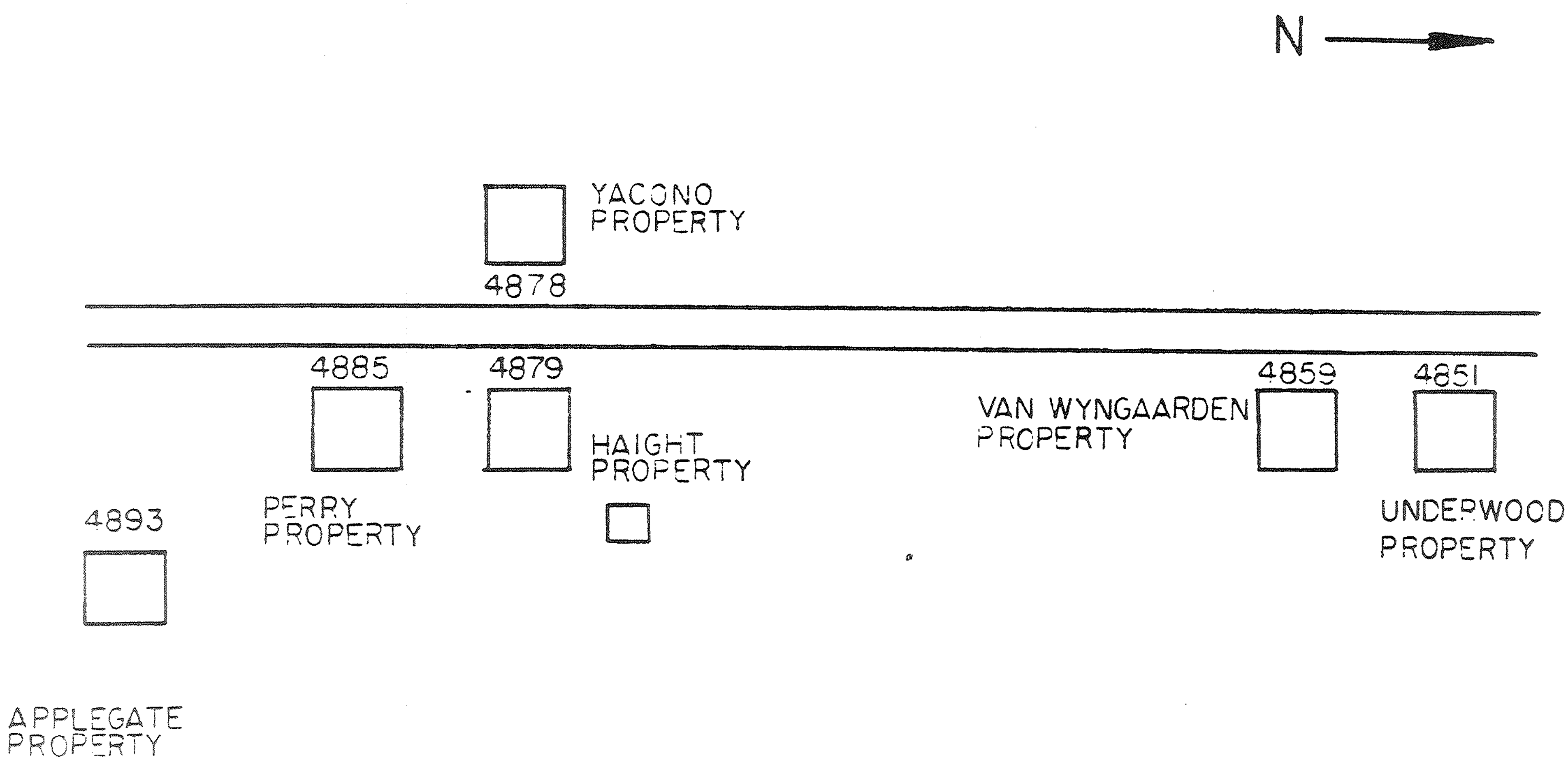
HAIGHT FARM SITE
CLARENDON, NEW YORK

DEC SITE #837006

PREPARED BY: DAY ENGINEERING, P.C.
700 EXCHANGE STREET
ROCHESTER, N.Y. 14608

DATE PREPARED: JUNE, 1989

REVISED: OCTOBER, 1989



Revised: 5/89 SM

SCALE NTS	FIGURE 2
DATE 12/28/87	DWG. NO. 87-166-B
HAIGHT PROPERTY CLARENDON, NY	
DAY ENGINEERING, ROCH., NY	
DRAWN BY RPT	PROJ. NO. 87-166

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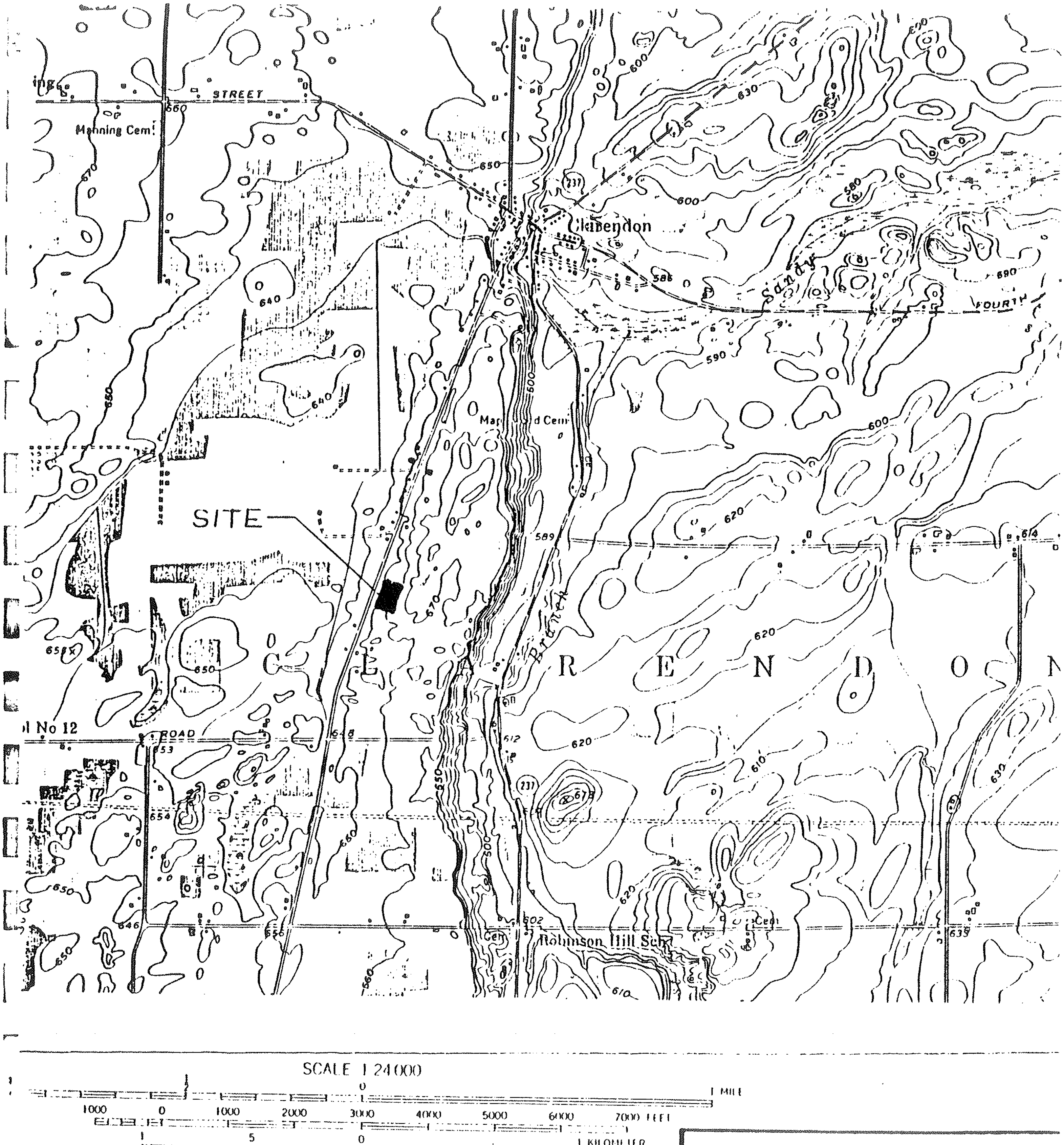
REMEDIAL INVESTIGATION PLAN
HAIGHT FARM SITE
4879 UPPER HOLLEY ROAD
CLARENDON (T), ORLEANS COUNTY, NEW YORK

I. INTRODUCTION

A. Current Situation:

The Haight property is approximately two acres in size and is located on the east side of Upper Holley Road in the Town of Clarendon, New York (Refer to Figures 1 and 2). The site has 260 feet of road front and extends about 300 feet east from the road right-of-way. It is located in a rural area and is bounded on either side along the road by private lots.

It is reported that approximately 40 drums containing used oil were stored on the site from approximately 1969 to 1984. These drums allegedly came from Erdle Perforating Company in Rochester, New York. Erdle used trichloroethylene (TCE) as a degreasing solvent. In December, 1984, the drums of oil were removed from the Haight property. At the time of removal, some of the drums were sampled and found to contain TCE. Some oil from the drums was reportedly spilled onto the ground during removal of the drums. The quantity of used oil



CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U S GEOLOGICAL SURVEY, WASHINGTON, D C 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

FIGURE 1

SITE LOCATION MAP

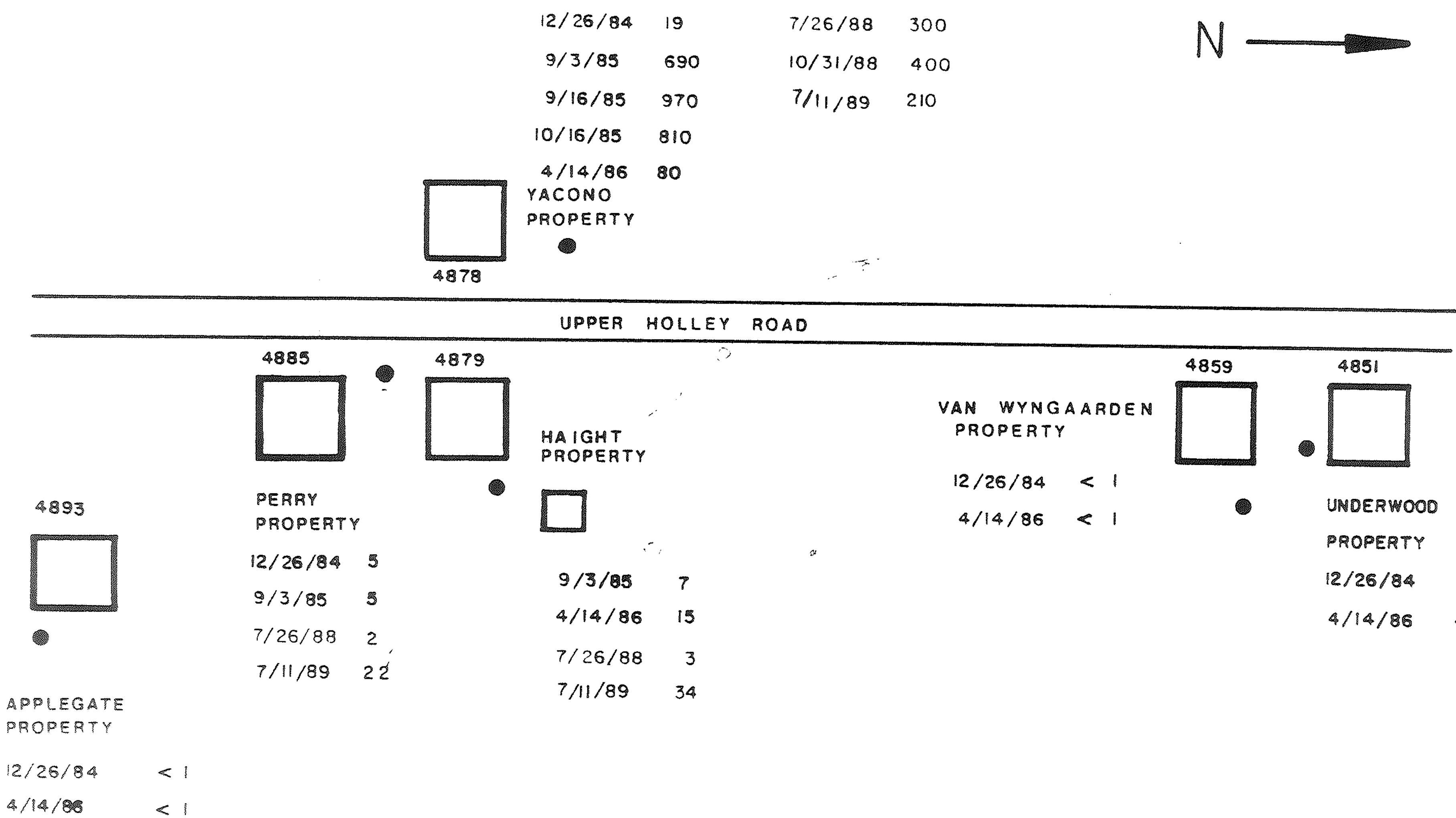
HAIGHT PROPERTY
CLARENDON, NY

USGS 7.5' TOPO. MAP
HOLLEY NY (QUAD)-1950

released is not known, although it has been estimated to be about 200 gallons.

A surface soil sample was collected by the New York State Department of Environmental Conservation (DEC) in the spill area at the time of removal of the drums. The sample was taken next to a truck onto which some of the drums had been loaded. This sample revealed the presence of TCE, and was also found to contain polychlorinated biphenyls (PCBs) at a level of 19 ppm. The samples taken from the used oil drums were reported to contain <1 ppm PCBs.

Six private wells in the area have been sampled and tested for volatiles and polychlorinated biphenyls (PCBs). This sampling was conducted by the Orleans County Department of Health between December 26, 1984 and July 11, 1989. The six wells sampled were Haight's well, the four wells on the properties adjacent to both sides of the Haight property, and the well on the property across the road. The TCE results for these wells are shown in Figure 3. All positive results for these wells are presented in Table 1.



PRIVATE WELL SAMPLING RESULTS CONDUCTED BY ORLEANS COUNTY DEPARTMENT OF HEALTH. SAMPLING DATES FOLLOWED BY TRICHLOROETHYLENE CONCENTRATIONS (PPB)

● WELL LOCATION

Revised 5/89: SM

SCALE NTS	FIGURE 3
DATE 12/28/87	DWG. NO. 87-166-C
HAIGHT PROPERTY CLARENDON, NY	
DAY ENGINEERING ROCHESTER, NY	
DRAWN BY RPT	PROJ. NO. 87-166

TABLE 1

Private Well Sampling Results

SAMPLING DATE	WELL	COMPOUND	CONCENTRATION (ppb)
12/26/84	Perry	Trichloroethylene (TCE)	5
12/26/84	Yacono	TCE	19
		Carbon Tetrachloride	1
		Chloroform	1
		Perchloroethylene (PCE)	1
		1,1,1-Trichloroethane	1
9/03/85	Haight	TCE	7
9/03/85	Perry	TCE	5
9/03/85	Yacono	TCE	690
		trans-1,2-Dichloroethylene	2
		Benzene	1
9/16/85	Yacono	TCE	970
		Chloroform	1
		trans-1,2-Dichloroethylene	3
		Benzene	1
		Toluene	1
10/16/85	Yacono	TCE	810
		trans-1,2-Dichloroethylene	2
		Benzene	2
4/14/86	Haight	TCE	15
		PCE	15
4/14/86	Yacono	TCE	80
7/26/88	Haight	TCE	3
7/26/88	Perry	TCE	2
7/26/88	Yacono	TCE	300
		trans-1,2-Dichloroethylene	2
10/31/88	Yacono	TCE	400
		trans-1,2-Dichloroethylene	2
7/11/89	Haight	TCE	34
7/11/89	Perry	TCE	22
7/11/89	Yacono	TCE	210
		cis-1,2-Dichloroethylene	1

TCE has been found in only three of these wells: Haight's well; Yacono's well (across the street); and Perry's well (next door to the south). In the samples collected from Haight's well, levels of TCE were found at 15 ppb and 7 ppb. The well on the Perry property twice exhibited a TCE concentration of 5 ppb.

The Yacono well is the only well in the immediate area located on the west side of the road. TCE concentrations found in this well ranged from 19 ppb in 1984 to a maximum of 970 ppb in September, 1985 (Refer to Figure 3). Since that date, the detected concentrations have decreased. In April, 1986, the TCE concentration was 80 ppb. In July and October of 1988, 300 ppb and 400 ppb, respectively, were found. It is reported that a separate source may exist on this property in the form of buried drums containing solvents. This has been referenced in a letter dated May 23, 1986 from Eric Wohlers of the Orleans County Department of Health to Deborah Jackson of the DEC. This letter is included in Appendix A.

Trace levels of other purgeable halocarbons and some purgeable aromatics were found in some of the well samples (Refer to Table 1). PCBs were not found in any of the well samples.

A preliminary study was conducted by Day Engineering, P.C. in May, 1987 to initially determine the approximate areal extent of soil contamination. An HNU Photoionization Detector was used to detect organic vapors in the soil at selected locations in the vicinity of the area where the drums had been stored. This was a qualitative study whose sole purpose was to determine the horizontal extent of solvent contamination in order to estimate the magnitude of a soil excavation project. A copy of this report is included in Appendix B.

Actual surface soil sampling was also conducted as part of the Day Engineering study. This sampling indicates that TCE contamination existed in the soil. The results are presented in Table 1 of the report included in Appendix B.

A Phase I Investigation was conducted at the site by Engineering-Science, Inc. As part of that investigation, the Hazard Ranking System (HRS) was applied at the site. The preliminary HRS scores were determined to be:

$S_M = 26.82$

$S_{FE} = 0$

$S_{DC} = 25.00$

Recommendations were made in the Phase I report to conduct a Phase II investigation.

B. **Background Geologic Information:**

The site is located south of Clarendon, New York on Upper Holley Road. The ground surface slopes to the west from an elevation above mean sea level of approximately 660 feet near the eastern edge of the property to about 650 feet adjacent to Upper Holley Road. The majority of the Haight property soil is designated in the "Soil Survey of Orleans County, New York" as Ontario stony loam. Adjacent to and west of Upper Holley Road, the soil type is designated Hilton loam.

The Ontario series soils are formed in glacial till derived from limestone and sandstone. The solum (i.e., surface soil and subsoil) ranges in thickness from 34 to 48 inches and is characterized by moderate permeability. The underlying substratum is characterized by a lower permeability. Bedrock is at a depth greater than 40 inches.

The Hilton series soils are similar to Ontario soils. These soils are also formed in glacial till derived from limestone and sandstone. The thickness of the solum ranges from 24 inches to 40 inches with a moderate permeability. The underlying substratum has a lower permeability. A temporary high water table is perched above the substratum during spring and wet periods.

Underlying the unconsolidated material is the Lockport dolomitic limestone. The bedrock outcrops along the face of a north-south trending escarpment located approximately 1500 feet to the east of the site. The escarpment is approximately fifty feet in height.

Based on the aforementioned available information, potential migration pathways of TCE from the former drum storage area on the Haight property are:

- o Overland flow toward the swale adjacent to Upper Holley Road.
- o Horizontal groundwater flow during wet periods within the upper moderately permeable soils.
- o Downward percolation from the upper moderately permeable zone through the underlying less permeable unconsolidated material into bedrock.
- o Flow within bedrock.

Overland flow and horizontal flow within the suspected underlying upper moderately permeable zone would occur only during periods of precipitation and would be in the direction of the existing topography.

The direction of flow within the uppermost portion of the bedrock cannot be determined with any certainty based on the available information. The bedrock controlled escarpment to the east may locally affect groundwater flow direction. In the vicinity of the escarpment, groundwater within bedrock underlying the upland may flow east toward the escarpment. The areal extent of the influence of the escarpment on groundwater flow is unknown, and the flow within the bedrock underlying the Haight Farm Site may be in an eastern direction. Alternatively, a local groundwater divide may exist east of the site between the site and the escarpment and flow underlying the site may be to the west.

In conversation with a representative of Genesee LeRoy Stone Corporation's Clarendon, New York quarry, located approximately 3600 feet north-northeast of the site, it was noted that the majority of groundwater seeping into the quarry operation emanates from the bedrock at or near the bedrock/unconsolidated material interface.

II. WORK PLANS

A. Remedial Investigation Work Plan:

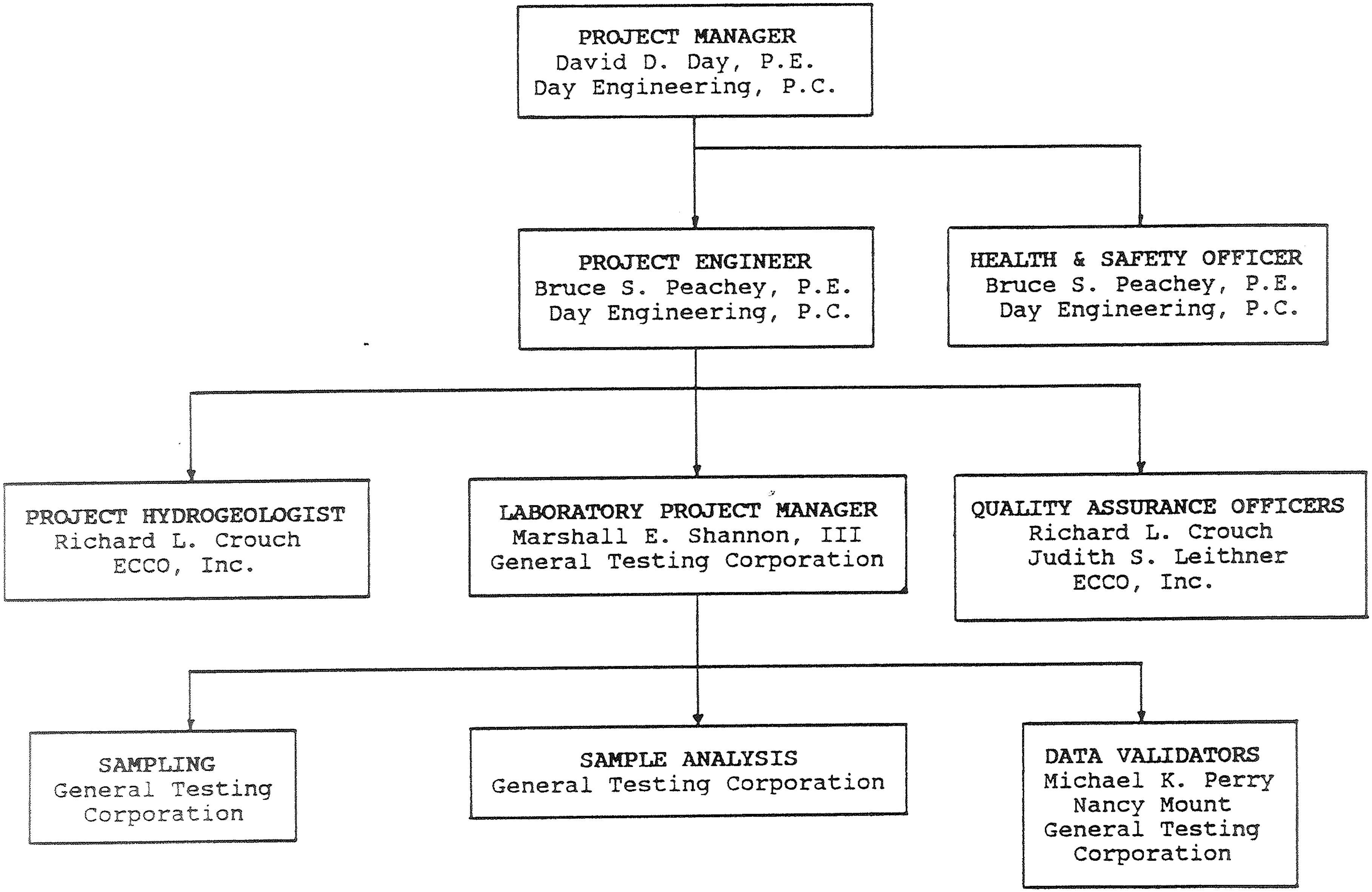
Day Engineering, P.C., in cooperation with ECCO, Inc. of Buffalo, New York and General Testing Corporation of Rochester, New York, proposes to conduct an evaluation to determine the presence and extent of contamination in the soil and groundwater at the Haight Farm Site in the Town of Clarendon, Orleans County, New York.

The investigative team will consist of a Project Manager, Environmental Engineers, Hydrogeologists, and Geotechnical Specialists. David D. Day, P.E. of Day Engineering will be the Project Manager for the remedial investigation. Bruce S. Peachey, P.E. of Day Engineering will be the Project Engineer responsible for implementing the remedial investigation. He will also be the Health and Safety Officer. As the Health and Safety Officer, he will be responsible for ensuring that the safety rules and regulations outlined in the Site Health and Safety Plan are adhered to by personnel involved at the Haight Farm Site. Richard Crouch of ECCO, Inc. will be the Project Hydrogeologist. General Testing Corporation, a New York State certified laboratory, will be utilized for sample analysis. Michael K. Perry and Nancy Mount of General Testing will act as data validators. Richard Crouch and Judith S. Leithner of ECCO will be the Quality Assurance Officers. The resumes of the data validators and QA officers are included in Appendix D. A project organization and responsibilities chart is included as Chart 1.

The detailed technical approach is set forth in the Site Investigation section (Section III) of this plan. Upon receipt of the approved Remedial Investigation Plan, the investigation will be initiated within thirty (30) days. It is anticipated that the field work outlined in this plan can be accomplished within a period of one hundred eighty (180) days. Analytical turnaround, data evaluation, and report preparation will take approximately one hundred twenty (120) days. The Remedial Investigation Report will be submitted within three hundred thirty (330) days of the approval date of the Remedial Investigation Plan. A written schedule of field activities will be submitted to the DEC at least five working days prior to commencement of any field work.

B. Site-Specific Health and Safety Plan:

A site-specific Health and Safety Plan is attached as Appendix "C".



PROJECT ORGANIZATION AND RESPONSIBILITIES CHART

CHART I

C. **Quality Assurance/Quality Control:**

A copy of the signed contract between Day Engineering and General Testing is included in Appendix D. For Target Compound List analyses, New York State Department of Environmental Conservation 1987 Contract Laboratory Protocol (CLP) will be used. All Quality Assurance/Quality Control requirements are addressed within this protocol.

For analyses using methods outlined in EPA Manual SW-846, standard laboratory protocol will be used. However, the level of duplicates and spikes will be in accordance with that required by CLP. In addition, the reportables and deliverables specified in the guidance provided by George Momberger (1/9/89) will be provided.

The project analytical QA objectives are included in Appendix D, as is General Testing's Quality Assurance Program. Data validation procedures are contained in the Quality Assurance Program. The sections of General Testing's Standard Operating Procedures that pertain to Quality Assurance and Quality Control are also included in Appendix D. The procedures outlined will be followed. Tables of methods, detection limits, and acceptance limits for each analyte are also included in

Appendix D (Tables D1-D9). If higher detection limits will be required at any time, General Testing will immediately notify Day Engineering. Day Engineering will then notify the DEC representative to determine appropriate action. If holding times are in danger of being exceeded because a decision on how to proceed has not yet been made, General Testing will utilize their knowledge and expertise to proceed with the analysis. All samples will be received at the laboratory on the day they are collected. A copy of General Testing's chain-of-custody form is included in Appendix D.

A set of eight forms has been included in Appendix E. These forms will be completed and included in the analytical report for all laboratory analyses conducted. The method to be used to determine Total Organic Carbon (TOC) is also included in Appendix E, as is General Testing's laboratory soil compositing procedure.

D. **Field Procedures Manual**

During the site investigation, precautions will be taken to ensure that sample integrity is not compromised by improper field procedures. The particular procedures to be followed in the field with respect to equipment cleaning and handling, sample collection and transfer, and instrument calibration and operation are outlined in the Field Procedures Manual, which is attached as Appendix F.

III. SITE INVESTIGATION

A site investigation will be conducted in order to characterize the type and extent of contamination present on the Haight Farm Site so that remediation options can be developed. The site investigation will include test borings and monitoring wells, soil sampling and analysis, groundwater sampling and analysis, and a select survey of the property. Prior to any deviations from the procedures specified in this work plan, the DEC will be notified so that an agreement can be reached on such deviations.

The site investigation is described in detail below. It incorporates a phased approach in which the design of some later work will be dependent upon the results of activities associated with earlier stages of the investigation.

The first phase of the site investigation will be confined to the Haight property. The elevated TCE concentrations found in the Yacono well (across the road) may be attributable to a separate source, as indicated in the letter dated May 23, 1986 from Eric Wohlers of the Orleans County Department of Health to Deborah Jackson of the DEC. A copy of this letter is included in Appendix A.

Site investigation activities will follow the work plans described in Section II and the guidance provided in "EPA Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA". Specific sample locations will be noted on a site map that will be generated from data collected during the investigation. Sample collection and analysis will be conducted in accordance with EPA protocols or DEC requirements, and chain-of-custody procedures will be followed.

The site investigation will include the following detailed activities:

A. **Literature Review:**

A review of available data regarding the site will be performed prior to or concurrent with the site reconnaissance. The literature review process will include an inspection of site sketches and topographic maps, and the determination of the need to acquire any permits prior to the initiation of field activities.

An investigation will be made into the availability of pertinent local geologic and hydrogeologic information. In addition, an attempt will be made to obtain information regarding the depth and construction of the six private wells shown in Figure 3. All private wells listed with the Orleans County Department of Health within one-half mile of the site will be identified. Efforts will also be made to identify the locations of any underground utilities present on the site.

B. Site Reconnaissance:

A site reconnaissance will be conducted prior to the commencement of any drilling or sampling activities. This will include staking and numbering tentative locations for test borings, monitoring wells, and surface soil samples. These locations will be selected so that the potential for disturbing any underground utilities identified on the site will be minimized.

A reconnaissance of the quarry north of the site will be conducted if permission can be obtained. Additionally, various site-specific information for drilling activities will be obtained. This will include such tasks as locating a source of water for drilling and evaluating the site's accessibility.

Concurrent with the site reconnaissance, an air monitoring program will be performed using an HNU photoionization detector or equivalent. This program will be used to establish initial site conditions. The air monitoring levels will be taken in the zone of breathing, normally 4-6 feet above the ground surface. Wind direction will be noted at the time of monitoring. One upwind and one downwind location will be monitored to determine whether significant air contamination is resulting from this site.

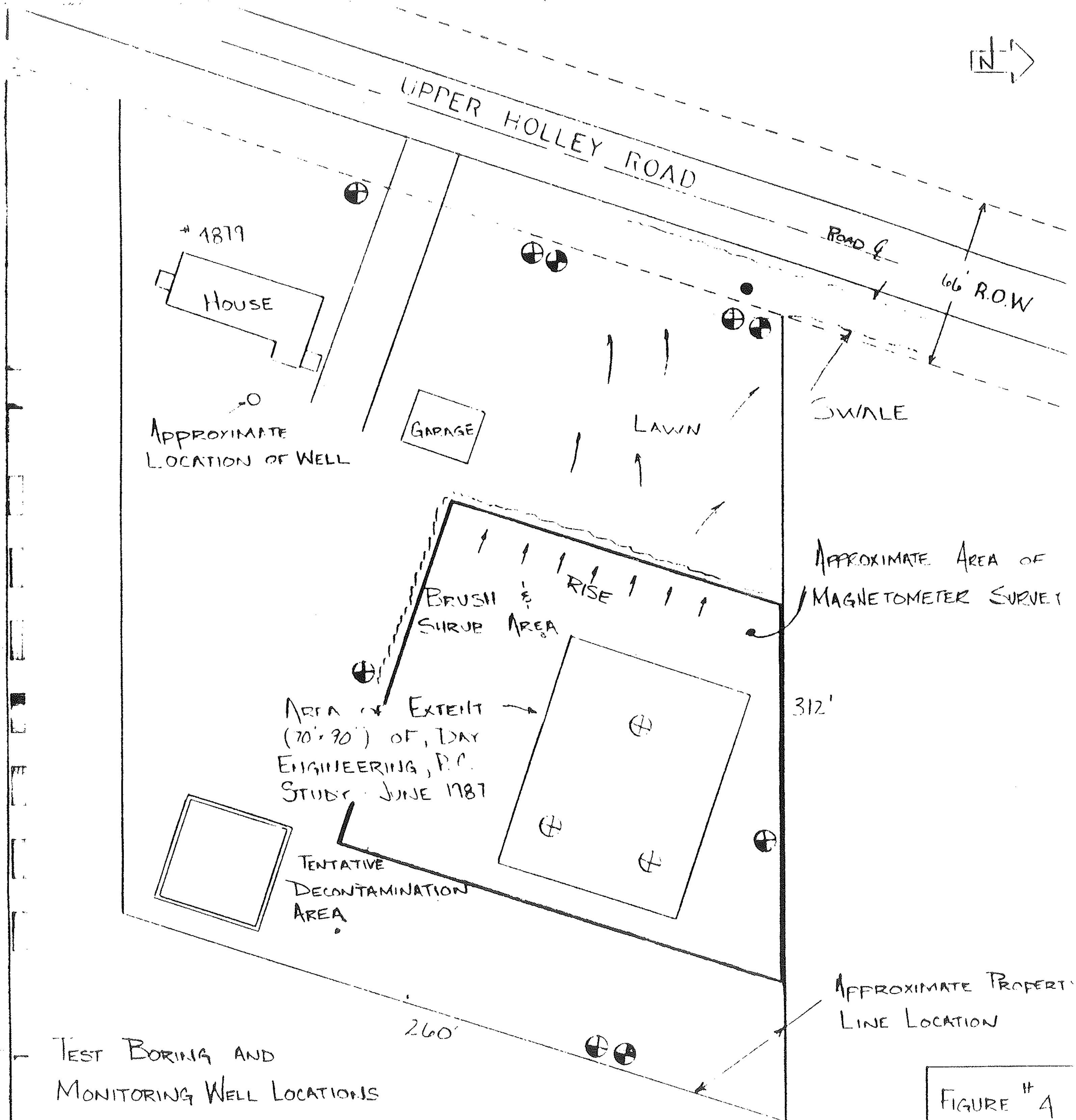
C. **Magnetometer Survey**

A magnetometer survey will be conducted in the area outlined in Figure 4. The purpose of this survey will be to attempt to delineate the location of buried ferrous metal objects (e.g., drums). The magnetometer survey will be performed using an EG&G Geometrics, Inc. Model G-856A portable proton magnetometer. This instrument can measure the intensity of the shallow subsurface magnetic field to within 0.1 gamma.

Upon entering the site for the performance of this survey, all pertinent health and safety protocol discussed in Appendix C will be followed. Initially, a baseline will be established. A grid pattern on a 25' x 25' spacing will be surveyed from the baseline and flagged. This will result in an initial data base of fifty (50) points. In addition to the points on the grid system, a base station will be established. Prior to conducting the magnetometer survey over the grid system. The magnetometer will be calibrated and background "natural" magnetic field intensity will be obtained at the base station. At the completion of the survey, a second/final reading will be obtained at the base station. The initial and final reading at the base station will enable a correction to be made for any time variant field intensity.

At each point on the grid system, a magnetic field intensity reading will be obtained. Any significant anomalous deviation from the initially established background level will be further investigated by a series of measurements on a 2' x 2' grid surrounding the anomalous reading.

All readings and time of readings will be recorded in a bound waterproof field book and also stored in the magnetometer. At the completion of the survey the logged readings and stored readings will be checked prior to the leaving the site. Subsequently, an isopleth map of the magnetic readings will be constructed and, if present, magnetic anomalies will be identified. This information will be used in the siting of test borings within the surveyed area.



TEST BORING AND MONITORING WELL LOCATIONS

FIGURE #4

- ↑ - INDICATES SURFACE RUNOFF DIRECTION
- ● - TELEPHONE POLE
- ⊕ - BEDROCK MONITORING WELL
- ⊕ - SHALLOW MONITORING WELL
- ⊕ - TEST BORING

HAIGHT PROPERTY CLARENDON, NY	
D.D. DAY ENGINEERING, P.C. ROCHESTER, NEW YORK	
DRAWN BY: SM	DATE: 10/87
SCALE: 1" = 50'	DWG. NO. 87-166

D. Test Boring/Monitoring Well Installation:

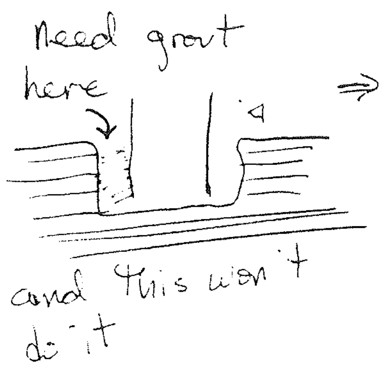
1. Test Borings

Nine test borings will be advanced. Three borings will be located in the former drum storage area. Two of these borings will be located in the areas exhibiting the highest levels ("Very High") of contamination in the May, 1987 study conducted by Day Engineering. A copy of the report on this study is included in Appendix B. The third test boring in the former drum storage area will be sited in an area characterized as "High" or "Medium" in that study (see Figure 2 in the Appendix B report).

The remaining six test borings will be sited at the following locations: three adjacent to Upper Holley Road; one each north and south of the area where the drums were stored; and one on the eastern portion of the Haight Property. Based on a preliminary field visit at the site, tentative locations for the borings have been selected and are shown in Figure 4. The actual locations will be determined in the field by Day Engineering representatives in concurrence with a DEC representative.

The three test borings in the former drum storage area will be advanced to bedrock. These borings will be filled immediately after completion with cement/bentonite grout. Monitoring wells will be installed in the six test borings located around the perimeter of the site. At the three bedrock well locations shown in Figure 4, test borings will be advanced into the first major bedrock water-bearing zone. Prior to drilling, the total depth of the bedrock test borings will be assessed if reconnaissance of the quarry is possible and information on private well construction is available. At the three single shallow well locations shown in Figure 4, test borings will be advanced to bedrock. Test borings will not be associated with the three shallow wells adjacent to the three bedrock wells.

Test borings will be advanced through the unconsolidated material with hollow stem augers driven by truck-mounted drilling equipment. Assuming that a shallow water-bearing zone is encountered within the unconsolidated material beneath the site, the drilling method for test borings located at the downgradient bedrock well locations will differ from the remaining test borings. The drilling technique proposed at the two locations will minimize hydraulic communication from the shallow aquifer to the deeper bedrock aquifer via the borehole. At these two locations, 6.25-inch I.D. flights of hollow stem augers (HSA) will be used. Once bedrock is encountered, a 5 7/8 inch roller bit will be used to construct a socket hole one foot into bedrock. A 4-inch I.D. steel casing will then be installed into the socket hole with a minimum 2.5-foot stick up above ground surface. The 4-inch casing will then be tremie grouted with a cement/bentonite mixture to ground surface and the top of the casing prepared for a locking cap. After the grout has hardened, a 3 7/8 inch roller bit will be used to drill out the inner grout plug in the 4-inch I.D. casing. An NX core barrel will then be used to advance the test boring to intercept the uppermost major bedrock aquifer. The rock core hole will then be enlarged using a 3 7/8 inch roller bit.



The remaining upgradient bedrock test boring and shallow test borings will be advanced using 4.25-inch I.D. HSA. Once bedrock is encountered at the upgradient bedrock test boring, an NX core barrel will be used to advance the boring into the bedrock aquifer of concern and the core hole subsequently reamed with a 3 7/8 inch roller bit. If at any time during the advacement of a test boring the boring must be left unattended, the boring, where appropriate, will be secured by leaving the auger cap attached to the auger flights and drill rig or the 4-inch steel casing locked.

Continuous split-spoon sampling will be conducted through the unconsolidated material in all nine test borings. Upon retrieval of each split-spoon sample, the on-site geologist will screen the sample using an HNU Photoionization Detector or equivalent and record the reading. Geologic classification of the sample will be performed and recorded. The sample will then be placed in a precleaned, 16-oz., teflon-lined screw-capped glass jar to be used for subsequent head space screening. At this time, any sample containers needed for subsequent soil analyses will also be filled. Each sample container will be appropriately labeled with date, project number, test boring number, sample number, sample depth interval, and standard penetration test result. Head space screening will later be performed on the 16-oz. jars, as discussed in Section III-F-2.

The on-site geologist will record all pertinent information for each test boring in a field book. At a minimum this information will include:

- o Date, test hole identification, and project identification
- o Name of individual developing the log
- o Names of driller and assistant(s)
- o Drill make and model, auger size, core barrel
- o Identification of alternative drilling methods used and justification therefor (e.g., rotary drilling with a specific bit type to remove a sand plug from within the hollow stem augers)
- o Depths recorded in feet and fractions thereof (tenths or inches) referenced to ground surface
- o Standard penetration test (ASTM D-1586) blow counts
- o For samples and rock cores, the length of the sample/run interval and the length of the sample/core recovered

- The depth of the first encountered water table, along with the method of determination, referenced to ground surface
- Drilling and borehole characteristics
- Sequential stratigraphic boundaries
- Initial screening results for split-spoon samples.

During the drilling, an HNU Photoionization Detector or equivalent will be used to monitor any gases exiting the borehole. Auger cuttings and drill water from a borehole that exhibits organic vapor readings of 5 ppm or greater above background levels will be retained and drummed. Subsequently, any groundwater removed during development of a well constructed in such a borehole will also be drummed. In addition, if visual observations and evaluations indicate the presence of waste material in the water or soil, it will be drummed.

Once a drum has reached capacity, the top will be securely fastened. These drums will be centralized on-site in an area whose location will be determined during the site reconnaissance.

2. Monitoring Well Installation

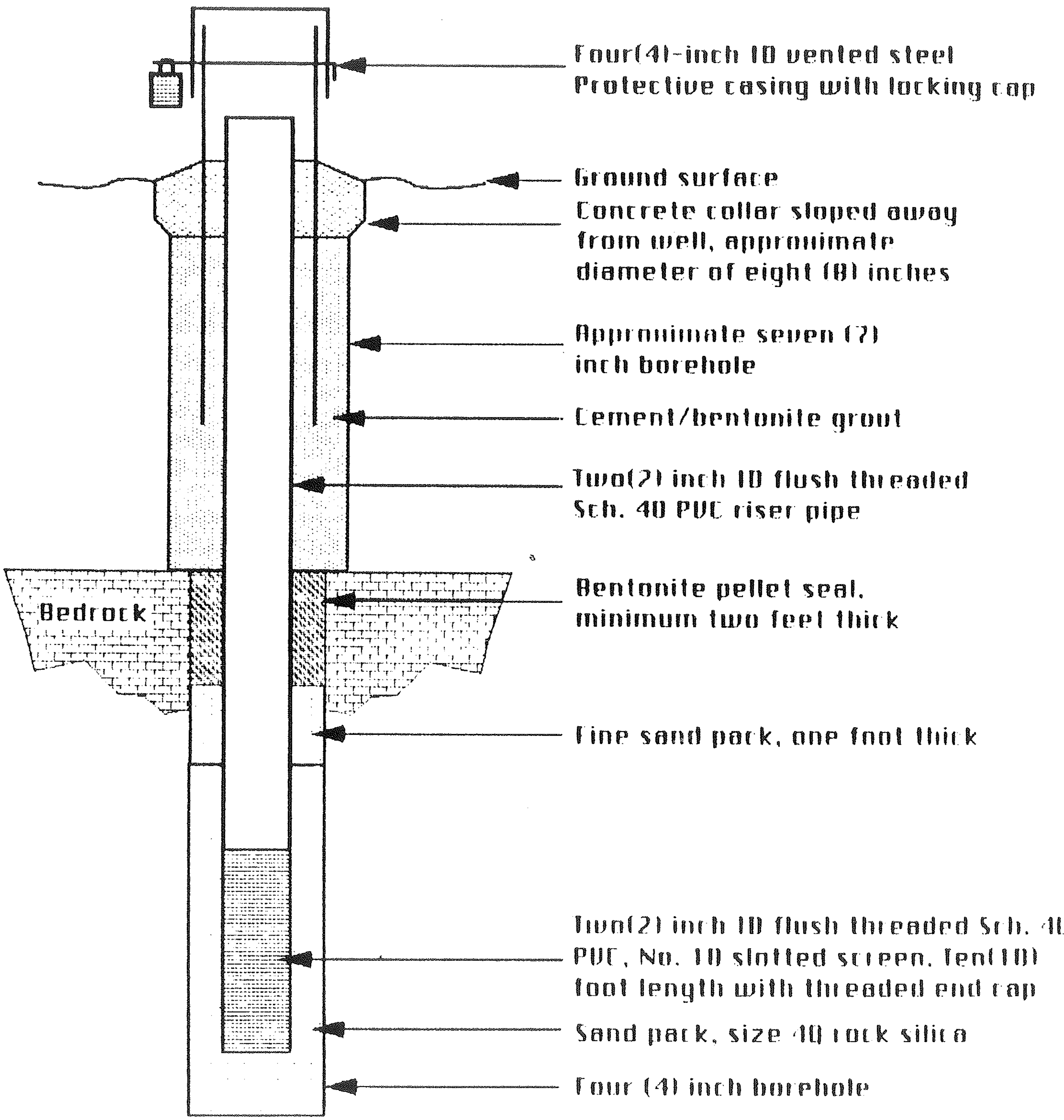
At this time, installation of six shallow and three bedrock monitoring wells is proposed. The proposed well locations are shown in Figure 4. If a saturated zone is not encountered in the unconsolidated material during the advancement of the test borings, single bedrock monitoring wells will be installed at all six locations.

The bedrock monitoring wells will be constructed of precleaned ten-foot long, two-inch I.D., threaded, flush-jointed No. 10 slot, schedule 40 PVC screen with attached riser casing of same construction material. Well screens will be installed to intercept the bedrock aquifer of concern. Each installation will include a washed and graded sand pack surrounding the screen and extending one foot below it and one and a half feet above it. A minimum two-foot thick bentonite seal will be placed above the sand pack and the remaining annulus will be filled with cement/bentonite grout to within two feet of the ground surface. The cement/bentonite grout will be tremied into the annulus above the bentonite seal using a grout pump and hose. A four to six inch diameter steel protective casing with locking cap will be placed over each well and cemented in place. An exception to the installation of protective casings will be at the test boring at which a permanent 4-inch steel casing was installed during drilling. Figures 5 and 6 show schematics of the proposed bedrock monitoring well construction.

The shallow wells will be constructed of the same materials as the bedrock monitoring wells with a ten-foot screen straddling the water table. The construction detail for the proposed shallow wells is presented in Figure 7.

Development of each well will begin no sooner than 24 hours after the well grouting has been completed. Well development will be performed for each well utilizing precleaned dedicated stainless steel bailers or a surface peristaltic pump fitted with dedicated clean polyethylene tubing. The precleaning procedures for the bailers are outlined in the Field Procedures Manual.

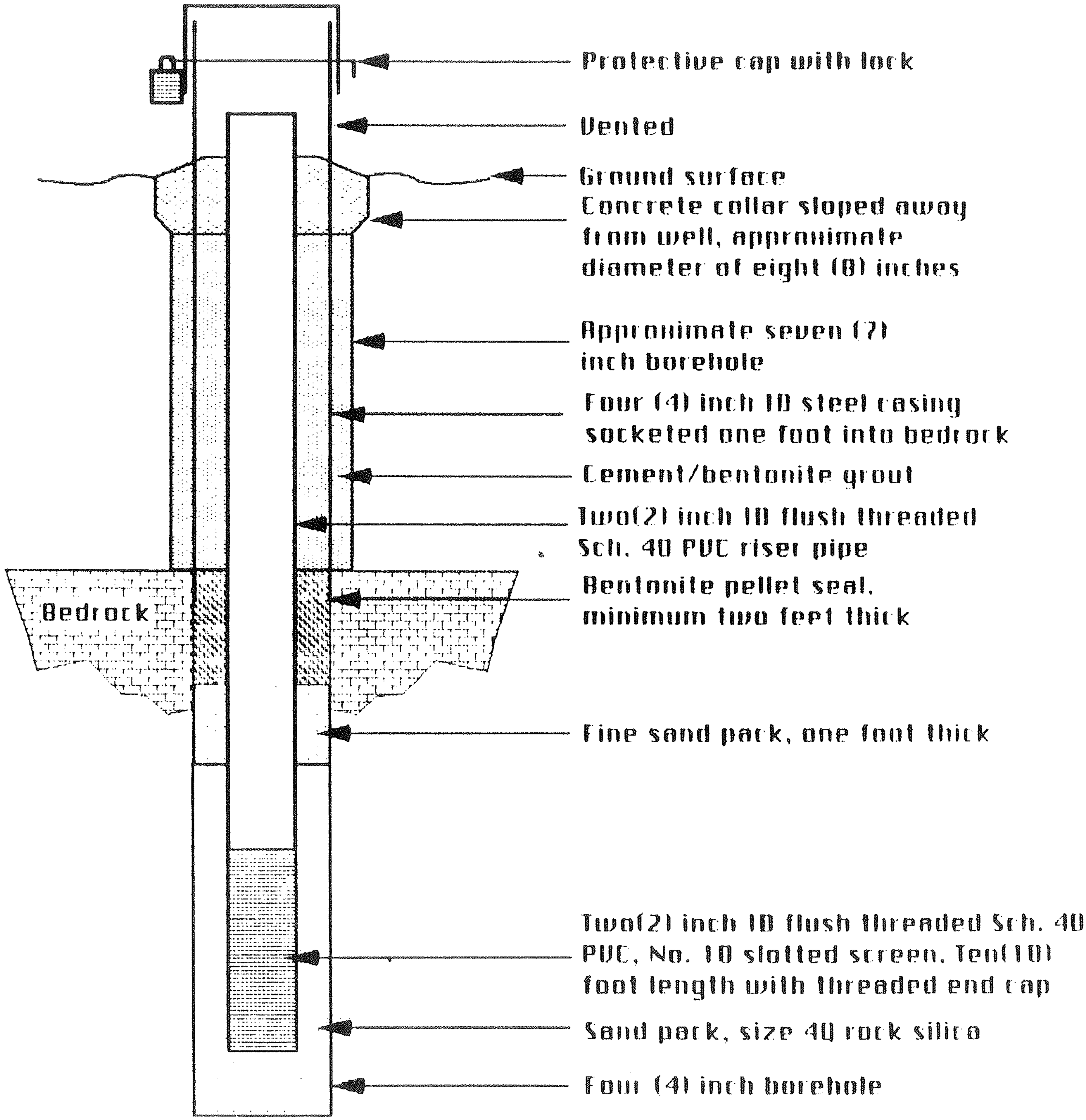
Prior to water and sediment evacuation, the static water level will be recorded at each well using an electric water level indicator and an engineer's



DAY ENGINEERING, P.C.
Rochester, New York

FIGURE 5
Typical Bedrock Monitoring
Well Construction Details

DATE 5/8/89	DRAWING NO. 87-166 F



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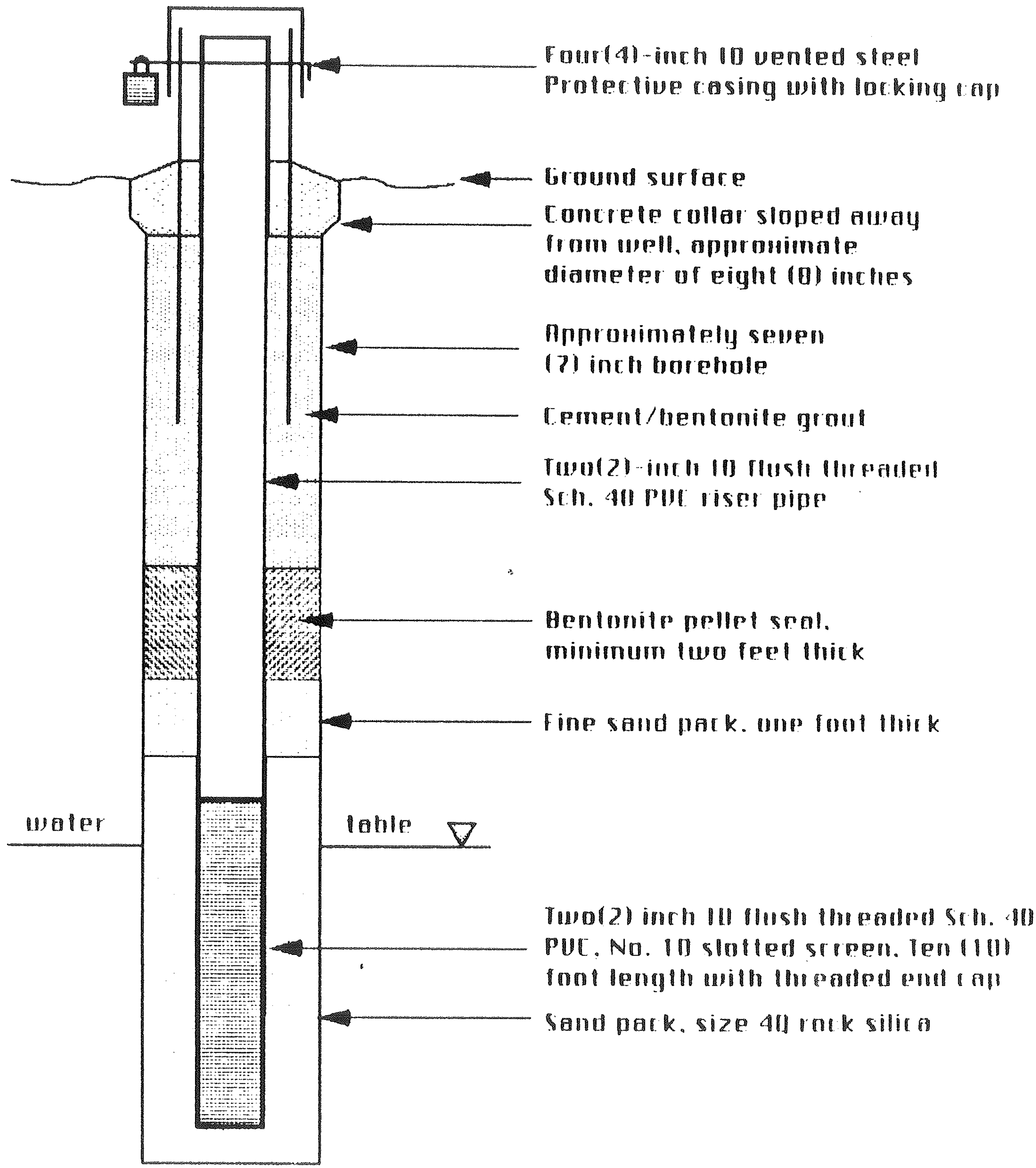
Rochester, New York

FIGURE 6
Typical Bedrock Two-casing Monitoring Well Construction Details

DATE: 5/8/89	DRAWING NO. 87-1666



DAY ENGINEERING, P.C.
Rochester, New York

FIGURE 7
Typical Shallow Monitoring
Well Construction Details

DATE 5/8/89	DRAWING NO. 87-166H

ruler. Also at this time, the depth to the well bottom will be measured using a weighted fiberglass tape. All measuring devices will be cleaned prior to each use in accordance with the procedures outlined in the Field Procedures Manual. The water/sediment volume in the well will also be calculated.

Well development will be supplemented by:

- o Temperature, pH, and specific conductance measurements
- o Evacuation volume measurement
- o Visual identification of water clarity and color
- o Visual identification of the physical characteristics of removed sediments.

During the development process, an attempt will be made to develop the wells until a turbidity measurement of less than 50 Nephelometric Turbidity Units (NTU) is obtained. In addition, the wells will be developed until constant pH, specific conductance, and temperature are obtained. In the event that turbidity less than 50 NTU's is not achieved after 4 hours of well development, but constant turbidity, pH, specific conductance, and temperature have been achieved, the development process will be temporarily discontinued and the DEC representative will be notified. At such time, a determination of the next appropriate action will be made.

The well development described above is designed to correct any clogging of the water-bearing formation which may occur as a side effect of the drilling, and to remove any drilling water (if used) such that each well will yield groundwater samples which are representative of in situ conditions. Static water level measurements will also be made following well development.

Following the installation of the three wells along Upper Holley Road and the well on the eastern portion of the property, a preliminary survey will be conducted to determine the relative elevations of the tops of casings. Using the static water level after well development and preliminary top of casing elevations, potentiometric maps will be constructed in the field. Upon evaluation of the field potentiometric maps constructed for the wells along Upper Holley Road

Should get real elevations not just relative ones
No nearby BM's though

and the well on the eastern portion of the property, the proposed locations of the monitoring wells north and south of the former drum storage area may be amended if Day Engineering and DEC representatives concur.

3. Permeability Testing

In situ permeability testing of the newly installed monitoring wells will be conducted following their development. Initial static water level measurements will be made in each well followed by the injection of a weighted slug of specific volume. An instantaneous head displacement associated with the slug volume will be created, and the subsequent decline in water level will be measured with an electric water level indicator. Once head conditions reach a static state, the slug will be removed and a negative head condition will result relative to the initial static water level. The subsequent rise in water level will be measured with an electric water level indicator.

Data analysis will involve the determination of the coefficient of permeability. The analysis will utilize a technique provided by Harry R.

Cedergren in Seepage, Drainage, and Flow Nets, 2nd Edition, in which the log of the head ratio (dependent variable) is plotted with respect to elapsed time (independent variable). Data points for the permeability determination are obtained from a linearization of this plot and utilized in an appropriate equation.

This testing will provide data on the permeability of the bedrock, and of the unconsolidated material if shallow wells are installed intercepting the water table. An additional parameter/variable is necessary to determine seepage velocities. That parameter is termed effective porosity. The Army Corps of Engineers test EM1110-2-1906 or equivalent will be followed to arrive at the porosity as well as other closely associated parameters. These tests will be performed on six soil samples. Two samples each will be obtained from the saturated zone at two downgradient and one upgradient test boring locations.

These values, permeability and porosity, will subsequently be utilized for determining approximate seepage velocities within the saturated zone and extrapolated to estimate permeability in the unsaturated zone, if appropriate. This data will be useful in assessing contaminant migration rates in this area and in evaluating potential remedial alternatives, if required.

E. **Groundwater Sampling and Analysis:**

Following equilibration of water levels within the newly installed monitoring wells (approximately one week), static water levels will be measured to determine the potentiometric surface. Thereafter, monitoring well levels will be measured at least monthly during the field work associated with this investigation.

As part of Sampling Round 3 (see Section III-G for an outline of the sampling rounds), representative groundwater samples will be collected from each of the six well locations shown in Figure 4 after the wells have been fully evacuated or after a volume of three times the well contents has been removed. If shallow aquifer wells have been installed at these locations, the shallow aquifer wells will be the ones sampled. Upon collection, measurements of field pH, temperature, and specific conductance will be recorded. These samples will be transported to General Testing for analysis. These six groundwater samples will be analyzed for TCL volatiles, semivolatiles, pesticides, PCBs, and inorganics by NYSDEC 1987 CLP. The groundwater samples will not be filtered prior to analysis.

Based on the results of these analyses, and the CLP analyses of soil samples (see Section III-F), a proposed site-specific list of indicator compounds for groundwater samples (SSIC-water) will be developed and submitted to the DEC for approval. The analytical results, including estimated values below detection limits, will be submitted with the proposed SSIC-water. Once approved, this list will constitute the analytical program for future well samples. All monitoring wells will be sampled and analyzed for SSIC-water during Sampling Rounds 4 and 5 (see Section III-G). The groundwater samples will not be filtered prior to analysis.

F. **Soil Sampling and Analysis**

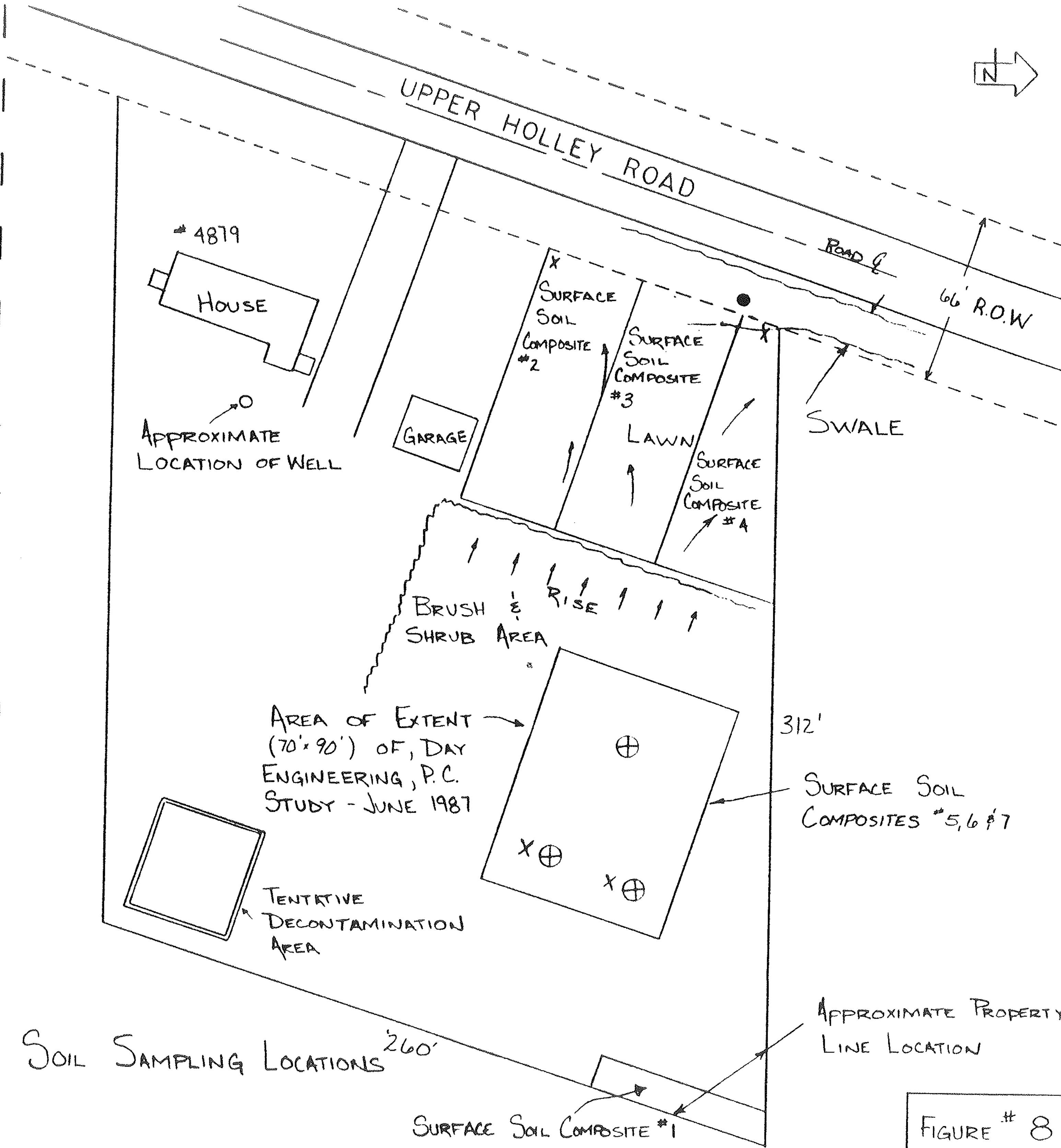
If requested in advance by the DEC representative, provisions will be made to split soil samples with the DEC.

1. Surface Soil Sampling

Two discrete surface soil samples will be collected from the areas labeled as "Very High" in Figure 2 of the report contained in Appendix B. These samples will be collected during Sampling Round 1 (see Section III-G). Discrete surface soil samples will be collected during Sampling Round 2 on the property near each end of the swale that runs along the front of the property adjacent to Upper Holley Road. The precise locations for these samples will be determined in the field with the concurrence of the DEC representative. If standing water is present in the swale at the time of sampling, it will also be sampled.

Surface soil samples will also be collected at various other locations on the site and composited in the laboratory according to the program shown in Figure 8. General Testing's laboratory soil compositing procedure is included in Appendix E. No more than four discrete samples will be collected from each area for compositing. The composites are described below:

- Composite 1 (Sampling Round 1): Samples collected from near the wooded area at the



SOIL SAMPLING LOCATIONS

FIGURE # 8

↑ - INDICATES SURFACE RUNOFF DIRECTION
● - TELEPHONE POLE
X - DISCRETE SURFACE SOIL SAMPLE
⊕ - TEST BORING

HAIGHT PROPERTY CLARENDON, NY	
DD DAY ENGINEERING, P.C. ROCHESTER, NEW YORK	
DRAWN BY: SM	DATE: 5/89
SCALE: 1" = 50'	DWG NO. 87-166E

back of the property. This sample will be used to represent background levels in the area.

- Composites 2, 3, and 4 (Sampling Round 2): Samples collected from the front lawn area. Runoff from the site appears to flow in the western direction over this area and toward the swale that runs along Upper Holley Road.

- Composites 5, 6, and 7 (Sampling Round 2): Samples collected from the surface soils contained within the rectangular area (70' x 90') investigated during the Day Engineering study conducted in May, 1987. This block of land contains the former drum storage area. Refer to Appendix B for the report on this study. Composite 5 will represent the areas labeled as "High" in Figure 2 of the report. Composite 6 will represent those areas labeled as "Medium". Composite 7 will represent the "Low" areas shown in this figure.

The surface soil samples will be placed into appropriate precleaned containers, labeled, chilled, and transported to General Testing for analysis.

2. Subsurface Soil Sampling

During Sampling Round 1, two subsurface soil samples will be collected at locations in the areas labeled as "Very High" in Figure 2 of the report contained in Appendix B. In each of the two locations, a combination of head space screening and visual screening will be employed to select the most appropriate sample interval for analysis. The sample interval judged by screening to have the greatest potential contamination will be selected.

During Sampling Round 2, soil samples obtained during drilling of the three test borings within the former drum storage area will be analyzed. The analysis scheme for each of these test borings will consist of analysis of split-spoon samples obtained from each two-foot depth interval until bedrock is encountered. The purpose of this sampling is to define the vertical extent of contamination, if any.

Soil samples obtained from the unsaturated overburden during drilling of the six test borings associated with the monitoring wells will also be analyzed. A combination of head space screening and visual screening will be employed for each boring to select the most appropriate sample interval for analysis. The sample interval judged by screening to have the greatest potential contamination will be selected. If the screening results are consistent with depth, the top 12 inches of soil will be analyzed.

If an interval other than the top 12 inches is selected for analysis, a surface soil composite will also be analyzed. This composite will be formed in the laboratory from a maximum of 4 samples collected within a 15-foot radius of the borehole.

The head space screening referred to above will be conducted as follows. As each split-spoon sample is collected, a portion of the sample will be placed into a 16-oz. glass jar with a teflon-lined screw cap. Any containers that are needed for subsequent soil analyses will also be filled, labeled, and chilled at this time. The 16-oz.

glass jars will be inspected to assure that the teflon-lined screw caps are tight. These jars will then be placed in an area which will allow the temperatures of the samples to increase and become approximately the same. At the completion of each bedrock test boring, the head space within the 16-oz. jars obtained from the unsaturated zone will be scanned using an HNU Photoionization Detector or equivalent. These measurements will be recorded. These readings will be used to select the appropriate sample interval for analysis.

Soil samples obtained from the saturated zone in the contaminant plume, if any, will also be collected.

3. Soil Sample Analysis

The two discrete surface soil samples, and the two subsurface soil samples selected by screening, from the areas characterized as "Very High" in the former drum storage area, as well as Composite 1 (background), will be collected during Sampling Round 1. These five samples will be analyzed for TCL volatiles, semivolatiles, pesticides, PCBs, and inorganics using NYSDEC 1987 CLP. Based on the results of these analyses, a site-specific list of indicator compounds for soil samples (SSIC-soil) will be developed and submitted to the DEC for approval. The analytical results, including estimated values below detection limits, will be submitted with the proposed SSIC-soil. Once approved, this list will constitute the analytical program for future soil samples collected on the site.

The remaining surface soil samples, as well as all subsurface soil samples, will be collected during Sampling Round 2 and analyzed for SSIC-soil.

In addition to SSIC-soil, saturated soil samples in the contaminant plume, if any, will be analyzed for Total Organic Carbon (TOC) using the method contained in Appendix E.

G. **Sampling and Analysis Summary:**

The following is a summary of all sampling rounds and analytical programs.

Sample Description	Samples for Analysis	Analytical Program
Round 1		
2 discrete surface soil samples from VH areas	2	TCL
2 subsurface soil samples from VH areas (chosen by screening)	2	TCL
Surface soil composite 5 (background)	1	TCL
Develop SSIC-soil		
Round 2		
All other surface soil sampling	8-14	SSIC-soil
All other subsurface soil sampling	est. 30	SSIC-soil
Round 3		
6 monitoring wells (uppermost aquifer)	6	TCL
Develop SSIC-water		
Round 4		
All monitoring wells	6-9	SSIC-water
Round 5		
All monitoring wells	6-9	SSIC-water

H. **Surveying:**

Upon completion of well installation activities, the top of the well casings will be surveyed to determine their locations and elevations above mean sea level. The survey will be based on the nearest USGS datum. A map will be prepared showing the location and appropriate elevations (ground surface, top of monitoring well casing, etc.) for each boring, sampling location, and monitoring well installation, and for other key contour points as determined by Day Engineering representatives. The map will also show the locations of buildings and other appropriate details on the Haight property.

I. **Drummed Material Handling:**

All decontamination fluids will be collected and drummed. Should air monitoring data collected while advancing a borehole indicate readings of 5 ppm or greater above the background levels measured that day, or if visual observations indicate the presence of waste material, all auger cuttings and subsequent well development water will be handled in the following manner:

- o Drum Filling and Labeling

  All auger cuttings and all groundwater from well development and purging prior to sampling will be placed into drums. These drums will be individually labeled with a permanent marker detailing the site, date, boring number, and contents. Efforts will be made to keep solids and aqueous material in separate drums.

- o Drum Sampling and Analysis

  It is expected that proper methods of disposal for the drummed materials can be determined based on the analytical data obtained during the site investigation. However, should sampling and analysis of the drummed materials themselves be required, discrete samples or composite samples representing no more than five drums will be analyzed. Analytical requirements will be dictated by the contaminants present on-site and the intended method of disposal.

- o Drum Disposal

  After all analytical data has been evaluated, the drummed wastes will be properly disposed of.

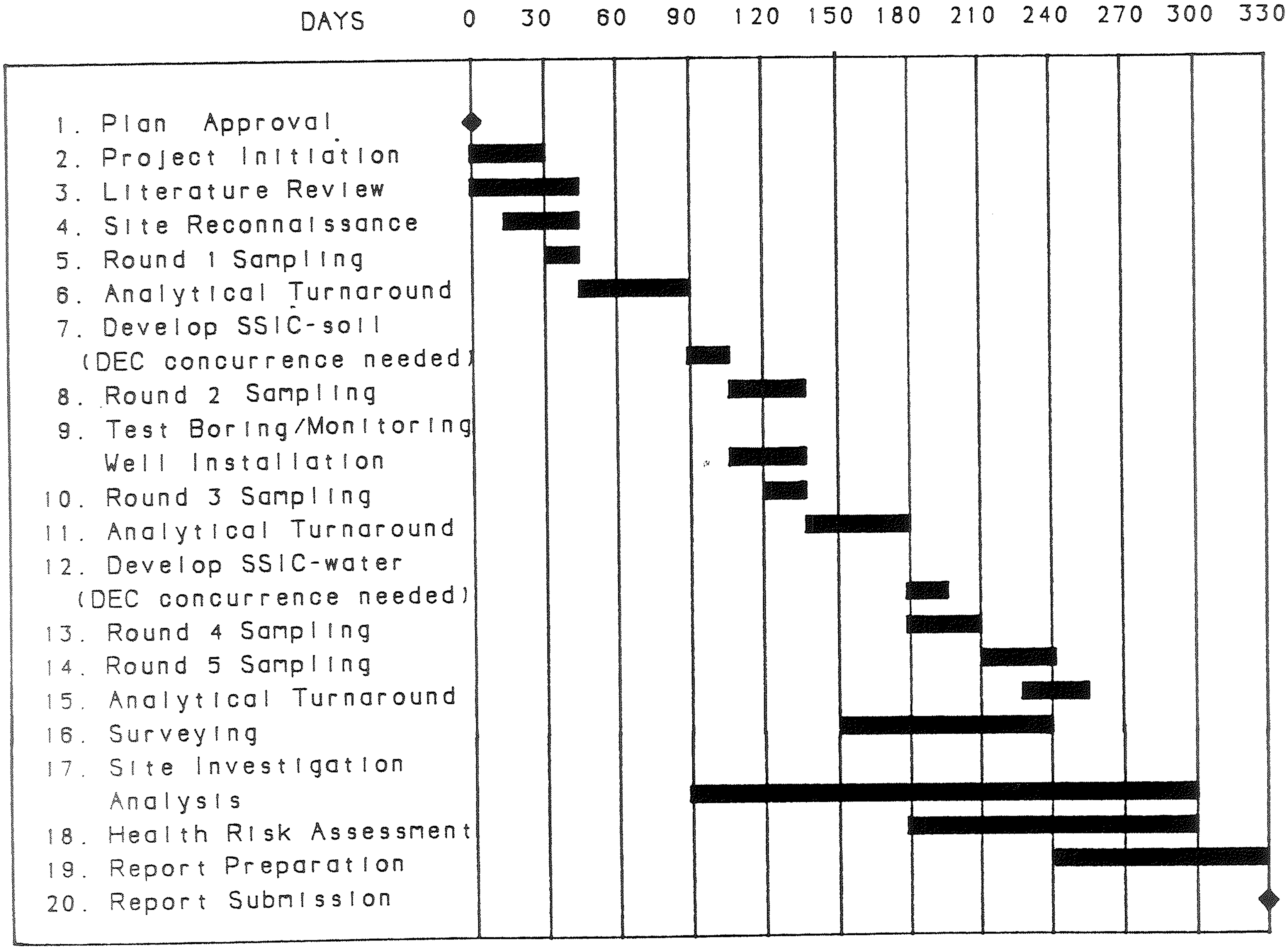


FIGURE 9 TASK TIME COMPLETION CHART

J. **Projected Safety Level:**

At the present time, it is anticipated that Level D protection will be utilized on the site. As explained in the Health and Safety Plan (Appendix C), the safety criteria will be frequently reviewed and upgrades of the protection level will be implemented as required.

K. **Task Time Completion Chart:**

Figure 9 is a Task Time Completion Chart illustrating the projected timing for the completion of the tasks associated with this work plan.

L. **Community Relations:**

We understand that the information generated during the Remedial Investigation will become public once it has been submitted to the DEC, and we agree to participate in public hearings and meetings to discuss this information.

IV. SITE INVESTIGATION ANALYSIS

The purpose of the proposed remedial investigation for the Haight property is summarized below:

- o Determine the areal extent of surface soil contamination.
- o Determine the vertical extent of soil contamination in the former drum storage area.
- o Develop an understanding of potential migration pathways within the unconsolidated material.
- o Develop an understanding of groundwater flow (direction and rate) in the upper bedrock zone at or near the bedrock/unconsolidated material interface.
- o Determine the extent of groundwater contamination resulting from the former drum storage area, if any.
- o Determine contaminant migration rates if groundwater contamination resulting from the former drum storage area is found.

The specific information to be obtained during the site investigation is summarized below:

Geologic Information

- o Information on the construction of the six private wells shown in Figure 3, if available

- Depth to bedrock and to any change in physical characteristics within the unconsolidated material
- Cross-sections through the nine test boring locations
- Depths to all water-bearing zones encountered
- Soil and bedrock permeability estimates
- Estimated groundwater flow direction for each water-bearing zone encountered
- Horizontal groundwater flow rate estimates within each water-bearing zone encountered
- Vertical hydraulic relationship if more than one water-bearing zone is encountered

Analytical Information

- Target Compound List constituent concentrations in the surface soils in the two areas exhibiting the highest levels of contamination encountered during the May, 1987 study conducted by Day Engineering, in the subsurface soil samples chosen by screening at these same two locations, in the surface soils near the wooded area in the back of the Haight property (background), and in the six uppermost aquifer monitoring wells
- Uppermost aquifer SSIC-water concentrations, as well as temperature, pH, and specific conductance, at the six proposed monitoring well locations shown in Figure 4
- Upper bedrock zone aquifer SSIC-water concentrations, as well as temperature, pH, and specific conductance, at two well locations along Upper Holley Road and the one location east of the former drum storage area
- SSIC-soil concentrations of composites representing the surface soils in the areas characterized as "High", "Medium", and "Low" in the May, 1987 study conducted by Day Engineering
- SSIC-soil concentrations of composites formed from surface soils in three sections of the front lawn area
- SSIC-soil concentrations in surface soil samples taken near each end of the swale along Upper Holley Road

- o SSIC-soil concentrations in each two-foot interval to bedrock from the three test borings within the former drum storage area
- o SSIC-soil concentrations from one overburden sample, selected by screening, from each bedrock monitoring well location
- o TOC concentration and porosity of saturated soil samples collected from the contaminant plume, if any

Upon analysis and review of the above information, recommendations will be made based upon the data and information obtained as a result of the remedial investigation.

V. HEALTH RISK ASSESSMENT

If chemical contaminants attributable to the former drum storage area are determined to be present on the site at levels potentially significant to human health, a quantitative risk assessment will be performed to estimate the degree of potential adverse effects to humans and the environment that would result from the release of site-specific chemical compounds. These effects can be determined by the following:

- Specify the identity and rate of release of the contamination from the source
- Quantify the rate of transport and potential dilution of the identified chemical constituents of concern
- Quantify the rate of exposure and uptake to receptors
- Quantify the degree of the toxicological effects

The quantitative risk assessment will be conducted in accordance with the USEPA Superfund Public Health Evaluation Manual, October 1986. It will be performed in conjunction with the remedial investigation. The data generated during the investigation will identify whether a source is present on the site, and whether groundwater degradation has occurred. If a source attributable to the former drum storage area is determined to be present, its areal and vertical extent, as well as the chemical constituents of concern and their respective concentrations, will be quantified. The transport of the source components by each of the routes (i.e., air, surface water, and groundwater) will then be evaluated based on site-specific data. The release rate of the source components to the identified transport routes will be quantified based on soil and groundwater analytical data. Direct contact, although not a transport route, will also be evaluated.

The next component of the risk assessment, estimation of exposure and uptake rates, will involve: identification and count of present and projected human and wildlife population within the range of the identified transport routes; a water use profile of the identified population; and the rate of uptake from exposure routes based on actual analytical data generated from private well sampling and estimated for the other identified routes.

The final component of the risk assessment will be the evaluation of the toxicological effects due to exposure (i.e., dose-response exposure).

VI. REPORT

An engineering report detailing the results of this investigation at the Haight Farm Site will be developed and submitted to the DEC. The report will document the procedures followed throughout the investigation and describe the nature and extent of contamination, if any, found in the groundwater and soils at the site. Deviations from the procedures specified in this work plan will be documented in the report.

This report will include the following:

- Description of field activities;
- Complete laboratory reports;
- Summary of analytical results, including estimated values below detection limits;
- Data validation/usability report;
- Evaluation and interpretation of field data and analytical results;
- Drawings showing specific locations of test borings, monitoring wells, and surface soil samples;
- Locations of private wells listed with the Orleans County Department of Health within one-half mile of the site;
- Summary of the evaluation; and
- Recommendations for further action, if warranted.

APPENDIX A

COUNTY OF ORLEANS
DEPARTMENT OF HEALTH
14012 Route 31
Albion, New York 14411
(716) 589-5673

JOHN H. STAEBLE, M.P.H.
Public Health Director

TO: Deborah Jackson, Principal Engineering Technician (Debbie)

FROM: Eric Wohlers, Public Health Engineer (Eric)

DATE: May 23, 1986

SUBJECT: PHASE I DRAFT REPORT - HAIGHT FARM

Both David Turkow and I have reviewed the report and our questions, comments, and concerns are as follows:

1) How does an HRS score of Sm = 18.78 rank in comparison to other sites in New York State? Where does this score place the Haight site in terms of being a priority for remediation?

2) Recent reports by area residents indicate that other unknown quantities of the same or similar material may have been buried on the west side of Upper Holley Rd. Eyewitness accounts of barrels being buried across the road from the Haight site may explain why TCE concentrations are much higher in the Yacono well than in Mr. Haight's well. On May 14, 1986, David Turkow and M. Mehta attempted to locate and identify such an additional contaminated area. It is recommended that a serious effort be made to interview the residents and locate this other site if it exists because it may drastically increase the scope of the Phase II study and eventual clean-up.

3) As indicated in the report, water testing by the Orleans County Health Department has revealed that aquifer contamination has taken place and several individual water supplies indeed have been impacted. In the case of the Yacono residence the TCE concentrations have necessitated the installation of GAC filters which were of great expense to the owner. Also, continued monitoring of the area water supplies is necessary to indicate when the GAC filter media needs to be replaced and if contamination increases to a level where additional GAC treatment systems need to be installed on other area wells.

Phase I report recommendations indicate that further groundwater investigation should consist of four (4) monitoring wells, water analyses for HSL organics and metals, sieve and hydrometer analyses on representative samples of the subsurface soils, and an in-situ permeability test on each well.

It is requested that the Phase II work plan groundwater investigation also include the continued monitoring of area residence wells for purgeable halocarbons (EPA 601) and aromatic purgeables (EPA 503.1) on a scheduled basis. The valuable data from such testing would help define the movement of the contamination plume and monitor the varying chemical concentrations within the aquifer especially in relation to seasonal changes in the groundwater.

Subsequently, the costs of these necessary water analyses and even the cost of the required treatment equipment and maintenance should be included in the Phase II estimates and eventually borne by the responsible parties.

We have a strong interest in the health of area residents especially where well contamination has been confirmed but GAC treatment has not been installed. Continued consumption of even low levels of TCE, especially by children, will surely have some undetermined long term effects. Therefore, it is imperative that not only environmental concerns but also public health concerns be addressed in the Phase II study.

Please call if I can be of further assistance.

mas

xc: Paul Schmied, Region 8 NYSDEC; Avòn, NY
G. Bailey, Region 9 NYSDEC; Buffalo, NY
L. Violanti, NYSDOH; Buffalo, NY
F. Yacono
S. Bates, BTSA, NYSDOH, Albany, NY

APPENDIX B

Haight Property Site Investigation

June, 1987

Prepared for: Harter, Secrest & Emery
700 Midtown Tower
Rochester, NY 14604-2070

Haight Property Site Investigation

June, 1987

INTRODUCTION

A preliminary soil sampling program was conducted April 30, 1987, on the Haight property at 4879 Upper Holley Road in the Town of Clarendon, New York. The sampling program involved utilizing an HNU Meter to measure for the presence or absence of volatile organic vapors (e.g., chlorinated solvents) in the soils on this property.

According to available information, approximately forty drums of waste oil generated by Erdle Perforating Company, Inc. (Erdle) were stored on the property for about fifteen years, and some of this oil leaked or was spilled during storage and/or removal of the drums. It is suspected that the waste oil was contaminated with chlorinated solvents, particularly trichloroethene. The New York State Department of Environmental Conservation (DEC) has issued a consent order to Erdle to underwrite the costs to conduct investigative studies and implement remedial action programs at this property.

The purpose of this investigation was to determine the extent of horizontal migration of any chlorinated solvents in the soil and to determine if soil excavation would be a viable and cost effective remedial action approach.

FIELD WORK DESCRIPTION

The information obtained from this monitoring program can be used to confirm the presence of volatile organic compounds, provide a relative indication of the degree of contamination, and provide an indication of the extent of horizontal migration. This type of monitoring program does not provide quantitative results, nor does it provide information regarding the extent of vertical migration.

The site was inspected visually prior to commencement of the field work. Based on observations made at that time, and discussions with the property owner and his son-in-law, an area of study was tentatively defined and is shown in Figure 1. Figure 1 was developed from a sketch in the files obtained from Harter, Secrest & Emery.

An HNU Photoionization Meter (Model #PI101) was used to analyze volatile organic vapors at selected locations in the area of study. The meter was used with an 11.7 eV Photoionization Lamp. This lamp was chosen because it is sensitive to a wide variety of chlorinated hydrocarbons. The instrument includes a remote probe which is wired to the meter. A small fan in the probe head draws air through the probe and across the detection lamp that generates an output signal. This signal is sent to the meter, resulting in a reading that corresponds to the amount of organic vapors detected. The meter reading is in parts per million in the vapor phase. The detection lamp is sensitive to a variety of compounds and is unable to differentiate among them, so only a "total" vapor reading is measured. The meter is calibrated to benzene, which means that it gives a true reading when benzene is the only compound detected. Since the detection lamp is less sensitive to chlorinated solvents than to benzene, the meter reading for chlorinated solvent vapors is lower than the actual vapor phase concentration.

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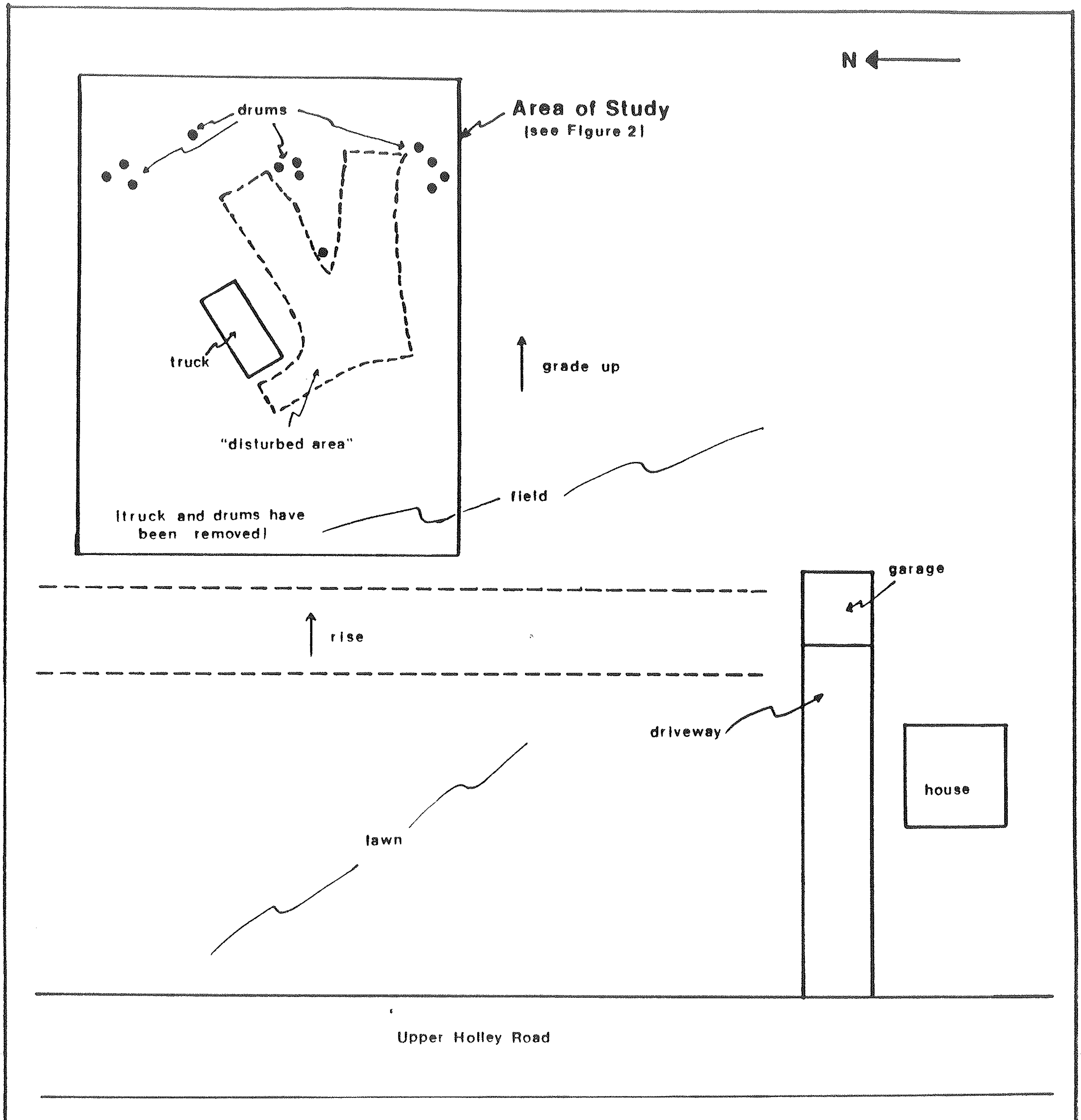


NOT TO SCALE

FIGURE 1

HAIGHT PROPERTY
CLARENDON, NY

DAY ENGINEERING
ROCHESTER, NY

JUNE 1987
87-166-A

A rectangular grid pattern was established with sampling locations ten feet apart in each of two perpendicular directions (see Figure 2). The sampling plan was adjusted in the field as the readings were recorded. Some locations in the northwest quadrant of the grid were not surveyed because of low readings found in this area. The survey was extended to the southeast because the readings along the grid boundary in that region were not deemed low enough to define the edge of the affected area. Two interstitial locations were also sampled in areas where blackened soil was observed, because these areas may have represented areas where drums had leaked or spilled.

At each sampling location, a hole was dug with a shovel to a depth of approximately ten inches. A 3/4-inch diameter steel stake was then driven through the bottom of the hole to an additional depth of approximately two feet. This stake was pulled from the ground and a narrow section of the probe was inserted into the hole. The head of the probe was pressed firmly against the soil to inhibit direct infiltration of atmospheric air. The resultant reading was recorded.

The steel stakes were cleaned with methanol and deionized water between locations.

As an experiment, the probe was placed a few inches above the soil surface in several areas where blackened soil was observed. The meter registered a reading. The meter typically did not register a reading when this procedure was used in an area with a clean soil surface. This method was used to confirm that the blackened soil represented areas where spills involving volatile compounds (e.g., chlorinated solvents) may have occurred.

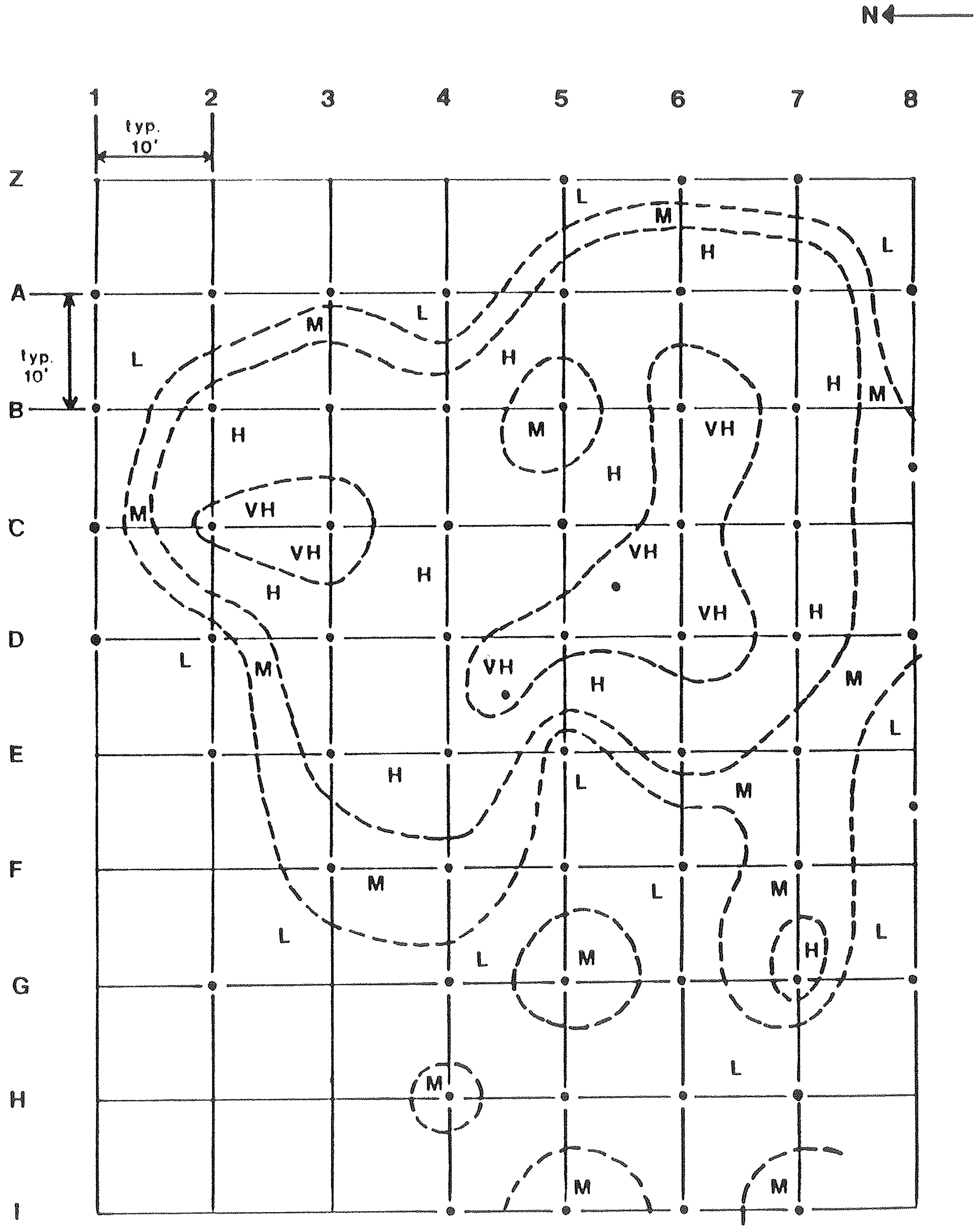
DISCUSSION OF RESULTS

The HNU Meter readings are used in this study as a qualitative indicator of contamination. It is important to note that the instrument readings can not be used to determine actual concentrations of chlorinated solvents in the soil. This is true because of varying field conditions and complexities inherent in the soil matrix.

The readings have been tentatively grouped into four categories: LOW (0-5 ppm); MEDIUM (6-10 ppm); HIGH (11-49 ppm); and VERY HIGH (50+ ppm). These ranges were used to develop a map to illustrate the areal extent of migration of volatile compounds in the area of study (see Figure 2). The categorization of the concentration levels was determined by Day Engineering personnel and is based on field observations, the HNU Meter readings obtained during the study, and laboratory soil analyses that were conducted as part of this study. These ranges are only intended to be used as a semi-quantitative guide for analyzing the results of the HNU Meter readings, and can not be used as a representation of actual soil concentrations.

Seven laboratory soil analyses were performed to quantify soil contamination levels in the area of interest. Only two compounds were detected, and these were trichloroethene (the suspected contaminant in the drummed oil) and 1,2-dichloroethene (probably a breakdown product of trichloroethene in the soil).

The results of these soil analyses are presented in Table 1. These analytical results were utilized in developing the concentration ranges into the categories described above. Also, the results indicate that chlorinated solvents are present in the soils in the area of study in concentrations greater than those allowed by DEC.



KEY:
L - Low (0 - 5 ppm)
M - Medium (6 - 10 ppm)
H - High (11 - 49 ppm)
VH - Very High (50+ ppm)

FIGURE 2	
HAIGHT PROPERTY CLARENDON, NY	
DAY ENGINEERING ROCHESTER, NY	JUNE 1987 87-166-B

Table 1

Grid Location	HNU Meter Reading(ppm)	Trichloroethene (ug/g)	1,2-Dichloroethene (ug/g)
B.5-8	6	0.5	<0.02
B-3	20	1.4*	<0.02*
D-7	32		
D.5-4.5	85	192	<0.02
A-7	18	0.43	<0.02
D-6	70	162	13
A-3	5	0.025	<0.02
C-3	55	0.73	<0.02

* This value resents the analytical result obtained from a composite of the soils collected from Locations B-3 and D-7.

DD119

CONCLUSIONS

The total surface area categorized as exhibiting either medium, high or very high concentrations is approximately 3500 square feet (refer to Figure 2). Excavation and disposal of soils in an area this size will involve considerable expense. Although the vertical extent of solvent migration is not known, it is expected that a soil excavation and disposal project involving an area of this size to a depth of three feet will cost in excess of $100,000. More cost-effective means may be available for remediation; however, this can not be determined without conducting further studies.

Also, it is important to note that for the purposes of this study, those areas that exhibited concentrations categorized as low were not included in the computation of the volume of soils to be excavated. Laboratory soil analyses would need to be conducted to verify that these low vapor readings represent acceptable levels of solvent constituents in the soil.

In summary, a preliminary soil investigation program was conducted that utilized an HNU Meter to determine the presence of volatile vapors in the soils at the Haight property. The readings obtained from the meter indicated that volatile vapors are present in the soils. Day Engineering personnel categorized the meter readings into concentration ranges, and then made some assumptions in order to generate a rough estimate of the volume of soil that would be involved in an excavation and disposal project. The cost of such a project was determined to be more than $100,000. A more cost-effective means may be available for remediation at this site; however, this can not be determined without conducting additional studies.