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1333 N CALIFORNIA BOULEVARD SUITE 450
WALNUT CREEK CALIFORNIA 94596
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August 30, 1991

Ravi Arulanantham, Ph.D.
Hazardous Materials Specialist
Alameda County Health Agency
Division of Hazardous Materials
Department of Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

Re: Dolan Lumber Company
6365 Scarlet Court, Dublin, CA

Dear Dr. Arulanantham:

Pursuant to your request, enclosed please find a work plan for additional investigation at the above-referenced site. The plan has been prepared by Kenneth R. Henneman, water resources consultant. We would appreciate the benefit of your comments regarding the plan.

Very truly yours,

COOPER, WHITE & COOPER

Keith Howard, Esq.

KH/dmd
Enclosure

cc: Kenneth R. Henneman
Michael P. Dolan

Kenneth R. Henneman, Water Resources Consultant
3142 Montpelier Court
Pleasanton, CA 94588
(415) 846-4450

August 26, 1991

Mr. Keith Howard
Cooper, White and Cooper
1333 No. California Blvd., Suite #450
Walnut Creek, CA 94596

Mr. Michael P. Dolan
Dolan Lumber Company
6365 Scarlett Court
Dublin, CA 94568

Subject: Initial Plan for cleaning up groundwater pollution under the old gas tank site at 6393 Scarlet Court

Gentlemen:

This is in response to your 8/1/91 request following our field inspection of the site. You asked for a plan to start cleaning up groundwater polluted with gas under the now defunct Dublin Rock and Ready Mix site next to the Lumber Yard. Currently this site is occupied by Dublin Concrete & Materials, which continues to produce and sell ready-mix concrete. The site location is shown on Attachment 1.

I understand you want to submit this plan to Alameda County as soon as possible, accordingly it was prepared using the scant available data. A site history and better maps will be prepared and included in the first report.

Since there has been essentially no work done at the site, it was agreed that the first work needed is to start to define the extent of the groundwater contamination. Several monitoring wells are needed to determine the groundwater vector (direction).

Accordingly it is recommended that we do about three days of drilling to obtain 10-15 groundwater samples. Water samples from the first day, and possibly some from the second day, will be analyzed overnite. These results will be used to help determine where to sample the second and third day, and where to put the monitoring wells.

Material on the plan is presented as follows:

- Background
- Field work plan
- Schedule

BACKGROUND

Owner - Michael P. Dolan, Dolan Lumber Company, 6365 Scarlett Court, Dublin, CA 94568, 829-0350

Location - 6393 Scarlet Court, next to 6365 Scarlett Court.

Tenants - From the late 1960's to late 1990 - Dublin Rock & Ready Mix; currently Dublin Concrete & Materials.

Gas tank - 500 gallon steel. Used probably from early 1970's to mid 1980's? Removed in February 1990, 3-5 years after closed. No holes detected. No concrete cover - just gravel I believe, but do not know. No floating product reported when removed. Samples showed gas in soil and water under the tank.

Work to date - Five shallow (15') borings in October 1990, about 40' away were drilled and sampled. Gas was detected in all of them. The results were submitted to the tenant, T. Bettencourt, DRRM, (he sent to County Dept. Environmental Health) by me in a letter dated 10/17/90. Regional geohydrology was briefly addressed in 9/27/90, 9/5/90, and 8/24/90 letters by me to Bettencourt and submitted to CDEH.

Work proposed - Take 10-15 water samples (from borings or from water sampling probe) and install about three monitoring wells. About three days of field work scheduled for October pending approval and funding. Report to follow in late November or December 1991.

Special Conditions - Because the previous downdip samples were near the property line, the new samples on the south and southwest will have to be taken <u>off the property</u> (possibly even in the road). There are water, sewer, electric lines, and trees where it would be appropriate to sample. It would be desirable, particularly if groundwater is taken from under the road, to sample as rapidly as possible with a minimum of drilling.

Soil Column - A brief review of County DEH records showed borings for investigations conducted nearby (on Scarlett Court) generally terminated in clay 5'-10' below groundwater, or about 15' deep. The sand reported at 3'-5' depth in the 10/17/90 report appears to be site fill, not natural soil. Mr. Dolan indicated he thought there was some fill put in - I believe before he purchased the site.

FIELD INVESTIGATION PLAN

The work done indicates there is pollution in the groundwater around the tank extending out to at least 50'. The expected source is the old gas tank. Groundwater appears to be under hydrostatic pressure rising from perhaps 10' to 14' depth to perhaps 6'-10' in depth. The Groundwater table probably slopes south or southwest. The major problem appears to be groundwater pollution, that is, I do not expect to find the soil above the groundwater capillary zone contaminated.

While vapor at the groundwater/soil interface is expected, a vapor probe investigation may work, but, water samples provide better information on the groundwater, and borings provided better information on the soil column characteristics. I suggest we use a drill rig and take water samples.

Several subsurface exploratory tools and methods are available: These include regular drilling with flyte and/or hollow stem augers; the use of a "BAT", "Hydropunch", "water sample probe", or a 1" driven pipe; and using Cone Penetrometer equipment. I use a team that can use different methods at the same site. This flexibility will be most helpful at this site because we simply do not know how far the pollution extends, and samples almost have to be taken in the middle of Scarlett Court, where we do not want to tie up traffic or make holes that need special backfilling. Of course you do not obtain geology with the water sample probe, so there is a tradeoff.

The proposed plan is described below.

Purpose - The primary purpose is to:

a) determine the extent of gas pollution in the groundwater,
b) determine soil column characteristics near the tank site, and
c) install three monitoring wells if proper locations can be determined with the data obtained the first one or two days.

What - About 8-12 groundwater samples will be taken and probably three monitoring wells installed. The tentative locations are shown on Attachment 1. The first day 5-7 samples will be taken and analyzed overnite. On the second day additional samples will be taken, however, the locations will be determined in part after the results of the first day's work are returned. On the third day monitoring wells can be installed. It is anticipated the off site (off property) samples will mostly be taken using a special 1½" Ground Water Sampling Probe in order to obtain as many samples as possible in a minimum amount of time. Borings to water can be used for on site sampling, these will be about 15' deep if the soil column is clay below the groundwater. The borings will be logged and soil samples taken as needed. I understand the County Dept. of Environmental Health prefers to have the borings remain open several hours, and even purged some, if possible, before samples are taken, and this will be done when possible. Continuous core samples will be taken at several borings around the tank to provide better geologs for design of an extraction system.

When - The work is planned for October, 1991, pending approval and funding.

Who - The sampling will be done by John Sarmiento of Newark (JSA), 2199 Valparaiso Avenue, Menlo Park, CA 94025, (415/854-8422). Mr. Sarmiento is a geologist and registered Civil Engineer. He has an M.S. from Stanford, worked with the USGS doing field testing, and has extensive field experience in soil investigative work and in installing monitoring wells. He does Cone Penetration Testing (CPT), and has developed a special Groundwater Sampling Probe which we will use where appropriate. A description of the sampling device is enclosed.

Mr. Sarmiento, and the driller he will work with, HEW Drilling Company, Inc., 1045 West Street, East Palo Alto, CA 94303, license #389167 (415/322-2851), will be prepared to do the borings to water, the groundwater sampling, and to install monitoring wells. A regular sampling and geologic report, which will include the geologs, will be provided by JSA.

Laboratory analyses will be done by Clayton Laboratory, 1252 Quarry Lane, Pleasanton, CA 94566, Certification No. 1196, (426-2600).

Blaine Tech Services, Inc. (BTS), 1370 Tully Road, Suite 505, San Jose, CA 95122, (408/995-5535) normally develop monitoring wells for me, and, later on, sample them as needed. BTS for years has specialized in sampling soil and water at pollution sites.

I have worked with this team with excellent results. All have safety training and are accustomed to sampling contaminated sites. If borings or samples are taken below Scarlett Court Road the City will probably have an inspector at the site, and Zone 7, Alameda County Flood Control and Water Conservation District, will probably have an inspector present to inspect the boring sealing. County DOHS staff may also be present. Please call any of the above persons if you have any questions.

Water samples - Groundwater samples will be analyzed for gas with benzene, toluene, ethylbenzene, and Xylene (TPHd with BTX) using EPA #8015/8020 analyses method. The tentative daily schedule for sampling at specific points is shown below.

	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18
1st day *			B		B		P	B		P	P	
2nd day **	?	B		B		?			?			?
3rd day	Install monitoring wells											
Later -	Develop and sample wells											

* Overnite turnaround time, B = boring to water, P = probe sample
** To be modified pending results from 1st day. Some 2nd day samples may also be analyzed overnite.

In addition to analyzing for gas, some samples, probably edge samples as S7, S9, D1, and S13, will be analyzed for general minerals in order to determine: a) if the water is potable (fit for drinking or other beneficial use), b) the quality of water expected to be discharged into DSRSD wastewater system if a pump and treat remediation system is put in, and c) if there is continuity in the physical characteristics of the water to help determine if there is natural groundwater flow movement under the site.

Soil samples - I do not envision many soil samples being taken to test for gas. Apparently it has been many years since the tank was used, and we are, at this time, primarily concerned with groundwater pollution that is under pressure under a clay cap over 50' away from the tank (source). We will note any gas odor during drilling, and take a soil sample if it will contribute to understanding what happened, or to remediation system design. However, soil samples will be taken as deemed necessary to define the physical characteristics (nature of the clays, silts, fine sands) of the soil needed to understand soil water storage, groundwater movement, groundwater yield, and water and gas absorption potential. Mr. Sarmiento takes many bag soil samples and generally tests these for density and moisture so we can tell something about the moisture holding capacity. In addition, standard brass cylinder soil samples are taken so Atterberg (sieve density, moisture, liquid limit, plastic limit, hydrometer) tests can be run. Of particular interest will be the soil characteristics between say 7' and 16' in the D1-S10-D2-D3 area. About half a dozen soil samples for analyses are planned.

Well construction, sealing and sampling - The monitoring wells will be constructed under an Alameda County - Zone 7 Flood Control and Water Conservation District permit. Three and possibly four wells will be installed. They will be 4" wells about 16' deep, with 10' of screen and with the top about six feet sealed using neat cement placed over a 1'± bentonite lense in accordance with Zone 7 specifications. Normal schedule 40 PVC casing with 0.020" slots will be used. Well D1 may b increased to 6" as it can be used to extract. Final design will be done in the field after soil type and depth to groundwater has been determined. The wells will be developed and then sampled in accordance with standard protocol. The samples will be iced and submitted to the laboratory using standard chain of custody protocol. BTS normally evacuates the wells with a pump, and then samples with a bailor. Evacuated water will be placed in a drum for later proper disposal.

Reporting - A report will be prepared after the receipt of the laboratory analyses from the monitoring wells. If the work goes as scheduled, it should be completed in late November or December. It will include the soil and water sampling and geology reports, the water quality analyses, and recommendation on follow-on work. Since there reportably is contamination a remediation system will probably be necessary. Pump and treat systems have been used elsewhere along Scarlett Court, and probably will work at this site.

SCHEDULE

September 1991 - Finalize locations, obtain permission from offsite land owners, obtain approval and permits from County and City. Schedule drilling.

October 1991 - Complete field work, including developing (cleaning out) the wells and sampling.

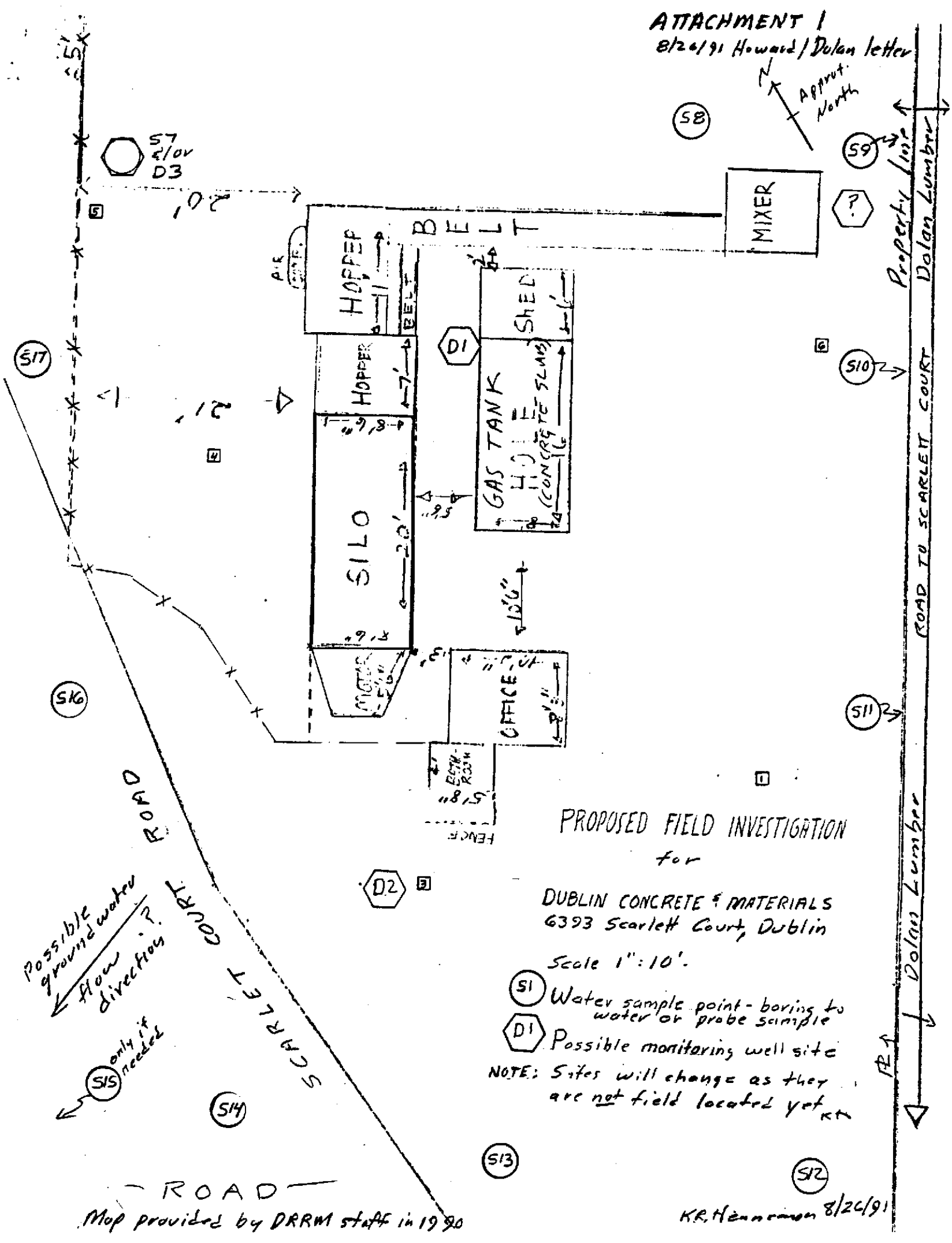
Nov.-Dec. 1991 - Prepare first report.

* * * *

Sincerely yours,

Kenneth R. Henneman
Consultant, RE17700

ATTACHMENT 1
8/26/91 Howard/Dolan letter



PROPOSED FIELD INVESTIGATION
for
DUBLIN CONCRETE & MATERIALS
6393 Scarlett Court, Dublin

Scale 1" : 10'.

(S1) Water sample point - boring to water or probe sample

(D1) Possible monitoring well site

NOTE: Sites will change as they are not field located yet KR

Map provided by DRRM staff in 1990

K.R. Hennemuth 8/26/91

GROUNDWATER SAMPLING PROBE

The groundwater sampling probe (GWP) was developed to extract groundwater samples using the CPT steel push rods. The GWP is a simple method which does not produce soil cuttings and can obtain limited groundwater samples within isolated soil intervals.

The sampling procedure consists of pushing the steel rods with a slip-on Teflon point to the designated depth. The rods are then pulled upward 1/2 to 2 feet disengaging the point and allowing water to flow into the opened space. A 1/2-inch O.D. diameter bailer, made of stainless steel or other appropriate material, is lowered down the center of the rods and into the accumulated water. The bailer is withdrawn and the water poured into appropriate vials or bottles for chemical analysis.

To grout the hole a 1/2-in I.D. grouting pipe (PVC or similar) is put down the center of the push rods to within 1/4 foot of the bottom of the hole prior to further retraction of the rods. In non-collapsible soils the push rods can be retracted entirely leaving the grouting pipe in-place. The pipe is then attached to a grout pump and grout is pumped at a slow rate. As grouting progresses the grouting pipe can be pulled up slowly, allowing the grout to upwardly displace the water in the hole. In collapsible soils the push rods can be retracted in 1 meter increments and grout pumped into the open space through the grouting pipe. The grouting pipe can then be retracted 1 meter. The procedure is repeated until the all the rods have been removed and the hole filled with grout. The retraction interval can be increased depending on the ability of the grouting pipe not to bind with the collapsing soil. The Teflon point is abandoned in the grouted hole.

John Sarmiento & Associates
Cone Penetration Testing Services

2199 Valparaiso Ave., P.O. Box 547, Menlo Park, CA 94025 (415) 854-9422

CONE PENETRATION TEST

The cone penetration test (CPT) was developed in order to economize on the time and effort needed in developing continuous subsurface soil profiles. Although the test does not obtain an actual soil sample it can be best be used to economize on soil sampling by aiding in determining the depth and type of soil (or groundwater) samples needed. It can also be used to minimize the number of borings necessary in correlating soil layering and noting soil changes across a site.

The CPT is performed using a steel cone tip which is pushed into the ground using a string of 1 meter long steel rods. The cone is advanced downward at a steady speed of approximately 2 cm/sec at 1 meter increments. The cone is typically pushed into the ground using either a specially equipped truck with up 20 tons of vertical driving force or drilling rigs with a vertical driving force generally ranging from 8 to 20 tons depending on the rig.

The standardized electric friction-cone penetrometer (ASTM D3441-86) is composed of two main parts each with an electronic sensor:

1) A conical tip with an apex angle of 60 degrees and a base area of 10 cm2. The tip measures the resistance to penetration and is recorded as the Bearing Stress, Qc.

2) A friction sleeve, immediately behind the tip, approximately 3.6 cm. in diameter and 13.4 cm. in length and having a surface area of 150 cm2. The sleeve measures the friction between the sleeve and the soil and is recorded as the Friction Sleeve Stress, Fs.

Simultaneous recordings of the tip and sleeve are typically taken every 5 centimeters or 2 inches during penetration but may be taken more or less often. The ratio of the sleeve reading to the corresponding tip reading is the Friction Ratio, Rf. The data obtained is generally plotted in Qc vs depth and Rf vs depth graphs and can readily be used to differentiate the profile into layers. Using published correlations of Qc and Rf values with soil behavior types, the differentiated layers can be assigned a soil behavior type. Thus cohesive materials can readily be differentiated from cohesive materials (ie. sand layers vs. clay layers). Once adjacent soil samples have been obtained, the CPT profiles can be refined and used as an index to define the actual soil types for a specific site. Published correlations of the Qc and Rf values with soil characteristics such as soil strength are also available. If necessary the holes can be grouted using the procedure described for the Groundwater Sampling Probe (GWP).