ML - Morris County Fair Housing
v. Boonton

Jan 23, 1980

Transcript of Depositions of Robert Catlin and Gary S. Salzman

Pg. 165

ML 000932S

SUPERIOR COURT OF NEW JERSEY
LAW DIVISION - MORRIS COUNTY
DOCKET NO. L-6001-78PW

42-4270

MORRIS COUNTY FAIR HOUSING COUNCIL, et als,

Plaintiffs,

vs.

BOONTON TOWNSHIP, et als,

Defendants.

DEPOSITIONS OF:

ROBERT CATLIN
GARY S. SALZMAN

Transcript of depositions taken by and before DOROTHY M. PONTE, a Notary Public and Certified Shorthand Reporter of the State of New Jersey, on January 23, 1980, at the Offices of Robert Catlin & Associates, 2 Valley Road, Denville, New Jersey, commencing at 10 a.m.

A P P E A R A N C E S :

STANLEY C. VANNESS, ESQ., Public Advocate
BY: KEITH A. ONSDORFF, ESQ.,
Public Advocate
For the Plaintiffs.

MESSRS. YOUNG, DORSEY & FISHER
BY: JOHN H. DORSEY, ESQ.,
For Hanover Township.

Reporting Services Arranged Through:
ROSENBERG & ASSOCIATES
CERTIFIED SHORTHAND REPORTERS
769 Northfield Avenue
West Orange, New Jersey 07052

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I N D E X

I N D E X O F E X H I B I T S

I N D E X O F E X H IB I T S - 2

NUMBER	DESCRIPTION	IDENT.
RCH-13	Soil Survey of Morris County	25
GSH-1	Resume of Mr. Salzman	63
GSH-2	Summary of augmentation work	85
GSH-3	Report dated August 29, 1979	87
GSH-4	Report dated November 1, 1979	87
GSH-5	Report dated December 12, 1979	87
GSH-6	Map dated October 31, 1979	105

ROBERT CATLIN,

2 Valley Road, Denville, New Jersey,

having been duly sworn by the reporter, testified as follows:

DIRECT EXAMINATION BY MR. ONSDORFF:

Q Mr. Catlin, during today's deposition we're going to focus in on the Township of Hanover in regards to this litigation which we discussed during the last deposition. Could you briefly explain or elaborate on your professional relationship with the Township of Hanover since you began your career in this area?

A We were first retained by the Township of Hanover in the very early '50s. I don't recall the exact date, but I think it was about 1952 or '53. We have been retained as the planner-consultant since that time.

We did a master plan for the Township in the early '50s and we also prepared a comprehensive to that master plan in the '60s, and we presently updating the land use element of the master plan that was started last year.

Q I'd like to show you this document and ask if you can identify it.

A Yes. This is the master plan that we prepared

in 1963.

Q And this is the most current master plan for the Township of Hanover, to your knowledge?

A It's the most current printed comprehensive version of the master plan.

There have been some master plan studies that have been prepared subsequent to that with the idea of amending the zoning ordinance. The land use ordinance which was adopted, I believe, in 1976, but this is the latest printed document reflecting the master plan.

Q I think we will mark that as R[redacted] Robert Catlin, Hanover, trying to keep our list of documents clear as to what we're doing.

(Hanover Township master plan marked RCH-1 for identification.)

Q Now, you mentioned that the land use element, land use element was being updated and revised at this time; is that correct?

A That's correct.

Q For what period of time has that project been underway?

A We started that project, as I recall, in the spring of last year.

Q And do you know when it is anticipated

that that land use element update will be completed?

A I would anticipate that it would be completed probably within the next five or six months.

Q And what is the purpose of doing this update at this time?

A Well, the State Planning Act, as you know, mandates that every municipality in the State should take a look at the land use element of the master plan every six years; and inasmuch as the last revision was looked at in about 1976, they felt that now was the time to start this next go-around.

Q Now, in regards to the litigation we're presently involved in, what specific work have you performed on behalf of the Township of Hanover in that litigation?

A We have updated the existing development so we know exactly what the Township land use pattern is at the present time. We have also made an analysis of all of the vacant land in the Township, the zone [illegible] vacant land is located, and then we looked at the various environmental constraints of this vacant land.

Q Does your report of September 27, 1979 constitute the work product which came out of the various endeavors which you've just outlined?

A Yes.

Q I show you that and ask if that's acopy of your report.

A Yes, it is.

MR. ONSDORFF: I would ask that that be marked as RCH-2.

(Report of Robert Catlin marked RCH-2 for identification.)

Q Now, what materialspecifically did you examine in the preparation of the report which has been marked RCH-2?

A Well, we prepared a series of studies trying to locate and quantify the various environmental constraints of the vacant lands, and we relied very heavily on the Soils Conservation Service information which was subsequently reviewed and detailed in the report prepared by Converse, Ward, Davis & Dixon.

The environmental constraints are listed in this report which refers to those studies listed on page three.

Q In addition to the Soils Conservation Serice report, did you do any field examination in the preparation of this report?

A Only as it relates to land use development pattersn.

We did not make field examinations of any of the environmental inputs which was, as I understand it, prepared by the consultants retained by the Township; namely, the Goodfriend who prepared a study on the noise impact; Converse, Ward, Davis & Dixon who did a number of test borings for the various environmental problems with vacant land; Fletcher Platt of Killam Associates, who did a study on the effect of developing the vacant land, both on the site itself and the impact it would have on the downstream drainage conditions; and [redacted] Kirk from Richard Brown Associates who did [redacted] analysis of developing some of the vacant lands in the Township.

Q Any mention as far as your own field examinations you did certain work in regards to land use patterns, I believe?

A Yes. We made a windshield inspection of some of the areas of the Township to update the existing [redacted]opment pattern.

Now, in regards to the development of this community since 1950, could you briefly describe how that has transpired based upon your professional experience and involvement with this town over essentially that period of time?

A Well, I think the only way to really have an objective look at what's happened since 1950 is to compare the existing development map of the early 1950 master plan with the existing development map that we have updated as of September 1979; and these two exhibits which speak for themselves.

It could show what properties have been developed and how they have been developed, for what use in that intervening period.

Q Well, I realize we could do that; and what I'm endeavoring to do is have you just briefly summarize it for convenience. In other words, is it your opinion that the Town was rural at one time and has now become suburban? Has there been a substantial increase in residential dwellings, just to give it that type of analysis, snap analysis?

A Well, I think that at the time we first started working in Hanover Township in the earlier '50s it could be considered a suburban community. I think that at the present time it's still a suburban community, but for all practical purposes it's pretty much developed except for these vacant properties that are shown in these exhibits that have, in most instances, a number of environmental problems.

Q Do you know what the population growth has been since 1950 in the Township?

A Not offhand but I could tell you that by simply referring to population charts, what has happened since 1950. I'd have to get the 1950 master plan, which I believe has a 1950 population Census information and what it is at the present time.

Q Maybe we will do that when we have a break and it will be more convenient, if that's all right with you.

A All right.

Q How about employment growth since 1950 within the Township? Would that figure also [redacted]le?

A No. We don't have that information on employment growth.

We have not made any study on what has happened in employment in the past 20 -- 25 years.

Q Would you know of any source document that could be examined to ascertain that employment analysis?

A Not offhand, but I'm sure they are available. [redacted] find out.

MR. DORSEY: Let me just say this: Mr. Biscaire has already examined Mr. Lindbloom relative to his report, and his report does in fact contain basic data, I think, taken

from either the State Department of Labor and Industry or the U.S. Department of Labor relative to that.

MR. ONSDORFF: Okay.

Q Now, directing your attention, Mr. Catlin, to RCH-2, I believe the first attachment appended to your report is an analysis of the type of structures found within the municipality; is that correct?

A Correct.

Q In addition to single-family residences, there are a number of residences for two-family, three-family and four-family.

Do you know whether these residences under those categories are apartments or are they attached homes which are larger than required for single-family use; and therefore, are occupied by more than one family?

A I think that most of these units are very large, old homes that have been converted into apartments within those homes.

Q Do you have an opinion as to whether any of these multi-family residences constitute low-income housing?

A No. I have no opinion on that.

Q In the planning work that you have done

for Hanover Township and are continuing to do, have you reached any conclusions as to any anticipated [redacted] growth in the community over the next ten to 25 years?

A Well, I believe there will be residential growth. There are still some vacant properties and isolated vacant properties with that existing residential zones, which I have to assume at some time in the future will be developed.

Q I believe the third table appended to your report discusses the vacant land wit[redacted] various zones in the municipality; is that c[redacted]

A That's correct.

Q Based upon this zoning, would you be in a position to tell us how many additional dwelling units can be constructed within the municpality pursuant to this zoning as applied to the vacant land that exists in the Township?

A I can't do that just looking at this table. [redacted] way you could really prepare a meaningful [redacted] projection is to take each one of the residential zones and take each of the vacant land categories and then actually attempt to locate on vacant lots within those zones the number of homes that could be constructed, and those that have

acreage within those zones, prepare some kind of a possible subdivision layout for those properties. This, of course, is assuming thatall of the [redacted] land that is zoned in this table is developable, but that has not been done: and I cannot do it without taking several hours to actually make such a potential development analysis.

Q Well, you indicate that there may be some question as to the development potential of these vacant properties.

What inhibitions or limitations on de[redacted] would be within the context of that statemen[redacted] made? What did you have in mind?

A Well, I think these are all set forth in this report. The environmental limitations are set forth in the report, such as the environmental constraints of bedrock, high water table, excessive slopes, erosion potential, internal drainage, stream overflow, flood plains; and then, of course, the one that has [redacted] quantified is the availability of public [redacted] water on each of these tracts.

There are, or there is, available sanitary sewers in the Township, but not all -- not all areas of the Township are presently served with sanitary sewers.

Q You listed a number of practical constraints on the development potential of these tracts. Are there any municipal ordinances or codes which translate those practical limitations into authoritative law?

A I think that the municipal law use ordinance itself, which requires every application for development to be processed by the Planning Board, would certainly be a limitation. The applicant would have to prove that the development of that property, whether it is for residential or nonresidential, can be accomplished without resulting in problems to the general [redacted]

I'm talking now about storm water runo[redacted] providing adequate off-street parking and addrssing the question of traffic circulation on and around the site, and things like this nature. So to be specific, the one code that would be of paramount consideration would be the land use ordinance.

There is also a flood plain ordinance that [redacted]ations pretaining to the development of [redacted]es of all kinds within a flood plain.

Q In this flood plain ordinance, is the flood plain actually delineated and set forth as to what lands are within the coverage of this ordinance?

A I do not have a flood plain ordinance, but it's my understanding that they are.

When we were doing, they say environmental [illegible], they -- we asked the Township engineer to supply us with a map that would show the areas within flood plains; and I have such a map here which has been superimposed upon these overlays.

I have not reviewed in detail the flood plain ordinance regulations.

Q Do you recall offhand then whether the delineation that you have examined and incorporated in your overlays was undertaken by the munic[illegible] or whether it merely adopted some other gove[illegible] study as to what constituted the flood plain areas?

A I'm not sure, but I believe that it was adopted by the municipality which was based upon either the State or Federal flood plain information.

Q Would it be possible for us to check at some other convenient time to ascertain exactly [illegible] flood plain in fact was delineated?

A I think the most meaningful way to check that would be to get that information from the Township engineer. He's the one that has to deal with this from day to day, and when I ask him for that particular environmental constraint, he sent me a map which was --

he superimposed upon one of our base maps the area of the flood plain and a red-colored up delineation of that zone; and I simply took that as the area that was within the flood plain as far as the local ordinance was concerned.

Q So the map he sent you wasn't a State map or Federal map, it was work he had done personally?

A I think that he took the information from the State or Federal map and superimposed it on our base map, which was a much more detailed scale than the State or Federal government had.

Q Now, directing your attention to the first page of RCH-2, you discussed the location and transportation systems serving Hanover Township in that first paragraph. Is it your opinion that the transportation highways within the municipality are presently sufficient to handle the transportation needs for the foreseeable future of this township?

A I have not made a study on the regional transportation needs. All I can tell you is what is there at the present time.

The State highways that are there and those that are proposed through the Township that have not been developed, but I have not attempted to quantify the adequacy of what the regional highway systems

are as far as Hanover Township is concerned.

Q Are you aware of any current transportation problems within the municipality?

A Again, I have not made any kind of a study of transportation problems.

We have made in our previous master plans proposals for arterial streets throughout the township, but these were primarily as they relate to the moving traffic in the township and not from within the region of which the Township is a part.

Q Do you recall the last such recommendation you made to the township regarding arterial [redacted] when that was?

A No, I don't recall when that was.

Q Would it have been within the last nine years?

A It was certainly done in the 1963 master plan, and when we were reviewing the land use element of the master plan about the time of -- the '76 zoning ordinance was prepared, some study could have been made [redacted] but I dont recall.

Q Are you aware of any outstanding recommendations that you have made regarding arterial strets which is awaiting action by the muncipal governing bodies?

A Well, probably the most significant arterial

street recommendation was the proposed development of the Algonquin Parkway, which goes back over 20 years. I guess you could assume that it's awaiting municipal action of the governing body and it probably will be awaiting municipal action of the governing body for the next 20 years, because it has been on the master plan since the early '50s.

Part of this rather major arterial north-south highway which runs from Columbia Road up to Route 10 and beyond has been developed through the processing of certain site plan applications; but it's one of those things that is only going to evolve over a long period -- long period of time, because to the best of my knowledge, the township does not intend to build any part of that road. We hope to have it built as development comes in along that property.

Q Now, on page two of your report of September 27, 1979, you discuss in the first full sentence on that page the approximately 1,227 acres of the township which is vacant.

In whatmanner did you arrive at that figure of 1,227 vacant acrs?

A We simply located on the map every parcel of land that had some form of development on that, and those parcels or parts of parcels that did not have

development on it, we placed in the vacant land category.

Q You indicated that you located every parcel with a structure on it. What was your source for that analysis?

A The source was the existing development map we prepared and updated in September of '79.

Q Now, in regards to the particular parcel of land which had, say, a structure on it, but was sufficiently large that it had substantial open spaces, and in what category would such a tract be placed in the development on undeveloped [redacted]?

A I think the map and exhibits will speak [redacted] themselves. You'll have to take a look at the existing development map which shows how each piece of property is presently being used and then overlay that on the map that shows all of the vacant land.

Now, this map which the draftsman hasn't put a title on it yet, but it will be entitled something like vacant land by zone in Hanover Township, shows all of the parcels of land that we have quantified in that table as vacant property. This map is entitled Existing Development, September 1, 1979, and it shows the present use of all of the properties in the Township.

Q Let me very briefly ask you one question

before we specifically examine your maps.

If my understanding is correct, you have not established a standard for evaluating a particular tract which may have some limited development on it as to what category it would be placed on. It would appear to me that you've done a site specific analysis of parcel by parcel to determine what category you willplace it in. Is that corect?

A Not exactly. There are vacant lands on this map which also have a structure of some form on it. I refer you to vacant land parcel 93, vacant parcel 94, vacant land parcel 60, parcel 20. There are several others, but this will indicate or illustrate the methodology that was developed in trying to determine which of these lands are vacant.

Those four parcels that I've just outlined are acreage parcels, but they have structures on them.

Q My question was specifically in those parcels which do have structures, have you set a uniform standard as to the amount of open space required to be -- have that parcel included in the vacant category? In other words, must there be five acres or ten acres or what as to placement of a particular parcel with one or more structures in it

in the vacant category because of the sufficient open spaces that go along with that structure?

A I think, as a rule of thumb, what we use was that we would try to set around or set aside land that would be adequate to subdivide a lot out of that vacant parcel that would meet the zone in which it fell and a balance of the property would be classified as vacant land.

This can best be illustrated by looking at parcel number 93, which has perhaps between three and five acres. I'm just guessing by looking at this map, and you'll notice that there is a [redacted] on that house and we have then arbitrarily set enough land aside around that house that would meet the zone classification of the R-25 zone; and the balance of that parcel is then thrown into the vacant land category.

If you look at these two maps, the existing development map overlaid on the vacant parcel, you will see that in every instance thathas been done.

Q All right. Well, let's take a second and go off the record.

(Whereupon, there is a discussion off the record.)

("Vacant Land by Zone Map" marked

RCH-3 for identification.)

Q Why don't you just tell what your other overlays are.

A All right. Why don't we take these in the same order as they are.

First is the stream overflow. Now, do you want to discuss this or should I --

Q I think it would be easier to go through them. The stream overflow is RCH-5. You indicated we could mark that on an obtrusive spot.

(Stream overflow map marked RCH-5 for identification.)

Q The next sheet is 100 year storm.

(100 year storm map marked RCH-6 for identification.)

A This overlay shows all of the swamp lands. This overlay shows the seasonal highwater table.

(Swamp lands overlay and seasonal high water table overlay marked RCH-7 and RCH-8, respectfully, for identification.)

A This overlay shows the land that is suitable for construction with basements.

(Overlay showing land suitable for construction with basements marked RCH-9 for identification.)

A And the last overlay, which was submitted by Louis Goodfriend -- I mean, the information shown on this map is in Louis Goodfriend's report, and this shows the major areas impacted by environmental noise; that is, the noise that results from the traffic on 287 and the Morristown Airport.

(Overlay showing major areas impacted by environmental noise marked RCH-10 for identification.)

Q Now, Mr. Catlin, we've marked a number of overlays and your report exhibits RCH-2 through RCH-10. Do these materials constitute your work product on behalf of the defendant, Township of Hanover, in this litigation?

A Yes. I have another map which we have prepared which is an existing development pattern which shows the various land uses in land use category.

(Map showing land uses by land use category marked RCH-4 for identification.)

There are two other maps that were prepared as part of this project. This is an existing development pattern which is another way of showing the same land use as shown on the existing devebpment map.

Instead of showing the land use by symbol, it shows

the land use pattern by color as is indicated on this legend on the bottom corner of the map.

(Existing development map marked RCH-11 for identification.)

A The last exhibit is the map showing the soils classifications of all lands in the township. It's -- the source of information is from the Soils Conservation Service study.

Those exhibits through 12 represent all the exhibits that we have prepared as part of this study.

(Soils Classification map marked RCH-12 for identification.)

Q Why don't we discuss these exhibits briefly in order starting with RCH-5, your stream overflow overlay.

MR. DORSEY: How about reverse order since he now has them on reverse order on the table?

A I don't think so because you can put anyone on the base map first, but you have to put on one at a time.

MR. DORSEY: Okay.

A All right. This is the stream overflow.

Q Now, what I'd like to know about this first is is this exhibit completed as of now?

A Yes.

Q Could you elaborate briefly on what it purports to depict?

A I believe the report itself, starting on page five, describes each one of these maps and exactly what it depicts and what it means. If you want, I can read what's in this report for the record, but it is pretty much explanatory itself.

Q We don't want to burden the record. What is the source for the material as shown on this overlay?

A The Soils Conservation survey report. as numbers are concerned, that are reflected in the table of environmental constraints of the 1,227.40 acres of vacant land in Hanover Township, there are 614.23 acres or over 50 percent fall within the stream overflow category as shown on this exhibit.

Q Now, directing your attention to page five of your September 27 report, you do indicate that the frequent stream overflow map is intended to show those areas that are likely to flood and/or pond with a given frequency. What frequency are we talking about?

A Well, as far as the Soils Conservation Service is concerned, if the category is frequent stream overflow

which this map depicts, they indicate that flooding is likely more than once in two years.

That doesn't meanyou have to wait on an average of two years for each one of these parcels to flood. Some may be flooded, you know, much more frequent than that, but presumably, all of these parcels are flooded more than once in two years.

Q Have you done any field investigation to verify the flooding frequencies as detailed by the Soils Conservation survey data which you utilized?

A We have not made any field examinations, but I understand that Converse, Ward, Davis & Dixon actually taken tests, field tests of a number of these various parcels; and I understand that Killam Associates has also made studies to verify the accuracy of what the Soils Conservation Maps show.

Q Now, I show you this document which is entitled Soils Survey of Morris County, New Jersey. Is that the data source that you're referring to for this stream overflow?

A Yes. This, and we also referred to the one that was put out just prior to this one, but the information is basically the same.

(Document entitled Soil Survey of Morris County, New Jersey marked RCH-13 for identi-

fication.)

Q This was issued in August of 1976; is that correct?

A This particular book was, yes.

Q Do you recall the date of issue of the prior one which you referred to?

A This has a date of October '74. I believe the '76 document is merely a refinement of the '74, but as I say, the information is 99 percent the same on all documents.

Q Now, is it your position, Mr. Catlin, that the lands which are within the yellow colored areas of RCH-5 are so constrained as to be inappropriate for residential development?

A I believe they should not be developed unless something is done to alleviate the problem that you find with the soils that are -- fall within this category. It is physically possible to develop any kind of land if you want to spend enough money to do so.

These problems or these soils, these lands that have this soil characteristic certainly can be developed as is anything, but there are problems that are inherent with this category that is going to result in some real development costs.

Q What problems would you envision occurring should development go forward without mitigating factors in these properties on these properties?

A Well, there's going to be problems with putting in infra-structure, putting in impervious materials such as parking lots and streets, the construction of buildings themselves without doing something with that soil. I believe this is best illustrated in the converse, Ward, Davis & Dixon report which indicate that you could build log houses on this property, but to do so can result in some tremendous problems in the future unless that soil is dug out and replaced with some compacted fill that is not going to result in these problems.

I'm now talking about just the physical construction problems. You also have the environmental problem of some of this land, much of this land as shown in this exhibit acting as natural retention basins for watersheds that go way beyond Hanover Township; and if you do alleviate the problems of construction, the physical problems of building impervious material and homes and so forth by mucking out the bad soil and bring in new soil, you are reducing some of the natural retention basins that may result in potential problems downstream.

Q Well, then what are the mitigating measures that you would recommend as appropriate for reducing or eliminating the environmental concerns you have just outlined as far as development in these areas?

A I believe the best solution to much of this problem is to prohibit any kind of development, and a lot of the soil and acquire some of these properties, particularly this very large area in the northwestern quadrant where it abuts Parsippany-Troy Hills and to some kind of a natural conservation reserve; because as you see, when we go to some of the subsequent overlays, this particular area which is many, many acres is impacted not only with stream overflow soils, but impacted with all of the other environmental constraints.

I think to a certain extent you find the same problem over in the eastern section of the township around the Morristown Airport where that land is not only stream overflow impacted but has a high water table. It's swampy. It's mucky. It's a natural retention basin and so forth, and I think that much of that land should also be acquired perhaps through Green Acres or conservation areas.

Q Now, in addressing the two specific

parcels which you have just mentioned, the one in the northwest corner abutting the Township of Parsippany-Troy Hills, what water course traverses that tract of land?

A The name -- that is not on this map, so I'll have to refer to some other information.

That water course as referred to as Malpardis Brook. This ia Malpardis Brook and what we're talking about is the area shown on the base map, including parcel 75 through 79. I'm sorry. It's basically parcel 78 through 83, and that is approximately 290 acres, and the brook that traverses that is Malpardis Brook.

Q What is the present zoning applicable to that tract?

A Present zoning is office building and research laboratory.

Q Are there any development controls which would be consistent with the environmental protection needs that you have previously outlined applicable to the tract?

A Well, again, the development controls would be that they must comply with all the provisions of the land use ordinance; and also, I believe that this parcel of land is also -- much of it is within the

flood plain as regulated by the flood plain ordinance.

Q Have you performed any study or analysis of what the environmental impacts would be of a development at this location consistent with all the zoning and land use controls and what the consequences of such a development would be?

A We have not, but I understand that Mr. Salzman from Killam Associates has, and I believe that -- Mr. Platt from Killam Associates and Mr. Salzman from Converse, Ward, Davis & Dixon have addressed that problem in their report.

We have not made any kind of study as to what development problems would occur other than recognizing, as I said before, that this land is impacted with just about every kind of an environmental problem that you can imagine.

Q Now, in regards to the other large tract of vacant land impacted by the overflow soils, which I believe you indicated was in the southeast portion of the township adjacent to the Morristown Airport, could you identify that by the tract number system which you have previously discussed?

A This land consists mainly of parcels 46 through 56 and parcels 122, 123 and 58.

Q And is there a particular water course which traverses those lands?

A Well, some of this land abuts the Black Brook, and also the Whippany River runs through some of this property at the northerly end.

Q Now, what is the current zoning applicable to those parcels?

A All of that land with very few exception is either in the industrial zone or the industrial park zone. The exception being the land running along Route 10, which is an industrial busin[redacted] zone in a very small part in the OBRL zone.

Q Are you aware of the maximum square footage of buildings that can be constructed in these industrial zones under the current zoning ordinance?

A You mean the maximum -- maximum size building by regulation or that you could physically construct?

A The regulalation. What land use limitations there are as to the density of buildings and other impervious surfaces that could be placed on those lands.

A The maximum at the present time is 30 percent floor area ratio.

The Planning Board at the present time is

considering an amendment to the zoning ordinance which indicates that there must be an open space left on the property after full development that would vary between 30 and 35 percent, that would include lands that could not be covered by building, parking lot, sidewalks or any other impervious material.

Q Now, have you performed any analysis or study of the environmental impacts which would occur were these lands to be developed at the maximum densities that we've just discussed?

A We have not attempted to quantify what the impact would be on the environmental, either on the site or downstream, other than to recognize that this land is environmentally impacted with several of these constraints.

Again, I think that Killam Associates and Converse, Ward, Davis & Dixon have addressed that problem in their reports.

Q I believe the next exhibit overlay is the 100 storm overlay; is that correct, RCH-6? Am I correct in saying that RCH-6 depicts, through use of a blue coloring, those areas in the municipality which come within the 100 year storm elevations?

A That's correct.

Q And is this exhibit complete as of now?

A As far as I'm concerned it is.

Q What way the source for delineations as depicted on this overlay?

A This was the map that was provided by the Township engineer.

Q Now, on page five of your report the statement appears, and I quote:

"Development of any structure for any use within this zone should be prohibited."

Is that the position as adopted by the municipality

A I'm not sure. Again, as I told you earlier, I have not examined the flood plain ordinance. I'm not sure if they prohibit development within the area shown on this map, or if they regulate it, it's possible that if it's regulated by requiring that anyone that wants to develop this property to do something with the land to raise the elevation of any structure one foot above the 100 year storm level, but I just don't know.

Q Could you briefly elaborate on the basis for your recommendation on a total prohibition of any structural development?

A This land, as I mentioned also before, is land that has soils and it's located in areas that act as natural retention areas, natural retention basins; and again, it is possible to muck out the soil and replace it with compacted fill to comply with the provisions that would minimize danger to public health and so forth, and safety on the site; but by doing so, you're filling in natural retention basins in water shed areas. That, I believe, would be best left undeveloped and that's why I believe the proposal to acquire some of the very environmentally sensitive areas for natural resource areas on the master [redacted] makes a lot of sense.

Q To your knowledge, has the municipality adopted or implemented any type of a program to acquire these areas as you have recommended?

A Well, they certainly have acquired property that we have recommended through the years as being acquired for public open spaces, yes.

I don't believe they have started any kind of program for acquiring these areas because this information has only been recently developed; but it will be a proposal in the master plan that's presently under consideration.

Q Now, your recommendation as to a total

prohibition on construction within 100 year storm elevation, are you aware of any other governmental agency which has responsibilities for flood protection which has similarly adopted a recommendation against any development within these areas?

A I think there are a number of municipalities which have adopted regulations that prohibit development within certain parts of those flood plain areas. I don't know of any municipality that has an outright prohibition for development within entire limits of the flood plain areas.

Q Are you aware of any State Department of Environmental Protection regulation on this subject?

A They certainly regulate development within those flood plains.

Q As opposed to prohibit it?

A Part of it is prohibited and part of it on the fringe is regulated. Anything that falls within the floodway of that 100 year storm, I understand development is prohibited. Anything within the fringe of the 100 year storm is regulated.

I'm really not sure how much of this you see on this overlay is within the floodway and how much

is within the fringe. because it's all one category and this is the information given to us by the Township engineer.

Q Are you aware of any other mitigating measures which a developer can implement as part of thie development to retain flood water retention levels to the same degree as would have been available had the premises been left vacant?

A THey can build retention basins, but to a great extent, much of this is already a natural retention basin for much larger area.

Q Now, I believe your next exhibit is RCH-7, an excessive slope and swamp land overlay.

Now, I believe RCH-7 depicts excessive slope with a purple coloration and swamp lands with a brown color; is that correct?

A Correct.

Q Is this exhibit complete?

A Yes.

Q What were the data sources for the two delineations which appear on this exhibit?

A This information was taken from the topographic map prepared -- for the Township by the aerial photograph method.

The 15 percent or greater category was computed by our office and the swamp lands were taken

from the map, topo map of the township which shows these areas as being swamp lands.

Q Now, you indicated that aerial photographs had been prepared for the municipality. Do you know the date of that aerial survey?

A I'm not sure, but I think it was soemtime in -- the '60s. I just don't know the exact date.

Q Do you know who performed that aerial survey?

A No. If that information is important, I can tellyou in three minutes by looking at the map in the drafting room.

Q Possibly during a break we'll take a look at it. It wouldn't be worth it to do it now. Thank you anyway.

In regards to, I believe, your report of September 27 indicates 20.36 acres of vacant land subject to excessive slope constraint which you have delineated on this overlay; is that correct?

A That's correct.

Q Do any of those areas fall on parcels of land which are so impacted as to your mind lose their ability to be developed for residential purposes?

A Well, the areas themselves are relatively

small and I think you could probably devise a plan for the development of any vacant land, whether it's residential or nonresidential, that would accommodate these vacant lands so that the land would not have to be disturbed. In other words, what I'm saying is that all of these 20 acres should be and could be left in its natural site and still developed in most instances a balance of vacant land that are impacted by these.

Q On my examination of your overlay it would appear that one particular parcel, which is numbered 41, would seem to be substantially encompassed within this excessive slope category.

A Yes. It looks like perhaps 50 percent of it would be impacted by that.

Q One thing that I haven't figured out. I probably should have asked this question previously. What was the numbering system that you used? How was it that the various parcels are numbered as they appear on your base map?

A These numbers are, as I mentioned before, only for identification and I simply started at the top of the map and gave each vacant parcel a number. There's no other significance to that numbering

system other than to identify it.

Q Now, the parcel 41, what is the present zoning applicable to that property?

A That's in the business zone.

Q Are there any land use controls applicable to that property which would limit or in another way regulate the development, the business use of that part of the tract which is subject to excessive slopes?

A As far asI know, there is no environmental impact statement required as is required in so many municipalities; but the one control that would regulate that would be the processing of an application pursuant to the land use ordinance, and that would have to be detailed engineering submitted to the planning baord to indicate that the development of that would not run -- run into a problem of storm drainage runoff and also access, building any kind of road across that slope would be looked at very carefully.

As a practical matter, there would be no need nor desire on the part of the applicant as far as I can see for running such a road, because this property abuts the property owned by the Board of Education and you would not have to build a road across this property to get to the school property.

Q Now, in regard to adverse environmental consequences which would occur as a result of a development on that property, I believe you mentioned storm drainage problems. Would you foresee any other adverse environmental impacts from the development of those sloped lands?

A That seems to be so far the only environmental impact that affects that parcel 41; that is, the excessive slopes of about 50 percent of the land.

Q Now, in addition to parcel 41, I believe parcel 115 seems to be substantially impaired with your excessive slope designation also; is that correct?

A That's correct.

Q What is the present zoning applicable to that piece of property?

A That's in an R-15 zone. That particular property is a very narrow sliver of land that abuts a proposed Route 24.

Q Can you give us an approximate estimation of the acreage located at parcel 115?

A This is 600 scale. I think it would average 100 foot in width and perhaps 700 feet in length. That's 70,000 square feet and that's less than two acres. Approximately 1.6 acres, very roughly.

Q Now, pursuant to the present zoning,

what type of residential development could take place on that land?

A That is zoned for single-family detached homes requiring a minimum lot size of 15,000 square feet.

Q And what controls are incorporated in the land use ordinances of the municipality which relate to the excessive slopes designation which you have delineated pertaining to that land in regards to development, which could take place under the zoning ordinance?

A To the best of my knowledge, there is no controls per se that regulate land over a certain slope.

There are general provisions in the ordinance that indicate that the development of the land will only be permitted after the applicant can show that he complies with all the minimum required provisions, and that the development of the land is not going to result in an adverse impact on the surrounding property.

Q Now, if development did take place on that land, would you envision any adverse environmental consequences occurring as a result of such a development?

A Well, if you look at the geometry of the

property, the only access it has is off from approximately 400 feet of frontage on Horse Hill Road, and it would probably be developed into two or three building lots that would front on Horse Hill Road; so that other than the location of a house, a single-family detached house on, let's say three lots, the land would not have to be disturbed by running in roads or other site improvements.

If we're talking about some form of development, residential development other than single-family detached, which is permitted in R-15 zone, it would be extremely difficult to develop that land; again, if you try to run in any kind of access road on the property, the property is so shallow that you'd take up most of the property with improvements.

Q Well, discounting access problems, as far as the construction of dwelling units, you dont foresee any adverse environmental impacts then?

A Only disturbing a slope that has over 15 percent.

Q Which results in what?

A Which results in then destroying natural water retention.

There are trees on that property that now

absorb a lot of the runoff, and the minute you go in and disturb any part of that land, even for the construction of a single family home, is going to result in some serious storm water runoff problems.

Q Now, I believe there's at least one other parcel which appears to be substantially impacted by excessive slopes, which would be an adjoining tract labeled 116; is that correct?

A That's correct. This property is also abutting and coincidental to the proposed Route 24.

My records indicate that this is a land-locked piece of property with no access other than [redacted] which abuts Route 24, unless the owner of Lot [redacted] also owns Lot 16. I don't know that.

Q Now, what is the present zoning applicable to that particular piece of property?

A That's in an industrial zone. These parcels we're talking about, 116 and 115, are really left over parcels after the Route 24 right-of-way was acquired. For all I know, that property may be owned by that highway department.

Q Your vacant land, I believe that is colored vacant is not limited to privately owned then?

A No. This is every parcel of land, whether

it's private ownership or public ownership.

Q Now, as regards parcel 116, what is the maximum density development that could take place on that land?

A This is in an industrial zone which is presently regulated by a maximum 30 percent floor area ratio.

Q And what environmental consequences would you envision for this parcel to be developed at the maximum density permitted under the present zoning ordinance?

A The same environmental consequences as we discussed on 115, that it appears as if, other than the question or problem of access which I've outlined, is that of excessive slope; and again, the property is relatively small in-area.

If there is access, either through abutting lot 115 or perhaps 117, you would have a problem of disturbing the natural environment, the natural ground cover and vegetation on that steep slope.

Q Now, you mentioned that was a relatively small tract of land. Could you give us a rouge estimate of the size of parcel 116?

A I believe that's about three and a half acres.

Q Upon the construction of New Jersey Highway

24, would the access problem to that property be possibly eliminated?

A You mean would Route 24 provide access to the property?

Q That's correct.

A I don't believe so. I understand that that has limited access through that area. There will be a proposed interchange where Route 24 will intersect 287. I'm not sure if there's an interchange at Horse Hill Road, but it doesn't appear as if there will be any access to that parcel from Route 24.

If you look at this map, you will see that all the other parcels of property in that area back on to that highway and there's no access provided.

Q Now, the other environmental category depicted on RCH-7 is swamp lands, and your report indicates that they comprise 298 acres: is that correct?

A That's correct.

Q In what manner was this acreage so delineated?

A This was simply taken off from the arterial

topographic maps prepared by the Township.

Q Was any field verification work done?

A By my office?

Q By your office.

A None by my office but there was verification made by Mr. Salzman in his report.

Q Now, in regards to where these areas are located, would it be accurate to say that the main tracts of land so impacted are the large 200-plus acre tract at the northwest corner which we discussed previously at some length in regards to the stream overflow problems and also the tracts of land in and about the Morristown Airport?

A That certainly takes up the bulk of the swamp land category.

There is another small area along Stoneybrook that runs through the large vacant parcel abutting Route 10 and the railroad.

Q The parcel which you havejust identified I believe is noted on your base map as parcel 34?

A Correct.

Q Do you know the acreage involved at that location?

A Parcel 34?

Q That's correct.

A Again, I can estimate it very roughly by scaling it.

It's such an ordinary shape. If it was rectangular, I could tell you almost exactly what it is. I would guess, and it's strictly a guess on my part without actually putting a pelimeter on that, that it would be in the neighborhood of 50 acres.

Q And out of those 50 acres, would it be fair to say that not more than 30 percent are impacted by the environmental constraints you have so far delineated; the stream overflow, the 100 year flood area, the swamplands and excessive slope?

A I believe that's a reasonable approximation.

Q Now, pursuant to the current zoning ordinance, what type of development is allowed on tract 34?

A That's in an R-25 zone?

Q And that would be single-family residence on 25,000 square foot lots?

A Correct.

Q Are there any provisions in addition to the flood plain ordinance which control or otherwise regulate the development that could take place in that area?

A Again, the only local controls I'm aware of

as a flood plain ordinance and the land use ordinance. I believe those arethe limitations.

Q Now, would you envision any unusual environmental problems occurring were that tract of land developed in a manner clustering residential development outside of those environmentally sensitive areas as substantial densities?

A Well, there is a problem of access there. Route 10 is a divided highway. There is frontage on Route 10. You would only be able to get into that property in the westerly direction.

It's my understanding that that property is owned by the Paper Mills. Much of it is presently being used as a sanitary landfill.

Q Okay. As far as environmental impacts in addition to potential access problems, would you foresee any other adverse consequences of a high density residential development which respected your environmental delineations and left those as open spaces?

A As far as we have gone so far, I would see no other environmental impacts as it is shown in these Soils Conservation Services environmental studies; but again, if that property is used for a sledge deposit or sanitary landfill for the paper

mills and so forth, there may be tremendous environmental problems that wouldn't show up on the kind of studies we're making here.

That would require detailed on-site inspection to see what, if anything, is happening on that property that would impact that soil and so forth.

Q Are you aware of the existence of any such studies?

A Again, I think if there have been any made, it may possibly show up in Salzman's report or Fletcher Platt's report. We have not made an on-site studies.

Q I believe your next overlay is [redacted] seasonal high water table.

Now, RCH-8 is an overlay which I believe delineates those areas with a high water table at two and a half feet, or less below the surface by a green coloration; is that correct?

A Correct.

Q And in what manner was this delineation done?

A This was made by taking the Soils Conservation Service soils' classifications and taking the information out of the Soils Conservation Report and these soils that you see in the green shaded area here fall within

that category of having a seasonal high water table within two and a half feet of the surface of the ground.

Q And did you perform any field investigation to verify the Soils Conservation data?

A I did not, but Mr. Salzman did.

Q Now, in regards to those areas so impacted as delineated on this exhibit, would it be accurate to say that the large 200-plus acre tract then at the northwest corner of the municipality abutting the Township of Parsippany-Troy Hills, and again, the industrial zones in the southeastern portion of the municipality abutting the Morristown Airport, are major areas so impacted as you've delineated and we've discussed before in regards to the other environmental constraints in your other exhibits?

A Those are the two major areas, but there are several other areas throughout the township that are also impacted with this high water table.

Q Now, in regards to development limitations which a property is impacted with as a result of high water, what are the main concerns that these cause as far as you're concerned for the development of a property?

A Well, I think the main concerns are the same things

that I mentioned earlier; and that is, you have problems of development infra-structure.

Many times infiltration of sanitary sewer lines with water table or water from the highwater table. You also have the problem in a number of instances, and I think it would best be illustrated by this area that we're talking about, OBRL zone, where these areas are natural retention areas; and again, as I mentioned before, you can muck out this soil and physically develop it; but by done so you're reducing the natural retention basins and retention areas. Physically, as I said before, you can develop all of this land if you want to spend enough money to do so. But there are problems that are going to result in developing this property.

I believe Mr. Salzman in his report points this out very pointedly where he indicates that this land can be developed if you want to spend enough money to put it in shape to develop it; but from a practical standpoint, it's questionable. From a physical standpoint, it's possible to develop it.

Q Now, in respect to certain other areas of vacant land which are delineated as impacted with high water table. I believe there's a tract at the very northern tip of the municipality which encompasses

the parcels numbered 1 through 6, which you have delineated on your base map; is that correct?

A That's correct.

Q What is the current zoning applicable to those vacant lands?

A Much of it is in the R-40 zone, which is a single-family detached residential zone requiring a minimum lot size of 40,000 square feet. Some of it is in the industrial park zone, which is that land lying closer to Interstate 287.

Q Now, in regards to the parcels, I believe it would be three through 6 which are in the R-40 zone, are there any municipal land use controls regarding the development of these lands in relation to the environmental concerns you have expressed pertaining to the high water table?

A No. I believe the only one would be the land use ordinance. I don't believe that that land is impacted in any other way other than on a stream overflow, which would indicate that the soil makeup is such that it has subsurface problems.

Q But as regarding the high water table, the municipality would not require a developer to take any mitigating steps in regards to the development pursuant to the current zoning ordinance; is that correct?

A Well, it depends upon what he's proposing to do there. If he plans on building structures, single-family detached structures that are going to have full basements, I'm sure that the Planning Board and the construction official would want to be informed as to how he would intend to solve that potential problem of building where water tables that sometimes within two and a half feet of the ground.

Q So the elimination of basements would be one mitigating measure that would reduce the potential problems as a result of this high water table condition?

A If that was the only problem. You see, there's high water tables in all kinds of soils. If that has a high water table and the soil has no other problems for development, then I would think that that would certainly minimize a problem by building on a slab. Whether or not the soil characteristics are such that you could put a slab on that property, I don't know. This would depend upon you know, on the detailed soil studies.

Q One other tract which appears to have some substantial high water table delineation is I believe, site 36.

A That s correct.

Q What is the current zoning at that location?

A That s in a designed shopping center district.

Q And what type of development can take place in that zone?

A A shopping center.

Q With what density of impervious and coverage and buildings. if you know?

A I don't know. I'm not sure that there is a floor area ratio. I'm sure there is one in the industrial zone, but I don't know that there is a limitation on the size of the structure that goes in there.

Q So conceivably, all vacant land could be covered up either with buildings or --

A No. becasue there are certain setback requirements and buffer strips that are required, even though there is no regulation as far as the maximum floor area ratio is concerned.

Q To your knowledge, would such setback and-buffer requirements limit the coverage to less than say 30 percent or --

A I don't know what that would be. The only way to quantify that would be to take the zone and look at all of the various cross-reference requirements and

theoretically try to compute what that number would be, but I don't have any idea.

As you know, that property is traversed by a zone district boundary line that separates the designed shopping center zone from the R-15 zone and there very well could be restrictions that would prohibit any kind of development within a certain distance from that zone district boundary line but I just can't give you that answer without making an analysis.

Q One other substantial tract of land which appears to be delineated with your high water table is in the southwestern corner and encompassing, I believe, properties 111 through 114: is that correct?

A Correct.

Q What are the zoning provisions applicable to those properties?

A Much of that land is in an industrial zone. There is a corner of the tract which includes parcel 112 that is in an R-15 zone, residential zone.

Q And in regards to, I guess it would be parcels 111, 13 and 14, those are found in the industrial zone?

A Yes.

Q And they are subject to what development

limitations in respect to high water table, if any?

A There's no mention made of a high water table per se in the land use ordinance. They would be subject to all of the restrictions of the land use ordinance as far as -- maximum coverage, the required parking access, traffic, all of these other land use controls; but nothing in that ordinance refers to water table.

Q So to your knowledge, there wouldn't be any provision in the municipal land use controls prescribing development over those lands which are subject to high water table; is that right?

A Not high water table per se, but as you can see on some of the previous impacts that land is impacted with other environmental constraints. Some of that land has a stream overflow. Some of it -- much of it is within a 100 year storm and much of it has a high water table.

If you're just taking a high water table by itself, again, there's nothing that would per se regulate that particular factor. It would be regulated by looking at some of these other things, perhaps in the flood plain ordinance. Much of that land is in the flood plain.

Q One other parcel I would direct your

attention to would be 119. That also appears to have a portion of its land area delineated as high water table area; is that correct?

A Correct.

Q And that is also found within the industrial zone?

A Correct.

Q Are there any other environmental constraints applicable to property 119 to your knowledge?

A None that I have found from the Soils Conservation study up to this point. I don't know whether the next overlays are going to show anything or not up to this point. I don't know of anything else that comes out of that Soils Conservation study.

Q What other overlays do we have to go? My records reflect we've got a basement suitability.

A That's correct.

Q So discounting for the moment any concern for suitability of this land for development which would encompass basements, you wouldn't foresee at this time based upon the analysis you performed, any other environmental constraints on the development of tract 119 beyond the high water table that you've delineated?

A None that I have seen so far. That's right, sir.

Is it also correct that pursuant to the present zoning, there is no prohibition on the development of that tract as regards to leaving those areas impacted by high water table, prescribing development on those? The present zoning ordinance is not prescribed development in this area impacted by high water table; is that correct?

A When you say prescribed development, what do you mean?

Q Prohibited.

A Oh. Is there anything in the ordinance that would prohibit that land from being developed?

Q That's correct.

A Not that I know of.

Q Now, would it be possible to develop this property for say high density residential development in such a fashion to cluster the development outside of the areas impacted by high water table and leave these areas as open spaces?

A Physically, you can do anything on that land. That's not impacted by high water table. but again, if we're only boking at the environmental constraints that we have attempted to quantify, my records indicate

that that is vacant land in an industrial zone that has no environmental impact that we have attempted to quantify other than a high water table.

Q Now, would it be more consistent with the environmental protection goals that you have outlined to develop that in a cluster manner away from the high water table impacted areas than developing it in such a fashion that those areas were built upon?

A Cluster for what?

Q Cluster -- would it matter as [redacted] consistency with the environmental protection [redacted]

A Sure, it would matter if it's in an industrial area. I don't think it should be developed for anything other than industrial use. If you want to cluster the industrial use, by all means I think it makes a lot of sense from a planning standpoint to try to locate the industrial operation away from those areas that are impacted by any kind of environmental constraints.

Q Are there industries presently operating in the adjacent properties to tract 119?

A Oh, yes.

Q And do you know what type of operations are located at those sites?

A Well, there are a number of industrial areas there, and I think directly across the street is the large Mennen plant, but in the township itself there is an industrial plant both on either side of this property. There is an industrial office laboratory on the corner of Horse Hill Road and Hanover Avenue.

In fact, all along Horse Hill Road as you would go north from Hanover Avenue, there are all industrial and office research laboratory plants as is along this industrial park that runs north of the property and abuts this property we're talking about; so the particular area, this tract, 119, is completely circumscribed by either the Interstate highway or existing developed industrial parcels, not only in Hanover Township but also in the Townsip of Morris.

Q Now, in regards to those adjacent industrial uses, what public health and safety considerations do you view as significant in not developing that tract for residential purposes?

A I'm not sure I understand your question.

Q You seem to indicate that it would be incompatible use to develop tract 119 for residential purposes.

A Yes.

Q What are your reasons for that opinion?

A The proximity -- the use in the neighborhood. It would be like developing a hole in the donut for residential and the meat of the donut for industry.

Q What would be the public health and safety interests that you would see adversely affected by such an inconsistent development?

A I don't think it's a very attractive natural environment for residential development, even low or least cost housing. I don't think you necessarily want to take all of your vacant land that's completely circumscribed by industrial development and put your least cost housing in there. Just because people don't have as much money as they would like to have, doesn't mean that they shouldn't have an attractive place to live and you don't stick them in an industrial area.

MR. ONSDORFF: Okay. Thank you. We'll take our lunch break here.

(Deposition proceedings resume after luncheon recess.)

G A R Y S. S A L Z M A N,

91 Roseland Avenue. P.O. Box 91, Caldwell, New Jersey, having been duly sworn by the reporter.

testified as follows:

DIRECT EXAMINATION BY MR ONSDORFF:

Q Mr. Salzman, I'm Mr. Onsdorff, counsel for the plaintiffs in the litigation in the Morris County Fair Housing Counsel versus the 26 municipalities in the County which are subject to this suit, and presently we're going to focus on Hanover Township. I'm going to ask you a series of questions and endeavor to produce a record here which may be used in later stages of this litigation; and if I ask any question which you don't understand, please let me know and I'll endeavor to clarify it. If your counsel for the township interposes an objection, please withhold your answer until that objection is resolved. Is that okay?

A Yes.

Q Have you ever been deposed before in litigation situations?

A Yes.

Q I show you this document and ask if you can identify it.

A Yes. It is my professional resume as prepared by Converse, Ward, Davis & Dixon. It is slightly out of date. It indicates my title as Principal engineer. My title is now vice-president, and there are other projects which would tend to be appropriate

for addition to my experience list, such as increase in the Federal Dam Safety Inspection Program to the State of Connecticut, the Exxon research and engineering facility in Clinton, New Jersey, a high dam in San Carlos, Arizona and other projects.

Q Okay. Why don't we just have this marked as GSH-1 for identification.

A I'm sorry. There's another item that does show up on the newer resume, and that is after hours I put on my other hat as chairman of the Randolph Township Municipal Utilities Authority at a salary of $1 a year.

Q Would you be in a position to have a copy of an updated resume to simplify matters?

(Mr. Salzman's resume marked GSH-1 for identification.)

Q Now, on your resume which we just marked as GSH-1, it indicates that you received a civil engineering degree from the Cooper Union in 1948; is that correct?

A Yes

Q What areas of academic discipline were incorporated in this degree program?

A The program included mathematics, the basics of the science of physics and chemistry, a full humanities

program, physical education, structural engineer, fluid mechanics, thermodynamics, highways, hydraulics, soils engineering, photogrametry; and I'm certain there were other courses, but it's been many, many years now and I don't specifically recollect them all. Geology is one.

Q In regards to this soil engineering, what specifically did this encompass?

A Well, the textbook used was authored by Taylor and it was a basic soil mechanics and foundation engineering text course where there was five class hours per week of program covering the physical properties of soil, testing, evaluation of soil properties and foundation systems, laboratory was part of that program.

Q Now, subsequent to graduation from Cooper Union you pursued a number of graduate programs, apparently specializing in soil; is that correct?

A That is correct.

Q Could you elaborate briefly on the nature of these graduate studies?

A I received a Master of Science degree from the University of Illinois in 1959, studying under Dr. Ralph Peck and having attended a lecture by Carl Ticksogney (phonetic), who is known as the founder

of the field of mechanics. My course work at that time included fundamental soil mechanics, once more [redacted]ineering, geology as taught by Dr. Dere, who was one of the most eminent rock mechanic specialists in the United States. It included hydrology from Dr. Chow, who was one of the most eminent hydraulic engineers in the United States, if not the world. It included a series of courses in advanced soil mechanics from Dr. Peck, including retaining structures, deep foundations and many other courses of that nature.

There was also an aerial traffic term[redacted] given and there was a highway soils course gi[redacted] I believe at that time I also took a course in public health engineering.

The other course work -- if I may borrow this for a second -- and other programs included post graduate studies of soil mechanics and foundations at Columbia University studying under Dr. Donald Burmister, which dealt primarily with the properties [redacted]r soils; studies at Newark College of [redacted]ng. There was Raamot, Raamot which were involved primarily in theoretical, sheer strengths and plastic materials.

There was post graduate studies in hydrology and hydraulics at Rutgers Univerisyt. Several courses

taught by Dr. Al Pagan (phonetic) who was one of the leading experts in the State on hydrology and hydraulics, and then courses in soil erosion and sediment control at the University of Wisconsin and at Rutgers University.

There were other miscellaneous seminars and programs of continuing education which I have not listed.

Q Now, it indicates that you received your master's degree in 1959 and pursued subsequent post graduate studies. Was this in a doctorate program that you were pursuing these subsequent university studies?

A No, they were not. They were courses that where I wished to receive additional knowledge pertaining to certain areas, and so I did. They were not part of a doctoral program.

Q Subsequent to your educational program which you were pursuing, I would assume on a full-time basis, what was your first professional position?

A My first professional position following my master's degree was with Joseph S. Ward Incorporated, which is the predecessor firm to Converse, Ward, Davis & Dixon, my present employer.

Q And that was in 1960?

A 1959.

Q And could you just briefly explain your responsibilities when you joined Joseph Ward Incorporated in 1959?

A When I first joined the firm, I went through a training program on soil sample identifications, on field procedures for explorations and field procedures for construction observations, and then for an approximate period of two years I was essentially a full-time field inspector, observing borings, construction operations, such as pile driving foundations, footings, cassons, piers, mats, compacted fill.

Q Was this period of time spent in New Jersey or where were you physically located?

A The office has always been located in Caldwell, New Jersey and the work occurs around that area.

Our office does work all over the country and all over the world, but the bulk of the work is in the New York-New Jersey metropolitan area.

Q Subsequent to this initial two-year period, what was your next professional position?

A It was actually a gradual occurrence where I might say I graduated from being a full-time field inspector to being a part-time field observer and part-time office engineer, and that transition I don't know how long that transition was; but it evolved

to the point where I was assisting in the design, foundation design of different structures and then eventually to managing projects in full with a staff of assistants working for me; and recently that position has changed again.

I am now both a manager of projects with a team working for me and I am special consultant to the engineering department and to the geology department within my firm.

Q Have you published any material in your field in any periodicals or other learned journals?

A I have presented to Gilbert Associates a paper on ground water control and seepage. I have also presented to the New Jersey Society of Municipal Engineers a paper on the geotechnical aspects of sanitary landfill design. I don't know if you can call it a paper, but I have prepared the excavation standards for the National Bureau of Standards in Washington, D.C. and I will be preparing a paper on seepage and ground water control for the United States Navy for their design manual known as NAVDOCKS, which is their soil mechanics and foundation engineering handbook for their design purposes.

My office has the contract for rewriting that document.

Q Now, in regards to the paper for the Gilbert Associates, I believe it was on ground water control and seepage, what was the date of that? Do you recall?

A Not exactly. It was about five years ago.

Q '74-75, around there?

A Roughly.

Q If I wanted to obtain a copy of that, how would I go about doing that?

A We have a copy in our office, and if Mr. Dorsey says okay, I'm sure I can duplicate it.

MR. ONSDORFF: Sure. The easiest way would be to ask you that.

Q Is that a request now?

MR. DORSEY: You're going to send him an updated resume. You're going to send him a copy of that. Just make a note.

A When you see that publication, you might notice the form is a little unusual because it is presented as a slide presentation and so you will see a series of reproduced slides representing the report.

Q Now, with regard to the subjects that we have just been dsicussing, have you at any time given testimony in any legal form in the State of New Jersey or elsewhere?

A Yes.

Q Could you indicate on what occasions you did so and what was the subject matter of that testimony?

A I represented Lenape Valley Regional High School in presenting testimony concerning the value of land in a condemnation proceeding, and the land in question is the land that Lenape Valley Regional High School now sits upon.

I was involved - I didn't present testimony, but I did present deposition and was present in the courthouse on the environmental suit brought by the Public Advocate against AT&T in the matter of Basking Ridge Development and Highway.

I'm certain there were others, but they just don't come to mind right now.

Q Now, I believe the two occasions you have just mentioned, one involved in the value of land and the other was environmental impact on certain structures and roadway.

A No. There was -- the suit was brought by a woman whose name escapes me at the moment, joined by the Public Advocate charging AT&T with certain environmental damage in the construction of an entry road to their Basking Ridge facility, and I was the

geotechnical or soils and foundation expert for AT&T in that manner. As a matter of fact, for the entire project.

Q -Well, in regard to the environmental impacts that were the subject matter of the suit in regard to this Basking Ridge facility, what were the alleged adverse impacts that were the concern in that matter?

A The destruction of a swamp. That was the claimed impact.

Q And your analysis of that roadway construction led you to what conclusion regarding that allegation concerning destruction of the swamp?

A That the land was not pristine. That in fact there was a septic tank in the zone that was socalled undisturbed and that the procedures being used by AT&T were recreating the natural swamp conditions; and as a matter of fact, that was my design. An adjacent area was reexcavated to reduplicate the ground water condition. The stream overflow circumstances were duplicated to match the original overflow in the original swamp, and the swamp deposits themselves were bodily picked up with construction equipment and laid down vegetation and all in their relocated position; and therefore, the swamp was not being destroyed

It was simply moved, and the Judge saw fit to agree with the AT&T case in that matter.

Q So then would it be correct to say that you have not presented any testimony regarding construction of residential dwellings at any time; is that correct?

A That's correct.

MR. DORSEY: In court.

A I have presented testimony pertaining to residential dwellings before Planning Boards and Board of Adjustment.

Q Could you relate on which occa[redacted] you did that, say in time period since 1975?

A Well, last week I was in Ridgewood, New Jersey prparing testimony in the matter of Skrogs Hills Estates before the local Planning Board where they were -- where the Planning Board was concerned about the soil conditions within the property as it affects development and where the Planning Board was concerned about the stability of an adjacent rock slope.

I was called in by the developer to evaluate the soil conditions and the stability of rock slope. I presented that testimony to Ridgewood and next month I will be presenting a similar testimony to Hohokus, because the subject property happesn to fall on a

municipal border and the property is within both municipal borders.

Recently I think it was about a year or so ago, I presented testimony before the Mine Hill Township Board of Adjustment in the matter of a proposed residential development over reported iron mines, and presented the restrictions that could and should be provided in that development and how the development could go foward with certain restrictions.

Q This was development over an abandoned iron mine; is that correct?

A Correct.

Q What type of restrictions to that development did you deem appropriate?

A The full delineation of the openings of the mines and a prohibition of development within those opening zones, but since the opened zones could be thoroughly defined, the remaining area would be come available for development.

Q. Are there any other occasions you can recall in regards to providing testimony to either local planning boards or boards of adjustment?

A Not offhand.

Q Based upon your educational background, professional experiences which we have just discussed,

how would you characterize your area of expertise?

A I consider myself an expert in the field of soil mechanics and foundation engineering with a strong knowledge of geology, hydrology and ground water geology.

Q Now, on behalf of the defendant, Hanover Township, what professional services were rendered.

A I was asked to evaluate the sale conditions in the existing open lands within Hanover Township and to comment concerning potential soils, water and foundation limitations. Specifically, to Mr. Catlin's terms from the SCS maps by sampling the soils so that a firsthand knowledge and information could be gathered; and we went through many different steps to accomplish that purpose.

Q Why did you deem it appropriate to get a firsthand knowledge of the soils as delineated by the Soil Conservation Service?

MR. DORSEY: Wait a minute. I think you have to rephrase that question. I think the answer to the question you've asked is that I, as counsel of the Township of Hanover, decided that it was important to have him do that.

Q Well, in regard --

MR. DORSEY: He did not make that initial determination. In other words, we gave him --

MR. ONSDORFF: I understand. Okay, I'll rephrase it.

Q What was the purpose of the field examination? What additional information or what information at all was deemed would be obtained by such field examination in respect or in regards to what the Soils Conservation Service had provided already?

A Well, again, the Soils Conservation Service is traditionally an agricultural firm. They are a subheading of the United States Department of Agriculture and they do not always look at soils with an engineering eye; and so, having engineering and geologic review with a specific hand on running the soil through one's fingers and physically examining the sites, one can gain much more information which would either verify or modify what the SCS has reported, and in fact, a lot of information that we gathered did augment SCS data.

Q In what respect was that information augmented?

A Well, things such as -- let me just see if I can find some. Rotted and fallen trees on a parcel

which would influence developmental costs and illustratio considerable filling having been formed on the property which would adversely impact the construction, the existence of a pond on a parcel of land, depth undetermined with excavation material stockpiled, which did not show up on SCS map. It has now been brought to our attention. I don't know if it's appropriate or not, but the presence of Great Blue Heron on one of the sites we examined was of interest.

Other items included things, organic soil, which is a very weak deposit and makes development quite costly, marshy surface conditions not [illegible] reported by Mr. Catlin, but yet found from one of our sites, a site being three to four feet lower than the roadway which would mean the site would probably have to be filled to be useable, which was not reported in any other document. Sites sloping down to ten feet below the roadway, again, probably requiring substantial fill for development; for visible ponded water but not indicated as a swamp by Mr. Catlin. Other topographic depressions. Again, site being three feet lower than a proposed road with ponded water on the site, but not indicated as a swamp by Mr. Catlin.

The presence of shallow ground water in an area plotted as having no shallow ground water. Isolated

concentrations of boulders on a parcel indicating indications of potential prior filling. A border swamp condition being found where no swamp was indicated. Site filling having occurred where filling had not been indicated. Another site with filling. Just a general note that one soil type mapped as PS where the SCS indicates highly variable soils and suggests specific sites investigation. Another site where water was not expected to be shallow, but we found water in a depth of two foot one inch. That a site not indicated as swamp showed ponded water after a rainfall and that is the type of additional information I mean when I suggest so augmenting the SCS documentation.

Q Now, the documents that you've just been referring to, are those your field notes?

A These are notes prepared specifically for today to summarize the differences found and are not field notes. They are interpretive notes taken from the field records.

Q So those notes in essence are a summary of the relevant portions of what were found out in the field which are not consistent with the SCS survey material, is that in essence?

A It's not consistent or inconsistent. It's an augmentation where -- for the most part, it's an

augmentation where SCS may say that the site condition consists of shallow ground water and some other type of items which we found; but then we also found other things which we then reported and it's those other things that I've just mentioned.

Q Would it be possible to make copies of those notes available for our inspection?

MR. DORSEY: Sure.

A There is a color code on them which will not reproduce.

Q Fine.

A Now, the date of that I just discussed to a large degree is summarized on pages B1 through B6 of our report dated December 12, 1979, where that is just a tack mark summary, while what I read to you is a narrative of a similar condition.

Q Could you just explain a little bit further because I've inspected the material you've just referred to and I am not sure I understand how any augmentation is reflected by the various tack marks shown over the 124 sites which were analyzed.

A The old fills would not have been represented on any other document that I know of.

MR. DORSEY: Specifically, SCS, you mean?

THE WITNESS: Yes. I am not sure about all the urbanized land. The poor surface drainage, basically, our terms with the -- including the SCS data, so it's a compilation, a combination. The weak soil, again, is our -- it's a combined effort, so the old fills are the primary ones with weak soils also in there, but I did mention some other items in my discussion which were details which would, to some degree, be available from reading the probes.

Some other data may have been [illegible] via daily field reports.

Q Now, if I can direct your attention to what we've already marked today as RCH-13 for identification, which purports to be a copy of the soil survey, Morris County, New Jersey, is that the document which you utilized in your efforts?

A Yes. I was checking the date.

Q Now, based upon your experience which you have just related concerning the augmentation of the Soils Conservation Service materials which was obtained through this field verification and inspection work, what conclusions have you reached, if any, pertaining to the appropriate methodology for determining

the actual development potential of specific parcels of vacant land?

A There are various restrictions of different parcels of land as established by our specific field explorations, and by correlating those expirations with existing mapping such as the SCS map and also the Rutgers soil survey maps.

When combined with other determinations and evaluations, such as terms of stereo pairs of aerial photographs, the general geological literature, and I believe it is something like 11 prior soils and foundation studies that my office has performed in Hanover Township where the soil data is available that was used in this investigation. From all that, we conclude that a great majority of the open land in the Township has remained vacant because it is relatively extensive to develop, that most sites will require dewatering and/or filling to compensate for high ground water condition and/or poor surface drainage and many require soft soil and/or utilization of deep foundation. Development without these necessary site alterations are very likely to incur damage to building frame and slabs from settlement to utilities, roadways, parking lots, et cetera, from frost heaving and to landscaped areas from the muddy

conditions.

Q I'm sorry. I guess you didn't really understand or see what I was actually driving at with that question. I was speaking in general as to a planning methodology or a manner in which a developer would be able to obtain sufficient data to reach a reasonable judgment as to the development potential of a specific parcel or tract of vacant land. Would it be sensible in your view to rely upon the Soils Conservation Service, or would it be necessary to obtain certain additional materials and analyses prior to submitting a site plan to a Planning Board, or making a developmental decision as to whether it be worthwhile to prepare such materials for specific tracts of vacant land.

A In my opinion, a developer could use the SCS maps for preliminary planning purposes. However, if he is intending to construct a building on a certain piece of land, he should do specific field explorations such as borings and/or test pits under the direction of a geotechnical engineer to establish what his site development costs would be and what his foundation system would be and I would urge as a developer to do that before he made any substantial, financial commitment to any parcel of land and as a matter

of fact, a large portion of my company's business and a large portion of my work is doing just that.

Now, this is what I want to get a cleaner picture on. I believe you've mentioned several times as to some work your firm has done and some work you have done in Hanover Township. Specifically, in just limiting all your testimony to work that you've personally done, what has been your experience in addition to the work on this litigation that you have done for Hanover Township?

A I hate saying that, but all I've prepared was a list of project numbers and I would have to go back into my files to get the specific names of specific sites that we've worked upon.

Q Well, I'm not really concerned with, you know, what the firm has done or what specific sites you have looked at. I just want to have you characterize for the record projects, the nature of the projects that you have done for various entities in land areas found within the Hanover Township boundaries.

A I can't specifically point to a specific project. Well, perhaps one.

There was a project in the vicinity of the airport where we performed a study some years ago.

and again, I must apologize for having a very vague recollection on it, because I am involved normally in hundreds of projects per year, and without having access to my files to recheck, I could not put a specific project tunnel within Hanover Township on there. However, whether I personally worked on the project or not is, I believe, not the vital point in the study of the Township; but the point is that the loggings of the borings and the test pits that were performed were available to me in putting together the picture of the municipality, and that data was available and was used.

Q Now, the previous projects done by the firm in Hanover, I believe you referred to page C1 of your report of December 12, 1979.

A That is correct, and if you refer to drawing Number 1A, the locations of those projects are shown by a triangular symbol.

Q Now, by my count, you have listed 11 separate projects within the municpality that were undertaken by your firm?

A Correct.

Q Do you know the period of time when they were undertaken?

A I can, from the project number, because there's

a chronological tie to it. The earliest dates April, 1965 and the latest, 1978.

Q And out of those 11, would you be in a position to state how many you personally worked on?

A Not specifically, but I would think I personally worked on three or so.

Q In regard to those three since, I believe the earliest was 1965, would you have done any of the field work in regard to any of these projects yourself?

A I would have been on the site sometime during the course of the work, but I don't know what you mean by field work. I doubt if it was the spector of the drilling.

Q Making any of the test borings or other sampling?

A They would be done by a member of my staff under my supervision, but I doubt if I was personally on the site to watch the drilling be performed.

Q Now, why don't we take one moment to mark your summary of the augmentation work that your field inspection did when compared to the material found within the soils conservation service. I believe you have identified these as 1 of 5, 2 of 5, 3 of 5, 4 of 5 and 5 of 5, indicating five total pages of

summarized material.

A Yes.

Q In light of that for identification, I think it would be appropriate just to mark the first page as Exhibit GS-2, I believe, as an exhibit comprising these five pages.

(Mr. Salzman's summary of augmentation work marked GSH-2 for identification.)

Q In respect to this present project on behalf of the Township of Hanover, at what period did your work begin?

A Our work began in August of 1979.

Q Now, the first report I have is dated the 1st of November, 1979. I'd like to show you that document at this time.

A Yes.

Q Was that one of the reports that you submitted in the course of this project?

A Yes, that is an interim progress report that has been superseded by the report of December 12, 1979.

That report was made without having the benefit of specific field explorations augmented for this study, and so in some ways would tend to be more general and less specific than I would have liked

at that time.

Q You have indicated that it's been superseded. Specifically, what do you mean by that statement?

MR. DORSEY: Could I just go off the record to explain that so you know what happened?

(Whereupon, an off-the-record discussion takes place.)

MR. ONSDORFF: I guess the question is still pending.

Would you read it back?

(Whereupon, the reporter reads back the last question.)

A I mean that subsequent to November 1, 1979 a series of tests holes were excavated throughout the Township and the information from those test holes was incorporated into our study, and all the data utilized to present a more complete product and everything that had gone before, plus the results of those new explorations and their evaluation are included in the December 12, 1979 issue. Therefore, the reports before that which stem -- stand both incomplete and possibly slightly inaccurate.

Q Have you made a comparison between your

your December 12th report and this November 1, 1979 report to ascertain in any specific areas where the field exploration may have rendered any of the material shown in the November 1 report to be inaccurate?

A I have not made that specific evaluation. I would suspect, however, that the augmentation data on the five pages that were previously marked would not have been indicated in any manner in the November 1, 1979 submission because that data was simply not available.

I would think that there would be some [redacted] somewhat superseded but I would not think it would be terribly severe.

Q Now, the first page of your November 1, 1979 report makes reference to a progress report dated August 29, 1979 containing tentative findings and conclusions. Is that report available?

(Report dated August 29, 1979 marked GSH-3 for identification.)

(Report dated November 1, 1979 marked GSH-4 for identification.)

(Report dated December 12, 1979 marked GSH-5 for identification.)

Q All right. The witness is going to describe

some of the words placed upon Exhibit GSH-2, which on our copy didn't come through in a legible manner.

A On sheet 5 of 5 it reads out of 26, referring to 26 probes, that 7 check out as maped, 16 poorer than mapped, two may be better than mapped, but could be water other times -- and by that I mean that water was not encountered within the two and a half foot depth, however, at other times of the year the water could very well be there, and the last comment on this sheet is one part better, one part worse, and there was one probe that had that designation. That was P-20.

Q Now, in regard to this exhibit again, one other significant change that I would point out for the record in light of the copy not reflecting the color code used in the original, we have used the symbols DB and R to take the place of the color code: G representing the site conditions, R as mapped, B for site conditions better than as mapped, and R for site conditions worse than as mapped; is that correct?

A Yes, that is correct.

Q Now, directing your attention again to your report GSH-4, November 1 report, you indicate that the data that was collected and reviewed in pre-

paring this report on page one. I think we've discussed a number of these items, but very briefly, the geologic [illegible] from your files, could you elaborate on what [illegible] data comprised?

A The geologic data from our files would include the prior studies that we've performed. I don't know without looking at whether that was referring also to the SCS mapping and to the Rutgers soil survey mapping, plus it would refer to any general geological maps that we maintained in our geologic files in the office.

There is geologic data covering the entire State of New Jersey and we had mapping and documentation concerning that in the standard geologic literature which we did utilize.

Q The number of other materials you've indicated are listed here apparently as separate categories. My only question was pertaining to geologic data from your files. Would that have been generated [illegible] in response to specific development proposals for [illegible] tracts of land within the township?

A Yes, it would. That I assume is the 11 projects within Hanover Township that we've previously discussed, in addition to standard geologic literature on soil and rock conditions in the vicinity.

Q And in examining those 11 projects that your firm had previously undertaken in the Township do you recall the nature of the data which was generated for each of those projects? Could you summarize what it is those files contain?

A Unfortunately, I did not bring the files with me. I didn't know they'd be needed, but for the most part they would include borings or test pits to depths of 10 or more feet or proposed new construction. They may have involved construction observation as well.

I'm simply not certain at this time.

Q Could you define very briefly and distinguish a boring from a test pit?

A A boring is a drilled hole normally between two and a half inches and four inches in diameter, which is advanced by a drilling rig, where periodically in the advancement of the hole, one secures a soil sample by the standard penetration test, which is the driving of a spoon sampler into undisturbed earth below where the hole had been advanced. When rock is reached, that rock can be drilled and brought to the surface, again, in relatively small diameters. One and three-eighth inches diameter to two-eighths selected undisturbed soil can be secured for purposes of

comprehensive laboratory tests; that these drilled holes now can go to basically any depth that you wish. If one wished to drill several hundred feet, one could put, again, one is looking at a small diameter section. This is the standard way for exploring ground conditions.

A test pit is just a hole excavated with a backhoe, where an excavation is performed, typically, to a depth of 10 to 12 feet and an observer can log and record the soil conditions by examining the sides and bottom of the excavation.

You can also secure samples of the soil that exist, so one is a big hole in the ground and the other is a tiny drilled exploration.

Q Did you specify as to the depth of the borings that you had in these files? You indicated that the test pits, I believe, go to 10 to 12 foot?

A I wouldn't know from recollection how deep the borings went, but I would assume they were in the 20 foot depth range.

Q Why would they be to that depth range?

A Well, if data was only needed to a depth of 10 feet, we probably would have used-test pits; and since borings were used, it meant it was necessary to obtain information at greater depths, probably because

of the potentiality of soft soil conditions and heavy structure requiring a potentially deep foundation [redacted] may have to penetrate to greater depth.

[redacted] Also, the heavier a structure, the deeper one has to explore; because the stresses from that structure would go deeper into the ground and could adversely impact to a greater depth.

Q What would be the shallowest bore hole that you would have examined for any development project for the Township of Hanover that you would have worked on, meaning your firm?

A Probably 15 feet, but potentially 20 [redacted] more.

Q And do you recall what type of development project would be the 15 to 20-foot range?

A Not offhand. I'm not sure if Apollo Chemical -- is that Hanover or East Hanover? I don't recollect right now, but I do recollect the Apollo Chemical job where the exploration range from 20 to 50 feet [redacted] and the soil conditions are typical of what [redacted] finding in this site. Geologically, that's pretty representative.

Q Now, you also indicated the data provided by Robert Catlin and Associates was material that you relied upon. Do you recall specifically what

data that referred to?

A Yes. The municipal mapping.

Q I'm sorry. What municipal mapping, specifically?

A The maps of the municipality, what lands were open, what were the undeveloped parcels.

MR. DORSEY: He is referring to what I think has already been marked as RCH-4 and/or RCH-11.

As a matter of fact, before he did anything, he met with -- he met here [redacted] Catlin and reviewed those basic maps order to determine that.

Q My understanding of the scope of your work as you've outlined, as Mr. Dorsey has just confirmed, dealt with the open or vacant tracts of land within the Township; is that correct?

A Yes.

Q Do you have any knowledge regarding [redacted] in those areas of the municipality which [redacted] already been developed?

A Yes.

Q In regards to their suitability for residential construction, would you have knowledge of the soil types and areas that have been devoted to

residential construction previously?

A Most of our work is not involved in residential construction, so I don't know how many of the projects we've been involved with residential work. I would assume that our studies -- that most of our studies within the municipality in the past were for non-residential purposes; and therefore, our programs were aimed in that direction. I'm confident that given the data, it could be evaluated in light of the proposed residential development, because the -- there is information still there, but we haven't done that.

Q Specifically, what I would be interested in is finding out -- and I don't know, based upon that answer whether you'd be in a position to give me that information. You've identified, based upon my review of your several reports, a number of areas that or within the municipality where the soils present considerable problems to residential development proposals that might be put forward for the utilization of these open tracts. Are you aware of whether or not these same soils affect areas which have already been devoted to residential development within the Township of Hanover?

A I have not performed that study, but I would

assume to some degree that they have.

Q Are you aware of any problems regarding residential developments within the Township of Hanover as a result of constructions on soils which you have identified as presenting development problems due to their soil types and consistency?

A Since I have not attempted to make that determination, I'd know of no such circumstances.

Q Are you aware of any situations in the Township of Hanover involving nonresidential construction where the soils types have created [redacted] based upon their nature and quality in the n[redacted]al development which took place?

A Yes.

Q Could you specify the sites and what the problems were which you identified?

A The only one that -- well, there are two that come to mind.

One is Apollo Chemical where a shallow water condition and a swampy surface necessitated excavation and filling under difficult circumstances, and placement of foundations under water which increased the construction costs of the project.

In the Morristown Airport vicinity, there was another deep swamp deposit.

MR. DORSEY: Wait a minute. I think he wants you to identify where Apollo Chemical [redacted].

Before we move on to the next one, you're now referring to RCH-12, the Apollo Chemical site. Could you, for the record, identify that with regards to certain landmarks depicted on this exhibit?

A South Jefferson Road. I assume it's in the vicinity of Apollo Drive.

MR. DORSEY: Halfway between Route 10 and Cedar Knolls Road.

A It would probably be in the zone desi[redacted] as PK on the map.

Q And this may have been stated before, but could you briefly refresh my memory as to what the source was for the delineation depicted on this map?

A This was -- had been prepared by Robert Catlin & Associates, and I understand from Mr. Catlin that [redacted] duplication of the soil conservation [redacted] as it appears in the soil survey of Morris County, New Jersey.

Q And the PK designation listed from the soils conservation survey mapping standards for what, if you know?

A Parsippany Silt Loam.

Q You seem to be referring to a specific [redacted] in the Soils Conservation Survey; is that [redacted]?

A Yes.

Q What page is that that you're --

A Immediately precedes the maps and it is entitled Guide to Mapping Units. It's two pages.

Q Now, are you familiar with the nature or qualities of the Parsippany Silt Loam soils?

A I'd have to refresh my recollection b[redacted] to page 98 of the report and seeing that th[redacted] frequent flooding potential.

Q In other words, you're just referring to the material as --

A Listing, yes.

Q Are you aware of the date of the Apollo Chemical development at this location?

A The latest development is 1979. That's [redacted] it is so fresh in my mind. I believe that [redacted]construction is not yet completed on their latest building.

Q Now, you indicated that they endeavored toresolve the soil problems by excavation and fill, and were there other mitigating measures that implicated

at that site?

A There was a major dewatering operation that occurred, and I believe that there was an importing of select quality sand and gravel.

Q Fill, in other words?

A Select fill.

Q Are you aware of the success that they experienced with these efforts?

A I really wouldn't like to answer that question. This is between, I think, Apollo Chemical and our office. I don't know. This is information that they own the data that I generated for this project and I would prefer having their permission to release the answer to the question that you've just asked. This gets into a matter of professional responsibility that we have.

MR. DORSEY: When you asked the question, what success they incurred, did they complete the building?

THE WITNESS: The building is being completed now.

Q Let me see if I understand your concern. Was there a contract which you executed with them concerning maintaining certain information confidential?

A On every project that we perform for any client,

that client owns all of the data that we generate and we should receive the permission of that client before our releasing of any data concerning it. Now, items of a general nature as to what the soil conditions are, I have no problem with or the general construction procedures, fine; but when it gets down to specific contractual items, I think I would prefer having Apollo Chemical's consent before that information becomes public.

Q Well, I think we can work around that. That's why I asked the question, because I am not interested in any specific data. My [illegible] is, obviously, the construction is going forward as you've indicated; therefore, the municipality must have been satisfied and issued appropriate building permits. Are you aware of any general adverse environmental impacts which will flow as a result of this construction to the injury of the public in any regard from activities at this site?

A No, I am not.

Q Okay. You mentioned another site, I believe

A Work in the Morristown Airport. My recollections are more vague about that one, but I do recollect a substantial thickness of organic soil necessitating

expensive foundation construction; and I don't recollect whether the building or potential building that we were investigating at that time was actually built.

I guess my only question would be substantial thickness of organic soils, I believe, you testified was experienced during the encounter there. Could you be more specific or elaborate on what you mean by the thickness you encountered and what is meant by the terminology organic soil?

A Well, the thickness encountered; again, this is from recollection of something that occu[redacted] years ago -- was, I think, in excess of five[redacted]

Now, organic soils are soils made up not of silica particles as we normally think of sands and gravels and loams; but they have as their predominent constituent organic matter. Where, when one considers an upland area where there is vegetation growing and the vegetation dies, rots and eventually becomes mixed with upper formulations to create a top soil, then think of a lowland area that receives runoff from the upland area; and over enough period of time the surface organic materials from the upland area wash down into the lowland area creating this layer of organic soil, and it is exceedingly soft. It is exceedingly compressable. It is exceedingly weak

in many places. It is too soft to walk on.

A classic example of organic deposits is [redacted]ensack Meadowlands. That is the traditional [redacted]t happens to be a salt water organic deposit where it is washed by the tides of similar circumstances occur in fresh water environment such as the vicinity of Mroristown Airport.

Q Okay. Since the depth that you indicated had the substantial thickness was in excess of five feet, I would assume then that you had to go considerably deeper than that to find stable foundation materials. Would that be correct?

A Yes, it would.

Q Do you recall the depth of the borings that were done at that location?

A I'm afraid I don't.

Q I guess I should ask that same question about the Apollo Chemical site. What was the depth of concern in that construction project that you had [redacted]e?

A From recollection, about -- between 50 and 60 feet.

Q Directing your attention again to the GSH-4 document on page two, you also indicate that certain aerial photographs were examined. Do you

recall what photographs those were?

A I don't remember the company that we obtained them from, but the entire State of New Jersey has been flown by several aerial survey firms and with the presence of key maps which we have, we can call these firms, and for a very small fee get copies of stereo pairs of aerial photographs covering any portion of the State. As a matter of fact, much of the United States is covered that way, and we, therefore, can call, or an assistant can call one or more air photo firms and secure copies of photographs of the municipality at the scale indicated.

Now, those were stereo pairs, which meant that they're each two photographs that had a 60 percent overlap, which means every point on the ground is shown on not less than two photographs, sometimes three.

One can then look at those photographs through a stereo viewer to bring the conditions up in three dimensions, and by evaluating what is seen, one can generate certain judgments concerning the shallow soil conditions.

As an illustration, darker soils generally indicate shallow water, where lighter soils generally

indicate deeper water. That was one thing.

One can also look at the land form and reach certain geologic conclusions of this data if used in conjunction with points of noninformation to allow judgments to be made about a larger area without having to physically make a hole at every point.

Q Now, in respect to the updated findings and evaluation shown on pages 2, 3, 4 and 5 of your report, number four, by my count there are -- there appears to be 18 separate parcels which were selected for analysis. Do you recall if that's correct?

A That number is approximately correct. If you would like to count them --

Q My main area of concern is in what manner were these individual sites selected for analysis?

A At that time what we did was take what looked like the 18 big pieces of open land. We were working under significant time constraints such that we were not able to evaluate each of the 124 parcels designated for Mr. Catlin. Therefore we selected large ones and representative ones, or ones that we thought would be typical from the available data and chose those for evaluation.

Q In other words, you selected probably what was felt to be the more likely quadrants for development if a choice had to be made in the time frame you were dealing with? Is that --

A Not necessarily. We threw out tiny ones basically, but I don't know whether or not they would be available for development or not. I don't know what size considerations are, but we did generally take the bigger ones and the ones we would consider rather typical.

Q In regards to size then, do you recall what your cutoff point was, if any?

A I'm afraid I don't, but I'm certain that on the record, by going to block and lot, one could get from the municipality what the acreage is or Mr. Catlin may have a tabulator somewhere. I don't know.

MR. ONSDORFF: Off the record for a moment.

(Whereupon, there is a discussion off the record.)

MR. ONSDORFF: We have located a map which was referred to as drawing number one, property location plan, included with the November 1, 1979 report.

The map itself is dated October 31, 1979,

and it depicts via shading -- if I'm correct -- vacant parcels and is their lot and block number from the tax maps. In certain instances, appearing to be the 18 parcels which were examined as part of this November 1 report. Is that correct, Mr. Salzman, my characterization?

A Yes, it is.

Q Why don't we mark this for identification as GSH-6.

(Map dated October 31, 1979 marked GSH-6 for identification.)

Q In order to move through this as expeditiously as possible, why don't we start with the first tract you examined, Lot 1, Block 6202, and locate that with reference to one or two landmarks as shown on GSH-6.

A That parcel is immediately east and west of the north end of Morristown Airport.

Q Based upon your analysis as reflected upon your November 1 report, what is your opinion as to the development potential for this piece of property?

A As I said before anything is developable. However, that parcel has exceedingly poor soil conditions

and the cost of development would be very substantial. In addition, because it is a swamp series, the Carlysle muck is one of the designations of the area. It probably has an adverse impact concerning ground water recharge and downstream flooding as well.

Q I can then refer you to the later report numbered parcels site.

MR. ONSDORFF: Off the record.

(Whereupon, there is a discussion off the record.)

Q Now, based upon the further work [redacted] as reflected in your December report, have you obtained any additional data which would in any way alter your analysis as to the development potential for this tract?

A From the tabulation on page B-3 for sites 48 through 50, I would not alter that. I would, however, also like to make a third correlation if [redacted] and that is, by noting a probe has been performed on site 50 referring to -- now referring to the sheets 1 of 5 through 5 of 5 to indicate a confirmation; so there is now agreement.

Q Moving right along to the next parcel identified in your November report as Lot 1, Block 3401,

could you locate that for us on the exhibit 6 --

A Lot 13401.

Q -- with reference to landmarks on that exhibit?

A Northern end of town. I don't have the street designation here. North of the Power and Light eastment, west of 287. Let's see if I can find it on the -- I believe that is parcel number 83, or thereabouts.

Q What was your opinion as to the soil conditions and their relevance to any development proposal for this tract of land?

A Based on the November 1, 1979 report. there was a perched water table condition and some streams, sedimented material which would have a potential for adverse impact. Well, the high water table would have an adverse impact on the cost of development.

Q Now, from my reading of your description here, you indicate that the soil conservation survey indicates the site is underlying by Parsippany silt loam and the Rutgers' soil survey indicates a contact between shallow Alluvial over greying glacial lake bed sediments and glacial marine deposits.

Are these two reports consistent, or how do they

compare?

A They're saying different things. Parsippany silt loam refers again to a somewhat agricultural type description of what the surface formulations are, and the SCS mapping invariably only carries you to a maximum depth of five feet. The Rutgers' soil survey mapping alternatively treats the area geologically with what formulations were formed when, by what geologic process and what the nature of the soil is; so a glacial lake bed sediment is nonmaterial of alternating layers of clay and silt, while a Parsippany silt loam description is perhaps a little more vague.

Q Would it be fair to say then that the Rutgers' is generally dealing with the subsurface materials at a greater depth than the soil conservation material?

A Well, Rutgers treats the material from the surface on down and invariably identifies the soils to greater depth.

Q And in considering the appropriateness of a particular vacant site for development, you found that it is necessary to get depth found in addition to this soil conservation survey, those which are discussed in the Rutgers' material?

A Yes. It also aids in understanding the geologic process to evaluate the subsurface conditions.

Q Now, in evaluating the Rutgers' material, I believe the sentence just following the one I quoted a minute ago, you state the former may consist of a thin veneer, et cetera,and then you indicate in the next sentence the latter may consist of an unassociated and heterogenous.

Your evaluation seems to be qualified opposed to being given indefinite terms. Is that correct?

A Well, by qualified all we can do is [redacted] what somebody else's mapping has said. We [redacted] again being the secondhand party in this discussion, where this is a standard way of evaluating things by using other people's experience to reach conclusions. However, where specific data is available, that specific data would always take precedence.

Q Have you obtained in regards to this site any firsthand analysis of the soils which would [redacted] more definite evaluation of their actual characteristics?

A Yes. We have performed in parcel number 83 probe number P-14, which appears on Page A-17 of our later report. That's the report of December 12, 1979, and that shows a shallow water table as anticipated

but it also shows one foot eight inches of a dark grey organic silt, a very soft surficial formation which would require excavation before construction is considered. It is totally unsuitable material to build upon.

Q The next lot appearing in your report on page three is number 6 Block 9001. Could you endeavor to locate that on your exhibit?

A That is also identified as parcel number 34, which has also probe number P-11 within it.

Q Now, at parcel number 34, what [illegible] the soil characteristics that you found and [illegible] in your November report?

A The November report from the SCS maps indicate a seasonally high water table and the Rutgers soil survey map indicates underlying formulations of glacial lake bed sediments and sands with a perched water table near the surface; so the two maps do appear consistent and we had a little bit [illegible]ise when we did the probe at that location.

Q Before we get on to that fieldwork, I'd like to ask you one or two other questions.

In regards to the soil type, Haledon silt loam, I believe you indicated is what the SCS found. How does that stack up as far as a soil suitable

for construction activities?

A I believe it's the Haledon silt loam is discussed on page 6 of our report of December 12, 1979 lumped together with other mapping units with similar characteristics, and they have seasonally high water tables as the specific factor that causes limitations on the property.

Q Well, discounting the work you did subsequent as of your November report, had you reached any conclusions as to the development potential of the Haledon silt loam soils?

A Yes. With the Haledon silt loam, th[redacted] water table imposes restrictions on the development in that there is potentiality for cutoff, the ground water recharge. There's potentiality of development generating downstream flooding, and there is also the potentiality of other damaging conditions such as floor slab subject to dampness, subjecting the area to local flooding, potential floor subsidence, paved parking lot, sidewalk service lines and other amenities would be subject to potential frost heave; and that was inundated by runoff. There will be wet and muddy conditions.

Q Let me stop you at that point.

I think you've made your point. My concern is

discounting for the moment the water aspects, as far as the characteristics of this soil itself, [redacted] as its compactness or its odd physical nature, [redacted] ee that as being an impediment to development?

A Other than the impact of the shallow water condition, according to the mapping, it would not be an impediment. However, that was modified by our subsequent work.

Q Now, before we get to that again, as far as high water tailing conditions at this site, are they susceptible to mitigation to [redacted] construction techniques?

A Yes.

Q Now, you indicated --

A However, those construction techniques do represent a certain cost factor.

Q Certainly. You indicated that certain field work was done at this location. Could you enlighten us as to what was ascertained?

[redacted]. That was probe number P-11, which [redacted] that there was two feet of a very soft organic soil at the surface. That material is not a suitable founding material and would have to be removed before development could be considered.

Q To what depth?

A At this location -- at the depth of the probe it is two feet.

Q Now, this is test logs found at page A-14; is that correct?

A Yes.

Q I believe it's reflected on that page that there was a refusal at three foot ten inches. What does that terminology indicate?

A There were two young men who were turning a screw auger into the ground and that represented the depth at which their muscles could penetrate, and not more. The soil got further and they co[illegible] auger further.

If we had other techniques such as a boring rig, some mechanical device, we could have gone much deeper. However, with just hand tools, that was the maximum practical depth.

Q Were you at this site to witness their physical limitations?

A No, I was not.

Q Then what is the basis for your opinion that the utilization of mechanical tools would have permitted the boring to go to a deeper location?

A My experience with working in the area that the only thing that would inhibit a boring rig would

be rock, and even rock could be drilled; and on this site rock is not expected for significant depth based on the November report, page three, discussing the Rutgers soil survey findings.

Q Now, the next site that you address is a lot 1, block 301. Can we locate that?

A That's parcel 80 where we have probes P-5 and P-6.

Q Very briefly, could you share with us your evaluation of the development potential at this location?

A I will refer to the logs of P-5 and P-6 to begin with; and note that on P-6 there is two feet six inches, minimum of two feet six inches of soft organic soil, and that the probe penetrated to four foot three inches, but the auger stopped at two foot six inches, which means the organic could easily be deeper than two feet six inches at that location; and going to the back of the report to parcel 80, I note there are substantial restrictions because of poor surface drainage, and high ground water conditionand soft surface soils, so this site appears to be quite unsuited for development without substantial cost.

Q The next parcel you evaluated is identified

as lot 7, block 3002. Could you locate that on Exhibit 6?

A I believe that is parcel 77 which also includes probe P-7.

Q Now, based solely on your November report, what was your analysis of this location?

A We identified the Biddeford and Parsippany soils with Rutgers indicating glacial Moraine.

I'd have to double-check Biddeford and Parsippany.

Q Page 6, I believe, is the discussion at the top.

A Biddeford and Parsippany. Those formations are seasonally high ground water table and frequent flooding which will adversely impact on proposed development and there's also indications of surface zones of soft soils and rotted trees.

Q How do you distinguish between Biddeford soil and Parsippany soils?

A I would have to go back into the SCS maps to get the specific differentiation, however, both the soils were lumped together together with the Preakness soils, because they all indicate certain characteristics in common.

Q I believe you did some probe at this location?

A That was probe number P-7, which showed one foot of a soft soil underlaid by one foot of a firm clay material, and although we did not encounter water in that probe, we found a modeled material, and a modeled material means that there is a seasonal water taken that does influence it, that causes the modeling; so if we had done those probes at a different time, we would have found water.

Q In regards to the soil types found at this location in these two probes, did they confirm the data found in the soil conservation survey?

A There was one probe performed there, P-7.

Q I thought P-8 also was on there?

A I don't know where P-8 -- P-8 was on parcel 109. P-7 was on parcel 77, which I believe is the parcel under discussion now.

Q That did not directly verify the water condition, but indirectly did by the color of the soil; and I note on my exhibits here of sheets 1 of 5 through 5 of 5 that there was considerable filling done on the south end of this parcel and a large pond, about 200 feet was excavated. Material had been stockpiled into a large mound about 30 feet high. Other areas had been moderately filled.

Now, this adds the additional limitation of

having filled ground and that filled ground creates all sorts of other problems because it fills later in an uncontrolled manner. There are a series of questions that come up. One does not know the nature of the soil that they are covering, so there is that uncertainty, plus the uncontrolled fill could contain voids. It could contain material that will generate gases over a period of time. It could have things like an oil drum which could collapse under a new load, and as such becomes highly unreliable for construction to cons[redacted] pond.

Q Then you've made a distinction between uncontrolled fill and properly engineered fill?

A Oh, yes. Very much so.

Q Based upon your observations or your firm's observations at this site, have you reached an opinion as to whether this fill activity which was observed was uncontrolled or properly engineered?

A From the random nature of the filling, it appears to be an uncontrolled fill operation.

Now, we have another problem with the presence of fill these days; and that is, the NJDEP has imposed significant restrictions on where fill can be relocated, and therefore, now substantial numbers of

environmental assessments that have to be performed in order to pick up fill from one area and put it down somewhere else, where one is talking about building debris, or let's say, unnatural material other than soil.

Q Are there any other indications of uncontrolled fill in addition to what you described as random nature of the activity, which would indicate the true nature of this activity?

A Well, it was stockpiled in mounds and the general procedure to create a mound is to take a machine and throw the soil from the hole be[illegible] dug toward the mound. You simply bull doze it up There would have been no reason on the part of whoever was doing it to perform a controlled fill operation, so it is exceedingly unlikely that any engineering control at all was exercised.

Q And these observations were your field inspectors' and not your own; is that right?

A Yes.

Q The next location in which you examined, I believe, is lot 9, block 2104. Possibly you could locate that with reference to the map exhibits.

A There's parcel number 109 which also includes probe number eight.

Q Which is found along Frederick Place and the Morris and area railroad?

A Yes, that is the way it's mapped.

Q And your November report describes this parcel as being suburban land?

A The block and lot again on that?

Q Block 9, 2104.

A Yes, and by urban land we mean that has modified the surface so that the SCS could not make a strong determination of what the soil conditions were. It has been masked by man's activities. The Rutgers' soil survey maps indicate the [illegible] glacial lake bed sediments.

Q Now, since the alterations by man essentially render the SCS as not applicable, what do the Rutgers' University surveys indicate as far as development potential for this tract?

A Glacial lake bed sediments as an underlayment is not a severe restriction in itself except it [illegible]ly associated with a shallow ground water [illegible]n; so one would then have to go to other sources to see what has happened.

Q Now, we're going to get to that, so in respect to the analysis you had done as of November, you were not in a position to say what

the development, actual development potential was for this site. Would that be correct?

A Not fully, because when man has disturbed the land, the strong potentiality exists that man has filled the land perhaps, and in doing so may have really fouled it up and made it tough for the next guy to come in.

Q Or conversely, he may have filled it in preparation for proper development. Is that not also a possibility?

A It's a possibility, but far more remote, because if it were prepared for development of land, it would be unlikely that the man would have developed it and then walked away.

Q Filled it and then walked away, right?

A Yes.

Q All right. Did you endeavor to make further analysis as to the actual suitability of this particular parcel of land for development?

A Yes, we did. We performed probe number 8 in that specific location designated as site 109, and that probe indicates a poor surface drainage condition, a high ground water condition in an Alluvial land zone. It shows a burrowed layer of soft organic soil indicating

that the material above it could possibly be a fill too two to four inches; and in reading my [illegible] notes, the organic material here could very well be deeper than the four feet indicated becasue the probe, according to our field notes, refused on routes, so we could have actually had a significantly thicker organic deposit making this a very suspect site for development

Q Now, the next parcel you examined is identified as lot 6, block 8001. Could you endeavor to locate that site with reference to our exhibit [illegible]

A Here we go. That is shown as parcel [illegible] 18, which includes probe number 4. According to our November report, it is again the Parsippany soils and the Rutgers' soil survey indicates glacial moraine.

Q Your opinion, based upon your overall work as to the development potential for this particular piece of land?

A Based on the November study and the Parsippany [illegible], it has those restrictions relating to frequent flooding and seasonably high water table and potentiality for marshy conditions.

Q And was this verified through your field work?

A Probe number P-4 indicated a shallow water table two foot three inches below the ground surface, which verifies the water condition; and basically, it was a full verification of what had been previously indicated.

Q Now, at page A-7 where your lot P-4 is shown, the notations for, I believe, density are shown as firm and hard. How is that consistent with the marshy or swampy condition which you have described?

A The potentiality for marshy or swampy conditions. There were none found at that location.

Q The next site that you examined is identified as lot 23, block 2903, I believe.

A Did you skip one, 6001?

Q I'm sorry. You're correct. We did. Three, 6001.

A Here it is. That is also indicated as parcel number 47, which includes probe number 10. That is characterized as muck, shallow over clay.

Q Did your field work verify these conditions?

A We did find soft materials and a foot of dark brown organic material, and we, in addition, noticed

ponding water on the surface. We saw a gas line running north-south on/or near the west side of the parcel with the parcel being three to four feet lower than the road and the surface soils being very soft and such filling having occurred to a depth of three to four feet on the east side of the parcel. All of those represent limitations in different ways.

Q That brings us then to lot 23, block 2903.

A I believe that is parcel number 89, which includes probe number 12

Q Now, based upon your analysis in November, what were your preliminary conclusions as to the development potential of this particular site?

A Based on our November paper study, we again saw the Parsippany soils, which is the shallow water and potential flooding condition, which would generate previously discussed limitations.

Q And based upon your subsequent work, what were your ultimate conclusions in regards to this location?

A Well, we verified the presence of shallow water condition by finding water level one foot down.

We found two foot five inches of a soft modeled silty clay in the surface, and including vegetation. A poor surface drainage condition. There was ponded water visible on that site.

Q Now, your log at A-12 -- I'm sorry. Is it probe 12?

A Probe 12 on page A-15, so that's soft surface soil. It would take additional evaluation to see whether or not that material could remain.

Q As opposed to being removed and replaced with selected fill?

A Right. It may very well have to be. It [illegible] a quite soft density.

Q The next parcel we'd want to look at would be lot 11, block 8901.

A Parcel number 34, and includes probe 13.

Q What were the preliminary conclusions that would be elicited from the paper study you performed in November of '79?

[illegible]e found the Boonton series soils with a variable seasonally high water table, so it was a little difficult to reach any firm conclusions concerning that parcel, except maybe one might say --

Q Well, what do you know about Boonton soils? I believe that's a new soil category that

we haven't discussed previously.

A The Boonton series falls in the same category as the Haledon, which we have discussed before. It has the same general characteristics which is the seasonally high water table, which has with it the associated limitations.

Q Do you know the basis for having a Boonton, being a different soil type than the Haledon if they have similar characteristics?

A Not offhand. I'm certain there are certain characteristics that do vary between them, but that the seasonally high water table isn't common.

Q Now, directing your attention to the soil survey, RCH-13 which we've just discussed previously as one of your source documents, I direct your attention to page 90. The last soil category shown on that page, I believe, is the Boonton soils. Would that not be correct?

A That's correct.

Q Now, in describing those soils, what is the analysis as to their suitability for construction as reflected in this document?

A I'm reading. It depends on -- it depends on the subheading of the, as I remember. BOB, BOC or BPC; so it's a variable.

Q In the BOB and BOC, what are the --

A In the BOB and BOC, they say moderate limitations; but they also say seasonal high water table.

Q Now, that is in regards to dwellings with basements. Is that not correct?

A Yes.

Q And if dwellings without basements were constructed, the limitations are found to be slight. Is that not also correct?

A According to the SCS for conditions BOB and BOC, yes; but not for BPC, which is the next page; and we'd have to go to the Catlin map [redacted] to see, or I might have it right here. Prob[redacted] No. I'm not sure there. That may have actually been refined. I believe that one has been refined now. It's preliminarily the PK soils that exist at that location, which are the Parsippany silt loams.

Q You say that has been refined. How did that occur?

A I don't recollect. I'm talking now from memory, and I can't do a quick verification of it. One can see on the map.

Q Referring now to RCH-12.

A A lot of these soil types come in and out in a very short distance, and in going in from one to another,

it is conceivable that there could have been a scaling change and this has now been adjusted.

Q What you're saying is that soil types don't respect property boundary lines?

A Absolutely, and what we try to do is where we could get the probes so that we could see what the actual soil conditions were.

Q And if a site was underlaid by several soil types varying in suitability for development, the location of your probe might in fact be the key determinant in what type of analysis you would render as to the overall site suitability. Would that not also be correct?

A Again, this is general because in order to do a study of each and every square foot, one has to do a very, very substantial number of explorations; and what we were attempting to do is get the general picture of the parcels.

Q Well, for purposes of determining, say, in making a recommendation to a developer, if you had a particular site in mind, would not the appropriate and reasonable course of action be to examine the delineation from the soil conservation survey as to the several soil types that were found, if several were found on that specific site?

A If their characteristics were expected to change

such as if we would expect glacial lake bed sediment deposits from the Rutgers' soil survey, we would not necessarily be interested in secondary nuances in the top soil growing characteristics of the surficial soils; but would simply take a representative condition, which is what we've attempted to do for this study.

Q For example in this specific occasion, we're discussing lot 11, block 8901. If you've got one portion of tract along, say one corner impacted by the Parsippany soils which we've [redacted] at some length as having rather severe deve[redacted] limitations and the vast majority of tract is actually Boonton soils, and those can run from moderate to slight development limitations, you would want to know before doing probes as to whether you were going to hit Parsippany or the Boonton, would you not?

A Not, not really because the Boonton does indicate seasonally high water conditions.

Q Now, with those seasonally high water conditions we're expecting a probe, and that probe is consistent wherever seasonally high water conditions are encountered independent of what the Morris County Soil Survey says. They have defined a condition. We have attempted to form our independent evaluation

of the physical condition to delineate ramifications.

Q Now, with that seasonal high water table presenting a problem; that is, in terms of what aspects of the development proposal that the problem is encountered?

A Well, there are items such as -- well, basements become very difficult, if not impossible. It means that foundations, excavations will encounter water and dewatering during construction will be needed. It normally means that grade has to be raised to avoid freezing of amenities such as pavement [redacted] of sidewalks and the like.

Also, with seasonally high water table it's invariably associated with muddy conditions unless grade again is raised; so we're talking about incurring expenses. We're also talking about the potentiality and varying from site to site of perhaps eliminating ground water recharge and the potentiality of increasing downstream flooding.

Q Now, you mentioned the problems with foundations and basements so it actually would be a cost reducing factor in that case to just eliminate your basements and build on a slab, would it not?

A Yes, but that still has its cost influencing factors because the foundations for structure

would still have to penetrate the ground and will encounter water.

Also, the slabs would have to be raised enough above the present grade to get out of the water potential situation.

Q Now, in regards to this lot 11, block 8901, your report of November indicates the seasonal high water table of between one and one-half foot to six feet below the surface. At what depth does ground water become not really a concern or a problem?

A It depends on the nature of the construction. If one is placing a foundation, one would prefer not to have place that foundation into water.

Normally, a foundation will penetrate a minimum of three feet below grade to get below any frost potential, so once one gets below -- well, even in digging down to that, if the water level is close on the founding leveing the vibration caused by construction activity could cause capillary water [illegible] -- and that potential is over 20 feet, by [illegible] way -- and cause some softening of the foundation, subgrade materials; but in general, if the water level is at least two feet or so below designed founding level, it would normally be a significant problem. However, as far as amenities are concerned

such as roadways, sidewalks and the like, if the soil is duch that water can pass through from a capillary point and if the water level is within 20 feet of the surface. the area is subject to frost heave. Significant frost heave, I should say.

Q 20 feet below the surface?

A That's approximately the practical suction pressure that can be exerted by capillary soils.

Q Are you aware of any areas in Morris County which water is normally found, the depth below 20 feet below the surface?

A I'm sure there are. Nothing specific comes to mind.

Q Anything in Hanover Township where water was found below that depth?

A I would doubt it, but it's possible.

I am not familiar and have not studied the entire municipality.

Q Now, the next parcel you've identified is lot 16, block 6301.

Which is again near the airport, and I believe it is parcel number 54, which includes probe number 3.

Q Now, what were your preliminary paper study evaluations in November of '79 of this particular

tract of land?

A That that area is part of the Carlysle series which is a muck or soft organic soil condition with a shallow water condition; and therefore, would impose limitations on construction because of the high water level and the softness of the soil.

Q Did your subsequent field investigation confirm this preliminary analysis?

A Yes, it did. At the location of probe number 3 we found one foot six inches of soft soil. We found a water level at the surface. Let's see if I have any other notes. We noted some rotted, fallen trees, poor surface drainage, ponded and wet surface conditions seen after a rain. Obvious swamp.

Q What depth was firm soil struck?

A On this side we encountered firm soil at a depth at the probe location where we encountered firm soil of one foot six inches.

Lot 17, block 4402, I believe, would be your next particular parcel that was analyzed.

A That is also identified as parcel number 68, which includes probe number 17.

Q Now, based upon your preliminary analysis in November you identified this site as being

underlain by Riverhead, gravely, sandy loam; is that correct?

A Yes.

Q And what does that soil type indicate as far as development?

A In general, I believe that's favorable, the Riverhead and the Rockaway series includes -- let me just double-check something out. According to the literature, they should generally be suitable for development.

There are few, if any, restrictions according to the paper.

Q That includes the soil of the [redacted]ion survey?

A That's correct.

There's a however on that one. However, the probe taken within there shows a shallow water condition, and from that we conclude that even though sites indicated as potentially favorable such as the Riverhead do need specific evaluation, because here we encountered this -- ths surprise of finding what we did not expect, and that is a shallow water condition; and therefore, all the restrictions relating to shallow water condition would apply.

Q In other words, based upon this surprise water condition that was located via probe

17, you would want to do further analysis to determine with more specificity the actual development potential of this tract?

A What I have attempted to say so far is that although the SCS indicates that this is a generally favorable site, we would, from the information we found, see that we have a problem location at this specific parcel.

Now, if that problem location is at parcel 68, which we had on the limited restrictions, then the remainder of the parcels plotted as limited restrictions would also need verification; so we cannot [illegible] say that just because the SCS indicates parcels [illegible] as being favorable for development or of limited restrictions, that that automatically means that that is the case: because here on this specific parcel we have found the opposite to be the case.

Q Based upon one probe?

A Based upon one probe.

Q Is there any other explanation for [illegible] finding, isolated water, for instance?

A It could be a localized condition, but the only thing I can swear to that it happened there.

Q Exactly. So, in order to make a comprehensive or ultimate conclusion, would not the

approrpiate action be to take additional probes?

A Well, additional explorations would certainly be appropriate.

Q The next parcel which you have examined is identified as lot 12, block 3101, I believe.

A That is also identified as parcel number 3, which includes probe number 18.

Q This is situated at the northern tip of the municipality along North Jefferson and the border of the Township of Parsippany Troy Hills. Is that not correct?

A Yes, it is.

Q Now, your preliminary analysis [redacted] November indicated that the site was underlain by Parsippany and also Haledon soils; is that correct?

A Yes.

Q Do you know in which soils the probe was placed?

A No, I do not, not offhand. It would take a detailed plotting in order to make that determination.

Q Would that be relevant to the formulation of your opinion as to the actual development potential of this tract?

A Not particularly, because both formulations do show the shallow ground water condition, and that

shallow ground water condition was verified by the probe number 18.

Q So as far as the soil characteristics themselves, you see no difference in their quality as far as suitability for foundation, support and these other considerations in a development proposal?

A There could very well be a very minor shade of differentiation, but nothing that would be particularly relevant toward development.

Q The next site is identified as lot 1A, block 0601, I believe.

A That is parcel number 119, which inc[redacted] probe number 19.

Q Now, this is indicated in your November reportas urban land?

A Yes, which means it has been reworking according to the mapping.

Q Therefore, you would have to withhold any opinion as to its suitability for development until you had the opportunity to examine what the [redacted]g of the land had transpired at this site; is that correct?

A Yes. The Rutgers soil survey indicates that a stratified drift which is not a particularly negative condition, and the ground water table was

not expected to be shallow.

Q When your field investigation was undertaken, what were the results of that analysis in regards to this site?

A At this site we did find the shallow water. We did find the absence of shallow water condition. We did not find a water condition, but then again, we only probed two feet and we were not expecting a shallow water condition; so aside from those areas which have been disturbed, we did not see the tendency for severe restrictions on this site.

Q But in order to reach an actual recommendation to give to an actual developer, you would want your probe to go to a depth of in excess of 20 feet, if I understand your prior testimony?

A Yes. We'd like to know just where he is developing this building and we'd probably want borings, perhaps one per 5,000 square feet of building area; so we might be talking eight holes per acre for a specific building.

But at this point in time, based upon the analysis you've undertaken, you cannot at this time foresee any unusual development limitations at this site; is that correct?

A That is correct to a point, and we know that

within this site is urban land, which means disturbed land. and we have not fully defined it: but other than the disturbed land, we do not find any restrictions.

Q Do your field notes and summary indicate any further information as to the nature of that distrubed urban land?

A Our notes do not so indicate. I do note, though, that our notes say that this is industrial and office building surrounding this site.

(Deposition proceedings resumed after a short recess.)

Q I think we're on lot 1002, if I'm not mistaken, which we located as being in the far corner west corner abutting the boundary with Parsippany-Troy Hills.

A That's corect, and that shows up as parcel 84, which also includes probe number 20.

Q Now, based upon your November work, what preliminary conclusions had you reached in regard to development at this site?

A Well, the Haledon were identified at that location. As such, we were expecting a shallow water condition.

Q What did you find?

A We did not encounter water to a depth of three foot two inches; so the water may or may not be [redacted]. It would take a reexamination; and perhaps [redacted] where the water level would tend to be higher. We did see on that parcel a concentration of boulders which could indicate it had served as a filling or dumping ground in the past. We did not have sufficient information to make a positive determination in that matter.

Q Would this analysis, I believe it was lot 17 of block 4402, where you had the Riv[redacted] soils, which indicated the absence of water [redacted] your probe found water; and my question was whether that might have been an isolated incident and this situation you didn't find water. Could that again be just a quirk of where the probe was located?

A It could be one of two things. It could be one of three things. It could be an isolated instance of water table purely being deep, or it could be that [redacted] water level was actually just several inches [redacted] where we probed, and at a different time of year it will be up near the ground surface; so those are the potentialities.

When we find the water, we know the water is there. When we don't find the water, we cannot be

certain the water will not be there. If our explorations were done in November, which is a time near the low water mark; where June is the time of high water; so these -- an exploration at this same location duplicated and repeated in June could very well show a shallow water condition within the depth that we probed.

Q So therewould be two additional things you would do to make an ultimate development decision. You'd do additional probes and do them in a different time of year?

A That's corect, because in this area, in general, one can have seasonable variations in water of several feet very easily.

Q Now, the next partel was lot 22, block 1502.

A Correct. That was identified as parcel number 112, which included probe number 21.

Q Now, your November report indicated this was urban land?

A Yes.

Q Again, necessitating a withholding of a development opinion as a result of man's actions at this site; is that correct?

A Yes, and for that parcel, old fills are indicated but again, for this specific parcel we did not

encounter the expected ground water to a depth of two feet six inches, which means at another time of year we may or may not see that shallow ground water that is expected from the SCS maps.

Q I'm sorry --

A And by the way, from the Rutgers' soil survey mapping as well, which indicates glacial lake bed sediments which normally does have associated with it shallow water conditions.

Q In the case of the SCS, you indicated the site was mapped as urban land, and my understanding that was not associated with high water. That's associated with man's disturbance?

A Yes, but we also -- we would tend to expect to find a shallow water condition, glacial lake beds.

Q This was not found?

A This was not found, but then again, the probe was only two foot six inches and in a different time of year could very well be up there.

Q At this time your opinion, however, primarily it maybe would be that there would be now no identified limitations due to soil conditions on development of this site?

A Not quite. Based on the one probe, there was nothing found in the one probe that would tend to limit development conditions. However, the land was

identified as urban land. Therefore, it would need additional investigation to see whether or not what man has done to the land that may have fouled it up.

Also, additional explorations would be needed at another time of the year. As of this instant, based on everything in front of me, there is no conclusive evidence of adverse condition.

MR. DORSEY: Could you just point out for me where this particular parcel is?

THE WITNESS: 21, which is site 11? It might be easier finding it on site 11.

Q Now, your field notes summary, did that reflect any on-site observations of your inspectors regarding the nature of this urban land?

A No.

Q Were your inspectors under instructions to note any unusual site conditions which might have a bearing on the suitability for development?

A Yes, they were, but that doesn't mean they would walk the entire parcel. They would attempt to get in to perform the probes and whatever they could observe from that location, fine; but not to trespass to any significant degree.

Q But based upon the absence of field note

observations to the extent that they observed the site from doing the probe work, that would reflect their not observing any unusual inhibitions to development; so would that be correct?

A That's correct, but that does not mean that there are no inhibitions to development.

Q That just means they didn't see any?

A Correct.

Q The next site is lot 9, block 0701.

A Okay. That's identified as parcel number 117, which is probe number 22.

Q And in your November report you identified this as having Rockaway stony, sandy loam soils. What preliminary development evaluation did that indicate?

A The Rockaway series is generally a series with few inhibitions where there's generally a deep water table according to SCS, and therefore, one would expect to find few, if any limitations on parcels so mapped.

Q Now, the site was subsequently inspected?

A Yes.

Q What was the analysis that was made as a result of that site inspection?

A Well, the site inspection indicated and the probe indicated a water level at a depth of four inches below the surface. It indicated a border swamp condition and with a wet surface at the lower elevations within the parcel and one foot eight inches of soft swamp deposits at the surface; so at the location of this probe there are severe limitations.

Q You're reading from probe number 25; is that correct?

A No. Probe number 22 on page number A-25.

Q Which indicates that contrary to the soil conservation service map as opposed to being an excellent site for development, what is found is a site with severe limitations; is that correct?

A Yes.

Q How would you account for this disparity of evaluations?

A The SCS mapping is approximate and one need get sites specific. One could use SCS as a guide and say in general this soil type generally means this; however, on any particular parcel, it could be a complete turnaround.

Q To what extent is error factor anticipated? Is an error factor anticipated in SCS mapping? Is

there any standard division which is experienced as shown normally than found in mapping techniques?

A No.

Q Now, in regards to the one probe that was done at this site, could another explanation be that the entire site might be along a border, and a border of soil types and the Rockaway could predominate and the probe could have been placed just across the border in a separate soil type?

A I would think that the probe was placed in the soil mapped as Rockaway; however, it would take an investigation across the parcel to see if [redacted] better conditions occurred elsewhere.

Q Do you know the approximate size of this parcel of land?

A Number 117?

That parcel is roughly 400 by 600 feet in dimension.

Q Now, it appears to be contiguous with a number of small lots?

A Yes.

Q Which are not colored in indicating that they have been developed; is that correct?

A I don't think I understand. I'm sorry. I was looking at the wrong map.

Q The vacant lands are shown in the

coloration. These other lots appear to be developed. Are you aware of any problems consistent with the soil types identified by the probe in any of those developed properties?

A I did not investigate them, therefore, I have no knowledge or information about it.

Q The final parcel of land you identified as substantial in size and worthy of detailed examination identified as lot two, block 6401, I believe.

A That is parcel 58, probes 23 and 24.

Q Is that the only site on which you had multiple probes?

A I don't believe so. There was, I believe, another site elsewhere. I simply don't recollect.

Q As far as the ones, the 18 we have discussed today, is my recollection correct that that was the only one that had a multiple probe?

A I think so, yes.

Q Do you know the reason for multiple probes?

A A big parcel where we had access to more than one location along it.

Q And what was your analysis of this site's development potential, potential in November?

A In November it was identified as the Carlysle

muck, which means swamp deposits and the Rutgers soil survey indicated deep swamp deposits.

Q Your probes indicated what actual site conditions?

A Those were probe numbers 23 and 24. In probe 23 there was fill on the surface and we could not penetrate the fill to get below -- we cannot get to the fill and we had to stop the probe at eight inches.

Probe 24 shows five feet of organic soil in the auger, but we were able to probe to [illegible] so I would suspect that we have at least seven and a half feet of soft organic soil there; and although we did not encounter water, I'm sure it was, because the hole wasn't open long enough and the water was really there and we would tend to have a surface water condition at certain times.

Q Now, probe 24 indicates firm soil reaches approximately five foot depth?

A Well, firm is as a relative term. It was harder to dig, but it was still black organic soil, which in general would still be an unsuitable material for founding; and since the probe was able to penetrate to 7½ feet, I suspect in the organic soil which would be unsuitable for founding

continues to at least a depth of 7½ feet.

We also found that most of the site had been filled with stone, cement, tar paper and other miscellaneous type materials like that.

Q Which sounds consistent with uncontrolled fill?

A Yes.

Q Now, based upon your years of experience with construction in northern New Jersey, are you familiar with residential construction that has gone on soils identified within Biddeford [redacted] on any occasions?

A My certain types of studies normally will not relate to a certain SCS formation condition and construction over it, because invariably when I form an evaluation, I will use the SCS simply to give me a starting point, rough idea of what might be there; and then I would do a site specific evaluation; so as far as I am familiar with construction over [redacted] specific SCS soil type, I would be unable to respond. If you ask me with certain soil water conditions, that I could certainly respond to.

Q Now, directing your attention to your report of December 12, identified as GSH-5, on page one of that document you state that the purpose

of this analysis to be an investigation to assess the subsurface condition and undeveloped sites within the Township and to evaluate potential foundation constraints and the general economic consequences of the constraints on costs of development; is that correct?

A That is correct.

Q Does this study in fact support with that purpose as stated therein?

A Yes, it does. The economic consequences are treated qualitatively and not quantitatively but yes, it does.

Q Now, with regard to the development constraints pertaining to foundations, what was your overall conclusion?

A As far as foundations that there are areas where that will be difficult in providing a conventional foundation, and that certain sites will require specialized foundation systems; and by that, it is implied that the costs go up.

Q -Now, with regards to aid environmental impacts which might be implicated by certain residential development, are they incorporated into this study also?

A Yes, they are. We discussed the affect of

urbanized lands, or rather than that, we discuss the ramifications of the presence of poor surface drainage, of high ground water table and perch water table, of the presence of soft or weak soils and the presence of filled sites. We do that with respect to the different soil series which we lump together and then reach our conclusions concerning the development of the site and the restrictions and limitations pertaining to development.

Q Now, were any quantitative analyses done to describe the environmental impacts that would occur from the development of these various vacant parcels in accordance with the provisions of the current zoning ordinance in the Township of Hanover?

A No such evaluation was made by us.

Q So you would not be in any position to compare those environmental impacts which are presently permitted under the current zoning ordinance as would relate to environmental impacts that could be exploited if certain vacant parcels were developed pursuant to a multi-family, high density housing types. Would that be correct?

A That's correct. I did not perform that study, so I could not comment in that regard.

Q On page one of your study, numbered paragraph four, this indicates that you performed a geologic site evaluation of selected parcels. Again could you briefly indicate the basis for the selection of parcels that were so investigated?

A We generally attempted from the available geologic literature to have the larger pieces of undeveloped land and representative pieces to try to get a spread throughout the municipality to an extent that we would be reasonably confident that once we investigated those parcels, that we could be able to project our findings to other parcels that had nst been investigated in detail.

Q Now, how many parcels in total were examined?

A We've already discussed, I believe, 18, but I know -- what I should do is go to the probes and listed on the probes is the site number; so unless there's a duplication of probe number, they would tend to be investigated.

Q Let me rephrase rather than take up time, because we're running-very short here.

A One report, it does state how many parcels were investigated somewhere. I just have to see if I can find it.

Q Don't spend your time doing it now.

Appendix B1 appears to list the number of vacant parcels in the municipality as 124 separate sites and we've discussed 18 sites, and that incorporated 27 probes.

A 27 probes would be more than 18 sites. 24 sites were represented.

Q Out of 124?

A In probes, yes.

Q Were additional field investigations done on sites not probed?

A Aerial photographic review was performed for the entire municipality, so the other sites would be included and we used our boring data from prior studies for general determinative and correlative purposes, so that without making a hole on each of the 120 some odd parcels, we were able to extrapolate the data secured to reach conclusions about the others as well.

Q Now, on page eight of your December report there appears to be what I would characterize as a disclaimer of sorts indicating the purpose of the study being limited to use in this litigation; is that correct?

A That is correct.

Q Is that intended to limit the application of these materials at litigation is not a development proposal? In other words, you would not intend the materials to be placed in the hands of a developer, and say, based upon my analyses of these selected sites, you could at this point in time go forward with a development proposal. Is that in essence what the import of this statement is?

A Basically, yes. What we have in mind is that we do not wish a builder to take this data and say, "Oh, I now have everything and can construct a building on this site, because the report [illegible] are no limitations to go out and build it. And because it takes a detailed investigation in greater detail than what we have performed here in order to be ready to prepare a set of plans for construction, and we wished everybody to be aware that an additional step would be necessary before plans for construction could be prepared.

Q Now, on page A-1 of your December report, the third paragraph, last sentence in that paragraph states, and I quote:

"The exploration location should be considered accurate only to the degree implied by the methodology used."

The preceding sentence indicates that these

locations were determined by pacing from landmarks shown on aerial photographs and map references. Could you elaborate on the degree of accuracy of probe locations as indicated by that pacing methodology that was used to locate these probe sites?

A Yes. We knew where we were on the street from municipal maps and had landmarks which we were able to see on the street, and also be able to see on the photographs and we paced it in.

Now, our personnel are experienced in pacing and one has a pace of known dimension after a period of experience, but the angle of entry and the distance is not an exact number; so I would say that we are plus or minus some number of feet from the plotted location. However, within accuracy of the mapping which is a one-inch equals 500 scale. The thickness of X is a fair number of feet to begin with, and so the locations shown are generally correct, except that if you would ask is this location correct to the nearest foot, the answer is no.

Q From what you've just told me as regards to the scale of a map in addition to the imprecise nature of the pacing, you have two factors working in conjunction as far as being able to indicate precise locations: the map factor and the actual

pacing fact; is that correct?

A Yes, but we are within the parcel designated in the vicinity of the location plotted, so there is no need for this study for a greater degree of accuracy.

Q To the extent that soil types as mapped on various documents you used traverse various parcels without respect on the boundaries of the parcels, would that not make a relevant factor in regards to determining what soil types you were actually probing as to getting the exact lo[redacted] order to correspond to the maps showing or [redacted]g that soil type?

A I can say that is extremely unlikely.

Q Why?

A Because we are able to get a reasonable degree of accuracy to begin with, and the different soil types you have certain items in common and it is -- I would suspect it to be highly unusual for different soils [redacted] different characteristics showing up. Like [redacted]y, within a parcel, all of the soil types mapped would tend to have the seasonally high ground water condition; so it really wouldn't matter whether the probe was in one or the other. However, the probes are of sufficient accuracy, or I would not expect to be

hundreds of feet off and move from one soil type to another.

Q Are there more exact locating methodologies that your firm uses on other types of studies?

A Yes, they are methods where transit and tape could be used to tie the locations down, and if a proposed building were to be located or were proposed at a specific location on the site, we would certainly not wish to be off by 20 or 10feet; and so we would come in by precise survey and we might even hire a professional land surveyor to come in and locate that work for us.

However, that degree of accuracy is not needed for the purpose of this study.

Q Now, directing your attentionto page B1 of your December report, the description of material at the top of the page appears to indicate that in the circumstances where the soil conservation service delineated the soil types of one classification, and at a particular parcel your probe found a different characteristic, you classified in the material for the entire 124 sites, vacant sites in the Township the characteristics as ascertained by your probe on all these sites in addition to the one where the probe actually found that material as opposed to

what the soil conservation service delinated; is that correct?

A Not exactly. We did take into account other features such as we identified one soil type before as not having a high ground water condition, and even though we found it on a specific parcel, we would tend to indicate it as such for that parcel; but we would not have extrapolated other areas where SCS; so we gave the benefit of the doubt to other areas.

I can trying to find an illustration of [redacted] if you wish.

Q Before you said sites not field investigated but mapped as the same soil type as the sites visited in the field are considered to display similar site conditions as observed in the field. That is the sentence I was getting at which I'm not clear on.

A Right. If a soil is mapped as a Carlylse [redacted] to take an illustration, and we perform probes, [redacted] of probes in the Carlysle series, and those probes indicated the presence of a such deposit of weak soil and a high ground water condition and a poor surface drainage condition, we would -- which SCS indicates is occurring and our probes indicate

as occurring, we then feel confident in extrapolating all the Carlysle muck mapped in the municipality as having those characteristics. However, where we get to the Riverhead series, perhaps, I believe it's the Riverhead where the conditions are not expected to be severe. Let me double-check that to be sure. Yes. Riverhead and Rockaway series. We did not extrapolate that circumstance, not necessarily extrapolate that circumstance.

The columns are off on page B4, so this would be --

Q When you say they're not lined up correctly on B4, it's just that they're shifted over as opposed to being otherwise directly underneath so all we have to do is draw our lines at an angle. On my B4, the first set appears between the Alluvial and Boonton.

A I'm trying to make that determination by seeing that site has all old fill. I'm not absolutely certain.

Q In light of that observation of possibly clerical error on B4, I think it would be fair to ask that you just double-check for all the pages to make sure that we have all our columns aligned. I m sure some just on initial observation will prove they are aligned properly, but maybe you better

verify that and let us know. I appreciate that. Thank you.

Let's see. We were still trying to clarify your extrapolation methodology.

A We did not say since one series everything plotted in that series has the same negative condition.

If you'll notice, I'm turning to page B5. Parcels 95 through 98 are plotted are Riverhead series, which would indicate, according on paper, a deep water condition; but in a couple of illustrations there was a shallow water condition, and for [redacted] 97 that was probably a probe that was plotted [redacted] parcels 95, 96 and 98. We did not extrapolate that and assume that since we found it in one case, it was universally true; so we used that with professional judgment in making the determination of what is happening elsewhere in performing our extrapolations.

Q Now, the final descriptive sentence on B1 indicates, and I quote:

"Where more than one soil type per site was referenced, the poorer condition was considered."

I guess my concern in regards to that quality, if I remember, would be the situation where you had a particular site sloping. For instance, say the site was quite large, 40 acres, and at its one extreme edge

it might dip down in the last 100 feet into a swamp and you would have to pain a swamp or muck condition and reference that for a 40-acre site in which it was only the boundary or tip whichwas so impaired.

A That did not occur. Where there was more than one condition, it had to be a substantial part to be considered.

Q Now, would you define substantial? What was the cutoff point for that type of a situation?

A I honestly don't recollect. I'd have to go through piece by piece.

Q Even if it was a substantial condition, say you had a 40-acre tract again, and 20 acres contiguous to say the eastern half were impaired and the 20 acres on the western half were unimpaired. Would not the 20 acres of unimpaired land constitute a substantial piece of vacant, developable land that would not be lumped in with the 20 acres that you would want to prepare as open space?

A Yes. That could best be established by going to Catlin's drawings which would make that differentiatio and using ours for correlation purposes.

Q But as far as your delineations reflected in B-1, that type of differentiation between two portions of a contiguous tract would not be shown;

is that correct?

A Yes. The impact of that I would suspect to be relatively small.

That would have to be determined, however?

A It would have to be determined.

Q I believe my last question would be that you indicated that your field work was done by others in your firm; at any time did you accompany these field crews in these work projects?

A I did not. I did drive through the areas so I could get a feel for the work, but I did not accompany the field crews.

MR. ONSDORFF: Thank you.

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C E R T I F I C A T E

I, DOROTHY M. PONTE, C.S.R., a Notary Public and Shorthand Reporter of the State of New Jersey, do hereby certify that prior to the commencement of the examination

ROBERT CATLIN and GARY SALZMAN

was duly sworn by me to testify the truth, the whole truth and nothing but the truth.

I DO FURTHER CERTIFY that the foregoing is a true and accurate transcript of the testimony as taken stenographically by and before me at the time, place and on the date hereinbefore set forth, to the best of my ability.

I DO FURTHER CERTIFY that I am neither a relative nor employee nor attorney nor counsel of any of the parties to this action, and that I am neither a relative nor employee of such attorney or counsel, and that I am not financially interested in the action.

_____

Notary Public of the State of New Jersey