

SPECIAL MEETING

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ENVIRONMENT, LAND ACQUISITION & PLANNING COMMITTEE

of the

Suffolk County Legislature

Minutes of Hearing on Groundwater Quality

A special meeting of the Environment, Land Acquisition & Planning Committee of the Suffolk County Legislature was held in the Rose Y. Caracappa Legislative Auditorium of the William H. Rogers Legislature Building, Veterans Memorial Highway, Smithtown, New York, on August 14, 2002.

MEMBERS PRESENT:

Legislator David Bishop - Chairman

Legislator Ginny Fields

MEMBERS NOT PRESENT:

Legislator Michael Caracciolo - Vice-Chair

Legislator Andrew Crecca

Legislator Jonathan Cooper

ALSO IN ATTENDANCE:

Paul Sabatino - Counsel to the Legislature

Tim Motz - Aide to Legislator Bishop

Maeghan O'Keefe - Aide to Legislator Bishop

Allyson Feld - Intern/Legislator Bishop's Office

Barbara LoMoriello - Aide to Legislator Cooper

Lisa Keys - Aide to Legislator Caracciolo

Jim Dobkowski - Aide to Presiding Officer Tonna

Nicole DeAngelo - County Executive's Office/Intergovernmental Relations

Vito Minei - Suffolk County Department of Health Services

Martin Trent - Chief/Bureau of Groundwater Resources/DHS

Paul Ponturo - Chief/Bureau of Water Resources

Jeff Dawson - Department of Public Works/Highway

Karen Randazzo - Suffolk County Water Authority/Director of Laboratory

Tim Hopkins - Suffolk County Water Authority

Lee Koppelman - Long Island Resource Planning Board

Sarah Meyland - Exec.Dir/Citizens Campaign for the Environment

Adrienne Esposito - Assoc Ex.Dir/Citizens Campaign for the Environment

Jessica Ottney - Program Coord./Citizens Campaign for the Environment

Laurie Farber - Chairperson/Long Island Sierra Club

Julie Penny - South Fork Groundwater Task Force

Stephen Terracciano - Hydrologist/U.S. Geological Survey

Mark Serotoff - Townline Association

Valerie Burgher - Newsday

J. Jioni Palmer - Newsday

Leonard Grecco - Suffolk Life
All Other Interested Parties

MINUTES TAKEN BY:

Alison Mahoney - Court Stenographer
Donna Barrett - Court Stenographer

1

(*THE MEETING WAS CALLED TO ORDER AT 10:16 A.M.*)

CHAIRMAN BISHOP:

Good morning. This is the Environment, Land Acquisition & Planning Committee Special Hearing on Groundwater. Please rise for the Pledge of Allegiance to be led by Vito Minei.

Salutation

Thank you. Yesterday we focused on quantity and today's hearing is on quality, and the Health Department, Suffolk County Health Department has done extensive work on quality issues. And I would ask that Mr. Minei and Mr. Trent at this time present --

MR. MINEI:

A change of characters today.

CHAIRMAN BISHOP:

Oh, you're subbing in.

MR. MINEI:

Good morning. Again, I'm Vito Minei, I'm Director of Environmental Quality for the Department of Health Services. Today I'm joined by Paul Ponturo who's Chief of our Office of Water Resources. Just to recap quickly what we went through focusing on the quantity issue yesterday, we established our position that we believe indeed there is sufficient quantity, talking in terms of sheer volume, to supply the population as now projected in Suffolk County into the foreseeable future. Today we're going to concentrate on quality issues and we're going to cover quite a bit of information on parameters of concern, monitoring and regulations and things like that. And I'll recap again at the end with a conclusion, but I don't want it lost in all the information we're about to present.

Essentially our position is that not only is there sufficient quantity, but we believe that we can assure the quality of the drinking water into the foreseeable future. We're going to give you

some caveats and some issues and some concerns as we go through and I'll elaborate on that conclusion when we get to the end of the presentation.

Today we're going to cover our public supply regulatory programs and monitoring, we're going to discuss some of the monitoring as it relates to water resources planning. We're going to concentrate on groundwater quality issues as they relate to water supply. There obviously are major issues as they relate to natural resources. We do a lot of work on groundwater underflow, yesterday in Martin's presentation he showed you some of the equipment we use, but I think today we'll only concentrate on the water supply issues, we can discuss surface water issues at another presentation.

Again, the concern for all of us here is to assure that the water supply is safe and we're going to be talking about why we have the position we've taken with regard to water quality. Essentially it's based on the availability, the volume, again, of high quality, a source of groundwater. Also, another reason is because of the amount,

the comprehensive nature of the surveillance. Water supply not only has, especially in terms of the Water Authority, very extensive self-monitoring, they have an extremely fine laboratory there, but also we do a lot of monitoring on behalf of the State Health Department with regard to guaranteeing the quality of the drinking water supply. Paul will be talking about different treatment technologies. Again, technology and how it's progressed over the last 30 years is an important issue as we talk about assuring good water quality. The state of enforcement and also we'll get a little bit into why the drinking water is protected. Suffolk County is indeed proud, as it should be, with regard to our Open Space Programs and we'll continue to venture into the discussions of education.

This, again, is a short list of some of obligatory references that I talked about the history lesson that was in the 1970 study, the Comprehensive Water Supply Study 24, and talked about how the findings have evolved from 30 years plus. The Long Island 208 Study was really a cornerstone to a lot of our environmental management. Indeed, some of our Sanitary Code provisions are based on the groundwater management zones that were established and a lot of the really cutting edge investigations that were done back in the mid 70's with regard to toxic chemicals and viruses and other concerns. And it really was, as I believe, probably the foremost 208 Study discussing groundwater issues.

If you recall, in 1972 the Water Pollution Control Act really dealt with fishable, swimmable surface waters and Long Island was really probably the premier groundwater investigation in that.

In 1987, the '87 plan as you referred to it, Dave, was a comprehensive water resources plan and there was a lot of discussion about trying to project forward with regard to water supply issues. We had a series of maps in there that showed water quality, again, snapshots at that time period at different elevations in the upper glacial Magothy aquifer. There were discussions of some of the concerns with regard to isolated peninsulas on the north fork and the concerns out on the south fork, they were referred to as insular areas in that report.

And you have seen a presentation on -- from Martin Trent on the pesticides investigations that we've been doing recently under a grant from the State DEC. And I'll wrap up at the end with a discussion of the Source Water Assessment Program, SWAP, this long-term planning effort that we're about to embark; well, we're into the early stages of that study.

At this point I would like to turn it over to Paul and he'll go through some of the details of the investigation.

MR. PONTURO:

Thank you. Good morning, Mr. Bishop. Am I on all right? Basically I think it's important to give some sense of the regulatory framework under which we operate. I think it's important to stress to something that you already know but to the public at large all the time, that we are primarily, especially in the Bureau of Drinking Water, our activities are driven by existing regulations and the fact that we regulate public water suppliers in the County. So I'm going to try

3

and briefly recap for some of the -- more for the members of the audience a sense of what that regulatory framework is like, because that drives a lot of what we have done.

So if you can give me the next slide we'll move on to the findings later on. The Safe Drinking Water Act is the principle regulation currently in the United States and New York State Sanitary Code of course predated that and goes back to almost the turn of the century in terms of regulatory authority over water supplies. The Health Department has been in the regulatory business of public water supplies going back before I was born. The act has been reauthorized

a number of times, those reauthorizations have had a lot of public input and essentially it has been Congress during those periods of time kind of making decisions on where are we going, what do we know, what have we learned in the intervening years, what needs to be changed. So the reauthorizations at roughly a ten year frequency have been very important to us.

As you mentioned, the Safe Drinking Water Act covers approximately 287 million people, that's not the whole United States. So I think you should recognize, as we have, that there are people that have been disenfranchised in terms of water supply safety. Quite frankly, there are still national issues with people that do not have reliable water supplies at all, as much as we don't like thinking that we live in a Third World country. Next slide, please.

Over the course of everybody's experience we keep hearing the word sole source aquifer. The sole source aquifer designation does stem from the Safe Drinking Water Act, it's important to recognize because it does involve Federal involvement when Federal funds are used in safe -- in areas where a sole source aquifer has been designated. Certainly this is one of the areas, however, where Suffolk and Nassau are getting on board very early on in our earlier planning efforts to get that designation and we think it was very important in terms of raising it and in consciousness of the public at large and even the federal authorities. But we should talk about the disenfranchised group. We're not disenfranchised in Suffolk. Private wells have been an area where we have always had concern, we have always had a private well monitoring program, again, going back to the 1950's, but there are certain areas where to some extent trying to address issues, things are lacking and I've given you some sense. I've talked about the fact that there's a lack of Federal authority. There is no real inventory on a day-to-day basis. We try and work backwards from data from our public water suppliers in terms of who's hooked up; that tends to be problems in -- when we try and do private well surveys, when we try and get some sense of long-term planning issues relative to private well owners. But it is a driving -- it's something that we try and address.

New homes, however, have historically been carried in terms of construction standards. The Health Department has had private well standards for many years. One of the few counties that had standards as extensive as that in the State in fact went to us in terms of using our standards for their State model. We do have rough estimates of wells based on the past census. There used to be a question on private wells in the United States Census, the last Census there was

not, so as a result we have estimates based on the Census. It's important to recognize, though, that even then, to my mind, the way the question was asked, it did not account for seasonal residents that are on private wells, so if you owned a seasonal home the likelihood is that well wouldn't have been counted.

So this will account for a lot of times in terms of you you'll hear me talk about how many wells are in the County and sometimes the numbers will fluctuate somewhat. The point is that 63 to 77,000 range is probably accurate if you account for seasonal wells; that's a very substantial percentage of the population and obviously we're never going to walk away from that responsibility in terms of what are those people drinking.

I also want to end by saying that the Legislature in 2000 passed a law that we think was significant in terms of public education which was to require on resales of homes that there should be a testing mechanism or should be a relationship between the buyer and seller surrounding the testing of the private well. We have seen a lot of inquiries in terms of homeowners since that time driven by lawyers, driven by real estate agents perhaps, but the point is the questions are coming in to us and in terms of educational outreach it's had a good impact we feel in that area.

Let's talk about the next slide which covers some of the natural constituents and some of the natural characteristics of the groundwater in Suffolk County. I think it's always important to recognize that we have to have a concern about what's in the groundwater and as a native event. The water has a low pH generally speaking and is naturally soft, that means it's corrosive. Many private well owners will tell us that they get blue water stains, especially when there's a dripping faucet, that's due to the natural corrosivity of the water by and large. We say that properly installed wells do not exhibit coliform, that -- coliform is an indicator of bacterial contamination and has historically, going back to the turn of the century, been what we rely on relative to waterborne disease potential. Hopefully I will get to a little bit later on the talk about where things are changing in terms of microbiological quality in terms of what we feel needs to be done there. The mineral content, to some people this is a surprise, that's relatively low. Again, compared to the midwest where you have water as hard as a brick, the overall mineral content is relatively low, it is soft, about the only naturally occurring minerals that seem to be of a concern esthetically are iron, manganese predominate on the south shore and in private

wells on the two forks. The dissolved oxygen is low and the carbon dioxide are low, those tend to be issues relatively to the corrosivity of the water.

I do mention the natural radioactivity. It's important to recognize that all groundwaters have a natural radioactivity by virtue of the fact that the soils, the geological structures themselves have radioactive content and that the water, by virtue of being in intimate contact over long periods of time, will pick up radiological constituents. By and large, again, compared to much of the country, it's not a big issue. But I mention this in the sense that on the

5

national play list, radiological is starting to rise in a lot of people's minds and this is a plate that we've got to step up to as well.

We have a large number of concerns in terms of the gross contaminants that we look at. I should mention that as I go into contaminant groups you will see that I have added a couple of other contaminants, again, by virtue of what seems to be on the national scoreboard, so to speak. Last week's U.S. News and World Report did bring up some contaminants that concern us in that we've been on -- that have been on our play list, if you will, for a long time like MTBE. But you will also see contaminants in that U.S. News and World Report like Radon and like Arsenic and those are things that we need to be concerned about because from a regulatory structure we will have to make sure our water supplies comply and we want to do our own background work even though we don't think that by and large they're an issue. But nationally they are of great concern legitimately, and worldwide in the case of say Arsenic very much so.

So these are broad groups that I'm going to talk about. Many of them have been, if you will, on our score board for many, many years, agricultural chemicals initially just talking about nitrates. Solvents and Petroleum were issues as broad groupings of chemicals that we started to see of concern in starting in the 70's and they're still of great concern. The broad spectrum of sewage related contaminants as indicators of density of population, ammonia and again, Nitrate levels there, too. Salts and chlorides certainly are problems. Early on we addressed the proper storage of road salts.

CHAIRMAN BISHOP:

Are you going to go through each one of those and tell us where we're at on Long Island, later on?

MR. PONTURO:

As we progress, yeah.

CHAIRMAN BISHOP:

Okay.

MR. PONTURO:

And to a greater or lesser extent depending on things that you've heard in the past. The next three are things that are moving up on the chart in terms of -- at this point we want to say that there are concerns, we're trying to -- I'm going to try and give you a thumbnail on how we're trying to address each of these as best we can.

Again, getting back to the regulatory framework a little bit. So what do we have all together in Suffolk County that we regulate? We actually have 582 public water systems. The common misconception is we have one, the Suffolk County Water Authority; that's a misconception. Again, putting on the regulatory hat, you can see what we regulate; we regulate 48 community water systems. These are water supply systems that serve year-round populations, people that are living all the time in their locations. The biggest one is obviously Suffolk County Water Authority which serves something in excess of one million people. We've got small ones serving as small as six

6

year-round cottages, little motels, trailer parks, okay? All these people deserve to be protected, that's what the Congress says and that's what we're actively doing.

Then we have a new category or what became a new category when the Safe Drinking Water Act came in of what were called non-community water systems. Again, legitimacy in terms of coverage, certainly if a school is on a well and the kid is there for the whole day, you want to be assured that the water that child is drinking is safe, so it's very true. But this gets down to other public access facilities like parks, office buildings, a lot of restaurants still on private wells, and you can see, we have a great number of those systems, 534. Again, predominantly in the areas where our private wells are, more on the east end of the Island. Again, a certain regulatory commitment is there, a certain monitoring commitment in terms of the Bureau of Drinking Water is always there.

So what do we have? The public water supply monitoring, first of all, there's extensive self monitoring dictated by the Safe Drinking Water

Act, the New York State Sanitary Code builds on that and is a little more restrictive, the Suffolk County Sanitary Code builds on that and is a little more restrictive, but that's all self monitoring. Suffolk County Water Authority has its own laboratory, the remainder of the public water supplies use private laboratories that are approved by New York State Health Department that report their data into us, as does the Water Authority.

I want to mention, though, that historically there's been a lot of voluntary self monitoring among -- primarily among the Suffolk County Water Authority and a lot of the water districts. We've tried very hard to do a lot of consciousness raising and as a result, we find that the larger water supplies across the board tend to do even more than we require.

And then finally I think the County oversight monitoring is what we've historically felt is what people want. The State Health Department dictates to us as their agent, so to speak, that we do a certain amount, but in terms of the sophistication of the monitoring, the number of samples and the desire among the population we feel that there be an independent monitoring entity of those public water supplies. We've always felt that that is a very important activity and that special oversight monitoring is very critical in our operation.

Okay. To give you a feeling in the next slide for what our overall monitoring is like, we have, again, within the Office of Water Resources' two bureaus, you've gotten a sense of it, the Bureau of Drinking Water handles essentially those activities that reflect on what people drink, the Bureau of Groundwater Resources tends to be our evaluative unit in terms of looking at the overall groundwater condition, looking at sources of contamination, resource-related studies. Let's talk quickly about the Bureau of Drinking Water.

You can see our activity in 2001, a lot of private well data. Subdivision test wells reflect on an enforcement activity or regulatory activity. If a new subdivision is proposed and if under our

standards the department can consider private wells on that subdivision -- again, subject to our regulations -- the regulations call for test wells to be installed on that proposed subdivision, we handle the sampling. The Bureau of Drinking Water handles the actual sampling and our Public Environmental Health Laboratory, Ken Hill's office, does the analysis, just as the oversight of our public water

supplies, it's identical.

Community supply wells, you can see that we've taken a great many samples. Community supply surveillance, by that I mean samples actually from representative points of view, primarily from schools and firehouses. These are taken at random without knowledge by the water suppliers, we feel that, again, that has been a very useful tool for us. The water suppliers are aware because we tell them if there are some things that look a little out of line or a Ph seems to be low or if Chlorine residuals seem to be out of line or if we find more serious problems which is much more rarely we do have a complaint response in terms of the community water supplies. Every year we get a certain number of complaints; again, we respond to those by and large the same way as we do our surveillance. Again, from the standpoint of water supply, totally transparent, it's totally independent of their own activities and we do as comprehensive analysis there by and large as we do in our surveillance, our routine surveillance samples.

The Non-community Water Supply Program, as you can see, indicates that we're roughly sampling, depending on man power and laboratory capacity, roughly -- we're trying to aim towards getting half of them sampled every year.

This is the laundry list of contaminants, okay; again, this is by contaminant grouping. This is where the lab is for us, okay. None of this would be possible in terms of what we're able to do without the laboratory. We wouldn't be able to achieve our surveillance goals, we wouldn't be able to move those surveillance goals ahead in terms of staying ahead of the national curve and finding out what could be a new type of contaminant if it wasn't for the laboratory. You will see a whole laundry list of analytical groupings and in the brackets you'll see the large number of contaminants that are run in those individual groupings. A great many of those contaminant analytical procedures like the {Carbomate Pesticides} was developed, the methodology that is used nationally was developed in our laboratory initially for the pesticide {aldacard timic} which, as you know, was something we initially found in the early -- basically '81 in terms of own laboratory analysis, we're still finding it.

I want to call to your attention, though, some of the areas that Martin has talked to you about in the past in terms of tremendous expansions in terms of analytical capabilities in pesticides. The {organal Halite} pesticides, the {metabolites of Dactal}, there's a method and a piece of equipment that is dedicated to running two contaminants, okay, it's in some cases extremely labor intensive to do these things and I think everybody needs to walk away with an

appreciation for that in terms of what it needs to do. But {Dactal Metabolites}, as you'll see later and as Martin has talked to you about in the past, still show up even though it's been removed from the Long Island market, still show up. It's moving forward on the

national databases now as large public water supplies nationally are looking for it, we have been looking for it for years.

Perchlorate is a new contaminant that we've been looking at. Herbicide Metabolites have expanded, that's a new area where Martin has talked to you about extensively. The semi-volatile organics I think I already talked about, that's expanded from about 25 a year ago to -- what's indicated here, 75 right now. That's an area of expansion where a number of new pesticides are being run, but more importantly in terms of one of the emerging issues, we're running a number of household chemicals and pharmaceuticals which on the national score board again are becoming very significant and I want to play that up to show that that this is an area where we feel that as time goes by we're going to gain a lot of information and a lot of knowledge on our overall resources.

I've pretty much touched on the Bureau of Drinking Water Sister group, the Bureau of Groundwater Resources. Martin has kind of elaborated on it in terms of giving you a sense of the work that they do in terms of resource management. Every year additional wells go in, some of those reflect on our contractual relationships with New York State DEC, for example, in terms of the pesticide monitoring programs. Some of those activities reflect on working with the Bureau of Drinking Water and working with our Office of Pollution Control in terms of where there's a serious problem to try and delineate the extent of the problem. Recently that's been involved in things like -- that activity has been involved in our North Phillips Avenue survey work where we've had some private well contamination in Speonk. A follow-up to some degree in terms of some additional work we've done elsewhere, historically in Yaphank and in other areas of the County.

The Bureau does its own monitoring in this activity, in the course of water samples actually being taken. So while Martin intended to emphasize yesterday in terms of groundwater levels and an indication of the overall magnitude of the resource, those activities. Again, a lot of water samples are taken during the course of those activities as well. I should also mention that we do a certain amount of stream sampling. But again, the monitoring programs across the board, especially here, have historically been a function of field manpower

and to a degree laboratory capacity.

Let's talk a little bit about the contaminants themselves, now we're moving into the meat that you really want to hear about, I know.

CHAIRMAN BISHOP:

I'm confident that you're aggressively testing.

MR. PONTURO:

I think that -- if that doesn't come across, we haven't been doing our job for quite a long while, Mr. Bishop. The fundamental issue that we've pounded away at a long time, when you're dealing with agricultural chemicals we feel that the nature of the soil characteristics is important to stress to people. That we do have shallow topsoil, relatively little microbiological activity in the soil structure itself, sandy subsoils. Many of the areas with private well problems that are of agricultural origin have high groundwater.

9

And again, finally stressing the fact that the regulatory process needs to address those chemicals that have good leaching potential, and that's an area where we feel that there's a real need among the authorities that are responsible for approval of pesticides to have an awareness, and that's not just a local problem, that's a national problem.

Nitrate. We have been talking about nitrates and we've been doing things about nitrates. Going back to the 1950's, nitrates have been a contaminant of concern for known health effects, Blue Baby Syndrome, Methemoglobinemia, one of those long words that I don't like to throw around too much. It's always been an indicator, a good indicator of man bacteriors. You'll find through the two comprehensive studies that were done and through the 208 study, the thinking is that that Nitrate data is very important to us in terms of indicating the overall quality as it relates to man's activities, agricultural activities, but also sewage disposal activities, okay?

CHAIRMAN BISHOP:

This is nitrates in the groundwater?

MR. PONTURO:

That's correct, that's correct. We're talking -- as Vito indicated, I think the bulk of what I'm going to be talking about, while there are ramifications to the surface water, we have to keep talking about the groundwater concentrations of Nitrate.

CHAIRMAN BISHOP:

I was thinking nitrates in terms of surface soil.

MR. PONTURO:

We've got a significant historic database for Nitrate which is useful for these long-term projections. It's important to recognize that if it wasn't for the Nitrate data and importantly the Long Island 208 study, our density related criteria in Article 6 saying how many homes on cesspools per acre the various groundwater management zones can handle, we wouldn't have that. So all this stems out of ultimately the Nitrate data, so I think it's always important to mention. And I've mentioned -- the final issue is that there is long-term good data that Nitrate does cause health effects in excess of drinking water standards. So there's validity to all this work historically.

The next slide I should mention the fact that in our comprehensive studies, most recently in the Suffolk County Water Resource Management Plan, the last groundwater study if you will, this concept was dragged out in terms of looking at the Nitrate concentrations in active community supply sources. It expanded on a concept that was in similar -- in previous studies and we think it's useful to project that for the purpose of giving you a sense. Again, ten parts per million being the drinking water standard and then three other categories, okay, just to give an overall feeling of the condition.

In the next slide I wanted to try and compare our data, this is data pulled out of our databases so these are our samples, and comparing the previous study which covered the period of 72 to 83 quality data, to more recent data from '97 to 2001, and then by aquifer, glacial and

10

Magothy. What I think is important to recognize, especially -- again, not to belabor numbers and, you know, have people glaze over when they see numbers here. What I think needs to be stressed --

CHAIRMAN BISHOP:

The glacials.

MR. PONTURO:

I'm sorry. The glacial aquifer is the shallowest aquifer segment, the magothy aquifer is the deeper. When discussions were -- came across yesterday in terms of talking about the aquifer segments and talking especially about Nassau County data, I think this slide is important because I think it illustrates something that is different about

Suffolk versus Nassau, one of many things. The fact is is that building unfortunately on Nassau's experiences but also building on our studies, there has been an active encouragement of our public water suppliers not to -- to essentially do an evaluation in terms of the desirability of staying shallow with their wells versus going deeper. And if going deeper into the Magothy involves going into aquifer segments where the glacial aquifer and the Magothy aquifer are hydraulically connected we're they're kissing up to each other, all you're doing is buying yourself time. In the long run you're running some risk -- and again, I don't want to over simplify, but there should be a recognition because this has been one of our educational efforts in terms of working cooperatively with the water suppliers to say going deeper is not always going to be better because you may just be buying time. Again, it's got to -- you've got to make those --

CHAIRMAN BISHOP:

Are the aquifers typically connected?

MR. PONTURO:

No. In fact, if you look at the -- if you look at -- there have to be connections at points. The connections tend to be greatest, if you will, in the deep recharge areas, the central areas of the County, okay. Those areas in particular are areas where if you stress the Magothy you may run the risk of pulling stuff down through the glacial. And while, again, I stress to you that making these decisions on a case by case basis is not easy --

CHAIRMAN BISHOP:

I thought that's the preferred area to drop wells.

MR. PONTURO:

Overall it is. But what I'm stressing to you is the idea of using the resources that we have available to us in the glacial, okay, and using them efficiently, okay --

CHAIRMAN BISHOP:

Right.

MR. PONTURO:

-- is an important part of our overall philosophy. I should mention that, you know, again, you were asking about aren't they connected everywhere; the answer is no, on the south shore the glacial and Magothy have Gardiner's Clay between the two. So you will find in

Babylon, in your district, the Suffolk County Water Authority has a preponderance of Magothy wells now because in the glacial wells in the 50's, 60's and into the early 70's got to a point where it wasn't viable, okay, relative to quality and that going Magothy made a lot of sense and it's through substantial amounts of clay. If you look at the town by town data in some of our other presentations about MTBE, the Magothy wells in the Town of Babylon don't show any MTBE. Again, the protective aspects of the Gardiner's Clay in that area is something to recognize. But at the same time, again, we want to give you a sense of the fact that we're trying to look at the shallower aquifer segments on a case by case basis and to make rationale decisions about the properties of that segment.

CHAIRMAN BISHOP:

Sorry to ask such --

MR. PONTURO:

That's okay.

CHAIRMAN BISHOP:

Chemicals don't leach through the clay level?

MR. PONTURO:

By and large, most of the contaminants that we've looked for in those areas where the clay is significant enough that they have not shown those kind of problems, where the well pumpage has actually pulled the stuff down; that by and large has not happened.

MR. MINEI:

If I can just jump in quickly.

CHAIRMAN BISHOP:

Sure.

MR. MINEI:

There are a lot of USGS reports that show the configurations of Gardiner's Clay, and it tends not to be this contiguous shelf of thick clay that retards flow but tends to be fingers of clay reaching up. So there are places where the Gardiner -- where the glacial and the Magothy come in contact but there is some level of separation caused by the Gardiner's Clay.

MR. PONTURO:

Okay. Again, to shift -- the point is what I want to mention here is that while there has been an increase in the total number of wells, there's still a significant reliance on the glacial aquifer. You'll

see that the totals from '72 to '83 at 301 through the '97 to 2001 period at 282, it's not a significant change considering the time period. So the glacial aquifer is still in extensive use.

I also want to call to your attention the fact that taking the idea of even blending for Nitrate purposes, that there's a certain legitimacy to that. And you will see 13 poor wells in the glacial aquifer with Nitrates, okay, that are by and large either being treated or blended down, okay. And the point is is that, again, the idea being there's no point -- in certain locations you can make decisions based on geology,

12

but going deeper is only going to buy you time and that with the State Health Department's approval blending for Nitrates has been considered acceptable. Now, in other areas the agricultural contamination problems on the north fork with Nitrates, blending is not an option and I don't want to misrepresent that. But the point is that what I'm saying to you is that drawing real broad conclusions resource wide, okay, is an issue and it's a danger and you have to recognize the fact that there is no one solution and that the issue is with our knowledge base we have to make case by case decisions based on what we know and what we could anticipate. I'm going to move on to the next slide because I don't want to blow anybody's mind.

The last thing I want to say relative to Nitrate and sewerage, again, primarily relying on Martin Trent's group data, the stream data and the shallow test well data, we are starting to see Nitrate improvements in terms of the quality in those shallow segments, the streams and the shallow glacial aquifer segments in the sewerage areas, much as Nassau County has seen. We think that on balance that's a good thing because, as indicated earlier, that water is traveling to the estuarine system, so there is advantages here, we want to stress those to you.

The next slide, let's start moving into the more recent generation of contaminants and give you, again, an overview of some of these problems. Chlorinated solvents became of significance to us through the mid to late 70's, they're still of great concern. I try and stress the fact that in terms of frequency of detection, they're probably of greater concern at County wide -- again, not over simplifying but on a County wide basis they're probably geographically of greatest concern because of how they're spread. We've detected a total of 40 at one location of the others since the mid 70's. Many of those are not federally regulated so a lot of times we have to go by the State Health Department's best guidance in terms of giving people

advice or telling the water suppliers to make decisions on those wells. Still, all these years in, the three that are probably most common are the three solvents, trichlorethylene, tetrachlorethylene and trichloroethane. Very common degreasing agents, solvents. Early on we used to see it in densely populated areas with private wells because through the 60's and early 70's solvents were used or actively sold as cesspool cleaning agents selling people on the idea that somehow their cesspools would run more efficiently if you threw chlorinated solvents down; not the best idea in the world.

Finally, obviously petroleum contaminants have been an issue, leaking gasoline tanks have been of concern through the 60's and 70's. The last dreaded contaminant of course is MTBE. And I should mention, as I go into MTBE, that we've given talks in the past on MTBE to the Legislature, we were very pleased that the Legislature has gotten on board in terms of recognizing this thing as a local and a national issue, MTBE in gasoline is something that's really got to be addressed and we still feel very strongly that way.

I should also mention that because -- again, in the interest of brevity I'm going to touch on MTBE relatively fast. As a contaminant of concern, we've done a separate fact sheet on that and another

contaminant, Perchlorate, and that goes into much more detail in terms of what we're talking about.

MTBE was detected by our laboratory in 1991. Since that time, we've done in excess of 49,000 analysis, probably well over 50,000 by now; that is the largest data base, I can say with some confidence that's bigger than most State databases, okay. Time wise I'm confident that there are very few databases that will go back as extensively as this that far back in time. We basically tried between '91 and '94 to get a handle on the problem and as we have in the past, we've dictated to our water suppliers to start monitoring, and in 1994 we made that decision. Now, I should say to you this is an area when I talked about voluntary self-monitoring, the Water Authority got on board with self-monitoring in roughly the same time period as we did, late 1991, okay; we do talk to each other.

You basically know what the problems are with MTBE from past presentations. It's a fuel oxygenate, it's used as an additive in gasoline, how it's getting into the environment is very complex. We're also seeing MTBE as a cross contamination product in fuel oil and in other products that carry through the petro chemical pipeline

so to speak. Highly soluble, that's why we're seeing it, that's why we're seeing so much of it, that's why we've seen more of it as the usage -- the percentage increase in gasoline has increased. It doesn't remove very well but we've got locations where public water suppliers are removing it very well, so if you keep an eye on it the technology can deal with it.

I should mention right now, we've been acting since really 1989 with a generic State guideline of 50 parts per billion. We very much expect that number to go down, the State Health Department has been talking about ten parts per billion actively for a little over two years. The New York State DEC uses that same ten PBE number as a number for remediation in its State's spill activities which are its remediation activities under the State Spill Law. Suffolk County Water Authority has been voluntarily shutting down, I think there are one or two wells that they voluntarily remove from service at ten PBE. The photo kind of gives you an illustration of where we were on board well in advance. EPA -- the industry has talked and I've been at hearings where the industry has talked and said the problem is not MTBE, the problem is all those leaking tanks in Suffolk County. I want to say to you definitively we do not believe that to be true, okay? The reason being --

CHAIRMAN BISHOP:

Are they mutually exclusive?

MR. PONTURO:

The reason being -- I'm sorry.

CHAIRMAN BISHOP:

Are they mutually exclusive?

MR. PONTURO:

No, not necessarily. The issue is is that the industry has made a broad comment of leaking tanks relative to MTBE. And while certainly

we're open to the possibility that installation issues are an issue, you should recognize the fact that we had through the late 70's and 80's I guess a very vigorous program of tank replacements and that today our tank replacement -- I'm sorry, the standards for tank replacement, double walled containment tanks, detection systems between, overfill protection, all these things --

CHAIRMAN BISHOP:

You're talking about tanks of gas.

MR. PONTURO:

In terms of gasoline tanks.

CHAIRMAN BISHOP:

Right.

MR. PONTURO:

Okay? That these are things we had in place and that largely have been taken care of, okay. So the point is is that we feel that there is a need to recognize that yes, tanks can be a problem in certain areas and in some of the most notable cases very definitely tanks are an issue, but we should recognize the fact, and we're trying to get on the national score board a sense that other mechanisms really need to be looked at. MTBE is going out of the exhaust of every gasoline -- of every motor. The MTBE is known to be in precipitation. MTBE Is known to be in the streams by virtue of recreational craft use and in surface waters, okay. Those things need to come out, okay, that needs to be considered.

CHAIRMAN BISHOP:

May I ask some MTBE questions at this time?

MR. PONTURO:

Absolutely.

CHAIRMAN BISHOP:

Or would that break your flow up?

MR. PONTURO:

I have no problem with that, my flow will be just fine. Go ahead, sir.

CHAIRMAN BISHOP:

Tanks; how many oil, gasoline tanks are there on Long Island that are believed to have spills?

MR. PONTURO:

Vito, could you throw a number in? Keep in mind, I don't get involved in the direct regulation in that program.

MR. MINEI:

I knew you were going to do this, it's the second page of our MTBE fact sheet. All of the gas stations have been replaced in the early 80's first with single-wall fiberglass and then followed up quickly in the mid 80's with double-wall fiberglass. And I think the point --

and I think that's -- we're talking about a few thousand tanks at something like 750 gas stations in Suffolk County.

15

CHAIRMAN BISHOP:

That are --

MR. MINEI:

That are replaced and were replaced over the last 15 years because of Article 12 of the Suffolk County Sanitary Code.

CHAIRMAN BISHOP:

There is a DEC spill list, right?

MR. MINEI:

Yes.

CHAIRMAN BISHOP:

How many tanks are on that list, that's what I want to know.

MR. MINEI:

There are still several hundred tanks that for one reason or another they were municipal in nature, still remain to be replaced. I'm trying to remember this fact sheet, I'm struggling here.

CHAIRMAN BISHOP:

But that's preventative, right?

MR. MINEI:

Yes.

CHAIRMAN BISHOP:

What I'm speaking of is --

MR. MINEI:

They're spills.

CHAIRMAN BISHOP:

-- tanks that have holes in them that have ruptured. Is there not a list in the hundreds of tanks that --

MR. MINEI:

Right. We certainly have fuel spills that we're still tracking down. Paul's point was that the replacement as a result of Article 12 predated MTBE as a lead replacement and then others. But yes, fuel

leakage, fuel spills remain to be a problem. In fact, our Office of Pollution Control follows up something on the order of 275 spills and leaks a year.

CHAIRMAN BISHOP:

Merging Paul's point and my question, are you saying then that because of the preventative measures taken in the 80's that the tanks that we have spills in now that currently have spills are not MTBE tanks because --

MR. MINEI:

I made Paul take out some of the slides. The slide Paul is trying to refer to that's no longer in his presentation is this map of all the MTBE designations, locations, and what Paul is saying is you can't

16

assign all of that MTBE detections to gasoline stations and gasoline tanks.

CHAIRMAN BISHOP:

I believe that. What I'm now probing is a different area which is is the -- I know from experience in my district that the DEC will tell you, "Oh, you have a fuel spill underneath that gas station from the 70's or the 60's and we'll get to it and we get to it," and that's probably about ten years from now.

MR. MINEI:

Okay.

CHAIRMAN BISHOP:

And I'm concerned that that kind of attitude is contributing to the problem of MTBE and other contaminants showing up in our well testing.

MR. MINEI:

And we share your concern. If you're citing the Jericho Marine site, that not only has --

CHAIRMAN BISHOP:

That's my personal favorite.

MR. MINEI:

Well, I can visualize that graphic and it's nestled up pretty close to Santapo Creek. So in terms of that stream's subsystem, I think it's relatively safe that it probably has reached that because that gas station went out of business quite a long time ago.

CHAIRMAN BISHOP:

Right.

MR. MINEI:

What Paul is saying again is that this MTBE, this gasoline additive is so ubiquitous that we cannot assign it purely to what would be a more manageable issue of let's replace gas station tanks. When you find it in so many locations in residential neighborhoods with no gas stations nearby, when you find it in surface waters with again, no gas stations nearby, you have to be concerned about the other sources.

CHAIRMAN BISHOP:

I assure you that I understand that point and I agree with you.

MR. MINEI:

But to answer you, yes, there are fuel tanks --

CHAIRMAN BISHOP:

My target is of the State DEC, I want to know why -- how they can take a cavalier attitude towards gasoline spills. That's really what I'm driving at. Doesn't it concern you, as scientists and health professionals --

MR. MINEI:

Oh, absolutely, absolutely.

17

CHAIRMAN BISHOP:

-- that it takes ten years to get a spill cleaned up?

MR. MINEI:

Absolutely we're concerned. Those discussions carry on and that debate of the extent of clean-up that should take place at various locations and how extensive that should go down gradient is a continuing source of debate between agencies. The terminology of how you characterize it is your language, not ours sense though. I mean, this basically is an enormous problem, you know, when you relate it to the resources to address all these problems, and that's our concern as we come back.

CHAIRMAN BISHOP:

Synthesized fashion, what do you tell the DEC is your position on the spills?

MR. MINEI:

Well, basically it's very brief, that these VLC's are such a concern as suspected carcinogens, we would like to see in almost all instances very vigorous clean-up, very extensive clean-up of not only gasoline stations but some of these other sources, dry cleaners. There's a number of dry cleaners that we've debated the extent of clean-up that we would like to see more comprehensive clean-up; and in fact, we have offered resources to help with delineating plumes and things like that. But it's one thing -- and people do it to us all the time -- to recommend an extent of reaction and what the resources in any agency can do to react to that. But that's a continual conversation that goes on quarterly, actually, between our department, Office of Pollution Control and the DEC.

CHAIRMAN BISHOP:

Your recommendations are based on your science and you probably know more about what's going on, I assume you know more about what's going on underneath the ground than State DEC does; is that fair?

MR. MINEI:

We think we know more about groundwater conditions than probably any place in the country. But a lot of these -- a lot of these cases get turned over to them. Please recall the relationship, when we detect groundwater contamination, our requirement is to notify the DEC and often times they take over the investigation. There's one now in Hampton Bays, I believe it's emanating from two different gas stations along Montauk Highway, we did a lot of the initial work, we alerted them to that problem, we turned over the actual investigation to the DEC, we're following up on some private well sampling -- and again, it sort of elevates the concern, but a lot of this we turn over to them.

CHAIRMAN BISHOP:

So what I want to know, as the people who know the most about what's going on underneath, are you seeing evidence of unacceptable contamination levels because of the slow movement of DEC to clean-up these sites? That's what I want.

MR. MINEI:

We remain concerned about the reaction time to a lot of these spills.

18

CHAIRMAN BISHOP:

Is that concern based on data that you're seeing?

MR. MINEI:

Yes, yes, it's data and experience. So even if you don't have site

specific data, we know enough about the characteristics of groundwater flow in Suffolk County to be concerned about these things. So it is a constant source of debate and concern.

CHAIRMAN BISHOP:

I think that's also an important policy issue for Legislators at this level and at the State level to understand.

MR. MINEI:

Especially when there's a dedicated fund out of what you pay as taxes when you go to the gas pumps.

CHAIRMAN BISHOP:

Okay, flow again.

MR. PONTURO:

Continue on. Okay, let's go on to the next slide. This is an area where, you know, I'm probably going to do a disservice to Martin and the people in the Office of Water Resources that have put a lot of time into pesticide monitoring. But again, I think the Legislature has recognized the importance of these efforts. I point out that about a month ago we actually -- Martin and I gave two talks here and out in the Riverhead office that it represented a pretty unusual joint meeting between two Legislative committees, the Health Committee and your own committee, sir, and I think it recognizes the fact that pesticides as a whole are of great concern to us in terms of our overall water resource planning and to us as a Health Department in terms of what exactly is out there and what are people drinking.

We've had a presence in pesticide monitoring, as I indicated earlier, going back to the Aldicarb problems which came to the fore initially from private -- a laboratory of the manufacture back in 1979, we're still finding that contaminant. So the point is is that we've been in there. I think, though, that the emphasis in terms of public perception right now has been, and we want to hone in for the purpose of this presentation briefly, on those activities that we embarked upon following the availability of funds through the Pesticide Notification Law. We've actively gone after the groundwater resource or the resource monitoring aspects of that State law and by and large we have had success in those areas and the next couple of slides reflect on what we've learned from it.

The intention from the beginning was to look at pesticides and to look at metabolites; Metabolites got brought up a little bit later on. Breakdown products of pesticides are really just starting to reach a national front in terms of even getting EPA and to ask its public

water suppliers to look for a very limited number of breakdown products. But we have felt -- again, Aldicarb was our good example. While we keep saying we found Temik, the reality of it is far more often we found very long-lived breakdown products and specifically in those areas there is something to suggest that those breakdown

19

products in the case of Temik specifically that there was data -- certainly data in the minds of some health researchers to say legitimacy to be concerned about those breakdown products. So in that sense, our mind set was set back in '79 to recognize that we've got to follow through on breakdown products. I should mention -- I'm sorry, sir.

CHAIRMAN BISHOP:

I have now gotten into the habit of interrupting you.

MR. PONTURO:

That's okay.

CHAIRMAN BISHOP:

There's no standards for the breakdown products.

MR. PONTURO:

By and large that is correct, that essentially we tend to be looking at just a generic catch-all State standard of 50 parts per billion in most cases. One of the slides that you'll see a little bit later on emphasizes that point a little bit further. I should mention that these were not groundwater resource studies as a whole, there was a certain element of -- it was non-random, a certain element of non-randomness to these specific studies. The intention was to look at impacts, yet at the same time it was a bi-County study. Again, we were after State DEC funds so we had the cooperation of Nassau County Department of Health, Nassau County DPW and the collection of samples our laboratory did the analysis, that was basically what happened. Again, we also had subprograms in there where we were targeting specific uses of concern and you've seen some of that work, golf course work, vineyard work, other agricultural activities. We're now moving into some work involving residential pesticide applicator locations to see if there are any issues with those offices as -- the facilities those operations in terms of as individual points of contamination.

Next slide. So what did we do during the course of this program? We collected over 42,000 samples, you can see the breakdown between

Nassau and Suffolk. During that period, starting in '97 through 2001, the laboratory was not resting on its laurels, it was expanding the analytical capabilities throughout, that's something that we succeeded in dangling in front of DEC to say, "Look, we can now look for additional contaminants," so that's what kept us alive through that period. So we increased from 70 up to 113, we expect that that will continue with or without DEC funding, that we'll be doing everything we can to continue that evaluative process.

In the next slide, these are the broad findings. And again, you know, I commend you to our previous presentations to go into a lot more detail about what we're talking about, the extent of the problems and so forth.

CHAIRMAN BISHOP:

Yeah

20

MR. PONTURO:

But for our purposes in terms of overview, we want to try and do some justice to it but at the same time I really think this is an area that interests a lot of people and there's a lot of good data out there. Between our previous presentations to you and our summary reports, I think there's more than enough information to get a feeling for where we think we're going.

In terms of those roughly 113, we detected up to 13 pesticides or the breakdown products in excess of recognized MCL's. We detected 52 of the 113 somewhere in the system, okay, indicated to our mind a pretty good selection criteria was applied in terms of our laboratory capabilities, looking at what was available out there in terms of leachability and so forth.

Overall we did a pretty good job in terms of the locations. You can see that 30% of them contained at least one or more. But again, it just indicates that we were good in terms of our targeting capabilities and I wouldn't apply that to the resource as a whole. Why don't we go on to the next slide.

CHAIRMAN BISHOP:

Before you leave that.

MR. PONTURO:

Yes, sir, I'm sorry.

CHAIRMAN BISHOP:

That was the study where the State funded it.

MR. PONTURO:

Yes, sir.

CHAIRMAN BISHOP:

And we were looking at agricultural areas to see the impact on both private and public wells.

MR. PONTURO:

Yes, but there were also components of that that were bi-county in nature, so we had to accommodate a lot of pesticide related demands over the period of '79 to 2001.

CHAIRMAN BISHOP:

It wasn't just agriculture.

MR. PONTURO:

It was not -- I don't want to mischaracterize it and say it was exclusively agricultural. And I think on the next slide when we look and you see where we sampled, I think you can see that certainly while the preponderance of -- and again, you know, this doesn't play -- I would refer you more in terms of to the slides that we handed off to you in the previous presentations in terms of viewability, but this is just intended for our purposes to give you a sense of the fact that we did a across section of sources, that we sampled private wells, public wells and community supply wells, bi-county. The preponderance, though, we succeeded in making our needs known in terms of the north

and south fork active agricultural areas, okay. And again, this indicates just the locations where there were detections. There are companion maps to this that show where are locations that weren't detected. But I think that for our purposes it shows you that in terms of the pesticides that we were looking at, overall in Western Suffolk we did not glean an awful lot of new information but we gleaned an awful lot of new information further east. Okay?

Keep in mind that, again, from the standpoint of these studies, they built on a knowledge base that we already had relative to some older pesticides. Okay?

CHAIRMAN BISHOP:

If I recall correctly, the percentage of private wells tested in these

areas, it was an intolerably high amount of them had contaminants.

MR. PONTURO:

Yes, sir. I believe that still comes across a couple of slides later on, so if you want to hold your question.

CHAIRMAN BISHOP:

Okay.

MR. PONTURO:

Okay, let's move on to the next slide. This gives you a sense of those pesticides that actually exceeded recognized MCL's. You'll see that most -- most of them have been banned or voluntarily removed from Long Island use. I will stress to you, though, that there are a fair number of them that are relatively of recent vintage in terms of the action of banning or removal. Nevertheless, the other thing to stress is groundwater moves ponderously slow, so the need for long-term monitoring for these contaminants. And quite frankly for MTBE, you know, it could stop tomorrow but the people that come after me in this job will have to always keep MTBE in the back of their heads. We're not going to walk away from that monitoring for generations, quite frankly, because we have to know, we have to know. Let's move on.

Talking about the private wells, I think this addresses a little bit more of your concern. This just gives you the laundry list of the ten compounds that were most frequently detected in those 834 private wells that we sampled. Essentially, Martin used the 2000-2001 period because it reflected the highest volume of laboratory capacity in terms of all those contaminants. It also brings in the ones that came in later on which are the breakdown products of Metalachlor and Alachlor.

I should mention in the context of this to show you that things are just starting to happen. Yesterday I was looking at an Iowa study that referred to 90% of the samples in the study, groundwater samples in the study, showing {Metaliclhor} breakdown products. So I think that what we've been saying and what we've been crying out for a long time, that the Metabolites need to be addressed at least in terms of environmental reporting and environmental analysis to find out is it out there, I think that word is starting to get out to some degree and it is moving forward -- yes, sir.

CHAIRMAN BISHOP:

Metabolites being the breakdown product --

MR. PONTURO:

That's correct.

CHAIRMAN BISHOP:

-- of the initial chemicals.

MR. PONTURO:

Okay? So when you see on this list Metalachlor, ESA and OA, those are the breakdown products of the parent Herbicide Metolichlor, later on you'll see Alachlor ESA and OA which are the breakdown products of the parent Alachlor. And you'll see for the purpose of this chart that while we do have some detections of the parent, they weren't high enough to really show up on this -- well, Metolachlor was, but {Alichlor} as a parent wasn't -- didn't really show up in the top ten, we certainly did detect it. And again, this slide also addresses what you were talking about before, an MCL being a formal standard in the Sanitary Code or in the Safe Drinking water Act, the UOC being the generic guideline that the State Health Department has adopted into its code standing for Unspecified Organic Contaminant which is a catch-all and under which, quite rankly, the same 50 is the way we applied MTBE, okay? Reflects on the fact that State Health has some general concerns about organic contaminants in general, but that there's not enough health data there for State DOH to feel comfortable enough to establish its own standard.

CHAIRMAN BISHOP:

The standard, though, for the parent product is not 50, it's 10?

MR. PONTURO:

It depends on what parent you're talking about.

CHAIRMAN BISHOP:

(Inaudible).

MR. PONTURO:

Well, the parent for Carbofuran was established at 40 by Federal EPA, okay? We have seen the breakdown products in the past of Carbofuran but it's just not happening, okay. But yeah, there can be a dramatic difference between the limit for a parent and the guideline for a breakdown product. Again, the thing to stress is parents have been historically addressed in the environmental health studies and therefore have gone to the finish line in terms of having established MCL's. The breakdown products and combinations of many breakdown products, you know, that combined factor really hasn't been on the national radar and we're hopeful to move that forward and you will see

more concern about that, and the way to do it is to look for it.

CHAIRMAN BISHOP:

I guess what I'm asking as I think it through -- Martin's on the edge of his seat, this is exciting for him.

MS. MARTIN:

It is to me. I think --

23

CHAIRMAN BISHOP:

I think you have to come up, though, because the stenographer needs you to.

MS. MARTIN:

Mr. Bishop, you're probably referring to something like the Alachlor breakdown products where the standard we're applying is 50 and the standard for Alachlor, the paraesticide is two parts per billion.

CHAIRMAN BISHOP:

And the metabolite we're finding is greater than two.

MS. MARTIN:

Much, much higher.

CHAIRMAN BISHOP:

Right, so that's my point.

MR. PONTURO:

And at much greater frequency.

CHAIRMAN BISHOP:

So if it was the parent we would have, you know, a certified concern, but since it's the derivative product the standard, the generic standard of 50, to me at least, intuitively doesn't seem to be appropriate.

MS. MARTIN:

That's our concern also.

CHAIRMAN BISHOP:

You didn't think I could understand something so complicated, did you?

MR. PONTURO:

Why don't we move on to the next slide.

MR. MINEI:

There will be three credits offered for all of this information today.

CHAIRMAN BISHOP:

I'm all proud of myself.

MR. PONTURO:

Okay, so this kind of summarizes what we have said in the previous slides. We have tested it through that period, again, looking at the period of maximum analytical capacity in terms of the pesticide program. We did 834 private non-community wells, I grouped them together there because the non-community wells tend to be as shallow and in the same areas of the private wells, of which this is the figure you were referring to before, Mr. Bishop, 50% having detection of either a parent product or a breakdown product. Multiple products being detected, not always finding any specific contaminant in excess of any standard. So in terms of dealing with people, what do you tell them? This is a serious concern to us and this is where we're trying to work with the State Health Department and ultimately trying to get

24

the word to the Federal Government that this needs to be addressed because there are a lot of concerned people out there.

Martin made a specific point about the fact that a fairly high percentage, 131 of that 834, had five or more compounds, okay, and that four of the wells actually went up as high as ten compounds, okay, not all of which exceeded anything for any one compound. So this is a challenge that we're facing all the time in terms of trying to tell people what does this data mean. Why don't we go on to the next slide and we'll try and move on to make people's concerns greater, unfortunately.

I think the important thing is that -- I'm being facetious. I think that this as a whole is a story that people should walk away with some confidence that we're addressing concerns and that we're actively trying to determine the environmental presence of these contaminants and that this is an extremely open process and that getting the word out to people is important for us and that recognizing -- telling people what we know and what we don't know are at some level in terms of the need for public involvement equally of importance to us.

Emerging contaminants has become a new buzz word, I think in my life I've seen a lot of environmental buzz word, but it's as good a term as

any. We've been concerned for quite a while about the presence of a broad array of pharmaceuticals and personal care, and Vito had me move that up to the top of list. Even though we don't know a lot about it, we feel this is an area where there is a crying need to do a lot more work. I'm going to talk about all these contaminants in groups very shortly. Perchlorate we have done presentations on in the past relative to some of our more specific problems. Am I losing --

CHAIRMAN BISHOP:

I want to ask questions.

MR. PONTURO:

Okay. Well, how about when we come to the individual slides?

CHAIRMAN BISHOP:

Okay.

MS. LOMORIELLO:

Can I ask questions too?

CHAIRMAN BISHOP:

Go to the individual slides.

MR. PONTURO:

Okay. We've got two contaminants that are on the national scale, Arsenic and Radon are things that you're going to read about. If you look at anything that discusses national water supply issues, those are two contaminants that will always keep creeping up. We've got -- in the world we've got 25 million people in Bangladesh drinking Arsenic, okay, in excess of more than ten times what is the new U.S. standard, okay, and that is a nation -- that is a worldwide environmental concern and people have a right to read about it and be concerned about it.

I want to talk about the fact that -- hopefully if you don't cut me for time, the whole issue of microbiological quality that I feel and a number of people feel that while the chemical end of things that have been developed over the past years have been legitimate, there is a still a concern -- and I'm going to try and give you a sense of why there's a concern -- of needing to assure to a great degree from a microbiological standpoint our water resources are safe to drink.

I'm going to talk briefly about Arsenic. There's been a New York State standard and many states and Federal standards were all 50 parts per

billion. A greater concern with more health effect studies and a long-term, long drawn out national discussion of what the standard should be has yielded at the final finish line ten parts per billion. That is a number that we're actively looking at in terms of what should concern us and the next slides will mention it. I should say we've got huge amounts of Arsenic data. Arsenic has been an analyte for many years in our analytical capacity, so we've got a lot of data and we can speak from authority in terms of the occurrence of arsenic. The sources, natural and agricultural, are certainly mentioned in the literature and both are of concern to us.

Let's talk about the data itself. I use 1997-2001 data primarily because it was a period of time where our laboratory analytical capacity, detection capacity went down to about one or two parts per billion, a significant number of detection or capacity of detection relative to a new standard. The detections are very, very low. We -- in our data from 1997-2001, only 17 community water supplies even had Arsenic detected, okay? Only two of them exceeded this proposed half of the MCL, just to give you a sense of what are the numbers like, okay? And I should mention that at those two locations we happen to have iron removal systems that are removing the Arsenic, okay? Those happen to be at a location of a very small water system that we have out in Montauk.

In terms of the private wells, we've only had three detections in all the private wells that we've seen in that period over, again, the ten -- the MCL of ten. So we just don't see this as a big issue. It will be a national concern, you will have constituents that will be reading as time goes by about Arsenic problems elsewhere in the country. I think it's important to stress to you and to everybody else in the audience that this is one of many problems that we've been on for a long time. Like everybody else, we've been waiting for the health effects decisions to be reached and we're happy to comply as our water supplies will be happy to comply with a standards. Luckily we don't see it as being a major issue. Okay? Next slide, or do you have any questions on Arsenic?

CHAIRMAN BISHOP:

No.

MR. PONTURO:

Okay, let's move on to Radon. Again, we anticipate that this is moving forward in terms of the national concern. You will find it mentioned in the U.S. News and World Report cover story on water resources today. Radon is a radiological contaminant, it's been recognized as an environmental health concern for many years. Many

parts of the country has Radon and people have Radon in their basements, it's a gas, inhalation is a great concern. You should recognize as I said earlier, all radiological contaminants, groundwater is of concern because of the long-term contact between the water and the subsoils, the subsurface. We do not expect any serious problems with Radon based on previous studies, we're awaiting a finalized standard.

It looks like the Federal Government is moving in the area where states that have programs that consider the contribution of Radon through basements which are primarily people that have basements in bedrock areas. Radon in basements is not a big problem on Long Island, or at least through Suffolk County. But the point is that EPA recognized what is called a multi-media approach, they recognize the fact that people's environmental exposure to Radon gas is predominantly through inhalation, predominantly environmentally through gas getting into the basement, radioactive gas seeping its way into basements. And then now we're moving on to the possibility that in some geological structures that water contribution can be an issue and that's why we're now going to see water supply in the next several years regulated for Radon.

Next slide. We have been involved in Radon in the past. We did a cooperative study with New York State Health Department in 1988, the highest concentration we encountered was 460 picocuries. The indication is that if a state has multi-media considerations -- in other words, if they consider from an educational standpoint what people may be getting in the basement -- that the drinking water component will probably be regulated at around 3,000, okay? The Suffolk County Water Authority voluntarily did an analysis in 1999 and showed levels, a high level that was roughly in the same range, 310. So it does show that there is detectable Radon, primarily the higher levels are the ones concentrations will be in the wells that are closer to bedrock because that's where the Radon is being emanated from -- is emanating from. But again, it is a very small environmental contributor. Relative to the fact that we don't have basement air problems, the thinking is that while it is an area that we have to be knowledgeable of and that there will be a public education component as time goes by, at this point based on our knowledge base it doesn't look like it's going to be a big problem. Nationally, very big, even other parts of New York State, very big, okay.

Move on to the next slide. Perchlorate is another contaminant that

we've talked to you about in the past. We've got a separate fact sheet on it, we've looked for it since 1998. The Suffolk County Water Authority looked at the kinds of uses, looked at some problems involving the Southwest relative to uses. You will see that it's not an organic chemical, I have spent a lot of time talking about chemicals of an organic nature. Perchlorate is a salt, okay, extremely high solubility, relatively difficult to remove. So it's -- where we have contamination it concerns us.

The types of uses. Broad arrays of industries use it, not an awful lot of it, but it's used in virtually every state of the union according to EPA, predominantly in rocket fuel. Ninety percent of the rocket fuel -- of the Perchlorate used in the United States is used in

27

rocketry, solid fuel rockets, of that 90%, 90% is used in the space shuttle, so just to give you some sense of what we're looking at. It's the secondary uses, obviously, you know, although personally I'd like to see a rocketry program on Long Island, I don't anticipate that's going to happen.

CHAIRMAN BISHOP:
Even after this.

MR. PONTURO:
Hopefully not. Obviously we look at the other uses of concern to us, the usages of fire works. We saw in the literature the possibility that agricultural components could be an issue. As I go on and I show you where some of our detections are, keep that in mind; we feel that that is something that needs to be definitely developed. The State of California is very concerned about that component and they've got some of the worst Perchlorate problems in the country.

When the Suffolk County Water Authority, reading about some of the work that was being done elsewhere, started out -- starting us down this road for us in 1988, they hired a private laboratory on the west coast to do some initial samples. Initial location, one of the initial locations was a well that they took over years ago from when the Bomarc Missile Base stood down. All they knew at that point in time, as did we, was that, well, there used to be rockets there, maybe they had a well field literally right next to that site, it seemed like a good location, they found Perchlorate, okay. We don't want to go into too much detail in terms of what that involves because that involves activities and a Notice of Claim that's been filed against the County of Suffolk because, as you know, we took over the rest of

that site. Nevertheless, I can say in a broad sense that, you know, based on the data it does look like certainly there are issues involving the disposal of fireworks on the Bomarc site.

We have, however, and this is a good --

CHAIRMAN BISHOP:

Fireworks did you say?

MR. PONTURO:

That's correct. Confiscated fireworks were disposed of on the Bomarc site.

CHAIRMAN BISHOP:

Oh, I see.

MR. PONTURO:

Okay? The -- we should say, though, that subsequent samples, there have been some changes in practices, subsequent samples indicate significant improvement in groundwater quality. State DOH gave us and the Suffolk County Water Authority an action level of 18 parts per billion which is what the State Health Department -- which is what the public water suppliers are currently being told to comply with. Suffolk County Water Authority, as are we, are aware of the fact that there is a broad amount of the health effects data, again, driven by some of the really serious population issues out west. You've got

tens of millions of people in California that are drinking detectable levels of Perchlorate below what was a California State Guideline which also was 18. So the health effects studies are being driven by those kinds of concerns. Our findings are relatively minor but, again, we've been in very close conversations with the State and the Federal Government all along on this. But the point is a possible reduction of the action level possibly as low as the detection limit which is around two parts per billion, three parts per billion, is seen by a number of people as being a real possibility. So in terms of our planning and our discussions with the Water Authority and their own internal discussions, they're acting on the assumption that there will be a reduction in the action level.

If we can move on to the next slide. I mention the fact of where we are, we have seen detections in 6% of the wells -- again, we feel talking about detection as opposed to exceedences is important here -- that's 37 wells on 21 sites, it's wells as deep as 609 feet. Again,

an illustration of the fact that, you know, contaminants can be drawn down into deeper aquifer segments by deeper wells. When you get away from the Bomarc site, most of those community wells have been in the three to 15 part per billion range. In test pumpages, not to the public but the Water Authority test pumpage of the one well that they voluntarily shut down back in '88 showed a relationship with pumpage where they were able to get the numbers up -- again, blown to waste, not to the system, people were not exposed to it -- but they were able to get numbers as high as 145 parts per billion; small potatoes compared to some of the levels in the millions of parts per billion in the southwest. Nine communities, again, representative of our private wells and representative of our next regulatory or next monitoring priority in terms of limited lab capacity, we found 7% there. And then finally later on, in late 2000-2001 we were able to start moving into the private wells and we have done a limited number of private wells and we've seen 13% of those relatively targeted locations showing concentrations of up to 49 parts per billion.

The next slide ought to give you a sense of the public supply wells and their -- where the detections are and there are some interesting patterns that we feel need to be evaluated. You will see the red dots indicate detectable perchlorate, I know it doesn't show up as well on some of the -- on what you have in front of you. But the prevalence on the north fork of public supply wells of detection of Perchlorate and the absence on the south fork is interesting. Certainly it doesn't -- we see an agricultural relationship there yet but we still need to develop an understanding of perhaps what types of activities that seem, one would think, to predominate on the north fork but yet haven't had an impact on the south fork. I'm just pointing this out to you in honesty that there's a clear need that there's a lot of work that needs to be done.

When you go into the western wells, the wells that have detection in the western part of the County, actually most of those have one of two things that are noticeable to me; old detectable levels of pesticides, okay, indicating older farmer activities, high to moderate levels of Nitrates. One of the things that we're hopeful of is that the -- as we talked earlier about the groundwater model yesterday, we're hopeful that in time by running the model back in time and looking at older

land uses, that we may see some of our questions answered relative to the occurrence of Perchlorate. And we feel that this is very important to us in terms of knowing what's going to happen in the future. Next slide.

CHAIRMAN BISHOP:

We're leaving Perchlorate now.

MR. PONTURO:

We are leaving Perchlorate.

CHAIRMAN BISHOP:

So it's a good time --

MR. PONTURO:

Elvis has left the room. Go ahead, sir.

CHAIRMAN BISHOP:

Perchlorate -- Radon and Arsenic basically not a concern. Is --

MR. PONTURO:

Based on what we know right now, I would say that's the case.

CHAIRMAN BISHOP:

Is Perchlorate a concern at this point?

MR. PONTURO:

It is a concern -- I would say to you it is of concern from two standpoints. Number one is if the health effect studies pass muster in terms of the people that are -- the professional environmental health people in the country that are reviewing the current -- the new studies, if that indicates that a drinking water standard needs to go down to the detection limit or somewhere thereabouts, okay, the --

CHAIRMAN BISHOP:

And that's what they're indicating to you, they're in the process of dropping --

MR. PONTURO:

It becomes -- yes. It becomes a more significant problem and it becomes -- and here's item two, it becomes a much more significant problem when you looked at the geographical distribution of those detections, okay, particularly on the north fork. And the Suffolk County Water Authority is more than aware of that and, you know, there have -- as best as they can in the context of our knowledge base right now are trying to evaluate what options they may have to seek.

CHAIRMAN BISHOP:

And where is it coming from? I know you touched on it.

MR. PONTURO:

I would say to you that our assumption is that the majority of these low level detections, okay, seem to have a relationship in a broad sense to agricultural activities, yet there are wells that are clearly impacted by agricultural that don't show Perchlorate. So it's not universal, it's not mutually exclusive conditions, okay, but there

30

seems to be a relationship.

CHAIRMAN BISHOP:

That fascinates you, right?

MR. PONTURO:

And there seems to be a real -- as far as we're concerned, especially in the context of the standard going down, there's a real need to understand that, okay. Because if it reflects on current uses of agricultural materials that we're just not aware of contain Perchlorate, for example, that needs to be addressed.

CHAIRMAN BISHOP:

Vito wants to say something.

MR. MINEI:

(Inaudible).

MR. PONTURO:

Yeah. I was going to -- the next slide actually kind of addresses that to a degree. Treatment. I want to talk a little bit about in the context of some of these contaminants that we have a better handle on, the fact that treatment has a roll in terms of our overall management criteria, okay. You'll see on the slides three treatment systems, a carbon filter, a granal-activated carbon filter of the Suffolk County Water Authority, and air stripper which is owned by the South Huntington Water District and a -- it doesn't show up very well, a drawing of a Nitrate removal plant that we built back with an EPA Grant back in 1991 for the Village of Greenport initially which is still running like a champ thanks to the due care and diligence and day beating of the Suffolk County Water Authority and is removing Nitrate, and I should mention is also removing Perchlorate. The site where this Nitrate removal plant is, Mr. Bishop, also happens to be one of the detects of Perchlorate. So we do know that there's a technology that will remove Perchlorate. The issue is, as it is with many technologies, very few technologies make a contaminant go away, there's always another media that has to suffer or sacrifice. In the

case of the carbon filters it's in the carbon, the carbon has to be disposed of, hopefully environmentally properly, certainly off Long Island, okay.

In terms of air, admittedly, air strippers allow the contaminants, if they're volatile enough which is why you would make a decision on air strippers, to go into the air, okay. The argument is that there would be a UV breakdown of a number of those contaminants, but nevertheless it is a media transfer and being honest with people is important. The Nitrate removal plant that we have illustrates the third technology that we've seen which is iron exchange. The Suffolk County Water Authority uses it in removing iron on some of their south shore water plants that they've built over the past couple of years in response to some of your iron problems in your Legislative District, Mr. Bishop, basically same technology, okay. The problem there, of course, is you're transferring the iron, or in this case the Nitrate and Perchlorate, to another media, okay. Ultimately a resin, the resin has to be in this case regenerated, the regeneration process creates a

31

waste, the waste has to be disposed of in a manner that is environmentally sensitive, that meets standards.

CHAIRMAN BISHOP:

How do we know that?

MR. PONTURO:

There are no free rides in this business. Nevertheless --

CHAIRMAN BISHOP:

We truck it out elsewhere?

MR. PONTURO:

Well, in the case of the iron removal plants, obviously you're not dealing with a toxic contaminant, those waste products are going to -- the liquid waste fraction is going to in most cases Southwest Sewer District. In the case of this Nitrate removal plant it's going to the Greenport Sewer District, Greenport Sewer Plant, so there's no -- as I said, there are no free rides environmentally. However, I think it's important to recognize that Vito mentioned earlier there's a lot of remediation that goes on, there's a lot of clean-up that goes on. We've actively encouraged, where technologies are available we've actively encouraged treatment where it's an overall good decision, geologically speaking, engineering wise, public health wise. Because we feel that this has a significant role in terms of the management of

the resource, okay.

We've actually seen some wells where the Water Authority or other water suppliers are actually able to stand down treatment because the water has met standards, that we've dealt with a source of contamination or sources of contamination that have gone away, okay. We're not about to suggest that's universal, but what I want to try and do, since this is primarily still quality as it addresses the resource, to say to you that treatment has a significant role to play, okay, and it's one that we're actively encouraging in the best interest long-term of the management of the resource.

Let's move on to the next slide and get back into some of where we're going analytically. I moved up the pharmaceutical and personal care product. We're very concerned, this is something that's been addressed in many meetings in terms of environmental groups that are concerned. There's -- we're starting to see data come out through U.S. Geological Survey, internationally Germany and England are doing some very good work in terms of what we would call personal care products. When we talk about pharmaceuticals we're talking about over-the-counter drugs, we're also talking about prescription drugs. So this is an area where our main role at this point is an initial shot that kind of evil -- I see parallels to our pesticide concerns. We wanted to try and look at what's being used most, what other data is out there showing it in the waste stream of sewage treatment plants and things like that. So we want to try and make the best decisions we can working in very close conjunction with the Public and Environmental Health Laboratory over analytically what equipment do we have that could potentially look for these contaminants and to try and expand our ability in these areas.

32

MS. LOMORIELLO:

Can I ask a question here?

CHAIRMAN BISHOP:

Please.

MR. PONTURO:

Go ahead.

MS. LOMORIELLO:

I don't know if this is on.

CHAIRMAN BISHOP:

Barbara LoMoriello is the Chief of Staff to Legislator Cooper.

MS. LOMORIELLO:

Regarding the pharmaceuticals and you spoke briefly about how the hospital -- not hospital, but the prescribed --

MR. PONTURO:

We're talking about prescription drugs and non-prescription drugs.

MS. LOMORIELLO:

Right. I was just wondering --

MR. PONTURO:

Not necessarily hospital usage.

MS. LOMORIELLO:

Well, I have to just ask this question about it.

MR. PONTURO:

Go ahead.

MS. LOMORIELLO:

Because in my past I've had experience with facilities that had to use large quantities of prescription drugs and there's no real mechanism it seems for the pharmaceuticals when they're prescribed to let's say group homes or anything else or hospitals to -- once they're discontinued to get rid of them, and a lot of them are flushed down the toilet. And I was wondering if maybe there are any studies around those areas where there are hospitals or outpatient facilities and what the outcome would be; is there?

MR. MINEI:

Not so much on hospitals but one of the definitive studies Paul is talking about was done by a colleague of ours in South Carolina where he studied two different tributaries of the same stream. One was new affordable housing and young couple, they found very few pharmaceuticals, another tributary had an adult home on it and he said --

MS. LOMORIELLO:

Exactly.

MR. MINEI:

-- he found every pharmaceutical known to human kind with regard to

it. The concern here is it's an emerging issue and, number two, there aren't standards for a lot of these pharmaceuticals. And Paul's point is we're working actively with our Environmental Health Laboratory to make sure we have the analytical capability to sample and analyze further.

MR. PONTURO:

The other thing --

CHAIRMAN BISHOP:

But in the sewerred areas it's going to go through the sewer plant, right?

MR. MINEI:

Yes, yes.

CHAIRMAN BISHOP:

So this is entering mostly in the non-sewerred areas.

MR. MINEI:

Yes.

MS. LOMORIELLO:

Because that's where the homes, that's where the homes would be --

MR. MINEI:

Well, in areas of the country where they have sewage treatment plants discharging to streams, a lot of this work, especially if you look at antibiotics, a lot of sewage treatment works are biological systems. So one concern is as we more and more rely on the use of antibiotics, what will be the effect on our treatment capability. And number two, as they get into the environment, antibiotics have nontarget organisms that they can affect as well. There's multiple concerns about pharmaceuticals.

CHAIRMAN BISHOP:

Antibiotics kill living things.

MR. MINEI:

Yes, that's what their purpose is. And when they're out -- when they're released out into the environment, they don't have to attack what the antibiotic was prescribed for, so there's a number of concerns. And Paul's point is once again we're trying to be on the forefront, the cutting edge before standards are set for this.

CHAIRMAN BISHOP:

You're ahead of the curve.

MR. MINEI:

If we could move along, I was hoping to get, you know, for the sake of time --

34

MR. PONTURO:

I do want to stress to you that we're not talking universally about improper disposal of pharmaceuticals.

MS. LOMORIELLO:

Right.

MR. PONTURO:

Okay? The point is is that they -- my point is is that there's a second mechanism that we need to bring up which is the fact that pharmaceuticals by their nature are excreted significantly for significant periods of time. The uptake is relatively low for many of these pharmaceutical compounds and so that it will be in the waste stream. While I'm not minimizing your concern about if there is an improper disposal issue, I wouldn't minimize that, the point is is that I think you have to recognize that it would be in the waste stream to some degree regardless and that's one of the things that we're trying to evaluate. And it's important I think to make that distinction as we move along through this process to recognize that there probably are two mechanisms there, okay?

MS. LOMORIELLO:

Thank you.

MR. PONTURO:

All right. So again, we're looking at, again, very broad groupings just to try and give you an overall sense of what we're trying to address.

Of personal care products if you will or household products we want to try and get ahead of that plastersize have been an issue for a long time. Food antioxidants we want to try and see if we can get a handle on that. Next slide. This will give you a sense of where we are right now. I mentioned earlier that we're seeing extensive changes in terms of laboratory I want to mention a couple that we found. We have found very infrequently but -- and in shallow private wells that I should mention also show other sewage related indicators. So I wouldn't suggest these detections indicate an aquifer segment

contamination, but it just shows you that if you are -- at least based on what we know right now, if you're unfortunate enough to have a very shallow private well immediately downgradient of a cesspool, okay, a high concentration of contamination, we're also seeing detectable levels of Deet and Ibuprofen which is a trade name Tylenol and other products. Gemfibrozil, which is a Lipitor alternative, that has been mentioned in Europe extensively where it's much more popular. We have detected caffeine, that's been mentioned in the literature many times. If you want to find caffeine, go to the off shore waters in Seattle. And again, I mention the antimicrobials.

CHAIRMAN BISHOP:

I'll add to your play list. You know in Suffolk County the number one prescribed medication is Psychotropic} drugs.

MR. PONTURO:

Yes, sir.

35

CHAIRMAN BISHOP:

Because we have all the mental hospitals in the area.

MR. PONTURO:

I should mention that one of the things --

CHAIRMAN BISHOP:

There was a time when a sixth of our population were in the hospitals.

MR. PONTURO:

One of the lists that we gave to our PEHL in terms of evaluation was the list of the most popular drugs, okay; we got that we list from our own pharmacist. We also got some -- we also got off the Internet some national numbers. So again, it parallels our pesticide approach in saying well, let's consider what has the best chance of showing up but let's also consider what's being used most. Okay, so we're trying to make some reasonable decisions based on this.

All right, I'm going to move out of chemicals and briefly touch upon something totally different which is microbiologicals. Again, through this whole process nationally the radar has been primarily on chemicals, and rightfully so. But in the middle of all this we have seen significant water-borne disease outbreaks. We saw a major outbreak in Milwaukee a few years ago. Two years ago {Walkerton}, Ontario, an Ecoli outbreak, half the town got sick, four people died. Okay? We always have to have a sense of is -- we have always have to

look harder in terms of water quality and say are we missing, what are we missing? I'm a very neurotic person and I'm the kind of person that you want to see doing this job.

Anyhow, what's a little bit disturbing about a number of these water-borne outbreaks are that our microbiological safety net, looking for coliform bacterior as an indicator of fecal contamination. While it's held us very well, and I emphasize this, going back to the turn of the century, there seems to be -- due to the fact that a couple of these outbreaks didn't appear to show coliform violations seems to say -- drive the force of saying what can we do better. You will also see people keep talking about, well what about all these unreported intestinal illnesses? You'll see reports that, you know, twice a year everybody will get some sort of diarrhea related illness and it will always come up, how much of it is food, how much of it is hand-to-mouth exposure to somebody who's got the same bug, right? How much of it is water? It's a legitimate question to ask and we're going to be trying to answer that as best as we can.

The third bullet is very important to us. The segment of the population, growing segment of the population that's immunol compromised. Obviously we're not just talking about immunol compromised diseases, we're talking about people that are undergoing chemotherapy, certain heart medications, transplant medications, people on chemodialysis. There are studies that indicate all these people have -- are immunocompromised as far as EPA. And they define -- EPA said -- projected right around 2004 about 20% of the population will be immunocompromised as they define it, which is pretty much as I've laid it out to you right now. So that clearly

36

there's a need for better indicators and I want to give you a sense that this is a surface that we're trying to scratch.

One more slide. Okay, the buzz word is a fecal indicator and looking for alternatives to coliform. Well, we've been looking at one of the alternatives all our water suppliers since 1989 which is Ecoli. But we have another study under way that I just want to mention and indicates, so far indicates very good quality data in the sense of non-detections is Enterelcosis}. And that's been mentioned in the literature as perhaps being a good secondary indicator. So we've been running Enterelcosis} now since the first of the year to the tune of about 25 samples a week. So it's a very controlled study that we're doing looking at worst case well locations, community -- small non-community wells, some of our community wells repeatedly, month

after month, going back to the same locations. We feel that a targeted study was necessary given capacity, and the State Health Department has helped us out in terms of guidance in that area.

Okay, we're approaching the end point, at least as far as my portion and then Vito wants to take over with a few more points. Next slide. I want to go back to the comprehensive plan and since recommendations were mentioned earlier in Marty's presentation in terms of studies that reflect additional things that need to be done in terms of the aquifer. I want to come back to a recommendation that we've tried to -- that are quality based which is more monitoring. We have done a lot of it in terms of the water sources but I think I wanted to try and give you a sense of a isolated specific recommendation which is the value of monitoring wells, what we used to call land use wells.

We've been pushing for in terms of our involvement in State and Federal superfunds what we call outpost wells. If we know we've got contamination that's off a site, we're pushing that that responsible party install outpost wells ideally say midway between, considering the direction of groundwater flow, that known contamination and where the nearest public supply well might be. We think there's a lot of value to that. I think that this is something that should move forward in terms of greater consideration, although it obviously would be considerably costly. It's something that should be considered as time goes by, especially in the context of the groundwater model and once we move on to the Source Water Assessment Program which is what Vito is going to talk about next.

I think the next slide is where you take over, Vito. Thorough enough for you?

MS. LOMORIELLO:

Yeah.

CHAIRMAN BISHOP:

That was great and I have many questions.

MR. MINEI:

Give me a couple of minutes to sum this all up, Dave, please?

CHAIRMAN BISHOP:

Yes.

MR. MINEI:

Paul is not only our chief neurotic but I think often times, Dave, I have expressed my pride in being associated -- I have mentioned many times, I don't believe there's anyone in New York State that knows more about the water supply issues than Paul Ponturo and the support cast with Marty Trent and others is a source of pride. And our laboratory, coupled with the Water Authority's laboratory, I think gives us a capability that's unparallel anywhere in the country.

We talked about a little bit about surveillance and I'm sure you got a good feel for how seriously we take it and how comprehensive it is here. We talked a little bit about regulations and the pride Suffolk County takes in the Open Space and aquifer Protection Programs a little bit. I want to go into the other part to this, it was something we touched on yesterday. From time to time, week to week we know water quality is in pretty good shape here in Suffolk County because of all the surveillance and regulatory programs. We've talked about Article 6 of the Sanitary Code on housing density and Article 7 and 12 about controlling toxic chemicals. But the thing I've felt we were missing is, again, the new generation of long-range planning, that's what the Source Water Assessment Program is. It was required as part of the 1996 Safe Drinking Water Act, and if we can have the next slide, please, Larry.

I'd ask those who are following in the hard copy please to avert your eyes from -- the conclusion slide is out of place on the hard copy, we had a computer breakdown so I'll get to the completion at the end. By law, the Source Water Assessment Program has various components of this. We're to delineate the source of our water supply, inventory contaminant inputs to the source, determine the susceptibility of our source and to provide an assessment of the information to the public. Next slide, please.

This is just sort of a simplified graphic of some of the simplified -- some of the sources of contamination we have not only here on Long Island but elsewhere. I think we're all very much aware of these. Next slide.

We talked yesterday briefly about the evolution of groundwater modeling. I took you through quickly the Healy Shore model that was produced in the late 60's, all that was was a physical model of a transect from Huntington down to Robert Moses. It was followed in the 70's by the United States Geological Survey that had a physical model called an analog model, they used electrical components to try to represent different characteristics of our groundwater system. And we moved into the 80's into what's called computer or digital modeling, it, again, is mathematical equations used to represent the

characteristics of our groundwater system. The core of that group on Long Island came as students from Princeton University and started groundwater modeling and to that date modeling has moved forward.

Martin yesterday told you that the model that we're using for the Source Water Assessment Program literally looks at the movement, the quantity of groundwater and the quality in seven layers. So there's a lot of information on stream flow that can be simulated out of this

38

model, but more importantly is the quality issues as we talk about source water assessment. Next slide, please.

One of the important elements of all this modeling -- this is a busy graphic but if you can just follow with me -- what those blotches represent are public supply well fields and the different times of travel in a three-dimensional sense to the different public supplies. We have a very ambitious work plan under way where we will have a simulation of every public supply well in the Nassau/Suffolk area, this is overall. Next slide, please.

This is a two-dimensional representation of a well field probably a stone's throw from here in the industrial park. And what this represents -- and I'm color blind so please forgive me -- the yellow boundary is a short-term travel distance to the well field to the right of this graphic, moving to the left, we have a different color which is a different time period, then 10 to 50 year period and you move out to 100 years. Also coupled with this, the colors in the field of the graphic are land use. You've heard many times about how proud we are in Suffolk County of the Planning Department's Land Use Geographic Information System, the GIS. Again, I think it's unequaled anywhere, how detailed and comprehensive the land use information we have.

So what the Source Water Assessment Program goes through is evaluating what's going on in the land surface and we've discussed that pretty much water supply protection, groundwater protection is a land use management decision here in Suffolk County. So we have the land uses represented on this graphic, also we have inventories from our Pollution Control Office of different sources of contamination. And we have a susceptibility evaluation that's under way where you look at different parameters. Our biological parameters can move short distances so you would be concerned about any releases of biological contamination virus, pathogens from residents if they were nearby a well field, and you can see on this graphic there is indeed some

residential land use close to that well field. As you move to the left or upgradient, the water moves from the left to the right in this graphic as you're pumping, so there's more industrial uses. So then we start to get concerned with some of the volatile organic chemicals, the solvents that are in use, and then from this evaluation you can do times of travel to the well fields with regard to the impacts on it.

In a three-dimensional sense, they also have another model, it's called particle tracking. When you look in profile you can see how the particles move from a source to a well field; very important. Because you can do one of two ways, you can go forward in time from a source and impact a well, or if you have an impacted well you can go backwards and try to isolate the sources; very powerful tool. In fact, this truly is remarkable capabilities. We're one of the few places in the country that have this kind of modeling. {Kim, Dresser and McCee's} is the consulting firm doing it and they're one of the handful of top consulting firms in the country. Next slide, please.

So you have all this information that will be put together. What do you do with all this assessment? The problem with SWAP is that it stops, it is not by definition a management plan, it is strictly an

39

assessment of the sources of contamination as it impacts your water supply. But it does have a lot of values and we're planning to make that move forward into management. It certainly will be important to us in a regulatory sense, it will help guide us with regard to monitoring of public supplies. It provides input to the water suppliers. Because you can now monitor or model out to a hundred years, it will give a head start or some foresight on to well locations, treatment needs further on down the line, and also it will help us with regard to public education. We want to get the word out. When people came to me and asked, "Should we get involved with this," who knows more about groundwater and water supply than Suffolk County? It was this long-range planning element that we felt very strongly about and why we got involved with it and the State Health Department was really very agreeable to it and really kept upping the anti. Originally they thought maybe 100 to \$200,000 would cover it; the price tag for this study is in excess of \$500,000, the results of this study are to come out next spring. I think we should probably have a presentation specific to the source water assessment at some time late in the fall, probably early winter because that's when the public hearings would take place. So we'll be hearing more and I hope that the acronym SWAP becomes part of people's parlance when we talk about long-range planning.

I wanted to wrap up, Dave, if I could. At the beginning I made the statement that the conclusion yesterday we felt that the sheer volume the quantity of groundwater was there to certainly serve water supply. And now even with all the caveats, and we hope we didn't frighten you too much with regard to some of the concerns, certainly with private wells, there are administrative concerns about the time it takes to set contaminant levels in drinking water, there seems to always be emerging issues with us. But when you couple the elements we have here in Suffolk County, it's the reason for the guarded optimism and the positive statement I made. Obviously to be prudent we should weak the findings of the Source Water Assessment Program and we can talk about more definitive conclusions and where we go from there. But I think when you couple the quality of the resource of the vast volumes we have that is protected that's high quality, in the Pine Barrens and elsewhere in the County. Paul talked about the level of treatment technology, it's something that has really advanced over the last few decades at different types of technology for various parameters, it adds to our confidence. And also the sheer management that takes place here. We're proud of our articles of the Sanitary Code that talk about protection, but the towns should certainly be proud of the upzonings that have taken place and some of the actions they have taken as well.

We talked at length about the surveillance, something that we take very seriously here in Suffolk County, and now we have added to this the long-range planning. So that's the reason for the guarded optimism, that's the reason for the positive statement, obviously the vigilance needs to stay in place.

MS. LOMORIELLO:

I have a question.

40

CHAIRMAN BISHOP:

Go ahead, question.

MS. LOMORIELLO:

Yes. I have a question regarding -- I don't know if you addressed this yesterday or earlier today. It's regarding boat yards, you know -- boat yards? Okay. And we have plenty of boats on Long Island and of course, you know, they're all pulled out and they're all worked on and the chemicals all are on the ground it seems. I don't know what chemicals that you've identified would be traced back to the boat yards, but I guess my concern is that when we acquire land, and if

it's a boat yard or if we do first the environmental study, there needs to be a clean-up of the area. Is there a proactive way or anything that we're doing to look at boat yards in the area and the chemicals that might be given off every year when boats are being stripped and repainted?

MR. MINEI:

That was the specific subject of a pilot study that was done out at {Cockel's} Harbor Marine out in Shelter Island under the Peconic Estuary Program; it's where Billy Joel gets his boat done and Jimmy Buffet has his boat done. But the important part of that investigation was it looked at paint removal capabilities and how to handle the materials. Because they're right along the shoreline, boat yards, there's a concern about storm water drainage systems nearby, so the idea of how to protect runoff from leaving the site, so there was a number of recommendations. Cornell Cooperative Extension, Seagrant worked on it with the boat yard, the marina operator there, to come up with recommendations on minimizing that source. As you know, too, the bottom paints, the formulation has been changed. But also the sanding, the paint stripping, all of the other -- you know, the discharge from the sanitary systems of boats is always a concern, but yes, that's being addressed. And quite honestly, the Association of Marine Industries has been very active partners in the Peconic Program because they want that to be considered a main resource, recreational resource and not a source of contamination. So we are addressing that issue.

MS. LOMORIELLO:

And just to follow up, I just wanted to just say that I know that you're following up but it is not -- it doesn't seem to be one of your greater concerns as pharmaceuticals and all the others that you pointed out.

MR. MINEI:

Well, just look at the distribution of the maps that Paul showed. I mean, when you talk about any of these contaminations starting with the historic ones of Nitrate moving forward with the solvents, you know, it's industrial sources, it's household uses of those and pharmaceuticals. Again, it's the sheer distribution which makes it a comprehensive issue. The boat yards, we know the sites, we know how to deal with them. And quite honestly, I haven't found a marina operator that doesn't want to cooperate. They, again, want to be seen as part of the industry, part of the tourism attraction to Eastern Long Island, so they've been very actively involved in some of these studies and trying to correct some of the problems.

MS. LOMORIELLO:

Thank you.

CHAIRMAN BISHOP:

Monitoring is one of the themes of the presentation and we had a very successful monitoring partnership program with the State DEC that we've learned about earlier and at earlier hearings and we reviewed today. What is the future of that initiative?

MR. PONTURO:

I think it's continuing. We have tried to be pragmatic. You're aware from the previous hearings that DEC's position is still pretty much that they want to move on elsewhere in the State relative to the issue of drinking water resources. So as a result, we're now into our second year of no funding for pesticide monitoring of private wells and that was the subject of several hearings here. That doesn't mean we're walking away from it, but we are -- and by the same token, that still -- there are still other projects that we're trying to move forward on. We're still -- we still have other work plans that DEC is interested in, it's just that there were plans that don't involve private well monitoring. That's not to say that we're happy with the circumstances. We still are standing on the idea that we feel that based on the data that Martin has developed over the past several years there's still a need to move forward more aggressively on a much more shorter time period than we're now capable of to sample the four to 5,000 private wells that we feel are in closest proximity to active agriculture in order to get a fair sense of the extent of that problem.

CHAIRMAN BISHOP:

The State grant was for what years?

MR. PONTURO:

Basically the -- Marty -- I may need Marty's help on this thing, but basically the grant as a whole is still continuing. As long as he's here, why don't I have him talk.

CHAIRMAN BISHOP:

It was my understanding that the grant has been cut off; is that --

MS. MARTIN:

No, it hasn't been cut off. The program actually began in 1997. For the first two years we received \$100,000 in funding in '97 and '98, we then signed a long-term contract with the State for a million dollars

worth of funding over five years. We're basically in the fourth year of that contract now and the funding has been reduced from the initial years where we were expecting and receiving \$300,000 a year to this year our funding will be 131,000.

CHAIRMAN BISHOP:

Okay. So they have reduced the grant by almost two-thirds. Does that compromise the extent of the study? You get less money, are you doing less things?

MS. MARTIN:

Certainly, we have fewer resources.

42

CHAIRMAN BISHOP:

Yet it's at a time when you have found more significant information than you anticipated when you started the study, correct?

MS. MARTIN:

Correct.

CHAIRMAN BISHOP:

So it's counter intuitive and counter productive.

MS. MARTIN:

We also think that way.

MR. MINEI:

I'll take the mike from him, he's personally involved. But the important points to be made is some of the labeling decisions made from the DEC about removing some of the chemicals have come out of this study and a lot of the important issues deal with this idea of private well sampling. You heard from Paul, you've heard from Martin several times, this is a very important subject to us, not only because of the public health implications for those actual people using those wells, it's a major component of our overall monitoring program. It provides a lot of useful information, not only to drinking water decisions but also to our surface water management concerns as well. We feel very strongly about the private well sampling.

CHAIRMAN BISHOP:

I know that you're hesitant to -- perhaps you're hesitant to make waves on this, but Legislators should know what the implication is of not receiving the same level of assistance because perhaps it will be

deemed a County priority and it's something that we can pick up on locally. So what gets cut when you go from 300 to 130, and what should we be doing if we had the full resources?

MR. MINEI:

Several of the important work plans, we can provide those to you, what Martin proposed as the multiple tasks in the work plan, what was cut. And I think it's pretty straightforward even on casual reading that some important tasks get cut out of it and we no longer have the staffing resources and the equipment to compensate for that loss of that kind of work that we feel very strongly about. I would add that a lot of times there are legitimate disagreements, you know, among regulatory agencies, we have them every day on these things. It's a matter of resources, a Statewide perspective compared to a County wide perspective, but we feel very strongly about the importance of Martin and his staff's work on this.

CHAIRMAN BISHOP:

I'm sure there are legitimate disagreements but what -- the study revealed a greater problem than you anticipated, so what would it take for them to keep it going? Why would you cut something when you -- what is their response that? You say, "Hey, look at all the problems we're finding and the significant findings we've uncovered."

43

MR. MINEI:

I think if you followed the trail of the correspondence and if there were records kept of Martin's personal meetings, you would see that those same questions were asked.

CHAIRMAN BISHOP:

I am not doubting they were asked, I'm asking for their response.

MR. MINEI:

Well, we obviously can't give you their response. We can just assure you once again that we made those same arguments. We believe, as you obviously believe, that this is a straightforward thought process.

CHAIRMAN BISHOP:

If it's a legitimate policy disagreement, what's their response, that it's not --

MR. MINEI:

That they want to spread the remaining financial resources Statewide. That they've learned very important stuff from the Suffolk County

investigations, it's time for them to move on. There are agricultural areas throughout the State that they're concerned about groundwater implications of pesticide application. So I think that's the crux of the decision, what do you do with the remaining funding from a dwindling pot of funds in a Statewide perspective.

CHAIRMAN BISHOP:

If you would be so kind as to just give me in brief what we're missing out on by not having a full grant.

MS. MARTIN:

One of the things that we had proposed was to continue the private well monitoring program. To do that it takes a lot of resources not only for people collecting the samples but within the laboratory to analyze those samples, because as you saw Paul's earlier slide, each analysis is specific to a piece of equipment and a chemist, you know, has to be trained to run it. When the funding is taken away for doing those analyses or collecting those samples, those things aren't getting done to the degree that we would like to or maybe to the degree that they had been done in the recent past.

CHAIRMAN BISHOP:

Here's a basic question and it's one that I know the answer is going to be it depends but I'll ask it anyway. How long does it take for a contaminant to reach the glacial aquifer, the Magothy aquifer? It depends is going to be the answer, but give me the --

MR. MINEI:

Well, it's -- Martin gave you the summary answer pretty quickly. Basically once it's discharged, you saw that most of our soils here are very sandy in nature, so the leaching depends on the character of the chemicals. Some chemicals like phosphorous, we don't discuss that as -- in fertilizer your major components, as in sewage, are phosphorous and nitrogen, our main concern is nitrogen. Nitrogen leaches through our sandy soil mantle very quickly, phosphorous gets captured very quickly. Heavy metals tend to get -- that whole list,

44

Aluminum, Zinc, Cadmium, those things tend to get caught in the upper soil mantle. Some of these solvents move very rapidly through our system, so you're talking about getting down to the groundwater system in a matter of days and then moving at a rate generally of between one foot and two feet per day. We have an investigation now in Bay Shore that really has concerned us. We had a dry cleaner up -- and just visualize the geography with me, north of Southern State Parkway in

the late 80's we detected dry cleaner fluid being released from it; there is a clean-up operation going on, another source of deliberation. Move ahead about 14 years, we're now detecting that plume we believe down in a cluster of irrigation wells in the Bay Shore School System, about 9,000 feet removed from the source. So you're talking about nearly two miles of movement in a 14 year period moving towards the {Panatequot Creek}, we're south of the South Shore Mall now, so it moves about one to two feet.

That was Paul's suggestion, that long after the three of us are gone from County employee our successors are going to have to keep track of things. Aldicarb, banned in 1980's, is still showing up in our groundwater system, it moves very slowly.

CHAIRMAN BISHOP:

And that's the point of my question. We have, you know, a unique, extraordinary and challenging situation here on Long Island that we have a million -- Long Island as a whole three million people Nassau/Suffolk on top of their water system; now, that's unusual, right? Most places with that kind of population draw their water from the rural area and bring it down.

MR. MINEI:

The water authority will tell you they are the largest single water supplier dependent on a groundwater source.

CHAIRMAN BISHOP:

Given that, so anything we do on top eventually goes underneath.

MR. MINEI:

That pretty much sums it up. And that's why I talked about land use management.

CHAIRMAN BISHOP:

When?

MR. MINEI:

Would you like a job as a Public Health Sanitarian?

CHAIRMAN BISHOP:

No, but I want --

MR. MINEI:

With retirements we need field staff. Sorry, I'm getting a little punchy.

CHAIRMAN BISHOP:

It's all right, I invite it. What I'm driving at is the level of optimism, isn't it tempered by the knowledge that it's all flowing

45

down there and we may not be seen today what's going to be there in 40 years which was put up there a hundred years ago.

MR. MINEI:

And I'm talking about prudent, cautioned optimism. I think -- you asked the question yesterday of Henry {Bokanyavith}, you said, "Gee, why is conservation such a big issue," and his point in sum was you're taking a high quality product, the water supply, you're contaminating it and then you're adding it back to the reservoir we have to draw from. So that's why it makes sense to cut back on the sheer quantity of water we're utilizing and try to eliminate the contamination. I mentioned that pretty much water supply management is a matter of land use management and we fully agree with your statements.

CHAIRMAN BISHOP:

Mr. Ponturo, do you --

MR. PONTURO:

I don't ever disagree with the boss.

MR. MINEI:

You do every day, this is good behavior.

MR. PONTURO:

There really isn't an awful lot to add to that. I think yesterday there was an attempt to try and, you know, point out what's different between Nassau and Suffolk. What's different between Nassau and Suffolk in the final analysis is -- besides the basic issues of just how big it is and, you know, we've heard it, roughly the same population but twice the area. The other thing is the land use/utility decisions that we've made, you know, the decisions on sewerage. The decision to try and walk a road between the alternatives of sewerage and essentially what amounts to population control.

CHAIRMAN BISHOP:

We're at the bottom of the regulatory framework, the Federal EPA at top, DEC second, then little ole us.

MR. PONTURO:

Sometimes I feel lower than the bottom.

CHAIRMAN BISHOP:

Is the regulatory framework sufficient for an area as unique as Long Island?

MR. PONTURO:

I think historically, you know, I've gone through 30 years of EPA control. I mean, the -- the regulatory process, because it's dictated based on national needs, especially when you get down to the health effects, what do we look for, those kinds of decisions, but most importantly probably the health effects are kind of daunting to somebody at a local regulatory level like me in the sense of you know more but you can't provide the answers to people.

46

CHAIRMAN BISHOP:

But one of themes that I picked up from the presentation is that we are ahead of the curve and we face unique challenges and that's why we need to be ahead of the curve. What I'm driving at is even if we know there's a problem, are there cases where there's nothing we can do about it? Because the Federal or State standard is set and we don't have the power locally to do anything about it, even though you as experts know it's a problem.

MR. PONTURO:

I think I understand your question. If you are talking about local agencies setting standards, in some cases -- well, first of all, you want to be able to set a standard based on scientific knowledge. When you get down to pesticides, there would be some limitations, I believe, in us setting standards.

MR. MINEI:

The short answer is we share your concern about the slow pace to set Federal regulations that we have to deal with. On a strictly enforcement regulatory perspective, yes, our hands are tied by standards set elsewhere, but that doesn't prevent us from the guidance we always provide on MTBE ten years before EPA required monitoring, on Perchlorate years before any consideration was given to an MCL. On some of these others, pharmaceuticals, we are there, we're probably a decade away from MCL's, maximum contaminant levels, for pharmaceuticals. We believe we can still provide that service to the people even though you're absolutely correct, we're concerned about the slow pace. Look what happened to Alidcarb. As we learned out later, it was -- we learned later that it was not tested on sandy soils, it's permit for use was based on studies elsewhere. So there

are unique conditions that really draws our concern every day

CHAIRMAN BISHOP:

If the standards that you believe are prudent were enacted, what would be the percentage of private wells that you believe would not be safe? That's highly hypothetical.

MR. MINEI:

I'm going to duck that one, Dave, for this reason. That, you know, there still is legitimate discussions about the level of the pesticides. I mean, we're at detection levels that are very low and we suggest caution to people, don't use this water even though it's below the actual drinking water standards. So, I mean, typically we sit around and we say not only are we regulatory agents, we're also residents of Suffolk County and things like that, family members as well, so we put ourselves in that place. Would you drink water from that well? And typically our answer is no. So therefore, strong, sometimes alarming language is put as guidance to people. So I would rather leave it that way, whether or not it is safe in the strictest sense of long-term health studies and safe as, you know, Federal drinking water standards are. I always relate to a joke that I believe is attributed to either Seinfeld or Jay Leno about the Federal Government setting the amount of rat hairs that can be in candy; personally, I don't want rat hairs in candy, personally I don't want pesticides in drinking water. I don't want gasoline additives in drinking water at any level. I don't want fertilizer in drinking water

47

at any level. So we provide guidance even though the standards may say that over the long-term it may be safe for you to consume it and thus the guidance language we provide, and we will continue to do that. Did I hedge well enough?

CHAIRMAN BISHOP:

Yeah, you're allowed to duck.

MR. PONTURO:

I think there's also an issue that you have to recognize that there's -- the same contaminants are in multiple media, and that doesn't minimize the fact but there has to be some perspective that many of these same contaminants people are being exposed to in the air and through the food.

Having said that, water suppliers and people who are regulators of water suppliers don't mind that water is being held to a higher

standard because that's what people want. But I think there does have to be a little bit of perspective, especially when you deal with MTBE. I've had people ask me, "Should I be concerned about the level of MTBE in my water," and in many cases the level of MTBE in the water is non-detectable. But the real concern to be is that while there are some people being exposed to MTBE through water, everybody is being exposed to MTBE today through the air, because the one thing you can't do is stop breathing and it's in the air. Okay? So that probably hurts more than helps but, you know, it's an issue.

MR. MINEI:

Just one final point. The issue I hear all the time is, "Gee, these standards seem to go down all the time." It seems to be correct almost in every issue, on every parameter, so the concern remains if ten milligrams per liter is acceptable now or 50 parts per billion are allowed now, in four years you're going to tell us that five parts per billion are the safe level. So that's why the added guidance, that's why the language is as strong in our letters to people on the water supply. So that's another reason to continue to be vigilant on these issues.

CHAIRMAN BISHOP:

Is it fair to say that where there is development there will be chemicals or contaminants eventually found beneath that development?

MR. MINEI:

We make the same blanket statement everywhere we go. If you want the ultimate insurance policy, if you want the cleanest water, open space is the best way to go. Any level of development will indeed incur contamination, whether you're talking one house per quarter acre, one house per five acres, there will be levels of contamination. Often times the turf applications on some of these larger estates overwhelm. And in fact I think the break point from our previous stays is about a half acre where the agricultural nitrogen input overtakes the sanitary sewage discharge of nitrogen. So yes, the answer is any form of development will ultimately have some degradation on the groundwater resource.

48

CHAIRMAN BISHOP:

So the extraordinary pace of development in the Town of Brookhaven in the last 30 years, we're only beginning to see the effects of that, whereas in Babylon and Huntington we probably know where we're at more; is that a fair assessment?

MR. MINEI:

Essentially development is moving further east. But I think you also have to give due credit to the town boards from Brookhaven on east with a considerable upzonings that have taken place. Brookhaven went from a quarter to third acre in my areas to at least one acre, one unit per acre in most of the towns, certainly in the Pine Barrens area and outside. The north and south fork are two acre and better in terms of environmental protection with regard to being more stringent. So that's occurred over the last ten to 20 years.

CHAIRMAN BISHOP:

I guess my final questions are about Perchlorate. This is most often in a very minimal form found in agricultural products but in a very concentrated form found in jet fuel and fireworks, is that -- did I understand that?

MR. PONTURO:

Solid rocket fuel, not jet fuel.

CHAIRMAN BISHOP:

Solid rocket fuel.

MR. PONTURO:

Yes, sir.

CHAIRMAN BISHOP:

Which we -- we don't have that around but we do have --

MR. MINEI:

Bomarc didn't have it. That was the response of the Defense Department, that it was liquid rocket fuel that they use and that's why we looked the elsewhere for the sources.

CHAIRMAN BISHOP:

But we do have fireworks factories, right, I mean, we have one that we all know of; is there a competitor here as well I think?

MR. MINEI:

There is another one that we're investigating that they have an assembly plant on Gabreski Airport in Westhampton Beach, I think it's called Bay Fireworks. So we have at least two competing fireworks companies in Suffolk County that I'm aware of personally.

CHAIRMAN BISHOP:

And how fast does that leach down? I mean, why are we finding -- I'm just --

MR. MINEI:

It's a salt, it moves even quicker than some of the others. If you recall, we gave a very extensive discussion on Perchlorate, I think to

49

the Health Committee, not through a joint committee. But essentially we talked about the travel of the plume in the Yaphank area traveled very quickly, probably over about a ten or 12 year period. Again, at least at the rate of one to two feet per day horizontally in the groundwater system. The concern there was indeed there were some

private wells still in use in the line of the plume as well as a stream, a major stream, Carmen's River.

CHAIRMAN BISHOP:

And this in its concentrated form, when it's used in fireworks and solid rocket fuel, is a significant threat to public health.

MR. MINEI:

Yeah, the health effects are well documented. We're just finding out about the ecological effects, but the health effects are on thyroid metabolism, it's especially critical with regard to pregnant mothers and to infants. In fact, I think it's used to treat -- I always get these terms reversed -- hyperthyroidism to slow down the activity of the thyroid gland.

CHAIRMAN BISHOP:

So do we have -- we probably do but I don't know about it -- do we have extraordinary levels of regulation for fireworks companies, that manufacture assembly?

MR. MINEI:

No. Basically we have the straightforward ones which work in this case, basically Article 7 and Article 12 as well as the State DEC's activity with regard to groundwater contamination. It was a chemical we did not know until 1998; we might have misstated a few times '88 but it was actually '98. And this was a case where the Water Authority alerted us to the national problem, not the reverse, but from '98 on we've known about this. But the concern was that we don't need extraordinary regulation, basically we need to follow our own regulations with regard to the storage of the chemical.

In the case of the fireworks factory, it was a very mundane operation, we believe, of how do they treat duds of the fireworks. It was a

little simple soaking operation spilling over on to the ground, then incinerating the duds -- we're getting counterintuitive, but you do -- and then having this ash laden with Perchlorate stored on site. So our reaction was remove that source, which is what we do in every instance of contamination, and assure that the water supply for the people in the direction of the plume are taken care of with public supply, that was our reaction to that situation and it's covered by our regulations.

MS. LOMORIELLO:

This was the recent wells that were discovered I think in Miller Place, around there in Yaphank, around that area?

MR. MINEI:

No, we're talking about in the Yaphank area just north of Sunrise Highway.

50

CHAIRMAN BISHOP:

Is there anything comparable, any other industry comparable that uses as can I say dangerous contaminant on a daily basis?

MR. MINEI:

Every industry that uses degreasing solvents is for the last 20 years probably a major activity of our division. I mentioned briefly that our -- and gas stations as a concern.

CHAIRMAN BISHOP:

Degreasing solvents are as problematic?

MR. MINEI:

Yeah, it's certainly -- where Perchlorate is a thyroid metabolism question, we're talking about known animal carcinogens, suspected human carcinogens that are really ubiquitous in our environment and indeed are contained in very low concentrations in household chemicals. So the fact that we have over 275 clean-ups of different spills of different toxic chemicals is probably by far a more important issue to us than actually the Perchlorate issues.

CHAIRMAN BISHOP:

But that's my point, that we find that degreasing in products that have it in low levels of concentration, of course we're concerned about it, but we don't -- do we have any industry that uses that high concentration toxin?

MR. MINEI:

Absolutely. Every automotive parts, every metal finishing place, we have dozens of those in your district. I mean, we have a concern --

MS. MARTIN:

Dry cleaners.

MR. MINEI:

Dry cleaners keep getting nudged, but dry cleaners have been a major concern and people are asking about, "Gee, what were the findings of that breast cancer survey by the state Health Department." One of the particular sources they were concerned about was an inventory of dry cleaners in that Coram/Mt. Sinai/Port Jefferson area where they had the high levels of breast cancer. So there are things as simple and as straightforward as dry cleaners, auto repair locations, you know, auto sales, places that have maintenance shops, and all these industries. And quite honestly, there are a lot of backyard industries where we've found characters storing drums of solvent to clean equipment and things like that get very difficult to detect as we go around and say -- there is no industry -- the investigation I'm talking about was in Sayville. There is no industry nearby that we can attribute the plume at this level in the groundwater reservoir, so solvents I would still say are way up there. Pesticides are still way up there. Pharmaceuticals is emerging and because of how widespread they are way up there. Perchlorate, because of its agricultural use in small concentrations and the few actual sources, is lower but still a concern.

51

MS. LOMORIELLO:

I just want to follow up on one question regarding dry cleaning. Is there a chemical that can be used as an alternative to the chemicals that you're using, that they're using presently? I ask this question because I just switched dry cleaners and there's a big sign out there that says that they have this environmentally-friendly chemical and,

you know, I forgot what the name of it is and I'm saying is this hype --

MR. MINEI:

It's probably Tide.

MS. LOMORIELLO:

Excuse me?

MR. MINEI:

I don't mean to act facetiously. No, the problem is multiple with dry cleaners. In fact, it again -- anyone who has ever walked into a dry cleaner knows it's in the air, so there's the inhalation route that's always a concern. But for us, if indeed that is the solvent and if it's of this volatile organic nature, it is a concern to us. It's the storage, use, final disposal of these that we feel really have to be taken into consideration. The use of the indoor air and the filtration that goes on there is another issue for people to address. I'm personally -- I would have to check with our Pollution Control people in Farmingville, I'm not personally aware of anything that's used other than Perchlorate.

MS. LOMORIELLO:

I'll get you the name of that.

CHAIRMAN BISHOP:

One last question and then we're going to take a break. On pharmaceuticals, let's assume that you establish it's a significant problem; what could be done? It's not an industry to be regulated, it's personal consumer use.

MR. PONTURO:

I'm not going to suggest we stop birth control. I think at this point we're not even at that -- you're right, we're not even at that point. The only thing I can say to you at this point, and I would say to you only in a very, very preliminary sense, is that the positives that we've had of those four or five that I listed before were private, shallow, extremely shallow, private wells that showed other indicators of high levels of domestic sewage indicating a poor location of that well. I think at this point in time the only conclusion you can say is that it's certainly in the waste stream. I mean, I could conjecture that at times future steps might be to look at, as has been done elsewhere, to look at nursing homes that have sewage treatment facilities that are discharged in the groundwater and look at the downgradient test wells from those locations. That might be a reasonable step. Certainly we would want to try and get a handle on the larger public water supply impact in the sense of -- but so far we haven't seen positives in that area.

MR. MINEI:

Just quickly to add to Paul's point. It just reinforces our concerns, number one, about the shallow private wells. We'd prefer a public water supply more monitored, more treatment capability at them, as

well as centralized sewage collection and treatment. Again, these chemicals seem to be getting through a lot of these treatment systems but at least you have a centralized location where you have the opportunity to treat for them as the technology moves up to address these concerns. Right now with 80% -- sorry, I don't want to overstate it, about 70% of our population on ceptic systems, that means we will continue to have ubiquitous widespread distribution of the contamination and wherever you have private wells, you are really dependent on what your neighbor is doing with some of these shallow wells. So public water supply, centralized collection of sewage and treatment so at least we can address the treatment before it's returned to the drinking water supply.

CHAIRMAN BISHOP:

Thank you for this morning, into this afternoon, presentation and for your good work.

MR. MINEI:

Thank you.

CHAIRMAN BISHOP:

We're going to take -- let's start again, a 15 minute break and then Penny, members of the public can speak also.

(*THE MEETING WAS RECESSED AT 12:39 P.M.*)

(*THE MEETING WAS RESUMED AT 1:20 P.M.*)

(SUBSTITUTION OF STENOGRAPHER - DONNA BARRETT)

CHAIRMAN BISHOP:

Good afternoon, I'm resuming the Environment Committee Hearing on water quantity and quality issues in Suffolk County. And this afternoon our first speaker is Julie Penny from the South Fork Groundwater Task Force.

MS. PENNY:

Good afternoon, Mr. Bishop. I want to comment on this morning's presentation and say that I really appreciate all the hard work that the Health Department is doing in their research, it's really remarkable. And on that I will read my comments now into the record. Again, I'm Julie Penny, co-chair of the South Fork Groundwater Task Force. Yesterday I spoke about quantity, today about the quality of our water. All levels of our government and agencies have suffered from a lack of strong stewardship, so that over the years figuratively and literally the quality of our aquifers has been going down the

drain and continue to do so even as we speak. In Nassau and Suffolk our drinking water is such -- our drinking water is in constant need of artificial resuscitation to keep it drinkable, and even then sometimes the effort fails and some public wells need to be shut down.

Looking at this year's Annual Water Quality Report for the year 2001 from the Suffolk County Water Authority, it is demoralizing to see how treated water as opposed to raw water contains so many chemicals in certain districts. It is not a healthy cocktail to be drinking for the long run, especially as the chlorine additive potentiates the noxious chemicals that remain at so-called acceptable levels in the tap water even after filtering. It appears the Suffolk County Water Authority hasn't taken into perspective the rapidity in which our aquifers have been in decline. In just about 60 years, a mere drop in the geological bucket, Nassau and Suffolk degraded their aquifers to a remarkable degree. A glacially pristine aquifer that was tens of thousands of years in the making has been compromised by our human activities. What if our founding fathers polluted our water between 1700 and 1800 to the degree it is polluted today? At that rate, we would -- would we be here today? We should be ashamed of the legacy we are creating for those who follow us. To meet the challenge before us the Suffolk County Water Authority and our government need to combat this degradation head on.

On the South Fork, our situation is even more precarious. We depend mostly on our upper glacial aquifer because our older aquifer, the Magothy, to a great water (sic) has saltwater intrusion. And we have no ancient Lloyd aquifer to speak of as they do west of the Shinnecock Canal. We take it for granted water. You may be riding in your car, walking hand in hand with your child along the beach, a quite lane, standing at a check out counter, strolling under a canopy of trees in the woods, gardening in your own backyard, and there beneath you at all times is the water that brings and sustains life to the South Fork, indeed, to all of Long Island. School teachers, construction workers, farmers, real estate brokers, film stars, artists, accountants, makes no difference who you are or what you do, our biology is just the same. And without pure water we cannot be healthy. The water molecules that affect us physically, affects us economically sustaining our lives, sustaining our economy. Like a house of cards, it all falls apart if we don't have good drinking water and at a cheap price. There is no snow capped mountain runoff for us nor Adirondack reservoirs. What comes out of our taps is what comes out of the ground. We take -- what we take out of ground is affected by what we put into the ground.

From Brooklyn and Queens on out to Montauk Point, millions of us depend on groundwater for our drinking water in the form of three aquifers that are piggy-backed one on top of the other. Each was formed at a different stage of our geological past. The most recent is the upper glacial aquifer formed a mere 18 million years ago during the retreating ice age. It forms a hilly spine running down the length of Long Island. On the East End we depend on this aquifer closest to the surface, the upper glacial aquifer. Because their upper glacial aquifer is contaminated, Nassau and Western Suffolk rely on the more ancient Magothy aquifer sandwiched just below it and the bottom most and oldest aquifer, the Lloyd. Yet the Magothy aquifer is experiencing problems too from contaminants -- contaminants in chloride.

54

Now there is a lesson to be learned here for we on the South Fork from what's transpiring to our west. Development, overuse, pollutants, saltwater intrusion are putting our aquifers at risk. For a variety of reasons; the agricultural use of pesticides, landfill leachate, petroleum and solvent spills, commercial leaks from all manners of chemicals, MTBE, saltwater intrusion, golf courses, heavy iron content, the South Fork's water is already compromised in many regions. Regions that may or may not have access to public water. And even public wells are contaminated. Across Suffolk, thousands of private and hundreds of public wells must be treated with expensive and elaborate carbon filtering systems. It will only get worse.

There is a bureaucratic mentality that says there's trillions of gallons of water in the Pine Barrens, but it is cost prohibitive to pipe and move. It is always best and cheapest to protect and conserve what is closest to home. It is not feasible and just plain costly to pump water onto the South Fork from off the South Fork. Frankly, we can't afford it. While experiencing diminishing recharge and increasing areas of contamination, we also find that the last decade has left us with burgeoning needs. Our population is expanded and will continue to do so. In summer our population trebles. Increasingly, there is conversions from seasonal to year round residences. Demographically, retirees are moving from the City and Western Long Island to the East End. Seniors are coming back up from retirement in Florida to be near their children as they become frail. Increasingly, the well heeled are raising their children here on the East End while the husband commutes from the City or telecommutes. More and more legal and illegal aliens crowd into legal and illegal housing. All together our need for high quality water is escalating.

What does this imply besides fetching more water from the tap to slake our collective thirst? It means more showers, pools, sprinkling and other out of door uses, laundry and an increased demand of public water for firefighting, more switching from private to public well water and a limited supply of high quality potable water which will only worsen unless we plan and manage it now.

The best way to guarantee future sources of potable water is to save our watersheds as open space. In the long run, it's the most effective tactic. Nationally, as an article in the New York Times says, apropos watersheds, it's costing trillions what nature does for free, and besides nature does a better job of it. Additives like chlorine while killing bacteria also kill beneficial intestinal flora that helps us absorb needed nutrients. Besides accidental spills and leaks from gas stations and what not, there's a time bomb ticking from all the older buried residential tanks, not to mention car junkyards too. Also, in it's headlong drive to get people to sign up for public water, even those who's water is superior in quality to the Suffolk County Water Authority's, short shrift is being given by the Suffolk County Water Authority to the change over from private wells to public wells. They don't tell the potential customer that if they have -- that if they have old submersible pumps, as many have, and don't follow proper change over protocols, they can contaminate the groundwater. Just capping these old submersibles is insufficient. At present, there are no regulations to see that the retirement of these well is done correctly.

In proper well abandonment, the contractor removes the internal apparatus of the old pumps, which are filled with oil and PCBs. If this is not done or done improperly, it is a conduit for seepage for these noxious agents into our water table. Proper removal then means homeowners shelling out even more money on top of that already paid to the Suffolk County Water Authority for a hook-up. As it's unregulated and not mandated by law, the Suffolk County -- and the Suffolk County Water Authority isn't telling them, many just won't do it. Informing people would be just another proactive way that the Suffolk County Water -- another proactive way of the Suffolk County Water Authority helping to protect your groundwater. Treating contaminated -- contaminated water is costly, especially for MTBE whose filters need to be changed much more frequently than other chemicals in order to remove it. These filters are expensive and housed in buildings as big as a house. At what point in the future will it all become so cost prohibitive that our economy will be stunted by these increasing chemical degradations. Every day in East Hampton and Southampton we

have news of MTBE turning up, sometimes at astronomical levels as in Hampton Bays, where an MTBE plume has entered Tiana Bay. And I think this newspaper cover kind of puts in perspective exactly what all of Long Island, in fact, all the nation is up against with MTBE.

The study of wells conducted by the Suffolk County Department of Health Services shows that 50% of private wells and 23% of its public wells showed detectable levels of pesticides. Unfortunately, the DEC has pulled the plug on further testing by not funding the program further or as we learned today only a quarter of it as it was. The Suffolk County Department of Health Services collected samples from less than half of the community wells, 226 of them. Of those tested, 23% contained pesticides in spite of fact that there are activated carbon filters on a third of these wells. Of the 835 private and non community wells, 422 or 50% were found to contain pesticides. And of those 50%, 38% of the private had multiple compounds. Some of the pesticides found in the wells at greater than maximum contaminant -- some of the pesticides found in the wells at greater than maximum contamination levels are those that have been banned since 1983 or earlier. These contaminants are having -- having its effects on our health, especially children's. The Mount Sinai School of Medicine Center for Children's Health and the Environment has been running an important and enlightened series of full page ads in the New York Times this spring and summer with headlines like, "More Kids Are Getting Brain Cancer, Why?", about the rising incidents of brain, testicular and acute lymphocytic leukemia cancer from exposures to pesticides. Another ad reads, "Pesticides Could Become The Ultimate Male Contraceptive, Why?", this explores the frightening reproductive changes and abnormalities in animals and humans that is taken place because of pesticides in our environment.

The Mount Sinai Medical Center has a comprehensive web site on this whole topic with all the scientific background for the New York Times ads. Check out this important sight www.childenvironment.org. Recently the noted writer and biologist, Dr. Sandra {Steingrath} gave a lecture in East Hampton based on her book, "Having Faith," on the harmful impacts that chemicals like pesticides can have on the developing fetus. A woman's body is a baby's first environment, and exposure to noxious chemicals through the placenta at a critical

moment in fetal development even within the course of a few hours when certain cells metamorphe into becoming a particular organ can have devastating consequences. Same thing with breast milk that is laden with pesticides. Ingestion of contaminated milk can threaten each

crucial stage of infant development. When it comes to exposure, timing is everything. Her previous book is, "Living Downstream, an Ecologist Looks At Cancer and the Environment".

Not only is Suffolk applying tons of noxious chemicals to lawns, farms and vineyards, more than any other part of the state, Suffolk rates the worst in complying with the rules. No wonder we have one of the highest breast -- rates of breast and prostate cancer in the nation. The Office of the Attorney General, Elliot Spitzer, announced in June that it was taking legal action against Agway stores in Bridgehampton and Riverhead stemming from repeated sales of illegal pesticides. The last straw being a sale last year in May of 2001. In its latest report, the New York State Department of Environmental Conservation in its inspection of agricultural establishments, vegetable growers, orchards, vineyards, sod farms, nursery and greenhouse operations declared Suffolk the worst county in complying when compared to other New York State Counties. For example, non compliance Upstate is at 7% as opposed to Suffolk with a 98% non compliance rate. The report covered worker protection standards, pesticide related requirements such as applicator certification, record keeping, and the use of anti siphon devices at equipment filling stations to protect backflow of contaminated water into a water source.

As regards anti siphon devices the report says, "at a minimum, 30% of the agricultural establishments inspectors failed to comply with this measure. This takes on added significance considering more than 50 pesticides and degridates have been detected in the sole source aquifer underlying Nassau and Suffolk Counties. In fact, in eastern agricultural communities of Long Island, the pesticides most commonly detected are agricultural. It was also found that some growers have been using pesticides that are prohibited from use in Nassau and Suffolk Counties. Such prohibitions are specifically designed to safeguard groundwater resources. And this is a direct quote from the DEC, "lifted" -- I put in a table of pesticide use for the year 1998 -- "lifted below in table form are the amounts of pesticides in Suffolk County in 1998 according to the DEC data base". And in it for the year 1998 you see the sales to farmers as opposed to the sales to commercial applicators, sales to farmers in gallons was 89,000, around 89,000, where for commercial applicators it was on the order of 440,000, and in poundage, sales to farmers was 631,000 about, and in poundage it was almost three million. You can see that commercial use outstrips farmers by about four to one.

Our use of chemicals has to stop. People want to do the right thing, the healthy thing, but they've been brainwashed and do things on automatic without knowing that these chemicals can cause problems.

Clever advertising with cartoon weeds biting the dust with blast of Round Up makes the use of these chemicals even more appealing. The ordinary public has no idea just how destructive all this junk is. They've been programmed to shrink in horror at the thought of dandelions in their lawns. The pesticide industry has a powerful lobby. In the old days I remember the anti smoking campaign when

57

opponents had free air time. For every cigarette commercial, there were -- there was -- there were -- there were great and potent anti smoking ads that showed the real effects of cigarettes. Equal air time should come back. People need to see the graphic statistics and what this stuff does to our health and our environment. The public has to be educated and in a big, big way that they can have beautiful lawns and gardens without the use of chemicals. Education campaigns for the public have to be waged at every level of the government. That's where a lot of our money should be going, mindsets have to change. Certainly chemicals should be banned in our special groundwater protection areas. For starters, we should support legislation that would ban the use of chemicals for ornamental use. The state bills by LaValle and DiNapoli would do that. As far as enforcement goes, huge fines should be levied including jail time against those who do not comply with the law. And as far as farmers go on the East End, the federal government should give them subsidies for a transition to organic farming. Public water is not the panacea for the East End, strong land use laws and a change in the way people do things is. And in our own small way, the South Fork Groundwater Task Force has been having its own ad campaign over the airwaves and in the public -- and in our -- all our local papers over the summer, and I put in one of our ads.

CHAIRMAN BISHOP:

Please, thank you. Thank you, Julie, I appreciate it. Very good. Sarah and Laurie Farber. The team is back. You didn't do enough damage yesterday, huh? I'm pleased to announce that we're joined by Legislator Ginny Fields who has a long record of advocacy and work in this area.

MS. FARBER:

I really just have fairly brief comments. It seems to me that there are some things were not maybe taking seriously enough. In terms of yesterday's discussions on water quantity and water budget, what we forget sometimes is that in order to clean up one of these plumes of pollution or one of these spills it requires withdrawing large amounts of water with these contaminants. And I'm not sure that those

particular withdrawals are counted in anything that were counted in when we're looking at water quantity. So just a little extra thing to think about there. One thing that concerns me in looking at the Suffolk Water Authority's Confidence Report this year is the amount of chloroform in some of the drinking water actually and the tap water. And we're not carefully looking at the effects of the chlorine in the drinking water as well as the fact that this chlorine is going back into the ground in both areas that are cesspooled and in areas -- interior areas that have sewage treatment plants that discharge back into the ground, which are primarily in the deep flow recharge area, the non coastal areas. Coastal sewage treatment plants do discharge out into the coastal waters. So we have a situation where all these contaminants that we are flushing down the toilets, down our sinks, etcetera, are not only going to the coastal water through sewage treatment plants, but they are also going into our drinking water supply through these sewage treatment plants that discharge directly into the ground. So what does that mean?

58

We heard this morning that a lot of these materials do move fairly quickly through the groundwater system down horizontally, whatever. We forget sometimes we need to be looking at not the near future and the next couple of years, but we need to be looking long term, beyond our life span and beyond our grandchildren's life span. And I think if we start looking that far ahead, we're going to start realizing that these plumes, these contaminants, are going to be moving into the areas where we are having a problem. We are pulling this water out so quickly, we're pulling the stuff down and out and through very quickly. So it's coming out our streams, it's going into our drinking water, going into our costal waters. And what does that mean? Some of these things, as Julie referred to, are things that we would be very concerned about our children getting; hormone replacement therapy. I mean, we all know the number one -- the number one reason for breast cancer that has absolutely been proven about, the only thing that we have totally proven is lifetime exposure to estrogen. So what does it mean when we have estrogen from hormone replacement therapy getting into our waters as well as Viagra, as well as Ritalin, as well as caffeine. I mean you can make jokes about, you know, edgy fish that can't sleep, but the truth is this stuff is getting there. And what is it doing? And what will it be doing? Yes, maybe some of it will be in small quantities, but in some of the these medications, that's all you need is small quantities so -- especially for young children. So we have a lot of questions that we need answering, I think, to.

One thing perhaps that hasn't been looked at is the possibility of looking at composting toilets. I know the Health Department has some restrictions on the use of those, and maybe that's something that needs to be explored, because that would be a situation where the waste would not be going directly back into the ground, not be injected back into the ground. It seems that the Health Department has quite a lot of data, is doing quite a lot of testing, but I think there's two problems. One is that this data while very extensive is not easily available for people to study and to learn from and to look at. And I think the other piece of that is actually going back to some of the questions you answered -- you asked earlier is that there seems to be disconnect between the data that we have and what we're doing about it. And what are we doing about some of these things? How can we look at policies that will minimize and eliminate the future contamination? We know that what's in there isn't going away, and we have to deal with that. But we need to be looking at how can we prevent more from going in. And I don't think we're doing a very good enough job about that. Some of it does need to be public education, some of it does need to be policy changes, attitude changes. We're still spraying for nuisance mosquitoes in the County parks. I mean, just reading the paper over the summer, and that's something that shouldn't be happening. So we -- we have some problems, and we need to make these connections between what we're doing in our attitudes and what's happening and what will happen.

MS. MEYLAND:

Thank you. My name is Sarah Meyland. And I think so far today you've heard excellent testimony on what we're doing to look for contaminants on the water supply as well as, you know public, concerns about what we know, what we don't know and knowing that where we look, we find

these contaminants. I simply indicate so that the more we look, the more we'll find. I think one of the points that Laurie just made is worth mentioning. And that is basically that we can pay now or pay later. And a lot of this question of what do we do is really an economic decision. It's the same thing with the questions yesterday about how much water can we take out of the groundwater system in total and not do irreparable damage. And both of these come -- both of these issues really move from the realm of science into the realm of public policy and issues of what's best for a lifestyle and things like that. In both cases I think what you're hearing from the public that is presenting testimony to you is that we don't want to delay important decisions into the future to the point where we're either going to be paying enormous sums to correct the problem or we will

have made the problem so immense that there really is no going back in any meaningful way.

And what that means for Legislators, I think, is, you know, taking a look at the hard choices, and I think your hearings here are very important because they're designed to bring the information to the forefront so that you can start to ask the hard questions and make some of the hard decisions that will hopefully delay some of the these very significant consequences that you've been hearing about. I think Vito also said an interesting and important thing to reemphasize, and that is the point he made about water management as basically a land use management question. That is a truism that we've known about here on Long Island for well over 25 years, and we keep repeating it. And it's very much what the watershed protection efforts grew out of. But I think we need to look at that just a little bit more closely to understand really what that means. And what, I think, it really means is that when you are making the land use decisions on where growth occurs, we're looking at two different ways of dealing with pollution and also quantity issues. Depending on where you place certain activities, you can effect both nonpoint discharge activities that are associated with that land use and equally point source discharges. What that means for government is that by making enlightened decisions on where we place activities, we can to some degree minimize non -- nonpoint contamination that government does not have a good handle on controlling. And so the only way to control that is placement of the activity.

But we failed to frequently talk about the other piece, which is the regulatory piece. And we continue to ignore land used -- land use considerations when the fall back is, well, don't worry about it, we've got a regulatory program to address that. It's very important in looking at the long term that we revisit the issue of how well are our regulatory programs working. In reality, we've got some very enlightened programs on the book here on Long Island and in Suffolk County, and the question isn't are they good policies on paper, it's are they actually doing the job that they were intended to do in actual practice. And I think that's a very important issue for the Legislature in its oversight capacity to very closely examine.

Laurie was mentioning the sewage issue and the discharge of sewage through the sewage treatment plants all across Suffolk County. And Suffolk has chosen the non Nassau County solution, which is not massive sewerage, limited targeted sewerage. Some of sewerage takes

that collected waste and puts it off shore like they do in Nassau County, but the larger amount of sewage is collected and put back into the ground in Suffolk County. And historically, the one hundred plus so-called package plants that do the bulk of the sewage treatment job in Suffolk are historically inferior in the level of treatment that they provide the adequacy of, you know, good functioning operations at these facilities and the fact that they were placed right over the deep recharge area. And so we've got the double whammy of they're in a relatively undesirable area, they're putting contaminants back into the ground, and to some degree that may be a greater disservice to the quality of the aquifer, because it's a concentrated discharge point. And so I think it really merits close review to see how these sewage treatment plants are operating today. Do they have the same poor track record that we've known about for the last five years and the last ten years and going back beyond that? Or have things radically and -- radically improved for the better? Because if we're continuing -- and, you know, what Vito was arguing for at the end of his testimony was maybe we should do more sewage collection. And if we were to follow that advise, what does that really mean? Because it will be an expenditure of some amount. I think it could be a very important way to help protect the quality of the aquifer, but along with that, would have to go the commitment that we place the discharge of the sewage that does come out of those plants with some degree of wisdom, and we ensure that the plant really does operate to the best of its ability.

And just looking in the larger context, you know, one of the issues that my organization is very very deeply involved in at the moment is a problem that the sewer systems across the State of New York and across this nation have been so severely underfunded in their maintenance budgets that to an extensive degree they are not even getting the raw sewage to the treatment plant itself. The piping infrastructure is so aged and in such a state of ill repair that they leak, they back-up, they overflow, and the bottom line is they are spilling raw garbage back in the environment all along the way to the plant. And the State of New York has facilitated this process in other areas of the state by actually giving permits for overflow points in the sewage collection system, legalizing raw discharges of sewage back in the environment.

Now, here on Long Island we have a DEC Office that, I wouldn't say has a sterling history of being an aggressive enforcement agency, and so it's extremely hard to know the extent that this type of problem exists on Long Island, because there's simply no enforcement weight brought to bear on the sewer operators to enforce these overflows which are in violation of the Clean Water Act. So to some degree

there are going to be some problems out there for which if they happen they're illegal, but because there's no regulatory enforcement going on, there's no paperwork trail to create the evidence that the problem exists.

I'd like to speak just a moment about this issue of MTBE. I think it's very important that we recognize that Suffolk County probably has the most severe MTBE problem that we know to exist in New York State. And there are MTBE plumes all over the County, the question is are they making the link from being a spill into the groundwater system to

61

being a contaminant in the drinking water supply? And I think it's very clear that the answer to that question is yes. If you look at -- well, first of all, we get into the issue of how do we document this. And again, that disclosure of the type of information that would give you the ready evidence that, yes, the problem is severe, is not easily available. So if you go to some de facto ways of trying to make that linkage, one way to do that drinking water reports from the water utilities that have the obligation to report to their customers. And, of course, of the largest purveyor of water in the County is the Suffolk Water Authority. So if you look at their report as possibly an indicator of the conditions across all the water utilities in the County, what you see is two things; one is that because the Water Authority reports their data in distribution zones they are something on the order of 30 plus different zones that they report on and look at the presence of MTBE in those zones, and at least 50% indicate MTBE found in the samples in that distribution system. Well, that's one indicator that there may be reason for concern. But if you then also look at the extent of which MTBE seems to be turning up through recurring numbers -- numbers of samples for each of those distribution areas, you find that it is not a nondetect level that is really the level of concern. There are a number of distribution zones where they find a high spike of MTBE, for example, in one zone that comes to mind one of the distribution areas had a reading of 18 parts per billion of MTBE, I think it was. Well, they had over 1200 samples in that distribution area. So you would think that, yes, there may have been a spike, but hopefully, the vast majority of the readings would be quite low, and that result would be, if you average it all out, you wouldn't see it in your water supply. And, in fact, that isn't the way it is. After all 1200 samples you get, a detection level of near one part per billion, I don't remember the details of what they all are, but that is telling you that it is present in a large number of samples.

Now, is one part per billion damaging to your health? Well, we don't know the answer to that yet. But it goes back again to Vito's point, which is the public doesn't want any in their drinking water. And obviously it is there. The other thing we did was we looked at the data from all the wells in the Water Authority's system. And over the course of several years we saw very striking levels of MTBE in a large number of wells in the distribution system as a whole. I think one year it was over 100 of their wells. I think the most recent data we looked at it was down to something between 50 and 60 wells in their system. I don't know why there was a large change, but the point is a number of their wells are being impacted, and it is being presented to their customers at low levels, which is disturbing. It isn't the Water Authority's fault. I mean they take the water as they find it. So whose fault is it? Well, we go back to the issue of regulation and who regulates those who sell gasoline and the bulk storage program. And the answer to that is the joint program between the County and the State DEC, and especially the DEC. And so the question I think that the Legislature should be asking -- and it's very important that the DEC is not represented in either of these two days of hearings, because bottom line, the DEC is the ultimate steward of the groundwater on Long Island and around the rest of the state. And the fact that they are not here to share what they're doing, what they're not doing, and the conclusions that they're seeing from the

62

conditions in the groundwater system here on Long Island, I think it's very unfortunate. The DEC should be asked and they should have a very good answer for why there are the massive number of spills that are obviously occurring in Suffolk County and the rest of Long Island that are contributing to these huge numbers of contamination sites across Long Island and especially in Suffolk County. I don't think they have a good answer to that question. And the level of contamination in the groundwater really suggests that there has been a massive failure of the regulatory process to keep gasoline in the gasoline tanks where it belongs. And I would very strongly hope that this will be something that you will look into much more carefully and call those agencies in for special questioning on what they're doing on this issue.

I put a slide up there to just kind of run down the list of contaminant problems that we are aware of at the moment. And while sewage in general is a high priority, it's important to look at some of the constituents of sewage. The one that we've heard a lot of testimony today about is the pharmaceuticals. Pharmaceuticals are an indicator that really tell us that sewage is getting in the environment. Because usually the way we've dealt with sewage is we've

looked at indicators that have had multiple sources or origins; nitrates has been a classic. Nitrates, easy to test for in the environment in significant amounts, but the question always comes back, well, where is it coming from? It is animal waste, is it human waste, what is it? It is on site systems, whatever? Well, pharmaceuticals can't get away from the fact that it's human waste. And so when we're seeing it in areas where we don't want it to be, it's a real flag that we're get sewage in the environment in places that we probably don't want it to be. But more importantly, what does it mean for public health? And I think the point has probably been made, but it's worth making again. We -- we eliminate when we take drugs, the large majority of the amount of drugs we take. And our bodies only absorb a very small part of the dose that we're taking. The molecular structure of pharmaceuticals in general is very different from a molecular structure of many of the other contaminants, such as VOCs, that we deal with as a water contaminant. And so the molecular structure of a pharmaceuticals is designed to not be sticky so that as we take it into our body it doesn't get stuck, you know, in the lining of our digestive track or our throat or whatever, it gets into the cellular make up of our body. That allows it to go through the sewage treatment process almost completely unaltered. When it gets back into our bodies, even in parts per billions or parts per trillion, the molecular activity is still there. And so when you got those low levels, it's still able to impact at a cellular level the same thing it would have done in its original large dose level.

And, you know, they started looking for pharmaceuticals first in Europe, as I think you've already heard. They found some cases for example in England where they had large sewage discharges into some of the rivers that run through London, and they found incredibly deformed fish coming out of those rivers that where a result of being bathed living in the soup of pharmaceuticals chemicals. And what was clearly happening was that as the fish evolve from the embryo all the way up to the adult fish, these chemicals were massively transforming the way the fish develop, not only physically, but their endocrine system as

well. So they had fish that had, you know, both sex organs, and they had fish that were physically deformed as well. So this is the issue. If we're getting these pharmaceuticals back into -- we're recycling them back into the drinking water supply. One, we don't have good technology to get them out, but secondly, at these very low levels they can potentially alter our physiology. And that obviously is something that would be very undesirable for us here.

And the other thing with respect to sewage, the contaminant of pathogens, we look for Ecoli, Ecoli in the form that we look at it for is not a danger bacteria. There are forms of the bacteria that are dangerous to human health. It's simple another indicator. But there are many other pathogens in sewage that are quite dangerous. Viruses as a class, we don't look for it in the groundwater system. We don't monitor for it in sewage discharge, and we know that viruses can survive for long periods of time in the environment, especially groundwater because it's hidden from ultraviolet radiation, it's a nice cool moderate temperature, which fosters the survival. So viruses are certainly a thing that we don't much of a good track record, as far as the data base, but certainly it's something that should be continued to be looked at.

You've heard excellent testimony already about pesticides, and I think that certainly that's something that should be taken to heart. We don't have a good standard on a lot of the these pesticides. One of the issues that should be looked at is how do we interpret these contaminants when we don't a standard. Do we opt as we do today for the generic standard? So, for example, when we finds VOCs in the water, we have a generic standard that is far higher than the chemical specific standards that regulate drinking water. Is that the way to go, or do we want to opt for a low standard and use a high -- highly precautionary approach?

So I guess in summary, I'd like to say, one, that it would be good public policy and good from a standpoint of public understanding to improve our reporting on the information that we do have. It's reassuring to hear people from the Health Department come in and say that they monitor wells and they have a good program and they're on top of it. I think it's equally desirable and equally important to have that same level of information available to the public, available to public officials so that they can also look to see the same information that the regulatory agencies have available to themselves. And so I think, you know, one opportunity for legislation is to require an annual report from the regulatory agencies summarizing, tabulating, collating, documenting and dispersing this annual information that they collect. And I think that's equally important because our experience with some of the drinking water reports is that some of the information that we find is not entirely reliable. And so it again gives us an ability to cross check between different reporting entities.

And then the second issue is regulatory effectiveness and regulatory enforcement. If the regulations are on the books and the enforcement

is lax, than it is not that helpful to simply know that the regulation exists. An it's very important that we have very aggressive enforcement. I think produce bans is something that really should be

64

looked at very carefully here in the County. And also the possibility of no discharge zones so that -- so that it we do agree that land use management is important, that we protect key watersheds, then to keep those watershed protection areas viable and functioning in the manner that we anticipate that they will, we don't want discharges occurring within them. We may need to change some standards. And I think one of the thing that other states have done that would be prudent to look at here is kind of a two-tiered standard program where you have the enforcement standard where you don't want contaminants going beyond, but secondly, you have an action level. And when you reach the action level which is set much lower than the standard, it's the red flag that says, okay, ambient conditions are changing, they're changing adversely, and we need to start the process of taking steps that won't allow this to reach the point where a violation of a standard has occurred.

And going back to the public reporting process, one of the things that would be helpful for regulatory agencies to do would be to do trends analysis. So they not only publicize the raw data, but they look at the trend over the last year or five years or ten years. That's one that the USGS does that I think is very helpful, and we saw yesterday in looking at their water table monitoring data you can start to see how the water table has gone up and down over the course of a few years, over the course of half a century and you can start to understand, you know, where things are going. And I think that's very important in keeping with your intent to look for the long term.

And lastly, one thing you might want to consider is the possibility of having citizen suits authorized here in Suffolk County to address some of these environmental damage issues. We obviously have not been able to achieve that at the state level, but the County has some of its own regulatory programs and enforcement programs, and perhaps you would want to give the right for citizen enforcement for those in the same way that we have it under the Clean Water Act and some of the other federal environmental regulatory programs. So I would close with that. The only other contaminant that I think would be appropriate for you to have some heightened sensitivity to would be that of nitrates. Nitrates have been around as a contaminant, we've known about them for many years. The drinking water standard for nitrates is ten. We know that there are health consequences nitrates, a number

of states have action levels for nitrates. They're down on the level of two to three parts per million instead of ten parts per million. Interestingly, coastal ecosystems are much more sensitive to nitrates than we believe we humans are. And so nitrates of the two to three parts per million in the groundwater may not trigger a drinking water violation, but when that groundwater migrates into coastal waters, it does trigger very adverse reactions in the coastal aquatic populations, plankton plumes and things like that. So we can't forget that while we're focusing on groundwater as we humans are perceiving it, it does migrate out into the other parts of the ecosystem of Suffolk County, and there are consequences that don't affect we humans but do affect others. So I would wrap it up there. Thank you very much.

CHAIRMAN BISHOP:
Legislator Fields.

65

LEG. FIELDS:

One of the points you brought up were pharmaceuticals getting into the drinking water. How do they get into the drinking water?

MS. MEYLAND:

Humans take them in, we release them into our sewage system, whether it's a home on-site system or into the municipal sewer system. They either leak out of the sewer pipes as the sewer pipes move that waste to the sewage treatment plant. Once they get to the sewage treatment plant, they pass through the sewage treatment plant largely unaltered, and they come out as treated sewage, which is then released back into the environment, whether it's going into the ocean or just going into a stream or whether it's going back into the groundwater, it's part of the sewage component in raw sewage as well as treated sewage. It's a waste component of sewage basically.

LEG. FIELDS:

What about cesspools?

MS. MEYLAND:

Cesspools, yep, same thing.

LEG. FIELDS:

So how would you stop that from happening?

MS. MEYLAND:

There is not a good way. What Vito was suggesting was through more of

municipal collections systems rather than home on-site systems. At least you can get that waste into a central location with the expectation that in years ahead there will be some technology that will be invented to deal with pharmaceuticals chemicals.

LEG. FIELDS:

Okay. But that would actually mean that you would have to put everybody's sewage somewhere else. I mean, is there even something capable of collecting all of that?

MS. MEYLAND:

Well, I mean, you know, sewer systems in Nassau County discharge to the ocean. So the question is would -- would it make more sense to have Suffolk County's discharges go to the ocean?

LEG. FIELDS:

But wouldn't that create the same problem in the ocean? I mean, you just talked about --

MS. MEYLAND:

Well, we're not drinking it in the ocean.

LEG. FIELDS:

But you talked about fish that have been --

MS. MEYLAND:

Yes, but I'm talking about a difference of concentration between putting it in the ocean versus putting it into a narrow river.

LEG. FIELDS:

But if you were to multiply 1.4 million people, and out of those 1.4 million, I couldn't even hazard a guess as to how many of them take regular medications.

MS. MEYLAND:

Oh, absolutely.

LEG. FIELDS:

You know, you're now multiplying that discharge into the ocean, you might have an equally if not worse problem out in the ocean. We're eating that fish too.

MS. MEYLAND:

Well, I don't think it would be worse. But remember part of the

problem with sewage is we're getting antibiotic build up in bacteria, and it isn't just the chemicals, but we're getting antibiotics that now are in the waste stream. We've got sewage -- we've got bacteria in sewage in sewage treatment plants that are antibiotic resistant. And so when you put those antibiotics back into the environment, you build up antibiotic resistance and then natural bacteria in the environment as well. So this question of what is in sewage now is starting to rise to the top of people's radar screens and priority lists, because we're seeing that is isn't -- see, sewage has historically been perceived primarily as an aesthetics issue in terms of regulations. We regulate sewage for nitrogen, phosphorous, total suspended solids and PH, okay. None of those are health issues really. And so now with the findings with things like pharmaceuticals and others, it's starting to dawn on the regulatory agencies that there are things in sewage that really have to be regulated apart from the way we've done it in the past. And pharmaceuticals is one of the things that's starting to open the regulator's eyes that we aren't regulating sewage properly really and that it is a waste probably that's probably larger than we've given it credit in the past.

LEG. FIELDS:

Thank you.

CHAIRMAN BISHOP:

Regarding the sharing of the information, are you implying or are you stating flat out that -- that the Health Department has information that is not available to the public?

MS. MEYLAND:

No. No, I'm not saying that at all. I'm saying that there is no formal program in the County here to take the data that they routinely collect as a matter of doing their normal business and consolidating that in a form that is easy for anyone to obtain on an annual basis. For example, if I were to go ask the Health Department for some specific information, I think they would be entirely cooperative. But it's the process of then they have to take someone off whatever they're doing otherwise, collect it, provide it, blah, blah, blah. I'm saying if there was a normal reporting program, it would make the whole process easier. You'd be able to get that data on an annual basis, we all here in the environmental community could get it, and we could understand things, I think, better by looking at the details.

CHAIRMAN BISHOP:

Do other jurisdictions do that?

MS. MEYLAND:

No. We were -- both Laurie and I mentioned yesterday that the Nassau County Health Department has the best program in the state of collecting, tabulating and releasing to the public in an annual document all the information they have on groundwater and drinking water. And it's really an invaluable resource for understanding what's going on.

CHAIRMAN BISHOP:

Now, did you mention in passing product bans?

MS. MEYLAND:

Yes.

CHAIRMAN BISHOP:

Which products would you consider as, you know, for -- for banning?

MS. MEYLAND:

I think we should look at fertilizers, we should probably look at a number of pesticides. We may want to look at banning the discharge of some VOCs in some areas.

CHAIRMAN BISHOP:

And in terms of regulatory enforcement failures, do you have suspicions of particular regulations which you feel are great on paper but are not enforced properly? I assume you don't have any specific proof of that, but you probably have suspicions of those.

MS. MEYLAND:

Well, I think that the one that just screams out at us is the MTBE problem. I mean, the County and the state have very extensive bulk storage programs. And the County actually had one the first ones in the nation. So if the bulk storage programs are working the way we would want them to, there shouldn't be gasoline spills all over the County. And obviously, they are, because that's the only place the MTBE could be coming from.

CHAIRMAN BISHOP:

That's a point of disagreement. I thought that earlier the Health Department was indicating that they don't feel it's coming from the spills solely, that spills certainly are part of it, but that perhaps even a larger part of it is it's in the air, it gets in the rain water, and, you know, other --

MS. MEYLAND:

It would be in ambient levels. You wouldn't have plumes of it. We've got plumes of MTBE all over the place. That isn't something where it's coming down through the rain. If you just go off shore, we're finding MTBE in coastal waters, okay? So that may be an atmospheric deposition issue.

CHAIRMAN BISHOP:

Did you hear that?

68

MS. MEYLAND:

No, that was a little before I came in.

MS. FARBER:

Yeah, I did hear that, and part of that comment was actually about our exposure and that's correct, there's number of ways of being exposed to it. But in terms of what's getting into the ground, the bulk of it, if it's in the ground, it's plumes. As Sarah said, the bulk of it has got to be spills, because anything coming from rain is going to be lower concentrations and much more dispersed.

CHAIRMAN BISHOP:

MTBE was only a product from 1985?

MS. MEYLAND:

Well, they started concentrating it in levels of about 11% gasoline in the early 90s, but it has been a contaminant in gasoline for several decades at a one to 2% range. So, you know, we've only started seeing it in these massive plumes in recent years where it is such a higher concentration in gasoline, but it's been around for a long number of years.

CHAIRMAN BISHOP:

Okay. Thank you very much. Steve Terracciano.

MR. TERRACCIANO:

My name is Steven Terracciano, I'm a hydrologist with the US Geological Survey here on Long Island. I've worked for the Survey for the last 15 years. The title of my talk you can see, Sustainability of Groundwater Resources on Long Island, The Role of the US Geological Survey".

CHAIRMAN BISHOP:

Do you have a copy for Legislator Fields?

MR. TERRACCIANO:

In the handouts is circular 1186, it's prepared by the Office of Groundwater in the US Geological Survey. The title of that circular is, "The Sustainability of Groundwater". Much of my talk comes from that circular, fortunately for Long Island, a lot of the contents of that circular includes examples from Long Island and of the US Geological work. Ready?

CHAIRMAN BISHOP:

Yes.

MR. TERRACCIANO:

Very good. I guess the purpose of my talk is going to be to enlighten you and give testimony to the record on what the US Geological Survey does on Long Island. It's occurred to us that we have sat in front of this committee before, and we're going to take this opportunity to describe briefly what we do and what we have done in the past that relates to the issue at hand and what we are planning to do in the near future. As you can see, the US Geological Survey serves the nation by providing reliable scientific information to describe and understand the earth, to minimize loss of life and property from

69

natural disasters, to manage water, biological energy and mineral resources and to enhance and protect our quality of life.

We've done this cooperatively with public agencies on Long Island since the early 1900s. We provide data to support efficient management of its water resources and to assess effects of natural and man made stresses on the island wide system. That's the 1963 photo of someone sampling water and one a little bit more current. It's occurred to me that no one's really talked about sustainability, so I thought I'd put it up. As it pertains to groundwater, it's the use of groundwater that can be maintained in a manner for an indefinite time without causing unacceptable environmental economic or social consequences. And ultimately, the acceptable level of change or consequence must be set by the public and their representatives. And historically, it's been the job of the USGS to present the data needed to the public to and their representatives to make those decisions.

This is generally an outline of what we'll be covering for the remainder of the talk highlighted by some of the studies that the USGS has done. We'll go over a little bit about water quantity, groundwater storage and the connection between the groundwater and the surface water bodies. Groundwater quality, the subject of today's

discussion, {subfascial} contaminants that are introduced on the land surface, again, the groundwater and surface water connection with respect to water quality and a unique aspect of living on an island that's bounded by saltwater. The freshwater system is indeed bounded by saltwater, and it's another issue that needs to be addressed when describing sustainability.

Lastly, I thought I'd put up some information about meeting the challenges of sustainability. Historically, the USGS has been involved in developing models on Long Island. As Vito's referred to a couple of times, this is the analog model that was built in the '70's. Those are huge boards, and on the backs of boards you see resistors designed to represent the flow system as a whole. It's very important to do that when you're trying to assess the effects of stresses on the system and trying to isolate cause and effect relationships. The model, which is your best guess as how the system responds as a whole, allows you to isolate those topics of interest. We've used models for 30 years now to, among things, look at the effects of recent sewerage, the effects of historical pumpage. And we'll be using -- we have looked at injection, but we have a new study on the horizon that will be looking at that in Queens County. Effects of historical pumpage, as we talked about yesterday, we've developed models, island-wide models, and models in Queens and Brooklyn that have simulated predevelopment conditions of water levels in Kings and Queens Counties, the decline in the water levels and also the recovery of those water levels as pumpage has ceased. The effects of development on water quality was a regard -- with regards to water bodies. The effects of declining water levels on stream flows, this is something that we had a lot of discussion about yesterday. This is one of those 50 year plots of groundwater levels in the well, that's the top graph, and the trend line that you see drawn in and how in Nassau County after sewerage took place, which is right around here, you see a decline in water levels. And in a stream just south or nearby that well, we have discharge data. And this is annual discharge data at

70

Bellmore Creek specifically. You can see how the discharges decline correspondingly.

Since we had some discussion about this, I thought I'd bring the whole report. I think there may be handouts around. These are 50 year hydrographs, and I'd thought I just go through them quickly. The start in Western Long Island wells, and these are key wells that the USGS is hoping to continue to monitor to give an index of groundwater conditions as it relates around the Island. In Nassau County, I

don't believe we have any funding to do this so these plots are going to stop in Nassau anyway. From the top down, you see the effects of a decline in the water levels in wells and Herricks, wells in Old Westbury, water table wells in Pinelawn, which is right on the border with Nassau County. As you move eastward in Brentwood, there's some indication of a decline, I'm not so certain that its occurring as a go further to Ronkonkoma, less in Selden, it doesn't appear to be much a decline. Keep going to Uptown, you actually see a rise near the end here. We're not sure if that's because homes are on -- that were on private wells are now on public wells. But you can tell that I'm not certain about these things, and that is because I know that there are other things that could effect the level of the groundwater in these individual wells. And to properly assess those things, I'd want to take a look at those other things and possibly by using a regional model or a model of the groundwater in that area.

I'm going out to Riverhead and on down to Bridgehampton, you see less effect of any sewerage, but you do see back in here in 1966 when a drought had occurred and some other lows in the water table through periodic droughts since then. Similarly, the streams starting west at Bellmore, here's the example that I gave earlier, the decline in the discharge through time from 1951 to 1999. Massapequa Creek right on the border to Connetquot River, that's pictured below. The Nissequogue River's at the top, the Carmans and the Peconic River. So as you can see, things change as you move around the County.

Quickly moving on to water quality factors, the subject of today's hearing, the USGS has -- conducts typically cooperative studies with public agencies that -- where we are collecting water quality data from wells an streams and populating our data base. We also conduct national studies that are funded by the government, such as the National Water Quality Assessment Program, which is designed to look at the effect of human activity on the quality of groundwater and to assist trends. Historically though, on Long Island we've conducted a cooperative study with both counties and state that was the first in the nation really to establish the statistical relation between the occurrence of contaminants in the shallow groundwater and the land use that surrounds the well where the water was collected. So with that information, the National Water Quality Assessment Program went and took that and applied that to 60 subsidiaries across the country. In the slide I'm trying to show you that with increasing agricultural land surrounding a well, which is indicated by the yellow -- the amount of yellow you see in the bars, you have an increasing amount of agricultural pesticides; atrazine} and metachloral} in that water. And that -- I think that's all I'm going to say about that one.

Water quality, more water quality factors effecting sustainability. This relation to what Sarah just mentioned, the USGS has been involved in a number of studies, such as the Peconic Estuary Program, the Long Island Sound Study, the South Shore Estuary Study. In this slide I'm trying to show how the USGS used its data base of wells and water quality collected from those wells within a proximity of the shore line to evaluate Nitrate concentrations and how they relate to concentrations in the Long Island Sound. As I mentioned, water quality -- other water qualities unique to the Island really are -- well, not unique to the Island, really coastal environments; saltwater intrusion, and the Geological Survey here on Long Island has been adapting and developing methods to help better evaluate the position of the saltwater interface. And as you can see in this cross section, there's a squiggly line here and one here. This is a cross section through Manhasset Neck. You can see this log, induction log, is a tool passed through this well indicates a response like this and shows where the saltwater is through the cased well. And it provides a delineation of where the saltwater interface is beneath Manhasset Neck. It's relatively a new tool.

Merging issues in water contaminant risks is something we've been talking about. The USGS has been identifying and evaluating emerging water contaminants and the potential effects. Everybody knows there's been production of chemicals, new toxicological knowledge and new questions as we've discussed previously regarding degradates and mixtures. The USGS has conducted two national reconnaissances of emerging contaminant or waste water compounds. The first national recon of what has been termed emerging contaminants was conducted in 2000. That looked at surface -- excuse me -- it looked at surface waters. The second national recon looked at groundwaters, and indeed we have on Long Island participated in that and -- although the results have not been released. We have sampled four wells for over 200 emerging contaminants.

Regarding degradants. This is from the National Water Quality Assessment Program, the {Noqua} Study that looked at thousands of wells across the country. And the occurrence data from those wells supports what we see locally, that is that the total concentration of the degradation products from these compounds, which the USGS has developed some methods for far exceeds the concentration of the parent compound. Meeting the challenges of sustainability on to the importance of monitoring data. The foundation of any good groundwater analysis including those analyses who's objective is to propose and evaluate management strategies is the availability of high quality

data. So it behooves us to collect high quality data and maintain a monitoring network.

There are varied uses of the groundwater data that we get requests for in our office; droughts, water quality, saltwater intrusion. We get requests for floods with regards to subways and basements, water supply issues and source water protection. The current data collection network in New York looks like this. There are hundreds of sites or wells across Long Island, many of them are sampled just once. A few of them as you can see are sampled hourly. And soon there will be three sites that are collected continuously, real time data. There are eight real time coastal flood monitoring stations, three of them

72

are in operation, there are other -- the other five are in -- they're being built as we speak. Let's see, and there's one of the -- there's one real time stream data network which will go online -- I think it just went online last week at the Connetquot River. Samples that we collect on water levels from that network are published in water table maps, and they are available if you want them. As I mentioned a lot of the data that we collect or are planning to collect, there's a real push towards getting this data out as quickly as possible for certain management needs, especially coastal management, emergency flood warning systems and things like that. We use satellite telemetry to provide near real time data even when we can't get to gage sites. If you go to NewYork.USGS.gov home page, you can find a link which will allow you to bring up real-time data, allow you to bring up any of the water quality data that we have collected and that's been approved in your database. We also have surface water discharge, groundwater data, and I think we also have two sites now that provide you with meteorological data.

A little bit more about computer models. They are a very useful tool. Although the forecast of future events that are based on model simulations are imprecise, they nevertheless may represent the best available decision making information at any give time. It is very important and need to be updated and need to be looked at carefully to see if they actually give -- represent the system accurately. The USGS has been developing digital floor models, as I've said, since, oh, they built the first one back in 1980s, I guess, and it's preceded through time. These are some of the model areas that we've completed. We are continuing to develop new models. The next slide I'm going to show you is a cross section that is right here looking through this face in Queens County. And in the works are a very complex computer model that will simulate groundwater flow and the chemistry that

accompanies that flow. What's planned in Queens or proposed anyway is the injection of surface waters from Upstate that would be stored in the Lloyd aquifer for times of drought and was drawn at that time. And so we hope to be able to evaluate what effect that storage of water has on the native groundwater, the direction of flow of that water and where it extends to as well as the chemical interactions that are bound to occur between two different solutions. So I'll just step through this animation.

MS. LOMORIELLO:

Excuse me for one second. Can you just describe for us what we're looking at in terms of the colors that you've put up there.

MR. TERRACCIANO:

Yeah. The colors are for -- these colors you could consider them differences in chloride concentrations. Okay. The freshwater is the flow system. And as I step through it -- I'll go back one. You're basically in here where you have a fresh groundwater in the Magothy aquifer, there's the Raritan confining unit and the Lloyd aquifer beneath it. This is the Lloyd in here as a confining unit, the raritan, up here is the Magothy and above that you have your upper glacial aquifer. We put on that -- all those dots are at the center of boxes which divide up the model. These thing in here, these squiggly lines are all vectors describing groundwater flow. And basically after we recharge the water or inject water into the Lloyd

73

aquifer, we see changes in the direction of flow, and also are looking at just by this color it means there's a difference in conductivity. It merely illustrates the extent of the injected water in this slice of the flow system. And up under here, this is -- this is the bottom of the flow system. What happens is that as you move southward, which is to the right and into the page, the thickness of the hydrologic units increases. And so as you look in the plan or the cross sectional view what's happening is you're seeing the bottom of the aquifer, because it's thickening to the east. Okay.

A little something about strategies for sustainability. This may not make a whole lot of sense, but anyway, I thought I'd put it up. Innovative approaches that have been undertaken to enhance the sustainability of groundwater resources typically involve a combination of use of aquifers as storage reservoirs, conjunctive use of surface and groundwater, artificial recharge of groundwater through wells or surface spreading and use of recycled or reclaimed water. I know most of the water managers in the back are familiar with a lot of

this. Some of those strategies spelled out include the use of other sources of water other than local groundwater. In Kings and Queens, right, they're using surface water from Upstate. The changes in the rates or spacial patterns of groundwater pumpage can also increase the sustainability of the resource, or changing the rates or where you're pumping or spreading in out can enhance the longevity of it.

Increases in the recharge to groundwater to the groundwater recharge system that would be perhaps injecting reclaimed water or waste water instead of putting it out to sea in through those sewage treatment systems. Decreasing discharge from the groundwater system, that could mean things like minimizing {evapotranspiration}, it could mean things like actually scavenging water for supply near the boundaries of the flow system. As you may know, groundwater leaves the hydrologic system through streams and seeps to the saltwater system. So if you were to try and scavenge that water before it leaves, you would preserve, I think, the shape longevity of the groundwater system. And then changes in volume of storage at different times scales relates to the duration and location of pumpage.

This the one of my favorite slides because any use of groundwater changes the subsurface and surface environment that is when you pump water from the system, it has to come from somewhere. The public should determine the trade off between the groundwater use and the changes to the environment and set a threshold for what level of change becomes undesirable. And that's it. Thank you.

CHAIRMAN BISHOP:

Thank you. Regarding that -- that last statement.

MR. TERRACCIANO:

Sure.

CHAIRMAN BISHOP:

How do we measure what that -- is it your job to present us with what the trade would be if we let's say built out Long Island completely in the next ten years?

MR. TERRACCIANO:

Yes, it could be.

CHAIRMAN BISHOP:

But someone has to ask you, right?

MR. TERRACCIANO:

The Survey is -- is not a regulatory agency, and most cases we do not compete with the private sector. If the County or a public agencies were to ask, yes, we could help them address that question.

CHAIRMAN BISHOP:

Yesterday's -- yesterday morning we had -- I'm sure you know everybody who's in this room, you probably worked with them.

MR. TERRACCIANO:

Most of them, yes.

CHAIRMAN BISHOP:

And at the risk of mischaracterizing everybody's statements, the way I perceived it is that there was a difference of opinion as to whether we currently mine water. In other words, are we taking out more water from our system than is being put back in. And the Long Island Stony Brook --

MR. TERRACCIANO:

Henry Bokuniewicz, yes.

CHAIRMAN BISHOP:

We are not mining water, Sarah Meyland says we are mining water, do you have an opinion?

MR. TERRACCIANO:

Personally, yes. I don't think we're mining water. I don't -- haven't looked at the numbers. But one issue that did come up yesterday that I thought was worth highlighting at this time has to do with budgets. And I have worked for some time in the islands in the Pacific, and the water budget myth is near and dear to my heart. I spend many times -- many an hour trying to convince people that you shouldn't look at the system that way. And if you wanted to turn to page 15 of your circular, 1186, you don't have to, but anyway, I -- yeah, there's something referred to in there as the water budget myth, and it sounded something akin to that if it didn't rain for 300 years -- but anyway, some hydrologists believe that a predevelopment in water budget for a groundwater system, that is the water budget for the natural conditions before humans used the water, can be used to calculate the amount of water available for consumption or in other words, a safe yield. In this case, the develop of a groundwater system is consider to be safe if the rate of groundwater withdrawal does not exceed the rate of natural recharge. And this concept has been referred as the water budget myth. It's a myth because it's an other simplification of the information that's needed to understand the effects of developing a groundwater system. As human activities

change the system, the components of the water budget, the inflows, the outflows, the changes in storage also change and must be accounted for in any management decision. Understanding water budgets and how

75

they change in response to human activities is an important aspect of groundwater hydrology. However, as you'll see in the rest of this text, predevelopment in water budget is by itself of limited value in determining the amounts of water that can be withdrawn from on a sustained basis.

CHAIRMAN BISHOP:

All right. Well, that addresses one of yesterday's discussions. Regarding the trade off, I thought one the themes that came out of yesterday's discussion was that if Suffolk County continued to be developed, water could be supplied to accommodate that development, but there would be damage done to surface water levels, and there would perhaps be a need for a very extensive system of transferring water from one area to another. Is that something that you concur with?

MR. TERRACCIANO:

The manner in which the development takes place, how they've placed the wells, how much they pump, where they go, distribution, all plays an important role in determining what effects they're going to have. And that's why I kind ever stress the idea of looking at the system as a whole, perhaps through a model of sorts. It could effect the water levels, which could decrease the stream flow, which could drive wetlands, which could destroy habitat, change vegetation. And those are value judgements that need to be made. I don't know -- you could pump all the water out of the ground, it could turn salty and you just have good desalination. And hypothetically, I guess, it could occur, and it's, you know, those are all part of the, I think, decisions that need to be made when evaluating, you know, the water use issue.

CHAIRMAN BISHOP:

Thank you very much.

MR. TERRACCIANO:

You're welcome.

CHAIRMAN BISHOP:

Now, I have one card. Are there members of the public or Water Authority or anybody else here who wishes to speak? All right. First I have Mr. Mark Serotoff.

MR. SEROTOFF:

Thank you. Good afternoon. This afternoon I'm wearing my other hat, that of the science and technology health person of Townline Civic Association. There are issues of concern that exist that the Legislature should be aware of with regard to water quality and again, these several power plants that are being proposed for Long Island, specifically Kings Park Energy and Brookhaven Energy and Spagnoli Road. To recap yesterday, they roughly used collectively 5 million gallons of high quality water a day for missions purposes and for cooling the turbans. That's the equivalent of overnight throwing 50,000 more people into Suffolk County. It's a huge consumption. Specifically again, it just turns out that kings Kings Park Energy is the poster child of all that's evil in the world. And they exemplify in this case a problem with -- a serious problem on several fronts of water quality threats to Suffolk County.

76

For example, in order to make up water that Kings Park Energy is using, a contaminated nitrated well on {Salsburg} Drive will be opened up. Kings Park Energy was in discussions with the Suffolk County Water Authority. They will give half a million dollars to the Water Authority to make a denitrifying plant to open up this contaminated well. Earlier today it was mentioned by the gentlemen from the Suffolk County Health Services that the nitrates can cause blue baby, methemoglobin anemia. And I found out in the discussion with a lab technician from the Suffolk County Water Authority that the nitrates are also carcinogenic. The people in the area, which Townline Civic represents, which is Commack, East Northport, Fort Salonga, Kings Park, Dix Hills, East Northport, we're not against the plant, we're terrified of this plant. This plant will be using high quality potable water to cool the engines and for emissions purposes, where a little -- a little further west the people in the area of {Salsburg} Drive will now have that water, even though Mr. Miller of the Suffolk County Water Authority told me that it will be within safe governmental specifications of ten parts per billion of nitrates or less. There's still now the small amounts of carcinogens and nitrates in the water, and this is to make up for the use Kings Park Energy.

The other problem is economic; the denitrifying plant is over \$2 million, they're contributing a half a million dollars. So where does that 1.5 million come from? Essentially it seems that it might be helping a private company with public money. Another major concern that these -- all three power plants have for quality of Suffolk County water is storing large quantities of hazardous chemicals other

the aquifer. Spagnoli Road and Brookhaven Energy realizing that there were over Article 7 of the Suffolk County Sanitary Code aquifer deep recharge protection zones dropped bulk storage of distillate as a backup fuel, number two fuel oil. However, Kings Park Energy persists in insisting on storing about 100,000 gallons in prohibition of Article 7, against Article 7.

To its credit, the Suffolk County Government and Suffolk County Health Department is -- has not granted a waiver for Kings Park Energy, and now they are seeking at a waiver at the state level from the State Siting Board. Article 10, the Power Plant Siting Law allows the State Siting Board to override our Article 7. Mr. Minei told myself and several of the people in a meeting last year that this law of -- that protects our sole source of drinking water, Article 7, has never been successfully contested in court or any other front. It's always stood to protect our sole source of drinking water. A real possibility exists that the state may override in this case Article 7 and allow Kings Park Energy to store 100,000 gallons of proscribed materials, in this case it's about 15,000 of ammonia and 85,000 gallons of number two fuel oil. That opens up the possibility of a precedent being set. Once Kings Park Energy, if they were to get the waiver, the precedent would be set and other industries which have been clamoring to get exceptions and waivers for Article 7 will have that precedent. That's another real threat to our groundwater, the overcoming of Article 7 to protect it.

Yesterday I attended a fuel conference, technical conference, at the Dennison Building regarding alternatives to storing fuel on site. And here's the latest thing, it's unfolding as we speak, one of the

77

gentlemen from the state suggested well, we have a problem -- we may have a problem, meaning the state, in overcoming Article 7. What's the feasibility of running an oil pipeline from Commack/Kings Park to the Northport power plant facility. So Alex Santino of the Suffolk County Health Department was asked his opinion of that, and initially he looked at it as being unfavorable because a pipeline several miles a long, a foot or two feet in diameter, of number two fuel oil will itself contain thousands of gallons of fuel and that would be considered storage, again, in violation. And then one of the fuel engineers of Kings Park Energy said that in order for that to work a storage tank, a 20,000 gallon tank, must be added in addition. So here's another alternative that's laced with potential threats to our water supply. So to sum up, I would like to -- the Legislature to be aware of these power plants proposals, to say on top of them and to

participate with input into the siting process, because the threats are unfolding as we speak and continuing. And this has never happened before. Thank you.

CHAIRMAN BISHOP:

Thank you, Mark. Sir.

MR. {SUBERT}:

Good afternoon. I was just looking in Newsday today --

CHAIRMAN BISHOP:

Can you please state your name.

MR. {SUBERT}:

My name is Don Subert from Medford. And I saw this committee happening today, and I'm look around and trying to find out what land preservation or watershed preservation has been done in Medford. Some of the issues that you brought up today that I heard in the few minutes I was here is we have an intense population there. And I have never seen anybody purchase a square inch of land in Medford. And a good part of Medford is in zone -- Hydrological Zone III and a good part of it -- the rest of it is in -- part of it's in the Compatible Growth Area, okay? And we have a good pop -- a tremendous population. There might 120 sites that would be purchasable by the County; out east in Peconic or whatever, pristine perfect situations. But here -- there might be 120 there, but there might be only four left, two parcels that I would bring up to you are less than a quarter of mile from Route 112, just under 2000 feet from Route 112. And I don't see any -- I would like to see you purchase some parcels in Medford. It would be good for watershed, you don't have transfer water liked you talked about from a long distance from Manorville further east --

CHAIRMAN BISHOP:

How large are the parcels?

MR. {SUBERT}:

They're -- one's 50 some odd acres, the others 80, with parcels to the east of it that could be contiguous into Yaphank and on the Medford/Coram line. And one has -- one is, you know -- just there's some simple aesthetics parts of it. There's one that just scrub oak, pine barren, blueberry, but there might be a kid that never seen in Medford blueberry bush left the way the growth is going. And we have

such a population there. So that's one. The other parcel's on Granny

Road. Both of them aren't even a few hundred from the TOWN of Brookhaven's offices, okay? And you go down there and one parcel is maybe, you know, it's opposite Paintball, and Paintball's one too. And ironically, the County had parts of these parcels over the past.

CHAIRMAN BISHOP:

Paintball must be good for the environment.

MR. {SUBERT}:

Yeah, right, I can imagine how good that is. But what has -- when they say, you know, kettle holes, salamander ponds and all that, right off Granny, not far from Route 112. And it's going to be gone. There might be 120 still out in Peconic, but we don't have anything left here in the Medford area. And I bring that to your attention.

CHAIRMAN BISHOP:

The Legislators for Medford are Legislator Foley and Caracappa; is that correct?

MR. {SUBERT}:

Foley and Towle.

CHAIRMAN BISHOP:

Towle. Have you met with them?

MR. {SUBERT}:

I sent letters -- I sent letters, and I sent one to the County -- County Executive because he came to our Civic Association meeting in Medford, and I sent letters, and I haven't received a response from anyone. I think Mr. Towle -- I called him back, I think he got -- I got a phone call --

CHAIRMAN BISHOP:

Send a copy of your letters to them to me. I'll make sure that you get a response. It's unusual for a Legislator to not put forward preservation efforts like that -- of this type that you're speaking of, particularly in the parcel which has the kettle hole and the blueberry bushes. It just doesn't sound right.

MR. {SUBERT}:

Well, the blueberry bushes are on the other part, that sort of just a plain ordinary pine barren, scrub oak. The other parcel has hill -- you know, has rocks.

CHAIRMAN BISHOP:

Get me copies of that. I'll make sure that I present it to them, and

they'll respond.

MR. {SUBERT}:

I would like to see them purchased because I know there's so many parcels that people are interested in, and I'm sure that -- these might be contiguous to other parcels in the area too. And ironically, one of -- I'm sorry, go ahead. Go ahead.

79

CHAIRMAN BISHOP:

The way it works is that the Legislator for the area that parcel is in will put forward a resolution to take planning steps, which is to take a look at the parcel and evaluate its importance. And then the Planning Department will report to us their findings and then the environment -- this committee, which hopefully will have better attendance at the next meeting, you know, you can lead is Legislator to water, but you can't make them attend. This committee will vote on it after we get the report from Planning. So it starts with the Legislator whose district the parcel is in.

MR. {SUBERT}:

There's a couple of different factors here too. One parcel has to do with a land trade in Brookhaven Town, okay? But it's a land trade, the golf course in Rocky Point, that's non Pine Barren land. They're actually transferring the development into the Compatible Growth Area, and I think this is some kind of information you should know that towns are passing upon, that here's density from an area that's not in the Pine Barrens and they transfer it into the Pine Barrens. And that's just because it's not in the core area nobody knows it, okay? That's one. And another that may make people squirm and you can look around -- not people to squirm, I guess, but one parcel now Toussie owns, okay? And that -- you can see how straight everybody get to say his name, but that's still not a reason. Hey, maybe he's a, you know, an agreeable seller right now, maybe he's a motivated seller from the position he's in. And maybe we can do something that we should have got it back that the Town of Brookhaven actually -- the 152 acre parcel of scrub oak and pine, the Town of Brookhaven had it in their planning guide, they had it in their planning guide as preserved open space, because they thought the County owned it, of course, the County didn't own it. And it was in another -- and the other parcel was County owned at one time too. So here we are selling parcels then trying to buy them back at a later time when one time the County controlled it. And I'd like to see your help. Can I get your help on looking over this parcel and see how worthwhile? Especially to an area that has a lot of growth, could probably use public wells there.

You know, they can use more wells for the future, and it's not transporting water from eastern -- far Eastern Manorville to the western sections of the town or the County.

CHAIRMAN BISHOP:

You'll have my help in getting them considered. The first step though again, please send me a cope of what you sent.

MR. {SUBERT}:

I'll hand you one now.

CHAIRMAN BISHOP:

All right. Is there anybody else who wishes to speak before the committee? Well, that concludes our two day marathon hearings on water quantity and quality. I appreciate everybody who came. I certainly learned a lot, and I'll make sure that my colleagues in the Legislature receive a synopsis of everybody's remarks so they don't have to read the lengthy record. Thank you all.

(*THE MEETING WAS ADJOURNED AT 3:15 P.M.*)

{ } DENOTES SPELLED PHONETICALLY