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MEETING OF THE LONG ISLAND COMMISSION  
ON AQUIFER PROTECTION

June 7, 2017  
10:10 a.m.

260 Motor Parkway  
Hauppauge, New York

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Reported By  
Charissa Schwab

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

Stan Carey  
Nassau-Suffolk Water Commissioners Association

Jeffrey W. Szabo  
Suffolk County Water Authority

Frank Koch  
South Farmingdale Water District Superintendent and  
Long Island Water Conference

Michael White  
Suffolk County Legislature Presiding Officer

Walter Dawydiak  
Suffolk County Department of Health

Don Irwin  
Nassau County Department of Health

Brian Schneider  
Nassau County Commissioner of Public Works

Chris Ostuni  
Nassau County Legislature Presiding Officer

Jared Hershkowitz  
Suffolk County Presiding Officer

Sarah Meyland  
Nassau County Legislature Minority Leader

Paul Granger  
Port Washington Water District

Stephen Terracciano  
United States Geological Survey

Carrie Meek Gallagher  
New York State DEC

John C. Milazzo  
Suffolk County Water Authority

P R O C E E D I N G S

1  
2 MR. CAREY: Welcome to the second quarterly  
3 meeting of LICAP for 2017. We will start with  
4 introductions. My name is Stan Carey. I'm the  
5 representative from the Nassau-Suffolk Water  
6 Commissions Association.

7 MR. SZABO: Jeff Szabo, Chief Executive  
8 Officer of Suffolk County Water Authority.

9 MR. KOCH: Frank Koch, South Farmingdale  
10 Water District Superintendent and representative  
11 for Long Island Water Conference.

12 MR. WHITE: Michael White, representing  
13 Suffolk County Legislature, Presiding Officer.

14 MR. DAWYDIAK: Walter Dawydiak, Suffolk  
15 County Health Department.

16 MR. IRWIN: Donald Irwin, Nassau County  
17 Health Department.

18 MR. SCHNEIDER: Brian Schneider, Nassau  
19 County Executive Office.

20 MR. OSTUNI: Chris Ostuni, Nassau County  
21 Legislature.

22 MR. HERSHKOWITZ: Jared Hershkowitz,  
23 Suffolk County Legislature PO.

24 MS. MEYLAND: Sarah Meyland representing  
25 the minority leadership and the legislature in

P R O C E E D I N G S

Nassau County.

MR. GRANGER: Paul Granger, Superintendent  
Port Washington Water.

MR. TERRACCIANO: Stephen Terracciano,  
United States Geological Services.

MS. GALLAGHER: Carrie Meek Gallagher,  
Regional Director for New York State DEC for Long  
Island.

MR. MILAZZO: John Milazzo, Suffolk County  
Water Authority.

MR. CAREY: Today we have a couple of guest  
speakers. What I would like to do is I would like  
to stick to the agenda. We will have our guest  
speakers and conduct our business as a board and  
then we will have a period of public comment at  
the end.

I would like to stick to that agenda for  
several reasons. A lot of times we get out of  
turn and our stenographer really can't keep up,  
so I have to keep it orderly.

Second item on the agenda is the minutes  
for adoption from the September's meeting; is  
that correct?

MR. MILAZZO: No. From our special

P R O C E E D I N G S

meeting.

MR. CAREY: From our special meeting,  
right.

Our first presentation is on a Water Reuse  
Program. Our speaker is from the Tangent Company  
and his name is Adam Arnold.

Adam, can you come up? Welcome.

MR. ARNOLD: Well, thanks for having me  
here today and first off, congratulations to the  
Commission on all the great work completed to  
date. Up until a few months ago, I was not  
familiar with the challenges that Long Island  
faces with respect to the groundwater.

I had a chance to read the 2016 State of  
the Aquifer report and it's a really well-written  
document to get someone like me up to speed  
quickly. And after reading that, I really felt  
like I understood why Stan invited us to  
introduce the topic of on-site direct potable  
reuse.

Specifically we are going to take a look at  
the motivating factors for on-site direct  
portable reuse, unique design considerations, a  
pilot project that was carried out in Ohio

P R O C E E D I N G S

1  
2 between 2013 and 2016 and the plan moving forward  
3 in that state, and then we will briefly explore  
4 the potential for on-site direct potable reuse on  
5 Long Island.

6 To start with, I'm going to quickly review  
7 the two main types of potable reuse for those who  
8 are either not or only vaguely familiar with the  
9 concept. The first is indirect potable reuse or  
10 IPR in which highly treated reclaimed wastewater  
11 is added to a drinking water supply through some  
12 sort of environmental buffer, like a reservoir.  
13 The reclaimed wastewater could also be surface  
14 spread for percolation into an aquifer or  
15 directly injected into the aquifer, but it is  
16 added prior to the drinking water treatment  
17 processes.

18 The second is direct potable reuse or DPR  
19 whereby highly treated wastewater is added  
20 directly to a drinking water supply and this type  
21 of reuse is the focus of today's presentation.  
22 The first question that we normally get when  
23 familiarizing people with the work that we have  
24 done is why is Ohio a particularly water rid  
25 state interested in on-site DPR.

P R O C E E D I N G S

1  
2 And to start with, wells and septic systems  
3 serve over 700,000 rural and suburban homes  
4 representing over 2 million residents and  
5 businesses where centralized infrastructure is  
6 not available or is very expensive. The on-site  
7 water infrastructure is well established and well  
8 understood, but it can become problematic as a  
9 result of limited raw water availability due to  
10 overuse or periods of drought, degraded raw water  
11 quality as opposed to esthetic appeal or opposes  
12 to potential health risks due to contamination or  
13 challenges in on-site sewage discharge due to  
14 limited supple space or soils or concerns of all  
15 pathogens and nutrients.

16 Southwestern states like Texas and  
17 California, those are that are really driving  
18 potable reuse, have prominent raw water  
19 availability issues. Their primary motivation  
20 for DPR in general within these states is  
21 augmentation of increasingly depleted water  
22 supplies. Conversantly in Ohio, interest in  
23 on-site DPR is being driven by both longstanding  
24 and intensifying water quality and sewage  
25 discharge issues.

P R O C E E D I N G S

1  
2 To give you a couple of examples, in 2004,  
3 an outbreak saw 1,500 individuals on an island in  
4 Lake Erie, a popular summer destination,  
5 developed gastroenteritis from contamination of  
6 the groundwater wells. Two years after that  
7 incident in 2006, it was discovered that private  
8 wells in Wooster Township were heavily  
9 contaminated with E-coli and nitrates.

10 Four years ago in Mansfield, an industrial  
11 solvent trichloroethylene was detected in private  
12 wells that supplied a couple of facilities  
13 including a childcare center. One year later,  
14 high concentrates of another solvent  
15 tetrachloroethylene were detected in residential  
16 wells in Oxford Township. In many areas  
17 throughout the state have naturally high levels  
18 of arsenic.

19 So the greater water quality in Ohio is  
20 partly natural, partly the result of industrial  
21 pollution, but in many cases interlinked with  
22 sewage discharge challenges. The first two  
23 contamination examples I mentioned on the island  
24 in Lake Erie and in Wooster Township were some  
25 sewage that originated from septic systems.



P R O C E E D I N G S

1  
2 Surveys conducted in 2010 and 2012 have  
3 found that 30 percent of all sewage discharge  
4 systems have failed or are failing and because  
5 only six percent of the states' soils are  
6 suitable for our basic traditional installation.  
7 For some sites, Ohio EPA prevents off-lot  
8 discharge of treated sewage directly in the  
9 neighboring digenesis creeks and rivers. Of  
10 those off-lot systems, 65 percent or more are not  
11 meeting permitted water quality requirements.  
12 The consequences can then extend beyond localized  
13 degradation of the groundwater.

14 This 2011 satellite photo shows the extent  
15 of toxic algal bloom in Lake Erie, which  
16 essentially extends from Toledo all the way to  
17 Cleveland about 120 miles. Subsequent algal  
18 blooms in 2013 and 2014 resulted in bans on  
19 recreation and a do not use advisory for roughly  
20 a half of a million people in the Toledo area and  
21 2,000 individuals in Carroll Township who are  
22 serviced by municipal drinking water  
23 infrastructures.

24 Two things to note. One, under-treated  
25 sewage is only one of the contributing factors to

P R O C E E D I N G S

1  
2 those algal blooms, which partially leads to my  
3 second point. There are many solutions and  
4 combinations of solutions ranging in size and  
5 scope that will need to be implemented to deal  
6 with the issues presented, but the state has  
7 committed that one of the solutions will be  
8 on-site DPR because while it does reduce  
9 withdrawals of localized resources by recycling  
10 water as it is used, it also concurrently  
11 provides a safe and reliable water supply by  
12 recovering and purifying the water available in  
13 sewage rather than discarding it, and reduces  
14 pathogen and nutrient loading for local and  
15 potentially downstream environment by directly  
16 removing a portion of those contaminants and  
17 reducing the overall volume of sewage to be  
18 discharged thereby facilitating better treatment.

19 On-site DPR in Ohio began at this facility.  
20 The headquarters of the Western Reserve Land  
21 Conservancy, a nonprofit land trust whose mission  
22 it is to preserve the scene of beauty, rural  
23 character and natural resources of Northern Ohio.  
24 Accordingly, when it became necessary to expand  
25 their corporate headquarters in 2012, the new

P R O C E E D I N G S

1  
2 construction employed the most current innovative  
3 and environmentally sustainable building  
4 practices.

5 Several on-site water infrastructure  
6 challenges were encountered as part of the  
7 expansion. The existing well had insufficient  
8 yield to meet peak demand and had poor water  
9 quality and connection to the nearest public  
10 water system was cost prohibitive, and a  
11 relatively large amount of land was required for  
12 septic system installation in the clay soils, yet  
13 space was limited due to regulatory buffer zones  
14 surrounding a creek and other property features.

15 These challenges together with the  
16 commitment of stewardship of watermill resources  
17 compelled with the board of trustees and  
18 management to look at a number of creative  
19 resolutions, but what they specifically wanted  
20 was DPR. In advance of designing an on-site DPR  
21 system, differences in scale between small  
22 individual facility and typically larger  
23 centralized implementations had to be considered.

24 Firstly, with respect to source control,  
25 for on-site DPR there are no contributions from

P R O C E E D I N G S

1 agricultural runoff or industrial discharges.

2 And although it might be assumed therefore that  
3 the source the water would be more consistent,  
4 there's actually greater variability over time in  
5 between systems because there's no buffering on  
6 how water is used and what is put down the drain  
7 can vary significantly from one facility to  
8 another.  
9

10 Likewise, peak concentrations of pathogens  
11 in sewage from a single facility are likely to be  
12 higher than a municipal waste water and this is  
13 because there's less averaging from shedders and  
14 non-shedders. The figure here shows a  
15 hypothetical simulation for illustrative  
16 purposes. When every individual has the same  
17 infection shedding rates, we expect to see  
18 infrequent high spikes punctuating periods of  
19 pathogen absence for on-site scale, and that's  
20 represented by the green line, and more  
21 consistently year average concentrated, a larger  
22 centralized scale represented by the blue line.

23 On-site DPR installations also cannot  
24 depend on extensive human oversight because  
25 employing a full-time operator is not practical.

P R O C E E D I N G S

1  
2 However when an upgrader intervention is  
3 necessary to investigate the anomalous data, for  
4 example, specific treatment processes can be  
5 taken offline easily and quickly and without  
6 interrupting water supply because ample upstream  
7 and downstream water storage is more feasible  
8 than a centralized scale.

9 Finally, small scale systems can yield  
10 performance monitoring data. They are easier to  
11 interpret and possibly more sensitive  
12 particularly when they consistent of discrete  
13 process units.

14 Taking these unique considerations into  
15 account, Tangent designed an on-site DPR system  
16 for the Land Conservancy expanded headquarters.  
17 The system comprises three modular components:  
18 Preliminary purification, analogous to wastewater  
19 treatment and pretreats the water for improved  
20 performance of downstream processes. Advanced,  
21 purification, analogous to full advanced  
22 treatment with application of advanced treatment  
23 technologies to ensure the purity and safety of  
24 recycled water and purified water storage and  
25 delivery, analogous to an engineer storage buffer

P R O C E E D I N G S

1  
2 combined with distribution and monitors and  
3 maintains the supply of purified water that's  
4 suitable for delivery to the building as potable  
5 water.

6 Following recommendations, guidelines and  
7 principles developed by the greater water-use  
8 community, a multibarrier process designer  
9 approach was employed and the three components  
10 include equalization, traditional biological  
11 nutrient reduction, multistage filtration,  
12 reverse osmosis, UV advanced oxidation and  
13 disinfection, conditioning to reverse  
14 acidification caused by the RO and establish a  
15 neutral PH and chlorination. Hydrochloric is  
16 also added to the purified water storage tank to  
17 maintain a chlorine free residual and the chiller  
18 limits the water temperature to 20 degrees C.

19 I know it's difficult to see here, but this  
20 is an updated process flow diagram of the system  
21 and a key item of note here is that the existing  
22 well provides a backup water supply, as well as  
23 top-up supply to maintain a consistent system  
24 volume countering any discharge from the reverse  
25 osmosis process. When we introduce that top-up

P R O C E E D I N G S

1  
2 supply upstream of the advanced treatment  
3 processes, so that it doesn't reduce the  
4 efficiency of biological treatment by dilution  
5 and so that it also does not impact purified  
6 water quality.

7 The system is highly automated and the  
8 automation has gone through extensive  
9 verification. A central controller is used to  
10 log and interpret data from over 30 sensors with  
11 instant automated responses to a variety of  
12 process anomalous and delivery of notifications  
13 and service requests to offsite operators when  
14 necessary.

15 To protect the integrity of the stored  
16 purified water, the system was designed in a  
17 fail-safe way to halt advanced purification in  
18 the event of questionable performance of a  
19 central treatment device. For example,  
20 production of additional purified water ceases,  
21 elevated RO permeate conductivity suggests the  
22 possibility of a breached membrane. Likewise, a  
23 continued supply of potable water in the building  
24 is assured by switching to the existing well in  
25 the event of questionable purified water quality

P R O C E E D I N G S

1  
2 as indicated by low pre chlorine residual  
3 concentration for example.

4 The process control was established through  
5 adoption of a water safety plan approach  
6 beginning with the application of the hazard  
7 analysis critical control point framework to  
8 identify critical control points where ongoing  
9 performance verification is needed, the RO  
10 membrane for example. It also defines critical  
11 monitoring requirements, monitoring of the RO  
12 process requires online analysis of conductivity  
13 as well as periodic off-line vacuum decay  
14 testing.

15 The failure mode event analysis framework  
16 was subsequently employed to proactively  
17 anticipate potential failure scenarios, such as  
18 power outages or leaks and build a combination  
19 into the design accordingly. And finally, with  
20 all the microbial hazards having been considered,  
21 quantitative microbial risk assessment was used  
22 to conduct a preliminary exploration of the  
23 treatment targets for pathogens, and that  
24 preliminary analysis was captured in a poster  
25 presentation given at last year's National Water



P R O C E E D I N G S

1  
2 Quality Conference, which I would be happy to  
3 share with anybody who is interested.

4 As the system was being designed, Tangent  
5 simultaneously engaged with regulatory agencies  
6 to determine a strategy for permanent. Private  
7 water systems in Ohio are regulated by the  
8 Department of Health and local boards of health.  
9 In this case, the Cuyahoga County Board of  
10 Health. For lack of an existing regulatory  
11 framework allowing on-site water recycling as a  
12 potable water supply source, a pilot process was  
13 deemed necessary to demonstrate system  
14 performance.

15 Working collaboratively, it was agreed that  
16 the pilot would take part in two phases.  
17 Throughout both phases, the building sewage was  
18 diverted to the on-site DPR system for  
19 purification rather than being sent to the  
20 existing septic system. However, during phase 1,  
21 the purified water was discharged to the septic  
22 system rather than back to the office complex to  
23 allow for a low risk proof of concept.

24 With regards to permitting, phase one  
25 required the Board of Health to seek an

P R O C E E D I N G S

1  
2 experimental concurrence from the state to modify  
3 the building sewage management approach. In  
4 support of that request, the protocol document  
5 was prepared that examined all the potential  
6 risks and mitigation measures and outlined a plan  
7 for sampling and analysis.

8 Phase one commenced in April of 2013.  
9 Oversight of the study was assigned to the  
10 residential water and sewage program and the  
11 Bureau of Environmental Health who convened an  
12 advisory panel of water reuse experts to provide  
13 qualified guidance and critique. After more than  
14 a year of intensive sampling and challenge  
15 testing, the group reached consensus that the  
16 system can produce safe potable water directly  
17 from sewage and delivering purified water into  
18 the building for DPR warranted. So phase 2  
19 involved plumbing and purified recycled water  
20 into the office complex.

21 A request for variance was submitted to the  
22 state to permit alteration of the facility's  
23 existing private water system and an updated  
24 protocol document was prepared with a revised  
25 sampling and analysis plan, detail standard

P R O C E E D I N G S

operating procedures and reporting and notification protocols.

It was determined that phase 2 would be comprised of two periods. The first of which would limit the use of purified water for drinking and cooking with bottled watered provided for these purposes, and that was deemed necessary to allow for resolution of any unanticipated anomalies because it was thought that full scale implementation of DPR could have changed the building's sewage chemistry relative to the use of the well water. With the variance approved, phase 2 commenced in August 2014 and a second expert advisory panel was convened to provide guidance.

Again, after another year, it revealed operational water quality data that led to a consensus that drinking and cooking restrictions could be lifted. Consequently, the second period of phase 2 began in December 2015 with further demonstration of the system's safe and reliable performance, phase 2 was completed in May 2016 completing the pilot study.

Purified water sampling plans incorporated

P R O C E E D I N G S

1  
2 US EPA drinking water standards, as well as  
3 standards developed for indirect potable reuse in  
4 California and recommendations from the expert  
5 panelists. With respect to regulating  
6 contaminates total coliform and E. Coli were  
7 monitored consistently through both phases of the  
8 pilot with a total of 205 samples all yielding  
9 non-detects. 90 purified water nitrate analyses  
10 were completed with typical concentrations around  
11 3 milligrams per liter. One sample had a  
12 concentration that slightly exceeded the 10  
13 milligrams per liter MCL at 10.2 milligrams per  
14 liter. One analysis for a broad selection of 51  
15 synthetic organic compounds or SOCs, during phase  
16 1 yielded only non-detects except for 1.1  
17 micrograms per liter of Styrene and three  
18 follow-up Styrene analyses during phase 2 all  
19 yielded non-detects.

20 The primary drinking water standards for  
21 disinfection byproducts were consistently met.  
22 30 samples showed a declining trend for both  
23 TTHMs and haloacetic acids with ten samples  
24 yielding averages of 9 micrograms per liter and  
25 five micrograms per liter respectively in phase 1

P R O C E E D I N G S

1  
2 and six samples during phase 2 being all  
3 non-detects.

4 Primary unregulated SOCs including in a  
5 sampling plan were chosen according to their  
6 potential toxicity and hypothesized presence in  
7 sewage. Listed here, they were monitored four  
8 times in phase 1 and three times in phase 2 and  
9 were not detected in any of the samples.

10 Analysis for 33 additional unregulated SOCs was  
11 completed twice in phase 2. Of these, there were  
12 five detections of note. There were also  
13 detections in one sample of BPA, galaxolide, DEET  
14 and TCPD that were deemed suspicious due to  
15 detection in the corresponding blank.

16 Key unregulated DBPs were also monitored  
17 through both phases of the pilot. Nitrosamines  
18 NDMA and NDEA for example were detected during  
19 phase one in concentrations that exceeded  
20 California's 10 nanogram per liter action level,  
21 but neither were detected in 11 samples collected  
22 during phase 2.

23 Chlorate detections with concentrations  
24 sometimes exceeding the 210 micrograms per liter  
25 health reference level. Similarly to the

P R O C E E D I N G S

1 nitrosamines concentrations declined over the  
2 course of the pilot from an average of 408  
3 micrograms per liter during phase 1 to 47  
4 micrograms per liter during the second part of  
5 phase 2 with no exceedances.  
6

7 The reason for the general improved  
8 purified water quality from the startup to the  
9 end of the pilot was because process changes were  
10 made at various points to optimize and resolve  
11 issues identified in the data that was being  
12 received.

13 For example, anion exchange resins  
14 initially used in the treatment training were  
15 identified as the primary source of nitrosamines  
16 and the removal caused concentrations to drop.  
17 It was determined that the one nitrate exceedance  
18 was due to carbon and alkalinity deficiencies in  
19 the secondary treatment processes and  
20 supplemental feeds caused nitrogen reduction to  
21 improve and stabilize.

22 Further, nitrosamine reductions and control  
23 of chlorine were achieved through reducing the  
24 targeted free chlorine residual from 1 to 0.4  
25 milligrams per liter and switching the chemical

P R O C E E D I N G S

1  
2 disinfectant from sodium hypochlorite to calcium  
3 hypochlorite. There was a dilution effect when  
4 purified water was plumed into the building for  
5 use and top-up supply from the well began to  
6 occur. This is captured in the total organic  
7 carbon data collected from an online analyzer.  
8 The averaging concentration during phase 1 was  
9 258 micrograms per liter which fell to 40  
10 micrograms per liter during the second period of  
11 phase 2.

12 Overall the analytical data demonstrated  
13 the purified water is of high quality, but it is  
14 well understood that the safety with respect to  
15 pathogens cannot be confirmed through treated  
16 water monitoring alone. So challenge testing of  
17 the principle advanced treatment units was  
18 conducted in phase 1 to verify the pathogen  
19 reduction and inactivation was achieved using  
20 these technologies. Specifically the ultrafilter  
21 RO and unique processes were challenged with  
22 surrogate microorganisms. Further capability to  
23 reduce pathogens achieved through coronation was  
24 not evaluated mostly because it's very well  
25 understood.

P R O C E E D I N G S

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2 The results of these challenge tests are  
3 summarized on the table shown here with the  
4 exception of Enteric virus removal by  
5 ultrafiltration, every test demonstrated  
6 substantial reduction and cumulative log  
7 reduction values for Cryptosporidium, Total  
8 Coliform and Enteric viruses were 19.5, 22.2 and  
9 20.1, which for context is about three times what  
10 the states of Texas and California require for  
11 DPR.

12 Failures of the three key process units  
13 were also simulated to verify critical process  
14 control and sensitivity of the integrity test  
15 methods. As an example, the outside edge of the  
16 RO module was perforated with a small drill bit.  
17 A step change of permeate conductivity clearly  
18 indicated a loss of integrity.

19 The compromised membrane was challenged  
20 with surrogate microorganisms using similar  
21 procedures to the earlier challenge tests and the  
22 severely comprised process was still achieving a  
23 99 percent removal of Enteric viruses and at the  
24 same time, no viruses were detected downstream of  
25 the UV, and that showcased the reliability of a



P R O C E E D I N G S

1  
2 multibarrier treatment approach because the  
3 viruses were completely removed even when the RO  
4 performance was significantly impaired.

5 The data from the monitoring was important,  
6 but further feedback was the challenge testing  
7 that gave the regulators and expert panel members  
8 the confidence to move the pilot project forward  
9 and ultimately permit the use of purified water  
10 for drinking and cooking. Though resources that  
11 already have been directed to overseeing the  
12 pilot project, Ohio's commitment to on-site DPR  
13 was publicly on display and formalized on July  
14 14, 2014 when Governor Kasich signed the bill,  
15 Senate Bill 179, into the law expanding the list  
16 of private water systems to include recycled  
17 water.

18 The on-site DPR pilot system continues to  
19 operate as an approved private water system under  
20 the variance and up to today has reduced  
21 dependence on the well and septic system by more  
22 than 1.5 million leaders. Per the expert panels  
23 recommendations, regulatory requirements for the  
24 system have been modified that consists only of a  
25 central oversight including an ongoing regiment

P R O C E E D I N G S

of purified water monitoring, reporting,  
maintenance tasks and notifications.

In 2015, the health department assembled a group of stakeholders to conduct a five-year review of the private water systems' rules, which was to include developing and integrating new directives relating to recycled water. Focus shifted to only making modifications to existing regulations as a result of the lack of internal expertise and a desire therefore to engage regulators in other states and various other additional experts in the field. Prior to the next five-year review, the State's goal is to have completed development of the new recycled water directives for seamless integration into the role package.

During the 2015 stakeholder meetings prior to the change in scope, there were comprehensive discussions on a number of topics that included defining recycled water and classifying potable and non-potable end-uses, establishing minimum design standards, applying a quality management approach, setting requirements for field demonstration, challenge testing and

P R O C E E D I N G S

1  
2 certification, setting requirements for training  
3 of service providers and mandatory service  
4 contracts, creating mechanisms in administrative  
5 processes for approval and oversight of the  
6 recycled water systems, and sampling an analysis  
7 and reporting requirements. Based on the  
8 concerns expressed in the meetings, it's likely  
9 that the item which necessitates the most  
10 thorough consideration moving forward is service  
11 requirements to ensure longterm system  
12 performance and that could include providing  
13 local boards of health with enforcement  
14 capabilities.

15 So to summarize what I have covered today,  
16 on-site DPR may be a good option where  
17 traditional water infrastructure is problematic  
18 given that it can concurrently reduce withdrawals  
19 of water resources from the environment, provide  
20 a safe and reliable water supply and reduce  
21 pathogen and nutrient loading to the environment.  
22 The pilot project carried out in Ohio  
23 successfully demonstrated the first two points  
24 and there's an ongoing study to quantify the  
25 environmental impacts of the reduced pathogen and

P R O C E E D I N G S

1 nutrient load.

2  
3 With the passing of Senate Bill 179 in  
4 2014, Ohio has demonstrated its commitment to  
5 on-site water recycling including DPR. State  
6 regulatory agencies are mandated and motivated by  
7 challenges they face to develop appropriate  
8 regulations with a state of goal of putting them  
9 into effect in 2020. In the words of the senator  
10 who sponsored the bill, This modern option for  
11 private water systems will make a positive impact  
12 on our future water reserves. As in so many  
13 cases relating to sustainable practices, the risk  
14 of doing nothing is far greater than the risk  
15 associated with embracing new approaches.

16 So now I ask each of you to think about  
17 whether or not there should be a place for  
18 on-site DPR on Long Island. It's my  
19 understanding that this commission was formed  
20 back in 2013 because there is a need for  
21 increased conservation and protection of  
22 remaining groundwater supplies for all users,  
23 including the tens of thousands of residents who  
24 relying on private drinking water wells.

25 Water quality issues on the island include

P R O C E E D I N G S

1  
2 saltwater contamination, presence of industrial  
3 solvents, as well as nitrogen emanating from  
4 cesspools and septic systems. Per that 2016  
5 report, my understanding is that 10 percent of  
6 the population in Nassau County and 70 percent of  
7 the population in Suffolk County utilize on-site  
8 infrastructure for domestic waste disposal and  
9 the quality of water within these areas is  
10 usually somewhat degraded.

11 A primary goal of the commission is to  
12 issue a groundwater resources management plan, I  
13 believe, which is to include an assessment of the  
14 adequacy of existing regulations and  
15 recommendations on amendments as necessary, and  
16 certainly we suggest that regulations for on-site  
17 reuse be considered to include a wide range of  
18 alternative water, such as raw domestic sewage  
19 and a wide range of uses including full potable  
20 use.

21 In addition to facilitating better  
22 management of the groundwater, this could also  
23 support more sustainable development and notably  
24 avoid the complexities of dual plumbing systems  
25 for wastewater collection and water distribution

P R O C E E D I N G S

1 associated with greywater recycling for example.

2 I just have to quickly extend a special  
3 thanks to the Ohio Department of Health and  
4 Cuyahoga County Board of Health and to the  
5 employees working at the Conservancy  
6 headquarters, some of whom are shown here in 2015  
7 drinking their very first glass of purified water  
8 with what I will call skeptical enthusiasm.

9 Fortunately if you ask the same individuals of  
10 on-site DPR, I think you will find that there is  
11 just enthusiasm. Once again, thank you very much  
12 for inviting me to be here. If you have any  
13 questions after today, please don't hesitate to  
14 send me an e-mail or give me a call.

15 MR. CAREY: Thank you, Adam. I do have --  
16 do you have time for a couple of questions?

17 MR. ARNOLD: I do, yes.

18 MR. CAREY: My first question: The  
19 treatment process with the RO, I couldn't tell up  
20 on the screen. It was too small for me. Does it  
21 circulate back in or where does the waste go from  
22 the RO process?  
23

24 MR. ARNOLD: Yeah, there is some  
25 recirculation. The overall system of water

P R O C E E D I N G S

1  
2 recovery at that site is around 80 percent. So we  
3 are discharging 20 percent of the water with every  
4 passthrough and that is being discharged through  
5 the existing septic system.

6 MR. CAREY: Probably the biggest question,  
7 what was the system rated for in gallons per day?  
8 I may have missed it.

9 MR. ARNOLD: That system was rated for  
10 2,000 gallons per day.

11 MR. CAREY: And what was the cost of that  
12 pilot program?

13 MR. ARNOLD: The overall cost of the  
14 program was probably -- including cost of the  
15 infrastructure is probably half a million dollars.

16 MR. CAREY: Does anyone else have any  
17 questions for, Adam?

18 MR. GRANGER: What are roughly the  
19 operating end costs of something like that?

20 MR. ARNOLD: So we are still evaluating  
21 that. So essentially, that system was a custom  
22 design system. What we were doing is trying to  
23 develop -- we are pretty close to developing a  
24 prepackage on-site DPR system that operates about  
25 500 gallons per day for a three- or four-bedroom

1 P R O C E E D I N G S

2 home, and what we are targeting is a monthly  
3 operating cost that's approximately equivalent to  
4 what you pay for fuel and water. So we are  
5 targeting below \$100 a month.

6 MR. DAWYDIAK: And what would the capital  
7 for that kind of system be roughly?

8 MR. ARNOLD: Still to be determined. I  
9 think that what we are trying to achieve is about  
10 a \$50,000 capital cost --

11 UNKNOWN SPEAKER: Can you use the mic?  
12 Can't hear you.

13 MR. ARNOLD: So what we are targeting is  
14 about a 50,000 capital cost and at certain  
15 circumstances, that's equivalent to installing a  
16 traditional well and a septic system.

17 MR. DAWYDIAK: One more question. You  
18 talked a lot about the disinfection. Can you just  
19 summarize how the wastewater treatment --

20 MR. ARNOLD: The biological --

21 MR. DAWYDIAK: Yes, the MBR or --

22 MR. ARNOLD: Sure, sure. Again, that  
23 system is an MBR system on-site. They are just  
24 using filtration, so it's just a gravity sand  
25 filter and then it's just a combination of anoxic



P R O C E E D I N G S

1 aerobic processes with some equalization upstream.  
2 With our system, we have employed an MBR, but also  
3 has nutrient reduction built in as well.  
4

5 MR. GRANGER: Are you planning a public  
6 relations program to get public acceptance in  
7 order to determine the yuck factor? I obviously  
8 have no problem with it. I believe in the  
9 technology, but for the layperson drinking  
10 wastewater might not be --

11 MR. ARNOLD: Certainly the industry as a  
12 whole is really doing quite a bit of work to build  
13 public acceptance. We work with the staff there  
14 quite a bit through the pilot program and that was  
15 obviously -- their engagement was a very important  
16 part of what they were doing, you know, to accept  
17 what we were doing, and I think that was kind of  
18 evidence. Their acceptance was evidence in a  
19 recent independent survey that was conducted and  
20 18 out of 19 responses said that they use that  
21 water on a daily basis for drinking. And so the  
22 learning's from that process we want to now get out  
23 there and apply more broadly and particularly in  
24 the State of Ohio and beyond as well.

25 MR. TERRACCIANO: If the water is recycled,

P R O C E E D I N G S

1  
2 is there an opportunity for a concentration of  
3 containments that's not removed by the system?

4 MR. ARNOLD: Sure. We have -- that's the  
5 study ongoing right now. Obviously it's been  
6 running for two years in a close loop scenario and  
7 we haven't seen any concentration effect to date,  
8 but I would say, you know, we are still going to  
9 be evaluating that longterm to make sure --

10 MR. TERRACCIANO: And you are monitoring  
11 close for that and other things?

12 MR. ARNOLD: Correct, and certainly there's  
13 nothing like that in the drinking water and that's  
14 primarily because of the RO process and I think  
15 the literature suggests with the RO and the UV,  
16 there shouldn't be a concentration effect, but  
17 again, we want to make sure that is the case.

18 MR. TERRACCIANO: In the closeup system, do  
19 you still have human intersection in the loop?

20 MR. ARNOLD: The --

21 MR. TERRACCIANO: The closeup system, you  
22 are still allowing the individuals to use the  
23 water?

24 MR. ARNOLD: Correct, yeah. It's their  
25 primary source of drinking water now.

P R O C E E D I N G S

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2 MR. TERRACCIANO: So then the RO waste is  
3 going back into the system?

4 MR. ARNOLD: The RO waste stream is being  
5 bled to the on-site septic system.

6 MR. TERRACCIANO: How does it close  
7 completely if there's no additional --

8 MR. ARNOLD: It's not completely closed.  
9 We are getting about an 80 percent recovery. With  
10 the residential system, the prepackage system, we  
11 are currently operating a pilot as well for that  
12 system and we are getting over 90 percent recovery  
13 with that system.

14 MR. WHITE: This goes to Paul's question  
15 about acceptability. So the owed cost that you  
16 suggested secure in the minds of people consuming  
17 this is that they are going to know immediately  
18 that there's a problem with the system or is  
19 sometime down the line, like, I have been drinking  
20 this water that failed something for a week or two  
21 or a month.

22 MR. ARNOLD: That's a great point and  
23 that's why there's so much emphasis and  
24 particularly these processes being placed on  
25 process control as opposed to endpoint monitoring.

P R O C E E D I N G S

1  
2 Once you determined that it's there through  
3 endpoint monitoring, it's probably been there for  
4 a while. That's why we spent so much time  
5 challenge testing and verifying the process  
6 control to make sure that it automatically shuts  
7 down in the event of some type of failure  
8 scenario.

9 MR. KRUPSKI: Al Krupski, A-L  
10 K-R-U-P-S-K-I. Did you do any work on the treated  
11 water for a land application of the treated water?

12 MR. ARNOLD: We haven't done anything like  
13 that. Our focus has always been on producing  
14 water that's appropriate for potable use. We are  
15 looking at the right now what to do with the blade  
16 stream, the waste stream from the process, and we  
17 are working with the Department of Health in Ohio.

18 One of the things that we are strongly  
19 considering is making it appropriate for land  
20 application and I believe -- and again, correct  
21 me if I'm wrong, but I think because of the fact  
22 if your focusing was on recycling the water to  
23 use it for irrigation purposes, obviously it's  
24 potable water so my guess is it would be fine for  
25 irrigating as well.

P R O C E E D I N G S

1  
2 MR. CAREY: Go ahead, Toni. Just state  
3 your name for the record, please.

4 MR. LEUNG: Toni Leung, L-E-U-N-G. So this  
5 is just a general comment on the Long Island  
6 Nitrogen Action Plan scope, there's a section  
7 about water reuse and we just started to look into  
8 that right now and we right now are drafting a  
9 very small request for proposal. We want to look  
10 at water we use in terms of blackwater and  
11 greywater and even possibly what you are talking  
12 about direct reuse. With that said, we might be  
13 looking to convene in a small work group and start  
14 with that process. I just want to throw it out  
15 there so everybody knows that that's what we are  
16 looking for.

17 MS. BERRY: Glynis Berry, G-L-Y-N-I-S,  
18 Berry, B-E-R-R-Y. Have you compared both the  
19 risks and the costs of separating the source, the  
20 blackwater and then just treating the greywater?

21 MR. ARNOLD: Yes, certainly. I think  
22 that's a very common practice throughout the U.S.  
23 now is greywater recycling as you mentioned. Our  
24 focus has always been on basically one pipe in,  
25 one pipe out and really with the idea that you

1 P R O C E E D I N G S

2 reduce the complexity of the plumbing system. And  
3 I could probably quantify those costs for you, but  
4 I think just from a philosophical perspective, I  
5 think our belief is, again, because it does so  
6 many other things in terms of taking care of a lot  
7 of problems that this is really the longterm play.

8 MS. MEYLAND: A couple of points. One is  
9 so the solids are going into the septic system; is  
10 that correct?

11 MR. ARNOLD: Correct.

12 MS. MEYLAND: And then you have some of the  
13 recycled water that comes from the reverse osmosis  
14 system going into the septic as well, right?

15 MR. ARNOLD: Well, currently that's the  
16 only stream of water that's going into the septic  
17 system.

18 MS. MEYLAND: Since a lot of the  
19 contaminants are in the solids, how is it that you  
20 are able to improve the discharge quality of the  
21 septic system?

22 MR. ARNOLD: Right. So the water that's  
23 being concentrated in the RO has already gone  
24 through pretty extensive treatment, so the quality  
25 of water going out to the septic system -- the

P R O C E E D I N G S

1  
2 solids have been basically reduced to nothing.  
3 There's very little organic load there anymore and  
4 the nitrates been reduced through the nutrient  
5 reduction process so the loading is significantly  
6 reduced.

7 What we are quantifying right now is what  
8 are the impacts in terms of treatment in the  
9 septic leach field itself because further  
10 treatment does occur in the leach field and one  
11 thing I guess we are a little bit concerned about  
12 is without the organics that you won't get, you  
13 know, the same level of treatment in leach field.

14 MS. MEYLAND: But you are basically  
15 flushing the breakdown of the solids into the  
16 leach field?

17 MR. ARNOLD: The solids remain in our  
18 system, the on-site DPR system.

19 MS. MEYLAND: So you are removing solids  
20 from the whole system entirely? Is that what you  
21 are doing?

22 MR. ARNOLD: Correct.

23 MS. MEYLAND: Okay. Then I wanted to ask  
24 you about some of the treatment results for a few  
25 of the contaminants because I couldn't quite tell

P R O C E E D I N G S

1  
2 on your slides. For the PCPCs and the  
3 pharmaceuticals and all those, did you say or did  
4 you show that there was total removal or just  
5 significant removal?

6 MR. ARNOLD: There was total removal for  
7 most contaminants. There were a few. I had  
8 mentioned there were five hits of note. They were  
9 detected in much lower concentrations than what is  
10 currently considered to be toxic, but because  
11 those were hit, that's driving our further study  
12 essentially. We haven't detected those  
13 contaminants recently.

14 MS. MEYLAND: How about perchlorate because  
15 it looks like the results you achieved are higher  
16 than the standards we are using here, the  
17 guidelines we are using here in New York.

18 MR. ARNOLD: For chlorate?

19 MS. MEYLAND: Yes.

20 MR. ARNOLD: Yeah, they initially were and  
21 that's primarily because of the fact that we  
22 employed sodium hypochlorite, so a lot of the  
23 chlorites were being created through application  
24 of that chemical. When we switched to calcium  
25 hypochlorite, it was substantially reduced to, I



1 P R O C E E D I N G S

2 think, low double digits or 40 or --

3 MS. MEYLAND: It's 40, but we are using 18  
4 here in New York.

5 MR. ARNOLD: For drinking water?

6 MS. MEYLAND: Is it 18?

7 MR. MILAZZO: I think we are talking about  
8 two different things.

9 MR. ARNOLD: This is chloride. This is no  
10 perchlorate.

11 MS. MEYLAND: I thought you said  
12 perchlorate on the slide. So did you test --

13 MR. ARNOLD: We did, yeah, there's no  
14 perchlorate. It was all in the form of chloride.

15 MS. MEYLAND: So you didn't monitor for  
16 perchlorate?

17 MR. ARNOLD: We did. I really just put up  
18 the things we found. There was nothing there.

19 MS. MEYLAND: And you said something at the  
20 end about the pathogen removal was two times the  
21 California standards. So did you mean two times  
22 better than the California standards or --

23 MR. ARNOLD: I did, yes. Two times more  
24 than what's required in California and Texas for  
25 their treatment process.

1 P R O C E E D I N G S

2 MR. CAREY: Just one more question, please.

3 Does anyone else have a question over here? Last  
4 question, please.

5 MS. MURPHY: Maureen Murphy, M-A-U-R-E-E-N  
6 M-U-R-P-H-Y. In one of the slides you talked  
7 about blending. Is that a practice that happens  
8 automatically at the end? Is it something that's  
9 a fail-safe practice? How much of the water are  
10 you blending before it goes out to --

11 MR. ARNOLD: Sorry. The question you are  
12 talking about is when it switches to the on-site  
13 well supply?

14 MS. MURPHY: Right.

15 MR. ARNOLD: That happens periodically. If  
16 not, you know, I would say 1 percent of the time  
17 it switches. Mostly once the system is down for  
18 maintenance or we wanted to do some additional  
19 testing and we run out of purified water. So when  
20 that happens, it switches to the on-site well  
21 supply. It's very infrequent. Again, I don't  
22 know exactly the numbers, but it might be one  
23 percent of the time.

24 UNKNOWN SPEAKER: Could you make that  
25 presentation available?

1 P R O C E E D I N G S

2 MR. ARNOLD: I can. I will post it to our  
3 Website. If you give me a couple of days, I will  
4 have it there and you can go there.

5 MR. CAREY: Thank you, Adam.

6 MR. ARNOLD: Thank you.

7 MR. CAREY: Our next speaker is John Master  
8 son from the USGS on the Long Island Groundwater  
9 Sustainability Study.

10 MR. MASTERSON: So today in the interest of  
11 time, I am not going to go through all the  
12 background material --

13 UNKNOWN SPEAKER: Can't hear you.

14 MR. MASTERSON: I will start off with the  
15 objectives just to remind everybody what we are  
16 doing, that is to improve the understanding of the  
17 framework including the changes and positions of  
18 the freshwater-saltwater interface, develop a new  
19 regional groundwater-flow system and use that  
20 model to conduct a sustainability analysis and  
21 look at changes in pumping and recharge.

22 So today we are just going to talk about  
23 what we have been up to on the study and I say  
24 "we" because Fred Stumm is also here with me. I  
25 am going to cover evolved development and then I

P R O C E E D I N G S

1  
2 will turn it over to Fred and Fred will talk  
3 about the framework analysis component of the  
4 study. For the model development, we are really  
5 focusing on recharge, the inputs into the system,  
6 groundwater withdrawals and then we have  
7 developed a preliminary model based on the  
8 existing framework while we are waiting and while  
9 the framework analysis are being done so we can  
10 get at least a model up and running for some  
11 preliminary analysis.

12 When we start with recharge, you may have  
13 remembered, I've talked about the Soil-Water  
14 Balance Model that we use and that model allows  
15 us to come up with recharge across the landscape  
16 based on changes of soil type, topography, land  
17 cover, crop type, impervious surface and also  
18 factors in any changes in temperature and  
19 precipitation and then we can come up with a  
20 distributive recharge across the system and when  
21 you look at this map, what jumps out at you in  
22 towards southern Nassau, Brooklyn and Queens you  
23 see the purple color is much less recharged  
24 because of the impervious surface. And as you  
25 can get further out east, we see the recharge

P R O C E E D I N G S

1  
2 rates can be as high as 30 inches a year and we  
3 get a total of about 1.4 billion gallons a day of  
4 recharge that enters the system naturally.

5 We can use that same model to calculate  
6 what's that loss with the impervious surface and  
7 what we come up with is about 120 million gallons  
8 a day of water that's lost in the system. Now,  
9 in the city it may be lost completely through  
10 CSOs, combined sewer outfall, but in towards  
11 Nassau and Suffolk we know there are a number of  
12 recharge basins or sumps.

13 So some of that water is probably getting  
14 back into the system being rerouted and  
15 distributed to the recharge basin. So we are  
16 working on trying to figure out what percent of  
17 that 120 million gallons a day of water actually  
18 gets back in as aquifer recharge.

19 Also, we heard a little bit of wastewater  
20 return flow and that's another important  
21 component we are considering. We have looked at  
22 the non-sewer areas. It's about 350,000 septic  
23 systems, and that yields about 90 million gallons  
24 a day of water back into the aquifer. You can  
25 see the darker purple areas where there's higher

P R O C E E D I N G S

1 population density, more homes, more wastewater.

2 I just highlighted the Brentwood area south of  
3 here because that looks like the darkest purple  
4 in the area. So that's another input that we  
5 want to get back into the aquifer.  
6

7 Another one that we are considering is  
8 leaky infrastructure and I know what's up here  
9 right now is just the waterlines. This  
10 information we are able to get from the DEC when  
11 they clear the water supplies for their water  
12 loss. So we use that water loss and we  
13 distribute it along the distribution line and  
14 that's about 110 million gallons a day of water.  
15 There's also a lot of water going back into the  
16 city because that water is imported obviously  
17 from upstate and that's a loss along their  
18 distribution line. So there's a lot of water  
19 getting back in and, in fact, we didn't even  
20 include the loss and the sewer lines. We are  
21 still trying to sort that out.

22 So when you look at the components, the  
23 natural recharge accounts are about 80 percent of  
24 the total inflow into the system, but we could  
25 have another 20 percent that's either from leaky

P R O C E E D I N G S

1  
2 infrastructure, rejective recharge or domestic  
3 returnflow, but if all of it were to get back in,  
4 that would give us an average rate on the island  
5 of about 25 inches a year of recharge.

6 We are also working up the groundwater  
7 withdrawals. This is all input required in the  
8 model and we have information now not only on the  
9 public supply wells, the industrial, the  
10 remediation sites, commercial, agricultural.  
11 That information is all now in our database and  
12 we are able to apply that to the model. What you  
13 see if we have -- when you add that all up on  
14 average, it's about 460 million gallons a day of  
15 water.

16 Now, we look at the distribution of that,  
17 obvious public supplies is the biggest user,  
18 about 94 percent remediation sites and those are  
19 the sites coming in about three percent. We also  
20 have irrigation is two percent. I put an asteric  
21 there. This is averaging over 365 days for the  
22 year. Irrigation is really just during the  
23 growing season, so that number is more  
24 concentrated over those five months of growing  
25 season and it also changes year to year depending

P R O C E E D I N G S

1  
2 upon precipitation, and then we also have the  
3 industrial.

4 That irrigation, as I just mentioned, is  
5 about 10 million gallons a day on average for the  
6 year, but it's probably more like 25 million  
7 gallons a day for the growing season and that's  
8 split evenly between golf courses and the  
9 cultivated areas particularly out east. What we  
10 can do with that Soil-Water Balance Model that I  
11 talked about is we can hindcast because the  
12 reporting is very good for irrigation, we can go  
13 back into the record if we know the temperature  
14 and the precipitation and the crop type and the  
15 water demand for that crop and we can come up  
16 with some estimate as to how much water was  
17 probably pumped. And then going forward when we  
18 start doing climate change scenarios, we can look  
19 to see if there's changes in the temperature and  
20 precipitation, how that may effect the water  
21 demand for those crops. So that will all be  
22 factored into that analysis.

23 And all this feeds into the model. We have  
24 shown this a couple of times. We are ultimately  
25 working towards a 24-layer model, but the



P R O C E E D I N G S

1  
2 preliminary model we are starrng at right now is  
3 only going to be six layers and that's going to  
4 represent just the major hydrogeologic units and  
5 then going forward, as more information is  
6 available, we are going to begin to re-discretize  
7 and tighten up the model.

8 We are using the existing information on  
9 the framework. You have heard us talk about this  
10 Hydraulic atlas 709. It's a USGS publication  
11 from about 20 years ago and that has all the  
12 extents and thicknesses of the major units. We  
13 built that into this preliminary six-layer model  
14 and we have also looked at the 2,000 borings  
15 across the island.

16 We looked at all the information of those  
17 borings, related that information to the  
18 hydraulic conductivity, which is the measure or  
19 the ease in which the water moves through the  
20 aquifer and then we are able to distribute a  
21 preview across three-dimensional space and we put  
22 that in the model. So rather than just having  
23 one value for the Magothy where it's shown in  
24 orange in the upper left, if you look on the far  
25 right, you can see that there's changes in the

P R O C E E D I N G S

1  
2 methodology in Magothy and particularly the  
3 deeper portion of the Magothy, the basal Magothy,  
4 is a higher hydraulic conductivity than further  
5 up in the stack. So that's all built into this  
6 preliminary model while we are waiting to add new  
7 information from the drilling and new framework  
8 analysis.

9 So the preliminary 6-layer model we are  
10 calibrating right now, for those of you who know  
11 a little bit about modeling, we are using the  
12 software PEST for this calibration process. We  
13 are also working to set up the saltwater  
14 simulator. Right now this model is going to be a  
15 freshwater only model, meaning that interface  
16 position is fixed. It doesn't change in response  
17 to pumping.

18 This model is going to be used for --  
19 there's another DEC study looking at the  
20 contributors to the watersheds of coastal  
21 abatements. This model will be used for that  
22 purpose and then we are going to be then  
23 re-discretizing into 24 layers recalibrated and  
24 that will be used for the groundwater age  
25 analysis.

P R O C E E D I N G S

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2           You may have remembered that the USGS has a  
3 program called NAWQA, a national program. NAWQA  
4 has made Long Island one of the focus areas and  
5 we are leveraging that work. The development of  
6 the model started with a NAWQA study and we are  
7 looking at age distributions of the system as  
8 sort of a surrogate for susceptibility of water  
9 quality.

10           This example I have used before. We are  
11 looking at the top of that red line in that cross  
12 section. If you were to drill a hole in the dark  
13 blue area and went down, you have to go down  
14 about 800 feet below sea level, before you hit  
15 water that's older than 100 years. So that's  
16 part of this NAWQA study. It's a national  
17 program we are doing it here and it's being done  
18 in several sites across the country.

19           We are also looking at not only  
20 predevelopment, but how pumping perturbs the  
21 system and changes that age distribution. So we  
22 are benefiting from that work. We are going to  
23 have a model running and we will have to document  
24 that model as part of that NAWQA report and that  
25 will be hopefully in review sometime before the

P R O C E E D I N G S

1  
2 next year, and we can then use it for the  
3 sustainability study and start to do some  
4 preliminary analysis. It won't simulate the  
5 change in the interface position, but we can do  
6 some other things with it. As we wait for more  
7 information to be available from the framework  
8 analysis that model will then be updated. It  
9 will be sort of a living document. As more  
10 information becomes available, we will update the  
11 model, particularly information on the interface  
12 as we begin to move forward with the simulated  
13 saltwater.

14 With that, I will turn it over to Fred and  
15 Fred is the lead on the framework side and Fred  
16 will walk through what we have been up to in  
17 terms of the framework analysis.

18 MR. STUMM: Just as a background, while we  
19 are getting the drilling contract finalized, we  
20 are starting to select some prime sites for some  
21 of the outpost wells that we are looking to  
22 install. And just as a background, the drilling  
23 will include core samples which will be analyzed  
24 and integrated into the future model. They will  
25 have a full suit of borehole geophysical logs

P R O C E E D I N G S

1  
2 which will also help connect the dots. You can  
3 only get so many cores and the geophysical probes  
4 are able to measure different parameters and that  
5 can be integrated into the cross sections as well.

6 There's a current outpost world network and  
7 I will show you some of that in a second. The  
8 outpost world network was built primarily with  
9 Nassau County Department of Public Works. We  
10 worked in cooperation with them a few decades ago  
11 and even recently on the south shore. So that  
12 network is still in place and we are working  
13 closely with them to maintain that. They have  
14 done a really excellent job so far with that.

15 Those particular boreholes have PVC casing,  
16 so all the new wells will have that as well. PVC  
17 casing allows us to see through the casing using  
18 electromagnetics. It's basically a probe that  
19 can get an electric log at anytime we want to;  
20 whereas the past technology was we drill a well,  
21 you get an electric log at the time. And the  
22 idea is as water quality changes, specifically if  
23 it's a plume or road salt or saltwater intrusion  
24 we will be able to measure that.

25 The other disadvantage with having wells is

P R O C E E D I N G S

1  
2 we are sampling really from the smallest section  
3 of the aquifer. So it's really in a way a poor  
4 indicator of some of the changes. Unless you  
5 have 10,000 wells set up in a field, the  
6 geophysics will be able to kind of bridge that  
7 gap. And I will show you an example of that with  
8 some of the work we have done.

9 In the meantime we are analyzing the  
10 outpost world network. So Nassau County  
11 primarily has the outpost wells. Those  
12 boreholes, some of them were installed 20 years  
13 ago as part of the cooperative program that we  
14 have had over the years. Just like we have had  
15 also with the Suffolk County Water Authority, we  
16 are monitoring some of these wells. We go in  
17 with the geophysics and take a -- it's a way of  
18 taking a two-dimensional sample really and that  
19 data is archived.

20 We are now analyzing a lot of those wells  
21 and we are coming up with responses. So what's  
22 going to happen is we will have an EM log, but  
23 how does that relate to chloride concentration?  
24 So I'm going to show you some results of that.

25 And then also we will doing surface

P R O C E E D I N G S

1  
2 geophysics. Time-delayed EM is a surface type of  
3 measurement. And we have a couple of results  
4 that we are doing now. We are kind of working  
5 with a couple of partners for access to sites to  
6 fill in some gaps. And the idea is we want to  
7 see that for Nassau County.

8 So just as an example, this is one of the  
9 outpost wells in Manhasset Neck. The black line  
10 is the gamma log. It's a great indicator for  
11 finds as far as versus sand units, so aquifers  
12 versus clay units. It's going to have a higher  
13 increase to the right if it's radioactive  
14 naturally. Basically we have the EM log in red  
15 and it's a conductivity measurement.

16 So you can see pretty clearly that there's  
17 a conductive layer in the upper part of the  
18 aquifer here. The Lloyd is at the base. And  
19 what we looked at is we did filter-press samples.  
20 We extracted out of the floor spaces fluid and  
21 analyzed the chloride concentration. We also had  
22 some screens and took samples of those. So that  
23 gave us a data set with that geophysical log at  
24 that time. And then what we did was -- did that  
25 over 17 wells in Nassau County. We used some of

P R O C E E D I N G S

1  
2 these here. And the end result is a relationship  
3 between the two.

4 So this is the first time that a response  
5 has been correlated with the log. Most of them  
6 are log, log-type of things, so it's really a  
7 rough type of relationship. But with Lodge  
8 Island the geology is really -- really works  
9 well. It has a small component to the  
10 measurement.

11 And what does that mean? What that's going  
12 to mean is we can collect logs and then integrate  
13 this equation into the response and calculate  
14 with a high degree of accuracy what the chloride  
15 concentration is in zones that we don't have  
16 screens. And many times, within the aquifer  
17 there are zones with intrusion where it may be  
18 more conductive. Well, the well was screened at  
19 this particular horizon because at that time  
20 that's what we were hunting for. But there's  
21 zones that we missed. So instead of saying,  
22 well, things are getting worse, we can quantify.  
23 This is part of the work that's going on now with  
24 some of the older logs.

25 This was another outpost well. This was in



P R O C E E D I N G S

1  
2 1997. The red line, the orange, is in 2005. And  
3 the kind of purple or blue would be 2008.

4 So you don't have to be a geophysicist to  
5 see -- pretty much, though, this is the screen  
6 zone. The assumption was the saltwater is going  
7 to ride at the base of the aquifer. But in  
8 really, this zone here is much more transmissive  
9 and the plume is actually migrating above the  
10 screen.

11 Another technique that we are doing is  
12 surface geophysics. So obviously in Suffolk  
13 County we can take advantage of the open space.  
14 But what we are also looking to do is apply this  
15 to Nassau County and also the City. It's a  
16 technique where we just basically lay out a wire.  
17 We put a current through it using a small 12 volt  
18 battery. And we very accurately within -- it's  
19 within millions of seconds. We can turn it on  
20 and then listen to the response. So as this  
21 thing introduces an electromagnetic field into  
22 the earth, anything that's conductive or other  
23 layers will create a secondary field. So we are  
24 kind of sending a signal and then the earth, the  
25 layer, is sending us back a signal as well. So

P R O C E E D I N G S

1  
2 we will listen for that response back with a  
3 receiver coil.

4 And what does that look like? This is an  
5 example of a road-salt plume. We are doing a lot  
6 of research with Suffolk County Water Authority  
7 on some of their locations to delineate --  
8 instead of putting in, you know, tons and tons of  
9 wells or even to direct where the wells should be  
10 placed.

11 So this is a surface measurement that was  
12 taken. We have freshwater. So this is a  
13 resistivity log that was done from the surface.  
14 So I didn't have to drill the well. And then we  
15 can integrate time and depth. So we were able to  
16 get -- you have freshwater. You have a  
17 conductive plume which reduces the resistivity  
18 and then it get's more resistive below that  
19 layer. What's happening is there's a clay  
20 horizon right here (indicating).

21 We did apply then a couple of  
22 opportunities. We worked with the Shinnecock  
23 Nation in Southampton. Again, just to try to see  
24 does this technology relate to the real world?  
25 Is it just something that may not be as accurate?

P R O C E E D I N G S

1  
2 This is an example of a well that was  
3 drilled. Again, based on a theoretical 40-to-1  
4 ratio, we were looking at maybe the saltwater  
5 should be -- based on the water level should be  
6 about in this horizon. They didn't encounter it  
7 so we went and did a measurement, a sounding. It  
8 took about an hour and a half to take the  
9 measurement. And basically we were able to see  
10 down over 400 feet below the surface. And it was  
11 -- it indicated that, in fact, the interface was  
12 below the well, but we were also able to use that  
13 equation to calculate concentrations.

14 We took another sounding at the coast. Not  
15 surprising, at a discharge zone we are going to  
16 have a much smaller pressure water bubble and  
17 then saltwater discharging. And then we  
18 integrated it with a test well that the Suffolk  
19 County Water Authority had put in and then some  
20 of these surface soundings and you can get a  
21 cross-sectional view. So this will be in the  
22 middle of Southampton and on the coastline. You  
23 can kind of get a flow direction and then  
24 integrate where the saltwater interface is. So  
25 instead of putting in all these wells, we can do

P R O C E E D I N G S

1 it with surface measurements if it's available.

2 We are doing some work -- we are getting  
3 access also with the Town of Riverhead to some  
4 sites. This is a cross-sectional view using some  
5 new data. Again, integrating with the Suffolk  
6 County Water Authority, a lot of the test wells  
7 that goes in.  
8

9 But this is all relating to using borehole  
10 geophysical logs. Basically, I converted these  
11 all to conductivity so it's easy to see, but  
12 these are receptivity logs. And as we go further  
13 out east we have, you know, saltwater is much  
14 shallower. But what we found interesting was one  
15 of their supply wells has been impacted with  
16 saltwater and as we actually went west it was  
17 shallower. So it's just a little bit more  
18 complicated than just a textbook kind of cross  
19 section.

20 Overlapping now is a time-delayed EM  
21 measurement that we made. I had access -- I was  
22 able to put a 300 foot by 300 foot grid in a  
23 field and we were able to take a measurement. So  
24 it really correlated very well.

25 This is conductivity. So I calculated it's

P R O C E E D I N G S

1  
2 the inverse, so as I go to the right it is more  
3 conductive. So here's the clay horizon and we  
4 have a more conductive zone. But this is  
5 freshwater and then as we go further in depth  
6 this is the layer of clay. We were actually able  
7 to image the bedrock.

8 So it's a great tool for reconnaissance and  
9 picking sites ahead of time, also filling in  
10 gaps. We are only going to have so much outpost  
11 wells that we can put in in large areas. And  
12 this is another tool we looked into trying to  
13 integrate.

14 What we are doing now is, you know, using  
15 that experience, trying to see whether or not we  
16 can go with a smaller grid and see what the depth  
17 limitation is for some of the soundings.

18 Obviously, once we work in the Nassau and Queens  
19 area it's going to be a lot more limited.

20 They're not going to have a big field that I can  
21 put a 300-foot square in. It has to be in kind  
22 of a little bit more of an undeveloped area  
23 because we can get cultural noise. Anything will  
24 become radiant. So when I energize that field,  
25 if there's a pipeline underneath it, that becomes

P R O C E E D I N G S

1 a transmitter as well.

2 We digitized basically some USGS  
3 publications of the Magothy -- the deep Magothy  
4 intrusion for saltwater. This was -- the blue  
5 line is 1954. The yellow line is 1961 and then  
6 1988. So this just kind of gives a point of  
7 reference. And what we have done we've found a  
8 couple of sites that we can potentially get some  
9 soundings on. So that's going to be another  
10 point to help direct some of the drilling.

11 MR. CAREY: So the one question I have is  
12 how do you quantify those agricultural irrigation  
13 wells on the east end? Do you have a log of them,  
14 and how do you use that information in your data  
15 here, because you referenced that one well in  
16 Northville out in the Riverhead area and I know  
17 that's surrounded by many irrigation wells?

18 MR. STUMM: What we're doing -- I mean,  
19 from my point of view, I just want to determine  
20 where -- the biggest question, especially like an  
21 example would be like Riverhead Water District or  
22 Suffolk County Water Authority, where is the  
23 interface? How complicated is it? Why -- you  
24 notice also the geology is quite variable there as  
25

P R O C E E D I N G S

1 well. On the north shore we have some deeper  
2 erosion. There's a number of deep varied valleys  
3 that are filled with clay. So some of the wells  
4 are kind of protected in a way with some of those  
5 clay units and some of them were more vulnerable.  
6 So I'm looking at just trying to at least map  
7 where the interface is and then use that  
8 information as any test well that goes in or other  
9 supply wells and how they are impacted. But a lot  
10 of the irrigation wells are somewhat shallow.  
11 Some of them have records, some of them don't.  
12 But in general, you know, it's more cost-effective  
13 for them not to go too deep.

15 They are typically in a more shallow  
16 horizon, but depending on the local geology and  
17 what they encountered. So there's plenty of  
18 transmissive aquifer in the shallow zone. That's  
19 primarily what they are operating in. But as a  
20 package, in the summertime, they are a component  
21 that contributes to lowering the head.

22 In this particular example, there was some  
23 semi-confined zones that the well was set in, in  
24 the deeper part of the Magothy. So we were  
25 really primarily looking at can a surface

P R O C E E D I N G S

1 measurement taken with a technology like that  
2 match a borehole log?

3  
4 And I will have some more for the steering  
5 committee to show some slides. But what we found  
6 is that we got an excellent correlation with the  
7 borehole resistivity log and the surface  
8 resistivity measurement. We are kind of fine  
9 tuning it also to scale it down. We can work as  
10 small as like 40 meters, 120 feet square and get  
11 hundreds of feet of penetration as well. So  
12 that's what we are looking at and using in Nassau  
13 County to fill in some gaps and in the City. But  
14 in the background, you know, this is an  
15 island-wide study so these are some opportunities  
16 for us to work.

17 MR. FLAHERTY: Mike Flaherty, Nassau County  
18 Department of Public Works. Just to drive home  
19 that same point about the importance of the  
20 outpost well, the wells we put in 25 years ago  
21 jointly, if you had a well that was 1,000 feet  
22 deep with steel casing we had a 10-foot stream so  
23 you are only getting that bottom 10 feet. That  
24 was the only information that we could get.

25 The new wells that are going in and using



P R O C E E D I N G S

1  
2 the EM method, you can scan that entire 900 feet  
3 plus that you missed by using those methods, but  
4 you have to put in the plastic casing. The PVC  
5 wells, there's a lot of technology challenges.  
6 The steel wells hold up better at depth. That's  
7 why they were always used. So they are  
8 complicated completions. They cost a bit more,  
9 but they are well worth the money. And the  
10 placement, like Fred said, is very important  
11 because he can go and get that information from  
12 our old wells, which is very useful, but we can't  
13 scan the entire length of that casing. And  
14 that's what you have to understand, is that we're  
15 getting that full picture by using that method.  
16 So I think it justifies the cost and the effort.

17 MR. STUMM: Thanks, Mike.

18 MR. CAREY: Paul.

19 MR. GRANGER: Fred, good presentation. I'm  
20 looking at your graphic there and I notice Queens  
21 County, Nassau County. Are you coordinating  
22 efforts with the city folks right now with regard  
23 to that investigation?

24 MR. STUMM: There's not a cooperative  
25 program with New York City right now. We had in

P R O C E E D I N G S

1  
2 the past done some monitoring and some others, so  
3 there was more of a connection.

4 Right now, this is based on published --  
5 and the point also to drive home, the last  
6 investigation was 1988. So we have no idea where  
7 the interface is today based on the time alone  
8 that took place. And then on the, you know, some  
9 of the test, the older borings that we found,  
10 some of our assumptions, you know, the dogma was  
11 that the interface -- saltwater interface  
12 especially in the Lloyd is miles offshore.

13 And then, you know, working with John on  
14 the federal project with the costal plain study  
15 looking at all the offshore oil exploration  
16 wells, all the geophysics on those, a process  
17 that, I've never encountered freshwater in  
18 anything offshore. So it kind of drives home a  
19 different look at it.

20 In realty, the interface was always right  
21 at the coastline or even onshore in certain  
22 parts, maybe in western Long Island. And we are  
23 starting to look at, even in Suffolk County, you  
24 know, some of the assumptions.

25 But again, we didn't have data so the

P R O C E E D I N G S

1  
2 thinking then was it's miles away. That's why  
3 all the modeling was kind of done as well. But  
4 if you look at the historical data set and even  
5 some test wells that went in even at Smith Point,  
6 I saw they did a deep resistivity log on that and  
7 there's a couple of anomalies at depth in the  
8 Lloyd there as well. Again, if you look at that.

9 Again, looking at chloride concentration as  
10 well, I get a lot of pushback sometimes when we  
11 get upset at 10 or 20 milligrams per liter  
12 chloride in the Lloyd, but the big picture is it  
13 should be single digits. So we are starting to  
14 see small -- we would never look at those things  
15 as being significant because we're all thinking  
16 about the glacier or the Magathy, but in the  
17 Lloyd especially, it's very sensitive to changes  
18 in the interface. So we are starting to look at  
19 things a little bit differently and I think  
20 that's kind of holding up with what we are  
21 looking at with the research.

22 MS. GALLAGHER: Wait, let me just clarify a  
23 point there though. Fred was giving a very clear  
24 technical response in terms of chlorination, but  
25 for the purposes of this study, the Long Island

P R O C E E D I N G S

1  
2 Groundwater Sustainability Study, we are in close  
3 coordination with New York City DEP, DEC in Region  
4 2 central office, USGS folks so -- because we are  
5 clearly going to need to work with them in terms  
6 of locations for wells that are going to be  
7 drilled.

8 We actually just yesterday started  
9 formalizing a working group amongst the various  
10 parties at DEC USGS and DEP to make sure that  
11 there is close coordination moving forward so  
12 that we are sharing information, and that the  
13 model that's developed, you know, both for the  
14 purposes or maybe updated for DEP purposes, as  
15 well as the model we are developing, are going to  
16 be similar enough at -- that the decision-making  
17 process will be based on a similar model or the  
18 same model versus, you know, to a different  
19 model.

20 MR. CAREY: Jared.

21 MR. HERSHKOWITZ: Just a question about  
22 predictability. This is great. I love this  
23 because we can see clearly on the chart and of  
24 course the cost benefits of the system versus  
25 drilling wells all over the place. You can start

P R O C E E D I N G S

1  
2 to see things changing when you start looking at  
3 these charts and that's great.

4 Is it your intention at the end of the  
5 study to make some suggestions about  
6 predictability relative to, say, if New York City  
7 wanted to attack the Lloyds again, or if we had  
8 another Super Storm Sandy or the projections on  
9 seawater rising. Do you intend on including that  
10 in your study?

11 MR. MASTERSON: All the information that  
12 Fred presented will help inform the model, so if  
13 we can reproduce what we are seeing now it will  
14 give us some confidence that when we stress the  
15 system given climate change or increase in pumping  
16 that we would have some comfort that the, you  
17 know, results seem to be believable.

18 MR. HERSHKOWITZ: So you will include that  
19 in the study?

20 MR. MASTERSON: That is the study. I mean,  
21 that's really where we are going.

22 MS. GALLAGHER: So they -- USGS will not be  
23 making any recommendations. We as the  
24 policymakers will be making those, you know,  
25 determinations. They will be providing us with

P R O C E E D I N G S

1  
2 all the science and then we'll be working on that  
3 to come up groundwater resource management  
4 decisions moving forward.

5 That's the whole point of doing this.

6 Spending all this money, time and resources and  
7 working collaboratively to make sure that we can  
8 collectively be making better groundwater, you  
9 know, resource management decisions for the  
10 aquifer, not just in Nassau and Suffolk County  
11 but the entire chief aquifer which extends into  
12 Kings County.

13 MR. STUMM: Just to follow up also where I  
14 had briefly mentioned it, but the outpost well in  
15 Nassau County, they are in some critical areas,  
16 and now that we are able to quantify what the  
17 concentrations are, the peak concentrations and  
18 changes, we are coming up with rates of intrusion.  
19 So, you know, certain communities may be --  
20 depending on how much stress they've been  
21 impacting themselves just from the supply system  
22 in Nassau County, how much that's changed over  
23 time as well. So we are trying to come up with  
24 that and that's also going to be a useful piece of  
25 calibration tomorrow.

P R O C E E D I N G S

1  
2 MS. GALLAGHER: Yes. And I know we call it  
3 a study, but really what we are developing is a  
4 management tool. It's a water sustainability  
5 management tool for the entire geographic island.

6 MR. OTTAVINO: Jeremy Ottavino,  
7 O-T-T-A-V-I-N-O. Just looking for a little  
8 clarity. About a month ago I was at groundwater  
9 summit and one of the PowerPoint slides that you  
10 presented, John, showed that the  
11 freshwater-saltwater interface was at the  
12 shoreline of Long Beach Barrier Island and points  
13 west.

14 The clarity I'm looking for is five, ten,  
15 twenty years ago, how far out does the USGS think  
16 that the interface was into the seawater. Is  
17 that a fair question to ask or is your modeling  
18 off? What I'm looking for is how far it has  
19 migrated landward?

20 MR. STUMM: Again, like I alluded to in the  
21 past, we made -- you know, we made certain  
22 decisions based on what we thought the data was  
23 showing. So it's kind of like the chicken and the  
24 egg. If you don't have an out outpost well  
25 network, we didn't have what Nassau County put in.

P R O C E E D I N G S

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2 We had some older wells in Kings and Queens that  
3 we did monitor with the DEP. So to be fair, the  
4 network that was there and what was sampled  
5 indicated things are okay or things were  
6 looking -- especially in the Lloyd, there was no  
7 specific indicated for an issue.

8 So it's kind of like, you know, hindsight  
9 is 20/20, but really what we are looking at that  
10 time -- so all the indicators were that it's  
11 probably miles offshore just like it is on the  
12 rest of the island. And that's how you proceed  
13 with it. You have to have a starting point.

14 MR. OTTAVINO: Now I understand. That was  
15 the clarity I was looking for.

16 MS. GALLAGHER: Obviously, the point is  
17 technology advances, the model is better, there's  
18 better information and better data. We will be  
19 able to make better decisions with the new  
20 information and the new model and updated training  
21 today versus what they had 20 years ago or 25  
22 years ago or 30.

23 MS. GERMAIN: Mindy Germain, coordinator  
24 for Western Nassau Aquifer Committee. Thank you.  
25 It's been really fabulous to watch all the work we



P R O C E E D I N G S

1  
2 have been doing for the last two years come to  
3 life.

4 My question is: How do we take this new  
5 data, this new technology that we have been  
6 advocating for and how do we make this part of  
7 the discussion that's going on with the Queens  
8 wells? How do we fill in the gaps that the DEP  
9 currently has in the data, in the interface that  
10 they are basing their proposal on to reactivate  
11 those wells? How do we -- we are not always in  
12 those closed-door meetings? How do they make  
13 sure that they understand we need these tools to  
14 impact that decision?

15 MS. GALLAGHER: I think that they  
16 understand that now. I think that message is out  
17 there. Certainly when there's an editorial in  
18 Newsday and an article in Newsday and letters from  
19 state elected officials about the issue. I think  
20 the message has been received loud and clear by  
21 DEP and that's again part of the reason why we  
22 wanted to make sure that we kind of formalize this  
23 working group. Obviously, it's also the reason  
24 why we are prioritizing this study. I mean, the  
25 new wells that are going to be going in over the

P R O C E E D I N G S

1  
2 next -- you know, the first phase of this project  
3 are the Queens and Nassau wells to help inform --  
4 better inform DEC's decision-making process for  
5 renewing those permits.

6 MS. GERMAIN: Will there be any type of  
7 formal testimony made on June 21st about the need  
8 for this study, the need for the data from this  
9 study to be part of that process?

10 MS. GALLAGHER: I'm assuming that people  
11 that participate in that hearing will certainly be  
12 making that case. I mean, that would be my  
13 assumption. Are you asking if either DEP or DEC  
14 or someone --

15 MS. GERMAIN: Or the technical arm being  
16 the USGS that's behind the study.

17 MS. GALLAGHER: I don't think that decision  
18 has been made yet, but certainly I will take that  
19 request --

20 MS. GERMAIN: I think it will be helpful to  
21 have it.

22 MS. GALLAGHER: I hear your request, Mindy.  
23 Michelle?

24 MS. SCHIMMEL: Michelle Schimmel. I'm with  
25 the Western Nassau Aquifer Committee.

P R O C E E D I N G S

One of the golden grails is finding, if you can, that snapshot in time of where the saltwater-freshwater interface is.

My question is: Being that there are assumptions based on the past, to no fault, what was available at the time. And now I see there's a need, the term is always used for filling in the data. Is that being said? I know there are studies and continuing to use what you have used; in other words, at migrating that interface. Is it fair to say that you are going to do a blending, if you will, of past information with new information to find that information, or do you really have to suspend everything from the past and start anew in terms of looking for the golden grail of where those interfaces are? Because it sounds to me that it's so off that you can't even, for a lack of a better term, blend the two. Is it fair to say that you are starting from scratch in your mind?

MR. STUMM: Yeah, I mean that's why we are putting in the outpost wells to get a data point to start with instead of --

MS. GALLAGHER: But Fred, but I think it

P R O C E E D I N G S

1  
2 would be fair to say it's a major update and  
3 overhaul of the existing model, but you are not  
4 going to scrap all that good base information.  
5 That's why it's such a huge undertaking and effort  
6 to update the model with the new information.

7 MR. STUMM: Plus the wells that -- again, I  
8 go back with Nassau County because they kind of  
9 did a lot of heavy lifting with putting in the  
10 outpost wells. Again, you know, it's a  
11 significant cost just to put in one well,  
12 especially if you go to Long Beach, it's 1,500  
13 feet to bedrock. They pay by the foot and it's a  
14 months-long type of process.

15 But the well itself will be re-logged. The  
16 existing network is getting re-logged again.  
17 There will be sampling. And then also the new,  
18 that will help direct and it's already starting  
19 to direct us for a new drilling. And based on  
20 that, we will come up with a new interface  
21 location and then it will be able to be monitored  
22 for decades into the future. But that new data  
23 will go into the model, which is already off and  
24 running. And now with the framework, with the  
25 cores and everything else, because we are finding

P R O C E E D I N G S

1  
2 that there's a number of -- especially on the  
3 north shore and some other areas the geology is a  
4 little bit more complicated and it was kind of  
5 more generalized in 709, that particular study.  
6 And that's going to be integrated into the model.

7 You know, the next phase of that model will  
8 have the latest interface locations. It will  
9 have the latest geology, which will be related to  
10 the hydrology and that's what's going to be  
11 integrated, you know, for that decision-making  
12 that's going forward.

13 MS. SCHIMMEL: But at the same token, you  
14 know, it's on TV now. I read the book with  
15 Einstein. After so many years with natural law,  
16 he came up with a whole new dataset and it changed  
17 everything. Are we open to that? That, in fact,  
18 things change? You know, you are much more  
19 sophisticated now and the thought processes are  
20 much more sophisticated than they were 20 years  
21 ago. So we may have to suspend the natural law,  
22 if you will, for the case in point that things  
23 have changed that dramatically. I understand the  
24 language, but we will see what the data will drive  
25 --

P R O C E E D I N G S

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2 MS. GALLAGHER: We are certainly open to  
3 seeing what the new information shows us.

4 MS. BLUMER: Karen Blumer, B-L-U-M-E-R. It  
5 sounds like the working group is going to be doing  
6 some of the heavy lifting for policies and  
7 decisions, so who is on that?

8 MS. GALLAGHER: It's just a working group  
9 between DEC, USGS and DEP to specifically make  
10 sure that the modeling efforts for this study and  
11 the modeling efforts and information that's being  
12 produced as part of the DEP's permit and renewal  
13 process mesh and that we are actually coordinating  
14 and collaborating and not creating two separate  
15 models that then they are going to challenge for  
16 decision-makers.

17 MS. SCHIMMEL: So are these all officials  
18 or does it include people like Mindy and Michelle?

19 MS. GALLAGHER: No, no. It's just the  
20 technical people. It's just program staff.

21 MR. CAREY: One last question.

22 Mr. Krupski?

23 MR. KRUPSKI: Al Krupski. To a follow-up  
24 on Stan's first question about agricultural use.  
25 So you have great variability regionally, you

P R O C E E D I N G S

1  
2 know, the example last summer, we got two inches  
3 of rain in Peconic and obviously it made a big  
4 impact on agricultural demand. They didn't get a  
5 drop of rain in that event in Riverhead. And then  
6 Riverhead got five inches of rain in August. So  
7 those kind of regional variabilities.

8           And also the -- are you going to take into  
9 account the actual land use parcel by parcel?  
10 You know, next to us in Peconic there was 30  
11 years of continuous sod. The last two years it  
12 was fallow, zero demand on water. This year  
13 there will be field corn, zero demand on water.  
14 How are you going to take in those actual demands  
15 on freshwater resource?

16           MR. MASTERSON: We have a really detailed  
17 parcel scale of land use cover. It's not as  
18 detailed as you go back in time, but what we have  
19 now is quite detailed. And we also have the crop  
20 type and the water demand for the crop.

21           You spoke to the variability precipitation.  
22 We are limited by the precipitation weather  
23 stations and off the top of my head I don't know  
24 what we have out east. So if there are is only  
25 one, for instance, you wouldn't pick up the

P R O C E E D I N G S

1  
2 variability that you just described. But what we  
3 do have we will build in that variability based  
4 on those stations. And then with what I call the  
5 saltwater balanced model, we can make some  
6 predictions as to what the local water use should  
7 be. You know, there's also the over-irrigating  
8 water crops and we have to put in a fudge factor  
9 for that. It's worked well in the mid Atlantic  
10 and they certainly use it out in the mid-west.  
11 So it's true it has been tried and true. It  
12 hasn't been applied here, but we are confident  
13 that it will give us some information on filling  
14 in the gaps on the water use system.

15 MR. KRUPSKI: I think the concern is if you  
16 do that this year is accurate for 2017, then  
17 people are going to look at that and say this is  
18 set in concrete and these are the numbers. And  
19 not to account for different demands on the  
20 agriculture up or down and people will always  
21 refer to that number and it will kind of be doomed  
22 to using that data forever.

23 MR. MASTERSON: Well, we will show grafts  
24 and charts that show the variability on a year to  
25 year, the basis for the -- that's why I had the



P R O C E E D I N G S

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2 asterisk on irrigation to make that point. But  
3 you can look year to year for public supply and  
4 probably one year is the same as the year before  
5 or the next year, but we know for (inaudible) it  
6 is completely dependent upon antecedent and  
7 chronological data for conditions. So that will  
8 be factored in and we will be sure to make that  
9 point. I made a point of saying that was for  
10 2015. It doesn't mean -- I can't think of that  
11 line when they say when you are buying stocks but  
12 you know you can't predict --

13 UNKNOWN SPEAKER: You can't predict  
14 (inaudible) --

15 MR. MASTERSON: That's the one I am looking  
16 for. Thank you.

17 MR. CAREY: Sarah, last question.

18 MS. MEYLAND: I just have a technical  
19 question going back to how you are going to  
20 quantify recharge, specifically about the recharge  
21 basins.

22 Two things I just want to find out about.  
23 One, is that summary charge basins actually  
24 overflow into a system that drains into the  
25 coastal areas. So I wanted to know how you are

P R O C E E D I N G S

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2 going to deal with that. And secondly, some  
3 recharge basins aren't recharging. So are you  
4 actually going to do a basin-by-basin analysis or  
5 are you just going to make some general  
6 assumptions that may or may not fit every single  
7 basin that we have in the system?

8 MR. MASTERSON: We are still working  
9 through that. By last account, I heard 5,000  
10 recharge basins and they had a picture of one that  
11 looks like a forest. One next to my parent's  
12 house is a pond. So we can't go basin by basin.  
13 We are going to try to get out of it some kind of  
14 sensitivity analysis about how much water we could  
15 be getting back into the system through the  
16 basins. We can make some assumptions if they are  
17 fully efficient they way they are initially  
18 designed, what that will look like. If they're  
19 not behaving at all as designed what they look  
20 like.

21 MS. MEYLAND: A lot of them still have  
22 standing water in them. They are clearly not  
23 fully functioning the way they were intended.

24 MR. MASTERSON: We really don't have an  
25 answer as to how we're going to deal with that.

1 P R O C E E D I N G S

2 This is a recharge basin study. What might come  
3 out of this is more investigation is needed to  
4 fully determine just how efficient they are and  
5 what steps need to be made or taken to make them  
6 more efficient.

7 MS. MEYLAND: And what benefit you would  
8 get by maintaining them in a proper fashion.

9 MR. MASTERSON: Exactly. That I think we  
10 can quantify if they were working as designed how  
11 much water could get in. And then we could, of  
12 course, say if none of it's getting in what affect  
13 that will have on the system and that might be  
14 what we wind up with as an outcome.

15 MS. MEYLAND: Thank you. And by the way,  
16 this is wonderful information you are always  
17 bringing to us. Thank you very much.

18 MR. CAREY: Thank you Fred and John.

19 Okay, back to our agenda. We're up to item  
20 number 5 and that's a discussion on the  
21 Management Opportunities Report. We received it  
22 maybe about a week ago from Sarah and Jared.  
23 Several of us sat on the committee. So really we  
24 just want to have a discussion on how, or if we  
25 want to proceed with this report.

P R O C E E D I N G S

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2 I know in reading it, some of the  
3 information that a few of us had discussed at our  
4 meetings was not included. There was very little  
5 on extending LICAP, but along the same lines  
6 there was some other very good information. So  
7 given our time constraints where we want to go  
8 from here. We really didn't have any discussion  
9 on the report itself, but it was submitted a week  
10 ago. So we just want to open it up to the board  
11 and ask how we may proceed with this?

12 MS. MEYLAND: I brought copies for  
13 everyone. I wasn't clear who was getting --

14 MR. CAREY: When you sent it to us, whoever  
15 wasn't included I forwarded to them.

16 MR. HERSHKOWITZ: Does anybody need a copy  
17 of the report?

18 MS. MEYLAND: I have enough for the  
19 audience.

20 MR. SZABO: I would like to point out the  
21 report has come a long way. Certainly it is more  
22 detailed and includes incorporated information.  
23 This is sort of what we have been looking for. I  
24 don't think we are quite there yet, but as I said,  
25 come a long way.

P R O C E E D I N G S

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2 I do object to some of the terminology  
3 throughout the report. I think that there are  
4 sort of assumptions made that I don't believe the  
5 committee or the whole working group have  
6 necessarily supported. So I think it needs still  
7 quite a bit of work. And I think at this point  
8 in the process, I can't support including it in  
9 the Groundwater Management Plan.

10 MR. CAREY: I know one item that was  
11 missing was how we can improve the existing  
12 regulatory framework. We had talked about it in  
13 several meetings and I didn't really see a  
14 component on that included. I don't know, maybe  
15 is there a way we could continue our work on this  
16 report and maybe release it separately before  
17 LICAP concludes? Would that be a good suggestion?  
18 Does everyone agree with that? I don't think it's  
19 certainly at a point now where we can include it  
20 in the Groundwater Management Plan because we  
21 haven't even had any discussion since we received  
22 the report, which was labeled final when we  
23 received it. So is everyone open to continuing  
24 the subcommittee and issuing it possibly  
25 highlighting the points and issuing it separately

P R O C E E D I N G S

1  
2 at a later date?

3 MR. MILAZZO: I will just point out that  
4 you have two other reports are not going to be  
5 included in the plan, that will be presented next  
6 year probably.

7 MS. MEYLAND: What two are those?

8 MR. MILAZZO: Water Resources Opportunity  
9 and the infrastructure one. They are both in the  
10 LICAP legislation.

11 MS. MEYLAND: What was the other one?  
12 Water Resources Opportunity?

13 MR. MILAZZO: Yes. OS and IS.

14 So it's contemplated that not all of  
15 LICAP's work will be in the management plan, that  
16 there will be other documents and materials that  
17 are presented that are included.

18 MS. MEYLAND: I would just note that I  
19 think this is one of the components of the plan  
20 that's spelled out in the enabling registration.  
21 And I think we should try to get something that  
22 represents the management opportunity in the final  
23 report. It may not come in with this first set of  
24 reviews, but certainly we, I think, the way I  
25 understand the mandate of LICAP it should be, you

P R O C E E D I N G S

1  
2 know, a significant component because it's looking  
3 at where do we go from here.

4 MR. CAREY: Well, we debated amongst the  
5 committee -- as you I'm sure recall -- on the  
6 intent of the legislation of where it was written  
7 whether it was listed as a whereas or resolved.  
8 So we were at a difference of that opinion right  
9 from the start. But simply put we are out of  
10 time. We have two months to come up with the  
11 first draft of the Groundwater Management Plan and  
12 that's because it took so long to get all the  
13 other committee reports in. So that would be a  
14 very difficult task to do.

15 MR. HERSHKOWITZ: Just a clarification.  
16 When you say let's continue the work and submit it  
17 at a later date where we can satisfy Jeff's  
18 concerns and other concerns and the gaps in the  
19 plan extending LICAP and the regulatory framework,  
20 which I have no problem with. I don't understand  
21 how that would happen.

22 Are you saying that this might be an  
23 addendum to the management plan which would be  
24 added to the plan in December or in our fourth  
25 year we would issue this again as a separate

P R O C E E D I N G S

1 plan? I'm not sure what your intent is.

2 MR. CAREY: We could do an addendum or we  
3 could issue it as a separate report.

4 MR. HERSHKOWITZ: Just going along with  
5 Sarah's comments, I would have no objection if we  
6 could get it done issuing it as an addendum to the  
7 management plan. I have no problem with that.

8 But I think her point has to be well taken  
9 that whether you agree on the whereas or the  
10 resolved, there's something there in terms of an  
11 overriding conception of gaps that you guys  
12 asked, both Jeff and you said in the first  
13 meeting. We want to know where the management  
14 problems are, right, and then other members  
15 strongly said, Well, if there are gaps, how can  
16 we deal with those gaps? In what way could we  
17 deal with those gaps? So we are --

18 MR. CAREY: We said data gaps, not  
19 management gaps.

20 MR. MILAZZO: There's been a debate that's  
21 gone on for several years now on how the  
22 legislation should be construed and whether the  
23 management opportunities, which is in the 17th  
24 resolved, means management opportunities as the  
25



P R O C E E D I N G S

1  
2 entity or management opportunities with respect to  
3 existing things that can be done.

4 Like you had a presentation today.

5 Management opportunities on using wastewater and  
6 recycling. That may have been the motive. I  
7 know the intent of the word is management  
8 opportunities. If it is meant to say, management  
9 entity, it would have included those words.

10 MR. HERSHKOWITZ: John, We have debated  
11 this over and over.

12 MR. MILAZZO: I'm sorry, I didn't have the  
13 benefit of being at one of the meetings because  
14 these are always exciting conversations.

15 MR. HERSHKOWITZ: I must say the honesty  
16 and the openness on the part of all the members of  
17 this committee is wonderful. And we can  
18 respectively disagree with one another. And I  
19 think the committee was almost half and half in  
20 terms of that kind of disagreement. And it was a  
21 good debate. And I appreciate the chairman's  
22 identification that there's great value in this  
23 and that we should consider this with continued  
24 work for some sort of issuance, whether it be as  
25 an addendum to the management plan or a separate

P R O C E E D I N G S

1  
2 issuance, you know, down the road in our fourth  
3 year.

4 MR. CAREY: So to answer your question, I  
5 think we should continue our work as a group and  
6 come up with a product and then bring it back to  
7 the board and decide how it should be included in  
8 our mission.

9 MR. HERSHKOWITZ: I would respectfully ask  
10 that all members of LICAP, both the voting and the  
11 nonvoting members get this in an e-mail in the  
12 future so that we can get input from everyone who  
13 is a member of LICAP so that we can hear from  
14 everyone and make an adjudication based on the --

15 MR. CAREY: It was forwarded within an hour  
16 of when I received it, so --

17 MR. HERSHKOWITZ: To everyone or just the  
18 voting members?

19 MR. CAREY: The whole board.

20 MR. HERSHKOWITZ: I didn't get that.

21 MR. CAREY: You were on the initial one  
22 from Sarah, weren't you? Or no, I sent it to  
23 whoever was not on Sarah's e-mail with no  
24 comments. Just what she sent to me, the final  
25 version I forwarded to whoever wasn't on that

P R O C E E D I N G S

1 list.

2  
3 MR. HERSHKOWITZ: I understand. I just  
4 wanted to make sure I wasn't missed. I know when  
5 you issued P3 that just went to voting members.  
6 And I wanted to make sure.

7 MR. CAREY: That's because you wrote it.  
8 It came from you, that's why I didn't send it back  
9 to you.

10 MR. HERSHKOWITZ: Can I just ask for  
11 opinions from people who were on the committee who  
12 are here and whether they are in agreement to  
13 continue the work and, you know, possibly look  
14 towards an addendum or towards next year? So we  
15 can hear from Karen, Jerry and others, Ty?

16 MR. CAREY: That's fine.

17 UNKNOWN SPEAKER: I'm in agreement with  
18 this.

19 MR. HERSHKOWITZ: Jerry? Karen?

20 MS. BLUMER: Yeah. Absolutely. Since  
21 there's such a question about the entity that John  
22 Milazzo has raised, why don't we ask the  
23 legislator? We have a legislator here. Why don't  
24 we ask the legislator what they're intent is.  
25 William and Spencer has already to you and Jeff we

P R O C E E D I N G S

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2 don't want a monitor like the TV ad, we would like  
3 an enforcer, some action.

4 MR. CAREY: Right, but along the same  
5 lines, you know, LICAP was formed for a reason to  
6 come out with a Groundwater Management Plan. To  
7 come out with a Groundwater Management Plan by the  
8 end of the year, we have to give it time to be  
9 implemented. We have to see how the regulatory  
10 agencies respond to it.

11 You know, asking two legislators that may  
12 be here, I don't think would be appropriate, you  
13 know, for their opinion on what the intent of the  
14 legislation was because you could get -- I don't  
15 know how many in a legislator. 15 in each  
16 county, I guess, 18, 19? You can get 19  
17 different answers. So I am not going to do that  
18 today.

19 MS. BLUMER: But what is the purpose of the  
20 management plan?

21 MR. CAREY: So the question that was posed  
22 to you was are you in agreement to carrying  
23 forward with the committee and I think you clearly  
24 said yes.

25 MS. BLUMER: Yeah, I --

1 P R O C E E D I N G S

2 MR. CAREY: Thank you.

3 Who else did you want to ask. Jerry?

4 MR. CAREY: Jerry, yes?

5 MR. OTTAVINO: Yes. Thank you.

6 MR. HERSHKOWITZ: Thank you, guys.

7 MR. CAREY: You're welcome.

8 MR. WHITE: I'm in agreement with that  
9 approach. I think that really needs to be done.

10 First, I want to thank all the members of  
11 this committee for doing all this work so far and  
12 it should be used as a base going forward. I,  
13 however, don't believe that legislation says we  
14 should create or recommend an entity. Management  
15 opportunities in my mind go to how we are going  
16 to coordinate the agencies or that we already  
17 have that jurisdictions --

18 MR. HERSHKOWITZ: Just a correction. We  
19 were not suggesting that we create an entity. We  
20 were giving legislators choices of possible that  
21 they could proceed down the road, which I believe  
22 is what LICAP is supposed to do, make  
23 recommendations. It would be up to the legislator  
24 to make a determination as to where they want to  
25 go.

1 P R O C E E D I N G S

2 We are not recommending an entity. We said  
3 if there is, here's the criteria, here are the  
4 problems and here's some that we discussed. We  
5 didn't make a recommendation for a new entity  
6 here in this committee.

7 MR. WHITE: I don't disagree with that,  
8 Jared, but the volume that equals all those ideas,  
9 to me, doesn't fill what was the gap, the daily  
10 gap and/or talking about management opportunities.  
11 It just goes to talk we are assuming you are going  
12 to create an entity and here are some ideas.

13 MR. HERSHKOWITZ: If you are, then here.

14 MR. WHITE: And that's I think up to the  
15 legislature. I think it to be a great idea and it  
16 may be about time that LICAP go before both  
17 legislatures and make that report. Here's how we  
18 have gone forward. You know, I think this has  
19 been a great group in terms of connecting and its  
20 been doing things that no group has done before in  
21 terms of the dialogue that we are having, the  
22 information that's being presented and even the  
23 work product that has come out so far. And this  
24 work product that I think ultimately will include  
25 a work version of this in some form or another is

P R O C E E D I N G S

1  
2 an extremely important success story.

3 I think we differ on what that says, but I  
4 think we should go to the legislature and ask  
5 them. And by the way, I think one of the most  
6 important pieces that was in there -- I know the  
7 committee has discussed this and I think we have  
8 kind of battered around a little bit on the old  
9 commission is the idea that maybe not the  
10 jurisdictional or legal control in entity,  
11 whether or not the legislatures want to take that  
12 away from the DEC, health departments or  
13 whatever, but in terms of the management dialogue  
14 and building the consensus, I think this  
15 commission has shown the ability to do that.

16 So one of things I would focus on here is  
17 the opportunity that in continuation of this  
18 commission beyond the temporary status, and while  
19 the suggestion here looks like we reduced the  
20 members, I would suggest we increase the members.  
21 I mean let's get somebody from the EPA, let's get  
22 somebody from New York City. I think this is a  
23 great work in progress and, again, as a  
24 commission member, I want to thank you for doing  
25 that, but I think this is right approach to go

P R O C E E D I N G S

1 forward. Thank you.

2 MR. SZABO: Thank you.

3 MS. GALLAGHER: Since Michael brought up  
4 the issue of having EPA or someone in, I just  
5 wanted to make sure, I know probably most people  
6 are aware, but just a lot of the regulatory  
7 authority that's currently undertaken by DEC and  
8 DOH, which is delegated from the Federal  
9 Government and to the State and then down to the  
10 local health department, any suggestive changes or  
11 some larger entity that would assume those  
12 responsibilities is not something that can be  
13 made, honestly, at the local level or potentially  
14 at the State level. That would have be to Federal  
15 involvement. I just want to make sure everyone is  
16 clear on that.

17 MR. SZABO: I think over the last couple of  
18 years we have been very proactive in engaging in  
19 keeping both legislatures, both the Suffolk County  
20 Legislature and Nassau County Legislature, up to  
21 date on the work of LICAP. We have certainly have  
22 sent them our most dated aquifer reports, we have  
23 sent our annual reports. Some legislatures have  
24 attended some of the meetings, some have attended  
25



P R O C E E D I N G S

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2 our public hearings and I think it's appropriate  
3 to brief them on a Groundwater Management Plan and  
4 the progress we have made because we have a lot of  
5 to be very proud of. We have done a lot of good  
6 work, but I think it's likely -- and off the top  
7 of my head -- the best time to do that would be  
8 just before the public hearings this fall.

9 This fall, the plan should be in a form  
10 that we will share with the public, that we will  
11 share with elected officials. We can supply it  
12 to them, solicit their input and their comment  
13 and at that point, maybe have a further  
14 discussion about the future. I think we are not  
15 quite there yet. It's June, but maybe September,  
16 October might be an appropriate time for Stan and  
17 myself and Michael to go and brief them.

18 MR. WHITE: I absolutely agree with that.  
19 I think that's exactly the right time and it will  
20 be fully baked at that point.

21 MR. CAREY: Brian, did you have something?

22 MR. SCHNEIDER: I completely agree that  
23 this work should continue. I think that the  
24 latest iteration on this report has come a very  
25 long way since it was originally released and

P R O C E E D I N G S

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2 reviewed. I think that there are some -- and  
3 speaking with the county exec and the chief county  
4 deputy exec, I think they are in agreement that  
5 this discussion needs to continue.

6           There are some compelling arguments that  
7 were elicited in the document I think that  
8 illuminate some of the issues, but they do have  
9 some legitimate questions on how -- let's call it  
10 this management organization or entity would be  
11 rolled out, how it would be perceived especially  
12 when it comes to the cost per capita of \$3.50 per  
13 head, you know, how is the public going to eat  
14 that? They are not. And from a politician  
15 standpoint -- I'm not a politician. I did stay  
16 at a Holiday Inn Express last night, but it  
17 doesn't mean the general public is going to be  
18 welcoming to pay for something they feel is their  
19 right to have. So I think there's a lot of heavy  
20 lifting that's still going to be need to be done,  
21 but we certainly support going forward with  
22 additional discussion and vetting of this  
23 section.

24           MR. HERSHKOWITZ: If you can let me in  
25 those comments.

1 P R O C E E D I N G S

2 MR. SCHNEIDER: Sure.

3 MR. CAREY: Anymore discussion on this  
4 subject? Anyone else? Jerry?

5 MR. OTTAVINO: Two questions.

6 MR. CAREY: Since you are on a committee --

7 MR. OTTAVINO: Yes. Jerry Ottavino.

8 Number one, the question of terminology, would you  
9 say most, if not all is a function of adjectives  
10 and adverbs. I'm just trying to get my arms  
11 around exactly the terminology that everybody is  
12 disagreeing.

13 MR. MILAZZO: It sounds as if that group is  
14 going to continue, so we can have those  
15 conversations then just so we don't get slogged  
16 down today. I think all the points have been  
17 fully fleshed out. Everyone knows the different  
18 arguments.

19 As Jared says, there's a disagreement,  
20 which is fair. But that disagreement isn't  
21 preventing the work or the group from going  
22 forward because you heard today, we don't care  
23 about your disagreement. We want you to work as  
24 a group and provide something to review and that  
25 timeline is the only issue today and the timeline

P R O C E E D I N G S

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2 is going to be pushed back a little bit into the  
3 fall of next year rather than rehashing that  
4 argument. It doesn't matter. The committee has  
5 been charged to continue its work, prepare a  
6 report and I think you should focus on that.

7 MR. OTTAVINO: Second question I heard -- I  
8 am sorry, I don't know who said it, but implement  
9 something or a plan, who would do or how would  
10 that be implemented?

11 MR. MILAZZO: That's a good question and as  
12 Carrie said it flows down from the Federal  
13 Government. So LICAP is really to provide  
14 information to whomever reads the report and  
15 however that's used by policymakers is within in  
16 their discretion and their power.

17 I envision the local legislatures to read  
18 it and recommendations to the state and say this  
19 is an opportunity, and you have seen that happen  
20 already where the state has funded LICAP. So  
21 your efforts have succeeded in getting to the  
22 state level even though you are a creature of  
23 local legislation.

24 So the state is now funding LICAP. Will  
25 that continue? You heard one of the members say

P R O C E E D I N G S

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2 we would like to see LICAP continue. Does it  
3 occur at local level? Does it go to the state?  
4 Is there a combination? And that's the  
5 conversations that need to occur now and probably  
6 more importantly continue and then they will  
7 follow-up next year.

8 Look, you have a charge to report, to  
9 prepare a plan and get it done this year.  
10 Following your plan of having a management  
11 discussion may be perfect timing because here is  
12 our plan. Who is going to do it? And then you  
13 can say, Here is who is going recommend do it, so  
14 I just think it lines up perfectly.

15 MR. CAREY: Jared?

16 MR. HERSHKOWITZ: Just one last comment. I  
17 just want to reiterate again because we do have  
18 these time constraints, could I ask everyone who  
19 has a copy of this to please forward their  
20 comments, their suggestions, their criticisms as  
21 soon as you can so that when we meet next, we have  
22 the input from the entire committee.

23 MR. CAREY: Onto item number 6 the  
24 Structure of our Groundwater Management Plan. The  
25 author is the co-chairs of the various

P R O C E E D I N G S

1  
2 subcommittees came up with this. I don't know if  
3 we need to go through them all unless you would  
4 like to, but basically, you know, but basically it  
5 will have various sections. The reports that  
6 everybody contributed to will be used to write the  
7 Groundwater Management Plan.

8           There will be a list of the reports and who  
9 wrote them, they will be available to link to as  
10 a reference and that's really how we envision  
11 this going forward. Again, you know, each  
12 section here is shown and if there's any --  
13 that's how we envisioned it from the start. I  
14 don't know if there's any suggestions or if  
15 anybody wants to see it structured differently,  
16 please let us know because the work has already  
17 been done.

18           MR. HERSHKOWITZ: I have some questions and  
19 it's in regard to the overall recommendation  
20 section, which you and I have discussed. It seems  
21 to me as I have gone through this -- and forgive  
22 me, this is the first time I have seen this --  
23 that there are little or no references to some of  
24 the major problems that we are having in water on  
25 Long Island using fertilizing, nitrogen, financial

P R O C E E D I N G S

1  
2 issues relevant to management, pesticide,  
3 contamination standards, new contaminants, et  
4 cetera, et cetera, et cetera. I mean, there are  
5 some gaps. You know, but the reports that are  
6 here are grat. They are wonderful, but if we are  
7 going to present a plan -- and this is my argument  
8 about P3 -- is that there doesn't seem to be this  
9 holistic attack on all the issues and I think  
10 that's inherent and I think that's something we  
11 need to talk about.

12 MR. CAREY: Some of those issues are  
13 included in the Water Quality Report.

14 MR. HERSHKOWITZ: I'm not arguing that some  
15 are included. What I am saying is that --

16 MR. CAREY: And others were in the State of  
17 the Aquifer.

18 MR. HERSHKOWITZ: The statement was, but  
19 the recommendation as to how to attack these  
20 problems, many of these do not exist in the  
21 current reports that we have. I think that can be  
22 included in the recommendation section. And you  
23 and I actually had discussed that. So if we  
24 picked and choose -- let's say -- just for  
25 argument sake now, if we pulled P3 back and looked

P R O C E E D I N G S

1  
2 at some of the things in P3, some of the items in  
3 P3 that we can cherrypick -- Jeff, actually talked  
4 about the low hanging fruit -- relative to some  
5 suggestions to the legislature about how do we  
6 attack nitrogen problems, you know, how do we  
7 attack other new contaminant problems, et cetera,  
8 et cetera, et cetera, might not be covered in some  
9 of these reports. The recommendation section  
10 becomes a wonderful place for us to fill those  
11 gaps. That's all I'm saying. Is that what your  
12 intent is?

13 MR. CAREY: Our recommendations need to be  
14 clear and strong that was the conversation that I  
15 had with you and that's how it will be written.  
16 We have been asked to do that and that's the whole  
17 intent.

18 MR. HERSHKOWITZ: But will it fill in the  
19 missing places that the reports don't cover?

20 MR. CAREY: What I'm missing here is these  
21 reports went through everyone for months and  
22 months and we are hearing this now. Why didn't it  
23 come up?

24 MR. HERSHKOWITZ: I brought it up when we  
25 talked about P3.



P R O C E E D I N G S

1  
2 MR. CAREY: But in the last week we  
3 finalized --

4 MR. HERSHKOWITZ: And I objected strongly  
5 to that.

6 MR. CAREY: And the board voted and opposed  
7 that.

8 MR. HERSHKOWITZ: But there's no argument  
9 that the gap still exists.

10 MR. MILAZZO: I think that LICAP envisions  
11 its plan significantly different than Suffolk  
12 County's, which is this much amount of paper  
13 comprehensive data analysis. I think LICAP is  
14 hoping to have ten or fifteen recommendations,  
15 bullet points, here are steps that you can  
16 implement now to make a difference or here are  
17 issues that need to be addressed today, and that  
18 was the focus of the working groups have been  
19 meeting for two years, and the reports have all  
20 been circulated. You have been involved in  
21 writing them, reading them and contributing and  
22 all of your comments have been listened to.

23 To add things when you have a deadline of  
24 September would be difficult to address them, and  
25 I think the scope of LICAP is these are

P R O C E E D I N G S

1  
2 implemental goals and objectives that can be done  
3 today. Those items that you are addressing could  
4 be brought up in a public hearing and then they  
5 could be sort of addressed as a comment document,  
6 but to raise them now is a disservice to LICAP's  
7 work because they are not able to -- you have had  
8 your vote. They didn't agree on the one, and now  
9 to say, Well, I am going to try one more time --

10 MR. HERSHKOWITZ: No, no. You are equating  
11 two different things.

12 MR. MILAZZO: I always get it wrong with  
13 you, Jared. Everything I get wrong. Keep trying  
14 though.

15 MR. HERSHKOWITZ: No one can argue that  
16 there's a pharmaceutical problem in our water  
17 supply. That's not a -- no one can argue --

18 MR. WHITE: Well, but you know that it is,  
19 right? I think everybody in this room knows that  
20 there is. You want us to restate what's in the  
21 Suffolk County plan or Nassau County plan or are  
22 you saying that we should decide on what to do  
23 about that problem?

24 MR. HERSHKOWITZ: No. I am making  
25 suggestions that we should be making suggestions

P R O C E E D I N G S

1 to the legislature --

2 MR. WHITE: To solve that problem?

3 MR. HERSHKOWITZ: There are choices, yes.

4 MR. WHITE: I don't think that was in the  
5 scope of this at all. That would we should solve  
6 the pharmaceutical input problem to the  
7 groundwater? We can identify --

8 MR. HERSHKOWITZ: We can mitigate it.

9 MR. WHITE: -- it as an issue. It's an  
10 important issue, and I will also accept the fact  
11 that perhaps it needs more attention, but I don't  
12 think it's the job of this group to come up with a  
13 solution for that problem.

14 MR. HERSHKOWITZ: Then maybe I'm  
15 misunderstanding what a management plan is for the  
16 problems with our aquifer. Maybe you and I  
17 don't -- or are in a disagreement as to what a  
18 management plan should --

19 MR. MILAZZO: Steve, pharmaceuticals are  
20 addressed in the --

21 MR. COLABUFO: Steve Colabufo. Okay, how I  
22 and I believe you believe this can shake out is  
23 one recommendation could be limitation of a  
24 regional water quality database to study things  
25

P R O C E E D I N G S

1  
2 like pharmaceuticals, nitrates, et cetera. I  
3 don't think we need to sit there and address every  
4 single water quality issue individually the way I  
5 believe you just phrased it. So the  
6 recommendations should be able to cover all of  
7 these issues that you are raising or the vast  
8 majority of them, put it that way.

9 MR. MILAZZO: I think, Jared, it would be  
10 better to say get the plan done and then say  
11 what's not in it rather than say what's not in it  
12 today because it's not done. You don't know  
13 what's in there and you don't know what's not in  
14 there. Why don't we get a draft and you can  
15 review it and you could say, Here are the comments  
16 that we have and then maybe an opportunity to  
17 revise it based on those comments and based on the  
18 public comments. For you to speculate what's in  
19 and what's out is really a disservice to Steve's  
20 good work.

21 MS. GALLAGHER: And on the nitrogen issue,  
22 I think you can easily just have a short writeup  
23 about the Long Island Nitrogen Action Plan and,  
24 you know, and collaborate and coordinate --

25 MR. HERSHKOWITZ: Absolutely. And that can

P R O C E E D I N G S

1 be in the recommendation section. Absolutely.

2 MR. CAREY: That's the same principle for  
3 everything else you are asking for.

4 MR. HERSHKOWITZ: Well, that's what I asked  
5 the Chairman in my original question, What will be  
6 included in the recommendation section. That's  
7 all I asked.

8 MR. MILAZZO: I think the best answer to  
9 that is let's get the draft out there and then you  
10 can look at it and say, This is what's in it.  
11 Okay. We are very comfortable with what's in  
12 there, or if there's something missing --

13 MR. HERSHKOWITZ: And we can reference  
14 Suffolk County Water March 2015 report. We can  
15 reference a lot of things.

16 MR. CAREY: Let's let it unfold and you  
17 will have a chance to comment like you have all  
18 along.

19 MR. MILAZZO: That's what LICAP is doing,  
20 right. These are tough conversations and you are  
21 adding your comment. That's the value of LICAP.  
22 Although we always disagree.

23 MS. MEYLAND: So I think we kind of jumped  
24 ahead of ourselves. Can you just go back and tell  
25

P R O C E E D I N G S

1  
2 us what the status of the plan is from all the  
3 multiple chapters that have been prepared and what  
4 the process is going to be for the recommendation  
5 issues.

6 MR. CAREY: Steve has been involved with  
7 the whole process with all of his reports, so why  
8 don't you come up and answer that question.

9 MR. COLABUFO: Myself and Bill Mirkland  
10 (phonetic) with and a couple of other people have  
11 been reviewing the reports by people like Stan and  
12 the board and we are probably, I would say, about  
13 90 percent finalized with all the reports. Maybe  
14 even more than 90 percent.

15 Those reports -- when the plan is rolled  
16 out -- will be posted on the LICAP Website. They  
17 won't be included as pages in the report, but  
18 they will be summarized. The recommendations  
19 from them will be listed and then the overall  
20 recommendation session at the end in one of those  
21 sections, Section 8 or whatever it was, and they  
22 should cover the information submitted in those  
23 reports in a broad general sense and you will  
24 have the opportunity to look at each individual  
25 chapter to see where the information came from

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where those conclusions derive from. Does that make sense?

MS. MEYLAND: Are you saying that the individual chapters will not be made public or they will be made public?

MR. TERRACCIANO: They will be on the LICAP Website.

MS. MEYLAND: So the plan is not going to be the full individual chapters. It will be a summary of the individual chapters. Is that what you are saying?

MR. COLABUFO: Yes, and it will include recommendations from the reports and an overall recommendation and those should address the vast majority of issues that have brought up.

MS. MEYLAND: You are boiling down individual chapters into kind of like an executive summary is that --

MR. TERRACCIANO: A little more than an executive summary, but yes.

MS. MEYLAND: And then the recommendations that are currently in the individual chapters will be what, left in the executive summary or consolidated into a separate --

P R O C E E D I N G S

MR. TERRACCIANO: For the most part, yes.

For the most part each subject will have the summary that each described and for the most part the recommendations of each report will be listed in there, unless they are redundant or otherwise, and then in the overall conclusion of the report, the ones that seem to be part of all the reports or most of the reports will be called out, such as what I just mentioned before, the Regional Quality Database. Just with every report mentions that should be a part of the report so that we can get more information on that specific subject.

Obviously that's going to be one of the big overall recommendations the plan will have.

MS. MEYLAND: When will we see the recommendation list to be able to respond?

MR. TERRACCIANO: I will guesstimate sometime in early October, the first draft of the plan as it comes out.

MR. CAREY: We have been saying for a long time we are out of time. This is where we are going. We are done to the last couple of months here to put all this together.

MS. MEYLAND: I'm not arguing that point.



P R O C E E D I N G S

1  
2 I'm just trying to find out how this rolls itself  
3 out.

4 MR. HERSHKOWITZ: When do you intend to  
5 have the hearings then? You have to have them in  
6 November.

7 MR. CAREY: We plan on having a draft and  
8 circulating it with the board members and everyone  
9 who participated and then once we revise the draft  
10 based on the comments then we will schedule the  
11 public hearing -- well, we will probably have the  
12 public hearings scheduled already, but it will  
13 probably be before the public hearings.

14 MS. MEYLAND: If I can just follow-up. For  
15 example, I just found out very recently that the  
16 report that I chaired was modified, which I did  
17 not -- I was not aware of, and so I asked Steve to  
18 get a copy of the original final report, and then  
19 the suggestions for change, and then the final  
20 version reflecting those changes.

21 MR. CAREY: So what happened was, Sarah, at  
22 our last meeting, I didn't feel it was up to any  
23 one individual to say what the message should be  
24 coming out of these reports. So the board, I  
25 think the one report you are referencing we went

P R O C E E D I N G S

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2 through almost item by item and the board decided  
3 on how the message should be written.

4 MS. MEYLAND: So as I understand it, the  
5 changes were provided to the voting members, but  
6 not necessarily the full component of LICAP; is  
7 that correct?

8 MR. CAREY: We went over it item by item in  
9 a public meeting here two weeks ago --

10 MS. MEYLAND: I am not arguing that --

11 MR. CAREY: And I believe that they made  
12 copies and had them available here for the public  
13 to convene.

14 MS. MEYLAND: But I as the chair of the  
15 committee was not involved in any of that process.

16  
17 MR. HERSHKOWITZ: In other words, she  
18 wasn't sent those changes prior to the meeting so  
19 she could offer her comment.

20 MR. CAREY: They weren't agreed upon. It  
21 was a discussion a night before the meeting and  
22 then --

23 MR. HERSHKOWITZ: She didn't have an  
24 opportunity to see those changes, whereas other  
25 people did.

1 P R O C E E D I N G S

2 MR. CAREY: You are saying you still  
3 haven't seen them?

4 MS. MEYLAND: That's correct.

5 MR. CAREY: We will get you a copy.

6 MS. MEYLAND: I have asked Steve to do that  
7 for me, but is that what happened for all the  
8 reports or was that chapter the only one that went  
9 through that process?

10 MR. MILAZZO: One of things that has to  
11 occur when you prepare a report and you have so  
12 many different authors is you want to have  
13 consistency of language. So you are going to look  
14 at making sure that things just sound as if they  
15 are written with one voice and that maybe what was  
16 occurring. If ten different people write, you  
17 have ten different writing styles, you want to  
18 have a report that sort of flows with the same  
19 writing style.

20 MS. MEYLAND: I'm not raising any  
21 objections. I am just trying to find out what --

22 MR. CAREY: To answer your question on  
23 that, not all the reports went through that, but  
24 several of them did based on the feedback that we  
25 got from everyone. I think there were three or

1 P R O C E E D I N G S

2 four that we thoroughly went over at our meeting  
3 three weeks ago that had questionable language  
4 from several people who provided input.

5 MS. MEYLAND: So what I'm actually asking  
6 for is since I never saw any of those reports that  
7 were recommended for some changes, I would  
8 personally like to just get the original report,  
9 the recommended changes and what the final end  
10 result was so that I will just be informed, which  
11 I think would be an appropriate thing since I am a  
12 full member of LICAP.

13 MR. CAREY: So we will get you the revised  
14 version, but you wrote the initial version so you  
15 should already have that, right?

16 MR. HERSHKOWITZ: I do, but I don't know  
17 what Steve's recommended changes were and how that  
18 --

19 MR. CAREY: It was agreed upon by the  
20 board. It's not just Steve. It was the voting  
21 board.

22 MS. MEYLAND: I understand that, but the  
23 changes that were identify were identified by  
24 Steve --

25 MR. CAREY: And others and other. Not only

P R O C E E D I N G S

1 Steve.

2 MS. MEYLAND: I didn't know that.

3 MR. CAREY: We will get you the  
4 information.

5 MS. MEYLAND: That would be great. I  
6 appreciate it.

7 MR. CAREY: We are doing to move on the  
8 agenda. Number 7, Other Business.

9 Ty, can you provide us with an update on  
10 where we are with our funding?

11 MR. FULLER: Sure. Thanks, Stan. It's Ty,  
12 T-Y, Fuller, F-U-L-L-E-R, so at the last meeting,  
13 the special meeting, that we had we agreed on the  
14 allocation for the funding that LICAP received. I  
15 think the board was requesting more information on  
16 specific items, so I kind of brought up a  
17 framework of some of the items, which I will pass  
18 them onto you all.

19 The first one is irrigation audits.

20 There's two tabs in there, so you can start with  
21 one and work you way to the other. With the  
22 irrigation audits, essentially we kind of gave an  
23 overview of that. We wanted to contract with the  
24 Irrigation Association, get certified landscape  
25

P R O C E E D I N G S

1  
2 irrigation auditors, do an RP and through a  
3 program, an award program, that I have suggested  
4 we would have select homeowners that meet certain  
5 criteria have audits performed on their homes,  
6 their irrigation systems, and hopefully through  
7 that program we can measure the efficiency of  
8 their system, come up with suggestive changes and  
9 also offer, you know, a credit or, I guess,  
10 offset the cost that they would have to change  
11 their irrigation systems to become more  
12 efficient.

13 With that particular program, you know, we  
14 have some suggestive changes that were offered by  
15 Paul and other members. Some of the suggestions  
16 are people in order to do that criteria would  
17 have to have a property size ranging between a  
18 quarter acre to two acres, have a certain amount  
19 of water usage, be the primary homeowner for the  
20 property that we are going to do that irrigation  
21 audit with.

22 If we can agree on something like that and  
23 we can get this out, I would assume we can do  
24 this reaching out through the media, the various  
25 water suppliers and the program would be on a

P R O C E E D I N G S

1 first come first serve basis. That's essentially  
2 the irrigation consultation.

3  
4 For the monitoring wells, I actually did  
5 come up with an RFP for monitoring well sampling  
6 and also laboratory services and I can pass that  
7 out, but I think that this warrants further  
8 discussion. There's a couple of things at play  
9 right now.

10 Right now, you have the state pesticide  
11 monitoring that's occurring where they sample a  
12 network of monitor wells. I just found out,  
13 Nassau, their monitoring wells -- and Brian can  
14 probably comment on this. You receive funding  
15 from the state, so you may resume sampling for  
16 those monitoring wells. In addition, USGS, they  
17 have a program that they are working with the  
18 Suffolk County Department of Health Services,  
19 also the State using their wells from NAWQA.  
20 It's about a network of 32 wells that they are  
21 sampling island wide and, again, it kind of  
22 delves into what we were posing to do island wide  
23 monitoring samples.

24 I'm just offering various suggestions. We  
25 do have an RFP here. That's a possibility that

P R O C E E D I N G S

1  
2 we can do. I would request that we consider the  
3 USGS assisting us with this process. They have  
4 already established a network of wells. They are  
5 sampling for certain anolytes. We can compliment  
6 that by sampling other things. Unregulated  
7 contaminants, DOCs that they haven't sampled,  
8 maybe additional monitoring wells that would  
9 benefit us. That's just another suggestion that  
10 I offer.

11 And finally, the licensing agreement with  
12 Esri. Now that we are updating the water track,  
13 you now, this newer version, we want to have a  
14 more secure version for people, you know, like  
15 the Department of Health, the DEC that they more  
16 have access to more sensitive information. So I  
17 would only say that we may not need a server.

18 We contacted Esri and what they implicated  
19 to us is you can purchase licenses that will give  
20 you secure access. That's just a one shot deal.  
21 That's just a standard purchase for 10,000. If  
22 that's agreed upon, you take the 10,000 for the  
23 server and put that into the additional  
24 monitoring.

25 MR. GRANGER: I liked the idea you had with



P R O C E E D I N G S

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2 regard to he monitoring wells to work with USGS.  
3 Can we leverage those funds? In other words,  
4 whatever X amount we have enter into corporative  
5 agreement where they put some money towards it  
6 too.

7 MR. FULLER: This is what I would look for  
8 as well. You know, I did create an RFP for  
9 sampling. I wasn't sure the mechanism with which  
10 we can do that. I can handout the RFP, John, I  
11 don't know if that's worth doing, but I think the  
12 key is working with USGS right now.

13 MR. SZABO: Thank you very much for the  
14 update. The members here appreciate getting that  
15 substance associated with how we plan to spend the  
16 money. You have done a lot of work. Thank you  
17 very much.

18 I would just ask from a procurement  
19 perspective how would LICAP enter -- could we,  
20 Counsel, just enter into an agreement with USGS  
21 services without issuing an RFP or maybe Chris, I  
22 guess, from USGS can talk about that a little  
23 bit?

24 MR. MILAZZO: LICAP Legislation allows you  
25 to enter into agreements with government agencies

P R O C E E D I N G S

1  
2 and others for services. The question would be  
3 whether you need to do an RFP because you have  
4 that public test and you always want to get  
5 competition when you are spending public funds.  
6 The factor as I understand it is that if an RFP is  
7 issued, USGS may have some institutional issues on  
8 their ability to compete with that process. So  
9 you may find that USGS expertise versus the public  
10 risk of -- let me back up. USGS cannot compete in  
11 a people in a public bidding process so you may  
12 lose the ability to use USGS if you put out RFP  
13 and their familiarity and how it would compliment  
14 all the ongoing ethics.

15 That's really a question. I would have to  
16 look at it a little further because you are not a  
17 municipality, so not all the general municipal  
18 laws would apply, but your legislation claws  
19 allows you to do contracts. The real question is  
20 their proposal is so compelling that you can  
21 argue that we shouldn't do a public bidding and  
22 here are the reasons why. And if you can make  
23 that case and it's defensible and you somehow  
24 test their number, you would survive scrutiny  
25 discussions. That's the issue.

P R O C E E D I N G S

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2 MR. WHITE: I also think there's somewhat  
3 of a model here that we can relate to. As an  
4 example, DEC enters into memorandums of  
5 understanding with academic institutions or other  
6 levels of government where state monies are issued  
7 to those entities. Not private entities, but  
8 other governmental entities. So that may be a  
9 model we can work off of as well and I think the  
10 counties do that as well.

11 MR. TERRACCIANO: We are not permitted to  
12 speak in front of the sector, but in the event  
13 (inaudible) to do this work with other agencies  
14 and avoid the competition.

15 MR. CAREY: Thanks, Steve.

16 Chris?

17 MR. SCHUBERT: Chris Schubert, USGS. The  
18 only thing I would add to that is typically that  
19 type of arrangement that recognizes our expertise  
20 would be a sole source arrangement. So we could  
21 have a variety of templates and examples of that  
22 that we can perhaps help stand up or as others  
23 have suggested there's an opportunity to work  
24 through some existing arrangements. We have a  
25 work plan between the DEC and USGS in the state

P R O C E E D I N G S

1  
2 level. I'm not sure if that's been considered,  
3 but that might be a (inaudible) passing of funds.  
4 Thank you.

5 MR. WHITE: Do you have such an agreement  
6 with both the counties as well?

7 MR. SCHUBERT: We have agreements with the  
8 individual counties. We have Suffolk County Local  
9 Health Service, Nassau County DPW and obviously  
10 other local government entities and they are  
11 typically based on this sole source of  
12 (inaudible). We have all kind of had to jump  
13 through that hoop at some point.

14 MR. GRANGER: Including the water  
15 authority.

16 MR. MILAZZO: Those have been publicly  
17 vetted and piggyback because that review has  
18 occurred the public vetting has occurred and your  
19 authority allows you to enter into grants and  
20 contracts with public institutions. You don't  
21 want to -- the process shouldn't dictate the  
22 result.

23 This is an institution that knows what they  
24 are doing, they are doing the work and it will  
25 compliment what they are doing. That would be

1 P R O C E E D I N G S

2 the most efficient use of your funds to have them  
3 do it. The conversation that you all have to be  
4 aware of that that's the issue when you contract  
5 with them as a sole source that issue is open,  
6 but I think it's vetted.

7 MR. CAREY: Just an update. We continue to  
8 go through the application process to actually  
9 receive the funds. We have not received them yet.  
10 We are making progress. It seems like we are  
11 getting much closer. I didn't participate, but  
12 several people participated in a conference call  
13 two days ago and it sounds like we are getting  
14 much closer to receiving the funds, so we will  
15 certainly keep everyone updated.

16 Is there any other business that any board  
17 member wants to bring up before we go to the  
18 public comment?

19 MS. HAHN: I'm Kara Hahn, K-A-R-A H-A-H-N,  
20 Suffolk County Legislature Chair of the  
21 legislature's Environment, Planning and  
22 Agricultural Committee. I just want to offer that  
23 we can certainly extend your deadline and clarify  
24 our intent. I do not believe or imagine that  
25 there's a legislature either in Suffolk County or

P R O C E E D I N G S

1  
2 Nassau who wants this done quickly and not  
3 completely, so that can easily be achieved.

4 Also, you know, in terms of clarifying  
5 intent. I do firmly believe that are whereas  
6 clause speaks to intent and made that clear and  
7 in case anyone in the audience or on the board  
8 does want to know my opinion, I would argue that  
9 LICAP's mission to produce a Groundwater  
10 Management Plan would be incomplete if it does  
11 not include its section on management opportunity  
12 options, both an entity option and options to  
13 improve the existing regulatory framework.

14 Clearly, when we clarify our intent that  
15 will have to be something everyone agrees with to  
16 pass legislation, but if you are wondering about  
17 mine that is that. I will -- know Legislature  
18 Krupski who is here will probably comment next --  
19 we can very quickly extend your deadline and  
20 intend to try to do so.

21 Is there any legislature here from Nassau?  
22 No. So we will be talking with them.

23 MR. CAREY: Thank you.

24 MR. KRUPSKI: Just to go on a little bit  
25 more what Legislature Hahn said, if you ask for a

P R O C E E D I N G S

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2 deadline extension, quantify an amount of time you  
3 would think you reasonable need to accomplish what  
4 your goal is. Not just to extend it, but to say  
5 if you need another 60 days or you need another  
6 two years. I mean, I'm not sure what the goals  
7 are and what the comments are going to be on the  
8 draft, so give us a reasonable amount so we have  
9 something to work on.

10 MR. CAREY: Thank you.

11 MS. BLUMER: Karen Blumer. I would like to  
12 echo Sarah's request as a member of the Wastewater  
13 Treatment Subcommittee a majority of that  
14 committee were bypassed in the final writing of  
15 that report in terms of knowing that it was even  
16 being done and for asking for many months would we  
17 find a senior author. So in nine days we added  
18 our comments to something that had been worked on  
19 for a couple of months. We have not seen the  
20 results of our additions and our additions spoke  
21 to many significant recommendations for wastewater  
22 that the report didn't even touch. So we would  
23 like to see those. We would like to see that  
24 report after we sent our comments in and we never  
25 had a chance to see how they were integrated.

1 P R O C E E D I N G S

2 MR. CAREY: Okay. Thank you.

3 MS. BLUMER: Will that be possible?

4 MR. CAREY: I will ask Steve to forward a  
5 copy to Ms. Blumer and I do know that a lot of  
6 your comments were included in that final draft,  
7 just for the record. So we will get that to you.

8 MS. BLUMER: Good. Yeah, we would like to  
9 see those.

10 MR. CAREY: Anyone else? Yes.

11 MS. ESPOSITO: Just a small comment.  
12 Adriene, A-D-R-I-E-N-E, Esposito, E-S-P-O-S-I-T-O.  
13 Just with relationship to the irrigation audits, I  
14 think it would be advantageous. I know, for  
15 instance, Suffolk County Water Authority has  
16 produced a list of the top 100 water uses in  
17 Suffolk, and I think in addition to providing  
18 irrigation audits to homeowners, it would be  
19 interesting to use that top ten water use list and  
20 see if we can get them to participate in a water  
21 audit or an irrigation audit in specific because  
22 it might produce even greater choices for us on  
23 reducing water use.

24 MR. CAREY: Thank you. Anyone else?

25 The next full LICAP meeting is scheduled



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P R O C E E D I N G S

for September 13, 2017.

Motion for adjournment?

MR. WHITE: I.

MR. CAREY: Okay. Second it.

Thank you for coming everyone.

(Whereupon, the meeting was  
adjourned at 12:35 p.m.)

C E R T I F I C A T I O N

I, CHARISSA SCHWAB, a Shorthand Reporter and Notary Public within and for the State of New York, do hereby certify:

THAT the foregoing transcript is a true and accurate transcript of my original stenographic notes.

IN WITNESS WHEREOF, I have hereunto set my hand this 7th day of June, 2017.



CHARISSA SCHWAB