## In the Matter Of:

# LONG ISLAND COMMISSION

# **HEARING-LICAP**

December 05, 2017

Volume 2



1	SUFFOLK COUNTY WATER AUTHORITY
2	x
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4	LONG ISLAND COMMISSION AQUIFER PROTECTION
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6	IN THE MATTER OF:
7	GROUNDWATER RESOURCES MANAGEMENT PLAN
8	
9	x
10	1550 Franklin Avenue
11	Mineola, New York
12	December 5, 2017
13	Time noted: 6:05 p.m.
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21	Reported by:
22	Kevin Jones
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1	BEFORE:
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3	STAN CAREY - Chairman LICAP
4	
5	JEFFREY SZABO - Suffolk County Water Authority
6	
7	FRANK KOCH - Member
8	
9	BRIAN SCHNEIDER - Nassau County Executive's Office
10	
11	JOHN MILAZZO-Attorney for SCWA
12	
13	DON IRWIN - Nassau Department of Health
14	
15	MICHAEL WHITE - Suffolk Legislature P.O.
16	
17	STEPHEN TERRACCIANO - U.S. Geological Survey (USGS)
18	
19	CHRIS OSTUNI - Nassau Legislature
20	
21	STEVEN COLABUFO - Suffolk County Water Authority
22	
23	
24	
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1	HEARING-LICAP
2	MR. CAREY: Good evening, and thank
3	you for attending today's public hearing
4	hosted by the Long Island Commission for
5	Aquifer Protection or LICAP. My name is
6	Stan Carey, and I'm the chairman of LICAP.
7	I'm joined today by vice chairman
8	Jeff Szabo from the Suffolk County Water
9	Authority, as well as our counsel, John
LO	Milazzo, member Brian Schneider, member
L1	Frank Koch, member Michael White and member
L2	Don Irwin.
L3	The purpose of these hearings is to
L4	elicit public comment on LICAP's draft
L5	Groundwater Resource Management Plan. The
L6	draft is available online at LI Aquifer
L7	Commission dot com.
L8	In just a minute I will introduce
. ^	
L9	Steve Colabufo, who will give a brief
	Steve Colabufo, who will give a brief presentation on what the Groundwater
19 20 21	
20	presentation on what the Groundwater
20 21	presentation on what the Groundwater  Resource's Management Plan consists of as



you haven't picked one up already.

#### HEARING-LICAP

Before we begin, I would just like to remind everybody that today's proceedings are designed to provide the forum for comments on the plan, and it's not a question and answer session. Any questions you may have can be submitted electronically by e-mailing to LICAP at SCWA dot com or by mail to P.O. Box 38, care of Suffolk County Water Authority, Oakdale, New York 11769. Either I or one of the other LICAP members will get back to you with an answer as soon as possible.

All comments made today will be brought before the LICAP voting board for consideration during our upcoming general meeting on December 13th, and the final report we expect will be published before the end of the year.

As an organization our mission is to make sure our sole source of drinking water here on Long Island is protected for future generations, and so we love to see Long Island residents such as yourselves engage in these discussions and seeking to become



1	HEARING-LICAP
2	more educated about the issues that impact
3	our groundwater.
4	So thank you once again for
5	attending today's public hearing, and with
6	that I will turn it over to Steve Colabufo.
7	Also, there is just one other person up
8	here, he's coming back up, we have Chris
9	Ostuni who is a member and Steve Terracciano
10	from USGS.
11	MR. COLABUFO: Thank you, Stan.
12	As Stan mentioned, my name is Steve
13	Colabufo. I'm the water resources manager
14	at the Suffolk County Water Authority, and
15	I'm here tonight to talk about the LICAP
16	Groundwater Resources Management Plan. We
17	did a similar set of public hearings for the
18	state of the aquifer report that was first
19	deliverable. LICAP is the second and much
20	more comprehensive LICAP Groundwater
21	Resources Management Plan. For those who
22	may not know LICAP, the Long Island
23	Commission For Aquifer Protection, is a
24	partnership of water resource professionals
25	from Nassau and Suffolk Counties, including



1	HEARING-LICAP
2	such diverse groups as water suppliers,
3	regulators, government officials, academics
4	and citizen and activist groups, and it was
5	formed to address both quality and quantity
6	issues facing Long Island's aquifers on kind
7	of a regional basis. Prior to this really
8	everything had been handled on a site by
9	site. We're trying to do things more on a
10	regional basis, and LICAP certainly was
11	formed for that purpose. LICAP was created
12	through legislation passed by both Nassau
13	and Suffolk legislatures back in 2013. You
14	can see at the bottom of the page LICAP's
15	Web site. LICAP members include all water
16	suppliers in Nassau and Suffolk which
17	together serve over 3 million people;
18	representatives of the Nassau and Suffolk
19	County executives as well as the Nassau and
20	Suffolk County legislatures, employees of
21	the Nassau and Suffolk Health Departments,
22	state DEC and the U.S. Geological Survey.
23	This is kind of a collage of all the
24	different participating agencies within
25	LICAP. There's actually a lot more than



1	HEARING-LICAP
2	what is shown here, but this is all that
3	could fit on the page. It's a very broad,
4	inclusive tent of pretty much anybody from
5	any aspect of the groundwater situation on
6	Long Island. We have nine voting members,
7	many of whom are sitting behind me, and some
8	nonvoting members representing other units
9	of government and other aspects of the
10	groundwater situation on Long Island.
11	One of the more important internal
12	structures within LICAP is the formation of
13	the two standing subcommittees. We have a
14	Water Resources and Infrastructure
15	Subcommittee that was chaired by myself.
16	Our objective was to develop a plan for
17	identifying long-term risks to the water
18	supply industry. The second subcommittee,
19	Water Resources and Opportunity
20	Subcommittee, looked at more potential
21	short-term risks facing water suppliers and
22	distribution of water. That was chaired by
23	Bill Merklin of D and B Engineering. And we
24	began meeting first separately and then
25	together back in 2014. Meetings were



#### 1 HEARING-LICAP 2 attended by that same wide cross section of 3 groundwater professionals that I mentioned earlier, and the attendees at those initial 4 5 meetings following the adopted LICAP law 6 ultimately determined the subject matter and 7 all the topics that were to be included in 8 the plan. Once those determinations were 9 made the subcommittee chairs then divided 10 those topics based on their mission. 11 Resources and Infrastructure Subcommittee 12 focused more on long-term resource oriented 13 topics, and the other subcommittee, Water Resources Opportunity, focused more on 14 15 shorter-term facilities oriented topics. 16 The subcommittee chairs then organized and 17 oversaw report writing teams which 18 ultimately created and edited all the 19 reports that comprise the plan. We ended up 20 with 15 individual reports covering a wide 21 diversity of topics that were authored and 22 edited over that three-year span, and those 23 reports were kind of the raw material that 24 comprised the plan. So the plan is a 25 culmination of a three-year process starting



1	HEARING-LICAP
2	way back when LICAP was created. And the
3	difference between this plan and other plans
4	that have come forth is that this is
5	actually done by people who currently work
6	in the groundwater industry on Long Island.
7	Rather than it being assigned to a
8	consultant who works independently and
9	provides a product at the end this is kind
10	of an ongoing give and take cooperative
11	process among the existing groundwater
12	professionals on Long Island. That was a
13	significant departure from previous studies
14	and plans that have come out.
15	So the management plan has a couple
16	of functions. For one, it provides a
17	clearer picture of the specific threats
18	facing the aquifers, assesses the adequacy
19	of existing groundwater management
20	relations, creates an action plan for
21	sustainability, and even more importantly,
22	an implementation program and prioritization
23	schedule for the various recommendations
24	that stem from the plan, and then
25	recommended regulatory amendments and



#### 1 HEARING-LICAP

2 legislative actions to make that happen.

I mentioned earlier all the professionals, existing working professionals in the groundwater industry

6 who provided their authorship and expertise.

These next two slides kind of just give a

8 | shout out to my fellow authors. None of

9 | this could have been possible without their

10 work, their unpaid volunteer work that went

11 | into this, so a couple of slides, kudos to

all the people who helped me work on this

13 plan.

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So we ended up with 15 individual reports. We divided them up into various categories. The starting point was the existing regulatory framework for Long Island groundwater management and summary of existing regulations that govern the use of Long Island groundwater, and then natural and cultural issues affecting Long Island groundwater, everything from climate change to pine barrens and other land preservation

initiatives to protect water quality and

water quantity, and then issues such as



1	HEARING-LICAP
2	wastewater management, septic systems versus
3	sewers, Nassau versus Suffolk County
4	practices. Geothermal was given a lot of
5	attention because it is an up and coming
6	green technology, but it does use
7	groundwater for its functionality. So it
8	certainly needs to be addressed in some way,
9	so this report does that. And also water
10	supply alternatives. We always talk about
11	water supply alternatives kind of in
12	passing, so we have a report devoted to
13	technology such as desalination, potable
14	reuse and aquifer storage and recovery. We
15	talked about our share of water quality and
16	water quantity issues, anything from
17	regional contamination events such as the
18	Grumman plumes and other major plumes that
19	have occurred on Long Island; to more shall
20	we say mundane issues such as chloride
21	contamination, still significant but not as
22	spectacular as the other ones, and
23	additional water quality issues as reported
24	on by the Suffolk County Department of
25	Health in one of their reports. And then



#### 1 HEARING-LICAP 2 quantity issues, competing uses is 3 important, we're not the only people out 4 there who use groundwater. Farmers, 5 agriculture, golf courses and industry all use groundwater as well, so addressing and 6 7 dealing with those competing issues will 8 sort of help the overall picture. And then 9 the Lloyd aguifer use, pretty heavily used 10 water supply in Nassau and minimally used in 11 There was a report on the use Suffolk. 12 regulation and future use of the Lloyd 13 aguifer. And then, of course, efficiency 14 and conservation. All of these are 15 important but certainly getting more of a 16 look these days. And we have a little, a 17 part of that report is wastewater reuse for 18 golf course irrigation in Suffolk County, 19 the Riverhead county golf course. And cross 20 county water transmission, usually it's to 21 supply Nassau from either Suffolk or the 22 city, that's given a pretty good look here 23 in the report. And then probably one of the 24 more important ones, the reactivation or 25 potential reactivation of public supply



#### 1 HEARING-LICAP 2 wells in Queens. Brian Schneider behind me 3 did an excellent report on that. 4 In addition to those 15 reports we also thought it necessary to mention some 5 initiatives that have either been completed 6 7 or at least started while LICAP was in 8 session. Water Trag is one of the primary 9 accomplishments of LICAP. It's an interactive water quality map and database. 10 11 It's available at the LICAP Web site. 12 There's a tutorial onsite so anybody can look and get any kind of information on 13 14 public water supply or water quality 15 anywhere on Long Island. 16 Then the USGS has embarked on a 17 sustainability study which started about six 18 months or a year ago, and that will continue 19 with some of LICAP's help. That was started 2.0 after LICAP got going, and certainly it's an 21 important aspect and an important thing to do in the future. It should be an 22 23 interesting reworking or rethinking of Long

So the plan was organized with ten

Island's geologic framework program.



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1	HEARING-LICAP
2	sections. The executive summary and
3	introduction sections are available out in
4	the lobby. Some of you may have them. They
5	include the top 15 recommendations. We
6	didn't want to make people read through the
7	whole report. We gave the 15
8	recommendations out. We mention them right
9	out front.
10	Then the next couple of sections are
11	just a summary of existing groundwater
12	conditions, existing regulatory programs,
13	existing threats, and pretty much a summary
14	of all the existing conditions. And the
15	next couple of sections after that are
16	future oriented, the management and
17	implementation opportunities in the future
18	and most importantly recommendations moving
19	forward and how to implement them. We also
20	have a couple of sections where we
21	acknowledge the authors, list the reports
22	that they wrote and references, sources of
23	information they used for the reports. The
24	reports themselves are also contained in
25	full in the appendix so that if you do like



1	HEARING-LICAP
2	one of the topics that you come across in
3	the plan you can read the full report in
4	depth in one of the appendixes.
5	So the most important section of
6	this whole report arguably at least is the
7	recommendation section. These 15 reports
8	yield a total of 143 different
9	recommendations, some very specific to one
10	particular report or another. So all of the
11	recommendations are kind of assembled in a
12	database provided to the LICAP voting board
13	members and ranked by them in this priority
14	matter, A, B, C and even some are ranked as
15	E to be eliminated because they were not
16	perhaps important enough in the overall
17	groundwater scheme of things to be
18	considered going forward.
19	Similar recommendations for written
20	reports were combined within that
21	recommendation section. So ultimately
22	there's less than 143 total recommendations,
23	but most importantly are the 15 A-list

recommendations, and they are shown on the

next slide. They're in no specifics order,



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# 1 HEARING-LICAP

just the top 15 as voted on or ranked rather by the LICAP board members and stemming from each of the reports. And you all should have them in front of you if you stopped at the table.

So public comment, the full report is available in the appendix. Also, the whole plan is available on LICAP's Web site, and we'll be accepting public comment until Friday. And then we anticipate the final plan will be adopted on Wednesday, December 13th, at the LICAP board meeting. You can submit comments via the Web, via e-mail, telephone, or old fashioned snail mail to any of the addresses and phone numbers listed here.

Just in the near future we'll begin or we will complete our annual state of the aquifer report update. It should be in two months or so from now. We'll continue to budget for LICAP in the future based on whatever funding we receive from New York State and use that funding to expand the data for use in Water Traq and expand the



1	HEARING-LICAP
2	data for use in the USGS sustainability and
3	groundwater study.
4	So with that in mind I'll stop my
5	presentation. We'll open up the floor to
6	comments. Whoever wants to comment should
7	identify their name for the stenographer,
8	and also just make sure the red button is
9	pressed and the red light is on when you
10	address the panel.
11	MR CAREY: Thank you, Steve.
12	Do we have any cards, Seth? Just
13	one, right?
14	MR. WOOD: I think he's getting my
15	card, so we can probably jump right ahead.
16	My name is Doug Wood. I am the
17	associate director of Grass Roots
18	Environmental Education. First, I just want
19	to thank everybody up there for all your
20	work on this. It's quite a remarkable
21	report.
22	Grass Roots Environmental Education
23	is a science-based nonprofit organization.
24	We are based in Port Washington. We've had
25	several decades of experience addressing a



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### 1 HEARING-LICAP

2 | number of environmental contaminants

3 | impacting Long Island's aquifers and its

4 | surrounding waters. The GRMP is mandated to

address the many issues facing Long Island's

6 | water and to identify methods of mitigating

7 | those issues including anthropogenic threats

8 | to groundwater quality, a word I had to look

up, but a useful word. I'm here to address

that particular issue.

11 Long Island like other coastal

12 | regions up and down the east coast has

13 | significant nitrogen load problems relating

14 | to human activity, particularly human waste.

15 Upgrading and expanding ancient wastewater

16 | infrastructure and septic systems and

17 | cesspool replacement will take many years

18 | and cost many hundreds of millions of

19 dollars. But there is another source of

20 | nitrogen generated by people, and I'm

21 | talking about high-nitrogen lawn fertilizer.

22 | Although this is not as great a contributor

23 as wastewater, the use of high nitrogen lawn

24 | fertilizers on Long Island is something that

25 | can and should be addressed immediately and



#### 1 HEARING-LICAP 2 is completely missing from your 236-page 3 report. How does nitrogen in lawn 4 fertilizer contaminate our aquifers? synthetic nitrogen is designed to dissolve 5 in water guickly. With the first rain or 6 7 irrigation after application the nitrogen is 8 carried down through the soil, and as it 9 travels through the soil some of it is 10 immediately taken up by the roots of plants. 11 The rest is carried beyond the root zone and 12 eventually leeches into our underground 13 aguifers. As any hydro geologist can tell 14 you, Long Island soils have a high 15 proportion of sand and are not good at 16 holding nutrients. A report prepared by 17 Cornell University and funded in part by 18 Suffolk County said, "In reviewing the soil 19 characteristics of Suffolk County, 20 77 percent of the land area is defined as 21 excessively or well drained. These soils fell into group A, soils with a high 22 23 infiltration rate; and B, soils having a 24 moderate infiltration rate together posing a 25 relatively high risk of leeching."



#### 1 HEARING-LICAP

2 I spoke before about the solubility of synthetic nitrogen, but most naturally 3 4 derived nitrogen is not water soluble. 5 is called water insoluble nitrogen or WIN. 6 This type of nitrogen is broken down 7 naturally by the soil, which in turn make 8 the nitrogen available to grass plants. 9 Because they are not water soluble naturally 10 derived fertilizers tend to stay in place 11 releasing nutrients over time. Fertilizer 12 products containing primarily water 13 insoluble nitrogen are plentiful and easy to 14 obtain both for homeowners and commercial 15 landscapers. They are also less labor 16 intensive as they tend to release their 17 nutrients over eight to 12 week cycles 18 rather than the four to six weeks of water 19 soluble nitrogen products. Therefore, we 20 and many other organizations, some of which 21 are on your committee I noticed, are 22 strongly advocating an island-wide 23 prohibition on the sale and use of high 24 nitrogen water soluble fertilizers. We've 25 researched the availability of fertilizers



1	HEARING-LICAP
2	meeting a standard of 12 percent nitrogen by
3	weight with 50 percent or more being water
4	insoluble, and there are a large number of
5	such products and manufacturers offering
6	those products to meet the market demand,
7	and a list of those products is available.
8	We set up a Web site called I love Long
9	Island dot org, and we have a list and
10	pictures of all the available fertilizers
11	there.
12	One important aspect of such a
13	prohibition would be to level the playing
14	field for all professional landscapers, and
15	we want to be clear that most landscapers
16	are knowledgeable about nitrogen and are
17	aware of the potential for it to contaminate
18	our water. Nevertheless, they work in a
19	highly competitive industry where the
20	company that can make a customer's lawn
21	green up the fastest has a commercial
22	advantage.
23	Legislation currently in place in
24	coastal communities and other states

limiting applications of nitrogen to 0.9



1	HEARING-LICAP
2	pounds per thousand square feet not more
3	that three times a year is not only
4	impossible to enforce, but places the entire
5	burden of protecting our precious water
6	supply on homeowners and landscapers rather
7	than allowing the fertilizer manufacturers
8	to share some of that burden. In this time
9	of limited budgets to address the increasing
10	number of emerging water contaminants, this
11	common-sense solution of prohibiting the
12	sale and use of high nitrogen fertilizers
13	can be accomplished without any cost to the
14	state or any significant economic impact on
15	homeowners or landscape professionals.
16	I strongly urge you to include such
17	a recommendation in the final version of
18	your Groundwater Resources Management Plan.
19	Thank you very much.
20	MR. CAREY: Thank you, Mr. Wood.
21	Do we have anyone else here who
22	didn't fill out a card that wishes to
23	provide comments tonight? Anyone else?
24	MS. BORECKY: Hi. I'm Claudia
25	Borecky from Long Island Clean Air, Water.



1	HEARING-LICAP
2	I'm sorry, I expected this to be a
3	presentation of your report and of your
4	findings. So I didn't read the report
5	online, so I can't comment on anything. I
6	was very curious about the part six that
7	said about New York City wells, the status
8	of that and some other issues. Again, I'm
9	speaking because I have not seen the report.
10	I expected this to be a presentation of your
11	findings. So I'm kind of disappointed, but
12	I'll look at the Web site and I'll write you
13	if I have any concerns.
14	MR. CAREY: Okay, we will accept
15	comments until Friday. There is another
16	public hearing tomorrow in Riverhead. So if
17	have a chance to go online and read it you
18	can still provide comments after you have
19	had a chance to review it.
20	MS. BORECKY: Okay, thank you.
21	MR. SCHAGER: Good evening, and
22	thanks everybody for getting together on
23	such efforts.
24	MR. CAREY: If you can just state
25	vour name for the record, please.



#### 1 HEARING-LICAP 2 MR. SCHAGER: Oh, yeah. Mark 3 Schager, S-C-H-A-G-E-R. 4 I'm just a gardener with the City of New York. I did natural areas, restoration 5 6 with the Parks Department, and I do some 7 work with the DOT. I'm a little dismayed 8 that we didn't get an agenda. Aside from 9 that I have three points. I didn't read the report as of yet, but I'm curious about 10 11 storm water basins. I grew up in Williston 12 Park around Vanderbilt Parkway. There's 13 quite a bit of storm water basins around 14 there. Oftentimes I would hang out there, 15 and now that I can read the trees and the 16 plants I realize that we have big issues 17 there. We don't compost our leaves. 18 happened to that? And the gentleman, Mr. 19 Wood, was talking about nitrogen going 20 through the soil substrate. What does that 21 mean for the aguifers? And also, I don't 22 know if you guys could mention briefly about 23 some of the legislation you guys were 24 talking about and some of the efforts as far

as that goes. I know there's a few points



1	HEARING-LICAP
2	in the 15 points you guys described, but I
3	don't know, before the night ends I came
4	here from the city, maybe you can just
5	mention a few things legislatively that we
6	want to do, and if the southern pine beetle
7	and that situation is being discussed and if
8	that's a long term or short term. Thanks
9	everybody again and also the guests behind
10	me. Thanks.
11	MR. CAREY: Thank you, Mr. Schager.
12	We are here to receive public comment
13	tonight, really not to present specific
14	information about the plan. It was
15	available online. But it looks like we may
16	be ending early. So if you want to grab one
17	of our ears afterwards feel to do that,
18	otherwise our next regular meeting is on
19	December 13th in Hauppauge. We tend to
20	answer questions at those public meetings.
21	Is there anyone else who would like
22	to provide comment tonight? Okay, so being
23	that it's only 6:30 we're going to probably
24	sit here for a short period of time and see

if anyone else shows up and would want to



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1
                   HEARING-LICAP
 2
     provide comments. So we're just going to be
 3
     in temporary recess for a short time just to
     be available if someone comes a little
 4
 5
     later.
             Thank you.
 6
            (Whereupon, a recess was taken.)
 7
            MR. CAREY: We're going to close the
 8
     hearing for tonight. Again, the public
 9
     comments will remain open until Friday
10
     either by e-mail or regular mail. Our last
11
     public hearing will be tomorrow at 6:00 p.m.
12
     in Riverhead at the County Center. So
13
     thanks again for coming.
14
            (Time noted 6:47 p.m.)
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CERTIFICATE

I, KEVIN JONES, a Shorthand Reporter and Notary Public, within and for the State of New York, do hereby certify that I reported the proceedings in the within-entitled matter on the 5th day of December, 2017; that the minutes were taken stenographically by myself and transcribed by myself; and that this is an accurate transcription of these proceedings.

IN WITNESS WHEREOF, I have hereunto set my hand this 8th day of December, 2017.



KEVIN JONES



	38	action	12:5	19:4,13
0	4:9	9:20	ahead	24:21
		actions	17:15	area
0.9	5	10:2	Air	19:20
21:25		activist	22:25	areas
	50	6:4		24:5
1	21:3		allowing	
	21.3	activity	22:7	arguably
		18:14	alternative	15:6
11769	6	addition	s	aspect
4:10		13:4	11:10,11	7:5 13:2
12	6:00	additional	amendments	21:12
20:17	26:11	11:23	9:25	aspects
21:2	6:30			7:9
L3th	25:23	address	ancient	
4:17		6:5 17:10	18:15	assembled
16:13	6 <b>:4</b> 7	18:5,9	annual	15:11
25:19	26:14	22:9	16:19	assesses
		addressed		9:18
L <b>4</b> 3	7	11:8	anthropogen	
15:8,22		18:25	ic	assigned
15			18:7	9:7
3:24 8:20	77	addresses	anticipate	associate
10:14	19:20	16:16	16:11	17:17
13:4		addressing	appendix	attended
14:5,7	A	12:6	14:25	8:2
15:7,23		17:25	16:8	
16:2 25:2	A-LIST	adequacy		attendees
	15:23	9:18	appendixes	8:4
			15:4	attending
2	academics	adopted	application	3:3 5:5
	6:3	8:5 16:12	19:7	
2013	accept	advantage		attention
6:13	23:14	21:22	application	11:5
2014		advocating	<b>s</b> 21:25	authored
7:25	accepting 16:10	20:22	21.23	8:21
226	10.10	20 • 22	aquifer	Authority
236-page	accomplishe	affecting	3:5,16	3:9 4:10
19:2	d	10:21	5:18,23	5:14
	22:13	agencies	11:14	
3	accomplishm	6:24	12:9,13	authors
	ents		16:20	10:8
3	13:9	agenda	aquifers	14:21
6:17		24:8	6:6 9:18	authorship
0-1/	acknowledge	agriculture	18:3	10:6
	14:21			



availabilit	23:20	23:14,24	21:15	common-
У	bottom	25:11	clearer	sense
20:25	6:14	26:7	9:17	22:11
aware	Box	carried	climate	communities
21:17	4:9	19:8,11	10:22	21:24
	Brian	categories	close	company
В	3:10 13:2	10:16	26:7	21:20
	briefly	Center	coast	competing
back	24:22	26:12	18:12	12:2,7
4:12 5:8		cesspool		competitive
6:13 7:25	broad	_ 18:17	coastal	21:19
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