STATE OF LOUISIANA
DEPARTMENT OF NATURAL RESOURCES
OFFICE OF CONSERVATION

REPORT OF THE FOURTH REGULAR MEETING HELD BY THE WATER RESOURCES COMMISSION ON WEDNESDAY, JULY 30, 2014, IN BATON ROUGE, LOUISIANA.
9:00 A.M.

LABELLE ROOM
LASALLE BUILDING
617 NORTH 3RD STREET
BATON ROUGE, LOUISIANA 70802

REPORTED BY:
ESTELLA O. CHAMPION, RDR, CRR
BATON ROUGE COURT REPORTERS

IN ATTENDANCE:

MEMBERS OF THE WATER RESOURCES COMMISSION:

COMMISSIONER SCOTT ANGELLE, OFFICE OF THE GOVERNOR, CHAIRMAN OF COMMISSION
KYLE BALKUM, LOUISIANA WILDLIFE & FISHERIES
HON. JAMES WELSH, COMMISSIONER OF OFFICE OF CONSERVATION
HON. GLENN BRASSEAU, MAYOR OF CARENCRO
JONATHAN "JAKE" CAUSEY, LOUISIANA DEPARTMENT OF HEALTH & HOSPITALS
HON. GUY CORMIER, POLICE JURY ASSOCIATION
DAVID CULPEPPER, COMMISSION MEMBER
KAREN GAUTREAU, LOUISIANA WILDLIFE FEDERATION, COALITION TO RESOLVE COASTAL LOUISIANA AND LEAGUE OF WOMEN VOTERS.
EVE K. GONZALEZ, LOUISIANA PUBLIC SERVICE COMMISSION
JERRY V. GRAVES, LOUISIANA PORTS ASSOCIATION
CHARLES KILLEBREW, PH.D., THE GOVERNOR'S OFFICE OF COASTAL ACTIVITIES
CHRISTOPHER KNOTTS, PE, F.ASCE, LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

MEMBERS OF THE WATER RESOURCES COMMISSION:
IN ATTENDANCE: (CONTINUED)
SENATOR GERALD LONG, CHAIRMAN, SENATE COMMITTEE ON NATURAL RESOURCES
BENJAMIN J. MALBROUGH, CHAIR HOUSE NATURAL RESOURCES AND ENVIRONMENTAL COMMITTEE
TED W. MCKINNEY, SPARTA GROUNDWATER CONSERVATION COMMISSION
EUGENE H. OWEN, THE CAPITAL AREA GROUNDWATER CONSERVATION DISTRICT
JIM PRATT, EXECUTIVE DIRECTOR OF THE SABINE RIVER AUTHORITY
VINCE SAGNIBENE, LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY
BRADLEY E. SPICER, LA DEPARTMENT OR AGRICULTURE & FORESTRY
COMMISSIONER JIM WELSH, OFFICE OF CONSERVATION
LINDA G. ZAUNBRECHER, LOUISIANA FARM BUREAU

WATER RESOURCES COMMISSION STAFF:
JOHN ADAMS – STAFF ATTORNEY, CONSERVATION
GARY SNELLGROVE – DIRECTOR, ENVIRONMENTAL DIVISION
MATTHEW REONAS – EDUCATION AND MARKETING REPRESENTATIVE

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LOUISIANA STATE LAW INSTITUTE – WATER LAW
COMMITTEE

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(Meeting is called to order at 9:16 a.m.)

CHAIRMAN ANGELLE: Good morning.

We'll go ahead and call the Water Resources Commission Meeting to order, and certainly would extend a warm welcome to everyone here and to thank the members for making the sacrifices to be here and to serve the people of Louisiana.

We certainly have a robust agenda on this unseasonably cool July morning. It's really, really nice to wake up to that this morning. And I know we are now 30 days away from kickoff to the college football season. So as we begin to look forward to all those good things in Louisiana, again welcome and thank you for being here.

The first item would be for roll call so we can get our business in order, so I would ask the staff to call roll.

MR. ADAMS: Thank you, Chairman.

If you will please acknowledge when I call your name.

MR. ADAMS: Commissioner Scott Angelle?

CHAIRMAN ANGELLE: Here.

MR. ADAMS: Present.

Kyle Balkum?

MR. BALKUM: Present.
MR. ADAMS: Present.
Mayor Glenn Brasseau?
MAYOR BRASSEAUX: Here.
MR. ADAMS: Present.
Jake Causey?
MR. CAUSEY: Present.
MR. ADAMS: Present.
Parish President Guy Cormier?
PARISH PRESIDENT CORMIER: Here.
MR. ADAMS: Present.
James Cramond?
David Culpepper?
MR. CULPEPPER: Here.
MR. ADAMS: Present.
Mark Davis?
Representative Gordon Dove?
Paul Frey?
Karen Gautreau?
MS. GAUTREAU: Here.
MR. ADAMS: Present.
Eve Gonzalez?
MR. GONZALEZ: Here.
MR. ADAMS: Present.
Jerry Graves?

MR. GRAVES: Present.
MR. ADAMS: Charles Killebrew?
MR. KILLEBREW: Here.
MR. ADAMS: Present.
Christopher Knotts?
MR. KNOTTS: Here.
MR. ADAMS: Present.
Harold Leggett?
Jackie Loewer?
Senator Gerald Long?
SENATOR LONG: Here.
MR. ADAMS: Present.
Benjamin Marlbrough?
MR. MARLBROUGH: Here.
MR. ADAMS: Present.
Ted McKinney?
MR. McKINNEY: Present.
MR. ADAMS: Present.
Eugene Owen?
MR. OWEN: Present.
MR. ADAMS: Present.
Jim Pratt?
MR. PRATT: Present.
MR. ADAMS: Present.
Vince Sagnibene?

MR. SAGNIBENE: Here.
MR. ADAMS: Present.
Paul Sawyer?
Brad Spicer?
MR. SPICER: Here.
MR. ADAMS: Present.
Commissioner James Welsh?
COMMISSIONER WELSH: Here.
MR. ADAMS: Present.
Linda Zaunbrecher?
MS. ZAUNBRECHER: Here.
MR. ADAMS: Present.
We do have a quorum, Mr. Chairman.
CHAIRMAN ANGELLE: Thank you, sir.
We certainly want to take the time to acknowledge a former member of the commission, Captain Michael Rooney, who passed away after our December meeting. Mike was a great guy, young man, 53 years old; served his country in the armed services and did a variety of great things serving the people of Louisiana.
I thought it would be appropriate for us to perhaps observe a moment of silence in his memory, have the record recollect that, and ask the staff to send a letter to his family so noting that the Water

Resources Commission on this 30th day of July, 2014, took the time to stop and pause, to remember his service for the people of Louisiana.

So if you would join with me in a moment of silence.

(Moment of silence.)

COMMISSIONER WELSH: Thank you.

Okay. We have a couple of housekeeping items. We have some new members we want to welcome to the Commission, folks that we're looking forward to serving us in a very exciting way.

And the first one is Ben Malbrough. Ben serves as the appointment of the House Natural Resources and Environmental Chair, Gordon Dove; and he also serves as the Executive Director of the Bayou LaFouche Freshwater District. We have worked on a couple of projects here recently, and we're excited to have you as a part of our group here. And we know that you can add to the things that we're discussing. And since you're the youngest guy here, you will be responsible for a lot of other things that none of us want to do anymore.

So again, thank you so much.

The next guy is Guy Cormier. Guy represents the Police Jury Association of Louisiana.

Guy is the Parish President in St. Martin Parish. Guy is the second Parish President ever to be elected in St. Martin Parish. I was the first one, but he still remains the best one. And I'm glad to have you here, Guy.

David Culpepper. Where is David?

David -- got a chance to introduce myself to David. David is a geologist with over 30 years of experience in environmental management and groundwater remediation and was appointed by the Governor.

We're happy to have you, David, looking forward to your contributions. Thank you for being here.

And Jimmy Cramond. Jimmy.

Maybe he wasn't here when you called roll; correct?

MR. ADAMS: He's absent.

CHAIRMAN ANGELLE: Absent? Okay. Very good.

Again welcome, and we're looking forward to that.

Want to say a special shout out to Senator Gerald Long for being here. As many of you know, Senator Long is the Chairman of the Senate Natural Resources Committee, very active in the

management of the state's natural resources, and long advocate for some real smart water policy, a dear friend of our family; and again certainly thank you for being here.

I know that after the session, you probably had to go away for a little while to find your heartbeat and your pulse. But we're happy to have you, and it looks like you're doing well. So thank you for being here, sir. Appreciate it.

Before we get into adoption of the previous meeting summary, a special shout out to a couple of folks who are in the audience that we perhaps will hear from a little later, and that's Mr. Chip Groat, who is the former Louisiana Geological Society survey guy, worked with the USGS up in D.C., and worked with DNR, as well as Kai Midboe, who is the former Secretary of DEQ.

Gentlemen, just if you would, just both raise your hands. We thank you for being here. And you know, I always want to look and find folks who served in that area. And somebody asks why I always do that. I say, because when I'm 75 years old and I'm at one of these meetings, I want somebody to give me that same shout out. So I appreciate you guys and thank you for your service.

And Mr. Commissioner says we still have some 75-year-olds up here.

Okay. All right. So Item Number 4 will be the adoption of the previous meeting summary. As I recall, we did not have a quorum at that meeting. Is that correct?

MR. ADAMS: No, we had a quorum, yes.

CHAIRMAN ANGELLE: Okay. You're calling it a summary as opposed to minutes, I just thought maybe --

MR. ADAMS: We call it a summary as opposed to minutes just to include less information in it.

CHAIRMAN ANGELLE: Got it. Okay. Very good.

So is that information has been presented to the members, is that correct?

MR. ADAMS: That is correct, yes, sir.

CHAIRMAN ANGELLE: Via email; yeah?

MR. ADAMS: Yes, sir.

CHAIRMAN ANGELLE: Do you have any comments on it, Mr. Adams?

MR. ADAMS: No, sir. Staff at this time does request adoption of the previous meeting summary.

CHAIRMAN ANGELLE: Motion by Owen, second by Zaunbrecher.

Any questions? Any objections? Any discussions?

Hearing none, that motion is adopted.

Okay. We go to Item 5, to get into some of the meat of the agenda. And number 5 is a Report on the Water Bills from the 2014 Legislative Session. We'll ask Mr. John Adams with the Office of Conservation to take us through that.

MR. ADAMS: Thank you, Mr. Chairman.

As many of you are already aware, it was quite an active session for legislation, particularly water-related legislation.

Each of you in your packet has a copy of all of the water-related bills that were adopted last session.

Just to highlight a few, with regard to the coastal zones, HCR 62 Representative Harris requested the CPRA to study Lake Verrett as an alternative drinking water source for Bayou Lafourche.

With regard to ports, Act 505, Representative Anders expanded the Vidalia Port Commission to include all of Concordia.

With regard to public safety in the rural water systems, Act 573, Senator Morrell required the Department of Health and Hospitals to promulgate rules and regulations to maintain minimum disinfectant residual levels of free or total chlorine throughout

the public water systems.

And with regard to the surface water and groundwater treatment, Act 285 with our own Senator Long extended the time that the state may enter cooperative endeavor agreements for the sale of surface water.

Related to that is Act 556 from Representative Thompson which requires proceeds collected from the sale of surface water withdrawals to be deposited into a fund to address aquatic plant control.

Act 795 from Representative St. Germane addressed some -- added a member and cleaned up some language with regard to the Capital Area Groundwater Conservation Commission.

And then Senate Resolution 171 from Senator Claitor established or requested the Louisiana Law Institute to establish or come up with some language for a Louisiana water code.

As I said before, all these are included in the package. And if any of you would like additional discussion or have additional questions, feel free to contact us.

CHAIRMAN ANGELLE: John, do you have any particular areas of what you've addressed that are more

either problematic to us or are going to have -- or of more importance than others?

I'm assuming the water code legislation is probably the most important piece or the most far reaching piece.

MR. ADAMS: That one is by far the chief area of importance because that's -- the ultimate goal is to put together a Louisiana water code, which of course this Committee should have a grade deal of say and influence over.

Probably a lot of the legislation that was produced this year, although it's related, it's not directly related to the purpose of this Committee, for example. Of greater importance would be the rules pertaining to the disinfectant levels with regard to free and total chlorine in drinking water systems; or appropriating, looking at studying Lake Verrett as an alternate drinking water source. Those are much more directly related to drinking water and conservation issues than, say, expanding the Vidalia Port to include all of Concordia Parish.

CHAIRMAN ANGELLE: None of the legislation, in your opinion, has taken away the rights of any particular person as respects their ability to access groundwater?

MR. ADAMS: I don't believe so, no, sir.

CHAIRMAN ANGELLE: Any questions for Mr. Adams on this issue?

Okay. Hearing none, thank you, John.

We'll go to Item 6, which is to Review the Agency's Groundwater and Surface Water Activities since the last meeting. And Matthew Reonas with the Office of Conservation is going to lead us through that.

MR. REONAS: Right. Thank you, Mr. Chairman.

Again it's been an active year for all of us. And one of the biggest issues that we've tried to tackle, as noted in the 2012 Groundwater Commission Report, was well auditing, well registration, in terms of making sure that there's appropriate control over installation and registration of water wells.

I would like to note that, dealing with the 2012 report which we believe every Commissioner should have -- if not in their binder today, then we've provided them in the past. But if you do not have one, we can provide it. It's also online as well. Please just let us know.

But in your binder today -- this is just a black and white copy. But in your binder today is the report we produced in January of 2014 which listed

all the recommendations from that 2012 Groundwater Resources Commission, of course the precursor to this Commission.

In this report we went through all those recommendations for actions and have sort of listed out where we're at with those from an agency perspective and sometimes Office of Conservation, Department of Natural Resources, of course DEQ, DHH. And what we tried to do is go through and sort of give each of you an idea of where we're at with those. Some of them we've completed; others continue to be in progress.

A lot of these you'll hear from, in terms of progress, you'll hear from different speakers today. Particularly U.S. Geological Survey will talk about the groundwater monitoring network. Louisiana Geological Survey is here to discuss the surface water monitoring network. We have a representative from Capital Area Groundwater Conservation Commission here as well. So a lot of the points that are stipulated in here, discussed in here, a lot of the issues will be discussed at a point later on today with some of our other presenters.

But from our perspective, from an agency perspective, I did want to run through a few of the things that we have been involved in. Particularly one

of the biggest ones has been water well auditing and registration.

That was a huge issue, one that we ended up pursuing changes in the regulatory nature of it to really tighten down our control -- not over well owners, which again there's hundreds of thousands, potentially hundreds of thousands of well owners around the state -- but our focus was to really narrow our focus down to the well drillers themselves. Water well drillers are a relatively small body -- about 250 licensed water well drillers around the state -- and really focus on them to assure compliance in terms of prior notification for irrigation wells and industrial wells, and also to make sure that, when the wells are drilled, that they are properly registered.

CHAIRMAN ANGELLE: Matt, let me jump in right here.

MR. REONAS: Yes, sir.

CHAIRMAN ANGELLE: On that issue I recall at one point in time we were not including the water well drillers as kind of our primary source for registration; and as a result we were having folks who perhaps were getting only one well in their lifetime, being unaware of the rules and regulations of the state.

MR. REONAS: Correct.

CHAIRMAN ANGELLE: As a result then getting into a kind of a got-you situation where they were unaware. They were good people, they just failed to notify because of not knowing this stuff.

And you said about 250 water well, licensed water well operators. So if the well is going to be drilled by a licensed operator, now we're talking about a population of 250 we have to manage, as opposed to four and a half million people in the state.

MR. REONAS: Correct.

CHAIRMAN ANGELLE: And are you able to get now with the licensed drillers, that they are helping you to get wells registered and we're not counting on well owners to do that?

MR. REONAS: That's correct. And that's really what we're looking at.

We pursued a really aggressive auditing program over the past year and a half. As you can see from the PowerPoint, quarterly audits all through last year, audits through this year as well.

From over the fiscal year, July -- fiscal year 2014, July of last year through June of this year, we had approximately 480 wells that required prior notification -- for instance, irrigation wells

and industrial wells -- and so we had almost 87 percent compliance with prior notification. So 87 percent of those wells, you know, met what we were asked the well drillers to do.

CHAIRMAN ANGELLE: And prior to that, establishing that rule -- I don't expect you have that metric. Otherwise you would have put it up there.

MR. REONAS: Right.

CHAIRMAN ANGELLE: But would instinctively you be able to tell us that there is no question that 86 percent of compliance with the regulations, prior notice to the state --

MR. REONAS: Right.

CHAIRMAN ANGELLE: -- is a lot higher than it was prior to this change?

MR. REONAS: Without a doubt, it's through the roof in terms of compliance. So we've had a really great response from the well drillers.

We've interacted with them at their trade association conferences. We've worked a lot with the trade association -- that's Joel Walton with the Louisiana Groundwater Association -- to try and get the message out, to let them know that we're here to answer questions, provide guidance on any of the regulations and needs that they have.

And again, it's a process. Again the new regulations were adopted in November of 2012. So really we're going on basically two years of having this -- a year and a half of having this in place. And so it's a learning process, again from the well drillers themselves who have never really had to provide all this documentation. And again, they are busy, you know, out in the field most of the time. So again, it's a level of requirement from them that they weren't used to. And so we've had to work with them to get them accustomed to what we need.

It's not a burdensome amount by any means, but it's something that we feel provides us a better picture and better regulatory control over water wells in the state which, as you know, prior to the 1980s we had no regulations at all.

CHAIRMAN ANGELLE: And so you saved yourself a bunch of work because in the past you would have to start chasing down -- you said through the roof -- so I'm going to say probably half, if using "through the roof" perhaps as maybe almost doubling what you have here.

MR. REONAS: Sure.

CHAIRMAN ANGELLE: So you-all would have to chase, after the fact you would have to chase down

these well owners --

MR. REONAS: Right.

CHAIRMAN ANGELLE: -- and say, The law requires you to do this. Now you've got to get an after-the-fact-type permit or after-the-fact notice, and you don't have to do that anymore.

SENATOR LONG: And Mr. Chairman, if I might follow up on what you're speaking up?

Matt, when you look at those 480 permits that have been issued, can you give us a breakdown perhaps as to how many of those would be strictly for agriculture purposes?

In other words, are we seeing a trend in compliance or in the development of these wells, or is it just simply 480 that encompass all of the needs of Louisiana?

I'm just wondering: Do we have a percentage breakdown as to how these wells are?

MR. REONAS: We can get that for you. I don't have the number right here. I'm not sure if our water well staff has that, can pull it down; but we can get those numbers for you, yes, sir.

SENATOR LONG: I think it would be interesting if we could trend that particular pattern to see if, in fact -- because what I've discovered,

that, through the Senate Natural Resources, is that companies in particular are quick to comply with that; but where there perhaps is not quite as much structure in the organization, you may find some issues. It's just a point of reference.

MR. REONAS: Right. Yes, sir. We'll get that number for you, if that's acceptable.

SENATOR LONG: Okay. Thank you.

Thank you, Mr. Chairman.

CHAIRMAN ANGELLE: Thank you, sir.

Just so everybody -- we had more than 480 wells that were drilled.

MR. REONAS: That's right.

CHAIRMAN ANGELLE: Only 480 wells by statute, by definition that required prior notification because of their size or their geographic area. Correct?

MR. REONAS: Right. Right.

We have probably, the average is probably 300. It various of course. In the wet months of the year, it's less. You know, in the wet winter months, it's less. But 250 to upwards of 400 wells a month that are registered.

So these are ones that required prior notification by the regulations and for specific reasons; and again, we were at an 87 percent clip on

that.

And so we did of course, within our jurisdiction, we did issue under the Commissioner of Conservation's authority compliance orders with the water well drillers that were noncompliant in terms of filling out their paperwork.

Again, we're trying to work with them, educate them about what the needs are, what they need to do; and provide them with, you know, as much information as possible to, you know, to comply without being again sort of overly, overly burdensome. And again, our goal is to reach a hundred percent compliance.

To sort of help with that, one of the things we just ended up pursuing was an establishment of a compliance line with water well drillers.

One of the problems we ran into with water well drillers in particular -- again, because it's a small, relatively small group, a lot of them know each other. They were somewhat hesitant, or we found they have been somewhat hesitant to report unlicensed well drilling activity; that is, well drillers that are out drilling wells without either a license or without having prior notification or without registration. And this is an issue we need to sort of

tamp down on in terms of getting a handle on going forward.

And so one of the things we wanted to do to sort of start with is establish sort of a compliance line, sort of an anonymous reporting. A well driller can call in, report different issues.

And again, for them it's affecting their bottom line. If an unlicensed well driller is activating -- is working in their territory, that's a job that that licensed well driller, who is, you know, again following the rules, is complying with state regulations, that's a job he's not getting. So really it's in the well drillers', licensed well drillers' best interest to let us know really what's going on out there in terms of unlicensed well drilling activity.

And there are a number of cases that we have open right now that we're working on, trying to pursue unlicensed well drillers -- some of them are from out of state; some of them are from instate -- and sort of really crack down on that and get a handle on it.

So the compliance line we ended up implementing, again sort of an anonymous tip line. I hate to call it a hotline. I hate to call it sort of a Crime Stoppers. It's not really that. It's just: Let

us know, give us some information to where we can open an investigation, pursue the different leads that are out there.

And again, it was supported by the trade association, the Louisiana Groundwater Association. And again, primarily, let us know if there's a well being drilled in your territory, that: Look, you had a bid in on that well. A guy that doesn't comply with the regulations came in and said, I can do it for 30 percent less. Right? You know, that's really cutting into the bottom line for licensed well drillers.

So it's an issue we feel like we need to go ahead and get ahead of the curve on in terms of providing some opportunities for well drillers to call in and let us know what they see and what's going on out in the field.

And of course we distributed this to all the licensed water well drillers around the state, working with the Louisiana Groundwater Association to get some more messaging out, and sent it out through the LSU Ag Center, the Natural Resources Conservation Service, USDA. And really what we're trying to do there is reach down to the parish level, the county agents and conservation districts which work with

farmers.

This is primarily an issue in rural areas, heavily agricultural districts around the state, and really provide parish-level officials that work with farmers and domestic well owners on a day-in and day-out basis, again those county agents and other staff of the LSU Ag Center and RCS, just to try and get them some information as well so that they will be aware of what we're looking for, and perhaps they can pass that on to the people they interact with on a daily basis.

And again, you see the memo that went out, the announcement. And again, it's just an anonymous line.

MR. GRAVES: Excuse me.

CHAIRMAN ANGELLE: Yes, sir.

MR. GRAVES: Can I request that notification be distributed to the Commission Members --

MR. REONAS: Yes.

MR. GRAVES: -- for our need to get out to districts?

MR. REONAS: Yes.

MR. GRAVES: Thank you.

MR. REONAS: Yes, sir.

CHAIRMAN ANGELLE: Do you feel like perhaps

for the first time you're beginning to get your arms wrapped around the notification and the registration issue? Because as you try to manage the resource and we provide input to manage the resource, obviously having a very compliant registration process, knowing where the wells are, right --

MR. REONAS: That's it.

CHAIRMAN ANGELLE: -- is pretty important.

MR. REONAS: It's paramount, yes, sir.

CHAIRMAN ANGELLE: It's the very beginning of a management program. You're beginning to feel like the changes -- and I want to compliment the Commission because some of the ideas that you all implemented came out of these meetings.

You're beginning to feel like you as managers are wrapping your arms around that issue and getting to a point where it is becoming a culture of the state that registration and prior notification is just the way it's going to be; right?

MR. REONAS: Yeah, that's where we're going. Again, it's a work in progress. I mean, there's no way around that.

But again, we're seeing a lot of response. Well drillers are, for the most part, in compliance. They are understanding what we're

requiring of them and they are following the rules that we've set out.

So again it is, yeah, this is the lay of the land going forward. Let's get accustomed to it. How can we work together to make it for efficient?

And again, as you'll hear from USGS a little bit later, in terms of having the data that's out there available, understanding how many wells in the state are out there.

Again, before 1980s there was no regulation or registration of water wells. So there could be a hundred thousand wells out there, we have no idea: How big they are, where they are, what condition they are in. So this is a way for us to at least get a handle on wells being drilled going forward. And then, you know, as resources become available, try to work our way back on those unregistered wells that are still out there.

COMMISSIONER WELSH: Mr. Chairman, I would ask that the practice that we've established here with water wells is a long recognized process that's been used in oil and gas regulation, other activities that we regulate to interact closely with landowners, stakeholders, other industry, to report things to the Office of Conservation.

We've always said that landowners and other operators are our best inspectors. So it's a practice that other agencies, I'm sure, use that regulate various activities; but we thought this would round out that ...

CHAIRMAN ANGELLE: So if you're talking about perhaps an average of about 300 wells a month, and assume like, I guess do the math, about 40 a month that require prior notification, can you give the Commission -- maybe another staff member, I'm not sure if you're the one -- so give the Commission again -- I know that we just need to be reminded. We all need to be reminded -- of the type of wells that require prior notification. So, of 300 -- again using that as a monthly average -- about 40 of them are requiring prior notification. So I would like for the Commission to hear the kind of wells that require that --

MR. REONAS: Right.

CHAIRMAN ANGELLE: -- and then the kind of wells that don't require prior notification --

MR. REONAS: Right.

CHAIRMAN ANGELLE: -- but clearly the law requires some notification, again after the fact, which allows that information to come into your database.

So why don't you kind of run that

through, run through for the Commission members the difference between those wells.

MR. REONAS: Right. Well, in terms of -- I may not be actually the best person to speak on that.

CHAIRMAN ANGELLE: Mr. Snellgrove?

MR. SNELLGROVE: We'll bring Gary Snellgrove.

CHAIRMAN ANGELLE: Gary Snellgrove with the Office of Conservation.

MR. SNELLGROVE: I've confident Matt could have handled the task. I'm certainly pleased to be here and welcome commission members and will provide that information.

The type of wells that are not exempt from notification coming into the agency, at least 60 days prior to a well being installed, are: Public supply wells, industrial wells, irrigation wells, and rig supply wells, drilling rig supply wells that are being used for frack purposes, which we determined that to be an industrial type of purpose.

The type of wells that are exempt would include domestic wells and drilling rig supply wells in general.

So that's the breakdown of the type of wells that are out there that require prior notification.

And of course you have environmental wells that are drilled for monitoring purposes and what have you, and those are not required to provide prior notification before they install those types of wells.

CHAIRMAN ANGELLE: So just to clarify, so on the drilling rig supply well, which is perhaps a small well that is used for the general kind of wash-down, kind of cleanup, kind of general purposes associated with it, that is more akin to a domestic well and does not need notification.

But in the state of Louisiana, when a well is going to be used for frack purposes, that has the highest level of registration in the state, which is prior notification 60 days ahead of time. Correct?

MR. SNELLGROVE: Yes, sir, that's correct. Again drilling rig supplies, those are temporary wells. They are installed in locations where there may not be a public supply available, so for the purposes of drilling and completing the oil and gas well.

Typically those wells would be P&As, plugged and abandoned after the work has been completed for the oil and gas well. Sometimes they are not and they can be used on the facility for other purposes, or they can be transferred over to the landowner.

But if it is used, correct, for purposes

other than just that just that temporary use; i.e. for frack purposes, fracking, hydraulic fracking, then before they use the water for that purpose that's withdrawn from the well, the operator must provide at least 60 days prior notification for us to evaluate that use, the water for that purpose. And at that point we would determine whether or not there's any concerns for adverse impact to the aquifer or any nearby water users or other installations nearby.

CHAIRMAN ANGELLE: Ms. Zaunbrecher.

MS. ZAUNBRECHER: You talked about 60 days' notification for agricultural wells?

MR. SNELLGROVE: That's correct.

MS. ZAUNBRECHER: Is there any waiver? Sometimes you don't have 60 days that you need.

MR. SNELLGROVE: It's written in the law, the law actually requires that the well owner provide at least 60 days of prior notification. However, typically turnaround time for our evaluation is, you know, within the week or two.

MS. ZAUNBRECHER: It can be.

MR. SNELLGROVE: And then once we complete our process, we send notification back to the well owner and they can install at that moment. So they don't have to wait 60 days.

MS. ZAUNBRECHER: Okay.

CHAIRMAN ANGELLE: Isn't there a provision for a replacement irrigation well, that there is no requirement, that that's waived?

MR. SNELLGROVE: Any of the nonexempt wells -- public supply, irrigation -- any of those types of wells, if they are truly -- if they truly meet the definition of a replacement well, then that 60-day prior notification is not a requirement. It's not required. They can go ahead and install the well.

But, caution: I mean, it truly has to be a replacement. And the well that it is replacing needs to be plugged and abandoned within a certain time. Same depth, same size well, same use.

MS. ZAUNBRECHER: Yeah. And if you're going replace one, you probably wouldn't replace it with exactly what you had before.

MR. SNELLGROVE: Most of the time that's correct. It's usually bigger.

MS. ZAUNBRECHER: I understand. Or you wouldn't have to do it.

MR. SNELLGROVE: Yes, ma'am.

CHAIRMAN ANGELLE: And that law that requires the 60-day notice, that's been around since about 2001 or '2?

MR. SNELLGROVE: Correct. Beginning -- well 2001 I believe is the timeframe whenever it was enacted. And then there was a subsequent law that was passed that formalized that process being under the Commissioner's authority.

CHAIRMAN ANGELLE: Anybody have any questions, any commission members have any questions for staff on the issue of auditing or registration?

Seeing none. Okay.

You want to continue on with your presentation, Matt?

MR. REONAS: Yes, sir. All right.

Again, another issue we have been involved in is education, primarily here in East Baton Rouge, although certainly our focus is looking statewide. But when we started developing an education program, East Baton Rouge with its groundwater issues was a major area of focus. And we had a very successful teacher workshop this past -- about a month ago in late June at LSU, the School of Education.

We were very fortunate to develop a program last year. It's called "Water-Wise in BR." It was sort of a public awareness, but we really put a lot of emphasis on reaching teachers in the parish, especially science teachers.

We developed a specialized curriculum that focused on groundwater resources, awareness about groundwater, use here in Baton Rouge, saltwater intrusion, and really put that in the context of what we call "Science in Your Own Backyard." Here's a great opportunity to learn, right, learn about natural processes, the management of natural resources, the conservation, sustainability -- key vocabulary such as that -- and ended up developing the curriculum to go along with it.

This year, through a partnership with DEQ, through one of their beneficial environmental project programs, we were able to secure some additional funding, expanded the curriculum here in East Baton Rouge to include a 5th grade component. Prior it had really been 8th, 8th grade, middle school and a high school environmental science component.

We added a 5th grade component, added a math component to it as well -- again utilizing primary source material, charts, graphs, you know, real data, a lot of stuff from USGS -- getting students to engage with the material that we use as managers every day, and then also added sort of a civics component again because this comes down to government, management

of natural resources.

And so what we ended up doing was having the first of one of a series of workshops at the LSU School of Education in late June; had approximately fifty teachers from East Baton Rouge Parish schools.

We're reaching out. I'm doing a program next week with the Catholic school system here in the Baton Rouge area, trying to get this curriculum out to those teachers as well.

But it was a real success. Again about a three-hour program focused almost exclusively on curriculum.

The previous workshop we held we had about 30 or so attendees. This was last year. We had a big program, a day-long program where we had speakers from USGS, the Baton Rouge Water Company. We actually took them on field trips out to one of the Baton Rouge Water Company's well fields and out to Entergy to look at their co-gen plant, water use there.

This time around we wanted to focus very exclusively on curriculum development. We had a lot of demonstrations, hands-on activities for the teachers, and provided them, of course, with our classroom poster, copies of the curriculum, and a bunch of other goodies as well that they could use in their classroom.

So that's really the first and one of several we would like to hold over the next year here in East Baton Rouge.

Terri, can we go to the next slide, please.

However, we do have an interest in looking at statewide issues. One of the things I'm working on right now for development and launch once school gets back underway, probably September, I'm working with the Cane Center at LSU, which its focus is on STEM -- science, technology, engineering, mathematics -- curriculum at the high school level, middle school/high school levels.

What I want to, what I would like to develop is or what I'm developing right now is a statewide teacher survey, science teachers in particular, to really see what's being taught right now in the classroom, what the needs are going forward, especially with the adoption of the Next Generation Science Standards. It's going to be a huge emphasis -- and this is something that I had extensive conversations with the Department of Education about -- There is going to be a huge emphasis on engineering with these Next Generation Science Standards.

And for those of you that are involved

in education policy at all, trying to navigate through these Next Generation Standards, that's just very dense. Great stuff, but it takes a tremendous amount of time to work through them; and there's going to be a huge need -- from what I understand talking with the Department of Education, talking with a lot of teachers out in the field, there's going to be a huge need for lesson plans and curriculum.

What I'm trying to do right now -- and again I'm working with the Cane Center on developing this survey that we can send out and hopefully kind of get a picture, some data of what's being taught right now and what teachers are anticipating their needs are going to be going forward -- is the survey to, you know, give us again some data.

We need to understand what they are using right now, what's being taught right now, again what needs are they going to have going forward. We would like to launch this in September, and again we can keep the Commission posted as we develop this.

From more of a public policy standpoint, we're also working again with our parish contacts.

This is a list that we're continuing to expand and refine. It includes -- this is a project sort of we undertook a year and a half ago to sort of

develop a parish contact list of: Public works officials, parish presidents in some cases, police jurors in some cases, and just to keep them apprized of major, major developments in groundwater and surface water policy; again sort of as one of our management tools.

Again, that's a group; I have probably 80 to a hundred people on that list right now, and it's a group that kind of continues to fluctuate, as you could imagine at the parish level, as people come in and out of government or retire from their positions in public works departments. But again, just to try to keep them updated on major developments with the Water Resources Commission, with major management issues.

And so, for instance, this past January, when we released the recommendations, updates, status update, we sent that out with sort of a breakdown of contact information, relevant material that was available online.

Of course the USGS, we hit them with all the information on the expanded groundwater and surface water monitoring networks. And then just recently back in May, we reached out to them, just trying to sort of gauge what their needs, if they anticipated any on groundwater education, if they had any programs that

were undergoing within their areas, and then you know to provide them assistance if possible.

Now we haven't had a tremendous response from them. Of course some areas, especially in the Sparta for instance, are already very highly attuned to groundwater issues. Other parts of the state, Chicot, I think there's a high level of knowledge about groundwater issues.

But in terms of actually having sort of a public outreach and awareness that's -- and in many parts of the state it's relatively nonexistent. So that's one of the things we're looking at, just to kind of reach out to parish officials -- again police jurors, public works people -- let them know that we're out there, the Office of Conservation in particular, for groundwater issues, and to provide them sort of with regular updates on what's going on at the state level.

And then again, following sort of the last point I wanted to hit on in terms of agency actions was the recently amended South Caddo Emergency Groundwater Order.

Again, Commissioner, as you will recall -- you were secretary then -- the Office of Conservation issued a Temporary Groundwater Emergency

Order for South Caddo Parish here in 2011 when local wells began to run dry. We've monitored that area very extensively, created two areas of interest, had very strict regulations on groundwater use, installation of wells. And what we've seen over the past couple of years has been a steady trend of recovery.

Now that particular aquifer, the Carrizo-Wilcox there in South Caddo Parish, which is heavily used in sort of the rural areas below Shreveport, what we've seen is that there has been the steady trend of recovery. And with the recommendation of the Red River Watershed Management Institute which maintains a series of monitor wells in the area -- we were talking with Gary Hanson there extensively. Of course he was sending in regular data. USGS also of course had regular monitor wells in there and they were sending regular updates.

What we ended up doing was relaxing that order, amending the order this past June to provide for the resumption of normal water use. Again, we had very tight restrictions on water use in these two particular areas in South Caddo Parish below Shreveport.

Basically we're keeping the order in place, encouraging local residents to maintain sort of what we call a judicious use of groundwater,

understanding that the groundwater resources there are rather limited.

We sent out a flyer, an educational flier last September in a dry spell, just to kind of again remind local residents about the order and the restrictions. But even with that dry spell last September -- and I have a slide I'm going to go to in just a minute to show you --

And maybe we can go to that now, Terri.

What you've seen is -- and I'll come over here and show you. What we've seen, even with this sort of a mini-drought that hit late last summer in northwest Louisiana -- right, you see the dip here, that was last summer, and it still recovered to higher levels than before. And these are the deeper wells, so you see less movement up and down. And it's a cyclical pattern. It's very common.

But what we see -- and this was winter-spring 2012, winter-spring 2013, and winter-spring 2014 -- as you see the lines, the recovery lines going up and up. It's still an area, we still have the order in place in terms of maintaining strict regulations on installation of new wells in particular. Again, if anybody wants to go in and put a new well in those areas of interest, we have to have

prior notification of that, we have to put it through a very rigorous evaluation process --

CHAIRMAN ANGELLE: Matt, I don't want to interrupt you but --

MR. REONAS: Yes, sir.

CHAIRMAN ANGELLE: So you've given the Commission some method. So as we recall in 2011, we got some reporting that showed that the monitoring well was at a level -- what was that number?

MR. REONAS: These are the different wells, as you can see the lines here.

CHAIRMAN ANGELLE: No, I think it's a great graph. But I think unless someone takes a look at it and examines it for 30 minutes --

MR. REONAS: Right.

CHAIRMAN ANGELLE: -- it's very, very hard to just grasp real quick.

MR. REONAS: Right.

CHAIRMAN ANGELLE: So for members of the audience, you play like you're the weatherman, and that's an upper level low moving across, and tell us what the forecast looks like.

MR. REONAS: Right.

Well, here we had a low of minus 20 feet, right, a drop of 20-plus feet in some of the

wells, in the more shallow wells. The deeper wells the drop was less.

But what we've seen, right, in the wetter months of winter, you see a gradual increase; and then, right, the winter-spring of 2012 you saw an increase. And then when it gets hot again, as you would expect, water use goes up, the demand on the aquifer goes up, and so the water levels drop back down. Again this is about 20 feet here.

But you can see, this was the low, this was the high. The first -- or this was the next low, here was the next high, the next low again.

This was the last -- this was just last summer. Late summer Caddo Parish had a burn order in place. A couple of months was exceedingly dry. It was actually, I think it moved into like stage 3 or stage 4 drought on the U.S. Drought Monitor right here.

CHAIRMAN ANGELLE: So from that point right there to the previous point, the original point that caused the concern over to the left --

MR. REONAS: Right.

CHAIRMAN ANGELLE: -- what is the difference in that metric?

MR. REONAS: You're talking about almost 50 feet difference right there.

CHAIRMAN ANGELLE: Fifty?
MR. REONAS: Yes. From minus 20 --
CHAIRMAN ANGELLE: No, no, to the one right there.
MR. REONAS: Yes, about 30.
CHAIRMAN ANGELLE: That represents the next low; right?
MR. REONAS: Right, that's correct. Yes, sir.
CHAIRMAN ANGELLE: About a 30-foot recovery --
MR. REONAS: Yes.
CHAIRMAN ANGELLE: -- in the level of the well?
MR. REONAS: Yes, sir.
CHAIRMAN ANGELLE: Right. And we believe that that instance was caused by an extreme drought in 2011?
MR. REONAS: It's really a year and a half drought that started in 2010 and extended into 2011.
We feel like most of the wells that were in trouble, those well owners have gone to the expense of, right, deepening their wells and tapping into the aquifer at a different level.
So, again, we feel pretty good about the

situation there. And we feel very strong about it. And again, it was back primarily by our eyes on the ground there in Caddo Parish, the Red River Watershed Management Institute.

CHAIRMAN ANGELLE: Well, I think the Red River Water Institute Management deserves a lot of credit for kind of putting us on notice in 2011.

MR. REONAS: Oh, yeah, without a doubt.

CHAIRMAN ANGELLE: And I just would again tell the Commission members that, you know, there was a point in time when the State had a really robust monitoring program; and for a variety of reasons, that kind of got eroded. And then we've been working all together, all of our agencies and all of our folks working with parishes and whatnot, trying to put dollars together, and we've been able to put dollars together, and we've got now an expanded monitoring program.

Of course, you know, we're going to have to continue to press forward to appropriators that it is the right thing to do, that we need to do it.

In this instance, in this instance, had it not been for the early monitoring program, a monitoring program in that area, the state of Louisiana would not have had the information they needed for the

Commissioner to issue that order. He could have all the authority that he wanted to have, but if he doesn't have the data, he can't get it done.

MR. REONAS: That's right. Right.

CHAIRMAN ANGELLE: So again, you hit today on the monitoring program that we have been able to expand. To the degree that you-all are having conversations with people supporting a monitoring program that is robust, that gives the management team the ability to respond, to provide some pattern of recovery, to modify behavior when behavior needs to be modified and the conditions, it's very, very important.

And to not do that to me seems to just be going in the dark and having a program that is more counting on luck rather than management. And none of us have been able to really control our luck. Right?

So if we can work on the management side, thank you very much.

Do you have a few more on this?

MR. REONAS: No. That kind of wraps up the agency presentation. And I'll take any questions if there are any, in particular on any of the --

CHAIRMAN ANGELLE: So you get copies of -- I guess will you be wanting me to refer to the Report on the Groundwater Monitoring Network on Item 8 to get

into that a little bit deeper?

MR. REONAS: Yes. U.S. Geological Survey is here, John Lovelace, and he will present on the Statewide Groundwater Monitoring Network; and again kind sort of drill down into a local instance I think here in Baton Rouge where having, as you say, a robust network really provides you the management tool, the eyes on the ground, to see what's happening. Otherwise again we're sort of flying blind out there in terms of management and foreseeing anything that might happen down the road.

Again, we have a good sense of what these aquifers can do and what they are capable of; but again, when you have unpredictable weather, extended drought such as there was in 2010, and people are demanding water of aquifers that may not be able to sustain that, that's a huge issue. We've got to have some understanding of that, some data to sort of back up management actions.

CHAIRMAN ANGELLE: Good. Appreciate your help on that.

Obviously I always want to have a hundred percent compliance on reporting and to have wells registered so the managers can have that data and certainly expand. I'm very appreciative of the pilot

project here in the Capital City with regards to education. We need to expand that statewide. I know that you have a goal trying to get that out, but that would be something I know that we took on several years ago, something that would be very worthwhile.

As we're bringing, as we're changing the behavior of adults as it comes to registered wells, it's always a good thing to begin educating the next generation of users.

So to the degree we need to put that effort on steroids, I would certainly be willing to help try to find resources, private funds or whatever we can get our hands on. I think that's very, very important for the 5th graders or whatever choice grade you think is important --

MR. REONAS: Yes, sir.

CHAIRMAN ANGELLE: -- that we can make that change.

MR. REONAS: Well, there is money out there, especially for science and engineering. And I've had numerous conversations with nonprofits and private sources.

There's a tremendous amount of interest, and I think we're moving in that direction. There's a lot of interested parties out there and there is money

available.

I think the biggest thing for us, from an educational standpoint, is just to have the data available, again: What are teachers teaching right now? What resources do they have at their fingertips? What are they going to need going forward? What can we provide them going forward?

And I know Sparta is here to talk a little bit. Lindsay Gouedy is here. We'll talk a little bit about that. We had a great conversation yesterday.

And again, like I said, the nonprofits that are out there are very interested, and water is a huge issue going forward -- they realize it -- not only here in this state, but nationwide and around the world. And so I think there is going to be, I think there is money out there that we can tap into and develop a statewide program.

CHAIRMAN ANGELLE: Very good. Thank you very much. Appreciate it.

We're going to change the order just a bit, go to Item 13. Chris Knotts, who is a member of the Commission, has another engagement he has to take care of, so we're going to accommodate Chris.

And as you-all know, I guess it was in

2012, we changed the Groundwater Commission to the Water Resources Commission and expanded our advisory authority, not only to groundwater, but to also include surface water. So we thought it would be good for Chris to kind of give us a presentation on that.

So, Chris, thank you very much for being here.

MR. KNOTTS: Mr. Chairman, thank you for the opportunity to address the Commission. I do appreciate the modification of the agenda to allow me to take care of some family obligations later today.

Terri.

The Public Works Water Resources, Department of Transportation and Development, includes the statewide flood control program, federal projects, the Non-coastal Reservoir Priority and Development Program, Dam Safety Program, Levee Safety Program, Non-coastal Levee Districts. We are the coordinator for the National Flood Insurance Program for FEMA Region 6 for the state, and we also do all the hydraulics for the roads and bridges of the state.

For the purpose of this presentation, I'll focus on our dam safety program.

When an individual or an entity would like to construct a new dam, we have the application

online and they would go fill out the application. If they are computer savvy, they can submit it electronically. Otherwise they can print it out and send it in.

The dams that require notification of our office are ones that are greater than 6 feet in height or ones that store more than 15 acre-feet of water.

For those of you-all not familiar with an acre-foot of water, it's roughly 326,000 gallons per acre-foot of water.

Those that require a permit are ones that are greater than 25 feet in height or that store -- excuse me -- more than 50 acre-feet of water.

So you would get that application online, fill it out, send it to us, send it to the Corps of Engineers. The Corps of Engineers does the joint application process/notification process. Through all those comments, you would either get an approval or a denial from the Corps. Then you would send all of the letters of no objections and the permit from the Corps to us at the safety meeting.

We'll then conduct a public hearing in the parish that the dam, proposed dam is to be located in. The applicant is required to have -- they are

required or their representative is required to attend that hearing to answer any questions.

A hazard classification is determined by the evaluation of the probable maximum impacts of a dam breach.

The owner is responsible for establishing that hazard class; but in the dam safety unit, we assume that all the dams are high hazard until proven otherwise. And if we don't agree with the owner's assessment of the hazard classification, we can reject it.

So the program was created by Act 733 in 1981 regular session. We are responsible to define and enforce minimum standards, maintain the state levee safety inventory.

Applicable to all dams or impoundments, "any" which is defined as an artificial barrier which will impound or divert water or any liquid -- I put "any liquid" in red because some people don't realize that, if you build an industrial facility, you might have a storage pond, you might have a sewer treatment oxidation pond. If it meets those criteria, it's termed as a terminal reservoir and it has to be in the dam safety program. Those just are a listing of the graphs that were shown previous.

CHAIRMAN ANGELLE: So, if it's on private property and fits that description, that dam safety requirement, registration permit, whatever, is so you-all know from a potential flood, downstream flooding incident, if there's a failure?

MR. KNOTTS: Yes, sir. It doesn't matter whether it's public or private, it's all a matter of safety in the event that the dam does breach and the impact downstream of that water.

So the minimum design standards are for design, construction, modification and operation and maintenance. In that operation and maintenance, we will perform acoustic surveys, underwater inspections. We'll operate the gates on a periodic basis, just to make sure that they are still functional, and develop emergency action plans.

Right now in the state -- well, I put that as February. It changes on a monthly basis -- we have 547 regulated dams in the state of Louisiana. At that time 45 were high impact, 58 were significant impact, and 444 were low.

I do know that the significant, as we go and evaluate them, it changes, depends on what's been developed downstream. So the significant has gone up a little bit, but I think the high has stayed the same.

The high and the significant impact dams are inspected on an annual basis, and low impact dams are inspected every five years. On that schedule, with our number of dams, we're inspecting between 150 and 175 dams annually. The inspections include: Planning, scheduling, field inspections, and post-inspection reports.

So we'll look at the geographics of our dams, the required frequency of inspection, and we'll group them into sections, send folks out. They won't just go do one dam at a time. We try to get as many as we can for a time period that they're out.

Most of those dams are on private land. So we contact the dam owners, make sure they know we're coming, any other stakeholders that would have an interest in that dam's inspection. Sometimes they have lake commissions, sometimes other entities, state entities, wildlife and fisheries. We always make sure everybody knows we're going. And a lot of times the DOTD district in those areas also participate. And we send out confirmation letters to let everybody know what date we'll be there.

So on the actual field inspection, we'll verify the location and dimensions of the components. The dimensions sounds kind of redundant; but when you

have a structure, sometimes the owner doesn't go there very often. We take measurements to make sure that nothing is actually moving, make sure that there aren't any safety issues there. And we document anything we find, collect additional information from dam owners, other stakeholders that may be there, and we also look at the downstream activities to develop inundation maps and emergency action plans.

So we'll take all of that. We prepare an inspection report documenting the deficiencies, determine if immediate action is needed.

If immediate action is needed and it is a safety immediate, imminent safety issue, the department does have some other authorities that allow us to do some things to remediate those safety issues.

Otherwise we'll distribute the report, minor deficiencies to the owner and other stakeholders. We'll prepare a breach analysis, revisit the inundation map and emergency action plan to verify the hazard class.

We distribute the emergency action plan to the owner and stakeholders. We'll follow up with them and we will provide dam owners with additional information, and like I said, enforcement action if required.

The emergency action plans, sometimes when you build a dam, it's on private property, but you don't really own the property downstream of you, you might not be realizing the development that takes place, and that's where the emergency action plan hazard class can change as the years go by with a dam.

Contrary to popular belief, DOTD does not own dams, however we do maintain dams, and statutorily mandated to maintain 20. Unfortunately many of those are getting old in age, 40 or 50 years, and some have been poorly maintained due to lack of funds through the years.

Just to name a few that are in some critical need of repair: Lake Bistineau, Smithport Lake and Cheniere Brake Dam. But we do have a little good news. Cheniere Brake is currently in engineering and design.

That dam is unique in that it is integrated into a bridge. So we're actually doing the bridge and dam design for a replacement structure, just started earlier this year.

CHAIRMAN ANGELLE: Who owns those 20 that you are required to maintain?

MR. KNOTTS: Typically those are lake commissions or other local entities involved. They own

it, but we operate it and maintain it.

MR. McKINNEY: I have a question, please.

MR. KNOTTS: Yes, sir.

MR. McKINNEY: On the low-impact dams, notice you have here 40 to 50 years on some of these here.

Is there a time -- excuse me. Is there a timeframe in which these privately-owned low-impact dams -- when did you start doing this monitoring process?

MR. KNOTTS: Well, this program was created in 1981, so we have been doing it for 30 years.

MR. McKINNEY: So, if a private individual has a low impact, what we will say is a low-impact dam that is older than 1981, do they need compliance on these or what? How do you handle situations like that?

MR. KNOTTS: We continually get information from various sources that people will say, Hey, they have this dam or they have this pond or reservoir -- typically small -- that I found, but I don't think it's in the state dam inventory.

We will actually go out, do a little investigation, determine if it meets the criteria for being in the state dam inventory. And if it is, we will put it in. If it's not, then we'll just respond back to the individual or entity that we have

investigated and it doesn't.

But there's no penalty for having it and then we found out it's there and we go put it in inventory.

MR. McKINNEY: That's the point I'm ultimately getting to.

In some of these cases -- and I expect most of these cases -- and I'm thinking of one in particular. Okay? That's the reason I asked this question -- the timber growth is substantial on it. I mean big stuff. So in theory, if you go in and remove that timber, then in reality what you're creating is the root system deteriorating and ultimately the breaching of the dam. So you've got a dilemma, you know.

And I understand or I have been told there should be no vegetation on the dam.

MR. KNOTTS: That's correct.

MR. McKINNEY: But you've got 50 or 60 years growth there, you know, and you've got it. So what do you do in cases like that?

As you say, you do not hold the landowner responsible.

MR. KNOTTS: Yeah, we have to work with the landowner. I mean, we -- regulations, federal

regulations, you don't have growth on the dam itself all the way down a little bit past the toe, very similar to the levees.

In that case, if it was privately and small, we would have to look at it. But typically, we would require that the woody vegetation be removed. If that couldn't be done in a manner that still maintained the integrity of the dam, it would probably be breached and then repaired and then put back.

But thanks to the -- a little bit of good news -- the State Capital Outlay Funds, the Lake D'Arbonne Lake Commission with DOTD worked together, and the existing spillway was recently repaired.

We also added an auxilliary spillway with two 40-foot tainter gates that was completed in early 2014. This is an aerial view of the new alternate spillway at the bottom there. That's some pieced-together photos of the construction of the new tainter gates, and that's just some different views of the same gates.

These tainter gates are the only structures on reservoirs in the state that are designed for flood control. All the other gates are just designed for operation of the lake; but these two are actually designed for flood control specifically.

So we get a lot of requests from different entities, lake commissions and things, to come open the gates, you know, have flooding. We've worked through that earlier this year and got some internal documentation.

We just felt that opening gates that were not designed for flood control were putting the department a little bit at risk, especially should those structures be damaged during that activity. But we have worked through that and finally found a way to be able to do that for our lake commissions.

Real quick, you know, might be asking why we do all of this. Consequences of dam failure are fairly rare. But over the last 30 years there have been 135 fatalities with $2.6 billion in property damage as a result of dam failures.

This is just a list I pulled together. I'll talk a little bit about the two in Mississippi, the top one and the bottom one.

Percy Quinn. Percy Quinn didn't have a full breach. But during Hurricane Isaac, it had a very severe slope failure. It came very, very close to total breach. And through the -- you can see the number of, amount of equipment and manpower out there pumping the lake down. They did manage to hold that

dam together and repaired it subsequently.

One that wasn't so lucky was Big Bay Lake, 17 miles southwest of Hattiesburg, 32 miles north-northwest of Bogalusa. It was about an 1800-foot dam, about 55 feet high, a thousand-acre lake, relatively small. It was 42 feet at the dam.

By everyone's account that was a well maintained dam, although it always did have some minor seepage along the alignment and in the spillway conduit. It had regular inspections by an engineer and daily observation by maintenance staff.

In 2004, on a Thursday, the maintenance staff noticed that it had a new seepage near the spillway. They hadn't seen that before. Notified the owner's engineer. Engineer goes out, looks, sees a small boil, and advised that it be observed overnight.

Next morning he comes back. He noticed that the boil was clear -- which means that it has a clear path. It's no longer eroding soil. It's got a clear flow path through the dam.

He left to go call the contractor. And the maintenance staff called him back, said it was rapidly increasing. So at noon he has a pencil-size diameter. 30 minutes later it's four feet in diameter. Ten minutes later the National Weather Service issues a

flash flood advisory for the two downstream communities that were listed in its emergency action plan, and at the same time they had a complete dam breach.

So there's the picture of the dam breach, 385 feet wide, 230,000 cubic yards of material loss. The entire lake drained in 90 minutes.

And it's kind of hard to read there; but the flow path for that dam breach, which was a fairly small dam, was 17 miles long, but the emergency action plan only covered communities three miles downstream.

No one died. And by all accounts, everybody figures that the reason no one died was this was at noon and everybody was at work. But people did come home and see their entire homes destroyed.

With that I'll thank you very much and then take any questions.

CHAIRMAN ANGELLE: Chris, let's talk about -- appreciate the background on the dam safety. And certainly that's a very important part.

With regards to the dam portfolio that we have in the state, can you kind of give us an idea of what -- those dams were constructed for a variety of reasons: Flood control, I'm assuming some potable water source. Can you kind of take us just through a conversation -- because obviously we're definitely very

concerned about dam safety and would want to support the things that we need to do. Obviously public safety is very important.

But just to kind of manage the resources and give advice to others, kind of take us through the surface water dams -- let me back up -- the dams that we have that we use perhaps for surface water consumption, and how are those perhaps available to help us with some of the groundwater shortages that we have in some areas.

MR. KNOTTS: Most of the larger lakes that we have are either surface water drinking use or sometimes in a combination. Any time you build a lake, you're going to have recreation, and the bigger ones are that.

The 444 low-impact, small, those tend to be private, perhaps agricultural or just small dam owner property. But the larger ones are surface water and recreation primarily.

CHAIRMAN ANGELLE: And they were, you think, constructed to solve what was a groundwater shortage in a particular area way back when?

MR. KNOTTS: Historically they were not. They were constructed -- if they were put in a place, they were constructed where geography said it could be constructed, and they were used for surface water,

drinking water purposes.

The reservoir priority program -- I didn't mention it and we're still developing that. And one of the things that I really wanted to focus with that was siting future reservoirs in areas where science said would recharge groundwater aquifers, in trying to match up the surface geography with those two, and funding that development.

But a lot of the more recent ones have been surface water, economic development, recreation components.

CHAIRMAN ANGELLE: So outside of that, does your department have any specific authority to manage -- is there any management going on of the surface waters of the state that -- other than the cooperative endeavor agreements that I think several agencies have signed, a memorandum of understanding that they are working together on -- do you all have any authority whatsoever, for instance, when coastal, the coastal restoration folks are looking to determine volumes of water from Mississippi River flows and managing that to make sure that they have the kind of water that they need to yield the sediment that they would want for a particular project?

Do you all have any -- do you have a

seat at the table? From a surface -- managing the surface waters that the state of Louisiana owns, can you tell us anything that you've got going on in that area?

MR. KNOTTS: That's not in my area. And I don't know anybody else in the Department of Transportation, with perhaps the exception of the navigable waterways, which is a small group. Navigable waterways and ports is in the intermodal section.

But with respect to use of surface water other than reservoirs and dams, I'm not familiar with it.

And you said, if I have a seat at the table, I would think it's this seat right here is the one seat I have.

CHAIRMAN ANGELLE: So to your knowledge, other than the cooperative endeavor agreements that DNR and DEQ and Wildlife and Fisheries are working on for folks who request a withdrawal of surface water from the state of Louisiana, to your knowledge, that is the only so-called surface water management?

I'm trying to post that up against what Matt was talking about earlier from a groundwater standpoint, because we're going to have some additional conversations. So part of what I'm doing is kind of

setting up that conversation.

Under the groundwater withdrawals, there's obviously notification requirements. We heard about that. And in some cases the Commissioner has the authority to say yes or no, depending on if it's an area of groundwater concern, depending on what's going on, the ability to impose a withdrawal restriction as was talked about in 2011 in Caddo Parish.

So as you look at that and you post that up against the whole surface water regime, you're not aware of anything at DOTD that has any authority on managing the surface water. It's really just kind of collecting data and reporting it and making it available as far as managing would go?

MR. KNOTTS: Well, the surface water use, we are one of the commenting agencies. So I get all of those and we comment back.

The only other surface water is, on the 20 that we operate, if those lake levels want to be modified, we have to approve it. And a lot of times those come from Wildlife and Fisheries for Aquatic Vegetation Control or the Lake Commission for repair of the structure.

MR. McKINNEY: Question.

CHAIRMAN ANGELLE: Mr. Ted?

MR. McKINNEY: Regarding the Lake D'Arbonne Union Maintenance Initiative to extract potable water from that lake, are you saying that your department is involved in that ultimate decision in some way, form or fashion?

MR. KNOTTS: On the Lake D'Arbonne lake, we were party and participated in the operational scheme for the structure to manage the lake level for flood control.

MR. McKINNEY: You're talking about managing control of the lake; right?

I'm talking about extracting water for potable use.

MR. KNOTTS: No, sir, we're not involved in that.

MR. McKINNEY: You're not involved in that?

MR. KNOTTS: No, sir.

CHAIRMAN ANGELLE: Ms. Gautreau?

MS. GAUTREAU: So not necessarily in your department, Chris, but I do know that there are some implications for stopping water surface flow with regard to 401 water quality certification if we're going to impact downstream supplies, as wells as on certain streams the are like scenic streams in the state. Those are some other considerations that would

go I guess into the management of structures or inputting --

CHAIRMAN ANGELLE: That would be more -- just adding to the conversation -- that would be more of the environmental, that would be more of the environmental concerns, as opposed to the authority to withdraw.

MS. GAUTREAU: Well, I think your authority to withdraw would be dependent on potential impacts, very different, very different.

CHAIRMAN ANGELLE: Sure.

MS. ZAUNBRECHER: When you were referring to major diversions, is that what your thought was?

CHAIRMAN ANGELLE: Well, you know, one of the things that I think we've all kind of thought through -- and the LSU Law Institute produced a relatively robust report on potential solutions. And one of the things that many of us always thought is that, if we had a particular groundwater shortage in an area, but we had an excess of surface water in another area, how could we use our surface water excess to take care of our groundwater deficiencies and the authorities by which to begin to use the resource.

MS. ZAUNBRECHER: How do you get that done?

CHAIRMAN ANGELLE: Who is in charge? Who you has that authority? How do you go about doing it?

I think we've managed in a very excellent way with regards to the demand that we had in northwest Louisiana with regards to the need for withdrawal of water for fracking wells. We instituted a process that worked very, very well. We were able to -- with the Commissioner's help and leadership, as I recall, we were able to visit with companies and issue guidance documents -- not requirements, because the Commission didn't have that authority -- but guidance documents guiding them to a surface water withdrawal instead of a groundwater use for that particular purpose.

And as I recall some of the numbers going back were as high as 80 to 85 percent withdrawal of surface water in that area, and that seemed to be a smart policy. It's a smart policy only to the extent that we had the authority to do it and would not have any negative impact on too many surface water withdrawals in one particular area that would have an environmental and ecological impact.

So all those things, all those balls in the air have to be managed. In our thought process, it makes sense to continue to combine the management of that in one agency, getting comments from others, because obviously the left and the right hand have to

know what's going on.

COMMISSIONER WELSH: Mr. Chairman, the Commissioner of Conservation does have general authority to regulate the sustainability of the eleven main groundwater aquifers in the state. So in the Act there's different things that the Commissioner can do establishing areas of groundwater concerns, things like that, and so -- but that's limited to groundwater, but we used that in several cases.

MR. BALKUM: Chairman Angelle, just to clarify: The Department of Wildlife and Fisheries uses this program to regulate water withdrawals from associated water bodies, some 60 or 70 streams statewide.

And quick question for Chris.

I think you mentioned during your presentation that applicants entering into the DOTD permitting process, the registration process, after receiving an Army Corps of Engineers permit; is that correct?

MR. KNOTTS: Right. Before you can build a dam, you have to get a Corps permit and then our permit. On the Corps permit, all of the resource agencies comment.

CHAIRMAN ANGELLE: So, Collin, on the scenic

rivers, when you say the Department of Wildlife and Fishery regulates the withdrawal, again that's a volume withdrawal?

MR. BALKUM: Correct, we receive applications when that water is to be withdrawn, and we're looking at what are the impacts: Biological, scenic impacts, and recreation.

CHAIRMAN ANGELLE: Right, but not so much on the legal authority?

I guess what I'm looking at is, so what the State has done with their cooperative endeavor agreements is, in a sense, set up a process where commenting agencies in non-scenic river sites are bringing their comments to the table, and then the Department of Natural Resources is saying either yes or no, kind of modeling, if you would, that process that you have.

In your instance, you've kind of gone through that same process where you're looking at what are the impacts and whatnot. I'm assuming that you are then, in that process, assuming that the person who is making that application for that withdrawal has some legal authority to do so, and you don't comment on that legal authority as much as you comment on the environmental side.

MR. BALKUM: Correct.

SENATOR LONG: Mr. Chairman, if I might just a make a general comment?

We're all here trying, of course, to work through some of these very difficult issues that are going to have a profound influence on our state in any direction you want to go, environmentally, economically. We have been in several meetings this summer throughout the South dealing with water-related issues.

I simply say that to acknowledge, as we have worked through some legislative processes, that in my role as the Chairman of Senate Natural Resources, we have discovered that in Louisiana there are 21 agencies or subagencies that have some type of regulatory supervision over water. That creates of course a tremendous amount of reasons to bring together as much as we can commissions like the Water Commission, which of course was the legislative act that I created and the legislature supported.

Fast forwarding that: We're still one of only nine states that does not have a comprehensive water management plan. So that we don't lose focus on what we're doing and of course we work through all these issues, ultimately in Louisiana we're going to

have to address this issue of having a comprehensive water management program.

I have talked extensively with Chairman Angelle about this. He has given great leadership. But we welcome input from the audience. And at the appropriate time today, we would hope that some of you would engage this Commission about your concerns.

But I can tell you this: With the new federal Clean Water Act, it is going to add even greater significance to what we do in Louisiana.

I mention this in closing, Mr. Chairman, on these comments: Louisiana is one of only six states that has been designated as a water surplus state, meaning that when you look at the collection of water that Louisiana has, it puts us in an abundantly unique position to direct the economic development of our state in order to be environmentally sound.

We're all environmentalists. People ask me all the time about the environmental issues. We're all environmentalists: We want clean water, clean air.

But I think we have a unique opportunity in this state that we will never have again to get this issue of water management correct, not only for the next few years, but for years to come. It can be the economic engine that drives Louisiana in a way that no

other state will have that kind of opportunity.

Thank you for allowing me to share that.

CHAIRMAN ANGELLE: Thank you, Senator. Appreciate your leadership on that area.

And certainly being one of only six states with a water surplus creates both an opportunity and a challenge because, as we try to bring a management regime that is based on sustainability so that we can be one of those six states in that same category a hundred years from now, part of the problem and the concern -- and that's why it takes the grinding through of these issues -- is to bring the public along. Because it's hard, often cases it's hard to be able, from a top-down strategy, convince folks that we need to do this in a surplus time.

So obviously I think we found that not all surpluses last forever, even the ones in the big tall building across the street. Right?

SENATOR LONG: That's right.

CHAIRMAN ANGELLE: Okay. So, Chris, do you have anything else that you want to add?

MR. KNOTTS: No, sir.

CHAIRMAN ANGELLE: Any members have any questions for Chris in the surface water area?

MR. PRATT: Mr. Chairman?

CHAIRMAN ANGELLE: Yes, sir.

Mr. Pratt?

MR. PRATT: Yes, sir.

I was just interested, Chris, in what is the status of the reservoir priority and inventory program that was a phased project, and where are we at on the next phase?

MR. KNOTTS: We completed phase one. We are going to be seeking funds to finish that.

And what that program would do when completed would allow the state to look at siting of future reservoirs and the different -- and prioritize the proposed siting of which -- one of those priorities would obviously in my mind be a recharge of groundwater aquifer in addition to all of the more traditional uses for reservoirs.

MR. PRATT: Mr. Chair, I certainly think that that should be a priority in our next session is to try to see that next phase completed. I think it's all a component to our Senator's concern on our comprehensive plan and tying all that together.

Thank you.

CHAIRMAN ANGELLE: Thank you.

One of the things I also thought is that -- and I know it was one of the things that we

began to address -- but to the degree that we can have a fiscal policy that tends to reward a water management policy, I think you would get many more folks who would be willing to spend some of their own money on some innovative solutions to the degree that we as a state are participating; because again, there's no requirement for them to fix their own problem because they have an absolute right to, you know, withdraw in some areas to a degree. And I'm beginning to have some conversations whether or not we can use our fiscal policy to reward folks, incentivize folks. I think that's smart policy and kind of allows us to solve some problems that otherwise won't be solved.

Any other questions for Chris?

Thank you very much. And again I understand that you have to be somewhere else. Thank you for being here.

MR. KNOTTS: Thank you, sir.

CHAIRMAN ANGELLE: Okay. Go to Item 7, which is a report from the Louisiana State Law Institute regarding Senate Concurrent Resolution 53 of the 2012 legislative session.

Is Ms. Dian Tooley here?

MS. TOOLEY-KNOBLETT: Where do you want me to go?

CHAIRMAN ANGELLE: Right up on the front row. Thank you so much for being here.

MS. TOOLEY-KNOBLETT: My pleasure.

CHAIRMAN ANGELLE: I'm sure of all the things you had to do today, coming to the Water Resource Commission was one of the best things you could possibly do.

We'll recess for five minutes.

Oh, you're ready?

MS. TOOLEY-KNOBLETT: I'm ready.

Good morning. Is the sound okay?

My name is Dian Tooley and I have my contact information on the board. Please, please feel free to write down the mailing address, the email, and the cellphone. I accept texts. Students text me all the time.

And I say that because, as I'm going to explain, the Louisiana State Law Institute is launching the second phase of a water project, and it's the more exciting of the two phases, and I am very interested in getting feedback and I'm interested in maintaining a dialog with all of you because you have the expertise that I don't.

So I figured I would take minute or so, tell you exactly who am I.

I teach at Loyola. I taught for 30 years --

You can go back to the other one. I'm sorry.

I taught for 30 years. I was originally hired to teach oil and gas law because I had practiced oil and gas law for a couple of years, community property, regulated industries, contracts; and I was asked to move into the basic property areas. So I taught property for almost 30 years and I have taken over Professor Yiannopoulos's case work.

I got involved in Louisiana State Law Institute in 1987 four years after I -- three years after I started teaching. My mentor from LSU, Professor Saul Litvinoff, was reviewing law sales, and I found that I had both the passion and some facility in assisting in the water forum.

Since that time I have served on at least 25 law institute committees, various projects, and so I was asked back in 2012 -- you can go to the next slide now -- when the Law Institute was asked by the legislature to study the legal issues that surround both groundwater and surface water law and to recommend or -- to recommend whether there were any needs for revision and of course we could have at that point made

specific recommendations.

So when I took this task on -- I certainly took environmental law in school, and I had some, some dealings in practice, but I am not an environmental lawyer. I am more of a property lawyer and all-around civilian in terms of having a passion for the way in which we legislate.

So I took this on and I figured that probably, probably the two skills that I brought to the table, or maybe three skills: First was that, even though I worked for an oil and gas company, I don't have any philosophical bent towards any particular side. I am totally neutral. I want the best laws for my state.

And having been -- the second thing that I bring is I have been involved in a number of projects, so I have a lot of experience in researching and in drafting legislation.

So we assembled a wonderful committee. We had both practitioners in the oil and gas area, in the environmental area; we had administrators, and we had individuals with the specific expertise in this particular area. We also had some engineers and interested individuals who we welcomed to attend our meetings. And as the project went on, I reached out to

one or two individuals in the attorney general's office keeping them apprised of the development of our report.

So what were we asked to do? We had a very broad mandate to study the laws of Louisiana that address rights to surface water and rights to groundwater.

You can go to the next slide now.

But we also were apprised in the concurrent resolution that the legislature was aware that the legal regimes for both of these critical water resources have yielded various and often conflicting legal rules and therefore there was likely a problem. Now --

You can go to the next slide.

We know that the legislature did not on its own come to that conclusion; that, in fact, this body in 2012 published a masterful report on both surface and groundwater, and that the legislature's enactment of Senate Concurrent Resolution 53 was its reaction to the urgency and the compelling data that was brought to the legislature's attention from your report. And so --

You can go to the next slide. We're going run out pretty soon.

So we were given a very broad mandate in

the "therefore" clause to study all the legal issues that concerned both groundwater and surface water; but we also felt that we were charged with the task of exploring what seemed to be perhaps an imminent issue, and that was -- and this was just discussed before I got up here -- and that was whether somehow the withdrawals of surface water could be averted by shifting the focus on -- excuse me -- whether the withdrawals of groundwater could be diverted from having a shift to surface water. And under the present scheme with the cooperative endeavor agreements, fair market value is required, and so we were asked to explore whether it would be permissible to permit the non-compensated consumption of surface waters.

So in our report -- we were asked to come back in 2013, but it was too big a task. There was there were so many tentacles, that every time we would get into an issue, we would find more.

So we did an extensive overview of Louisiana's laws that govern surface water and groundwater. And for the surface water, the laws are bifurcated because we have, in our civil code, a general principle that's been there for a long time recognizing the state's power and rights over any running water or the waters of any navigable water

body. But we also have somewhere hidden back in a part of the code dealing with what we call "servitudes," which are rights less than ownership on land that you don't own, provisions that have been carried down unchanged since the 1825 code.

We then looked at the development of Louisiana's law that governs groundwater.

So you can go to the next slide. We're running out real quick because I did not get a chance to do much before I got here.

So we found that there's very little uncertainty governing the rights that the state has to what Senate Concurrent Resolution 53 described as "running surface water." This would be your running water, whether or not the body of water is navigable; your navigable water, your waters in your navigable rivers. And of course anything that the state owns would be within this as well, and so the state owns this.

Jurisprudence cases have shown the right of the state to take a public thing and to alienate it. And so there's very little question that the state would have the right to alienate waters that were running waters because, even though these are characterized as public, that the legislature has the

power to change discrete amounts by alienating them.

CHAIRMAN ANGELLE: Going back to the oil and gas background, so it's my appreciation that the state does not have the right to alienate maybe its water bottoms or perhaps its minerals or ...

MS. TOOLEY-KNOBLETT: Well, that's correct. And you see the reason for that is that the beds of navigable rivers were elevated to constitutional protection, as were the minerals.

CHAIRMAN ANGELLE: So the state -- excuse me. So the State through its capacity as a state would have the ability to alienate its water rights?

MS. TOOLEY-KNOBLETT: That's correct. That's correct.

As a general proposition, putting aside constraints that may be placed by the natural resources laws of the constitution, there's a vast difference between the running waters and the beds in rivers or the bodies of water that is navigable. Because obviously by having constitutional protection, mandating the inalienability of the beds of those navigable bodies of water, that takes away the power of the legislature.

CHAIRMAN ANGELLE: Got it.

MS. TOOLEY-KNOBLETT: But for just ordinary

running water, there's no overarching constitutional prohibition, so we found that this area was quite clear.

You can go to the next one.

We then moved to riparian rights, which is where I'm very sorry to say the PowerPoint ends.

Riparian rights are rights that landowners whose property abuts running water have to use that water. Now the running water may or may not be part of a navigable body of water. There are some water bodies that are not considered navigable but the water is considered to rise, not stagnant. It is in a state of movement.

Now since 1825, our law has permitted the adjacent owner, which we call the riparian owner, to use the water that is flowing through for both agricultural purposes and other purposes.

Now before 1825, it was limited to agricultural, but that clause "or other purposes" was added. And so the committee firmly believed that there are many ambiguities and unanswered questions regarding the scope of riparian rights:

What other purposes?

How much water?

Can the riparian permit someone else to

take the water?

Can he sell the water?

And so the scheme that we have for riparian rights we were very troubled by. And I know the legislature was too, because in 2010, in conjunction with the adoption of the legislation allowing the cooperative endeavor agreements, there was an amendment -- excuse me -- there was the enactment of a revised statute that would permit the exemption of the riparian rights and the transfer of those rights for agricultural and aquacultural purposes to be exempt from the cooperative endeavor agreement. So obviously we and the legislature have already recognized that there are a lot of problems.

And I'll talk in a minute about why those problems have persisted. But sometimes when you have a provision that is written in such broad, ambiguous language, the courts come in. And sometimes if you have no provision at all, the courts come in. In fact, until we had a mineral code, the development of Louisiana's oil and gas law was done strictly by the courts, and they did it in what as a civilian I would call the finest civilian style in terms of taking provisions and extrapolating them to situations that were not envisioned when the provisions were written.

And so we took a concept of a servitude, which is a property right less than ownership, and extrapolated that to minerals. We took the mineral lease and took the provisions that were written for the lease of houses and the lease of agricultural lands and we extrapolated that. But unfortunately, when it came to the courts' involvement in giving content and contour to the provisions on riparian rights, even judges that I generally admire did very little here. And I will say also, there is very little legislation -- excuse me -- very little jurisprudence.

But we were very troubled that, on the few opportunities the courts had to try and resolve some of these ambiguities, they did not even cite the codal provisions. They cited common law sources and they adopted a hands-off, laissez-faire approach. And I was going to give you one example here.

One case that went to the Louisiana Supreme Court involved, you had two landowners that were both riparian. The landowner whose land was upstream had a creosoting plant and the downstream landowner was a farmer. So the downstream neighbor brought a suit against the creosoting plant, asking the court to require them to stop permitting the runoff of the creosoting fluid into the river because it was

contaminating the water.

So the downstream river riparian owner said: Number one, he has damaged me because it's contaminated my crops and I would like monetary damages; and number two, I would like you to prevent him from doing this again.

And the trial court -- he asked for 2200, the trial court gave him 200. And he asked for an injunction, and the Court said no.

The Supreme Court said, We think $200 is quite liberal, and the court was totally unsympathetic and unwilling to grant an injunction.

So no content was added to these articles, no clarification because the articles were technically not even cited. So the judiciary has done nothing to create greater clarity. So that's the riparian rights.

Now when we get to groundwater -- oh, there's one other case I'll mention really quickly.

There was a Second Circuit case involving two riparian owners, and one of them brought suit against the other because the defendant in that suit was permitting his neighbor to pump water from the water body, and he was using it for his own irrigation purposes and he was not a riparian owner. But he was

also using it to -- apparently I guess the price of him getting that right was he was washing the riparian owner's dairy barn with the water.

So the neighbor who saw the water being used for non-riparian land and for washing a barn asked the court again to enjoin this, stop them from doing this.

And the court said: Can't do that, can't do that. Very little explanation, and again, no development of what the contours of riparian rights are.

CHAIRMAN ANGELLE: So in that case the riparian owner had transferred his right to withdraw to a second landowner, another landowner?

MS. TOOLEY-KNOBLETT: Correct. He permitted, whether through a formal contract or through some sort of reciprocity where he got cleaning services for his barn, and the court did not address expressly the propriety of that. The court gave a blanket -- because it was a suit for an injunction rather than damages.

The other riparian owner, seeing this happening, wanted the court to stop him from doing it in the future, and the court said no. So indirectly they permitted it, but not on the merits of the issue of whether that's permissible.

CHAIRMAN ANGELLE: So the legislature's statute/bill that specifically created -- I think you addressed it earlier -- the right for a riparian owner to transfer that right to another owner only for agricultural purposes -- is that right?

MS. TOOLEY-KNOBLETT: Agricultural and aquacultural purposes, that's correct.

CHAIRMAN ANGELLE: So that particular legislation would almost be in the same area --

MS. TOOLEY-KNOBLETT: I certainly have thought about that.

In 2010 the legislature adopted what was designated as Revised Statute Title 9, Section 1104, permitting the riparian owner to transfer rights, quote, equal to his own, but only for purposes of agricultural and aquacultural exploits in Louisiana.

Now there are some issues that the report addresses, which I won't get into, as to the further uncertainties as to: Well, if the rights are equal his own, what rights does he have left? Are the rights doubling?

But those are part of the myriad of issues that still exist relative to riparian rights.

All right. So then we got to groundwater -- and unfortunately I don't have a slide

on groundwater -- the only provisions we've had for groundwater since 1825 is a general statement that both civil law and the common law have. The common law says basically, If you own land, you own up to the sky and down to the center of the earth.

Louisiana is not quite that dramatic, but it does, in its civil code, presently Article 90, recognize that a landowner may not own what's beneath his land, but he has the exclusive right to go beneath his land to explore what's down there. And of course that provision was for, part of the basis on which our oil and gas law was developed.

But as far as how that provision applied to groundwater, until the mineral code took effect on January 1, 1973, the only provision at that point in the code was the one that would grant the exclusive right of the landowner to drill beneath his ground.

Now I mention as an aside that there was a very interesting provision in the 1808 Digest that was deleted in 1825. And that provision said, if there were an underground spring that came up on your land and that water flowed downstream or it flowed in such a way and the municipality used it, they had to pay you for it. And they took that out and said, That's a bad rule. So that at least got taken out creating a much

more general principle without a lot -- with no contours at all.

So fast forward to the early 60s, and we have -- well, we had a couple of cases. I guess I should mention the first one.

We had a Supreme Court case in the early part of the 20th century. Now this case is quite distinguishable from the other one because the case involved two wells that were drilled from the same reservoir. And for whatever reason, one of them was an unproductive well, but it affected the water pressure, and thereby, because it was not plugged and abandoned, it reduced the recoverable amounts that the other well owner could get.

And so the well owner whose own production was being diminished by an unproductive well that served no purpose, and by remaining unplugged interfered with the water pressure, causing the oil to move, asked the Court to make him plug and abandon it.

And frankly the Court's response was that the landowner who had not plugged and abandoned the well, he got no benefit at all, there was no reason at all for him to not plug and abandon it other than to damage his neighbor, and that concept is a civilian principle called an abuse of a right.

When a right is not absolute and if its exercise is solely to injure someone else, then it's not a legitimate right.

Now, I mention that case only because the court, before announcing the abuse of rights doctrine as the basis for requiring the plugging and abandoning of the well, did a survey of national cases, cases in other jurisdictions, and declared that it was crystal clear that we followed the rule of the other states; that you have the exclusive right to drill on your land, to get whatever was there. And some of the quotations from the other cases expressly mentioned subterranean water.

So even though that wasn't the basis of the holding, it wasn't the issue of the case, you had at this point in the early 20th century at least a Supreme Court opinion that was quoting decisions of other jurisdictions saying that subterranean water fits in with the scheme of oil and gas.

But the actual only case that came up in which you had a conflict between two landowners, both of whom had land beneath which was a common reservoir, was a 1963 case. And I'm going to give my editorial on this: I think that case is a bad case.

What happened here was you had basically

a neighborhood and all of the lots were above the Wilcox formation, and so all the neighbors were participating with a well that allowed them to get the fresh water from the Wilcox formation which is what they used.

The oil company comes in and it needs water for either secondary -- it just needs water to inject in the well. And so it gets permission from, not someone in this neighborhood, but another landowner who also is above the Wilcox formation, and it's drilling and removing the fresh water to place in the well. And the families who were using the water to live on brought suit complaining that, beneath the Wilcox formation was a deeper, at a lower depth saltwater, which was perfectly acceptable for the use that was going to be made. And so they asked the court to require the oil and gas company to drill a little deeper and use saltwater rather than fresh water.

And the Second Circuit Court of Appeals said: Oh, we can't do that. We have no authority to do that. We have no authority at all.

Yet the court did say: Maybe the legislature should look at this. Maybe the legislature should come up with a scheme. But the courts are without authority to establish any regulation by

judicial pronouncement. So they wouldn't touch it.

All right. So, in 1973 --

CHAIRMAN ANGELLE: Can --

MS. TOOLEY-KNOBLETT: Stop me at any time. I just keep talking.

CHAIRMAN ANGELLE: No, it's great. You've done a great job. It's been a great presentation.

Can you give us your comments why you personally think that that was a bad case or bad decision where the courts said they didn't have any authority to prevent that from happening?

MS. TOOLEY-KNOBLETT: I think that the earlier case on abuse of rights, even though premised on the notion that you have an abuse of right when there's no personal gain from your actions and just the harm to the other could have been expanded by analogy. And because I personally am not a judge, but I think that the judge has to decide that case.

And even in the absence of express legislative directive, the answer shouldn't be: Our hands are tied. I think their hands could have done anything they wanted.

That's just my opinion. I don't represent anyone but myself when I say that. I thought that the court punted on an issue that, had they

addressed, could have had a significant impact.

All right. We now get to one of the more enigmatic levels of the groundwater, and that is it wound up in our mineral code.

Now what is perplexing to me is that the reporter of the mineral code -- and the project went on for six years. And for the first five years, in published articles and published presentations, the reporter of the mineral code stated -- and I'm going to quote here: "Ground and surface water have been excluded from the ambit of our recommendations because the considerations governing water use and water rights are very different from those governing mineral law."

So for five years there was no intention of subjecting groundwater to be within the scope of the mineral code.

And four months before the project went to the legislature in a quite unexpected turn, there was an amendment to the article in the mineral code, which is Article 4, saying what is within the scope, and they added two words, "subterranean water."

Now, unfortunately -- I mean, I was able to access all the minutes; but unfortunately the more lengthy documents that would have given the deliberations of the committee and perhaps provide an

explanation for the very dramatic policy change, those documents were lost in a flood that took place in the Law Institute office some time back.

But I was happy that I at least found, I found the transcript of the meeting, even though it's not that illuminating, other than it shows that it was four months before.

So groundwater got ingrafted onto the mineral codes despite the reservations that had been expressed for five years.

So you look at the decision that wouldn't require the oil and gas company to drill deeper, and then you look at the mineral code, and there's really nothing in it that gives much more content, other than there's a provision that's never been tested in the courts saying that, those with rights in the common pool have correlative rights.

Again, that hasn't been explored.

So when we stood back and we looked at: Okay, surface water -- the ownership of the surface water and the right of the state to alienate it: Crystal clear. The riparian rights and the extent to which they can remove the water, what they can do with it, whether they can transfer those rights: Very, very unclear. And the courts had at least one or two

chances to clarify and did nothing.

Groundwater ingrafted onto the mineral code without any consideration of the tremendous differences between it and minerals, other than that they are in a sense fugacious.

So basically, when we came to our conclusions about the disparate regimes that this body noted in the 2012 report, we were in total agreement that these disparate regimes were a major impediment to the kind of legislative landscape that we're going to need in the future.

Now I won't get into all of the constitutional parts of the report that led the committee and the Law Institute to conclude that there were severe constitutional issues relative to giving away the surface water, the most significant of which is Article 7, Section 14's prohibition of the donation of state property. So I won't get into any of that. I'll get into sort of the real meat of this, and that's the recommendations.

So we, as a committee, found that the state of Louisiana legislation, given sort of the broad strokes on the rights to surface water versus groundwater, were in fact disparate, we recognized that the problem with the riparian rights is that simply,

other than the change in 1825, they have been carried over. But we also found that in the 1978, or the revision of that part of the code in the last several decades, that the reporter for that revision, Professor Yiannopoulos, that he had in fact noted in the introduction to the project that the committee simply replicated the older provisions of riparian rights because they did not believe it was within the scope of their mandate to revise them.

And here is what they said, that these policy decisions -- he talks about all the issues that still exist for riparian rights -- deserve exploration and discussion; but this revision has to be limited, and a change of policy would require implementation by detailed water legislation. And if that project is undertaken, then of course the principles we continue should be reconsidered.

So Professor Yiannopoulos did not retain the ambiguous and unhelpful riparian rights because he liked them, but because he envisioned that someone else would come along and there would be a comprehensive study of water.

And interestingly, the reporter for the mineral code, who four months before the report went to the legislature was saying that groundwater didn't

belong in the mineral code, I mean, he had advocated for years that water law is not really -- excuse me, groundwater is not really the same. It should not be governed by the same rules. It needs its own rules. We need to study this more.

So we basically came to the conclusion that there is no time better than the present, that the legislature had asked for a recommendation, and so we made the recommendation that the legislature give the green light to the Law Institute proceeding with the second phase, which would ultimately lead to the development of an integrated water code. And so that's where we stand now.

We have requested, and the resolution echos our request, that the committee be an interdisciplinary committee. We want people like you guys on that committee because you have the expertise in what Louisiana is doing now. You know where the rules don't work.

We want the scientists who understand hydrology. And I'm not saying that that's mutually exclusive to the people of this room. But we want the first part of this project to be another study, but a broader based study, because we're now focusing on, not what is, but what should be, and so understanding from

people other than the lawyers who read the statutes. So to get the information from those of you who we hope will come forward to help us, we can get a better understanding of where the problems are.

Now that would then lead eventually to the actual drafting which, as I see it, would not begin until the study phase is completed.

The last thing I want to say -- it's in the report -- but I think that it says volumes about where we are. I mean, Louisiana is not the only state that is having all these issues with the groundwater. There have been a number of cases, most notable being the Edwards case in Texas, where Texas attempted through regulation to change the nature of groundwater rights, and the Texas Supreme Court overruled it saying it is an unconstitutional taking of property, which I think will be one of the bigger legal issues we have to face. Although I'm not that worried that we would get a result like Texas, I think -- and the Texas opinion in Edwards has been highly criticized. But we haven't started that part of it.

The last thing I wanted to say is that of course we know that litigation over water rights is on the rise: States are suing other states. And the legislation that I am deeply interested in right now is

the lawsuit that was filed in the last two years by the State of Texas against the State of New Mexico relative to the Compact of the Rio Grande River. And Colorado has sought permission to join as a defendant in the suit; the United States has been given permission to join Texas as a plaintiff in the suit.

The basis of Texas's complaint is that, even though New Mexico has -- under their compact, their contract that the Congress has approved, New Mexico has not taken a drop more from the Rio Grande than the amount that was apportioned to it by the compact; however, there is on the New Mexico side of the Rio Grande an underground water reservoir. And when water is withdrawn from that, it has the effect of sucking in, so to speak, waters of the Rio Grande. And so El Paso is having drought problems.

And the basis of Texas's suit is that: Either their withdrawal of the groundwater is a violation of the compact because it's having an adverse effect on the amount of water that would have otherwise been in the Rio Grande for us, our share; or the compact should be interpreted to include any underground water reservoir that communicates with the Rio Grande.

And I am not a prophet, but I certainly

hope that the United States Supreme Court will give recognition to the interconnectiveness of the groundwater and the Rio Grande. And if I'm an apologist in any way for my predecessors who wrote the code and who wrote the civil code and the mineral code, it's that we had no clue about hydrology, and our water law reflects a sort of a lobotomized thinking that: there's groundwater and surface water and never the two shall meet. And now that we have been disabused of that old wives' tale, our laws need to reflect the truth.

Thank you.

CHAIRMAN ANGELLE: Okay. Any questions?

So again, just kind of repeating some of the actions that have happened --

MS. TOOLEY-KNOBLETT: Sure. Uh-huh.

CHAIRMAN ANGELLE: -- so the Groundwater Commission, recognizing that connection from which you just spoke about, the need said that we needed to engage those legal scholars to help with that. The legislature adopted SCR -- was it 53 of 2012?

MS. TOOLEY-KNOBLETT: Right.

CHAIRMAN ANGELLE: -- and requested Louisiana Law Institute to look at that. You have provided that report.

I'm assuming that a copy of that has gone to the President of the Senate and the Speaker of the House?

THE WITNESS: Yes, yes. It went on April 2.

CHAIRMAN ANGELLE: April 2. All right.

So the legislature received that report. All the members here I'm assuming have received a copy of that in electronic version. The legislature responded to that and said: Great, but that's not enough. Now we want you to convene to begin the process of adopting, drafting some comprehensive water code.

MS. TOOLEY-KNOBLETT: That's correct.

CHAIRMAN ANGELLE: And so I'm assuming, as you put folks together around the table, that that does not have, as SCR 53 had -- SCR 53 seemed to have a deadline of when the legislature wanted you to report.

MS. TOOLEY-KNOBLETT: Correct. This one just wants reports.

CHAIRMAN ANGELLE: Updates, progress reports?

MS. TOOLEY-KNOBLETT: Progress reports, which I did for this one in 2013. So again, this one --

I cannot envision how long it's going to take, but it's too important to be rushed.

CHAIRMAN ANGELLE: I totally agree. I'm glad

to hear you say that.

The concern sometimes I have when these resolutions are passed, some of them have been introduced -- as many of us up here working with the legislative delegation -- and then you end up getting a deadline. And it is clear to me that -- and we'll talk about perhaps a water budget in one of the later items -- is to put a timeline on when we would deliver or when you would deliver those recommendations I believe would set everyone up for failure and it would be a disaster. So I'm very, very pleased to hear that.

MS. TOOLEY-KNOBLETT: Right.

And I just want to say again that you guys didn't get a whole lot of time to come out with that March 2012 report, and that was a hell of a good report.

CHAIRMAN ANGELLE: Thank you. Thank you.

Okay. So how do you move forward with your process inasmuch as now the resolution has been passed? How has the Law Institute worked to process this request?

MS. TOOLEY-KNOBLETT: Well, we had a study committee for the first phase, and the report lists the members of the committee.

I do not envision that everyone who was

asked to serve on the first committee will be asked to remain because we are opening the committee up for inclusion of -- we don't need a bunch of lawyers. This is a job for everyone who has something to bring to the conversation.

So I have been contacted by a number of people saying, "Oh, please, remember me." And I just say, "It's not in my hands. Good luck."

But there will be in the next month or two some consideration. And as I said, I would love contact with you guys because we need your help too.

But I want to be inclusive so that we have lots of different voices. We don't need a room full of people like me. And yet I don't want the actual working committee to be so large that we have to go to a hotel room to find a conference room large enough. I think at some point it gets unwieldy.

So I'm envisioning to have a group that can fit in one room, even if it's a large room. But I'm interested at various junctures in the process of reaching out and keeping "the stakeholders" -- to borrow that word that I don't necessarily like -- "the stakeholders" apprised of it, because this is something we want a hundred percent buy-in on. And so I really do plan to either come around and talk about it or

solicit feedback, as I did for the other report.

As I said, some people in the attorney general's office, I sent things to them before I presented it and said: Do you have a problem with this? Do you see this differently?

That was a very long and very sort of unfocused answer. I apologize.

CHAIRMAN ANGELLE: Well, I suspect that one of the reasons that this has not happened yet in our state's history is, number one, because of the surplus, excess of the property.

MS. TOOLEY-KNOBLETT: Absolutely. Absolutely.

CHAIRMAN ANGELLE: And secondly, because of the intellectual challenge that it is to go through this process.

And you absolutely are right: It affects everyone; where I suspect that in '73 when the mineral code -- you said '73, correct?

MS. TOOLEY-KNOBLETT: '73 is when it took effect. Yes, that's correct.

CHAIRMAN ANGELLE: I suspect prior to that there were folks who were gathered in a similar fashion grinding through a process to produce something which took, I'm assuming, you know, a number of years.

MS. TOOLEY-KNOBLETT: It took them six years. And again, they had a fairly developed body of jurisprudence, which we don't.

CHAIRMAN ANGELLE: Right. Exactly.

So their starting point was perhaps a little bit more advanced and it took six years.

And while it's certainly very, very important to everyone in this state, that particular code is, I think we would all agree that there are a lot of folks who, in their daily routines of their lives, would perhaps not really pay attention to a bunch of smart folks who are meeting in some room developing a mineral code because it really perhaps didn't affect them in where they were in their lives and their time. But we all would agree that this one affects everyone, all four and a half, all 4.8 million, whatever the number is today, of Louisianans: The business interests, landowners, municipalities, local governments, farmers, users, electric power generators, on and on and on.

MS. TOOLEY-KNOBLETT: Absolutely.

CHAIRMAN ANGELLE: So it's an immense, challenge.

Again, I thank you for agreeing to serve in the capacity that you did and to be here with us

today. And we'll certainly let members go ahead.

And Ms. Zaunbrecher?

MS. ZAUNBRECHER: It was as an afterthought that subterranean water was added? Is that what you said?

MS. TOOLEY-KNOBLETT: It's not an afterthought. It was number one a Copernican change from total exclusion to total inclusion.

It occurred when the counsel of the Law Institute was doing what appeared to be its last look-through. And why it was injected, I have no clue. I have some theories, but I'll keep them to myself.

Or I'll tell you when the mic is not on.

MS. ZAUNBRECHER: Thank you.

CHAIRMAN ANGELLE: Ms. Gonzalez?

MR. GONZALEZ: Yes.

Do you anticipate the committee looking at laws in other states that already have --

MS. TOOLEY-KNOBLETT: Absolutely. Absolutely.

MS. GONZALEZ: I mean, I know Louisiana has unique laws, but obviously ...

MS. TOOLEY-KNOBLETT: Well, the truth is that, in this area, our laws are not very different. And part of that is that some of the development of

British water law was very much influenced by France and by Roman sources. And I have some student workers getting started on that. Mark Davis has some people working on that.

We want to see, we want to understand clearly what other states have done for those who have done for those that have done --

MS. GONZALEZ: Ones that have been successful? Not having to remake the wheel?

MS. TOOLEY-KNOBLETT: Correct. That is exactly right.

And that is another reason why we don't want to rush into the drafting stage, because it may take trips places. You know, it certainly will take a lot of legwork.

MS. GONZALEZ: Okay. Thanks.

MR. McKINNEY: Question. Question.

MS. TOOLEY-KNOBLETT: Yes, sir.

MR. McKINNEY: Is Louisiana -- and I think I know the answer to the question, but I'm going to ask it.

Is Louisiana law so different that it's going to be such a challenge as opposed to say the state of Arkansas or Mississippi or any of our adjoining neighbors in dealing with water law?

MS. TOOLEY-KNOBLETT: Not at all. Not at all.

As I said, there are among the other states -- there's no unanimity of thought about whether groundwater is owned, not owned, what the nature of the rights are. There is no unanimity of thought on the nature of riparian rights. So different jurisdictions have taken different approaches.

The Western states have been more, they have been more aggressive in developing laws because of the scarcity from the beginning. The more water-rich states, like Louisiana, have had a more laissez-faire attitude because it's not really been an issue.

MR. McKINNEY: Well, as a native Arkansan, I am rather somewhat amazed at how aggressive they seem to be currently in dealing with their water issues, and the success and magnitude by which they are doing it, and the quickness by which they are addressing, revising, so on and so forth. And I just ask the question.

MS. TOOLEY-KNOBLETT: Are you talking specifically about Kansas?

MR. McKINNEY: No. Arkansas.

MS. TOOLEY-KNOBLETT: Oh, I'm sorry, Arkansas.

Yes, oh, I'm impressed with Arkansas too. They are definitely -- I get the emails all the time about the updates.

And we're going to look into all of that as well, because anything we can avoid -- any mistakes we can avoid and any tips we can get, we want to collaborate. And I think that there's no impediment from the vantage point of us being a civilian state.

CHAIRMAN ANGELLE: Questions?

Okay. Thank you very much for being here.

MS. TOOLEY-KNOBLETT: Thank you very much.

CHAIRMAN ANGELLE: We're very much appreciative of your work.

Okay. Item number 8, Report on Statewide Groundwater Monitoring Networks, Mr. John Lovelace of the USGS.

MR. LOVELACE: Thank you, Commissioners, and good morning.

I think the last time we talked about this was right at the outset of this program. We have been into it for a year and a half now -- well, actually two years. And I want to go over what we're doing, why we're doing it, and why this is important. It was touched upon several times during the previous

presentations and discussions.

It stems originally from one of the recommendations, the findings by Ecology Environment when they made the recommendations for a statewide groundwater management plan. They did find that one of the most significant issues in groundwater management in Louisiana was a lack of comprehensive knowledge about our groundwater levels, our water well production, and our groundwater quality data. Although we do have and have had networks in place for many decades, the data were insufficient, they felt, for proper management of this resource.

So there were a couple of fundamental problems that we're trying to address or issues or concerns, however you want to look at it; and the first one is that groundwater levels have declined in some parts of the state to levels where some folks think that -- well, to the point where wells could go dry, it becomes more expensive to pump, and these sort of things need to be monitored. Problems are caused by withdrawals, and so we need a robust monitoring network to look at water levels throughout the state.

In some areas, in some of the aquifers, there is saltwater, and the withdrawals and changes to the flow scheme in the aquifers has caused saltwater

encroachment. So those are two of the things that we have been looking at for a long time: Changes in water levels, and saltwater encroachment in our aquifers.

And the third thing is relatively new, and it's related to hydraulic fracturing as this activity has taken off in Louisiana, and it's guaranteed to pick up in other areas, areas other than those that it's in now. It could adversely affect both water supplies and water quality.

So part of our task was to specifically address the issue of potential impacts of hydraulic fracturing.

CHAIRMAN ANGELLE: And just to be clear, John, on that last item, which I assume is a new item for this commission: You have no evidence that that has happened? There has been no issue with regards to the groundwater from any hydraulic fracturing; correct?

MR. LOVELACE: No, sir, that's correct. We have not seen any issues in Louisiana. And pretty hard pressed to find it in other areas of the U.S. Although there is a lot of speculation and anecdotal evidence, when you really start looking for it, it's hard to find.

So I'm not sure how familiar everyone is with our groundwater resources in Louisiana, but we

have a lot of groundwater here. Almost every area of the state, all those colored areas, there are one or more aquifers. In some areas there are as many as ten aquifers, layer-caked on top of each other. So there's very few places in the state where we don't have groundwater.

And because it's so prolific throughout the state, it is heavily used for all purposes. And pretty much every city/town in Louisiana is using groundwater, except the very large cities where there is not enough water there, groundwater there to meet their needs. In a lot of cases, they are either supplementing surface water or wholly on surface water.

So this is just a quick list. You can't read all of it. But there's 45 aquifers that we're looking at for this program. These aquifers are regionally or locally extensive. Most of them cover at least a couple of parishes. Several of them cover up to a dozen parishes or more.

So when we got into this monitoring, we are looking individually at each of these aquifers, trying to decide: Do we have good coverage, water level coverage? Are we hitting the recharge areas? Do we know what's happening around the pumping centers and areas where there is no pumping? Can we tell a good

story from what we have in these aquifers?

And the overall objective, as I said, is to provide the type of comprehensive information on our groundwater resources that bodies like you and other water managers and planners are going to need to manage these resources.

So we have a five-element approach to this program. The first is looking at our water, enhancing our water, existing water level network; the second one was updating potentiometric maps. Potentiometric maps are simply snapshots of water levels within each aquifer; enhancing our existing chloride network; initiating a water quality network in the area where there's going to be hydraulic fracturing, and then estimating water use on an annual basis for Louisiana.

So step through each of these elements. I gave you a little bit of information about why the water level network is needed. We need to understand the short and long term changes in water levels that are going on in each of the aquifers to understand how pumpage and other influences are affecting these aquifers.

So our objective and our approach was essentially to increase monitoring throughout Louisiana

and fill in a lot of holes in the existing network.

This map shows you the network that existed prior to 2013, all the green dots on the network; and then the darker, the blue dots are wells that we have begun monitoring during and since 2013.

You can see we had added a lot of wells in the Chicot aquifer in southwest Louisiana, especially in the Lake Charles area, where they have had water issues for decades there and our monitoring network had gotten pretty thin.

We had a lot of wells in southeast Louisiana too where we have typically eight to ten aquifers beneath all of these areas, and we had very few monitor wells in some of them.

We added a lot of wells up in central Louisiana in the Sparta, and over in the northwest, in the Wilcox aquifer, which overlies the Haynesville Shale and has been having issues.

But we looked closely at all the aquifers, made maps, looked at where there the pumpage was, where there's wells, and tried to get really good coverage in each individual aquifer.

And so we expanded our network. We had 279 wells previously. We're now monitoring 473 wells. We collect water levels quarterly, which gives us

good -- shows us typically seasonal fluctuations, whether or not those occur in that particular aquifer, and gives us a pretty good record for the year.

But the quarterly measurements don't always show you the highs and lows, and you may miss some things on short-term trends that occur during the year. So we've also put in equipment into 32 wells to collect hourly measurements, to report hourly measurements in these wells in 19 of the aquifers. And these kind of give us a big picture of what's happening in between those quarterly measurements, so we can extrapolate out from these few wells as to what's happening in the rest of the system.

And all of this data are available on USGS websites and searchable websites. I'm going to show you one here. It's called the USGS Groundwater Watch Network. And this is a national page, which you can go into just Louisiana.

And the wells, these are all the wells that we're monitoring water levels in. And they are color-coded to indicate whether the current, the most recent water level measurement at the well is at, above or below the normal for that well. And you can see the green, a lot of the wells are in green on there indicating normal conditions. Although there are quite

a few that, in that burgundy, which indicate that they are much below normal.

The colors didn't show up too well on here. There are a lot of gray wells, indicating that the wells are not ranked. These are virtually all of the wells, the bulk of the wells that we just added, started monitoring. They will not show up in colors on this network until -- this particular web page until we have at least ten years of data for these wells.

And what we want to get out of this, the importance of it is water levels in each well tell a story about what's happening in the aquifer. And I chose two wells. These are water levels over time in two wells here in the Baton Rouge area that are screened in the 2000-foot sand, and we have been monitoring these wells since the 1940s.

The green line on there is from a well that's very close to the Baton Rouge industrial district. It's located just east of there. And you can see, between 1940 and the early 70s, water levels fell about 300 feet, about 30 feet per year, in the industrial district at this particular well.

In the early 70s the state realized the need to get a handle on management of our resources here in Baton Rouge and they formed the Capital Area

Groundwater Conservation Commission, who has now put some limits on pumping, some moratoriums, got the users together. And you can see that water levels in this aquifer have been relatively stable, recovered a little bit, since the 1970s. But you can see the actions there of the directing act of pumping and then the response to management actions.

And the other line is from a well that's on the other side of the parish. It's far from the pumping. But you can see how the pumping in the industrial district has affected water levels at this well too. It's a regional issue that's pretty much centered on Baton Rouge and particularly in the industrial district.

So the second element was to update potentiometric maps. Like I said, these are our water level maps. They give us a snapshot in time of what's happening in the aquifer. They're sort of like a topographic map or a contour map, if you're familiar with those. We go out and collect a lot of water levels and then connect the dots.

And with that, with these maps you can see where there's cones of depression, you can figure out which way the water is flowing, how fast it's flowing. And if you can compare these two maps done at

different times, you can see and map out where the water levels have changed across the aquifer.

The biggest issue that we've had, we have been producing these maps over time, but we have not have a regular schedule for them. So maps for some aquifers are 30, 40 years old.

One of the findings of the Commission was we need more frequent potentiometric maps. So our approach was to come up with a schedule where we're updating potentiometric maps for all of our major aquifers on at least a 10-year basis. So we're trying to collect data and create potentiometric maps for two to four aquifers on an annual basis over the next 10 years.

And this is a schedule for it, the tentative schedule just throughout there. We've decided to look initially at areas where shale fracturing is occurring or is anticipated to occur in the near future.

So during the first year, we selected the Carrizo-Wilcox Aquifer and the Avahoula aquifers, and those maps are being prepared for publication now.

And this past year we have been looking at the aquifers, shallower aquifers in southeast Louisiana, which would be impacted most by pumpage for

hydraulic fracturing. And those are the 4 and 600-foot sands in the Baton Rouge area and the Upland Terrace and Ponchatoula aquifers.

And we're going to go ahead and step through each of the aquifers, aquifer or aquifer systems after that. We basically made this schedule looking at, you know, what had been done most recently and our perceived need for updated maps of these aquifers.

This is just an example of a map for the Carrizo-Wilcox aquifer. It's color-coded. The color coding is a little bit backwards on here. Actually the red is areas where there's high water levels and the green is where there's low water levels. And that's a little difficult to see, but you get the gist of it, that we kind of have a topography of the water level surface. The water flows from areas of high levels to the low levels.

And we can take this map and compare it to measurements that we made back in 1991, and these are measurements made at the same wells, and we can color-code those and show you where water levels have declined, which are all the red and orange dots on here, or where they have risen in the Carrizo-Wilcox.

And this is what we've done also for the

Catahoula aquifer in Central, Louisiana.

And to go back to the 2000-foot sand here in Baton Rouge, just illustrating the importance of these maps, you can see there's basically a bull's eye over the industrial district; and water from all areas of the aquifer are now flowing towards this pumping center, which is the industrial district.

And it's important to know which way the water is flowing on here because of the feature in Baton Rouge called the "Baton Rouge fault."

It runs through Central Baton Rouge, separates the downtown from the LSU area. And basically we have saltwater in most of our aquifers south of the fault. And the pumping north of the fault is slowly bringing that saltwater across into our freshwater system.

So if we know which way the water is flowing, we can anticipate which way the saltwater is going to flow once it comes across the fault.

Basically, right when it gets north of the fault, it's going to start flowing west, and it's going to flow west almost all the way to the river, and then it's going to make a beeline north towards the industrial district.

And that's the reason for a third

element of this study was to monitor chloride concentrations. Chloride is the major ion in saltwater. It's easily analyzed and it's conservative. So that is what we use: Collect samples, we send them into a lab. They tell us what the chloride concentration is, and that's how we know where there's saltwater in our aquifers.

We have an existing network, but we added about 50 wells to it, expanded it by essentially 50 percent, and that's going to give us a better idea of where saltwater's encroachment is occurring in the state.

We added a lot of wells in the southwest Louisiana, particularly in the Lake Charles area and the rice-growing areas where there have been and are ongoing concerns about saltwater encroachment.

We added some wells in the New Orleans area and over near Slidell, where there is saltwater. We don't know if it's encroaching, but it's been there. We've delineated saltwater plumes. That is a huge growth area, the Northshore in this case. And so we're trying to have a kind of early warning to see if that saltwater does start to move.

CHAIRMAN ANGELLE: John, are these wells in addition to the wells that you showed earlier or this

is just --

MR. LOVELACE: Yes, these are in addition to it.

CHAIRMAN ANGELLE: Different sites?

MR. LOVELACE: Yes.

Some of them are the same sites, but, you know, they are a combination.

I should have said that all of these are existing wells. We did not drill any new wells.

We go out -- when we identify a location that we're interested in, we go talk to the well owner, see if the well is suitable for collecting water levels.

A lot of pumping supply wells, they pump all the time. They don't want to shut them off so you can get a static water level. But they are more than happy to let you come get a sample for chloride analysis.

We try not to do too many public supply wells for this, because they are already being monitored by the Department of Health and Hospitals. So we look at irrigation wells. We have -- USGS has some wells out there. But, you know, we get whatever we can in an area to provide the best coverage.

I would like to say, we expanded from 96

wells to 146 wells, and we're essentially monitoring in 11 aquifers where we have known or suspected saltwater encroachment; and we collect these samples semiannually in the fall and in the spring.

And what we're hoping to see -- or perhaps we don't want to see but we want to be able to detect -- is a situation like this: These are two public supply wells in the downtown Baton Rouge area in the 2000-foot sand. And we had one initial point, the well at the top, EB630 back in the 60s. But we really began monitoring both of these wells in the 90s. And we immediately started seeing saltwater encroachment in the upper one; and shortly afterwards, by about 1998, saw saltwater encroachment occurring in the other one.

So this told us that there was indeed saltwater moving across the fault in the 2000-foot sand, and it was following our projected path and was moving northward through the downtown area toward the industrial district. And we were able to, using that basic early warning information, go out and do additional sampling and to find where a plume was moving northward.

And so it isn't a great map, but basically, where you can see the bend in I-110 just north of where we're projecting the chloride plume to

be now, and it's expanded from where it was back at Acadian near the interstate in 1966 and continued to grow in westward and then northward.

So then the fourth element was initiation of the monitoring network to look at possible water quality changes in aquifers that could be impacted by shale fracturing activities.

Our plan was to go into these areas and monitor specifically where we could domestic wells, because it's household wells, pretty much in rural domestic areas, they are home supplies. Again, we didn't feel too much of a need to go to public supplies because typically they are already being sampled on a regular basis by Department of Health and Hospitals. Also, the domestic wells are typically shallow wells. The homeowners don't spend nearly as much money as public suppliers to put in a deep well that's going to last forever. So being shallow and being put in by a variety of different well drillers, they may be more susceptible to issues like surface spills of frack fluid. So those are what we looked at.

And our plan was to select a hundred wells, and we have done that. We're still sampling the wells annually and having the samples analyzed for pH conductance, a variety of inorganic ions; but more

specifically, for dissolved organic carbon, gas oxygenates, and BTEX as indicators of the possible contamination by frack fluids or some petroleum product related to, you know, potential well blowout or leaking casing.

As we get these results back, we look through them, we compare them to the previous years. And if we do see problems, we will notify the well owners and possibly go out and do some more sampling and additional investigation.

We are just kind of wrapping up our initial sampling. We just wrapped up the initial sampling of this during the previous quarter and are just getting a lot of the data back now. So we haven't really had a lot of data there that we've looked at yet to see if there are existing problems in these areas. But it will also provide us with baseline information.

A lot of the area that we're looking at, there has been no shale fracturing activity. So we'll know what was there before they came in.

And these are the areas that we wanted to concentrate on: The area northwest Louisiana, Haynesville shale. That has already been pretty heavily developed but there will be additional development.

If you're not familiar with shale-fracturing activities, they typically are coming in and putting -- leasing sections, and putting in six to seven wells per square mile in this area, and it's pretty intensive.

We are also looking at the Tuscaloosa Marine Shale, which extends across central and southeast Louisiana, and then the Brown Dense Shale. There has been very little activity in these two. There has been some exploratory assessments of the Tuscaloosa Marine Shale.

And these are the locations of the wells that we've selected to sample. They are primarily domestic wells. We try to get a good spread on them.

And the fifth element of this program is to estimate water use in Louisiana on an annual basis. We have been doing this on a 5-year basis since 1960. And there's always that question of whether the fifth year is an extreme year or not -- Is it a drought year? Is it a wet year? Are we getting, you know, this average?

And so we wanted to, you know, really improve our estimates by doing it on a more frequent basis and also help us to understand what the current water uses are and what the water use trends are.

So we're going to continue to use the same approach we have been doing on a 5-year basis. We contact every public supplier, industry and power plant in Louisiana and ask them to report their pumpage to us, all recorded data; and then we estimate based on other information: Water use for irrigation by rural domestic populations, livestock and aquaculture. And then we tabulate this data by use, source, parish, aquifer, surface water basin; and we have the results for 2012. We're wrapping up the 2013 assessment, and they are all available on our local website.

And this is what we saw for 2012. The results were fairly similar to 2010. The dark red is surface water withdrawals in Louisiana, and the blue-green is groundwater withdrawals.

Show you the trends over time since 1960: Groundwater has been relatively stable. There's a pretty big decline in surface water withdrawals between 2005 and 2010, and that was primarily attributed to decreased industrial withdrawals. You can see, it increased slightly there between 2010 and 2012.

I just want to show how this data ties to the other data that we're collecting. Again, here's this graph from well EB90 in the Baton Rouge area in

the 2000-foot sand.

And we actually have really good pumpage records from the 2000-foot sand. Going back into the 1940s, we have estimated some of those values in there; but we, USGS, has been compiling data from Baton Rouge Water Company, Exxon, formerly Ethyl, GSU and Entergy for a long time; and we have been able to put together this pumpage record shown here in the bar charts. And you can see that there's a direct correlation between pumpage and the groundwater. Groundwater declines and then rebounds, and fluctuations at that particular well, indeed through the 2000-foot sand.

So knowing what your pumpage is really gives you, tells you what's going on in the aquifer and tells you why you're seeing those water level changes that you see. And having this data also lets you pinpoint where the pumpage is going on.

The Capital Area Groundwater Conservation has been collecting pumpage by well since the 1970s; and using that data and our data, we can now go in and pretty much tell you how much water is being pumped out on a well-specific basis in a lot of parts of the state.

And you can see, based on this, that green area there is the industrial district, and it is

still controlling the movement of water in the 2000-foot sand because that's where the pumpage is. That's why our potentiometric surface looks like it does and the flow patterns are like they are.

So that's in essence what we have been doing with this program. The state is extremely valuable to us. And I think, for management of the water, it allows you to assess the impact of past development, planning for future development, detecting and delineating problems as they occur, and then develop plans and tools to address the problems.

We have most recently been involved in a modeling study of the 2000-foot sand, and it's been, I think it's been a really good study. We have been able to investigate various management alternatives and potential solutions from looking at future scenarios. And it's all because we have this really good record here in the Baton Rouge area because, primarily because of our close proximity, and because the Capital Area Commission has been collecting a lot of data at the same time.

So I'm very pleased that DNR has funded this enhanced network, and it will end at the end of 2015. The bulk of the monitoring that we're doing is funded for three years, and I'm hoping -- and it took a

lot of setup to do this, a lot of on-the-ground looking at wells and investigation. I'm hoping it will continue past that point.

CHAIRMAN ANGELLE: Thank you, John.

So the contract that you have with the state is for a certain set of deliverables, of which you've kind of gone through the kind of things that you were doing.

MR. LOVELACE: Yes.

CHAIRMAN ANGELLE: And that runs through, you said, December of 2015, or perhaps maybe July, June 30, 2015?

MR. LOVELACE: It does. Well, it was for three years of data. We did get a late start on the water quality collection. It was a very intensive field investigation of finding wells. We started out with a water level network and then chloride network, so we got a later start on the water quality network.

We will have three years of data for virtually everything by the end of 2015, except we will be collecting the last of the water quality sampling in the shale fracturing areas in the first quarter of calendar year 2016.

CHAIRMAN ANGELLE: So when we did this originally, obviously you thought it was very

important. There was really no financial resources kind of laying around. We were able to work on the use of some funds that were I think penalties or fines that had been accumulated on the federal level and then shared with the state. Is that correct?

MR. REONAS: That's correct. Yes, sir.

CHAIRMAN ANGELLE: So there obviously is a finite number of dollars that we were able to access there. Nonetheless, it was very important for those of us that work on this to get started and, you know, again, have the most expansive network monitoring program we could.

I'm hopeful that all of you will join with me at a later point here within the next 30 days of signing a letter that we would send over to the various appropriators and folks that we need to requesting in this next budget cycle, as those budget requests are coming together, perhaps from the Louisiana Municipal Association, perhaps the Louisiana Police Jury Association, perhaps from the Farm Bureau, perhaps from every single group that we can kind of muster, that we have to find the resources in this next budget cycle to be able to continue this; or all we basically did was got started and then, you know, aborted our process.

For me personally, I can't think of a better thing that we need to be working on from a water management standpoint of making sure that we have the right data. Right data gives us a chance to instill confidence in the folks that we serve and to make the changes or recommendations that we think we need to based on science and not on politics. So I'm hopeful that all of you -- and by the way you're shaking your heads, I think that everybody agrees -- that we need to do that.

Anybody have any questions for John?

Okay. Seeing none.

Go ahead, Matt.

MR. REONAS: Mr. Chairman, I was going to say that we will send out an email notice to all the commissioners about posting these presentations online. We'll have those posted so that each commissioner can review those on their own or at their leisure.

CHAIRMAN ANGELLE: I think it would also be again really good, as you develop your database -- and I know you said the local governments, police juries, mayors, parish presidents, whatnot, you know -- there's a lot of stakeholders up here that are represented. Everybody is interested in this.

Any way that you can get the word out

that this kind of information is available, I just think this is awesome work.

MR. LOVELACE: I just also invite anyone that has an interest in a particular aquifer or area -- I just sort of blurred through it all here -- but if you want some more detailed information, feel free to contact me.

Sorry I didn't put my contact information up there.

CHAIRMAN ANGELLE: We'll find you. We can find you. When things are bad, we know how to find you.

So, John, just to kind of summarize: There's an effort that the feds have, federal government through USGS is, you know, in every state to do the kind of things that you do; and the state basically supplemented that with a financial contribution. Is that correct?

MR. LOVELACE: Yes.

CHAIRMAN ANGELLE: And do you believe that the network that we have now is, you know, is it adequate? Is it what -- do we need to --

MR. LOVELACE: I think it's a pretty robust network.

There are some areas where we simply

couldn't find any wells to monitor; but you know, the rest of it, I think it's good.

MS. GAUTREAU: I have a question.

CHAIRMAN ANGELLE: Sure, Ms. Gautreau.

MS. GAUTREAU: This is great information. Thank you, John. Should be useful in so many fronts.

I apologize if I did miss it. Is there an estimate of how much of a supplement you would need in order to move forward with fleshing out a network, doing the work you talked about into the future?

And I guess related to that, as an example when you were talking about the order of aquifers in which you're developing some of this information, is that capacity limit, funding limit, or both, in order for your 10-year projection I think is what you were thinking?

MR. LOVELACE: That was based on consistent funding over the entire period, funded at the level, I think it was around 900,000 a year for three years to do this.

MS. GAUTREAU: So theoretically, if you received a bigger infusion, once you could potentially accelerate what you're doing -- or it's not necessarily. Is there a direct correlation?

MR. LOVELACE: Not necessarily. We do have

manpower limits and the federal government is trying to downsize right now.

MS. GAUTREAU: So capacity as well as funding. Thank you.

CHAIRMAN ANGELLE: So I think the contract that we signed again had a 3-year period. What was really good with that, Karen, was that we had a source of funds that we had access to that could be used only for very, very narrow things.

My hope is that the state recognizes the need. In 2001, I guess, when we began to go down the road of standing up this whole groundwater-type management, there really hasn't been a bunch of financial resources that have been put at it. I get it; I understand. Everybody is fighting and scrapping, and money doesn't solve all the problems. But it takes resources to get data.

And so my hope is that we would then now be able to move to a point where some state agency would have a line item that would be reflective of funding a network program on an annual basis and be able to get this kind of information in front of the appropriation committee. Because quite frankly, I think once you see it, you believe that it's a priority.

MS. GAUTREAU: Absolutely. And I was just wondering, in terms of if we had opportunities to talk to some of the appropriators or the rest of the legislators at the appropriate time, if we had an idea.

Are you envisioning something that totals about the amount that we invested, to supplement it over the last three years?

CHAIRMAN ANGELLE: Yeah, my hope is that staff would be able to kind of grind that through. And within the next 30 days again perhaps, you know, send around a proposed letter for us to execute that would have that dollar amount made into it with specific deliverables.

Again, I think everybody is interested in deliverables, not fluff. And you all have done a good job with that.

To me this is one of the more robust presentations we've had on the things that we're all kind of yearning that we need to be able to see so that we can report back to the stakeholders that we represent that, you know, it takes time to get there.

The state has been absent at the table for a long period of time up until 2001. You know, there really wasn't a whole bunch of any management whatsoever, other than registering wells. And now I

see, you know, some really good, good action. Folks from 2001 did a really good job. We have I guess gone through three governors since 2001 and everybody has embraced it. I think it's just a matter now of putting it, you know, ramp it up a little more.

MR. McKINNEY: If I could add from the Sparta end: It's been amazing the data that Ben McGee and that group that have been there have collected, even on over into the Arkansas group that's working collaborative with the State of Louisiana to monitor those wells up there. It's great data.

And in reality, guys, it must continue. There's no doubt about it.

CHAIRMAN ANGELLE: Okay. Thank you, John.

Item Number 9 is a Report from the Surface Water Monitoring Network from Doug Carlson with LGS.

And as Doug approaches, again, you recall that originally when this group was set up, it was the Groundwater Resources Commission. We changed that to the Water Resources Commission, gave ourselves some authority -- or the legislature gave us some authority over surface water. It made sense to expand some of the things that we were doing to the surface water, and Doug is going to take us through that.

So the contract, looking to the DNR staff, we had a contract with USGS on groundwater monitoring; and we have a contract with LGS on surface water monitoring; is that correct?

MR. REONAS: Yes, sir.

CHAIRMAN ANGELLE: All right. Thank you.

Welcome, Doug. Thank you for being here.

MR. CARLSON: I thank you for having me here.

I would like to just briefly go through it.

As you can see from the list of --

CHAIRMAN ANGELLE: Excuse me. Just pull the mic a little bit closer to you. Thank you.

MR. CARLSON: Okay.

As you can see from the list of people that are listed there, it has been an activity for almost all of us at LGS -- and we appreciate this opportunity to do this -- I'm just going to briefly touch on some of the work that has been done.

Could I have the first slide?

There's essentially four parts to this study that has been done. And two parts involve inventory of current existing resources. Essentially we were asked to inventory access points to public

surface water bodies, such as a series of programs and such, and then also an inventory of public dams. And maybe some of what I'll talk about might answer some of your earlier questions.

Then we are asked for two other projects that were more ongoing, longer projects in the sense that they are monitoring of some select lakes in Louisiana that could be useful as reservoirs, and then the development of stream rating curves. And then I'll just briefly summarize at the end. Thanks.

There's 357 -- 377 reservoir public boat ramps. It turns out about two thirds of them are concrete, so they are already essentially developed operations.

Then there's a number of undeveloped ones that could be maybe finished in a more permanent matter, such as shell or dirt. Some are noted as "mixed" or "other." Essentially there's more than one essentially ramp to access a particular site. It turns out that most of these that have been noted are owned by parishes rather than the state itself.

The bottom figure: Some of them are owned by cities, state agencies own them, and then a very small number by the federal government. A few are other cooperatives and other units of governments own

those.

Next.

In terms of dams: There were 64 public dams that were in the list. Approximately half of them are state-owned. The records: Local-owned are about a quarter, then the federal, about a 6th; and then the records don't indicate who owns the dams. It's just that it's noted as a public dam apparently, and then one is a cooperative.

They all happen to be earthen structures that are noted. There are some that simply do not describe in the existing records what the structure is, but they are probably most likely earthen.

And then I think most interesting here is the use. And this is the primary use of the resulting reservoir and the dam structure. Setting up the reservoir for recreational use, about half of them; and then roughly equal amounts for fish and wildlife purposes. Another set is for flood control, about 60, and then smaller shares are used for public supplies, irrigation. And hydroelectric turns out there's one dam, that's Toledo Bend.

Next, please.

The reservoirs that sit behind these dams vary greatly in size. Though most of the public

reservoirs are fairly large. And this is dividing it up in terms of the number of reservoirs rather than the actual volume of water behind them. A little over 50 percent are between 1000 acres and 10,000 acres, or about one to 10 square miles roughly.

Toledo Bend happens to dominate. It's very much larger than anything else. It's about 10 times larger than the next one, which is Lake Bistineau; and it has 43 percent of the surface area available on all these public reservoirs.

In terms of water available in storage -- and this is the average amount that was noted for these particular structures -- Toledo Bend has almost three-quarters of all water available, and 30-times-plus what's behind Bayou D'Arbonne Lake outside of Farmington. So it dominates.

But a lot of them are smaller features and they tend to be typically about 10 to 15 feet deep is the reservoir behind most of these features.

Next, please.

Now the ongoing part that really we just got started and really should continue, I hope, beyond the current contract period is the monitoring of four different reservoir sites for water levels: Black Lake, Lake Bruin, False River, and Henderson Swamp

Control Structure in the Atchafalaya. These structures are all as contracted. They have been put in. There's about roughly a year's worth of record now already recorded on these in terms of water level.

Next please.

And it turns out, not surprisingly, Black Lake and Henderson Lake are essentially connected to the river systems, and since result there's a fairly wide variation of water level in these reservoirs.

It turns out the Henderson Lake Structure unfortunately was vandalized when one of our staff went and checked it. It was destroyed, and so we had to start over basically there. We're in the process of reinstalling that structure now. In fact, hopefully within the month it will be done and ready to go.

Each structure, I note the gauge levels here. They have been also tied into absolute water levels as well with the survey that was subsequently filed.

False River and Lake Bruin are essentially oxbow lakes along the Mississippi River. Although they are relatively isolated from surface water systems, they actually do participate with the Mississippi River. It's all one big alluvial system,

and there's an interaction between the river, the groundwater and these other lakes in this case being shown here, and there's rises and falls with the Mississippi River itself.

Next, please.

Most of the work that I've been doing personally is dealing with the development of rating curves. These are 51 sites selected. We looked at 60 altogether. Some of them were dropped because they were physically isolated, we couldn't get at them. Or they were estuarine sites that didn't indicate a free-flowing stream or essentially water was moving in one direction.

If you get south of I-10/I-12, a lot of the streams in that area tend to be estuarine. They flow in and out with the tides actually or with storms.

So these are essentially free-flowing streams going in one direction.

The 51 represents about a 70 percent increase on the preexisting ongoing set of USGS records where the records are gauged and there is a discharge value noted. And we have to develop these curves at these 51 sites, so it's a significant increase.

Next one, please.

The 51 sites include about a dozen here

in the Baton Rouge area, local streams. They could provide maybe possible sources of water to augment the various aquifers possibly, and so we've focused in on some of these as well.

They are all existing USGS sites in terms of water level, but they just have not developed in general gauging curves from rating them.

Next, please.

I have two instruments that we're working with. Essentially there's a thing called a River Surveyor Instrument Device for large streams, and then for small streams a Flow Tracker.

Essentially -- next, please.

The River Surveyor is essentially a sonar system attached to a foam boat. It's three-by-two-foot-sized boat. It's pulled back and forth across the stream. The top left figure is one way of doing it. The sonar comes out of the bottom of the instrument, below that tower. It essentially measures the depth. And then in three different directions it measures also the velocity of moving water, essentially a Doppler arrangement.

You can also do this from a bridge deck. And this is the technique that's most accessible when streams are in flood condition, such as shown in the

bottom two figures, shown as you work your way along the bridge and along the existing gauge and tower.

Next, please.

The Flow Tracker is designed for small streams. Essentially it measures water velocity, again another sonar system. You have to measure your position with a -- this is all low-tech here, just simply measure the lateral position by tape and then also the depth.

The pole that the instrument on the bottom left corner is where the probe is, that pole is marked off in increments of depths. So you measure the depth using that pole, and then a position, and then figure out the area and determine discharges.

So what ultimately developed -- next please -- is a series of discharge results, shows kind of the progress so far. The Flow Tracker is red with small streams. The Surveyor is in large streams in blue. We're more or less on target.

The contract suggested we have six measurements at each stream. So far we have reached that targeted goal for 48 of the 51 streams. There's three that were behind schedule, 25 that were ahead of schedule. So we are moving along on the contracted pieces quite well.

Next, please.

The ultimate goal is to develop rating curves, essentially come in four different types. If you have the misfortune of missing large discharges, such as in Shettleworth Bayou up near Shreveport, you end up with all low-flow, discharges are small and the gauge levels are crowded together. Notice the range of gauge level on the X axis is less than a foot. There's not much rain.

Most streams in Louisiana tend to be about 10- to 20-foot range, so you'll end up with the other three figures more likely.

Red Chute is an example of a linear feature. But many of the streams don't have an exponential curve, and that's ultimately what most streams are.

I've actually gone back through all of the USGS field records on their dataset, run through their 70 streams, and the bottom two curves are more likely. That's because most streams have an inner channel that's fairly narrow; and then the small, wider flood plain channel that, every time you add a foot of elevation of your water level, you end up with a great deal more recharge in the sense, essentially an exponential increase of discharge with again a water

level. And so ultimately we'll develop 51 of these curves to augment the pre-existing set already.

Next, please.

So far, in terms of the contract, we finished the portion that asked for the inventory on dams and access points. The monitoring of the streams is on schedule, as it should be. And we're going to get back to the fourth site once we take care of that. Unfortunately it was vandalized. And the progress is on schedule for developing rating curves.

Next, please.

However, the work for the last two points on rating curves and monitoring really isn't completed. It would be an unfortunate thing if support failed because, for the rating curves and monitoring need to continually keep track of things, ideally for a rating curve, you should have 15 observation points as kind of an international standard. And I noticed with the USGS records, they typically keep this up every few years. They go back to sites and keep refreshing, because the morphology of your channels can change -- as the surface land use in the watershed changes, it can actually change the stream itself. So these things need to be continually refreshed and monitored, so it would be ideal to continue the program in terms of this

portion of the work as well.

So that's all I have to say. I would be glad to field any questions.

CHAIRMAN ANGELLE: Thank you, Doug.

A couple of questions.

The work that you were doing -- actually I probably want to bring Kyle and Vince into this conversation.

I realize that you contracted with us to do things. Does this in particular have any value, especially on those rating curves, for DEQ and Wildlife and Fisheries in your work?

MR. CARLSON: Well, I would say it's good for Fish and Wildlife possibly because you ultimately will get a handle on the amount of water available; and then you could probably use that information for development of reservoirs, maybe selecting your sites possibly for the recharge work you talked about in your aquifers and possibly other uses.

So to know the volume of discharge would be useful, I think, for the setting up of reservoirs of set sizes and such, I would believe, for Fish and Wildlife, and certainly for irrigation.

CHAIRMAN ANGELLE: Well, I guess I'm looking specifically also at withdrawal permit applications,

say at DEQ for permit withdrawals.

I'm assuming the whole rating curve is part of what you-all have to do. I'm not sure that's in any of your areas of expertise, but I'm trying to get that conversation going here.

MR. BALKUM: I would say this is a tool we haven't used in the past.

CHAIRMAN ANGELLE: You haven't?

MR. BALKUM: No, we have not. It certainly seems that it could be very beneficial.

CHAIRMAN ANGELLE: Okay. So what we want to make sure is that, although you contracted with the Department of Natural Resources for this deliverable, we have to absolutely make sure that it's available to all of the decision makers in the state. It's important to Wildlife and Fishery, it's important to DEQ, I'm assuming.

MR. SAGNIBENE: And we might could use that in our forecast also, but I don't think we have to date. We could have.

CHAIRMAN ANGELLE: So, you know, Matt and Gary, let's make sure we create a triangle right here for at least those two resources. Ag and Forestry may have a need for it, I'm not certain. But let's just make sure that everybody knows about it and can access

it and can use it.

And any of the things that we're doing, Doug, are you all driving any -- Vince, this also pertains to you -- are you all grabbing any water quality?

MR. CARLSON: Well, it wasn't officially put in the contract, but I'm actually independently working on some of the local streams and looking at water quality as well. That certainly would be a very useful exercise, but it wasn't stated as part of our work, but I've actually independently started on local streams.

CHAIRMAN ANGELLE: So we're getting it for free. I like that better.

Hold on. Hold on.

MR. BALKUM: Any feature that's on the stuff we do, as long as it's cleaning the air and improving the water quality, is important.

CHAIRMAN ANGELLE: Well, part of what I'm doing -- maybe the scientists can help me here -- is that, again, over time as Dian and her group are beginning to look at, you know, changes in the law, if perhaps the legislature embraces that over a period of time, if we're talking about surface water being a useful tool to help solve some groundwater deficiencies, obviously the availability, the volume of

the water, the capability of that body, what can a stream yield is certainly important. And so your data I think was very, very good.

But, you know, I think we have to be able to also know over time is the water quality -- although it may be processed, people are going to want to know that we're starting with a pretty healthy product.

And so to the degree that we can chart the quality of the water in these particular streams as they may be, you know, selected in future years to be the source for reservoirs or whatnot, to me just seems to be a whole bunch of commons sense.

MR. CARLSON: Yeah, we could certainly grab samples and analyze them.

I've done a very small study locally; but it would certainly be worthwhile. Because two of these focus areas tend to be around Shreveport/Bossier area and then around the Baton Rouge area, which is a couple of urban areas with a certain amount of stress on groundwater resources in both areas. So certainly it would be a very ideal addition to augment a little support to analyze samples as well. I think it would be very appropriate, yes.

CHAIRMAN ANGELLE: So may I might suggest

that perhaps a phonecall next week with DEQ, Wildlife and Fisheries, DNR and yourselves to see what we might be able to do, to take something that perhaps is on the five-yard line and maybe get it a little bit further down the field, with just that little bit of tweaking.

I think there's a lot of things at play here, if we could just kind of make sure everybody is on the same page.

Would you all be willing to do that, set that phonecall up?

MR. REONAS: Yes, sir, we can do that.

CHAIRMAN ANGELLE: Okay. Thank you very much.

Yes, sir. Any questions?

MR. PRATT: Coming back to that, I think the part that I saw was that would be part of the component of eventually we have to establish what our end stream flow standards are if we're going to inundate or withdraw.

In addition, Doug, if we can go back to your inventory slide, I think we had -- just so that we don't get confused and misleading -- but when you look at the Toledo Bend Reservoir and the size and the percentage of water is held in it, we only have half of that. 50 percent of that water does belong to Texas.

MR. CARLSON: Okay.

MR. PRATT: So I think that, before we publish any of this, you need to clarify that.

I wish it were all of ours. And if we can find a way to do that, then that's even better. But I think we do need to be cognizant of that fact.

MR. CARLSON: Okay. Well, the chart is noted by the -- I can certainly cut that number in half and send you an electronic version if you would like me to do that.

MR. PRATT: Sure.

MR. CARLSON: But I just noted that the volume was given --

MR. PRATT: It is. But I think for the general public, when they see that, though, they start perceiving. And perceptions sometimes do become a reality.

MR. CARLSON: Okay. Certainly could have all those numbers.

CHAIRMAN ANGELLE: Yes, I think certainly an asterisk about ownership being split with the state of Texas.

And, Jim, if you could perhaps get him some information.

MR. PRATT: Well, it's 50/50.

CHAIRMAN ANGELLE: But get him perhaps the compact document or something that is the reference document.

MR. PRATT: Will do.

But other than that, again, back to your stream investigations there, Mr. Chair, I see that being valuable to our overall comprehensive plan needs.

Thank you.

CHAIRMAN ANGELLE: Absolutely.

Thank you very much.

I'm sorry? You want to break?

I was going to continue to push through, but we have been requested to have a break. We're going to have a 10-minute break.

You know, for those of you who want lunch, I understand the cafeteria is available. It is now about 10 minutes to one, and we will do it -- we will come back at 1:05.

(Brief recess taken.)

CHAIRMAN ANGELLE: Okay, we'll go ahead and call the meeting back to order.

Go ahead. Call Item Number 10. Our own member, Mr. Ted McKinney, will give us a report on the management activities in the Sparta district.

MR. McKINNEY: Mr. Chairman, before we get

started on our main presentation today, you had asked Matt to see if we couldn't have a pre-presentation on the Union/Lincoln Water Supply Initiative there in the northern part of our state.

This particular initiative is dealing with the Lake D'Arbonne Lake there and potable water from that lake. But we have one representative from that initiative here in the audience that I'm aware of, and that's Richard Durrett back there. He is a project engineer for this project, and I am not affiliated with this project other than I'm reporting as you had requested. So if you have any pertinent questions to ask about the project, Richard would be the gentleman to do that. Okay?

But this project -- prior to this project, the legislative body of the State of Louisiana enacted the Sparta Groundwater Conservation District in 1999. And of course, as we are all aware, that Sparta was in a declining mode and still basically is to some degree; but we have had some positive response from what's been going on up in our part of the state up there and south Arkansas.

But I do want to emphasize that it's exciting to see the well levels coming up. There's no doubt about that. But you have to realize that we're

dealing with cones of depression in that part of the country up there that are really beginning to recover. So we're not really out of the woods by any means.

So although people get excited about hearing about that -- and I have heard more than one person to express that -- I just want to emphasize we're not there by my any means. Okay?

But 1999, upon establishment of the Sparta Commission, shortly thereafter in 2002 they hired consultants and had some reporting done on the plight of the Sparta. And they came back with three basic recommendations for the 16-parish area which the Sparta is involved with in the northern part of our state, and that would be, for them to reduce pumpage in the Sparta by 18 million gallons a day would just stabilize the Sparta in our region there. But for future growth and for the bringing back of the Sparta, we needed to extract -- we need to reduce on our pumpages by 30 million gallons a day. Another suggestion by the research people at that time was that we needed to develop alternative sources for future needs.

The third -- and one that we're talking here basically at this moment in time -- is that we needed to use Lake D'Arbonne as an alternative supply

of water for the Union/Lincoln area.

Now about three years after that or four years after that, there was the forming of the Union/Lincoln Regional Water Supply Initiative that was created. And basically what that was was four entities -- the City of Farmerville and the City of Ruston, along with the parishes of Lincoln and Union -- went together to form this nonprofit 501(c)(3) entity to begin to try to come to some kind of conclusion as to what to do about these recommendations. And of course their approach was to take the one of trying to utilize the lake.

So its core objective by this initiative is to try to find solutions for extracting water from this 15,000-acre lake to be used by the City of Farmerville, which is adjacent to the lake, and the City of Ruston, which is some 30 miles to the south. Since the inception of this initiative, there have been studies and reports on the validity of this approach. There has been a lot of talk, as you can well imagine among the locals, about extracting water from this lake.

All of the scientific data and all the reports that have been done have reflected that there is no significant impact on the lake in extracting

water from it for potable use by these three entities.

And now I just wanted to give you a brief account of that, and I have been asked by the Sparta Commission to enter into the minutes the Sparta Resolution in support of that. And each of you have in your packets that particular resolution. And that resolution has some more details in it than what I have just mentioned here.

But whether we're dealing with this $100 million project or we're dealing with the very simple financial needs of the Sparta aquifer and the Sparta Commission, we must find solutions to fund these projects.

And as I have repeated over and over, Mr. Chairman: Sparta gets no dedicated funding, so we have to do it on our own.

And so that's all I'm going to say about that initiative. You can look at that resolution and pick up some more data on that.

But I want to introduce to you today Lindsey Gouedy, who is our educational administrator for the Sparta Commission, our educator -- I don't know what her official title is. But anyway she gets the job done, okay, and has been doing that for four years I think it has -- five years.

And she's going to present a brief overview of where we are with the Sparta Commission and the educational initiatives that we have done with that.

And so I'll turn it over to Lindsey.

CHAIRMAN ANGELLE: Thank you.

Welcome, Lindsey. It's good to see you again.

MS. GOUEDY: Thank you. Good to see you as well.

I'm going to try and be very brief -- I know we're on timeframes -- of what we have expanded and contributed on our Education Outreach programs in north Louisiana over the last five years.

Education Outreach did not begin in 2009 when I was hired. I just found some interesting ways to expand it and to continue it in our area that is experiencing such dire focuses on our water.

If we'll continue forward, my first point that I really would like to address with you-all is our Education Outreach Programs that we implement in north Louisiana known as our Water Fest Events. These we focus on our fifth graders in a number of parishes. And as you'll see coming through the screen, I have each of my Water Fest Events are coordinated to follow

the education system, the State Board of Education system, with goals and objectives the way that each school board would require them.

You can go on through, push them on. And you're welcome to read through those.

Stated directly as the school board would require: The learner will explain reasons why conservation of water is necessary, and you can continue through the objectives as well.

Of course this has changed over the last year or two with Common Core to "I can" statements, but these are more of the old-fashioned.

If we'll continue pushing through.

All of the activities that we do at these events -- this is a full day of interactive lessons that each student, each fifth grader in the parish participates in, comes out. We have lots of, lots of great information.

All of the information, all of the activities that these kids go through are correlated, both with the old grade-level-expectation standards that the state went by and the updated Common Core and Next Generation Science standards.

All of the activities that we do at our events come from something called "Project Wet," which

I have a copy of the old book right here. This is a wonderful curriculum base that we use and pull from to be able to implement something that the teachers can take back to their classrooms. Whether they are north Louisiana, south Louisiana, it's a great curriculum guide.

Recently, in conjunction with the Department of Agri-Forestry who promotes Project Wet for the State of Louisiana, we've recently worked with them to correlate the entire book with the entire curriculum guide to Common Core/Next Generation Science Standards. So that's a huge thing for environmental education in our state. It's a great tool. I would encourage it as the Department of Natural Resources continues to move forward with their educational activities and programs.

We can move forward.

Currently our programs that we coordinate extend through four parishes in north Louisiana. Now this is not limited to the education that is put out there on water conservation in north Louisiana. Of course these Water Fest events began over a decade ago now with Claiborne Parish kind of spearheading this activity. Robin Bridges and Teresa Reilly now both were very instrumental in beginning of

some of these efforts that we have worked very hard to expand. And, in fact, Miss Teresa still promotes and coordinates these activities today in her own parish through the Ag Center.

Jackson, LaSalle and Winn Parishes also have a program similar to ours that the Duck group puts on, as well as Ouachita Parish has a different kind of activity similar to ours. I believe that's through NRCS.

We focus with Lincoln, Union, Bienville and Webster Parishes. Again, these are school-board-sanctioned events. These are during school hours that the kids come out.

Over the last few years, we have actually been able to coordinate twelve events, reaching over 6000 students and approximately 200 teachers with this material, with this information. So we are step by step trying to reach as many folks as we can.

But what's more important is, we're not just reaching 6000 kids. We're reaching 6000 homes times however many folks are in that house, not to mention when they go to their grandparents'. And these kids do turn into the water police, which is of course our goal.

We have a great -- move forward. We really have a great network of folks in the state that come out and support us and help us. Without that network we could not do these events. These events are more than just getting the kids out there. It's getting the people with the knowledge to come out and teach the kids.

As you see, we have a list of: Agri-Forestry, LDEQ, the Ag Extension Program, Capital Water District Program, D'Arbonne Watershed, SciTech, the police juries, USGS, USDA, Rural Water Association, Trailblazers, Forest Service, NRCS, Louisiana State Parks. And if anybody is in the audience that I didn't mention, I do apologize. But we have such a great support group in Louisiana for these programs that it could easily be expanded with the right push and enough manpower.

You can move forward.

Of course these programs do cost, not only in time, but monetary. Our main expenses for these, of course, are overnight accommodations, meals for the presenters. We do send all of our participants and presenters with tee shirts, as well as event signage.

Each of these events costs approximately

$5000. Again, I would echo, these are funds that we've raised ourselves. These are funds that are not contributed by any state agencies to us.

The school boards do, however, contribute in-kind expenses. They cover lunch costs for the students, as well as bus transportation. And I will also add in that the police juries in Lincoln -- well, Lincoln Parish Police Jury has donated the Lincoln Parish Park now for four years at no cost to us, and that's the entire park. So that is a huge cost in-kind contribution there. That value is around $1500.

And if we will move forward, I will show some images of our event. These are some examples of the what the kids are doing. They are participating in interactive relays that gives them a great simulation of what it would be like to go and get their own water. We have kids that get to look at microorganisms in telescopes. Lots and lots of really great lessons that they take out. They're not just about water conservation; there's is water, water biology, water wall. We have a lesson in water wall. We cover lots of ground with this education program.

We're not only teaching these kids about turning off the tap; we're teaching these kids about

how to make choices sitting in your seats in 20 or 30 years, because that's sadly where we could be. There will still have to be decisions made that these kids are going to have to make and that's what we're trying to position them for.

Move forward.

Our big fund-raising event -- to follow-up our education program, our big fund-raising event is so-called the Sparta Shoot, sport clay competition. And we have just completed our third event. This has actually turned out quite successful for us to be able to fund our education programs.

These have taken place in Ouachita Parish the last two years. We've had great response from lots of industry in north Louisiana that wants to be involved.

Move forward.

Again, this is our main source of income for these programs, so we pull lots of sponsors. You can see our sponsor tiers there. And we have a lot of support base from our oil and natural gas industries in north Louisiana. Devon Energy that actually been the title sponsor for this event for the last three years, and they have recently been sold to a different company, and we do hope that that same environmental

stewardship will extend to this new company.

Move forward.

CHAIRMAN ANGELLE: Excuse me. Who is that new company?

THE WITNESS: Linn, L-I-N, Linn Energy. Yes, sir.

CHAIRMAN ANGELLE: I'm sure that if you send a letter to Commissioner Welsh requesting their continued support, Commissioner Welsh could follow that letter all the way to Linn, perhaps would go a long way in getting that process renewed for you. No guarantees, but --

MS. GOUEDY: Sure, absolutely. Every help is wonderful.

Of course, as I was saying a minute ago, the Ouachita Parish -- we have had this event in Ouachita Parish the last two years in which the sheriff there, Jay Russell, has donated the facility, Ouachita Parish Shooting Range. If you've never been there, it is a wonderful facility, wonderful site, and a huge, huge contribution from them.

Move forward.

The competition itself, of course, there are expenses there for us, as you can see listed.

Move forward.

Each team, it's a $500 fee for a five-man team. This last year we had 92 participants, we had I think 18 teams, and then two showed up the day of just wanting to shoot.

Of course we pull in lots of items for raffles. This was an idea that really has expanded because it was a way for us to raise funds to do what we need to do, but also for a unique way to reach a group of individuals that otherwise wouldn't be reached.

Through some of our efforts that we will discuss in a second, but the newspaper, with television advertising, with our website, you know, those are so easy to skip over and pass by. But especially having so many folks come out and just getting to visit with them for five minutes about our cause and that they are contributing to our cause is a huge deal. So we are all about looking at unique marketing opportunities in north Louisiana.

Of course we have our Sparta website through Donnie Bell Design, Incorporated out of Ruston. They have done a great job. And we try and definitely keep our events up to date and our statistics up to date.

Move forward.

Continuing back on those public service announcements that we have: Television, newspaper. We actually took 45 seconds of the video that the Sparta Groundwater Commission and DNR had developed a number of years ago. We took 45 seconds, put together a wonderful video which we actually had running in theaters in north Louisiana, and that proved to be very successful as opposed to putting it on public television. How many of us actually use public cable?

I know in my neck of the woods it's mainly satellite; you're not going to get cable. That also gives an opportunity for folks who would otherwise be able to turn the channel, they are bored waiting for a movie anyway, so they are going to get the information. And that was a wonderful campaign that I would love to see come back and expanded.

CHAIRMAN ANGELLE: Do they allow political ads during that time period?

MS. GOUEDY: That would be worth asking maybe.

We've estimated over the last few years, we've received over $500,000 in PSA donations in north Louisiana to be able to get our information out.

And then I will just briefly -- we've got two samples of our public service announcements

that have run in the newspapers, talking about just everyday conservation techniques that I know all of you are very familiar with; but just trying to reach the common, everyday person who just sees their water still coming out of the tap.

Upcoming events: We'll just update you-all on what we have already on the agenda.

Our Lincoln Parish Water Fest and our Union and Bienville are already on the calendar. We would love to see any and all of you there that would like to come and see what is that we're doing in north Louisiana.

Both of these events, October, 2 and 3, and 9 and 10, will be at Lincoln Parish Park, a great facility. Call me and let me know. I will make sure you have wonderful accommodations. But we would love to see you-all there. This is a program that could be expanded across the state, should be expanded across the state for every parish to be able to have an interactive lesson for water.

And then of course our Fourth Annual Sparta Shoot; if any of you-all are shooters, we would love to have you-all come out and participate in the sporting clays competition next year. Our registration form will be up close to the first of the year.

And ending thoughts, I'll conclude briefly here: Our numbers, as you can see, in 2000, we were looking in north Louisiana daily usage, 68 million gallons a day, close to 70 million. 2012 data has us down to 56 million gallons a day. That's over a 10-million-gallon-a-day decrease.

There are other contributing factors there. But the important thing there is, while we have been vamping up our education outreach programs in unique ways and in historical ways, we're seeing success. And that success is one thing we would like to encourage and help and be a part of across the state and continuing in north Louisiana.

And with that, I will be happy to answer any questions that anyone may have.

CHAIRMAN ANGELLE: A couple of questions, Lindsey.

How is the work that you do, how is that work funded?

MR. McKINNEY: Well, that's what I was just fixing to mention.

CHAIRMAN ANGELLE: You have been waiting all day.

MR. McKINNEY: When the Sparta Commission was established, it was established with the blessings of

the various parishes and municipalities in the area of need. And some of them stepped up and began making contributions on an annual basis.

Well, unfortunately, as time goes by, their remembrance of those contributions have dwindled. We have dropped off significantly. We have had some in the mails as recently as I guess the last week or so. But the bottom line is Lindsey is the only paid personnel of the Sparta Commission. And if it were not for these other -- for these entities paying what they do pay currently, we wouldn't be able to be in business now.

Now the point that we need to emphasize is that this $5000 per event that she talked about doing and this Sparta Shoot, those are funds that she and Rick Holt and a bunch of all the other givers have got in there and raised to put those on.

Now you made a point -- you may not remember it -- but several years ago in this very room, you gave an example of how you learned to wear a seat belt, and it was through your grandchildren, I believe.

CHAIRMAN ANGELLE: Children. We don't want get ahead of ourselves.

MR. McKINNEY: Great, great grandchildren I thought.

CHAIRMAN ANGELLE: You're not helping yourself.

MR. McKINNEY: But the point being is it was your children that made you wear that seat belt.

So it's these kids that find out, you know, you brush your teeth and turn the water off. And so it is of the utmost importance that we continue this educational program.

And if it were not -- and it is a huge commitment on behalf of the school board systems to do that because they are setting aside a total day out of their schedule to allow their children to do this, the fifth graders. So it's very, very important, and we thank them greatly for doing that.

CHAIRMAN ANGELLE: Okay. So what I would like, Lindsey, if you could email to me perhaps what would be kind of a sample budget that you think would be something that each area of the state could perhaps -- each aquifer area of the state I guess could perhaps, what would be the minimum necessary to fund to have a Lindsey in other areas?

While I'm very appreciative we have got Matt at the Baton Rouge level, I think it's very, very hard to get this kind of message out from a central place.

The reason I think it works in your area is because you've got some very interested, passionate people that you're their messenger that lives there, and, you know, you're bringing all the energy and the firepower to it. And ultimately you either win or you wear them out and they just give up and say, okay, we're going to do it your way. And that's coming from, you know, I'm very appreciative of that.

One of the things that we've all got to do, for instance, me and Ms. Zaunbrecher in south Louisiana, we've got to go find the resources from our parish governments to fund a similar, you know, Lindsey 2.0 in those areas, and other folks are going to have to do the same.

So if you can just send me something, I would be appreciative of that. That's one thing.

MS. GOUEDY: Yes, sir.

CHAIRMAN ANGELLE: And while this is the most important message, this obviously is where it's at, I'm wondering if you have any baseline data that shows what the penetration level or awareness level of what the Sparta issue was in 2000?

MS. GOUEDY: As far as the education?

CHAIRMAN ANGELLE: Yeah.

MS. GOUEDY: And that's something that we've

worked on, developing with some surveys.

The first group of kids that I had in 2009 come through these water fests are now going to be freshmen -- they are going into 10th year, 10th grade year -- which is generally when you see environmental science. So that's one thing that we've evaluated, going back and meeting with those same kids at the same point.

I do take an opportunity following the event to visit with the teachers, to visit with -- and historically we've done written surveys with the students, kind of a pre- and post-: What did you get from this? What do you remember? What was your best part? What are you going take away from this?

But as far as hard data, what are the numbers of kids conserving, families conserving in the home versus today, that hard data is not there.

CHAIRMAN ANGELLE: Okay. So 10th graders through 6th have already seen it?

MS. GOUEDY: Yes.

CHAIRMAN ANGELLE: And 11th and 12th haven't?

MS. GOUEDY: They weren't there for it.

CHAIRMAN ANGELLE: Right.

So what I would be interested in not so much the metrics of what have they consumed, but I

think you have a group that's kind of a captive audience, which is your 11th and 12th graders who have not gone through this, and it would be interesting to perhaps -- and I'm willing to work with you to try to find some funding to -- because I think it's important for the rest of the folks who are thinking of writing a check that you can show them some awareness levels. All I'm interested in awareness. Awareness leads to changed behavior.

And so, if we could perhaps find a way to poll or survey 11th and 12th graders and see if they know a little bit less, if you would, than the 10th graders, inasmuch as the 10th graders have been through the program. And I don't know if that's the right way, but perhaps we could have a phonecall and kind of look at it; because there's going to be a period of time where you're going to lose your opportunity to create that baseline.

MS. GOUEDY: Well, even pulling from other regions. You have other areas of the state where the media is not as full with water issues as we are in the north.

CHAIRMAN ANGELLE: Right. So go to other areas and survey 6th graders and see what they know against your 6th graders and then be able to compare.

That's probably a better example.

I think it's important that we get out, get some data there because, again, as we're asking people to invest in these programs, you probably have -- you absolutely have the most successful, most continuous program in the state. And if we can show that there are some metrics that make sense, I think we can get some investors along the way.

MR. McKINNEY: I think it's obvious that Ben McGee of USGS could take those figures and show you other things that impacted that, you know. I mean, the closing of the paper mill in Bastrop, for example, you know, and so on, so forth.

But that is very subjective; what you're asking is very subjective and can be done, but difficult to do. But this would be the only window of opportunity to probably do it with the two classes remaining.

CHAIRMAN ANGELLE: Yeah, I'm certainly not suggesting that what is known is all impacted by education.

MR. McKINNEY: I don't suggest --

CHAIRMAN ANGELLE: If we did that, I think we would be selling snake oil.

MR. McKINNEY: Right.

CHAIRMAN ANGELLE: But what I am saying is that, if there's -- again, not has the behavior modified, has the awareness come up? If the awareness has come up, we're building a brand. Before people actually purchase, right, you've got to get the brand right. So we're trying to get the brand, and you're helping us with that brand. Let's go see what the reflections are of folks who have kind of been through the program. Okay?

Questions?

MR. McKINNEY: I might add one thing to the Lincoln/Union initiative.

They have requested 4.3 million in capital outlay for this year. Right now there's $250,000 in there being considered. Again, money, money, money. It's like everything else, people, we need it, we really need it desperately.

CHAIRMAN ANGELLE: Regarding the Lake D'Arbonne, as I recall, this Commission actually adopted a resolution to support that?

MR. McKINNEY: I think you did.

CHAIRMAN ANGELLE: Thank you very much. Appreciate it.

Okay. Item number 11, John Jennings with the DEQ, who also is a member and works with the

Capital Area Groundwater Conservation District, to give us a report on the Groundwater Model and Management Activities for the Baton Rouge Area Aquifers.

Good to see you, sir.

MR. JENNINGS: Thank you.

CHAIRMAN ANGELLE: Thank you.

MR. JENNINGS: Chairman, if you would indulge me just a moment, I would like to thank Commissioner Marlbrough for the aid and assistance that you provided to DEQ and particularly, Mary Gentry -- just the names that are here -- and the work they have doing in Bayou Lafourche. It was good to get some help and things are looking better now there. So thank you.

Yes, what I want to talk about is the management plan that we've developed and has been approved in the Southern Hill Aquifer System. First of all, I would like to point out that the Southern Hills Aquifer is a very large aquifer system and extends from Vicksburg, Mississippi, all the way down to Lake Pontchartrain. And the area of concern that we deal with here are those five parishes you see up there: The Pointe Coupee, East and West Feliciana, East and West Baton Rouge. And that's the area that the Capital Area District has authority to work in.

Well, I got ahead of myself.

You can also see the uses of the water here. That's domestic, agricultural, light business, and industrial purposes. About 150 million gallons a day is drawn from it, mostly here in East Baton Rouge Parish. The two biggest users are public supply and industrial, as you might imagine.

Also the aquifers here in Baton Rouge are made up of 10 individual sands. You put all those together, along with the ones included, make up that Southern Hills system.

John Lovelace alluded to this earlier in his presentation, that the pumping began in the early or late 30s, early 40s and declined; and the water level, you know, really got to be an issue in the 70s. And that's when the Capital Area District was formed. And this slide also showed that that decline has leveled off, and if you look closely, in some cases, has begun to turn and go the other way.

The other issue then with this is saltwater encroachment.

And you can go to the next slide.

It basically impacts -- two of the main aquifers here that are pumped are the 2000-foot and the 1500-foot sands. And it's our intent and our goal to manage this resource here to provide the water for the

Baton Rouge area and the capital area, you know, into the future and, you know, that it's available and clean water.

What our plan does, the plan we developed is an umbrella plan. It gives an overall structure of how we intend to manage these ten sands. We've entered into contract with USGS to develop models to monitor all ten of these sands.

You can go to the next slide. You can skip that one too. I think everybody knows our makeup. And the next one.

But as we look at these sands and we get the data, we always talk about monitoring as one of the main things that has been mentioned today is data collection. And as data is collected, provided to the USGS, and they are able to develop the models. They have two already, as I said, you'll see later on, available to us.

We've initiated pumping restrictions within the two sands. We get quarterly pumpage data from the participants here. We monitor that to make sure that the pumping limits imposed are being met, and they are. We've not had a single quarter or a year that's exceeded these limits since they have been put in place recently.

CHAIRMAN ANGELLE: And the pumpage limits -- I'm sorry -- were put in place by the district?

MR. JENNINGS: Yes, that's correct.

CHAIRMAN ANGELLE: So the management of the district, the board of directors, whatever the number is, basically adopted a plan that had limitations on pumpage, and that stuff is reported to you-all on a regular basis?

MR. JENNINGS: Correct.

CHAIRMAN ANGELLE: Okay. So you have data that shows that those pumping limitations have produced a benefit, a recovery benefit, or perhaps a slowdown in what was originally happening?

MR. JENNINGS: Well, the pumping limits first imposed was in 1970.

CHAIRMAN ANGELLE: 19-- ?

MR. JENNINGS: '70 or '71, early 70s. And from that time, yes, the steady decline of the water level has stopped, it's leveled off. Again in the 80s, I believe it was the 80s or 90s -- yes, in the 1990s, that's before my participation, additional limits were put in place, and then more recently in the last two years.

CHAIRMAN ANGELLE: And so those pumpage limitations are on specific users, specific industries?

MR. JENNINGS: It's on the wells that we registered, which are the large volume -- or that we permit, actually. We don't register them, we permit them. And it is on those that are permitted because of they are large volume, large use wells; and we limit within a certain area, you know. Whoever meets those categories or, you know, size limits, then in that area that's the limits we post. Not necessarily going to each individual well owner and say, You've got to pump this much here. It's just within that area, that's what it needs to be or what it has to be.

CHAIRMAN ANGELLE: All right. So if you were there in 1970 or '71 and you don't need a permit, you get to pump as you did in '71? It's when you an apply for a new permit that that pumpage limitation is put on?

MR. JENNINGS: No. It's put on everyone within the sands that -- we have different limits within different sands, and I don't have that detailed information in front of me.

CHAIRMAN ANGELLE: Right.

MR. JENNINGS: But regardless of when your well was put in, if you meet those requirements as a high volume well, then you, as an entity, have to participate in reducing your pumping limits.

CHAIRMAN ANGELLE: So you-all obviously use science to help -- and I realize some of this started before your time -- but science has been the thing that you use to basically --

MR. JENNINGS: Right. It's always been. Now that's what we are doing is using these USGS models, using these models they developed, and the ones they will be developing over the next ten years, to run various pumping scenarios. And that's how we got to the most current pumping limits is we ran pumping scenarios on the 2000-foot, and I think we're working on the 1500 now.

CHAIRMAN ANGELLE: So if you would allow me to try set an analogy here that I could perhaps follow a little better?

So what I kind of sense is that the aquifer is a patient; and the team, the capital area is the group of professionals that are going to treat the patient, if you will, and come up with a treatment plan that includes a variety of things, including limitations and whatnot, all designed to get the patient better?

MR. JENNINGS: Yes.

CHAIRMAN ANGELLE: So what I'm trying to drill down on is, from where we are today, obviously

those things have helped. I'm trying to determine if they have been aggressive enough to get the patient where we need to get the patient.

MR. JENNINGS: Well, that's what we hope to find with the models that we run; because we run the models, it suggests certain treatments, if you will with the patient, and then we impose those. We look at it, take the patient's vitals. If they are improving, continue. If not, then there's something else that needs to be done.

Like I say, we're on two of the ten samplers. We're pretty much good, good for our modeling on the 2000. 1500 should be developed pretty soon.

You can go to the other slide and I can give you a schedule.

CHAIRMAN ANGELLE: Yeah. Before you do that, again I'm not -- none of my questions are trying to place blame, because we all got -- we all can show up when it comes to blame being passed out. So that's not it at all.

What I'm trying to look at, one of the slides that John Lovelace showed earlier was the 1966, and then the 1970, and then the 1975, and you get the continued expansion.

So I'm trying to determine, in a tactful way, in spite of those aggressive management efforts, in spite of doing those things and checking the vitals and so on, so forth, the area of saltwater intrusion has continued to grow. Has it grown at a declining rate?

MR. JENNINGS: Well, to answer that question, honestly I don't know because we don't have enough data right now to say that it's slowing down.

The movement of that plume is slow. So to say that that movement has slowed down, increased, whatever, from the time that we have been monitoring, or from the time that we've imposed these restrictions, there's really not enough data to say, yes, it started to do this.

That's one of the things -- there's two types of models that are being run on the 2000-foot is the availability, how much groundwater there is; the other one is the saltwater.

CHAIRMAN ANGELLE: So, the pumping -- I'm sorry -- the pumping restrictions were first placed in you said 1970.

MR. JENNINGS: In the early 70s, and that was because of the groundwater decline. The more recent ones and other actions that were taken in the 90s were

to deal with the saltwater encroachment.

CHAIRMAN ANGELLE: Got it. So there's not enough data there to yield whether or not we are slowing that down?

MR. JENNINGS: Well, we believe we can through these models. By instituting, running these different scenarios, there's a lot of different ways that you can, you know, turn pumps on, turn them off in this area, that area. You can shut down the industrial pumping altogether and it shows that the saltwater plume would head directly toward the pumping supply pumping wells. So that's really not an option at this time, you know.

But spreading out the location of the wells, as wells go out of service, or if it was severe enough and we got to the point to say, okay, you stop pumping and you can't use this, you have to relocate your well or your well field, I mean, those are all options of things to be looked at.

CHAIRMAN ANGELLE: Right. So if we go back to the previous presenter, they had a slide that again, that was on volumes, that was on withdrawals, and they showed 62 million and 52 million. That was the metric. And I know that that's what they were measuring. That's the important thing they were measuring.

You have some of that data. I get that. I understand on that.

You have in addition each year, not only just groundwater volumes, but is the saltwater issue?

MR. JENNINGS: Saltwater, correct.

CHAIRMAN ANGELLE: Are there any metrics at all associated with measuring saltwater intrusion and movement so that the public can get a feel one way or the other whether or not those efforts are yielding a slowdown?

MR. JENNINGS: Well, I believe we do. In answering that, we have historical data that shows the progression of the plume. Anything beyond that point is modeling, is subjective.

You know, we believe it's based on scientific data. And by running these models based on how the wells are pumped, how much water is pumped from that, we can show how the progression of that plume is progressing, is pulling back.

CHAIRMAN ANGELLE: I don't mean to belabor the point, but my last question -- and I understand what you're saying about the modeling. And I'm not a scientist, so you're going to have to help me here.

So what I'm kind of looking at is you have got historical measurement, so that's a definite

measurement of a place and a time. Right?

MR. JENNINGS: Right.

CHAIRMAN ANGELLE: And if we look at the last measurement, while the modeling tells us, perhaps if we did all this, we could slow it down, do we have anything that shows that it has slowed down?

MR. JENNINGS: I don't believe we do. You can back me up on that.

But I also believe that it's not been enough time to reflect that.

CHAIRMAN ANGELLE: Since the last time we measured it?

MR. JENNINGS: Measured it, that's correct.

Also, you know, you're talking about measuring something that's 2000-foot deep.

CHAIRMAN ANGELLE: Right.

MR. JENNINGS: So if you have a well here that is inputting, and you have here a well that's not, and that's a mile away, you know, there's not enough money to go and put monitor wells along the way to say, well, sure, it's not here. We projected it to be there, but it's not.

It's something, it's really difficult to predict; and you need good numbers, good science. And you need, you know, people such as some of the doctors

at LSU that are running their own models on it; and some of those reflect or are paired exactly with what USGS has been doing. It's almost an overlay of one another as to the plans that we want to put in place and how it affects the saltwater plume.

CHAIRMAN ANGELLE: My hope is that you don't take this as you as are a witness and being cross-examined today. I'm trying to get a conversation going here. I'm trying to find a metric. I absolutely believe that the public understands metrics, and trying to yield a metric out of this conversation, if we are going the right direction, we need to talk about we're going in the right direction, and we need to redouble our efforts to do what we need to do to get there.

But again, all this stuff is somewhat hard to project to the public if we're not kind of talking the same language. So I'm more trying to get on the same language. So again, please don't take it as a cross-examination.

You're looking at me and saying: I've handled bigger guys than you. Don't worry about it.

MR. JENNINGS: No, I just have my game face on. That's okay.

CHAIRMAN ANGELLE: You got your game face on. Okay. All right.

MR. JENNINGS: But I would like to, just to run through the end of it.

CHAIRMAN ANGELLE: Absolutely, sir.

MR. JENNINGS: At least through the list of aquifers that we're modeling and scheduled for that, so there should be a list coming up.

There we go.

Back to the fact of, you know, the funds and availability: We do have a schedule in place, money available from the Capital Area, from DOTD, East Baton Rouge Parish, East Baton Rouge Public Works, USGS. I believe that's all. I may miss someone. But anyway, they have committed funds.

We have an agreement with USGS to work this schedule, and it is flexible. You know, if we see that we need to move the 200-foot sand down and put the thousand foot sand up in the schedule, whatever, we have that flexibility to be able to do that.

And like I said, our management plan is in place. And our board, just like this board, has members that come and go, and the goal of that plan is that we stay in place, regardless of who is sitting in those chairs and making decisions on it; that that scientific data is coming in, it's handled and managed in the best way possible, and the best decisions are

made to provide ample water, groundwater for, you know, into the future.

Pretty much this just goes through how we look at the data of each sand.

You can go on to the next one.

So I'll take any other questions at this time.

CHAIRMAN ANGELLE: So when we go to the next item -- I know it will be another presenter -- the scavenger well that the Baton Rouge Water Works Company did, is that kind of a function of your management plan or is that something that they decided to do?

MR. JENNINGS: Well, it was in discussion between the Baton Rouge Water and Capital Area.

Of course it had to be, you know, someone with deep pockets to be able to put that in because that was very, very expensive. And that is one of the management functions. And probably the preferred one is a combination of installing an additional saltwater scavenging well and public reductions within the 2000-foot sand, because that one is in the 1500-foot sand.

And from looking at the models and trying different pumping scenarios and inserting the scavenger well within seems to get the best result long

term, protecting the other wells in the area, and having available groundwater for the future.

CHAIRMAN ANGELLE: So getting those vital signs and comparing those vital signs to the previous vital signs is just so important for our conversation. At the end of the day, we all want to go to the back of the book and see: Okay, yeah, it ends the process; yes, they working; yes, they are meeting; yes, they are grinding through it, and yeah, they are spending money. What are the results?

Again, as you know, having served the public, the public is very interested in the results.

MR. CAUSEY: Mr. Chairman, one question I have is, talking about those vital signs, I guess sort of my general appreciation is that you're not going to necessarily stop the saltwater migration.

I think we're just trying to get to -- maybe you could help me understand -- more of a steady-state scenario where your pumpage and the migration, perhaps with scavenging, allows you to continue to use the aquifers to the extent possible. Right?

MR. JENNINGS: Still going to have saltwater migration --

CHAIRMAN ANGELLE: Jake, before we do that, I

guess I'm supposed to say: How do we define success? If it's not stopping it and it's going to continue, at what continuing rate, continuing rate do we say, Job well done?

MR. CAUSEY: Yeah. Well, that's kind of my question to the Capital Area Commission. What exactly is that?

MR. JENNINGS: I believe that would be having the ability to control or remove the salt moving across the fault, because it's there. It's not -- I don't think anything you could do at this point that you could actually push it back through the fault.

If you're managing the amount of withdrawal from the north side of the fault, then you can slow down that movement through the fault. A well placed scavenger well can capture that so it doesn't affect wells beyond the fault. So you have again back to good water and a proper amount of water, and I think to me that's success.

Now I know at some point you have to have a number, you have to have the chart at the back of the book to say the chloride level went down in public supply well number whatever. It used to be 250, now it's 4.

And I think the guys from the Owen &

White can give you some indication as to what a scavenger well can do, so that may help with the back of the book.

CHAIRMAN ANGELLE: Who sits on the groundwater commission from -- is it John? Matt?

MR. ADAMS: Yes, sir.

CHAIRMAN ANGELLE: So as you kind of listen into this conversation, hopefully we can at the next meetings, as you kind of represent the state, DNR I guess, I think we've got to start driving towards some metrics that summarizes what John said.

I hear him. He's spot on.

But Jake and I are searching, and the others are up here searching for: What is success? How are we measuring that success? And if we're not there, what resources do we need to do it?

Because when we distill it to that level, then we get folks who can help us achieve that success. Otherwise it's just a conversation going on in some stone building in downtown Baton Rouge.

MR. REONAS: Yes, sir, I agree.

I think, you know, the ultimate goal, the mission statement, you know, in terms of dealing with saltwater intrusion is to stop saltwater intrusion from progressing further than where it is right now. I

mean, that's kind of the end; that should be the goal, the line of success, the one that the Office of Conservation has mandated -- not mandated, but has staked out, as look, this should be the end goal, recognizing, of course, that you're talking about, again, you're talking about a decade's long process, and it's been ongoing for decades.

But at this point in time, right now, that we know we have probably the best, clearest picture of what that saltwater intrusion looks like and the best projection, because we do have all that data now from the observation wells, the monitor wells. We have all that information right now, we can project that; that if we continue pumping at this amount in this particular well, then this saltwater will approach at this rate. And we can project that and model it, and it's pretty stark.

I mean, you talk about the industrial district, you also talk about public supply. You know, there's both. There's too much pull, as the Commissioner Office says: Too many straws in the same coke bottle pulling from too close to an area.

And you can look at the big potentiometric maps USGS puts out, as you know, and the closer you get into downtown Baton Rouge, the deeper

that cone of depression goes.

CHAIRMAN ANGELLE: Right. So I get the fact that we have a goal, everybody signs up for the same goal. The modeling kind of tells us what we need to do to be able to get there.

The remaining question that the public is begging to be answered is: Are those management tools and decisions working? As opposed to the model projecting that they are going to work, are they actually working?

MR. REONAS: Right.

CHAIRMAN ANGELLE: You know, again, there's a lot of comparisons. The one I think is simple would be, you know, the poll shows that candidate A is going to beat candidate B, but we've got to have the election to determine who is going to be the winner.

MR. REONAS: Well, at this point Capital Area has embraced the scavenger well concept in the 1500.

CHAIRMAN ANGELLE: Absolutely. And I under the process and I appreciate it, and I know that you're filling in the blanks by we're doing this, we're doing this. I'm totally supportive of that. I want to gold star award all those things.

Give me a number, give me something, that -- and if we can't, then I need to perhaps try to

reinvent or rethink how this Commission is going to communicate to the public that your Louisiana groundwater -- the Water Resource Commission is meeting. It's holding other folks accountable. And as a result -- and if there's not, we need to double-down or we need to get other people or other things.

Again, don't get lost in the process, because that doesn't get us where we need to be.

Anybody else? Jake, you're shaking your head.

MR. CAUSEY: I mean, I agree completely. And I guess, certainly I guess there's monitoring and things that have to occur.

But I guess one question that I had was, the plan or strategy that was I guess selected to be implemented now, I guess the model shows that that would accomplish the goal of bringing the saltwater migration to a stop, or did it only show that it would delay it or slow it?

MR. JENNINGS: I believe, if I'm correct, that by reducing pumpage and installing the scavenger well, that it would capture that and keep it from reaching other wells, and it would stop it, you know, where it's at.

CHAIRMAN ANGELLE: Okay. So we won't know

that for a period of time into the future?

MR. JENNINGS: That's correct.

As I'm using the table with my hands earlier, because of the distance from one well to the next, it just takes some time for the water to move and you wouldn't know until it was there. Or either you would know it's not there in the next 50 years, it's not there.

MR. CAUSEY: The scavenger well you're referring to is not the Baton Rouge Water Company scavenger well, but a new scavenger well?

MR. JENNINGS: Well, both of them. One is in 1500-foot sand the other is in the 2000.

MR. CAUSEY: I'm just curious. So the one that I guess is proposed, is a proposed scavenger well for the 2000?

MR. JENNINGS: A proposed scavenger well for the 2000.

MR. CAUSEY: And that's in the slides or not?

MR. JENNINGS: There's not a picture of it.

MR. REONAS: The one that's operational now is in the 1500. And Roy and Randy will provide that.

MR. CAUSEY: Talking about the 2000.

MR. REONAS: Right.

MR. OWEN: Mr. Chairman, I think that what's

missing from this discussion is the fact that the scavenger well that is now in existence and in operation is intended and is doing the job of intercepting the plume, not -- we've never proposed that that scavenger well will stop the saltwater intrusion in the 1500-foot sand. But we are intercepting and I believe that we are stopping the progression of the plume toward the public supply wells further north.

CHAIRMAN ANGELLE: And how are you measuring that for you to be able to say we believe we are intercepting and slowing or capturing the plume? What metrics do you have?

MR. OWEN: We take daily chloride measurements of the water.

CHAIRMAN ANGELLE: Right. So that is something that can again be put in a format that can instill confidence in the people in this area -- because that has a huge impact on a lot of discussion, has a huge impact on economic development, health and welfare, and to the degree that that is happening -- and I know that the Baton Rouge Water Company, at considerable expense, invested in that scavenger well, which is -- part of the conversation is that it's serving -- it's a private investment that in a lot of

ways is serving a public purpose.

MR. OWEN: That's correct.

CHAIRMAN ANGELLE: And, you know, that to me is another great way of contributing. There are other folks who are getting the benefit of that scavenger well who are not contributing to it.

MR. OWEN: That's right.

CHAIRMAN ANGELLE: Okay.

COMMISSIONER WELSH: I think one thing that's not been mentioned is the concept of saving the Baton Rouge aquifer drinking water and the industrial sand, both, what we've designed is a short-term plan and a long-term plan. I mean, if you look at it like that, the scavenger well that Mr. Owen has drilled and using would be part of the short-term plan to extend the life of your infrastructure; and new development would be away from that, you know, for the long-term use, and phase out the Lula Street area.

MR. OWEN: Well, Lula Street probably has a finite life, but the projections are that this scavenger well will extend the useful life of the Lula well system by about 50 years.

COMMISSIONER WELSH: And that would be considered short term?

MR. OWEN: Right. Well, depends on your

point of view.

CHAIRMAN ANGELLE: Well, again that's a great headline: Scavenger well to increase by 50 years. That's a prediction based on the best science.

And it would be really important again -- and I know I'm perhaps at the risk of repeating myself way too much -- it would be important if someone made a decision that, or projection that 50 years, that the life would be extended 50 years, 50 years is the sum total of some incremental years. And it would be important at some point, whether it's year one or year two or year five, to be able to get a number that shows: We are on our way to a 50-year extension.

And if not, maybe we could do something about it before we get to year 45 is kind of what I'm thinking about. Make sense?

MR. REONAS: Mr. Chairman, a large part of what the evaluation of Capital Area is focused on and of course that's depending a lot on the readings from the Baton Rouge Water Company, the progression of the scavenger well, to see if it's operational, what the numbers are coming out at. And again, it's early yet. It just went into -- I think the engineers can kind of give you an overview, Roy and Randy.

But, you know, so it's early yet in terms of: Is it working, is it not working. And I think at the point, if it's working, you continue with it and you build around it.

If it's not working, then you go to plan B. And I think that is, that's part of the evaluation process.

CHAIRMAN ANGELLE: Do you have any questions?

John, do you have any additional slides?

MR. JENNINGS: You can run through them. They all pretty much have been discussed.

So, no, that was it.

CHAIRMAN ANGELLE: Okay. Thank you very much. I appreciate it.

Thank you, Matt. I appreciate it as well.

We're going to go to Item 12, which is an update on the Baton Rouge Water Works Scavenger Well, and we've got Randy and Roy here; right?

MR. HOLLIS: Yes, sir.

CHAIRMAN ANGELLE: Thank you for being here. It's been a long day.

We now have had a Water Resource Commission that is in its seventh hour.

MR. HOLLIS: Mr. Chairman and Commission,

ladies and gentlemen, I appreciate the opportunity to be here and I'm honored to be here.

My name is Randy Hollis of Owen & White, and I bring with me Roy Waggenspack, also with Owen & White. And hopefully we can answer some of the questions that you just asked as we go through this presentation.

Hard numbers: The scavenger well is actually an intercepter well. We're intercepting the saltwater as it's moving forwards and moving 4000 pounds a day of salt that heretofore has never been removed. So we are intercepting it and removing it from the aquifer.

Now unfortunately groundwater moves like molasses, and that's the problem we have of finding -- we all want an instantaneous answer to something. I promise you, I want to know if this thing is working. It will be several years before we can definitively know the impact.

But what we do know today is we are removing 4000 pounds of salt every single day that has not been removed from that area before.

CHAIRMAN ANGELLE: You're disposing of it in an injection well?

MR. HOLLIS: No, sir. We actually have a

permit, or actually a Letter of No Objection from the DEQ and we're disposing of it in the Mississippi River.

Now let's not be confused: This is not saltwater like the sea, which is 35,000 parts per million of chlorides. These chlorides are about a thousand parts per million chlorides, so we're talking about one 35th the amount. So we're not dumping pure saltwater into the river by any means. So it's a very dilute -- if anything, it's a brackish water.

It's higher than that we can use domestically. The limit on that is 250. But that's why we need to remove it so that we protect these wells.

So I do appreciate the cooperation we've had throughout the past several years from DHH. Jake and his group have been really good because this is a potable water well, in combination with a saltwater well. It's been great to work with DEQ, USGS, DNR. Every agency has worked together with us to put this project in motion and we do appreciate the cooperation.

Let's go through. Okay. What I will cover today is a little bit of the background of where did we get the information to design this.

There have been many studies made of the saltwater intrusion into Baton Rouge, a lot of

theoretical models. All those have been very good. Baton Rouge Water Company actually commissioned two separate studies: From one Layne Hydro, which is a division of Layne, the large well-drilling group, and also Dr. Frank Tsai at LSU.

It was our job, Roy and myself, to take all these theoretical models and all this information and put it together into a nuts and bolts solution, to actually drill two wells -- two wells that have never been drilled this close together that we know of in the country -- to actually intercept saltwater and produce freshwater at the same time.

And so that's what we have accomplished here. And I think the data that you'll see at the end of this -- although we're engineers, we like to say the data looks very exciting, and we'll show that to you at the end of this.

We'll go through some of the analysis, how we physically constructed the well --

There we go. Thank you.

-- the start-up of the well. And then we've got some data that will show the chloride concentration and the flow for the well couple.

Okay. Now you can go.

What was the objective? The fault is a

long fault along Baton Rouge that follows about I-10. In a minute I've got a slide that will show you that. Our objective was to intercept the saltwater in the 1500-foot aquifer that was migrating northward from the Baton Rouge fault toward the Lula, the North Street -- North 45th, and the Government Street potable well fields. So that was our specific objective was to protect mostly Lula and then the other two well fields from saltwater intrusion.

Okay. What is the premise? The premise of our project was to construct a freshwater well pulling freshwater from the upper part of an aquifer in combination with a saltwater well pulling saltwater from the lower part of the aquifer that will allow a much greater capture of saltwater than simply the installation of a single saltwater well in the same aquifer.

Now that's a lot of words. What does that mean? We could have put in a single well. But if you put in a single well to capture saltwater, the zone of influence is very limited.

By coupling the saltwater well with a freshwater well, we're actually pulling more of the saltwater toward the saltwater well provided the aquifer stays stratified. And that's a very key

component of this. And I'll show you a slide in a minute. That means that saltwater is a little more dense, it stays on the bottom. Freshwater is on the top. And if we pump at the right amount with each of these two wells, we hope to keep those zones totally separate, stratified, and pulling together horizontally. And that is something that no one has attempted before, and that's why this is such an exciting project. And I'll show you some of the data from that.

Okay. Give credit to Layne Hydro. Some of theirs Ph.D.s that worked on this, Rhett Moore and Vic Kelson, did a very good job of it. They are a division of Layne.

Next slide.

We have to give credit to Frank Tsai, Dr. Frank Tsai at LSU, who worked with us also on his reports and analysis.

Okay. This is a slide showing the fault line through Baton Rouge. You've seen this before today. The fault line runs approximately along I-10 in Baton Rouge. And that's freshwater one side, saltwater to the south.

What you'll see above the areas in circles, you'll see the Government Street wells in the

circle to the right in the middle; and in the upper part, you'll see a circle and that is the Lula Street wells.

Okay. This is a cross section of the aquifers in Baton Rouge, the 10 aquifers that John mentioned a minuted ago. And it shows in blue the freshwater.

The recharge area is at the top in the left around Natchez. That's where the water fell approximately a thousand years ago in some estimates and has been going through the groundwater all the way down to Baton Rouge.

We'll see the fault line, the vertical line there; and on the right of that fault line is saltwater. It's mostly brackish water -- we all use the word "salt," but it's brackish. And what's happened is that water is coming across the fault and it is coming into the freshwater aquifers.

Okay. These are some projections in the 1500-foot sand, USGS, Dan Tomaszewski, in his report. And this shows the progression of the saltwater plume in the 1500-foot sand. Remember this is theoretical, you know. We have very few monitoring wells and most of this is theoretical.

We do know it has reached Lula because

one of the wells at Lula does have a high chloride concentration, Lula number 19. But you can see, 1966 is the first green line there, 1977, 1992; and then the top line right at the Lula Street pump station is 2005. So that's the progression of the saltwater plume coming in.

Okay.

CHAIRMAN ANGELLE: And we do not have any data after 2005 that could allow that particular graphic to be expanded?

MR. HOLLIS: We may, but I don't know --

MR. WAGGENSPACK: Back up one.

If you'll notice, part of what John's conversation was about, you need the monitoring wells.

Look at the dots. There's no dots between the yellow and the top one up at Lula, so you have no monitoring. That's all projected.

You need those monitoring wells to see where that line goes. We don't know what the chlorides are way to the west. We don't have a monitoring well over there to take it out to let us know.

So it's those monitoring wells, money to monitor what you want. If you want progression by years, it takes money.

John before us with DEQ was talking

about that. You don't have the data. You don't have the physical structure there to get the data.

CHAIRMAN ANGELLE: Right. And so the state, the public has a vital interest in knowing that.

MR. WAGGENSPACK: Correct.

CHAIRMAN ANGELLE: And you do as well?

MR. WAGGENSPACK: Correct.

CHAIRMAN ANGELLE: And obviously your asset, or the asset of your client is the ability to be able to produce fresh water and sell it; right?

MR. WAGGENSPACK: Correct.

CHAIRMAN ANGELLE: So you say that again? You said there are no dots?

MR. WAGGENSPACK: The dots are either wells or monitoring wells. That's where we collect the data. In the yellow down below the 1977 -- John Lovelace probably knows the numbers better than I do -- there's not a monitoring well between that one, all the way up to the Lula station. The nearest monitoring well is over to the right at Government Street, which is some of the Government Street public supply wells.

MR. HOLLIS: But let me chime in here.

You asked if there's any other data. We monitor the data at the Lula station frequently. We know the chlorides at Lula. So the 2005 is simply the

date that it hit the Lula station. So it hasn't left. It's still there.

CHAIRMAN ANGELLE: Okay. Maybe I'm asking an engineering question that you just said.

But inasmuch as the Lula station, the Lula field is where there is, you know, obviously maybe a withdrawal, it just doesn't have the ability engineering-wise, scientific-wise, to go any further? I mean, it would stop at the Lula station, wouldn't go any further; right?

MR. HOLLIS: Well, the cone of depression is the Lula station. So it's pulling everything toward it like a giant magnet. And so it will not move any further north than that because that's freshwater coming from the north to the south. So it will stop at Lula.

The problem is will the concentration get so high at Lula that we can no longer use those wells?

CHAIRMAN ANGELLE: So it's really not so much that it will go past Lula. The question is can we do things to have it actually recede or recede in concentration levels.

MR. HOLLIS: Correct.

CHAIRMAN ANGELLE: And receding in

concentration levels, by your body language, seems to be where you believe that engineeringly our solutions are.

MR. HOLLIS: We will show you that we can intercept the saltwater to some extent. We cannot pull it back from Lula.

CHAIRMAN ANGELLE: Right.

MR. HOLLIS: So the water that has passed the scavenger well that we have put in, that will continue to go to Lula. It's gone. It's going to get there. And the projection is it will be about five years before you'll see a major impact on the Lula station because groundwater moves that slow.

MR. CULPEPPER: Okay. Excuse me, Mr. Chairman.

It seems like you could really use two or three monitoring wells in the western part of that plume; is that right?

MR. HOLLIS: We would like to have a hundred.

MR. CULPEPPER: But it looks like that's where the real data gap is; is that correct?

MR. HOLLIS: Correct, yes.

MR. CULPEPPER: How much would it cost for three? Do you have any idea?

MR. HOLLIS: Monitoring wells are kind of

like a test well; you could be looking up to 75 to $100,000 apiece to put them in.

Okay. This was the area of the study. And this shows you: Green is the recharge area, which is, as you can see, is in Mississippi. And then what you'll see is the triangle area down at the bottom. And this is the very intensive part of the study. The brown area is an area of very low transmissivity. It's an area that's kind of like a clay or a sand that doesn't transmit water that well. So you can see, we've kind of got an area where the water won't go through too well to the west of us, and that just shows you the area of the study of the models. Okay.

This is an earlier one that shows the approximate flow across the fault. Now, this is a flow of about 900 gallons a minute that was estimated some 20 years ago, and everyone has kind of hung on that number. That's a theoretical number. I wish we had a flow meter. Nobody knows what the true flow across the fault is, but that was an estimate. And that is the projection of the saltwater plume for 2005.

Okay. This was the solution that was developed, to put in a one-million gallon intercepter well. And the area in red that you'll see is what could be captured by putting in one single well, a

million gallons a day in that area, which would capture the majority of the salt heading in that direction. It's not going to capture all of it, by any means, but enough that it will save the wells and give us about a 50-year life at the wells at Lula. Okay.

This piece of data is something I really like to see because the question was: Is the aquifer stratified? And what you'll see on the bottom right at number 1955, that is the bottom 17 feet of the aquifer when we went in and tested it, and it shows the chloride concentration at 1955.

The number right above that of 722 is only a 6-foot layer above that lower one which shows the chloride concentration of 722, and then the number above that, ND, says that it was non-detect in the upper part of the aquifer.

So what we're seeing in this data, what's really exciting is that the aquifer is stratified. We're seeing no chloride at the top and we're seeing the high concentration of chlorides at the bottom.

Okay. Now this simply shows freshwater in the top and the brackish water in the bottom in an ambient condition in the 1500-foot sand. Okay.

Theoretically what we would like to do is put in a water well that would pull the flow horizontally

into the freshwater and pull the flow horizontally into the brackish water and not mix the two at all; therefore, capturing as much of the saltwater as we can and pulling in freshwater. That's the concept of a coupled well is we're putting a saltwater well and a freshwater well right on top of each other.

Normally that is never done because you don't want to get the up-coning or the down-coning; but the theory is, can we pull the water in at the proper ratio to keep these two stratified?

We did that -- and Roy will get into that in a minute -- the pumping systems we used were VFDs, so we can actually control these pumps to regulate the flow up and down, to try and keep it stratified. Okay.

In reality here's what we had to install. We couldn't install one screen vertically all the way down, so we had a screen in the upper part of the aquifer, we have a second screen in the lower part of the aquifer, and they are actually separated horizontally by about 15 feet because you can't drill them right on top of each other.

But to think that we went down 1600 feet and we had them separated horizontally by only 15 feet, I have to give a lot of credit to Layne for doing a very good job of keeping those wells separated and working

as well as they are.

MR. WAGGENSPACK: And to give you a perspective what was actually built: That sand is approximately a hundred feet thick. They put 30 feet of screen in the saltwater aquifer down at the bottom and put 40 feet of screen up in the upper part of that aquifer. So we've got 70-foot of screen in an approximately hundred-foot thick sand.

MR. HOLLIS: So they are only separated by 30 feet. Okay. Next one.

All right. I'll turn it over to Roy for a minute here and talk about construction.

MR. WAGGENSPACK: Well, we were just going to go quickly over construction.

As Layne was doing the report and coming up with the theory, the water company quickly had a target area in which to try to find land to drill these wells on.

I wasn't involved in land acquisition. I do know it took year, year and a half to actually find the site.

This is the actual site that was finally they could get, purchase the property. The large street at the bottom is North Street, and it's 31st and 32nd Street are the two streets going toward the top

of the page to the north.

That's how the wells were drilled. The potable production well was to the south, toward North Street. And we had to label the saltwater well -- there's not a registration in DNR for saltwater wells. It's a dewatering well. We're trying to draw the water table down, draw that saltwater level down in that area. It's registered as a dewatering well.

Next slide.

Just to give you some idea: That was the site. It was an old subdivision. The homes have been gone for years.

The tree to the left was a community congregation area in this neighborhood. The water company wanted to be a good neighbor. The well driller wanted that tree gone. Well drilling is a lot easier on a clean site. The water company wanted -- actually, Mr. Owen -- wanted to save that tree and work around it try to get these two wells in. We did. We got an arborist in and saved that tree.

Next slide.

Some of the construction problems with the well -- just drilling the wells and the concept of the wells is the easy part. Taking potable water and putting it into the distribution system, which is right

there on North Street, is the easy part. We do that every day in the utility business.

The hard part of this project, which you've already raised the question, was the saltwater well and what are we going to do with the saltwater once we get it out the ground. Nobody wants it. If you know somebody wants to buy it, Mr. Owen will gladly sell it to them, I imagine.

We had to design a pipeline and work through the permitting process and we started looking at Capitol Lake, to dump it into Capitol Lake. That was waived and passed over.

We worked it out with the highway department and DEQ to take it to the Mississippi River -- and DNR. So that's the pipeline route that left that North Street site, taking it over to the Mississippi River. So that's through city streets, going under state highways, going under the interstate, going under the railroad, and getting into the drainage system right at the batture we put it into the Mississippi River. That's the pipeline route.

We had to cross Capitol Lake. As you-all all know, the shape of Capitol Lake looks like the Capitol. We had to do a boring underneath Capitol Lake there to get to our discharge point. Finding a discharge

location was tough.

CHAIRMAN ANGELLE: So it has no value, commercial value because its chlorine content is too low?

MR. HOLLIS: Right, right.

MR. WAGGENSPACK: And the transportation cost to get it to whoever wants it too would be another problem.

MR. HOLLIS: Because it does have chlorides in it, every part of that pipeline is built PVC, non-corrodible materials. So there's no dark alarm danger or anything. It's all plastic, PVC, polyethylene.

MR. WAGGENSPACK: Next slide.

Another quick slide just to show you the construction on that site. There's the rig actually set up by that tree to drill the first of the two wells.

Next one.

The saltwater well is all stainless steel. The casing pipe, the pump, everything, every component in there is stainless steel for corrosion purposes.

Next one.

And then just real quickly, to run

through here, the development of a well, if you have never seen a well developed, that's air lifting water and developing the screen to get the mud out of the screen and all. It's a pretty violent reaction. We thought it was a neat picture. We'll run through these. Everybody has been here a long time.

The same thing, that's the water being discharged from the well.

You can go to the next one.

There's the finished product of the two wells. The public supply production well is the one on the left, the saltwater well is the one on your right. I think we have about two pictures of this.

That's the site finished with the control building to the right.

Randy wanted to bring that up. We have variable frequency drives on these submersible pump motors, and we can vary the speed of the motors to vary the production that these wells put out to get us close to that total, that 900 gallons a minute or a million gallons a day, whichever in that range, 7 to 900 gallons a minute. So that's it.

Next one. We'll get to some results here at the end.

Again, I'll let Randy run through some

of the results that we've come up with.

MR. HOLLIS: And these wells are fairly new. This is February of this year, you'll see the data. So it's just gone into production this year.

And you'll see on the left, the North Street production well. The upper part is freshwater sands, and you'll see chlorides running from 124 to 135; and that's the upper part of the aquifer.

And the secondary limit on chlorides is 250, so that is a great production well and that water is being used for production in Baton Rouge. It's not being wasted.

What you'll see in the middle column is that's the lower part of the aquifer. And that's the very bottom, that's the scavenger well. And these are discrete samples that were taken, and you'll see 573 down to 1491. So here again we have our stratification.

With those screens only being 30 feet apart, we've got 120 at the top, and basically that's 600 at the bottom.

And then on the right you'll see Progress Park Observation Well. That was a well that Baton Rouge water drilled, and that's kind of our monitoring well that's located between here and Lula,

between this station and Lula. And that shows the discrete sampling from that well, which is located about a 10th of a mile away. Okay.

This is the data. And this shows you, the green at the top, the chlorides from the scavenger well. We started about 1100 or so; and as you see as we're going along, we have settled down now to about 830 parts per million of chlorides. And so the wells have really stabilized now. We do have the VFDs, we can control the pumpage rate, but we want to do this very slowly. It's not something that you tweak every minute or every day.

So we've tried to maintain a very consistent flow rate with the wells to see how it was performing. And what is exciting about this, the blue line at the bottom is the chlorides in the freshwater. We started out originally about 150, went up to 200; and what we've seen since then in the most recent data is we're seeing chlorides now about 100 to 105 or so. So what we're seeing is a continuing decline in the chlorides in the freshwater. And here we are pumping saltwater 30 feet away.

And so we can gradually -- we could make an interpretation of the data. At the top the saltwater looks like its increasing slightly. So the

concept of this well of having stratification in the aquifer and being able to pump two wells together for the sole purpose of increasing the capture zone of the saltwater appears to be working really well, and so that's the data that we have.

It's encouraging. We won't know for several years the impact, but we do know for a fact we're removing right at 4000 pounds of salt every day from this system.

CHAIRMAN ANGELLE: Do you have any data that shows what's happening at the Lula Street?

MR. HOLLIS: Yes, we do.

And Baton Rouge Water I'm sure can give that you from the Lula Street wells. I would love to say we're encouraged, it looks like its declining there; but that would simply be speculation because, theoretically, we shouldn't see a major impact for five years. But it looks like we are seeing some impact there.

MR. OWEN: I think it's too early to measure, but we do know this: That the indication -- and this is very slow -- the annual increase in chlorides at Lula at well number 19, which is kind of the sentinel well, has been very slow, but it's been an annual increase of about 10 milligrams per liter of chlorides.

Insofar as being able -- we have not seen an increase in those chlorides since this well was begun.

CHAIRMAN ANGELLE: Okay.

MR. OWEN: And that's the best method we have now, except the metric in the production well is now going down on the chloride content, that production well and the scavenger well.

CHAIRMAN ANGELLE: So the production well that's next to the scavenger well, that water is eventually put into the distribution system?

MR. HOLLIS: Oh, absolutely, chlorinated with chlorine and ammonia used in the system, just like any well in the system.

CHAIRMAN ANGELLE: Is it displacing any volume that was coming from Lula or it's in addition to?

MR. WAGGENSPACK: Well, displacing because they are not running Lula as hard --

CHAIRMAN ANGELLE: I'm sorry?

MR. WAGGENSPACK: It's displacing as a substitute, because the production they had there is a reduction at Lula.

MR. HOLLIS: And these wells are being run 24 hours a day nonstop.

CHAIRMAN ANGELLE: And over a period of time if you are able to reduce chlorides at Lula because of what you're doing here, and you have a demand in the Greater Baton Rouge Area for additional water resources, would you then be able to return and use Lula as a functioning asset?

MR. HOLLIS: Lula is a functioning asset now. It's continuing to be used.

CHAIRMAN ANGELLE: Well, I guess I didn't understand the answer.

MR. WAGGENSPACK: In the water production, they are turning wells on and off all day long based off of demand and filling tanks. And Dennis would be better to speak about it.

But wells are used according to where the demand is, and all they have done is shifted that slight amount, because the production at this production well, as you can see on the right there, is just under 500 gallons a minute.

CHAIRMAN ANGELLE: I guess I thought I understood when I asked the question about, is Lula in operation, and you said no, this is a replacement.

MR. WAGGENSPACK: No, no. The 500 gallons a minute is all that's being replaced. There's many millions of gallons still going out of Lula every day.

CHAIRMAN ANGELLE: Okay.

Any other questions?

Again, I think this is good information. You know, the Commission is going to continue to seek that kind of data and those metrics so that we can speak to stakeholders on what's going on. The more the merrier. The information that you can provide I think helps us to do our job, and we need to be transparent to the community. To the degree that you can help us, it's very important.

MR. HOLLIS: Yes, sir. Thank you.

CHAIRMAN ANGELLE: Okay.

The final scheduled item is item 14. And Mr. Chip Groat with the Water Institute of the Gulf is here to make a presentation. Thank you so much for being here. I know you've kind of sat through the entire agenda.

Again, we appreciate the work that you have done in the past for Louisiana and currently with the Water Institute of the Gulf.

MR. GROAT: Well, thank you, Mr. Chairman.

You know, in show business, the headline act is the last act, the one next to closing; so I'm honored by my position on the agenda.

CHAIRMAN ANGELLE: Don't take too much

credit. I'm not sure how that happened.

MR. GROAT: Thank you.

Thank you. It is a good opportunity to have sat here through the session because I learned a lot about all the things that are going on. And one of the things I'll say about the Water Institute is that our role in water resources, beyond what we're doing in coastal areas now, if there is one, will be to try to fill gaps to help meet unmet needs. And certainly there are a lot of needs that are being met. And part of the challenge is determining those that need to be met.

Just for those of you, we're not a household word. We've only been around two and a half years, February of 2012. We are a 501(c)(3) not-for-profit independent applied science organization, and were really created by three-fourths of the state of Louisiana who was particularly CPRA interested in creating an ongoing capability to bring applied science and high quality science into the Coastal Restoration and Protection Program.

Baton Rouge Area Foundation, who had similar ideas, and as did Senator Landrieu, and so understandably we have focused now on the fact that the kind of organizations we are makes us independent and

that we have aspirations for not only bringing that expertise into the coastal program in Louisiana, but also around the world, modeled somewhat on the Altaris, [phonetic] the Netherlands' organization that has done that.

But we are different from universities in the sense that we are really oriented towards the practical application of science and engineering, and that it should benefit society in some way. So basic fundamental research is extremely important, but our job is to do more of the applied types of programs.

I would use this as a lead-in to say "water" isn't our middle name. It's our first name, Water Institute of the Gulf. And while CPRA is certainly most interested in seeing us develop our capabilities to support their activities, Baton Rouge Area Foundation, Senator Landrieu had some thoughts that water meant water, without saying exactly what that meant. So we're in the process right now of applying our work and our program, and funding is coming from things that are of interest to CPRA. And we're very happy to do that, and we see that as a key part of our future certainly. But we are exploring what water means in the Water Institute of the Gulf's name and ultimately in its program.

There are three things that characterize our work in the coastal and Mississippi Delta area that I think is important, and one of those is integration.

You see coastal deltas and coastal communities and water resources in the center there; but in the outer ring we try to bring together, not only in-house capability to provide information, data and understanding, but also the ability to bring a lot of different components together. So that integration of others other than ourselves into this process is extremely important.

Also, the other thing that we're focused on -- and it will extend into what I'll talk about in the water -- is that it's a matter of getting knowledge into action. And you all know watching sometimes the science community is not always the best in communicating to those other than itself. And so how you turn what we gain in understanding and what others have gained in understanding into the action that supporting agencies anticipate; in other words, into good decisions for good projects and good activities. So we're committed to being effective communicators, as well as being effective scientists and engineers.

And then finally -- and this is the key part of what we do in anything we do -- is we certainly

don't claim to have, nor will we ever have all the expertise that's needed in whatever area we work in. We depend on linkages, partnerships and collaborations with private sector, with academics, with federal and state agencies, and with NGOs. In fact, these partnerships are extremely important in doing what we do.

42 percent of the money we receive to do coastal work goes back out the door to partners and collaborators, so it's an extremely important dependence for us.

There are two or three areas I wanted to briefly run through for you. Where we are, exploring opportunities that add dimensions that relate directly to water resources, and one of those is directly related to the fact that we were employing, able to employ Kai Midboe in this area.

Tying science -- tying law and policy to good science is something that can be done from a distance or it can be done internally. And if the Water Institute has developed, as we think we have, strong capabilities in that applied science area, how can you be effective in making sure that it does get translated into law and policy? And how can you link law and policy research to technical capabilities?

So one of the things Kai has encouraged us to do -- and we're in the process of doing -- is to recognize that in Louisiana, at LSU, at Tulane, and certainly at Loyola as you heard this morning, and at Sea Grant, there are legal forces that work on policy and legal aspects of good science and good application of science.

And we're not proposing to build an internal staff in this area but, as we have with our partners and our collaborators, the idea is that, if we could be a catalyst or an operating base to bring those people together to deal with law and policy issues and to work effectively towards infusing good science into those law and policy issues, then we will have done something that hasn't been replicated in many places; not only hasn't been replicated in Louisiana, but outside of Louisiana and outside the Gulf and perhaps outside the U.S. So there are national opportunities here if we can pull this off and international opportunities to make Louisiana an example of how good law and policy are based on good science and good engineering, and we've brought those under a common umbrella.

A second area is trying to identify gaps. We heard a lot today about some really excellent work

that's going in the USGS and the Office of Conversation and various organizations, and certainly the Nature Conservancy, in gathering information about Louisiana's water resources. And that information base is extremely important if we're going to effectively manage those resources.

But we also heard, Mr. Chairman, from you and I think from Dian that the process of deciding what the management scheme is going to be and how it's going to be implemented is not something that's done overnight. It's something that has to be done in a very studied way.

And our point of view in this is that this good management does depend on a firm technical base. And do we know everything that we need to know to do good management? And if there are areas where we don't, how do we set the priorities to gather that information?

And we're not proposing in any way the Water Institute would be that instrument, but we might help identify things that are important to be done where more funding might be needed by the USGS or the Office of Conservation for more monitoring and more modeling of information.

So we proposed a thoughtful process of

looking at the basins across the state, the groundwater and the surface water basins, identifying where there are perceived or real management needs in the future, determining where we do have information available that's adequate and where we don't, and using that as the basis for making recommendations about the kind of gaps that need to be filled to know the kind of water code that this Commission anticipates being the key player in. So that is an operation that we think is extremely important.

And I think you used the word earlier, Mr. Chairman, budget. We have to understand our water resource pays in a comprehensive way. There's a story in Texas, when they were launching into their water management plan, their water planning plan, that they went to the governor, Governor Bush at the time. They said, Look, Governor, we've had draughts. We have some severe issues here that need to be dealt with. We need to plan for them very carefully if we're going to use our freshwater resources adequately, and we're looking for your support.

Governor Bush supposedly turned and said: Gentlemen, just how much freshwater does Texas have? They kind of looked at him blankly and it turned out they really didn't know. We knew a lot about certain

areas, didn't know a lot about others.

So we didn't want to be in that position where good regulation, good policy, good implementation of laws are lacking because we didn't have an adequate technical base. So we want to see data as a parallel part, the budget part, in development of the code. We would like to help move that part along.

And finally we're engaged in a process that recognizes I think the point that Senator Long made very dramatically: There are only six states where water is seen as a surplus. Most states are fighting over water.

And so how do we celebrate the fact that Louisiana, while it has challenges and it has competition for its water resources in various areas and so it's not a perfect world; but on the par, on the whole, we are blessed with an adequate supply of fresh water. And the stories that are in the newspapers around the country are generally about drought in California and Texas, about the water wars in Atlanta, which is an area that was considered well watered at one time.

So how do we take the good story of our resources and make it part of our economic development scenario? And we're piloting in the capital area an

effort to bring people together who depend on water to work, to live and to play, and let's in a sense celebrate the fact that we've got water. Sure, we've got management issues, a lot of challenges that we heard about today; but let's get some input into how we point out to people how important we take water to be in the capital region, and how we are going to design ourselves in ways that make sure that water is here in perpetuity for, not only the next 50 years, but for generations to come. So we're doing a focus group just in a few hours to bring some of this kind of information together.

And then let me close with the idea of going back to communication again. Decision support.

How does science and engineering get communicated to those of you that have to make decisions about how we do manage, how we do regulate, how we do make sure that our resources are viable and useable in the future?

And as I said earlier, we aren't always the best at it in the scientific community. But there are some people who are pretty good at that. And so we're exploring in our efforts to bring science and policy together within our own research program a cooperative relationship with IBM, who has a track record around

the world, and particularly in their Smarter Water Program in Holland and Galloway Bay, of turning needs of information all across the sectors, from private sector, public sector and regulators and policy makers, into systems where models and monitoring information is turned into decision-support tools that are useful to people who do make decisions. And so we're looking at a pilot program with IBM to take our internal capabilities, those of our partners and our collaborators, and the needs that you all have for that kind of information, and be creative about translating science and engineering into meaningful policy and meaningful decisions.

So that's it. That's a shot at where we are. It's a very embryonic effort in water resources, but we think we can add some value in some places, and encourage you to explore our website for more information about the Water Institute. We're twittering and tweeting and twitching and doing all of those things the social media calls on; so if you go at things that way, I think you'll find some things useful there as well.

Thank you.

CHAIRMAN ANGELLE: Thank you so much, Chip. I appreciate your being here.

A couple of things: Certainly I would like to visit with you and perhaps Commissioner Welsh and others on trying to draft a particular couple of deliverables that I kind of came up with in my head as you were kind of going through your capabilities. I know I had the chance to visit with you about some of the those capabilities, and I think you kind of nailed some of the things that I think we need to do, what we talk about, answering that question that was put to Governor Bush in Louisiana right.

So how much do we have? How much do we need? We have an unbelievable opportunity to tell the world to come be a part of our economic development operations here because we have it. And not only do we have it, we have a plan that says we are going to have it. And certainly some of the economic development assets are 50-year-type assets, so we have to be able so to speak to that. So certainly we want to work with you on that.

A couple of things that are pretty obvious to me, as I was sharing with Karen at the break: Heard today that we have an 87 percent compliance rate for those wells that require prenotification. And I heard folks say that that number is through the roof from where it was just a

couple of years ago.

You know, we set out, the state had no education efforts other than what Lindsey was doing in north Louisiana. Matt is doing some things here. Lindsey is going to help us perhaps take what she's doing in her area and export that to other parts of the state.

We talked about a robust monitoring program, an improved monitoring program that we all know we absolutely have to have. We have to have that data to be able to make decisions.

The legislature has stepped up and certainly has requested the LSU Law Institute to help, now having looked at phase one, phase two, which is, you know, perhaps the beginning of some written law with regards to water law; and using all of the things that we're learning obviously hopefully yield a great product.

And the thing that I think was, you know, you and I, our discussions, making sure that we had all the law, we had all the monitoring, and we had all those things, that we clearly understood what our needs were and from I think you used the word budget. So I'm looking forward to working with you on that.

We have a lot of balls in the air,

probably more balls than I think we've ever had in this commission. A lot of good things happen at the same time, and I think that's really good stuff. So thank you for being here. I'm looking forward to visiting with you soon.

Thank you.

Any questions for Chip?

Okay. Thank you very much, sir.

We're going to go ahead Item 15, Public Comments. And anyone what wants to make a public comment, please come forward, take a chair, introduce yourself and have at it.

And seeing nobody really jumping up and down, I do want to encourage members, as you come up with ideas of what you believe ought to be discussed as a part of our agenda, send them in to staff, point them in the right direction. Let's get some, you know, some additional things on this agenda.

The law requires that we have two meetings a year. In the past we've had as many as six and four. Last year I think we had two. I'm hopeful to have another one perhaps in the fall and another one towards the end of the year.

I think the next one ought to be somewhere else other than in Baton Rouge. Perhaps we

could go to north Louisiana.

Mr. Ted has come from Ruston. It's a tremendous, tremendous public service to drive four hours here and to go four hours back. Right? And the pay is out of this world, so we appreciate that, sir.

And again give the opportunity for any of the commission members to make any comments.

MR. McKINNEY: May I make a comment?

CHAIRMAN ANGELLE: Yes, sir. Please.

MR. McKINNEY: This is my last meeting. My term expires in September. And I want to personally thank you and your staff and all of the staff members, in particular Ms. Charlotte and her kind words and everything she's helped me with; but to give me this opportunity to serve in this capacity, I've really enjoyed it and it has been an honor and I thank you.

CHAIRMAN ANGELLE: Appreciate your service.

You certainly over the years have helped put some things in front of us that I think we were forgetting about. And Sparta has led the way for I think the conversation that's gone on in Louisiana, as really sort of the epicenter of that conversation has been Sparta. So thank you very much, Mr. Ted, appreciate your public service.

Good. Hearing no more conversation,

I'll entertain a motion to adjourn. And I saw five hands go up at the same time.

So we have a motion by Jake and a second by Karen.

Any objection? Any discussion?

All right. That motion is adopted.

* * *

(Whereupon at 2:55 PM the meeting adjourned.)

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STATE OF LOUISIANA

PARISH OF EAST BATON ROUGE

REPORTER'S CERTIFICATE

I, ESTELLA O. CHAMPION, Certified Court Reporter and Registered Professional Reporter in and for the State of Louisiana, Certificate Number 76003 (in good standing), as the officer before whom this proceeding was taken, do hereby certify that on July 30, 2014, the foregoing 247 pages were reported by me in the Stenotype reporting method, that said transcript was later prepared and transcribed by me or under my personal direction and supervision and is a true and correct transcript to the best of my ability and understanding; that I am not related to counsel or to the parties herein, nor am I otherwise interested in the outcome of this matter.

Baton Rouge, Louisiana, this 25th day of August, 2014.

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ESTELLA O. CHAMPION, CCR, CRR