No. 142, Original

In The
Supreme Court of the United States

STATE OF FLORIDA,

Plaintiff,

v.

STATE OF GEORGIA,

Defendant.

DIRECT TESTIMONY OF HAROLD REHEIS, P.E.

October 26, 2016

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I, Harold Reheis, P.E., offer the following as my Direct Testimony.

I. INTRODUCTION.

1. I served as Director of the Environmental Protection Division of Georgia's Department of Natural Resources ("EPD") from 1991 until July 2003. In my capacity as Director of Georgia EPD, I managed all state environmental programs covering air and water quality, water resource allocation, solid and hazardous waste, ground water protection, the State Geological Survey, and other programs. An important part of my job as Director of EPD was ensuring that Georgia is a good steward of its natural resources, including water resources, while allowing for responsible water use that supports Georgia's robust economic activity and strong communities.

2. Georgia made significant progress in managing both municipal and industrial ("M&I") and agricultural water use during my tenure as EPD Director. With respect to M&I water use, Georgia passed into law the Metro District Act. That law established a water planning district covering the entire Atlanta metropolitan area, and tasked that district with developing and implementing long-term water management conservation plans. Georgia also adopted a state-wide Drought Management Plan, which provided for increasingly strict levels of municipal water use restrictions depending upon the severity of drought conditions (leading up to a total ban on municipal outdoor water use), and also included proactive pre-drought strategies.

3. In response to a combination of factors that indicated increased management of agricultural water use may be warranted, in the late 1990's, Georgia took a number of proactive measures to better understand, plan, and manage agricultural water use. Specifically, in 1999, Georgia placed a moratorium on new irrigation permits in the Lower Flint River Basin, which ultimately lasted over six years. While the moratorium was in place, Georgia conducted a Sound Science Study to improve Georgia's knowledge regarding the scale and potential impacts of agricultural water use in the ACF Basin. Georgia studied data and improved its database on the amount of irrigated acreage in the ACF Basin and irrigation application amounts for different crops and climatic conditions; measured annual and monthly distributions of agricultural water use on a number of farms in the ACF Basin; and worked with the United States Geologic Survey

("USGS") to develop an advanced hydrologic model to study the impact of groundwater pumping on streamflows.

4. In 2000, while the Sound Science Study was ongoing, Georgia passed innovative legislation allowing the State to administer an auction to take acreage out of irrigation when severe drought conditions existed in Southwest Georgia. Georgia conducted these auctions in 2001 and 2002, at a total cost of nearly $10 million dollars. The next year, in 2003, Georgia passed legislation requiring the installation of flow meters on irrigation withdrawals, to further improve Georgia's knowledge with respect to agricultural water usage across the state. I describe the history and details of these measures below.

II. PERSONAL AND PROFESSIONAL BACKGROUND

5. I hold a bachelor of engineering degree in civil engineering from the Georgia Institute of Technology, and a master's of engineering degree in environmental engineering from the University of Florida. I am a registered professional engineer in the states of Georgia, North Carolina, and South Carolina. I worked for EPD from 1969 through 1981, starting as an entry level engineer and working my way up to become the Section Chief of Water Quality Control Section of EPD.

6. From 1981 to 1983, I worked as a consulting engineer for a private engineering, planning, and consulting services firm called Jordan, Jones and Goulding. There, I managed approximately one quarter of the staff, and prepared reports analyzing issues relating to wastewater, water supply, and solid waste management. I returned to EPD in 1983 as Chief of the Land Protection Branch, where I was responsible for administering Georgia's laws and regulatory programs for managing solid waste, hazardous waste, erosion control, surface land reclamation. I was promoted to Assistant Director of EPD in 1984, and Director of EPD in 1991. I retired as EPD Director in July 2003.

III. GEORGIA'S MANAGEMENT OF MUNICIPAL AND INDUSTRIAL WATER USE.

7. During my tenure as Director of EPD, Georgia grew at a significant pace, with Georgia's population growing from approximately 6.5 million in 1990 to over 8.2 million by the year 2000. Much of that population growth (and corresponding economic growth) occurred in

the Metropolitan Atlanta region. As EPD Director I sought to manage water use to accommodate this growth while ensuring that Georgia efficiently and responsibly managed the resource for the benefit of future generations. Two examples of significant M&I water conservation efforts that occurred during my tenure as EPD Director are the Metro District Act and the Drought Management Plan.

A. The Metro District Act.

8. During the summer of 2000, the Metro Atlanta Chamber of Commerce and the Regional Business Coalition created the Clean Water Initiative ("CWI") to develop ideas for better managing water quality and quantity in the Atlanta metropolitan area. I served on the CWI, along with thirty six business leaders, environmental activists, and state and local government officials. The CWI used the consulting services of the Boston Consulting Group (which provided its services on a pro bono basis), interviewed hundreds of water and environmental professionals, and received substantial public input during eight heavily-attended public meetings held from May to October 2000. The CWI released its Final Report in November 2000. GX-0014 is a true and correct copy of the CWI's Final Report. I understand that it is maintained as part of the official records of Georgia.

9. The CWI concluded that it would be beneficial to water quantity and quality in the area to create consistency across the many local government jurisdictions in Metropolitan North Georgia regarding how they managed storm water, storm water runoff, water conservation, and other aspects of wastewater management and water use. To accomplish that, the CWI recommended the creation of a Metro Atlanta Water Planning District to develop watershed management plans for the greater metropolitan Atlanta area.

10. Georgia Governor Roy Barnes agreed that a water planning district should be created in the Atlanta metropolitan area, and requested that I, together with Joseph Young, an attorney for the Governor's office, draft the Metro North Georgia Water Planning District Act (the "Metro District Act") to establish such a district. The Metro District Act was passed by the General Assembly during the 2001 legislative session. Governor Barnes signed the law on April 5, 2001 creating the Metropolitan North Georgia Water Planning District (the "Metro District").

GX-1265 is a true and correct copy of the Metro District Act. I understand that it is maintained as part of the official records of Georgia.

11. The Metro District Act created a Water Planning District Board to manage the business of affairs of the Metro District comprised of twenty-nine members, ten of whom are appointed by the Governor, Lieutenant Governor, and Speaker of the House of Representatives. The Metro District Act mandated the preparation of three long-term water plans for the Metro District: the Water Supply and Water Conservation Management Plan, the Wastewater Management Plan, and the District-wide Watershed Management Plan. It detailed a list of minimum elements to be included in such plans. It also required that local governments within the Metro District implement the applicable provisions of those plans.

12. Soon after passage of the Metro District Act by the Georgia General Assembly, the Metro District got to work developing the first round of long-term water plans, which were due to be completed in 2003. EPD provided general direction to the Metro District and its consultants regarding the content of the plans, and answered questions and provided information to the Metro District as it put the plans together. I retired from EPD in July 2003, shortly before the first round of Metro District plans were approved by EPD. I have continued to follow the water planning process thereafter.

13. I am aware that the Metro District's 2003 Water Supply and Water Conservation Management Plan included a number of aggressive water conservation programs, including conservation pricing, replacing older, less efficient plumbing fixtures, rain sensor shut-off switches on new irrigation systems, commercial and residential water audits, and measures to reduce water system leakage. I am also aware that the 2009 Water Supply and Water Conservation Management Plan built on these water conservation measures and added new ones, including high efficiency toilet/urinal installation in government buildings and water recycling in new car washes.

14. The results of these water conservation measures have been phenomenal. For example, I am aware that since creation of the Metro District, the Metro District has seen a significant reduction in overall water demand and per capita use, even though total population increased by more than one million people over the same period. I am thankful that the General

Assembly took action to form the Metro District during my tenure as EPD Director, and I am proud of the remarkable progress that the local governments in the Metro District have made with respect to water conservation since the passage of the Metro District Act.

B. Georgia Drought Management Plan.

15. In response to drought conditions that Georgia experienced during the late 1990's, EPD began to work on developing a state-wide drought management plan, which would provide a comprehensive framework for responding to and mitigating drought conditions throughout the state. To put together a draft plan, EPD worked with relevant state agencies, as well as nearly 100 stakeholders with an interest or expertise in water related matters, including academic experts, and representatives from industrial, environmental, and water management groups.

16. While these efforts were ongoing, during the 2001 legislative session, the Georgia General Assembly passed SR 142, which created the Joint Water Plan Study Committee (the "Joint Study Committee"). The Joint Study Committee was composed of 23 members, including four members of the Georgia Senate, four members of Georgia's House of Representatives, as well as members from county government, city government, wildlife conservation groups, agricultural conservation groups, and state agencies. I served on the Joint Study Committee in my capacity as Director of EPD.

17. The Joint Study Committee was tasked with undertaking a study of the water resources issues facing Georgia, including water quality and quantity issues, and recommending actions or legislation it deemed appropriate. When the Joint Study Committee issued its Final Report in August 2002, one of its recommendations was that EPD should implement a statewide drought management plan and develop early drought response strategies designed to mitigate the impacts of drought conditions before they become severe. The Board of the Department of Natural Resources (the "DNR Board") approved a comprehensive state-wide management plan in March 2003, which contained a number of pre-drought mitigation strategies and drought response strategies (the "Drought Management Plan"). JX-161 is a true and correct copy of the Drought Management Plan.

18. Under the Drought Management Plan, EPD was required to regularly monitor drought conditions by looking at a range of independent climatic indicators. If certain conditions

were met, the EPD director had authority to declare four different levels of drought across the state and place correspondingly strict restrictions on municipal and industrial water use, up to a complete ban on municipal outdoor water use. The Drought Management Plan also included proactive pre-drought strategies designed to minimize the potential effects of drought before they became severe, including water conservation measures and a non-drought outdoor watering schedule.

19. I retired from EPD shortly after the Drought Management Plan was adopted by the DNR Board, and before the Board issued specific rules implementing the Drought Management Plan; however, I am aware that outdoor water use restrictions contemplated by the Drought Management Plan were implemented with success when northern Georgia experienced drought conditions from 2006 through 2008. During those years, as drought conditions in northern Georgia became more severe, the Director of EPD declared increasing levels of drought. This culminated in the declaration of a Level Four drought response for all counties in north Georgia in 2007, resulting in a total ban on outdoor water use in those counties lasting over a year.

IV. GEORGIA'S MANAGEMENT OF AGRICULTURAL WATER USE.

20. A significant proportion of Georgia's agricultural water use occurs in Southwest Georgia, specifically in the Flint River Basin. During my thirty-two years at EPD, Georgia became a major agricultural producer in the nation and the world. This is in large part due to the hard work of thousands of farmers in the Flint River Basin, whose jobs and economic livelihoods are closely tied to agricultural production.

21. As part of my job as EPD Director, I interacted with hundreds of stakeholders in the Flint River Basin, including farmers and agribusiness representatives, conservationists, environmentalists, and local elected officials. Based on my experience working with these stakeholders it was apparent to me that irrigation is a vital input to the productivity of the agricultural sector in the Lower Flint River Basin.

22. When I was Director, many banks in Southwest Georgia were reluctant to make operating loans on non-irrigated land. Some banks insisted on seeing irrigation permits on land that was being refinanced or sold. In short, access to irrigation water for farm use is critical to

providing economic security for Georgia farmers and their families. As EPD Director, part of my role was striking a balance between these valid and important interests on the one hand, and the State's important interest in managing and conserving the water resources to be fair to all its citizens.

23. During the late 1990's, a number of signs indicated that increased management of agricultural water use in Georgia may be warranted. *First*, Georgia had experienced significant growth in crop irrigation and agricultural production beginning in the 1970's and continuing through the 1980's and early 1990's. This occurred as farmers across Southwest Georgia increasingly adopted center pivot irrigation systems to irrigate more efficiently and improve their crop yields.

24. *Second*, starting in 1992 Georgia partnered with Florida, Alabama, and the United States Army Corps of Engineers (the "Army Corps") to conduct a comprehensive study of the ACT and ACF Basin (the "Comprehensive Study"). To complete the Comprehensive Study, the parties defined scopes of work to develop relevant technical information, strategies, and plans, and to recommend a formal coordination mechanism for the long term, basin-wide management and use of water resources. The U.S. Geological Survey ("USGS") was selected as the principal contributor to the ground-water-supply element of the scope of work, which studied ground-water availability and its relation to surface water.

25. In 1996, the USGS released a report detailing the results of its study in the area USGS called "Subarea 4," which covers the Upper Floridan Aquifer in southwestern Georgia, northwestern Florida and southeastern Alabama (the "1996 USGS Study"). JX-007 is a true and correct copy of the 1996 USGS Study. When combined with other available information, the model used in the 1996 USGS Study suggested that, during extreme drought periods, potential impacts on streamflows in the Flint River could occur as a result of agricultural withdrawals from area streams and the Floridan Aquifer.

26. This finding was preliminary and subject to many uncertainties. For one thing, the hydrologic model used by USGS Study was rudimentary. The USGS explicitly recognized as much in the 1996 USGS Study, warning that "[i]ncomplete hydrologic information precludes

a definitive assessment of ground-water resource potential, overpumpage, and potential for additional development." JX-007 at 1.

27. Moreover, the the output of the model used by USGS was dependent on a number of variables which were unknown at the time. For example, when the USGS Study was released, there were no precise estimates of the amount of irrigated acreage in the ACF Basin. Agricultural water uses in Georgia were unmetered. There were no precise estimates of total agricultural water use, either.

28. Lastly, as EPD critically reviewed the 1996 USGS Study, we had a number of concerns with the methodology used by USGS. Specifically, we believed that the pumping rates used by USGS Study were high; that the USGS study failed to account for the short term (or transient) effects of irrigation pumping; and that there were gaps in the data relating to the hydrologic properties of the Floridan aquifer. Nonetheless, the release of the USGS model raised the possibility that, during times of severe drought, agricultural water usage could have an impact on Flint River flows.

29. *Third*, in May of 1998, Georgia began experiencing what turned out to be a significant multi-year drought, lasting until 2002. This was the first significant drought Georgia had experienced in over a decade. It was also the first significant drought since the rise of agricultural irrigation in Georgia through 1990's, and the release of the USGS Study. The drought created a sense of immediacy and helped focus state officials and stakeholders in Georgia on issues of agricultural water use.

30. The onset of a serious drought, combined with the rise in irrigation and recent release of the USGS Study, led me to determine that Georgia should take action to address the modeling questions and other uncertainties described above, as well develop improved water management policies in the Lower Flint River Basin. I could not accomplish this alone. I needed the help of a broad base of state and local officials, as well as support from a variety of local stakeholders, including farmers and agribusiness representatives. It was critical that I draw their attention to issues surrounding agricultural water use in order to garner their support to take action.

31. To that end, throughout the late 1990's and early 2000's I authored a number of memorandums and made various public statements designed to inform state officials and stakeholders that agricultural water use in the Flint River Basin was a serious issue that required their attention. These statements sometimes contained strong language and warnings. My goal was to raise awareness, focus attention, and garner support for regulatory improvements. I authored these memos understanding that the data and tools motivating my concerns were limited and tentative. As a result, while my statements were intended to be truthful, there were times when my strong language may have overstated the risks or gone beyond what the scientific analysis at the time actually supported. That being said, my efforts were ultimately successful, as Georgia promptly took a number of progressive, proactive measures described later in my testimony. I understand that Florida has taken many of my statements out of context.

32. One example is a letter to James Butler, a member of the DNR Board, dated June 1, 1999. FX-2 is a true and correct copy of that letter. In FX-2, I wrote that "[o]ur computer models . . . indicate that if EPD continues to issue permits to new applicants who desire them, we will soon over-allocate the aquifer. In a bad drought the model indicates that the Flint River could dry up." FX-2 at 2. I also wrote that "[f]or years, we thought there was plenty of water for agriculture. We have now found that is no longer the case in southwest Georgia, from technical tools that have been developed under the comprehensive studies." *Id.* at 1.

33. These statements were made to a member of the DNR Board in an effort to draw his attention to the fact that agricultural water use could affect Flint River flows during extreme drought periods. The "technical tools" and "models" I was referring to were associated with the USGS Study I described earlier. These models were based on extremely limited data, and subject to many uncertainties. I believed it was necessary to research agricultural water use and its relationship to streamflows more thoroughly before reaching any conclusions, which is why I successfully advocated for Georgia to commence the Sound Science Study described later in my testimony.

34. I am glad that we did research these issues more thoroughly, because the more extreme outputs of the model from the USGS Study turned out to be wrong. Despite severe drought conditions between 1998 and 2002, the Flint did not dry up during my tenure as EPD

Director, nor has it since. There is also still "plenty of water" for agriculture, and thanks to the research prompted by my strong warnings, Georgia has developed a series of regulatory strategies designed to ensure it remains that way.

35. In the same June 1, 1999 letter to James Butler, I wrote that "EPD was given no new money or personnel with which to operate the permit program, so we have done it on a shoestring for years. We basically have had one professional assigned to review applications and issue permits." FX-2 at 1. These statements were true at the time, but reflected my efforts to improve the situation. Specifically, I was attempting to persuade a DNR Board member to help me secure increased funding for field and model verification efforts. Those efforts were successful. EPD began field verifications soon thereafter, and I understand that Georgia later opened an office in Southwest Georgia with a dedicated staff for agricultural permitting.

36. As further detailed below, my efforts to draw attention to these issues worked. Georgia listened and took action to better measure and conserve agricultural water use.

A. Georgia Institutes a Permit Moratorium and Launches a Sound Science Study.

37. Georgia launched a Sound Science Study (the "Sound Science Study") in March 1998, with the goal of developing further information regarding the uncertainties surrounding agricultural use in the Flint River Basin. Specifically, we set out to study and document: (1) how many acres were being irrigated; (2) how much water was being used on those acres; and (3) the impacts of agricultural pumping on streamflows. Georgia spent over $4 million on the Sound Science Study, gave EPD additional staff to work on the study, and authorized EPD to contract with technical experts and consultants, including technical experts and academics from the University System of Georgia and USGS, to research these issues.

38. In connection with the Sound Science Study, EPD worked cooperatively with numerous technical experts and stakeholders to carefully study the amount of irrigated acreage and agricultural water use in the region. Specifically, EPD worked with the National Environmentally Sound Production Agriculture Laboratory ("NESPAL") and the J.W. Jones Ecological Center to map many thousands of irrigated acres in the Lower Flint River Basin. EPD also worked with NESPAL to meter hundreds of irrigation wells statewide, including

roughly 200 in southwest Georgia, to help provide a more accurate estimate of water use for a wide variety of crops based on various soil and weather conditions.

39. EPD teamed up with USGS to re-evaluate and improve its stream-aquifer computer models that address the impact of ground-water based irrigation on flows in the Flint River Basin. EPD worked with USGS to use new water use and well location data, and to develop transient models which incorporated more realistic irrigation scheduling. The Georgia Geologic Survey also participated in the study, supervising and constructing several dozen monitoring wells in order to gather data on aquifer properties.

40. Throughout the Sound Science Study, EPD also worked with experts from the agricultural community, the University System, and representatives of agriculture trade groups to outreach to farmers on how to improve the efficiency of their systems so that they could use less water and still end up with the desired results in terms of productivity of crops.

41. Given the uncertainties regarding the extent and impacts of agricultural usage, I thought it would be prudent to cease issuing permits in the Flint River Basin while Georgia studied those issues further. On April 16, 1999, I gave a speech at the Southwest Georgia Summit to a number of stakeholders on that topic. FX-5 is a true and correct copy of my notes for the speech. The notes say that "I do believe that the state will need to put a cap on water depletions one of these days from the Floridan aquifer to keep water flowing in the lower Flint River in drought years." FX-5 at GA01186514. By "cap on water depletions" I was referring to a moratorium on the issuance of new permits. EPD did announce a moratorium on the issuance of new permits a few months later.

42. Specifically, in June 1998, soon after Georgia launched the Sound Science Study, EPD ceased issuing new irrigation permits the Flint River Basin. EPD held a series of meetings with farmers and agribusiness representatives to raise awareness of a potential moratorium on new irrigation permits. On October 14, 1999, I announced that no agricultural permit applications in the Flint River Basin from surface water sources or the Floridan aquifer would be considered if received by EPD after November 30, 1999.

43. During the time between the cessation of the issuance of new permits, in June 1998, and the date the permit moratorium became effective, on November 30, 1999, EPD received approximately 2,500 applications for new permits. EPD field-verified those applications and determined that no irrigation wells had been drilled for about 1,000 of them. 864 applications were for wells that had already been drilled. The rest of the applications were duplicates, outside the area of concern, or no longer applicable for reasons such as a change in farm ownership.

44. As Director of EPD I had to decide whether to issue permits to the 864 applicants who had already installed irrigation wells. I explained the reasoning for my decision in a July 24, 2000 letter to James Reynolds, a member of the DNR Board. FX-12 is a true and correct copy of that letter.

45. On the one hand, as I explained in FX-12, denying permits for farmers with previously-installed irrigation systems would have caused farmers to lose the benefit of a significant investment in their irrigation systems. It also would have imposed significant economic hardships on hundreds of farmers, because of the historically low commodity prices at the time, the likelihood that practicing dryland farming during a drought year would be a losing venture, and the fact that some lenders required farmers to have an irrigation permit to be eligible for a crop loan.

46. On the other hand, I believed the Flint River Drought Protection Act, described below, would help mitigate the potential streamflow impacts during the remainder of the drought. (And in fact we did implement the Flint River Drought Protection Act in 2001 and 2002.) Balancing these factors, I decided to issue permits to the 864 applicants who had previously installed irrigation wells. I believe this was the right decision, particularly given that we were working on other conservation measures beyond the moratorium that I believed would offset the issuance of these permits. This is just one example of the type of balancing between valid, competing interests that I was called upon to do as EPD Director, a responsibility I took seriously and always executed in good faith.

47. The suspension of permit consideration for the Floridan aquifer and surface water permits in the Lower Flint River Basin lasted for over six years, until completion of the Sound

Science Study and release of the Flint River Basin Water Development and Conservation Plan by my successor, Director Carol Couch, in March of 2006. Although the moratorium was lifted at the time, EPD adopted a series of policies and practices that greatly limited the issuance of permits in areas that had the highest connectivity between the aquifer and the stream and also imposed a variety of requirements on newly issued permits.

B. Georgia Passes the Flint River Drought Protection Act.

48. Given the drought conditions experienced by Georgia beginning in 1998, and out of an abundance of caution, I did not want to wait until the conclusion of the Sound Science Study to take action to protect streamflows in the Flint River Basin. To that end, during the late 1990's I engaged in numerous discussions with state officials, farmers and agribusiness leaders regarding potential management tools that could help accomplish that objective.

49. One potential policy option EPD considered, but chose not to pursue, during this time period was issuing "interruptible permits." The idea behind interruptible permits was to issue permits with a condition attached to them requiring the permitholders to cease water usage if drought conditions were expected. EPD did not pursue this policy for a number of reasons.

50. *First*, after consulting with farmers in the Lower Flint River Basin, it became clear that many farmers would not be able to run a viable business if they were issued interruptible permits. Specifically, farmers would face significant challenges obtaining operating loans (to finance purchases of seed, fertilizer, pesticides, etc) if the lenders knew that the farmers risked having to resort to dryland farming in the event drought conditions were declared. That is because lenders (like farmers) were aware that dryland farming significantly reduced farmers' yields and therefore put them at risk of not being able to repay their loans. *Second*, we believed that enforcement of such a permitting scheme on a large scale would be difficult, if not impossible, to achieve. This was particularly true given that agricultural use was not metered, and therefore to ensure compliance with interruptible permits, EPD staff would need to perform repeated, wide-ranging surveys of irrigated areas to ensure farmers were not irrigating when they should not. *Third*, assuming implementation was possible, enforcement and monitoring costs would be very high for the same reasons described above. *Fourth*, we recognized interruptible permits would represent a significant change in Georgia's agricultural permitting scheme and

therefore may be challenged in court. We did not believe it would be prudent or helpful to pass a measure that could be tied up in court, particularly if there were measures we could take that would be less likely to be challenged and equally (or more) effective.

51. In consulting with stakeholders in the Flint River Basin, as well as academics such as Ron Cummings, a Professor of Economics at Georgia State University, EPD developed an innovative management tool: reverse irrigation auctions. The idea behind these auctions was to pay farmers to voluntarily stop irrigating when severe drought conditions occurred. This accomplished a similar result as interruptible permits, in that some farmers would stop irrigating entirely during dry periods. But because the auction concept involved compensating farmers for ceasing to irrigate, it served to alleviate the economic hardships that would be imposed by issuance of interruptible permits, and also made it much less likely that farmers would irrigate when they should not.

52. I assisted in drafting a bill that would implement this auction mechanism, and worked with the members of the House and Senate Natural Resources and Environment committees to explain the bill when it came to them for consideration. I also fielded questions from legislators while the bill was under consideration. In June 2000 the Georgia General Assembly passed into law the Flint River Drought Protection Act (the "FRDPA"). JX-009 is a true and correct copy of the FRDPA, as it was passed in 2000.

53. The FRDPA and the implementing rules authorized the EPD Director to issue a prediction of "severe drought conditions" by March 1st of each year. If such a prediction was issued, the Director was authorized to hold an "irrigation reduction auction" whereby farmers were paid on a per acre basis not to irrigate land associated with a permitted irrigation withdrawal.

54. The implementing rules for the FRDPA allowed for different auction methods to be used. Two irrigation reduction auctions were held during my tenure as EPD Director: one in 2001, and another in 2002. For the 2001 auction, all permitted surface water users in the entire Flint River Basin were eligible to participate. For the second auction, EPD limited eligibility to those surface water permittees who had irrigated within the past three years.

55. The 2001 auction was conducted as a day-long multiple bid process. In this auction, EPD decided confidentially on how many acres EPD intended to suspend irrigation. Five auction sites were established throughout the lower Flint River Basin, at which computer stations were operated by students and staff of Georgia State University. Farmers submitted blind bids based on what they expected to receive per acre from EPD to not irrigate. Bids ranged from $75 to $800 per acre; they were entered into a computer database linked to all five auction sites. EPD decided which bids to accept and which to reject based on the total amount of acreage removed from irrigation compared with available money in the auction fund. All bids that had been accepted were issued receipts. Successful bidders were then paid from a fund established to pay for the auction. Approximately 33,000 acres were taken out of irrigation that year for a total cost of approximately $4.5 million.

56. The second auction, held in the spring of 2002, was conducted differently. In that auction, the EPD announced beforehand that (1) no bid above $150 per acre would be accepted, and (2) EPD would entertain all bids at or below that price up to the point at which the targeted acreage was removed from irrigation. As before, EPD did not reveal what the targeted acreage would be. Bids were submitted by mail, and their evaluation occurred all at once on the "auction day." Bids ranged from $74 to $145 per acre. In this auction, approximately 41,000 acres were removed from irrigation at a cost of $5.3 million.

57. I believed that the FRDPA was sound public policy, indicative of a commitment to conservation, and preferable to other options EPD considered at the time. Still, these auctions were an early experiment, so they did have problems. For example, some participants in the first auction were paid for very marginal or long-fallow land, or for land that is not regularly irrigated. I understand that later EPD Directors continued to work on those and other issues in an effort to improve the effectiveness of the FRDPA.

C. Georgia Establishes an Agricultural Metering Program.

58. The Sound Science Study was instrumental in helping Georgia to understand levels of agricultural water use in a sampling of areas in southwest Georgia. However, to develop better information concerning the extent of agricultural water withdrawals statewide, I

believed it was necessary to require that farmers meter their water use. I also thought it would be good stewardship to develop a program for reading those meters on a regular basis.

59. To that end I personally advocated for the creation of an agricultural water metering program in Georgia. I met with farmers and farm leaders in southwest Georgia to educate them on the need for metering. I also personally recommended to Governor Sonny Perdue that he support legislation which would establish a metering program, and provide that the state would pay for the costs of the program.

60. Georgia listened to my recommendations and acted. Governor Perdue signed HB 579 into law on June 4, 2003. The legislation required all new permittees to install meters on the associated wells and pumps. It required the creation of a priority system for the installation of meters on wells and pumps associated with existing permits. It also established the Agricultural Water Use Measurement Program (the "Agricultural Metering Program") whereby the Georgia Soil and Water Conservation Commission would install, maintain, inspect, and collect data from meters at the State's expense on irrigation systems in Georgia. I retired from EPD shortly after the passage of HB 579; however, I understand that the Agricultural Metering Program has been a success. I understand that since the program began in 2003, thousands of irrigation systems in the state have been successfully metered.

61. I am proud of the progress Georgia made managing agricultural water use during my tenure as EPD Director, and thankful that the Georgia legislature and stakeholders in the region listened, and took action in response to the issues I raised.

V. THE COMPACT NEGOTIATIONS.

62. On January 3, 1992, during my tenure as EPD Director, Georgia entered into a Memorandum of Agreement with Florida, Alabama, and the Army Corps, which provided for the parties to participate in the Comprehensive Study. I served as the lead technical representative for Georgia Governor Zell Miller in the Comprehensive Study. In 1997, the states of Alabama, Florida, and Georgia passed, and the United States Congress ratified, the Apalachicola-Chattahoochee-Flint River Basin Compact (the "Compact"). The Compact created an "ACF Basin Commission" composed of governors of the three states and a representative of the Army Corps, and charged the Commission with developing an allocation formula for apportioning the

surface waters of the ACF Basin among the states. From early 1998 through the expiration of the Compact, in August 2003, I served as Alternate Commissioner for Governors Miller, Barnes and Perdue on the ACF Compact Commission and all associated allocation formula negotiations.

63. I reviewed the direct testimony submitted in this case by David Struhs. Mr. Struhs acted as former Florida Governor Jeb Bush's representative on the ACF Basin Commission from 1999 until August of 2003, when the Compact expired. I strongly disagree with many of the assertions in Mr. Struh's testimony, as well as his characterization of the Compact negotiations. I do not desire to burden the Court with a point-by-point rebuttal of Dr. Struh's recollection of events that occurred 15 to 20 years ago. However, I do want to set the record straight on four things.

64. *First*, Mr. Struhs is wrong to say that "Georgia was operating in bad faith" during Compact negotiations. I simply do not understand how Mr. Struhs could reach that conclusion, particularly in light of the thousands of man hours and millions of dollars Georgia devoted to the Comprehensive Study and Compact negotiations during a time period lasting well over a decade. I took my responsibilities as Alternate Commissioner seriously and always acted in good faith during my dealings with the parties to the Compact. I know my colleagues from Georgia who worked on the Comprehensive Study and Compact conducted themselves the same way. Of course, as with any negotiations, there were significant areas of disagreement between the parties to the Compact at various points. Georgia always sought to resolve those disagreements in good faith. Mr. Struh's direct testimony appears to view Georgia's disagreements with Florida's negotiations positions as evidence of bad faith but they were nothing more than good faith disagreements between parties to a negotiation with strongly held beliefs.

65. For example, Mr. Struhs complains that Georgia did not agree to a "cap" on its water consumption in the ACF, and instead proposed a "guaranteed minimum flow" at the state line. I do not recall Florida ever explaining why a "cap" was necessary to achieve its stated goal of mimicking a "historical" flow regime in the Apalachicola Bay. Moreover, as described earlier in my testimony, during my tenure at EPD, the amount of agricultural water usage in Georgia, and the impact that usage had on streamflows, was highly uncertain. As for M&I

usage, Metro Atlanta had grown at a significant pace during the 1990's and 2000s, and we expected that growth to continue, although it was difficult to predict the pace.

66. Given the uncertainty about Georgia's current agricultural usage and future M&I usage, we believed a "cap" on Georgia's consumptive use would not only impose draconian costs on Georgia; it could have a multitude of unforeseen consequences for all three states and the Corps. At the same time, our modeling showed that Georgia, and the Corps through its operations of federal reservoirs, could deliver flows at the state line that would often equal, and sometimes exceed, historical flows in the Apalachicola River, which is the outcome Florida told us they wanted. Georgia's negotiation position was not "bad faith"; it was common sense.

67. *Second*, Mr. Struhs complains that during Compact negotiations, Georgia proposed irrigated acreage and agricultural water use numbers that were different from those developed during the Comprehensive Study. As detailed earlier in my testimony, in March of 1998 (after the Comprehensive Study was completed) Georgia initiated a Sound Science Study, which significantly improved Georgia's knowledge regarding irrigated acreage and irrigation water use in the ACF Basin. Georgia used the more recent information from the Sound Science Study for Georgia's irrigated acreage and water use estimates during Compact negotiations with Florida because Georgia believed it to be the best information available at the time.

68. I provided Florida with a detailed explanation of the status of the Sound Science Study, and the basis for Georgia's irrigated acreage and associated water use estimates, in the April 29, 2003 memorandum Mr. Struhs references in his testimony. *See* FX-219. As I explained to Mr. Struhs in FX-219, "Georgia has spent approximately $4.2 million over the past 4 years on comprehensive studies of irrigation"; "[t]he most up-to-date remote sensing, GIS, database, and metering technology has been employed in these studies"; and Georgia's irrigated acreage and water use estimates were based on data from the studies. *Id.* at 9. Providing Florida with the more recent data was not "walking away from long-established understandings," as Mr. Struhs says. It was also perfectly consistent with the Compact, which expressly provided: "[t]his Compact shall not commit any state to agree to any data generated by any study . . ." FX-209 at Art. VII(e).

69. *Third*, Mr. Struhs is wrong that Georgia "secretly" participated in a mediation with the Army Corps regarding water supply storage in Lake Lanier in the case captioned *Se. Fed. Power Customers, Inc. v. Caldera, et al*., No. 00-2975 (TPJ) (D.D.C.) (the "D.C. Case"). Georgia's participation in the D.C. Case was not a secret to Florida. The complaint filed by Southeastern Federal Power Customers ("SeFPC") initiating the D.C. Case was publicly available. It sought a declaration that the Army Corps' practice of allowing withdrawal of water for local municipal and industrial usage was not authorized by federal law. Georgia recognized that the D.C. Case could affect the terms under which local governments utilize water supply storage in Lake Lanier, and therefore quickly moved to intervene in the D.C. Case. Georgia's motion to intervene was public. When the participants in the mediation ultimately reached a settlement, in January 2003, the settlement agreement was public as well.

70. Florida had an equal opportunity to move to intervene in the D.C. Case, but chose not to do so. In fact, I later learned that the judge presiding over the D.C. Case expressly found that "the States of Alabama and Florida . . . were aware of the mediation but made no effort to participate." *Se. Fed. Power Customers, Inc. v. Caldera*, 301 F. Supp. 2d 26, 30 (D.D.C. 2004), *rev'd sub nom. Se. Fed. Power Customers, Inc. v. Geren*, 514 F.3d 1316 (D.C. Cir. 2008). Moreover, when the settlement agreement was filed in January 2003, Florida had every opportunity to, and in fact did, intervene in the D.C. Case and object to the settlement. I am aware that Judge Bowdre indicated her view that Georgia "never mentioned to Alabama and Florida that they were simultaneously engaged in settlement discussions in the D.C. case that involved some of the same issues," but that decision was later vacated and Judge Bowdre did not address the D.C. court's finding that Florida was "aware of the mediation but made no effort to participate."

71. *Fourth*, Mr. Struhs misstates the facts when he suggests that Georgia let the Compact expire on August 31, 2003. In truth it was Florida that walked away from the Compact. On July 22, 2003, the states signed a Memorandum of Agreement, which resolved that the states had reached substantial agreement in principle regarding many of the terms of an allocation formula, and detailed a number of principles the states agreed should be included in such a formula. However, the very next month, on August, 26, 2003, Florida sent Georgia and Alabama an allocation proposal that departed significantly from the principles the parties had

agreed to only a month before. Florida communicated to the parties to the Compact that this was a "take it or leave it" proposal. Georgia had very significant issues with Florida's allocation proposal, but Georgia nonetheless communicated to Florida that Georgia stood ready to continue negotiations in an effort bridge the gaps. Governor Sonny Perdue of Georgia and Governor Bob Riley of Alabama both agreed to extend the Compact in an effort to continue negotiations. But Florida refused to sign the extension. Because Florida refused to participate, the Compact expired on August 31, 2003.