

No. 142, Original

In the
Supreme Court of the United States

STATE OF FLORIDA,

Plaintiff,

v.

STATE OF GEORGIA,

Defendant.

Before the Special Master

Hon. Ralph I. Lancaster

**PRE-FILED DIRECT TESTIMONY OF FLORIDA WITNESS
BRETT CYPHERS**

PAMELA JO BONDI
ATTORNEY GENERAL, STATE OF FLORIDA

JONATHAN L. WILLIAMS
DEPUTY SOLICITOR GENERAL
JONATHAN GLOGAU
SPECIAL COUNSEL
OFFICE OF THE ATTORNEY GENERAL

FREDERICK L. ASCHAUER, JR.
GENERAL COUNSEL
FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION

GREGORY G. GARRE
Counsel of Record

PHILIP J. PERRY
CLAUDIA M. O'BRIEN
ABID R. QURESHI
JAMIE L. WINE
LATHAM & WATKINS LLP
555 11th Street, NW
Suite 1000
Washington, DC 20004
Tel.: (202) 637-2207
gregory.garre@lw.com

PAUL N. SINGARELLA
LATHAM & WATKINS LLP

CHRISTOPHER M. KISE
JAMES A. MCKEE
ADAM C. LOSEY
FOLEY & LARDNER LLP

MATTHEW Z. LEOPOLD
CARLTON FIELDS JORDEN BURT P.A.

ATTORNEYS FOR THE STATE OF FLORIDA

October 14, 2016

CONTENTS

I.	Introduction.....	1
II.	Background.....	4
	A. Professional Background.....	4
	B. The Northwest Florida Water Management District	5
III.	Water Use In The Florida Portion of the ACF.....	7
IV.	Permitting and Regulatory Measures	10
	A. Water Use Permitting.....	10
	1. Individual Water Use Permits	11
	2. Agricultural Water Use Permits	14
	3. Monitoring and Reporting	19
	4. Other Regulatory Restrictions.....	20
V.	Agricultural Water Conservation	21
	A. Mobile Irrigation Labs and Cost Share Program.....	22
	B. Crop Rotation Program	26
VI.	Other Non-Regulatory Approaches	26
	A. Alternative Water Supply Development	27
	B. Water Resource Investigations	28
	C. Land Acquisition and Restoration	28
	D. Hydrologic Monitoring	31
	E. Public Outreach and Education	32
VII.	USGS Sumatra Streamflow Gage	32
VIII.	Conclusion	32

I. INTRODUCTION

1. I, Brett Cyphers, offer the following as my Direct Testimony.

2. I am Executive Director of the Northwest Florida Water Management District (“NFWWMD” or “the District”). I have held this position since 2014. I have worked on State water management issues on and off since 2003.

3. The primary purpose of my testimony is to explain how Florida manages its water and natural resources in the Florida portion of the Apalachicola-Chattahoochee-Flint River Basin (“ACF Basin” or “Basin”). NFWWMD covers the entirety of the Florida panhandle, including the Florida portion of the ACF Basin, and is Florida’s primary water management agency in the Basin.

4. About 13 percent of the total land area in the ACF Basin lies within Florida. Florida’s portion of the Basin consists primarily of six counties that are sparsely populated, with an estimated population of only 93,000 people. (*See A RIVER MEETS THE BAY: A CHARACTERIZATION OF THE APALACHICOLA RIVER AND BAY SYSTEM, JX-29, at 123.*) Like the population, water use within Florida’s portion of the Basin is incredibly small. For example, Florida’s total water withdrawals in the ACF Basin amounted to a mere 42 million gallons per day (MGD) in 2014, the majority of which (26 MGD) was used for agricultural irrigation. (*See ACF Basin Active Individual Water Use Permits, FX-676.*)

- a. Exhibit JX-29 is a true and accurate copy of a December 2008 report written by H. Lee Edmiston in conjunction with the National Oceanic and Atmospheric Administration, the Apalachicola National Estuarine Reserve, and the Florida Department of Environmental Protection. I have reviewed this document in my capacity as Executive Director of the NFWWMD.

b. Exhibit FX-676 is a true and accurate copy of a document that was prepared by NFWFMD staff in September 2016 detailing active individual water use permits in the Florida ACF Basin. It is based on data produced to Georgia as part of this litigation and which is publicly available at <https://permitting.sjrwmd.com/nwepermitting/jsp/start.jsp>. It is a summary of information prepared by my staff from records maintained during the regular course of business. I reviewed and relied on it in my capacity as Executive Director of the NFWFMD.

5. Notwithstanding the very small amount of water used in Florida's portion of the ACF Basin, Florida has aggressively moved to implement water conservation measures, primarily by placing limits on how much water farmers can withdraw and helping farmers to increase agricultural irrigation efficiency. I will describe many of the efficiency and conservation measures that Florida, via the NFWFMD and its sister agencies, has implemented to conserve water in the Basin, including the water savings Florida has achieved through government assistance programs to farmers. For instance, Florida has documented approximately 7.7 MGD in agricultural irrigation water savings in the ACF Basin since 2006, approximately 23 percent of the total being used in the Basin today for irrigation. (ACF Basin Water Savings Summary, FX-861.)

a. Exhibit FX-861 documents water savings in the ACF Basin in Florida. This exhibit is a true and accurate copy of a document prepared by Florida Department of Agriculture and Community Services ("FDACS") staff in collaboration with staff from NFWFMD in December 2015, based on data maintained by FDACS. It was introduced as an exhibit during my deposition. I understand that FDACS

keeps and maintains routine records of this information in the normal course of business. I reviewed and relied on it in my capacity as Executive Director of the NFWFMD.

6. My testimony will also address consumptive use permitting, our regulatory program, and the conservation programs in which the NFWFMD participates. For example, we permit groundwater withdrawals within the Basin, and Florida law requires that any proposed use of water must be reasonable and beneficial, by definition prohibiting the issuance of any water use permits that are unnecessary, wasteful, or harmful to natural resources, fish or wildlife. Our water use rules also require us to consider whether a water use significantly impacts others who use and depend on the resource.

7. In the agricultural irrigation setting, for example, the water use permits we issue contain caps on the farmers' total annual withdrawals. As I will describe, this numeric limitation is set by the District based on the needs that are adequately demonstrated by the farmer, and by robust modeling that considers acreage under cultivation, crop water needs, soil types, and long-term rainfall records. Farmers are not given 100 percent of their total water needs for their crops during drought periods, so that water is conserved and our natural resources in the Basin are protected during dry years.

8. Florida law also gives NFWFMD the specific authority to set aside water and dedicate it wholly to conservation purposes, meaning that is not available to prospective water users by permit. In 2006, the District did just that for the Apalachicola and the Chipola Rivers. We adopted a regulation, known as a "reservation," which prohibits all new surface water withdrawals from the rivers, conserving them for the environment, fish, and wildlife. The only exceptions were for a few, very small then-existing uses.

9. Florida's natural resource management in the Apalachicola is robust because it is based on the principle that the waters of the Basin (and throughout Florida) are a limited resource that is not inexhaustible. Using the tools provided by Florida law, NFWFMD has acted as a good steward of our resources, managing carefully the very limited consumptive uses of water in the Florida portion of the ACF Basin.

II. BACKGROUND

A. Professional Background

10. After graduating high school, I served in the United States Army, the Florida National Guard, and then the U.S. Army Inactive Ready Reserve.

11. After my active duty, I enrolled at Hillsborough Community College and then the University of South Florida. While at the university, I began working for the Florida Department of Labor, and shortly thereafter, around 2001, I worked for a member of the Florida Senate as a legislative assistant, focusing on water issues in the Tampa Bay region.

12. In 2003, I joined the Office of Policy and Budget ("OPB") in Tallahassee under Governor Jeb Bush as the analyst for all of Florida's five water management districts. OPB is Florida's equivalent of the federal Office of Management and Budget ("OMB"). I was responsible for oversight of the budgets of all five of Florida's Water Management Districts and the related legislative processes and policy issues.

13. In 2005, I moved to the Tampa area to work for the Southwest Florida Water Management District, but returned to Tallahassee in 2007 to rejoin OPB as the policy chief for the environment. In this position, I oversaw all policy and legislation related to natural resources, including the water management district budgets.

14. From 2009 to 2011, I held staff positions in the Florida Legislature and completed my bachelor's degree in Interdisciplinary Social Science at the Florida State University. In 2011,

I joined the Florida Department of Environmental Protection (“FDEP”) as Director of Water Management District Budget Oversight. At FDEP, I was once again in charge of oversight of all of the water management district budgets.

15. In 2012, I became the Assistant Executive Director of the NFWFMD, and in 2014, I was appointed by Governor Rick Scott and subsequently confirmed by the Florida Senate as the Executive Director of the NFWFMD.

B. The Northwest Florida Water Management District

16. Florida manages its water resources primarily through five water management districts tasked with the core mission to protect Florida’s water supply, water quality, and natural systems, and to provide flood protection. The water management districts are organized along the geographic boundaries of the five major watersheds in Florida. The districts have primary responsibility for issuing water use permits for, among other things, agricultural irrigation, public supply, industrial, and other uses. The districts work under the oversight of and in collaboration with the FDEP in implementing their resource protection mission.

17. NFWFMD, which I am responsible for, covers sixteen counties in the Florida panhandle. The Florida portion of the ACF Basin is located primarily in six of those counties: Calhoun, Franklin, Gadsden, Gulf, Jackson, and Liberty.



Map of the Florida Portion of the ACF Basin. This a true and accurate copy of a map created by NFWFMD staff in October 2016.

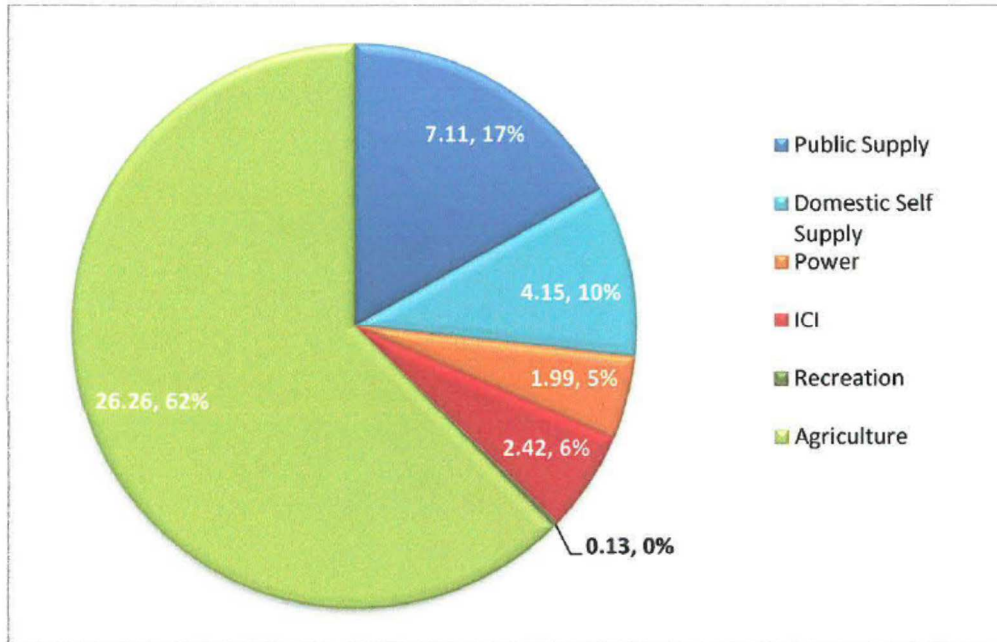
There are also very small portions of the Basin in Bay and Washington counties to the West, but not enough to be significant for management purposes.

18. The water management districts implement Chapter 373 of the Florida Statutes, which governs water resources. In Northwest Florida, the District utilizes a comprehensive approach that includes both regulatory and non-regulatory programs to: (1) ensure a clean and adequate supply of water for the people and natural resources of northwest Florida, (2) protect, maintain, and improve the quality of water resources across the Florida Panhandle, (3) promote flood protection through non-structural techniques, and (4) protect and improve natural systems in Northwest Florida through land acquisition, management, and ecosystem restoration activities.

19. There are several specific tools the District relies upon to manage water resources including, among other things, (1) a water use permitting system, (2) reservations of water use, (3) water supply planning through periodic water supply assessments, (4) mobile irrigation labs (“MILs”), (5) the Agricultural Best Management Practices Cost Share Program, (6) the promotion and development of alternative water supplies, (7) land acquisition and management, (8) hydrologic monitoring, and (9) hydrogeologic investigations. All of these help Florida manage its water use effectively in the ACF.

III. WATER USE IN THE FLORIDA PORTION OF THE ACF

20. Protecting the water resources of the ACF Basin is critical to the District. It is one of Florida’s most important ecosystems, and we vigorously manage and regulate water consumption in a way that protects the environmental needs of the Basin, the Apalachicola River, and the Apalachicola Bay. But before getting into the details of our various conservation and efficiency efforts, I would like to give a brief overview of water use in Florida’s portion of the ACF Basin. Below is Florida’s use of water in the Basin in 2014 and 2015:



Total Water Use in the ACF Basin, 2014-15. This is a true and accurate copy of a graph created by my staff in late 2015 that summarizes information maintained by the NFWFMD in the normal course of business.

21. Florida law requires NFWFMD to conduct periodic water supply assessments. A recent evaluation shows that approximately 42 MGD were withdrawn by Florida water users in the entire Apalachicola Basin in 2014, with approximately 3 MGD from surface waters and the remaining 39 MGD from groundwater. (See, e.g., ACF Basin Active Individual Water Use Permits, FX-676.) This modest use derives in part from the region’s low population, but also from the decision to set aside hundreds of thousands of acres as public conservation lands. Also, since 2014, a large power plant on the Apalachicola River was shuttered, eliminating much of the surface water withdrawals going forward that had previously been used in Florida for power plant cooling water).

22. The 42 MGD of withdrawals within Florida’s portion of the Basin equates to about 65 cubic feet per second (“CFS”) when multiplied by the conversion factor of 1.55. Some of that amount is consumed, and a large portion of it is treated and returned to the Basin in the

form of return flows. The total withdrawals are a small amount considering that even in low flow times, the Apalachicola River runs in the *thousands* of cubic feet per second.

23. The majority of Florida's water withdrawals come from groundwater wells in the Floridan aquifer. While the District has not done a comprehensive groundwater model of the Basin, we know that less than 100 percent of the 39 MGD (a fraction of a percent of River flow in low flow conditions) withdrawn from groundwater in the Basin actually impacts flows in the Apalachicola River.

24. Agricultural water pumping from groundwater is the largest use in the Apalachicola Basin, with 45 MGD permitted. Actual agricultural usage in 2014, however, was only 57 percent of permitted use, or around 26 MGD. We have compared pumping rates in wet years and dry years and we have not seen meaningfully higher pumping rates in a dry year, like 2011. (ACF Basin Agricultural Pumpage Comparison 2011 and 2014, FX-678 (showing 23.12 MGD in 2011 and 24.27 MGD agricultural pumping in 2014.))

- a. FX-678 is a true and accurate copy of a document that was prepared by NFWFMD staff in September 2016. It is based on data maintained by NFWFMD that was produced to Georgia as part of this litigation and which is publicly available at <https://permitting.sjrwmd.com/nwepermitting/jsp/start.jsp>. It is a summary of information prepared by my staff from records maintained during the regular course of NFWFMD's business. I reviewed and relied on it in my capacity as Executive Director of the NFWFMD.

25. Altogether, there are currently about 36,000 irrigated acres in the Florida Portion of the ACF Basin. Most of that farming occurs in Jackson County, which is in the northernmost portion of the State, bordering both Georgia and Alabama. Growth in irrigated acreage in

Florida has been modest. There were around 17,000 irrigated acres in the Basin in 1987, and based on current projections, we are only expected to add around 1,500 additional irrigated acres by 2035. (Estimating Florida Statewide Agricultural Irrigation Demand (FSAID) using Economics and Engineering Models, Final Report, FX-674 at Table A-2; 2015 Florida Statewide Agricultural Irrigation Demand (FSAID), FX-862a at 53-55; 2015 FSAID Appendix B, FX-862b at Table B-5; 2015 FSAID Appendix C, FX-862c; 2015 FSAID Appendix D, FX-862d.)

- a. Exhibits FX-674 and FX862a through FX-862d are true and accurate copies of documents prepared by The Balmoral Group, LLC, in 2014 and 2015 under contract with FDACS, based on data maintained by FDACS staff in the normal course of its operations. These Florida government documents are publicly available. The reports document the methodology and results of a project to develop a central data repository for agricultural water use projections. The FSAID contains statewide parcel-level GIS coverage of agricultural and irrigated lands, estimates of agricultural acreage by crop type or category, and projections of irrigated agricultural acreage and water supply demand. This information is maintained in the regular course of business of FDACS and is part of Florida's official records. I reviewed and relied on them in my capacity as Executive Director of the NFWFMD.

IV. PERMITTING AND REGULATORY MEASURES

A. Water Use Permitting

26. Florida has a stringent and efficient permitting scheme that is, frankly, far more protective than what I understand of Georgia's water use permitting. The District issues permits for the use or consumption of water pursuant to the permitting program in Chapter 40A-2 of the Florida Administrative Code. Individual water use permits are issued for public supply (drinking

water), agricultural use, recreation and landscape irrigation, commercial, industrial, and institutional uses, power generation, diversions and impoundments, as well as other assorted uses. Small water uses, which are less than 100,000 gallons per day, are not required to obtain an individual permit but are still regulated.

27. The District has active permits for approximately 69 MGD in the ACF Basin. The permitted amounts are cap on total use, even in a drought year. This number excludes one permit for a coal-fired power plant on the River that was recently shuttered. Approximately 130 MGD was permitted for withdrawal from the Apalachicola River for the now-shuttered plant, but even prior to closing the plant only consumed 2 MGD on average. The majority of the cooling water that the plant withdrew was returned to the River. Only 42 MGD of the total permitted amount was actually withdrawn in 2014.

28. As I explain below, permittees must justify their need for permitted water resources, and permits are issued only if the District determines that the withdrawal will not harm the water resource or otherwise adversely affect the public interest.

1. Individual Water Use Permits

29. Generally, individual water use permits are required for withdrawals of 100,000 GPD or greater and for groundwater wells eight (8) inches in diameter or greater, and surface water intake structures six (6) inches or greater in diameter. In addition to groundwater, all “diversions” and “impoundments” of surface waters require permits. Diversions are where surface water is diverted through a pump or operable water control structure like a canal. Impoundments are structures like man-made ponds and recreational reservoirs. By law, water use permits are only issued for uses that meet each of the following criteria: the use must 1) be “reasonable-beneficial,” 2) not interfere with existing legal uses, and 3) be consistent with the

public interest. In addition, the use must comply with the FDEP's Water Supply Protection and Management rule, found at 62-40.410 of the Florida Administrative Code.

30. To satisfy the "reasonable-beneficial" use requirement, the use must be limited to "such quantity as is necessary for economic and efficient utilization for a purpose and in a manner which is both reasonable and consistent with the public interest." (§373.019(16), Fla. Stat. (2016).) The FDEP's Water Supply Protection and Management rule further lists eighteen factors that define what uses are "reasonable-beneficial." Those factors include, among other things: the suitability of the use to the source of water; the practicality of mitigating any harm by adjusting the quantity or method of use; water conservation measures taken and available to be taken; the feasibility of using alternative sources such as reclaimed water, and; whether the proposed use would significantly affect natural systems. (Fla. Admin. Code R. 62-40.410.)

31. In its own regulations, the District requires that an *applicant* for a water use permit demonstrate that its proposed use will not cause harm to the water resources of the area. Among other things, the applicant must show that the proposed water use: 1) will not cause harmful water quality impacts to the water source resulting from the withdrawal; 2) will not cause harmful hydrologic alterations to natural systems, including wetlands or other surface waters; and 3) will not otherwise cause harmful hydrologic alterations to the water resources of the area. (Fla. Admin. Code R. 40A-2.301(2)(g).) Thus, avoiding potential environmental impacts guides every water use permitting decision we make.

32. To obtain a water use permit, a user must submit an application along with substantial information regarding the proposed use. The application then goes through a review process by District staff that includes, among other things, publication in a local or regional newspaper to notify the public. In reviewing permit applications, the District evaluates several

factors pertinent to the efficient use of water. (NFWFMD Water Use Permit Applicant's Handbook, FX-671 at 51-52.)

- a. Exhibit FX-671 is a true and accurate copy of a document that was prepared and is maintained by NFWFMD staff in April 2015 to assist permit applicants with the application process. It details general water use permit requirements. The document is publicly available and was also produced to Georgia as part of this litigation. It was made as part of NFWFMD's regular practice, and this information is maintained in the regular course of business of the NFWFMD and is part of NFWFMD's official records. I have reviewed and relied on it in my capacity as Executive Director of the NFWFMD.

33. In addition to the general review, there are specific review criteria that apply depending on the specific use for which the applicant is seeking a permit, such as agricultural use, and the location of the withdrawal. District staff often meet with permit applicants prior to an application being submitted. For larger proposed uses, District staff often conducts a preliminary analysis to determine if the use could adversely impact the water resources of the area. As an example we utilize benchmarks, such as the Environmental Protection Agency's 7Q10 stream flow requirement for assessing low flows, to evaluate impacts of proposed withdrawals on surface water flows. (See NFWFMD Water Use Permit Applicant's Handbook, FX-671 at 54.) 7Q10 refers to the lowest seven-day average flow in a ten-year period.

34. The District requires the applicant to support its application with more extensive, and at times expensive modeling or testing to demonstrate its use will not harm the aquifer, surface waters, or the environment. It is not uncommon for this type of groundwater investigation to cost a permit applicant tens or even hundreds of thousands of dollars to

complete. After analysis and evaluation, if we determine a proposed water use will cause harm to the water resources, such as a stream going below the 7Q10, for example, the permit would be denied.

35. This is not an exhaustive list of all of the information required and analyzed by the District in determining whether to issue a water use permit. Rather, it illustrates the many steps taken and factors considered by the District and the State to ensure that permits are issued only for water uses that efficiently utilize our water resources.

2. Agricultural Water Use Permits

36. Agricultural water use permits issued by the District contain numeric limits on total amounts of water permit holders may pump from ground or surface water sources for irrigation. Accordingly, agricultural permit holders cannot turn on the pump and leave it running to capacity, day and night, through wet periods or droughts. Permits contain a cap on total use by an individual farmer.

37. To obtain an agricultural water use permit in the Apalachicola Basin, applicants must demonstrate that the quantities requested represent *actual agricultural needs* based on: 1) the irrigated acreage, 2) the type of irrigation system, 3) crop types and rotations, and 4) planting and harvesting seasons. District staff take that information, along with the relevant long-term climate and rainfall data and soil types representative of that farmer's field, and estimate water needs using the Agricultural Field-Scale Irrigation Requirements Simulation ("AFSIRS") model. (See NFWFMD Water Use Permit Applicant's Handbook, FX-671 at 32-33; Agricultural Permit Example, FX-679; NFWFMD Water Use Technical Staff Report, Application 107507, FX-682.) This model was developed at the University of Florida's Institute of Food and Agricultural Sciences under a joint contract by the state's five water management districts. (Revision of AFSIRS Crop Water Simulation Model, FX-603 at 1; Evaluation of Reference

Evapotranspiration Methodologies and AFSIRS Crop Water Use Simulation Model, FX-604 at

1.) NFWWMD considers AFSIRS an essential and reliable tool in helping manage agricultural water use in the Basin.

- a. Exhibit FX-679 is a spreadsheet compiled from information related to a water use permit for 7507 Greenwood Oaks Farm, Inc. This exhibit is a true and accurate copy of a document that was prepared by NFWWMD staff in September 2016. The information is publicly available at <https://permitting.sjrwmd.com/nwepermitting/jsp/start.jsp>. It was made as part of NFWWMD's regular practice, and this information is maintained in the regular course of business of the NFWWMD and is part of NFWWMD's official records. I have reviewed and relied on it in my capacity as Executive Director of the NFWWMD.
- b. Exhibit FX-682 is NFWWMD Water Use Technical Staff Report Application 107507. This exhibit is a true and accurate copy of a support document to a water use permit that was prepared by NFWWMD staff in November 2014. The information is publicly available at <https://permitting.sjrwmd.com/nwepermitting/jsp/start.jsp>. It was made as part of NFWWMD's regular practice, and this information is maintained in the regular course of business of the NFWWMD and is part of NFWWMD's official records. I have reviewed and relied on it in my capacity as Executive Director of the NFWWMD.
- c. Exhibit FX-603 is a true and accurate copy of a September 2007 technical report produced on behalf of the St. Johns River Water Management District in Florida.

I understand that it was made and maintained in the regular course of business of the St. Johns River Water Management District and is part of the District's official records. I have reviewed and relied on it in my capacity as Executive Director of the District.

- d. Exhibit FX-604 is a true and accurate copy of a April 2001 technical report produced on behalf of the St. Johns River Water Management District in Florida.

I understand that it was made and maintained in the regular course of business of the St. Johns River Water Management District and is part of the District's official records. I reviewed this document in my capacity as Executive Director of the NFWFMD.

38. AFSIRS has a long history at the District. After being developed in 1990, it was relied on by Florida, Georgia, and Alabama (along with a model developed by Jim Hook of the University of Georgia) as part of the ACT/ACF River Basins Comprehensive Study, the Agricultural Water Demand component. (the "Comp Study") (*See* Comprehensive Study, JX-6 at 117-125.) The Comp Study used AFSIRS to analyze the potential impacts on crop growth for scenarios of limited water availability, and found the model results were applicable in Florida, as well as southern Georgia and Alabama. (*Id.* at 116, 127.) The premise of this work was that farmers in the ACF Basin may not be able to irrigate to maximum capacity because of the limited water resources available in the ACF. AFSIRS predicted the loss in yield that would occur by "deficit" or "limited" irrigation of a crop. (*Id.* at 123-125.) In 1991, NFWFMD began using AFSIRS as the primary regulatory tool for our agricultural water permit allocations. To my knowledge, Georgia did not adopt similar deficit or limited irrigation permit requirements, despite knowing of this water saving technique in the Comp Study.

- a. JX-6 is the River Basins Comprehensive Study Agricultural Water Demand Report. This exhibit is a true and accurate copy of a document that was created by the United States Department of Agriculture Natural Resources Conservation Service in 1995. This information is maintained in the regular course of business of the NFWWMD and is part of NFWWMD's records. It also is publicly available on a website maintained by the Army Corps of Engineers: <http://cdm16021.contentdm.oclc.org/cdm/ref/collection/p266001coll1/id/3053>. I reviewed and relied on it in my capacity as Executive Director of the NFWWMD.

39. AFSIRS recommends only enough water to allow Florida farmers sufficient irrigation for optimal crop growth 80 percent of the time, using a long-term average. Thus, during a period of less than average rainfall, farmers in NFWWMD are not permitted to withdraw 100 percent of projected total crop water demands. In significant droughts, farmers are compelled to use substantially less water than might otherwise be employed to protect the aquifer from being overdrawn. The numeric limit in the agricultural irrigation permits cannot be exceeded, and permittees are required to report water use information to NFWWMD. (*See* ACF Basin AFSIRS Output Summary, FX-677; ACF Agricultural Permit Example, FX-679; NFWWMD Water Use Technical Staff Report, Application 107507, FX-682.)

- a. Exhibit FX-677 is a true and accurate copy of a document that was prepared by NFWWMD staff in September 2016 in the normal course of the District's operating procedures. The information was produced to Georgia and is publicly available online at <https://permitting.sjrwmnd.com/nwepermitting/jsp/start.jsp>. It was made as part of NFWWMD's regular practice, and this information is maintained in the regular course of business of the NFWWMD and is part of

NWFWMD's official records. I have reviewed and relied on it in my capacity as Executive Director of the NWFWMD.

40. Let me explain a bit more about what I mean by "80 percent of the time." Long term rainfall records and potential evapotranspiration ("ET") are used to simulate daily gross irrigation requirements for a crop season for the number of years of the climate record. This long term record is used to calculate the probabilities of extreme values. (Technical Manual, Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) Model, FX-605 at 5.) AFSIRS reports these probabilities and the 80 percent probability would be expected to exceed the actual irrigation requirements in 80 percent of the years observed. (Technical Manual, Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) Model, FX-605 at 30-31.) In other words, farmers are given enough water in their permit to achieve maximum crop yield in 80 percent of the years and in 20 percent of the years, the "dry years,"¹ farmers do not have sufficient permitted water to irrigate their crop to achieve maximum yield.

- a. Exhibit FX-605 is the Technical Manual for the Agricultural Field Scale Irrigation Requirements Simulation (AFSIRS) Model. This exhibit is a true and accurate copy of a technical report produced on behalf of the St. Johns River Water Management District in Florida. I understand that it was made and maintained in the regular course of business of the St. Johns River Water Management District and is part of the District's official records. I reviewed this document in my capacity as Executive Director of the NWFWMD.

¹ For AFSIRS, a dry year is represented by a 20 percent chance of receiving less than optimal crop water demands as a result of less than average rainfall and is referred to simply as a "two year in ten" scenario. For this scenario, a dry year will have less rainfall than 8 out of 10 years. An "average" year, on the other hand, is a "five year in ten." Thus, a dry year is below average in rainfall, but it is not necessarily an extreme drought year.

41. Thus, the District's standard practice is to require deficit/limited irrigation by farmers in dry years. (*See* FX-677 and 679, showing permitted irrigated inches data used to create water use caps in each permit and the backup data on how those inches are derived.) Florida considers this to be a reasonable and beneficial measure that conserves the groundwater resources in the ACF Basin, and I believe that Georgia should adopt deficit/limited irrigation practices as well, particularly in dry years.

42. In addition to numerical water use caps in permits, all agricultural permittees must maintain at least a 75 percent irrigation efficiency if utilizing a center-pivot system. For permits issued after May 2014, NFWMD requires that any new center pivot have an efficiency rating of 90 percent or greater, with some limited exceptions. (*See, e.g.*, ACF Agricultural Permit example, FX-682, at 4.)

3. Monitoring and Reporting

43. As of June 2016, around 240 individual water use permits were issued in the Florida Portion of the ACF Basin. (*See* ACF Basin Active Individual Water Use Permits, FX-676.) If a permit is issued, the recipient must comply with various monitoring and reporting requirements. Certain permits also contain additional conditions, requiring the permittee to perform site-specific hydrologic and water quality monitoring to ensure their withdrawals do not harm water resources.

44. Agricultural permittees with an average daily rate greater than 500,000 gallons per day (.5 MGD) or with new wells 8-inches or larger (since May 2014), and those existing wells with diameters of 12 inches or greater are required to install flow meters to monitor and record their pumpage. Agricultural permittees who do not have meters but have an average daily rate greater than 100,000 gallons per day (.1 MGD) must also report the amount of water pumped each month. Non-agricultural permittees must install flow meters on any newly

constructed wells ten (10) inches in diameter or larger and for wells that withdraw 500,000 gallons per day (.5 MGD) or more.

45. Additionally, *any* permittee using 100,000 gallons per day or more must provide an annual water use report, which states how much water was pumped in a given year. The District audits those reports regularly. As part of the process, we take the information from the reports and input it into our database, which is then made available to the public on our website.

46. The auditing staff reviews the information in the annual reports for any anomalies or indications of overpumping. Even though some of the audited users do not have meters, the District is able to determine total use based on permittee records of calculated pump run time and pump capacity. The District can then compare the total use against the amount of water allocated in the permit. If there is evidence of material overpumping, the District can initiate an enforcement action. While fines are the general tool for ensuring compliance, revocation of a permit is also possible in extreme situations. In short, we work hard to ensure that permittees do not exceed their allocations.

4. Other Regulatory Restrictions

47. In addition to permitting, the District has other statutory and regulatory authority to ensure water is efficiently used or conserved. Under Chapter 373 of the Florida Statutes and Chapter 40A-2 of the Florida Administrative Code, for example, the District can reserve water from use to protect fish and wildlife or public health and safety. By making a reservation, the District eliminates a body of water as a source for any new water use permits.

48. In a critical protection measure issued in 2006, the NFWFMD reserved *all* surface waters in the Apalachicola and Chipola rivers, the Chipola being the primary tributary to the Apalachicola within the State of Florida. In other words, we prohibited any new withdrawals from those vital rivers. In making that reservation, the Governing Board of the District

determined that withdrawals of surface water from the main stem of the Apalachicola and Chipola rivers were not in the public interest, and thus removed those waters from permitting consideration, with a few minor exceptions. (See JX-84, NFWWMD 2013 Water Supply Assessment, at 1-3, 3-80.). Annual withdrawals in the two rivers from the few surface water permits that were grandfathered amounted to three (3) MGD in 2014, and again, the majority of these withdrawals have been significantly reduced with the shuttering of the power plant.

- a. JX-84 is a true and accurate copy of the NFWWMD 2013 Water Supply Assessment, a document that was prepared by NFWWMD staff in the normal course of the District's operating procedures in 2013. NFWWMD publishes water supply assessments yearly detailing water use information, among other data. It was made as part of NFWWMD's regular practice, and this information is maintained in the regular course of business of the NFWWMD and is part of NFWWMD's official records. I have reviewed and relied on this document in my capacity as Executive Director of the NFWWMD.

49. Annual withdrawals in the two rivers from the few surface water permits that were grandfathered amounted to three (3) MGD in 2014, and again, the majority of these withdrawals have now ceased with the shuttering of the power plant. The other component of these surface water withdrawals is about one (1) MGD that is diverted from the Chipola River to the City of Port St. Joe, which is the only interbasin transfer in the Florida portion of the Basin. (See NFWWMD 2013 Water Supply Assessment, JX-84 at 3-80.)

V. AGRICULTURAL WATER CONSERVATION

50. Florida's water conservation program is not limited enforcing regulations. In addition, Florida invests resources in helping farmers to learn how to use water more efficiently

through two complementary programs: the mobile irrigation lab (“MIL”) program and best management practices (“BMP”) cost share program, discussed below, operate in conjunction.

51. These water conservation and protection programs have been developed and supported by the District, FDACS, the West Florida Resource Conservation & Development Council, and many agricultural producers.

52. The State has developed and implemented these programs in order to maximize the efficient use of water by the agricultural sector, and we’ve had tremendous success with them. Through information provided by the MIL program, FDACS estimates that Florida has saved 7.7 MGD in the ACF Basin. (ACF Basin Water Savings Summary, FX-861.) That represents approximately a 23 percent savings in water use, with actual agricultural use decreased to 26 MGD.

A. Mobile Irrigation Labs and Cost Share Program

53. The MIL program is the most important agricultural conservation program in the ACF Basin in Florida. MILs are state funded and are, quite literally, mobile laboratories. Each MIL consists of one vehicle, a one- or two-person team, and field equipment. The MILs travel around the District to analyze irrigation systems and then educate the system owners on how to improve their water conservation. This program is provided free of charge to farmers. (FX-150, Mobile Irrigation Lab (MIL) Handbook.)

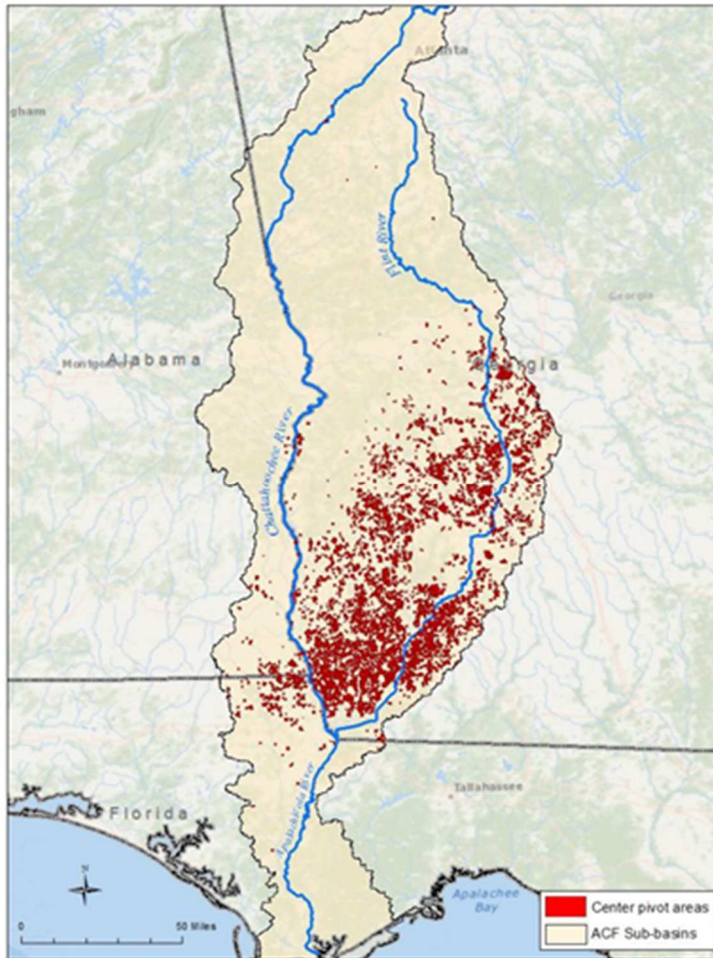
- a. Exhibit FX-150 is a true and accurate copy of the Mobile Irrigation Lab Handbook, a document that was prepared by the United States Department of Agriculture and FDACS in 2014. It was made as part of FDACS’ regular practice, and this information is maintained in the regular course of business of FDACS and is part of Florida’s official records. I have reviewed and relied on it in my capacity as Executive Director of the NFWFMD.

54. In addition to giving recommendations to property owners about how to reduce their water use through, among other things, irrigation system improvements, the MILs inform the property owners about opportunities to improve water quality through best management practices. Then, to help speed the implementation of water efficiency upgrades, the District and FDACS provide cost-share funding to actually assist farmers with implementing best management practices that help protect and conserve water, and improve water quality. (NFWWMD 2016 Consolidated Annual Report, FX-670 at 3 & 17.) Florida is putting its money where its mouth is, so to speak. Millions of gallons of water have been saved in the Basin through this program.

- a. FX-670 is a true and accurate copy of a document that was prepared by NFWWMD staff in the normal course of the District's operating procedures in early 2016. These reports consolidate several legislatively mandated plans and reports regarding the status of NFWWMD programs and water resources. NFWWMD must submit this report every year to the Florida government. It was made as part of NFWWMD's regular practice, and this information is maintained in the regular course of business of the NFWWMD and is part of NFWWMD's official records. I have reviewed and relied on it in my capacity as Executive Director of the NFWWMD.

55. There are currently about 460 irrigation systems in the Florida portion of the ACF Basin. Of those, 440 (or 95 percent) are center-pivot irrigation systems. By comparison, based on work done by my staff at the District, I understand there are over 9,000 center-pivots in the Georgia portion of the ACF. The map below, showing the locations of center-pivots, is a true

and accurate copy of a map that was created by the District in 2013 based on aerial imagery of the ACF Basin.



(From Testimony of Jonathan P. Steverson, Executive Director of the Northwest Florida Water Management District to the U.S. Senate Committee on Commerce, Science and Transportation, August 13, 2013, FX-414 at 8.)

56. Between 2006 and 2015, MILs visited, evaluated and provided recommendations for over 346 center pivots in the ACF, covering 31,678 irrigated acres. In other words, the MILs have assessed over 79 percent of all center pivots systems in the Florida portion of the ACF Basin, representing 88 percent of the irrigated acres in the Florida portion of the ACF Basin. Beyond that, the MILs have serviced 257 center-pivot systems (our primary targets for upgrades) more than once, amounting to almost 60 percent of center-pivots in the Basin, and we have

documented significant efficiency gains. We expect that in the next few years, the MILs will have serviced 100% of the center-pivot systems in the Basin for a second time, generating even greater efficiency gains.

57. The most important of the measures in the MIL program to reduce water use by farmers involves retrofitting center-pivot irrigation systems. Sometimes because of their age or outdated technology, there are center-pivots that are more inefficient than we would like. When the MILs determine that a center-pivot system is inefficient, Florida gives grants to help retrofit and upgrade these systems, helping both the landowners and the State reap significant water conservation improvements.

58. Typical water saving upgrades to a center-pivot system include installations of drop nozzles and end gun controls, which are relatively inexpensive and greatly improve efficient water delivery. By lowering the sprinkler from the center pivot arm closer to the ground and the crop, less water is lost to evaporation and more gets to the roots of the crop. Also, end guns on the pivot are notorious for spraying outside the field. By controlling the end gun spray or in some cases turning them off, if feasible, we save large amounts of water that would otherwise be wasted.

59. Currently, over 90 percent of the Basin center-pivots serviced by the MILs are operating at low pressure to reduce pumping rates and have end gun shut off devices installed to prevent wasteful overspray on roads or outside field boundaries. And nearly 70 percent of those center-pivots also utilize drop pipes to reduce drift and evaporation and to maximize water reaching the crop.

60. Unfortunately, Georgia does not appear to engage in the same conservation efforts. In July of this year, members of my staff traveled to the lower Flint River Basin to

observe center-pivot operations in Georgia. They took numerous pictures of center-pivots that were wasting water by failing to use end gun controls. (Pictures of Georgia Center Pivots, FX-110-116, 119-120, 122-124, 127; Affidavit of Bruce Wilson, a true and accurate copy of which is attached as Exhibit A to this pre-filed testimony.) When I reviewed the pictures, I noted end guns irrigating outside the fields and other photos showed center-pivots running in the rain. Preventing this type of water waste is exactly why we operate the MIL program in Florida.

B. Crop Rotation Program

61. Recently, the District entered into a cooperative program that it funds in conjunction with the University of Florida's Institute of Food and Agricultural Sciences to study, among other things, the effects of incorporating pasture into crop rotations.

62. This research program is testing these effects at locations in the ACF Basin. Acreage is planted in a rotation; two years of warm-season perennial grass is followed by two years of row crops. So far, these practices are showing real results. Water irrigation demands are reduced – as much as 60 percent – as are nutrient and pesticide application rates. The nitrogen application rate alone can be reduced by approximately 50 percent. As an added bonus, crop yields are *increasing* when using the program's methods. We believe this program holds great promise to make the limited amount of agricultural water use in the Florida portion of the ACF even more efficient.

VI. OTHER NON-REGULATORY APPROACHES

63. In addition to the regulatory and conservation programs the District uses to conserve water, and the efficiency and conservation initiative within the agricultural sector, I would now like to touch on some of the other measures the District has taken or is taking to conserve water in the ACF Basin.

A. Alternative Water Supply Development

64. The District has provided assistance to public water supply utilities and local governments in the Basin in identifying and promoting the use of alternative water supplies. Such water supplies include, among other things, saltwater and brackish water, and reuse of wastewater. Reclaimed water offsets the need to pump additional water from the aquifer and provides groundwater recharge in the Basin. The law requires a preference for reclaimed water where it is available and feasible to use, and the District requires recreational use applicants like golf courses, to receive reclaimed water to avoid pumping from the aquifer. (*See* § 373.250, Fla. Stat.; Fla. Admin. Code ch. 40-A2.)

65. In 2014, there were 30 public supply utilities and 8 institutional-commercial-industrial users in the ACF basin withdrawing potable water totaling 9.5 MGD. Of the water being withdrawn from these supply systems, approximately 4.85 MGD was returned to the Basin in the form of wastewater. This, along with the water returned to the Basin by public drinking water users through septic tank flows (2.6 MGD), represents over 78 percent of the water that was withdrawn for public supply and commercial-industrial uses.

66. Florida is also proud of the fact that it is a national leader in wastewater reuse, and this policy also extends to the ACF Basin. In 2014, 75 percent of the total wastewater flows in the Basin were reused for beneficial purposes, reducing new groundwater from being pumped from the aquifer and providing aquifer recharge. For instance, the City of Apalachicola utilizes 100 percent of its wastewater flow to meet municipal irrigation demands for parks and medians. The City of Carrabelle provides reclaimed water to a golf course for irrigation and to a state prison for toilet flushing. Additionally, a pilot stormwater reuse project is underway at Chipola College in Marianna to use flows captured during rain events to offset irrigation demands on the campus.

B. Water Resource Investigations

67. The District’s experts perform what we call Water Resource Investigations. These hydrologic and hydrogeologic investigations – basically studies or guidance documents – are designed to provide technical information to support our management of water use and resources in the ACF Basin.

68. In particular, the District has been investigating the use of the Claiborne Aquifer as an alternative supply of water. The Claiborne is located in Jackson County and sits below the Floridan aquifer. If feasible, use of water from the Claiborne could further reduce withdrawals from the Floridan, which has a greater connection to the Apalachicola and Chipola Rivers.

C. Land Acquisition and Restoration

69. The District, state and federal agencies, local governments, and non-governmental conservation organizations have acquired and manage hundreds of thousands of acres land in the ACF Basin. The total basin area is 1.8 million acres, and approximately a third of the land in Florida’s portion of the Basin is conservation land (609,130 acres), not available for development or agriculture.

Ownership Type	Conservation Acres in Florida ACF Basin	Percent Land in Category
Federal	262,943	43.17%
State	333,326	54.72%
Local	224	0.04%
Private	12,636	2.07%
Total	609,130	100.00%

(Generated by District Staff using Florida Natural Areas Inventory, FX-673; *see also* Land Transaction Table, FX-144, ACF; Map of Conservation Lands, Florida ACF, FX-143.) These conservation lands protect water quality, natural systems, public access and use, and water supply. These conservation lands in the Apalachicola floodplain allow the District to better maintain aquifer recharge rates, limit development and associated water use in environmentally sensitive areas, and restore critical natural resources.

- a. The chart above was generated by District staff in October 2016 at my direction using the Florida Natural Areas Inventory, which is FX-673, and represents a true and accurate copy of their work. It is a summary of information prepared by my staff. I have reviewed and relied upon the chart in my capacity as Executive Director of the NFWFMD.
- b. Exhibit FX-143 is a Map of Conservation Lands in the Florida ACF. This is a true and accurate copy of a map that was generated by staff at FDEP in January 2016 and, among other things, was provided to Florida's experts in this case. I have reviewed and relied on it in my capacity as Executive Director of the NFWFMD.
- c. Exhibit FX-144 is a true and accurate copy of a table that was generated by staff at FDEP in February 2016] and, among other things, was provided to Florida's experts in this case. It was made as part of FDEP's regular practice, and this information is maintained in the regular course of business of FDEP and is part of Florida's official records. I have reviewed and relied on it in my capacity as Executive Director of the NFWFMD.

70. One significant example of Florida's efforts to preserve and restore lands in the Basin is the Tate's Hell State Forest Hydrologic Restoration project. Tate's Hell State Forest encompasses nearly 205,000 acres within the lower part of the Basin near Apalachicola Bay. This area was once a swampy mosaic of wet prairies, cypress sloughs, Atlantic White Cedar forests, and other wetland and pine flatwoods communities. (Tate's Hell State Forest Hydrologic Restoration Plan, JX133.) This exhibit is a true and accurate copy of the executive summary and two volumes of a restoration plan that was prepared by NFWFMD staff in the normal course of the District's operating procedures in August 2010. It is publicly available. It was made as part of NFWFMD's regular practice, and this information is maintained in the regular course of business of the NFWFMD and is part of NFWFMD's official records. I have reviewed and relied on it in my capacity as Executive Director of the NFWFMD.

71. Large-scale private forestry operations during 1960s through 1980s converted extensive areas of native habitats to slash pine plantation. More than 800 miles of roads were constructed to support logging operations and ditches were excavated along most roads to provide road-fill material and drain adjacent wetlands. These activities adversely impacted the hydrology and ecology of historic vegetation communities and affected the magnitude, timing, and quality of surface water runoff discharged to the Apalachicola Bay system. (Tate's Hell State Forest Hydrologic Restoration Plan, Executive Summary, JX-133 (Executive Summary, at 1)-; Ten Year Resource Management Plan for Tate's Hell State Forest, JX-22 at 21-22.)

- a. Exhibit JX-22 is a true and accurate copy of a management plan that was prepared by FDACS. It was made as part of FDACS' regular practice, and this information is maintained in the regular course of business of FDACS and is part of Florida's

official records. I have reviewed and relied on it in my capacity as Executive Director of the NFWMD.

72. In 1994, the State of Florida began purchasing the property from timber companies with the goals of improving the quality of surface water runoff discharged from the site to the Apalachicola Bay system, re-establishing historic surface water drainage patterns, and restoring wetland ecosystems. (Tate's Hell State Forest Hydrologic Restoration Plan, Executive Summary, JX133 at 2.)

73. This multi-year effort will return Tate's Hell to its former state, restoring the historical surface water drainage patterns and ecological communities of Tate's Hell. (Tate's Hell State Forest Hydrologic Restoration Plan, Executive Summary, JX133, at 2.) The project was not done for the purpose of increasing flows into Apalachicola Bay, as flows from the Tate's Hell portion of the Basin historically were miniscule in comparison to the flows from the Apalachicola River. As I understand it, the flows from Tate's Hell did not and do not have a significant impact on salinity levels in the Bay.

D. Hydrologic Monitoring

74. The District collects and evaluates hydrologic data on rainfall, aquifer levels, stream level and flow, spring flow, and water quality. We have a network of continuous data collection stations to help us measure groundwater and surface water levels.

75. Collecting and evaluating this data allows us to continually monitor the status of our critical water resources in the ACF Basin. Among other things, it allows us to develop assessments of flood and drought conditions, develop and calibrate hydrologic models, develop minimum flows and levels, and assess impacts of withdrawals.

E. Public Outreach and Education

76. Finally, in addition to all of its other work, the District has distributed thousands of water conservation brochures to local governments, utilities, schools, and private organizations in the ACF Basin. We feature links to these brochures on our website. And in cooperation with FDEP, we participate in the Water Conservation Month activities every April. As part of that, our staff calls local governments within the District to encourage them to adopt resolutions to promote water conservation practices.

VII. USGS SUMATRA STREAMFLOW GAGE

77. NFWFMD relies regularly on streamflow gage data in the Apalachicola River from gages maintained by the U.S. Geological Survey (“USGS”) and the Army Corps of Engineers. Specifically, we have reviewed data from the Sumatra Gage, in the lower part of the River, at River Mile 21. My staff recently received and reviewed a letter from the USGS on July 25, 2016, indicating that USGS is reassessing some of the flow measurements at the Sumatra gage as they believe some water flow was not being captured properly by the gage. (*See* Letter from Rafael Rodriguez, USGS, to Edward Chelette, NFWFMD, FX-515.) FX-515 is a true and accurate copy of the letter sent by Rafael Rodriguez, USGS, to Edward Chelette, NFWFMD, on July 25, 2016. The District understand that USGS may be revising its data set related to measurements at Sumatra.

VIII. CONCLUSION

78. NFWFMD, in concert with its sister agencies, strives to carefully manage the water resources in the Apalachicola Basin. As I have testified, we do this through 1) a robust regulatory program, 2) a resource program that provides assistance to farmers, 3) setting aside surface waters from use, and 4) setting aside important lands in the flood plain. While these strategies are extremely important, we also know that the hydrologic health of the system also

depends most heavily on the water that flows into our river from upstream. As Florida's primary water manager in the Apalachicola Basin, I believe that implementing the management techniques we use in Florida across the entire ACF Basin, particularly numerical permit limits and deficit/limited irrigation, would dramatically increase the protection provided to the Apalachicola River and Bay.

79. In my testimony, I referenced several documents, all of which were either generated by my staff at the District and reviewed by myself, or which I reviewed as part of my duties as the Executive Director of the NFWMD. True and accurate copies of all of the documents are submitted as evidence, and I describe the documents and my familiarity with each of them below.

- a. JX-6 - River Basins Comprehensive Study, the Agricultural Water Demand: Described in text.
- b. JX-22 - Ten Year Resource Management Plan for Tate's Hell State Forest: Described in text.
- c. JX-29 - H. Lee Edmiston, A RIVER MEETS THE BAY: A CHARACTERIZATION OF THE APALACHICOLA RIVER AND BAY SYSTEM (2008): Described in text.
- d. JX-84 - NFWMD 2013 Water Supply Assessment: Described in text.
- e. JX-133 - Tate's Hell State Forest Hydrologic Restoration Plan: Described in text.
- f. FX-110, FX-111, FX-112, FX-113, FX-114, FX-115, FX-116, FX-119, FX-120, FX-122, FX-123, FX-124, and FX_127 - Pictures of center-pivots in Georgia's portion of the ACF Basin: These exhibits are true and accurate copies of photographs taken by Bruce Wilson, the Chief of our Bureau of Groundwater Regulation, or by a member of our staff who traveled with Mr. Wilson in July

2016. In his affidavit, Bruce Wilson confirms that these photographs fairly and accurately represents the scene portrayed in each photograph. This information is maintained by the NFWFMD.

- g. FX-143 - Map of Conservation Lands, Florida ACF: Described in text.
- h. FX-144 - Land Transaction Table ACF: Described in text.
- i. FX-150 - Mobile Irrigation Lab (MIL) Handbook: Described in text.
- j. FX-414 - Testimony of Jonathan P. Steverson, Executive Director of the Northwest Florida Water Management District to the U.S. Senate Committee on Commerce, Science and Transportation, August 13, 2013: This is a true and exact copy of the written testimony given by former NFWFMD Executive Director Jonathan P. Steverson to the U.S. Senate on Commerce, Science and Transportation, given in August 2013, as well as the email to which it was attached. I have reviewed and relied on it in my capacity as Executive Director of the District. A color version of the testimony (including the map) is publicly available at <http://tinyurl.com/SteversonTestimony>.
- k. FX-515 - Letter from Rafael Rodriguez, USGS, to Edward Chelette, NFWFMD: Described in text.
- l. FX-603 - Jennifer Jacobs & Michael Dukes, REVISION OF AFSIRS CROP WATER SIMULATION MODEL (2007): Described in text.
- m. FX-604 - Jennifer Jacobs, EVALUATION OF REFERENCE EVAPOTRANSPIRATION METHODOLOGIES AND AFSIRS CROP WATER USE SIMULATION MODEL (2001): This exhibit is a true and accurate copy of a technical report produced on behalf of the St. Johns River Water Management District in Florida. I understand that it

was made and maintained in the regular course of business of the St. Johns River Water Management District and is part of the District's official records. I reviewed this document in my capacity as Executive Director of the NFWWMD.

- n. FX-605 - A.G. Smajstrla, TECHNICAL MANUAL, AGRICULTURAL FIELD SCALE IRRIGATION REQUIREMENTS SIMULATION (AFSIRS) MODEL (1990): Described in text.
- o. FX-670 - NFWWMD 2016 Consolidated Annual Report: Described in text.
- p. FX-671 - NFWWMD Water Use Permit Applicant's Handbook: Described in text.
- q. FX-673 - Florida Natural Areas Inventory: Described in text.
- r. FX-674 - Estimating Florida Statewide Agricultural Irrigation Demand (FSAID) using Economics and Engineering Models, Final Report: Described in text. This document was published in September 2014.
- s. FX-676 - ACF Basin Active Individual Water Use Permits: Described in text.
- t. FX-677 - ACF Basin AFSIRS Output Summary: Described in text.
- u. FX-678 - ACF Basin Agricultural Pumpage Comparison 2011 and 2014: Described in text.
- v. FX-679 - Spreadsheet compiled from information related to a water use permit for 7507 Greenwood Oaks Farm, Inc. – Described in text.
- w. FX-682 - NFWWMD Water Use Technical Staff Report, Application 107507 (WUP_261_3 (2)) – Described in text.
- x. FX-861 - ACF Basin Water Savings Summary: Described in text.

- y. FX_862a through FX-862d – 2015 Florida Statewide Agricultural Irrigation Demand (“FSAID”) Report & Appendices: Described in text.

ATTACHMENT'C

No. 142, Original

**In The
Supreme Court of the United States**

STATE OF FLORIDA,

Plaintiff,

v.

STATE OF GEORGIA,

Defendant.

DECLARATION OF BRUCE WILSON

I, Bruce Wilson, being duly sworn, state as follows:

1. I am employed by the Northwest Florida Water Management District (“NFWMD”), and my title is Chief, Bureau of Groundwater Regulation.
2. My business address is: 81 Water Management Drive, Havana, FL 32333-4712
3. I am over the age of eighteen, and I am not a party to this action.
4. From July 10, 2016, through July 20, 2016, I led a team from the NFWMD in photographing inefficient irrigation practices of farmers in the Flint River Basin in Georgia.
5. The team traveled to locations in counties including: Colquitt, Crisp, Dougherty, Miller, Mitchell, Seminole, and Worth.
6. The team took photographs using both digital cameras and smartphones such as iPhones.
7. Following the trip, I reviewed the images taken by the team and confirmed that they were all taken at locations in the Flint River Basin. Based on my personal experiences, information, and belief, the images fairly and accurately represent the scene as captured on that day.
8. Attached as Exhibit A is a spreadsheet detailing these photographs, as well as any available GPS or other location data regarding these photographs.
9. The images have been maintained by the NFWMD.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

Executed this 6th day of September, 2016, at Havana, Florida.



Signature of Declarant

Bruce Wilson

Name of Declarant

Florida Exhibit Number (September 9 List)	Filename	Bates	Deposition (If Any)	Decimal Degrees		Latitude (North)			Longitude (West)		
				Latitude	Longitude	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
114	Picture 4.jpg	FL-ACF-04142775	N/A	31.18861111	-84.32916667	31	11	19	84	19	45
123	Picture 2.jpg	FL-ACF-04142774	Irmak Ex. 29	30.5845	-84.4632						
110	6995 River Road 311712.89 841832.75 (2).jpg	FL-ACF-04142765	Irmak Ex. 24	31.28691389	-84.30909722	31	17	12.89	84	18	32.75
119	IMG_1020.jpg	FL-ACF-04142772	N/A	31.203125	-84.38634722	31	12	11.25	84	23	10.85
122	IMG_1021.jpg	FL-ACF-04142773	N/A	31.203125	-84.38634722	31	12	11.25	84	23	10.85
120	Albany_52.jpg	FL-ACF-04142766	Irmak Ex. 25	31.58016667	-84.04541667	31	34	48.6	84	2	43.5
116	022.jpg	FL-ACF-04142764	Irmak Ex. 30	31.19138889	-84.56861111	31	11	29	84	34	7
112	Small GM 310547845143.jpg	FL-ACF-04142779	Irmak Ex. 21	31.05478	-84.5143						
113	Small DM 31.266620, -84.148633.jpg	FL-ACF-04142777	Irmak Ex. 23	31.26662	-84.148633						
111	Small RH 305755 844634.jpg	FL-ACF-04142780	Irmak Ex. 27	30.5755	-84.4634						
115	Small GM 31 11 29 N, 84 34 7 W.jpg	FL-ACF-04142778	Irmak Ex. 31			31	11	29	84	34	7
124	Small Wright Farms 312703.02 840606.88-E.jpg	FL-ACF-04142781	Irmak Ex. 28	31.270302	-84.060688						
127	Small DM 31.179006, -84.393335.jpg	FL-ACF-04142776	N/A	31.179006	-84.393335						