



**REPORT ON CURRENT GROUNDWATER CONDITIONS  
IN BATON ROUGE AND RECOMMENDATIONS FOR  
THE SUSTAINABLE MANAGEMENT OF LOCAL  
GROUNDWATER RESOURCES INTO THE FUTURE**

**AS REQUESTED BY:**

**HOUSE CONCURRENT RESOLUTION No. 31 OF 2019**

**FEBRUARY 14, 2020**

## TABLE OF CONTENTS

I.	INTRODUCTION AND EXECUTIVE SUMMARY.....	3
<b>PART ONE: LEGAL FRAMEWORK FOR AREA OF GROUNDWATER CONCERN/ CRITICAL AREA OF GROUNDWATER CONCERN DECLARATIONS</b>		
II.	RELEVANT STATUTORY DEFINITIONS (LA. R.S. 38:3097.2).....	7
III.	ROLE OF THE COMMISSIONER OF CONSERVATION.....	8
IV.	STATUTORY LAW RELATING TO AREAS OF GROUNDWATER CONCERN AND CRITICAL AREAS OF GROUNDWATER CONCERN.....	8
V.	OFFICE OF CONSERVATION RULES.....	11
	Initial Application Process.....	11
	Direct Action of the Commissioner and Limits.....	11
	Groundwater Emergency Process.....	12
	Application Review, Hearing, and Decision.....	12
<b>PART TWO: CURRENT GROUNDWATER CONDITIONS IN BATON ROUGE AND FINDINGS ON SUSTAINABILITY</b>		
VI.	OFFICE OF CONSERVATION FINDINGS ON GROUNDWATER USE AND SALTWATER INTRUSION IN BATON ROUGE.....	14
VII.	OFFICE OF CONSERVATION FINDINGS ON THE SUSTAINABILITY OF GROUNDWATER USE IN BATON ROUGE.....	17
	Definition of Sustainability.....	17
	Previous Findings from HCR No. 115 of 2016 Report.....	17
	Factors Impacting a Sustainability Determination.....	18
VIII.	OPINION ON THE NECESSITY FOR AN AREA OF GROUNDWATER CONCERN/ CRITICAL AREA OF GROUNDWATER CONCERN.....	22
	No Groundwater Emergency.....	24
	Potential for Area of Groundwater Concern/Critical Area Designation.....	24

**PART THREE: ROLE OF THE CAGWCC AND RECOMMENDATIONS ON  
MANAGING GROUNDWATER IN BATON ROUGE FOR THE FUTURE**

**IX. ROLE OF THE CAPITAL AREA GROUND WATER CONSERVATION COMMISSION  
IN REGIONAL GROUNDWATER MANAGEMENT . . . . . 27**

- Membership and Groundwater Use Permitting . . . . . 27**
- Creation Pre-Dates State Groundwater Law, Shared Jurisdiction  
with Commissioner of Conservation . . . . . 27**
- Authority as a Regulatory Agency, Recognition of CAGWCD as  
*de facto* Critical Area of Groundwater Concern. . . . . 28**

**X. RECOMMENDATIONS FOR THE FUTURE. . . . . 29**

- Importance of Long-Term Planning by the CAGWCC . . . . . 29**
- Performance Audit of the CAGWCC by the Legislative Auditor. . . . . 29**
- Specific Recommendations for CAGWCC Action. . . . . 30**
- Recommendations to the Legislature . . . . . 32**

**APPENDIX: NOTES ON THE CAGWCD AND CAGWCC . . . . . 34**

- Importance of East Baton Rouge Parish in the CAGWCD . . . . . 34**
- Current CAGWCD and CAGWCC Organization. . . . . 35**
- Influence of Regulated Users on the CAGWCC . . . . . 36**

## I. INTRODUCTION AND EXECUTIVE SUMMARY

The purpose of this report is to provide an evaluation of current groundwater conditions in Baton Rouge and to make recommendations for the sustainable management of local groundwater resources into the future. The Office of Conservation also will address specifically the requests found in House Concurrent Resolution No. 31 of 2019, namely that the Commissioner of Conservation: 1) “study, outline the requirements, and make recommendations as to the necessity of an area of groundwater concern or a critical area of groundwater concern declaration in the Baton Rouge area to limit saltwater intrusion and protect regional groundwater supplies for the future”; and 2) “include recommendations [in the study] that provide for the role and necessary actions required of the Capital Area Ground Water Conservation Commission in any plan to preserve and manage the groundwater resources of the Baton Rouge area.”

The sustainable management of Baton Rouge’s groundwater resources is an issue that has commanded the attention not only of the current Commissioner of Conservation but also his immediate predecessor. Saltwater intrusion in local aquifers is a serious threat to sustainability that must be addressed. It is well-documented and accepted by all scientists and regulatory agencies involved in the study of the situation as well as by the largest regulated users of groundwater in the area. The Office of Conservation has been deeply involved in working towards the sustainable management of Baton Rouge’s groundwater resources for many years. Previous findings on this subject were included in a study report prepared in response to House Concurrent Resolution No. 115 of 2016.

This report is divided into three parts. Part I addresses the role of the Commissioner of Conservation in the declaration of an Area of Groundwater Concern and provides a review of the Area of Groundwater Concern/Critical Area of Groundwater Concern statutory law and the application, hearing, and decision process. Part II evaluates current groundwater conditions in Baton Rouge, particularly groundwater use and withdrawals along with water level declines and saltwater intrusion in local aquifers. This part also assesses the issue of local groundwater sustainability under the Commissioner’s authority, specifically whether the situation at Baton Rouge meets the requirements for a groundwater emergency or an Area of Groundwater Concern/Critical Area declaration. Part III considers the role and authority of the Capital Area Ground Water Conservation Commission (CAGWCC) in regional groundwater management and offers recommendations for improvement. Part III also offers specific recommendations to the Legislature for consideration.

Briefly, the Office of Conservation finds:

- 1. The expansion of groundwater withdrawals in East Baton Rouge Parish after 1940 and especially between 1960 and 1980 and the maintenance of these historically high-volume withdrawals in the decades since have caused water level declines and the encroachment of saltwater across the Baton Rouge Fault in certain local aquifers, particularly in the 1500- and 2000-foot sands.**

2. There are no major plans to reduce the current high-volume use of groundwater close to the Baton Rouge Fault that initially caused water level declines and induced saltwater intrusion in certain local aquifers.
3. The maintenance of current high-volume groundwater withdrawals close to the Baton Rouge Fault will continue to cause water level declines inside certain local aquifers and allow the flow of saltwater into previously freshwater areas north of the fault.
4. Unacceptable environmental damage to local aquifers is continuing.
5. The economic costs of water level decline and saltwater intrusion have not been effectively measured but are significant and assured to increase in the coming years.
6. The social consequences of increased costs for water and/or a conversion from groundwater to surface water in the Baton Rouge area have not been defined or evaluated.
7. The public health consequences of a conversion from groundwater to surface water in the Baton Rouge area have not been evaluated although it is expected that any and all public supply providers will continue to meet Environmental Protection Agency (EPA) and state Office of Public Health standards for safe drinking water.
8. The current groundwater conditions in Baton Rouge do not constitute a groundwater emergency as provided for by statute because the impacts of continued withdrawals are not “unanticipated occurrences” and a large supply of groundwater remains available for “beneficial use” into the future.
9. Previous studies and evidence presented to various governmental bodies over recent years appear to provide ample material for an affected water well owner to warrant making a request for initiating a public hearing and investigation process into the possibility of declaring either an Area of Groundwater Concern or a Critical Area of Groundwater Concern. Following receipt of an application requesting such a declaration as required under state law, the Commissioner of Conservation can open an official investigation, hold public hearings, and/or issue potential conservation orders. No such application has been received to date.
10. There is a shared jurisdiction over regional groundwater management in the Baton Rouge area between the Commissioner of Conservation in his responsibilities for groundwater sustainability and the Capital Area Ground Water Conservation Commission (CAGWCC).
11. The Louisiana Legislature created the CAGWCC in 1974 as the governing board of the Capital Area Ground Water Conservation District (CAGWCD) and vested this board with significant regulatory authority as the front-line manager for regional groundwater resources in the Baton Rouge area, specifically to resolve the problems

of water level decline, saltwater intrusion, and land subsidence caused by high-volume groundwater withdrawals.

12. Based upon the Legislature's creation of the CAGWCD and the authority provided to the CAGWCC in the discharge of its duties, the Office of Conservation consistently has recognized the CAGWCD as a *de facto* Critical Area of Ground Water Concern.
13. The Louisiana Legislative Auditor reported in May 2019 multiple deficiencies (listed on pp. 29-30) in the CAGWCC's performance of its duties as a regulatory agency charged with regional groundwater management.
14. The Commissioner of Conservation recommends substantive improvements (listed on pp. 30-32) to the CAGWCC's planning and operations based on the audit findings.
15. The Commissioner of Conservation also recommends to the Legislature:
  - a. Enact legislation mandating and/or funding the development, completion, implementation, and enforcement by the CAGWCC of a long-term groundwater management plan to address saltwater intrusion in the Baton Rouge area, said plan to be completed and operational effective July 1, 2023.
  - b. Enact legislation requiring the CAGWCC to present comprehensive updates annually before the appropriate committees of the Legislature on progress towards the development, completion, implementation, and enforcement of a long-term groundwater management plan to address saltwater intrusion in the Baton Rouge area ahead of the July 1, 2023 plan deadline.
  - c. Enact legislation requiring the CAGWCC to complete a periodic management plan revision and update process every five years after July 1, 2023, said revision and update process to be similar to that conducted for the state Coastal Master Plan by the Coastal Protection and Restoration Authority.
  - d. Consider an evaluation of the adequacy and appropriateness of the organization and governing structure of the CAGWCD in meeting the above recommendations for developing, completing, implementing, and enforcing a long-term groundwater management plan (see Appendix, pp. 34-36).
  - e. Failing suitable progress by the CAGWCC towards the development, completion, implementation, and enforcement of a long-term groundwater management plan to address saltwater intrusion in the Baton Rouge area by July 1, 2023, consider providing the Commissioner of Conservation with adequate funding and/or additional authority to pursue necessary groundwater management planning and plan implementation in the CAGWCD.

**PART ONE:  
LEGAL FRAMEWORK FOR AREA OF GROUNDWATER  
CONCERN/CRITICAL AREA OF GROUNDWATER  
CONCERN DECLARATIONS**

## II. RELEVANT STATUTORY DEFINITIONS (LA. R.S. 3097.2)

**"Area of ground water concern"** shall mean an area in which, under current usage and normal environmental conditions, sustainability of an aquifer is not being maintained due to either movement of a salt water front, water level decline, or subsidence, resulting in unacceptable environmental, economic, social, or health impact, or causing serious adverse impact to an aquifer, considering the areal and temporal extent of all such impacts. An area of ground water concern, declared pursuant to R.S. 38:3097.6, shall be designated a **critical area of ground water concern** when the commissioner finds that sustainability cannot be maintained without withdrawal restrictions.

**"Beneficial use"** means the technologically feasible use of ground water for domestic, municipal, industrial, agricultural, recreational, or therapeutic purpose, or any other advantageous purpose.

**"Commissioner"** shall mean the Commissioner of Conservation.

**"Ground water"** is water suitable for any beneficial use percolating below the earth's surface which contains fewer than 10,000 mg/l total dissolved solids, including water suitable for domestic use or supply for a domestic water system.

**"Ground water emergency"** shall mean an unanticipated occurrence as a result of a natural force or a man-made act which causes a ground water source to become immediately unavailable for beneficial use for the foreseeable future or drought conditions determined by the commissioner to warrant the temporary use of drought relief wells to assure the sustained production of agricultural products in the state.

**"Historic ground water production"** means the average annual production of a ground water well since the calendar year 1995.

**"Person"** shall mean any natural person, corporation, association, partnership, receiver, tutor, curator, executor, administrator, fiduciary, or representative of any kind, or any governmental entity.

**"Sustainability"** means the development and use of ground water in a manner that can be maintained for the present and future time without causing unacceptable environmental, economic, social, or health consequences.

**"User"** shall mean any person who is making beneficial use of ground water from a well or wells owned or operated by such person.

**"Well" or "water well"** shall mean any well drilled or constructed for the principal purpose of producing ground water.



### **III. ROLE OF THE COMMISSIONER OF CONSERVATION**

Specific to the purposes of this report, the Commissioner of Conservation has been granted the authority “to make, after notice and public hearings in accordance with the Administrative Procedure Act, any reasonable rules, regulations, and orders that are necessary from time to time in the proper administration and enforcement of this Chapter [13-A-1. Water Resources Management], including rules, regulations, or orders” to, among other things, “determine areas of groundwater concern and designate critical areas of groundwater concern in accordance with La. R.S. 38:3097.6.”

### **IV. STATUTORY LAW RELATING TO AREAS OF GROUNDWATER CONCERN AND CRITICAL AREAS OF GROUNDWATER CONCERN**

By statutory definition (La. R.S. 38:3097.2), an area of groundwater concern is “an area in which, under current usage and normal environmental conditions, sustainability of an aquifer is not being maintained due to either movement of a salt water front, water level decline, or subsidence, resulting in unacceptable environmental, economic, social, or health impact, or causing serious adverse impact to an aquifer, considering the areal and temporal extent of all such impacts.” Inherent within this legal construct of an area of groundwater concern is the term “sustainability,” which is defined in the same statute as “the development and use of ground water in a manner that can be maintained for the present and future time without causing unacceptable environmental, economic, social, or health consequences.” In evaluating any possible area of groundwater concern, the Commissioner of Conservation must first assess the sustainability, under this definition, of local groundwater resources in an area.

Action that would initiate investigation into the possible designation of an area of groundwater concern is provided for in La. R.S. 38:3097.6, specifically that “any owner of a well that is significantly and adversely affected as a result of the movement of a saltwater front, water level decline, or subsidence in or from the aquifer drawn on by such well shall have the right to file an application to request the commissioner to declare that an area underlain by such aquifer is an area of groundwater concern.” This application must include a statement of facts and “supporting evidence substantiating the area may be an area of groundwater concern.”

Upon receipt of an application, the Commissioner of Conservation shall “either deny the request, in writing, or issue a draft order which describes the proposed boundaries of the area of groundwater concern.” The decision of the Commissioner shall be based on the merits of the application and evidence provided along with an understanding of good management practices and sound science. If a draft order is issued, the Commissioner must hold at least one public hearing in the locale and must provide copies of the draft order to the House Committee on Natural Resources and Environment and the Senate Committee on Natural Resources at least 30 days prior to such a hearing.

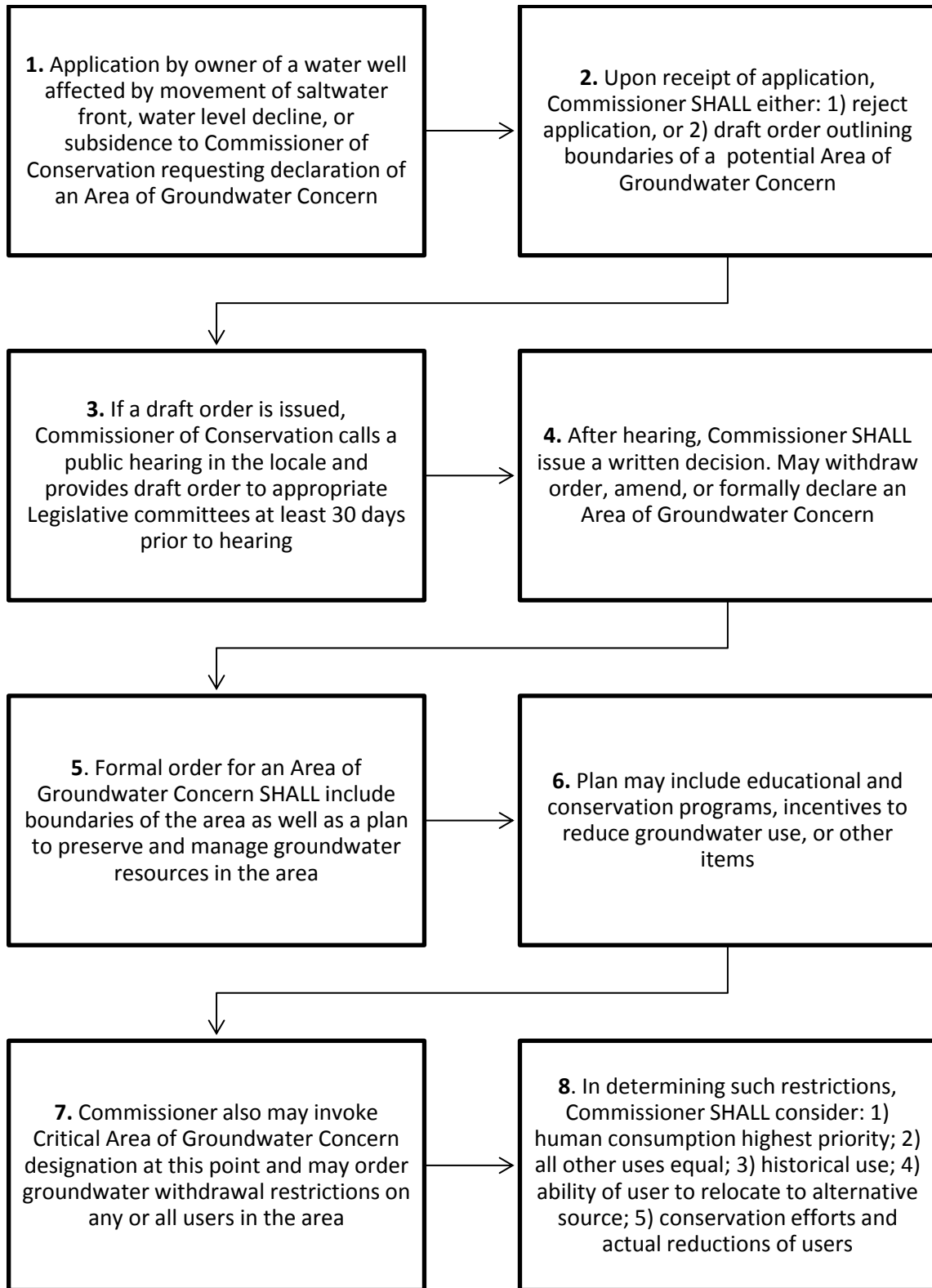
The holding of a public hearing necessitates further action on the part of the Commissioner in the form of a written decision after its close. The Commissioner has several options at this point, based on the evidence and information developed during the hearing

process relevant to “good management practices and scientifically sound data” for groundwater resources. One option may be to withdraw or amend the draft order for an area of groundwater concern. However, if an area of groundwater concern is determined to exist, the Commissioner shall issue an order describing the boundaries of the area and including a plan to “preserve and manage the ground water resources in that area.” This plan shall include, but is not limited to, educational and conservation programs and incentives to reduce groundwater use.

Under the weight of the gathered evidence, the Commissioner also at this time may invoke the critical area of groundwater concern designation; this is provided for when it is found that “sustainability cannot be maintained without [groundwater] withdrawal restrictions.” In such a case, the Commissioner “may restrict the amount of withdrawals by any or all users in the area.” In imposing such restrictions, the Commissioner shall: 1) give highest priority to groundwater needed for human consumption and public health and safety; 2) give equal priority (or standing) to uses of groundwater other than for human consumption and public health and safety; 3) consider historical use of groundwater; 4) consider the ability, including economic ability, of a particular user to relocate to an alternative source of water; and 5) consider conservation efforts and actual reductions in water usage by individual users of groundwater, taking into account historic groundwater production.

Water well owners affected by restrictions found in an order declaring an area of groundwater concern or, more specifically, a critical area of groundwater concern may appeal to the Louisiana Water Resources Commission, in accordance with La. R.S. 38:3097.4.D(1), and to the 19<sup>th</sup> Judicial District Court, as stipulated in La. R.S. 38:3097.5.

## PROCESS FOR DECLARING AN AREA OF GROUNDWATER CONCERN OR CRITICAL AREA OF GROUNDWATER CONCERN



## **V. OFFICE OF CONSERVATION RULES**

The Office of Conservation's rules and regulations for handling area of groundwater concern applications are detailed in the Louisiana Administrative Code Title 43 (Natural Resources), Part VI (Water Resources Management), Subpart 1 (Groundwater Management). Chapter 1 of this Subpart provides a few basic definitions from the statutory law and further defines "owner" in reference to the provision that the "owner of a well" shall have the right to make an application for an area of groundwater concern. Chapter 3 provides information on who may apply for an area of groundwater concern declaration, requirements for the official publication of a notice of intent to file an application, requirements for the content of an application, the criteria for an area of groundwater concern designation, the agency's review process for an application, and its recordkeeping procedures. Chapter 5 provides details on the public hearing process for an area of groundwater concern subsequent to issuance of a draft order by the Commissioner, the rules of conduct of such hearings, the decision of the Commissioner after the hearing, and the right of appeal of water well owners impacted by any final order issued by the Commissioner.

### **Initial Application Process**

Briefly, the owner of a water well is defined as the owner registered with the Office of Conservation or the legal owner of the property where the well is located, a person with a long-term lease of the property, or a person with the legal right to drill and operate a well on the property. Following the statutory law, the owner of a well "significantly and adversely" impacted by the movement of a saltwater front, water level decline, or subsidence shall have the right to file an application with the Commissioner of Conservation requesting the declaration of an area of groundwater concern. The applicant shall publish notice of the intent to file such an application in the official journal of any and all parishes potentially affected by the proposed application. The notice shall include all relevant information, a location where the application may be viewed, and the statement that comments about the application should be sent to the Office of Conservation. Five (5) copies of the application shall be filed with the Commissioner of Conservation no sooner than 30 days and no later than 60 days after publication of the notice of intent. The application must include relevant identifying and geographic information and a statement of facts and evidence showing that taking no action would likely negatively impact groundwater resources. It may also include a proposal to preserve and manage these resources.

### **Direct Action of the Commissioner and Limits**

Upon receipt of an application and after due deliberation, the Commissioner of Conservation may decide to initiate direct action for a critical area of groundwater concern hearing, in essence bypassing the request for consideration of the less stringent area of groundwater concern declaration. In taking this direct action, the Commissioner must provide public notice and all relevant information as required in the application process. It is important to note that the Commissioner is not authorized to take direct action on a critical area designation without first receiving an application for an area of groundwater concern.

## **Groundwater Emergency Process**

Under La. R.S. 38:3097.3.C(8), the Commissioner of Conservation has the statutory authority to declare a groundwater emergency by direct action outside of the area of groundwater concern application process. Of course, an emergency declaration request also may be included as part of an area of groundwater concern application or the Commissioner may take direct action on an emergency declaration after receipt of an application, if so warranted. For the purposes of this report, a “groundwater emergency” by statutory definition must be “an unanticipated occurrence as a result of a natural force or a man-made act which causes a ground water source to become immediately unavailable for beneficial use for the foreseeable future.” In this sense, a groundwater emergency necessitates an imminent or immediate threat; it is not a situation that can be readily anticipated, studied, and modeled over a long period of time.

### **Application Review, Hearing, and Decision**

Within 30 days of receipt of an area of groundwater concern application, the Commissioner of Conservation will notify the applicant if the document is administratively complete; if not complete, the applicant will be notified in writing of the needed information and will have 180 days to respond. The Commissioner may reject applications considered frivolous or without merit, or ones still incomplete after an initial response for more information. If an application is deemed complete and valid, the proposed area under consideration will be evaluated under the criteria established by law.

The Commissioner then may convene a preliminary hearing in the locale of the proposed area of groundwater concern before taking any further action. Otherwise, a draft order shall be issued and a regular hearing scheduled in accordance with the law. Hearings shall be fact-finding in nature with cross-examination limited to the Commissioner and Office of Conservation staff. The applicant is allowed to present evidence, followed by evidence or testimony from interested parties, either in support or opposition. The hearings shall be recorded and transcribed.

Following the hearing(s), the Commissioner shall issue his decision in the form of a draft order which shall contain the designation of an area of groundwater concern or critical area of groundwater concern, boundaries of the area, and a plan to preserve and manage groundwater resources in the area. Hearings on the draft order and any proposed management controls or restrictions shall follow before adoption of a final order.

**PART TWO:  
CURRENT GROUNDWATER CONDITIONS IN  
BATON ROUGE AND FINDINGS ON SUSTAINABILITY**

## VI. OFFICE OF CONSERVATION FINDINGS ON GROUNDWATER USE AND SALTWATER INTRUSION IN BATON ROUGE

- 1. The Southern Hills Aquifer System is the primary source for groundwater use in East Baton Rouge Parish.** This is a regional aquifer system composed of aquifers or “sands” identified by depth, *e.g.* “400-foot sand.” These include the 400-foot sand, 600-foot sand, 800-foot sand, 1000-foot sand, 1200-foot sand, 1500-foot sand, 1700-foot sand, 2000-foot sand, 2400-foot sand, and 2800-foot sand. Fresh groundwater in this system is soft and requires little treatment for potable use (“drinking water”) or industrial purposes. The Baton Rouge Fault has served to reduce the hydraulic connections between largely freshwater aquifers to the north and saltwater aquifers to the south.<sup>1</sup>
- 2. Groundwater from the Southern Hills Aquifer System accounts for 100% of public supply water use in East Baton Rouge Parish.** East Baton Rouge Parish is currently home to approximately 441,000 people, all of whom depend on groundwater for their daily “drinking water.” In 2015, groundwater pumped for public supply purposes totaled approximately 72.21 million gallons per day (Mgal/d). The major public supply provider in East Baton Rouge is the Baton Rouge Water Co. and its subsidiary, Parish Water Co.<sup>2</sup>
- 3. Groundwater pumped in East Baton Rouge from the Southern Hills Aquifer System also furnishes the daily public supply for a large number of residents in Ascension Parish.** Between 80,000 and 90,000 people in Ascension Parish are supplied with groundwater pumped originally in East Baton Rouge Parish. Ascension Water Co.—a subsidiary of Baton Rouge Water Co.—began operations in 1994 with 1,730 customers and counted 27,961 at the end of 2016. Ascension Parish’s population has doubled since 1990 and is expected to continue to grow in coming decades.<sup>3</sup>
- 4. Groundwater accounts for approximately 83% of industrial and power generation water use in East Baton Rouge Parish.** According to *Water Use in Louisiana, 2015* by the U.S. Geological Survey (USGS), industrial users of water in East Baton Rouge such as Exxon, Georgia-Pacific, and Entergy, among others, drew approximately 79.99 Mgal/d from local aquifers and only 16.68 Mgal/d from surface water sources like the Mississippi River. Industrial use of groundwater in 2020 in East Baton Rouge is expected to be significantly reduced due to reported reductions of as much as 25 Mgal/d following the closure of large parts of the Georgia-Pacific facility.<sup>4</sup>

---

<sup>1</sup> For further information, see Vincent E. White, “Water Resources of the Southern Hills Regional Aquifer System, Southeastern Louisiana,” U.S. Geological Survey Fact Sheet 2017-3010, March 2017.

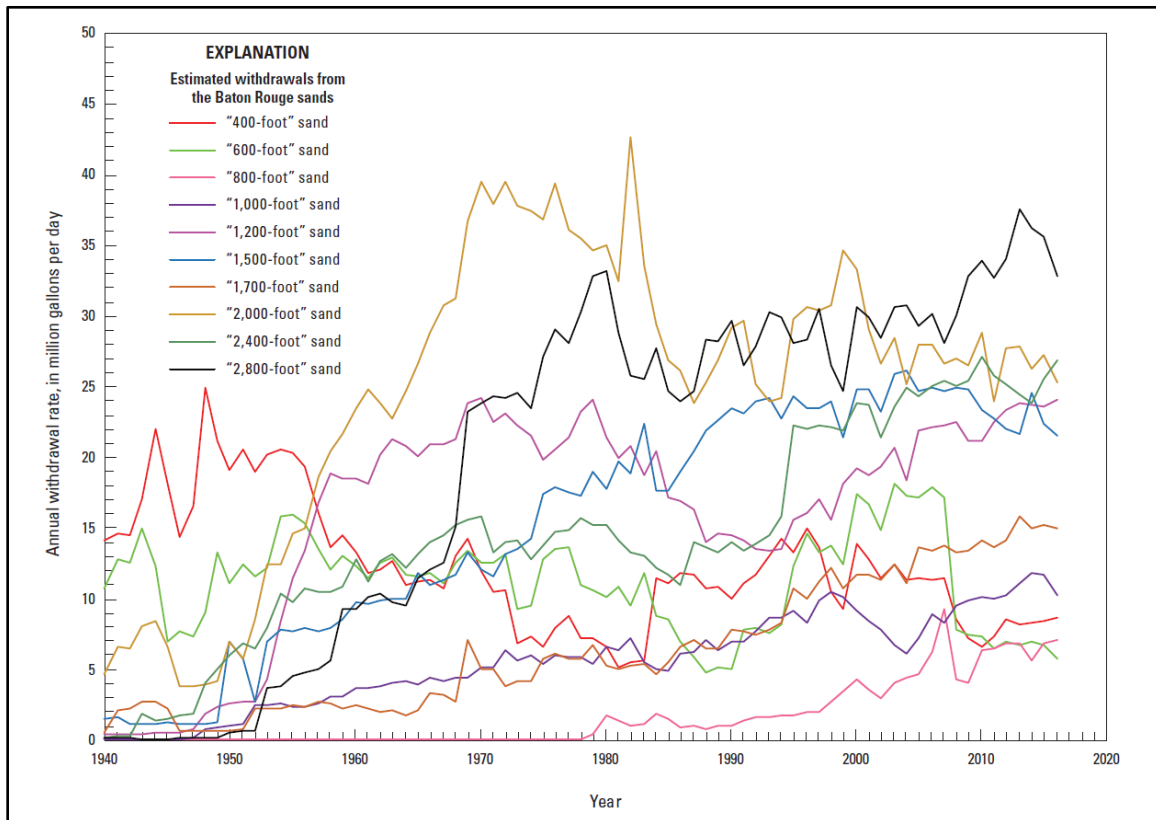
<sup>2</sup> Angela L. Collier and B. Pierre Sargent, *Water Use in Louisiana, 2015*, Louisiana Dept. of Transportation and Development Water Resources Special Report No. 18, in cooperation with the USGS, Baton Rouge, La., 2018, p. 40, available on-line at: [https://wise.er.usgs.gov/dp/pdfs/WaterUseinLouisiana\\_2015.pdf](https://wise.er.usgs.gov/dp/pdfs/WaterUseinLouisiana_2015.pdf).

<sup>3</sup> Estimate on supply to Ascension Parish extrapolated from 2017-2018 CAGWCD Act 425 reports, available on-line at: <http://dnr.la.gov/act425>. Information on Ascension Water Co. from reports to the Louisiana Public Service Commission, available on-line at: <http://lpscstar.louisiana.gov/star/portal.aspx>.

<sup>4</sup> Collier and Sargent, *Water Use in Louisiana, 2015*, p. 40.

5. **Groundwater users in East Baton Rouge Parish significantly expanded their withdrawals from the local aquifer system after 1940 and especially between 1960 and 1980.** After an already substantial increase in use after 1940, the USGS estimated that groundwater withdrawals further increased from 96.42 Mgal/d in 1960 to 149.54 Mgal/d in 1980. Importantly, this increase in withdrawals necessitated a shift in usage in the decades after 1940 from the shallow 400- and 600-foot sands to the deeper 1200-, 1500-, 2000-, and 2800-foot sands.<sup>5</sup>

**Fig. 1, Estimated Withdrawals from the Baton Rouge Sands, 1940-2016**<sup>6</sup>



6. **Groundwater users in East Baton Rouge Parish have continued to withdraw circa 1980 volumes (or greater) from the aquifer system since 2010.** Due to reductions in industrial use, groundwater withdrawals declined from a peak of 149.54 Mgal/d in 1980 to an estimated 118.15 Mgal/d by 1985 but withdrawals steadily increased back to circa 1980 volumes by 2010 (125.73 Mgal/d in 1990, 135.66 Mgal/d in 2000, and 149.89 Mgal/d in 2010). According to self-reported groundwater use data collected by the

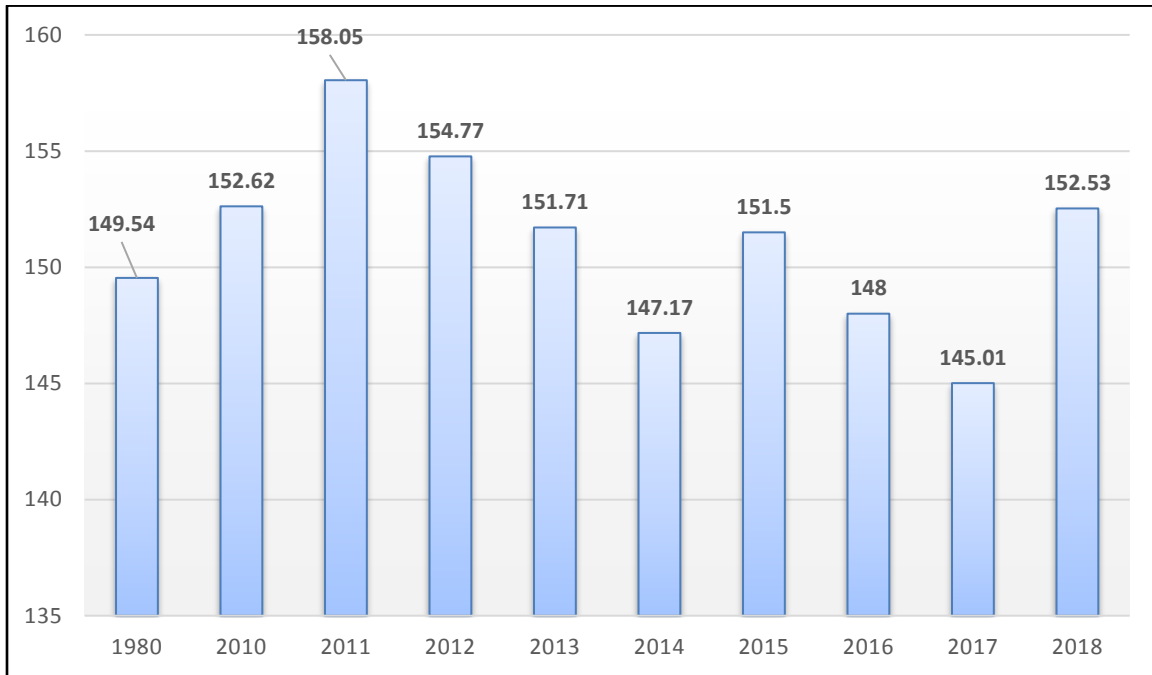
<sup>5</sup> The USGS five-year reports on water use in Louisiana are available on-line at: [https://www.usgs.gov/centers/lmg-water/science/water-use-louisiana?qt-science\\_center\\_objects=0#qt-science\\_center\\_objects](https://www.usgs.gov/centers/lmg-water/science/water-use-louisiana?qt-science_center_objects=0#qt-science_center_objects).

<sup>6</sup> This figure is used courtesy of the USGS. It is found as Figure 5, "Estimated withdrawals from the Baton Rouge sands, 1940-2016," in Charles E. Heywood, Maxwell Lindaman, and John K. Lovelace, "Simulation of Groundwater Flow and Chloride Transport in the '1,500-foot' Sand, '2,400-foot' Sand, and '2,800-foot' Sand of the Baton Rouge Area, Louisiana": U.S. Geological Survey Scientific Investigations Report 2019-5102, 2019, p. 10, available on-line at: <https://doi.org/10.3133/sir20195102>.



Capital Area Ground Water Conservation Commission (CAGWCC) from its regulated users (water well owners pumping more than 50,000 gallons of groundwater on any day during the year from a single well or group of wells), since 2010 such “users” in East Baton Rouge Parish have continued to withdraw groundwater from local aquifers at circa 1980 numbers (see Fig. 2).<sup>7</sup>

**Fig. 2, Groundwater Withdrawals in East Baton Rouge Parish, 1980 (control) and 2010-2018, in million gallons a day (Mgal/d)**



**7. The expansion of groundwater withdrawals in East Baton Rouge Parish after 1940 and especially between 1960 and 1980 and the maintenance of high-volume withdrawals in the decades since have caused steep water level declines inside local aquifers, particularly in the 1500- and 2000-foot sands.** These declines were summarized in a March 2012 report to the Louisiana Legislature by the Louisiana Ground Water Resources Commission (later the Louisiana Water Resources Commission). Among the established facts presented were: 1) water level declines of as much as 175 feet in the 1500-foot sand since 1945 with a cone of depression centered at the Baton Rouge Water Co.’s Lula Street Pumping Station; and 2) water level declines of as much as 275 feet in the 2000-foot sand between 1945 and 1970, followed by a rise of between 25 and 50 feet after 1975 with depressed but mostly stable levels since 1985, with a large cone of depression centered at the industrial district.<sup>8</sup>

<sup>7</sup> For groundwater use data by year and regulated user, see: <http://cagwcc.com/site2015/wateruse/pumpage.htm>.

<sup>8</sup> Louisiana Ground Water Resources Commission, “Managing Louisiana’s Groundwater Resources: An Interim Report to the Louisiana Legislature,” Baton Rouge: March 2012, pp. 72-78.

8. **The expansion of groundwater withdrawals in East Baton Rouge Parish after 1940 and especially between 1960 and 1980 and the maintenance of high-volume withdrawals in the decades since have caused the encroachment of saltwater across the Baton Rouge Fault, particularly in the 1500- and 2000-foot sands.** The USGS summarized this development in a recent report: “Prior to groundwater development in the 1940s, fresh groundwater flowed from recharge areas in Mississippi southward toward the [Baton Rouge] fault and then upward to discharge at springs. This groundwater-flow pattern caused aquifers north of the fault to generally contain freshwater, whereas they may contain saltwater south of the fault.” However, “large groundwater withdrawals north of the fault in Baton Rouge, primarily for public supply and industrial use, have lowered water levels and created gradients conducive to the movement of saltwater from the south side of the fault into previously freshwater areas north of the fault (Whiteman, 1979; Tomaszewski, 1996). In aquifers above the ‘2,800-foot’ sand and Catahoula aquifers, most saltwater currently north of the fault moved there in response to the groundwater withdrawals in the Baton Rouge area.” Saltwater has been detected in seven of the 10 local sands.<sup>9</sup>

## **VII. OFFICE OF CONSERVATION FINDINGS ON THE SUSTAINABILITY OF GROUNDWATER USE IN BATON ROUGE**

### **Definition of Sustainability**

In order to gauge sustainability or the sustainable use of groundwater in Baton Rouge, the Office of Conservation must turn to the definition established in state law, which reads that, “Sustainability means the development and use of ground water in a manner that can be maintained for the present and future time without causing unacceptable environmental, economic, social, or health consequences.” This definition guides all agency policy with regards to groundwater management.

### **Previous Findings from HCR No. 115 of 2016 Report**

The agency opined on the issue of regional groundwater sustainability in a previous legislative study report published in February 2017. Specifically, House Concurrent Resolution No. 115 of 2016 requested that the Office of Conservation evaluate overall groundwater sustainability in the Southern Hills Aquifer System and the impact for those parishes in the regions dependent upon this groundwater resource. In its report, the Office of Conservation first established a sustainability timeframe that extended from the present (2017) into the near future (five years) based on the reasonable expectation that: 1) assumptions about major groundwater demand factors such as population and economic growth would continue to be refined for accuracy and reliability based on new data; 2) the statewide groundwater resource monitoring network and reporting system would continue to be available for identifying unacceptable longer-term groundwater level and quality trends; and 3) any future unacceptable (non-sustainable) aquifer conditions that may arise would be managed in

---

<sup>9</sup> Heywood, Lindaman, and Lovelace, “Simulation of Groundwater Flow,” 2019, p. 6.

accordance with the existing governmental and legal framework. The agency then looked at all available data to evaluate “near future” sustainability.

In its evaluation, the Office of Conservation found that groundwater withdrawals in the 10-parish region had doubled since first measured and/or estimated in 1960. Consistent with such an increase in use, water level declines inside local aquifers were evident, to a lesser or greater degree, in all sample wells reviewed. Within the more recent timeframe of the past 15 or 20 years, though, groundwater levels appeared to have stabilized in many places throughout the region. The agency noted that it was important not to equate these new, mostly static lower levels with unsustainable conditions unless quantity and quality issues emerged.

Such quantity or quality issues had not become apparent based on scientific observations in most places within the region except at Baton Rouge, where ongoing saltwater encroachment was well documented. Therefore, the Office of Conservation found: 1) groundwater withdrawals to be substantially sustainable across the region for the near future, and 2) already reported and acknowledged unacceptable effects on sustainability in East Baton Rouge Parish caused by current and projected groundwater withdrawals in certain sands.<sup>10</sup>

## Factors Impacting a Sustainability Determination

### 1. **There are no major plans to reduce the current high-volume use of groundwater close to the Baton Rouge Fault that initially induced saltwater intrusion in local aquifers.**

After taking testimony and examining evidence during a public hearing in April 2012, on May 23, 2012, then Commissioner of Conservation James H. Welsh issued Order No. ENV 2012-GW011. This order required groundwater well owners with wells in the 1200-, 1500-, 1700-, and 2000-foot sands in a defined area of East Baton Rouge Parish close to the Baton Rouge Fault—including both the Baton Rouge industrial district and large centers of public supply production—to report on current groundwater usage and projections for near-term and long-term usage.

The responses from well owners ultimately showed a projected increase in groundwater use for public supply demand with minimal reductions projected for industrial use. Self-reported data provided by regulated users to the CAGWCC since 2010 (see Fig. 2) supports this assessment and demonstrates the continuation of groundwater use at historical rates that initially induced saltwater encroachment. Outside of the reductions reported at the Georgia-Pacific facility (discussed below), the agency knows of no other major proposed reductions in groundwater use from current producers, particularly those close to the Baton Rouge Fault and subject to the 2012 Order.<sup>11</sup>

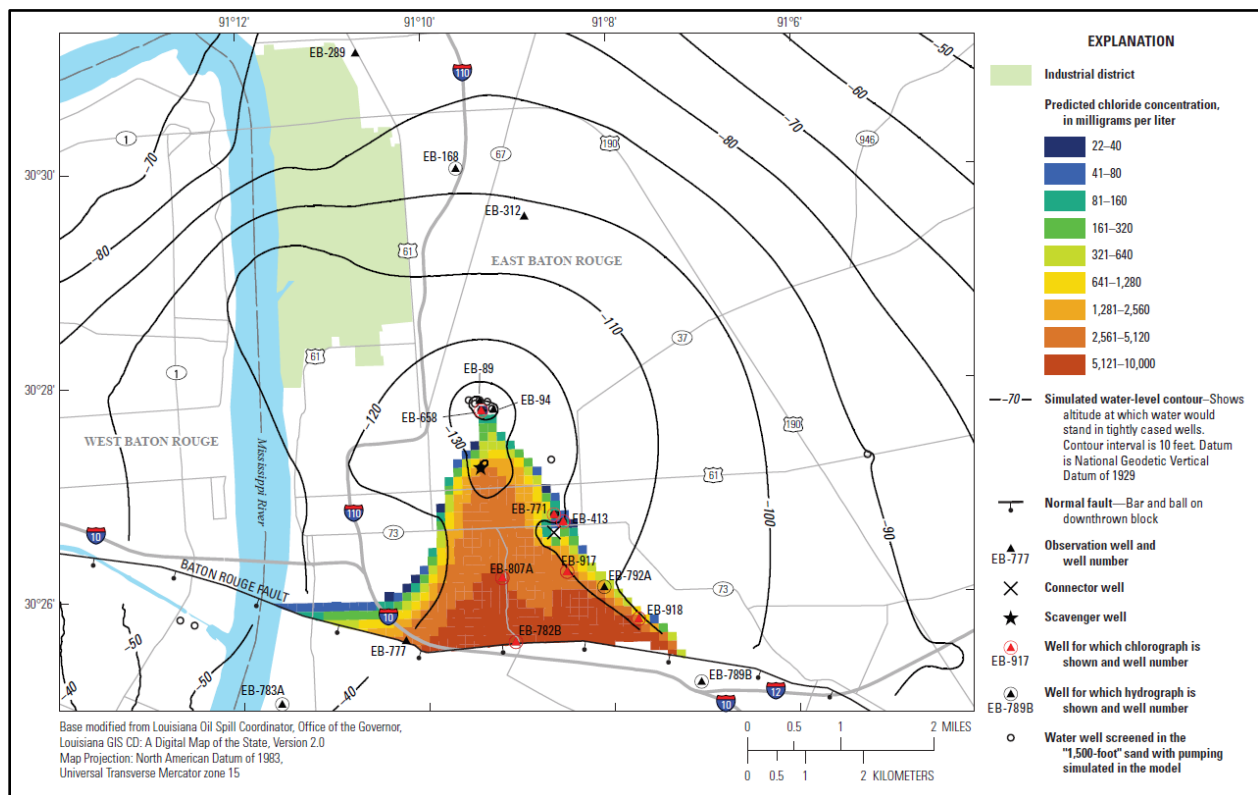
---

<sup>10</sup> Office of Conservation, “Report on the Effects of Groundwater Withdrawals on the Sustainability of the Southern Hills Aquifer System and the Water Supplies of Parishes within the Region Dependent Upon Groundwater Resources, as requested by HCR No. 115 of 2016,” Baton Rouge, La., February 27, 2017, pp. 7-8, on-line at: [http://www.dnr.louisiana.gov/assets/OC/env\\_div/gw\\_res/NEWS\\_RELEASE/HCR115StudyReport\\_OfficeOfConservation\\_2.27.2017.pdf](http://www.dnr.louisiana.gov/assets/OC/env_div/gw_res/NEWS_RELEASE/HCR115StudyReport_OfficeOfConservation_2.27.2017.pdf).

<sup>11</sup> See public hearing transcript and documents, Order, and responses to Order at: <http://dnr.la.gov/southernhills>.

2. The maintenance of current high-volume groundwater withdrawals close to the Baton Rouge Fault will continue to cause water level declines inside local aquifers and allow the flow of saltwater into previously freshwater areas north of the fault. The USGS has completed numerous groundwater models that show the negative impacts of current high-volume groundwater withdrawals in local aquifers. The USGS summarized the situation thus in a 2013 report: “If groundwater withdrawals continue at rates similar to the historical rates, saltwater encroachment will probably continue to occur (Tomaszewski, 1996).” In one scenario modeled at that time (2013), the USGS estimated an additional six-foot drop in water levels in the 1500-foot sand and about a 17-foot drop in the 2000-foot sand by 2047 if pumping rates remained the same; the area at the base of the 2000-foot sand with chloride concentrations above background levels would “increase by about 25 percent.”<sup>12</sup>

**Fig. 3, Predicted 2047 water levels and chloride concentrations at the base of the 1500-foot sand (on the approach to the Lula St. Pumping Station), after continued withdrawals at 2016 rates—green areas are approaching or beginning to exceed the upper limit (250 mg/l) of the EPA safe drinking water standard for chlorides (salt); light orange areas are five to 10 times that limit<sup>13</sup>**



<sup>12</sup> Charles E. Heywood and Jason M. Griffith, “Simulation of Groundwater Flow in the ‘1500-Foot’ Sand and ‘2000-Foot’ Sand and Movement of Saltwater in the ‘2000-Foot’ Sand of the Baton Rouge Area, Louisiana,” USGS Open-File Report 2013-1153, 2013, pp. 6, 23.

<sup>13</sup> This figure is used courtesy of the USGS. It is found as Figure 19 in Heywood, Lindaman, and Lovelace, “Simulation of Groundwater Flow,” 2019, p. 34.

In a 2015 report, the USGS stated that continued groundwater withdrawals at 2012 rates in the 1200-foot sand would result by 2047 in about a 10-foot drop in water levels at the industrial district, with the leading edge of the saltwater plume predicted to migrate a maximum of about one mile north of the Baton Rouge Fault. For the 2000-foot sand, the USGS noted that between 2047 and 2112, continued groundwater withdrawals at the same rate would lead the saltwater plume to continue to migrate northward towards the cone of depression at the industrial district, with an “increase at most observation wells” in chloride concentrations. A 2019 USGS report similarly concluded that “continuation of the ‘status quo’ withdrawals results in lower water levels by 2047” in the 1500-, 2400-, and 2800-foot sands, with saltwater continuing to encroach towards groundwater pumping centers with large withdrawals both for public supply and industrial use.<sup>14</sup>

- 3. Reductions in groundwater use are the most effective way to remediate water level declines and saltwater intrusion in local aquifers.** Among the different management scenarios modeled for the 2000-foot sand by the USGS, the “largest increase in water levels and change in chloride concentrations” came from a cessation of industrial use from 24 wells for a total reduction of 16.5 Mgal/d (from more than 25 Mgal/d to 8.5 Mgal/d) over the years 2008 to 2047. A similar scenario modeled for the 1500-foot sand that included a cessation of pumping from seven industrial wells with a reduction of 10.8 Mgal/d beginning in 2008 showed a 15- to 20-foot increase in water levels in that sand by 2047.<sup>15</sup>
- 4. Reported reductions in groundwater use at the Georgia-Pacific facility might have only a minimal impact on water level decline and saltwater intrusion problems closer to the Baton Rouge Fault.** Representatives of Georgia-Pacific have reported verbally to the Office of Conservation and the CAGWCC expected reductions of as much as 25 Mgal/d following the closure of a large portion of the facility. In the 2019 report referenced above, the USGS modeled a recovery in the 2800-foot sand of between 25-30 feet in water level by 2047, along with the slowing of saltwater encroachment, after a projected reduction at Georgia-Pacific of about 15 Mgal/d. Such an outcome would be highly significant.

However, it is unknown at this time as to how reductions at this facility will impact water levels and saltwater encroachment in other sands. The presence of the Denham Springs-Scotlandville Fault south of the Georgia-Pacific complex almost certainly will limit the impact of any reductions. Distance from the Baton Rouge Fault is another issue. The major centers of groundwater production for industrial use and public supply are located much closer to the Baton Rouge Fault and therefore exercise

---

<sup>14</sup> Charles E. Heywood, John K. Lovelace, and Jason M. Griffith, “Simulation of Groundwater Flow and Chloride Transport in the ‘1200-Foot’ Sand with Scenarios to Mitigate Saltwater Migration in the ‘2000-Foot’ Sand in the Baton Rouge Area, Louisiana,” ver. 1.1, USGS Scientific Investigations Report 2015-5083, 2015, pp. 35-66. The 2019 findings are from Heywood, Lindaman, and Lovelace, “Simulation of Groundwater Flow,” 2019, p. 1.

<sup>15</sup> Heywood and Griffith, “Simulation of Groundwater Flow,” 2013, pp. 23-28.

much greater “control” over the continued intrusion of saltwater in the sands they utilize, primarily the 1200-, 1500-, 1700-, and 2000-foot sands. For this reason, then Commissioner of Conservation James H. Welsh did not include the Georgia-Pacific facility in the study area delineated by Order No. ENV 2012-GW011, issued in May 2012. These centers close to the Baton Rouge Fault were then, and are still today, most directly at threat from saltwater encroachment.<sup>16</sup>

5. **“Scavenger well” technology is unproven and, at best, only a temporary solution to saltwater intrusion.** The CAGWCC has embraced “scavenger well” technology as a means to protect groundwater production at vulnerable well fields in the 1500- and 2000-foot sands. In particular, the currently operational 1500-foot “scavenger well” is intended to shield a major public supply production center of the Baton Rouge Water Co. located at the Lula Street Pumping Station. A proposed 2000-foot “scavenger well” is intended to eventually shield a production center in the industrial district (primary) north of the State Capitol along with another public supply center (secondary).<sup>17</sup>

While this technology has the potential to protect the viability of groundwater production at these well fields for several decades—as noted in published reports—several more years of observation are required to prove the effectiveness of these assertions. The Baton Rouge Water Co. is currently under an order from the Commissioner of Conservation to report data on its 1500-foot system for this reason, having stated that, “The hydrologists who originally designed the Scavenger Well Couple had estimated that it would take around five years to reflect any real impact of chloride removal at the Lula Pump Station, due to the transmissivity of the formation and the physical separation. The station was placed on line [in] March of 2014.”<sup>18</sup>

“Scavenger wells” can serve a purpose in the strategic management of Baton Rouge’s groundwater resources. However, they do not halt the continued flow of saltwater but rather serve only to temporarily remediate encroachment within their immediate capture area. In fact, LSU civil engineering professor Dr. Frank Tsai, who conducted one of the original studies for the Baton Rouge Water Co.’s “scavenger well” system, apprised the Office of Conservation that, “Scavenging alone will NOT halt saltwater intrusion, but will make the problem worse in the long run.” In short, chloride

---

<sup>16</sup> See Heywood, Lindaman, and Lovelace, “Simulation of Groundwater Flow,” p. 1; on Order No. ENV 2012-GW011, see public hearing transcript and documents, Order, and responses to Order at: <http://dnr.la.gov/southernhills>.

<sup>17</sup> On support for “scavenger wells,” see Capital Area Ground Water Conservation Commission, “Plan for Management of the Southern Hills Aquifer System in the Baton Rouge Area, April 8, 2014”; also, Anthony J. Duplechin, “Taking a Logical Approach to Addressing Saltwater Intrusion in Baton Rouge, Louisiana,” *Louisiana Civil Engineer*, v. 21, no. 4 (August 2013).

<sup>18</sup> Reports on the viability of “scavenger wells” in Baton Rouge include Rhet Moore, Vic Kelson, and Erik Anderson, “Remedial Options for Saltwater Encroachment in the 1500-ft Sand” (Lane Hydro Report), 2011, and Frank T.-C. Tsai, Ph.D., “Scavenger Well Operation Model to Assist BRWC to Identify Cost-Effective Approaches to Stop Saltwater Intrusion toward the BRWC Water Wells in the ‘1500-ft’ Sand of the Baton Rouge Area,” 2011. Quote from Baton Rouge Water Co. to Office of Conservation, email correspondence, September 13, 2016.

levels will continue to build in front of the “scavenger well” system and, at some point in the future, likely will overwhelm the system’s capacity and/or move around its flanks to compromise the continued viability of the production center it is meant to protect.<sup>19</sup>

Indeed, the Baton Rouge Water Co. has stated explicitly that the goal of their 1500-foot “scavenger well” was simply to “reduce the amount of chlorides progressing towards the Company’s Lula Pump Station in order to extend the stations [*sic*] useful life by about fifty years.” It was a necessary emergency measure because saltwater was “actually advancing much faster” than previously anticipated. Even more, at an administrative hearing pursuant to a utility rate increase before the Public Service Commission in 2013, the Chief Financial Officer of the Baton Rouge Water Co. testified that the 1500-foot “scavenger well” was “our short-term solution.” He further noted that, “Our long-term solution, obviously, is the treatment plant with water from the Mississippi [River].”<sup>20</sup>

### **VIII. OPINION ON THE NECESSITY FOR AN AREA OF GROUNDWATER CONCERN/ CRITICAL AREA OF GROUNDWATER CONCERN**

In a letter penned to the CAGWCC in January 2013, then Commissioner of Conservation James H. Welsh opined that, “The 1500 and 2000 foot sands of the Southern Hills aquifer system located in the Baton Rouge area are not being used in a manner that can continue indefinitely without causing unacceptable environmental, economic, social, or health consequences.” This assessment was echoed several years later in the study report prepared under his successor, Commissioner of Conservation Richard P. Ieyoub, in response to HCR No. 115 of 2016. In that document, the Office of Conservation found saltwater encroachment in the aquifers at Baton Rouge continuing and long-term sustainability threatened due to a lack of reductions in groundwater use.<sup>21</sup>

Specifically, the agency noted that, “The most recent published information from the USGS indicates that saltwater continues to encroach into the 1500- and 2000-foot sands further away from the Baton Rouge Fault and towards these respective pumping centers at a rate that threatens to compromise long-term sustainability of the aquifer system in the Baton Rouge area.” Further, in the absence of “publicly released plans for major groundwater pumpage reductions,” groundwater use at the “present level or along a slightly upward trend seems a logical assumption, with all attendant consequences.” At the same time, the agency found local groundwater usage to be “relatively sustainable into the *near future* (over the next five years)

---

<sup>19</sup> Frank Tsai, Ph.D., to Office of Conservation, e-mail correspondence, February 6, 2017.

<sup>20</sup> Baton Rouge Water Co. to Office of Conservation, email correspondence, September 13, 2016; “Scavenger Well Guards Baton Rouge’s Drinking Water,” *National Driller* (magazine), September 1, 2013; LPSC hearing transcript of December 6, 2013, available at <http://lpscstar.louisiana.gov/star/portal.aspx>.

<sup>21</sup> Commissioner of Conservation James H. Welsh to CAGWCC, January 14, 2013; “Report on the Effects of Groundwater Withdrawals on the Sustainability of the Southern Hills Aquifer System,” 2017, p. 10.

based on current and expected demand, with only minimal projected impacts without any additional management actions other than the ones already taken.”<sup>22</sup>

The Office of Conservation evaluates groundwater sustainability for unacceptable consequences in any and all of the following four areas: environmental, economic, social, or [public] health. With regards to Baton Rouge’s groundwater use, the Office of Conservation can say with certainty at this time that:

- 1. Environmental damage is continuing.** The maintenance of the unaltered groundwater pumping regime in Baton Rouge as it currently exists without some sort of remediation will continue to result in further degradation of the aquifer system in the coming decades. “Scavenger wells” will not stop the flow of saltwater into the affected aquifers and their utilization should be viewed, at best, only as a short-term solution for protecting well field production while other long-term solutions are developed and implemented to conserve aquifer sustainability. The Office of Conservation considers the environmental damage that is continuing to occur as unacceptable.
- 2. The economic costs of water level decline and saltwater intrusion have not been effectively measured but are significant and assured to increase in the coming years.** Private companies such as Exxon, Entergy, Georgia-Pacific, and the Baton Rouge Water Co. already have invested tens of millions of dollars in their groundwater production infrastructure as a result of water level decline and saltwater intrusion in local aquifers. This has come in the form of new wells and pumps, particularly as production shifted into the deeper sands of the aquifer system after saltwater intrusion was encountered in the shallow sands; improved water treatment facilities and some limited conversion to surface water; planning and engineering costs; and most recently—for the Baton Rouge Water Co.—approximately three million dollars and counting for the installation and operation of the 1500-foot “scavenger well.” Individual households and small businesses pay for this investment in the form of “cost of business” price increases, rate hikes on their water bill, and the “groundwater assessment fee” imposed on regulated users to fund the work of the CAGWCC, which is passed onto average consumers in the area by their public supply providers. The CAGWCC’s assessment fee has gradually increased from \$1 per million gallons in 1975 to \$5 per million gallons in 2013 and now \$20 per million gallons in 2020.

Continued deterioration of groundwater quality due to saltwater encroachment most likely will require: 1) more extensive treatment of this resource for use; 2) decommissioning of water wells and the movement of infrastructure; 3) development of new infrastructure; and 4) the conversion to surface water at some point in the future. All of these scenarios should be expected to entail a significant increase in cost to the producer and consumer warranting further evaluation. The Office of Conservation has not made a determination as to what economic cost is “acceptable” or “unacceptable” in this regard.

---

<sup>22</sup> Ibid., p. 13.



- 3. The social consequences of increased costs for water and/or a conversion from groundwater to surface water have not been defined or evaluated in Baton Rouge.** Public attitudes, opinions, and preferences on this matter have not been fully explored; the Office of Conservation, through its “Water-Wise in BR” public awareness and classroom education program, has conducted several surveys which point to generalized support for maintaining groundwater as the main source of public supply. However, these surveys were limited in size and content and cannot be viewed as a complete assessment of the public’s outlook. The agency can say with confidence that the people of Baton Rouge are more knowledgeable about the source of their water than ever before but what they consider an “acceptable” or “unacceptable” social consequence of continued saltwater intrusion is unclear.
  
- 4. The public health consequences of a conversion from groundwater to surface water have not been evaluated.** The Office of Conservation expects that public supply providers in Baton Rouge—particularly the Baton Rouge Water Co.—will do all things necessary to continue to provide safe drinking water in accordance with national and state standards no matter the source. However, the full costs of testing, monitoring, and treatment of surface water—whether “blended” with groundwater or as part of a wholesale conversion from groundwater use—have not been evaluated, nor has a determination been made as to what would be considered “acceptable” or “unacceptable” in this regard.

### **No Groundwater Emergency**

The Office of Conservation can say absolutely that the groundwater situation does not currently meet the definition of a “ground water emergency” as there has been no “unanticipated occurrence as a result of a natural force or a man-made act which causes a ground water source to become immediately unavailable for beneficial use for the foreseeable future.” In fact, the water level declines and saltwater intrusion seen in Baton Rouge aquifers have been almost completely predictable and easily anticipated since at least the 1970s when scientists began to more clearly understand the architecture of the aquifer system and the role and impact of the Baton Rouge Fault. The system is now one of the most studied and modeled in the nation. Also, of course, groundwater in Baton Rouge continues to be readily available in large quantities, and at a high quality, for “beneficial use.” This availability can be modeled effectively into the future.

### **Potential for Area of Groundwater Concern/Critical Area Designation**

Previous studies and evidence presented to various governmental bodies over recent years appear to provide ample material for an affected water well owner to warrant making a request for initiating a public hearing and investigation process into the possibility of declaring either an Area of Groundwater Concern or a Critical Area of Groundwater Concern. In accordance with the strict statutory definition provided for a critical area declaration, under current usage and normal environmental conditions as established by the most recent available scientific data, it can be argued that the long-term sustainability of certain aquifers in Baton Rouge—particularly the 1500- and 2000-foot sands but also possibly others—is not being

maintained due to a combination of water level decline and ongoing movement of a saltwater front. These factors have resulted in an unacceptable environmental consequence at the present time (“serious adverse impact to an aquifer”) and may result in possible unacceptable economic, social, and health consequences in the future. Further, comprehensive modeling by the USGS of the groundwater system, including the movement of chlorides (salt) in various aquifers, indicates that long-term sustainability cannot be maintained under the current pumping regime and that reductions in groundwater use (“withdrawal restrictions”) provide the most effective remedy to this problem.

In accordance with the Administrative Procedure Act and the Office of Conservation’s Title 43 rules, following receipt of an application requesting the declaration of an area of groundwater concern/critical area from “any owner of a [water] well that is significantly and adversely affected as a result of the movement of a saltwater front, water level decline, or subsidence,” the Commissioner of Conservation can open an official investigation, hold public hearings, and/or issue potential conservation orders to preserve and manage local groundwater resources. No such application requesting declaration of an area of groundwater concern/critical area in the Capital Region has been received to date.

**PART THREE:  
ROLE OF THE CAGWCC AND RECOMMENDATIONS  
ON MANAGING GROUNDWATER IN BATON ROUGE  
FOR THE FUTURE**

## **IX. ROLE OF THE CAPITAL AREA GROUND WATER CONSERVATION COMMISSION IN REGIONAL GROUNDWATER MANAGEMENT**

The Capital Area Ground Water Conservation District (CAGWCD) was created by the Louisiana Legislature in 1974 and includes the parishes of East and West Baton Rouge, East and West Feliciana, Pointe Coupee, and Ascension (added in June 2018). Groundwater resources in the district are administered by the CAGWCD's governing board, the Capital Area Ground Water Conservation Commission (CAGWCC). The Legislature established the CAGWCD due to concerns about overuse of local groundwater resources that had led to water level declines and saltwater encroachment inside local aquifers, along with potential land subsidence.

### **Membership and Groundwater Use Permitting**

Members of the CAGWCC are appointed by the Governor and include representatives of various user groups (industry, public supply, and agriculture), local parish governments, and state regulatory agencies, including the Department of Environmental Quality and the Office of Conservation (beginning only in 2012, per change in state law). The CAGWCC issues permits for groundwater use to individuals or corporate entities wishing to install, or already operating, an individual water well or set of wells within the CAGWCD that pumps more than 50,000 gallons of groundwater on any day during the calendar year. These regulated permit-holders currently include public supply providers, power generation and industrial facilities, and other commercial users who have wells in the deep sands of the Southern Hills Aquifer System. Groundwater use for irrigation/agricultural purposes is specifically exempted from CAGWCC regulation, as is use of groundwater from sources above 400-feet in depth (primarily the Mississippi River Alluvial Aquifer, or MRAA). Agricultural use of groundwater in the CAGWCD comes almost exclusively, if not completely, from the MRAA.

### **Creation Pre-Dates State Groundwater Law, Shared Jurisdiction with Commissioner of Conservation**

The creation of the CAGWCD as a "special district" in 1974 pre-dated the establishment of the state's comprehensive groundwater management law in 2003 by some 30 years and reflected deep concerns even then about long-term sustainability of the Baton Rouge area's groundwater resources. The term "sustainability," though, was not in common technical use at the time and indeed cannot be found in the CAGWCD's statutory law. Specifically, its management emphasis focuses on the "orderly utilization of groundwater resources" and the "efficient administration, conservation, orderly development and supplementation of groundwater resources," that is, the efficient pumping and withdrawal of local groundwater resources, their fair distribution among the regulated users in the district, and the development of alternative sources (surface water or other) if needed.

The Louisiana Legislature did provide for shared jurisdiction in the management of local groundwater resources through amended statutory language added in 2003 (La. R.S. 38:3076.A). Specifically, the law requires that the CAGWCC "shall work with the commissioner of conservation in his responsibilities to do all things necessary to prevent waste of

groundwater resources, and to prevent or alleviate damaging or potentially damaging subsidence of the land surface caused by withdrawal of groundwater within the district” and to “take all necessary steps to prevent intrusion of salt water or any other form of pollutant into any aquifer or aquifers.” The law further notes that the CAGWCC’s various authorities shall be exercised “in conjunction with the commissioner of conservation.”

### **Authority as a Regulatory Agency, Recognition of CAGWCD as *de facto* Critical Area of Groundwater Concern**

When it created the CAGWCD, the Legislature vested its governing board with extensive powers as a regulatory agency. The CAGWCC has the authority, among other things, to:

- Conduct scientific investigations and research;
- Collect data and information from regulated users;
- Inspect facilities and operations of regulated users;
- Permit large-volume water wells and require metering;
- Undertake special projects, acquire property, and operate facilities;
- Set groundwater use priorities and production limits;
- Restrict groundwater use;
- Assess a groundwater use fee on regulated users (currently \$20/million gallons);
- Develop alternative sources for use;
- Subpoena individuals and information, as needed; and,
- Issue financial bonds.

The power vested in the CAGWCC to manage local groundwater resources in fact is more sweeping than that granted to the Commissioner of Conservation under the area of groundwater concern/critical area statute. The CAGWCC has wide latitude under its statutory provisions to combat water level decline, saltwater intrusion, and subsidence. Consequently, the Office of Conservation consistently has recognized the CAGWCD as a *de facto* critical area of groundwater concern, if not *de jure* only because of its creation three decades before the critical area definition was enshrined in state law. The Office of Conservation does recognize the shared jurisdiction with the CAGWCC for regional groundwater management in the Baton Rouge area and has in the past, and will in the future, continue to engage the CAGWCC in acknowledgement of, and compliance with, the legislative will in this regard.

## **X. RECOMMENDATIONS FOR THE FUTURE**

### **Importance of Long-Term Planning by the CAGWCC**

The CAGWCC's lack of long-term planning for the management of local groundwater resources is an issue of paramount concern to the Office of Conservation. Since its creation by the Legislature in 1974, the CAGWCC has never created such a formal, long-term management plan. Former Commissioner of Conservation James H. Welsh called on the CAGWCC repeatedly to initiate such planning during his tenure in office, especially after the issuance of Order No. ENV 2012-GW011 in May 2012. Such requests have been echoed by his successor in office, current Commissioner of Conservation Richard P. Ieyoub. After extensive discussions on the subject, the CAGWCC voted in June 2018 to contract for a phased-approach to such planning with the Water Institute of the Gulf—a non-profit “think tank” focused on helping water management organizations in their strategic decision-making processes. Commissioner Ieyoub has called this agreement “the best opportunity to-date to build for a sustainable groundwater future in the region” and stated his belief that the “full funding to completion of the management plan process” with the Water Institute was the “most important matter before the CAGWCC at this time.”<sup>23</sup>

### **Performance Audit of the CAGWCC by the Legislative Auditor**

The Louisiana Legislative Auditor released a performance audit report of the CAGWCC in May 2019. The report was direct in its analysis, the first sentence of the summary stating bluntly that, “While the Commission has taken some actions to regulate water usage from the Southern Hills Aquifer (aquifer), the Commission does not effectively regulate water withdrawals from the aquifer to reduce and manage saltwater encroachment and ensure the sustainability of fresh groundwater for the future” (emphasis added). The deficiencies in performance and management included:

- The Commission does not have a complete inventory of all wells it should be regulating. Maintaining a complete inventory of wells is necessary to effectively regulate water withdrawal from the aquifer.
- While the Commission has implemented certain measures to regulate the aquifer, these measures have not sufficiently addressed saltwater intrusion caused by the withdrawal of groundwater from the aquifer.
- Unlike other districts that regulate groundwater, the Commission does not limit withdrawal amounts by well, which is another way to regulate groundwater usage.

---

<sup>23</sup> See Welsh to CAGWCC, January 14, 2013; Welsh to CAGWCC, November 27, 2013; Welsh to CAGWCC, April 4, 2014; Welsh to CAGWCC, December 16, 2014; also, see Office of Conservation, “Report on the Effects of Groundwater Withdrawals on the Sustainability of the Southern Hills Aquifer System,” p. 13, and Ieyoub to CAGWCC, May 2, 2017. Ieyoub quotes from Ieyoub to CPRA, October 24, 2018, and Ieyoub to CAGWCC, September 11, 2019.

- The Commission did not monitor the withdrawal of water on 62 wells during calendar year 2018 that appear to meet its standard for regulation.
- Although the Commission raised the withdrawal fee in 2016 from \$5.00 to \$10.00 for every million gallons of water withdrawn, the current fee is still lower than five other districts that regulate groundwater.
- The Commission did not permit the drilling and construction of [23.4% of] new wells constructed since 1997 in the Capital Area District, as required by policy established by the Commission and state regulations.
- While the Commission has a plan to manage the aquifer as required by law, this plan is not as comprehensive as plans in other districts that regulate groundwater.
- Even though the Commission added Ascension Parish as part of its District in June 2018, it has not begun regulating or collecting fees from the wells in this area.
- Some Commission members receive salaries or benefits from entities that are regulated by the Commission, which may be a violation of state law.
- The Commission could improve its public outreach when compared to other districts in Arkansas, Colorado, Florida, Mississippi, and Texas that regulate groundwater.<sup>24</sup>

### **Specific Recommendations for CAGWCC Action**

The big-picture goal of the CAGWCC should be to remediate, slow, and/or stop completely the flow of saltwater into the affected aquifers in the Baton Rouge area. The only clear-cut method of achieving this goal is a reduction in pumping volumes close to the Baton Rouge Fault, which will require of the CAGWCC's regulated users—all things remaining the same—development of alternative sources of water, shutting-in of water wells, movement of infrastructure, deployment of new technologies, and/or any combination of these or other solutions. Which strategies the CAGWCC chooses to embrace in pursuit of this goal, and over what timeframe, should be the focus of deep contingency planning.

The Office of Conservation desires to see the CAGWCC, with its greater and more flexible authority granted to it by the Legislature and its deeper stakeholder involvement, do all things necessary to produce a comprehensive management plan for local groundwater sustainability that meets current and future challenges by evaluating sound science, economic

---

<sup>24</sup> Audit summary available on-line at: <https://lla.la.gov/go.nsf/getSummary?OpenAgent&arlkey=40180019APPP-BBZRRAA>; full audit available at: <https://lla.la.gov/go.nsf/get?OpenAgent&arlkey=40180019APPP-BBZRRAA>.

realities, and public preferences in an open, transparent process. In the agency's view, this means funding to completion of the current management plan effort with the Water Institute of the Gulf.

The completion of Phase I of the CAGWCC planning effort with the Water Institute is encouraging. Phases II and III likely will exceed significantly the amount that the CAGWCC has factored into its current financial planning. The relatively minimal cost for the development of a long-term management plan, though, should not deter the CAGWCC from completing this important task; indeed, an investment in planning at the present time should be viewed appropriately as a down-payment for future groundwater sustainability in the region. The Office of Conservation expects the management plan process to be completed and its implementation and enforcement by the CAGWCC to be underway effective July 1, 2023.

Below are specific recommendations to the CAGWCC that should be addressed either by the Water Institute planning effort or direct agency action. In particular, the Office of Conservation recommends that the CAGWCC:

- Adopt formal goals, plans, and strategies for overall groundwater sustainability and remediation of saltwater encroachment;
- Evaluate all possible groundwater management alternatives, their associated costs, and feasibility through the use of models, statistics, and other methods;
- Commit specifically to the reduction in groundwater use by regulated users in threatened aquifers as the most productive tool for stopping saltwater encroachment in the absence of other viable alternatives;
- Establish timetables for scientific evaluations and management actions;
- Require that detailed water management plans, infrastructure assessments, plans for alternative source use, and any other relevant information held or developed by regulated users be delivered to the CAGWCC for utilization in on-going planning;
- Study the organization, fee structures, and planning efforts of other similar groundwater districts, and adopt reasonable changes to the CAGWCC and district organization to reflect "best management practice";
- Commit to the hiring of additional staff and/or consultants to meet administrative, policy development, and regulatory enforcement requirements;
- Evaluate carefully public attitudes and preferences (social impact);
- Develop and adopt a long-range financial plan and appropriate fee structure to meet planning and regulatory needs;



- Assess and enhance regulatory compliance through water well and meter inspections;
- Overhaul out-of-date rules and regulations found in Title 56 of the Louisiana Administrative Code;
- Pursue statutory authority to create a tiered-fee and/or disincentive fee system to address the problem areas of groundwater overuse and saltwater encroachment;
- Improve public outreach and information efforts and invest in local groundwater education;
- Identify potential regulated users and wells in Ascension Parish (added to the district in 2018) and take appropriate regulatory action;
- Change commission meeting times and places to encourage more active public participation and to meet the spirit and letter of the Open Meetings Law; and,
- Resolve potential ethics/conflict-of-interest issues of certain members.

Failure to make significant progress towards the overall goal of sustainability through the development, completion, implementation, and enforcement by the CAGWCC of a long-term groundwater management plan by July 1, 2023, must of necessity result in the Office of Conservation addressing the issue through the powers available to the agency (and those shared “in conjunction with” the CAGWCC), including the institution of public hearings and the issuance of orders mandating any and all of the relevant recommendations listed above or others as needed.

### **Recommendations to the Legislature**

- 1. Enact legislation mandating and/or funding the development, completion, implementation, and enforcement by the CAGWCC of a long-term groundwater management plan to address saltwater intrusion in the Baton Rouge area, said plan to be completed and operational effective July 1, 2023.**
- 2. Enact legislation requiring the CAGWCC to present comprehensive updates annually before the appropriate committees of the Legislature on progress towards the development, completion, implementation, and enforcement of a long-term groundwater management plan to address saltwater intrusion in the Baton Rouge area ahead of the July 1, 2023 plan deadline.**
- 3. Enact legislation requiring the CAGWCC to complete a periodic management plan revision and update process every five years after July 1, 2023, said revision and update process to be similar to that conducted for the state Coastal Master Plan by the Coastal Protection and Restoration Authority.**

- 4. Consider an evaluation of the adequacy and appropriateness of the organization and governing structure of the CAGWCD in meeting the above recommendations for developing, completing, implementing, and enforcing a long-term groundwater management plan (see Appendix, pp. 34-36).**
  
- 5. Failing suitable progress by the CAGWCC towards the development, completion, implementation, and enforcement of a long-term groundwater management plan to address saltwater intrusion in the Baton Rouge area by July 1, 2023, consider providing the Commissioner of Conservation with adequate funding and/or additional authority to pursue necessary groundwater management planning and plan implementation in the CAGWCD.**

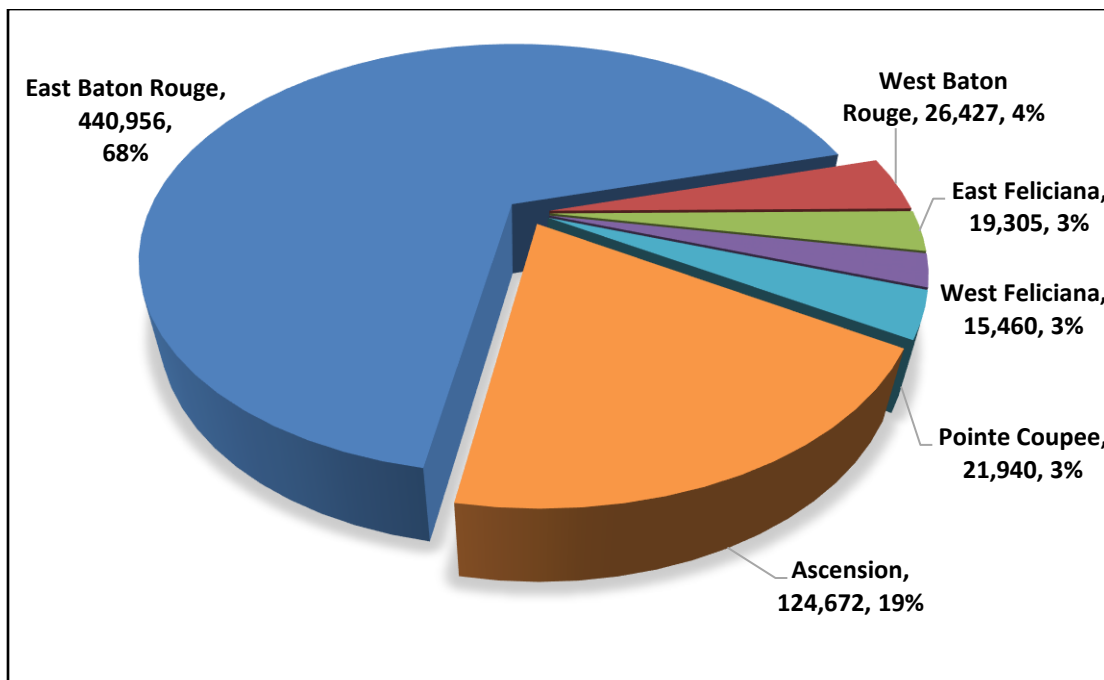
## APPENDIX: NOTES ON THE CAGWCD AND CAGWCC

### Importance of East Baton Rouge Parish in the CAGWCD

Groundwater pumped in East Baton Rouge Parish supplies the daily water needs of approximately 530,000 people in the Capital Region (approximately 441,000 in East Baton Rouge and an estimated 90,000 in Ascension). The populations of these two parishes comprise approximately 87% of the total CAGWCD district population (see Fig. 4). Moreover, as of 2019, the groundwater pumped in East Baton Rouge totaled nearly 90% of the total amount of groundwater withdrawals in the whole district (see Fig. 5). The saltwater intrusion issue also is unique to East Baton Rouge among the other parishes in the CAGWCD (outside of West Baton Rouge) and is the overwhelming focus of board business.

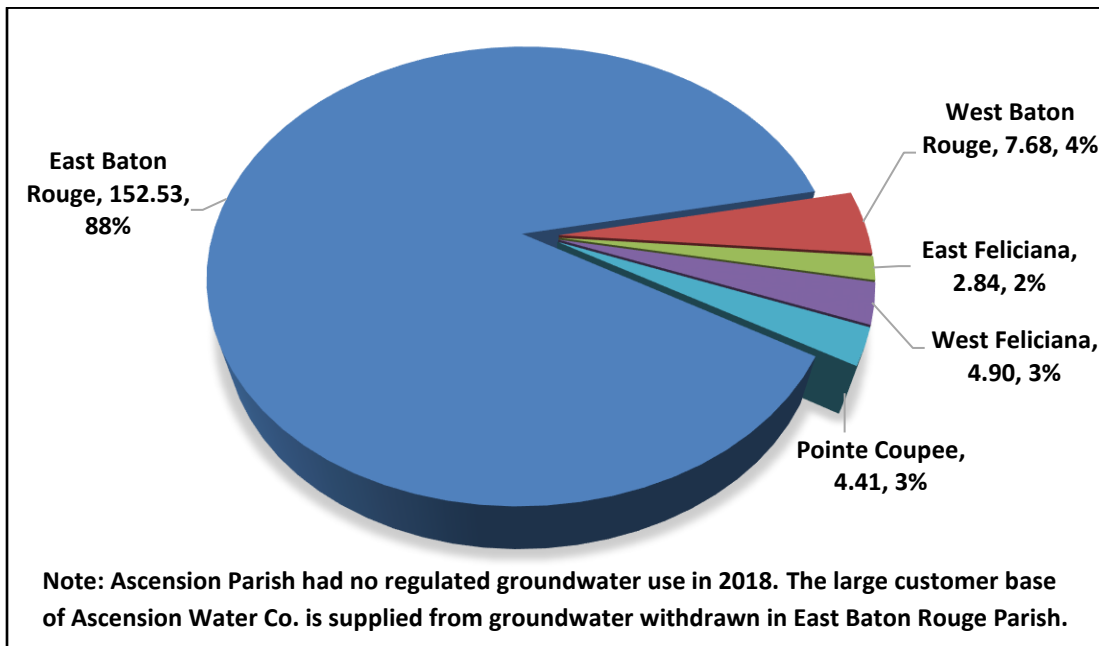
East Baton Rouge Parish seats only three members on an 18-member board. The mayors of towns like Zachary, Baker, Central, or the new municipality of St. George are not represented nor are there any explicit consumer or environmental advocates on the board. The Farm Bureau seats a member but groundwater use for irrigation/agricultural purposes is specifically exempted from CAGWCC regulation, as is use of groundwater from sources above 400-feet in depth (primarily the Mississippi River Alluvial Aquifer, or MRAA). As noted earlier, agricultural use of groundwater in the CAGWCD comes almost exclusively, if not completely, from the MRAA. This use is concentrated primarily in Pointe Coupee Parish.

*Fig. 4, Parish Populations in the CAGWCD, July 1, 2018 (Estimated)<sup>25</sup>*



<sup>25</sup> From U.S. Census estimates, available for search on-line at: <https://www.census.gov/quickfacts/LA>.

**Fig. 5, Regulated Groundwater Use in the CAGWCD, 2018, by Parish, in millions of gallons a day (Mgal/d)<sup>26</sup>**



### Current CAGWCD and CAGWCC Organization

The CAGWCD includes the parishes of Ascension, East Baton Rouge, East Feliciana, Pointe Coupee, West Baton Rouge, and West Feliciana.

The CAGWCD's governing board—the CAGWCC—counts 18 members, allocated thus:

- Eight (8) members representing parish governments
  - Ascension Parish governing authority
  - East Baton Rouge Parish governing authority
  - East Baton Rouge Parish (Mayor-President)
  - East Baton Rouge Parish (from divisions of Public Works Department)
  - East Feliciana Parish governing authority
  - Pointe Coupee Parish governing authority
  - West Baton Rouge governing authority
  - West Feliciana governing authority
- Three (3) members representing industry
- Three (3) members representing public supply (one must be from a privately-owned user)
- Secretary of the Department of Environmental Quality or designee
- Commissioner of Conservation of designee

<sup>26</sup> Compiled from CAGWCC data, available on-line at: [www.cagwcc.com](http://www.cagwcc.com).

- One member representing the Louisiana Farm Bureau and Louisiana Cattlemen’s Association
- One member nominated by the CAGWCC (board appointment)

### **Influence of Regulated Users on the CAGWCC**

For-profit, regulated users within the CAGWCD (most notably Baton Rouge Water Co., Exxon, Entergy, and Georgia-Pacific—the four largest “users” in the district) have exercised considerable influence over the regulatory activities of the CAGWCC by having employees seated as board members. Such employees held the chairmanship of the CAGWCC 80% of the time from 1975 to 2004 and since 2013, employees of these companies all have either served as board chairman, vice-chairman, or committee chairmen, often multiple times. The current chairman is an employee of Entergy. Of the three public supply seats on the CAGWCC, Baton Rouge Water Co., is guaranteed one of them by law as the only privately-owned public supply provider in Baton Rouge, but it has traditionally held one of the other seats as well. The conflict-of-interest issue found in the service of board members who are also employees of regulated users was raised by the Legislative Auditor in the May 2019 report.

***Fig. 6, CAGWCC Chairmen Employed by or for Regulated Users, 1975 to 2020<sup>27</sup>***

<b>Year(s)</b>	<b>Name</b>	<b>Company Affiliation or Appointment Type</b>
1975	Leo Bankston	Baton Rouge Water Co.
1976	Austin Anthis	Georgia-Pacific
1979	Mark Walton	Gulf States Utilities (Entergy)
1980	Clinton Sussky	Exxon
1981	Charles Smith	Industry
1982	John Overmeyer	Ethyl (Industry)
1983	R.I. Peairs	Baton Rouge Water Co.
1984	Mark Brown	Georgia-Pacific
1985	Carl Courtney	Gulf States Utilities (Entergy)
1988-89	Kent Naquin	Baton Rouge Water Co.
1990	Mark Walton	Gulf State Utilities (Entergy)
1991-92	Ross Ford	Exxon
1993-94	Mitchell Hollier	Gulf State Utilities (Entergy)
1995-96	William Edrington	Owen & White (BR Water Co.)
1999-00	Mitchell Hollier	Gulf State Utilities (Entergy)
2001-02	Patrick Kerr	Baton Rouge Water Co.
2003-04	Joey Hebert	Georgia-Pacific
2013	Joey Hebert	Georgia-Pacific
2014	Dennis McGehee	Baton Rouge Water Co.
2019-20	Nelson Morvant	Entergy

<sup>27</sup> Compiled from CAGWCC public records. This list includes only chairmen and not any other officers or committee chairmen.

**LOUISIANA DEPARTMENT OF NATURAL RESOURCES**  
**OFFICE OF CONSERVATION**

617 N. Third St.  
Baton Rouge, LA 70802  
(225) 342-8244  
[dnr.louisiana.gov](http://dnr.louisiana.gov)