

ALL THE FACTS: C-43 WEST RESERVOIR

Caloosahatchee Riverwatch Position Paper

The Comprehensive Everglades Restoration Plan (CERP) constitutes a massive, multi-agency (federal, state and local), integrated plan to address water related problems in the South Florida ecosystem.¹ While this paper primarily discusses one CERP component – the proposed C-43 West Reservoir, Caloosahatchee Riverwatch recognizes that the bigger picture necessitates regulatory reform and interventions north, south, east and west of Lake Okeechobee. But, the C-43 reservoir encapsulates the plethora of issues involved in addressing water problems in south Florida.²

The proposed C-43 reservoir is a \$600+ million above ground water storage project that will cover 9,000 acres or 170,000 acre-feet in western Hendry County. As conceived, the C-43 reservoir will provide some excess wet season river flow storage, approximately 38% of the total watershed storage needs of the Caloosahatchee estuary. The water will be released into the river during the dry season to help balance estuary salinity and improve its ecosystem.

All stakeholders recognize the need for water storage in the Caloosahatchee River watershed, perhaps as much as 450,000 acre-feet. While the C-43 reservoir has the potential to help address salinity issues, critics, including Caloosahatchee Riverwatch, have serious concerns with the lack of a water quality treatment component, safety issues, ecological effectiveness related to model uncertainty, and cost benefits when compared to possible alternatives. The C-43 reservoir presents a perfect storm of poor project planning. Since at least 2005, critics have voiced concerns about the C-43 reservoir design and performance. These concerns are discussed below.

Background

As conceived originally, the C-43 reservoir was to store and treat water from the Caloosahatchee basin and pump it back to Lake Okeechobee. However, this rationale was based on erroneous low rainfall estimates that failed to take into consideration the historical rainfall. Approximately 33 aquifer storage and recovery (ASR) wells

¹ For a comprehensive overview of the CERP and other plans to address water quality, quantity and flow see *Options to Reduce High Volume Freshwater Flows to the St. Lucie and Caloosahatchee Estuaries and Move More Water from Lake Okeechobee to the Southern Everglades*, An Independent Technical Review by the University of Florida Water Institute.

² For a discussion of Florida's water regulatory regime see: Totoiu, Jason and Samson, Ansley; *Optimizing Florida's Water Supply Planning Law to Advance Everglades Restoration: A White Paper*, Everglades Law Center, December 2014. This position paper by Caloosahatchee Riverwatch reflects many of the issues raised in the Everglades Law Center's White Paper.

were to be drilled and they would store and provide the primary source to supplement low river flow and provide water for agriculture. Owing to arsenic in the aquifer, the the proposed ASR wells were found unsatisfactory and this component was dropped.

The initial plan called for locating the C-43 reservoir east of the Ortona locks. When the property at the current proposed location came on the market, the South Florida Water Management District (SFWMD) made a last minute change to relocate the reservoir. SFWMD planned to use the C-43 reservoir as a water supply source for agriculture in the basin as the ASR wells no longer afforded a viable option. This would enable SFWMD to shift consumptive use permits for agriculture from water supplied by Lake Okeechobee to sources within the basin. But such permit shifting proves problematic when pursuing federal funding. The Federal Government will only fund “restoration” and not “farm water supply.” Thus, SFWMD decided to reserve the C-43 reservoir water for restoration purposes. This is the context in which the current proposal needs reviewing.

Harmful Algal Blooms

Critics argue that the C-43 reservoir would serve as an incubator for cyanobacteria or harmful algal blooms (HABs), more commonly known as blue/green algae. SFWMD developed test cells to determine the impact of storing water in a reservoir. The test cells showed a progressive increase in chlorophyll, an indicator of algal abundance, over time. When asked if the C-43 reservoir could produce a massive algal bloom, William Mitsch, a Florida Gulf Coast University Professor and one of the foremost wetlands scientists in the world, said, “I can predict 100 percent that that’s going to happen.”³ Professor Mitsch does not believe that a deep water reservoir is sustainable.⁴

In the past, HABs constituted an occasional occurrence in the Caloosahatchee, but they now appear annually when the weather warms and too much fresh water lowers the salinity level. This has become the new normal. HABs cause fish kills and present a growing threat to public health when water users come in contact with the water while boating or at beaches. Toxic HAB threats range from fever-like symptoms and rashes to diarrhea and vomiting. In addition to the health and environmental harm, the economic aspects can prove devastating for tourism, commercial and recreational

³ Gillis, Chad; *\$600 M reservoir Could Hurt Rather Help, Scientist Say*, Newspress, April 9, 2016. A video statement by Professor William Mitsch can be viewed at: <http://www.news-press.com/videos.news/2016/04/08/82796718/>

⁴ Mitsch, W. J.; *Restoring the Greater Florida Everglades, Once and For All*; Ecological Engineering 93:A1-A3, 2016.

fishing, and other water dependent businesses. Furthermore, HABs can depress real estate values for property owners on or near the Caloosahatchee River.⁵ Owing to the proliferation of HABs, in June 2016, Governor Rick Scott declared Lee, Martin, St. Lucie and Palm Beach Counties disaster areas.

The discharge of water from the C-43 reservoir to the river will have to meet water quality effluent limitations related to the impaired downstream segments of the river. These impairments, including one for nutrients, were determined after the C-43 reservoir plan was submitted for approval. Florida's numeric nutrient criteria (NNC) requires that at the time of permit issuance, the permit applicant must provide reasonable assurance that the effluent does not cause or contribute to the impairment of downstream waterbodies.

One unintended consequence of discharging harmful algae from the C-43 reservoir to the Caloosahatchee River is that the Olga water treatment plant draws water directly from the River. The water will require testing and or treating for algal toxins. In the past the Olga plant has had to close due to this problem.

Safety

The reservoir as designed is a “perched” style reservoir with the majority of its volume above grade – up to 25 feet of stored water. This creates a safety issue related to berm or dam failure, similar to the concerns associated with Lake Okeechobee and the Herbert Hoover Dike. According to the Army Corp of Engineers (ACOE) and SFWMD Design Criteria Memorandum DCM-1, the C-43 reservoir has been classified as having the highest hazard potential (“high hazard potential impoundment”). Additional planned development near the reservoir may contribute to the hazard level. Surrounding homeowners, including Lehigh Acres, along State Road 80 and the river shoreline may need to purchase costly flood insurance. Theoretically, the reservoir has been designed to not compromise the safety of nearby residents. But critics have concerns as the design criteria has not been readily available (C-43 Engineering Appendix).

Planning

Supporters say that despite uncertainties related to C-43 reservoir containment safety and water quality, the need for new storage must constitute the priority. They contend that they have addressed the uncertainties associated with the C-43 reservoir design and performance by citing the ACOE and Congressional approval. Finally, they

⁵ *The Impact of Water Quality on Florida's Home Values*, Florida Realtors, March 2015, p VII-VIII.

argue that the planning process and money already invested in the project justifies its completion – still a decade or more away.

Critics say that bureaucratic largess proves a poor excuse for failing to examine other design or storage alternatives. They believe that the ongoing delays and deferrals of more than a decade may facilitate policy makers avoidance of hard political decisions – often opposed by powerful interests that compete for limited water supplies. Critics believe that the process was politically driven owing to pressure to complete a long overdue project, despite the uncertainties. As a consequence of existing political demands and bureaucratic processes, timely or affordable alternatives have not received adequate consideration, despite concerns about design defects raised back in 2005. In light of costs and public safety concerns, alternative designs or projects merit consideration.

Florida Public Policy and Law

The Florida Resources Act (Florida Statute, Chapter 373) represents one of the most forward-looking, comprehensive and highly regarded water laws in the nation. The Act calls for the public interest to drive water use and protection. Pursuant to this law, the Caloosahatchee estuary, a public resource, should have priority for using Lake Okeechobee water during the dry season with protection from damaging releases during the rainy season. The Act provides the tools to address water quality, quantity, timing and distribution. For instance, a statutory reservation can provide the legal mechanism to set aside water from consumptive uses for the protection of fish and wildlife or public health and safety.

Water Management Districts, however, have failed to make adequate use of this important legal tool. We have seen an over-allocation to private users that leave the public resources without adequate water when needed, thus depleting our aquifers. This happens despite Florida case law that holds that “water is not a property right.”

ACOE and SFWMD say that they lack sufficient science to determine public resource needs or that current system design has too many constraints when asked to address lack of supply to the resource to prevent “harm”. They, however, require little or no science to allocate vast volumes of water, pursuant to permit, to private consumptive users. This creates inequity between consumptive users and the environment.

Compounding the problem, the Florida Legislature passed a massive new water bill (Florida Springs and Aquifer Protection Act) that came into force on July 1, 2016. This Act does little to balance competing interests for water in a rapidly growing state. The Act fails to provide meaningful requirements for water conservation and makes it

harder for a Water Management District to deny a consumptive use permit (CUP). The Act specifies that water allocations cannot be reduced based upon reduction due to conservation practices. In essence, this legislation moves Florida water policy in the direction of privatizing water by supporting special interests that benefit economically from water availability and private use, particularly agriculture. The water supply situation will worsen by reducing water use reporting requirements, allowing inter-basin transfers of water and providing more discretion in determining water quality compliance standards.

Water Regulatory Regime

The Lake Okeechobee minimum flow and levels (MFL) was intended as a science driven process to identify the water needs for a healthy estuary during the dry season. Since the rule's promulgation in 2001 (Rule 40E-8.221(2), Fla. Administrative Code), SFWMD has failed to make any revisions to the minimum flow target to reflect the best available information for the flow-salinity relationship to prevent harm to the estuary. This despite the general consensus that the MFL rule underestimates the flow target.⁶ An MFL figure of 650 cfs represents a more reasonable figure than 300 cfs used. SFWMD has pursued a path of delay and inaction and today operates with outdated standards and an incomplete recovery strategy.

SFWMD staff need to submit a revised, draft MFL rule to the Governing Board for adoption. This comes years after the adoption of the C-43 reservoir project implementation report (PIR). SFWMD sees the C-43 reservoir as the corner stone for its strategy to achieve recovery for the Caloosahatchee estuary. But, it now appears that the reservoir will provide even less water for the estuary than assumed during the initial reservoir design planning. An accurate flow-salinity relationship proves critical when developing an MFL rule and designing water storage aimed at restoring an estuary. The discrepancy in water storage needed and the inadequacy of the MFL flow target have existed for many years. This brings into question the validity of the process from both economic and ecological perspectives. Compounding the problem, the ecological modeling fails to take into consideration sea level rise and algal biomass.

Originally, the rule required reassessment at five year intervals. SFWMD argues that reassessments are not needed, as the C-43 reservoir planning process adequately addresses the problems. The situation of an inadequate dry season water supply to the estuary, however, has grown worse. SFWMD continues to allocate additional

⁶ See 2009 Report on the Caloosahatchee River Watershed by SFWMD, Florida Department of Environmental Protection and Florida Department of Agriculture and Consumer Services,

volume to consumptive users, primarily agriculture, by issuing new CUPs or renewing existing ones. This increases the discrepancy between what the Caloosahatchee estuary needs and the water available.

Cost Benefit Analysis

The C-43 reservoir has marginal cost-benefit attributes. Critics challenge the cost benefit relationship and say that alternatives including regulatory reform make more sense than expensive infrastructure projects, such as the C-43 reservoir. For some decision-makers, however, the high initial dollar cost of the C-43 reservoir is less than the political costs of vigorously enforcing the law. SFWMD needs to incorporate faster and interim ways to implement an MFL – including on-the-ground adaptive management, operational, or regulatory fixes – into its water recovery strategy. This is a time critical action.

Conceptual Alternative to Current Plan Design for the C-43 Reservoir

Riverwatch supports Professor William Mitsch's proposal for an accelerated planning and funding process for a storage/treatment area in the Everglades Agricultural Area (EAA), along with the additional planned storage and treatment features north of Lake Okeechobee. This would complement and integrate with a revised design for the C-43 reservoir. An EAA storage/treatment area with approximately 100,000 acres of treatment wetlands would address water quality demands for water entering Everglades National Park. This represents a better treatment option than the EAA deep water reservoir currently being planned as part of the CERP Integrated Delivery Schedule with an estimated completion date in 2026. With the alternate approach recommended by Mitsch, a smaller reservoir or existing flow equalization basin in the EAA would optimize wetland treatment. Displacement of 100,000 acres of existing sugar production would offset the irrigation demand in the EAA by approximately 140-150 thousand acre feet per year.⁷ The irrigation allocations currently associated with EAA lands could be transformed into a southern flowway.

This potential volume should be reserved by reservation (Florida Statutes Chapter 373) in Lake Okeechobee, which would continue functioning as a “balancing reservoir” for regional water supply. Reserving this water for the Caloosahatchee MFL requirement would enable greater flexibility in the C-43 reservoir design by focusing on water quality treatment and potentially reducing the end cost of the current design. This conceptual alternative (conveying water south and greater overall storage) should also provide greater flexibility toward managing excess flows east and

⁷ This estimate is based on 2015 estimated irrigation demand for sugar production in Glades and Hendry Counties as reported in the Lower West Coast Water Supply Plan 2012 for an average rainfall year.

west to the estuaries under most conditions. The Lake Okeechobee regulation schedule may need revising to incorporate this alternative.

Conclusion and Recommendations

1. The C-43 reservoir, as designed, will promote the growth of algae including the harmful toxin producing species collectively referred to as bluegreen algae. Future design or design changes must include a water quality treatment component.
2. The C-43 reservoir, as designed, creates a safety issue related to berm or dike failure. The engineering plans need extensive scrutiny with possible design revisions.
3. The C-43 reservoir has marginal cost-benefit attributes. Alternatives such as regulatory reform make more sense than expensive infrastructure projects.
4. A conceptual alternative or enhancement of the current C-43 reservoir design should include additional storage north and south of Lake Okeechobee enabling greater “balancing” performance of the Lake with regard to water supply and excess discharge to the Caloosahatchee Estuary. Such additional storage could allow for greater design flexibility and thus could include a water quality component for the C-43 reservoir.