

Project Name: C&SF: CERP Indian River Lagoon – South (IRLS)
C-23/C-24/C-25/ Northfork and Southfork Storage Reservoirs (UU P1 & UU P2) and
C-44 Basin Storage Reservoir (B)

Project ID: 1101 (CERP Project WBS # 07)

Lead Agency: USACE / SFWMD

Authority: WRDA 2000; WRDA 2007; (“C-44 Basin Storage Reservoir (B)” was a WRDA 2000
Initially Authorized Project; uncompleted portions of the original C&SF project were de-
authorized in WRDA 2007 when the broader IRL-S project was authorized for construction)

Funding Source: Federal/State

Strategic Plan Goal(s) Addressed: Primary: 1-A.1 Secondary: 2-A.3, 1-B.1, and 1-B.2

Measurable Output(s):

- 130,000 acre-feet reservoir storage (12,000 acres of above-ground storage)
(C-23/24 N: 43,920 ac-ft; C-23/24 S: 48,900 ac-ft; C-44: 33,150 ac-ft; C-25: 5,176 ac-ft)
- 9,000 acres of manmade wetlands (C-23/24: 2,363 acres; C-44: 6,000 acres; C-25: 142 acres)
 - 122 metric tons/yr. phosphorus expected load reduction
 - 475 metric tons/yr. nitrogen load expected reduction
- 99,781 acres of habitat improvement/restoration and additional water storage
 - Mosaic: 95,230 acres natural upland/wetlands habitat
 - Allapattah: 42,348 acres
 - Palmar: 17,143 acres
 - Cypress Complex: 32,639 acres
 - North Fork: 3,100 acres (flood plain preservation)
 - Aquatic Habitat: 4,551 acres in St. Lucie River and Estuary
 - Benthic: 2,650 acres
 - Submerged: 922 acres aquatic vegetation restoration
90 acres artificial submerged vegetation habitat
- 889 acres or more of oyster habitat (muck removal at 1.8 ft = 7.9 M yd²)

April 1999 (Restudy) Project Synopsis: Included above-ground reservoirs with a combined storage capacity of approximately 349,400 acre-feet located in the C-23/C-24/C-25/Northfork and Southfork basins in St. Lucie and Martin Counties, as well as an above-ground reservoir with a total storage capacity of approximately 40,000 acre-feet located in the C-44 Basin in Martin County. The initial design of the reservoirs in the C-23/C-24/C-25 Basins assumes 39,000 acres (water levels up to 8 feet above grade) and 9,350 acres (water levels up to 4 feet above grade). The initial design of the reservoir in the C44 basin assumes 10,000 acres (water levels up to 4 feet above grade). Features are to capture runoff and provide water quality improvement including reduced loading of nutrients, pesticides and runoff pollutants.

Current Project Synopsis: This project is located in the Martin, St. Lucie, and Okeechobee counties.

The C-44 storage area feature was one of the initially authorized projects for implementation in WRDA 2000 and was recommended by the Chief of Engineers in August 2004. Plans and specifications for the C-44 Reservoir and STA were also part of the SFWMD early start work.

Since that time, the combined cost for the IRL-S project was estimated at \$1.365 billion when the entire project was authorized for construction in WRDA 2007, dependent on appropriations from Congress. Based on the feasibility study and the PIR, and further refinements, the entire IRL-S project is expected to include the following components:

- Construction and operation of an additional 12,000 acres of above-ground storage and their connecting canals, control structures, levees and pumps to capture water from the C-44, C-23, C-24 and C-25 canals.
- Construction and operation of four new stormwater treatment areas to reduce sediment, phosphorus, and nitrogen going to the St. Lucie River estuary and the lagoon. STAs are planned for each of the basins: C-44 basin (1), C-23/24 basin (2) and C-25 basin (1) reducing damaging effects of watershed runoff
- Restoration of the upland/wetland mosaic with ditch plugging, berm construction, and periodic fire maintenance at three locations.
- Redirection of water from the C-23/24 basin to the Northfork of the St. Lucie River attenuating freshwater flows to the estuary.
- Muck removal from the north and south forks of the St. Lucie River and the middle estuary reducing nutrients (nitrogen and phosphorus). Oyster shell, reef balls, and artificial submerged aquatic vegetation near muck removal sites will be added for habitat improvement.

Current Status:

Construction of the C-44 reservoir and stormwater treatment area component of the IRL-S project began in 2011 and, it is being implemented through use of multiple construction contracts by the USACE and the SFWMD until its current scheduled construction completion in the year 2020. The first major construction contract (canals, roads, culverts, and bridge work) was awarded in July 2011 and was completed in July 2014. Due to questions regarding the 2008 design, Contract 2 (initially reservoir, pump station, and discharge canal) was divided in two phases. Contract 2 Phase 1 design addressed questions regarding surveys accuracy, need for additional surveys, removal of unnecessary low-level discharge culverts, construction phasing, appropriate storm-routing analysis, incorporation of latest guidance and standards from USACE and SFWMD, and embankment armoring soil-cement mix and design. Phase 1 was completed in April 2012. The design of Phase 2 began in October 2012 and addressed the changes identified in technical memoranda prepared by the designer of record during phase 1 design. Contract 2 design completed in December 2014. Contract 2 construction was awarded by the Corps in September 11, 2015. STA and Pump Station construction contracts were awarded by the SFWMD in October 2014 and April 2015. Construction of the entire facility is scheduled for September 2020, which will be followed by a 1-yr operational and monitoring testing of all its components.

Est. Cost: \$ 3,820,858,000

Project Schedule:

- 2011 C-44 reservoir construction began with Contract 1 (canals, roads, culverts, and bridge work)
- 2014 C-44 Contract 1 completed; C-44 STA construction initiated
- 2015 Construction of C-44 Reservoir and C-44 Pump Station initiated
- 2017 C-44 STA finish
- 2018 C-44 Pump Station finish
- 2020 C-44 Reservoir finish
- 2020 C-23/24 North Reservoir and C-23/24 STA constructions begin
- 2021 C-23/24 South Reservoir construction begins
- 2029 C-25 reservoir and STA construction begins
- 2028 Allapattah complex construction begins
- 2028 Muck removal & artificial habitat construction begins
- 2032 North fork land acquisition (flood plain) begins
- 2037 Palmar complex construction begins
- 2041 Cypress Creek / Trail Ridge complex construction begins

Detailed Project Budget Information (rounded):

IRLS	Obligations Thru FY 2016
USACE	\$119,762,000
SFWMD	\$508,078,000
Total	\$627,840,000



Aerial photo of C-44 Reservoir and Stormwater Treatment Area's intake canal at Citrus Blvd bridge (March 2014).

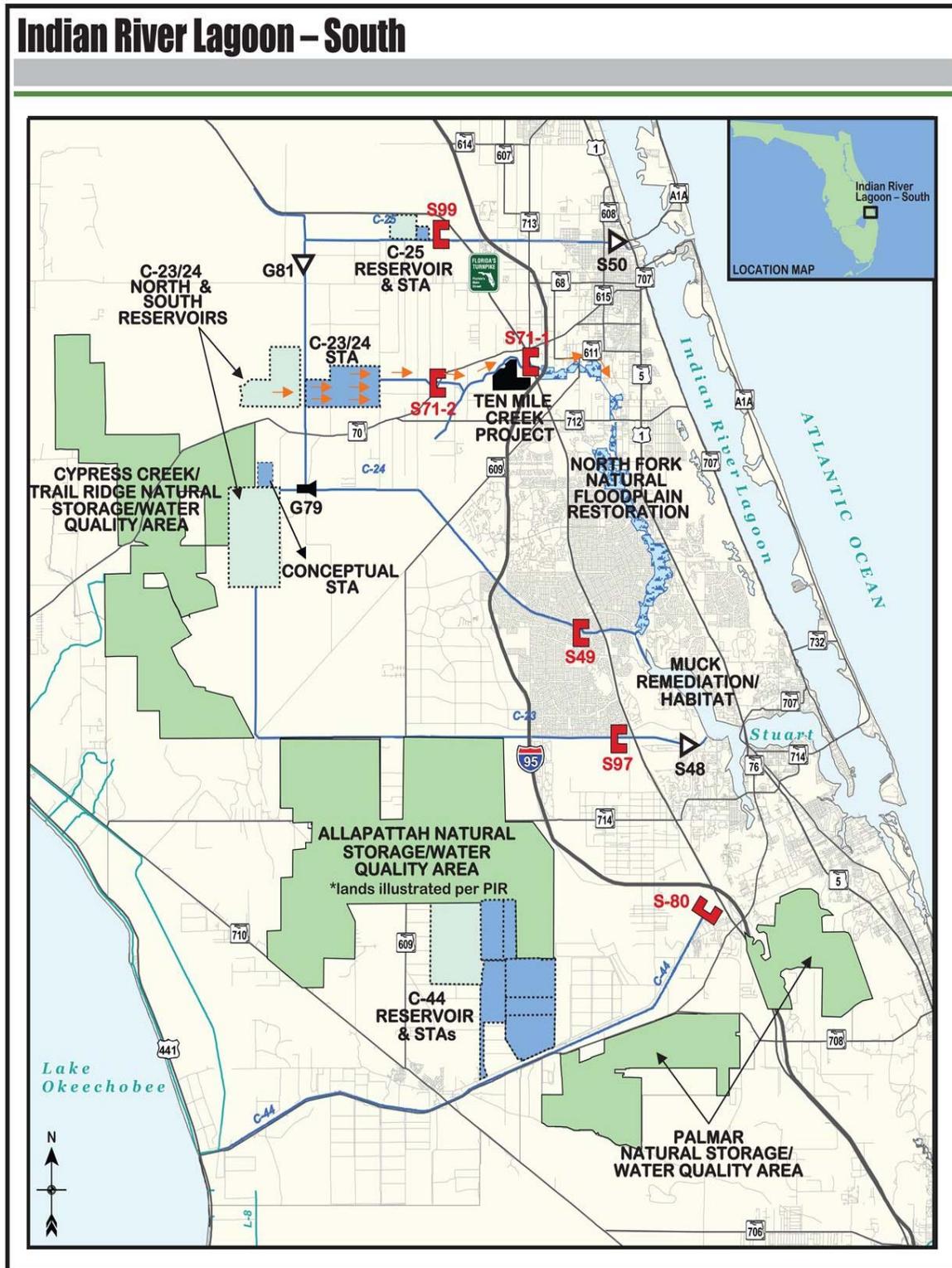
Hyperlinks: <http://www.saj.usace.army.mil/Missions/Environmental/EcosystemRestoration/>

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Source: Original project description summarized from the *Central and Southern Florida Project Comprehensive Review Study (Restudy)* (1999). Cost estimate and current project status includes information summarized from the *Central and Southern Florida Project Indian River Lagoon – South Final Integrated Project Implementation Report (PIR) and Environmental Impact Statement (EIS)* (2004) and is updated to reflect current price levels in May 2013 dollars; along with the authorization in WRDA 2007. Current status was provided by the project manager. Actual expenditures include all federal expenditures through FY14 (Sept, 2014) and sponsor verified and recorded in kind credit through 4th quarter FY14. Schedule is updated based on the approved *Integrated Delivery Schedule Through 2020* (February 10, 2010).

Additional Information:



Program Name: Infrastructure
Project Name: C&SF: CERP - Indian River Lagoon South - Project includes C-44 Basin Storage Reservoir (B) - C-44 (St. Lucie Canal) Reservoir / Stormwater Treatment Area (STA) and C-23/C-24/C-25/Northfork and Southfork Storage Reservoirs (UU)
Project ID: 1101A (CERP Project WBS #07)
Lead Agency: SFWMD
Authority: C-44 initially authorized in WRDA 2000;
Memorandum of Agreement Regarding Acceleration of the CERP
WRDA 2007
Project Partnership Agreement with USACE - September 2010
Project Partnership Agreement Amendment w/ USACE - August, 2014
Funding Source: State and Federal

Strategic Plan Goal(s) Addressed: 1.A.1

Measurable Output(s): 50,600 ac-ft reservoir, pump station and 6,300-acre STA (C-44 measurable outputs are part of the overall project total; The November 2015 Integrated Delivery Schedule indicates that design for the C-23/24 South Reservoir is expected to be initiated in FY18, for the C-23/24 North Reservoir in 2019 and for the C-23/24 STA in 2026. C-25 RSTA Design will begin in 2022.

Project Synopsis: A 3,400-acre, above-ground reservoir approximately 15 feet deep (50,600 acre-feet) to capture local C-44 basin runoff then provide treatment using 6,300 acres of Stormwater Treatment Areas. This project is a component of the Indian River Lagoon South (IRL-S) Project Implementation Report (PIR) and is located in central Martin County, adjacent to and north of the C-44 Canal, between Lake Okeechobee and the east coast.

Current Status: Plans and specifications for the C-44 Reservoir and STA were part of the early-start work by the SFWMD and were completed in 2007 and updated in 2008. The SFWMD has completed construction for three C-44 project related relocation efforts: the C-132 and northern C-133 canal modifications, the Troup Indiantown Water Control District temporary modifications and the C-44 Communication Tower. The USACE has completed Contract 1, which includes the Intake Canal, Project Access Road, C-133 Canal and the Citrus Boulevard Bridge. In 2014, the Project Partnership Agreement with the USACE was amended to allow some of the project components to be constructed by the SFWMD. The USACE issued a Notice to Proceed for construction of the 50,600 acre foot reservoir in October 2014. SFWMD has responsibility for constructing the remainder of the project and has initiated construction for the 6 STA cells, the System Discharge Canal and Spillway and the Reservoir Pump Station. The System Discharge construction contract was awarded in August 2014 and construction was completed in November 2015. The STA construction contract was awarded in October 2014 and is currently scheduled for December 2017 completion. The Reservoir Pump Station contract was awarded in March 2015 and has a completion date of September 2018. In 2015, the SFWMD also awarded a contract for removing the agro-chemically impacted soils from the reservoir footprint. The work was completed in June 2015.

Total Estimated Project Cost: \$1,336,696,000 (all reservoirs and STAs, without land)

Actual Construction Start Date:	May 2010 (SFWMD contract)(Relocations)
Actual Construction Start Date:	October 2015 (USACE contract 2, C-44 Reservoir)
Actual Construction Start Date:	September 2014 (SFWMD, System Discharge)
Actual Construction Start Date:	October 2014 (SFWMD, C-44 STA)
Actual Construction Start Date:	April 2015 (SFWMD, C-44 Reservoir Pump Station)

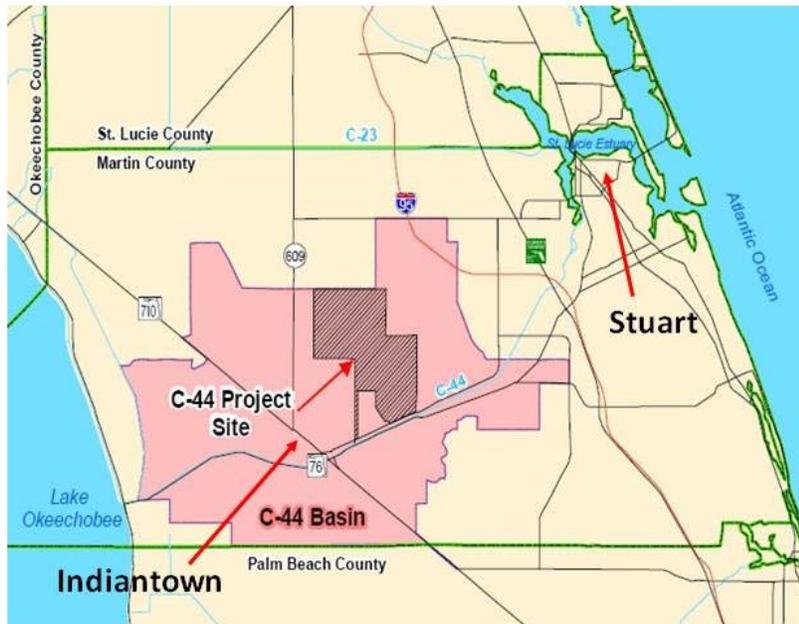
Scheduled Project Construction Completion Date: April 2020

Actual Expenditures to date by SFWMD*:

	Thru 2011	2012	2013	2014	2015	2016 (Q1+2)	Total
SFWMD	\$47,919,528	\$1,853,296	\$6,296,712	\$3,298,104	\$31,918,497	\$8,618,202	\$99,970,340

*Costs included are for design, relocations and construction

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C-44 Project site location maps shown above.



Southern view of the C-44 STA discharge canal, the C-44 System Discharge Structure S-404, and the C-44 Canal



Southern view of the C-44 STA southbound collection canal from the north east corner of Cell 2



East-Southeast view of the Tremie Pour at the C-44 Pump Station. In the Foreground the concrete trucks are lined up to pour the Tremie that is below the pump station foundation. The background shows the C-44 Communication Tower, the C-44 Intake canal (USACE Contract 1) and Cell 2 of the STA.