

The Florida Senate
BILL ANALYSIS AND FISCAL IMPACT STATEMENT

(This document is based on the provisions contained in the legislation as of the latest date listed below.)

Prepared By: The Professional Staff of the Appropriations Committee on Agriculture, Environment, and General Government

BILL: CS/SB 978

INTRODUCER: Environment and Natural Resources Committee and Senator Berman

SUBJECT: Advanced Wastewater Treatment

DATE: April 9, 2025

REVISED: _____

	ANALYST	STAFF DIRECTOR	REFERENCE	ACTION
1.	<u>Barriero</u>	<u>Rogers</u>	<u>EN</u>	<u>Fav/CS</u>
2.	<u>Reagan</u>	<u>Betta</u>	<u>AEG</u>	<u>Pre-meeting</u>
3.	<u> </u>	<u> </u>	<u>FP</u>	<u> </u>

Please see Section IX. for Additional Information:

COMMITTEE SUBSTITUTE - Substantial Changes

I. Summary:

CS/SB 978 provides that, by December 31, 2025, the Department of Environmental Protection (DEP), in collaboration with water management districts and wastewater facilities, must submit to the Governor and Legislature a report detailing specific information about all sewage disposal facilities with a permitted capacity of greater than 1 million gallons per day. The report must include, among other things, the year of construction and any maintenance or upgrades, permitted and actual wastewater treatment volumes, current treatment levels with concentrations of specified contaminants, pollutant load estimates, disposal methods and volumes discharged to receiving waterbodies, spill history, and facility location relative to floodplains and coastal hazards.

The bill provides that, by December 31, 2026, the DEP must submit a report to the Governor and Legislature outlining a priority ranking process for upgrading all sewage disposal facilities with a permitted capacity of greater than one million gallons per day in the state to advanced waste treatment by 2036.

The bill also directs the DEP to provide a progress report to the Governor and Legislature on the status of upgrades by June 30, 2027. This progress report must include a list of the sewage disposal facilities required to upgrade to advanced wastewater treatment, preliminary cost estimates, projected timelines for upgrade commencement and completion, and the anticipated operational start dates of the upgraded facilities.

The DEP may incur costs to prepare the reports required by this bill. These costs can be absorbed within current resources. See Section V., Fiscal Impact Statement.

The bill has an effective date of July 1, 2025.

II. Present Situation:

Wastewater

Domestic sewage contains toxicants, solid waste, plastics, and bacterial contaminants.¹ It also contains nutrients such as nitrogen and phosphorus.² Once wastewater is treated to standards set and monitored by state and federal officials, it is typically released into a local waterbody.³ However, conventional wastewater treatment is often ineffective at removing certain pollutants, such as contaminants of emerging concern,⁴ heavy metals, *Escherichia coli* (e. coli), pharmaceuticals, pesticides, and microplastics.⁵ As a result, the discharge of conventionally treated wastewater can be a significant source of pollution in aquatic ecosystems, leading to documented declines in biodiversity and essential ecosystem functions.⁶

¹ Mehtab Haseena et al., *Water pollution and human health*, Environmental Risk Assessment and Remediation, vol. 1, 16, 18 (2017), available at https://www.researchgate.net/publication/326828651_Water_pollution_and_human_health. See also C. Chahal et al., *Pathogen and particle Associations in wastewater: Significance and Implications for Treatment and Disinfection Processes*, Advances in Applied Microbiology, vol. 97, 68 (2016), available at <https://www.sciencedirect.com/science/article/pii/S0065216416300971>.

² See EPA, *Nutrient Pollution: Sources and Solutions: Wastewater*, <https://www.epa.gov/nutrientpollution/sources-and-solutions-wastewater> (last visited Mar. 7, 2025).

³ EPA, *Nutrient Pollution: Sources and Solutions: Wastewater*, <https://www.epa.gov/nutrientpollution/sources-and-solutions-wastewater> (last visited Mar. 7, 2025).

⁴ Contaminants of Emerging Concern (CECs) are chemicals that are being discovered in water that previously had not been detected or are being detected at levels that may be different than expected. While there are no regulatory limits, there may be a long-term potential risk to human health or the environment associated with CECs. EPA prioritizes CECs for research and data collection. DEP, *Regulated Drinking Water Contaminants and Contaminants of Emerging Concern*, <https://floridadep.gov/comm/press-office/content/regulated-drinking-water-contaminants-and-contaminants-emerging-concern> (last visited Mar. 6, 2025).

⁵ See Joshua Matesun et al., *Limitations of wastewater treatment plants in removing trace anthropogenic biomarkers and future directions: A review*, Ecotoxicology and Environmental Safety, 1 (2024), available at <https://www.sciencedirect.com/science/article/pii/S0147651324006869>; Jonas Margot et al., *Treatment of micropollutants in municipal wastewater: Ozone or powdered activated carbon?*, Science of The Total Environment, 480 (2013), available at <https://www.sciencedirect.com/science/article/abs/pii/S0048969713005779?via%3Dihub>; Sunanda Mishra et al., *Membrane bioreactor (MBR) as an advanced wastewater treatment technology for removal of synthetic microplastics*, Development in Wastewater Treatment Research and processes, 45 (2022), available at <https://www.sciencedirect.com/science/article/abs/pii/B9780323855839000223>.

⁶ See Daniel Stalter et al., *Do Contaminants Originating from State-of-the-Art Treated Wastewater Impact the Ecological Quality of Surface Waters?*, Plos One, vol. 8, 8 (2013), available at <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0060616>; Katja Bunzel et al., *Effects of organic pollutants from wastewater treatment plants on aquatic invertebrate communities*, Water Research, vol. 47, 597 (2013), available at <https://www.sciencedirect.com/science/article/abs/pii/S0043135412007610?via%3Dihub>; Dania Albini et al., *The combined effects of treated sewage discharge and land use on rivers*, Global Change Biology, 6415 (2023), available at <https://pmc.ncbi.nlm.nih.gov/articles/PMC10946937/>.

Advanced wastewater treatment (AWT) has been shown to be more effective at reducing effluent toxicity than conventional treatment.⁷ There are several types of AWT technologies. Some AWT methods such as membrane bioreactor filtration can treat wastewater to match the physical, chemical, and biological properties of the waterbody the treated water will be discharged into.⁸ Membrane bioreactors and other AWT technologies, including oxidation processes and powdered activated carbon, have also been shown to be effective at removing micropollutants such as pharmaceuticals, pesticides, and microplastics,⁹ and nutrients like phosphorus.¹⁰ Adsorption processes have also been shown to be potential solutions for the removal of micropollutants in advanced treatment plants.¹¹

Domestic Wastewater Treatment Facilities in Florida

The majority of the state's wastewater is controlled and treated by centralized treatment facilities regulated by the Department of Environmental Protection (DEP).¹² Florida has approximately 2,000 permitted domestic wastewater treatment facilities.¹³

Wastewater treatment facilities are required to provide secondary treatment prior to reuse or disposal.¹⁴ Such treatment requires that carbonaceous biochemical oxygen demand (CBOD5) and total suspended solids (TSS) not exceed specific levels based on the method of disposal (i.e., surface water disposal, reuse, land application, or groundwater discharge).¹⁵ For example, for land application or groundwater discharge, the annual average of CBOD5 and total suspended solids may not exceed 20.0 milligrams per liter (mg/L), and the maximum-permissible concentration in any single sample may not exceed 60.0 mg/L.¹⁶

AWT provides a reclaimed water product containing no more than the following concentrations of pollutants:

- five mg/L of Biochemical Oxygen Demand;
- five mg/L of Suspended Solids;

⁷ Johannes Völker et al., *Systematic Review of Toxicity Removal by Advanced Wastewater Treatment Technologies via Ozonation and Activated Carbon*, American Chemical Society ES&T, vol. 53, 7226 (2019), available at <https://pubs.acs.org/doi/full/10.1021/acs.est.9b00570>.

⁸ University of Florida Institute of Food and Agricultural Sciences, *Advanced Wastewater Treatment (AWT)*, <https://blogs.ifas.ufl.edu/sarasotaco/2020/07/30/advanced-wastewater-treatment-awt/>.

⁹ See Margot, *Treatment of micropollutants in municipal wastewater: Ozone or powdered activated carbon?* at 480; Radhakrishnan Krishnan et al., *Recent approaches and advanced wastewater treatment technologies for mitigating emerging microplastics contamination—A critical review*, Science of the Total Environment, vol. 858 (2023), available at <https://www.sciencedirect.com/science/article/abs/pii/S004896972206781X?via%3Dihub>.

¹⁰ EPA, *Advanced Wastewater Treatment to Achieve Low Concentration of Phosphorus*, 3 (2007), available at <https://www.epa.gov/sites/default/files/2019-02/documents/advanced-wastewater-treatment-low-concentration-phosphorus.pdf>.

¹¹ Biniam Belete et al., *Micropollutant Removal Efficiency of Advanced Wastewater Treatment Plants: A Systematic Review*, Environmental Health Insights, vol. 17, 1 (2023), available at <https://journals.sagepub.com/doi/full/10.1177/11786302231195158>.

¹² DEP, *Domestic Wastewater Program*, <https://floridadep.gov/water/domestic-wastewater> (last visited Mar. 6, 2025).

¹³ DEP, *General Facts and Statistics about Wastewater in Florida*, <https://floridadep.gov/water/domestic-wastewater/content/general-facts-and-statistics-about-wastewater-florida> (last visited Mar. 6, 2025).

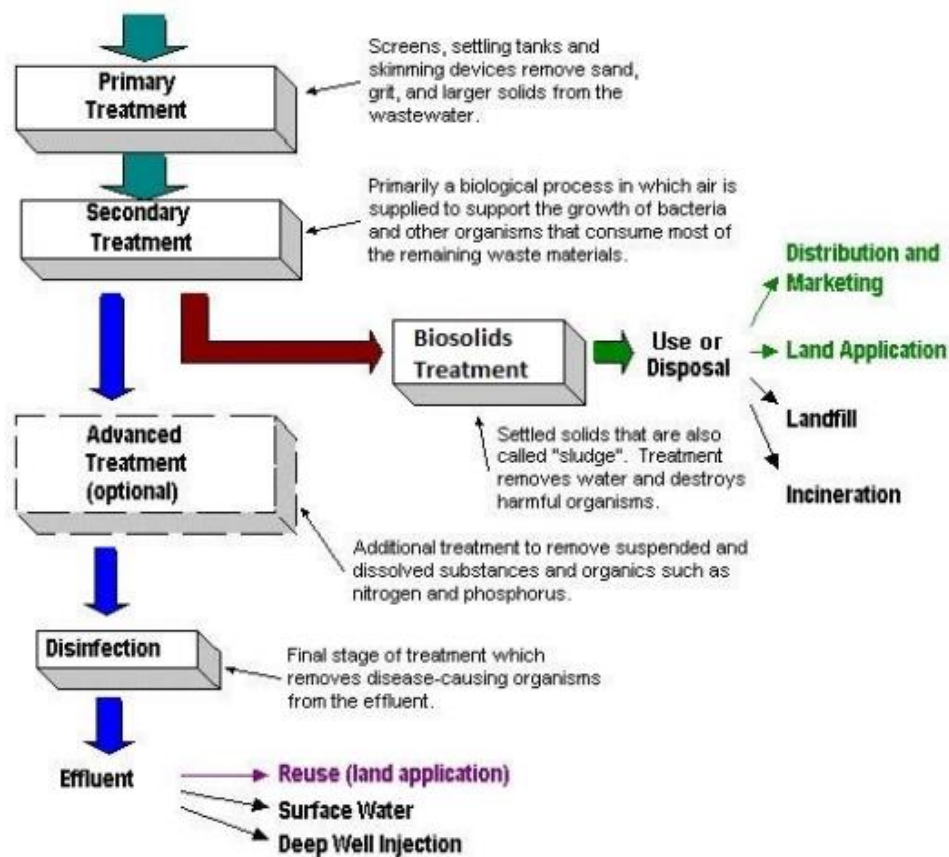
¹⁴ Sections 403.086(1)(a) and (2), F.S.; Fla. Admin. Code R. 62-600.420.

¹⁵ CBOD5 is the quantity of oxygen utilized in the carbonaceous biochemical oxidation of organic matter present in water or wastewater, reported as a five-day value determined using approved methods. Fla. Admin. Code R. 62-600.200(8).

¹⁶ Fla. Admin. Code R. 62-600.420(3).

- three mg/L of total nitrogen; and
- one mg/L of total phosphorous.¹⁷

AWT is required before discharging into certain impaired waterbodies, including, but not limited to, the Indian River Lagoon beginning July 1, 2025, and by January 1, 2033, waterbodies that are not attaining nutrient-related standards or that are subject to a nutrient basin management action plan (BMAP) or reasonable assurance plan.¹⁸ In addition, in 2024, the Legislature passed a law requiring that by July 1, 2034, wastewater treatment facilities providing reclaimed water for irrigation or land application in areas within a nutrient BMAP or a reasonable assurance plan must meet AWT standards for total nitrogen and total phosphorus if the DEP determines that the use of reclaimed water is causing or contributing to nutrient impairment.¹⁹ For such determinations made by the DEP after July 1, 2024, the facility has 10 years to meet AWT standards.²⁰ The DEP may also order AWT if deemed necessary.²¹



¹⁷ Section 403.086(4)(a), F.S. DEP, *Domestic Wastewater Treatment Process*, available at <https://floridadep.gov/water/domestic-wastewater/documents/domestic-wastewater-treatment-process> (showing flowchart of wastewater treatment process).

¹⁸ Section 403.086(1)(c)1. and 2., F.S.

¹⁹ Chapter 2024-180, s. 13, Laws of Fla.; section 403.086(1)(c)3., F.S.

²⁰ *Id.*

²¹ Section 403.086(1)(a), F.S.

Wastewater treatment facilities may be required to provide additional treatment to satisfy water quality standards for receiving surface and ground waters.²² Systems within Monroe County are subject to different treatment requirements.²³

Wastewater treatment facilities must monitor the flow, the influent for CBOD5 and TSS, and the effluent for all effluent parameters as required by the permit.²⁴ The minimum schedule for sampling is based on the facility's permitted capacity. For example, for facilities with a permitted capacity of five million gallons per day (mgd) up to 15 mgd, sampling must be conducted according to the following parameters:²⁵

- Continuous testing for flow, pH, and chlorine residual;²⁶
- Weekly testing for e. coli or enterococci;
- Daily (seven days per week) testing for TSS, CBOD5, nutrients, chlorine residual, and total coliform.²⁷

Impaired Waters, Total Maximum Daily Loads (TMDLs), and BMAPs

Under section 303(d) of the federal Clean Water Act, states must establish water quality standards for waters within their borders and develop a list of impaired waters that do not meet such water quality standards.²⁸ States must also develop a list of threatened waters that may not meet water quality standards in the following reporting cycle.²⁹

Due to limited funds and the wide variety of surface waters in Florida, the DEP sorted those waters into 29 major watersheds, or basins, and further organized them into five basin groups for assessment purposes.³⁰ If the DEP determines that any waters are impaired, the waterbody must be placed on the verified list of impaired waters, and a TMDL must be calculated.³¹ A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards.³² A waterbody may be removed from the verified list at any time during the TMDL process if it attains water quality standards.³³ If the DEP determines that a waterbody is impaired but further study is needed to determine the causative pollutants or other factors

²² Fla. Admin. Code R. 62-600.430.

²³ Section 403.086(11), F.S.

²⁴ Fla. Admin. Code R. 62-600.660(1).

²⁵ *Id.* at Figure 1.

²⁶ Total chlorine residual measured for disinfection effectiveness. *Id.* at n. 2.

²⁷ Fecal coliform must be tested five days per week, but total coliform must be tested seven days per week. *Id.* at Figure 1.

²⁸ EPA, *Overview of Identifying and Restoring Impaired Waters under Section 303(d) of the CWA*, <https://www.epa.gov/tmdl/overview-identifying-and-restoring-impaired-waters-under-section-303d-cwa> (last visited Mar. 9, 2025); 40 C.F.R. 130.7. Following the development of the list of impaired waters, states must develop a total maximum daily load for every pollutant/waterbody combination on the list. DEP, *Watershed Evaluation and Total Maximum Daily Loads (TMDL) Section*, <https://floridadep.gov/dear/water-quality-evaluation-tmdl/content/total-maximum-daily-loads-tmdl-program> (last visited Mar. 9, 2025).

²⁹ *Id.*

³⁰ DEP, *Assessment Lists*, <https://floridadep.gov/dear/watershed-assessment-section/content/assessment-lists> (last visited Jan. 26, 2024).

³¹ *Id.*; DEP, *Verified List Waterbody Ids (WBIDs)*, <https://geodata.dep.state.fl.us/datasets/FDEP::verified-list-waterbody-ids-wbids/about> (last visited Mar. 9, 2025); section 403.067(4), F.S.

³² Section 403.067(6)(a), F.S. *See also* 33 U.S.C. § 1251, s. 303(d) (the Clean Water Act).

³³ Section 403.067(5), F.S.

contributing to impairment before the waterbody is placed on the verified list, the waterbody will be placed on a statewide comprehensive study list.³⁴

BMAPs are one of the primary mechanisms the DEP uses to achieve TMDLs. BMAPs are plans that address the entire pollution load, including point and nonpoint discharges,³⁵ for a watershed. There are currently 34 adopted BMAPs in Florida.³⁶

The DEP may establish a BMAP as part of the development and implementation of a TMDL for a specific waterbody. First, the BMAP equitably allocates pollutant reductions to individual basins, to all basins as a whole, or to each identified point source or category of nonpoint sources.³⁷ Then, the BMAP establishes the schedule for implementing projects and activities to meet the pollution reduction allocations.³⁸ Producers of nonpoint source pollution included in a BMAP must comply with the established pollutant reductions by implementing appropriate best management practices or conducting water quality monitoring.³⁹

Public Notification of Pollution Releases

Florida law requires public notification of certain pollution releases.⁴⁰ A reportable pollution release is any unauthorized release or discharge of a substance into the air, land, or waters of the state that must be reported to the Division of Emergency Management's State Watch Office under applicable rules, permits, orders, or variances.⁴¹ If an owner or operator of an installation discovers such a release, they must notify DEP within 24 hours.⁴² If no notification is made, the DEP may take enforcement action against all parties subject to the notification requirement.⁴³ If the pollution release migrates beyond the facility's property, the owner or operator must provide an additional notice to the DEP within 24 hours of the discovery of the migration.⁴⁴

The DEP must publish all pollution notifications on its websites within 24 hours of receipt and maintain an electronic mailing list for local governments, health departments, news media, and other interested parties to receive announcements of any notices.⁴⁵ The DEP must also provide an online form and email submission option for reporting pollution releases.⁴⁶

³⁴ Section 403.067(2), F.S.; ch. 62-303.150, F.A.C.

³⁵ "Point source" is defined as any discernible, confined, and discrete conveyance, including any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. Nonpoint sources of pollution are sources of pollution that are not point sources. Fla. Admin. Code R. 62-620.200(37).

³⁶ DEP, *Basin Management Action Plans (BMAPs)*, <https://floridadep.gov/dear/water-quality-restoration/content/basin-management-action-plans-bmaps> (last visited Jan. 26, 2024).

³⁷ *Id.*

³⁸ *Id.*

³⁹ Section 403.067(7)(b)2.g., F.S. For example, BMPs for agriculture include activities such as managing irrigation water to minimize losses, limiting the use of fertilizers, and waste management.

⁴⁰ Section 403.077, F.S.

⁴¹ Section 403.077(1), F.S.

⁴² Section 403.077(2)(a), F.S.

⁴³ Section 403.077(2)(b), F.S.

⁴⁴ Section 403.077(2)(d), F.S.

⁴⁵ Section 403.077(3)(a) and (b), F.S. See DEP, *Public Notice of Pollution*, <https://floridadep.gov/sec/sec/content/public-notice-pollution> (last visited Mar. 9, 2025).

⁴⁶ Section 403.077(3)(c), F.S.

Providing notice of a pollution release does not constitute an admission of liability or harm.⁴⁷ However, failure to provide the required notification can result in civil penalties.⁴⁸

Contaminants of Emerging Concern

Contaminants of Emerging Concern (CECs) are chemicals that are being discovered in water that previously had not been detected or are being detected at levels that may be different than expected.⁴⁹ While there are no regulatory limits, there may be a long-term potential risk to human health or the environment associated with CECs. Additional studies may also bring new or changing health exposure information. The United States Environmental Protection Agency prioritizes CECs for research and data collection. As part of this data collection, all large and selected smaller public water systems across the U.S. are required to monitor for the targeted CECs.⁵⁰

III. Effect of Proposed Changes:

Section 1 includes the following legislative findings:

- The discharge of inadequately treated wastewater and aging sewage disposal facilities compromise the quality of the environment, including freshwater, brackish water, and nearshore and offshore salt waters, and threatens the quality of life and local economies in the state that depend on those resources.
- The only practical and cost-effective way to fundamentally improve wastewater management is to implement advanced wastewater treatment or better at all sewage disposal facilities with a permitted capacity of greater than one million gallons per day in the state.

The bill provides that, in order to prioritize the upgrade of sewage disposal facilities, by December 31, 2025, the Department of Environmental Protection (DEP), in consultation with the water management districts and wastewater facilities, must submit to the Governor and the Legislature a report detailing all of the following for all sewage disposal facilities with a permitted capacity of greater than one million gallons per day in the state:

- Year of construction for the facility and any maintenance or upgrades.
- Total permitted volume of wastewater treated daily.
- Actual permitted volume of wastewater treated daily including the most recent one-year and five-year averages.
- Current level of treatment, including concentrations for each of the following:
 - Biochemical oxygen demand.
 - Suspended solids.
 - Total nitrogen.
 - Total phosphorus.
 - 1,4-dioxane.

⁴⁷ Section 403.077(4), F.S.

⁴⁸ Section 403.077(5), F.S.

⁴⁹ DEP, *Regulated Drinking Water Contaminants and Contaminants of Emerging Concern*, <https://floridadep.gov/comm/press-office/content/regulated-drinking-water-contaminants-and-contaminants-emerging-concern> (last visited Jan. 18, 2024).

⁵⁰ *Id.*

- Perfluorooctanoic acid.
- Perfluorooctanesulfonic acid.
- Molybdenum.
- Other contaminants of emerging concern as determined by DEP.
- Estimated total pollutant load based on permitted volume and concentrations.
- Disposal methods and the volume discharged to any receiving waterbodies, if applicable, pursuant to s. 403.064(16), F.S.⁵¹
- Impairment status of any receiving waterbodies within the watershed.
- Implementation status of total maximum daily loads (TMDL) and basin management action plans (BMAPs) and recommended reductions for load allocations and wasteload allocations for pollutants of concern.
- Total volume and concentration of any permitted and nonpermitted wastewater spills since 2010.
- Elevation of the facility and supporting infrastructure.
- Location within a floodplain, flood zone, or coastal high-hazard area and, if applicable, the corresponding zone number.

The bill provides that, by December 31, 2026, the DEP, in consultation with the water management districts and sewage disposal facilities, must submit to the Governor and Legislature a report outlining a priority ranking process to upgrade all sewage disposal facilities with a permitted capacity of greater than 1 million gallons per day in the state to advanced waste treatment by 2036, based on all the following:

- Overall environmental benefit of a project based on:
 - Water quality in receiving waterbodies, including impairment status;
 - Severity and duration of documented algal blooms;
 - Loss of submerged vegetation;
 - Death of fish and wildlife;
 - Public health advisories;
 - Quantity and concentration of permitted and nonpermitted spills; and
 - Risk of failure.
- Estimated reduction in nutrient and pollutant loads with advanced waste treatment.
- An explanation of additional projects necessary to meet any adopted TMDL and BMAPs if upgrading to advanced waste treatment is not sufficient.
- Cost-effectiveness as determined by a planning-level cost estimate.
- Potential financial assistance available, including the water quality improvement grant program and availability of local matching funds.
- Project readiness and the estimated date of completion.

The bill provides that, by June 30, 2027, the DEP, in consultation with the water management districts and sewage disposal facilities, must submit to the Governor and Legislature a progress report on the status of upgrades established through the priority ranking process for each sewage disposal facility with a permitted capacity of greater than one million gallons per day in this state. The report must include:

⁵¹ Section 403.064(16), F.S., requires domestic wastewater utilities to eliminate nonbeneficial surface water discharges by January 1, 2032.

- The priority list identified by the DEP in its 2026 report;
- The preliminary cost estimates for the upgrades;
- A projected timeline of the dates by which the upgrades would begin and be completed; and
- The date by which operations of the upgraded sewage disposal facility would begin.

Section 2 provides an effective date of July 1, 2025.

IV. Constitutional Issues:

A. Municipality/County Mandates Restrictions:

None.

B. Public Records/Open Meetings Issues:

None.

C. Trust Funds Restrictions:

None.

D. State Tax or Fee Increases:

None.

E. Other Constitutional Issues:

None.

V. Fiscal Impact Statement:

A. Tax/Fee Issues:

None.

B. Private Sector Impact:

Indeterminate.

C. Government Sector Impact:

The Department of Environmental Protection may incur costs to prepare the reports required by this bill which can be handled with existing resources.

VI. Technical Deficiencies:

None.

VII. Related Issues:

None.

VIII. Statutes Affected:

This bill creates an undesignated section of Florida law.

IX. Additional Information:**A. Committee Substitute – Statement of Substantial Changes:**

(Summarizing differences between the Committee Substitute and the prior version of the bill.)

CS by Environment and Natural Resources on March 17, 2025:

- Clarifies that the bill does not require sewage disposal facilities to upgrade to advanced wastewater treatment;
- Clarifies that “the department” refers to the Department of Environmental Protection (DEP) and that DEP’s report outlining a priority ranking process must include all sewage disposal facilities with a permitted capacity of greater than one million gallons per day.
- Corrects a statutory reference, changing it from s. 403.064(17), F.S., to s. 403.064(16), F.S.

B. Amendments:

None.