

The Water & Sewer Side of the Ledger

*A Companion Analysis to Understanding Carrying Capacity
and The Fiscal Side of the Ledger*

Michael Collett | August 2026

St. Simons Island and Sea Island, Georgia

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Start With What You Already Know

Most residents of St. Simons Island rarely think about the island's water and wastewater systems. Every day we turn on the faucet, water our lawns, wash dishes, take a shower, or flush a toilet with little thought about the complex infrastructure quietly working beneath our feet. For most of us, the system simply works.

Like roads, bridges, and electrical service, water and wastewater infrastructure is largely invisible until something changes. Perhaps your monthly utility bill increases. A major construction project begins at the Dunbar Creek Water Pollution Control Facility. A discussion arises about tap-in fees for new development. Or you hear concerns about future growth and wonder whether the island's infrastructure can continue keeping pace.

- Is our drinking water safe?
- Is the wastewater system reliable?
- Who pays for expanding infrastructure?
- Are today's utility revenues sufficient to support tomorrow's infrastructure needs?
- Is long-term planning keeping pace with long-term growth?
- Is our water and sewer system prepared to deal with future weather events?
- How does our system compare with other barrier islands, such as Hilton Head?

This paper seeks to answer those questions using publicly available information, official planning documents, engineering reports, utility records, financial statements, and transparent analysis. It is not intended to advocate for or against growth. It is intended to better understand the relationship between growth, infrastructure, finance, resilience, and long-term stewardship.

A Note on Terms Used in This Paper

This paper uses some technical language that water and sewer professionals use every day but that most residents do not encounter often. Here is a quick, plain-language reference. You will not need to memorize these — you can return to this list whenever a term is unfamiliar.

- **MGD (Million Gallons per Day)** — the standard unit for measuring how much water a plant can treat, or is treating, each day.
- **NPDES Permit** — the state and federal permit that legally limits what a treatment plant can discharge, and how much.
- **Influent / Effluent** — influent is the wastewater flowing into a plant; effluent is the treated water flowing back out.
- **Tap Fee** — a one-time charge paid when a new home or business first connects to the water and sewer system.
- **Enterprise Fund** — a utility budget funded by customer bills and fees, not property taxes — this is how BGJWSC operates.
- **Lift Station** — a pump station that moves wastewater along when gravity alone cannot carry it to the treatment plant.
- **I&I (Infiltration and Inflow)** — rainwater and groundwater that leaks into sewer pipes, adding extra flow the plant must treat, especially during storms.
- **SPLOST** — a temporary, voter-approved local sales tax used to fund specific capital projects, renewed by referendum roughly every six years.
- **GEFA** — the Georgia Environmental Finance Authority, a state agency offering below-market loans for water and sewer projects.
- **DMR / ECHO** — a Discharge Monitoring Report is the monthly flow and pollutant data utilities must file with EPA; ECHO is the public website where anyone can look up that data.
- **ASR (Aquifer Storage & Recovery)** — a well system that banks treated water underground during low-demand months, for use later during high-demand periods like hurricane season

This Paper Begins With Good News

Based upon the official information reviewed during this research, St. Simons Island has a functioning and professionally operated water and wastewater system. The available record does not suggest an island-wide failure of drinking-water quality or wastewater service.

This paper is not an evaluation of day-to-day operations, nor is it intended to criticize the utility or the professionals responsible for operating it. A capacity constraint does exist, however — under peak/heavy-rain conditions, Dunbar Creek is already operating at approximately 100% of its existing permitted monthly-average limit as of 2026, consistent with the actual permit violations recorded in 2024. That finding is addressed in detail later in this paper. It is worth being precise about what that finding means: the 4.0/5.0 MGD figures discussed throughout this paper are permitted monthly-average discharge limits under Dunbar Creek’s NPDES permit, not the plant’s physical peak hydraulic capacity, which BGJWSC’s Executive Director has confirmed is approximately 10.0 MGD today and would rise to approximately 12.5 MGD after the planned expansion. The near-term risk this paper identifies is a monthly-average permit-compliance problem under wet-weather conditions — not the plant being physically overwhelmed. Instead, it asks a different question:

As St. Simons Island continues to grow, is the utility’s long-term financial and infrastructure planning keeping pace with the additional demand created by that growth?

Why This Paper Was Written

This paper began during the preparation of The Fiscal Side of the Ledger. That analysis examined the relationship between residential growth, property-tax revenues, and transportation demand. Several readers then asked an important follow-up question:

If approximately 3,000 additional homes are constructed over the next twenty years, what happens to the island’s water and wastewater systems?

Every new home requires clean drinking water, generates wastewater, and creates additional demand for wells, water mains, lift stations, force mains, treatment facilities, maintenance, rehabilitation, future capacity, and storm resilience. At the same time, every new home generates additional revenue through tap-in fees and ongoing monthly utility bills.

Is the combination of tap-in fees, monthly utility rates, and other funding sources keeping pace with the long-term capital investments required to provide reliable water and wastewater service as the island continues to grow?

Why Dunbar Creek?

The previous papers focused on the Frederica Road and Sea Island Road intersection because it is a major point where transportation demand converges. This paper focuses on the Dunbar Creek Water Pollution Control Facility for a similar reason.

Dunbar Creek treats wastewater from the publicly sewered portions of St. Simons Island and receives wastewater conveyed from Sea Island. Wastewater reaches the facility through neighborhood collection lines, gravity sewers, lift stations, and force mains. Areas not connected to public sewer may rely on septic systems.

Dunbar Creek has been expanded and rehabilitated over time. The current planning process contemplates increasing treatment capacity from 4.0 to 5.0 million gallons per day. A separate rehabilitation project, focused on reliability rather than capacity, illustrates that maintaining existing infrastructure and expanding future capacity are distinct obligations.

A Different Way of Thinking About Growth

Communities rarely experience growth one infrastructure system at a time. Every new home simultaneously increases demand for transportation, drinking water, wastewater treatment, stormwater management, public safety, parks, schools, and many other public services.

The same residential growth assumptions used in Understanding Carrying Capacity and The Fiscal Side of the Ledger are used again here so each infrastructure system can be evaluated through a common planning framework.

Is St. Simons Island making the long-term infrastructure investments necessary to preserve the quality of life residents enjoy today while accommodating the growth expected tomorrow?

Chapter 1

What This Analysis Found

Five conclusions emerge consistently from the information reviewed to date. Together, they define the central findings of this paper.

1. The model assumes no development boom.

The primary scenario simply continues the historical construction pace used in The Fiscal Side of the Ledger: approximately 155 homes per year, or roughly 3,100 additional homes over twenty years.

2. St. Simons Island has a functioning and professionally operated system today.

The paper does not begin from the premise that the current system is failing. It asks whether the system can remain reliable as growth, aging infrastructure, capital requirements, and storm risks accumulate.

3. Every new home creates both utility revenue and a long-term infrastructure obligation.

A new connection produces immediate and recurring revenue through tap-in fees and monthly charges. It also creates continuing obligations for water production, wastewater collection and treatment, maintenance, replacement, regulation, emergency capability, and future expansion.

4. Dunbar Creek is the principal point of wastewater convergence for this analysis.

Dunbar Creek serves the publicly sewered portions of St. Simons Island and receives wastewater conveyed from Sea Island. The collection system, lift stations, force mains, water-production facilities, and distribution network also matter.

5. Property-tax and utility funding are separate ledgers.

Property-tax revenue generated by new homes does not flow directly into BGJWSC. The utility is funded through rates, fees, borrowing, designated sales-tax proceeds, grants, and other utility resources.

Primary Exhibit — Twenty Years at the Island's Own Pace

Year	New Homes	Added Water	Added Wastewater	Tap Fees	Annual Rate Revenue	Modeled Dunbar Flow	Use at 4.0	Use at 5.0
2026	155	0.043 MGD	0.022 MGD	\$1.05M	\$0.15M	3.22 MGD	80.5%	64.4%
2030	775	0.215 MGD	0.109 MGD	\$5.27M	\$0.74M	3.31 MGD	82.7%	66.2%
2035	1,550	0.429 MGD	0.217 MGD	\$10.54M	\$1.48M	3.42 MGD	85.4%	68.3%
2040	2,325	0.644 MGD	0.326 MGD	\$15.81M	\$2.22M	3.53 MGD	88.1%	70.5%
2045	3,100	0.860 MGD	0.434 MGD	\$21.08M	\$2.96M	3.63 MGD	90.9%	72.7%

What This Exhibit Shows

- Approximately 860,000 gallons per day of added potable-water demand.
- Approximately 434,000 gallons per day of added wastewater flow.
- Approximately \$21.08 million in cumulative tap-in fees.
- Approximately \$2.96 million in additional annual water-and-sewer revenue by 2045, stated in current dollars.
- **Under peak/heavy-rain conditions (Exhibit 3B), estimated wet-weather monthly-average flow already reaches approximately 100% of the existing 4.0 MGD permitted monthly-average limit in 2026 — before any of the growth modeled above is added on top. (The plant's physical peak hydraulic capacity is substantially higher, approximately 10.0 MGD; see the callout following Exhibit 3B.)**

The "Use at 4.0" and "Use at 5.0" columns above reflect average-day conditions, and on their own they understate the system's actual near-term risk. Under peak/heavy-rain conditions, documented in Exhibit 3B, Dunbar Creek's wet-weather monthly-average flow is already at approximately 100% of the existing 4.0 MGD permitted monthly-average limit as of 2026 — consistent with the actual NPDES permit violations recorded in August and September 2024. **That is a monthly-average permit-compliance challenge, not evidence that the plant is physically overwhelmed: BGJWSC's Executive Director confirms the facility's physical peak hydraulic design capacity is approximately 10.0 MGD today, rising to approximately 12.5 MGD after the planned expansion. This is the central near-term challenge this paper identifies: not a distant capacity threshold reached decades from now, but a wet-weather margin that has already been exceeded today**, before layering on any of the residential growth modeled in this table. The planned 1.0 MGD expansion addresses this immediate gap and appears capable of absorbing the modeled residential increment on top of it under the central assumptions. Actual remaining margin will still depend on Sea Island demand, commercial growth, infiltration and inflow, seasonal use, and the definition of reliably usable capacity.

What Is Official—and What Is Assumed?

Classification	Examples
Official or locally documented	4.0 MGD existing rated capacity; planned increase to 5.0 MGD; historical construction assumption carried from companion paper.
Calculated	Tap-fee revenue; added annual rate revenue; added daily flow; utilization percentages.
Illustrative pending verification	200 gallons water/home/day; 140 gallons wastewater/home/day; 100% connection rate; 3.2 MGD baseline; current fees and rate estimate.

One growth curve. Two sides of the utility ledger.

Chapter 2

Understanding the Existing Water and Wastewater System

Before estimating how future growth may affect capacity, rates, and capital investment, it is necessary to understand the system that already serves St. Simons Island and Sea Island.

The system is not one facility, one pipeline, or one construction project. It is a network of wells, pumps, water mains, sewer lines, lift stations, force mains, treatment equipment, electrical systems, controls, and emergency-response capabilities developed and renewed over many decades.

Two Related—but Different—Systems

The drinking-water system produces and delivers water to customers. The wastewater system collects used water and conveys it away for treatment.

How the Drinking-Water System Works

St. Simons Island produces drinking water locally from groundwater wells located on the island. Publicly available information identifies production facilities associated with Mallery, Airport, Harrington, and Hampton South.

- Average and peak customer demand
- Adequate system pressure and fire flow
- Water-quality compliance
- Equipment outages and maintenance
- Electrical outages and severe-weather emergencies

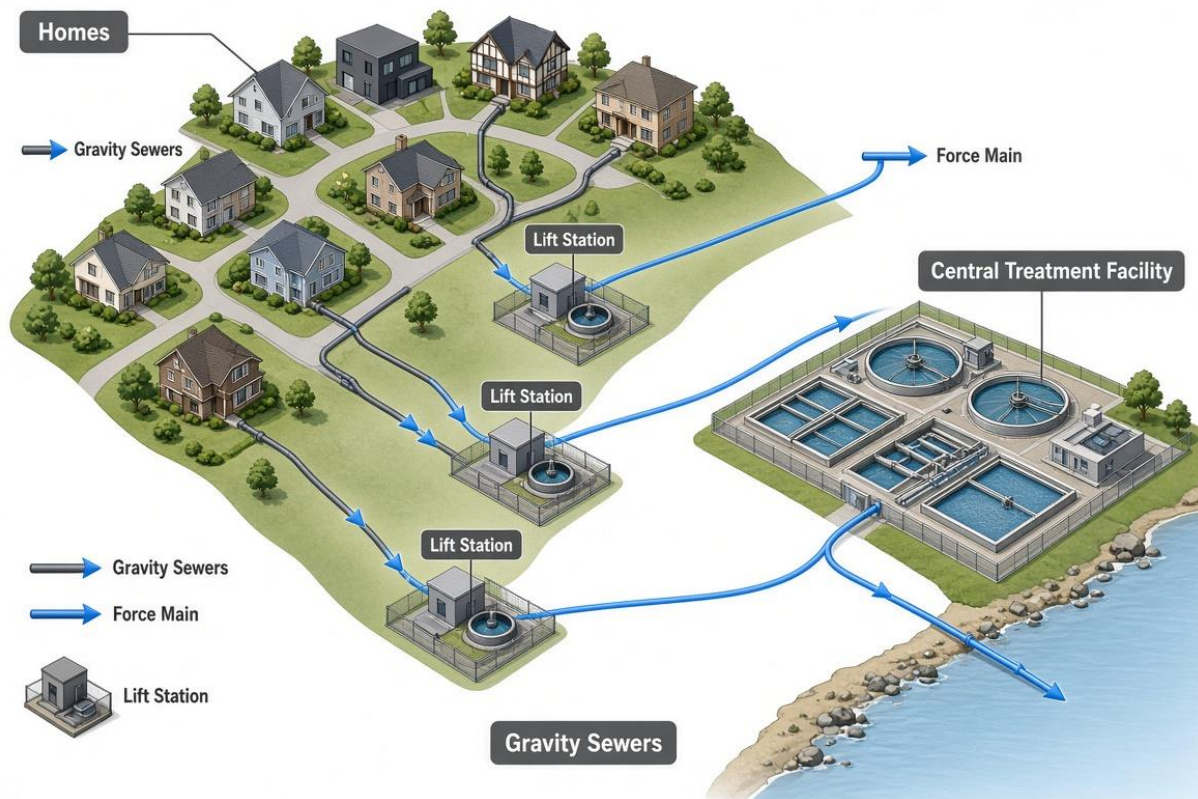
Local production is an important strength because routine service does not appear to depend upon a drinking-water pipeline crossing the F.J. Torras Causeway. However, wells still require power, pumps, controls, fuel, access, staffing, and backup capability.

How the Wastewater System Works

Wastewater from homes, businesses, hotels, restaurants, schools, and public facilities enters neighborhood collection lines. In some areas it moves by gravity. Because the island is low and relatively flat, lift stations pump wastewater into force mains that convey it toward treatment.

Dunbar Creek treats wastewater from the publicly sewered portions of St. Simons Island, together with wastewater conveyed from Sea Island.

Exhibit 2 — How the Island’s Wastewater System Works



Sea Island requires special consideration. Sea Island is a privately owned resort community with its own, fully separate water system — per BGJWSC’s own published information, it is not a BGJWSC water customer at all, and its growth has no effect on BGJWSC’s water production capacity or wells. Sewer service works differently: Sea Island owns and operates its own private sewer collection system, but everything that system collects is conveyed into BGJWSC’s network and treated at Dunbar Creek, under a separate per-capita generation rate (146 gallons per capita per day) in BGJWSC’s own 2016 Master Plan. This means Sea Island growth adds real, ongoing load to Dunbar Creek’s treatment capacity without appearing anywhere in a count of new St. Simons Island homes or BGJWSC water accounts — a structurally distinct demand driver that any capacity forecast for Dunbar Creek should track separately, not assume is captured by SSI residential growth alone.

The exhibit is intentionally simplified. Its purpose is to show that wastewater is generated across many locations, collected through a distributed network, and concentrated at one principal treatment facility.

Why Lift Stations Matter

Lift stations are essential on a low-lying barrier island. They depend on power, pumps, controls, communications, downstream capacity, maintenance access, and backup power. A failure at one station can affect service within its collection basin even if the treatment plant remains operational.

Dunbar Creek: The Point of Wastewater Convergence

The collection network is distributed across the island; treatment is concentrated. That makes Dunbar Creek a key point of infrastructure convergence, while still recognizing that collection lines, lift stations, force mains, and water-production facilities are equally necessary to dependable service.

Capacity and Reliability Are Different Questions

A treatment plant can have unused rated capacity and still require major rehabilitation. It can also be well maintained while approaching its treatment limit. Capacity projects increase what the system can handle. Reliability projects preserve or improve infrastructure already in service.

Capacity Investments	Reliability and Rehabilitation Investments
Increase treatment capacity	Replace aging pumps and equipment
Expand pumping or force-main capacity	Repair or line sewer mains
Add water production or storage	Modernize controls and electrical systems
Extend collection or distribution systems	Improve backup power and storm protection

The System Does Not Have a Single Age

The St. Simons water and wastewater system is a multi-generational infrastructure network that has been expanded, rehabilitated, and modernized as the island developed. The age of the original system matters less than the condition, remaining useful life, capacity, and resiliency of its individual components.

What This Chapter Establishes

1. St. Simons produces its drinking water locally.
2. Dunbar Creek serves the publicly sewerred portions of St. Simons Island and receives wastewater conveyed from Sea Island.
3. The collection system matters as much as the treatment plant.
4. Capacity and reliability require different investments.
5. The utility must finance existing obligations and future growth at the same time.

Chapter 3

Growth Creates Demand—and Revenue

Chapter 1 established the findings and Chapter 2 explained the system. This chapter applies the common residential-growth scenario to estimate added demand, revenue, and long-term obligations.

One Home at a Time

Every new home creates revenue through tap-in fees and monthly charges. It also creates a continuing obligation to provide safe water, collect and treat wastewater, maintain supporting infrastructure, replace assets, meet regulatory requirements, and prepare for emergencies.

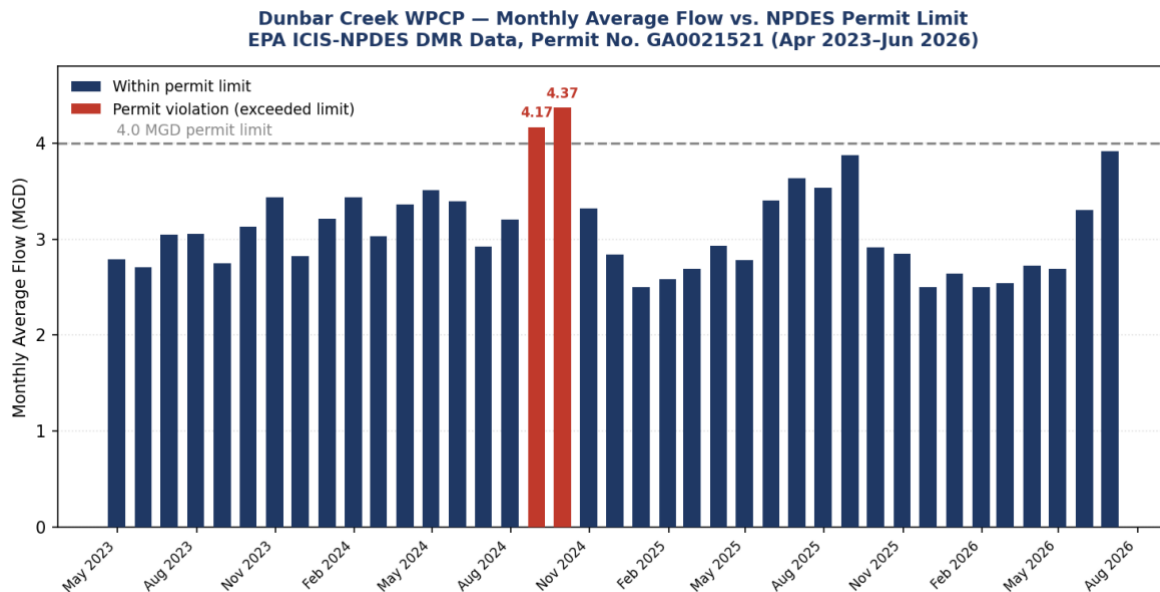
Central Planning Assumptions

Assumption	Central Value	Classification
New-home construction	155 homes per year	Prior-paper planning assumption
Twenty-year new homes	3,100	Calculated
Public water and sewer connection	100% of modeled homes	Illustrative
Potable-water demand	277 gallons/home/day	Illustrative — AWWA/Water Research Foundation, Residential End Uses of Water, Version 2 (2016), "Landscape Group" average (838 households); reflects a realistic mix of irrigation intensity, appropriate for a blend of modest and larger, irrigated north-end homes
Wastewater flow	140 gallons/home/day	Illustrative local proxy
Combined tap fees	\$6,800/home	VERIFIED — BGJWSC Capital Improvement Fee Schedule (adopted Feb. 1, 2018): \$2,300 water + \$4,500 sewer per 1" meter; no more recent schedule provided as of the Aug. 2026 ORR response
Annual water-and-sewer revenue	\$955/home	Calculated working assumption
Dunbar baseline flow	3.2 MGD	VERIFIED — EPA ICIS-NPDES DMR data (Permit GA0021521): monthly avg. ranged 2.50–4.37 MGD, Apr 2023–Jun 2026; 3.2 MGD approximates the non-storm average
Existing treatment capacity	4.0 MGD	Reported
Planned treatment capacity	5.0 MGD	Announced

Independent Verification: EPA Discharge Monitoring Data

The Dunbar baseline flow figure above does not need to rest on BGJWSC's self-reported committee minutes alone. Dunbar Creek WPCP holds NPDES Permit No. GA0021521, and as a permitted discharger it is required to submit monthly Discharge Monitoring Reports (DMRs) to Georgia EPD, which are compiled into EPA's national system of record (ICIS-NPDES) and publicly accessible through EPA's Enforcement and Compliance History Online (ECHO) database. This is an independent, federally maintained record — not something BGJWSC compiles or controls — and it can be checked against the utility's own reporting the same way GDOT's continuous count stations independently validated traffic volumes in the companion paper.

Exhibit 3 — Dunbar Creek Monthly Average Flow vs. Permit Limit (EPA DMR Data, April 2023–June 2026)



The independent record shows something the self-reported figures alone do not: Dunbar Creek formally exceeded its NPDES permit flow limit in two consecutive months in 2024. August 2024 averaged 4.166 MGD (104.2% of the 4.0 MGD limit), and September 2024 averaged 4.368 MGD (109.2%). Both months are logged in EPA's system as violation code E90, "DMR, Limited - Numeric Violation." September 2024 coincides with Hurricane Helene's passage through Georgia.

The independent record also corroborates BGJWSC's own reporting. The utility's Facilities Committee minutes reported July 2024 flow at approximately 3.2 MGD (80% of capacity); the EPA DMR record for that same month shows 3.207 MGD (80.2%) — a close, independent match.

Monthly flow has otherwise ranged from a low of 2.499 MGD (62.5% of capacity, November 2025) to the two 2024 violation months, illustrating substantial month-to-month volatility around any single average figure. The most recent month in this record, June 2026, shows flow at 3.915 MGD — 97.9% of the permit limit, the highest reading since the 2024 violations.

Source: U.S. EPA, ICIS-NPDES Discharge Monitoring Report data for NPDES Permit No. GA0021521 (Dunbar Creek WPCP), accessed via EPA ECHO, covering April 2023–June 2026.

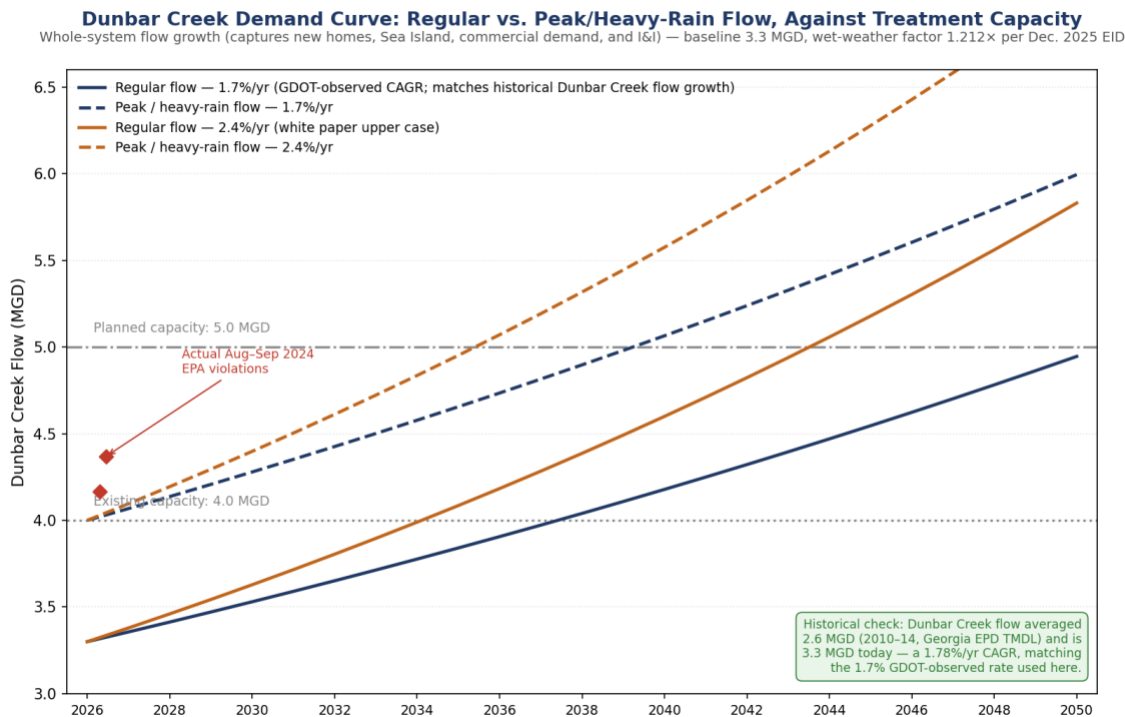
This pattern was not unforeseen. BGJWSC's own December 2025 Environmental Information Document, drawing on the 2016 Master Plan's rainfall-scenario analysis, warned in advance that "if the WPCP is currently operating at 3.3 MGD, then a significant rainfall event of 6"+ could cause a breach in permitted capacity." The August and September 2024 violations — occurring as Hurricane Helene moved through Georgia — are close to exactly that scenario. The utility's own engineering analysis anticipated this outcome before EPA's compliance record confirmed it.

Demand Curve: When Does the New Capacity Get Consumed?

The exhibit above establishes that current flow already exceeds capacity under wet-weather conditions. The next question is how quickly that pressure grows. Two growth rates are used here for consistency with the companion traffic analysis: 1.7%/yr, the empirically observed rate from GDOT Continuous Count Station 127-0289 on Frederica Road (2015–2024), and 2.4%/yr, the traffic paper's original upper-sensitivity case. Both are applied here as whole-system flow growth rates — not a new-homes-only count — because they capture Sea Island demand, commercial growth, and infiltration/inflow alongside residential construction, all of which flow into Dunbar Creek together.

This choice is supported by the historical record: Dunbar Creek's own flow averaged 2.6 MGD from 2010–2014 (Georgia EPD TMDL data) and stands at 3.3 MGD today — a 1.78%/yr compound growth rate over that period, closely matching the 1.7% GDOT-observed rate used below.

Exhibit 3B — Dunbar Creek Demand Curve: Regular and Peak/Heavy-Rain Flow vs. Capacity



The peak/heavy-rain lines start essentially at the existing 4.0 MGD ceiling in 2026, because BGJWSC's own 2016 Master Plan and December 2025 EID state that a 6"+ rainfall event at the current 3.3 MGD average pushes flow to approximately 4.0 MGD — and the actual August–September 2024 EPA violations (marked above) sit almost exactly on that line. This is not a speculative projection; it reproduces what has already happened.

Projected year the new 5.0 MGD capacity is exceeded under peak/heavy-rain conditions:

- 1.7%/yr (GDOT-observed): approximately 2039
- 2.4%/yr (white paper upper case): approximately 2035

Even under the lower, empirically observed growth rate, peak flow is projected to exceed the new 5.0 MGD capacity within roughly 13 years — well inside a typical infrastructure planning horizon, and before accounting for the EID's own 29-month design-to-construction timeline for whatever comes next.

A Note on Terminology: Permitted Capacity vs. Physical Peak Capacity

The 4.0 and 5.0 MGD figures used throughout this paper are permitted monthly-average discharge limits under Dunbar Creek's NPDES permit — the ceiling BGJWSC is legally allowed to discharge on average over a month, not the plant's physical ability to treat water. BGJWSC's Executive Director, in reviewing an earlier draft of this paper, confirmed that Dunbar Creek's physical peak hydraulic design capacity is approximately 10.0 MGD today, and would rise to approximately 12.5 MGD after the planned 5.0 MGD expansion. The August and September 2024 events documented in Exhibit 3 were monthly-average permit violations, not the plant being physically overwhelmed — an important distinction this paper did not draw clearly in earlier drafts.

Source: Email correspondence with Andrew Burroughs, P.E., BGJWSC Executive Director, August 2026.

How Much Does a Storm Actually Add? A Closer Look at Debby and Helene

BGJWSC's Executive Director also noted, in the same correspondence, that repairs already identified through the utility's inflow-and-infiltration (I&I) program could remove an estimated 2 MGD of inflow per inch of rainfall system-wide — with the caveat that dry-weather flow already includes some baked-in groundwater infiltration, so this figure cannot be subtracted linearly from the baseline, and the flow response above roughly 1 inch of rain is not perfectly linear either. That caveat is directly supported by the two 2024 violation months themselves:

Storm	Month	Rainfall	Monthly-Avg Flow	Excess per Inch
Tropical Storm Debby	Aug. 2024	5.8" (KBQK, Brunswick)	4.168 MGD (104.2%)	0.150 MGD/in
Hurricane Helene	Sept. 2024	3.92" (Jekyll Island, nearest reporting station)	4.368 MGD (109.2%)	0.272 MGD/in

Rainfall sources: NWS Jacksonville post-tropical-cyclone reports for Debby (AL04 2024) and Helene (AL09 2024).

September produced a larger monthly-average permit exceedance on nearly two fewer inches of rain than August — the opposite of what a simple linear rain-to-flow relationship would predict. This is direct field evidence for the non-linearity BGJWSC flagged: antecedent soil and groundwater saturation (Debby having already saturated the ground seven weeks before Helene arrived) can matter more than a single storm’s own rainfall total. With only two data points, and a non-monotonic relationship between them, this paper does not attempt to fit a single calibrated inflow curve — doing so would imply more precision than the data supports. Instead, the excess-flow-per-inch figures above are presented as an illustrative range (approximately 0.15–0.27 MGD per inch), CALCULATED from EPA DMR data and NWS rainfall reports, rather than as a single rate.

Added Drinking-Water Demand

At 277 gallons per home per day (AWWA/WRF Residential End Uses of Water, Version 2, Landscape Group average — a realistic blend given the mix of modest and larger, irrigated north-end homes expected among new construction), 3,100 homes add approximately 859,000 gallons per day, or 0.859 MGD, of potable-water demand.

Added Wastewater Flow

At 140 gallons per home per day, 3,100 homes add approximately 434,000 gallons per day, or 0.434 MGD, of residential wastewater flow.

Revenue Generated by New Connections

The model estimates approximately \$21.08 million in cumulative tap-in fees and approximately \$2.96 million in added annual water-and-sewer revenue by 2045, reflecting a blended usage assumption (277 gpd) that accounts for larger, irrigated homes typical of north-end construction.

Exhibit 4 — One Growth Curve. Two Treatment-Capacity Ratings.

Year	New Homes	Added WW Flow	Modeled Flow	Use at 4.0 MGD	Use at 5.0 MGD
2026	155	0.022	3.22	80.5%	64.4%
2030	775	0.109	3.31	82.7%	66.2%
2035	1,550	0.217	3.42	85.4%	68.3%
2040	2,325	0.326	3.53	88.1%	70.5%
2045	3,100	0.434	3.63	90.9%	72.7%

Growth Is Not the Only Driver of Future Investment

- Rehabilitation — preserving and replacing infrastructure already in service.
- Capacity — accommodating additional customers and demand.
- Resiliency — allowing essential service to continue, or be restored quickly, after storms, outages, equipment failure, or loss of normal access.

The Unique Infrastructure Obligations of a Barrier Island

St. Simons Island should not be evaluated as an ordinary mainland utility service area. Its infrastructure operates in a low-lying coastal environment exposed to hurricanes, flooding, saltwater corrosion, prolonged power outages, seasonal demand, and potentially restricted access across a single causeway.

Why Evacuation Does Not Eliminate the Utility Obligation

A mandatory evacuation order does not produce an empty island. Some residents will remain because they cannot evacuate, choose not to evacuate, have pets or property concerns, distrust the forecast, or have experienced difficult reentry after prior storms. Emergency personnel, utility operators, public-safety staff, and damage-assessment crews must also remain nearby or return before the general public.

St. Simons has already experienced this reality. Before Hurricane Irma in 2017, BGJWSC announced a controlled shutdown of island water and sewer service to avoid equipment damage and sewage releases. After power losses occurred, the utility imposed severe conservation measures specifically to preserve limited capacity for residents who had not evacuated and for first responders. Residents were asked to avoid showers, baths, washing machines, dishwashers, and even toilet flushing where possible.

The lesson is clear: evacuation policy and utility resiliency are complementary, not interchangeable. The system cannot be designed on the assumption that everyone will leave.

What Past Storms Demonstrated

Exhibit — Storm Performance: St. Simons and Hilton Head

Storm experience	Operational lesson	Quality-of-life consequence
Hurricane Matthew, St. Simons	Loss of power and damaged assets contributed to sewer problems, pressure loss, a boil-water advisory, and delayed reentry.	Residents could not safely return until basic water, sanitation, and public-health conditions were restored.
Hurricane Irma, St. Simons	BGJWSC shut down island assets in advance and later imposed strict conservation for those who remained and for first responders.	People who stayed faced sharply restricted water use and uncertainty about when normal service would return.
Hurricane Matthew, Hilton Head	Hilton Head PSD restored water production within about 24 hours, normal pressure within about 48 hours, and wastewater treatment within hours.	Rapid restoration supported public safety, property access, business reopening, and community recovery.

What the Local Public Record Now Establishes

BGJWSC records show that emergency resilience is not merely theoretical. A 2025 facilities record describes a federally supported project, referred to as Project 801, for eight fixed generators intended to preserve critical community services. Two listed locations are the Mallery and Airport water-production facilities on St. Simons Island.

The associated construction specifications require double-wall fuel tanks sized for 24 hours of continuous operation at full rated load. Actual runtime could be longer at reduced load or extended through refueling, but 24 hours is the documented onsite design basis for the new fixed-generator program.

BGJWSC also installed automatic transfer switches at lift stations, under a separate 2021 project, so portable generators can be connected during outages and sewer spills can be reduced.

The records reviewed do not yet provide one island-wide inventory showing the generator and fuel status of Dunbar Creek, every St. Simons lift station, portable generators dedicated to the island, reserve fuel, resupply priority, or the number of days the reduced system can operate.

What Hilton Head’s Approach Illustrates

Hilton Head provides a useful planning benchmark because it has incorporated resilience into ordinary capital planning through elements such as stored water capability, dedicated emergency generation, hardened emergency operations, mutual-aid participation, and public storm-performance reporting. Its more visible program cannot be explained by population alone — a tourism-dependent economy, direct experience with Hurricane Matthew, and a deliberate decision to integrate resiliency into capital planning all play a role. Emergency generation is being incorporated into major water-treatment and booster-pumping projects, and a second Aquifer Storage & Recovery facility, designed to store more than 250 million gallons of treated water, is described by the utility as critical for hurricane recovery.

The comparison is not an argument that St. Simons should copy every project or that BGJWSC is deficient. It illustrates how a barrier-island utility can define the level of resilience it intends to provide and build that standard into its capital program.

Peer Comparison: Where St. Simons Stands

A six-community comparison was prepared using the same six measures for each island. The scores assess publicly documented plans, projects, and measurable capabilities — not confidential emergency plans or equipment that may exist but is not publicly described.

Exhibit — Scoring Method

Score	Rating	Method
1	Limited or unclear	Little public evidence, fragmented projects, or no measurable island-wide standard.
2	Developing	Meaningful projects or planning exist, but capability is incomplete or not fully quantified.
3	Advanced	Integrated, publicly documented program with funded projects, redundancy, or measurable performance.

Metrics: formal resilience plan; water-and-sewer continuity planning; emergency power and fuel; water-supply redundancy; flood and critical-infrastructure hardening; and public reporting with measurable capability.

Exhibit — Six-Island Resiliency Comparison

Community	Plan	Continuity	Power/Fuel	Water Redund.	Hardening	Reporting	Total /18
Hilton Head Island	3	3	3	3	2	3	17
Key Biscayne	3	2	3	1	3	3	15
Ocean City, NJ	3	2	2	1	3	3	14
Tybee Island	2	2	1	1	3	2	11
Fernandina Beach	2	1	1	1	3	2	10
St. Simons Island	1	2	2	1	2	1	9

What the matrix indicates. St. Simons is not without resilience investments. Permanent generators, transfer switches, portable-generator capability, flood-elevation requirements, and hazard-mitigation projects are meaningful. However, among these peers it receives the lowest preliminary score because the public record does not yet present those investments as one integrated, measurable island program. Hilton Head stands apart through water-storage redundancy, emergency generation embedded in major projects, documented storm restoration, and visible continuity planning. Key Biscayne and

Ocean City also provide stronger community-wide plans and public reporting. Tybee and Fernandina are closer to St. Simons, but their public programs show broader flood or resilience planning.

Important limitation. The matrix scores public evidence. A score of 1 does not mean a community has no generators or emergency procedures; it means residents cannot readily determine the capability, runtime, fuel reserve, restoration objective, or system-wide operating standard from the records reviewed.

Federal Guidance Supports a Risk-Based Approach

No federal rule assigns generator hours or fuel storage by barrier-island population. EPA guidance is risk-based and addresses short outages of roughly two to three days as well as longer regional disruptions. That makes local generator capacity, fuel storage, resupply, communications, essential loads, and restoration priorities central planning issues.

Population affects consequences, but the standard must also consider seasonal demand, people who remain, emergency personnel, vulnerable residents, single-causeway access, fuel delivery, lift-station dependence, public health, and delayed reopening.

The documented 24-hour fuel design is a meaningful baseline—not yet proof of multi-day island-wide resilience.

Exhibit 5 — Expansion Should Add Both Capacity and Resilience

Traditional Expansion Question	Broader Resilience Question
How much additional flow can be treated?	Can critical treatment continue during an extended outage?
How many customers can be served?	How quickly can service be restored after a major storm?
What equipment must be enlarged?	What equipment needs redundancy, elevation, or protection?
What does the expansion cost?	Which resilience improvements are most economical to add during construction?
How will the project be financed?	Are resilience grants, GEFA loans, or hazard-mitigation funds available?

The objective should not be merely a larger system. It should be a larger, stronger, and more recoverable system.

Chapter 4

How the System Is Funded

The utility must fund operations, rehabilitation, asset replacement, debt service, regulatory compliance, growth-related capacity, and barrier-island resilience. This chapter asks where that money comes from.

Not Property Taxes

BGJWSC is operated as an enterprise utility. Its revenues and expenses are accounted for separately from tax-supported county and city budgets. Property-tax revenue generated by new homes does not directly pay for Dunbar Creek expansion.

Growth's fiscal benefit to the county's general fund does not automatically pay growth's cost to the water and sewer system.

The Funding Toolkit

1. Monthly water and sewer rates
2. Tap-in and connection fees
3. Revenue bonds
4. Georgia Environmental Finance Authority loans
5. SPLOST allocations
6. Federal and state grants

Monthly Water and Sewer Rates

Rates support personnel, electricity, chemicals, maintenance, administration, regulation, debt service, and portions of the capital program. Borrowing changes when a project is paid for; it does not eliminate the cost.

As of the FY2026–2027 rate resolution approved by the Commission on June 18, 2026, BGJWSC held residential water and sewer rates flat for the coming fiscal year, even as commissioners flagged significantly rising costs. “I hope everyone heard our rates are not going up, which is good news because our costs are going up significantly,” Commissioner Charles Cook told The Brunswick News. Some non-residential and industrial rates, along with certain fees for water and sewer service lines and new meter installation, were increased instead. At the same meeting, the Commission approved a \$492,000 contract, the first phase of a \$9.8 million budgeted total, to expand two sewer force mains on the mainland — one near I-95 tied to Port of Brunswick expansion, and one near Ga. 99 and Golden Isles Parkway tied to the Glyndale Elementary School replacement and nearby new subdivisions. Executive Director Andrew Burroughs described the latter project as increasing capacity from 800 to 1,950 gallons per minute. This meeting did not separately address funding or cost for the Dunbar Creek expansion (source: The Brunswick News, June 20, 2026, reporting on the June 18, 2026 Commission meeting). BGJWSC’s Environmental Information Document for the Dunbar Creek expansion, however, had already been completed six months earlier, in December 2025, and does address cost, funding, and timeline directly — see below.

What the December 2025 Environmental Information Document Confirms

BGJWSC’s Environmental Information Document (EID) for the Dunbar Creek 5.0 MGD upgrade, prepared by Hussey Gay Bell and dated December 2025, provides the cost, funding source, and timeline that public meetings and committee minutes had not yet disclosed as of this paper’s earlier drafts.

- Cost: the Engineer’s Preliminary Opinion of Probable Cost totals \$9,700,000, covering \$8,595,000 in construction, design services, and an 8% contingency.
- Timeline: the project is projected to take 29 months from the start of design to completion of construction.
- Funding: BGJWSC will use funds from its own budget. The EID states directly that “a loan will not be utilized to cover costs associated with the upgrades” — meaning this project is not expected to draw on a new revenue bond, a GEFA loan, or a SPLOST allocation, a different path than the Funding Toolkit above might otherwise suggest for a project this size.
- Rate impact: as of December 2025, the EID states that “sewer rates are not expected to increase at this time” as a result of this specific project.

These figures come from a completed engineering planning document, not a final construction contract — actual bid costs, financing decisions, and schedule can still shift as the project moves from planning into design and construction. The Priority Verification Items list has been updated to reflect what this document now resolves.

Understanding Tap-In Fees

Tap-in fees are one-time charges associated with new connections. They are distinct from monthly rates and are intended to require new development to contribute toward infrastructure capacity.

Do tap-in fees recover a sufficient share of the long-term capital cost created by new development, or do existing and future ratepayers absorb the remaining obligation through monthly rates and debt service?

Revenue Bonds

Revenue bonds provide upfront construction funding and are repaid from future utility revenues. They spread cost over time but create principal, interest, reserve, and coverage obligations.

GEFA Loans

GEFA financing may provide below-market rates, longer terms, and in qualifying programs partial principal forgiveness. Resilience features may improve eligibility for favorable funding, but borrowed balances still require repayment unless forgiven.

SPLOST

SPLOST can broaden the funding base to include residents, businesses, and visitors. It remains temporary, voter-approved, project-specific, and not guaranteed for future expansions.

Federal and State Grants

Grants can reduce local cost for eligible purposes such as emergency power, flood protection, hazard mitigation, and environmental compliance. They are restricted, competitive, and not a dependable substitute for the utility's underlying financial capacity.

Exhibit 6 — Who Pays for Water and Sewer Infrastructure?

Funding Mechanism	Immediate Source	Ultimately Supported By	Main Limitation
Monthly rates	Customer bills	Current ratepayers	Higher obligations may require higher rates
Tap-in fees	New connections	New development	One-time and dependent on construction
Revenue bonds	Investors	Future utility revenues	Principal and interest must be repaid
GEFA loans	State financing	Future utility revenues	Still debt unless forgiveness applies
SPLOST	County sales tax	Residents, businesses, visitors	Temporary and referendum-dependent
Grants	Federal/state programs	Public program funds	Restricted and not guaranteed

Financing Capacity and Resilience Together

A project designed from the beginning to include emergency power, flood protection, hardened controls, redundancy, and recovery capability may qualify for financing sources not available to a minimum capacity-only project.

The Timing Problem

Infrastructure often must be built before the future revenue base that will help pay for it fully exists.

Tap fees arrive as development connects, monthly revenue accumulates gradually, grants require approval, SPLOST requires a referendum, and construction costs may be due years before all future customers arrive.

The Central Financial Test

The adequacy of projected revenue cannot be determined until it is compared with the complete cost of the expansion, rehabilitation, collection-system improvements, debt service, water-production investments, emergency generation, flood protection, and long-term asset replacement.

New development produces meaningful utility revenue, but the adequacy of that revenue cannot be determined until it is compared with the complete infrastructure obligation.

Chapter 5

Testing the Assumptions

Long-term planning should not depend upon one forecast being exactly right. This chapter tests whether the central conclusions remain reasonable when growth, usage, starting flow, project cost, tap fees, and financing conditions change.

Exhibit 7 — Three Residential Growth Scenarios

Scenario	Homes/Year	Homes by 2045	Added Water	Added Wastewater
Slower growth	100	2,000	0.400 MGD	0.280 MGD
Central case	155	3,100	0.620 MGD	0.434 MGD
Faster growth	200	4,000	0.800 MGD	0.560 MGD

Effect on Dunbar Creek Utilization

Scenario	Modeled 2045 Flow	Use at 4.0 MGD	Use at 5.0 MGD
Slower growth	3.48 MGD	87.0%	69.6%
Central case	3.63 MGD	90.9%	72.7%
Faster growth	3.76 MGD	94.0%	75.2%

Sensitivity to Wastewater Flow Per Home

Wastewater Assumption	Added Flow	Modeled 2045 Flow	Use at 5.0 MGD
110 GPD	0.341 MGD	3.54 MGD	70.8%
140 GPD	0.434 MGD	3.63 MGD	72.7%
170 GPD	0.527 MGD	3.73 MGD	74.5%
200 GPD	0.620 MGD	3.82 MGD	76.4%

Starting Flow Is One of the Most Important Assumptions

The 3.2 MGD baseline is derived from a reported 2024 utilization level of approximately 80 percent of the 4.0 MGD rating. It is not presented as Dunbar Creek’s current 2026 operating flow. Current annual-average, monthly-average, maximum-month, and peak-flow data remain pending verification.

Starting Flow	Modeled 2045 Flow	Use at 5.0 MGD	Remaining Rated Margin
2.9 MGD	3.33 MGD	66.7%	1.67 MGD
3.2 MGD	3.63 MGD	72.7%	1.37 MGD
3.5 MGD	3.93 MGD	78.7%	1.07 MGD
3.8 MGD	4.23 MGD	84.7%	0.77 MGD

Average Flow Is Not Peak Flow

Annual-average flow can understate operating pressure caused by rainfall, groundwater infiltration, leaking lines, improper connections, seasonal occupancy, equipment outages, maintenance periods, and temporary process limitations.

1. Maximum-month flow
2. Wet-weather flow
3. Peak-day or peak-hour conditions where available
4. Infiltration and inflow by collection basin
5. Lift-station and force-main capacity
6. The operating reserve maintained below rated capacity

Exhibit 10 — Illustrative Combined Stress Case

Component	Central Case	Illustrative Stress Case
Starting Dunbar flow	3.20 MGD	3.50 MGD
New homes by 2045	3,100	4,000
Wastewater per home	140 GPD	170 GPD
Residential increment	0.434 MGD	0.680 MGD
Commercial, Sea Island and other demand	Not modeled	0.250 MGD
I&I / wet-weather allowance	Not modeled	0.200 MGD
Modeled 2045 flow	3.63 MGD	4.63 MGD
Use at 5.0 MGD	72.7%	92.6%

The stress case is illustrative, not a forecast. It shows how apparent margin narrows when several plausible pressures occur together.

Exhibit 11 — Illustrative Capital-Cost Range

Project Cost	Modeled Tap Fees	Tap Fees as Share	Remaining Before Financing Costs
\$9.7M (actual, per Dec. 2025 EID)	\$21.08M	217%	Fully covered — \$11.38M theoretical surplus
\$15M (illustrative)	\$21.08M	141%	Fully covered — \$6.08M theoretical surplus
\$25M (illustrative)	\$21.08M	84%	\$3.92M
\$35M (illustrative)	\$21.08M	60%	\$13.92M
\$50M (illustrative)	\$21.08M	42%	\$28.92M

At the verified \$6,800 combined rate, modeled cumulative tap-in fees (\$21.08 million over 20 years) exceed the actual \$9.7 million EID cost estimate for the Dunbar Creek expansion. This should not be read as proof that tap fees alone can fund the project: the \$9.7 million is a discrete cost due within a 29-month construction window, while tap-in revenue arrives gradually, one new connection at a time, as homes are actually built over 20 years. A revenue stream collected over two decades cannot substitute for financing available on the timeline construction requires — which is precisely why the EID states the project will be funded from BGJWSC’s existing budget rather than from tap fees collected in the future.

Tap-Fee Sensitivity

Combined Tap Fee Per Home	Cumulative Revenue from 3,100 Homes
\$2,720 (prior working assumption — superseded)	\$8.43M
\$5,000 (illustrative)	\$15.50M
\$6,800 (VERIFIED — adopted Feb. 2018 rate, 1" meter)	\$21.08M
\$7,500 (illustrative)	\$23.25M
\$10,000 (illustrative)	\$31.00M

What Would Change the Conclusion?

- Current average flow materially above the preliminary 3.2 MGD baseline
- Maximum-month or wet-weather flows well above annual averages
- Faster residential growth or greater per-home wastewater generation
- Significant Sea Island, commercial, or institutional demand
- High infiltration and inflow
- Reliably usable capacity below the stated 5.0 MGD rating
- Future regulations that reduce effective capacity
- A substantial operating reserve below rated capacity

Priority Verification Items

1. Recent annual-average, monthly-average, maximum-month, and wet-weather flow (largely RESOLVED — see Exhibit 3 and BGJWSC's monthly Wastewater Flow Reports, Jan. 2025–Jul. 2026)
2. Permitted, design, rated, and reliably usable capacity
3. Residential water and wastewater usage by customer class
4. Sea Island, commercial, and institutional demand forecasts
5. Infiltration-and-inflow estimates
6. Major lift-station and force-main constraints
7. Expansion scope, cost, resilience components, and financing plan (cost, timeline, and funding source RESOLVED — see December 2025 EID; resilience components partially addressed via Project 801)
8. Current tap-fee schedule and cost-of-capacity methodology (RESOLVED — see Feb. 2018 CIF Schedule; no post-2018 update on record as of the Aug. 2026 ORR response)

The model does not show an immediate water or wastewater crisis. It shows why the expansion should be evaluated against a full range of operating, financial, and barrier-island conditions.

Chapter 6

What the Final Facilities Plan Should Answer

The planning process should explain how the system will remain reliable, financially sustainable, and resilient throughout the life of the investment—not merely identify the next construction project.

Start With a Clearly Defined Planning Horizon

The final plan should state whether 5.0 MGD is intended to serve committed development, a ten- or twenty-year forecast, remaining island buildout, additional Sea Island demand, commercial growth, or some combination.

Under current conditions — no upgrade yet underway — peak/heavy-rain monthly-average flow at Dunbar Creek is already at approximately 100% of the existing 4.0 MGD permitted monthly-average limit as of 2026, consistent with the actual permit violations recorded in August and September 2024. This is a permit-compliance margin, not the plant's physical peak hydraulic capacity (approximately 10.0 MGD today). Without expansion, that compliance margin does not hold steady; it continues to erode as new homes are added, reaching an estimated 113% of the permitted limit by 2045 at the island's historical construction pace.

If design and construction begin in 2027, the EID's 29-month timeline would bring the new 5.0 MGD capacity online around mid-to-late 2029. During that roughly three-year interval, the existing 4.0 MGD plant remains the operating system, and peak flow is projected to reach approximately 102% of its rated capacity by the time the upgrade is completed — meaning the new capacity arrives after the old ceiling has already been exceeded under storm conditions, not ahead of it. The final plan should state plainly whether the 5.0 MGD figure is sized to close that immediate gap alone, or to also serve committed development, a ten- or twenty-year forecast, remaining island buildout, additional Sea Island demand, and commercial growth — some combination of which will determine how much runway the new capacity actually buys once it is in service.

Use Verified Current Operating Data

The final plan should publish annual-average, year-to-date average, maximum-month, wet-weather, and peak-flow information, and distinguish permitted, design, rated, and reliably usable capacity.

Operating Measure	Verified Result	Capacity/Limit	Utilization	Period
Annual-average flow	To be reported	4.0 MGD	To be calculated	Most recent full year
Current year-to-date average	To be reported	4.0 MGD	To be calculated	2026 through latest month
Maximum-month flow	To be reported	Relevant design limit	To be calculated	Most recent full year
Wet-weather maximum	To be reported	Relevant hydraulic limit	To be calculated	Defined storm period
Planned post-expansion capacity	—	5.0 MGD	—	Upon completion

Explain the Complete Demand Forecast

1. New St. Simons residential connections
2. Changes in existing-customer use
3. Sea Island demand and anticipated development
4. Commercial and institutional development
5. Hotels, restaurants, tourism, and seasonal occupancy
6. Infiltration and inflow
7. Known development commitments
8. Operating reserve below rated capacity

Identify Collection-System Constraints

The plan should identify lift stations, force mains, gravity mains, collection basins, electrical systems, controls, and emergency-power improvements required to support the added treatment capacity.

Separate Capacity, Rehabilitation and Resiliency

The public should be able to distinguish which project components add capacity, which restore or replace existing infrastructure, and which improve storm resilience. Overlapping benefits should be explained rather than hidden.

Exhibit 12 — What the Final Facilities Plan Should Disclose

Planning Area	Information Residents Should Receive
Current operations	Recent average, maximum-month, wet-weather and peak-flow data
Capacity	Existing, planned, permitted, design and reliably usable capacity
Demand forecast	Residential, commercial, institutional, Sea Island and seasonal demand
Collection system	Lift-station, force-main and collection-basin constraints
Project scope	Capacity, rehabilitation and resiliency components
Cost	Construction, engineering, contingency, escalation and financing
Funding	Rates, tap fees, reserves, bonds, GEFA, SPLOST and grants
Rate impact	Effect on typical residential and commercial bills
Resiliency	Emergency power, fuel, flood protection, redundancy and recovery
Planning horizon	Expected years of service under alternative scenarios

Establish Barrier-Island Resiliency Standards

- Permanent versus portable emergency generation
- Generator deployment priorities and fuel duration
- Flood and storm-surge protection
- Elevation of electrical and control systems
- Communications redundancy
- Staffing, sheltering, access, and mutual aid
- Expected restoration priorities and recovery objectives

A barrier island should know not only how much capacity it has, but how much remains dependable when normal power, access, or equipment availability is disrupted.

Publish Measurable Performance Objectives

- Treatment capacity added
- Reduction in infiltration and inflow
- Critical facilities with emergency power
- Generator runtime without resupply
- Restoration-time objectives
- Pumping and process redundancy
- Flood-protection level
- Operating reserve after projected demand
- Expected useful life of major components

Show the Financial Effect on Customers

1. Total construction cost

2. Engineering, contingency, escalation, and financing costs
3. Use of reserves and tap-in revenue
4. Borrowed amount, interest rate, term, and annual debt service
5. Grant, principal-forgiveness, or SPLOST contribution
6. Expected effect on typical customer bills

Explain How Tap-In Fees Were Determined

The public record should explain what infrastructure costs are included, how water and sewer portions are calculated, how frequently the method is updated, how collections are accounted for, and what share of growth-related capacity the fees are expected to recover.

Establish a Regular Public Reporting Cycle

A concise annual update should report plant flow, maximum-month and wet-weather results, customer growth, capital-project status, costs and change orders, debt and reserves, infiltration-and-inflow progress, resilience improvements, and remaining treatment margin.

A strong facilities plan should allow residents to see the full chain from growth, to demand, to infrastructure, to financing, to customer cost, to long-term performance.

Appendix — Inflow and Infiltration: 2025 Smoke and Dye Testing Findings

This appendix summarizes findings from a primary engineering source not available when earlier drafts of this paper were written: McKim & Creed’s 2025 Smoke and Dye Testing Services Technical Memorandum (dated June 2026), prepared for BGJWSC, together with its Appendix J repair recommendations. It supplements — and in one place clarifies — the I&I remediation program BGJWSC’s Executive Director described in email correspondence reviewing an earlier draft.

What the Testing Program Found

- **Scope:** 1,069,148 feet of sanitary sewer mainline smoke-tested across Mainland, South Mainland, and St. Simons Island sewer sheds, October 2025–May 2026 (with a spring 2026 suspension for the Brantley County wildfires).
- **Defects found:** 1,123 total defects identified: 693 Mainland, 82 South Mainland, 348 St. Simons Island.
- **Dominant defect types:** Frame Cover Leaks (597) and Broken Cleanouts (334) together account for roughly 83% of all defects found.
- **CCTV follow-up:** 21 mainline segments televised; 14 fully inspected manhole-to-manhole, 7 abandoned mid-inspection due to field conditions.

Source: McKim & Creed, Inc., 2025 Smoke and Dye Testing Services — Technical Memorandum, June 2026 (VERIFIED, primary engineering document).

What the Repair Recommendations Show (Appendix J)

Appendix J prices out a specific repair recommendation and priority ranking (1–3) for each of the 1,123 defects, along with an estimated inflow contribution at a 1-inch rain event. The figures below are CALCULATED by this paper’s author directly from that appendix; they are not stated in the McKim & Creed report itself.

Area	Defect-Repair Lines	Est. Inflow @ 1" Rain	Est. Repair Cost
St. Simons Island	369	1,923,099 gal	\$498,148
South Mainland	89	598,447 gal	\$123,522
Mainland	665	3,872,763 gal	\$864,878
System-wide total	1,123	6,394,309 gal (≈ 6.39 MG)	\$1,486,548

Of the 369 SSI repair lines, 33 are Priority-1 (highest urgency), representing an estimated 274,286 gallons of removable inflow at a 1-inch rain event for approximately \$59,528 in repair cost — the most cost-effective near-term subset for BGJWSC to prioritize on the island. Only the St. Simons Island row bears directly on Dunbar Creek's capacity picture: Mainland and South Mainland flows discharge to BGJWSC's Academy Creek and South Port treatment plants, not Dunbar Creek, and are included in the system-wide total for completeness but are not part of this paper's Dunbar Creek analysis.

Reconciling Two Different Inflow Estimates — Resolved

BGJWSC's Executive Director stated in email correspondence that repairs could remove an estimated 2 MGD of inflow per inch of rainfall. In follow-up correspondence, he clarified the scope of that figure: it referred to St. Simons Island only, not all three wastewater systems BGJWSC operates (Dunbar Creek, Academy Creek, and South Port). This paper's own calculation from Appendix J for SSI alone — approximately 1.92 MG per inch — correlates closely with his estimate. The larger system-wide figure calculated in this appendix (approximately 6.39 MG per inch) includes Mainland and South Mainland defects, which discharge to Academy Creek and South Port, not Dunbar Creek, and are therefore not relevant to the Dunbar Creek capacity discussion in this paper. The two estimates were never in conflict — they were answering different questions, and only the SSI figure bears on Dunbar Creek.

Repair Timing — Resolved

BGJWSC's Executive Director confirmed in follow-up correspondence that smoke and dye testing is complete across all basins, including St. Simons Island, and that his earlier comment about repair focus "shifting to St. Simons Island this fall/winter" referred specifically to repair execution on SSI, not testing. The bulk of repair work to date has occurred on the mainland, where access and traffic impacts are lower; SSI repair work is the next priority as the tourist season winds down.

None of the figures in this appendix change the paper’s core capacity finding in Chapter 1 and Exhibit 3B. They add an important, separately sourced dimension: a documented, costed program already under way — with testing

complete and repair execution now shifting to SSI — to reduce the wet-weather inflow that drives the monthly-average permit exceedances discussed above.

What This Paper Does Not Claim

- It does not claim that St. Simons Island is experiencing an island-wide water or wastewater failure.
- It does not conclude that BGJWSC is poorly operated.
- It does not conclude that the planned expansion is too small or too large.
- It does not predict one exact year in which Dunbar Creek will reach capacity.
- It does not claim that the preliminary 3.2 MGD baseline reflects current 2026 operations.
- It does not argue that growth should stop.
- It does not claim that tap-in fees or monthly rates are necessarily too low or too high.
- It does not conclude that Hilton Head's exact system should be copied.
- It does not claim that every modeled flow, cost, or revenue value will occur exactly as presented.

The analysis makes a narrower point:

- Continued growth creates utility revenue.
- The same growth creates long-term utility obligations.
- Rehabilitation continues regardless of growth.
- Barrier-island resilience requires additional planning and investment.
- A complete public discussion should consider these effects together.

Final Observation

St. Simons Island begins this discussion from a position of strength. Its drinking water is produced locally. Its wastewater is treated locally. The available information indicates that the system is professionally operated and generally provides reliable service.

Those are meaningful advantages. But independence is not the same as invulnerability. Wells, lift stations, force mains, treatment facilities, electrical controls, generators, fuel supplies, communications, and operating personnel must function in a low-lying coastal environment exposed to hurricanes, flooding, corrosion, prolonged power loss, and restricted access.

At the island's historical construction pace, approximately 3,100 additional homes could be built over twenty years. Those homes generate meaningful tap-in fees and monthly revenue. They also add hundreds of thousands of gallons per day of water demand and wastewater flow.

The planned increase to 5.0 MGD appears capable of absorbing the modeled residential wastewater increment under the central assumptions. That is encouraging. But treatment capacity is only one part of the long-term obligation.

Will the complete water and wastewater system—including treatment, collection, water production, rehabilitation, financing, and barrier-island resilience—remain strong enough to support the community expected to depend upon it twenty years from now?

That is not an argument against growth. It is an argument for aligning growth with the infrastructure, financial capacity, and resilience required to support it.

For a barrier island, the goal should not be merely enough capacity for ordinary days. It should be a system capable of protecting public health, supporting the community, and recovering predictably when conditions are anything but ordinary.

Key Questions to Ask County and Utility Leadership

This paper is not a substitute for asking BGJWSC and Glynn County leadership these questions directly — it is meant to make those questions easier to ask, by giving residents a common set of facts to start from. The questions below are organized by theme and drawn from the open items identified throughout this paper. They are written to be asked in plain language, at a town hall, in a letter, or in an email.

On Capacity and Growth

- Is the current Dunbar Creek expansion, from 4.0 to 5.0 MGD, sized for the growth already planned and approved on St. Simons Island, or only for what the plant needs today?

On Resiliency and Storm Preparedness

- How many days of fuel and generator capacity does the system carry at full deployment, and how is that capacity affected if the F.J. Torras Causeway is impassable?
- Is BGJWSC a member of Georgia’s statewide mutual aid network (GAWARN), so it can call in outside utility crews after a major storm, the way Hilton Head’s utility does through South Carolina’s WARN network?
- Is there a published after-action report for how the system performed during a past storm, so residents have a track record to point to rather than an assurance to take on faith?

On Transparency and Ongoing Reporting

- Will BGJWSC commit to publishing a regular, plain-language annual update on plant flow, capacity utilization, and capital project status — rather than requiring residents to piece it together from committee minutes and public records requests, as this paper had to?
- Where can residents go to see current, verified operating data for Dunbar Creek, rather than estimates or averages that may be a year or more out of date?

None of these questions assume bad intent on the part of BGJWSC or county leadership. They are the same kind of questions any careful board would ask of its own staff before approving a major capital project — and residents are entitled to the same answers.

A Closing Note on Method and Intent

The author is not a water or wastewater engineer. This analysis was prepared by a career technology, business, and analytics consultant using publicly available records, utility documents, financial reports, planning materials, and transparent calculations.

It should be read as a structured framework for community discussion—not as a substitute for professional engineering, regulatory, legal, or utility-rate analysis.

The paper intentionally distinguishes among:

- Official or locally documented information
- Calculated values
- Illustrative planning assumptions
- Items pending verification

The paper should be provided to BGJWSC and appropriate technical reviewers with a request for correction, updated data, and professional comment. As verified information becomes available, the analysis should be revised and amended editions identified clearly.

Sources and Supporting Material

This paper draws on the specific documents, records, and public data below. Each entry reflects what was actually reviewed in preparing this analysis, with dates and authorship noted where known.

Brunswick-Glynn Joint Water & Sewer Commission (BGJWSC) — Provided in Response to Open Records Request

- Dunbar Creek Water Pollution Control Plant 5.0 MGD Upgrade — Environmental Information Document, prepared by Hussey Gay Bell, December 2025
- Wastewater Flow Report (Academy Creek, Dunbar Creek, and South Port WWTPs) — monthly operating and water-quality data, January 2025–July 2026
- Pump Station Capacity Sheet — St. Simons Island, presented to the Commission at the January 14, 2026 retreat
- Capital Improvement Fees memo, Andrew Burroughs to JWSC Members, February 1, 2018
- Capital Improvement Fee Schedule (Exhibit A), adopted February 1, 2018
- Capital Improvement Fees Discussion and Capital Improvement Fee Recommendation presentations, February 1, 2018

BGJWSC — Public Records and Website

- 2016 BGJWSC Water and Sewer Master Plan Update (2015–2035), prepared by Applied Technology & Management and Four Waters Engineering, February 2016
- 2020 JWSC Water and Sewer Master Plan Update (published on bgjwsc.org)
- BGJWSC website, Water and Wastewater department pages — production facilities, service areas, and the Sea Island / Jekyll Island private-system arrangement
- BGJWSC Commission meeting minutes, June 18, 2026 (FY2026–2027 rate resolution)
- BGJWSC Facilities Committee minutes, April 2024 and July 2024 (Dunbar Creek monthly flow reporting)
- Facilities Committee minutes and attachments regarding Project 801 fixed-generator installation, 2025
- Project 801 Generator Installation Phase II construction specifications and combined bid set, 2025
- Automatic Transfer Switch Project No. 801 bid documents, 2021
- Hurricane Irma Water & Sewer Service Availability notice, September 7, 2017
- Water and Sewer Service Explanations and Update, September 10, 2017
- Hurricane Irma Strict Water & Sewer Conservation Plan, September 11, 2017

BGJWSC Correspondence and Inflow/Infiltration Reports

- Email correspondence with Andrew Burroughs, P.E., BGJWSC Executive Director, reviewing an earlier draft of this paper and clarifying inflow-per-inch scope and repair-timing, August 26–27, 2026
- McKim & Creed, Inc., 2025 Smoke and Dye Testing Services \u2014 2014 Technical Memorandum and Appendix J (Repair Recommendations), prepared for BGJWSC, June 2026
- National Weather Service, Jacksonville, FL \u2014 2014 Post-Tropical Cyclone Reports and Impact Narratives, Hurricane Debby (AL04 2024) and Hurricane Helene (AL09 2024)

Georgia and Federal Regulatory Sources

- U.S. EPA, Enforcement and Compliance History Online (ECHO) — ICIS-NPDES Discharge Monitoring Report data, NPDES Permit No. GA0021521 (Dunbar Creek WPCP), April 2023–June 2026
- Georgia EPD, Wasteload Allocation Transmittal (WLA000138), February 27, 2024
- Georgia EPD, Enterococci TMDL Report (2017) — source of 2010–2014 Dunbar Creek flow data
- Georgia EPD Watershed Protection Branch — NPDES permitting and wasteload allocation records
- GEMA / FEMA hazard-mitigation and generator-installation grant records referenced in BGJWSC Facilities Committee minutes
- U.S. EPA, Power Resilience Guide for Water and Wastewater Utilities

News and Public Reporting

- The Brunswick News, "JWSC votes not to change residential water and sewer rates," June 20, 2026

Traffic and Growth-Rate Reconciliation (Companion Analysis)

- GDOT Continuous Count Station 127-0289, Frederica Road — Single Station Annualized Statistics, 2015–2024
- Understanding Carrying Capacity and The Fiscal Side of the Ledger — companion white papers establishing the 155 homes/year, 2.4%/year growth baseline
- Addendum B, Buildout Capacity Verification and Data Correction, August 2026 — Glynn County CAMA parcel data cross-check and the 1.7%/2.4% growth-rate reconciliation

Barrier-Island Comparison

- Hilton Head Public Service District — Water Supply & Resiliency Projects (December 2024) and Winter 2026 Newsletter; Hurricane Season 101 and Hurricane Matthew recovery reporting
- Village of Key Biscayne, Resilient Key Biscayne strategy and backup-generator project materials
- City of Ocean City, New Jersey, Community Resilience Plan and utility capital presentations
- City of Tybee Island, stormwater, sanitary-sewer, hazard-mitigation, and capital-project materials
- City of Fernandina Beach, Waterfront Resiliency Master Plan and resilience project materials

How to Verify the EPA Flow Data Yourself

This paper cites independent federal discharge monitoring data for Dunbar Creek WPCP rather than asking readers to take BGJWSC's or the author's figures on faith. That data is publicly accessible, and any reader can pull the same record directly.

Where to Look

EPA's Enforcement and Compliance History Online (ECHO) system: <https://echo.epa.gov>

Facility Identification

Dunbar Creek Water Pollution Control Facility (listed in EPA's system as "Saint Simons Island WPCP") is regulated under NPDES Permit No. **GA0021521**. Searching ECHO's Water Facility Search for this permit number, or for "Brunswick-Glynn" / "Dunbar Creek" in Georgia, will bring up the facility's Detailed Facility Report.

How to Reproduce This Paper's Flow Chart

1. On the facility's Detailed Facility Report, locate the NPDES Monitoring Data Download tool (sometimes labeled "Download DMR Data").
2. Enter NPDES ID GA0021521 and select the widest available date range.
3. Export the data and filter for parameter code 50050, "Flow, in conduit or thru treatment plant," at monitoring location "Effluent Gross," statistical base "MO AVG" (monthly average).
4. Compare each month's reported flow (dmr_value_nmbr, in MGD) against the permit limit (limit_value_standard_units, 4.0 MGD). Any row with violation_code "E90" indicates a formal numeric permit violation for that month.

This paper's Exhibit 3 was built directly from this export, covering April 2023 through June 2026. As BGJWSC submits future monthly reports, this same process will surface more recent data than what appears here — readers checking this paper after its publication date should expect to find additional months on record.