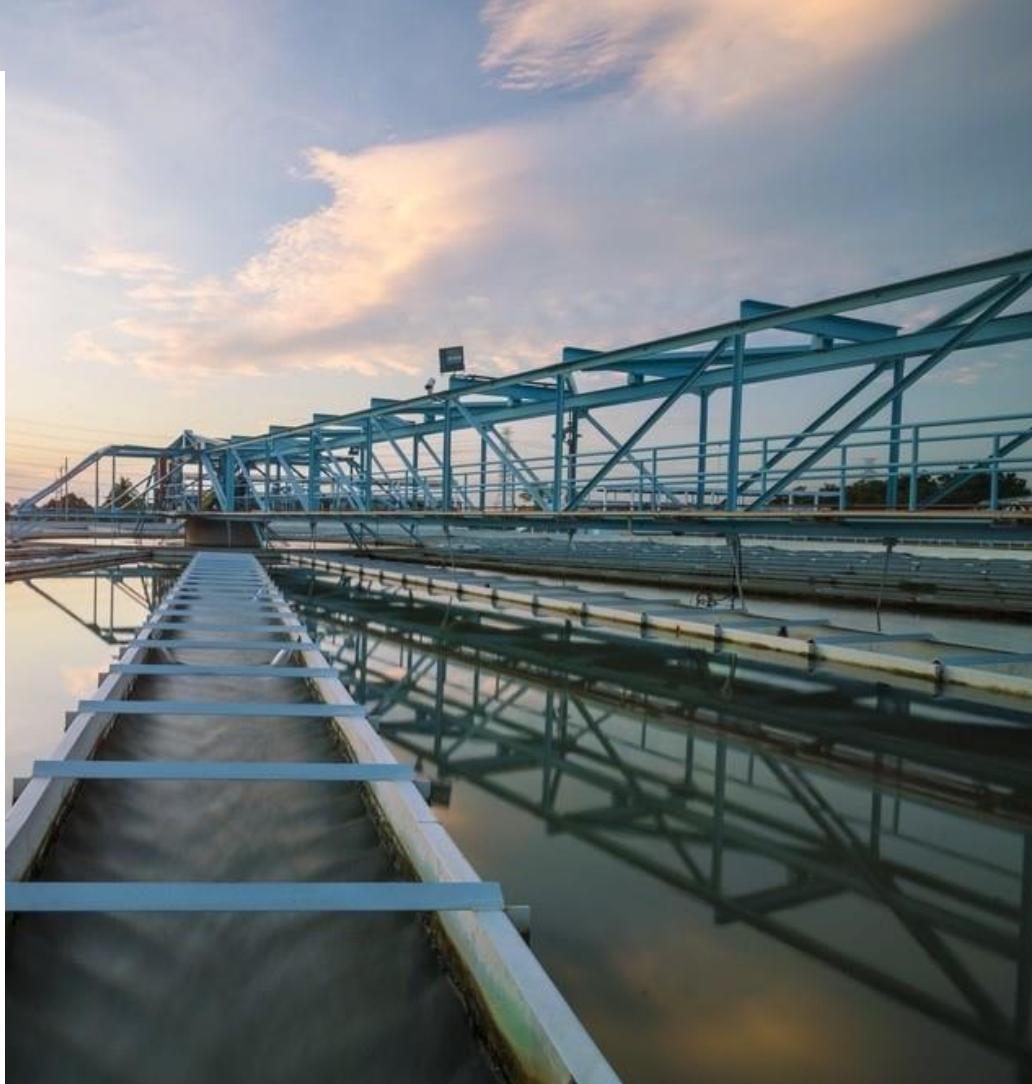


UTILITY REPORT



DECEMBER 2024

**King George County
Service Authority**

**Authored by:
Inboden Environmental
Services, Inc.**



INTRODUCTION

This Utility Report provides information on operations, facility performance, equipment issues, and regulatory compliance for the month prior. Information includes items related to water facility productions and wastewater effluent discharge volumes, laboratory analytical data, operations notes, and compliance auditing.

WATER

Operational Notes:

- KGCSA maintenance replaced the air release valve on Filter #2 at Fairview Beach WTP.
- Bacteriological samples were collected and passed.
- Continuing to backwash green sand filters.
- Effectively dosing sodium hypochlorite to maintain disinfection.
- IES staff replaced the chlorine injectors for Well 1 and 2 at Canterbury.
- KGCSA maintenance replaced Circle 2 well pump.

Canterbury Subdivision – PWSID 6099085

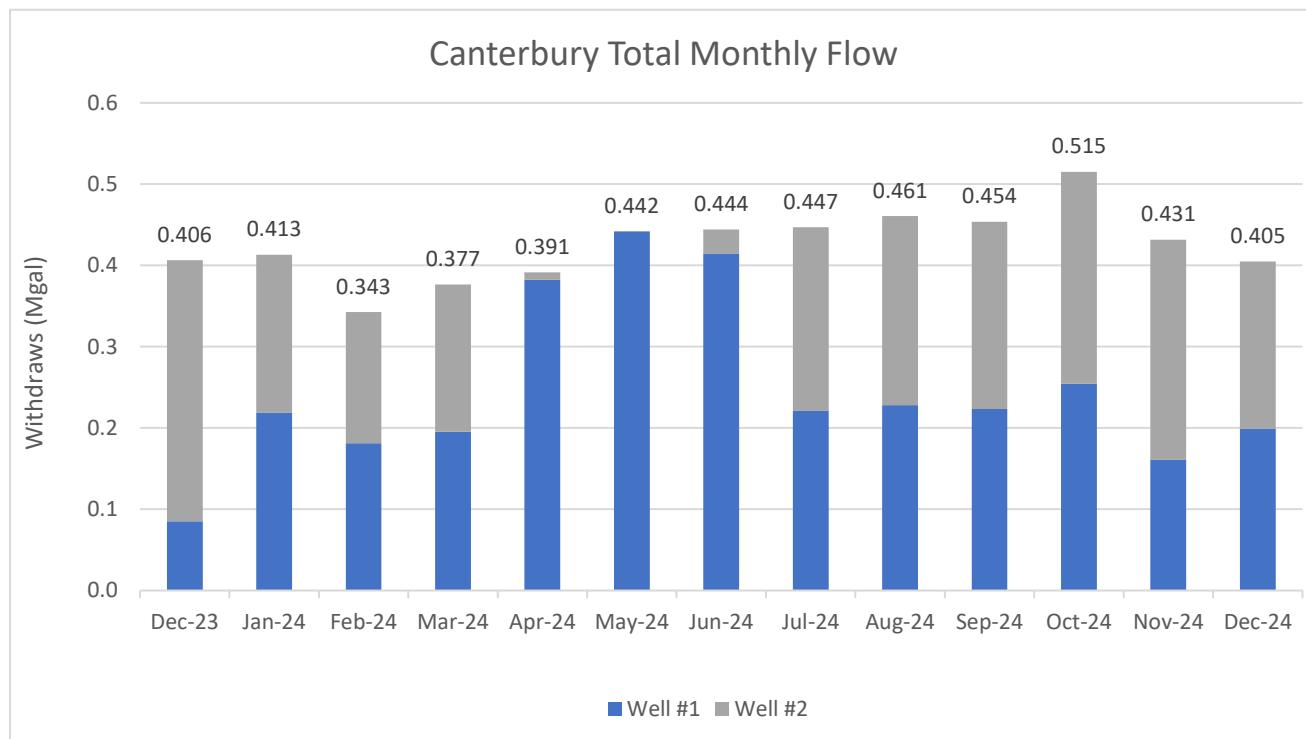
Water Quality:

The Water Treatment facility and distribution system maintained compliance with all required sampling. Routine bacteriological sample results are shown in the table below.

Bacteriological Analysis:

Location Code	Location Address	Date	Result
020	12343 Kent Rd.	12/12/2024	Absent

System Production:



Circle – PWSID 6099100

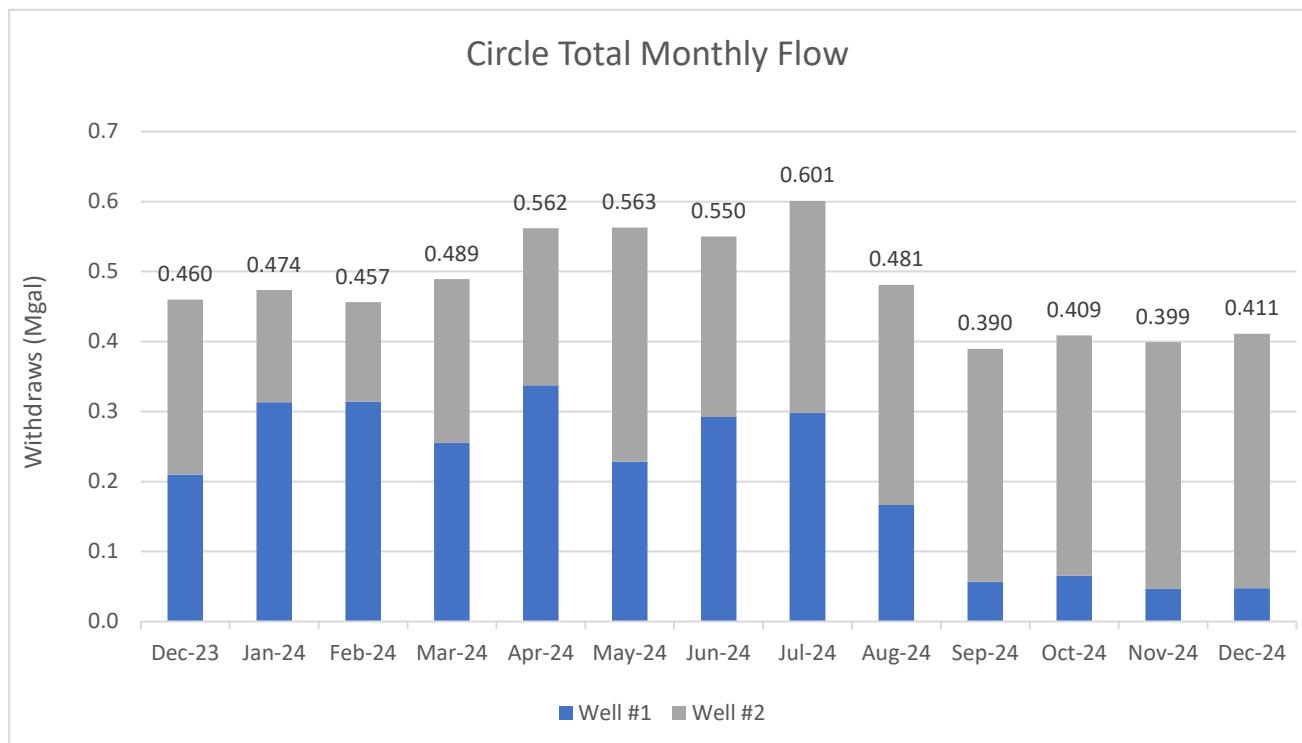
Water Quality:

The Water Treatment facility and distribution system maintained compliance with all required sampling. Routine bacteriological sample results are shown in the table below.

Bacteriological Analysis:

Location Code	Location Address	Date	Result
030	11052 Vernon Woods Dr.	12/12/2024	Absent

System Production:



KGC Courthouse – PWSID 6099050

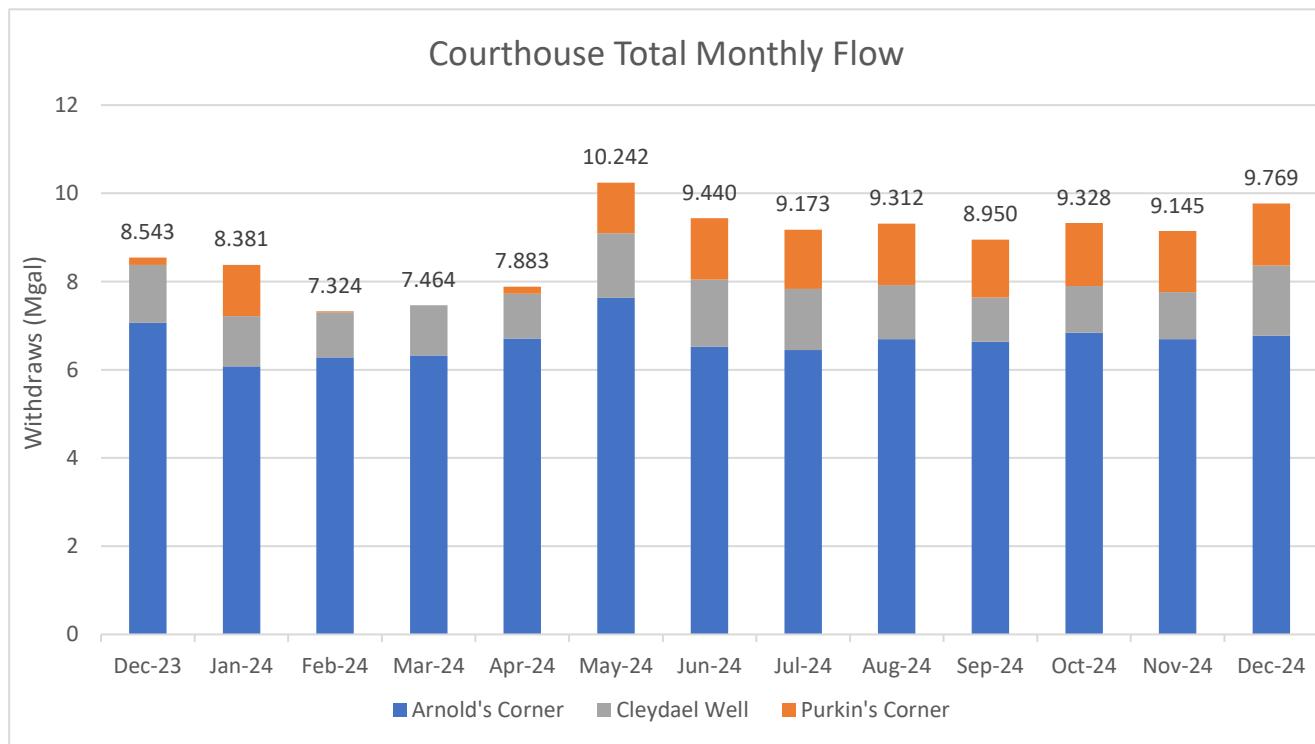
Water Quality:

The Water Treatment facility and distribution system maintained compliance with all required sampling. Routine bacteriological sample results are shown in the table below.

Bacteriological Analysis:

Location Code	Location Address	Date	Result
07	12128 Cleydael Blvd.	12/10/2024	Absent
06	12159 Ward Rd.	12/10/2024	Absent
012	9333 Inaugural	12/12/2024	Absent
011	8352 Kennedy Dr.	12/12/2024	Absent
013	8095 Washington Dr.	12/17/2024	Absent

System Production:



Dahlgren – PWSID 6099295

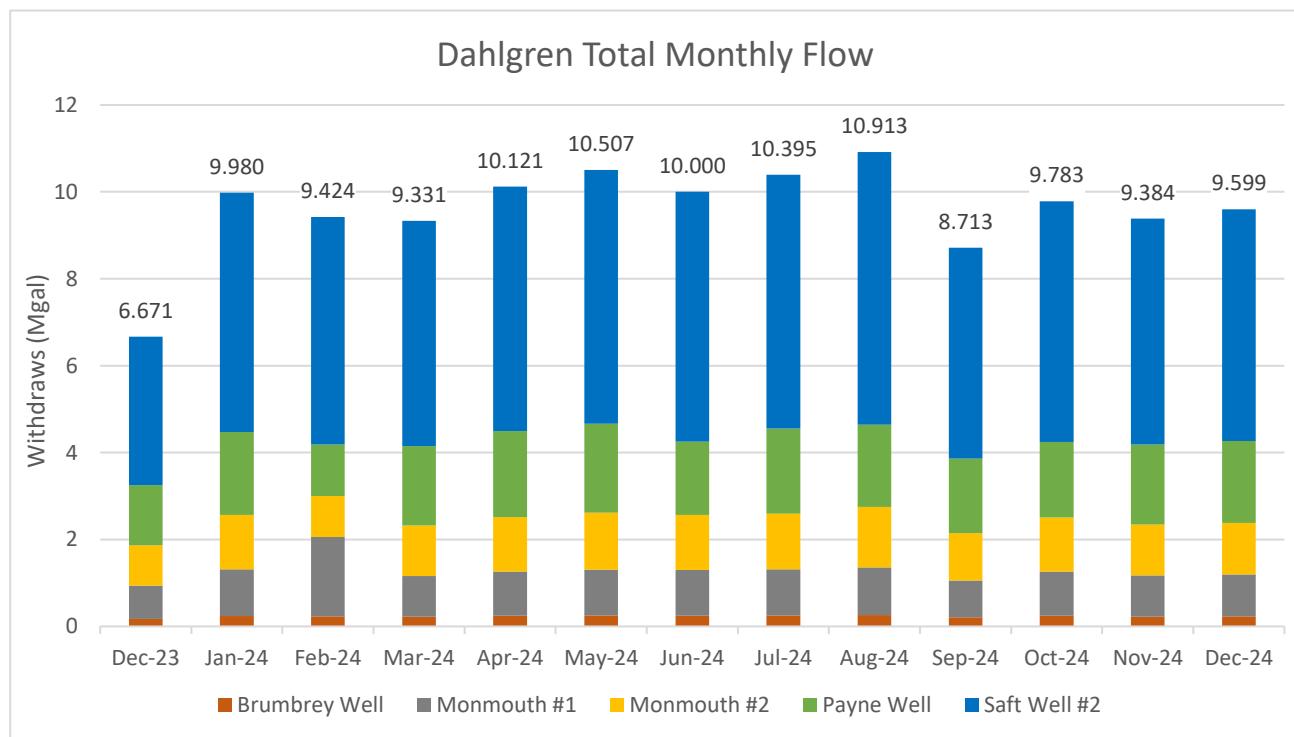
Water Quality:

The Water Treatment facility and distribution system maintained compliance with all required sampling. Routine bacteriological sample results are shown in the table below.

Bacteriological Analysis:

Location Code	Location Address	Date	Result
01	15375 Dahlgren Rd.	12/10/2024	Absent
08	4471 James Madison Pkwy.	12/10/2024	Absent
03	5394 Gordon Drive	12/17/2024	Absent

System Production:



Fairview Beach – PWSID 6099250

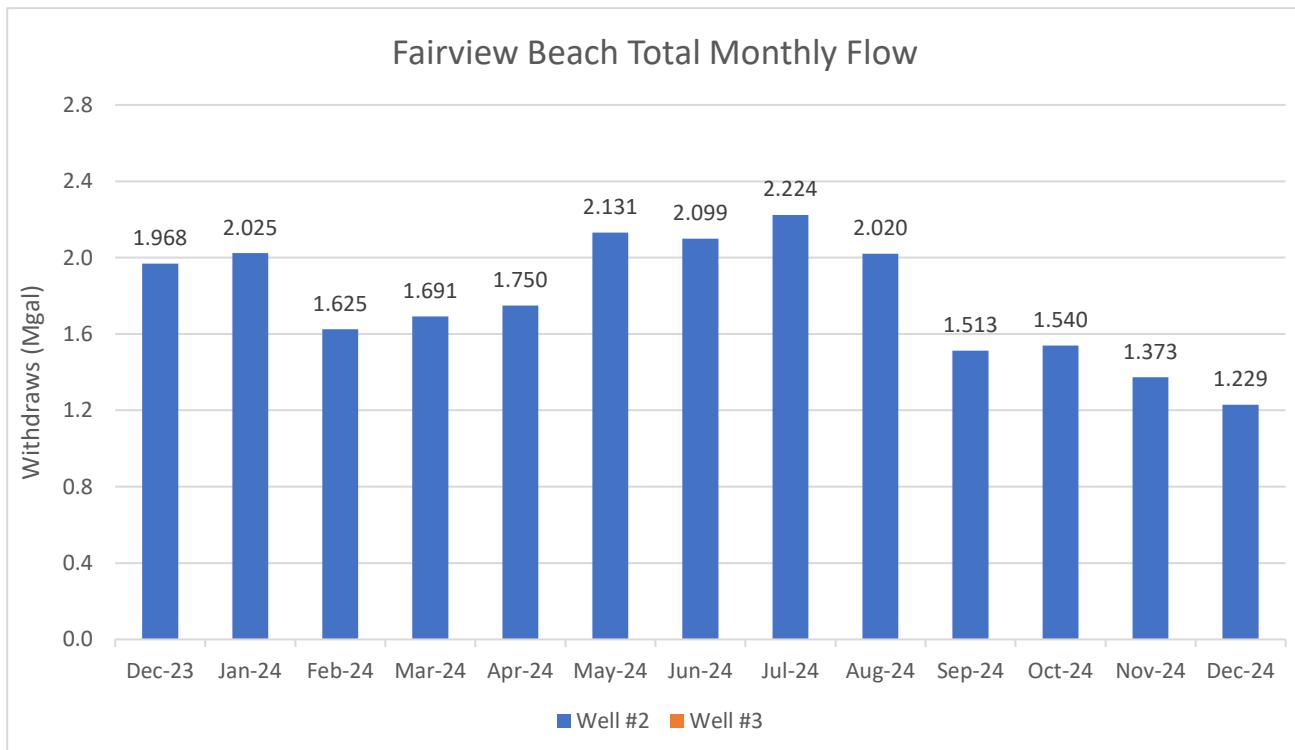
Water Quality:

The Water Treatment facility and distribution system maintained compliance with all required sampling. Routine bacteriological sample results are shown in the table below.

Bacteriological Analysis:

Location Code	Location Address	Date	Result
040	6072 River View Dr.	12/5/2024	Absent
RW	Fairview Well House	12/31/2024	<1 MPN

System Production:



Hopyard Farm – PWSID 6099283

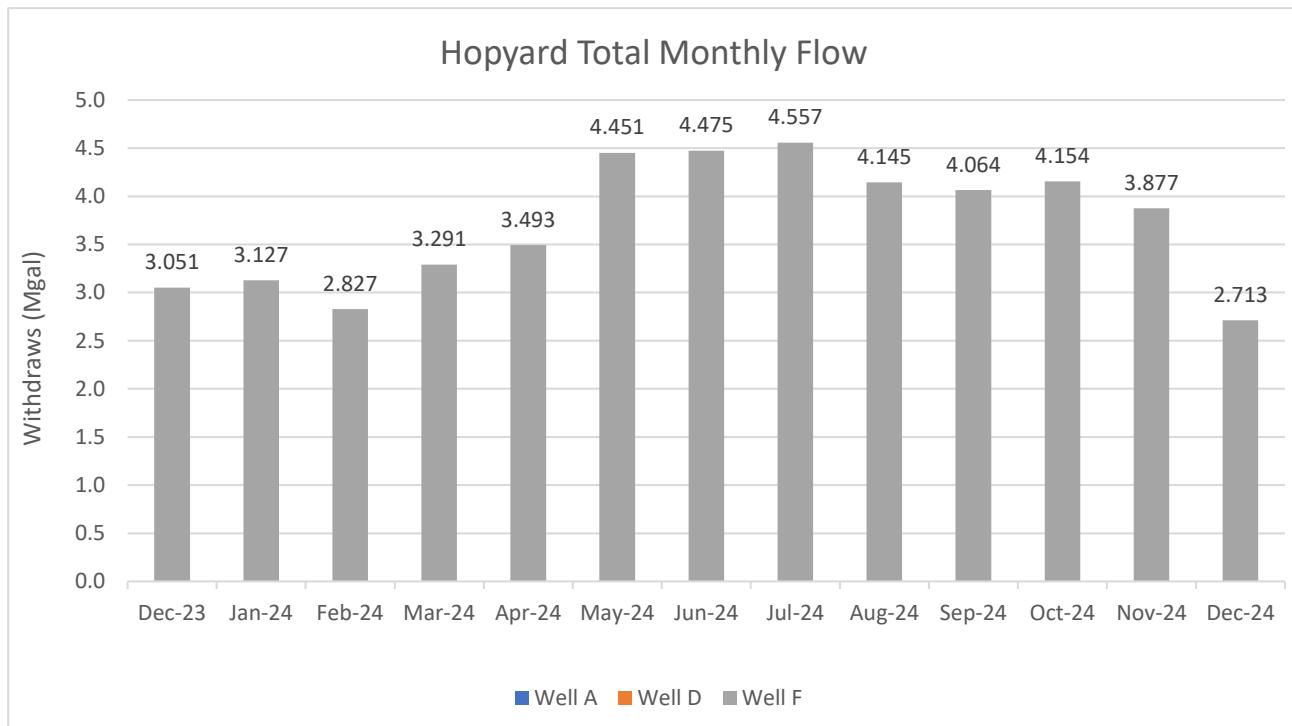
Water Quality:

The Water Treatment facility and distribution system maintained compliance with all required sampling. Routine bacteriological sample results are shown in the table below.

Bacteriological Analysis:

Location Code	Location Address	Date	Result
050	5217 Spinnaker Ln.	12/17/2024	Absent
010	5964 Parsons Ln.	12/17/2024	Absent

System Production:



KGC School Board Office – PWSID 6099296

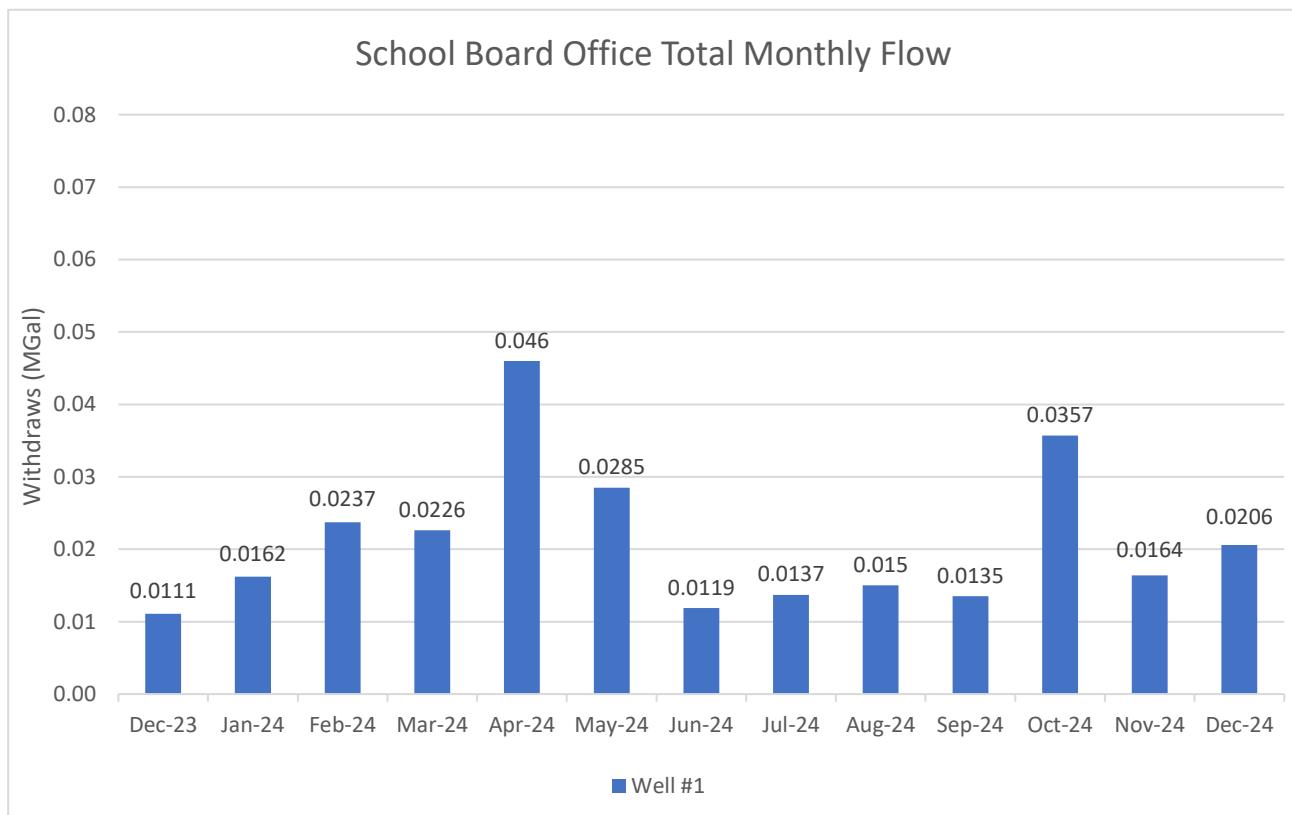
Water Quality:

The Water Treatment facility and distribution system maintained compliance with all required sampling. Routine bacteriological sample results are shown in the table below.

Bacteriological Analysis:

Location Code	Location Address	Date	Result
010	School Board Office	12/5/2024	Absent

System Production:



Ninde's Store – PWSID 6099300

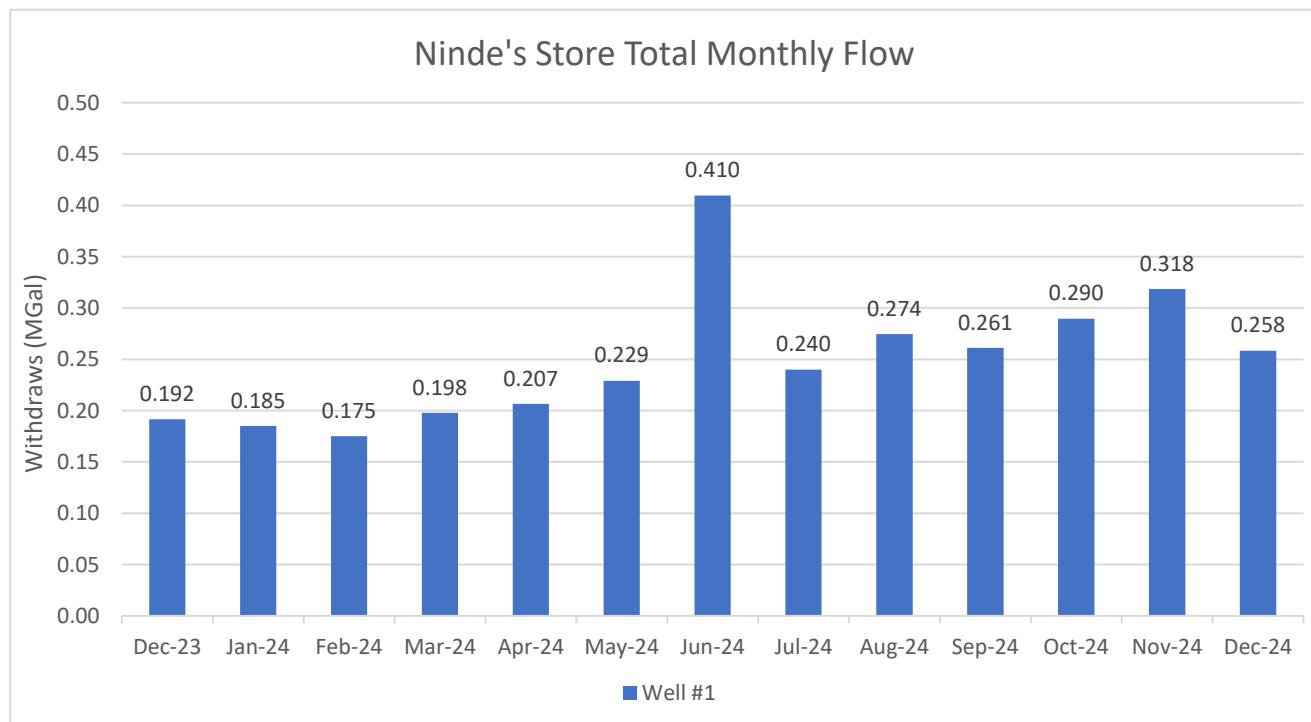
Water Quality:

The Water Treatment facility and distribution system maintained compliance with all required sampling. Routine bacteriological sample results are shown in the table below.

Bacteriological Analysis:

Location Code	Location Address	Date	Result
010	16195 Ridge Road	12/17/2024	Absent

System Production:



Oakland Park – PWSID 6099350

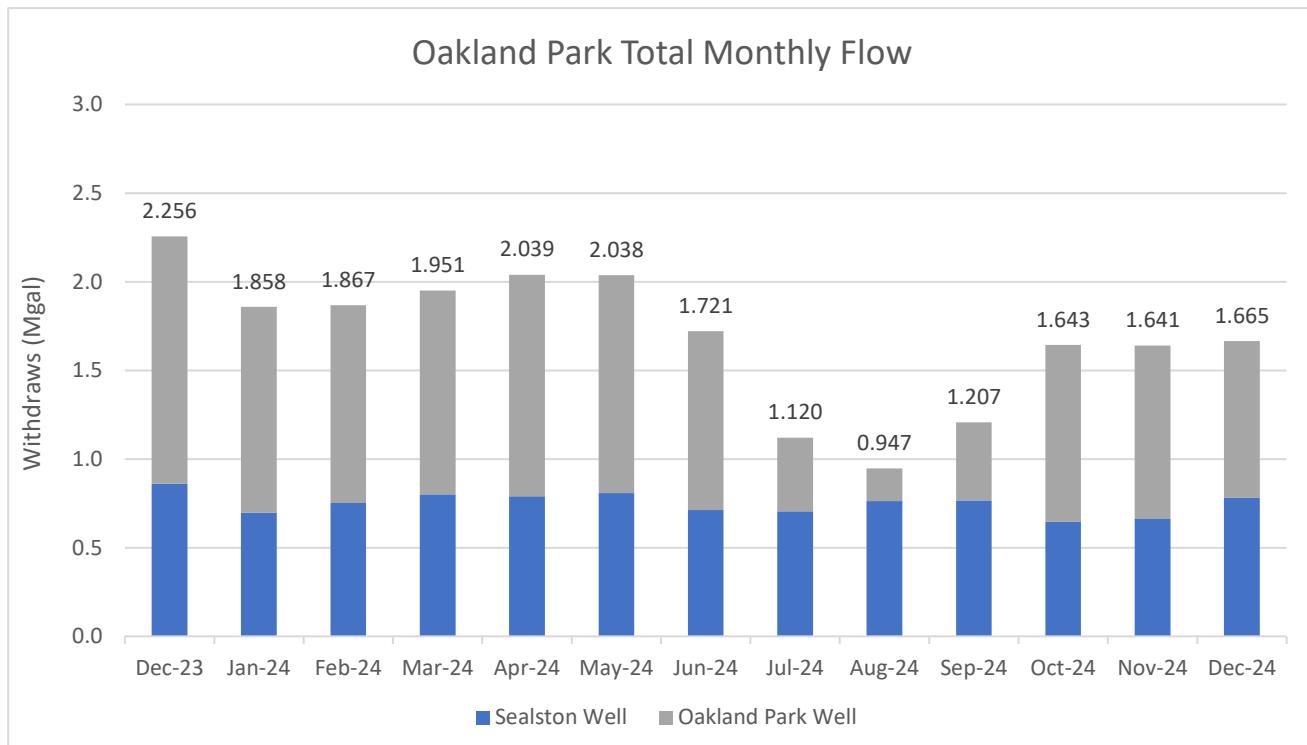
Water Quality:

The Water Treatment facility and distribution system maintained compliance with all required sampling. Routine bacteriological sample results are shown in the table below.

Bacteriological Analysis:

Location Code	Location Address	Date	Result
03	9121 Covington St.	12/5/2024	Absent
04	1139 French Ct.	12/5/2024	Absent

System Production:



St. Paul's/Owens – PWSID 6099550

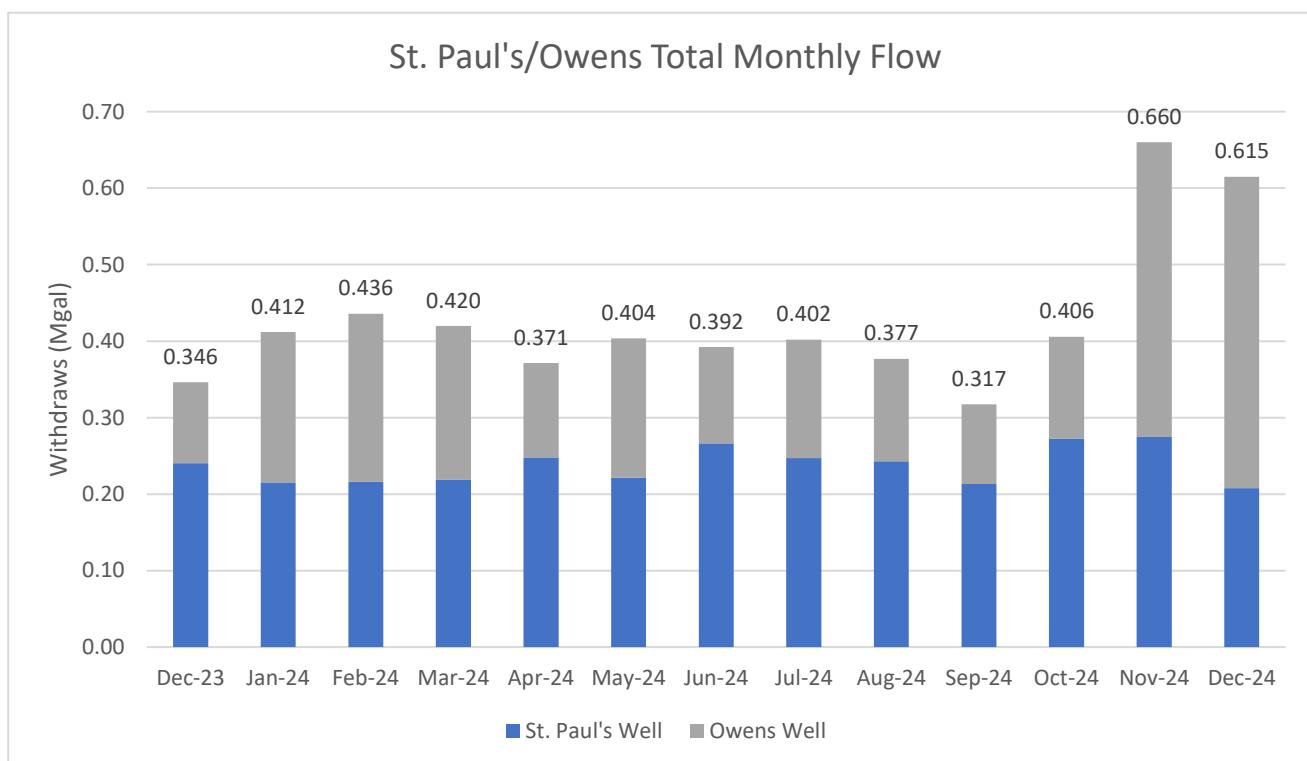
Water Quality:

The Water Treatment facility and distribution system maintained compliance with all required sampling. Routine bacteriological sample results are shown in the table below.

Bacteriological Analysis:

Location Code	Location Address	Date	Result
020	5268 Thompson Hill Rd.	12/17/2024	Absent

System Production:



WASTEWATER

Dahlgren WWTP

Effluent Quality:

The wastewater treatment facility maintained compliance with all permit-required sampling.

Wastewater Treatment:

The Dahlgren WWTP met the sewer service area's sanitation demand with an average daily discharge of 0.184 MGD for a total monthly discharge of 5.716 MG.

Operational Notes:

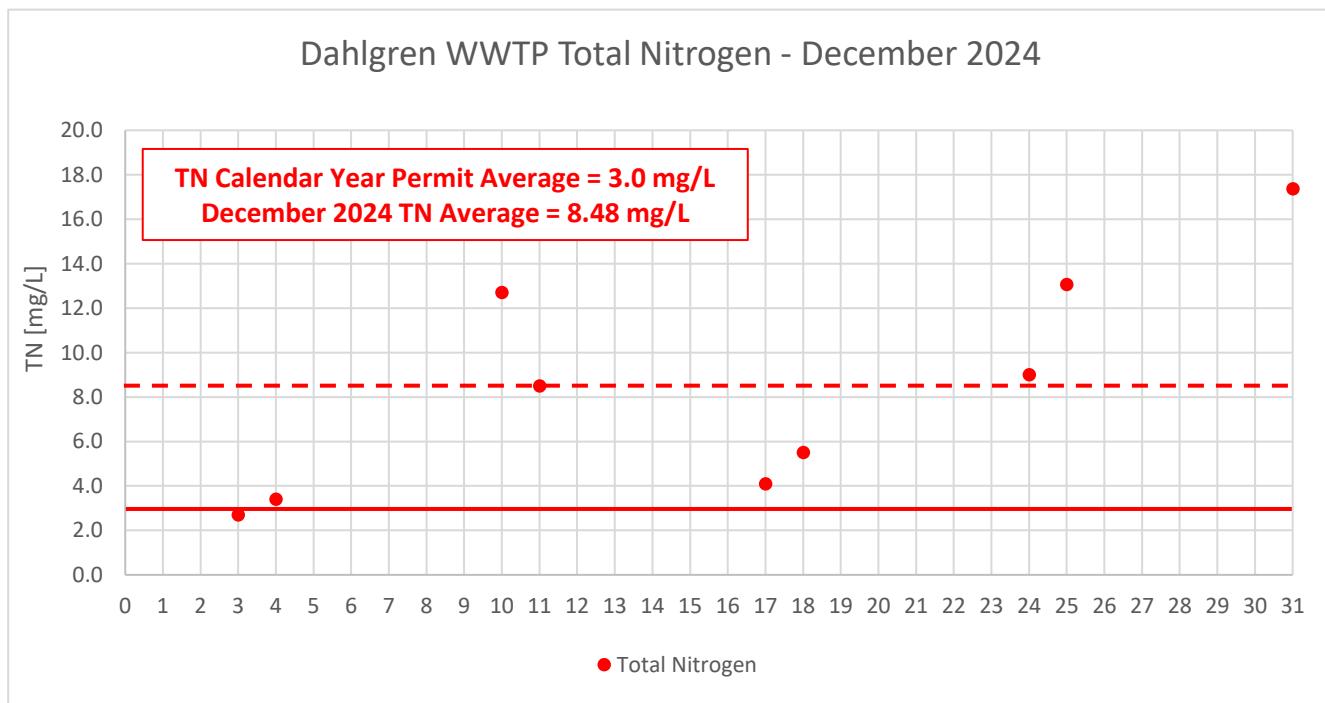
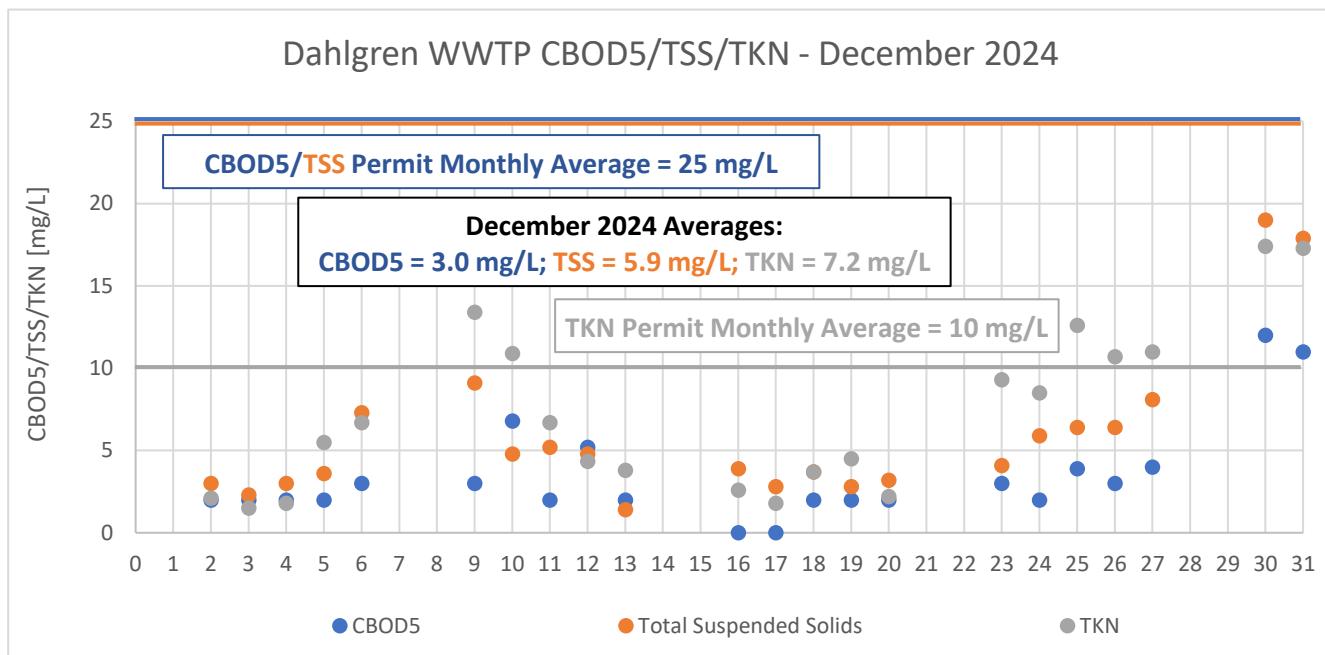
- KGCSA maintenance installed a screen to minimize the growth of algae in the post aeration tank.
- IES staff noticed the larger BioCarb tank had started leaking at the flange; KGCSA maintenance staff tightened the flange.
- IES staff alerted KGCSA maintenance to a stuffed conveyor belt; KGCSA maintenance freed conveyor roller and adjusted.
- IES staff could not get the backhoe to start; KGCSA maintenance replaced batteries.
- IES staff noticed the sludge transfer pump was leaking; KGCSA maintenance replaced packing.

Exceedance Details:

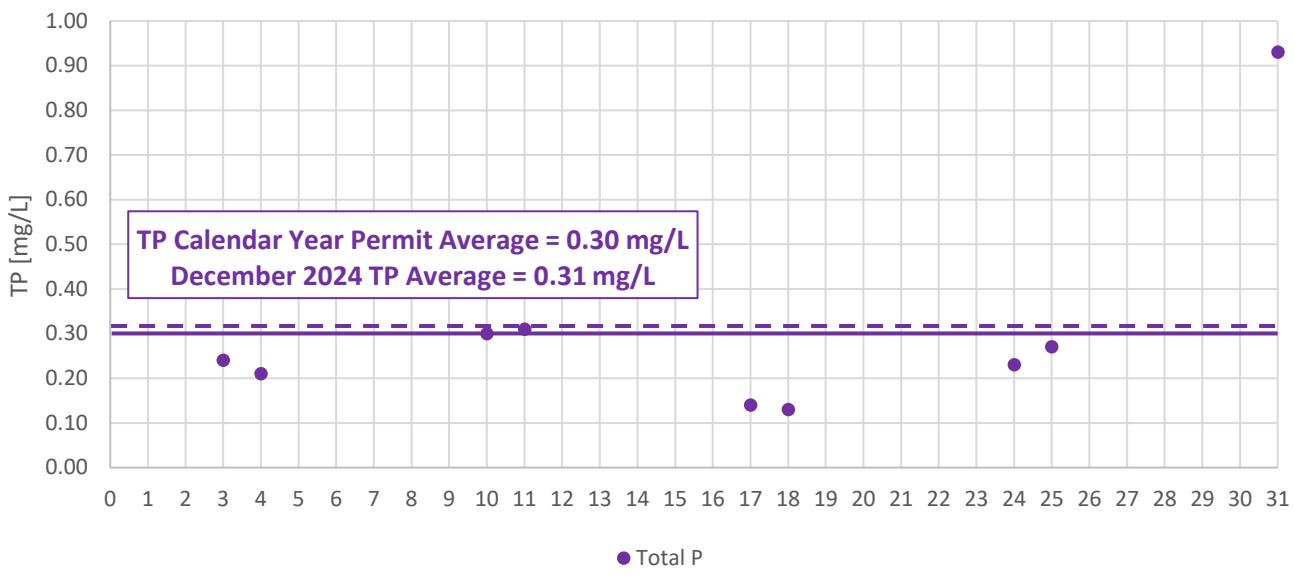
- During the 2024 monitoring period, Total Nitrogen exceeded the yearly average permit limit of 3.0 mg/L with a facility average of 5.83 mg/L. Total Phosphorus also exceeded the yearly average permit limit of 0.30 mg/L with a facility average of 0.37 mg/L. After discussion with operations, it was determined that the elevated Total Nitrogen and Total Phosphorus concentrations were due to the failed SCADA system and an inadequate aeration system. KGCSA is actively in the process of repairing the SCADA system and has subcontracted an engineering firm to design a replacement for the current aeration system.

Data Trending:

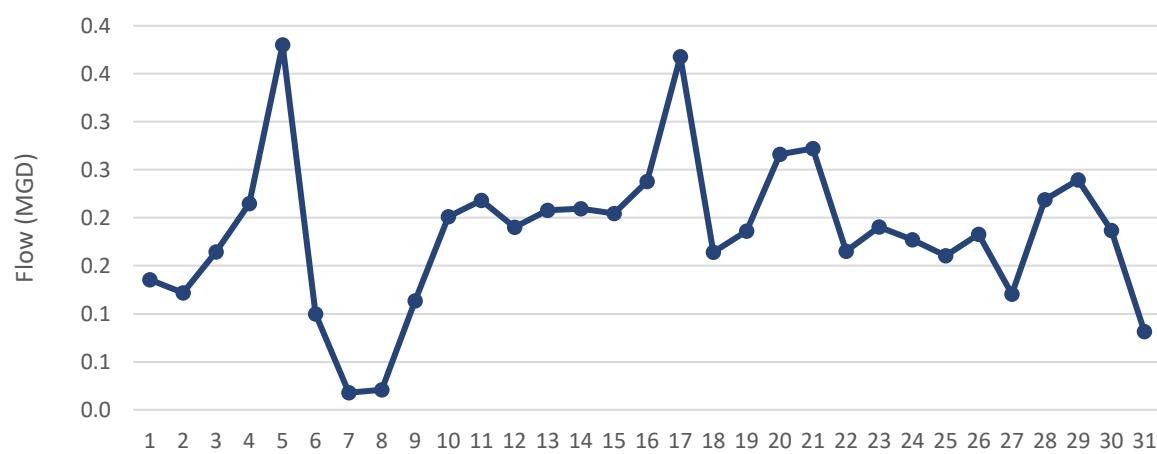
The following charts depict a graphical analysis of effluent quality monitoring and treatment plant daily and total monthly flows.



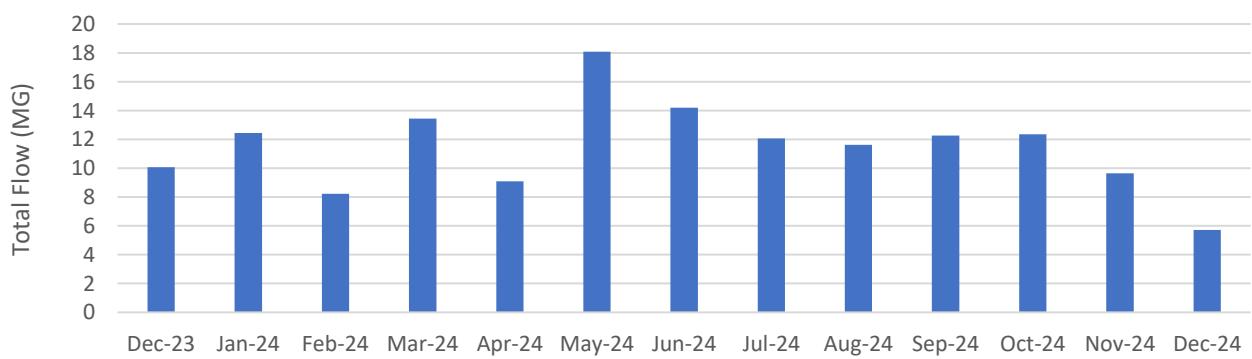
Dahlgren WWTP Total Phosphorus - December 2024



Dahlgren WWTP - December 2024



Dahlgren Total Monthly Flow MG



Hopyard Farms WWTP

Effluent Quality:

The wastewater treatment facility maintained compliance with all permit-required sampling.

Wastewater Treatment:

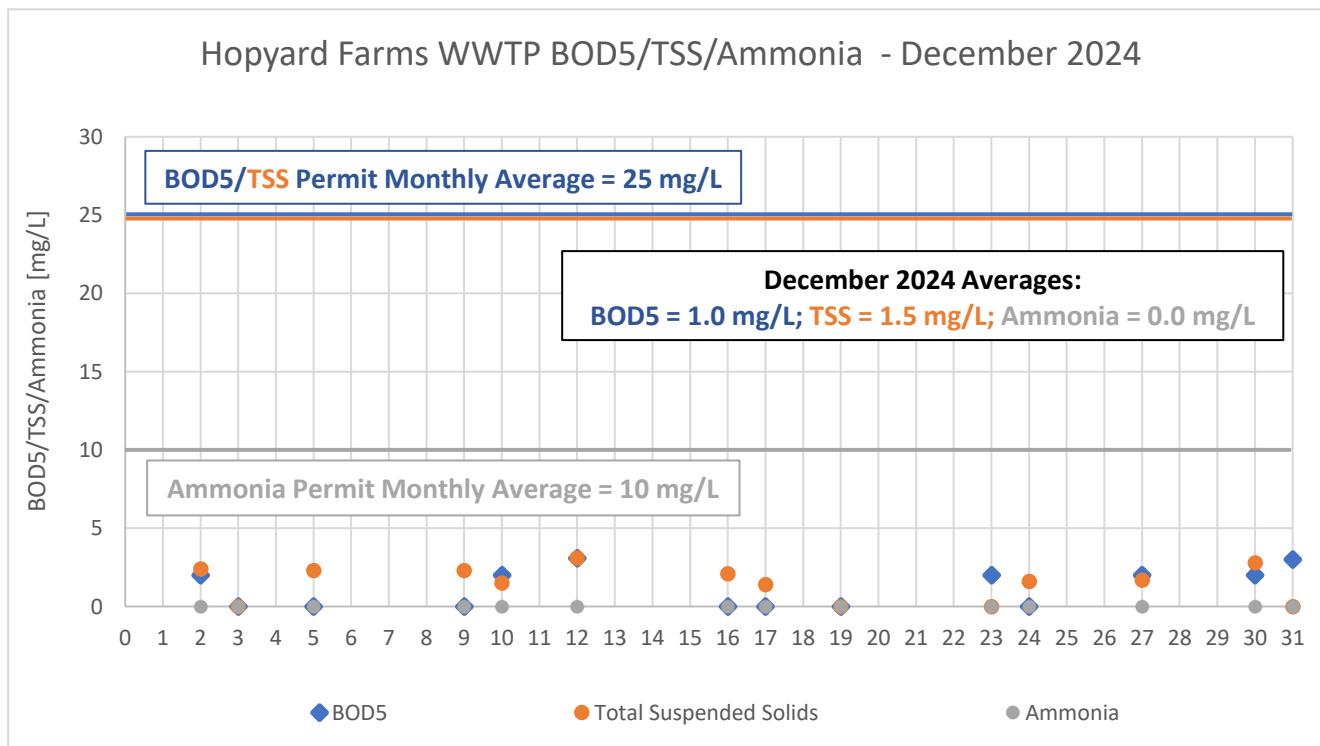
The Hopyard Farms WWTP met the sewer service area's sanitation demand with an average daily discharge of 0.10 MGD for a total monthly discharge of 2.73 MG (27 days with flow).

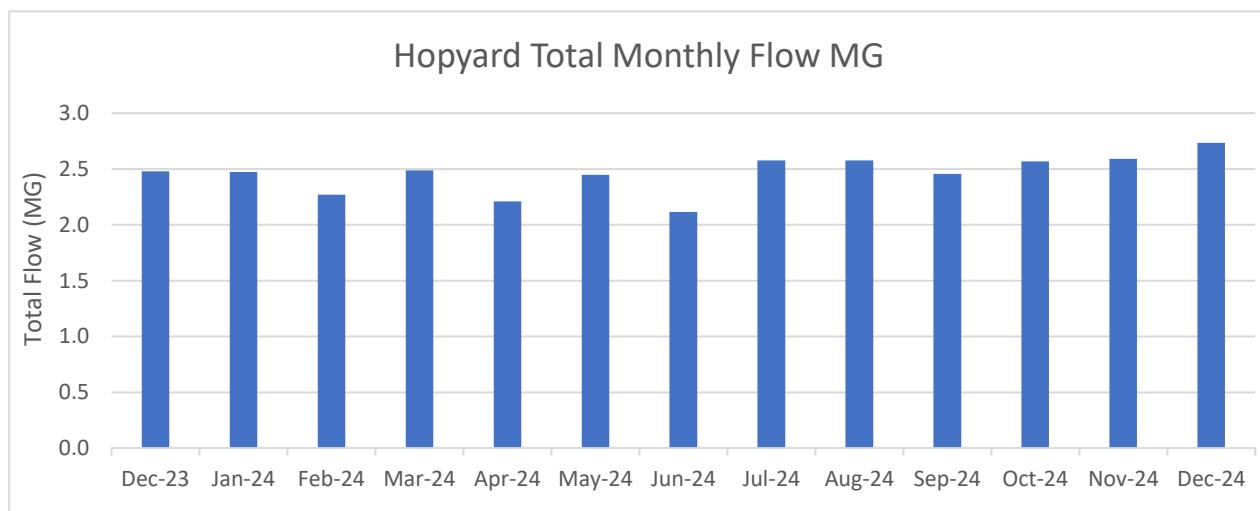
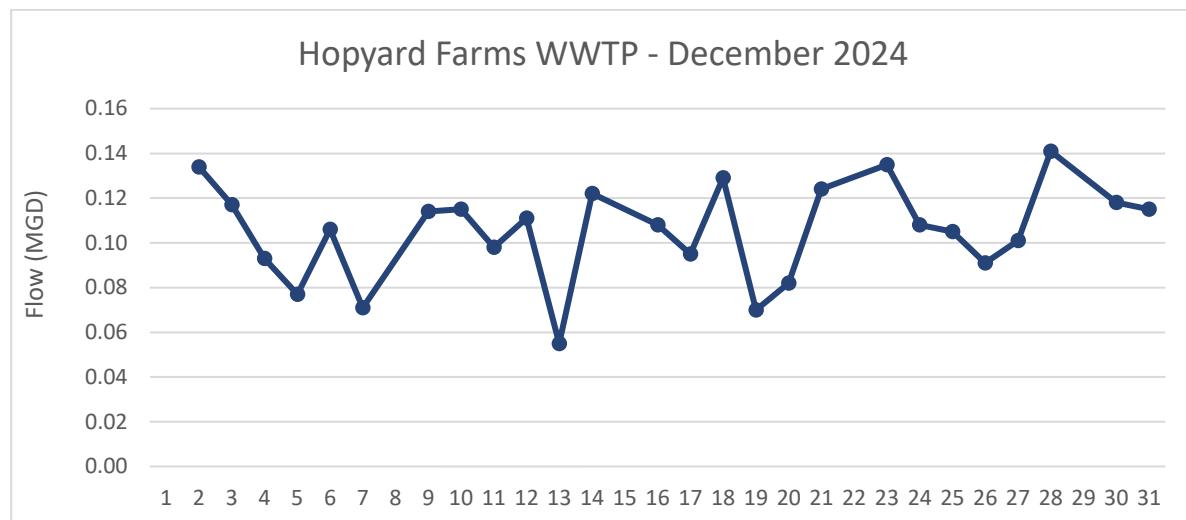
Operational Notes:

- IES staff noticed post EQ pumps were not working correctly; KGCSA maintenance assisted in diagnosis. No mechanical issues were identified. PLC code prevented pumps from starting until the cycles switched.
- IES noted that standby SBR blower is making an unusual noise; KGCSA maintenance assessed the issue. KGCSA maintenance will replace if the blower fails. It is important to note that if the standby blower is lost, Hopyard will only have one process blower, which is insufficient for successful operations.

Data Trending:

The following charts depict a graphical analysis of effluent quality monitoring and treatment plant daily and total monthly flows.





Purkins Corner WWTP

Effluent Quality:

The wastewater treatment facility maintained compliance with all permit-required sampling. TKN exceedances were noted as explained below.

Wastewater Treatment:

The Purkins Corner WWTP met the sewer service area's sanitation demand with an average daily discharge of 0.06 MGD for a total monthly discharge of 1.869 MG.

Operational Notes:

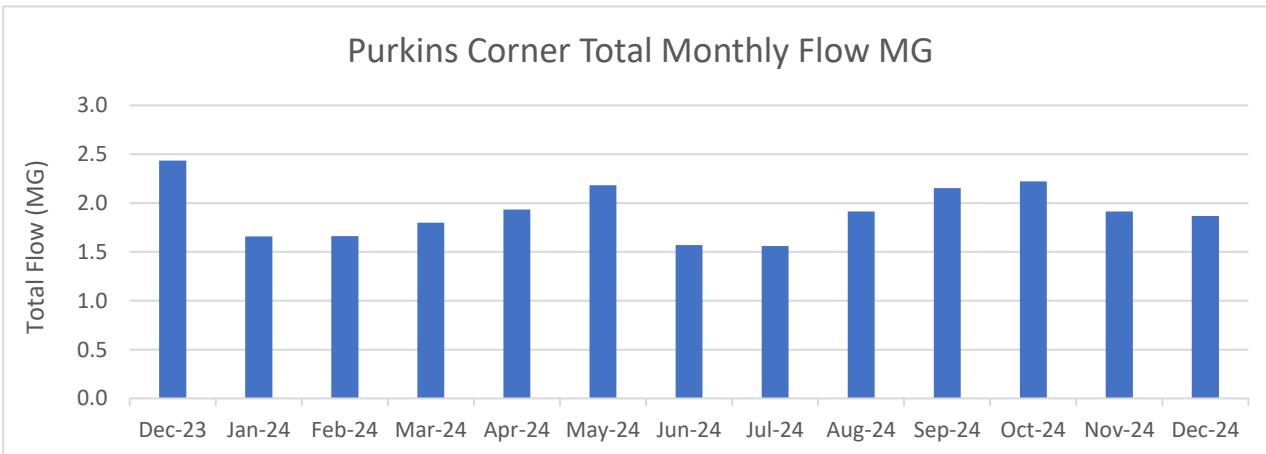
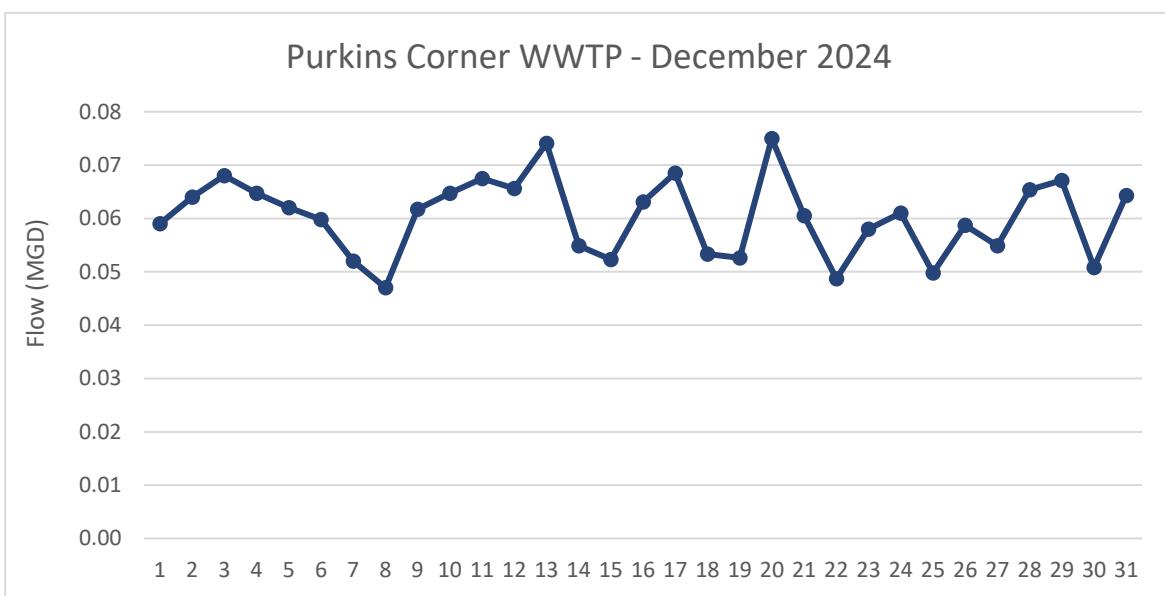
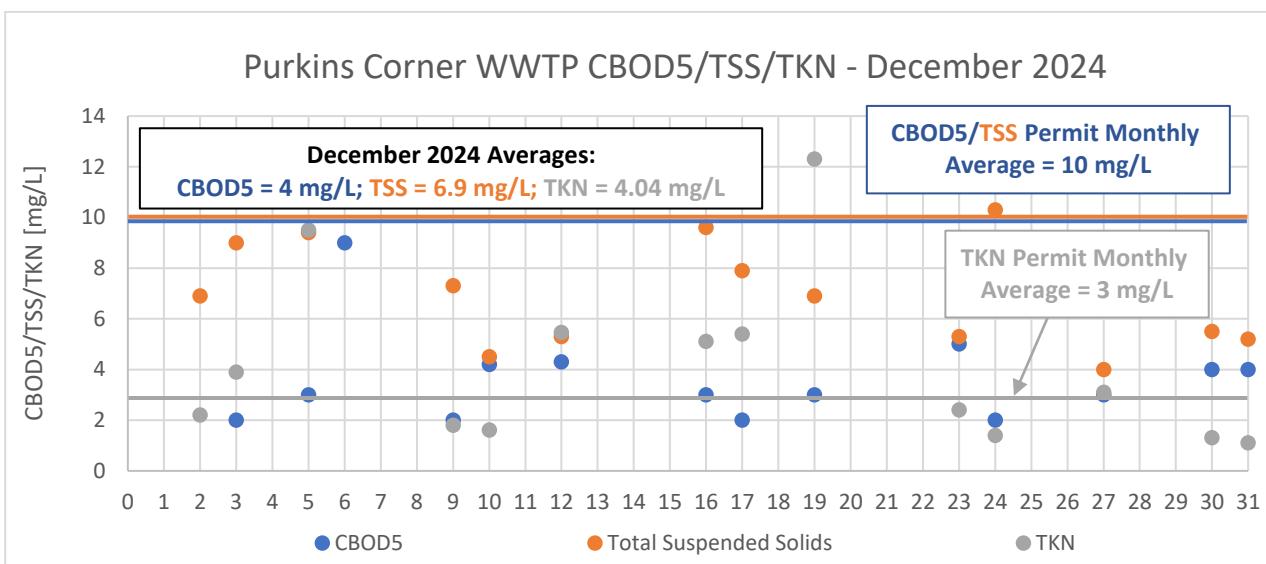
- IES noticed BioCarb not feeding properly; operations staff removed the blockage and resumed BioCarb feed.
- DEQ on-site for recon inspection; toured the plant and noted the improvements made to the alarm systems.
- B Plant mixer tripped and was reset; there have been no further issues since this event.
- IES staff replaced sampler tubing and added heat trace and insulation to prevent freezing and algae growth.
- Inspected diffuser module in B Plant aeration.
- Several loads of influent had to be hauled from Purkins EQ basin due to flow variations. IES team has adjusted operations to accommodate flow variability.
- IES operations team noticed the surge tank was not draining as needed. A blockage was cleared and surge tank operations returned to normal.

Exceedance Details:

- During the December monitoring period, the weekly average for TKN exceeded the permit limit of 4.5 mg/L with values of 5.20 mg/L and 7.60 mg/L. Additionally, the monthly average for TKN also exceeded the permit limit of 3.0 mg/L with a value of 4.04 mg/L. After discussion with operations, it was determined that the high TKN concentrations were caused by the drastic decrease in temperature which inhibited nitrification. IES operations will continue to monitor treatment and make necessary adjustments as needed. KGCSA is in the process of replacing air diffusers in the aeration basin, which will be an overall improvement to the treatment process.
- During the 2024 reporting period, the WWTP facility exceeded the annual Total Nitrogen average permit limit of 10.0 mg/L with a facility average of 13.36 mg/L. IES believes numerous anoxic tank mixer issues have made it impossible to create the proper environment for denitrification to take place. The anoxic tank mixer was replaced in November and the power supply to the mixer motors is currently being evaluated.

Data Trending:

The following charts depict a graphical analysis of effluent quality monitoring and treatment plant daily and total monthly flows.



Oakland Park WWTP

Effluent Quality:

The wastewater treatment facility maintained compliance with all permit-required sampling. TKN exceedances were noted as explained below.

Wastewater Treatment:

The Oakland Park WWTP met the sewer service area's sanitation demand with an average daily discharge of 0.038 MGD for a total monthly discharge of 1.137 MG.

Operational Notes:

- KGCSA maintenance removed rags from EQ basin.
- KGCSA maintenance replaced broken belt on post aeration blower.
- IES staff pumped down and removed foreign debris from A and B Plant clarifiers with the assistance of Patriot.
- IES staff noted that the performance of the influent pump for A Plant decreased; KGCSA maintenance pulled the pump and removed rags from impeller.

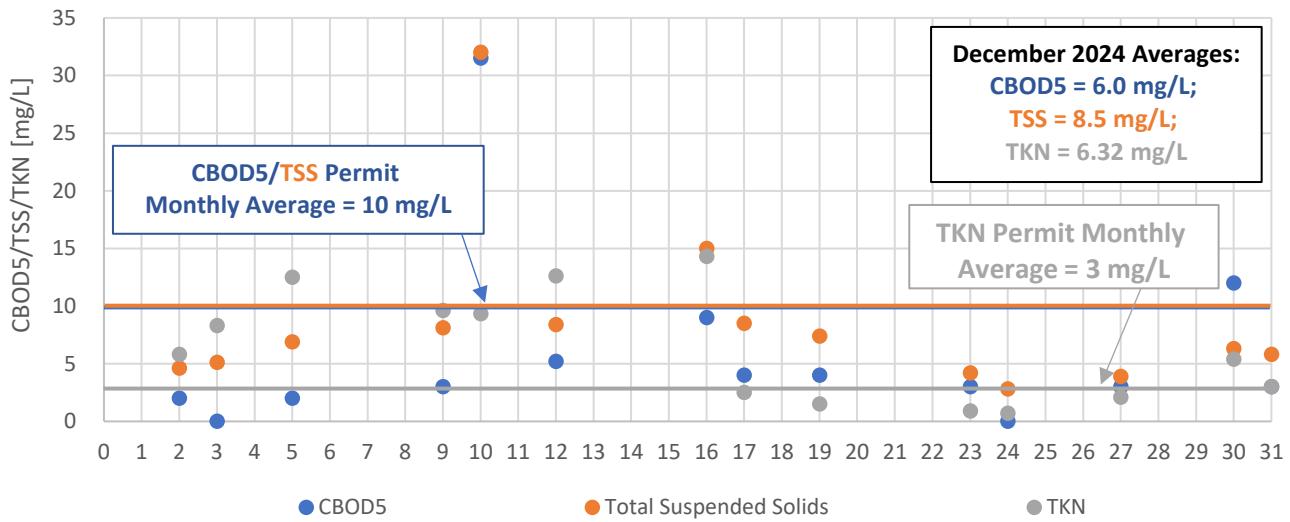
Exceedance Details: For the December 2024 monitoring period, the following exceedances occurred:

- Oakland Park WWTP experienced TKN concentrations which exceeded both the monthly and weekly permit limits of 3.0 mg/L and 4.5 mg/L, respectively. It is believed the elevated TKN concentrations were due to a lower temperatures which inhibited nitrification. KG Maintenance is also in the process of replacing failed air release valves throughout the collection system that will temporarily cause higher TKN concentrations in the influent but will improve influent characteristics and eventually improve overall treatment. Treatment will continue to be monitored and adjustments will be made as necessary. KGCSA is also in the process of replacing the air diffusers in the aeration basins which will further improve treatment.
- A sample collected on December 10th had a TSS concentration of 32.0 mg/L; this brought the weekly average to 16.2 mg/L, exceeding the permit limit of 15.0 mg/L. It is believed that the elevated TSS was due to a clogged RAS line and an ineffective tertiary sand filter. The clarifiers were drained, and all heavy solids and grit was removed from the bottom to reduce the amount of RAS line obstructions. KGCSA is in the process of obtaining parts to repair the sand filter.
- A sample collected on December 30th had an E. coli result of > 2419 cells/100 mL; this result brought the geometric mean to > 8 cells/100 mL. It is believed that the elevated E. coli was due to an ineffective tertiary sand filter. The analysis was not run in extended range because there was no reason to request it. KGCSA is in the process of obtaining parts to repair the sand filter.

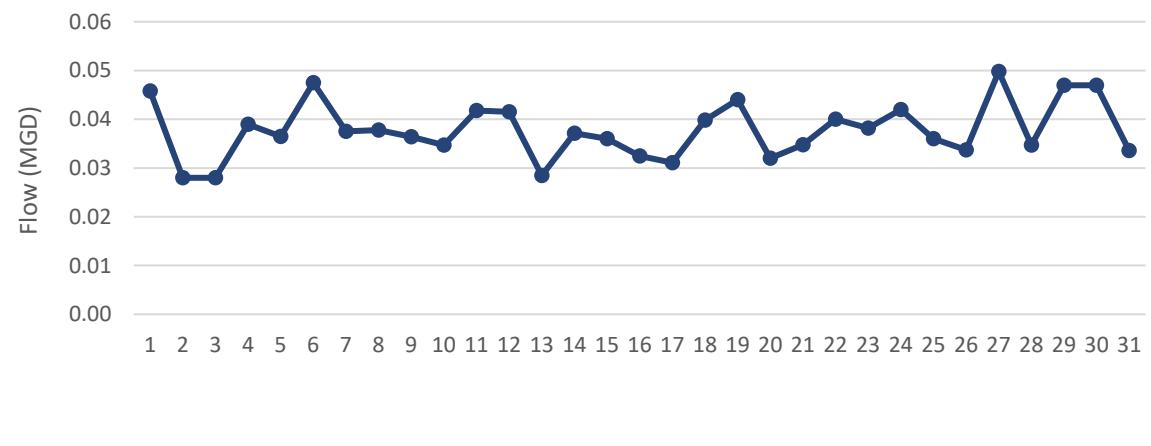
Data Trending:

The following charts depict a graphical analysis of effluent quality monitoring and treatment plant daily and total monthly flows.

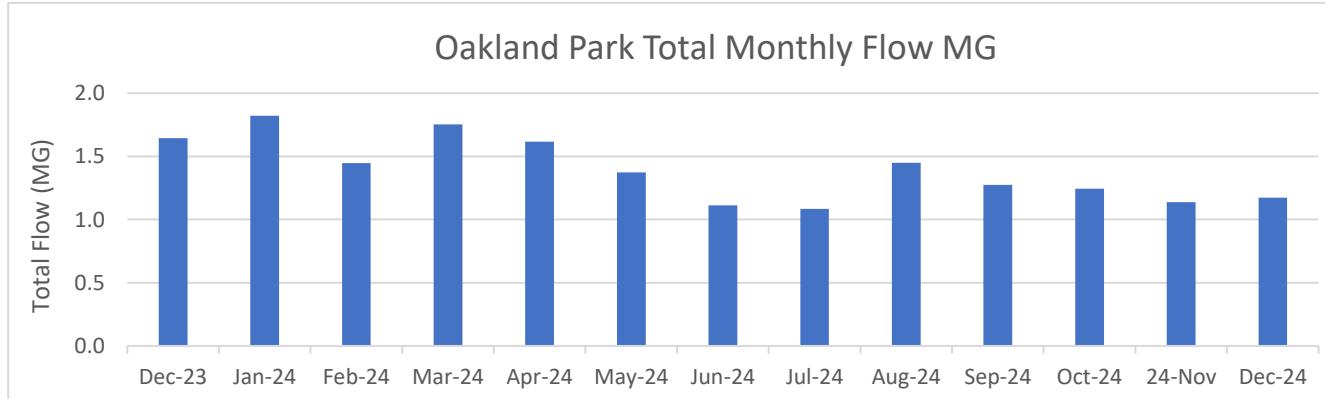
Oakland Park WWTP CBOD5/TSS/TKN - December 2024



Oakland Park WWTP - December 2024



Oakland Park Total Monthly Flow MG



Fairview Beach WWTP

Effluent Quality:

The wastewater treatment facility maintained compliance with all permit-required sampling.

Wastewater Treatment:

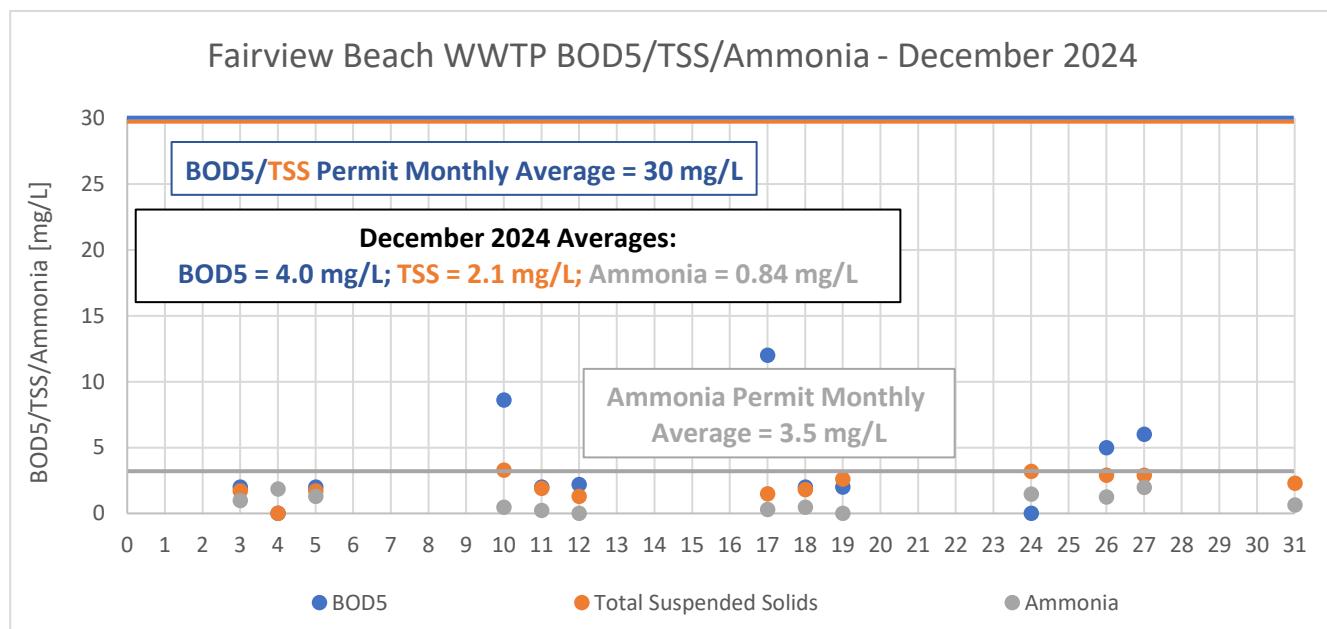
The Fairview Beach WWTP met the sewer service area's sanitation demand with an average daily discharge of 0.043 MGD for a total monthly discharge of 1.120 MG (26 days with flow).

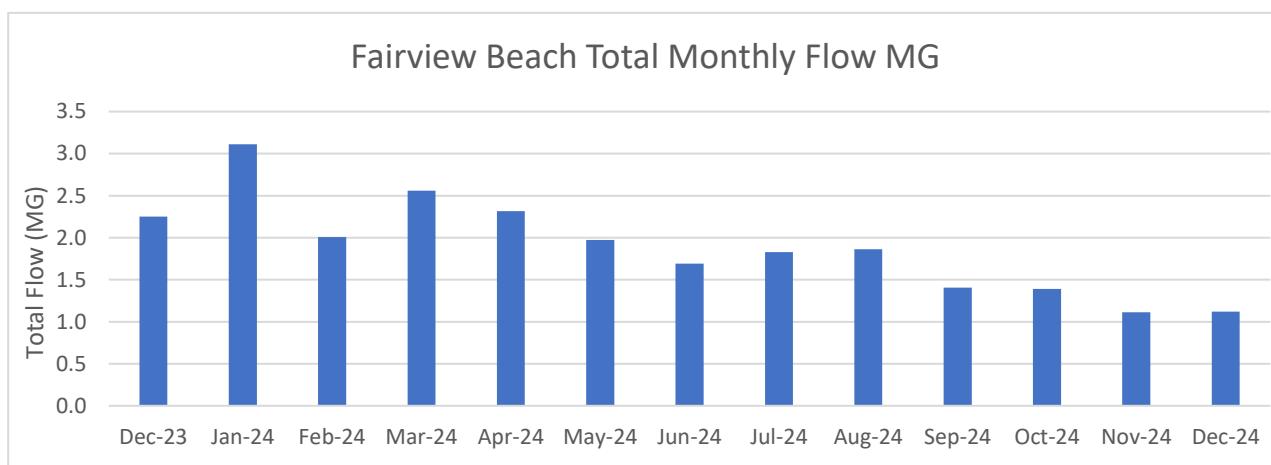
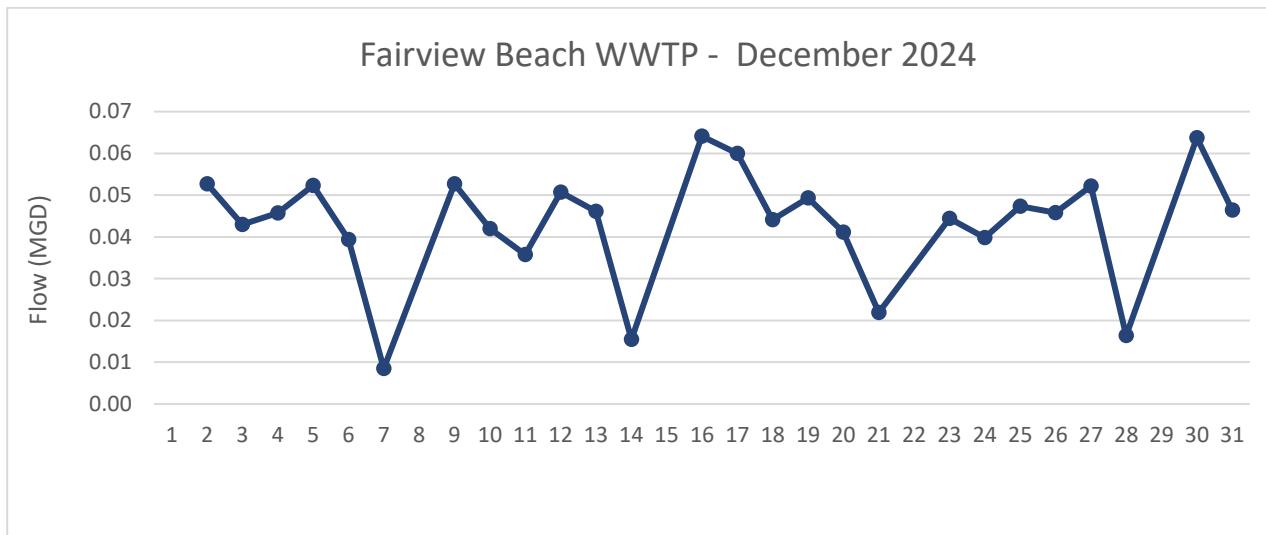
Operational Notes:

- IES staff intermittently fed BioCarb to help control ammonia.

Data Trending:

The following charts depict a graphical analysis of effluent quality monitoring and treatment plant daily and total monthly flows.





Glossary

Bacteria	E.coli and/or Total Coliform
BOD5	5-day Biochemical Oxygen Demand
CBOD	Carbonaceous Biochemical Oxygen Demand
cfu	colony forming unit
CIP	Capital Improvement Plan or Cast/cleaned-in-place
Cl	Chloride Ion
Cl2	Chlorine
CMF	Continuous Membrane Filtration?
D.O.	Dissolved Oxygen
F/M ratio	Food to Microorganism ratio
FOG	Fats, Oil and Grease
GST	Ground Storage Tank
HWTP	Harmony Water Treatment Plant
I&I	Infiltration and Inflow
Inorganic Nitrogen	Nitrate + Nitrite
LS	Lift Station
mg/L	Milligrams per Liter
MGD	Million Gallons Per Day
mL	Milliliters
MLSS	Mixed Liquor Suspended Solids
MLVSS	Mixed Liquor Volatile Suspended Solids
MPN	Most Probable Number -bacteriological well sample
MW	Monitoring Well
N/N	Nitrate/Nitrite
Organic Nitrogen	TKN
P/A	Presence/Absence- bacteriological samples for drinking water
PFAS	polyfluoroalkyl substances
PLC	Programmable Logic Controller
POE	Point of Entry
RAS	Return Activated Sludge
SCADA	Supervisory Control and Data Acquisition
STEP	Septic Tank Effluent Pump
TKN	Total Kjeldahl Nitrogen
TN	Total Nitrogen
TP	Total Phosphorous
TR-6	Copper sequestering chemical for wastewater
TSS	Total Suspended Solids
UV	Ultraviolet Light
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant