

2021 ANNUAL REPORT

The 2021 Annual Report highlights the significant projects completed at the Gloversville-Johnstown Joint Wastewater Treatment Facility (GJJWTF). Routine assignments such as tank cleaning, instrument calibration, laboratory analysis, sample collection, general maintenance and upkeep, while important, are not identified in this report. General statistics are included to illustrate additional activities at the facility.

O & M expenditures totaled \$4.3 million for 2021. The adopted budget was \$4.9 million. The Fund Balance at end of 2020 was \$477,006.

Electrical Synopsis:

Generated	5,842,258 kilowatt hours		
Purchased	503,257 kilowatt hours	--	\$59,720
Sold	677,923 kilowatt hours	--	\$38,376
Consumed	5,667,593 kilowatt hours		\$498,748 (Saved, at \$0.088/kWh)

COGENS produced 100% of GJJWTF's electrical power needs, with 3.1% excess power.

O & M revenues totaled \$4.3 million during 2021. The Industrial contribution was 44.8%, Residential 28.5% and Trucked/Pumped waste and miscellaneous revenue totaled 26.7%. The average industrial sewer bill increased by 6%. The residential rate increased 11%. Use of \$477,006 from the rate stabilization reserve fund helped to minimize the rate increase.

Belt Filter Presses operated 3,968 hours producing 19,279 wet tons of sludge. Fulton County Department of Solid Waste received \$656,546 to accept the sludge.

The Dairy Industry accounted for **47.0%** of the total O&M revenue collected. Together, FAGE USA Dairy Industry, Inc. and Euphrates Inc. pumped a total of **30.7 million** gallons of whey and **189.2 million** gallons of washwater to GJJWTF for wastewater processing via two dedicated pipelines.

A dedicated pipeline transports the whey to a 350,000-gallon equalization tank. Then, operators pump the whey directly to the Primary Digester at a constant feed rate. During the digestion process, the digester anaerobes produce large quantities of digester gas (~54% Methane). The Cogeneration System (consisting of COGEN-1, COGEN-2 and COGEN-3) combust the digester gas to generate the electrical power used to self-power the facility. Any excess electricity is sold to National Grid per a Power Purchase Agreement.

The other dedicated pipeline transports **189.2 million** gallons of dairy washwater from FAGE USA Dairy Industry, Inc. and Euphrates Inc. to the headworks of the Contact Adsorption Settling Thickening (CAST) System. CAST continued to successfully operate for all of 2021.

The foundation for success of GJJWTF is due to the support of the Gloversville-Johnstown Joint Sewer Board (GJJSB) and the work of its twenty-one (21) employees. As a result of the conscientious efforts by all GJJWTF employees on days, nights, weekends, holidays, during

severe weather, the COVID pandemic and often in an inhospitable environment, the facility continues to operate and meet its wastewater discharge SPDES permit requirements.

Employee names (as of 12/31/21) are:

Barbara Allen	Erich Goodemote	Richard Pedrick
Wallace Arnold	Haleigh Grubb	Hilary Ruzycky
Ricky Barnett	Matthew Handy	Victor Rzesos
Charley Brown	Reuben Kennedy	Michael VanAlstyne
Steven Burns	Mark Levendusky	Christopher VanAuken
Justin Cotter	Adam Mihalik	Christian Walters
Bruce Gardner	Lacie Newland	Robert Yaggle

PERSONNEL

2021 Joint Sewer Board

- Members – Chairman John Rizzo, Vice Chairperson Bobbi Trudel, Secretary Christopher Vose, Christopher Perry, Craig Talarico and Wrandy Siarkowski.
- Board members Chris Perry and Craig Talarico resigned effective Dec 31, 2021.

Licensed Operators

The total number of NYSDEC Grade 4A, 3A and 2A license holders at this facility totaled five (5).

Operator License Renewal – 5-Year Recertification

Michael VanAlstyne, Grade 3A

Retirements

David Malagisi – Operator - 31 years of service.

Catherine Maragno – Account Clerk - 10 years of service.

James McMillan – Maintenance Supervisor - 13 years of service.

Donna Renda – Financial Officer - 31 years of service.

David Malagisi and Donna Renda inducted into Employee Hall of Fame.

New Hires

Charley Brown joined the GJJWTF Staff as an Operator Trainee.

Obtained Commercial Driver's License

Justin Cotter

Charley Brown

Sick Days

Seven (7) employees utilized three (3) sick days or less during 2021. The names of those employees are as follows:

Charley Brown
Bruce Gardner

Haleigh Grubb
Lacie Newland

Hilary Ruzycky
Christopher VanAuken

Christian Walters

Work Related Injuries

Two (2) work related injuries reported in 2021 with no lost time from work reported.

Annual NYSDEC Inspections

June 9, 2021, NYSDEC conducted the annual on-site comprehensive SPDES plant inspection. The facility was rated in satisfactory condition.

August 2, 2021, NYSDEC conducted an on-site inspection of the Chemical Bulk Storage Program. Received a renewed permit valid to March 2023.

December 7, 2021, NYSDEC conducted an on-site inspection of the CAST system and side streams. The facility was rated in satisfactory condition.

Odor Complaints

One (1) odor complaint was posted to the website in 2021.

New Waste Hauler

USA 1 Septic & Excavation

OPERATIONS AND MAINTENANCE

1. Center for Regional Growth sponsored a lunch and tour of the facility by Assemblyman Smullen, Senator Tedisco, Congresswoman Stefanik's representative, City Mayors, and County Supervisors on April 16th. Purpose of the event was to let representatives be aware of what we have to offer and our future upgrade funding needs.
2. CFI Contracting, Inc. performed repairs on the UV Disinfection System. Trojan Technologies provided a field service inspection and verified repair work was satisfactory. Certificate of Substantial Completion received from Delaware Engineering.
3. Adopted a Communicable Disease Disaster Emergency Plan.
4. Class I Service of Aeration Turblex Blower. Cracks discovered in impellor fins. New unit ordered from Germany and installed by Howden Roots, LLC in October 2021.
5. On April 29, 2021, a large duct bank collapsed near the creek causing an emergency power failure. High Voltage Electric Services accomplished repairs.
6. Board accepted Amendment No. 2 to Power Purchase Agreement No. 1824 between National Grid and Gloversville-Johnstown Joint Wastewater Treatment Facility.
7. Plant Manager and Lab Director assisted Environmental Design Partnership and the City of Gloversville to locate manholes along the trunk sewer line to assist with a feasibility study of the Route 30 and Route 30A corridor.
8. Professional Services Agreement with Arcadis of New York to prepare engineering report and grant documents for thermal sludge drying equipment.
9. Contracted with StoredTech for IT computer services and support.
10. Boilers passed inspection by a NYS Department of Labor representative.
11. Installed new LMI pump in Thickener Building for chlorine pumping to CAST system.
12. Cogen Nash GAS Compressor No. 1 repaired by Troy Industrial.
13. Two (2) new overhead doors installed in garage on southside.
14. Installed new switch on Cogen No. 3 gas control panel to allow for resetting panel without interrupting power.
15. Replaced cyclone liners in Grit Classifier No. 1 and No. 2 at Screening Building.
16. Replaced seals on heat exchanger in Digester Building.
17. Replaced all chains and eighteen (18) flights at Primary Tank No. 1

18. Replaced hydrant at RV dump station.
19. Prime Automation provided software updates and battery backups for Cogen Engines.
20. Installed new hypochlorite pump at CAST system.
21. Precision Industrial replaced spent media in hydrogen sulfide scrubber vessel.
22. Facility backflow preventors were inspected by Adirondack Mechanical. One backflow preventor replaced.

GRANTS & LOANS

Received \$55,000 from NYSDEC towards the UV Disinfection Construction Project to close.

L & S Energy Services provided a Measurement & Verification (M&V) Inspection for 4th year performance of Cogen Engine No. 3, per NYSERDA grant disbursement requirements. Payment of \$82,673.68 received for M&V period July 4, 2019 to July 3, 2020.

COMPLIANCE MONITORING AND TESTING

Completed annual reviews of the following lab manuals: Laboratory Quality Assurance, Test Method Standard Operating Procedures (SOP), Administrative/Quality Procedures, Monitoring and Field Activities, and Laboratory Chemical Hygiene.

Completed the 2021 annual ELAP internal laboratory audit.

NYS Department of Health's Environmental Laboratory Approval Program (NYS DOH ELAP) biannual assessment occurred virtually during 2021 on June 15th and 16th. Findings were minor and corrective actions accepted.

All semi-annual NYS DOH proficiency test (PT) samples submitted were acceptable. The samples included BOD, CBOD, TSS, TKN, Ammonia, Dissolved Sulfide, Settleable Solids and Fecal Coliform.

PG Environmental inspectors, contracted by EPA, visited GJJWTF on November 16th and 17th to assess the industrial inspection requirements of the facility's pretreatment program. This portion of the audit completed EPA's virtual audit of 2020. The industrial facilities visited were Taylor Made, Colonial, Androme, and Euphrates. The auditor's observations were minor. Inspectors also made suggestions to assist in future inspections. This EPA on site assessment is scheduled every five years.

The Industrial pretreatment program's semiannual reports were submitted to EPA.

The lab continued to analyze effluent samples in house maintaining its certification for Fecal Coliform.

At the conclusion of 2021, the two-year nutrient study required by SPDES permit concluded.

NYS DEC renewed GJJWTF's SPDES Permit and ended the 2-year Effluent Nutrient Study.

During the summer of 2021, flow data measured at the Gloversville flume and at the head of the plant were shared with Environmental Design Partnership. This data collection study analyzed the impact of Inflow and Infiltration (I&I) on the collection system.

The annual ethics and data integrity training of all laboratory and monitoring personnel took place during December of 2021.

A Mercury Minimization Plan was submitted to DEC in January of 2021. This plan contains the industrial sampling results, low level plant effluent results and an EPA required one time compliance report for dental discharges

The annual DMR QA 41 submission to EPA was completed. All proficiency test results for the analytes listed in the SPDES permit reported to EPA.

In 2021 all permitted industries completed an Industrial Chemical Survey (ICS). This five-year pretreatment program requirement is listed in the facilities SPDES permit.

Changes in Volume and Type of Work:

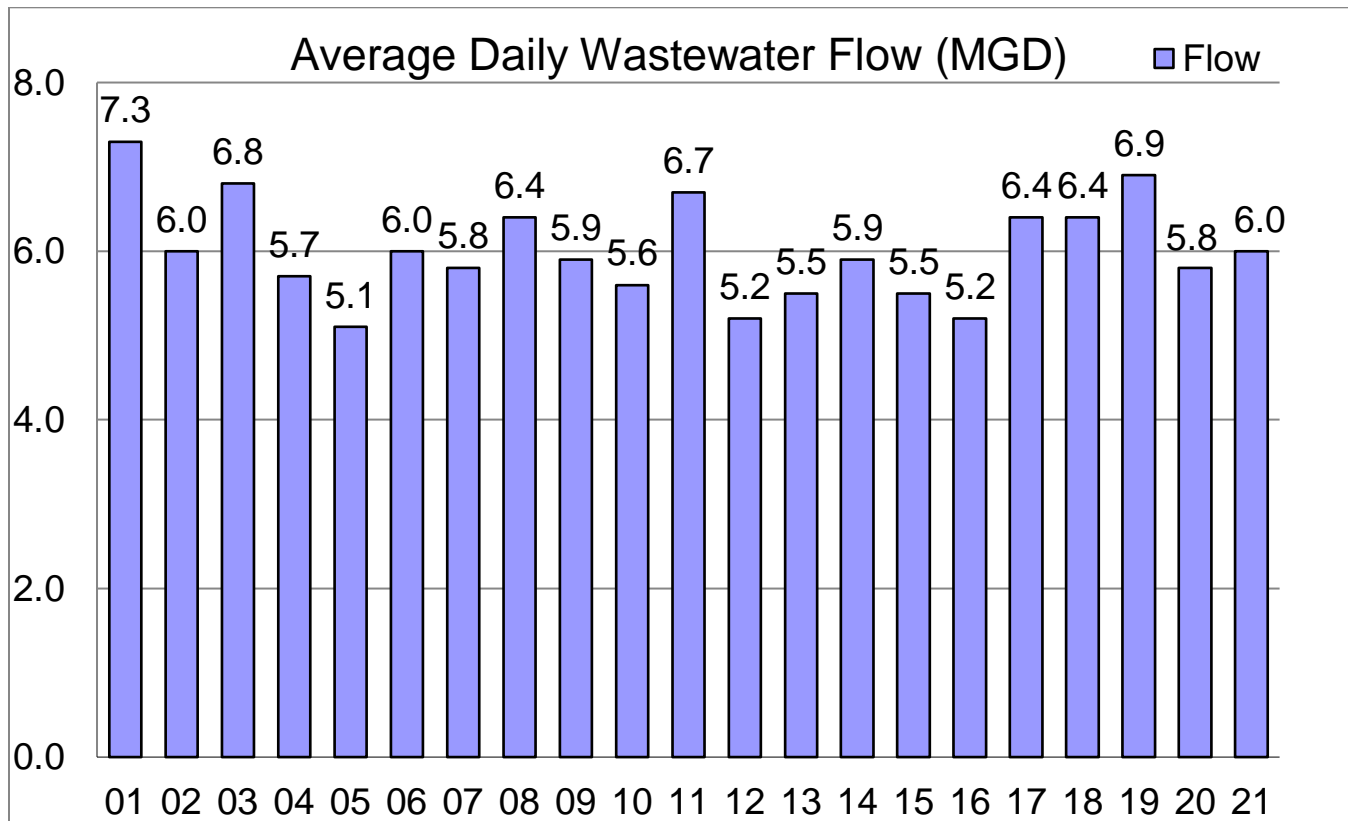
Issued discharge permits to 11 Industries in Johnstown and 11 industries in Gloversville.

This year, GJJWTF performed Priority Pollutant scans on the following industries: Hudson Dyeing and Finishing, Pearl Leather Finishers, Fulton County Department of Solid Waste, Benjamin Moore, Century Linen, Townsend Leather, Euphrates and FAGE. No violations found.

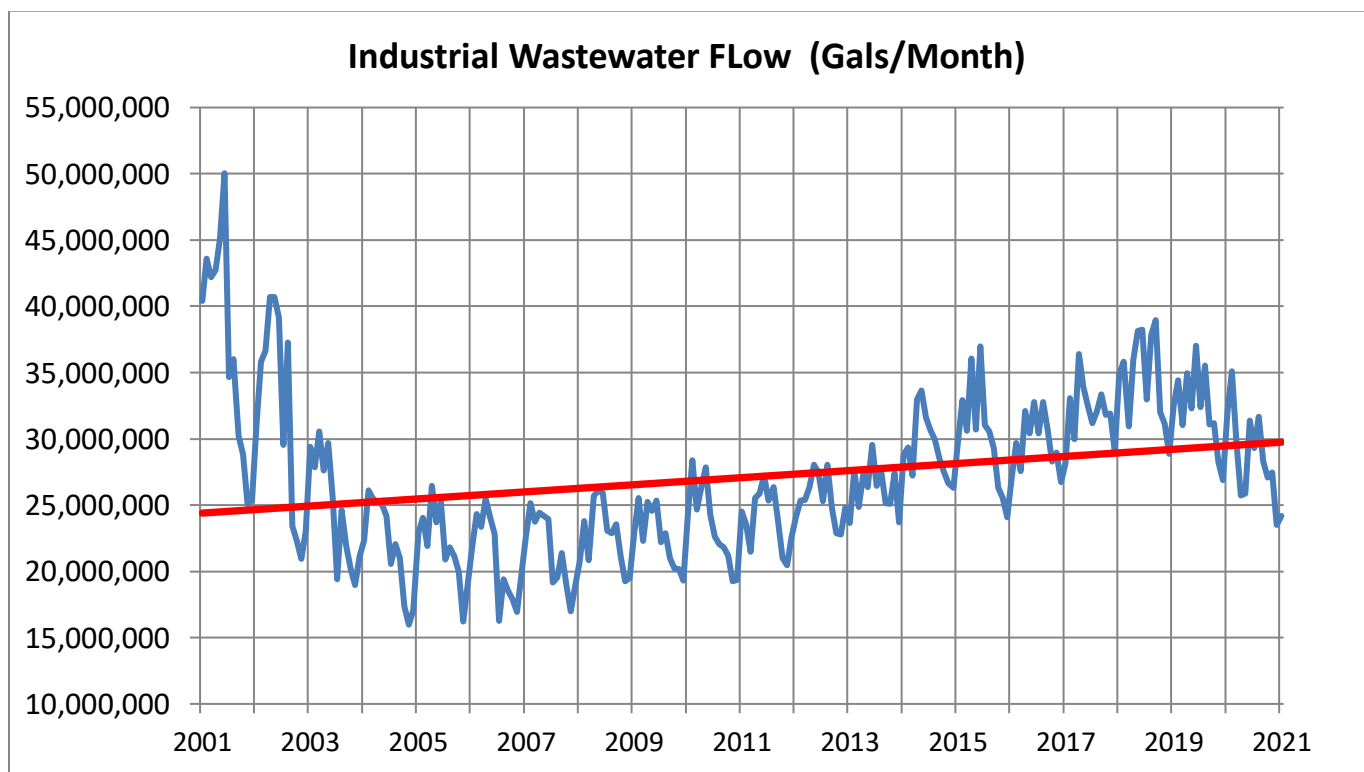
GJJWTF issued no NOVs or Orders On Consent to industry during 2021.

TOTAL WASTEWATER FLOWS

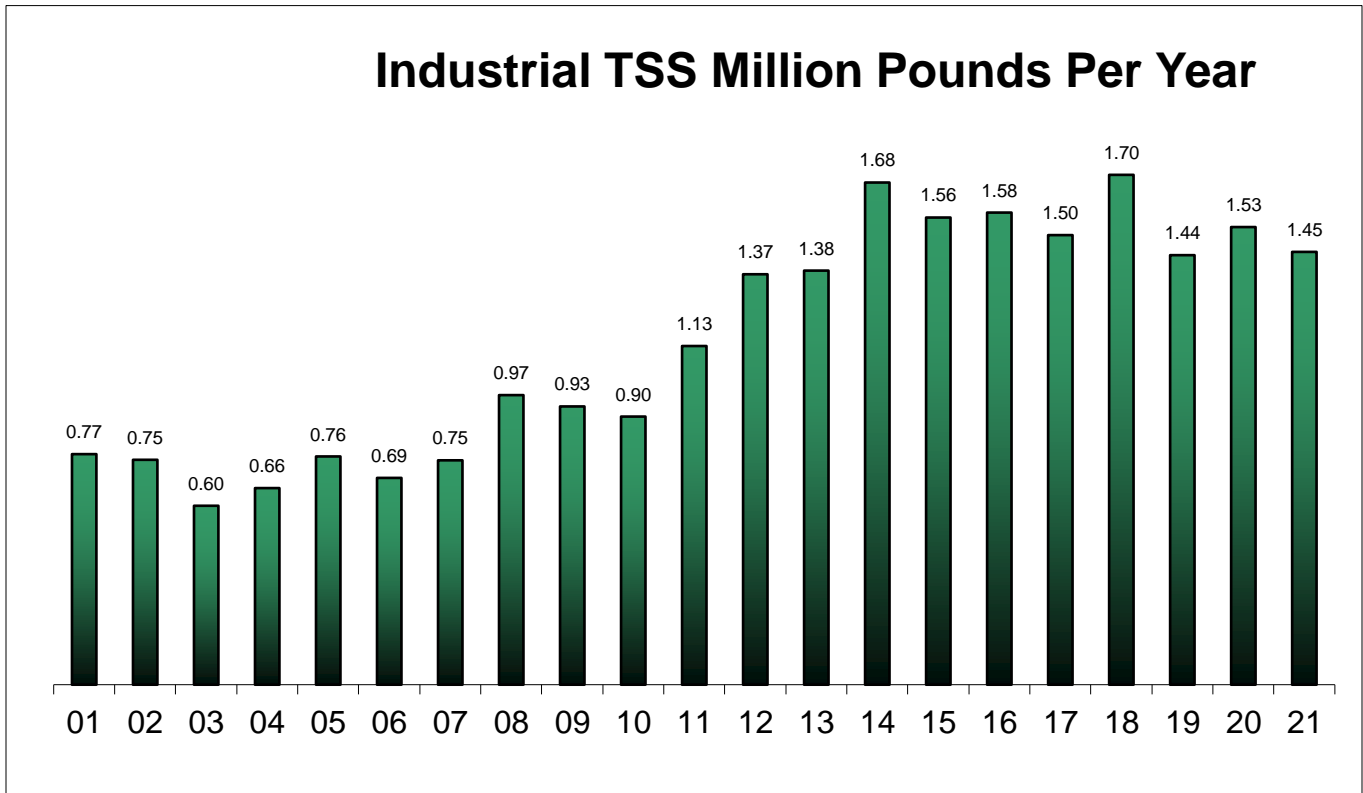
Historically, the total flow of Influent wastewater to the Plant is relatively constant.



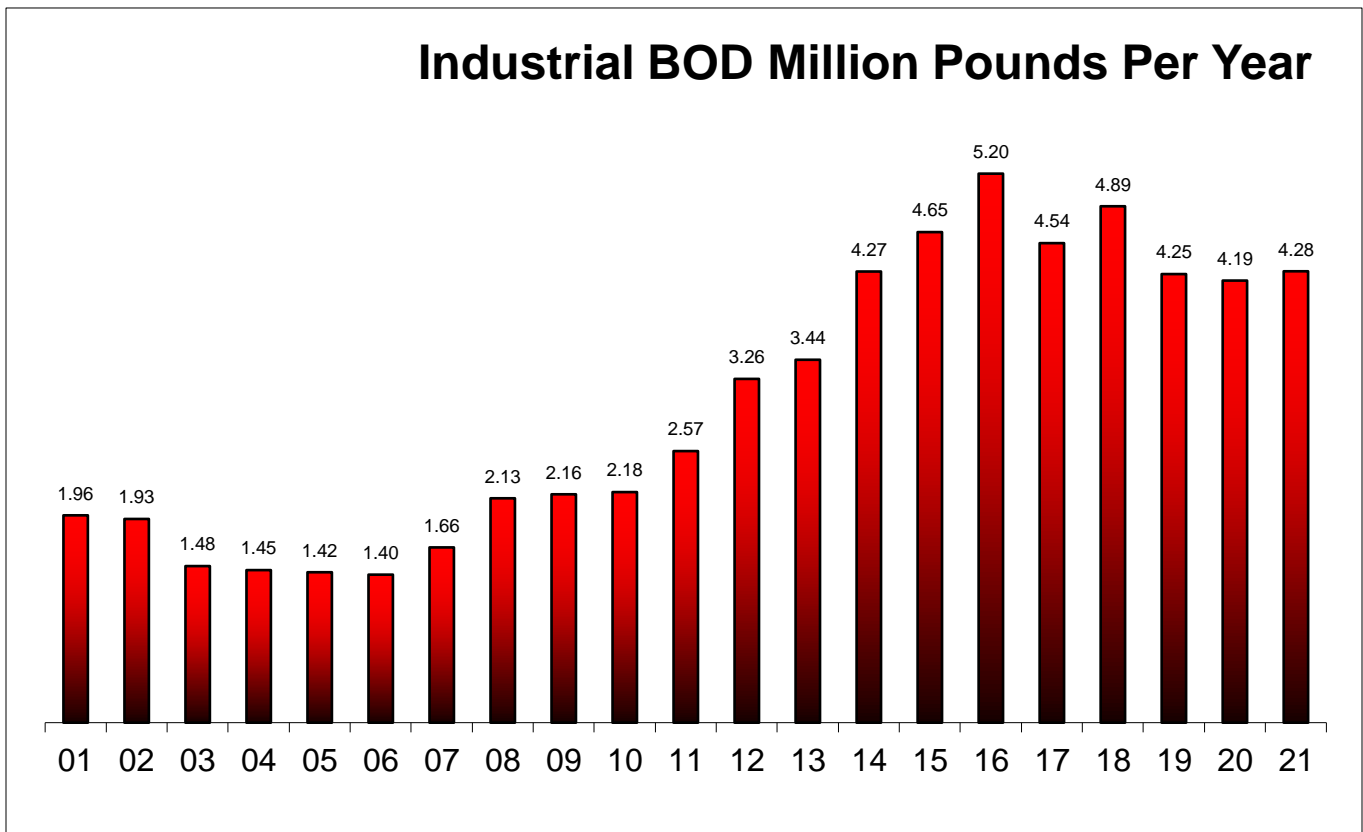
Total Industrial Flows decreased 7.9% in 2021.



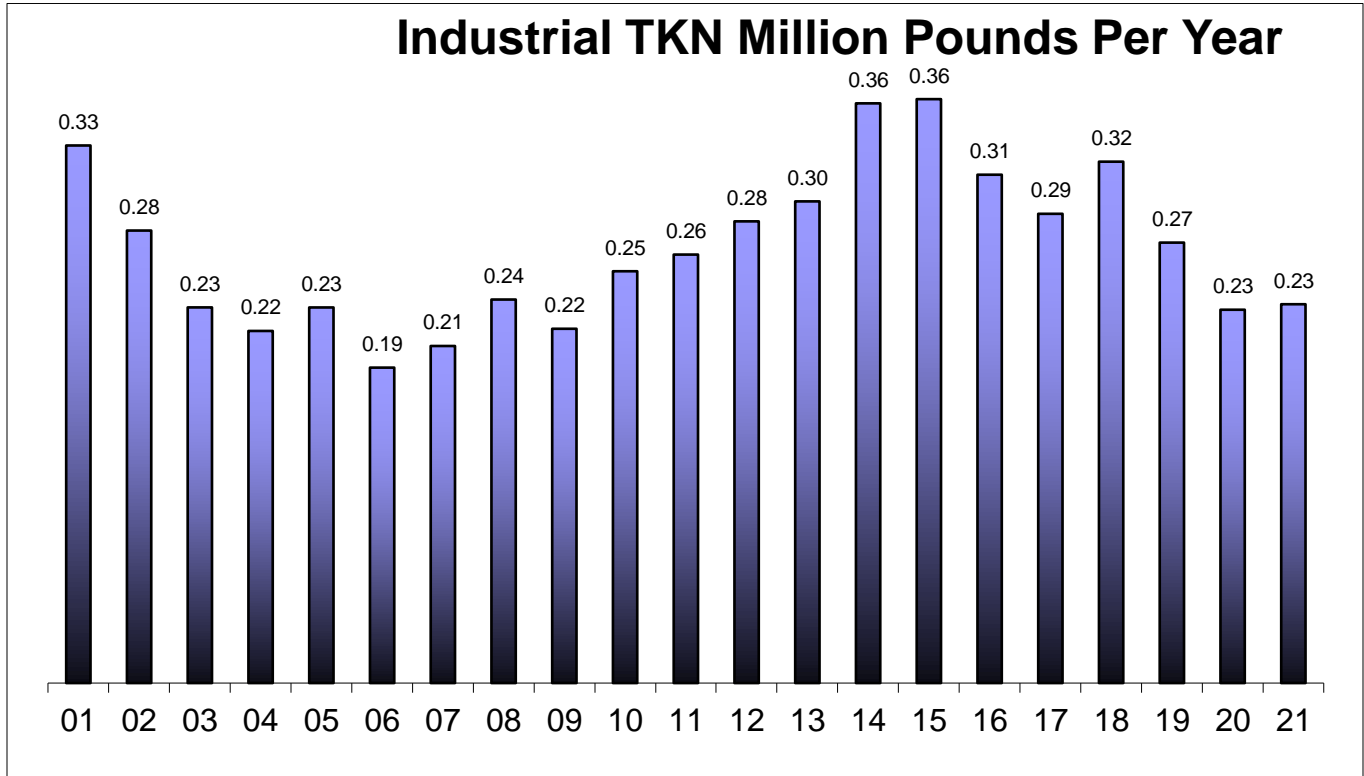
Industry: Total Suspended Solids (**TSS**) decreased 5.4% in 2021.



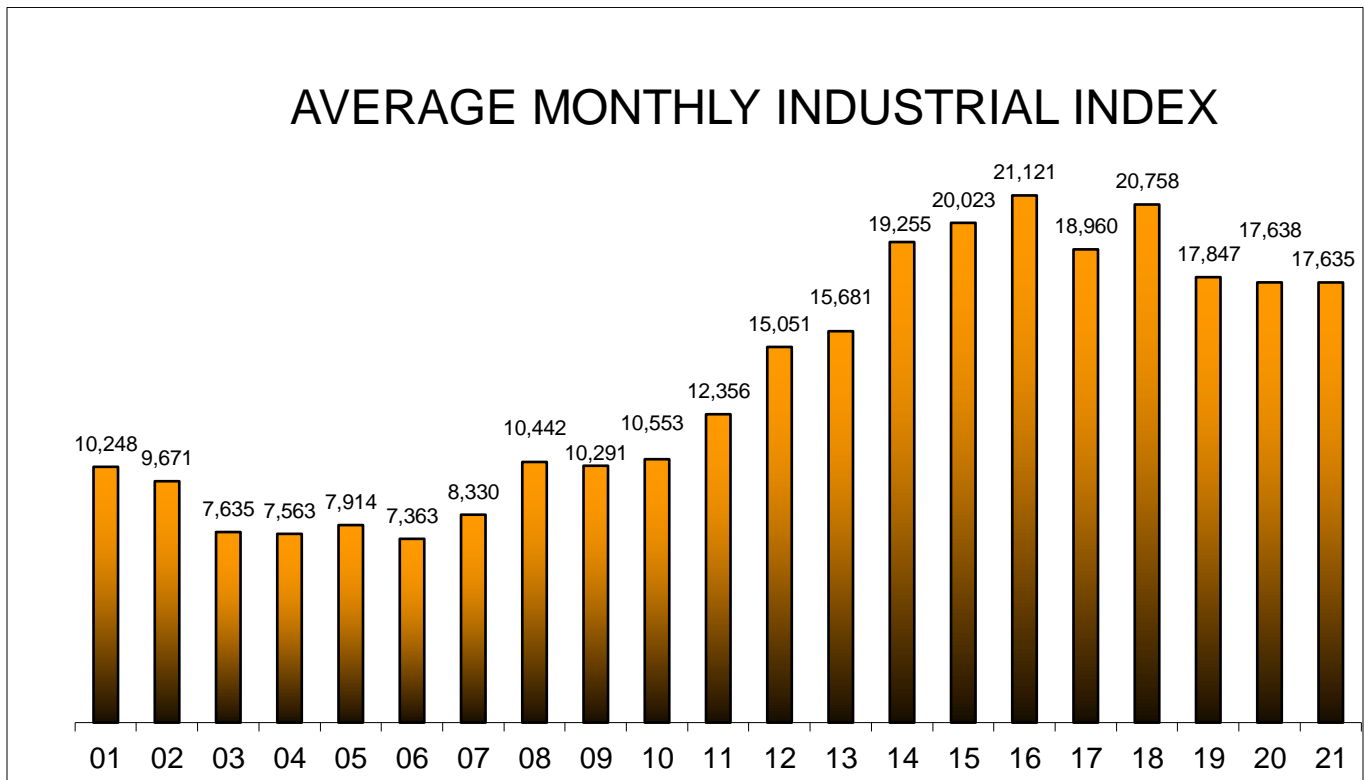
Industry: Biochemical Oxygen Demand (**BOD**) increased 2.1% in 2021.



Industry: Total Kjeldahl Nitrogen (TKN) increased 1.5% in 2021.



Finally, in order to measure the relative strength of the industrial waste, staff developed a formula that combines TSS, BOD and TKN data. The resulting value, **Industrial Index**, provides a single numeric number. The Industrial Index remained the same from 2019 to 2021.



Overall, Industrial wastewater conveyed to GJJWTF via the sanitary sewer decreased in 2021.

However, the industrial index system does not incorporate the following waste streams:

- 1) Whey directly piped to the anaerobic digesters;
- 2) Dairy washwater directly piped to the CAST System;
- 3) National Grid remediation discharges;
- 4) Fulton County Department of Solid Waste's leachate.

As shown in the graphs, industrial loadings to GJJWTF significantly decreased over the previous year. Total Industrial Flows decreased 8.5%. Total suspended solids (TSS) decreased 2.8%. Biological Oxygen Demand (BOD) increased 3.9%. Total Kjeldahl Nitrogen (TKN) decreased 1.3% in 2021.

PLANT LOADINGS

2021 Industrial loadings (Total, Includes Dairy):

FLOW: 319,748,495 gals
BOD: 4,276,213 lbs
TSS: 1,446,729 lbs
TKN: 233,703 lbs

2021 Dairy Loadings:

194,084,728 gals
3,729,444 lbs
1,135,624 lbs
155,138 lbs

Dairy accounted for:

60.7% of Industrial Flow
78.5% of Industrial TSS
87.2% of Industrial BOD
66.4% of Industrial TKN

Dairy COD strengths for whey are as follows:

FAGE	Euphrates	Blended
(mg/L)	(mg/L)	(mg/L)
59,287	110,846	63,081

FAGE's yogurt product creates a relatively low COD strength whey byproduct.
Euphrates' feta cheese product creates a relatively higher COD strength whey byproduct.

CAST

Contact Adsorption Settling Thickening Project (CAST) continues to significantly reduce the overall wastewater load on the facility's Aeration System. During 2021:

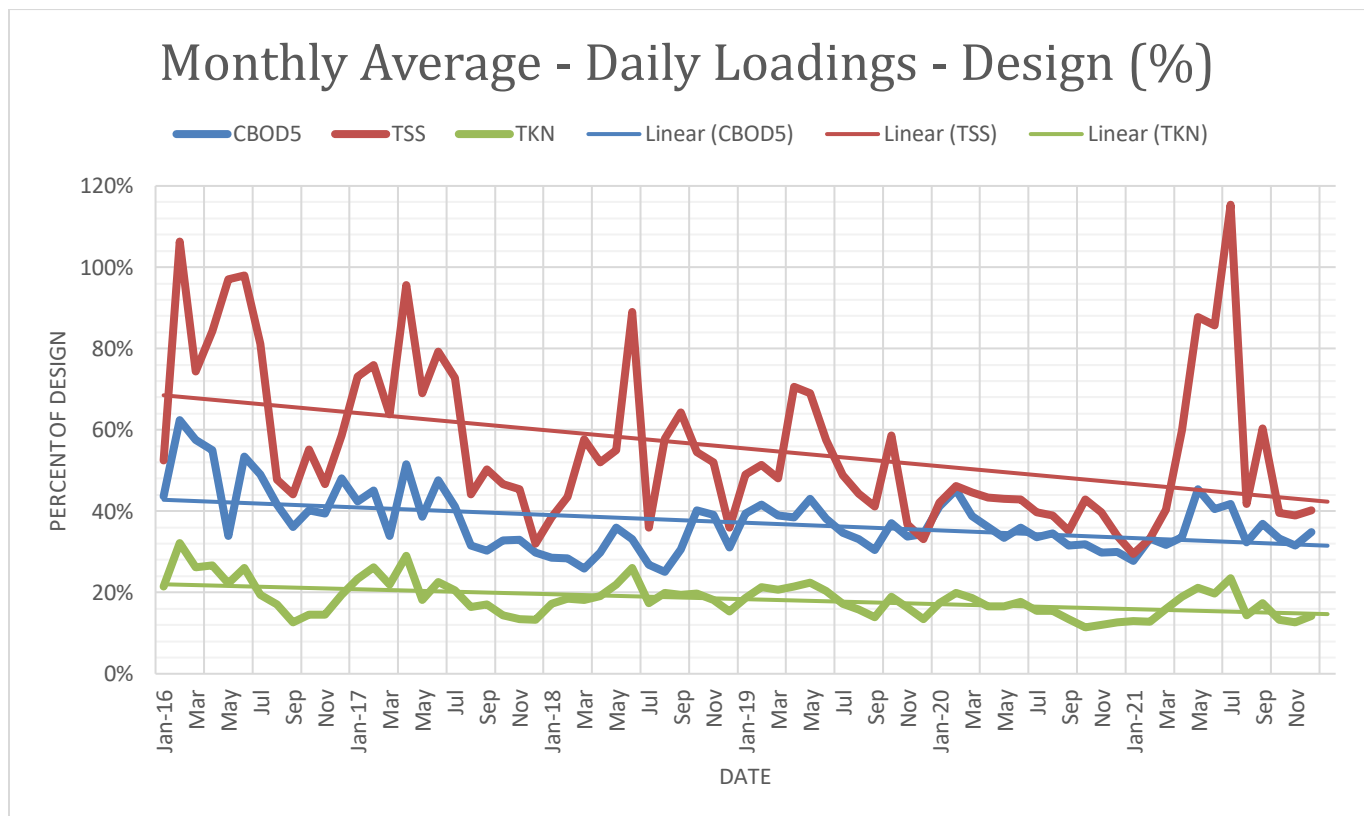
CAST removed 41% of the dairy washwater COD load and 43% of the TSS load.

Facility

Comparison of Facility's 2021 Total Plant Daily loadings relative to Design Loads:

- 1) CBOD daily loadings (lbs/d), averaged monthly, equaled 35.3% of GJJWTF's designed CBOD load. May was highest at 45.3% of design load. January was lowest at 27.8% of design load.
- 2) TSS daily loadings (lbs/d), averaged monthly, equaled 56.1% of GJJWTF's designed TSS load. July was highest at 115% of design load. January was lowest at 29.5% of design load.
- 3) TKN daily loadings (lbs/d), averaged monthly, equaled 16.4% of GJJWTF's designed TKN load. July was highest at 23.6% of design load. November was lowest at 12.6% of design load.

Since the Wastewater Plant continues to operate below its design loadings, GJJWTF can accept future wastewater loads from the community at large and/or new industries/businesses, as well.



LEGAL/MISCELLANEOUS

The Gloversville-Johnstown Joint Sewer Board (GJJSB) continued contracting for legal services from the Glens Falls based law firm Miller, Mannix, Schachner, & Hafner, LLC (MMSH). MMSH specializes in environmental issues.

ENVIRONMENTAL

Enforcement of the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) permit continues. This stringent effluent permit regulates the discharge limits of a multitude of parameters measured on a daily, weekly, monthly and/or annual basis.

GJJWTF reported no non-compliance events in 2021.

GJJWTF exercised two (2) NY-Alert Notifications during 2021.

On June 2, 2021, a pipe broke in the Sludge Building's heating system causing a loss of approximately 40-gallons of water/antifreeze to a storm drain.

On September 8, 2021, the plant disconnected twice from the electrical grid resulting in a loss of power and disruption of UV disinfection.

OPERATIONS

The year-to-year removal efficiency rates for the GJJWTF are as follows:

Parameters	2015	2016	2017	2018	2019	2020	2021
Total Suspended Solids	97%	98%	95%	97%	97%	97%	98%
Biochemical Oxygen Demand	99%	99%	98%	98%	98%	98%	98%
Total Kjeldahl Nitrogen	92%	92%	91%	93%	92%	93%	93%

As shown in the Table, the TSS and BOD removal efficiencies are greater than the permitted removal rate of 85% prior to discharge to the Cayadutta Creek.

Belt Filter Presses (BFPs) operated 3,595 hours producing 19,279 wet tons of sludge (14.6%, ↑). During 2021, sand and/or dried sludge was blended into the sludge cake to meet the minimum 20% solids landfill disposal requirement.

Together, the BFPs and Gravity Belt Thickeners (GBTs) utilized 50,100 pounds of polymer (35.4%, ↑). In addition, the BFPs used another 5,308 gallons of an emulsion polymer (35.2%, ↓) to enhance sludge dewaterability.

GJJWTF purchased 32,270 gallons of Ferrous Chloride (3.9%, ↓) to control sulfides at the anaerobic digesters. GJJWTF also purchased 36,484 therms of Natural gas to heat various buildings (11.9%, ↑).

BACKFLOW PREVENTERS

Adirondack Mechanical Corporation tested all backflow preventers on-site. One backflow preventer failed and was replaced. Nine (9) backflow preventers keep the Facility's effluent from entering and contaminating the City's drinking water supply. Currently, all backflow preventers passed the annual inspection.

SULFA-TREAT VESSEL

Precision Industrial Maintenance removed and discarded the spent media (IP4 from NiChem Company) which scrubbed the digester gas of hydrogen sulfide gas. The IP4 media lasted from 9/25/20 to 12/2/21 or 434 days.

LEACHATE

GJJWTF processed 13.3 million gallons of leachate in 2021. This represented an 8.9% decrease compared to 2020. The Fulton County Landfill pumps leachate to the facility via a dedicated six (6) mile long force main.

RENEWABLE ENERGY – CLIMATE CHANGE

The Dairy Industry pumped **30,747,081 gallons of whey** via a dedicated pipeline directly to two (2) whey storage tanks located at GJJWTF. From these tanks, operators pump the whey at a constant feed rate to the anaerobic digesters. Then, anaerobic bacteria break down the whey and expire large quantities of digester gas (~ 54% Methane and 43% Carbon Dioxide).

A direct result of GJJWTF's cogeneration philosophy is the significant reduction towards our **carbon footprint and our contribution to climate change**. The Anaerobic Digesters produced **173.2 million cubic feet** of biogas from the whey, CAST Settleable Solids, Primary Sludge and Waste Activated Sludge.

GJJWTF's biogas generators combusted 68.3% of this biogas to generate **5.84 million kilowatt hours** of electricity. In terms of climate change, our electrical production meant that less energy was required from fossil fueled power plants.

The biogas generators (COGEN-1, COGEN-2 and COGEN-3) are rated at 1.10 megawatts. GJJWTF generated 5,842,258 KW (4.4%,↓), sold 677,923 KW (47.7%,↓) and purchased 503,257 KW (65.4%,↑). GJJWTF consumed 5,667,592 KW (9.2%,↑).

13.2 kV Power Cable Project

The Gloversville Johnstown Joint Wastewater Facility contracted High Voltage Electric Service, Inc. (HVES) when GJJWTF experienced a power failure on April 29, 2021. GJJWTF immediately started both onsite emergency generators, the 50 KW and 650 hp generators. In order to get power to the Primary Building, the Fulton County Emergency Management Office loaned GJJWTF two (2) 50 KW emergency generators.

Cause of Failure - The Orangeburg pipe installed in 1970 had flaked and swelled from groundwater infiltration causing a duct bank collapse and a total facility electrical power failure. Orangeburg pipe has a life expectancy of 30 years, but failed after 51 years of service. The only good duct bank remaining was under Union Avenue from the manholes on either side of the road going up to the Screening Building. This section of duct work was reused. Approximately 1,800 feet of duct bank and electrical cables were replaced along with a compromised manhole by the pipe bridge which was severely cracked with 2-inch cracks and a bad floor. The duct work from the Main Electric Manhole by the Main Substation to each of the two feeders was also replaced. A new 200-amp break elbow was installed on either side of the Union Avenue's duct bank. In the future, this duct could be replaced without having to replace the entire length of electrical cables.

On May 4, 2021, the repair plan was finalized to enable the work to commence since time was of the essence. Repairs continued through May 11. New fuses on both 13.2 kV switches and spare fuses were installed. Both primary disconnects were tested. All cables in all manholes were fire-wrapped. Each feeder in every manhole was labeled for ease of future identification. On May 21, the Screening Building transformers, TC-1 and TC-7 were energized. Once loads were applied, the voltage and phase rotation were verified to be correct.

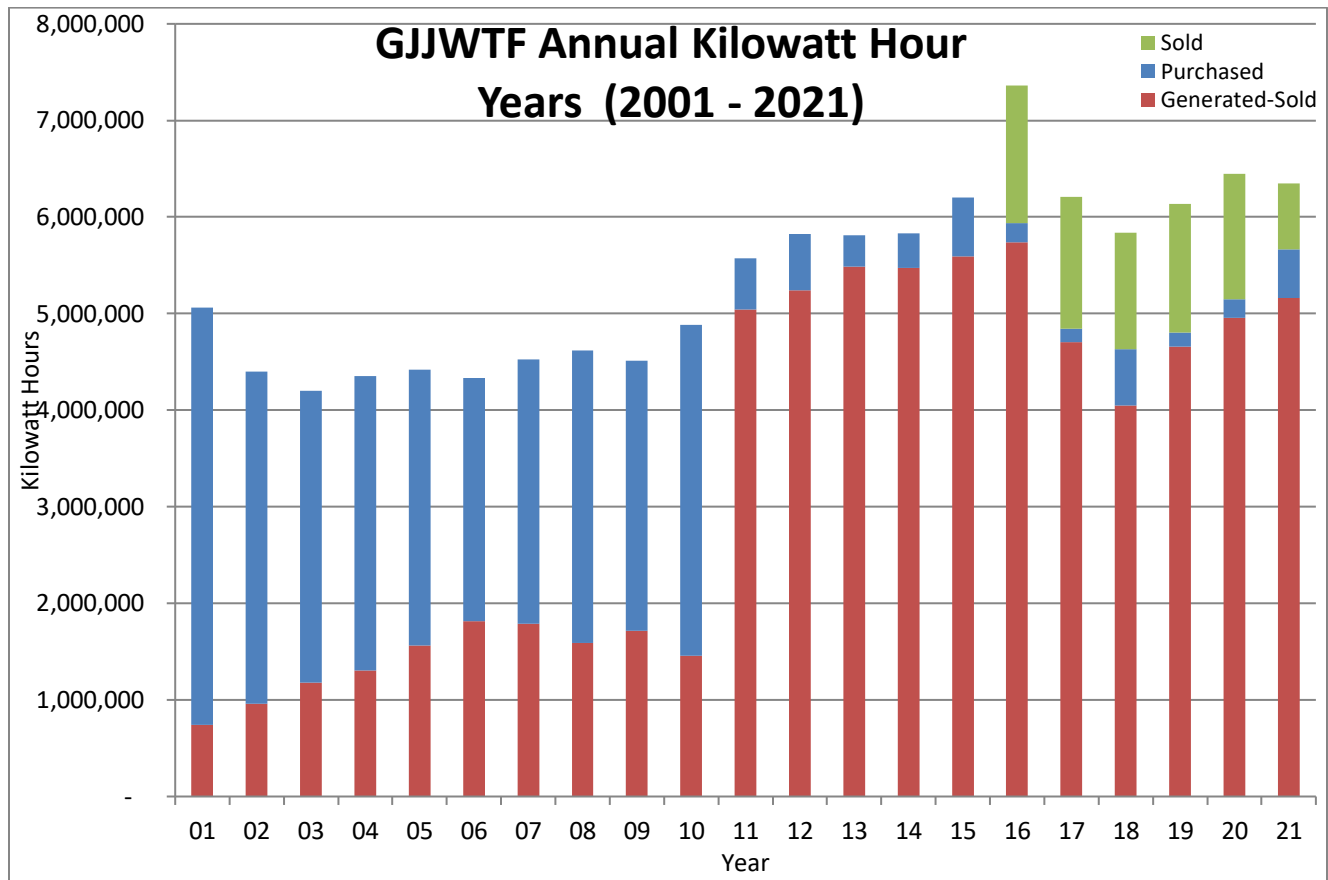
On May 25, 2021, the Primary Building transformer XF-11 was energized. Again, loads were applied, the voltage and phase rotation verified to be correct. On May 26, site cleanup and labeling of all cables and manhole grounds began. On May 27, plant drawings were updated to reflect the new duct bank's routing and cable pathways.

From May 26 to June 16, Stephen Miller General Contractors, a subcontractor to HVES continued on site cleanup, back filling trenches, and replacing any removed asphalt. A new bore hole for signal cables under Union Avenue was successfully completed. All work was completed June 16, 2021. The total cost of the 13.2 kV Power Cable Replacement Project was \$897,241. The facility's electrical infrastructure should last another 50 years.

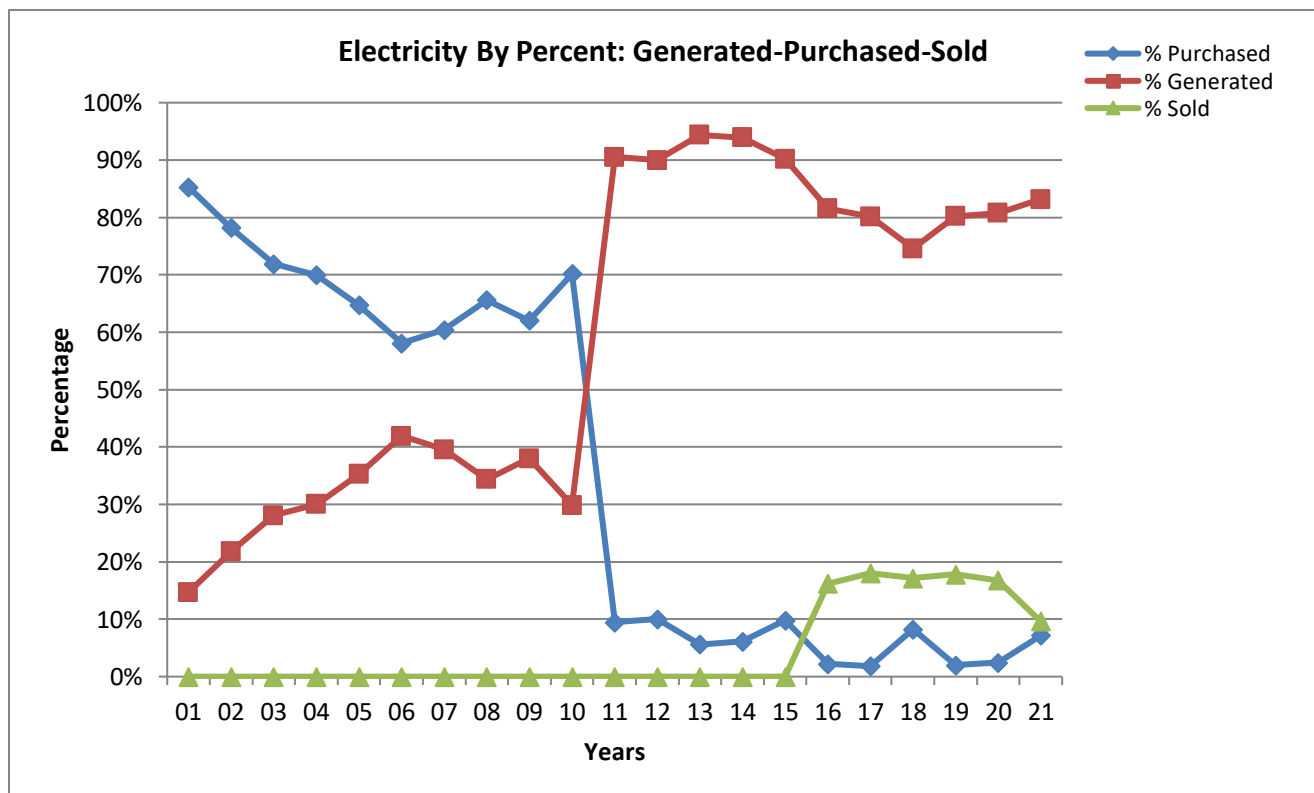
ULTRA-VIOLET (UV) DISINFECTION PROJECT

In 2021, the UV Disinfection system successfully operated from May 1 to Oct 31 per GJJWTF's SPDES Permit. No Notice of Violation (NOV) was issued for high fecal coliform concentrations. However, there were (2) New York Alert declared for loss of power as described earlier in this report. UV Disinfection started on May 1, 2020. This completes UV's second year of operation.

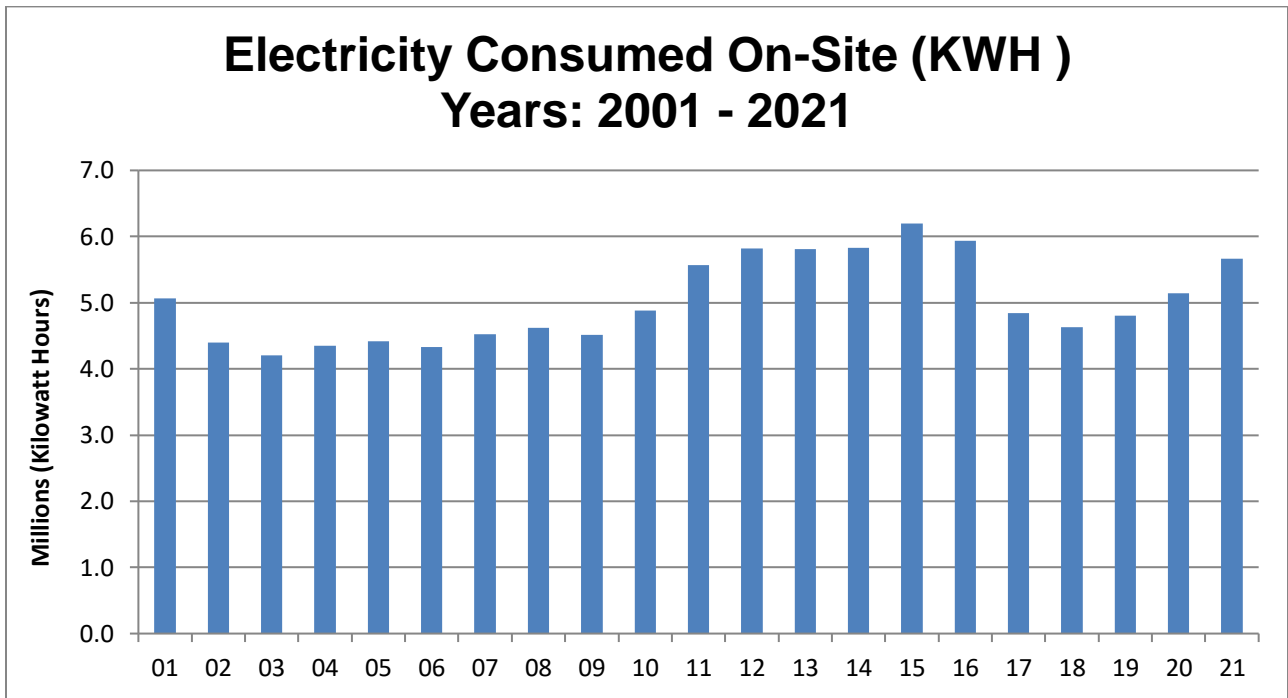
Electricity Profile at GJJWTF:



“Green” Power Profile Curve (Percent):



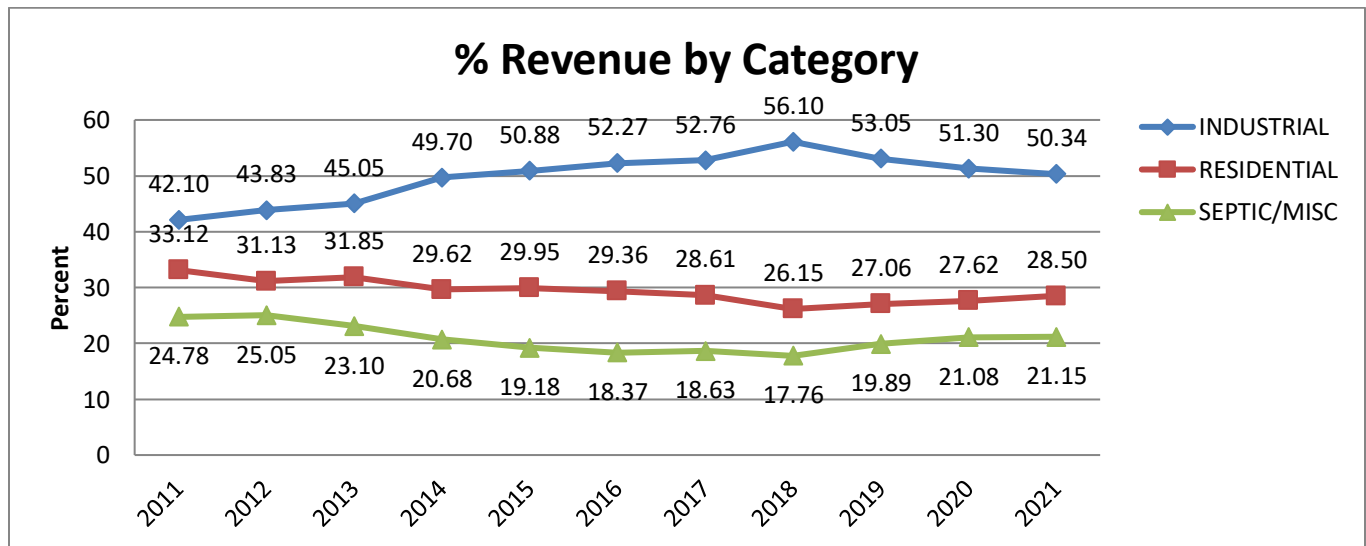
Annual Electrical Power Consumption at GJJWTF:



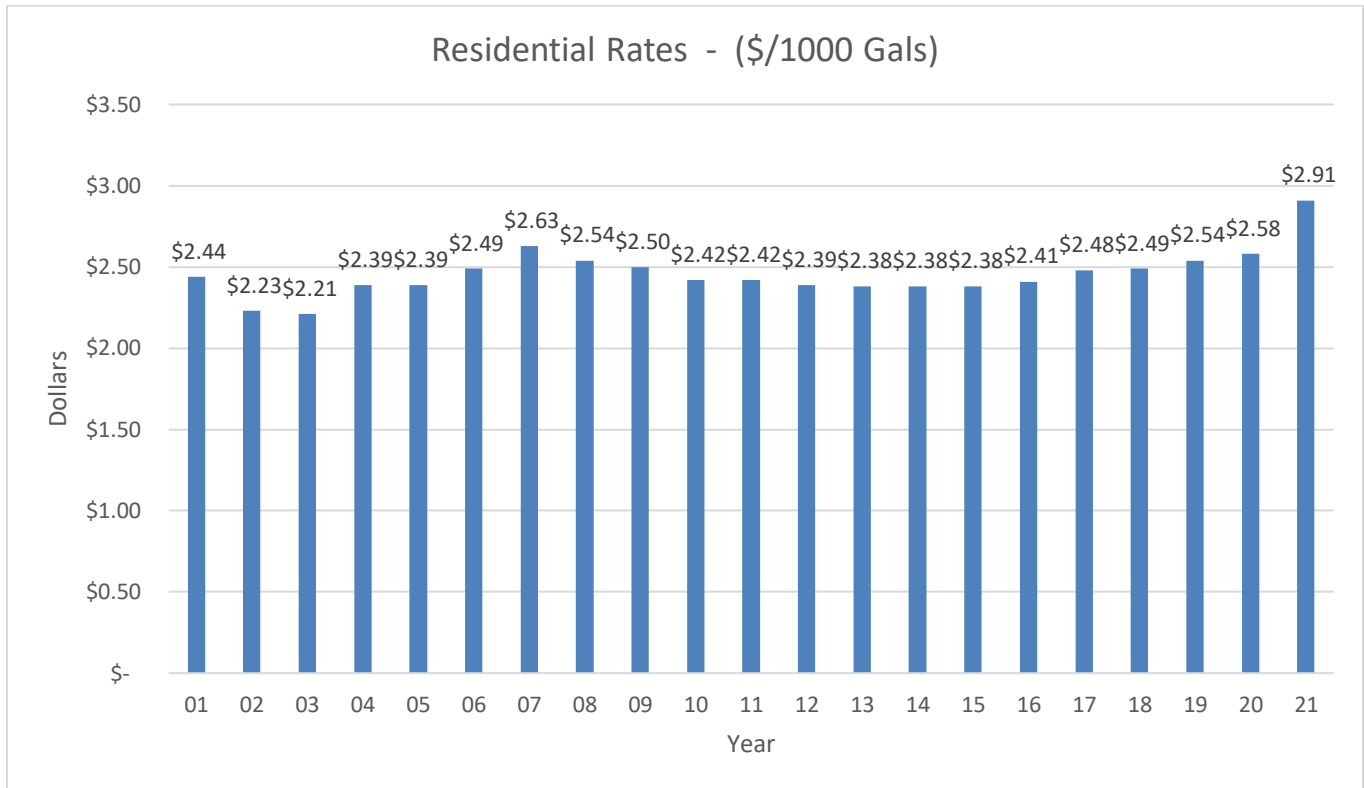
FINANCE OFFICE

The 2020 Financial Audit Summary from Bollam, Sheedy, Torani & Co. disclosed no issues of noncompliance, and no alternative procedures or corrective actions were suggested.

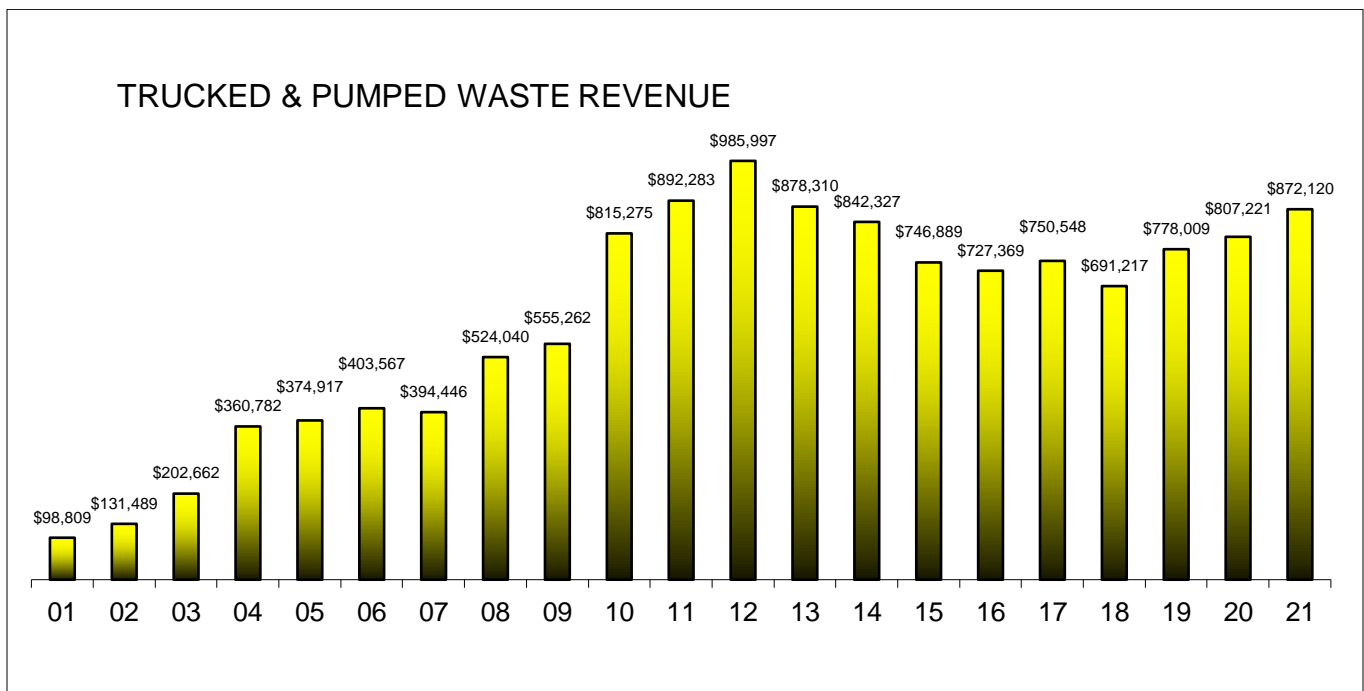
O&M revenues totaled \$4.3 million during 2021. The Industrial contribution was 50.3%, Residential 28.5%, and Trucked/Pumped waste and miscellaneous revenue totaled 21.2%.



Residential rates have remained low since 2001.



Continued marketing to make surrounding communities and entities aware of what our facility has to offer proved beneficial during 2021. For 2021, trucked & pumped waste receipts totaled \$872,120. The single largest trucked waste contract was Adirondack Septic.



Sewer Rates

Sewer rates were adopted after a public hearing. Household sewer rates increased 11%.

INDUSTRIAL USE

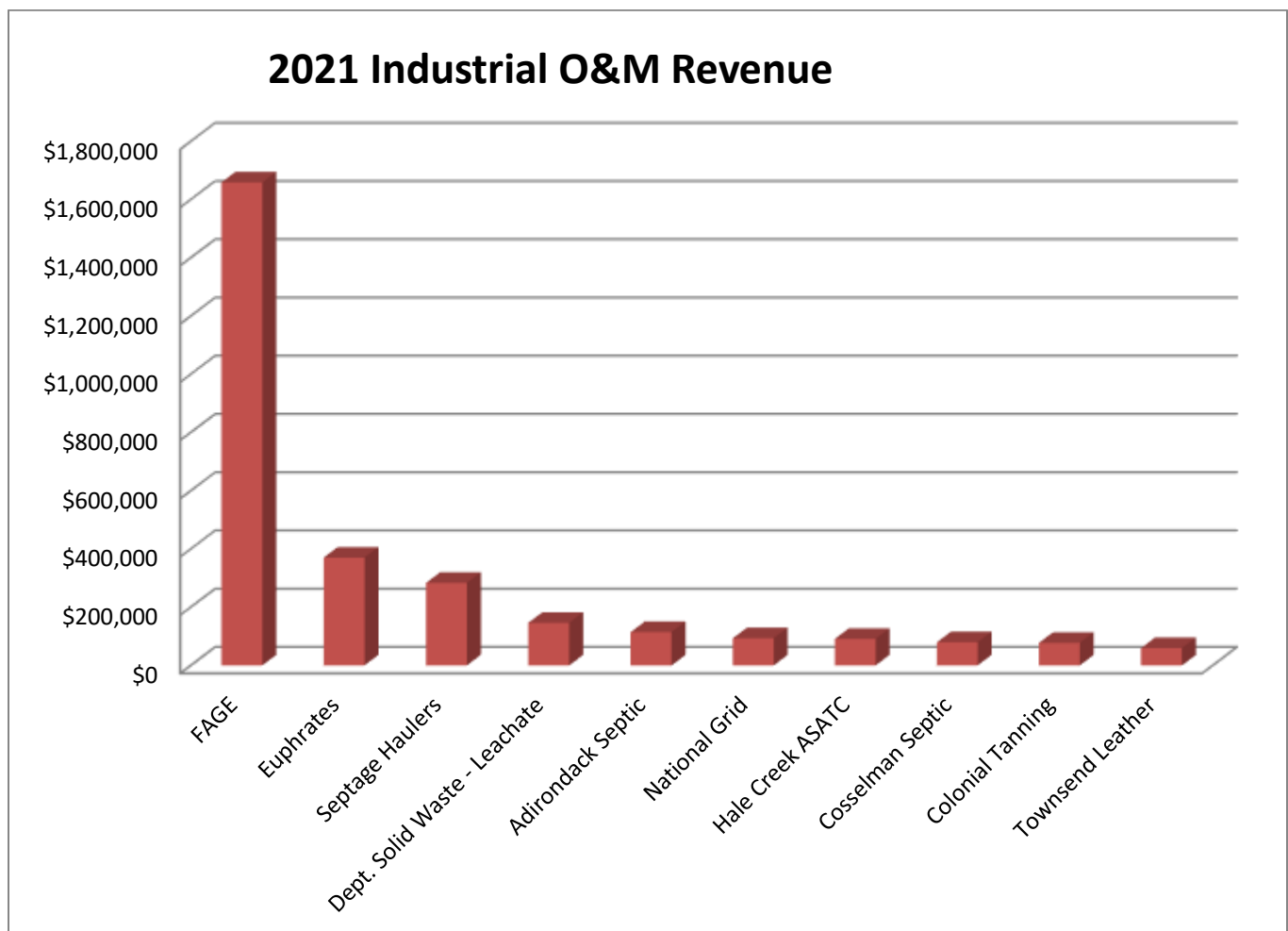
O&M revenue from industrial users increased 4.6% in 2021.

Dairy Industry accounted for the top two (2) facility users. FAGE USA Dairy Industry, Inc. continued as the Number 1 user and Euphrates Inc. as the second largest user.

Septic Haulers as a group are the third largest user of the wastewater facility. Two (2) trucked waste accounts (Adirondack Septic and Cosselman Septic) in order of rank are part of the Septic Haulers category.

The leather Industry is represented by two companies (Colonial Tanning and Townsend Leather) listed as top revenue producers.

Fulton County Department of Solid Waste, Hale Creek ASATCA and National Grid remediation site round out the top largest customers of the facility in 2021.



13.2 KV Orangeburg Pipe Duct – Sample



13.2 KV Project



Gloversville Student Tour



Cleaning Whey Tank



2022 Maverick AWD – Added to Fleet

