

DOCKET NO. D-2010-040-2

DELAWARE RIVER BASIN COMMISSION

**Vicinity Energy Philadelphia Inc.
Industrial Wastewater Discharge to Surface Water
City of Philadelphia, Philadelphia County, Pennsylvania**

PROCEEDINGS

This docket is issued in response to an application submitted to the Delaware River Basin Commission (DRBC or Commission) by the docket holder on September 28, 2020 (Application) for renewal of the docket holder's discharge of industrial wastewater to surface water and the addition of Reverse Osmosis (RO) reject wastewater and Ultrafiltration (UF) clarifier overflow wastewater to the existing effluent discharge stream. The discharge is permitted by the Pennsylvania Department of Environmental Protection (PADEP) in National Pollutant Discharge Elimination System NPDES Permit No. PA0011657. The PADEP Water Quality Management Permit for the improvements to the docket holder's deionized water treatment system is pending.

The Application was reviewed for approval under Section 3.8 of the Delaware River Basin Compact. The Philadelphia City Planning Commission has been notified of pending action. A public hearing on this project was held by the DRBC on May 12, 2021.

A. DESCRIPTION

1. Purpose. The purpose of this docket is to renew approval of the docket holder's existing discharge of up to 43.6 million gallons per day (mgd) of Non-Contact Cooling Water (NCCW), Steam Condensate and intake screen backwash water generated from the Grays Ferry Cogen Facility (GFCF) and the Tri-Gen Facility (Tri-Gen) which discharges to the Schuylkill River via existing Outfall No. 001 located at Vicinity Energy Philadelphia, the former Schuylkill Generating Station site. This docket also approves the addition of Reverse Osmosis (RO) reject wastewater and Ultrafiltration (UF) clarifier overflow wastewater to the existing effluent discharge stream.

2. Location. The GFCF and Tri-Gen are located on east bank of the Schuylkill River at the intersection of Gray Ferry Avenue and Christian Street in the City of Philadelphia, Philadelphia County, Pennsylvania. The facility will continue to discharge to the tidal portion of the Schuylkill River, in Delaware River Water Quality Zone 4, at River Mile 92.47 – 5.6 (Delaware River – Schuylkill River).

Specific location information has been withheld for security reasons.

3. **Area Served.** The project discharge is generated by the Vicinity Energy Philadelphia electric generating and cogenerating facilities that discharge NCCW, Steam Condensate, intake screen backwash discharge, RO reject wastewater and UF clarifier overflow wastewater.

For the purpose of defining the Area Served, Section B (Type of Discharge) and D (Service Area) of the docket holder's Application are incorporated herein by reference, to the extent consistent with all other conditions contained in the DECISION Section of this docket.

4. **Design criteria.** The surface water withdrawal Intake No. 1 and discharge Outfall No. 001 for GCFC and Tri-Gen are located on the former Schuylkill Generation Station Site. The intake features are described in Docket No. D-1964-074-3. The travelling intake screen is backwashed intermittently and discharges back to the Schuylkill River via Outfall No. 001. The GCFC is a combined heat and electric cogenerating facility utilizing a once-through cooling water system. Tri-Gen is a steam heat production facility. NCCW for Tri-Gen and the GCFC is withdrawn from the Schuylkill River and is directed back to the Schuylkill for discharge through Outfall No. 001. The primary use for the NCCW is the condensers serving the electric generation cycle at the GCFC. NCCW is also used to cool mechanical equipment at the GCFC (water feed pumps for the boiler) and Tri-Gen (fans for the boiler). The amount of water used by Tri-Gen is less than the GCFC.

The docket holder proposes to improve its deionized water treatment system used for the creation of steam. The combined heat and power process (GCFC) is a highly efficient use of natural gas to create both electricity and steam. The docket holder also operates gas-fired boilers (Tri-Gen) to provide supplemental steam when needed. The new deionized water treatment system will be more reliable, more cost effective, and will reduce chemical use & discharge. The new system will replace city water use with an incremental additional withdrawal from the docket holder's Schuylkill River water intake. Reverse Osmosis (RO) reject water and Ultra Filtration (UF) clarifier overflow will be combined with the existing effluent discharge. The docket holder will not discharge RO reject nor UF clarifier overflow to the river when non-contact cooling water flow is below 12 MGD. Makeup water to the steam system must be deionized to avoid corrosion and protect equipment. Steam generated by the deionized water is sent to customers' buildings through the district energy system to provide them with steam heat. The deionization system is designed to produce 2,000 gallons per minute (gpm) of deionized water. This is sized to meet the docket holder's needs under most operating conditions. When supplemental deionized water is needed, it will be supplied using the existing system using city water supplied by PWD. Average operation will be lower than the project's design capacity. At design conditions, the system will use 3,038 gpm of incoming water, with 7% of the water entering the UF used to backwash accumulated solids, and 30% of the water entering the RO used to reject accumulated salts. After the steam's thermal energy is used, condensate water is discharged to drains at the customers' locations, collected through the Philadelphia Water Department (PWD) sewer system.

The GFCF and Tri-Gen also receive process and/or potable water from the Philadelphia Water Department (PWD). That water stream is segregated from the water stream associated with Intake No. 1 and is conveyed to the City of Philadelphia's collection system, which ultimately is discharged to the Water Quality Zone 4 via the PWD Southwest wastewater treatment plant (WWTP), approved by DRBC Docket No. D-70-53 CP and NPDES Permit No. PA0026671.

5. Facilities.

5.1 GFCF. The GFCF consists of a dry low-nitrogen oxide combustion turbine, a natural gas-fired heat recovery steam generator, a single case steam turbine, and an auxiliary boiler whose combined power output is approximately 173 mega-watt (MW).

5.2 Tri-Gen. The Tri-Gen facility currently consists of two boilers rated 795 and 761 million Btu per hour, providing steam only to local customers for heating. Tri-Gen was formerly a steam and electric generation plant. The electric generating capacity was removed in 2008.

Wasted sludge will be hauled off site for disposal in accordance with NPDES Permit No. PA PA0011657.

6. Water withdrawals. The potable water supply in the project service area is supplied by the PWD. Process water is supplied by the PWD and the docket holder. The water withdrawal from the Schuylkill River is described in detail in Docket No. D-1964-074-2.

7. NPDES Permit / DRBC Docket. NPDES Permit No. PA0011657, issued by the PADEP includes effluent limitations for the existing discharge to surface waters designated by DRBC as Delaware River Water Quality Zone 4 and by PADEP as supporting migratory fishes (MF) and warm water fishes (WWF). EFFLUENT TABLES C-1 & C-2 included in Section C. DECISION Condition C.1. of this docket contain effluent requirements for DRBC parameters that must be met as a condition of this approval.

NCCW and steam condensate discharged from GFCF and Tri-Gen is internally monitored at Monitoring Point M.P. 301 prior to comingling with the travelling screen backwash for discharge to the Schuylkill River via Outfall No. 001.

The RO reject water and UF clarifier overflow will discharge to new monitoring point MP-401. That is an internal monitoring point, prior to combining with NCCW and discharge through the existing discharge structure and existing Outfall No. 001.

8. Relationship to the Comprehensive Plan. The project discharge was included in the Comprehensive Pan via Docket No. D-2010-040 CP-1 on May 11, 2011. As this is a private project, continuation of the project discharge in the Comprehensive Plan is not required. This docket (D-2010-040-2) removes the project from the Comprehensive Plan.

B. FINDINGS

The purpose of this docket is to renew the approval of the docket holder's existing discharge of up to 43.6 mgd of NCCW and intake screen backwash water from the existing SGS. The NCCW is generated by steam, heat, and electricity generating operations at Tri-Gen and the GFCF.

1. Ownership

On December 30, 2019, Antin Infrastructure Partners finalized its purchase of Veolia North America's district energy assets in the United States. Now officially named Vicinity Energy, the district energy business is comprised of steam, hot and chilled water and electricity production plants, including cogeneration, across 13 networks in 10 major cities.

2. Temperature

Zone 4 stream quality objectives for temperatures require that discharges shall not result in an induced temperature increase of 5°F (2.8°C) above the average 24-hour temperature gradient displayed during the 1961-1966 period, or a maximum of 86°F (30.0°C), whichever is less, which temperatures shall be measured outside of designated heat dissipation areas (HDAs). The Commission's Interpretive Guideline No. 1 also requires an effluent limitation of 110°F (43.3°C) where the discharge is readily accessible to human contact for the protection of Public Safety.

The docket holder provided the modeling study "Heat Dissipation Study, Vicinity Energy Schuylkill Outfall" dated January 21, 2020 (the Study) to the DRBC which presents a model of the thermal influence of the discharge of effluent from Outfall No. 001 on the Schuylkill River and demonstrates whether the existing discharge meets the effluent quality requirements for temperature in Section 4.30.6 of the Commission's Water Quality Regulations.

The Report indicates that at an ambient Schuylkill water temperature of 81 degrees Fahrenheit (°F), a constant effluent temperature of 96.8 °F, a constant effluent flow of 43.6 mgd (67.5 cfs), and a 7Q10 flow condition in the Schuylkill of 246 cfs, the model application scenario predicted an HDA extending 290 ft in the downstream direction and 490 ft in the upstream direction. Further, the model scenario predicted the HDA could extend across the water surface to the opposite bank approximately 5-10% of the time. As a result, the maximum HDA width is equivalent to the maximum channel width of approximately 400 ft at the discharge location. However, the model application scenario predicted the HDA would not occupy more than 25% of the total cross-sectional area of the river at the discharge location.

The study shows that the location and size of the thermal plume is typically transient and dynamic in response to tidal conditions. Under typical flow conditions, freshwater flow pushes the plume in a downstream direction, resulting in more rapid mixing and less penetration of the plume across the river channel. Under low-flow conditions corresponding to the 7Q10, the discharge momentum carries the plume across the channel at the surface, but the plume does not

extend across the river channel below the surface. At depths greater than four feet, the plume is typically limited to less than 150 ft across the channel.

The position of the plume is dynamic. During the majority of the model application scenario, the plume does not extend across the entire width of the river. Approximately 50% of the time, the plume extends no more than two-thirds of the way across the river channel. The HDA, as defined by the position of the thermal plume shown in this model application, is dynamic, limited to 490 ft in the upstream direction, limited to 290 ft in the downstream direction, limited to the surface of river, and constitutes no more than 25% of the river cross-section.

Based on the assumptions and conditions described in the study, the study shows the discharge of wastewater will not increase the median ambient temperatures of the receiving waters by more than 5°F above the average 24-hour temperature gradient displayed during the 1961-1966 period, nor will such discharge result in stream temperatures exceeding 86°F, except within an assigned heat dissipation area consisting of 780 ft by 266 ft (length by width), or 490 ft in the upstream direction, 290 ft in the downstream direction, and 266 ft across the Schuylkill River and including the exceptions noted above under the modeled flow scenario.

An addendum to the Study was submitted to the DRBC on March 8, 2021 wherein the docket holder reports that the model was re-run at an alternate Schuylkill River 7Q-10 flow of 388 cfs. When the Schuylkill River flow is 388 cfs, the dimensions of the HDA produced from the model are reduced. The upstream extent, the downstream extent, and the cross-river extent of the thermal plume are all reduced. The upstream extent is reduced by approximately 100 feet to 390 feet, the downstream extent is reduced by approximately 30 feet to 260 feet, and the cross-river extent is reduced by approximately 30 feet to 370 feet. Using a river flow of 388 cfs, the HDA no longer extends the full width of the river at the river's surface.

In summary, under the lowest flow conditions (246 cfs), the HDA for the thermal discharge from Outfall 001 of the docket holder's facility is 780 ft by 266 ft (length by width), or 490 feet in the upstream direction, 290 feet in the downstream direction, and 266 feet across the Schuylkill River except as noted above under the modeled flow scenario.

3. RO and UF Discharges

The docket holder shall not discharge RO reject water nor UF clarifier overflow to the NCCW waste stream or Schuylkill River when NCCW flow measured prior to the addition of RO reject water and UF clarifier overflow is below 12 MGD in accordance with Section C. DECISION Condition C.3.

4. Future Discharge Flow

Prior to the docket holder initiating operations that will result in an average monthly discharge greater than the approved 43.6 mgd or initiating construction of additional generating units at the docket holder's facilities that will require a discharge of process or cooling water exceeding an average monthly discharge of 43.6 mgd, an application for modification must be submitted to and approved by the Commission. (see Section C. DECISION Condition C.24.).

5. Other Findings

GFCF provides electric generating capacity to the Independent System Operator (PJM). Per PJM, "capacity represents a commitment of resources to deliver when needed, particularly in case of a grid emergency." GFCF is obligated to make available, and provide, as dispatched by PJM, full plant electric output during grid capacity shortages and transmission security events. The docket holder has requested a limited exemption from the new temperature and thermal discharge limitations provided in Section C. DECISION Condition C.1. Effluent Table C-1 (98 °F 30-day rolling average and 250 MMBtu/hr or greater for more than 7 consecutive days) when needed to meet GFCF's capacity obligations to PJM. The limits do not apply if GCFC unit is needed to support electric grid dispatch and reliability provided that the docket holder notifies DRBC of the occurrence and provides evidence that the exceedance is because of GCFC meeting capacity obligations to PJM. The discharge from Outfall 001 shall not exceed 110 °F at any time.

The Schuylkill River is tidal at the point of withdrawal and discharge from the docket holder's facilities. Using the United States Geological Survey (USGS) Streamstats program, Commission staff estimate that the Q7-10 flow (lowest 7 consecutive day flow in a 10-year period) of the Schuylkill River is 388 cubic feet per second (cfs) or 250.8 mgd at the point of withdrawal and discharge. The thermal evaluation described above utilized the more conservative Q7-10 estimate of 246 cfs.

The Delaware River is tidal at the point of discharge. There are no surface water intakes of record for public water supply downstream of the docket holder's discharge. The nearest upstream surface water intake of record for public water is operated by the Philadelphia Water Department and is located on the Schuylkill River approximately 5 river miles upstream of the project discharge.

The project does not conflict with the Comprehensive Plan and is designed to prevent substantial adverse impact on the water resources related environment, while sustaining the current and future water uses and development of the water resources of the Basin.

The limits in the NPDES Permit for the existing discharges conform with Commission effluent quality requirements, where applicable.

The project is designed to produce a discharge meeting the effluent requirements as set forth in the Water Quality Regulations (WQR) of the DRBC.

C. DECISION

Effective on the approval date for Docket No. D-2010-040-2 below, the project described in Docket No. D-2010-040 CP-1 is removed from the Comprehensive Plan; Docket No. D-2010-040 CP-1 is terminated and replaced by Docket No. 2010-040-2. The project and appurtenant facilities as described in Section A of this docket are approved pursuant to Section 3.8 of the *Compact*, subject to the following conditions:

Monitoring and Reporting

1. The docket holder shall comply with the requirements contained in the EFFLUENT TABLES below. The docket holder shall submit the required monitoring results electronically to the DRBC Project Review Section via email aemr@drbc.gov on the **Annual Effluent Monitoring Report Form** located at this web address: <https://www.nj.gov/drbc/programs/project/docket-app-info.html#3>. The monitoring results shall be submitted annually, absent any observed limit violations, by January 31. If a DRBC effluent limit is violated, the docket holder shall submit the result(s) to the DRBC within 30 days of the violation(s) and provide a written explanation that states the action(s) the docket holder has taken to correct the violation(s) and protect against any future violations. The following average monthly effluent limits are among those listed in the NPDES Permit and meet or are more stringent than the effluent requirements of the DRBC.

EFFLUENT TABLE C-1: DRBC Parameters Included in NPDES Permit

OUTFALL 001 (Water Quality Zone 4 Schuylkill River)		
PARAMETER	LIMIT	MONITORING
pH (Standard Units)	6 to 9 at all times	As required by NPDES Permit
Intake Water Temperature	Monitor and Report	Daily with corresponding effluent temperature
Outfall Effluent Temperature	98 °F 30-day rolling average*	Daily with corresponding influent temperature
	110 °F maximum instantaneous	
Heat Rejection	250 MMBtu/hr or greater for more than 7 consecutive days*	Daily with Temperature
Total Dissolved Solids	1,000 mg/l	Monthly

* Limit does not apply if GCFC unit is needed to support electric grid dispatch and reliability provided that the docket holder notifies DRBC of the occurrence and provides evidence that the exceedance is because of GCFC meeting capacity obligations to PJM.

The following effluent limits are among those listed in the NPDES Permit and meet or are more stringent than the effluent requirements of the DRBC.

EFFLUENT TABLE C-2: DRBC Parameters Included in NPDES Permit

Monitoring Point MP-301 for effluent prior to backwash discharge		
PARAMETER	LIMIT	MONITORING
pH (Standard Units)	6 to 9 at all times	As required by NPDES Permit
Total Suspended Solids	30 mg/l	As required by NPDES Permit

2. Effluent Table C-1 requires that daily influent and effluent temperature monitoring be measured and recorded and that daily calculations of parameters related to influent and effluent temperatures be calculated and recorded. However, more frequent influent and effluent temperature monitoring and recording and related parameter calculating is desirable to better understand, manage, and optimize cooling water operations at the facility. The docket holder shall install such temperature monitoring and recording devices capable of monitoring and recording at least hourly Schuylkill River water influent temperatures and corresponding temperatures of effluent being discharged to the Schuylkill River through Outfall 001. The devices shall be installed and operational within 6-months of docket approval.

3. The docket holder shall not discharge RO reject water nor UF clarifier overflow to the NCCW waste stream or Schuylkill River when NCCW flow measured prior to the addition of RO reject water and UF clarifier overflow is below 12 MGD.

4. The discharge of wastewater shall not increase the ambient temperatures of the receiving waters by more than 5°F above the average 24-hour temperature gradient displayed during the 1961-1966 period, nor shall such discharge result in stream temperatures exceeding 86°F, except within an assigned heat dissipation area of 780 ft by 266 ft (length by width), or 490 feet in the upstream direction, 290 feet in the downstream direction, and 266 feet across the Schuylkill River and including the exceptions noted above under the modeled flow scenario.

5. Within 10 days of the date that construction of the project has started, the docket holder shall notify the DRBC of the starting date and scheduled completion date. Within 30 days of the date of project completion, the docket holder shall notify the DRBC of the project completion date.

6. Within 30 days of completion of construction of the approved project, the docket holder is to submit to the attention of the Project Review Section of DRBC a Construction Completion Statement (“Statement”) signed by the docket holder’s professional engineer for the project. The Statement must (1) either confirm that construction has been completed in a manner consistent with any and all DRBC-approved plans or explain how the as-built project deviates from such plans; (2) report the project’s final construction cost as such cost is defined by the project review fee schedule in effect at the time the application was made; and (3) indicate the date on which the project was (or is to be) placed in operation.

7. The docket holder is responsible for timely submittal to the DRBC of a docket renewal application on the appropriate application form including the appropriate docket application filing fee (see 18 CFR 401.43) at least 6 months in advance of the docket expiration date set forth below. The docket holder will be subject to late filed renewal surcharges in the event of untimely submittal of its renewal application, whether or not DRBC issues a reminder notice in advance of the deadline or the docket holder receives such notice. In the event that a timely and complete application for renewal has been submitted and the DRBC is unable, through no fault of the docket holder, to reissue the docket before the expiration date below, the terms and conditions of the current docket will remain fully effective and enforceable against the docket holder pending the grant or denial of the application for docket approval.

Other Conditions

8. Sound practices of excavation, backfill, and reseeded shall be followed to minimize erosion and deposition of sediment in streams.

9. Except as otherwise authorized by this docket, if the docket holder seeks relief from any limitation based upon a DRBC water quality standard or minimum treatment requirement, the docket holder shall apply for approval from the Executive Director or for a docket revision in accordance with Section 3.8 of the *Compact* and the *Rules of Practice and Procedure*.

10. The docket holder may request of the Executive Director in writing the substitution of specific conductance for TDS. The request should include information that supports the effluent specific correlation between TDS and specific conductance. Upon review, the Executive Director may modify the docket to allow the substitution of specific conductance for TDS monitoring.

11. The docket holder is permitted to treat and discharge wastewater as set forth in the Area Served Section of this docket, which incorporates by reference Sections B (Type of Discharge) and D (Service Area) of the docket holder’s Application to the extent consistent with all other conditions of this DECISION Section.

12. The docket holder is prohibited from treating/pre-treating any hydraulic fracturing wastewater from sources in or out of the Basin at this time. Should the docket holder wish to treat/pre-treat hydraulic fracturing wastewater in the future, the docket holder will need to first apply to the Commission to renew this docket and be issued a revised docket allowing such treatment and an expanded service area. Failure to obtain this approval prior to treatment/pre-treatment will result in action by the Commission.

- 13.** The facility and operational records shall be available at all times for inspection by the DRBC.
- 14.** The facility shall be operated at all times to comply with the requirements of the Commission's WQR.
- 15.** If at any time the receiving treatment plant proves unable to produce an effluent that is consistent with the requirements of this docket approval, no further connections shall be permitted until the deficiency is remedied.
- 16.** Nothing herein shall be construed to exempt the docket holder from obtaining all necessary permits and/or approvals from other State, Federal or local government agencies having jurisdiction over this project.
- 17.** The docket holder shall discharge wastewater in such a manner as to avoid injury or damage to fish or wildlife and shall avoid any injury to public or private property.
- 18.** The issuance of this docket approval shall not create any private or proprietary rights in the waters of the Basin, and the Commission reserves the right to amend, suspend or rescind the docket for cause, in order to ensure proper control, use and management of the water resources of the Basin.
- 19.** The docket holder shall be subject to applicable DRBC regulatory program fees, in accordance with duly adopted DRBC resolutions and/or regulations (see 18 CFR 401.43).
- 20.** This approval is transferable by request to the DRBC Executive Director provided that the project purpose and area served approved by the Commission in this docket will not be materially altered because of the change in project ownership. The request shall be submitted on the appropriate form and be accompanied by the appropriate fee (see 18 CFR 401.43).
- 21.** The docket holder shall request a name change of the entity to which this approval is issued if the name of the entity to which this approval is issued changes its name. The request for name change shall be submitted on the appropriate form and be accompanied by the appropriate fee (see 18 CFR 401.43).

22. The Executive Director may modify or suspend this approval or any condition thereof, or require mitigating measures pending additional review, if in the Executive Director's judgment such modification or suspension is required to protect the water resources of the Basin.

23. Any person who objects to a docket decision by the Commission may request a hearing in accordance with Article 6 of the Rules of Practice and Procedure. In accordance with Section 15.1(p) of the *Delaware River Basin Compact*, cases and controversies arising under the *Compact* are reviewable in the United States district courts.

24. Prior to the docket holder initiating operations that will result in an average monthly discharge greater than the approved 43.6 mgd or initiating construction of additional generating units at the docket holder's facilities that will require a discharge of process or cooling water exceeding an average monthly discharge of 43.6 mgd, an application for modification must be submitted to and approved by the Commission.

BY THE COMMISSION

APPROVAL DATE: June 9, 2021

EXPIRATION DATE: June 9, 2026