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DOCKET NO. D-2008-021 CP-4

DELAWARE RIVER BASIN COMMISSION

**Marcus Hook Energy, LP
Cooling Tower Blowdown Discharge
Borough of Marcus Hook, Delaware County, Pennsylvania**

PROCEEDINGS

This docket is issued in response to an application submitted to the Delaware River Basin Commission (DRBC or Commission) on August 1, 2024 (Application), for renewal of the docket holder's existing wastewater treatment plant (WWTP) and its discharge. The Pennsylvania Department of Environmental Protection (PADEP) issued National Pollutant Discharge Elimination System (NPDES) Permit No. PA00244449 for this discharge.

The Application was reviewed for continuation of the project in the Comprehensive Plan and approval under Section 3.8 of the *Delaware River Basin Compact*. The Delaware County Planning Commission has been notified of pending action. A public hearing on this project was held by the DRBC on August 6, 2025.

A. DESCRIPTION

- Purpose.** The purpose of this docket is to renew the approval of the docket holder's existing discharge of up to 4.32 mgd of cooling tower blowdown from the Marcus Hook Cogeneration Facility. This docket also renews approval of a total dissolved solids (TDS) determination for the discharge consisting of an average monthly effluent limit of 5,000 mg/l.
- Location.** The docket holder's WWTP is located on Green Street in the Borough of Marcus Hook, Delaware County, Pennsylvania. The WWTP will continue to discharge cooling tower blowdown directly to Delaware River Water Quality Zone 4 at River Mile 78.7.

The location of the WWTP outfall in the Delaware River Watershed as follows:

OUTFALL NO.	LATITUDE (N)	LONGITUDE (W)
001	39° 48' 23.44"	75° 25' 9.72"

Specific location information has been withheld for security reasons.

3. **Area Served.** The docket holder will continue to discharge process water consisting primarily of cooling tower blowdown from the Marcus Hook Cogeneration Facility, which is a combined cycle cogeneration (steam and electricity) facility located on an approximately 20-acre leased parcel at the Marcus Hook Refinery in the Borough of Marcus Hook, Delaware County, Pennsylvania. Electricity produced by the Marcus Hook Cogeneration Facility will continue to supply the Pennsylvania-New Jersey-Maryland (PJM) grid and steam produced by the Marcus Hook Cogeneration Facility will continue to supply operations at the Refinery. For the purpose of defining the Area Served, the Type of Discharge and the Service Area sections from the docket holder's Application are incorporated herein by reference, to the extent consistent with all other conditions contained in Section C. DECISION of this docket.

4. **Design Criteria.** The Marcus Hook Cogeneration Facility is a nominal 750 megawatt (MW) combined cycle cogeneration facility that produces electricity for the PJM grid and up to one million pounds per hour of steam for use at the Marcus Hook Refinery. The facility discharges up to 4.32 million gallons per day (mgd) of cooling tower blowdown, boiler blowdown, and reverse osmosis (RO) reject water, the majority of which is cooling tower blowdown.

5. **Facilities.** The existing power generating facilities include 3 General Electric 7FA dry low-NOx combustion turbines, 3 supplementary fired heat recovery steam generators (HSRGs), a steam turbine and 4 back-up boilers. The power generating facilities primarily use natural gas for fuel, but the HSRGs and boilers can also use refinery gas as a back-up. Ancillary facilities include power switching equipment, station transformers, a makeup water pre-treatment system, wastewater treatment/pumping equipment, and a closed cycle mechanical draft cooling tower. The facility utilizes Delaware River intake water for cooling tower makeup water. The facility discharge of cooling tower blowdown is essentially Delaware River water in higher concentrations of mineral and dissolved salts than that of the intake water, due to the approximately 2.5 to seven recycle loops in the closed loop cooling tower.

The Marcus Hook facility includes a dichlorination system designed to remove chlorine from cooling tower blowdown prior to its discharge to the Delaware River. The dichlorination system consists of a flow proportional sodium bisulfite feed system that reduces the total residual chlorine concentration of the discharge to acceptable levels.

Sanitary wastewater generated at the Refinery is directed for treatment to the Delaware County Regional Water Quality Control Authority (DELCORA) Western Regional Wastewater Treatment Plant (WWTP). The DELCORA WWTP was most recently approved by the DRBC via Docket No. D-1992-018 CP-4 on March 13, 2019. The Commission has a renewal application for this project and it is currently under review.

6. **Water Withdrawals.** Potable water for the facility is provided by the Chester Water Authority, as described in detail in DRBC Docket No. D-1969-060 CP-1, approved on May 28, 1969. Cooling tower makeup water for the facility is withdrawn from the Delaware River at the docket holder's surface water intake, as described in detail in Docket No. D-2000-044-2, which was approved on February 11, 2009.

7. **NPDES Permit / DRBC Effluent Requirements.** NPDES Permit No. PA00244449 issued by the PADEP includes final effluent limitations for the project discharge of 4.32 mgd to surface waters classified by the PADEP as supporting Warm Water Fishes (WWF) and Migratory Fishes (MF). EFFLUENT TABLE C-1 included in Section C. DECISION Condition C.1. of this docket, contains effluent requirements for DRBC parameters that must be met as a condition of this approval.

8. **Relationship to the Comprehensive Plan.** The docket holder's facility was first approved by the Commission via Docket No. D-2008-021-1 on December 10, 2008. The facility discharges were then incorporated into the DRBC Comprehensive Plan via Docket No D-2008-021 CP-2 on May 10, 2012. This approval was continued in Docket No. D-2008-021 CP-3 on December 11, 2019. Issuance of this docket (D-2008-021 CP-4) will continue the WWTP in the Comprehensive Plan.

B. FINDINGS

The docket holder applied to renew approval of their existing discharge of up to 4.32 mgd of process water, primarily cooling tower blowdown from the Marcus Hook Cogeneration Facility. No modifications to the WWTP are proposed.

1. Heat Dissipation Area

The Marcus Hook Cogeneration Facility discharges cooling tower blowdown directly to Delaware River Water Quality Zone 4 at River Mile 78.7. Section 4.30.6. of the Commission's *Water Quality Regulations (WQR)* contains temperature requirements for Delaware River Basin discharges regulated by the Commission. *WQR* Section 4.30.6.C. requires that discharges to Zone 4 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 (see TABLE B-1 below), or a maximum of 86° F (30.0° C), whichever is less.

**TABLE B-1: Average Daily Temperatures (1961-1966)
(Temperatures may be interpolated)**

DATE	Zone 4 Delaware Estuary from Big Timber Creek to Pennsylvania-Delaware State Line
January 1	42
February 1	36
March 1	40
April 1	47
May 1	58
June 1	72
July 1	80
August 1	81
September 1	78
September 15	76

DATE	Zone 4 Delaware Estuary from Big Timber Creek to Pennsylvania-Delaware State Line
October 1	70
November 1	60
December 1	50
December 15	45

Section 4.30.6.E. of the *WQR* allows for the limitations above to be exceeded in thermal mixing zones, referred to as heat dissipation areas (HDAs), to be designated by the Commission on a case-by-case basis, subject to the following dimension limits in Zone 4 as defined in 4.30.6.E:

- a. *Maximum Length.* As a guideline, heat dissipation areas shall not be longer than 3500 feet, measured from the point where the waste discharge enters the stream.
- b. *Maximum Width.* Heat dissipation areas shall not exceed a maximum width of two-thirds the surface width measured from shore to shore at any stage of tide. Within any one heat dissipation area, only one shore shall be used in determining the limits of the area.
- c. *Maximum Cross-section.* Heat dissipation areas shall not exceed a maximum of one-quarter of the cross-sectional area of the stream.

During the review of DRBC Docket No. D-2008-021-1, the docket holder provided an analysis demonstrating that a thermal mixing zone of 144 feet was required to meet the temperature requirements of *WQR* Section 4.30.6. conditional upon the discharge not exceeding a temperature of 95°F. The docket holder requested an HDA consisting of a radius of 200 feet around Outfall No. 001, which was granted by DRBC Docket No. D-2008-021-1 and continues herein (See DECISION Conditions C.1. and C.3).

2. **BOD and CBOD₂₀ Wasteload Allocation**

The Commission's *WQR* provide for the allocation of the stream assimilative capacity where waste discharges would otherwise result in exceeding such capacity. It was determined in the 1960's that discharges to the Delaware Estuary be limited to a total of 322,000 lbs/day of carbonaceous biochemical (first stage) oxygen demand (CBOD₂₀). In accordance with the *WQR*, the assimilative capacity of each Delaware Estuary zone minus a reserve was originally allocated in 1968 among the individual dischargers based upon the concept of uniform reduction of raw waste in a zone (Zones 2, 3, 4 and 5). The totals and percent reduction for each zone are given in Table 1 of the Commission's *Status of CBOD₂₀ Wasteload Allocations* (Revised October 1, 2000). The Trainer Refinery and its IWTP discharge are located in Water Quality Zone 4 at River Mile 78.4. Zone 4 is allocated at 91,000 lbs/day of CBOD₂₀ and has a minimum percent removal requirement of CBOD₂₀ of 89.25%.

The Commission approved a CBOD₂₀ allocation for the docket holder's discharge consisting of 1,082 lbs/day from Outfall No. 001 via Docket No. D-2008-021-1 on December 10, 2008, which was continued in Docket No. D-2008-021 CP-2. Docket No. D-2008-021 CP-2 required the docket holder to monitor Outfall No. 001 quarterly for CBOD₅ and CBOD₂₀. Effluent monitoring since 2012 indicated that the cooling tower discharge from Outfall No. 001 does not contain BOD. The only BOD generated at the facility is sanitary wastewater generated at the Refinery that is directed to the DELCORA WWTP for treatment and discharge.

Since the facility and cooling tower operations do not generate wastewater containing CBOD to be treated and discharged from Outfall No. 001, the CBOD₂₀ allocation of 1,082 lbs/day is rescinded by this docket (D-2008-021 CP-3). Additionally, the 89.25% Zone 4 reduction requirement CBOD₂₀ is not applicable. The docket holder shall continue to meet the CBOD₅ effluent limits contained in the NPDES permit (See DECISION Condition C.1).

3. Total Dissolved Solids

The Commission's basin-wide TDS effluent limit is 1,000 mg/l (*WQR* Section 3.10.4.D.2.). The Commission's Zone 4 stream quality objective for TDS is not to exceed 133% of the background (*WQR* Section 3.30.4.C.9.). During the review of Docket No. D-2008-02-1, the docket holder submitted a modeling evaluation demonstrating that the Zone 4 stream quality objective for TDS would be met at an Outfall No. 001 effluent concentration discharge of 5,000 mg/l TDS. The Commission approved a TDS determination for the Marcus Hook Cogeneration Facility discharge consisting of an average monthly effluent limit of 5,000 mg/l from Outfall No. 001 via Docket No. D-2008-021-1 on December 10, 2008, which was renewed in Docket Nos. D-2008-021 CP-2 and D-2008-021 CP-3, approved on May 10, 2012 and December 11, 2019, respectively and continues herein.

4. Other

There are no public water supply intakes downstream 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 effluent limits in the NPDES Permit 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 Commission's *Water Quality Regulations (WQR)*.

C. DECISION

Effective on the approval date for Docket No. D-2008-021 CP-4 below, the project described in Docket No. D-2008-021 CP-3 is removed from the Comprehensive Plan to the

extent that it is not included in Docket No. D-2008-021 CP-4; Docket No. D-2008-021 CP-3 is terminated and replaced by Docket No. D-2008-021 CP-4; and the project and the appurtenant facilities described in Section A "DESCRIPTION" of this docket shall be continued in the Comprehensive Plan. 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 (Delaware River Water Quality Zone 4)		
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
BOD5	30 mg/l	As required by NPDES permit
Temperature	95°F (instantaneous max.)	As required by NPDES permit
Total Dissolved Solids*	5,000 mg/l	As required by NPDES permit
Ammonia Nitrogen	Monitor & Report	As required by NPDES permit
Acute Toxicity Ceriodaphnia Survival	Monitor & Report	As required by NPDES permit
Chronic Toxicity Ceriodaphnia Survival	Monitor & Report	As required by NPDES permit
Chronic Toxicity Ceriodaphnia Reproduction	Monitor & Report	As required by NPDES permit
PCBs	Monitor & Report	As required by NPDES permit

* See DECISION Condition C.4.

Other Conditions

2. This docket continues approval of the heat dissipation area (HDA) in Delaware River Water Quality Zone 4 consisting of a radius of 200 feet around Outfall No. 001. 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 consisting of a radius of 200 feet around Outfall No. 001.

3. 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*.
4. The docket holder may request 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.
5. This approval shall expire on the expiration date set forth below unless prior thereto the docket holder has applied to the Commission to renew or extend this approval.
6. In accordance with 18 C.F.R. 401.8. of the Commission's *Rules of Practice and Procedure (RPP)*, if at any future time the Project is changed materially from the Project as described in this docket, it will be deemed to constitute a new and different project for the purposes of Article 11 of the *Delaware River Basin Compact* and will require Commission amendment of the Comprehensive Plan. In accordance with the same section of the *RPP*, whenever a change to the Project is made, the sponsor must advise the Executive Director, who will determine whether the change is deemed materially for purposes of this provision.
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 C.F.R. 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 DRBC issues a reminder notice in advance of the deadline or the docket holder receives such notice. If 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 pending the grant or denial of the application for docket approval.
8. 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 the Type of Discharge and Service Area sections of the docket holder's Application to the extent consistent with all other conditions of this DECISION Section.
9. In accordance with the Commission's regulations at 18 C.F.R. Part 440, the docket holder is prohibited from discharging wastewater from high volume hydraulic fracturing ("HVHF") or HVHF-related activities to waters or land within the Basin. The docket holder is further prohibited from discharging hydraulic fracturing wastewater, whether treated or untreated, from sources within or outside the Basin, without obtaining the Commission's prior review and express approval in the form of a revised docket. Violation of this or any condition of this docket

approval may result in enforcement, including the risk of financial penalties, pursuant to Section 14.17 of the *Delaware River Basin Compact* and Section 2.7.8 (18 CFR 401.98) of the Commission's *Rules of Practice and Procedure*. The facility and operational records shall be available at all times for inspection by the DRBC.

10. The facility and operational records shall be available at all times for inspection by the DRBC.

11. The facility shall be operated at all times to comply with the requirements of the Commission's *WQR*.

12. 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.

13. 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.

14. 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.

15. No sewer service connections shall be made to newly constructed premises with plumbing fixtures and fittings that do not comply with water conservation performance standards contained in Resolution No. 88-2 (Revision 2).

16. 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.

17. 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).

18. 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).

19. 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).

20. 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.

21. 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.

BY THE COMMISSION

APPROVAL DATE:

EXPIRATION DATE: March 31, 2031