

**Department of The Environment
Groundwater Discharge Permit
Summary Report and Fact Sheet**

Executive Summary

State Application No.: 19-DP-3460

Facility Name and Location: The Trappe East Wastewater Facility located at East of Backtown Road and North of Piney Hill Road, Trappe, MD 21673

Description of Facility: Wastewater treatment and disposal via spray irrigation for residential development and a community center

Facility Discharges: Treated wastewater from residential development

Pollutants Limited: BOD5 < 10 mg/l, TSS <10 mg/l, total nitrogen <3 mg/l, total phosphorus <0.3 mg/l and fecal coliform <3 MPN/100 ml.

Changes from Previous Permit: (1) Page 2, Section I.A.2., the previous effluent limitations of TN<8 mg/l and TP<3 mg/l have been changed to TN<3 mg/l and TP<0.3 mg/l, respectively. (2) Page 2, add the 5 phases WWTP construction, spray system construction and the housing development; (3) Page 3, add ground water monitoring table with limitations and add MW 5 next to Miles Creek with a total of 12 monitoring wells as well as delete SW-2 at Koogler Road and Wrights Mill Road and SW-1 in upper Miles Creek shown on Map B; (4) Page 4, add NetDMR reporting requirements; (5) Page 6, increase storage requirements from 60 days to 75 days; (6) Page 8, add updating Nutrient Management Plan (NMP) requirements; (7) Page 8, add grass clipping removal requirements, (8) Page 9, revise surface monitoring station number from 5 to 3; and (8) title page, revise Trappe East LLC to Trappe East Holding Business Trust.

Controversial Provisions: Neighboring residents oppose the spray irrigation proposal.

Unusual Conditions: This Permit has two Permittees (Town of Trappe and Trappe East Holding Business Trust).

Major Facility: No. (0.54 mgd)

Summary of Wastewater Facility:

The applicants applied for a permit to discharge treated wastewater to the land and subsequently to ground waters of the State. Significant information involving the application, additional data and determinations made by the State may be summarized as follows:

The Trappe East wastewater facility will support a proposed residential development and commercial retail. Wastewater from this community will be treated at an advanced wastewater treatment plant which produces a tertiary effluent quality of BOD < 10 mg/l, TSS <10 mg/l, total nitrogen <3 mg/l, total phosphorus <0.3 mg/l and fecal coliform <3 MPN/100 ml. Treated effluent will be disposed of via spray irrigation. The spray irrigation site includes: (1) 87.6 acres primary irrigation area to be sprayed at 2"/wk., (2) 22 acres to be reserved for future use and (3) Ground water quality will be monitored quarterly via 12 ground water monitoring wells and surface water quality will be monitored via 3 sampling stations (see permit Map B for locations).

Project Type: Spray Irrigation

State Application No.: 19-DP-3460

Facility Name: The Trappe East Wastewater Facility

Address: East End of Backtown Road and North of Piney Hill Road, Trappe
Talbot County, Maryland 21673

County: Talbot

Contact (Name, Title): Robert D. Rauch, P.E.

Phone: (410) 770-3666 (Rauch)

SIC Code: 4952, POTW

Applicant is engaged in: POTW and developer

Legal Name of Applicant: (1) Town of Trappe and (2) Trappe East Holdings Business Trust

Address: (1) P.O. Box 162, Trappe, MD 21673
(2) C/o Ryan Showalter, Esq, McAllister, DeTar, Showalter and Walker,
100 North West Street, Easton, MD 21601

Basin Code: 02130404

Receiving Water Name (class): Ground water type I aquifer

Latitude: 38°40'23" N **Longitude:** 076°02'76" W

Project Manager: Mary Dela Onyemaechi

Phone: (410) 537-3778

Wastewater Characteristics

Designed Average Flow: 540,000 gpd

Proposed Discharge Period: all year round except for inclement weather

<u>Parameter</u>	<u>Raw Concentration</u>	<u>Treated Concen.</u>
BOD5	250 mg/l	10 mg/l
TSS	250 mg/l	10 mg/l
Nitrogen(total as N)	60 mg/l	3 mg/l ^a
Phosphorus	8 mg/l	0.3 mg/l ^a
Fecal Coliform	3 MPN/100ml	

^a Phosphorus (P) loading rate to spray field (87.6 acres): $(0.54 \text{ mgd} \times 0.3 \text{ mg/l} \times 8.34 \times 365 \text{ days/yr}) / 87.6 \text{ acres} = 5.6 \text{ lb/acre/year}$ which is the vegetation phosphorus uptake rate required under permit condition I.C.7.

On page 18 of the Lakeside at Trappe Nutrient Management Plan (NMP) dated 6/2/2020, it mentioned that orchardgrass will be planted and maintained for the startup phase of the project. Page 17 of the NMP shows the phosphorus uptake rate of orchardgrass is 18-45 lb/acre/yr which is greater than the 5.6 lb/acre/year phosphorus loading rate.

Nitrogen (N) loading rate to spray field (87.6 acres): $(0.54 \text{ mgd} \times 3 \text{ mg/l} \times 8.34 \times 365 \text{ days/yr}) / 87.6 \text{ acres} = 56 \text{ lb/acre/year}$.

On page 18 of the Lakeside at Trappe Nutrient Management Plan (NMP) dated 6/2/2020, it mentioned that orchardgrass will be planted and maintained for the startup phase of the project. Page 17 of the NMP shows the nitrogen uptake rate of orchardgrass is 222-311 lb/acre/yr which is greater than the 56 lb/acre/year nitrogen loading rate.

PRETREATMENT FLOW DIAGRAM

Assimilative Capacity

Limiting Parameter (s) Loading Rate Land Required

Use an irrigation time of 290 days

Hydraulic Loading 2"/wk 87.6 acres provided (71.3 + 9.2 + 7.1 acres initial irrigation area)*

Area required: $(540,000 \times 365 \times 7) / (27154 \times 290 \times 2"/wk) = 87.6 \text{ acres}$

Reserve area : 25% x 87.6 acres =21.9 acres, 22 acres provided

*Updated Final Report of Hydrogeologic Evaluation Services – Lakeside aka Trappe East, Talbot County, Trappe, Maryland”, John D. Hynes & Associates, Inc. 11/5/2019

GROUND WATER SYSTEM

Aquifer Name: Columbia Group (surface aquifer, 70’ in depth) *

Estimated Aquifer Transmissivity: 13670 ft²/day**

Estimated Aquifer Permeability: 195 ft/day (based on 70’ aquifer thickness)

Estimated Total Dissolved Solids Concentration: 61-1260 mg/l**

Other Properties: Thickness of the aquifer is 70’

**Information excerpted from “Aquifer Identification and Injection Well Inventory, State of Maryland” by Gordon Wolman et al, Johns Hopkins University, May 1981

Present Use: No wells are located within 1/4 – mile of the site* (page 6 of the Hydro report)

Projected Impact: Irrigation of treated wastewater with total N <3 mg/l meeting the MCL (nitrate: 10 mg/l) and should have little impact to ground water quality. The limits of total N < 3 mg/l and Total P < 0.3 mg/l along with the nutrient uptake (uptake of N > 56 lb/acre/yr and uptake of P >5.6 lb/acre/yr) by vegetation will result zero N and P in the percolate.

Rationale For Permit Conditions

- (1) Page 2, add the 5 phases WWTP construction, spray system construction and the housing Development.

The Permittee plans to divide the development project into 5 phases with wastewater flow of approximately 100,000 gallons/day increase in each phase.

- (2) Page 3, add ground water monitoring table with ground water quality limitations and add MW 5 next to Miles Creek with a total of 12 monitoring wells. Delete two surface water monitoring stations SW1 and SW2 included in Map B of previous permit (04DP3460). SW-1 at Tarbutton

Road and Miles Creek and SW2 at Wrights Mill Road and Miles Creek were located within a neighbor's property.

Twelve ground water monitoring wells (4 upgradient wells and 8 downgradient wells) were required in the discharge permit to intercept ground water flow for water quality monitoring prior to exiting to surface water. Ground water quality limitations included in Section I.A.3 of the draft discharge permit must be met for protecting the ground water quality. Ground water monitoring wells are the major water quality monitoring tool for ground water and surface water quality protection. The surface water monitoring stations are in the auxiliary role. The surface water monitoring station SW-2 located at Koogler Road and Wrights Mill Road and SW-1 located at upper Miles Creek of the site shown on Map B of the previous permit were deleted due to tidal effect and property ownership. MW-5 ground water monitoring well was added on Map B after deletion of SW-1 and SW-2 for monitoring ground water quality prior to discharging into Miles Creek. The ground water quality affecting this portion of the Miles Creek will be monitored by ground water monitoring wells MW-3, MW-4, MW-5, and MW-6 shown on Map B. The Permittee will be responsible for effluent and ground water quality violations.

(3) Page 4, add NetDMR reporting requirements

All DMRs must submit electronically via a secure Internet application. The Permittee must apply for access to NetDMR at www.epa.gov/netdmr and register for a NetDMR Webinar.

(4) Page 6, increase storage requirements from 60 days to 75 days.

Department of Agriculture regulations - COMAR 15.20.07.02, Supplement No. 7 (May 2012, amended and effective January 2, 2017) prohibit winter discharge between 12/25 and 2/28 (75 days) to prevent nutrients from entering into ground water or resulting in surface runoff.

(5) Page 8, add updating Nutrient Management Plan (NMP) requirements;

COMAR 15.20.07.05.D.(1) states that except as provided in §D(2) of this regulation, at least once every 3 years from the date that the current plan was prepared, the operator shall revise and update the plan

(6) Page 8, add grass clipping requirements;

Clipping from grass cutting shall be removed from irrigation site to eliminate nutrient recycling back to the ground water

(7) Page 9, revise surface monitoring station number from 5 to 3.

Rationale similar to (2) shown above.

Transport and vegetation nitrogen uptake assumptions for determining the yearly nitrogen load transported to surface water from the Trappe East Spray Irrigation system

- (1) Nitrogen (N) loading rate to spray field (87.6 acres): $(0.54 \text{ mgd} \times 3 \text{ mg/l} \times 8.34 \times 365 \text{ days/yr}) / 87.6 \text{ acres} = 56 \text{ lb/acre/year}$ which is less than the nitrogen uptake rate of 222-311 lb/acre/year for orchardgrass to be planted in the spray fields.

Page 18 of the Nutrient Management Plan (NMP) dated 6/2/2020 indicates orchardgrass will be planted and maintained for the start-up phase of the project. The initial establishment of the phase 1 spray irrigation area in orchardgrass will be maintained for up to 3 years. Other silage grasses may be rotated to existing and future spray fields as recommended in subsequent nutrient management plan updates. Page 17 of the NMP shows the nitrogen uptake rate for orchardgrass is 222-311 lb/acre/yr which is greater than the 56 lb/acre/year nitrogen load from effluent irrigation.

- (2) Department of Agriculture regulations - COMAR 15.20.07.02, Supplement No. 7 (May 2012, amended and effective January 2, 2017) prohibit winter discharge between 12/25 and 2/28 (75 days) to prevent nutrients from entering into ground water or resulting in surface runoff.

The Permittee will provide 75 days winter storage per Permit Condition I.C.2. No irrigation is allowed between 12/25 and 2/28 of the following year.

- (3) Based on vegetation TN uptake described in item (1) and 75 days non-irrigation winter period shown in Item (2), the yearly nitrogen load transported to surface water from the Trappe East Spray Irrigation system will be zero.
- (4) The Integrated Water Planning Program (IWPP) at MDE, is the group responsible for establishing TMDLs (Total Maximum Daily Load) the maximum amount of an impairing substance or stressor that a waterbody can assimilate and still meet WQs and allocates that load among pollution contributors in the State of Maryland. The IWPP staff reviewed the calculations in item (1) and the conclusions reached in item (3) and concluded that the calculations and conclusions were correct. The review concluded that the yearly nitrogen load transported to surface water from the Trappe East Spray Irrigation system will be zero.