

MARYLAND DEPARTMENT OF THE ENVIRONMENT
WATER and SCIENCE ADMINISTRATION
Wastewater Pollution Prevention and Reclamation Program

1800 Washington Boulevard
Baltimore, Maryland 21230



Response to Public Comments

Regarding

Trappe East Wastewater Facility

State Discharge Permit Application No. 19-DP-3460

FINAL: October 27, 2022

RESPONSE TO COMMENTS DOCUMENT
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BACKGROUND

The Town of Trappe, P.O. Box 162, Trappe, Maryland 21673, and Trappe East Holding Business Trust, 1960 Gallows Road, Suite 300, Vienna, VA 22182 (collectively, the “Applicants”), submitted an application for a permit to discharge an average of 540,000 gallons per day of treated domestic wastewater from the Trappe East Wastewater Treatment Facility (the “Facility”), located at East End of Backdown Road, Trappe, Maryland, to groundwater via a spray irrigation system. Subsequent to issuance of State Discharge Permit 19-DP-3460 (the “Permit”) on December 25th, 2020, judicial review of the permit was requested by ShoreRivers, Inc., on January 28th, 2021, and the Chesapeake Bay Foundation, Inc., with certain individual petitioners (collectively, the “Petitioners”) on February 1st, 2021. On March 24, 2021, the Circuit Court for Talbot County remanded the Permit to the Department after the Applicants jointly consented to Petitioners’ requested remand for an opportunity to comment on the Permit’s required Nutrient Management Plan (“NMP”), which the Department did not oppose. The Department consequently began a new public comment period, of 90 days. A Notice of Tentative Determination to issue the Permit, with the required NMP, was published in the Star Democrat on June 25, and July 3, 2021. A public hearing was held on October 28, 2021. The Department received oral and extensive written comments on the tentative determination during the public hearing and up to the closing of the comment period on December 6, 2021.

INTRODUCTION

The Department has reached a final determination to issue the Permit with conditions resulting from comments received during the public comment process. First, the Department has determined that a groundwater discharge permit is appropriate in this instance. The discharge authorized in this permit is not functionally equivalent to a direct surface water discharge. The enhanced nutrient removal wastewater treatment plant produces an effluent for the spray irrigation that is 70% higher quality than the State Groundwater Quality Standards. Then the spray irrigation is optimized to maximize crop uptake and to minimize the amount of effluent that will even reach groundwaters. Any effluent that travels through the vegetated zone into the subsurface soils will have a low potential delivery factor because it is greater than 1,000 feet to any surface waters. The unsaturated soil treatment zone reduces the travel time and provides degradation by chemical and microbiological activity from the soil. In combination with the soil characteristics, dilution by precipitation, and dilution by other groundwater; the sprayed effluent, if any, will not retain its distinctive identity by the time it may enter any surface water. We thus conclude that the discharge has no reasonable potential to impact surface waters and is thus not functionally equivalent to a direct surface water discharge.

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In addition, the final permit changed the initial spray irrigation to the northern location, the furthest from any surface waters. This limits the potential impact of this discharge on surface waters by requiring that only the northern sprayfields be initially used.

We'll briefly describe below, and more fully throughout this response document, the many processes the effluent goes through. In particular, see the response to Comment #85.

Low Delivery Factor - Per the Chesapeake Bay Program's nitrogen delivery rate guidelines MDE assumes a worst-case scenario 30% delivery rate for discharges to groundwater greater than 1,000 feet from any perennial surface water.

Long travel time to surface waters - The average horizontal distance between the northern spray field's surface and the nearest surface water stream is roughly 1,159 feet. The estimated transit time from groundwater at the northern fields to Miles Creek was calculated at approximately 12 days. This calculation does not reflect the transit time from the plant root zone through the unsaturated soil treatment zone.

High level of treatment decreases likelihood of the effluent retaining its distinctive identity- Wastewater from the Trappe East community will be treated at an advanced wastewater treatment plant, which will yield 70% lower nitrogen, versus the usually applied Groundwater Quality Standard. See the table in the response to Comment # 85. This highly treated effluent is then further cleansed through the discharge in the spray fields. Any remaining nutrients in the wastewater will be absorbed into the soil and held by capillary action in the root and vadose zones. Effluent percolates through the unsaturated soils. The soils facilitate nutrient adsorption, filtration and microbiological consumption. In the response to Comment #85 we show that all of the phosphorus, and nitrogen in the discharge exiting the treatment plant will be used up by the crops as required by the nutrient management plan. The Trappe East permit (page 6) calculations for the estimated nutrients delivered to the nearby local surface water from the Trappe East system have been estimated to be zero.

Effluent is Significantly Diluted by rainfall before it would reach surface waters - The treated effluent undergoes significant dilution after it is sprayed. Rainfall will dilute any sprayed effluent that does not leave the land through evapotranspiration as it seeps into the earth. The permit location's annual average natural precipitation is roughly 54.2 inches/year, or 104.9 Million gallons/year¹ over the northern spray fields. The authorized discharge for phase I will be 100,000 gallons/day. This equates to a maximum possible discharge of 29 Million gallons/year. Thus the annual dilution by rainfall would then be 3.6:1.

Effluent is Significantly Diluted by other groundwater before it would reach surface waters - Any effluent making its way through the vegetated cover will percolate through the soil layers and

¹ The northern spray fields are 71.3 acres (310582 square feet).

The annual precipitation averages 54.2 inches (4.516 feet).

Volume (in cubic feet/year) equals area (in square feet) x rainfall (in feet/year) = 310,5828 x 4.516 = 14,027,990 cubic feet/year (104.9 Million gallons/year)

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make its way to the aquifer that now exists beneath the site. In this aquifer, the irrigation water will mix with already-existing groundwater and rainwater that has seeped into the earth. This mixture will then slowly migrate through the subsurface soils by diffused lateral movement, eventually reaching surface stream flows to navigable water.

Spray Irrigation is optimized for crop uptake - Land application of sprayed effluent will provide a water source for crop production. The permit restricts the annual average loading rate to 2 inches/week. This provides flexibility in system operation. In the hot summer, the vegetation planted in the spray field with high water demand may require an irrigation rate of 4 inches/week. Alternatively, on a rainy day or in the freezing winter season, no irrigation is allowed. Additionally, the spray area will be divided into two or three zones. Each zone will be sprayed one day per week. The zones will be set up to be sprayed at approximately ¼ inch per hour for 8 hours each. This schedule will allow 4 to 5 days per week for rain, saturated soil conditions and/or maintenance.

The distinctive identity of the effluent will be degraded by chemical and biological action in the soils - The site is underlain predominately with Atlantic Coastal Plain soils. The soils consist of silt loam, loamy sand, silty clay loam, and sandy clay loam. These unconsolidated sediments provide the opportunity for filtration, nutrient adsorption, and microbial consumption. These soils are suitable for "slow rate" land discharge systems as is proposed for the site. Atlantic Coastal Plain soils are different from a variety of soil types that may offer more direct conduits to surface waters, such as lava tubes, karst sinkholes and fissures, fractured rock, or gravel.

SUMMARY OF CHANGES FROM THE TENTATIVE DETERMINATION DRAFT

1. [See Response to Comment #1](#) - The permit will require routine monthly monitoring of groundwater levels during the time period when the spray fields are operational. Additionally the permit will require that the spray area be divided into two zones. Each zone will be sprayed a maximum of two days per week. The zones will be set up to be sprayed at approximately ¼ inch per hour for 8 hours each.
2. [See Response to Comment #7](#) - Only an annual average flow of 100,000 gpd will be authorized, versus the 540,000 gpd requested in the application.
3. [See Response to Comment #14](#) - A re-opener special condition has been added for if the groundwater monitoring well data shows that the plant cover nitrogen uptake is ineffective and has caused elevated nitrogen and or phosphorous in groundwater. Additionally a NMP report shall be submitted to the Department annually.
4. [See Response to Comment #15](#) - Footnote 1 & 2 of Special Conditions I.A.2. will be amended to require the following: (1) A major permit modification is required for any future expansion of this facility. (2) To limit the permitted flow to 100,000 gpd and to require the 37,500 gpd being discharged to the existing Trappe Wastewater Treatment Plant. to be discharged via the permit once the wastewater treatment plant associated with this permit is constructed and operational.
5. [See Response to Comment #17](#) - Added a requirement for a minimum of 100-foot buffer to intermittent streams and perennial streams. Conditions are also being added to allow for

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alternate means, upon Departmental approval, that will be suitable to control the movement of spray onto adjacent land.

6. [See Response to Comment #18](#) - Added requirements for the collection and removal from the spray field of grass clippings from cutting vegetation planted on the spray site.
7. [See Response to Comment #19](#) - Requires the spray area to be divided into two or three zones. Each zone will be sprayed one day per week. The zones will be set up to be sprayed at approximately ¼ inch per hour for 8 hours each. The northern zone spray field will be used first as the initial disposal field.
8. [See Response to Comment #21](#) - Will require pumping and hauling to maintain 3 feet freeboard in the lagoon.
9. [See Response to Comment #36](#) - Confusing passage has been fixed.
10. [See Response to Comment #37](#) - Clarifies that the permittee is only authorized to discharge advanced treated wastewater in accordance with the terms, conditions, and limitations in this permit via spray irrigation onto designated areas and is not authorized to discharge any treated or untreated industrial wastewater to waters of the State.
11. [See Response to Comment #39](#) - Corrected a typographical error.
12. [See Response to Comment #43](#) - Confusing passage has been fixed
13. [See Response to Comment #50](#) - Amended the permit to include testing for Escherichia coli (STORET code 51040) in place of fecal coliform (STORET code 74055).
14. [See Response to Comment #51](#) - The STORET Code 00665 for “Phosphorous, Total as P” will be included in the effluent limitation table in section I.A.2.
15. [See Response to Comment #53](#) - Monitoring for Nitrite+Nitrate (00630) will be added to the permit.
16. [See Response to Comment #57](#) - Requires the development of a “Manual of Operation and Maintenance” for the entire wastewater treatment facility. MDE will be able to review and request for amendment of the manual if there is a demonstrated need for the review and/or amendment.

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RESPONSES TO SPECIFIC COMMENTS

This section contains abbreviated comments, the responses to those comments, and any changes that will be made in the final permit as a result. Each of these three parts are repeated for each comment (or comment set).

COMMENT 1:

- a. *The conditions of the draft permit include limits on the volume of irrigation that the applicant can discharge. However, the limits are not adequate to prevent ponding, runoff, and nutrient loading to groundwater, because they do not take into account real world factors that determine whether the irrigation will result in pollution. These factors include (1) the difference between annual average irrigation rates in the permit and the maximum rates; (2) seasonal changes in crop uptake and evapotranspiration; and (3) how such substantial quantities of irrigation will impact the vegetation and soils in the spray irrigation fields.*
- b. *The monitoring required is insufficient to determine if the water table fluxes to within 2 feet of the surface. The only indication will be observation of ponding, which is not required to be reported.*

RESPONSE:

Effluent limits and monitoring requirements are required for both the treated wastewater prior to land application and the groundwater after land application. The effluent limits and monitoring requirements are in place to ensure that the discharge of treated wastewater does not cause an exceedance of groundwater quality standards and to ensure that no pollutants are migrating offsite

The volumetric discharge limits in the permit are not the only stipulations to prevent ponding and runoff. The permit also has numerous conditions to take into account “real world” factors. Specifically, Section I.C.1 of the permit stipulates that the hydraulic loading rates of the spray irrigation area shall not exceed 2 inches/week (annual average). Section I.C.2. stipulates that irrigation of treated wastewater shall not take place during periods of any precipitation such as rain, snow or sleet. Spray irrigation will not be permitted under any wind conditions which allows irrigation to travel outside the designated spray area. Spray will be prohibited during temperatures below 32 degrees Fahrenheit or when soils are saturated. The permit also states that at no time shall spray irrigation be conducted on areas with bare unvegetated soils or with groundwater table depth less than 2 feet from ground surface. There is also a complete prohibition against surface runoff or ponding caused by the facility’s spray irrigation.

The application rate for a spray irrigation system is determined based on the soil infiltration rate with the application of a safety factor. The maximum hydraulic loading rates of the Trappe East spray irrigation area is limited at 2 inches/week (annual average). The vegetation consumption rate in Maryland ranges from 0.26"/wk to 0.45"/wk based on the golf course irrigation rates. Since the application rate is based on the soil infiltration rate alone, the application rate is always less than

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the sum of the soil infiltration rate and the consumptive use. Therefore, the application rate is a conservative number to ensure the system is not over applied.

In addition, the annual average loading rate of 2 inches/week provides flexibility in system operation. In the hot summer, the vegetation planted in the spray field with high water demand may require an irrigation rate of 4 inches/week. On a rainy day or in the freezing winter season, no irrigation is allowed; this complies with Section I.C.2. operational conditions of no surface runoff or ponding. On rainy days or in freezing weather, the treated wastewater will be stored in a lagoon.

In addition to the above and required monitoring, the permittee is required to provide routine monthly field inspections for ponding, record and submit observations with the monthly operations reports. If any area has ponding, operation of the spray sequencing could be adjusted to avoid any discharge on the portion of the spray area with ponding until the ponding (and groundwater level) subsides.

See also response to comment #10.

CHANGES FOR THE FINAL PERMIT:

The permit will be modified to require routine monthly monitoring of groundwater levels during the time period when the spray fields are operational to ensure that the 2 feet separation is maintained. Spray field groundwater levels will be monitored via spray field monitoring wells. Each spray field monitoring well will be constructed as 2-inch diameter, 20-foot-deep infield piezometers with 15-foot screened intervals extending from 5 feet to 20 feet, and constructed within a minimum 6-inch diameter borehole, gravel packed from depth to 2 feet above the top of screen, with a bentonite seal 2 feet above the gravel, cement grouted to the surface, and finished with 4- inch steel protective standpipe grouted at the surface and covered with a secured cap on the monitoring well. The reference point for measurements will be clearly marked on the piezometers. Piezometer water level and total depth observations measurements will be recorded monthly and submitted with the monthly operations reports. If measurements show less than 2 feet of separation between the land sprayed surface and groundwater during spray periods (outside of the NMP (2020) 12/16 - 2/28 no-spray 75-day period), operation of the spray sequencing shall be halted to ensure that the spray area maintains the two feet of separation.

In addition, the following extract from the hydrogeologic report will be added to Special Condition I.C.1: “The spray area will be divided into two zones. Each zone will be sprayed a maximum of two days per week. The zones will be set up to be sprayed at approximately ¼ inch per hour for 8 hours each”.

The following definition of ponding will also be added as permit condition I.B.2.f.: “Ponding includes any surface runoff caused by or including irrigation water accumulating on the ground surface for more than 24 hours.”

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COMMENT 2:

- a. *The potential for and magnitude of hydraulic mounding beneath the spray irrigation field(s) calculated as 0.14 feet but was based on a single value of hydraulic conductivity (195 feet/day) and an assumed specific yield (0.1). No citation was presented as the basis for the value of specific yield. As noted earlier, site-specific values for hydraulic conductivity and specific yield are essential to have the ensuing calculations representative of the site. Using a hydraulic conductivity more representative of a Silty Sand (0.1 feet/day) predicted groundwater mounding under the spray-irrigation field of 1.7 feet that persisted about 80 feet from the center of the spray-irrigation field that could potentially cause the depth to groundwater to contravene the requirement to maintain a 2-foot depth to the water table below the ground surface.*

RESPONSE:

During the site evaluation, 23 borings, 6 test pits and 18 infiltration tests were performed. 15 soil samples were collected from both the primary spray fields and the reserve area spray field in 2019 to characterize soil conditions. 18 piezometers were installed and sampled six times between November 2002 and October 2003. Groundwater levels in the wet season ranged from approximately 11 to 18 feet below ground surface within the footprint of the spray field designated area. The hydrogeological report for the site indicates that the mounding analysis adequately represents the hydraulic conductivity of the site.

See also the response to comment #1.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 3:

Given how dramatically different the climate conditions are now and are projected to be during the life span of the proposed wastewater system, it is critical for MDE to reanalyze the suitability of this spray field to receive a massive increase in naturally occurring precipitation plus an even greater volume of spray irrigation. This analysis should be conducted in conjunction with MDA or an experienced nutrient management planning professional. We urge MDE to re-calculate potential evapotranspiration utilizing one of the recommended methodologies described in the Antea report, such as the Penman-Monteith method.

RESPONSE:

To address the concern addressed in the comment, additional valuation was conducted utilizing the Penman-Monteith method to determine potential evapotranspiration (PET). This evaluation used the ETo calculator (Version 3.2) provided by the United Nations Food and Agriculture

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Organization (2012) as described by Allen et al. (1998). For input climatic data, the software CLIMWAT 2.0 (Grieser, 2006) was used, which is also provided by the FAO and selected the closest weather station, WASHINGTON-NAT-VA. ETo was then multiplied by the crop use coefficient (Kc) to determine PET based on Table 17 (Allen et al., 1998) the Kc of 0.95 was selected for both orchard grass (the average Kc for Bermuda and ryegrass hay crops before and following cuttings) and loblolly pine (the Kc for conifer trees). The results had similar outcomes to those using Hynes (2019) and NPM (2020) inputs with the Blaney-Criddle PET estimation method.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final permit due to this comment.

COMMENT 4:

- a. *The lack of site-specific evaluation is particularly problematic in this instance because, as noted by the Antea report, the hydraulic conductivity was “estimated from the transmissivity of a single high- capacity injection well as 195 feet/day, which is indicative of “clean sand, and sand and gravel”, whereas “the dominant soil type identified within the water-bearing zone is Silty Sand (SM) which would be expected to have a hydraulic conductivity between 0.1 and 10 feet/day.” This means that “[t]he consequences of using a single high value of hydraulic conductivity that is not representative of the site is that the calculated groundwater flow velocities would be orders of magnitude higher than if site-specific hydrogeologic parameters had been measured and used.” We strongly urge MDE to require the applicant to conduct the various site-specific tests described in the Antea report, which, the report notes, are generally accepted practice.*
- b. *According to the Technical Memorandum commissioned by the Chesapeake Bay Foundation and prepared by the Antea Group and Sand County Environmental, Inc. (“CBF Expert Report”), the Draft Permit relies on an inappropriate and unrepresentative measure of soil hydraulic conductivity in the Hynes Report from a single deep injection well. The Hynes Report also ignores the shallow clayey lenses (“argillic horizons”) that are present on the site.*

RESPONSE:

Section I.C.1 of the permit stipulates that the hydraulic loading rates of the spray irrigation area shall not exceed 2 inches/week (annual average). Section I.C.2. stipulates that irrigation will not be permitted under any wind conditions which allows irrigation to travel outside the designated spray area. Spray irrigation is prohibited during temperatures below 32 degrees Fahrenheit (freezing conditions) or when soils are saturated to create a one inch or greater ribbon. At no time shall spray irrigation be conducted on areas with bare unvegetated soils or with ground water table depth less than 2 feet from ground surface. Excessive irrigation resulting in surface runoff or

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ponding is prohibited. The annual average loading rate of 2 inches/week provides flexibility in system operation. In the hot summer, the vegetation planted in the spray field with high water demand may require an irrigation rate of 4 inches/week. On a rainy day or in the freezing winter season, no irrigation is allowed which meets the above operational conditions of no surface runoff or ponding. On rainy days or in freezing weather, the treated wastewater will be stored in a lagoon.

See the responses to comment #1 and #2.

CHANGES FOR THE FINAL PERMIT:

Changes to be made are detailed in the response to comment #1.

COMMENT 5:

- a. *MDE must determine a suitable, and preferably conservative, storage volume requirement that is designed to hold all of the effluent from the treatment plant during periods when irrigation would be plainly unlawful or when any irrigation will likely result in discharges to ground or surface water or cause harm to the fields. Finally, we would like to simply echo the calls of the applicant to reinstate the 3-foot freeboard requirement that inexplicably vanished from the permit.*
- b. *Justify that the 75-day storage period for pre-treated effluent is sufficient. Seventy-five days is the length of time between December 25 and February 28 during which winter application of nutrients is prohibited by state law. The 75-day storage requirement would leave no storage capacity on each day following that 75-day period or for any winter with above-average precipitation. It also would not provide adequate storage the remainder of the year if precipitation, high winds, or saturated soil conditions exist, in which cases the proposed permit requires spray field applications to cease.*
- c. *The 60-day storage requirement is the minimum specified in the MDE Guidelines and appears in the Permit 2019. Permit 2021 increased required storage to accommodate 75 days of effluent {40,500,000 gallons}. However, the scientific or climatological basis for the 75-day storage requirement was not provided.*
- d. *The 75 day requirement for the holding facilities to store effluent when it cannot be sprayed seems to be marginal. How was this time period established? Was it based on historical weather patterns and, if so, why hasn't climate change impacts been included?*
- e. *MDE should require the Hynes Report to be redone using more representative 2018 rainfall from the County's Region 2 WWTP (or from the existing Trappe WWTP), and the lagoon to be resized to accommodate a 75-day no spray annual period. In addition, the Permit should retain the requirement from the prior Draft Permit to maintain 3 feet of freeboard.*

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- f. MDE needs to adjust the Pre-treatment Flow Diagram and the 75-day storage requirements to accurately account for the number of days that irrigation cannot occur according to the actual length of the growing season, the dates of the fertilizer prohibition period as described in COMAR, and consideration of current and future weather patterns. We also ask that MDE consider historical rainfall data that is representative of the location of the proposed spray irrigation fields such as data from the Town of Trappe's WasteWater Treatment Plant or within 5 miles from the irrigation fields.*

RESPONSE:

The permit includes suitable and conservative, storage volume requirements. Permit Special Condition I.C.2. requires the permittee to provide a storage facility capable of containing wastewater generated during no less than 75 days of normal operation of the wastewater facility. In addition, the lagoon is proposed to provide an 18" thick compacted clay liner per Natural Resource Conservation Service (NRCS) Conservation Standard Practice code 520(see below link). The lagoon will also have 14" over the 75-day storage volume elevation for rainfall in addition to 3 feet of freeboard as mandated by the groundwater discharge permit as a safety factor ([Pond Sealing or Lining-Compacted Soil \(Ft2\) \(520\) Conservation Practice Standard](#)).

Maryland Land Treatment Guidelines require that a minimum of 60 days storage be provided for all spray irrigation systems receiving wastewater flows throughout the year. Storage time more than 60 days has been required for systems installed at colder regions of western Maryland and/or systems installed at sites with less permeable soils and/or shallow water table. The Trappe east spray irrigation site has well-drained soils and a deep water table. These are favorable conditions for spray irrigation. The currently required 75 days represents a 25% increase over the initial 60- day storage requirement. Climate data for the Royal Oak 2 SSW station covering the period of 1981-2010 provided by Menne et al (2012) indicates that the minimum temperature is below freezing from 12/17-2/25 which coincides with the NMP (2020) 75-day no spray period. The pretreatment diagram factors in the 12/16 - 2/28 no-spray 75-day period as required by the NMP.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 6:

ShoreRivers requests that MDE and/or the applicant be required to conduct at least 24-36 months of groundwater and surface water monitoring in order to firmly grasp the seasonal changes in the hydrology, and to incorporate finer details and more appropriate special conditions in the permit.

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RESPONSE:

Baseline monitoring for up to 1 year is required in the final permit before the treatment system would become operational (Special Conditions I.D.2.b.).

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 7:

- a. *Demonstrate that the capacity of the spray field to assimilate an average of 2 inch per week of pre-treated effluent accounts for the additional volumes of water produced by extreme weather events, variable spray field conditions, and historic precipitation.*
- b. *The draft permit proposes an irrigation limit at an annual average of 2" per week and an annual average of 540,000 gallons per day. The draft permit fails to acknowledge and analyze the maximum amount of wastewater that the applicant intends to spray on the irrigation fields at any given time, which is listed on page 2 of the permit application as 1,510,000 gallons per day. A report prepared by the Antea Group also noted this deficiency, and warned that "[t]he lack of daily or weekly maximum irrigation limits allows for over application to the point of causing percolation and/or surface run-off events." MDE needs to include in the permit daily or weekly maximum irrigation limits and special conditions that require irrigation off-sets from precipitation to ensure 100% uptake of effluent and avoid pollution from spray irrigation.*
- c. *The Draft Permit fails to impose both any limit whatsoever on the rate of daily discharge and any effective limit on the rate of weekly discharge.*
- d. *The tentative determination fails to adequately regulate sources and flows.*

RESPONSE:

The tentative determination in special condition I.2., authorized the discharge of an ultimate wastewater flow of 540,000 gpd. The approval of the permitted flow to 540,000 gpd was divided into five separate Phases. The capacity of each phase of the WWTP was expected to be approximately 100,000 gallons per day per phase. The spray irrigation infrastructure was planned to be constructed in 100,000 gpd phases as well, to support the discharge from each phase of the WWTP. The final phase was planned for the remaining 140,000 gpd.

The volumetric discharge limits in the permit are not the only stipulations to prevent ponding and runoff. The permit also has numerous conditions to protect the assimilative capacity of the spray field. See the responses to comment #1 and #33.

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The annual average loading rate of 2 inches/week provides flexibility in system operation. In the hot summer, the vegetation planted in the spray field with high water demand may require an irrigation rate of 4 inches/week. On a rainy day or in the freezing winter season, no irrigation is allowed which meets the above operational conditions of no surface runoff or ponding. On rainy days or in freezing weather, the treated wastewater will be stored in a lagoon. Special Condition I.C.2 prohibits excessive irrigation resulting in surface runoff or ponding.

CHANGES FOR THE FINAL PERMIT:

Special Condition A changes the permitted wastewater flow to be 100,000 gpd. The 100,000 gpd will allow for approximately 400 residential units to be built. Any future flow increases will require major modification of this permit. An initial discharge of 37,500 gpd has already been authorized to discharge to the existing Trappe Wastewater Treatment Plant. Once the wastewater treatment plant associated with this permit is constructed and operational, the 37,500 gpd flow must be discharged via this permit. The 37,500 gpd is part of the 100,000 gpd authorized in this permit.

Also see changes for the final permit in the response to comment #1.

COMMENT 8:

The impacts of the proposed hydraulic loading have not been considered from a horticultural or silvicultural standpoint. The plants mentioned for potential use in the irrigation fields cause concern because of their inability to withstand saturated soils and/or have significant gaps in their growing season with limited/no ET and reduced ground cover. Either condition reduces protection from soil erosion.

RESPONSE:

The permit has numerous conditions to make sure the spray field does not become hydraulically overloaded. In addition to required monitoring, the permittee will provide routine monthly field inspections for ponding, record and submit observations with the monthly operations reports. If any area has visible ponding (outside of the NMP (2020) 12116 - 2128 no-spray 75-day period), operation of the spray sequencing shall be adjusted to avoid any discharge on the portion of the spray area with observed ponding until the ponding (and groundwater level) subsides.

Ponding could negatively influence plant health and routine operation of the spray facility will prevent ponding conditions and thus support positive plant health. Changing the spray field cover from orchard grass to loblolly (southern) pine may further address this concern as 1) loblolly are facultative hydrophytes meaning they appear in wetlands and non-wetlands and adapt to normal moisture and some flooding and moderate drought, and 2) the conifer species have a longer growing season. A variety of grasses, crop and forest compositions may be utilized as appropriate spray field land covers to address observed conditions and may be considered through routine nutrient management plan updates. The NMP provides for the use of several cover crops that can be used to ensure proper management of the spray facility.

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See also the response to comment #1.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 9:

- a. *Mass loading is not specifically mentioned in the Hydrogeologic Evaluation or Permit 2021, except as it relates to specifying concentration limits for Total Nitrogen (3 mg/L) and Total Phosphorus (0.3 mg/L). The Hydrogeologic Evaluation states that the equations for acceptable loading rates are based on nitrogen uptake and evapotranspiration being active throughout most if not all of the year. As such, the Hydrogeologic Evaluation concluded there would be no impact on the groundwater underlying the spray irrigation fields and no further evaluation of potential nitrogen or phosphorus impact to the groundwater or surface water was conducted.*
- b. *COMAR Section 9-1110 requires the permit be approved consistent with a nutrient management plan (NMP) in compliance with MDA laws and regulations. Therefore, MDE must analyze how the discharge will impact phosphorus leaching on each field through consultation with the Maryland Department of Agriculture or a certified agronomist. We urge MDE to pause the comment period and refrain from making a final determination until the system design - including plans for the fate of effluent from the first phase of the development - is finalized. Once it is finalized the NMP, like the permit itself, will need to be updated.*
- c. *Comments about calculation of water entering groundwater in the Hydrogeological Report. NMP doesn't include precipitation. Spray volume and acreage need to be reevaluated.*

RESPONSE:

The permit requires that the wastewater system be in conformance with the NMP which shall be subject to the conditions of COMAR 15.20.07.05.D. and COMAR 15.20.08.05E. The conditions require that the wastewater treatment facility be operated in a manner that will not lead to an overload of nutrients (which include Nitrogen and phosphorus). We also highlight the following facts. 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 and the nitrogen uptake rate of orchardgrass is 222-311 lb/acre/yr which is greater than the 56 lb/acre/year nitrogen loading rate.

Evaluation of input values from Hynes (2019) and the 2020 Trappe Nutrient Management Plan (NMP) to calculate potential nitrogen loading at the northern spray field confirms the estimated percolate entering the groundwater from orchard grass or loblolly (southern) pine results are

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negative and demonstrate no net nitrogen increase on a month-by-month basis. The monthly nitrogen uptake in cultivated areas being converted to orchard grass or loblolly (southern) pine is reasonably assumed to be a function of the monthly potential evapotranspiration percent times the yearly nitrogen uptake rate from the Trappe (2020) NMP. The results for orchard grass, loblolly (southern) pine support the finding of no increased nitrogen loading impacts to groundwater. No additions from fertilizers were considered since these are not planned in excess of plant needs. Plant health was assumed to be unstressed.

See also response to comment #10 and 14.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 10:

Soil profile descriptions appear incomplete and crucial information regarding saturated soil conditions and water table depths and fluxes in those depths have been omitted.

RESPONSE:

Test pits and soil profiling of the spray fields included extensive on-site evaluation. Cross sections (A-A' and B-B') presented in the hydrogeologic report indicate that the soils underlying the footprint of the spray area are silt loam, sandy, loam, sand and loamy sand. Water level readings range from 11 to 18 feet below ground surface during the wet season month of February when the measurements were taken.

Ponding could negatively influence plant health and routine operation of the spray facility will avoid ponding conditions and thus support positive plant health. The NMP allows for the use of a variety of plants to be used as a cover crop for the spray fields. For example, loblolly (southern) pine are facultative hydrophytes meaning they appear in wetlands and non-wetlands and adapt to normal moisture and some flooding and moderate drought, and some conifer species have a longer growing season. A variety of grasses, crop and forest compositions may be utilized as appropriate spray field land covers to address observed conditions and shall be considered through routine nutrient management plan updates

See also response to comment #1 for response on ponding and notes on additional monitoring and reporting requirements.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

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COMMENT 11:

- a. *Prove that implementation of the Nutrient Management Plan and related spray field management requirements will recycle the entire effluent nitrogen and phosphorus loads into the vegetation grown on the spray field as required in the proposed permit.*
- b. *The tentative determination's estimate of nutrient uptake in the spray field is not accurate. The tentative determination's description of groundwater conditions fails to acknowledge several factors critical to the accuracy of predicted nutrient uptake.*
- c. *The permit should not be issued because no research on orchardgrass is available to support the supposition that 100 percent of the nitrogen and phosphorous will be removed in the crop root profile prior to wastewater infiltrating to the vadose zone and to the local groundwater.*

RESPONSE:

Page 17 of the NMP shows the phosphorus uptake rate of orchard grass is 18-45 lb/acre/yr which is greater than the 5.6 lb/acre/year phosphorus loading rate and the nitrogen uptake rate of orchard grass is 222-311 lb/acre/yr which is greater than the 56 lb/acre/year nitrogen loading rate.

Special condition I.D.3 requires the permittee to monitor and test phosphorus concentrations in the soils of irrigation fields. The Permittee shall also evaluate the soil phosphorus adsorption capacity at various soil depths in the spray fields. If the evaluation indicates inadequate soil phosphorus adsorption capacity, a plan to further reduce phosphorus loading to soils shall be submitted to the Department for review three months after the date when the inadequate soil phosphorus adsorption capacity is revealed.

Evaluation of input values from Hynes (2019) and the 2020 Trappe Nutrient Management Plan (NMP) to calculate potential nitrogen loading at the northern spray field confirms the estimated percolate entering the groundwater from orchard grass or loblolly (southern) pine results are negative and demonstrate no net nitrogen increase on a month-by-month basis. The monthly nitrogen uptake in cultivated areas being converted to orchard grass or loblolly (southern) pine is reasonably assumed to be a function of the monthly potential evapotranspiration percent times the yearly nitrogen uptake rate from the Trappe (2020) NMP. The results for orchard grass, loblolly (southern) pine support the finding of no increased nitrogen loading impacts to groundwater. No additions from fertilizers were considered since these are not planned in excess of plant needs. Plant health was assumed to be unstressed.

Ponding could negatively influence plant health and routine operation of the spray facility will avoid ponding conditions and thus support positive plant health. Changing the spray field cover from orchard grass to loblolly (southern) pine may further address this concern as 1) loblolly are facultative hydrophytes meaning they appear in wetlands and non-wetlands and adapt to normal moisture and some flooding and moderate drought, and 2) the conifer species have a longer growing season. A variety of grasses, crop and forest compositions may be utilized as appropriate

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spray field land covers to address observed conditions and may be considered through routine nutrient management plan updates as spelled out in the NMP.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 12:

Prove that the removed substances requirements in the proposed permit will result in no additional nutrient loads to surface or groundwater caused by application of the substances to land offsite.

RESPONSE:

The Permit requires that sewage sludge generated by the Facility is utilized according to the terms and conditions of a valid sewage sludge utilization permit issued by the Department.

Sludge from the Lakeside WWTP will be disposed of by a licensed sludge hauling and disposal company. Sludge from future expansion could be dried by a sludge filter press and disposed of at an approved landfill under an MDE-approved sludge disposal permit. A sewage sludge utilization permit will be applied for and received prior to the start-up of the first phase of the Lakeside WWTP.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 13:

Issuance of the proposed permit would be inconsistent with MDE's Land Application Guidelines. In describing the coordinated state-county approach to land application permitting in Chapter 4, the Guidelines explain, "If information is presented at the [public] hearing which indicates that the land application system will result in adverse effects on the environment or public health, the permit may be modified or canceled."

RESPONSE:

The proposed permit is consistent with MDE's Land Application Guidelines.

Wastewater from this community will be treated at an advanced wastewater treatment plant, which will produce tertiary effluent quality consistent with groundwater quality standards. The following table shows a comparison between the effluent limitations in the permit and groundwater quality standards (GWQS).

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Parameters	Trappe East Treated Effluent	Groundwater Quality Standard
BOD5	10 (mg/l)	30 mg/l
TSS	10 (mg/l)	30 mg/l
Total Nitrogen (N)	3 (mg/l)	10 mg/l
Total Phosphorus	0.3 (mg/l)	N/A
Fecal Coliform	< 3 (MPN/100ml)	< 3 (MPN/100ml)

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 14:

- a. *Prove that implementation of the Nutrient Management Plan and related spray field management requirements will recycle the entire effluent nitrogen and phosphorus loads into the vegetation grown on the spray field as required in the proposed permit.*
- b. *The tentative determination's estimate of nutrient uptake in the spray field is not accurate. The tentative determination's description of groundwater conditions fails to acknowledge several factors critical to the accuracy of predicted nutrient uptake.*
- c. *The Hydrogeologic Report submitted by the applicant suggests this groundwater to surface water loading could occur: "a portion of the treated water will percolate through the water table aquifer and may recharge underlying aquifers. Treated water will, also, enter the groundwater system through the subsurface, and eventually enter surface water streams".*
- d. *The permit should not be issued because no research on orchardgrass is available to support the supposition that 100 percent of the nitrogen and phosphorous will be removed in the crop root profile prior to wastewater infiltrating to the vadose zone and to the local groundwater.*

RESPONSE:

In response to the comment we highlight the following facts. Page 17 of the NMP shows the phosphorus uptake rate of orchard grass is 18-45 lb/acre/yr which is greater than the 5.6 lb/acre/year phosphorus loading rate and the nitrogen uptake rate of orchard grass is 222-311 lb/acre/yr which is greater than the 56 lb/acre/year nitrogen loading rate.

Special condition I. D. 3. Requires the permittee to monitor and test phosphorus concentrations in the soils of irrigation fields. The Permittee shall also evaluate the soil phosphorus adsorption capacity at various soil depths in the spray fields. If the evaluation indicates inadequate soil phosphorus adsorption capacity, a plan to further reduce phosphorus loading to soils shall be

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submitted to the Department for review three months after the date when the inadequate soil phosphorus adsorption capacity is revealed

Evaluation of input values from Hynes (2019) and the 2020 Trappe Nutrient Management Plan (NMP) to calculate potential nitrogen loading at the northern spray field confirms the estimated percolate entering the groundwater from orchard grass or loblolly (southern) pine results are negative and demonstrate no net nitrogen increase on a month-by-month basis. The monthly nitrogen uptake in cultivated areas being converted to orchard grass or loblolly (southern) pine is reasonably assumed to be a function of the monthly potential evapotranspiration percent times the yearly nitrogen uptake rate from the Trappe (2020) NMP. The results for orchard grass, loblolly (southern) pine support the finding of no increased nitrogen loading impacts to groundwater. No additions from fertilizers were considered since these are not planned in excess of plant needs. Plant health was assumed to be unstressed.

Ponding could negatively influence plant health and routine operation of the spray facility will avoid ponding conditions and thus support positive plant health. Changing the spray field cover from orchard grass to loblolly (southern) pine as the need arises may further address this concern as 1) loblolly are facultative hydrophytes meaning they appear in wetlands and non-wetlands and adapt to normal moisture and some flooding and moderate drought, and 2) the conifer species have a longer growing season. A variety of grasses, crop and forest compositions may be utilized as appropriate spray field land covers to address observed conditions and may be considered through routine nutrient management plan updates.

CHANGES FOR THE FINAL PERMIT:

Permit Special Condition I.C.8. will be modified to include “If the groundwater monitoring well data show that the plant cover nitrogen uptake is ineffective and caused elevated nitrogen and or phosphorous in groundwater, the Department may reopen this permit to evaluate alternatives to enhance nutrient removal. A NMP report shall be submitted to the Department annually.”

COMMENT 15:

The tentative determination fails to accurately account for projected treatment volumes.

RESPONSE:

In response to the comment we have changed the final determination to limit the flow to 100,000 gpd and exclude any references to the future phases of the project. Any additional flow to the facility will require a major modification to the permit.

CHANGES FOR THE FINAL PERMIT:

Footnote 1 & 2 of Special Conditions I.A.2. will be amended to read as follows:

- (1) A major permit modification is required for any future expansion of this facility.
- (2) The permitted flow is limited to 100,000 gpd. The 100,000 gpd will allow for

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approximately 400 residential units to be built. Any future flow increases will require major modification of this permit. An initial discharge of 37,500 gpd has already been authorized to discharge to the existing Trappe Wastewater Treatment Plant. Once the wastewater treatment plant associated with this permit is constructed and operational, the 37,500 gpd flow must be discharged via this permit. The 37,500 gpd is part of the 100,000 gpd authorized in this permit.

COMMENT 16:

- a. *The proposed discharge permit limits for total Nitrogen and total Phosphorus for the Trappe East WWTP are 3 mg/l and 0.3 mg/l respectively. Are these the lowest limits that can be achieved?*
- b. *I am very concerned that the wastewater will not be filtered to the maximum degree that is currently, technologically possible. I ask that your agency require that all wastewater be filtered through ultrafiltration membranes. Not simply suggested but written into the permit as a requirement.*

RESPONSE:

Wastewater from this community will be treated at an advanced wastewater treatment plant that uses membrane bioreactor (MBR) technology which uses ultrafiltration membranes. This is one of the most advanced treatment systems available to treat wastewater.

See also response to comment #13.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 17:

If there is any wind, the plan for a 25' buffer from the stream will not keep the aerosol droplets out of the surrounding waterways. There needs to be an analysis of the number of days removed from the available bucket of spraying days due to rain, wind, coastal flooding and days where the plants are dormant.

RESPONSE:

The permit has conditions to deal with windy weather. Special Condition I.C.2. prevents irrigation of treated wastewater during periods of precipitation, high winds, freezing conditions, or saturated soil conditions.

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The permit provides for a 25' buffer from the property line. In addition, a 100' stream buffer is also required as shown on page 9 of the NMP. This will be clearly indicated in the permit.

CHANGES FOR THE FINAL PERMIT:

Permit Special Condition I.C.3.b. will be amended to read “a minimum of 100-foot buffer to intermittent streams and perennial streams; In addition, a new provision will be added as Special Condition I.B.3.e. as follows “Or such alternate means which are approved by the Maryland Department of the Environment as suitable to control the movement of spray onto adjacent land (i.e., wind break of tightly placed trees, etc.)”.

COMMENT 18:

MDE must provide sufficient evidence that:

- a. *The permit conditions based on annual averages will result in zero discharge to surface and groundwater.*
- b. *Include enforceable and rigorous conditions that will ensure zero discharge of nutrients into both groundwater and surface waters.*

RESPONSE:

In response to the comment, we highlight the following facts. Implementation of the Nutrient Management Plan and related spray field management requirements will recycle the entire effluent nitrogen and phosphorus loads from the treated wastewater into the vegetation grown on the spray field. This treated effluent will not discharge into the surface waters. This permit has no nutrient impact on or to groundwaters of the State or to surface waters.

Removed substances requirements in special condition I.C.9. of the permit requires that grass clippings from cutting vegetation planted on the spray site be collected and removed from the spray field to eliminate onsite accumulation of nutrients from the clippings.

See also responses to comment #9, 14, 24, 84 and 85.

CHANGES FOR THE FINAL PERMIT:

Special Condition I.C.9. will be amended to read as follows “Grass clippings from cutting vegetation planted on the spray site shall be collected and removed from the spray field and removed/transported offsite to eliminate onsite accumulation of nutrients in the clippings”.

COMMENT 19:

The draft permit in its present form should be revised, and the Nutrient Management Plan should be revised, requiring that:

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- a. *Soils must be supplemented with potassium to maximize the nutrient utilization rate. The amount of potassium applied should be as much as 90% of the amount of nitrogen removed by the plants.*
- b. *Orchard grass be initially harvested each year at the early heading stage of growth in the spring*
- c. *Subsequent harvests be performed at 5-to-6-week intervals throughout the growing season*
- d. *All crop residues must be removed at each harvest*
- e. *Weekly applications of wastewater should occur over a 3-day period each week, spraying only 8 hours/day during daylight hours.*
- f. *The permit should not be issued until the Nutrient Management Plan is so revised, and these five requirements are specifically included in the groundwater discharge permit as enforceable language, in a manner that includes the numeric details and also includes reporting requirements to assure that they are implemented.*

RESPONSE:

In response to the comment we highlight section 3.2 of the hydrogeologic report which provides information on the application plan for the spray fields “The spray area will be divided into two or three zones. Each zone will be sprayed one day per week. This schedule will allow 4 to 5 days per week for rain, saturated soil conditions and maintenance. The zones will be set up to be sprayed at approximately ¼ inch per hour for 8 hours each.

Special Condition I.C.9. requires that any vegetation cut from the spray fields must be removed to eliminate onsite accumulation of nutrients.

See also responses to comment #11, 12, 13, 14 and 18.

CHANGES FOR THE FINAL PERMIT:

Section I.C.1 will be amended to include the following “The spray area will be divided into two or three zones. Each zone will be sprayed one day per week. This schedule will allow 4 to 5 days per week for rain, saturated soil conditions and maintenance. The zones will be set up to be sprayed at approximately ¼ inch per hour for 8 hours each. The northern zone spray field will be used first as the initial disposal field”

Special Condition I.C.9. will be amended to include the following “all cuttings must be removed/transported offsite”.

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COMMENT 20:

MDE should require that the Nutrient Management Plan be amended to include a spraying plan that quantitatively stipulates the maximum allowable daily application rate, the acceptable times of day for applications, and the maximum allowable wet/dry ratio (i.e., the length of the wetting periods to the length of time of the subsequent drying intervals).

RESPONSE:

See response to comment #4 and 19.

CHANGES FOR THE FINAL PERMIT:

Changes to be made are detailed in comment 19.

COMMENT 21:

It is imperative that:

- a. MDE include in the language of the final permit the prohibition on operating the spray irrigation equipment between December 15 of any year and February 28 of the following year.*
- b. MDE require a 40 percent (i.e., 1.4) factor of safety for the design volume of the storage facility. That is, the storage facility should be designed for 140% of the expected flow rate for 75 days of operation, or approximately 30 more days of storage at the average plant flow rate.*
- c. MDE explicitly state in the permit a requirement that the permittee(s) have in place pre-arranged contract(s) with sewage haulers to pump and transport sewage in the amounts of the daily sewage flow at the facility in the event that the storage facility is at capacity and the spray irrigation prohibitions are implemented.*
- d. MDE make it clear in preemptive permit language that storage capacity issues will not be acceptable topics for force majeure considerations, and that under no circumstances are the permittee(s) allowed to operate the spray irrigation equipment under conditions of the prohibitions detailed the permit.*
- e. The permit should not just require 75 days of storage, but must define December 15 to February 28 as a period when spraying of effluent is not permitted. The permit must require the plant operator to have adequate contracts in place to haul waste, so that if the storage facility is full, the waste can be removed to other treatment plants. Prohibitions on spraying effluent that are based on precipitation, high winds, or temperature need to be specific and quantifiable, e.g., spraying is not allowed on any day when the temperature falls below a defined level.*

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RESPONSE:

See responses to comment #1, 3, 5, 7 and 12. In addition, if the lagoon reaches the 3 feet freeboard, the permittee shall pump and haul to maintain the 3 feet of freeboard.

In addition to the above response to the comment, we highlight the following facts. Special condition I.C.4 requires daily logs of the response of each disposal area to the application of treated effluent shall be kept by the plant operator. Subjects to be included in the log are:

- a. Area(s) or section(s) under irrigation.
- b. Application rates (hourly and weekly).
- c. Effect of irrigation on vegetation.
- d. Instances of ponding or runoff.
- e. Weather conditions.

The log shall be kept at the waste treatment facility and be available for inspection by the Department personnel upon request.

CHANGES FOR THE FINAL PERMIT:

The following will be added to section I.C.2. “if the lagoon reaches the 3 feet freeboard, the permittee shall pump and haul to maintain the 3 feet of freeboard”.

COMMENT 22:

We ask the MDE to show how they considered the cumulative impact on the designated uses of Miles Creek from this discharge and development. We also ask MDE to evaluate the impact of the new impervious surfaces, the stormwater retention and infiltration practices, and the spray irrigation on groundwater levels. Given that the cumulative impact of massive increases in imperviousness and groundwater inputs results in several new and additional sources of discharge (nutrient leaching, groundwater flows to surface water, and inflow/infiltration), we ask MDE to explain how the permit will account for the anticipated increases in loads from the discharges.

RESPONSE:

In response to the comment we highlight the following facts. Though stormwater management is not within the scope of this groundwater discharge permit, the Lakeside Development must be constructed in accordance with the Department’s and the Town of Trappe’s stormwater management standards.

Stormwater management practices will be designed and constructed implementing State and local regulated Environmental Site Design (ESD) to the Maximum Extent Practicable (MEP). The regulations require the mitigation of stormwater runoff from land use changes to protect adjacent

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properties, waterways, wetlands, and groundwater. The proposed stormwater management practices can be expected to reduce nutrient loads resulting from the current farming practices, by managing drainage from the developed site to simulate undisturbed natural woodland conditions.

Drainage system outfalls are directed to provide hydrologic connections for nontidal wetlands and streams. No drainage from new impervious surfaces will be discharged onto, or infiltrated to groundwater in proximity to, the spray fields. Accordingly, new impervious surfaces and stormwater retention and infiltration practices will not impact the mounding analysis for the spray fields.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 23:

We strongly recommend that MDE require an updated NMP and a variable rate irrigation system capable of ensuring that irrigation rates match crop uptake rates at all times and at all locations within the fields. Only such seasonally appropriate limits can possibly comply with state law requiring 100% uptake.

RESPONSE:

As the volume of wastewater increases with its development phase, reevaluation of the nutrient management plan will be needed to ensure that sufficient crop plantings in both volume and type are considered. It is anticipated that the initial 100,000 gal/day of wastewater will be sufficient through 2023 and managed under the initial nutrient management plan.

The permittee will now be required to submit an annual NMP report to the Department annually.

Also see response to comment #1, 2 and 14.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 24:

- a. *The Hydrogeologic Report submitted by the applicant suggests this groundwater to surface water loading could occur: “a portion of the treated water will percolate through the water table aquifer and may recharge underlying aquifers. Treated water will, also, enter the groundwater system through the subsurface, and eventually enter surface water streams”.*
- b. *The proposed spray irrigation site presents the poster child for “the functional equivalent” of a federally-regulated Clean Water Act surface water discharge. Unless substantial*

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changes are made to (1) ensure spray irrigated effluent is at all times (i.e., 100%) taken up by crops or evaporated and not allowed to percolate below the root zone and (2) contain, to the extent possible, aerosolized effluent through buffers and barriers, we urge MDE to issue a standard surface water discharge permit in lieu of this groundwater discharge permit to reflect the fact that surface water pollution discharges will occur.

- c. *Will effluent eventually enter local waterways and aquifers?*
- d. *I understand that the future plan is to spray neighboring fields with wastewater. Is this “greywater” or “blackwater (water from toilets)? The fields will run off into the creek, especially during hurricane or heavy rainstorm events, and will further contaminate La Trappe creek and eventually the Choptank.*

RESPONSE:

See response to comment #1, 2, 18 and 85.

In addition to the above response to the comment, we highlight the following facts. This wastewater disposal system will not discharge into the surface waters. Treated effluent will be sprayed onto the fields where the entire effluent nitrogen and phosphorus loads from the treated wastewater will be recycled through the vegetation grown on the spray field before percolating to the surficial aquifer. Therefore it is expected to have no impact on groundwater or surface waters. In addition, the flow from the facility should not be large enough to make any impacts on surface waters.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 25:

Does the MDE have 2021 data for chlorophyll a, dissolved oxygen, suspended sediment, nitrogen, phosphorus and fecal coliform for La Trappe Creek and the unnamed tributary (UTLTC) into which Trappe's wastewater is discharged? If so, please provide.

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RESPONSE:

The data for La Trappe Creek and the UTLTC has been requested several times through the PIA process and provided to several requesters. All data is available in the Maryland Ambient Water Quality Monitoring System (AWQMS) found here:

<https://mde.maryland.gov/programs/water/tmdl/md-awqms/pages/awqms.aspx>.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 26:

Did the MDE do a 2017 TMDL environmental assessment of UTLTC to see if the required 60% pollutant reductions are being met? If so, please provide.

RESPONSE:

The commenter may be referring to the Chesapeake Bay TMDL for nutrient and sediment Phase I and II Watershed Implementation Plans, which required the state to achieve 60% reduction of those pollutant loads by 2017 (the Mid-point assessment). This was required at the statewide and major basin scale, not at the scale of the UTLTC. EPA's evaluation of MD's 2017 requirement can be found here: <https://www.epa.gov/chesapeake-bay-tmdl/epa-final-evaluation-2016-2017-milestone-and-midpoint-progress-and-2018-2019>

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 27:

Especially in a time of the COVID-19 pandemic where traces of the virus are being found in wastewater, the nuisance and health impacts of aerosolized wastewater needs to be taken seriously and considered when developing permit conditions. How has MDE assessed the impacts of these pollutants on human and environmental health, both when being aerosolized and when discharged on an agricultural field growing crops?

RESPONSE:

Wastewater treatment includes disinfection. It is typically a final step to remove organisms from the treated water before the effluent is discharged. The EPA states "disinfection is considered a primary mechanism for inactivating/destroying pathogenic organisms and preventing the spread of waterborne diseases to downstream users and the environment. Some of the most commonly used disinfectants for decentralized applications include chlorine, iodine, and ultraviolet (UV) radiation."

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For the Trappe East WWTP, disinfection will be provided through a chlorine disinfection system.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 28:

Signs will need to be posted at Trappe Landing (similar to example shown below) that state the water quality is so poor that it is unsafe for recreational use. It's only fair to warn the public, watermen, recreational boaters, water skiers, and jet skiers that there is a danger of being infected by the wastewater bacteria. This is a public health & safety issue.

RESPONSE:

The treated effluent will not discharge into the surface waters. In addition, the Wastewater treatment process includes disinfection.

In addition, see response to comment #24.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 29:

- a. *Our family's health and safety will be negatively affected because living so close to the proposed spray irrigation facility will significantly increase our probability of inhaling pathogenic aerosols as discussed in the article,(Health and Hygiene Aspects of Spray Irrigation, C.A. Sorber).*
- b. *Our family's safety would also be negatively affected by viruses such as SARS-CoV-2 which has been found to survive in treated wastewater as noted in the article, (Rethinking wastewater risks and monitoring in light of the COVID-19 pandemic, A Bogler). This article also states that there is a need for research involving the spread of COVID-19 in treated wastewater.*

RESPONSE:

See the response to comment #17 with regards to wind and buffer requirements.

Wastewater treatment includes disinfection. The disinfection is to make the wastewater safe for human contact. For the Trappe east WWTP, disinfection will be provided through a chlorine disinfection system. Coronavirus is susceptible to disinfection and standard treatment and

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disinfection processes at wastewater treatment plants are expected to be effective. In addition to the disinfection, special condition I.C.3d. requires a minimum of 25-foot buffer to public roads and residential property lines.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 30:

- a. *I ask that air monitoring be a requirement for this facility, to ensure that your agency can guarantee to the local residents that no threat exists from airborne pathogenic viral, bacterial or chemical micro-droplets.*
- b. *Where is there consideration also for the salmonella and enteroviruses shown by scientific studies to be present in aerosol droplets from wastewater spray?*
- c. *I ask that the hours of application of treated water through spray irrigation, only be allowed during daylight hours, to allow for optimum natural environmental elimination of the potential airborne pathogens.*

RESPONSE:

Special Condition I.C.2. prevents irrigation of treated wastewater during periods of precipitation, high winds, freezing conditions, or saturated soil conditions. The final determination expands these conditions.

In addition, the Wastewater treatment process includes disinfection.

See also response to comment #1 and 29.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 31:

People who live in other areas where wastewater is sprayed noticed an increase in the gnat and fly populations. The wastewater will find its way into small creeks and rivers which flow into the Choptank River. The river has seen a decline in certain fish which once were plentiful in the river. People who live along the tributaries cannot enjoy swimming or fishing in these bodies of water due to increased contamination from runoffs. Also, a concern is the wastewater seeping into the aquifer which supplies water to my home.

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RESPONSE:

The permit has been constructed such that discharges in accordance with the permit will not discharge nutrients (nitrogen and/or phosphorus) to ground or surface waters. Wastewater from this community will be treated at an advanced wastewater treatment plant, which will produce tertiary effluent quality significantly below groundwater quality standards. In addition, the wastewater disposal system will not discharge into surface waters.

Removed substances requirements in the proposed permit and Implementation of the Nutrient Management Plan and related spray field management requirements will recycle the entire effluent nitrogen and phosphorus loads into the vegetation grown on the spray field. 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 and the nitrogen uptake rate of orchardgrass is 222-311 lb/acre/yr which is greater than the 56 lb/acre/year nitrogen loading rate. This will result in no additional nutrient loads to surface or groundwater caused by application of the treated effluent.

In addition, Special Condition I.C.3. requires a minimum of 100-foot buffer to potable wells, and surface water intakes.

See also response to comment #13, 18, 24, 29, 30 and 85.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 32:

We ask MDE to specify in the permit the treatment technology for which the applicant is committed to building and operating with a certified superintendent and operator(s), and the details on the individual steps of the wastewater treatment process using such technology.

RESPONSE:

The Lakeside WWTP is a Membrane Bio Reactor (MBR) Enhanced Nutrient Removal (ENR) wastewater treatment plant. Pre-treatment will be provided by rotary drum screens with a compactor, flow equalization tank, and a Helisieve screen. The biological nutrient removal system is a Bardenpho style treatment system. The MLSS solids separation system utilizes industrial- grade tubular, back-washable, out-of-basin PVDF ultrafiltration membranes provided by Innovative Treatment Products, Inc. (ITP). ENR-quality effluent will be discharged by spray irrigation. The design of the Phase 1 of the MBR ENR WWTP has been fully reviewed by MDE and the construction permit is pending the issuance of the groundwater discharge permit.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

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COMMENT 33:

To be consistent with the zero discharge standard of this permit, ShoreRivers asks that a special condition be applied to this permit requiring that the stormwater permit include a guaranteed method of channeling any stormwater captured in ponds back through the wastewater system and discharged again as to avoid the additional groundwater inputs, as well as requiring that all stormwater ponds be lined.

RESPONSE:

In response to the comment we highlight the following facts. Special Condition I.C.2 states that Excessive irrigation resulting in surface runoff or ponding is prohibited. In addition, The Lakeside Development will be constructed in accordance with MDE and Town of Trappe stormwater management standards. Drainage system outfalls are directed to provide hydrologic connections for nontidal wetlands and streams. No drainage from new impervious surfaces is discharged onto, or infiltrated into groundwater in close proximity of the spray fields. Accordingly, new impervious surfaces and stormwater retention and infiltration practices will not impact the mounding analysis for the spray fields.

See also response to comment #1 and 22.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 34:

ShoreRivers requests that MDE include a special condition in the permit that requires the applicant to submit, for approval by MDE and MDA, a sewage sludge utilization plan and permit within 60- days of the issuance of any permit. The plan must include (1) a testing and reporting program for nutrients, heavy metals, PFAS, pharmaceuticals, hormones, and other contaminants of emerging concern identified by the Chesapeake Bay Program, (2) detailed reporting on what farms will receive the sludge including the quantity of sludge received by quarter, and (3) the NMP for all the farms that receive and apply sludge generated by this wastewater treatment system as verification that those farms can safely handle the sludge material without polluting groundwater or surface waters.

RESPONSE:

In response to the comment we highlight the following facts. Sludge from the first phase of the Lakeside WWTP will be disposed of by a licensed sludge hauling and disposal company. Sludge from future phases will be dried by a sludge filter press and disposed of at an approved landfill under an MDE-approved sludge disposal permit. A sewage sludge utilization permit will be applied for and received prior to the start-up of the first phase of the Lakeside WWTP.

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In addition, the Permittee shall comply with all existing State and federal laws and regulations that apply to sewage sludge monitoring requirements and utilization practices, and with any regulations promulgated pursuant to Environment Article, Section 9-230 et seq. The Permittee is responsible for ensuring that its sewage sludge is utilized in accordance with a valid sewage sludge utilization permit issued by the Department. Any requirements pertaining to the sewage sludge utilization permit is outside of the scope of this permit.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 35:

This permit should explicitly require an actual approval from MDE at each phase of expansion and not just notice from the Permittee. I also urge MDE to treat each expansion-stage approval as a major permit modification.

RESPONSE:

In response to the comment we highlight the response to comment #15.

CHANGES FOR THE FINAL PERMIT:

Changes to the permit are detailed in response to comment #15.

COMMENT 36:

- a. *In the first line of text at the top of Page No. 3 of the Draft Permit there is a confusing “widowed” heading. The text is intended as a continuation of Footnote 2 to Special Condition I.A.2. However, it begins with the Header instead. In the first line of text on Page 3, everything before “IV” should be deleted.*
- b. *Note that the title for Section I.B.1.d. refers to Groundwater as “Ground water” (i.e., 2 words, not 1 word).*

RESPONSE:

Acknowledge and will correct these in the final permit.

CHANGES FOR THE FINAL PERMIT:

The typographical errors will be corrected in the final permit.

COMMENT 37:

Draft Permit Special Condition I.A.1. would authorize the Permittee “to discharge advance treated wastewater via spray irrigation.” It then states that the Permittee “is not authorized to

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discharge any treated or untreated industrial wastewater.” The first statement should be qualified by the addition of “in accordance with the terms, conditions, and limitations in this permit.” In addition, since the authorization does not extend to all wastewater, you should further clarify the scope of the authorization by adding “domestic” before the term “wastewater” in the first sentence, so that it would read “advance treated domestic wastewater.”

RESPONSE:

Permit Special Condition I.A.1. has been amended to read as follows “The Permittee is authorized to discharge advanced treated wastewater in accordance with the terms, conditions, and limitations in this permit via spray irrigation onto designated areas shown on the attached Map A. The Permittee is not authorized to discharge any treated or untreated industrial wastewater to waters of the State”.

CHANGES FOR THE FINAL PERMIT:

Permit Special Condition I.A.1. has been amended to read as follows “The Permittee is authorized to discharge advanced treated wastewater in accordance with the terms, conditions, and limitations in this permit via spray irrigation onto designated areas shown on the attached Map A. The Permittee is not authorized to discharge any treated or untreated industrial wastewater to waters of the State”.

COMMENT 38:

MDE should also issue for this discharge a “zero discharge” NPDES permit, so that appropriate and effective monitoring, reporting and corrective action can be required when runoff to surface waters does occur. The boilerplate “Operational Restrictions” stated in General Condition II. A. 2. that address ponding and runoff are meaningless pabulum. They require no routine, systematic inspection and no monitoring, record-keeping or reporting when these conditions occur. They are therefore completely unenforceable.

RESPONSE:

The commenter is concerned that there are inadequate limitations to prevent ponding and runoff. The permit has numerous conditions to prevent discharges to surface waters. The general conditions referenced in the comment are just one of many overlapping controls within the permit. See the response to comment #1 and 8 which includes information on additional monitoring and reporting requirements.

See also response to comments #10 and 85.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

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COMMENT 39:

Second, Footnote 2 to the table in I.3.a. guts even those “limits” that are stated by mis-designating both upgradient and downgradient wells as “background.” It reads, “if the average ground water quality in either background upgradient well [] or background downgradient well [] exceeds the ground water discharge standards, the Department may evaluate whether a violation exists on a case by case [sic] basis.” (Emphasis added). The upgradient wells (MW-1, -2, -11, and -12) should be the only “background” wells. The whole purpose of having downgradient wells is to determine the extent to which the spray irrigation is changing the groundwater, when compared against upgradient, background groundwater quality. The downgradient wells are certainly not “background.”

RESPONSE:

We agree with the comment. The word “background” will be removed to describe downgradient wells.

CHANGES FOR THE FINAL PERMIT:

The word “background” will be removed from the description of the downgradient wells in the permit.

COMMENT 40:

Special Condition I.A.3.a. purports to state limitations for groundwater quality in monitoring wells by setting forth in a table concentration limit values for a few select parameters: Nitrite, TDS and Chlorides. But it falls short in three ways. First, for the nutrients of concern in adjoining surface waters, Total Nitrogen and Phosphate, which the Hynes Report says will be recipients by underground migration, it has no limitations at all. See Hynes Report at p. 5 (“Treated water will, also, enter the groundwater system, through the subsurface, and eventually enter surface water streams. The water will then flow into the nearby Choptank River.”) For the critical nutrients of concern, the Draft Permit states in Footnote (1), “Monitoring required without limitation.” I recommend that limits be established for both Total Nitrogen and Total Phosphorous in groundwater in order to protect the already-impaired waters of Miles Creek and the Choptank River from further degradation from migration of nutrients through the groundwater. Given MDE’s and the Hynes Report’s assumption that no nutrients will reach groundwater, those limits for both should be any increase above the average of the readings in the upgradient background wells during any monitoring event.

RESPONSE:

See responses to comments #3, 9, 11 and 14.

Additionally, the premise of the comment is incorrect. The permit has been designed such that discharges in accordance with the permit will not discharge nutrients (nitrogen and/or phosphorus) to ground or surface waters. The special conditions noted in the comment are simply a feature of

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the permit to confirm that the other conditions of the permit are working. Special condition I.A.3.a. and b. require the permittee to sample 13 groundwater monitoring wells (12 wells were proposed in the permit, one more will be added to bring the total to 13 monitoring stations) and test for 9 parameters to ensure that groundwater quality standards are not exceeded due to the application of the treated effluent to the spray fields. The limitations in this section of the permit are based on the drinking water standards for NO₂ (Nitrite 00615), Total Dissolved Solids (70295), Chloride (00940), and E. Coli (51040).

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 41:

The Draft Permit notes in Footnote 2 to Special Condition I.A.2. that the commercial development is “expected to be included” in Phases 2, 3 and 4,” but there is no explicit recognition of how the additional flow from the retail/commercial space will be handled.

RESPONSE:

The commercial flow was to be factored into phases #2, 3 and 4. The final determination is for a permitted flow of 100,000 gpd for approximately 400 residential units. Any future expansion of this facility will require a major permit modification.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 42:

With the climate changes we bear witness to every year, we are seeing more rainfall, more severe storms and therefore more runoff carrying pollutants into our waters. MDE must fully account for the influence of these factors when permitting the application of treated sewage to farmland.

RESPONSE:

In response to the comment we highlight the following facts. The permit includes volumetric discharge limits to prevent ponding and runoff. The permit also has numerous conditions to protect the assimilative capacity of the spray field. See also responses to comments 3, 7, 8 and 30.

In addition, the Lakeside WWTP will be constructed outside of all floodplains and is elevated above any potential near-term increases in tidal or riverine flood levels. The proposed storage lagoon includes the 3 feet freeboard required by MDE and additional capacity for storage of rainfall. State goals for reuse of treated wastewater include increasing the amount of current types of reuse and adopting regulatory and programmatic changes to make reuse easier. Reuse of

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treated wastewater for crop irrigation can increase yields and recharge groundwater and is a recognized climate resiliency practice.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 43:

The Draft Permit eviscerates the groundwater quality “limits” by stipulating that “the average groundwater quality” is to be compared to the limit to see whether it exceeds the standard. And then it fails to specify how the average is to be determined. Is it the average of one quarter’s sampling results? The average of downgradient wells? The average of upgradient and downgradient wells? The annual average value from all wells? From any one well? Without addressing these specifics, the Draft Permit makes the limits meaningless. In addition, groundwater typically moves slowly, and the average concentration may not exceed a limit until a sizable plume is already irretrievably contaminated. The Permit should require prompt reporting of any observed exceedance of any limit in any downgradient monitoring well. In addition, since some limits are based on drinking water standards, the Permit should require similarly prompt notice to any well owners within one-half (1/2) mile of the site.

RESPONSE:

We agree that the wording in the current permit could use greater clarity. Consequently, footnote 2 to the table in I.3.a. and b. will be amended to read as follows “the average yearly groundwater quality”.

CHANGES FOR THE FINAL PERMIT:

Footnote 2 to the table in I.3.a. and b. will be amended to read as follows “the average yearly groundwater quality”.

COMMENT 44:

There is a typo in Special Condition I.C.8. The phrase “State of Maryland in consistent with the terms and conditions of this permit” should read “State of Maryland and consistent with the terms and conditions of this permit.”

RESPONSE:

We agree with the comment. This will be corrected in the final permit

CHANGES FOR THE FINAL PERMIT:

Changes will be made in the final permit in agreement with the comment.

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COMMENT 45:

The view of the plant performance should be increased from only 4.3% of the monthly operational time to at least 13.1% of the time. The MDE should revise Section I.A.2 of the draft groundwater discharge permit to change the Sample Type to require 24-hour composite sampling for Parameter Codes 00310, 00530, 00600, and 00665.

RESPONSE:

The permit provides the conditions for monitoring and maintaining plant performance.

See response to comment #10.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 46:

- a. *The permit should specify that the results of the laboratory analyses for the individual samples required in Section I.A.2. for BOD5, Suspended Solids, Total Nitrogen, Total Phosphorous, and Fecal Coliform (and, as requested above, E. coli) should be reported in the daily operations section of the Monthly Operating Report as individual sampling results, as represented on the laboratory results sheets (i.e., not monthly averages).*
- b. *The view of the plant performance should be increased from only 4.3% of the monthly operational time to at least 13.1% of the time. The MDE should revise Section I.A.2 of the draft groundwater discharge permit to change the Sample Type to require 24-hour composite sampling for Parameter Codes 00310, 00530, 00600, and 00665.*

RESPONSE:

The permittee is required to keep a daily log of activities. This includes information on when samples are taken and analyzed. All logs shall be kept at the waste treatment facility and be available for inspection by the Department personnel upon request.

See also response to comment #10 on plant performance.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 47:

The permit should include language requiring the operators to develop and deliver to MDE a groundwater monitoring plan that includes a quality assurance program plan before the plant is permitted to operate. The sampling program is intended to have samples obtained from the

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lysimeters and the wells to be analyzed for the water quality parameters listed elsewhere in the permit: Total Nitrogen, Nitrite+Nitrate Nitrogen, Total Ammonia Nitrogen, Organic Nitrogen, Total Phosphorous, Dissolved Phosphorous, Orthophosphate e-Coli, Fecal Coliform.

RESPONSE:

This will be captured in the background monitoring data. A monitoring plan requirement is included in the permit section Special Conditions I.D.2.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 48:

The permit needs to stipulate that a certified operator is in place on day 1 of the plant operation.

RESPONSE:

The permit requires that the plant be operated by a certified operator. All conditions in the permit (unless otherwise specified) take effect on the effective date of the permit.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 49:

The Nutrient Management Plan and the permit both should address the critical needs for continuous soil monitoring by including specific quantitative prescriptive language with methods, parameters, sampling schedules and quarterly reporting requirements. The permit should include language requiring the operators to develop and deliver to MDE a soil monitoring plan that includes a quality assurance program plan before the plant is permitted to operate.

RESPONSE:

In response to the comment we highlight the following facts. Special condition I.D.3 provides specific soil sampling and reporting requirements that the permittee must comply with. In addition, the permittee will be required to submit a NMP annual report to the Department.

CHANGES FOR THE FINAL PERMIT:

Special condition I.C.8. will be amended to require the NMP annual reporting.

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COMMENT 50:

The monitoring requirements for the treated wastewater detailed in Section I.A.2 should be expanded to include a requirement for a “Monitor Only” (i.e., no Effluent Limitations) weekly grab sample for Escherichia coli (STORET code 31633, or similar equivalent). E. coli is a more reliable indicator of sewage or animal waste contamination and now is the regulatory bacterial indicator parameter recommended for use by the USEPA and MDE. The E. coli values should be reported in the daily operations section of the Monthly Operating Report as individual sampling results, as represented on the laboratory results sheets (i.e., not monthly averages).

RESPONSE:

We agree with the comment.

See also response to comment #46.

CHANGES FOR THE FINAL PERMIT:

The permit will be amended to include testing for Escherichia coli (STORET code 51040) in place of fecal coliform (STORET code 74055) in Section I.A.2.

COMMENT 51:

The monitoring requirements for the treated wastewater detailed in Section I.A.2 has no STORET parameter code for Total Phosphorous. The STORET Code 00665 for “Phosphorous, Total as P” should be included in the table.

RESPONSE:

We agree with the comment.

CHANGES FOR THE FINAL PERMIT:

The STORET Code 00665 for “Phosphorous, Total as P” will be included in that section.

COMMENT 52:

The MDE should provide more specific information on the proposed treatment technologies in an amended Summary Report and Fact Sheet and extend the comment period to allow the public to respond.

RESPONSE:

See the response to comment #32.

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The summary of the wastewater treatment facility in the fact sheet provided with the permit indicates that the wastewater 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. The Department extended the initial comment period of 30 days to 90 days which ended December 6, 2021.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 53:

The MDE should add 'Monitor Only' requirements to Section I.A.2. of the permit for weekly 24-hour composite samples for: Nitrite+Nitrate (00630), Total Ammonia (00610), Organic Nitrogen (00605), and Orthophosphate (04175). Further, these results should be reported in the Monthly Operating Report as individual sample results (i.e., not monthly averaged).

RESPONSE:

We partially agree with the comment. Monitoring for Nitrite+Nitrate (00630) will be added to the permit. The permit already requires monitoring for TKN (Ammonia plus organic Nitrogen) and Phosphorous, which includes phosphate, so they do not need to be added to the permit monitoring requirements.

See also response to comment #46.

CHANGES FOR THE FINAL PERMIT:

Monitoring for Nitrite+Nitrate (00630) will be added to the permit.

The permit will be amended to include testing for Escherichia coli (STORET code 51040) in place of fecal coliform (STORET code 74055) in Section I.A.2.

COMMENT 54:

The Draft Permit's definition of average flows in Special Condition I.B.2.a. is inconsistent with Department of Agriculture regulations at COMAR 15.20.07.02 and not supported by the hydrogeological analysis in the Hynes Report. The Draft Permit provision instructs that the flow rate "shall be divided by the total number of days of each month" to get the monthly average. Yet the Department of Agriculture regulations prohibit spraying during half of December and all of January and February. Under the Draft Permit's approach, the Permittee would have to divide half a month's worth of spray volume by 31 days to get the "monthly average" for December. To compound the error, the Draft Permit further provides, "The yearly average flow shall be the summation of monthly average flows divided by 12." So for two months, the monthly average flows will be zero, and yet the Draft Permit would still divide by 12 months. This method would

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understate and misrepresent the actual flows during months of operation. The portion of the definition regarding flow rate should be revised to read as follows, "The only exception is flow rate which shall be divided by the total number of days of each month during which spray application is permitted. The yearly average flow shall be the summation of monthly average flow divided by 9.5."

RESPONSE:

See responses to comments #3, 9, 11 and 14.

In response to this comment we also highlight the following facts. Section I.C.1 of the permit stipulates that the hydraulic loading rates of the spray irrigation area shall not exceed 2 inches/week (annual average). Section I.C.2. stipulates that irrigation of treated wastewater shall not take place during periods of precipitation, high winds, freezing conditions, or saturated soil. At no time shall spray irrigation be conducted on areas with bare unvegetated soils or with groundwater table depth less than 2' from ground surface. Excessive irrigation resulting in surface runoff or ponding is prohibited. The annual average loading rate of 2 inches/week provides flexibility in system operation. Application of the spray is managed by the NMP and the time restrictions as detailed in the permit.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 55:

Special Condition I.D.3. requires annual sampling of the soils in the spray area for phosphorus and an evaluation of the adsorption capacity of the soil for phosphorus. But it fails to say when the evaluation must be performed. Annually? Or only once? If inadequate adsorption capacity is found, I.D.3. requires submission of a plan to reduce phosphorus loading three months later. I urge the Department to require submission of the loading reduction plan as soon as possible, and not later than 30 days after the inadequate adsorption is documented.

RESPONSE:

Special Condition I.D.3. requires that representative soil samples be taken once a year after the growing season for analyzing soil-test phosphorus. The Permittee is also required to evaluate the soil phosphorus adsorption capacity at various soil depths in the spray fields.

he three-month time frame for submitting the report is to give time for sampling and analysis followed by conclusions and presenting the findings and recommendations in a report.

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CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

See also response to comment #1.

COMMENT 56:

Special Condition I.D.2.b. requires installation and pre-startup sampling of the groundwater monitoring wells for 12 months to determine background water quality. It should also require that the Permittee report the analysis results to MDE and retain them for at least the duration of the active spray irrigation operations.

RESPONSE:

Other special conditions in the permit specify reporting and document retention requirements. In particular, special conditions I.B.1.d., I.D.2., I.D.6., and I.D.2.d. provide detailed information on reporting requirements for groundwater sampling and results of analysis which is required for the lifetime of the facility.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 57:

Special Condition I.C.5. requires “the Permittee shall develop a ‘Manual of Operation and Maintenance.’” I recommend that it requires that the Permittee not only “develop” but also maintain up-to-date that Manual, especially since the treatment facility will be expanded in Phases. More specifically, I recommend that the Permit require the Permittee to submit a new, updated Manual before MDE approval of each successive phase of expansion.

RESPONSE:

Special condition I.C.5, requires the development of a “Manual of Operation and Maintenance” for the entire wastewater treatment facility. A review and request for amendment of the manual will be made by MDE if there is a demonstrated need for the review and amendment.

CHANGES FOR THE FINAL PERMIT:

Special condition I.C.10. will be added to the permit that will require a third party engineering assessment of O&M of the facility every three years and a submission of the findings in a report to MDE upon completion of the assessment.

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COMMENT 58:

- a. *Special Condition I.C.2. contains general prohibitions on spray application of treated wastewater during “periods of precipitation, high winds, freezing conditions or saturated soils.” Because of the Draft Permit’s failure to define any of those terms, they are as unenforceable as they are general. Each of those terms must be defined to make the prohibition meaningful and enforceable. For example, “periods of precipitation” should include explicitly “on any day during or within 24 hours of which there is 0.1 inch or greater of rainfall.” The term “high winds” should be defined to mean any wind at the site in excess of 12 miles per hour, the National Weather Service’s upper cutoff for a “Gentle Breeze.” In addition, the Permittees should be required to install and maintain at the site a recording anemometer to measure the winds. “Freezing conditions” should be defined to include any day within which ground surface temperatures at the site have dipped, or are expected to dip, below 34 degrees within 36 hours. Note that the Hynes Report’s mounding analysis posits that the groundwater mound resulting from each spray day will have six (6) days to dissipate. See Hynes Report at p. 6. That analysis assumes that infiltration will not be impeded by frozen ground. In addition, the requirement to keep a daily log in I.C.4. should specify that, with respect to weather conditions, the readings of temperature, humidity, pressure and wind speed are to be made on site.*

- b. *Special Condition I.C.2. also contains a similarly meaningless and unenforceable prohibition against “Excessive irrigation resulting in ponding or runoff.” Unless the Permit defines these terms and requires the Permittee regularly and systematically to inspect the spray area and to record and report the results of the inspections, this prohibition is completely unenforceable. MDE should require visual or drone video inspections of the spray area and its perimeter at least weekly following spray events, with the results recorded in the daily log. Further, the Permit should require any evidence of ponding, runoff or erosion to be reported to MDE with the monthly monitoring reports.*

RESPONSE:

See response to comments #1, 3, 7 and 10.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 59:

Section I.A.3.b. of the draft groundwater permit that specifies monitoring requirements for groundwater parameters calls for a Total Phosphorous result but does not require sampling for other forms of Phosphorous. While it may be presumed that in groundwater all or most of the observed TP is in a soluble or dissolved form, for assessments of the risk to down-gradient waterways, it is important to know how much of that observed TP is refractory, which can be approximated by subtracting Orthophosphate from TP. The MDE should include a requirement in

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Section I.A.3.b. for a grab sample for Orthophosphate (STORET Code 00660, Phosphate, Ortho as PO4).

RESPONSE:

In response to the comment we highlight the following facts. The Lakeside WWTP is a Membrane Bioreactor (MBR) Enhanced Nutrient Removal (ENR) wastewater treatment plant which will treat the wastewater to 0.3mg/l of phosphorus before it is discharged. In addition, there is a requirement to monitor for phosphate in the monitoring wells.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 60:

In addition, the effectiveness of any supposed groundwater quality limits is further compromised by the limited frequency of the only required reporting of groundwater monitoring results, the “Groundwater Monitoring Report (GMR) [sic].” Under the Draft Permit’s Special Conditions I.B.1.d. and I.D.6, these reports would be required only annually, even though monitoring is required quarterly. I urge MDE to require reports of groundwater monitoring results to be filed quarterly by the 28th day of the month following the end of each calendar quarter.

RESPONSE:

The premise of the comment is incorrect. Special Conditions I.B.1.c. requires that “the Permittee shall submit monthly operating reports on a form supplied or approved by the Inspection and Compliance Program. Reports shall be submitted to the Inspection and Compliance Program postmarked no later than the 28th day of the month following the reporting month.”

In section II.A.3., the Permittee is required to notify the Department of any noncompliance occurrence and steps taken to mitigate the occurrence, within 24 hours, by telephone at (410) 537-3510 during work hours and at (866) 633-4686 during evenings, weekends and holidays and provide the Department with written documentation within five days of the notification.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 61:

General Condition II.B.4. addresses transfer of ownership or control with MDE’s usual boilerplate provision. Because of the unusual nature of the relationship between the Applicants here and the planned turnover of the facility to a fiscally challenged small municipality in this case, any transfer (or corporate reorganization or merger) that would relieve TEHBT of permit

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compliance responsibility should be subject to prior MDE approval. And MDE's approval should be conditioned upon demonstration of adequate financial assurance of the ability to maintain and operate the WWTP and spray irrigation system in accordance with the Permit.

RESPONSE:

Permit conditions for the operation and maintenance of the treatment plant require that the WWTP and spray irrigation system be maintained and operated in accordance with the Permit. In addition, The permit is being issued to a municipality as a co-permittee and will not be transferred to another entity.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 62:

General Condition II.A.5. requires the Permittee to take all reasonable steps to minimize adverse impacts to "ground water quality" resulting from any noncompliance with the permit. Given the potential for runoff and infiltration into adjoining surface waters, I urge MDE to revise this provision to include surface water quality as also deserving protection from adverse impacts of noncompliance.

RESPONSE:

This permit only authorizes discharge to groundwaters of the state. There is no discharge to surface waters from this site.

See also response to comments #7, 8, 22, 23, 33 and 85.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 63:

An automated digitally recorded event and effluent pumping log should be maintained and stored for the operational life of the facility. The shutdown of the spraying should be automated under system supervisory software control. The monthly operating reports should be structured to include precipitation related operating conditions and operational actions. Section I.C. 2. should be amended to include these stipulations and requirements.

RESPONSE:

The permit specifies and the fact sheet gives rationale for the level of recordkeeping. Special

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condition I.C.4 requires that daily logs of the response of each disposal area to the application of treated effluent shall be kept by the plant operator. This will include:

- a. Area(s) or section(s) under irrigation.
- b. Application rates (hourly and weekly).
- c. Effect of irrigation on vegetation.
- d. Instances of ponding or runoff.
- e. Weather conditions.

See also response to comment 1.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 64:

MDE needs to increase the minimum buffer requirement in the DRAFT PERMIT to comply with the 35' standards established for managing agricultural land in order to prevent impacts to nearby waterways.

RESPONSE:

See response to comment #7 and 17.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 65:

As a ground water discharge from a spray irrigation system, the draft permit is governed under a specific statutory provision in Maryland law that requires "100% of the nitrogen and phosphorus in the applied effluent will be taken up by vegetation" and "under a nutrient management plan required under § 8-803.1 of the Agriculture Article". Md. Code. Ann., Envir. § 9-1110. Neither the permit nor the fact sheet contains any reference to this law, and the permit does not contain any limit that would achieve this legal standard.

RESPONSE:

See response to comment #8, 9, 11, 13 and 14.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

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COMMENT 66:

What evidence does MDE have for how this DRAFT PERMIT does not negatively impact the adjacent Biodiversity Conservation Network Areas (BCNAs)?

RESPONSE:

In response to the comment we highlight the following facts. The Biodiversity Conservation Network (or BioNet) of Maryland identifies and prioritizes ecologically important lands to conserve Maryland's biodiversity (i.e., plants, animals, habitats, and landscapes). BioNet is a source of environmental data and is not part of a regulatory program. The Biodiversity Conservation Network (or BioNet) of Maryland does not establish any Federal, State or locally enforceable regulatory standards. BioNet classifies the waterway and wooded area that separates the two spray fields areas as a Tier 4 BioNet Priority area. A Tier 4 BioNet area is considered as "Moderately Significant for Biodiversity Conservation." Biota is Maryland's GIS Data Catalog. Biota data indicates that a Tier 4 area may provide habitat for interior dwelling birds. The relatively narrow width and age composition of the corridor, however, limits the viability of the area as prime interior dwelling bird habitat. Any potential habitat within this limited corridor will not be disturbed by any clearing within the Tier 4 area. The spray irrigation system will also not interfere with migration or access to the habitat. A Tier 4 area may also serve as a wildlife corridor for fish, small animals, deer and birds. The corridor will not be disturbed since there will be no clearing within the area

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 67:

- a. *This interconnection between the Town of Trappe's WWTP and the Trappe East WWTP proves to be problematic when trying to understand exactly what is being treated and discharged. However, because the possibility exists through this interconnection to send wastewater from the Trappe East WWTP to the Town of Trappe's existing WWTP for discharge makes it practical that the Trappe East WWTP should be permitted as a NPDES surface water discharge permit. MDE should reprocess this permit application as a NPDES surface water discharge permit to account for the possibility of discharging wastewater from Trappe East to La Trappe Creek via the Town's existing WWTP.*
- b. *Issuance of the draft permit for operation of a new spray field facility at Lakeside would include the unauthorized expansion of the existing Trappe WWTP, contrary to Maryland law.*
- c. *MDE must take action so that NO wastewater discharged from the dwelling units intended to be served by this permit may be diverted to the existing Trappe wastewater t The Lakeside WWTP is a Membrane Bio Reactor (MBR) Enhanced Nutrient Removal (ENR)*

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wastewater treatment plant. treatment plant until and unless that plant has been duly licensed and certified to provide ENR levels of wastewater treatment.

RESPONSE:

In response to the comment we highlight the following facts. The permit has no surface water discharge of nutrients, and is not the functional equivalent of a surface water discharge; therefore an NPDES permit is not required and the Department may appropriately regulate the groundwater discharge under the terms and conditions of this Permit.

The effluent is essentially treated four times before any possible discharge to surface waters. The wastewater will first be treated by an Enhanced Nutrient Removal wastewater treatment plant. Then the treated effluent will be sprayed on crop fields according to the NMP. The NMP ensures that the nutrient uptake of the plants within the root zone will result in zero nutrient discharge to groundwater. The sprayed water is filtered and treated by its journey through the ground and further diluted as it mixes with ground water and travels within the 70 feet thick soil zone towards surface waters. The removed substances requirements in the proposed permit and implementation of the Nutrient Management Plan and related spray field management requirements will recycle the entire effluent nitrogen and phosphorus loads into the vegetation grown on the spray field. This will result in no additional nutrient loads to surface or groundwater caused by application of the treated effluent.

The current Trappe Wastewater Treatment plant has the ability to treat the flow diverted from Trappe East Phase 1A and meet current effluent limitations in its permit. Wastewater from the 120 homes (Phase 1A) will be redirected back to the MBR plant once constructed.

See also response to comment #15 and 85.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 68:

- a. The existing Trappe WWTP is not equipped to treat additional wastewater flow and discharge into La Trappe Creek; it does not meet the standard for water treatment (ENR); it does not even meet the old standard (BNR).*
- b. The existing Trappe WWTP has had a history of serious violations and a current, unresolved inflow and infiltration (I & I) problem*
- c. MDE groundwater discharge program needs to confer with the enforcement staff in the Water and Science Administration in order to know what, if any, enforcement actions and requirements will be taken for the failure of the existing Trappe WWTP. ShoreRivers asks MDE that through this permit they address the possibility that the existing plant cannot*

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handle more effluent given violations, inflow and infiltration problems, and apparent sludge issues.

RESPONSE:

In response to the comment we highlight the following facts. In preparation of this document we have conferred with MDE's Water and Science Administration's Compliance Program and confirmed that the Town of Trappe WWTP is currently in compliance with its discharge permit. MDE also confirmed that the Town of Trappe WWTP has the capacity to accommodate the temporary flow from Trappe East.

See also responses to comments #69 and 73.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 69:

- a. *DNR has closed La Trappe Creek to shellfish harvesting because of unsafe pollution*
- b. *EPA has long declared the La Trappe Creek to be "impaired" under its "fishable and swimmable" quality standards*

RESPONSE:

These comments are not applicable to this permit. The discharge from Trappe East WWTP is outside of the La Trappe Creek watershed.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 70:

MDE needs to require the applicant to conduct a Breeding Bird Survey and Anadromous Fish Spawning Survey prior to authorizing any wastewater discharge.

RESPONSE:

Via this permitting process, we don't have the legal or regulatory authority to require a Breeding Bird Survey or an Anadromous Fish Spawning Survey as requested in the comment. More importantly, this permit contains appropriate conditions to be protective of groundwater quality and will not result in a discharge to surface water. By extension and implication this will also protect those water resources.

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CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 71:

- a. *The cwsp prohibits sewer extension until the current system is safe and adequate.*
- b. *R281 reclassified and remapped the wrong property.*
- c. *The planning commission found a central element of r281 inconsistent.*
- d. *Adoption of r281 was rooted in falsehood, and mde is largely culpable.*
- e. *The Draft Permit is also not consistent with the approved Talbot County CWSP, as amended by Resolution 281, Amendment 1.*
- f. *The proposed permit is also not consistent with the (a) Town of Trappe's Wastewater Flow Allocation dated August 4, 2021 (Attachment 21), (b) the January 11, 2021 Wastewater Capacity Allocation Agreement between the Town and the Developer, or (c) MDE's mandated design flow.*

RESPONSE:

On August 11, 2020, Talbot County amended its water and sewer plan to include the wastewater flows anticipated to be generated by this Facility. On November 4, 2020, MDE reviewed and approved that amendment. Comments and concerns regarding that approval are beyond the scope of this permitting process.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 72:

The proposed permit cannot properly be considered a "re-issue" or "renewal" permit, as Ms. Onyemaechi described it at the October 28, 2021 public hearing, for at least four reasons. Issuance (or reissuance) of the proposed Draft Permit would be inconsistent with COMAR § 26.08.04.02, entitled "Requirements for the Issuance or Reissuance of Permits."

RESPONSE:

On the 24th day of March 2021 the judge handling the judicial review of the issuance of the Trappe east permit 19-DP-3460, remanded the permit back to the Department. Thus the comment is moot. 19-DP-3460 is a duly issued permit. Only issued permits are subject to judicial review and thus

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remand by a judge back to the MDE for further review. This document is the final stage of Departmental response to the remand of an issued permit.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 73:

Include a provision in this draft groundwater discharge permit that prohibits any Lakeside/Trappe East connection to the Trappe WWTP until it is in compliance with ENR standards.

RESPONSE:

Placing requirements on the Trappe WWTP discharge permit is outside the scope of this permit process.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 74:

I am hereby formally requesting that the transcript be entered into the record as my response to your request for comments.

RESPONSE:

As a matter of law and regulation, the transcript from the public hearing always becomes part of the administrative record of a permit process. Such will be done in this case as well.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 75:

I would like to know if the MDE bond in the amount of \$982,310, OK'd by the Maryland Board of Public Works back in the Fall of 2020, for the Town of Trappe for the purpose of fresh water system upgrades has any connection to, impact upon or any benefit whatsoever to the Trappe East/Lakeside/Easton Overlook development.

RESPONSE:

The commenter is referring to a bond that concerns drinking water supply for the Town of Trappe. The bond in question is outside the scope of this permit process which concerns wastewater for

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the Trappe East development. Funding of \$982,310 – a \$491,155 Drinking Water State Revolving Fund loan and a \$491,155 grant in the form of forgiveness of a Drinking Water State Revolving Fund loan – to the Town of Trappe will help fund the design and construction of a new water supply production well, well house, pump and other accessories. Although the town is served by two 50-year old wells, the project will allow the existing components to be taken offline for maintenance activities. This project will be constructed in accordance with coastal and non-coastal resiliency guidelines developed as part of the Coast Smart Program to reduce climate change risks to such projects.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 76:

Discharge Permit No. 19-DP-3460 must include a condition that the developer of Lakeside shall post a bond guaranteeing adequate performance of the new spray field facility for a period of at least ten years.

RESPONSE:

Construction and maintenance bonds are outside the scope of the permit process for groundwater discharge permits in the state of Maryland.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 77:

Scope of the approval encompassed by the pending draft permit should be reduced to apply only to that portion of the Lakeside property that has been reclassified to S-1 under Resolution 281.

RESPONSE:

In accordance with COMAR 26.08.04.02 entitled “Requirements for the Issuance and Reissuance of Discharge Permits,” the Department may issue or reissue a discharge permit to a sewage treatment works if the treatment works and the sewerage systems, including the pumping stations, are in compliance with the approved county water and sewerage plan (Plan) adopted under Environment Article, Title 9, Subtitle 5, Annotated Code of Maryland. For a community or multi-use sewerage system using any class of effluent for land application of treated wastewater, the sewerage system will be considered in compliance with the Plan if that plan specifically identifies the wastewater treatment plant and its capacity, and identifies the area to be served by it as S-1 or S-2 (as defined in COMAR 26.03.01.04G(2)), and the project is otherwise in compliance with the Plan.

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See also response to Comment #71.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 78:

Look at the designation of the Critical areas. The permit makes no mention of tidal wetlands. This permit needs to be evaluated factoring in the proximity to critical areas. I want to see in the permit the results of this analysis.

RESPONSE:

The comment is not applicable to this permitting process. The proposed discharge area is not located within a critical area.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 79:

There is a designated oyster recovery zone in the Choptank right at the intersection with the Miles creek – where is that impact considered? Another consideration not factored in – the impact of freshwater runoff to the salinity of the stream/river. Where is that impact considered?

RESPONSE:

As explained in responses to other comments, this wastewater disposal system will not discharge into the surface waters of the UTLTC or the Choptank River, therefore it should have no impact on the salinity of the Choptank River. In addition, regardless of whether the wastewater disposal is to the surface waters or groundwater, the flow from the facility would not be large enough to make any impacts on the salinity of the Choptank River.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 80:

Orchard grass has a growing season, and it is not 290 days. In addition, it is considered an invasive species according to a simple internet search. It requires careful cutting management and is troubled with disease and insect problems. (www.britannica.com) How is this even allowed by

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the MDE – to plant over 80 acres of an invasive species in a watershed area? Nrcs.usda.gov states that orchard grass is a restricted noxious weed for lawn/turf seed in the states of Delaware, Maryland and other states.

RESPONSE:

The NMP allows for the use of other plants. Changing the spray field cover from orchard grass to loblolly (southern) pine may further address this concern as 1) loblolly are facultative hydrophytes meaning they appear in wetlands and non-wetlands and adapt to normal moisture and some flooding and moderate drought, and 2) the conifer species have a longer growing season. A variety of grasses, crop and forest compositions may be utilized as appropriate spray field land covers to address observed conditions and may be considered through routine nutrient management plan updates.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 81:

What happens when the WWTP fails to meet limits?

RESPONSE:

The permittee is required to inform MDE immediately of any significant permit violations and what will be done to address the violation. When in violation of any condition of the Permit, the permittee is also subject to enforcement actions as detailed in General conditions II.A.9 and 13.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 82:

In testimony before the Talbot County Planning Commission on October 6, 2021, attorneys for the permit applicants revealed that plans are under development to optionally divert sewage from the existing Town of Trappe sewage collection and treatment system to the proposed Trappe East facility. A further option discussed in the testimony suggested that partially treated effluent from the Trappe East facility might be pumped back to the existing Trappe wastewater treatment facility (operating under NPDES Permit No. 0020486) for discharge to the unnamed tributary to La Trappe Creek. Either action would require that, for the facilities included in the subject groundwater discharge permit application, the applicants would need to seek co-coverage under an NPDES discharge permit, likely through a Part II NPDES permit application process. Under these conditions the ultimate fate of at least part of the effluent from the Trappe East plant then would constitute a discharge to surface waters of the state.

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RESPONSE:

This comment is outside the scope of this permit process because there has not been a proposal to discharge "partially treated effluent " to any waters of the State from either the Lakeside WWTP or the Trappe WWTP. The Town of Trappe recently completed a preliminary engineering report (PER) that evaluated several alternatives for upgrading or replacing the existing Trappe WWTP. One alternative involves expansion of the treatment capacity of the Lakeside WWTP to provide ENR treatment of all wastewater in the Town of Trappe. If that alternative is eventually selected and implemented, the Town's existing NPDES permit may be modified for discharge of fully treated, ENR-quality effluent from the Lakeside WWTP, but no such changes are proposed at this time. Any changes would require a major modification to a permit.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 83:

The permit should not be issued until a management plan for stormwater pollutants runoff control (elimination) is established and incorporated as part of the Nutrient Management Plan. The permit language should be changed to include a requirement for the applicants to obtain coverage under an individual stormwater NPDES permit from MDE, and that the facility not be allowed to start up until all requirements of the stormwater permit are fully implemented and operational.

RESPONSE:

The development is separately covered via registration under the Construction Stormwater general permit. It is this registration that authorizes the stormwater discharge associated with the construction. The Lakeside Development will be constructed in accordance with MDE and Town of Trappe stormwater management requirements and standards. Drainage system outfalls are directed to provide hydrologic connections for nontidal wetlands and streams. No drainage from new impervious surfaces is discharged onto, or infiltrated to groundwater in close proximity to, the spray fields. Accordingly, new impervious surfaces and stormwater retention and infiltration practices will not impact the mounding analysis for the spray fields.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 84:

MDE needs to provide evidence for how this added source of wastewater is consistent with the Bay TMDL, and how the Bay TMDL was considered when determining effluent limitations. ShoreRivers asks MDE to include in their response to comments document the assessment

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conducted by the IWPP through which their conclusion of zero discharge of nutrients was made. We urge MDE to take seriously its obligations under the Bay TMDL and, using monitoring data and modeling, require the permittee to obtain nutrient offsets equivalent to the observed or modeled delivered loads as would be required under federal Clean Water Act regulations and the Bay TMDL.

RESPONSE:

In response to this comment we highlight the following facts. The assessment and calculations that concluded the wastewater disposal system will result in a zero discharge of nutrients to surface waters were made by the MDE Groundwater Permits Division using a scientifically/EPA approved methodology, and based on information provided by the facility's Nutrient Management Plan, which in turn has been reviewed and approved by MDA. The assessment/calculations, as well as the Nutrient Management Plan have been provided to the Public during the public comment period.

Wastewater from the Trappe East WWTP will not be discharged into surface waters. Because of the type of wastewater disposal system, consisting of an Enhanced Nutrient Removal wastewater treatment plant and a spray irrigation field, and based on the calculations mentioned above, the system will result in zero nutrient discharge. Wastewater from the Trappe East WWTP will not add nutrients to the Bay and its tributaries and therefore it is consistent with the Bay TMDL for nutrients and sediment.

See also response to comment #85.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.

COMMENT 85:

The proposed spray irrigation site presents the poster child for “the functional equivalent” of a federally-regulated Clean Water Act surface water discharge. Unless substantial changes are made to (1) ensure spray irrigated effluent is at all times (i.e., 100%) taken up by crops or evaporated and not allowed to percolate below the root zone and (2) contain, to the extent possible, aerosolized effluent through buffers and barriers, we urge MDE to issue a standard surface water discharge permit in lieu of this groundwater discharge permit to reflect the fact that surface water pollution discharges will occur.

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RESPONSE:

The discharge authorized in this permit is not functionally equivalent to a direct surface water discharge. The groundwater discharge permit for Lakeside Trappe East has the enhanced nutrient removal wastewater treatment plant which produces an effluent that is 70% higher quality than the Groundwater Quality Standards. The effluent is pumped to a lagoon where it is stored until it may be applied to the land via the spray irrigation system. The spray irrigation is optimized to maximize crop uptake and to minimize the amount of effluent that will reach groundwater. Any effluent that travels through the vegetated zone into the subsurface soils will have a low potential delivery factor because it is greater than 1,000 feet to any surface waters. The unsaturated soil treatment zone further reduces the travel time and provides degradation by chemical and microbiological activity from the soil. In combination with the soil characteristics, dilution by precipitation, and dilution by other groundwater, the effluent will not retain its distinctive identity by the time it may enter any groundwater. We thus conclude that the discharge has no reasonable potential to impact surface waters and is thus not functionally equivalent to a direct surface water discharge.

MDE groundwater discharge permits are designed to take into consideration the potential impact from any discharge of treated wastewater on any waters of the State including groundwater and surface water. This is accomplished by placing nutrient effluent quality limitations on those discharges exceeding 5,000 gallons per day (maximum flow exceeding 10,000 gallons per day).

Existing facilities with a discharge permit within the Chesapeake Bay or Coastal Bay watersheds are required to meet the yearly nitrogen loading limit based on an effluent nitrogen concentration of no greater than 20 mg/l. Permittees must not exceed the average design flow of the on-site disposal system. In addition, wastewater facilities located in a wellhead protection area, the total nitrogen concentration shall not exceed 10 mg/l (monthly average). Limitations are to be met at the point of discharge prior to disposal via the onsite system. For all permitted facilities the discharge of wastewater shall not cause nitrogen levels in groundwater to exceed 10 mg/l at the property line.

In accordance with the Chesapeake Bay Watershed Implementation Plan, the standard nitrogen rate used to determine the nitrogen delivery rate to surface water is as follows:

- (1) An 80% delivery rate in critical area;
- (2) a 50% delivery rate within 1000 feet from any perennial surface water; and
- (3) a 30% delivery rate from distances greater than 1,000 feet from any perennial surface water.

Wastewater from the Trappe East community will be treated at an advanced wastewater treatment plant, which will produce tertiary effluent quality significantly below groundwater quality standards. The following table shows a comparison between the groundwater quality standards

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(GWQS) and the effluent limitations in the permit. You'll see that the limitations meet or exceed the GWQS.

Parameters	Trappe East Treated Effluent	Groundwater Quality Standard
BOD5	10 (mg/l)	30 mg/l
TSS	10 (mg/l)	30 mg/l
Total Nitrogen (N)	3 (mg/l)	10 mg/l
Total Phosphorus	0.3 (mg/l)	N/A
Fecal Coliform	< 3 (MPN/100ml)	< 3 (MPN/100ml)

This highly treated effluent is then further treated through the discharge in the spray fields. Remaining nutrients in the wastewater will be absorbed by the soil and held by capillary action in the root and vadose zones and absorbed by plant roots.

As explained in the Trappe East permit (page 8) calculations for the estimated nutrients delivered to the nearby local surface water from the Trappe East system have been estimated to be zero. This is based on the following calculations:

Phosphorus (P) loading rate to the spray fields (71.3 acres): $(0.1 \text{ MGD} \times 0.3 \text{ mg/l} \times 8.34 \times 365 \text{ days/yr}) / 71.3 \text{ acres} = 1.3 \text{ lb/acre/year}$ 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 1.3 lb/acre/year phosphorus loading rate.

Nitrogen (N) loading rate to the spray fields (71.3 acres): $(0.1 \text{ mgd} \times 3 \text{ mg/l} \times 8.34 \times 365 \text{ days/yr}) / 71.3 \text{ acres} = 16.22 \text{ lb/acre/year}$. On page 18 of the Lakeside at Trappe Nutrient Management Plan (NMP) dated 6/2/2020, it states that orchardgrass will be planted and maintained for the startup 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 12.8 lb/acre/year nitrogen loading rate.

The highly treated wastewater that will be used for irrigation will have total N < 3 mg/l and Total P < 0.3 mg/l (this is well below the groundwater quality standard of 10 mg/l for N). This along with the nutrient uptake (uptake of N > 12.8 lb/acre/yr and uptake of P > 1.3 lb/acre/yr) by vegetation will result in zero N and P in the percolate.

See also responses to comments 28, 31, 32, 67 and 84.

The extent to which the pollutant is diluted or chemically changed as it travels,

The treated effluent undergoes significant dilution both chemically and biologically after it is sprayed. The NMP and the hydrogeological report, show that the nutrients required by the orchard grass crop exceeds what will be present in the discharged effluent and will require additional nutrients to thrive. This means that a portion of the fertilizer requirements and applications

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currently made as part of the property's grain cultivation activities would be partially offset by the limited nutrients given by spray irrigation. Additionally, it is anticipated that rainfall will also dilute any sprayed effluent that does not leave the land through evapotranspiration as it seeps into the earth. The permit location's annual average natural precipitation is roughly 54.2 inches/year.

The nature of the material through which the pollutant travels

Natural soil is the best medium to treat and recycle wastewater. This method protects human health as well as the environment. The ability of soil to remove or inactivate contaminants depends upon the physical, chemical and biological characteristics of soil. Soils with large surface area in unsaturated conditions are the optimal conditions for longer retention times for which biochemical reactions will occur. The soil's ability to attenuate wastewater and remove pollutants that cause disease begins with the physical treatment process of filtering, when water moves through the small soil pores, effluent particles are removed. Naturally occurring microbes attach and grow on the surface of soil particles and consume the organic matter and nutrients as their food source. While organic matter is consumed in the effluent, ammonia is transformed to nitrate. Adsorption of pollutants occurs due to the chemical nature of soils. Phosphorus is removed from wastewater as it attaches onto soil particles or forms insoluble compounds in the soil. Bacteria and viruses are removed in the same manner by attaching onto soil particles in unsaturated soils.

To identify the soil properties underlying the Trappe east project site, 23 soil borings and 6 test pits were described and evaluated. This included 18 infiltration tests performed in the footprint of the project site. The result of the field survey is summarized in the hydrogeologic report and indicates that the site is underlain by Atlantic Coastal Plain soils. The soils textures are described as silt loam, loamy sand, silty clay loam, and sandy clay loam.

These unconsolidated sediments offer options for filtration, nutrient adsorption, and microbial consumption. These soils are suitable for "slow rate" land discharge systems as is proposed for the site. Atlantic Coastal Plain soils morphology and characteristics are different from soil types that offer more direct conduits to surface waters, such as lava tubes, karst sinkholes and fissures, fractured rock, or gravel.

Transit time

The hydraulic conductivity of the aquifer and distance from the spray fields to the nearest navigable waters as presented in the hydrogeologic report was used by MDE to calculate estimated average transit time for the sprayed treated effluent to travel from the underlying aquifer to the nearest surface water. The results showed that it will take approximately 7.3 days on an average for the effluent to reach surface waters once it attenuates to the aquifer. The estimated transit time for the Northern fields was calculated at approximately 12 days. The Southwest and Southeast fields were estimated to be 5 days each.

Distance traveled

The location and landscape position of the spray fields determine how far individual irrigation water droplets must travel once it attenuates to the aquifer. The average horizontal travel distance

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between the spray field's surface and the nearest surface water stream is roughly 709.4 feet; the average travel distances are 476 feet, 493 feet, and 1,159 feet, respectively, for the southwest, southeast, and northern sprayfields.

The permit requires that the primary northern sprayfields be used for spray irrigation of the development.

The manner by or area in which the pollutant enters the navigable waters

Any nutrients still present in the irrigated water are absorbed by the vegetative cover crop as the irrigated water percolates through the soil treatment zone. The unconfined aquifer that exists beneath the site will be recharged by any irrigation water that is not lost to evapotranspiration. (Hydrogeologic Report, p.6) In this aquifer, irrigation water will mix with already-existing groundwater and rainwater that has seeped into the earth. This mixture will then possibly slowly migrate through the subsurface soils by diffused lateral movement, feeding surface stream flows to navigable water.

The degree to which the pollution (at the point of entering navigable waters) has maintained its specific identity.

The treated effluent that is spray irrigated onto the Trappe East site will not retain its distinctive identity at the point of entering navigable waters because, all of the aforementioned elements have contributed to the transformation of its "particular characteristic/identity" of any pollutant. In summary, the following actions work individually and collectively to alter the specific identity of any pollutant in the treated sprayed water:

- I. plant absorption;
- II. evapotranspiration;
- III. aerobic and anaerobic microbe digesting;
- IV. soil filtering; and
- V. groundwater dilution and rainfall dilution.

Summary

The results of various studies conducted indicate that land application is a proven, feasible and effective method of renovating and recycling wastewater and especially beneficial for aquifer recharge. This method is widely accepted; consequently, the Environmental Protection Agency, through amendments PL 92-500 and PL 95-217 to the Federal Water Pollution Control Act, has required that land applications be evaluated during the waste treatment facilities planning stage.

On October 1, 2002, Section 9-303.1 of the Annotated Code of Maryland became effective. It stipulates that the Department shall encourage the use of reclaimed water as an alternative to

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discharging wastewater effluent into surface waters as a pollution control measure and authorizes the Department to establish buffer and setback requirements for the use of reclaimed water. The Trappe East permit authorizes the reuse of wastewater through a discharge to groundwater via spray irrigation in line with the Department's [land application guidelines](#). The provisions set forth in the permit meet or exceed the requirements for land application.

MDE has to address the requirements set out in the U.S. Supreme Court decided *Maui County v. Hawaii Wildlife Fund*, which holds that in some instances a discharge of pollutants to groundwater that reaches surface water will be considered to be a discharge to surface water that requires an NPDES permit according to the Clean Water Act. In evaluating whether the release of pollutants is the functional equivalent of a direct discharge from the point source into navigable waters, the Supreme Court recognized the possible significance of "time and distance" as essential elements, but acknowledged that a case-by-case consideration for the application of these factors be considered rather than see this as a clear-cut judgment. *Id.* in 1476, 1477. Additionally, the Court explicitly emphasized that the fundamental statutory goals of the Clean Water Act should serve as a guide for decision-making. *Id.* at 1462, 1477.

In accordance with the Maui judgment, the policies and preferences of the State of Maryland for water reuse procedures though governed by and mandated by State legislation to be suited to local circumstances, are especially made to prevent uninterrupted pollution from entering surface waters in support of keeping the chemical, physical, and biological integrity of the nation's waters which is a goal of the CWA. 33 U.S.C. §1251 (a).

These goals regarding water reuse are supported by this permit which is structured so as to not allow the discharge of nutrients to surface waters via groundwaters of the state. An NPDES permit is therefore not required or applicable. This is because, and as expatiated throughout this response document, the treated and disinfected effluent that will be sprayed using irrigation techniques, will be free of the nutrients and possible contaminants that, if the treated effluent were discharged directly to navigable waterways, would be subject to the Chesapeake Bay TMDL and an NPDES permit. In this case, if any minute pollutant is transported to groundwater, its composition or concentration will be changed significantly from how it was initially discharged when the groundwater eventually reaches navigable waters. The change will occur as a result of numerous safety checks put in place that collectively protect groundwater. This is in contrast to the Maui case where millions of gallons of partially treated wastewater was being discharged through injection wells directly into the ground with no plant uptake, storage or haling provisions and was traceable to navigable waters.

These safety factors are reiterated here and include nutrient pollutant levels meeting or less than drinking water standards, the prevention of the hydraulic overload of the drain fields by approving an application rate for a spray irrigation system that was determined based on the soil infiltration rate with the application of a safety factor. The maximum hydraulic loading rates of the Trappe East spray irrigation area is limited at 2 inches/week (annual average) and each spray area will be divided into two or three zones. Each zone will be sprayed one day per week. This schedule will allow 4 to 5 days per week for rain, saturated soil conditions and maintenance. The zones will be set up to be sprayed at approximately ¼ inch per hour for 8 hours each . The vegetation

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consumption rate in Maryland ranges from 0.26 "/wk to 0.45"/wk based on the golf course irrigation rates. Since the application rate is based on the soil infiltration rate alone, the application rate is always less than the sum of the soil infiltration rate and the consumptive use. Therefore, the application rate is a conservative number to ensure the treated effluent is not over applied and any nutrients are absorbed by plant uptake.

In addition to any nutrients in the irrigated water being taken up by plants via their root zones, any pollutant remaining will be altered by chemical or biological interactions with soils, microbes, rainwater and groundwater dilution, or just through natural processes. Where the irrigated water makes it to the groundwater table, the average travel distances to the nearest navigable waters are 476 feet, 493 feet, and 1,159 feet, which takes a travel time of five to seven to 12 days based on the aquifer transmissivity respectively, for the southwest, southeast, and northern sprayfields. It is therefore plausible to infer that the reuse of ENR-treated water for spray irrigation in this case is not the "functional equivalent" of a direct discharge of pollutants to a US water body due to physical attenuation, dilution and distance to navigable waters.

CHANGES FOR THE FINAL PERMIT:

No changes are being made to the final due to this comment.