

## HEARING OFFICER'S REPORT

**TO:** The Honorable Shawn M. Garvin  
Cabinet Secretary, Department of Natural Resources and Environmental Control

**FROM:** Lisa A. Vest  
Regulatory Specialist, Office of the Secretary  
Department of Natural Resources and Environmental Control

**RE:** Applications of Artesian Wastewater Management, Inc. (“AWMI”) for the proposed On-Site Wastewater Treatment and Disposal System (“OWTDS”) Construction Permit and proposed OWTDS Operations Permit Amendment for the AWMI planned Phase 2 project, consisting of construction and operation of a new wastewater treatment system at the Sussex Regional Reclamation Facility (“SRRF”), located in Sussex County, Delaware.  
(Hearing Docket No. 2022-P-W-0004)

**DATE:** February 19, 2024

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### **I. BACKGROUND AND PROCEDURAL HISTORY:**

A virtual public hearing was held on Wednesday, February 23, 2022, at 6:00 p.m. via the State of Delaware Cisco WebEx Meeting Platform by the Department of Natural Resources and Environmental Control (“DNREC” or “Department”) to receive comment on the pending applications of Artesian Wastewater Management, Inc. (“Artesian,” “AWMI” or “Applicant”) for (1) an On-Site Wastewater Treatment and Disposal System (“OWTDS”) Construction Permit; and (2) a proposed OWTDS Operations Permit Amendment for the AWMI planned Phase 2 project, consisting of construction and operation of a new wastewater treatment system at the Sussex Regional Reclamation Facility (“SRRF”) located in Sussex County, Delaware (“Applications,” “proposed project”).

The current Phase 1 project approval authorizes AWMI to receive treated poultry processing wastewater (treated effluent) from the Allen Harim Foods Harbeson Processing Facility’s wastewater treatment system for storage in a 90 million gallon (“MG”) lagoon prior to discharge via spray irrigation for final disposal. The Phase 1 project is operating in accordance with AWMI’s State of Delaware OWTDS Operations Permit No. 359288-02 for the Artesian Northern Regional Water Recharge facility (“ANSRWRF”), which is now called the SRRF.

Artesian has applied for a State of Delaware OWTDS Construction Permit (“Construction Permit”) for a Phase 2 project, consisting of the construction of a wastewater treatment system designed to treat up to 625,000 gallons per day (“GPD”) of municipal wastewater received from AWTMI’s wastewater service territories in Sussex County, Delaware. The Phase 2 construction project’s scope includes construction of a 3.0 MG combined equalization and off-spec water diversion lagoon, a headworks system consisting of screen and grit removal equipment, an influent lift station, a Hybrid Bardenpho process treatment system, two cloth media filters, an ultra-violet disinfection system, and an effluent lift station to pump treated wastewater to the existing 90 MG treated effluent storage lagoon. The construction project is to be located at the existing SRRF site on Sussex County Tax Map/Parcel Number 2-35 6.00 28.09, located on a 75-acre site south of Reynolds Pond Road, east of Route 30, north of Ingram Branch and Route 16, and west of Cedar Creek Road, Sussex County, Delaware.

Artesian has also applied for an Amendment to their current Operations Permit (No. 359288-02) to authorize the operation of the systems and equipment installed during the proposed Phase 2 construction project (“Operations Permit Amendment”). The proposed draft Operations Permit Amendment would authorize the Phase 2 project’s newly constructed wastewater treatment system to receive and treat wastewater from within AWTMI’s service territories in Sussex County. Treated effluent from the treatment system will be blended in the lagoon with the treated effluent from the Allen Harim Foods Harbeson Processing Facility (“Allen Harim”) wastewater treatment system and discharged via spray irrigation onto privately owned agricultural land, under a lease held in perpetuity by AWTMI as the wastewater utility provider. The spray fields have been permanently placed in an Agricultural Preservation Easement by the Delaware Agricultural Preservation Foundation.

The above Applications were submitted by AWTMI in accordance with 7 DE Admin. Code 7101, *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems* (hereinafter referred to as the “Regulations”).

The hearing record (“Record”) reflects that AWTMI submitted to the Department an application for a Construction Permit for the proposed project on February 3, 2021, and an application to amend the existing Operations Permit was submitted on February 4, 2021. Accordingly, following a thorough review of both Applications, the Department prepared Draft Permits in this matter and published Legal Notice in both the *Delaware State News* and the *News Journal* on January 30, 2022, advising the public of the above-described proposed project, the Draft Permits prepared by the Department, and that a virtual public hearing would be held to consider comments on the proposed project on February 23, 2022. Notice of the public hearing was also placed on the State of Delaware Public Meeting Calendar at that time as well.

Department staff, representatives of the Applicant, and members of the public attended the public hearing held on February 23, 2022. The public hearing was held virtually on the WebEx platform, as noted above, resulting in the potential of a greater level of participation by members of the public (when compared historically to in-person attendance at such events). Comments were received from the public concerning the pending Applications, both at the time of the public hearing and subsequent to the hearing, as the Record remained open for public comment through March 10, 2022. All comments were posted on the DNREC public hearing web page dedicated to this matter upon receipt. Proper notice of the hearing was provided as required by law.

Following the close of the public comment period as noted above, additional information was requested by the Department from AWTMI, in order to address all comments and questions received from the public in this matter. The Applicant provided the requested information on July 12, 2022. Thereafter, at the request of this Hearing Officer, the Division of Water’s experts in the Commercial and Government Services Section (“CGSS”) provided a Technical Response Memorandum (“TRM”), for the benefit of the Record generated in this matter. The Department’s TRM provided not only detailed technical responses to the comments received in this matter but offered extensive discussion on the revisions made to the initial Draft Permits prepared by the Department in this matter. The Department’s TRM, dated August 21, 2023, and received by this Hearing Officer on October 9, 2023, is discussed in greater detail below.

## **II. SUMMARY OF THE PUBLIC HEARING RECORD:**

The Record consists of the following documents:

(1) The official verbatim Transcript of Proceedings from Wilcox & Fetzer, Ltd., generated from the virtual public hearing of February 23, 2022;

(2) Nineteen (19) exhibits identified as the Department's Exhibits regarding the Application as referenced above, introduced by responsible Department staff at the aforementioned hearing, and marked accordingly as "Dept. Exh. 1-19";

(3) Copy of the Applicant's presentation offered at the public hearing, marked accordingly by this Hearing Officer as "Applicant's Exhibit 1," identified as such on the hearing web page dedicated to this matter under the "Applicant's Exhibits" section;

(4) Copies of the public comments received by the Department regarding the Applications as referenced above, as identified on the hearing web page dedicated to this matter under the "Public Comments" section; and

(5) Technical Response Memorandum ("TRM") prepared by the Department's Division of Water, CGSS, dated August 21, 2023, and provided to this Hearing Officer by CGSS on October 9, 2023. The TRM includes, but is not limited to, the associated *revised* Draft Phase 2 Construction Permit and the *revised* Draft Phase 2 Amended Operations Permit to be issued by the CGSS, should the Secretary approve this pending permitting matter.

The Department's person in the Division of Water primarily responsible for reviewing this Application, Marlene Baust, Engineer IV, CGSS, developed the Record with the relevant documents in the Department's files.

As noted above, the Record generated in this matter reflects that the Department's Division of Water, CGSS, provided a TRM to (1) specifically address the concerns associated with the Applications, as set forth in the public comments received by the Department; and (2) offer conclusions and recommendations regarding this pending permitting matter for the benefit of the Record. The TRM provides an exhaustive evaluation of the Applicant's proposed project in light of the requirements of the applicable statutes and regulations, a summary of the public comments received by the Department in this matter, and detailed responses to the same. Accordingly, the Department's TRM, dated August 21, 2023, along with Appendices I-VII as contained therein, is attached hereto for the Secretary's review as Appendix "A," and is hereby expressly incorporated herein.

### **III. RECOMMENDED FINDINGS AND CONCLUSIONS:**

Currently pending before the Department are the above-described Applications for AWMI's proposed Phase 2 project, consisting of constructing and operating a new wastewater treatment system at SRRF located in Sussex County, Delaware. As noted previously, the Department has *revised* the initial Draft Permits subsequent to the time of the public hearing, based upon the comments received from the public in this matter.

I find that the Applicant is required to obtain both a Construction Permit and an Operations Permit Amendment, as described above, for the proposed Phase 2 project at SRRF. I further find that above-described Applications are subject to various state and federal regulatory requirements, including, but not limited to, the requirements of Delaware's *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems* (7 DE Admin. Code 7101), and as provided for under 7 *Del.C.* Ch. 60.

The Department's TRM provides a thorough review of AWMI's proposed project in light of the applicable statutes and regulations associated with the Applications and the concerns voiced in the public comments received in this matter. Further, the TRM also discusses various conditions added to the Department's *revised* Draft Permits, pursuant to that review.

The regulations provide the criteria for evaluating projects such as the proposed Phase 2 wastewater treatment system set forth in the Applications. Further, the burden is on the Applicant to prove to the Department that the requirements of the statutes and regulations have been met, and if the granting of any permit, lease or approval will result in loss to the public of a substantial resource, or that the loss has been offset or mitigated.

The following section of this Report summarizes all areas of concerns raised in the public comments received in this matter, and the Department's response to the same. It should be noted that, where public comments received were similar in nature, the Department combined similar comments together and paraphrased for the purposes of brevity and clarity. While the below section references various revisions that have been made by the Department to the initial Draft Permits, a detailed discussion regarding each of those revisions, including the reasons therefore, is contained in a separate section later within this Report.

### **1. Public Health - Potential Contamination to Water Supply Aquifer**

Numerous comments received from the public in this matter expressed concerns for the health of area residents that are on private wells, Homeowner Association ("HOA") wells, or the town's municipal well that could be potentially affected by the treated effluent discharging to their water supply aquifer. In response to such concerns, the TRM notes that wastewater is generally composed of a range of physical, chemical, and biological constituents. The goal of wastewater treatment is the removal of specific constituents of concern for the protection of public health and the environment. The primary constituents of concern in wastewater include total suspended solids ("TSS"), pathogens, biodegradable organics, nutrients (i.e., nitrogen and phosphorus) and other dissolved inorganics, heavy metals, and priority pollutants (i.e., carcinogenic organic and inorganic compounds). Wastewater treatment systems are designed to remove specific constituents depending on the source of the wastewater (i.e., municipal, industrial, agricultural, etc.) and point of discharge (surface water, groundwater, public or agricultural reuse, etc.).

The Department is required via permitting, compliance, and enforcement activities to ensure that Permittees comply with Section 3.13 of the Regulations, which requires all permitted OWTDS to be "...operated and maintained so as not to create a public health hazard or cause water pollution." Additionally, Section 3.20 of the Regulations requires the Department to ensure that a Permittee takes "...all necessary actions to eliminate and correct any adverse impact on public health or the environment resulting from permit non-compliance." To achieve these regulatory directives, the Department's experts in the CGSS prepared an initial proposed Draft Construction Permit for the Phase 2 construction of a wastewater treatment system by AWWMI at SRRF and an initial proposed Draft Operations Permit Amendment authorizing the operation of the Phase 2 wastewater treatment system upon completion.

During the post-hearing phase of this permitting matter, the CGSS reviewed the Record generated in this matter, including all comments received in this matter from the public, and *revised* the initial proposed Draft Permits authorizing the Phase 2 Construction and Operations of AWWMI at SRRF. The *revised* Draft Permits include effluent limitations along with operational, monitoring, and reporting conditions designed to protect public health and the environment.

The TRM notes that the State of Delaware is dependent on groundwater for the bulk of its potable water supply. Thus, the Department's Division of Water issues discharge permits that are designed to protect groundwater quality to the maximum extent practicable by including requirements to control the amount of inorganic and organic compounds and nutrients (e.g., nitrates as nitrogen) discharged in treated wastewater (treated effluent). To further meet the Department's mission to protect human health, disinfection requirements are also incorporated into permits. To address public health concerns more thoroughly, the Department's TRM describes in detail the regulatory and permit conditions established to protect groundwater, including treatment criteria, off-spec contingency plans, and groundwater monitoring requirements.

The treated effluent from the SRRF wastewater treatment system will be required to meet the State of Delaware's highest wastewater quality criteria, as required by the Regulations, for the spray irrigation of treated wastewater: unlimited public access. The treated effluent from the SRRF wastewater treatment system will also be required to meet a daily average Total Nitrogen concentration of 10 mg/L. The Phase 2 operation is designed to combine and blend the SRRF treated effluent with the previously permitted Phase 1 Allen Harim treated effluent within the storage lagoon. The combined effluent daily average Total Nitrogen concentration will be required to meet 22.5 mg/L. Part I.D.10 of the *revised* Draft Operations Permit Amendment delineates the effluent Total Nitrogen concentration requirements for Phase 1 and Phase 2 and the combined/blended matter.

With regard to the drinking water standard for nitrates, the TRM notes that the federal Maximum Contaminant Level ("MCL") for Nitrate as Nitrogen in drinking water is 10 mg/L. The SRRF application includes nitrogen balance calculations (as prepared by a Delaware licensed Professional Engineer) verifying that SRRF incorporates sufficient land to spray the maximum amount of effluent each month at a total nitrogen concentration of 22.5 mg/L and not exceed a percolate of <10 mg/L beneath the spray irrigation fields, thereby meeting the MCL for nitrate-nitrogen and not causing an impact to groundwater resources and local drinking water wells. Part III.A.2 of the *revised* Draft Operations Permit Amendment requires that the "...operation of SRRF shall not cause the quality of Delaware's groundwater resources to be in violation of applicable Federal or State Drinking Water Standards." Further, that same Section states that "[i]f the Department determines that the discharge is impacting groundwater quality or downgradient receptors, corrective actions will be required."

To protect groundwater resources, Part I.D.11 of the *revised* Draft Operations Permit Amendment incorporates nitrogen loading limits as calculated in the design nitrogen balance calculations dated May 3, 2023, and further requires that the total amount of nitrogen authorized to be applied to each spray field acre not exceed certain loading limitations. The limits include supplemental fertilizers, nitrogen supplied from the effluent, and any other source.



In addition to the above permit limitations aimed at protecting public health and groundwater resources, both the Regulations and the *revised* Draft Operations Permit Amendment also require diversion capabilities and contingency plans in the event effluent does not meet specified criteria. It should be noted that the initial proposed Draft Operations Permit Amendment prepared by the Department prior to the public hearing included contingency plans for Fecal Coliform Bacteria, Turbidity, and Total Nitrogen delineating requirements to ensure only high-quality treated effluent is used for irrigation. However, based upon the Department's review of the comments received from the public in this matter, and to address compliance deficiencies documented by the Department during recent compliance evaluations, the permit conditions have been *revised* to provide additional clarity regarding the steps the Permittee is required to perform if the plans are initiated.

Furthermore, the CGSS is including a Phase 1 contingency plan for Fecal Coliform Bacteria to address both the aforementioned compliance deficiencies and public concerns raised in the comments received by the Department in this matter. This contingency plan requirement will be in effect during continued Phase 1 Operations at the facility until the new treatment plant is online, at which point the Phase 2 contingency plans will then be required.

In addition to the incorporation of protective permit limitations for treatment criteria and requirements for diversion and detailed contingency plans in the event of effluent not meeting the design criteria, the *revised* Draft Operations Permit Amendment also includes extensive operational and monitoring requirements to ensure the protection of groundwater resources and public health. To protect the State of Delaware groundwater potable water supply aquifer, an extensive groundwater monitoring well network is required to be maintained and monitored to ensure any wastewater related contaminants are promptly detected and quantified. The monitoring well network serves as a sentinel for nearby supply wells and surface water bodies.

The Applicant's existing Phase 1 Operations Permit consists of a groundwater monitoring well network of eighteen (18) wells to ensure that wastewater related contaminants are detected, quantified, and analyzed regarding their impact to groundwater quality. These parameters are set forth in detail in the Department's TRM, and include the following: Ammonia as Nitrogen; Chloride; Depth to Water; Dissolved Oxygen; Fecal Coliform; Nitrate + Nitrate as; pH; Sodium; Specific Conductance; Temperature; TSS; Total Nitrogen; and Total Phosphorus. To further ensure groundwater protection and fully address public comments and concerns, the Department has added the following groundwater monitoring parameters to the *revised* Draft Operations Permit Amendment, to be measured by the Department once every five (5) years: Arsenic; Cadmium; Chromium; Copper; Hardness; Iron; Lead; Manganese; Mercury; Nickel; Selenium; Sulfate; and Zinc.

Both the existing Phase 1 Operations Permit and the *revised* Draft Operations Permit Amendment require that operation of the OWTDS not cause the quality of Delaware's groundwater resources to be in violation of applicable Federal or State Drinking Water Standards. Specifically, Part III.A.23 of the *revised* Draft Operations Permit Amendment states that:

*...the Permittee shall take all reasonable steps to eliminate or minimize any adverse impact to waters of the State resulting from this Permit, including such accelerated or additional monitoring as necessary to determine the source, nature, and extent of the impact from a noncomplying discharge. In addition, at the direction of the Department, the Permittee shall submit a corrective action plan which will include a description of the proposed actions to mitigate or eliminate the source of the impact and an associated completion schedule. The plan shall be enacted as approved by the Department.*

In accordance with Section 6.6.3.16 of the Regulations, and to ascertain any increasing trends of wastewater constituents in groundwater after the initiation of operations, AWWMI was required to perform three separate rounds of groundwater and surface water sampling prior to the facility going into operation.

Samples were required to be analyzed by a certified laboratory to establish background levels for nutrients, organic, and inorganic contaminants of concern. Operational sampling is required by the facility through the following devices: lysimeters (in-field), monitoring wells (in-field, up-gradient, and down-gradient), and surface water grab samples (up-gradient and down-gradient). Using this data, the CGSS will be able to assess any impact the spray irrigation activities may have on the spray fields, groundwater, and surface waters within and adjacent to the SRRF spray fields. Annual soil sampling is also required, and heavy metals are required to be sampled once every five (5) years. The background samples obtained and tested during the site investigation portion of the project will then be utilized to determine whether any impacts are occurring due to spray irrigation activities.

The Department's TRM further notes that the Division of Water maintains a group of highly trained environmental professionals, including inspectors, engineers, hydrologists, and geologists qualified to analyze the effluent, groundwater, and surface water monitoring data. Data assessments and compliance evaluations are performed during the review and processing of monthly Discharge Monitoring Reports ("DMRs") and routine inspections, and compliance concerns are addressed through various Departmental enforcement measures, including Notices of Violation, Corrective Actions, and Orders.

In addition to routine compliance analysis performed by the Department, Part IV.A.1 of the *revised* Draft Operations Permit Amendment requires the Permittee to prepare a Compliance Monitoring Report ("CMR") every five (5) years, in accordance with Section 6.5.4.3 of the Regulations. The Permittee will be required to have a Delaware-licensed professional geologist ("PG") prepare a hydrogeologic assessment that includes an evaluation and comparison of temporal trends in both effluent and groundwater quality in comparison to background samples and/or previous sampling results. Further, the PG must provide a conclusion of the operating status of the irrigation system based on the monitoring data and provide any recommendations for future monitoring, system upgrades or improvements if deviations from baseline groundwater conditions are detected.

In the event trends of increasing concentrations and/or impacts are observed, the *revised* Draft Operations Permit Amendment will require the Permittee take all necessary actions to eliminate and correct and adverse impact on public health or the environment resulting from permit non-compliance, in accordance with Section 3.20 of the Regulations.

In light of the above information, the Department's TRM concludes that the permitted constituent limitations outlined in the *revised* Draft Operations Permit Amendment for SRRF's OWTDS, coupled with the facility's diversion capabilities, mandated contingency plans, wastewater, groundwater, and surface water monitoring, along with routine inspection and data assessments, is protective of public health and the environment, including the protection of the local drinking water supply aquifer.

## **2. Public Health - Potential Impact on existing groundwater contamination**

Comments were received by the Department in this matter that expressed concern about the potential impact of SRRF's operation, specifically, Field G, on existing groundwater contamination beneath the Clean Delaware facility. Additional comments requested a central water system be provided to the Collins, Russell, and Slim Street neighborhood downgradient from Clean Delaware. In response, the Department's TRM notes that AWMI initiated the application process for the SRRF via a letter of intent in 2006. AWMI proceeded with a site evaluation, including a 2007 Site Selection and Evaluation Report, a 2008 Soils Investigation Report, a Hydrogeologic Investigation Report, and a Groundwater Mounding Analysis. Based on that application (and supplemental information obtained by the Department), a Construction Permit for SRRF (then known as ANSRWRF) was issued in 2013. That permit included construction requirements and reporting elements designed to ensure that the facility is constructed in accordance with proposed design plans, and in accordance with all regulatory requirements.

With regard to spray irrigation at SRRF's Field G, the treated effluent being applied to Spray Field G, up-gradient of Clean Delaware's Milton Farm, will undergo treatment and disinfection prior to application. The TRM notes that the Regulations seek to require the use of on-site wastewater treatment and disposal systems, including slow rate land treatment systems, that will function according to their performance criteria without causing the State's groundwater resources to violate U.S. Environmental Protection Agency ("EPA") Drinking Water Standards on an average annual basis. This system, however, is designed so that spray irrigation of the treated effluent will result in a percolate less than 10 mg/L Total Nitrogen beneath the spray fields *on an average monthly basis*, which is a more stringent standard.

The Department's TRM further notes that groundwater movement through the unconfined aquifer is complex, and there are many factors that must be taken into consideration related to land application and the potential for impacts to groundwater quality. Typically, groundwater monitoring wells associated with land application sites such as Clean Delaware are shallow to allow for the detection of impacts from land application activities directly above the water table.

Water deeper in the aquifer is comprised of water that has entered the groundwater system at various other locations in the up-gradient direction. The TRM states that, while the water sprayed on Spray Field G may ultimately flow beneath Clean Delaware, and although it may slightly increase the hydraulic gradient in the area due to the increased recharge, it is not expected to have any negative impact regarding any potential existing contamination. Part II.A.3 of the *revised* Draft Phase 2 Operations Permit Amendment for SRRF requires routine quarterly groundwater monitoring for nitrates from a monitoring well network consisting of nine (9) wells beneath Spray Field G alone (eighteen wells across all fields). Monitoring will ensure that any potential nitrate impacts to groundwater do not go undetected. Should an increasing trend be detected, the Permittee will be required to proactively implement corrective actions as required by the *revised* Draft Operations Permit Amendment.

The Department's TRM further notes that, beginning in 2013, the Division of Water initiated monitoring well requirements at all biosolids land application sites to ensure nitrate impacts from land application activities are identified if they occur, and additional best management practices can be implemented if necessary. In 2013, Clean Delaware installed a network of groundwater monitoring wells at its land application sites, and elevated nitrates were detected. After receiving the monitoring results, once the Department became aware of the nitrate impacts to groundwater, the Division of Water required corrective actions by Clean Delaware and the implementation of best management practices to minimize the impact of land application activities to groundwater.

Additionally, upon identifying private drinking water wells on Slim, Collins, and Russell Streets that were impacted above the drinking water standard for nitrate, Clean Delaware provided treatment at no cost to the owners/tenants. After several years of Clean Delaware's operation with enhanced best management practices in place, groundwater conditions beneath the land application fields have shown significant improvement.

Based on the Department's compliance efforts working with Clean Delaware to improve groundwater quality beneath their application sites, along with SRRF's design to meet a percolate concentration that does not exceed 10 mg/L Total Nitrogen, in conjunction with an extensive monitoring well network for routine monitoring of spray irrigation activities at SRRF (and, in particular, on Spray Field G), the activities regulated by the *revised* Draft Operations Permit Amendment should not adversely impact groundwater beneath Clean Delaware's Milton Farm or the quality of the drinking water wells located on Russell, Collins, and Slim Streets.

### **3. Public Health – Avian Flu**

Additional comments received by the Department in this matter questioned how public health is being protected from Avian Flu getting into the groundwater, thereby potentially migrating to nearby public wells. In response, the Department notes in the TRM that the existing SRRF Operations Permit allows for the disposal of treated poultry processing wastewater from Allen Harim via spray irrigation.

In accordance with State Permit 597261, Allen Harim treats and chlorinates wastewater generated by poultry processing for transfer and disposal at the SRRF. The permit requires Allen Harim to provide sufficient chlorination of the treated wastewater to maintain a total chlorinated residual of at least 1.0 mg/L. The Center for Disease Control (“CDC”) has indicated that the avian influenza (H5N1) is readily inactivated by chlorination. Also, the EPA recognizes research results confirming that free chlorine concentrations typically used in drinking water treatment would be sufficient to inactivate the virus.

The Department’s TRM concludes, as per the EPA and the CDC guidance, that the chlorination process at the Allen Harim facility’s wastewater treatment process, in conjunction with the permit requirement to maintain a total chlorine residual of at least 1.0 mg/L, is protective of human health and the environment relative to the Avian Flu.

#### **4. Groundwater Monitoring**

Some of the written comment received from the public in this matter questioned where the groundwater monitoring data from MW-1L is, and whether DNREC has had access to the data when deliberating over the additional wastewater volume from new service area sources (approximately 625,000 gallons). In response, the Department’s TRM states that the Division of Water’s technical staff has reviewed both the background and the current monitoring well data for MW-1L, and did not have significant concerns regarding the same.

Additional comments inquired as to whether Artesian is reporting to DNREC the groundwater monitoring around land application areas authorized by the Phase 1 Permit, specifically, Spray Fields F and G. In response, the Department’s TRM notes that the Division of Water has required thirteen (13) monitoring wells located around Fields F and G to monitor groundwater. Section 6.8.1.3. of the Regulations requires that:

*Spray irrigation systems require a minimum of six (6) monitor wells (MWs): one (1) upgradient, two (2) downgradient, one (1) within the wetted field, one (1) upgradient and one (1) downgradient of the treatment and storage pond(s).*

Further, Section 6.8.1.5 of the Regulations allows the Department to “...require additional wells depending on site or project characteristics,” if deemed necessary. Part II.A.3 of the *revised* Draft Operations Permit Amendment requires groundwater monitoring from four (4) wells for Field F and nine (9) wells for Field G, and Page three of that permit shows the well locations. In addition to background data provided in 2018, AWMI has been providing quarterly data since the initiation of SRRF operations in July of 2021.

Additional comments questioned how the Department’s proposed Draft Permits provide tangible evidence to ensure that the wastewater does not leak or seep from the storage lagoons into shallow groundwater. In response, the TRM again references Sections 6.8.1.3 and 6.8.1.5 of the Regulations, as noted above. Further, the TRM notes that four (4) wells have been situated around the property that the existing storage lagoon and the proposed lagoons are located. The four wells are depicted on page three of the *revised* Draft Operations Permit Amendment. Additionally, monitoring well 1-F (258634) is downgradient of the existing storage lagoon. As noted previously, SRRF began Phase 1 operation in July of 2021. Given this, the Division of Water has concluded that the monitoring well network is in line with the regulatory framework and will provide sufficient warning of a compromised lagoon liner. Further, the TRM notes that, to date, all monitoring data received for these wells is consistent with prestart-up background concentrations.

## **5. Surface Water Monitoring**

Some of the public comments received by the Department in this matter inquired as to whether any monitoring was being performed in the Ingram Branch to determine any impact(s) from spray irrigation of the treated effluent. Concerns were expressed that, when AWMI sprays into the trees (the minimal forest near SRRF), Ingram Creek exists in the same spot, which is connected by various creeks and ponds to the Broadkill River and Delaware Bay.



In response, the Department's TRM refers to Section 6.3.2.3.13.12 of the Regulations, which requires the following:

*Surface water bodies adjacent to wastewater spray irrigations sites must be monitored by the wastewater treatment facility. The Department may deem necessary the monitoring of other surface water bodies in close proximity to the spray irrigation site. Monitoring must be performed upgradient and downgradient of the irrigation site.*

Part II.A.9 of the current Operations Permit (No. 359288-02) requires quarterly surface water monitoring from six (6) locations. The surface water sampling locations include Ingram Branch and Sowbridge Branch. Three of the monitoring locations are positioned to monitor Ingram Branch, and the other three monitoring locations are positioned to monitor Sowbridge Branch.

The current Operations Permit, as well as the *revised* Draft Operations Permit Amendment, only authorizes the use of Field F and Field G. Fields D and E are not yet permitted for operations. The *revised* Draft Operations Permit Amendment will maintain surface water monitoring requirements, and Department staff in the CGSS will review the quarterly data to assess any impact on surface water quality from the spray irrigation of the treated effluent.

## **6. Monitoring Data Accessibility**

Some of the public comments received in this matter requested the availability of the monitoring well data and the effluent monitoring at Allen Harim. Additional inquiries were received about the availability of monitoring well data at the Clean Delaware site. In response, the Department notes that Clean Delaware does not discharge to SRRF, and thus such monitoring data is outside the subject matter of this present hearing matter. For transparency and ease of access regarding the public's review of this matter, however, the TRM summarizes the monitoring of the flow from Allen Harim to SRRF, in accordance with Part II.A.1 of the current Operation Permit (No. 359288-02).

## **7. Treatment/Design Concerns**

Certain public comments noted that the influent/effluent table data indicates the treatment efficiency is 97.5 percent, and inquired as to whether DNREC has compared that confidence of treatment to known treatment efficiencies of working Hybrid Bardenpho systems in Delaware. Other comments and concerns relative to the efficiency of the treatment proposed in this matter were also received by the Department. In response, the TRM offers a lengthy, technical description of the Hybrid Bardenpho design specifications, as provided in Appendix “B” of the February 2021 Design Engineer Report, and notes that the system would achieve monthly average effluent concentrations of BOD5, TSS, and Nitrogen less than or equal to 10 mg/L, and Phosphorous less than or equal to 8 mg/L.

The TRM further notes that, while Division staff was unable to locate another Modified Bardenpho system in Delaware for comparison of treatment efficiency, staff did perform additional research and found a Fact Sheet published by the EPA that provided efficiency comparison with other biological nutrient removal technologies. That Fact Sheet, titled *Biological Nutrient Removal Processes and Costs* (available for public review on EPA’s website), provides information on the types of biological nutrient removal technologies, nutrient removal efficiencies, and the associated costs for small and large municipal systems.

## **8. Equalization/Off-Spec Diversion Lagoon Concerns**

Public comments expressed at the time of the hearing requested clarification and additional detail on how the emergency diversion is proposed to work at AWMI. Additional written inquiries received by the Department wanted more information concerning this particular area of AWMI’s operation, including, but not limited to, the time lag between treatment and the determination of “off-spec diversion,” what happens when the diversion pond is full, whether the diverted inflow will be raw domestic sewage, and, if so, what types of aeration will be provided in the diversion pond to keep the odors controlled (and not be a neighborhood nuisance).

In response, the Department’s TRM provides significant technical detail regarding AWMI’s operation, and the same may be reviewed in full by the public therein, as the TRM is expressly incorporated into this Report and attached hereto as Appendix “A.”

For the purposes of brevity, this Report notes that the Department concludes that AWMI’s proposed management of the emergency diversion would properly divert and manage flows in accordance with the intent of Section 6.3.2.3.2.4 of the Regulations, which stipulates diversion requirements for wastewater that fails to meet operation specifications. Additionally, the TRM notes that the management of any diverted wastewater upon implementation of the contingency plan will minimize the potential for odor concerns because the wastewater will be recirculated back through the plant for treatment as soon as is possible.

## **9. Monitoring for Pathogens**

Some of the written comment received in this matter inquired as to why there is no influent pathogen information for Phase 2 domestic wastewater provided in AWMI’s Phase 2 Design Engineer Report (“DER”), and whether the Applicant was claiming that there will be no pathogens, or whether they simply have no data to report. In response, the Department’s TRM notes that the SRRF Phase 2 wastewater treatment facility is designed to treat domestic wastewater. The influent concentration tables provided in the DER do not list a specific value for Fecal Coliforms and instead lists “N/A.” However, Section 1.3.2 of the DER, *Influent Characteristics*, notes the following:

*Where available, the design influent wastewater characteristics (§6.5.1.4.1.1.5) are based on actual concentrations from monitoring results for the AWMI Regional System for a three-year period. In general, the influent has been consistent with low flow rate/high strength domestic wastewater as described in Metcalf & Eddy...*

In accordance with Section 6.3.1.9 of the Regulations, and since the SRRF is designed for unlimited public access treatment criteria, the effluent from the SRRF will be required to reduce Fecal Coliforms to less than or equal to 20 col/100mL. The TRM further notes that Part I.D.14 of the *revised* Draft Operations Permit Amendment requires that SRRF meet this requirement.

The TRM provides additional discussion and significant technical detail with regard to pathogen monitoring requirements, including the matter of disinfection, as required to be addressed by the Applicant in Section 6.5.1.4.1.7.4 of the Regulations. To gain a full understanding of the technical details concerning pathogen monitoring requirements, the TRM, along with all of its Appendices, may be reviewed in full in Appendix “A” of this Report.

For the purposes of brevity, this Report notes that the Department has concluded that, although the influent concentration table provided in the DER does not list a specific value for Fecal Coliforms, the design does account for treatment of Fecal Coliform bacteria at concentrations consistent with high strength domestic wastewater, and is designed to achieve the regulatory required concentration of less than or equal to 20 col/100mL. Further, the Division of Water is imposing this disinfection requirement, as well as monitoring of the effluent to ensure compliance and contingency language to protect public health, in the *revised* Draft Phase 2 Operations Permit Amendment.

## **10. Tertiary Treatment Clarification**

Some comments requested clarification on tertiary treatment relative to the proposed Bardenpho treatment process. In response, the TRM notes that “tertiary treatment” is a level of wastewater treatment that provides for the removal of residual suspended solids (after secondary treatment), usually by granular medium filtration or microscreens. Disinfection is also typically a part of tertiary treatment. Nutrient removal is often included in this definition as well. The SRRF application for the Phase 2 construction of the wastewater treatment system proposes a process that, according to the February 2021 SRRF Phase 2 DAR, includes nutrient removal, filtration, and disinfection. In line with the above definition, the TRM states that the Bardenpho treatment process, followed by filtration and disinfection, would constitute tertiary treatment.

Additional technical detail concerning AWMI's proposed treatment process is set forth in the TRM. Again, for the purposes of brevity in this Report, it should be noted that the Department has concluded that the design of the proposed Phase 2 wastewater treatment system is in line with appropriate recommended standards for achieving high quality wastewater effluent through tertiary treatment.

## **11. Phase 2 Wastewater Treatment Capacity**

The Department received comment expressing concern about the capacity of the proposed Phase 2 treatment facility versus the recent commitments AWMI has made to accept wastewater from the Town of Milton, Georgetown, and several other subdivisions and communities. In response, the TRM notes that, regardless of any commitments AWMI has made, the *revised* Draft Operations Permit Amendment limits AWMI to an influent of 0.625 MGD (Peak Month Average Daily Inflow) from all sources to the wastewater treatment plant. Any additional proposed flows would require AWMI to apply for Phase 3 upgrades to the wastewater treatment system.

For phased systems, the Regulations require notification when flows reach 80% of the facility's capacity, and require the Permittee to design and apply for a construction permit for upgrades to the facility. The Regulations specifically prohibit flows to exceed the permitted capacity. Part III.A.12 of the *revised* Draft Phase 2 Operations Permit Amendment reiterates the requirements of Section 6.3.1.15 of the Regulations, requiring AWMI to submit notification and an Application, Plans, Specifications, and a Design Engineer Report for the construction of the next phase of operations when wastewater flow reaches 80% of the permitted treatment capacity.

The CGSS has concluded that the *revised* Draft Operations Permit Amendment aligns with regulatory requirements, limits influent to 0.625 MGD for the Phase 2 wastewater treatment system, and requires AWMI to apply for upgrades once the flows reach 80% of the current permitted capacity.

## **12. Pre-Treatment Standard Requirement (for the Construction Permit)**

Numerous comments received from the public asked the Department about the specific pre-treatment standards that would apply to “Artesian Phase I and II” that are referred to in Part III.A of the proposed Draft Construction and Operations Permits. Additional questions concerned which communities would have sanitary waste treated at the Phase 2 SRRF, which communities would have commercial and/or industrial wastewater inputs that would end up at Phase 2 SRRF, and whether there is a list of sources contained in the Application materials submitted to the Department by AWMI. In response, the TRM notes that SRRF was established by Artesian as a regional wastewater facility and, as such, is tied into Artesian’s regional wastewater system. Therefore, Artesian can route flow to SRRF from any part of the regional system, based on system adjustment needs. In correspondence with the Department, Artesian has stated that it requires pre-treatment of flow from industrial users that discharge into their interconnected system (i.e., all potential flow, not just flow that is sent to SRRF), and that only approximately 7% of flow discharged into Artesian’s interconnected system is comprised of pre-treated industrial flow.

To specifically address the public concerns in this area, the CGSS is adding a condition (Part II.B.12) to the *revised* Draft Operations Permit Amendment that requires Artesian to maintain and annually update an industrial listing that provides the names and addresses of all current Significant Industrial Users (“SIUs”) and Non-Significant Categorical Industrial Users (“NSCIUs”), as defined in 40 CFR 403.3, discharging to the SRRF Phase 2 wastewater treatment system. Additionally, Part III.2 prohibits the operation of the wastewater treatment and spray system from impacting Delaware’s water resources, including the violation of applicable Federal or State Drinking Water Standards. Should the Department determine that the discharge (including industrial pass-through or interference) is impacting groundwater quality or downgradient receptors, Part III.23 will require corrective actions designed to eliminate or minimize any adverse impact to Waters of the State.

Further, to ensure that industrial inputs are not impacting water resources, the *revised* Draft Operations Permit Amendment requires extensive influent, effluent, surface water, groundwater, and soils monitoring of various industrial parameters, including metals. The TRM notes that the Department is confident that any significant industrial discharge to the SRRF Phase 2 wastewater treatment system will be detectable through the required monitoring.

Continuing with the TRM's response to this particular area of public concern, Part III.A of the proposed Draft Construction Permit originally included language regarding effluent limitations on pollutants attributable to industrial users. This condition was inadvertently carried over from a permit for a publicly owned treatment works regulated under the Federal Clean Water Act requirements. The condition has been removed from the *revised* Draft Construction Permit, since the concern is addressed in the *revised* Draft Operations Permit Amendment.

### **13. Phosphorus**

Several commenters inquired about the cause of the high Phosphorus levels in the crop areas of Fields D, F, and G, and questioned who is ultimately responsible for the decision to land apply on cropped acres that have high Phosphorus levels. In response to the above concerns, the TRM notes that the Division of Water does not have data or records regarding activities performed in the crop areas of Fields D, F, and G prior to the baseline site investigation for the SRRF. Thus, the cause of the high Phosphorus levels in those areas is unknown. However, the levels may be legacy residual, potentially related to historical or previous farming practices.

As a result of the concerns of elevated Phosphorus in the soils, Part I.D.2 of the *revised* Draft Operations Permit Amendment limits the application of Phosphorus to not exceed annual crop uptake rates, as follows:

*The total amount of Phosphorus that may be applied to the crop areas in Fields D, F, and G shall not exceed uptake needs of 31.2 lbs./acre per year. This amount includes supplemental fertilizers, the Phosphorus supplied from the effluent, and any other source.*

*The wooded areas in Fields D and G, as well as all of Field E, do not have high Phosphorus, and are thus exempt from these criteria [February 2021 SRRF Phase 2 Design Engineer Report, Appendix C.2]*

*Adjustments and reductions are not to be factored into the annual reporting of Total Phosphorus Loading for demonstration of compliance with this limitation. If any crops are not removed from the spray irrigations fields, then the Total Phosphorus application rate for the field shall be reduced by the amount of Phosphorus that would be removed by harvesting the crop.*

In addition to the incorporation of a protective permit limit for the application of Phosphorus, the *revised* Draft Operations Permit Amendment also includes operational and monitoring requirements relative to Phosphorus. Furthermore, in consideration of the public concerns regarding elevated concentrations of Phosphorus in the soils and the need to limit the application of Phosphorus to crop uptake values as discussed above, Part II.A.2.b, *Requirements for Phase 2 Effluent*, has been modified to increase the monitoring of Total Phosphorus in the effluent at both points of compliance from “quarterly” to “monthly” (i.e., immediately post SRRF treatment system and post-storage of the combined blended treated effluent), thus allowing for better monitoring and monthly calculation of Phosphorus loading to the site.

With regard to groundwater/soil monitoring and operations requirements, the TRM notes that Part II.A.3 of the *revised* Draft Operations Permit Amendment requires monitoring of the groundwater for Total Phosphorus on a quarterly basis, thereby allowing any increase in mobility of soil Phosphorus to be detected. Part II.A.7 requires monitoring of the soil for Phosphorus annually. Should soil Phosphorus levels become excessive for plant growth, a Phosphorus Adsorption test is required. The permit further notes that:

*Excessive levels of soil Phosphorus are defined by the Delaware Nutrient Management Commission. Soil Phosphorus levels must be tested in accordance with the University of Delaware soil testing methods. If the soil Phosphorus levels become excessive, the Permittee shall perform a Phosphorus Site Index (PSI) study.*



*The results shall be submitted to the Department within 30 days of completion. Based on these results, the Department may require the Permittee to submit a plan for detailing steps to reduce the Phosphorus loading rates at the site.*

Further, Section 6.3.2.3.8.2.1.3 of the Regulations requires the following:

*Once Phosphorus has become the LLC [Land Limiting Constituent] the Phosphorus application rate must be reduced to crop phosphorus uptake levels. Under such conditions, high Phosphorus utilization vegetation may be grown to increase the phosphorus assimilative capacity.*

The TRM further notes that the Division's technical staff (including a soil scientist) will analyze and evaluate the monitoring data. Data assessments and evaluations are performed during the review and processing of Annual Reports and during various permitting activities (e.g., permit renewals and/or amendments). In the event Phosphorus levels trend upward in the effluent or become excessive in the soils, the Permittee will be required to take all necessary actions to eliminate and correct any adverse impact on public health or the environment, and to provide a corrective action plan detailing steps to reduce the phosphorus loading rates at the site (e.g., treatment system upgrades, or growing high Phosphorus utilization vegetation to increase the Phosphorus assimilative capacity).

In light of the above actions, the Division of Water believes that the permitted limitations outlined in the *revised* Draft Operations Permit Amendment for Phosphorus application, coupled with groundwater and soils monitoring and routine data assessments, is protective of public health and the environment. As previously noted, to further address concerns voiced regarding elevated Phosphorus at the site, the Division has *revised* the effluent monitoring frequency in the Draft Operations Permit Amendment from quarterly to monthly, to allow for closer tracking of operational Phosphorus contributions to the fields.

Additional questions were raised by the public with regard to how DNREC enforces the Delaware Nutrient Management Commission’s interim technical standards. In response, the TRM notes that the Department of Agriculture provides State Technical Standards (“STS”) that specifically note any practices that would require permitting oversight by DNREC, as well as which DNREC regulations apply. In such instances, the STS mirror the Department’s regulatory requirements. Other comments regarding this area of concern inquired as to where the sludge from the clarifiers will be land applied with respect to Phosphorus limited soils (since the Phosphorus removed from the wastewater will be concentrated in the sludge). In response, the TRM notes that, since application of Phosphorus at the site is limited to crop uptake values, the site will not be permitted for the application of biosolids. The Permittee will be required to utilize a licensed, contract hauler for proper disposal of biosolids. If disposed of in Delaware, the disposal application site is required to have a biosolids application permit from the Department.

#### **14. Biosolids**

Some comments received from the public questioned why the Draft Permit language is “so vague” with regard to the proper disposal of biosolids and sludge from the domestic sewage treatment. In response to such concerns relative to the management and disposal of biosolids from the proposed Phase 2 wastewater treatment systems, the Applicant provided the following information in their response letter of July 12, 2022:

*Management and disposal of biosolids produced at Artesian’s SRRF WWTP will be handled by pumping and transport to Sussex County’s Class A biosolids treatment facility at the Inland Bays complex. Artesian owns and operates two (2) 5,000-gallon pumper trucks operating under State of Delaware Non-Hazardous Liquid Waste Transporters Permit Number DE OH-300. These trucks will be used by Artesian to transport the sludge and biosolids. Artesian entered into a disposal agreement dated September 19, 2019, with Sussex County Council to dispose of up to 100 dry tons of biosolids per year at their IBRWF biosolids facility.*

The Department's TRM notes that, after review of the additional information provided by AWMI, the Division of Water has concluded that the proposed management and disposal of biosolids produced at the proposed Phase 2 wastewater treatment system will be in accordance with the Non-Hazardous Liquid Waste Transporters Permitting Requirements of the aforementioned Regulations, as well as the *Guidance and Regulations Governing the Land Treatment of Wastes* (7 DE Admin. Code 7103). However, to fully address the public's concerns regarding the Applicant's biosolids/sludge handling operations, and to provide more clarity regarding AWMI's management of same, the Division of Water is now including the following conditions in this matter:

*All sludge (biosolids) shall be handled in accordance with standard wastewater practices and shall be disposed of in a manner such as to prevent any pollutant from entering the surface water or groundwater and to comply with applicable federal or state laws and regulations.*

*Management and disposal of biosolids produced at the SRRF wastewater treatment system shall be handled by pumping and transport to Sussex County's Class A biosolids treatment facility at the Inland Bays Regional Wastewater Treatment Facility. The Permittee owns and operates two (2) 5,000-gallon pumper trucks operating under State of Delaware Non-Hazardous Liquid Waste Transporters Permit (No. DE OH-300). The Permittee shall use these trucks (or other permitted trucks) to transport biosolids.*

*The Permittee shall handle sludge in accordance with the disposal with the disposal agreement dated September 19, 2019, with Sussex County Council to disposal of up to 100 dry tons of biosolids per year at their IBRWTF biosolids facility. The Permittee shall maintain a current copy of the executed agreement with Sussex County on file with the Department.*

*In order to deviate from the above biosolids management and disposal plan, the Permittee shall submit an alternative plan for Department approval.*

## **15. Construction above grade wastewater ponds**

Concerns were voiced in the public comment received as to whether there are any “secondary containment provisions” in case of a catastrophic failure of the above-grade Lagoon A berms that would protect Ingrams Branch, and, if so, what they are. Additional written comment also inquired that, in the event of a catastrophic failure of the above-grade Lagoon A berms, how Artesian would prevent the combined Allen Harim poultry processing wastewater and the treated domestic sewage from entering Ingrams Branch to the south of the property.

The Department’s TRM notes that the above concerns reference the “As-Built Drawings” from the Phase 1 Construction that were provided in the DAR. Specifically, Lagoon A in the As-built Drawings references the 90 MG lagoon built during Phase 1 construction. The Phase 1 components including the 90 MG have already been permitted and constructed, thus, the design of the Phase 1 system elements is not the subject of this present permitting matter. Nevertheless, the Division of Water wished to address the same safety concern relative to the Phase 2 proposed 3.0 MG Combined Equalization and Diversion Lagoon, and thus sought additional information from AWMI to address the same.

In response to the public comment requesting that the Applicant “elaborate and demonstrate safety factors considered and incorporated into the design of the above grade wastewater ponds, AWMI provided the following:

*The proposed equalization/diversion lagoon was designed as a below grade installation. Due to the lack of above grade earthen berms erosion, the primary cause of problems for earthen berms has been eliminated as a potential source of failure. The earthen berm being constructed within the equalization/diversion lagoon also remains below grade. Additionally, the entire interior of the proposed lagoon is going to be lined, which will protect the soil underneath.*

Furthermore, in response to the public inquiry regarding how AWMI would prevent the combined Allen Harim poultry processing wastewater and the treated domestic sewage from entering Ingrams Branch to the south of the property, and whether there are any secondary containment provisions regarding same, AWMI again notes that "...the proposed equalization/diversion lagoon is a below grade installation. Accordingly, no secondary containment provisions have been incorporated."

The TRM notes that, after review of the above additional information provided by AWMI, the Division of Water has concluded that the proposed Phase 2 equalization/diversion lagoon was designed as a below grade installation, the potential for failure is unlikely, and the lagoon does not require a secondary containment unit.

#### **16. Hydrologic Impact of Future Lagoon B**

Written comment received from the public in this matter also inquired about the hydrologic impact of the future Lagoon B to the subsurface flow of Ingrams Branch. In response, the Department notes that this particular comment references the "As-Built Drawings" from the Phase 1 Construction (as did the immediately preceding area of concern). As noted previously, Lagoon A references the 90 MG lagoon built during Phase 1 Construction. Lagoon B is a conceptually proposed storage lagoon that is not part of the Phase 2 Construction; however, the same may be a part of a future phase.

Section 6.3.2.3.5.8 of the Regulations requires "[t]he base of any pond, at its lowest point, must be at least two (2) feet above the seasonal high water table." The TRM notes that, in the April 3, 2017, Geotechnical Evaluation prepared by Duffield Associates for the ANSRWRF Lagoon site, Duffield recommended a seasonal high water table ("SHWT") elevation of 24 feet be utilized for design. Once an application is received for a future phase containing design specifications for the additional storage lagoon previously depicted as Lagoon B, the Division of Water will review the specifications to ensure the base of the lagoon is at least two feet above the SHWT, as recommended by Duffield in this matter.

As with the previous section, even though this particular inquiry is relative to a future lagoon that is not part of the present Phase 2 application, the Division of Water wished to address these safety concerns. Thus, on July 1, 2022, the Division of Water requested that AWWMI provide a hydraulic profile for the Phase 2 proposed 3.0 MG Combined Equalization and Diversion Lagoon demonstrating the lagoon complies with Section 6.3.2.3.5.8 of the Regulations. The request further noted that, unless a more recent technical report is available and had been provided to the Division of Water, the SHWT should be based on Duffield's findings in the aforementioned 2017 Geotechnical Report. In response, the Applicant confirmed that the SHWT to be used for design at the SRRF site is 24 feet, and that no additional geotechnical report related to groundwater levels has been completed since the 2017 Duffield report. Further, AWWMI noted that the lowest point in the proposed equalization/diversion lagoon is 26.5 feet (which is 2.5 feet above the defined SHWT, and thus the design of the proposed SRRF wastewater treatment facility complies with Section 6.3.2.3.5.8 of the Regulations, as noted above. The requested hydraulic profile was provided as requested at that time as well.

The Department's TRM concluded that, after reviewing the additional information provided by AWWMI, the Division of Water has concluded that the Phase 2 design of the proposed 3.0 MG Combined Equalization and Diversion Lagoon meets the regulatory requirements of Section 6.3.2.3.5.8 by being designed to maintain a separation distance of two (2) feet above the SHWT. Further, the TRM confirms that all future phase applications will be reviewed by the Department to ensure this regulatory requirement is also met.

## **17. Agricultural Preservation**

The Department received comment suggesting that the application of treated wastewater was not the intent of agricultural preservation. In response, the TRM notes that, in 2005, DNREC and the Delaware Department of Agriculture ("DDA") entered into a *Memorandum of Understanding Relating to Agricultural Land Preservation and Spray Irrigation* ("DNREC/DDA 2005 MOU") to clarify and expand upon 3 *Del.C.* §909(a)(5)(e), and to establish an appropriate application volume and appropriate levels of treatment.

Specifically, 3 Del.C. §909(a)(5)(e) states as follows:

*Spray irrigation designed to replenish soil nutrients and improve the quality of the soil is allowed provided that the spray effluent is treated pursuant to the best available treatment technology, is disposed of on property utilized for the production of conventional cash crops, and all storage and treatment of the effluent disposed of on the District property takes place on property other than District property.*

The aforementioned Memorandum of Understanding provides in pertinent part that, “[i]rrigation rates on any given field shall be determined by crop utilization and uptake limits and not by treatment facility wastewater disposal needs.” Thus, levels of treatment are to be based on the source and type of treated wastewater.

The Department’s TRM has concluded that the *revised* Draft Operations Permit Amendment for SRRF’s OWTDS establishes operational parameters that meet the intent of the *Agricultural Land Preservation Act*, as interpreted and clarified under Title 3 and the DNREC/DDA 2005 MOU. Spray irrigation limits are based on the nitrogen balance developed in consideration of crop type and crop uptake limits, which sets a finite disposal capacity for the facility driven by agricultural needs, and not the Permittees’ wastewater disposal needs. Further, the utilization of treated wastewater effluent for spray irrigation purposes not only supports crop development, but also preserves aquifer groundwater resources that would otherwise be used by the farmer to irrigate the crops.

**18. Miscellaneous General Comments:**

With regard to comments inquiring whether the Department had assigned dedicated inspectors to inspect, review the monitoring reporting submittals and ensure the facility is operating in compliance, the TRM confirms that the Division of Water maintains inspectors, engineers, soil scientists and hydrologists on staff to review monthly and annual reports, perform inspections and sampling, and assess whether the facility is operating in compliance with all permits and regulations.

Additionally, as a matter of clarification, groundwater flow directions were confirmed by the Department's TRM for the AWMI seven (7) field areas, noting that, in general, according to the Division of Water's Hydrogeological Evaluation Memorandum dated October 28, 2009, the groundwater flow is to the east, and ranges from towards the northeast to towards the southeast, depending on the specific field in question.

Other comments questioned why the Department would consider the issuance of Phase 2 Construction and/or Operational Permits when the Phase 1 Construction Permit has been appealed. In response, the TRM notes that the filing of the April 7, 2020, Phase 1 Construction Permit appeal before the Environmental Appeals Board ("EAB") did not result in a stay on the Phase 1 Operations Permit. Thus, the appeal did not preclude AWMI from proceeding with operations, nor applying for a Construction Permit for Phase 2 Operations. It should also be noted that on March 28, 2023, Keep Our Wells Clean formally withdrew their consolidated appeals concerning the Phase 1 Construction and Operations Permits.

Additional written comment asked the Department how AWMI plans to manage mosquito control in all the wastewater ponds, what Artesian has done since the construction of Lagoon A to mitigate mosquito breeding grounds, and how DNREC has enforced this requirement in accordance with Secretary's Order No. 2012-W-0052, issued March 12, 2013. In response, the TRM notes that both the Allen Harim and the SRRF lagoons will be aerated to keep the waters agitated and moving. Mosquitos breed and proliferate in shallow, stagnant pools of water. The AWMI lagoons are deep (approximately 25 feet) and with aeration/agitation do not provide a good breeding ground for mosquitos.

Further, both the *revised* Draft Construction and Operations Permits include requirements to operate and maintain treatment and storage lagoons in such a manner as to limit the opportunity for mosquitos to proliferate. The TRM also notes that the Division of Water performed an inspection on June 3, 2022, at which time compliance personnel verified the storage lagoon was being aerated with non-shallow conditions and no vegetative growth.



In light of the above information, the TRM concludes that AWTMI has been implementing the management practices noted in their August 8, 2017, letter to the Department (which addressed their ongoing mitigation of potential mosquito concerns), and in accordance with Secretary's Order No. 2012-W-0052, and that mosquito proliferation is adequately controlled at this time. Should conditions change, or if control practices are not adequately maintained, the Division of Water would require corrective measures.

Lastly, written comment was received that questioned why AWTMI has constructed some of the proposed waste holding ponds north of Lagoon A prior to DNREC issuing the Phase 2 Construction Permit. In response, the TRM notes that the Division of Water performed an inspection on June 3, 2022, at which time conditions of the location north of the existing storage lagoon were observed. The inspectors verified that soil disturbance had occurred for use of the soils for Phase 1 lagoon berms that would need to be removed for Phase 2 construction; however, construction of the Phase 2 ponds have not yet been initiated. Thus, the TRM concludes that AWTMI has not initiated construction of Phase 2 components prior to obtaining the Phase 2 Construction Permit from the Department.

### **Permit Revisions to Address Comments and Compliance Issues**

As set forth above, Artesian has operated SRRF in accordance with their existing Operations Permit since July 2021. The permit authorizes the storage and spray irrigation of treated effluent received from Allen Harim's wastewater treatment system. The permit includes effluent limitations, operational, monitoring, and reporting requirements. This includes the submission of monthly DMRs designed to verify that the facility is operating in a manner that is protective of human health and the environment.

During routine compliance evaluations of SRRF's monthly DMRs and the 2021 Annual Report, and in conjunction with performing various reviews and data analyses designed to address public comments, CGSS staff identified many monitoring and reporting violations, deficiencies, and errors. These compliance issues were addressed in a *Manager's Deficiency Warning Letter* ("Warning Letter"), dated August 12, 2022.

The Warning Letter required several corrective actions, including submission of missing data, revised monitoring and reporting methods, and the development and implementation of a Quality Assurance/Quality Control Plan to ensure the delivery of accurate and complete monthly DMRs and future Annual Reports. Artesian completed the required corrective actions as required by the Department. However, subsequent data and compliance evaluations of SRRF's monthly DMRs continue to identify violations and compliance failures associated with SRRF's monitoring and reporting program.

The Department has determined that many of the violations and compliance failures are, in part, associated with the operational, monitoring, and reporting complexity required by AWTMI's proposal to use predictive monthly Nitrogen Balance worksheets in their current Operations Permit (rather than a fixed Nitrogen limit established via the facility's Nitrogen Design Balance). The complexity of AWTMI's proposed monitoring methodology resulted in numerous reporting errors, violations, and operational failures. It also created a situation in which AWTMI's partner farmer (the receiver of the treated effluent for irrigation) developed concerns regarding water quantity and nutrient requirements for crop viability. More significantly, it hindered the Division of Water's ability to effectively and efficiently perform evaluations to determine the facility's permit and regulatory compliance.

Therefore, to address the public concerns regarding the protection of public health and the environment, and to resolve the operational, monitoring, and reporting compliance concerns identified by the CGSS, the following revisions are being made by the Department to the proposed Draft Permits required in this matter:

## **Revisions to the Proposed Draft Operations Permit Amendment**

### **1. Effluent Limitations**

The operational flexibility originally proposed by AWMI (i.e., the use of predictive methods in determining discharge volumes while meeting water quality limits in the percolate) is being revised to include more stringent effluent discharge limitations based on the facility's design disposal capacity. This revision includes adding a Phase 1 Effluent Volume Limit Table and the Phase 2 Effluent Volume Limit Table. These tables limit the application rate (inches/acre per week) of the monthly and annual quantity of effluent discharged from SRRF to the spray fields or wooded areas (on any pivot or zone), thereby eliminating AWMI's flexibility to vary spray volumes monthly, based on predictive calculations. The addition of these tables results in more operational, monitoring, and reporting clarity (see Condition Part I.D.1 of the red-lined and finalized *revised* Operations Permit Amendment). Additionally, based on data provided by AWMI on May 3, 2023, the Division of Water is reducing the Phase 1 operations effluent Total Nitrogen concentration from 37.5 mg/L to the more stringent 34.6 mg/L, and reducing the Phase 2 operations combined and blended effluent Total Nitrogen concentrations from 24.1 mg/L to the more stringent 22.5 mg/L. These reductions are based on actual monitoring data and are protective of groundwater resources (see Condition Part I.D.10 of the red-lined and finalized *revised* Operations Permit Amendment).

### **2. Fertilizer Application Requirements**

To address agricultural operations and concerns regarding the need for sufficient volume of treated effluent for irrigation and nutrient loading for crop survival, the Division of Water is requiring the addition of a fertilizer application condition. The application of additional fertilizer will only be authorized by the Division upon the Permittee developing and implementing an enhanced, higher resolution monitoring plan, to ensure that groundwater is protected by providing accurate real-time data (via in-field instrumentation), thereby allowing the Division to determine (at a higher temporal resolution) whether potential groundwater impacts are occurring due to additional nutrient loading from fertilizer use.

Upon installation of the enhanced monitoring well network, and the acquisition of required baseline data, the Permittee will be authorized to apply nitrogen commercial fertilizers on the spray irrigation fields. The condition will also allow the Division to revoke the authorization of additional fertilizer in the event the enhanced monitoring identifies impacts to groundwater, or the Permittee fails to submit complete and accurate monitoring data.

The Department's TRM notes that, while the application of fertilizer may exceed the mathematical/design limitations contained in the Permit, the enhanced, real-time, high temporal monitoring will allow the Division to make more accurate data-based decisions on fertilizer impacts that are not currently captured using just the predictive model. This new condition specifically addresses the concerns voiced in the public comments received in this matter, and ultimately makes the *revised* Draft Permit more rigorously protective of groundwater quality (see Condition Part I.D.12 of the red-lined and finalized *revised* Operations Permit Amendment).

### **3. Enhanced Monitoring Plan**

In conjunction with the fertilizer application condition discussed above, the Division will now require the development and implementation of an Enhanced Monitoring Plan ("EMP"). The Permittee will be required to develop an EMP for Fields F and G for Division review and approval. The EMP is required to include, at a minimum: (1) the installation of additional groundwater monitoring wells at deeper depths, both in-field and down-gradient; (2) additional down-gradient wells to be located in between existing wells; (3) specific conductivity probes installed in the in-field and down-gradient monitoring wells for the collection of real-time data; (4) increased monitoring frequency monthly from May through October; and (5) additional monthly reporting of fertilizer quantity, timing of application, type of application, and constituents of fertilizer, and the collection of probe baseline data prior to application of additional fertilizer (approximately 6 months of data).

Along with the above described EMP, the Division will also now require the development and implementation of an Enhanced Monitoring Contingency Plan (“EMCP”). The EMCP will, at a minimum, address a potential event of elevated Nitrates, or upward trend, being detected in the in-field or down-gradient wells and will include multiple short- and long-term mitigation measures (e.g., field resting, crop rotation, or other source control measures and/or hydrogeologic investigation and corrective actions). This new condition specifically addresses the concerns voiced in the public comments received in this matter, and ultimately makes the *revised* Draft Permit more rigorously protective of groundwater quality (see Condition Part I.F.1 a-c of the red-lined and finalized *revised* Operations Permit Amendment).

#### **4. Enhanced Groundwater Monitoring**

The Division of Water has now included a new condition to the *revised* Draft Permit to now require the Permittee to collect, analyze, and report results of enhanced groundwater monitoring (see Condition Part II.A.4 of the red-lined and finalized *revised* Operations Permit Amendment).

#### **5. Sludge (Biosolids) Handling Requirements**

To further address the public concerns regarding sludge/biosolids, the Division of Water is now including additional language in the *revised* Draft Permit to ensure the Permittee will perform all sludge/biosolids handling in accordance with all state and federal regulations. The new condition also formally memorializes AWTMI’s sludge/biosolids handling plan as set forth in their response letter dated July 12, 2022 (see Condition Part I.H of the red-lined and finalized *revised* Operations Permit Amendment).

#### **6. Metals Sampling Requirements**

To address the public concerns raised regarding public health and groundwater protection, the Division of Water has added Metals to the list of groundwater sampling parameters. Groundwater will be sampled for metals on an annual basis.

The addition of metals sampling helps to address the public concerns set forth in the comments received by the Department in this matter, and ultimately makes the proposed *revised* Draft Permit more rigorously protective of groundwater quality (see Condition Part II.A.3-4 of the red-lined and finalized *revised* Operations Permit Amendment).

## **7. Annual Report Requirements**

To address the public comments regarding public health and groundwater protection, and to resolve SRRF's continued operational, monitoring, and reporting deficiencies, the "standard" Annual Report submitted to the Department is being revised to provide additional clarity. The revisions highlight selected data and information requirements that the Division has identified as missing in past Annual Reports. This includes the following: (1) a tabulated summary of the nutrient loading, crop removal and nutrient analysis; (2) lysimeter 12-month rolling average data for Total Nitrogen; (3) soils monitoring (with laboratory data sheets); (4) a tabulated summary of monthly fertilizer nitrogen applied (in lbs./acre per field/zone/pivot), fertilizer phosphorus applied (in lbs./acre per field/zone/pivot), and irrigation water used (in lbs./acre per field/zone/pivot); and (5) a summary of monthly storage lagoon volumes tabulated in comparison to the permitted action level volume (see Condition Part II.B.5 of the red-lined and finalized *revised* Operations Permit Amendment).

## **8. General Clarifying Changes and Typographic Error Corrections**

Lastly, numerous clarification revisions (and clerical error corrections) were made to the *revised* Draft Permit. For a detailed review of these revisions, the public may refer to the Department's TRM for the specifics regarding the same. A red-lined version of the *revised* Draft Operations Permit Amendment is found in Appendix V of the TRM, and a clean copy of the finalized *revised* Operations Permit Amendment is included therein as Appendix VI.

## **Revisions to the Proposed Draft Construction Permit Amendment**

As noted above, a comment was submitted to the Department regarding the condition found in Part III.A.1, *Effluent Limitations on Pollutants attributable to Industrial Users*. The Division of Water has determined that this condition is not applicable, and thus has been removed from the originally proposed Draft Permit. A red-lined version of the *revised* Draft Construction Permit is found in Appendix VII of the TRM, and a clean copy of the finalized *revised* Draft Operations Permit Amendment is included therein as Appendix VIII.

I find that the Division of Water's TRM offers a thorough review of all aspects of the Applicant's pending Applications, addresses those concerns germane to the subject matter of the aforementioned public hearing held by the Department in this matter, and responds to them in a balanced manner, accurately reflecting the information contained in the Record. I further find that the Record developed in this matter reflects that the Department's experts in the CGSS have concluded that AWWI's Applications for both the proposed Draft Construction Permit and proposed Draft Operations Permit Amendment, authorizing the construction and operation of the proposed Phase 2 SRRF project, is complete and in accordance with the applicable regulatory requirements of 7 DE Admin. Code 7101, *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems*, along with 7 Del.C. Ch. 60.

As set forth in the TRM, the *revised* Draft Construction Permit includes a schedule of compliance, construction requirements, monitoring equipment installation requirements, and project completion requirements designed to assure proper system construction, reduce treatment system malfunctions, ensure the retention of construction documents, and ultimately result in a wastewater treatment system that is protective of water resources and the public's health, safety, and welfare. The *revised* Draft Operations Permit Amendment includes effluent limitations, operational, monitoring and reporting requirements designed to protect human health and the environment.

Specifically, the revisions to the initial proposed Draft Operations Permit Amendment include more stringent effluent discharge limitations based on the facility's design disposal capacity, removal of prior operational flexibility, enhanced monitoring for fertilizer application to resolve concerns associated with discharge volumes, nutrients, and crop viability, and robust contingency requirements, should the treatment system be unable to achieve required water quality. The TRM notes that these revised conditions, along with the already extensive water quality monitoring using lysimeters (in-field), monitoring wells (in-field, up-gradient, and down-gradient), and surface water monitoring will allow the Division of Water to better assess the potential impacts the spray irrigation activities are having on the spray fields, groundwater, and surface waters within and adjacent to the spray fields. In the event trends of increasing concentrations and/or impacts are observed, the Permittee will be required to take all necessary actions to eliminate and correct any adverse impact on public health or the environment resulting from the spray disposal operation.

I find and conclude that the above revisions to the requisite Draft Permits required of the Applicant for the Phase 2 SRRF proposed project result in a more rigorous protection of public health and the environment. I further find and conclude that the CGSS within the Division of Water has recommended the issuance of both the *revised* Draft Construction Permit and the *revised* Draft Operations Permit Amendment for AWTMI's Phase 2 SRRF proposed project, as set forth above.

The mission of DNREC is to engage stakeholders to ensure the wise management, conservation, and enhancement of the State's natural resources; protect public health and the environment; provide quality outdoor recreation; improve quality of life; lead energy policy and climate preparedness; and educate the public on historic, cultural, and natural resource use, requirements, and issues. Furthermore, it is the policy of DNREC that no person shall, on the grounds of race, color, national origin, sex, age, or disability, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance, as provided by Title VI of the *Civil Rights Act of 1964*, the *Rehabilitation Act of 1973*, the *Civil Rights Restoration Act of 1987*, and all other related nondiscrimination laws and requirements.



The Department's subject matter experts in the Division of Water, CGSS, have reviewed the Record generated in this matter, and have determined that the issuance of the finalized *revised* Draft Permits is consistent with DNREC's Environmental Justice policy.

I find and conclude that the Record supports issuance of both the *revised* Draft Construction Permit and the *revised* Draft Operations Permit Amendment for AWMI's Phase 2 SRRF proposed project, as submitted by the Applicant to the Department's Division of Water, CGSS, in this matter. Upon approval, the finalized Permits to be issued to AWMI by the Department would be consistent with the *revised* Draft Permit authorizations prepared by the Department's experts in the Division of Water, with appropriate conditions, to ensure continued protection of public health and the environment, and reflective of the Record developed in this matter.

Accordingly, this Report recommends the issuance of the finalized *revised* Phase 2 Construction Permit and the finalized *revised* Phase 2 Operations Permit Amendment, authorizing the construction and operation of AWMI's Phase 2 SRRF project, as described above, with the appropriate conditions as set forth herein, consistent with the Draft Permit authorizations prepared by the Department's Division of Water, CGSS, and consistent with the Record developed in this matter.

Further, the Department concludes and specifically directs the following:

1. The Department has jurisdiction, as provided for under 7 *Del.C.* Ch. 60, *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems* (7 DE Admin. Code 7101), and all other relevant statutory authority, to make a final determination on the aforementioned pending Applications after holding a public hearing, considering the public comments, and all information contained in the Record generated in this matter;

2. The Department provided proper public notice of the aforementioned Applications submitted by AWMI, and of the public hearing held on February 23, 2022, and held the hearing to consider any public comments that may be offered on the Applications, in a manner required by the law and regulations;
3. The Department considered all timely and relevant public comments in the Record, as established in the Department's TRM of August 21, 2023, and all of the associated relevant documents included in the Appendices therein;
4. The Department has carefully considered the factors required to be weighed in issuing all permits and authorizations required by the aforementioned Applications, and finds that the Record supports approval of the same;
5. The Department shall issue the following authorizations to the Applicant in this matter: (1) the finalized *revised* Phase 2 Construction Permit; and (2) the finalized *revised* Phase 2 Operations Permit Amendment, authorizing the construction and operation of AWMI's Phase 2 SRRF project, as described above, with the appropriate conditions as set forth herein, consistent with the draft permit authorizations prepared by the Department's Division of Water, CGSS, and consistent with the Record developed in this matter, to ensure that Delaware's environment and public health will be protected from harm;
6. The Department has an adequate Record for its decision, and no further public hearing is appropriate or necessary; and

7. The Department shall serve and publish its Order on its internet site.

/s/Lisa A. Vest  
LISA A. VEST  
Regulatory Specialist