# AUTHORIZATION TO OPERATE AND MAINTAIN UNDER THE LAWS OF THE STATE OF DELAWARE

**PERMITTEE:** **Artesian Wastewater Management, Inc.**
664 Churchmans Road
Newark, DE 19702

**FACILITY:** **Artesian Northern Sussex Regional Water Recharge Facility (ANSRWRF)**

1. Pursuant to the provisions of 7 Del. C. §6003, **Artesian Wastewater Management, Inc.** is herein authorized to operate and maintain the facility known as **ANSRWRF** located in Sussex County, Delaware to receive and store treated poultry processing wastewater from Allen Harim Foods, LLC's Harbeson wastewater treatment system and to spray irrigate the treated effluent onto the spray fields consisting of approximately 1,714 acres located in Sussex County Delaware.

   **Wastewater Treatment Plant Site:** The ANSRWRF is located on Sussex County Tax Map/Parcel Number: 2-35 6.00 28.09 along Route 30 approximately 4,000' north of the intersection of Route 16 and Route 30.

   **Spray Irrigation Sites:** Sussex County Tax Map/Parcel Numbers listed in Part I.A of this Permit.

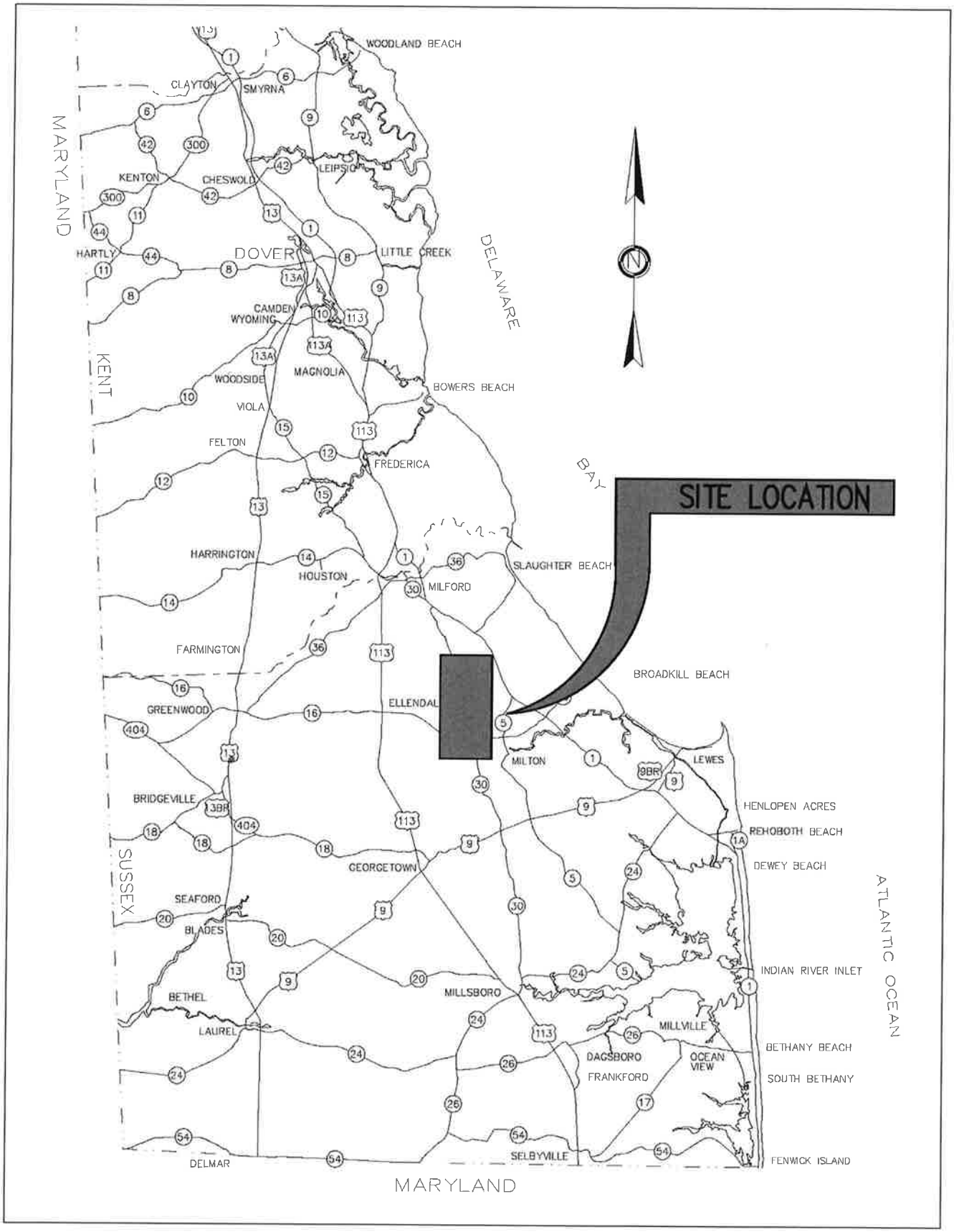
2. The Delaware Department of Natural Resources & Environmental Control's (the Department or DNREC) purpose in issuing this Permit, and in imposing the requirements and conditions specified herein, is for the protection of the environment and the public health as required by 7 Del. Admin. C. §7101 *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems* (the Regulations). The effluent limitations, monitoring requirements and other Permit conditions are set forth herein.

03/18/20

**John J. Rebar Jr.**
Environmental Program Manager I
Groundwater Discharges Section
Department of Natural Resources &
Environmental Control

**Date Signed**

# LOCATION MAP



# ANSRWRF Spray Irrigation Facility


## Legend

- Monitoring Wells
- Piezometers
- Lysimeters
- Surface Water Monitoring Locations

N
W E
S

0 550 1,100 2,200 3,300 4,400 Feet

# SITE MAP

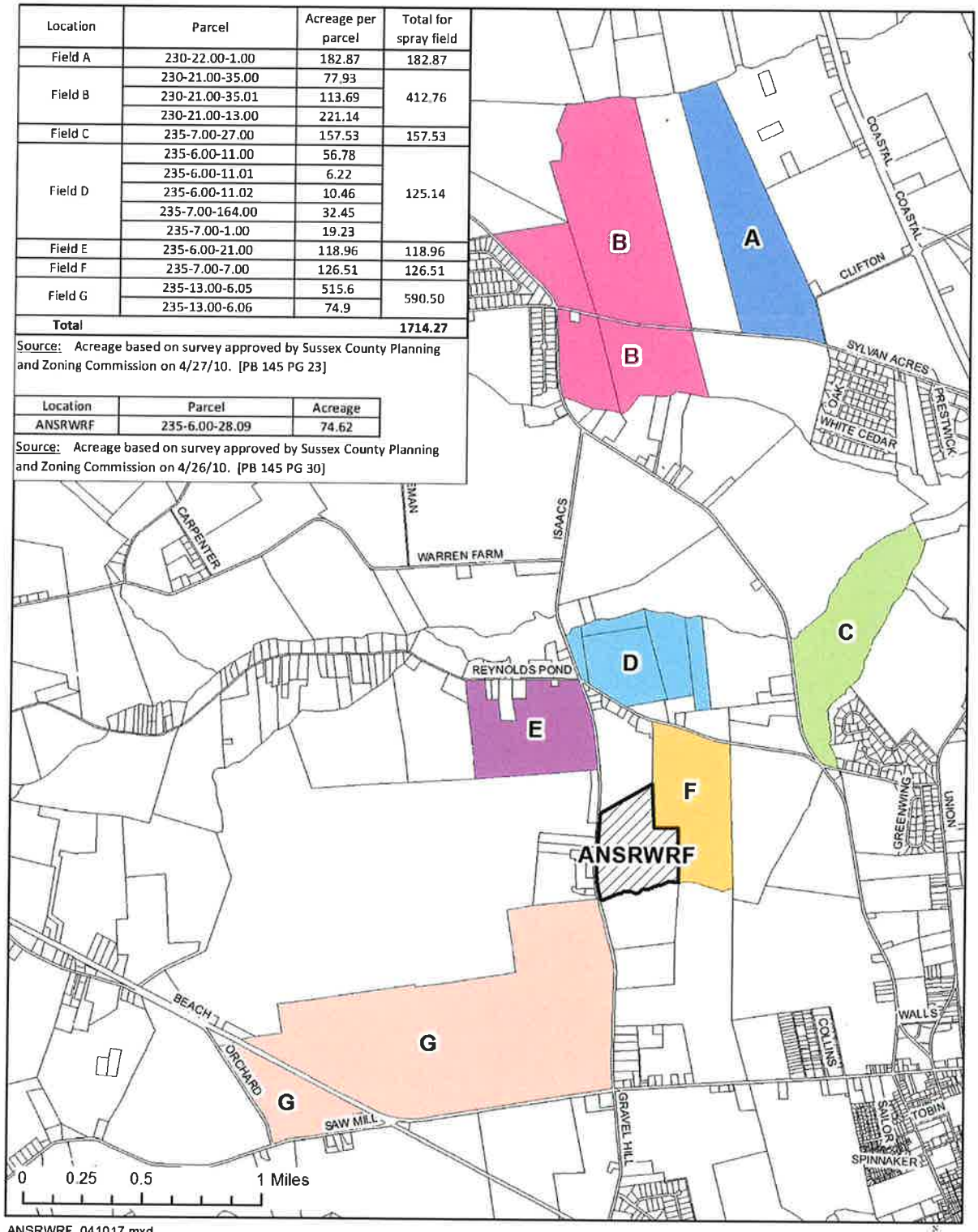
## Figure 3-3: Spray Field Designations

| Location | Parcel | Acreage per parcel | Total for spray field |
|---|---|---|---|
| Field A | 230-22.00-1.00 | 182.87 | 182.87 |
| Field B | 230-21.00-35.00 | 77.93 | 412.76 |
| | 230-21.00-35.01 | 113.69 | |
| | 230-21.00-13.00 | 221.14 | |
| Field C | 235-7.00-27.00 | 157.53 | 157.53 |
| Field D | 235-6.00-11.00 | 56.78 | 125.14 |
| | 235-6.00-11.01 | 6.22 | |
| | 235-6.00-11.02 | 10.46 | |
| | 235-7.00-164.00 | 32.45 | |
| | 235-7.00-1.00 | 19.23 | |
| Field E | 235-6.00-21.00 | 118.96 | 118.96 |
| Field F | 235-7.00-7.00 | 126.51 | 126.51 |
| Field G | 235-13.00-6.05 | 515.6 | 590.50 |
| | 235-13.00-6.06 | 74.9 | |
| **Total** | | | **1714.27** |

Source: Acreage based on survey approved by Sussex County Planning and Zoning Commission on 4/27/10. [PB 145 PG 23]

| Location | Parcel | Acreage |
|---|---|---|
| ANSRWRF | 235-6.00-28.09 | 74.62 |

Source: Acreage based on survey approved by Sussex County Planning and Zoning Commission on 4/26/10. [PB 145 PG 30]

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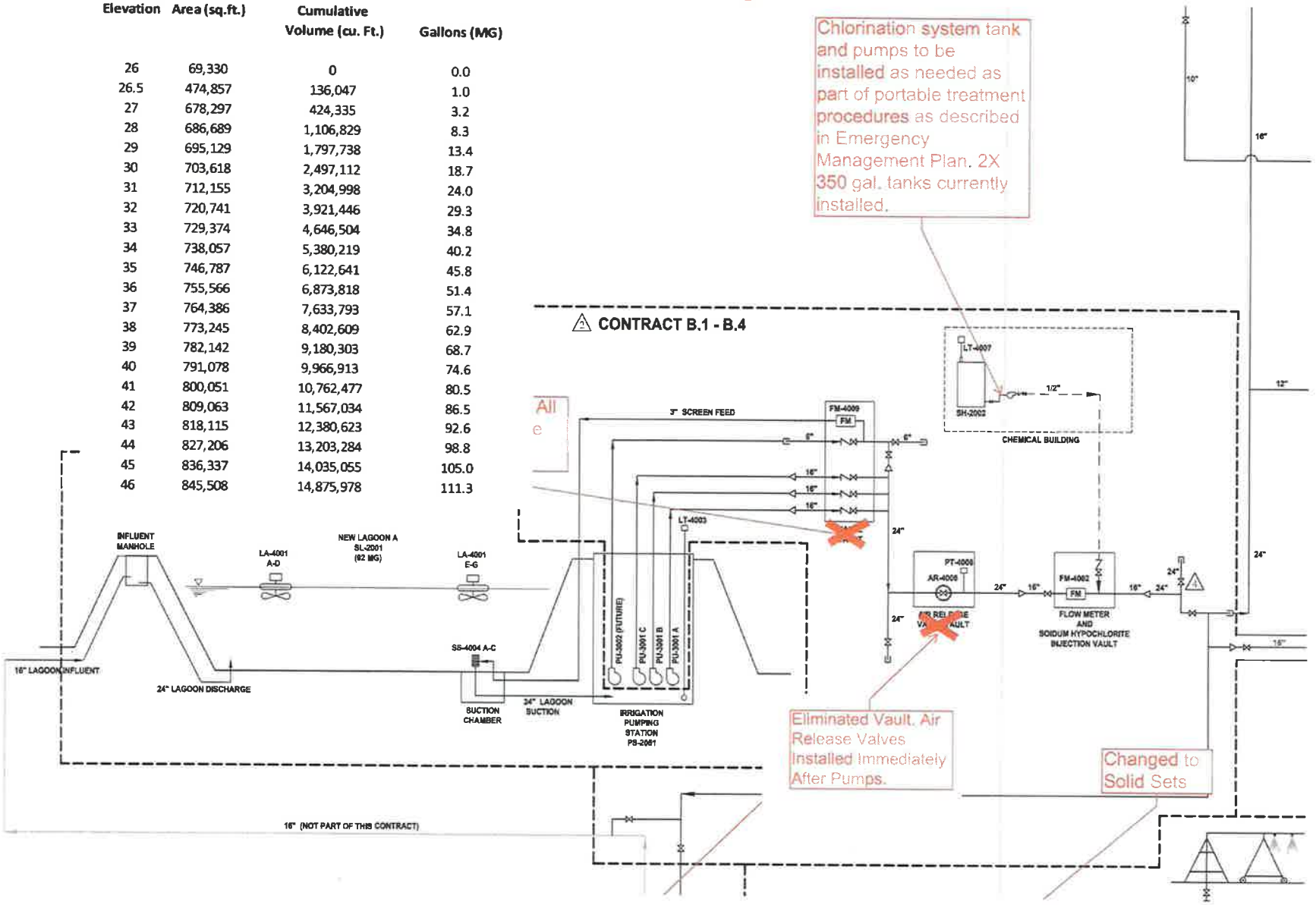
***ANSRWRF SPRAY FIELDS***

# PROCESS FLOW DIAGRAM & LAGOON VOLUMES [taken from 20190717 Drawings 3 and 4]

| Contour Elevation | Contour Area (sq.ft.) | Avg. End Area Cumulative Volume (cu. Ft.) | Gallons (MG) |
|---|---|---|---|
| 26 | 69,330 | 0 | 0.0 |
| 26.5 | 474,857 | 136,047 | 1.0 |
| 27 | 678,297 | 424,335 | 3.2 |
| 28 | 686,689 | 1,106,829 | 8.3 |
| 29 | 695,129 | 1,797,738 | 13.4 |
| 30 | 703,618 | 2,497,112 | 18.7 |
| 31 | 712,155 | 3,204,998 | 24.0 |
| 32 | 720,741 | 3,921,446 | 29.3 |
| 33 | 729,374 | 4,646,504 | 34.8 |
| 34 | 738,057 | 5,380,219 | 40.2 |
| 35 | 746,787 | 6,122,641 | 45.8 |
| 36 | 755,566 | 6,873,818 | 51.4 |
| 37 | 764,386 | 7,633,793 | 57.1 |
| 38 | 773,245 | 8,402,609 | 62.9 |
| 39 | 782,142 | 9,180,303 | 68.7 |
| 40 | 791,078 | 9,966,913 | 74.6 |
| 41 | 800,051 | 10,762,477 | 80.5 |
| 42 | 809,063 | 11,567,034 | 86.5 |
| 43 | 818,115 | 12,380,623 | 92.6 |
| 44 | 827,206 | 13,203,284 | 98.8 |
| 45 | 836,337 | 14,035,055 | 105.0 |
| 46 | 845,508 | 14,875,978 | 111.3 |



PART I

## A. GENERAL DESCRIPTION OF OPERATION/DISCHARGES

Artesian Northern Sussex Regional Water Recharge Facility (ANSRWRF) will serve as a regional facility meeting existing and future wastewater needs within the Artesian Wastewater service territories in Sussex County, Delaware. The facility will be owned and operated by Artesian Wastewater Management, Inc.

The ANSRWRF has been constructed under the DNREC Construction Permit DEN Number 359288-01. The wastewater treatment facility is located on Sussex County Parcel Number: 2-35 6.00 28.09; 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.

The regional facility will be built in three phases. This Permit authorizes the operation of Phase I only. Phase I of the project consisted of the construction of a storage lagoon and disposal spray fields, and to accept treated wastewater effluent from Allen Harim Foods, LLC (Allen Harim). The design average daily flow is 1.5 MGD with a peak flow of 2.0 MGD. Phase I disposal fields include Fields D, E, F, and G; however, as of the date of this Permit, only Fields F and G have been constructed and only Fields F and G are permitted for use. Fields D and E will be permitted for use upon completion of the Schedule of Compliance requirements iterated in Part I.F.1 of this Permit and upon written approval from the Groundwater Discharges Section.

The effluent is to be utilized for spray irrigation of privately owned agricultural land, under a lease held in perpetuity by Artesian as the wastewater utility provider. These sites have been permanently placed in an Agricultural Preservation Easement by the Delaware Agricultural Lands Preservation Foundation. Irrigation Sites are listed below.

**Phase I permitted Spray Irrigation Sites include Fields F and G** [Taken from 20190717 Drawing 29]**:**

| Field | Tax Map ID | Gross Area (acres) | Crop Spray Area (acres) | Woods Spray Area (acres) | Total Spray Area (acres) |
|---|---|---|---|---|---|
| A[1] | 230-22.00-1.00 | 182.9 | 116.3 | 34.1 | 150.4 |
| B[3] | 230-21.00-13.00<br>230-21.00-35.00<br>230-21.00-35.01 | 412.8 | 214.1 | 86.3 | 300.4 |
| C[1] | 235-7.00-27.00 | 157.5 | 37.0 | 38.2 | 75.2 |
| D[2,3] | 235-6.00-11.00<br>235-6.00-11.01<br>235-6.00-11.02<br>235-7.00-1.00<br>235-7.00-164.00 | 125.1 | 58.0 | 32.7 | 90.7 |
| E[2,4] | 235-6.00-21.00 | 119.0 | 90.5 | 0 | 90.5 |
| F | 235-7.00-7.00 | 126.5 | 110.5 | 0 | 110.5 |
| G | 235-13.00-6.05<br>235-13.00-6.06 | 590.5 | 276.1 | 200.5 | 476.5 |
| Total | | 1,714.27 | 902.5 | 391.8 | 1294.19 |

1) Spray areas based on preliminary design for Design Development Report dated June 19, 2009. These will be designed and permitted during a future phase.
2) Fields D and E have not yet been constructed.
3) One parcel from Field D (2-35-6-11.01) is not included in the current Conditional Use Ordinance 1923, adopted July 31, 2017. Spray will not commence on this parcel until it has been added to an approved Conditional Use.
4) There is a wooded region in Field E of approximately 10 acres which is not included in the existing design, but may be utilized in future phases.

## B. DOCUMENTATION

The application consists of the materials submitted by the Permittee and materials contained in the administrative record prior to the issuance of this Permit. This includes (but not limited to) the following information.

1. March 12, 2013 Secretary's Order No. 2012-W-0052.
2. May 5, 2017 Application Package for an Amended Construction Permit for the Artesian Northern Sussex Regional Water Recharge Facility (ANSRWRF) Phase 1 submitted by Artesian Wastewater Management, Inc. Application Package includes: Application Form, Amended Design Development Report (DDR), Drawings and Specifications.
3. August 18, 2017 Amended DDR Addendum 1 submitted by Artesian Wastewater Management, Inc. providing additional information requested.
4. June 12, 2018 Amended DDR Addendum 2 submitted by Artesian Wastewater Management, Inc. providing a revised drawing depicting surface water monitoring locations.
5. November 2, 2017 Secretary's Order No. 2017-W-0029.
6. August 17, 2018 Application for a Construction Permit Extension.
7. July 17, 2019 Spray Irrigation Permit Application.
8. July 17, 2019 Operation and Maintenance Plan.

## C. INFLUENT LIMITATIONS

1. The average daily influent received by ANSRWRF shall not exceed 1.5 million gallons per day in any calendar month or a peak daily flow of 2.0 million gallons per day. Only poultry processing wastewater from Allen Harim Foods, LLC (Allen Harim) shall be received by ANSRWRF. The connection of additional waste streams is prohibited without prior written approval from the Groundwater Discharges Section.

   Design Treatment Capacity: 1.5 MGD average daily flow
   [calculated as Total Monthly Volume divided by number of days in month]

   Peak daily flow not to exceed 2.0 MGD

## D. SPRAYED EFFLUENT LIMITATIONS

During the period beginning on the effective date and lasting through the expiration date of this Permit, the Permittee is authorized to discharge to the spray irrigation **Fields F and G** as identified on page 3, in Part I.A, and depicted on pages 3 and 4 of this Permit the quantity and quality of effluent specified below and in accordance with the design documents listed in Part I.B of this Permit:

1. The monthly quantity of effluent discharged from the wastewater facility to the spray fields shall not exceed a volume that has been calculated each month by the Permittee to not cause the groundwater to exceed the drinking water standard for Nitrate at the percolate. The monthly quantity is to be calculated by utilizing the average of the lab verified effluent Total Nitrogen concentrations from the previous month and the calculations and assumptions provided in the design Nitrogen Balance excel spreadsheet. Once actual data is acquired for the mathematical assumptions, it shall be utilized in lieu of the assumed data (i.e. crop nutrient uptake). All changes to the spreadsheet calculations and assumptions shall be approved by the Groundwater Discharges Section prior to implementation. Each monthly spreadsheet shall be provided (electronically in Excel format with calculations maintained) to the Groundwater Discharges Section to be considered with the monthly Discharge Monitoring Report.

2. The monthly quantity of effluent discharged may not exceed hydraulic loading assimilative capabilities of the site.

3. The average weekly quantity of effluent discharged to any portion of the spray irrigation field shall not exceed 1.65 inches per acre averaged over a 7 day rolling period.

   If operations of the facility encounter emergency or extenuating circumstances that would require the weekly quantity of effluent discharged to exceed 1.65 inches per acre per 7 day period, and the system would be able to assimilate the additional Nitrogen Loading without exceeding the limitations set forth in Part I.D.11 below, please contact the Groundwater Discharges Section for written authorization in accordance with Section 6.3.2.3.13.8.1 of the Regulations.

4. The quantity of effluent discharged to any portion of the spray irrigation field shall not exceed 0.25 inch/acre/hour.

5. There must be a sufficient rest period between applications to prevent field saturation and runoff from occurring in any part of the field.

6. If the system has a partial circle center pivot, there shall be a minimum one hour rest period when the center pivot reaches any in-field end stops if the instantaneous application rate exceeds a rate of 0.125 inch/acre in any one hour.

7. The pH of the effluent shall not be less than 5.5 standard units nor greater than 9.0 standard units at any time. The point of compliance shall be at Allen Harim's effluent pump station.

8. The Total Residual Chlorine (TRC) concentration shall not be less than 1.0 mg/L nor more than 4.0 mg/L at any time. The point of compliance shall be at Allen Harim's effluent pump station.

9. Design Effluent Nitrogen Concentration:

   The facility has been designed for an effluent Total Nitrogen concentration of 30 mg/L [May 5, 2017 Amended Design Development Report ANSRWRF Phase 1].

   If the effluent Total Nitrogen concentration exceeds 37.5 mg/L [Design Value + 25%] in any calendar month, the Permittee shall resample the wastewater and submit the additional analyses to the Groundwater Discharges Section. If the effluent Total Nitrogen concentration exceeds 37.5 mg/L for over a three month period, the Permittee must have the system evaluated to determine the cause and submit a revised Design Engineer Report to the Groundwater Discharges Section. If the effluent exceeds 45.0 mg/L [Design Value +50%], the Department may invoke the provisions of Part V.A.1 of this Permit. Also reference Part II.B.1.

10. The total amount of nitrogen that may be applied to each spray field acre shall not exceed the following. This amount includes supplemental fertilizers, the nitrogen supplied from the effluent, and any other source. [Taken from 20190716 Active Spreadsheet Nitrogen Balance]

| Crop Type | Nitrogen Loading Limit (lbs/acre-year) |
|---|---|
| Cover – Corn - Barley | 334.5 |
| Barley – Soybean – Cover | 388.8 |
| Woods (Loblolly Pines) | 435.4 |

11. The total amount of Phosphorus that may be applied to each spray field acre per year shall not exceed crop uptake needs of 31.2 lbs/acre [March 2019 DDR Appendix C.3]. This amount includes supplemental fertilizers, the phosphorus supplied from the effluent, and any other source.

    Adjustments and reductions are ***not*** to be factored into the annual reporting of Total Phosphorus Loading for demonstration of compliance with this limit.

    If any crops are not removed from the spray irrigation fields, then the total phosphorus application rate for the field must be reduced by the amount of phosphorus that would be removed by harvesting the crop.

12. The discharge to the spray irrigation fields shall be free from material such as floating solids, sludge deposits, debris, scum, oil and grease.

13. The facility has been designed for Unlimited Public Access criteria.

    Unlimited Public Access
    The treated wastewater utilized for unlimited public access sites must meet the following daily permissible average concentrations. The daily average concentration shall be determined by the summation of all the measured daily concentrations obtained from composite samples divided by the number of days during the calendar month when the measurements were made. Reclaimed wastewater that fails to meet the effluent criteria shall not be discharged to the spray irrigation areas.

    The point of compliance for Fecal Coliform shall be at ANSRWRF's effluent pump station.

    The point of compliance for $BOD_5$, TSS, and turbidity shall be at Allen Harim's effluent pump station.

    a. Disinfection of wastewaters containing domestic waste is required to yield a discharge not to exceed 20 col/100 mL Fecal Coliform.
    b. The 5-day Biochemical Oxygen Demand ($BOD_5$) of the treated wastewater shall not exceed 10 mg/L.
    c. The treated wastewater shall not contain more than 10 mg/L Total Suspended Solids (TSS).
    d. The turbidity of the treated wastewater shall not exceed 5 NTU.

| Parameter | Daily Permissible Average Concentration |
|---|---|
| $BOD_5$ | 10.0 mg/L |
| Fecal Coliform | 20 colonies/100 mL |
| Total Suspended Solids | 10.0 mg/L |
| Turbidity | 5 NTU |

## E. FACILITY CLASSIFICATION

1. A classification was performed on the permitted facility in accordance with Regulations Licensing Operators of Wastewater Facilities. The wastewater treatment system is designated as a Class I Facility. The facility shall be under the direction of a Class I Licensed Operator in Direct Responsible Charge for the facility who is available at all times. A licensed operator, operating under the direction of the licensed operator in Direct Responsible Charge for the facility, shall be available when the spray irrigation system is in operation.

## F. SCHEDULE OF COMPLIANCE

1. The Permittee shall submit the information necessary and/or complete the following requirements for proper compliant operation of the spray irrigation system:

   a. Prior to utilizing Fields D and E, Permittee shall complete the following:
      i. The Permittee shall notify the Department's Groundwater Discharges Section in writing of the intent to initiate construction activities for Fields D and E at least fifteen days prior to the commencement of construction. The written notification shall include a draft construction schedule. The Permittee shall provide updated construction schedules if the schedule changes as construction progresses;
      ii. Complete all construction relative to Fields D and E in accordance with State Permit DEN Number: 359288-01;
      iii. The Permittee shall notify the Department's Groundwater Discharges Section in writing upon completion of construction and request a Construction Completion Inspection to be performed by the Department's Groundwater Discharges Section staff. The Design Engineer, Class E.4 system contractor, licensed operator and the Permittee must be present during the inspection. During the inspection, all mechanical parts are to be tested.
      iv. Upon completion of construction, the Permittee shall submit to the Department's Groundwater Discharges Section the following applicable items. The items shall be combined in one package and must include an electronic copy of all items where possible. Failure to submit all required information constitutes grounds for denial of the authorization to utilize Fields D and E for disposal.
         (a) Design Engineer Inspection Report(s) certifying the facility has been constructed in accordance with approved plans and specifications.
         (b) Copies of any other applicable State/County inspection reports.
         (c) Contractor's Certificate of Completion.
         (d) A set of "as-built" drawings of the facility bearing the seal and signature of a licensed Professional Engineer registered in the State of Delaware.
         The "as-built" drawings must include:
            (i) Site map showing the location of all structures, piping and appurtenances, disposal areas and buffers.
            (ii) A full equipment list and technical specifications for all equipment used, if different than submitted in the permit application.
            (iii) The new topography elevations of the system.
            (iv) Monitoring/Observation well elevations at the top of the casing (TOC) and at the ground surface, GPS coordinates (State Plane), and local topography tied to a common benchmark.
            (v) The location and screen depth, length of stick up, and well ID's must be provided for each monitor well.
         (e) Any necessary updates to the Operation and Maintenance (O&M) Plan in accordance with Section 6.7 of the Regulations.

(f) Spreadsheet summary of groundwater monitoring well, lysimeter and pizometer information.
(g) GPS information detailing the northings and eastings; the local well ID number; and the DNREC Well ID/Well Permit Number. The GPS information shall be in either Delaware State Plane, North American Datum 1983 meters; or Latitude and Longitude decimal degrees.
(h) TOC elevations survey results for all monitoring wells to be utilized for groundwater monitoring. Provide the length of the well stickup and the well survey information to the closest 0.01 feet. Provide a permanent mark, etch, or fixture to be used to specify the survey point where the TOC elevations were read.
(i) A summary report detailing the analyses of the background groundwater quality sampling program that was conducted consisting of at least three (3) samples one (1) month apart and analyzed prior to the initiation of disposal activities (see Section 6.6.3.16 of the Regulations).
(j) An approved Conditional Use for Field D parcel (2-35-6-11.01).

v. Obtain written approval from the Groundwater Discharges Section authorizing disposal on Fields D and E.

b. The Permittee shall install flow meters to measure the volume of treated wastewater effluent applied to each spray irrigation zone on Field G solid sets in accordance with Section 6.3.2.3.13.16 of the Regulations. The meters shall be installed within one (1) year from the Permit effective date. Meter specifications shall be submitted to the Department within 30 days of installation.

2. The Permittee shall install a flow meter to measure the volume of treated wastewater effluent discharged to the synthetically lined lagoon from Allen Harim. The meter shall be installed within one (1) year from the Permit effective date. Meter specifications shall be submitted to the Department within 30 days of installation.

3. The Permittee shall submit either a report of progress or, in the case of specific actions being required by identified dates, a written notice of compliance or noncompliance by specified date. In the event of noncompliance, the notice shall include the cause of noncompliance, any remedial action taken, and the probability of meeting the next scheduled requirement.

## G. BUFFER REQUIREMENTS

Buffer zones shall be maintained in accordance with Section 6.3.2.3.10 of the Regulations unless otherwise specified below. Also see buffer requirement set forth in Part I.1.c.

1. Buffer zones of at least 150 feet shall be maintained around all public and private domestic wells identified in the well search.

2. A buffer zone of 150 feet shall be maintained from all downgradient domestic wells occurring on parcels 235-14.00-63.00, 235-14.00-66.00, and 235-13.00-6.00 [Per DNREC Hydrogeologic review dated March 25, 2010 and the August 18, 2017 DDR Addendum].

3. In accordance with Secretary's Order No. 2012-W-0052 Issued and Effective March 12, 2013, Permittee shall:
   a. Maintain all required buffers for the spray fields as set by both the Department and Sussex County.
      i. Maintain a 100 foot buffer from the wetted field area to the north-west corner of the Sylvan Acres Development.

## H. SLUDGE HANDLING REQUIREMENTS

N/A

## I. FACILITY SPECIFIC CONDITIONS

1. In accordance with Secretary's Order No. 2012-W-0052 Issued and Effective March 12, 2013, the Permittee shall:
   a. Design the treatment plant to look like an agricultural building and have landscaping to screen it from view from its neighbors.
   b. Ensure that the storage ponds shall not become a breeding ground for mosquitos.
   c. Maintain all required buffers for the spray fields as set by both the Department and Sussex County.
      i. Maintain a 100 foot buffer from the wetted field area to the north-west corner of the Sylvan Acres Development.
2. The Permittee shall comply with all applicable Sussex county ordinances and conditional use requirements placed on this facility.
3. The Permittee shall maintain an updated copy of the spray irrigation land area Lease Agreement on file with the Groundwater Discharges Section.
4. Phase I is designed to require only 65.2 MG of the storage lagoon's 90 MG capacity. If storage volume exceeds 65.2 MG, the Permittee must notify the Groundwater Discharges Section in writing. The additional 23 MG storage capacity may not be utilized during Phase I unless under the written authorization of the GWDS or in response to an emergency situation outside the Permittee's control (Force Majeure). See lagoon volumes table on page 4 of this Permit.
5. Wastewater spray irrigation will not be permitted on Field D parcel (2-35-6-11.01) until it is added to an approved Conditional Use. Parcel 2-35-6-11.01is not included in the current Conditional Use Ordinance 1923, adopted July 31, 2007. Once this parcel has been added to an approved Conditional Use, the Permittee must provide a copy of the approved Conditional Use to the Groundwater Discharges Section for approval.

# PART II

## A. MONITORING REQUIREMENTS

During the period beginning on the effective date and lasting through the expiration date of this Permit, the Permittee is authorized to discharge to spray irrigation **Fields F and G** as identified on page 3, in Part I.A, and depicted on page 3 and 4 of this Permit. Such discharge shall be monitored by the Permittee as specified herein.

For samples required to be taken 'monthly' and/or 'twice per month', the samples for each monitoring location (i.e. influent, effluent, well, lysimeter, etc.) shall be taken a minimum of 14 days apart.

Requests for monitoring modifications must be submitted to the Department's Groundwater Discharges Section in writing. Such requests must clearly state the reason for and nature of the proposed modification and, where applicable, must contain supporting scientific information, analysis, and justification. Requests will be addressed by the Department on a case by case basis.

Permittee shall initiate periodic reporting required under Part II.B.2 upon initiation of irrigation activities for all of the following monitoring requirements.

### 1. INFLUENT MONITORING REQUIREMENTS

Samples taken in compliance with the sprayed influent monitoring requirements for all parameters specified may either be taken from a sampling port located and meter[1] prior to storage at ANSRWRF, or reported as sampled in accordance with Allen Harim LLC Permit DEN 597261-01 at their effluent pump station.

| Parameter | Unit of Measurement | Monitoring Frequency | Sample Type |
|---|---|---|---|
| Flow - Total Influent Flow for Month to | Gallons | Continuous | Recorded |
| Flow - Max Daily Influent Flow to Facility | Gallons | Continuous | Recorded |
| Flow - Average Daily Influent Flow to Facility | Gallons/Day | Continuous | Calculation (Total Influent Flow for Month / Number of Days in Month) |
| BOD5 | mg/L | Monthly | Composite |
| TSS | mg/L | Monthly | Composite |
| Total Nitrogen | mg/L | Monthly | Composite |
| Ammonia Nitrogen | mg/L | Monthly | Composite |
| Nitrate/Nitrite as Nitrogen | mg/L | Monthly | Composite |
| pH | S.U. | Monthly | Composite |
| Total Phosphorus | mg/L | Monthly | Composite |
| Chloride | mg/L | Quarterly | Composite |
| Turbidity | NTU | Continuous | Recorded |
| Total Residual Chlorine | mg/L | Continuous | Recorded |
| Potassium | mg/L | Quarterly | Composite |
| Sodium | mg/L | Quarterly | Composite |

[1] See Part I F.2

## 2. SPRAYED EFFLUENT MONITORING REQUIREMENTS

Samples taken in compliance with the sprayed effluent monitoring requirements for all parameters specified shall be taken from a sampling port located at the discharge side of the irrigation pumps.

| Parameter | Unit Measurement | Monitoring Frequency | Sample Type |
|---|---|---|---|
| Ammonia Nitrogen | mg/L | Monthly | Composite |
| Cadmium | mg/L | Annually | Composite |
| Copper | mg/L | Annually | Composite |
| Effluent Flow | Gal/day per Field/Zone/Pivot | Continuous | Recorded |
| Fecal Coliform | Col/100 ml | Twice per month | Grab |
| Lead | mg/L | Annually | Composite |
| Nickel | mg/L | Annually | Composite |
| Nitrate + Nitrite Nitrogen | mg/L | Monthly | Composite |
| Organic Nitrogen | mg/L | Monthly | Calculation |
| Total Nitrogen | mg/L | Twice per Month | Composite |
| Sodium[2] | mg/L | Monthly | Composite |
| Total Residual Chlorine[3] | mg/L | Monthly | Composite |
| Zinc | mg/L | Annually | Composite |

Additionally, Permittee shall provide the following information:

| Parameter | Unit Measurement | Monitoring Frequency | Sample Type |
|---|---|---|---|
| Total Effluent Flow to all Fields/Zones/Pivots combined | Gallons | Monthly | Data |
| Max Daily Effluent Flow to all Fields/Zones/Pivots combined | Gallons | Monthly | Data |
| Average Daily Effluent to all Fields/Zones/Pivots combined | MGD or GPD | Monthly | Calculation (Total Monthly Effluent Flow / Number of Days in Month) |
| Number of Days Sprayed during the Month to all Fields/Zones/Pivots combined | Days | Monthly | Data |
| Total Effluent Flow to each Field/Zone/Pivot[4] | Gallons | Monthly | Data |
| Number of Days Sprayed During the Month to each Field/Zone/Pivots | Gallons | Monthly | Data |

[2] Sodium shall only be sampled in the event of a disinfection event at ANSRWRF
[3] Total Residual Chlorine shall only be sampled in the event of a disinfection event at ANSRWRF
[4] Effluent flow to each zone of Field G solid sets shall be estimated until meter installation is completed

| | | | |
|---|---|---|---|
| Nitrogen Loading Rate to each Field/Zone/Pivot | lbs/acre per Field/Zone/Pivot | Monthly | Calculation |
| Phosphorus Loading Rate to each Field/Zone/Pivot | lbs/acre per Field/Zone/Pivot | Monthly | Calculation |
| Monthly and Cumulative Loading and Percolate Calculations (Nitrogen Balance) for each Field/Pivot[5] | lbs/acre<br>mg/L | Monthly | Calculation |

[5] The Permittee shall submit to the GWDS monthly in Excel spreadsheet format

## 3. GROUNDWATER MONITORING REQUIREMENTS

Groundwater samples shall be taken from each monitoring well for the facility. Groundwater monitoring well locations are depicted on the Site Map found on Page 3 of this Permit.

Samples taken in compliance with the monitoring requirements specified shall be taken at each monitoring well in accordance with procedures approved by the Department and listed in the State of Delaware, Field Manual for Groundwater Sampling (Custer, 1988).

Groundwater monitoring results for each monitoring well shall be reported using the State of Delaware Well Identification Tag Number that is required on all wells in accordance with the Delaware Regulations Governing the Construction and Use of Wells, Section 11.1.

All field sampling logs and laboratory results for samples obtained from a well shall be identified by the DNREC ID affixed to the well.

Groundwater samples shall be tested from the following wells for the following parameters [Well info taken from 20190717 O&M p32]:

| DNREC Well ID | Local ID | Northings (meters) | Eastings (meters) | Ground Elevations (ft) | Top of Outer Casing (ft) | Length of Stick Up (ft) | Casing Depth (ft) |
|---|---|---|---|---|---|---|---|
| 254881 | MW-1L | 88993.83 | 206492.46 | 34.11 | 36.67 | 2.56 | 20 |
| 254882 | MW-2L | 89332.77 | 206846.20 | 33.21 | 35.67 | 2.46 | 20 |
| 254883 | MW-3L | 89038.74 | 207010.94 | 28.50 | 30.69 | 2.19 | 20 |
| 254884 | MW-4L | 88740.91 | 207018.88 | 34.11 | 36.67 | 2.56 | 20 |
| 258634 | MW-1F | 89056.08 | 206855.40 | 31.57 | 33.98 | 2.41 | 20 |
| 258632 | MW-2F | 89805.84 | 206844.26 | 31.53 | 33.93 | 2.4 | 20 |
| 258633 | MW-3F | 89653.61 | 207373.30 | 23.43 | 29.03 | 5.6 | 20 |
| 258635 | MW-4F | 88664.02 | 207398.01 | 18.48 | 20.98 | 2.5 | 20 |
| 258636 | MW-5F | 88901.57 | 207213.08 | 27.06 | 29.55 | 2.49 | 20 |
| 258620 | MW-1G | 87908.08 | 204453.82 | 39.08 | 41.88 | 2.8 | 20 |
| 258628 | MW-2G | 86961.64 | 204305.92 | 42.18 | 44.70 | 2.52 | 20 |
| 258630 | MW-3G | 87059.37 | 204894.01 | 38.48 | 40.82 | 2.34 | 20 |
| 258631 | MW-4G | 87083.99 | 205047.96 | 39.13 | 41.72 | 2.59 | 20 |
| 258625 | MW-5G | 87224.43 | 205871.48 | 35.28 | 38.11 | 2.83 | 20 |
| 258626 | MW-6G | 87338.98 | 206580.77 | 32.14 | 34.70 | 2.56 | 20 |
| 258627 | MW-7G | 87898.99 | 206585.64 | 33.23 | 35.64 | 2.41 | 20 |
| 258629 | MW-8G | 88466.82 | 206507.64 | 28.26 | 30.94 | 2.68 | 20 |
| 258624 | MW-9G | 87639.24 | 206170.14 | 33.67 | 36.15 | 2.48 | 20 |

1) Coordinates are in NAD 1983 Delaware State Plane 0700 Meters.
2) Monitoring Wells have been screened from a depth of 20-ft to 30-ft.

| Parameter | Unit Measurement | Measurement Frequency | Sample Type |
|---|---|---|---|
| Ammonia as Nitrogen | mg/L | Quarterly | Grab |
| Chloride | mg/L | Quarterly | Grab |
| Depth to Water | hundredths of a foot | Monthly | Field Test |
| Dissolved Oxygen | mg/L | Quarterly | Field Test |
| Fecal Coliform | Col/100mL | Quarterly | Grab |
| Nitrate + Nitrite as Nitrogen | mg/L | Quarterly | Grab |
| pH | S.U. | Quarterly | Field Test |
| Sodium | mg/L | Quarterly | Grab |
| Specific Conductance | µS/cm | Quarterly | Field Test |
| Temperature | °C | Quarterly | Field Test |
| Total Dissolved Solids | mg/L | Quarterly | Grab |
| Total Nitrogen | mg/L | Quarterly | Grab |
| Total Phosphorus | mg/L | Quarterly | Grab |

4. GROUNDWATER TABLE ELEVATION MONITORING REQUIREMENTS

Monthly water level measurements shall be taken at each piezometer and observation well listed below and depicted on Page 3 from December through April [Well info taken from 20190717 O&M p33].

| DNREC Well ID | Local ID | Northings (meters) | Eastings (meters) | Ground Elevations (ft) | Top of Outer Casing (ft) | Length of Stick Up (ft) |
|---|---|---|---|---|---|---|
| 265831 | PZ-1F | 88751.53 | 207166.42 | 22.53 | 25.53 | 25.41 |
| 265838 | PZ-1G | 87347.73 | 205271.49 | 35.45 | 38.86 | 37.92 |
| 265837 | PZ-2G | 87578.95 | 205093.80 | 37.31 | 41.29 | 40.00 |
| 265832 | PZ-3G | 87823.90 | 205250.09 | 32.78 | 43.00 | 41.81 |
| 265836 | PZ-4G | 87908.92 | 205455.69 | 32.64 | 36.24 | 32.23 |
| 265829 | PZ-5G | 88039.85 | 205768.25 | 32.67 | 35.97 | 35.23 |
| 265833 | PZ-6G | 88434.07 | 205949.66 | 31.58 | 34.63 | 33.21 |
| 265830 | PZ-7G | 88408.29 | 206450.31 | 25.91 | 29.58 | 29.92 |

Coordinates are in NAD 1983 Delaware State Plane 0700 Meters.

While performing the monitoring as required by Part II.A.3and Part II.A.4 of this Permit, if the 'Depth to Water' in any one of the monitoring wells has reached within 3 feet of the ground surface, the Permittee shall be required to collect additional weekly depth to water measurements from the monitoring wells within 3 feet of the ground surface. The additional monitoring is necessary to ensure that spray irrigation ceases on any areas of the spray fields where the groundwater may reach within 2 feet of the ground surface in accordance with Part III.A.5 of this Permit. The Permittee may discontinue the additional weekly sampling for depth to water in a well when the groundwater table elevation readings in the well exceeds a 3 foot separation between groundwater and ground surface. The additional groundwater table elevation measurements must be recorded in the operator's log and reported to the Groundwater Discharges Section in accordance with Part II.B.2 of this Permit.

## 5. LYSIMETER MONITORING REQUIREMENTS

Samples shall be taken monthly from each lysimeter for the facility. Lysimeter locations are depicted on the Site Map found on Page 3 of this Permit.

All field sampling logs and laboratory results for samples obtained from a well shall be identified by the DNREC ID affixed to the well.

Samples must be tested from the following wells for the following parameters. The constituents are listed below in highest priority first. In the event that sufficient sample volume may not be obtained to test for all parameters listed, the sample shall be tested for as many constituents possible in the following order [Well info taken from 20190717 O&M p35]:

| DNREC Well ID | Local ID | Northings (meters) | Eastings (meters) | Ground Elevation (ft) | Outer Casing (ft) | Inner Casing (ft) |
|---|---|---|---|---|---|---|
| 265827 | LY-1F | 89388.92 | 207110.93 | 33.13 | 35.73 | 35.23 |
| 265835 | LY-1G | 87984.44 | 205584.58 | 34.27 | 36.22 | 35.38 |
| 265834 | LY-2G | 87646.77 | 206139.14 | 33.80 | 36.10 | 35.82 |
| 265828 | LY-3G | 87205.37 | 204810.20 | 40.62 | 43.25 | 42.82 |

Coordinates are in NAD 1983 Delaware State Plane 0700 Meters.

| Parameter | Unit Measurement | Measurement Frequency | Sample Type |
|---|---|---|---|
| Total Nitrogen | mg/L | Monthly | Grab |
| Total Phosphorus | mg/L | Monthly | Grab |
| Nitrate + Nitrite as Nitrogen | mg/L | Monthly | Grab |
| Ammonia as Nitrogen | mg/L | Monthly | Grab |
| Chloride | mg/L | Monthly | Grab |
| Sodium | mg/L | Monthly | Grab |
| Total Dissolved Solids | mg/L | Monthly | Grab |
| pH | S.U. | Monthly | Field Test |
| Specific Conductance | µS/cm | Monthly | Field Test |
| Temperature | °C | Monthly | Field Test |

Lysimeter Rolling 12-Month Average

The Permittee shall maintain a rolling 12-month average of total nitrogen percolate concentrations in each lysimeter. The rolling 12-month average shall be calculated by adding the current month's total nitrogen concentration to the previous eleven (11) month's total nitrogen concentrations and dividing the sum by the number of samples obtained (i.e., 12 unless sample data was unattainable for any given month). The rolling 12-month average shall be reported to the Department monthly.

In the event that the rolling 12-month average exceeds the total nitrogen percolate concentration of 10 mg/L, the Permittee shall examine the facility's operation and maintenance log for improper operational procedures, conduct a physical inspection of the disposal system to detect abnormalities, and review monitoring data and other records to determine the cause/source of the total nitrogen exceedance. The Permittee shall report the finding to the Department with any proposed modifications to operational procedures or other corrective actions. The Permittee shall implement proposed actions upon approval by the Department.

## 6. SOIL MONITORING REQUIREMENTS

The Permittee shall submit a Soil Sampling Plan for GWDS approval within 120 days from the effective date of this Permit.

Composite soil samples representing each soil series within the wetted spray field shall be taken separately from both soil depths of 0–12 inches and 12–24 inches. A minimum of three composite sample for each mapped soil mapping unit are needed for each depth (0-12 inches and 12-24 inches) in accordance with the Regulations and the GWDS-approved Soil Sampling Plan. The composite soil sampling shall represent the average conditions in the sampled body of material. The discrete samples that are to be composited shall be collected from the same soil horizon and depth interval.

Soil sample locations shall be plotted on a scaled drawing and labeled consistent with the sample nomenclature. Each field shall also be identified so that sample results may be tracked and properly assessed for field life limiting factors.

Soil chemical testing should be in accordance with Methods of Soil Analysis published by the American Society of Agronomy, Madison, Wisconsin.

Testing for Cadmium, Nickel, Lead, Zinc and Copper shall be performed approximately one year prior to permit renewal so results may be utilized by the Permittee in the CMR and/or by Groundwater Discharges Section staff during renewal review. Reference Part IV.A.2 of the Permit and Section 6.5.4 of the Regulations regarding CMR requirements.

| Parameter | Unit Measurement | Measurement Frequency | Sample Type |
|---|---|---|---|
| pH | S.U. | Annually | Soil Composite |
| Organic Matter | % | Annually | Soil Composite |
| Phosphorus (as $P_2O_5$) | mg/kg | Annually | Soil Composite |
| Potassium | mg/kg | Annually | Soil Composite |
| Sodium Adsorption Ratio | meq/100g | Annually | Soil Composite |
| Cadmium | mg/kg | Once per 5 years | Soil Composite |
| Nickel | mg/kg | Once per 5 years | Soil Composite |
| Lead | mg/kg | Once per 5 years | Soil Composite |
| Zinc | mg/kg | Once per 5 years | Soil Composite |
| Copper | mg/kg | Once per 5 years | Soil Composite |
| Cation Exchange Capacity | meq/100g | *Only if soil pH changes significantly | Soil Composite |
| Phosphorus Adsorption (Mehlich 3 acceptable) | meq/100g | **Only if soil phosphorus levels become excessive for plant growth | Soil Composite |
| Percent Base Saturation | % | *Only if soil pH changes significantly | Soil Composite |

*A significant change in soil pH is defined as a change of one or more standard units from the original value established in the Design Development Report.

** 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 (Gartley, 2002). If the soil phosphorus levels become excessive, the Permittee must perform a Phosphorus Site Index (PSI) study. The results must be submitted to the Groundwater Discharges Section within 30 days of completion. Based on these, the Groundwater Discharges Section may require the Permittee to submit a plan for detailing steps to reduce the phosphorus loading rates at the site.

## 7. VEGETATION MONITORING

In the year prior to permit expiration, a minimum of one composite sample for each field is required upon each harvest. If a crop rotation is utilized either in alternate years or in the same year, the aforementioned requirement must be duplicated for each crop type. If a Compliance Monitoring Report (CMR) is required for the facility, testing should be performed approximately one year prior to permit renewal so results may be utilized by the Permittee in the CMR. Reference Part IV.A.2 of the Permit and Section 6.5.4 of the Regulations regarding CMR requirements.

| Parameter | Unit Measurement | Measurement Frequency | Sample Type |
|---|---|---|---|
| Yield | Bushels/acre and lbs/acre | Per harvest | Vegetation Composite |
| Nitrogen | % and lbs/acre | Per harvest | Vegetation Composite |
| Phosphorus | % and lbs/acre | Per harvest | Vegetation Composite |
| % Moisture | % | Per harvest | Vegetation Composite |

## 8. OPERATIONS MONITORING REQUIREMENTS

a. Spray Field Applications

| Parameter | Unit Measurement | Monitoring Frequency | Sample Type |
|---|---|---|---|
| Additional/Supplemental Irrigation Water (i.e. groundwater) | Total Gallons per field/zone/pivot | Monthly | Recorded/Calculated |
| Additional/Supplemental Irrigation Water (i.e. groundwater) | Inches/acre per field/zone/pivot | Monthly | Recorded/Calculated |
| Fertilizer Nitrogen | lbs/acre per field/zone/pivot | Monthly | Reported |
| Fertilizer Phosphorus | lbs/acre per field/zone/pivot | Monthly | Reported |

b. Lagoons

| Parameter | Sample Location | Unit Measurement | Monitoring Frequency | Sample Type |
|---|---|---|---|---|
| Lagoon Levels | Lagoons | Feet and Gallons | Weekly | Field Test |

## 9. SURFACE WATER MONITORING REQUIREMENTS

Surface Water samples shall be obtained from the six locations as approximately depicted on the Site Map found on Page 3 of this Permit. The surface water sampling locations include Ingram Branch and Sowbridge Branch (East of Reynolds Pond).

The geographic coordinates of the surface water sampling locations were determined and are as follows [Location info taken from 20190717 O&M p34].

| Local ID | Northings | Eastings |
|---|---|---|
| SW-1 | 88368.84 | 205871.47 |
| SW-2 | 88557.43 | 206493.46 |
| SW-3 | 88638.01 | 207393.63 |
| SW-4 | 90245.11 | 205198.77 |
| SW-5 | 90372.08 | 206230.09 |
| SW-6 | 90363.90 | 207758.40 |

Coordinates are in NAD 1983 Delaware State Plane 0700 Meters.

Surface Water Monitoring results for each monitoring point shall be reported using the established geographic coordinates.

A down gradient sample for a surface water body should be taken first, immediately followed by the up gradient location for the same surface water body. Followed by, the down gradient sample for the next surface water body being taken third, immediately followed by sampling of the up gradient location for this same surface water body. All samples should be taken on the same day.

Surface Water sampling should not occur within 3 days of a measurable rainfall event to ensure that the streams have returned to base flow, groundwater dominant, conditions.

| Parameter | Unit Measurement | Measurement Frequency | Sample Type |
|---|---|---|---|
| Ammonia as Nitrogen | mg/L | Quarterly | Grab |
| $BOD_5$ | mg/L | Quarterly | Grab |
| Chloride | mg/L | Quarterly | Grab |
| Dissolved Oxygen | mg/L | Quarterly | Field Test |
| Enterococcus | Col/100mL | Quarterly | Grab |
| Fecal Coliform | Col/100 ml | Quarterly | Grab |
| Nitrate + Nitrite as Nitrogen | mg/L | Quarterly | Grab |
| pH | S.U. | Quarterly | Field Test |
| Sodium | mg/L | Quarterly | Grab |
| Specific Conductance | µS/cm | Quarterly | Field Test |
| Temperature | °C | Quarterly | Field Test |
| Total Dissolved Solids | mg/L | Quarterly | Grab |
| Total Nitrogen | mg/L | Quarterly | Grab |
| Total Phosphorus | mg/L | Quarterly | Grab |
| Total Suspended Solids | mg/L | Quarterly | Grab |

## B. MONITORING SPECIFICATIONS AND REPORTING REQUIREMENTS

1. Representative Sampling

Samples and measurements taken as required in the operation permit shall be representative of the volume and nature of the monitored discharge. If there has been significant increase (> 25%) in the characterization of any one parameter of the effluent wastewater as established in the Design Engineer Report, the permittee shall resample the wastewater and submit the additional analyses to the Department. The permittee shall re-characterize the wastewater to determine if a change in treatment is required and/or if the land limiting constituent has changed. If a change in treatment is required and/or if the land limiting constituent has changed, a revised Design Engineer Report shall be submitted to the Department. After a review of these results, the Department may invoke the provisions of Part V.A.1 of this Permit.

2. Reporting

Monitoring results obtained during the previous one month/quarter shall be summarized and reported on an approved monitoring report form(s) postmarked no later than the 28th day of the month following the completed reporting period. Laboratory analytical results and sampling logs must be submitted with the corresponding month's monitoring report. Signed reports/forms, laboratory analytical results, laboratory sampling logs and field data sheets shall be submitted in one complete package to the Department at the following address:

Groundwater Discharges Section
Division of Water
Department of Natural Resources and Environmental Control
89 Kings Hwy
Dover, DE 19901
(302) 739-9948 Office

The Department may provide written requirements for the permittee to submit monitoring data electronically. Upon notification from the Department, the Permittee shall transition (as directed) to the Department's electronic database system. The submission may need to be electronically signed.

3. Monitoring results reported as less than the detectible limit should be reported with the less than symbol "<" before the detection limit. The full detection limit value must be utilized in any necessary calculations. The less than symbol must be carried through the calculation. The resulting value must include any appropriate less than or greater than symbol resulting from the calculation.

4. Additional Monitoring by Permittee

If the Permittee monitors any parameter at the location(s) designated herein more frequently than required, using approved analytical methods, the results shall be reported to the Department on an approved monitoring report form. Such increased frequency shall also be indicated.

5. Annual Report

The Permittee shall submit to the Department's Groundwater Discharges an Annual Report summarizing the operations, management, administration and maintenance of the facility for the calendar year. The Annual Report must be submitted to the Department's Groundwater Discharges on or before February 28th of each year. The Annual Report must include all applicable items found in Section 6.8.2.4.1.3 and Section 6.9 of the Regulations.

6. Test Procedures

Test procedures for analysis of pollutants shall conform to the applicable test procedures identified in 40 CFR, Part 136 or the most recently adopted copy of Standard Methods unless otherwise specified in this permit.

7. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the Permittee shall record the following information:

a. The exact place, date and time of sampling and/or measurement;

b. The person(s) who performed the sampling and/or measurement;

c. The date(s) the analyses were performed and the time the analyses were begun;

d. The person(s) who performed the analyses; and

e. The results of each analysis.

8. Records Retention

All records and information resulting from the monitoring activities required by this permit or the Regulations including all records of performed analyses, calibration and maintenance of instrumentation and recording from continuous monitoring instrumentation shall be retained for five years. This period of retention shall be extended automatically during the course of any unresolved litigation regarding the regulated activity or regarding control standards applicable to the Permittee or as requested by the Department.

9. Availability of Reports

All reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Department of Natural Resources and Environmental Control. Monitoring data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in 7 Del. C., §6013.

10. Operator Log

An operator log must be kept on site at all times. Each spray system section shall be numbered and referred to by number in the operator log. All records and reports shall also be kept in a bound log book on site at all times and must be made available upon request for review by the Department. This log shall, at a minimum, include the applicable items listed in Section 6.7.3 of the Regulations.

11. Quality Assurance Practices

The Permittee is required to show the validity of all monitoring data by requiring its laboratory to adhere to quality assurance practices in accordance with Section 6.8.2.4 of the Regulations.

# PART III

## A. OPERATIONAL REQUIREMENTS

1. Duty to Comply

   The Permittee shall comply with all the terms and conditions of this Permit.

   The discharge of any pollutant more frequently than, or at a level in excess of that identified and authorized herein, shall constitute a violation of the terms and conditions of this Permit. The violation of any influent/effluent limitation or of any other condition specified in this Permit is a violation of 7 Del. C. Chapter 60 and is grounds for enforcement as provided in 7 Del. C., Chapter 60 "Enforcement; civil and administrative penalties; and expenses.", "Criminal Penalties." and "Cease and desist order." for Permit termination or loss of authorization to discharge pursuant to this Permit, for Permit revocation and reissuance, or Permit modification, or denial of a Permit renewal application. The Department may seek voluntary compliance by way of warning, notice or other educational means, pursuant to 7 Del. C., Chapter 60 "Voluntary compliance." or any other means authorized by Law. However, the Law does not require that such voluntary means be used before proceeding by way of compulsory enforcement.

2. Groundwater Requirements

   Operation of the wastewater treatment facility and spray irrigation system shall not cause the quality of Delaware's groundwater resources to be in violation of applicable Federal or State Drinking Water Standards.

3. Facilities Operation

   The Permittee must properly maintain and operate all structures, pipelines, systems and equipment for collection, treatment control and monitoring which are used by the permittee to achieve compliance with the terms and conditions of the permit. Proper operation and maintenance includes, but is not limited to, effective performance based on designed facility removals, adequate funding, effective management, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures.

4. The spray irrigation fields shall be managed to assure at a minimum that:

   a. Spray irrigation of wastewater shall only occur on fields being prepared for planting or already planted with a crop and shall not occur on fields with crops not actively growing or on voluntary vegetation.

   b. The spray fields shall be maintained in such a manner as to prevent wastewater pooling and/or discharge of wastewater to any surface waters. Should pooled areas become evident, spraying on those areas shall be prohibited until saturated conditions no longer exist.

   c. Aerosols or nuisance odors shall not extend beyond the boundary of the spray irrigation site when treated wastewater is being applied. If odors are produced that are considered to be a public nuisance, the Permittee shall take the necessary steps to eliminate such odors. All action taken shall be reported to the Department in accordance with Part IV.A.4 of this Permit.

   d. Erosion controls must be employed to prevent wastewater runoff from the spray irrigation fields. The Permittee must notify the Department immediately if any wastewater runoff occurs.

   e. The spray irrigation field's crops must be maintained in optimal condition, including any necessary weed management, reseeding, or other vegetative management practices.

   f. Effective vegetative management shall be provided such that crops harvested on the spray irrigation sites are removed from the sites.

g. Forage crops must be harvested and removed from the irrigation field(s) at least twice a year. Crops harvested must be removed from the irrigation site within six (6) months of harvest.

h. The wastewater must be applied in a manner such that the application is even and uniform over the irrigation area.

5. Spray irrigation is prohibited when saturated or frozen soil conditions exist.

6. The groundwater mound created by the added infiltration shall at no time reach within two feet of the ground surface in any section of the spray irrigation fields. Should the groundwater mound exceed this limit, the Permittee shall cease all irrigation of wastewater to the affected fields until the groundwater mound recedes to acceptable levels.

7. Connections or additions to the spray irrigation system other than those indicated on the approved plans are prohibited without prior approval from the Department's Groundwater Discharges Section.

8. The Permittee shall take appropriate measures to protect the spray irrigation system from damage due to sub-freezing conditions.

9. Any leaks shall be reported to the Department and repaired immediately.

10. Signs

    Unlimited Public Access: Unlimited public access sites must have advisory signs posted at all entry points that indicate the site is spray irrigated with treated wastewater. Verbiage should include the following wording: "RECYCLED WASTEWATER – DO NOT DRINK". Alternate verbiage may be used if approved in writing by the Department.

11. Potable ground or surface water may be used for distribution system testing and irrigation to establish vegetation when sufficient treated effluent is not available.

12. Phased Systems

    a. Once an operation permit has been issued and the wastewater flow reaches 80% of the permitted treatment capacity for the constructed phase based on a period of seven (7) consecutive days, the Permittee must submit written notification to the Department. The written notification must include a work plan for construction of the next permitted phase. The Permittee must submit a construction permit application, plans and specifications and Design Engineer Report with applicable fees if the next phase has not yet been permitted or if there are changes to the previously permitted design.

    b. Any flow above the permitted flow for a phase shall not be allowed to be discharged to the system until construction is completed on the following phase and an operating permit has been issued or amended by the Department for the next phase.

    c. Required documents for connecting subdivisions may be found in Section 6.5.10.3.1 of the Regulations.

13. In the event that the permittee installs new monitoring wells or replaces any existing monitoring wells, the Permittee shall submit to the Department's Groundwater Discharges Section new elevation details relative to the common benchmark previously established. Additionally, the permittee shall conduct a groundwater quality sampling program prior to initiation of wastewater disposal activities on the area incorporating the well. The sampling program shall be sufficient to establish representative groundwater quality at each well prior to initiation of the wastewater disposal activities. A minimum of three samples shall be collected at least one month apart and analyzed. A summary report detailing all analyses shall be submitted to the Department's Groundwater Discharges Section prior to initiation of wastewater disposal activities. Analyses shall include the parameters iterated in Section 6.8.1 of the Regulations.

14. The Permittee shall calibrate all flow meters in accordance with the Manufacturer's recommendations. Calibration shall include, but not be limited to influent, effluent, continuous online turbidity and chlorine residual monitors. The calibration documentation must be submitted with the Annual Report in accordance with Part II.B.5.

15. The Permittee shall operate and maintain the land treatment system in accordance with the facility's design and the approved Operation and Maintenance Plan (O&M). A copy of the O&M must be on site at all times. The Permittee must maintain the O&M's accuracy and applicability in accordance with both their Permit and the Regulations. In the event of a discrepancy between the O&M and the Permit or Regulations, the requirements of the Permit and the Regulations would govern.

16. At least three feet of freeboard, measured vertically from the lowest point of the berm, is required for all ponds. The lowest point of the berm must be determined and marked.

17. The Permittee must notify the Department's Groundwater Discharges Section in writing prior to utilizing the freeboard in any lagoon or immediately upon unexpected encroachment into freeboard. In the event of encroachment into freeboard, Permittee shall contact the Groundwater Discharges Section to coordinate relief measures. In the event of an emergency, Permittee may contact the Department at the telephone numbers cited in Part II.B.2 of this Permit; however, written notification must subsequently be provided within 5 days of encroachment.

18. If the facility does not treat sewage and has a storage tank that requires cleanout, and if the Permittee intends to land apply material collected from the cleanout onto the spray irrigation field, the Permittee must analyze the material for nutrients and any other applicable parameters of concern as determined by the Groundwater Discharges Section Prior to tank cleanout being performed. Permittee must submit to the Groundwater Discharges Section a report including the results, the frequency and estimated volume of material to be applied, and how and where it will be applied. The report must include a mathematical analysis determining any nitrogen loading from the tank cleaning combined with nitrogen loading from wastewater application will not exceed the allowable nitrogen load.

19. Fencing is required at treatment facilities, pump stations and storage/treatment ponds. Fencing of spray fields is not required.

20. The collection and channelization of irrigated wastewater for purposes other than retreatment is prohibited.

21. Direct application of treated wastewater to drainage ditches, any water bodies, and wetlands is prohibited.

22. Emergency Repairs

    Emergency repairs or the replacement of critical "like kind" components of the wastewater treatment facility necessary for the continued operation of the facility may be performed without first obtaining a construction permit from the Department.

    A report must be submitted to the Department within five (5) days of completion of the emergency repairs. The report must summarize the nature of the emergency and the repairs performed. All violations must also be reported in accordance with Section 6.5.9.

23. Adverse Impact

    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.

24. Bypassing

The diversion of flow from any portion of the treatment facility's process flow (including, but not limited to, pretreatment, storage, distribution and land application) necessary to maintain compliance with the terms and conditions of this permit is prohibited unless:

a. The bypass is unavoidable to prevent personal injury, loss of life, severe property damage, or materially adversely affect public health and/or the environment; or

b. There are no alternatives readily available.

The Groundwater Discharges Section must be orally notified within 24 hours after such bypass; and, a written submission regarding the bypass must be submitted within five days of the Permittee's becoming aware of the bypass. Where the need for a bypass is known (or should have been known) in advance, this notification must be submitted to the Groundwater Discharges Section for approval at least ten days prior, or as soon as possible, before the date of bypass.

The treatment facility must be repaired and restored to the permitted design operations process flow.

25. Removed Substances

Solids, sludges, filter backwash or other pollutants removed in the collection, conveyance, or treatment of wastewater 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.

26. Power Failures

An alternative power source, which is sufficient to operate the wastewater treatment and disposal facilities, shall be available. If such alternative power source is not available, the Permittee shall halt, reduce or otherwise control production and/or all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater facilities.

# PART IV

## A. MANAGEMENT REQUIREMENTS AND RESPONSIBILITIES

1. Initiation of Facility Operations Notification

   If this Permit is for initial operations following construction, the Permittee shall notify the Department in writing within 24 hours of the initiation of operations.

2. Operation Permit Re-Issuance

   At least 180 days before the expiration date of this Permit, the Permittee must submit an application for renewal or notify the Department of the intent to cease discharging by the expiration date. The application package for systems with a design flow $\geq$ 100,000 GPD, must include a five (5) year Compliance Monitoring Report (CMR). The CMR must be in accordance with Section 6.5.4.3 of Regulations. In the event that a timely and complete application has been submitted as determined by the Department, and the Department is unable, through no fault of the Permittee, to issue a new Permit before the expiration date of this Permit, the terms and conditions of this Permit are automatically continued and remain fully effective and enforceable until a decision is made on the new application.

3. Change in Discharge

   All discharges authorized herein shall be consistent with the terms and conditions of this Permit. The discharge of any pollutant identified in this Permit more frequently than or at a level in excess of that authorized shall constitute a violation of the Permit.

   Any anticipated facility expansions, production increases, or process modifications that will result in new, different, or increased discharges of pollutants must be reported in writing to the Department's Groundwater Discharges Section for approval. A new Permit may be required.

   Any other activity which would constitute cause for modification or revocation and reissuance of this Permit as described in Part V.A.1 of this Permit shall be reported to the Groundwater Discharges Section. Following such notice, the permit may be modified to specify and limit any pollutants not previously limited.

4. Non-compliance Notification

   The Permittee shall report to the Groundwater Discharges Section orally within 24 hours from the time the Permittee became aware of any noncompliance that may endanger the public health or the environment by contacting the Groundwater Discharges Section at the telephone numbers cited in Part II.B.2 of this Permit.

   If for any reason the Permittee does not comply with, or will be unable to comply with, any effluent limitations or other conditions specified in this permit, the Permittee shall provide the Department with the following information in writing within five days of becoming aware of any actual or potential noncompliance:

   a. A description and cause of the non-compliance with any limitation or condition;

   b. The period of non-compliance including exact dates and times; or, if not yet corrected, the anticipated time the non-compliance is expected to continue; and

   c. The steps being taken or planned to reduce, eliminate and/or prevent recurrence of the non-compliant condition.

5. Spill Reporting

In the event of any environmental release of pollutants (i.e., spill), the Permittee shall call the Department's 24-hour Emergency Release Reporting Hotline at (800) 662-8802.

The Permittee shall also notify the GWDS regarding any environmental release of pollutants (i.e., spill) into surface water or groundwater or on land, within 24-hours from the time the Permittee becomes aware of the release and activate their emergency site plan. In addition the following information shall be reported to the GWDS within five days.

1) The facility name and location of release;
2) The chemical name or identity of any substance involved in the release;
3) An indication of whether the substance is an extremely hazardous substance;
4) An estimate of the quantity of any such substance that was released into the environment;
5) The time and duration of the release;
6) The medium or media into which the release occurred;
7) Any known or anticipated acute or chronic health risks associated with the emergency and, where appropriate, advice regarding medical attention necessary for exposed individuals;
8) Proper precautions to take as a result of the release, including evacuation;
9) The names and telephone number of the person or persons to be contacted for further information; and
10) Such other information as the GWDS may require.

6. Facility and Construction Changes

The Permittee shall submit a written report to the Department for review and approval, of any changes to the facility or construction of the system within the following time periods:

a. Thirty days before any planned activity, physical alteration to the permitted facility or addition to the permitted facility if that activity, alteration or addition would result in a change in information that was previously submitted to the Department;

b. Thirty days before any anticipated change which would result in noncompliance with any permit condition or the regulations; or

b. Immediately after the Permittee becomes aware of relevant facts omitted from, or incorrect information submitted in, a permit application or report to the Department.

7. Right of Entry

The permittee shall allow the Department entry and access, consistent with 7 Del.C. Ch. 60, to:

a. Enter the permitted facility.

b. Inspect any records that must be kept under the conditions of the Permit.

c. Inspect any facility, equipment, practice, or operation permitted or required by the Permit.

d. Sample or monitor for the purpose of assuring Permit compliance of any substance or any parameter at the facility.

8. Permit Transferability

Permits may be transferred to a new owner or operator. The Permittee must notify the Department by requesting a change of ownership of the permit before the date of transfer. The transfer must be consistent with any notarized legal documents and/or CPCN required by the Regulations. The legal documentation must be provided with the application. The application must be received 30 days before the transfer.

a. No person shall transfer a permit from one (1) person to another unless 30 days written notice is given to the Department, indicating the transfer is agreeable to both persons, and approval of such transfer is obtained in writing from the Department, and any conditions of the approval of such transfer is obtained in writing from the Department, and any conditions of the transfer approved by the Department are complied with by the transferor and the transferee.

b. The notice to the Department shall contain a written agreement between the transferor and the transferee, indicating the specific date of proposed transfer of Permit coverage and acknowledging responsibilities of current and new permittees for compliance with and liability for the terms and conditions of this permit. The notice shall be signed by both the transferor and the transferee.

# PART V

## A. PROVISIONS

1. Permit Revocation

   The Department may revoke a Permit if, among other things, the Permittee violates any Permit condition, these regulations, fails to pay applicable Departmental fees, obtains the permit by misrepresentation or fails to fully disclose all relevant facts.

   Except in cases of emergency, the Department shall issue a written notice of intent to revoke to the permittee prior to final revocation. Revocation shall become final within 20 days of receipt of the notice by the Permittee, unless within that time the permittee requests an administrative hearing in writing.

   The Department shall notify the Permittee in writing of any revocation hearing at least 20 days prior to the date set for such hearing.

   If the Department finds the public health, safety or welfare requires emergency action, the Department shall incorporate findings in support of such action in a written notice of emergency revocation issued to the permittee. Emergency revocation shall be effective upon receipt by the Permittee. Thereafter, if requested by the Permittee in writing, the Department shall provide the permittee a revocation hearing.

2. Permit Modifications/Amendments

   In consultation with the Permittee, the Department may modify or amend an existing permit provided that the modifications would not result in an increased impact or risk to the environment or to public health.

3. State Laws

   This Permit shall not be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation.

4. Property Rights

   The issuance of this Permit does not convey any property rights of either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

5. Severability

   The provisions of this Permit are severable. If any provision of this Permit, or the application of any provision of this Permit, to any circumstances is held invalid; the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

6. This Permit does not relieve the Permittee of complying with any applicable Federal, State or local regulations.

7. Additional Information

   The Permittee shall furnish to the Department within a specified period of time, any information including copies of records, which may be requested by the Department to determine whether cause exists for modifying, revoking, reissuing, or terminating the permit, or to determine compliance with the permit and the Regulations.

8. Wastewater Treatment Facility Closure/Abandonment

   In the event the wastewater treatment facility, or a component of the facility, is proposed to be abandoned, the permittee shall submit a proposed closure and abandonment work plan with procedures on how the facility will be abandoned for review and approval by the Department. The work plan shall address remediation if monitoring data indicates impacts to the environment. Upon review and approval of the work plan and completion of all closure and abandonment actions the permittee must contact the Department for a final inspection of the site.

9. In the event that the *Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems* or applicable federal regulations are revised, this Permit may be opened and modified accordingly after notice and opportunity for a public hearing.

10. This Permit supersedes all previous spray irrigation operation permits issued to the Permittee for this facility.