NORTH CAROLINA DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SECTION
ON-SITE WATER PROTECTION BRANCH

INNOVATIVE WASTEWATER SYSTEM APPROVAL

Innovative Wastewater System Approval Number: IWWS 2024-02-R2

Issued To: AQWA Inc.
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For: AQWA Drip Dispersal System

Approval Date: July 15, 2024
December 31, 2024 Renewed for 2025
December 31, 2025 Renewed for 2026

In accordance with G.S. 130A-343 and 15A NCAC 18E, Section .1700, an application by AQWA Inc., for renewal of their subsurface wastewater drip dispersal system has been reviewed and found to meet the standards of an innovative system when the following conditions are met.

I. General

Scope of this Innovative Approval

A. Design, installation, use, and operation and maintenance guidelines for AQWA Drip dispersal systems receiving effluent from an approved advanced pretreatment system designed to meet NSF-40, TS-I, or TS-II effluent standards pursuant to 15A NCAC 18E .1201(a), Table XXV, or reclaimed water effluent standards pursuant to 15A NCAC 18E .1002.
B. Use of AQWA Drip dispersal system with a design daily flow greater than 3,000 gallons/day may be permitted after approval by the Department on a case-by-case basis in accordance with 15A NCAC 18E .0302(e) or G.S. 130A-336.1.

II. System Description

The AQWA Drip system consists of the following components: a headworks assembly containing automatic filtration and field flush valves; supply and return lines; air release valves; Geoflow Wasteflow PC or Netafim PC drip line; and an integrated controller.

III. Siting Criteria

The AQWA Drip system shall be sited and sized in accordance with 15A NCAC 18E .1002 or .1204. The AQWA Drip systems shall meet all applicable horizontal setbacks in accordance with 15A NCAC 18E, Section .0600 or .1202. The minimum vertical separation distance to rock or tidal water for drip dispersal systems shall be 12 inches, regardless of treatment.

IV. Dispersal Field System Sizing

The system sizing criteria shall be based upon the long-term acceptance rate specified in 15A NCAC 18E .1204.

V. Special Site Evaluation

A special site evaluation may be required based on soil and site conditions. Refer to 15A NCAC 18E .0510(c) for when a special site evaluation is required.

VI. Design Criteria

A. The AQWA Drip dispersal system shall be preceded by an advanced pretreatment system designed to meet at least NSF/ANSI-40 or a more stringent standard in accordance with 15A NCAC 18E .1201.

B. The pump tank shall be sized in accordance with 15A NCAC 18E .1602(b).

C. Pumps shall meet the requirements of 15A NCAC 18E .1602(c).

D. Headworks assemblies shall meet the requirements of 15A NCAC 18E .1602(d).

E. The integrated controller shall meet the requirements of 15A NCAC 18E .1602(f).

F. The AQWA Drip dispersal system field design shall meet the requirements of 15A NCAC 18E .1602(e) and the following:
   1. Connection lines shall be conveyed over compacted earthen dams constructed at least two inches higher than the maximum elevation of each dripline served. These dams are to retain effluent in the driplines at the end of each dose cycle. The loops between runs must be elevated so that they drain freely into the run lines. Connection lines and loops shall be Schedule 40 PVC or solvent-welded, non-perforated flexible PVC.
   2. The hydraulic design shall be based on achieving the following conditions:
      a. No more than a 10 percent variation in flow between any individual emitters anywhere within a separately dosed zone, including any drain back.
      b. When the slope exceeds 10 percent, check valves may be used in the supply and return manifolds, or other acceptable means identified to minimize disproportionate amount of drainage into the lowest area of the zone. Alternatively, the supply and return manifolds may simply be placed at a relative elevation above the highest lateral to prevent drainback.
      c. Maintenance of scour velocity of at least 1.2 feet per second in the supply line from the

dosing tank to the beginning of the drip field during normal dosing cycles.

d. Maintenance of flushing velocities of at least 1.2 feet per second in each supply manifold segment during field flushing, and maximum flushing velocities less than 10 feet per second in each supply and return manifold segment.
e. Minimum pressure in the dripline of 10 pounds per square inch during flushing flows and a maximum of 60 pounds per square inch during normal dosing flows.
f. Maintenance of flushing velocities of at least one foot per second at the distal end of each dripline during field flushing, with valving provided to enable flushing velocities of at least two feet per second at the distal end of each dripline to be achieved with manual flushing.

3. The hydraulic design shall include documentation that minimum scour velocities and maximum pressure restrictions will be maintained, including project-specific calculations, computer simulations as necessary, or verification of adherence to pre-approved design criteria.
4. The operator authorized in writing by AQWA Drip (authorized operator) must be able to access all solenoid valves, air vents, pressures monitoring points, and isolation valves at all times for inspection, testing, and maintenance. Valves, pressure monitoring fittings, vents, and cleanouts shall be provided with protective vaults or boxes that are decay resistant, ultraviolet rated, and that extend at least to finished grade. Routine maintenance and monitoring shall be possible without effluent discharging from the network during these procedures.

VII. Installation and Testing

A. A preconstruction conference shall be required to be attended by the following, as applicable: designer authorized in writing by AQWA Drip (authorized designer), North Carolina Professional Engineer (PE), licensed soil scientist (LSS), Authorized On-Site Wastewater Evaluator (AOWE), installer authorized in writing by AQWA Drip (authorized installer), and local health department (LHD), prior to beginning any site modifications or construction of the AQWA Drip dispersal system.

B. All individuals or companies installing AQWA Drip systems shall be in possession of all necessary permits and licenses before attempting any portion of a new or repair installation. The company or individual must be a Level IV installer and authorized in writing by AQWA Inc.

C. AQWA Drip dispersal system installation shall be in accordance with 15A NCAC 18E .0908(f).

D. AQWA Drip dispersal systems shall be tested in accordance with 15A NCAC 18E .1603.

E. The tanks shall be leak tested in accordance with 15A NCAC 18E .0805.

F. The preservation of the original structure of the soil in the initial and repair dispersal fields is essential to maintaining the absorptive capacity of the soil. No activity other than the construction of the system is permitted within these areas before, during, and after installation of the system.

G. Dispersal fields shall be prepared in a manner that minimizes site disturbance.
   1. No equipment shall cross the field areas during rainfall events, or when the soil moisture

content of the fields is above field capacity.

2. Only equipment light enough to not compact the soil shall be used to remove trees, roots, and rocks, with hand incorporation of select fill material used to eliminate weak spots where roots or boulders must be removed.
3. Fill material and final cover shall be in accordance with 15A NCAC 18E .0909(c)(3). In some instances, final cover material may be approved to be added after dripline installation.
4. The dispersal field shall be prepared as needed to enable the final cover to be established and maintained prior to dripline installation.
5. The selection, transportation, and incorporation procedures of fill or cover must be carefully reviewed and concurred with by, as applicable, the authorized designer, PE, AOWE, LSS, and LHD prior to and during installation.

H. Drip laterals shall be staked out by use of an engineer's or laser level and taped prior to permitting. At least every fourth drip run or parallel adjacent dripline shall be field staked. Staking shall be more frequent if needed, as determined by, as applicable, the authorized designer, PE, AOWE, or LHD, to ensure conformity with natural contours and design requirements for sizing, location, and separations. Maximum dripline depth shall be in accordance with permit conditions.

I. Dripline shall be installed in accordance with the designer's and manufacturer's recommendations for each site. Soil moisture must be dry enough so that soil compaction or smearing will not occur. The system shall not be installed during periods of wet weather when the soil is sufficiently wet at the depth of installation to exceed its plastic limit. The plastic limit is exceeded when the soil can be rolled between the palms of the hands to produce a wire 1/8-inch in diameter and greater than 1½ inches in length without breaking and crumbling. Questions about the site workability shall be reviewed with, as applicable, the designer, PE, AOWE, LSS, or LHD prior to installation.

J. Leaf litter and debris shall be removed prior to the installation of dripline, where applicable, and the trench bottoms shall be cleared of roots, debris and litter.

K. Minimum depth of valves in protective vaults or boxes shall be at least 12 inches below finished grade, or as needed to be below normal frost depth.

L. Air vents shall be installed in a valve box so that the entire vent is below finished grade. The outlet of the vent must be above the installation depth of the dripline.

M. Extreme care must be taken during and after system installation to assure no extraneous debris enters the tankage, supply lines, and dripline network. Supply lines and manifolds shall be flushed out prior to system startup.

N. Dispersal fields shall be sloped to shed surface water and to facilitate system inspection, operation, maintenance, and repair. Provisions shall be made to establish and maintain a vegetative cover, such as grass, to prevent erosion and allow mowing with standard equipment, if applicable.

O. Other methods of site stabilization may be proposed, such as in woodland sites, that allow for the dispersal field to shed surface water and facilitate system inspection, operation, maintenance, and repair. Establishment of a permanent vegetative cover on a wooded site is not necessary if

the site is stabilized to prevent erosion after installation until a protective litter cover is naturally reestablished. Site-specific procedures shall be reviewed by, as applicable, the designer, PE, AOWE, LSS, installer, authorized operator, or LHD.

P. The authorized installer, PE, AOWE, authorized designer, and the operator authorized in writing by AQWA Inc (authorized operator), shall conduct a final inspection and start-up of the AQWA Drip dispersal system and all associated system components. The LHD will attend and observe the final inspection and start-up.

VIII. Operation, Maintenance, and Monitoring

A. AQWA Drip dispersal systems shall be classified, at a minimum, as a Type Va system in accordance with 15A NCAC 18E .1301(b), Table XXXII. Management and inspection shall be in accordance with 15A NCAC 18E Section .1300, except that the maximum inspection interval for systems up to 1,500 gpd shall be quarterly for the first year of operation.

B. All AQWA Drip dispersal systems require an operation and maintenance agreement. The authorized operator must have the proper equipment and training to access and program the control panels on site. The authorized operator shall be:
   1. a North Carolina certified subsurface operator (Operator in Responsible Charge); and
   2. either an employee of AQWA Inc or authorized in writing by AQWA Inc.

C. During the first operational inspection after system start-up, an AQWA Inc. representative will meet with the authorized operator and the property owner to explain the system and answer any questions.

D. All AQWA Drip dispersal systems shall be operated and maintained according to the latest version of the AQWA Drip O&M Manual.

E. At each AQWA Drip system inspection the authorized operator shall, at a minimum, observe, monitor, and record the following:
   1. Visual inspection of the drip dispersal fields;
   2. Observation and cleaning of the filter, as needed;
   3. Measurement of the dosing flow rate to each zone;
   4. Recordation of the flow meter reading, pump run times, and pump cycle counters;
   5. Measurement of flushing flow rates and pressure head readings during flushing shall be taken at least once a year;
   6. Volume of effluent delivered to each zone since the last inspection;
   7. Log of all malfunction incidences/notifications; and
   8. Any maintenance activities performed.

F. If any system is found to be malfunctioning in accordance with 15A NCAC 18E .1303(a)(1) or (2), AQWA Inc. will assist in the development of an action plan to bring the system back into compliance. When the system is found to be malfunctioning the inspection frequency shall revert to quarterly for a period of one year.

G. The authorized operator shall report inspection findings and measurements to the system owner,

AQWA Inc., and the LHD 30 days after the date of the inspection.

H. The authorized operator shall also conduct other additional observations, measurements, monitoring, and maintenance activities as specified in the Operation Permit (OP) and as recommended by AQWA Inc.

IX. Responsibilities and Permitting Procedures

A. Prior to the installation of an AQWA Drip dispersal system at a site, the owner shall submit an application or Notice of Intent (NOI) to the LHD for the proposed use of this system. Improvement Permits (IP) or Construction Authorizations (CA) issued by the LHD shall have a soil and site evaluation conducted either by the LHD, LSS, or AOWE. The NOI shall include a soil and site evaluation conducted by an LSS.

B. The IP, CA, and NOI shall contain all the conditions the site approval is based upon, including the proposed use of the Innovative system. The OP will include all the conditions specified in the IP and the CA. The Authorization to Operate (ATO) should include all the conditions specified in the NOI.

C. When a special site evaluation is required pursuant to 15A NCAC 18E .0510(c), an evaluation and written, sealed report from an LSS regarding the site shall be provided to the LHD prior to the issuance of the IP. The report shall contain the information specified in 15A NCAC 18E .0510(d). The LHD may request the assistance of their Regional Soil Scientist in evaluating this report prior to permit issuance.

D. The AQWA Drip system shall be designed by an authorized designer, PE, or AOWE. A PE shall design the system when required in accordance with 15A NCAC 18E .0303(a).

E. Prior to the LHD issuing a CA for an AQWA Drip system, a design submittal prepared by an authorized designer, AOWE, or PE shall be submitted. The design submittal shall include the information required in 15A NCAC 18E .0305.

F. For sites required to be evaluated by an LSS or licensed geologist (LG), the LHD, AOWE, or PE may specify as a condition of the permit that an LSS or LG oversee critical phases of the dispersal field installation and certify in writing that the installation was in accordance with their specified site and installation requirements prior to the OP or ATO issuance.

G. The LHD shall issue the OP after the following:
   1. Field verification that the installation has been completed;
   2. Receipt of written documentation from the authorized designer or PE that the system has been designed, installed, and is operating in accordance with the approved plans; and
   3. All necessary legal documents have been completed, including the contract between the system owner and the authorized operator.

   The LHD shall issue the OP for an (a2) and (a5) application after all necessary legal documents have been completed, including the contract between the system owner and the authorized operator.

The ATO shall be submitted to the LHD in accordance with G.S. 130A-336.1 and G.S. 130A-336.2.

X. Repair of System

The provisions of 15A NCAC 18E .1306 shall govern the use of the AQWA Drip dispersal system for repairs to existing malfunctioning wastewater systems.

Approved by: _____ Date: _____