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

PROVISIONAL WASTEWATER SYSTEM APPROVAL

Provisional Wastewater System Approval Number: PWWS 2019-01-R1

Issued To: Eljen Corporation
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Contact: Jim King
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For: Eljen Geotextile Sand Filter (GSF) System Model A42

Approval Date: September 6, 2019
December 31, 2024 Updated for 18E and renewed for 2024

In accordance with G.S. 130A-343 and 15A NCAC 18E Section .1700, an application by Eljen Corporation for renewal of their wastewater system utilizing the Eljen GSF A42 system has been reviewed and found to meet the requirements of a Provisional System when the following conditions are met.

I. General

A. Scope of this Provisional Approval
   1. Use, design, and installation requirements for Eljen GSF A42 systems to meet NSF-40 and TS-I effluent standards in accordance with 15A NCAC 18E .1201(a), Table XXV.
   2. Operation, maintenance, and monitoring requirements for Eljen GSF A42 systems to ensure compliance with effluent standards and hydraulic performance requirements.
   3. Proposal for evaluation of this Provisional System.

B. This Provisional Approval is only applicable to Eljen GSF A42 systems receiving domestic strength effluent or pretreated influent, not exceeding the parameters in 15A NCAC 18E .0402(a), Table III, and with a design daily flow less than or equal to 1,500 gallons per day (gpd).

C. Eljen GSF A42 systems may be proposed for facilities with high strength effluent, as defined in 15A NCAC 18E .0402(a), Table III or industrial process wastewater by a North Carolina Professional Engineer (PE) and Eljen Corporation to the Department for review and approval on a case-by-case basis, prior to permitting by the local health department (LHD). The system design shall include the proposed untreated wastewater strength in BOD_5, COD, TN, TSS, and fats, oils, and grease, the expected organic loading rate in pounds of BOD or N, the hydraulic loading rate on the pretreatment system, and the calculations, references, and any other

needed information to support the proposed design.

D. Any site utilizing an Eljen GSF A42 system shall have wastewater with sufficient alkalinity to facilitate biological treatment processes. The influent shall not have a pH or toxins that significantly inhibit microbial growth.

E. Use of Eljen GSF A42 systems that have a design daily flow exceeding 1,500 gpd may be permitted after review and approval by the State on a case-by-case basis in accordance with 15A NCAC 18E .0302(e).

F. This Provisional Approval is limited to 200 systems. The intent of this Provisional Approval is to gain sufficient field experience to qualify this system for Innovative Approval for both NSF-40 and TS-I systems pursuant to 15A NCAC 18E .1705.

II. System Description

The Eljen GSF A42 system consists of the following components: a Department approved septic tank, and final subsurface treatment and dispersal either in a trench or bed configuration dispersal field utilizing one or more rows of Eljen GSF A42 units. The Eljen GSF A42 unit consists of anti-siltation fabric, 4-inch diameter smooth wall performance distribution pipe, Bio-Matt™, and a cuspated plastic core 24 inches wide by 48 inches long and seven inches high. The Eljen GSF A42 system includes the GSF A42 unit and surrounding imported system sand meeting ASTM C-33, and further modified to meet manufacturer specifications, otherwise known as system sand. Refer to Attachment A.

A Department approved dosing tank may be used between the septic tank and the Eljen GSF A42 unit if required to meet site conditions or system design.

III. Siting Criteria

A. The Eljen GSF A42 system shall be sited and sized in accordance with 15A NCAC 18E Section .1200 for NSF-40 or TS-I systems, as applicable.
   1. Eljen GSF A42 systems designed to meet NSF-40 effluent standards shall meet the siting requirements in 15A NCAC 18E .1202(a)(1) and (3) and the following criteria:
      a. Trench configurations shall not have a design flow exceeding 1,500 gpd.
      b. Bed configurations in soil classified based on texture as Group I, II, or III shall not have a design daily flow exceeding 600 gpd. Bed configurations shall not be used in Group IV soils.
   2. Eljen GSF A42 systems designed to meet TS-I standards shall have a design daily flow less than or equal to 1,500 gpd or 480 gpd for an existing fill site and shall meet the following requirements:
      a. Trench configurations shall meet the siting requirements in 15A NCAC 18E .1202(a)(1) and (3).
      b. Bed configurations where the soil is classified based on texture as Group I or II, shall not have a design daily flow greater than 1,500 gpd and shall meet the siting requirements in 15A NCAC 18E .1206(c)(1) and (4).
      c. Bed configurations where the soil is classified based on texture as Group III shall not have a design daily flow greater than 600 gpd and shall not receive any additional siting

concessions other than those granted to NSF 40 systems.

d. Vertical separation requirements to a limiting condition are measured from the bottom of the imported Eljen-specified system sand.

B. The slope shall not exceed 15 percent for an Eljen GSF A42 system designed to meet NSF-40 standards in a bed configuration. The slope shall not exceed 10 percent for an Eljen GSF A42 system designed to meet TS-I standards that utilize TS-I siting or sizing allowances. A special site evaluation in accordance with 15A NCAC 18E .0510 is required for TS-I systems using a bed configuration on sites with slopes greater than two percent.

C. The system shall be considered to be a fill system if any part of the Eljen GSF A42 unit, excluding the 4-inch distribution pipe, is located above the naturally occurring soil surface. Fill systems shall be installed only on sites with uniform slopes less than 15 percent.

IV. System Sizing

A. The Eljen GSF A42 system shall be sized in accordance with 15A NCAC 18E Section .1200 for NSF-40 and TS-I systems, as applicable.
   1. Eljen GSF A42 systems designed to meet NSF-40 standards shall meet the following:
      a. The allowance in 15A NCAC 18E .1202(c)(1)(a) for a 33 percent increase in LTAR for a trench system for an Eljen GSF A42 system is applicable in Group I or II soils with suitable structure. 15A NCAC 18E .1206(b)(2) allows for the initial LTAR to be increased by a factor of 1.125 with a design daily flow less than or equal to 600 gpd. The proposed LTAR increase for bed systems is only for Group I and II soils.
      b. In Group III Soils, there is no trench or bed size reduction. The bed bottom area for the GSF system shall be 50 percent greater than the bottom area required for a trench system.
   2. Eljen GSF A42 systems designed to meet TS-I standards shall meet the following:
      a. The trench length may be reduced in accordance with 15A NCAC 18E .1202(c) up to a maximum of 50 percent when compared to the trench length required for a conventional system receiving domestic strength effluent with no additional pretreatment.
      b. The bed system shall be sized pursuant to 15A NCAC 18E .1206(c)(2)(D), with up to a maximum reduction of 50 percent in Group I or II soils when compared to the area required for a bed system receiving domestic strength effluent with no additional pretreatment. The net result is a bed bottom area that is 75 percent of the bottom area required for a conventional trench system receiving domestic strength effluent with no additional pretreatment.

B. Example calculations for sizing are provided in Attachment B.

V. Special Site Evaluation

A special site evaluation may be required based on the proposed dispersal system. Refer to 15A NCAC 18E .0510 for when a special site evaluation is required.

VI. Design Criteria

A. The Eljen GSF A42 System shall be designed in accordance with the following criteria.

1. A state approved septic tank sized as required in 15A NCAC 18E .0801 shall be provided. An access riser with lid extending at least to finished grade shall be provided over the outlet tank compartment opening and effluent filter. The access riser shall be designed and maintained to prevent surface water inflow.
2. A pump tank shall be provided if needed to overcome site and design constraints or for pressure distribution. A state-approved pump tank shall be sized as required in 15A NCAC 18E .0802. If a pump tank is provided, dosing may be demand or timed dosing for a system designed for up to 1,000 gpd. Timed dosing is required for a system designed for greater than 1,000 gpd. Dosing shall be a maximum of three gallons per Eljen GSF A42 unit per dose. A low-pressure distribution network may be constructed as well in accordance with the manufacturer's specifications.
3. Components common to all Eljen GSF A42 Systems:
    a. Septic tank with an effluent filter at the outlet end;
    b. Distribution box or pressure manifold when the design calls for more than one row of Eljen GSF A42 units in a trench or bed configuration;
    c. Eljen GSF A42 units where each unit measures 24-inches wide, 48-inches long, and 7-inches high;
    d. Geo-textile anti-siltation cover fabric supplied by the manufacturer;
    e. Sampling devices and inspections ports;
    f. A vent when the cover over the cuspated plastic core is greater than 18-inches deep, otherwise the vent is optional;
    g. Four-inch diameter perforated, smooth wall distribution pipe with the holes aligned at the 4 and 8 o'clock positions; and
    h. System sand meeting ASTM C-33 and further modified to meet the manufacturer specifications identified in Attachment A.
4. The minimum number of Eljen GSF A42 units per bedroom is six or 25 units per 100 feet of trench, whichever is greater.
5. In a trench configuration, each Eljen GSF A42 unit shall be aligned in the center of the trench and be butted together end-to-end with no voids or spaces between units. In a bed configuration, Eljen GSF A42 units shall be evenly spaced across the system sand in the bed and each Eljen GSF A42 unit shall be butted together end-to-end with no voids or spaces between units, except for the Eljen specified system sand between each lateral row of units, as relative to the distribution device.
6. Minimum system sand depths and minimum and maximum spacing requirements are as follows:
    a. Minimum sand below each Eljen GSF A42 cuspated unit: NSF-40: 6 inches; TS-I: 12 inches
    b. Minimum center to center spacing of Eljen GSF A42 units: Trench: 108 inches; Bed: 36 inches
    c. Maximum center to center spacing of Eljen GSF A42 units: Bed: 48 inches with Eljen-specified system sand between units
    d. For bed configurations, the horizontal distance from the center of the outer row of units to the side of the bed: NSF-40: 18-48 inches; TS-I: 18-48 inches
    e. Horizontal distance containing system sand from the end of a row of units to the ends of the trench or bed: 6-12 inches
    f. Minimum cover over unit – 12 inches, with eight inches over the pipe

7. Minimum and maximum Eljen GSF A42 unit row lengths:
   a. Minimum length – 20 feet
   b. Maximum length – 60 feet for gravity dispersal
   c. Longer rows are allowed with the use of pressure dispersal in accordance with the manufacturer's specifications for pressure dispersal
8. To meet the spacing requirements in Section VI.A.5 and 6, it may be necessary to provide more Eljen GSF A42 units than the minimum required by Section VI.A.4. Units shall be spaced uniformly within the dispersal field.
9. The system design shall incorporate provisions for complying with the flow monitoring requirements of 15A NCAC 18E .1701(a)(2)(I):
   a. If a pump is involved, the control panel shall meet the requirements of 15A NCAC 18E .1103.
   b. If the system is gravity fed, the system design will either incorporate a siphon system with a dosing cycle counter, or a tipping D-box with a cycle counter, where the counter display would be used as a mechanical logger.
   c. A data logging system will be incorporated with the cycle counter in order to allow review of the flows over time.
   d. In the rare instance where none of the above options are feasible, a water meter can be placed on the incoming line to the house connected to a data logging system, with the understanding that not all the water entering the house will enter the on-site wastewater system due to personal consumption, landscaping purposes, etc.
10. For bed systems designed for less than or equal to 1,500 gpd, two or more beds shall be used, and effluent shall be distributed to each bed and separate rows of Eljen GSF A42 units uniformly and evenly over a 24-hour period using a pump, control panel, and effluent dispersal system, in accordance with manufacturer requirements for pump systems.

B. Eljen GSF A42 systems shall be designed by a designer authorized in writing by Eljen Corporation (authorized designer), Authorized On-Site Wastewater Evaluator (AOWE), a PE. Systems greater than 1,000 gpd shall be designed by a PE.

VII. Installation and Testing

A. A preconstruction conference shall be required to be attended by the following, as applicable: authorized designer, AOWE, PE, installer authorized in writing by Eljen Corporation (authorized installer), Eljen Corporation licensed distributor, and LHD prior to beginning installation of the Eljen GSF A42 system.

B. Eljen GSF A42 system shall be installed according to directions provided by Eljen Corporation.

C. Trench and bed Eljen GSF A42 systems shall be constructed as a rectangle, with the long axis parallel to the ground elevation contours of the slope, unless it is determined the site's usable soil depth will allow the system design to be off contour. The bottom of the trench or bed shall be excavated level, with a plus or minus tolerance of ½-inch from side-to-side and a maximum fall along the trench of one inch in 100 feet. When sited in accordance with the appropriate sections of this approval, the bottom of the system sand bed for Eljen GSF A42 systems may be installed up to but no deeper than five feet below finished grade, provided that the vertical

separation requirements of this approval are met. The system sand bed shall be immediately installed without allowing machinery to traverse the excavated bed bottom. Eljen-approved small track vehicles may be used to traverse across the sand bed during installation. A six inch layer of sand shall be under the vehicle at all times.

D. Eljen GSF A42 units shall be installed level in a trench or bed lined with Eljen-specified system sand. The surface of the system sand shall be level with a plus or minus tolerance of ½-inch from side-to-side and a maximum fall along the trench of one inch in 100 feet. The unit, including the distribution pipe, shall be covered by the Eljen-approved geotextile fabric that extends along the full length of the top and sidewalls of the units, per manufacturer specifications. Eljen-specified imported system sand shall be level with the Eljen GSF A42 cuspated units and extend laterally at this same elevation over the entire perimeter of the trench or sand bed.

E. Backfill shall be installed over the finished sand trench or bed and between the GSF A42 units and the perimeter of the system. Backfill shall be free of trash or debris. Minimum backfill depth shall be 12 inches above the top of the Eljen GSF A42 cuspated units. Native soil may be used for up to eight inches of cover above the top of the Eljen GSF A42 cuspated units. At least the final four inches of backfill, after settling, shall have a finer texture, such as Group II or III soils, for the establishment of a vegetative cover.

F. When installing a fill system, backfill shall be installed with a side slope not to exceed a rise to run ratio of 1:3, unless a dry stacked interlocking block retaining wall is constructed adjacent to the Eljen GSF A42 unit and surrounding sand. Any other type of retaining wall shall be designed by a PE and its construction certified in writing. The use of a retaining wall for supporting the backfill does not supersede side slope requirements for fill systems, and setbacks shall be measured from the toe of the projected side slope.

G. Water tightness of the tanks shall be demonstrated by either a 24-hour water leak test or a vacuum test conducted at the installation site. A water level change of one-half inch or more over 24 hours, or visual observation of leakage shall be cause for failure of the water tightness test. The initial water level shall be two inches above the riser or adapter seam.

H. Specified site preparation steps and construction specifications for the dispersal system shall be strictly adhered to, including specified depth of trenches in relation to site limiting conditions, cover material specifications if needed, trench installation method, etc.

I. All individuals or companies installing Eljen GSF A42 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 Eljen Corporation.

J. The authorized installer, PE, AOWE, or authorized designer, and the operator authorized in writing by Eljen Corporation (authorized operator), shall conduct a final inspection and start-up of the Eljen GSF A42 system and all associated system components. The LHD will attend and observe the final inspection and start-up.

VIII. Operation, Maintenance, Monitoring, and Reporting

A. Eljen GSF A42 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.

B. All Eljen GSF A42 systems require an operation and maintenance agreement between the system owner and Eljen Corporation, its authorized representative, or with an authorized operator in accordance with 15A NCA 18E .1302(c). The authorized operator must have 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 Eljen Corporation or authorized in writing by Eljen Corporation.

C. All Eljen GSF A42 systems shall be operated and maintained according to the latest version of Eljen Corporation's O&M manual.

D. At each Eljen GSF A42 system inspection the authorized operator shall follow service procedure steps identified in the Eljen Corporation O&M Manual and, at a minimum, observe, monitor, and record the following:
   1. Wastewater level in the tanks;
   2. Sludge and scum levels in all the tanks, measure and record;
   3. Clogging of effluent filter;
   4. Water tightness of tanks, risers and pipe connections at tanks;
   5. Operation of pumps, floats, valves, electrical controls and alarms, where applicable;
   6. Dispersal field pump delivery rate (drawdown test), determination of the average pump run time, and dispersal field dosing volume;
   7. Any structural damage, malfunctions, accessibility issues, adequate ventilation, positive drainage, odor issues, insect or wildlife infestations, approved vegetative cover over the dispersal field, saturation, ponding or surfacing of effluent on the dispersal field area, and the designated repair area remains intact and undisturbed;
   8. A sample of effluent collected from the sampling port as indicated in the approved sampling protocol to check for effluent clarity and odor;
   9. Samples of Eljen GSFA42 influent if needed;
   10. Readings from pump cycle counters and elapsed time meters or water meters; and
   11. System operating conditions from the review of stored data for indication of 7-day and 30-day flows and flow variances or other abnormal conditions.

E. Sampling
   1. All sampling shall be done in accordance with 15A NCAC 18E .1302 and .1709. Eljen GSF A42 systems shall be sampled annually when the design daily flow is less than or equal to 1,500 gpd. Systems with design daily flows greater than 1,500 gpd and less than or equal to 3,000 gpd shall be sampled twice a year.
   2. Effluent for all systems shall be tested for BOD_5, TSS, and NH_3. Sampling is not required for fecal coliforms when the site is found to be compliant with all other constituents in Table XXV

of 15A NCAC 18E .1201(a).

3. Influent samples, if needed, shall be taken from a sampling port located between the septic tank and the dispersal field or from the pump tank.
4. Effluent samples shall be collected from the sampling device.

F. Notification and Performance of Maintenance and Repairs

1. The authorized operator shall notify Eljen Corporation, the LHD, and the system owner within 48 hours of needed maintenance or repair activities including, but not limited to, landscaping, tank sealing, tank pumping, pipe or control system repairs, Eljen GSF A42 unit replacement, and adjustments to any other system component.
2. The authorized operator shall keep the septic tank outlet effluent filter or screened pump vault cleaned and in proper operating condition, as per manufacturer's recommendations.
3. The authorized operator shall notify the system owner, Eljen Corporation, and the LHD whenever the pump delivery rate efficiency or average pump run times are not within 25 percent of the initial measurements conducted prior to system start-up.
4. Tank compartments will be pumped as needed upon recommendation of the authorized operator and in accordance with the O&M Manual instructions. However, at a minimum, the septic tank will be pumped whenever the depth of both the sludge and scum is found to be more than one-third of the liquid depth in any compartment.
5. The tanks shall be pumped by a properly permitted septage management firm, and the septage handled in accordance with 15A NCAC 13B .0800.
6. All maintenance activities shall be logged and recorded in the authorized operator reports provided to the system owner, Eljen Corporation, and the LHD.

G. Reporting

1. The authorized operator shall provide a completed written report to the system owner, Eljen Corporation, and the LHD within 30 days of each inspection. At a minimum this report shall specify:
   a. The date and time of inspection;
   b. System operating conditions measured and observed according to VIII.E, F, G and H;
   c. Results from any laboratory analysis of any influent and effluent samples;
   d. Maintenance activities performed since the last inspection report;
   e. An assessment of overall system performance;
   f. A list of any improvements or maintenance needed;
   g. A determination of whether the system is malfunctioning, and the specific nature of the malfunction;
   h. A summary of the flow data retrieved from the data logging devices, the daily, 7-day, and 30-day flows, flow variances, and other operating conditions; and
   i. Any changes made in system settings based on recommendations of the manufacturer.
2. Proposal for Evaluation and Reporting
   a. The manufacturer shall maintain a contract for evaluation of the performance of the Provisional wastewater system with an independent third-party laboratory, consultant, or other entity that has expertise in the evaluation of wastewater system and that is approved by the Department.
   b. An annual report is due with the approval renewal by November 30th of every year from the third-party. The reports shall include the following information at a minimum:

i. list of all systems currently installed under the Provisional Approval;
ii. results of all effluent quality samples collected, including a table summarizing all the effluent quality results;
iii. results of all ponding measurements
iv. flow monitoring, type of facility, and occupancy information;
v. copies of all authorized operator inspection reports;
vi. assessment of system performance in relation to effluent quality standards and showing compliance with 15A NCAC 18E .1709 and .1710;
vii. assessment of physical and chemical properties of the materials used to construct the system in terms of strength, durability, and chemical resistance to loads and conditions experienced and showing compliance with 15A NCAC 18E .1705(a)(2);
viii. recommended areas of applicability for the system; and
ix. conditions and limitations related to the use of the system.

c. Upon completion of the research and testing protocol, the third-party shall submit a final report to the State. This report shall be submitted in conjunction with Eljen Corporation completing an application for Innovative Approval.
d. The final report shall contain the following information at a minimum:
   i. list of all systems currently installed during the Provisional Approval period;
   ii. results of all effluent quality sampling and ponding measurements, including tables summarizing all the effluent quality and ponding results;
   iii. flow monitoring information;
   iv. copies of all ORC inspection reports;
   v. assessment of system performance in relation to effluent quality standards and showing compliance with 15A NCAC 18E .1709 and .1710;
   vi. assessment of physical and chemical properties of the materials used to construct the system in terms of strength, durability, and chemical resistance to loads and conditions experienced and showing compliance with Rule .1969(g)(2)(B), and hydraulic performance;
   vii. recommended areas of applicability for the system; and
   viii. conditions and limitations related to the use of the system.
e. The Final Report shall be in electronic format and may be published on the On-Site Water Protection Branch's website without confidentiality. The contents of the reports shall not be altered from the original document without approval from Eljen Corporation.
f. The research and testing protocol shall be managed by 3-Engineering, LLC or other approved third-party evaluator and includes the following minimum activities outlined in a detailed protocol that is appended to this Provisional Approval:
   i. A minimum of 50 complete data sets shall be collected from a minimum of 15 sites each, for NSF-40 and TS-I systems.
   ii. A complete data set includes the following information: influent BOD (NSF-40 and TS-I systems) and TKN (TS-I systems); and effluent CBOD and TSS (NSF-40 and TS-I systems), and fecal coliforms and NH_4-N (TS-I systems). There must be at least 30 days between samples collected from any one site.
   iii. Samples shall be collected from all sites. A site may be excluded if adequate justification is provided that the site is unsuitable as a test site. The samples from that site must be provided but will not be used as part of the data evaluation.

iv. Each site shall produce a minimum of two complete data sets collected over at least a 12-month period.
v. For coastal resort communities, two samples shall take place between June 1 and September 8 of each year. The samples must be taken at least six weeks apart.
vi. Other seasonal homes shall be inspected by the ORC and sampled during the projected times of peak use and/or occupancy. Samples shall not be collected during periods with limited or no occupancy.
vii. The samples will be collected during a scheduled visit by the ORC.
viii. A copy of the sample results will be provided to the On-Site Wastewater Branch after the analyses.
ix. Data from Eljen GSF A42 systems installed on NSF-40 sites and designed to meet NSF-40 effluent quality standards, may be sampled for TS-I parameters, and may be used in support of attaining TS-I Innovative Approval status. If analyzed, data for all TS-I parameters shall be reported, even if not ultimately utilized as a compliant site for TS-I approval.
x. Hydraulic performance shall be assessed based upon ponding conditions measured in 3-inch wide observation ports extending to finished grade shall be installed for each system at the Eljen-specified artificial system sand-soil interface on the trench/bed bottom and on the top of the cuspated units. Observation ports to the sand-soil interface shall be installed a minimum of 2-inches away from the cuspated units, to avoid short-circuiting from the unit to the sand-soil interface
    (a) For trench configurations, two observation ports located adjacent to the cuspated unit that terminate at the sand-soil interface shall be installed for each trench: one at proximal end and one at the distal end of the trench.
    For a bed configuration, hydraulic performance observation ports located adjacent to the cuspated units that terminate at the sand-soil interface shall be installed, as follows:
        (1) For beds up to nine feet wide, a minimum of three ports shall be installed: one located at the beginning, middle, and the end of the bed and staggered within the bed
        (2) For beds wider than nine feet, a minimum of five ports shall be installed.
    (b) For a trench or bed configuration each row of Eljen GSF A42 product shall include three observation ports that terminate at the top of the cuspated units shall be installed for each row of Eljen GSF A 42 units: one at the proximal end, one at the distal end, and one in the center of each row.
    (c) One of each type of observation port shall be installed within 10-ft of any sampling port installed for effluent monitoring.

    The hydraulic performance shall be assessed in accordance with the following:
    (a) a minimum of 15 NSF-40 and 30 TS-I sites shall be evaluated for hydraulic performance.
    (b) a minimum of 5 NSF-40 and 10 TS-I sites shall be evaluated for hydraulic performance in each of the three geographic regions of the state (Coastal, Piedmont, Mountain) prior to granting innovative approval for use in that portion of the state.
    (c) a least 95 percent of all observations, and 95 percent of all sites shall “pass” the hydraulic standard during each site assessment. A minimum of 90 percent of all

approval criteria must be met for all sites within a single geographic region of the state.

(d) Pass criteria for hydraulic performance is effluent ponding no higher than 3-inches above the sand-soil interface and no higher than 2-inches above the top of the cuspated unit observation ports; and for the site average ponding levels of 3-inches or less in all sand-soil interface observation ports and 2-inches or less in the top of the cuspated unit observation ports. Observation data can be discarded if a 1 inch or greater rainfall occurred in the last 24 hours. Failed observation data can also be discarded if the port is re-inspected from no more than 3 days afterwards and found to pass upon re-inspection.

(e) at least one measurement for each site used for the hydraulic assessment shall be taken during a typical wet-weather period, January through March, and after the system has been in use for at least six months, and no more than two measurements taken at a single site shall be used for the overall hydraulic assessment. Observation port readings shall be taken from all observation ports during each effluent sampling collection day, and all data collected shall be reported.

xi. In order to meet the effluent monitoring and hydraulic assessment criteria in this Paragraph, data may be presented that has been collected as part of a comparable third-party evaluation in another State or Canada.

IX. Responsibilities and Permitting Procedures

A. Prior to the installation of an Eljen GSF A42 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 Authorized On-Site Wastewater Evaluator (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 used of the Innovative system. The OP will include all conditions specified in the IP and 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, an evaluation and written, sealed report from a Licensed Soil Scientist (LSS) regarding the site shall be provided to the LHD. The report shall contain the information as 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. Eljen GSF A42 systems shall be designed by an authorized designer, AOWE, or a PE. Systems over 1,000 gpd, or as required in accordance with 15A NCA C18E .0303(a) shall be designed by a PE.

E. Prior to the LHD issuing a CA for an Eljen GSF A42 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. It is recommended that local authorized environmental health practitioners attend a design training session offered by the manufacturer or authorized representative prior to permitting the system. Also, at the request of the LHD, a Regional Engineer will review the design.

G. For sites required to be evaluated by an LSS or Licensed Geologist (LG), see Section V and IX.C, the LHD, AOWE, or PE may specify as a condition of the IP and CA 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.

H. The authorized operator shall be present during the final inspection of the system prior to the issuance of the OP or ATO.

I. The LHD shall issue the OP after the following:
   1. Field verification of installation completion;
   2. Receipt of written documentation from the authorized designer, AOWE, 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 Systems

The provisions of 15A NCAC 18E .1306 shall govern the use of the Eljen GSF A42 System for repairs to existing malfunctioning wastewater systems.

Approved By: _____ Date: _____

Attachment A: **SYSTEM SAND SPECIFICATIONS**

To ensure proper system operation, the system must be installed using ASTM C33 sand with the additional requirement for the sand to have less than 10% passing a #100 sieve and less than 5% passing a #200 sieve. Listed below is a chart outlining the sieve requirements for the Eljen-Specified System Sand. Ask your material supplier for a sieve analysis to verify that your material meets the required specifications.

Eljen System Sand Specification (modified from ASTM C33)		
Sieve Size	Sieve Square Opening Size	Specification Percent Passing (Wet Sieve)
3/8 inch	9.52 mm	100
No. 4	4.76 mm	95 - 100
No. 8	2.38 mm	80 - 100
No. 30	590 µm	25 - 60
No. 50	297 µm	5 - 30
No. 100	149 µm	< 10[1]
No. 200	75 µm	< 5[2]

1: ASTM C33 Specification for percent passing No. 100 Sieve is 0 to 10%

2: ASTM C33 Specification for percent passing No. 200 Sieve is 0 to 5%

Attachment B: Sizing Calculation Examples:

Example Premise:

Three bedroom residence, six occupants, design daily sewage flow 360 gpd, on a loamy sand (Group I)

Total computed **trench bottom area** is: 360 gpd/1.0-gpd/ft.^{2} LTAR = 360 ft^2

1. Eljen GSF A42 NSF-40 Trench System:

   360 ft^2 x (0.75) 25% Trench Bottom Area Reduction[1] = 270 ft^2

   270 ft^2/3 foot wide trench = 90 linear ft

   OR

   The required linear footage for Eljen GSF A42 NSF-40 system is:

   360 ft^2/4.0 ft = 90 linear ft

   Where 4.0 ft. is the equivalency factor for the Eljen GSF A42 NSF-40 trench system[1]

2. Eljen GSF A42 NSF-40 Bed System:

   Total computed **bed bottom area** is:

   360 ft^2 x 1.50% Bed Bottom Area Increase = 540 ft^2

   540 ft^2 x (0.75) 25% Bed Bottom Area Reduction[1] = 405 ft^2

   OR

   360 ft^2 x 1.125% Bed Bottom Area Increase = 405 ft^2

3. Eljen GSF A42 TS-I Trench System:

   360 ft^2 x (0.50) 50% Trench Bottom Area Reduction = 180 ft^2

   180 ft^2/3 foot wide trench = 60 linear ft

   OR

   The required linear footage for Eljen GSF A42 TS-I system is:

   360 ft^2/6.0 ft = 60 linear ft

   Where 6.0 ft. is the equivalency factor for the Eljen GSF A42 TS-I Trench system

4. Eljen GSF A42 TS-I Bed System:

   Total computed **bed bottom area** is:

   360 ft^2 x 1.50% Bed Bottom Area Increase = 540 ft^2

   540 ft^2 x (0.50) 50% Bed Bottom Area Reduction[1] = 270 ft^2

   OR

   360 ft^2 x 0.75% Bed Bottom Area Reduction[1] = 270 ft^2