

Remote Systems Resource Package

Remote Septic Systems Policy and Procedure

I. Permitting:

This document sets forth minimum design criteria, policies and procedures for the use of off-site or remote drainfield sites. The design criteria are minimum in nature and may not address all aspects of remote systems. All other appropriate requirements of 15NCAC 18A .1900 shall apply. Use of the proposed remote system and any conditions shall be described in the Construction Authorization. Such information shall also be described on the Operation Permit to be issued upon the acceptable completion of the system installation.

II. Remote System Terms:

- a. Remote System
 - i. Standard 1 – means that the entire wastewater system drainfield (initial and repair area) is located in an easement area, common area, or special purpose lot on a separate parcel from the dominant lot.
 - ii. Standard 2 – means that either the entire initial drainfield or repair area (but not both) is located in an easement area, common area, or special purpose lot separate from the dominant lot.
 - iii. Standard 3 – means a system that is not described in Standard 1 or 2 and any portion of the wastewater system is located more than 500 feet from the facility.
 - iv. Standard 4 – means that a portion of either the initial system or repair area is located in an easement area, common area, special purpose lot, or crosses a property line into an area contiguous and adjacent to the dominant lot.
- b. Tri-party agreement – An agreement in accordance with .1937(h) between the Developer, Homeowners Association, and Local Health Department.
- c. Easement – A document that is recorded at the Register of Deeds and contains all applicable provisions of rule .1938 j.
- d. Common Area – An area in a subdivision that is owned and controlled by the Homeowners Association.
- e. Special Purpose Lot – A non-build able lot designated for the sole purpose of installing, maintaining, monitoring and repairing a remote wastewater system.
- f. Supply line – A watertight pipe used to convey effluent from the septic tank or pump tank to the distribution device or drainfield
- g. Supply line network – A group of two or more supply lines ganged in one easement.
- h. Facility- means one or more dwelling units, places of business, or places of public assembly that generates wastewater.
- i. Drainfield Alternating Device – a manual or automatic device that diverts flow of wastewater from one drainfield (nitrification field) to another.
- j. Dominant Lot – the lot or parcel of land on which the facility served by a remote system is located.

III. System Description:

- a. Minimum pretreatment by septic tank and effluent filter as required in 15A NCAC 18A .1952.
- b. Pump Dosing Tank if necessary
- c. Pump and appurtenances, if necessary
- d. Pressure manifold, LPP distribution system, valve(s) or other pressure dispersal device if necessary
- e. Supply line and appurtenances
- f. Nitrification field(s)

IV. Responsibilities and Permitting Procedures:

- a. An application for a remote system shall include everything as required in Rule .1937.
- b. Prior to the issuance of an Improvement Permit for a standard 1, 2, 3(b), and 4 remote system site the following items shall be completed.
 - i. Nitrification field laterals shall be staked out by use of an engineer's level or laser level to assure conformation with natural contours.
 - ii. The proposed laterals shall be measured to verify design requirements for sizing, location and separations. Allowances shall be made for additional area as needed to accommodate staging of materials and maneuvering of construction equipment without encroaching on other properties or system areas.
 - iii. A site drawing shall be prepared that includes:
 - 1) line length;
 - 2) flag colors;
 - 3) line elevations (as applicable);
 - 4) proposed easement and/or property lines
 - iv. All proposed easement and/or property lines shall be staked in the field and labeled for LHD review; and
 - v. Other site specific data as deemed necessary by the LHD such as:
 - 1) mounding analysis,
 - 2) lateral and vertical flow analysis, and/or
 - 3) deep soil borings (>48"), permeability and hydraulic conductivity measurements, water level readings, and other information.
- c. All remote wastewater systems shall be designed by a professional engineer, local health department or by individuals with demonstrated knowledge. Plans shall incorporate best management practices and accepted design standards including, but not limited to: minimizing supply line crossings and lengths, accessibility of drainfields and other system components, and facilitation of the installation, operation, repair, and maintenance of the system.
- d. The system shall be designed by a professional engineer when:
 - i. pretreatment components have not received prior state approval, or
 - ii. daily flow exceeds 3,000 gallons per day, or
 - iii. duplex pumps are required (duplex pumps are required if linear footage of nitrification trenches exceeds 2000 feet), or
 - iv. supply line networks within one easement are conveying more than 1500 gpd total flow, or
 - v. When deemed necessary by the local health department.

Plans and specifications shall be prepared, reviewed and approved in accordance with Rule .1938 (i).

- e. Prior to the issuance of an Authorization to Construct, any easements for the remote septic system shall be executed and recorded with the county register of deeds. All easement areas and property lines shall be surveyed and marked in the field. Any required draft tri- party agreement in accordance with .1937(h) shall be submitted to the local health department for approval.
- f. An Authorization to Construct shall be issued that addresses each component of the remote system. Authorizations to Construct limited portions of the system (i.e. supply lines, nitrification fields, tanks and appurtenances) may be issued provided that the entire system is installed, tested, and approved prior to the issuance of the Operation Permit. All supply lines in a supply line network (standard 1 and 2 remote systems) shall be installed concurrently.
- g. All system components shall be installed by a contractor who is registered with the local health department. Prior to issuance of an operation permit for a remote system all of the following criteria shall be met, as applicable:
 - i. A contract for operation and maintenance shall be executed between the system owner and an ORC as required in accordance with Rule .1961(b) and Section VII of this document and shall remain in effect as long as the system is in use.
 - ii. The final tri-party agreement shall be executed and recorded at the Register of Deeds office.
 - iii. All inspections as required by the LHD shall be completed.
 - iv. For systems or system components required to be designed by a professional engineer or an authorized design individual, the owner shall submit:
 - 1) a written certification signed by the designer that the system was installed in accordance with the approved plans and specifications, and
 - 2) an as-built diagram representing the system components as they were installed.
 - v. All individual easement areas shall be surveyed and marked with permanent markers or monuments that are clearly labeled as to the easement area and the lot it serves. Markers shall meet minimum standards in accordance with the appendix.

V. System Sizing and Design Criteria:

- a. **Septic Tank:** The septic tank shall be designed and constructed in accordance with Rule .1952 and .1954 and sized in accordance with .1952 (b) (1). All septic tanks shall include a riser sealed to the outlet access. The riser shall extend above finished grade and shall be installed and maintained to prevent the inflow of surface water.
- b. **Pump Tank:** The pump dosing tank volume shall be not be less than the required septic tank volume and shall also provide for:
 - i. **Minimum pump submergence requirement:** Effluent volume that covers the pump and the pump housing, or in accordance with pump manufacturer's suggestions, but in no case shall less than 12 inches of effluent remain in the tank at all times. The pump intake shall be at least 5" from the interior bottom of the tank.
 - ii. **Minimum Dose Volume:** The volume needed to fill the nitrification lines to 66% of their capacity at each discharge except as required for low pressure pipe distribution, Modified Systems (.1956), and I & E systems.

- iii. High-Water Level Alarm: The high-water alarm that activates within six inches above the pump-on level.
 - iv. Emergency Storage Capacity requirement: Effluent volume that equals the design daily flow for the residence above the high-water alarm activation level.
- c. Supply line:
- i. Supply lines shall be located either individually in dedicated easements or within supply line networks (gangs) in common easements. Easements shall extend completely from the dominant lot to the drainfield area.
 - 1. Supply lines shall be located a minimum of 5 feet from the edge of an easement.
 - 2. Individual easements shall be a minimum width of 15 feet.
 - 3. Supply line network easements shall be under common ownership and provide for accessibility to all components for operation, maintenance and repair.
 - 4. Easements shall remain free of any encumbrances, structures, or other encroachments.
 - ii. Supply line design specifications shall meet the following minimum criteria:
 - 1. ***The discharge piping and supply line shall be at least 2 inches in diameter.***
 - 2. The ultimate pump size and supply line size shall be selected such that a velocity of at least two feet per second (minimum scour velocity) and no more than eight feet per second (to minimize water hammering) is achieved.
 - 3. An accessible ball valve and union and a check valve in the vertical position shall be provided on the pump discharge piping.
 - 4. Adequate anti-siphon devices (preferably a swing check valve that opens to atmosphere upon pump shutoff) shall be provided whenever the discharge orifice is at a lower elevation than the pump shutoff level.
 - 5. Watertight, flexible pipe seals (boots) shall be used for pipe penetrations through the pump tank wall.
 - 6. Supply lines shall be constructed of Schedule 40 PVC pipe labeled NSF-PW with solvent welded joints unless otherwise specifically designed and approved. All pipe, fittings, joints, installation and testing methods shall be in conformance with the appropriate ASTM or ANSI/AWWA standards as referenced in the appendix.
 - 7. All pipe segments shall be marked at the ends with an identifier (eg. lot number).
 - 8. An access vault with isolation ball valves shall be provided
 - a. every 1000 feet of supply line, and
 - b. whenever a supply line crosses another supply line
 - 9. An approved and accessible air release valve shall be provided in an access vault at all high points to prevent air locking of the supply line whenever

- a. An intermediate high point exists in the supply line between the pump and the discharge point and the distance between the low point and high point in the force main exceeds 10 vertical feet, or
- b. the length of the force main exceeds 1000 feet.

Access vaults and the distal end of each supply line shall be permanently marked (e.g non-corrosive metal tags) with the lot number and shall contain isolation (ball) valves.

10. A minimum burial depth of three feet, as measured from the crown of the pipe to the ground surface, shall be provided throughout the length of the force main.
- d. Drain field: The nitrification field shall be sized by the LTAR as determined in .1955, .1956 and 1957.
 - i. Standard 1 – Initial system and repair system drainfields shall be installed prior to issuance of the Operation Permit.
 - ii. Standard 2 – Initial drainfield and the supply line to the remote system area shall be installed prior to issuance of the Operation Permit.
 - iii. Standard 3 and Standard 4- Initial system shall be installed prior to issuance of the Operation Permit.
 - iv. Remote drainfield areas shall be accessible by an all-weather roadway or driveway.
 - v. Drainfields and other supply line components shall be reasonably protected from traffic or other unauthorized access.

VI. Installation and Testing Procedures:

- a. A preconstruction conference shall be required to be attended by the system designer, installer, local health department, and the licensed soil scientist and registered professional engineer, as applicable, prior to beginning construction of the remote system.
- b. The septic tank, dosing tank, and pipe penetrations, and risers shall be demonstrated to be watertight by an acceptable leak test.
- c. Nitrification fields shall be graded to shed surface water and in a manner which facilitates easy maintenance with standard mowing equipment. A grass or other suitable vegetative cover shall be established so as to prevent erosion and to allow for effective system inspection.
- d. Force mains shall be pressure tested and leak tested according to the protocol outlined in the appendix. Testing results must be verified and documented by either a P.E. or the LHD representative. Appropriate isolation valves shall be provided if the force main is tested in segments.
- e. After backfilling the supply line and prior to system approval, the pump delivery rate shall be measured and verification made of the flow at the distal end of the supply line or distribution device.
- f. Drainfield alternating device(s) and other distribution devices shall be demonstrated to be functional and accessible from the finished ground surface.

VII. Operation, Maintenance and Monitoring Requirements

- a. System management shall be required in accordance with Rule .1961(b), Table V (b). However the following minimum inspection/maintenance and reporting requirements shall apply unless otherwise specified in the Operation Permit.

<u>Remote System</u>	<u>ORC Insp. Interval</u>	<u>LHD Insp. Interval</u>
Standard 1	1 year	5 years
Standard 2	1 year	5 years
Standard 3a (w/o easement)	N/A	N/A
Standard 3b (w/ easement)	1 year	5 years
Standard 4	N/A	N/A

- b. The Operator in Responsible Charge (ORC) shall provide monitoring reports to the local health department within 30 days of each required inspection. The ORC shall maintain a log of all malfunction incidences/notifications, observations and maintenance activities. Minimum maintenance during each required inspection shall include:
- i. visual observation of the drainfield,
 - ii. checking/cleaning filter screen(s),
 - iii. checking sludge levels of tankage
 - iv. measuring delivery rate,
 - v. visual observation of the supply line and appurtenant valves for leakage and damage,
 - vi. alternation of drainfield alternating devices,
 - vii. measuring of pressure head and flushing of distribution devices as applicable,
 - viii. assurance that the ground surface and vegetation over the drainfield and supply lines are maintained.
- c. The owner shall be responsible for assurance of all maintenance and repair of the system including the mowing of grass over the drainfield and maintenance of access of the supply line easement areas. The repair and maintenance responsibilities shall be clearly defined and specified in the tri-party agreement and easement as applicable.

VIII. Repair of System:

The provisions of 15A NCAC 18A .1961 shall govern the use of the remote septic system for repairs to existing malfunctioning wastewater systems.

APPENDIX:

- i. Sample Tri-party Agreement;
- ii. Sample Easement Document;
- iii. Sample Declaration Document;
- iv. Minimum Design Criteria for Pump and Supply Lines

- v. Sample ORC Inspection Form
- vi. Samples of Standard types Heath Ward
- vii. Surveying standards for monuments of type XXX. (Guilford County)

**Minimum Design Criteria
for
Effluent Pump Stations and Force Mains**

Purpose of this Document

This document sets forth minimum design criteria for the design of septic tank effluent force mains to be used for off-site or remote drainfield sites.

It should be noted that these design criteria are minimum in nature only. Specifically, this document presents baseline, fundamental design and construction requirements necessary for pump station and force main systems that may be designed within the local health department. Exceeding the requirements of the minimum design criteria is not only allowed, but also strongly encouraged when and where deemed necessary by the designer and/or the North Carolina-licensed Professional Engineer certifying the design. All other appropriate requirements of 15NCAC 18A .1900 shall apply.

1.01 *Application and Permitting*

- A. Compliance with referenced standards, 15A NCAC 18A .1900, these minimum design criteria, and the issued permit shall be required. If requested by the Local Health Department or as required by the rules, the applicant shall be required to submit documentation prepared by a registered professional engineer (P.E.). Such documentation shall include, but shall not be limited to the following:
 - 1. Engineering calculations that have been signed, sealed, and dated by a PE. Such calculations shall include, at a minimum, the following items:
 - a. Total dynamic head calculations for all applicable pumping situations.
 - b. System curve/pump curve analysis used to determine pump selection and operational point.
 - c. Minimum velocity within the force main.
 - 2. Construction record drawings that have been signed, sealed, and dated by a PE. Such drawings shall include, but shall not be limited to the following:
 - a. Plan and profile views of the force main as installed as well as its proximity to other utilities and natural resources. The locations of specific force main materials as well as any valves and other force main appurtenances shall be indicated.
 - 3. Documentation that the required quality assurance/control tests, as described in Section 5.00, were performed.
 - 4. Proof that operation and maintenance (O&M) manuals have been supplied to the applicant following construction and commissioning of the pump station/force main system.

2.00 Pump Design

2.01 *General Requirements*

- A. Only pumps designed and manufactured for use in conveying septic tank effluent shall be acceptable.
- B. Pump selection shall consider velocity of flow (between 2 and 8 f.p.s.) in the supply line, dosing volume, delivery rate (gpm) and total dynamic head.

2.02 Selection Methodology

Pump selection shall be based on a hydraulic analysis of the system through which the wastewater is to be conveyed.

1. A system curve, plotting total dynamic head versus capacity, shall be developed for all operating conditions that may be imposed on the system. Total dynamic head requirements for the system shall be calculated as the total of the following individual components:
 - a. *Static head* requirements of the system shall be evaluated. In addition to calculating static head with the discharge elevation of the force main, any intermediate high points in the force main that would have an effect on the total dynamic head requirements of the pump shall be analyzed.
 - b. *Friction head* requirements of the system shall be evaluated. The friction head shall be calculated using the Hazen-Williams formula:

$$h_f = L \left(\frac{4.73Q^{1.85}}{C^{1.85} D^{4.87}} \right)$$

h_f = friction head for pipe segment evaluated (feet)

L = length of pipe segment evaluated (feet)

Q = pumping rate (gallons per minute)

C = Hazen-Williams coefficient

D = diameter of pipe segment evaluated (inches)

- c. All operating conditions shall be evaluated including, but shall not be limited to, the possibility for gravity flow conditions in force main segments with extreme negative slopes that may not flow full.
- d. Head derived from any minor losses of the system shall be evaluated. Such minor losses shall include head derived from valves and other fittings such as tees, bends, angles, etc.
- e. *Pressure head* requirements of the distribution or dispersal component.

3.00 Pump Station

3.01 Piping, Valves and Appurtenances

- A. The discharge piping systems shall be a minimum of 2 inch diameter and be provided with sufficient valves to allow proper testing, operation, and maintenance of the pump station during both normal and emergency conditions.
 1. Selected valves shall be suitable for use with septic tank effluent and shall be of a design suitable for its function, its installation location, as well as the normal and maximum operating pressures expected at the pump station.
 - a. A full-closing shut-off (ball) valve shall be provided on the discharge piping of each pump.
 - b. A restrained joint union (disconnect) shall be located between the pump and the ball valve.
 - c. A check valve shall be provided on the discharge piping of each pump, between the pump and the shut-off valve. Check valves shall be placed in the vertical position. A vent hole shall be located between the check valve and the pump.

2. All valves shall be located such that they are readily accessible without entry into the vault, riser, or tank.
- B. Watertight, flexible pipe seals (boots) shall be used on pipes exiting the pump station structures to allow for differential settlement without compromising the integrity of pipe penetration seal.
- C. Each pump shall be provided with a corrosion resistant, lift-out chain or cable. Pumps in excess of 1.5 HP shall be provided with a properly sized guide rail system.

4.00 Force Main Design

4.01 Material

- A. Force mains shall be constructed of one of the following types of pipe:
 1. Ductile iron (DI)
 - a. DI pipe shall conform to ANSI/AWWA C151/A21.51 "Ductile Iron Pipe, Centrifugally Cast in Metal Molds for Water or Other Liquids."
 - b. The thickness and pressure class of DI pipe required for the installation and operating conditions during the expected service life of the force main shall be determined in accordance with ANSI/AWWA C150/A21.50 "Thickness Design of Ductile Iron Pipe."
 - c. Fittings for DI pipe shall conform to ANSI/AWWA C110/A21.10 "Ductile-Iron and Gray-Iron Fittings, 3 In. through 48 In. for Water and Other Liquids" or ANSI/AWWA C153/A21.53 "Ductile Iron Compact Fittings, 3 In. through 24 In. and 54 In. through 66 In., for Water Service."
 - d. Force mains of DI pipe shall have mechanical or gasketed push-on type joints. If exposed, force mains of DI pipe shall have flanged joints. Restrained joint DI pipe may be used for anchoring purposes as described in Section 4.03C.
 - i. Gaskets shall be manufactured of vulcanized natural or synthetic rubber in accordance with ANSI/AWWA C111/A21.11 "Rubber Gasket Joints for Ductile Iron and Gray-Iron Pressure Pipe and Fittings."
 - ii. Flanged DI pipe shall conform to ANSI/AWWA C115/A21.15 "Flanged Ductile Iron Pipe with Ductile Iron or Gray Iron Threaded Flanges."
 - e. Consideration shall be given to the existence of or the potential for development of corrosive environments within and outside the force main shall be performed. Sources of corrosion may include: acidic soils, septic wastewater, and air entrainment within the force main. Where corrosion is deemed to be a serious problem, DI pipe shall be provided with cathodic protection or an internal/external encasement, lining, or coating appropriate for the pipe material and situation. Such encasements, linings, and coatings shall be manufactured or applied in accordance with the appropriate ANSI and AWWA standards.
 2. Polyvinyl chloride (PVC)

- a. PVC material used in the manufacture of PVC pipe shall conform to ASTM D1784 “Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.”
 - b. PVC pipe shall conform to ASTM D1785 “Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, 120” or to ASTM D2241 “Poly(Vinyl Chloride) (PVC) (SDR-PR).”
 - c. The thickness and pressure class of PVC pipe required for the installation and operating conditions during the expected service life of the force main shall be determined in accordance with AWWA C900 “Poly(Vinyl Chloride) (PVC) Pressure Pipe, 4 In. through 12 In., for Water” or AWWA C905 “Poly(Vinyl Chloride) (PVC) Water Transmission Pipe, Nominal Diameters 14 In. through 36 In.”
 - d. Force mains of PVC pipe shall have gasketed push-on type joints. Gaskets shall be manufactured of elastomeric material in accordance with ASTM F477 “Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.”
 - e. Mechanical joint DI pipe fittings conforming to ANSI/AWWA C110/A21.10 or gasketed PVC fittings shall be used for force mains four inches in diameter and larger. Solvent-welded bell-end coupled pipe may be used for smaller diameter force mains.
3. High-Density Polyethylene Pipe (HDPE)
- a. HDPE pipe shall be produced from a high molecular weight, high density, polyethylene resin, meeting the requirements of ASTM D3350 “Standard Specification for Polyethylene (PE) Plastic Pipe and Fitting Materials.” Resin material shall be listed by PPI in the name of the manufacturer and shall be based on testing in accordance with ASTM D2837 “Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe.”
 - b. HDPE pipe shall conform to ASTM D3035 “Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter” or ASTM F714 “D3035 “Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter.”
 - c. The thickness and pressure class of HDPE pipe required for the installation and operating conditions during the expected service life of the force main shall be determined in accordance with AWWA C906 “Polyethylene (PE) Pressure Pipe and Fittings, 4 In. through 63 In., for Water Distribution.”
 - d. Fittings for HDPE pipe shall conform to ASTM D3261 “Standard Specification for Butt Fusion of Polyethylene (PE) Plastic Fittings for PE Plastic Pipe and Tubing ” and shall be manufactured by injection molding, a combination of extrusion and machining, or fabrication from HDPE pipe material.
 - e. Force mains of HDPE pipe shall be joined by the thermal butt fusion process and shall be performed in accordance with ASTM A2657

“Standard Practice for Heat Fusion Joining of Polyolefin Pipe and Fittings” and the manufacturer’s recommendations during installation.

4. All pipe used for force main construction shall be labeled or otherwise identified as conveying wastewater.

B. Diameter

A minimum two-inch force main shall be used.

- C. Velocity** Wastewater velocity occurring in a force main shall be calculated using the continuity equation:

$$v = \frac{0.409Q}{D^2}$$

v = velocity (feet per second)
Q = pumping rate of single pump (gallons per minute)

Force main diameter and pump delivery rate shall be designed to achieve a velocity between 2 and 8 feet per second.

D. Anchorage

1. Force mains shall be adequately anchored to resist thrusts that may develop at bends, tees, plugs, and at any other location where a change in flow direction occurs.
 - a. Such anchoring shall be provided through the use of concrete thrust blocking or restrained joint pipe.
 - i. Concrete thrust blocks shall be located between the fitting to be anchored and undisturbed soil material. Appropriate thrust reaction block bearing areas shall be calculated based not only on the maximum expected force but also on the soil material. Concrete thrust blocks shall have a minimum compressive strength of 2,000 pounds per square inch.
 - ii. Self-restrained joints or joints restrained with tie rods and clamps shall both be acceptable. In both cases, component parts shall either be manufactured of corrosion-resistant materials or coated liberally with a corrosion-retarding product.
 - b. Anchoring devices shall be designed to withstand force main pressures of at least 25 percent greater than the maximum pump shut-off head plus an allowance for water hammer and an appropriate factor of safety.

4.02 Surge and Water Hammer

Force main design shall be such that active devices for control of transient hydraulic conditions are minimized to the greatest extent possible. However, if this is not feasible, the following shall be acceptable control strategies:

1. Variable-speed pumps or constant-speed pumps in combination with control valves that open and close slowly.
2. Providing air scouring velocities in the force main.
3. Construction of the force main using a higher-strength pipe.

4. Vacuum relief valves in accordance with Section 4.05A.
5. Specialized control and/or release valves and other devices designed to prevent transient pressures from reaching levels that could damage the pump station and force main systems.

4.03 Appurtenances

- A. Air Release and Vacuum Relief Valves
 1. The route of the force main shall be such that the number of air release and vacuum relief valves are minimized to the greatest extent possible.
 2. An air release valve shall be provided at all high points to prevent air locking of the force main whenever the distance between the low point and high point in the force main exceeds 10 vertical feet or if the length of the force main exceeds 1000 feet. Air release valves shall be automatic and of the quick-opening, slow-closing type to prevent the development of hydraulic surge conditions.
 3. Consideration shall be given to locating vacuum relief valves at locations along the force main where sub-atmospheric pressures or column separation may occur.
 4. Anti-siphoning devices shall be located in the pump tank whenever the discharge outlet is located at an elevation below the pump shutoff point.

4.04 Installation

- A. Joints and Bedding
 1. Force mains shall be installed such that pipe and joint deflection is minimized.
 - a. Force mains of DI pipe shall be installed in accordance with AWWA C600 "Installation of Ductile Iron Water Mains and Their Appurtenances."
 - b. Force mains of PVC pipe shall be installed in accordance with AWWA C605 "Installation of Underground Installation of Polyvinyl Chloride (PVC) Pipe and Fittings for Water."
 - c. Force mains of HDPE pipe shall be installed as described in Section 4.01B.3.e. Contractors shall be fully-trained and qualified by the manufacturer to install HDPE pipe.
 2. Continuous and uniform bedding, haunching, and backfill that is appropriate for the soil type and pipe material shall be provided in the force main trench. All rocks in excess of 3" nominal diameter shall be removed from the backfill material. [Reference ASTM D2774??]
- B. Burial
 1. A minimum burial depth of three feet as measured from the crown of the pipe to the ground surface shall be provided throughout the length of the force main. Consideration shall be given to utilizing a greater burial depth in locations where the frost depth exceeds three feet.
 2. In the event that the appropriate installation depth cannot be met by the design, the force main shall be constructed of ductile iron pipe or provided with a ductile iron pipe encasement.
- C. Separations

1. Stream Crossings
 - a. Force mains shall be routed such that the number of stream crossings is minimized. When a stream crossing is required by the design, the crossing shall be as nearly perpendicular to the stream flow as possible.
 - b. DI pipe with joints equivalent to water main standards or a watertight ferrous encasement pipe shall be used to construct force mains that cross streams.
 - c. Force main bedding, haunching, and backfill shall be appropriate for the installation location and pipe material. However, the ability of the bedding and backfill material to readily erode, cause siltation, damage the force main during installation, and corrode the force main after installation shall also be considered.
 - d. Only DI with flanged joints, used in conjunction with adequate supports, shall be used for aerial stream crossings.
 - i. Supports for aerial stream crossings shall be designed to prevent frost heave, overturning, and settlement.
 - ii. The force man shall be adequately protected from freezing and heaving.
 - iii. The impact of floodwaters and debris shall be considered during the design of aerial crossings. The bottom of the force main pips shall be placed no lower than the elevation of the 25-year flood stage of the stream.
2. Road Crossings
 - a. When necessary to cross roads or other utility rights of way, the force main shall be located within an encroachment easement and shall be constructed of ductile iron pipe or provided with a ductile iron pipe encasement for the full width of the right of way or easement.

5.00 Quality Assurance and Quality Control

5.01 Force Main Testing

A. General

1. Prior to testing any segment of force main, care shall be taken to prevent the pipe from moving while under pressure.
2. Temporary taps and air releases shall be permissible to facilitate testing.
3. All testing shall be performed in the presence of the PE, or other authorized representative. The Local Health Department representative shall be notified of the testing schedule and shall have the opportunity to be present during the testing.
4. The results of all testing shall be maintained by the PE, certified, and submitted to the local health department.

B. Pressure Testing

1. A hydrostatic pressure test shall be performed on each segment of installed force main.

2. The test shall be performed after the force main has been backfilled and at least seven days following the pouring of the last thrust block.
3. The following procedures shall be followed in performing hydrostatic pressure tests on force mains:
 - a. The force main segment shall be carefully filled with water at a velocity of approximately one foot per second. Water may be introduced from either the pump station or a temporary connection made in the force main. Appropriate measures necessary to eliminate all air from the force main shall be taken during this process.
 - b. Once full of water, the force main segment shall be pressurized and allowed to stabilize at a minimum test pressure of 1.5 times the maximum design pressure of the force main pipe material and a minimum of 40 psi.
 - i. This pressure shall be maintained for at least two consecutive hours.
 - ii. If the stated pressure cannot be maintained, the applicant is responsible for assuring that the cause of test failure is determined, all necessary repairs are made, and repeating the hydrostatic pressure test until the force main segment passes.

C. *Leakage Testing*

1. A leakage test shall be performed on each segment of installed force main at the hydrostatic pressure test stipulated in Section 5.01B.
2. Leakage shall be defined as the quantity of water required to maintain a pressure within five pounds per square inch of the specified test pressure after the pipe has been filled with water and all air has been expelled.

All visible leaks shall be repaired regardless of the amount of leakage. If leakage exceeds this rate, the applicant is responsible for assuring that the cause of test failure is determined, all necessary repairs are made, and repeating the test until the force main segment passes.

3. The leakage test may be performed concurrently or separately with the pressure test stipulated in this section.

- D. Each layer of fill or backfill over the force main shall be compacted to a density needed to accommodate the use of the force main installation area or as otherwise may be required (e.g., encroachment agreement with the North Carolina Department of Transportation, etc.).

5.02 *System start-up*

- A. Drawdown Testing – The pump delivery rate shall be measured and recorded after the force main has been completely filled.
- B. Witnessed Testing – A verification shall be made while the pump is running that:
 1. There are no breaches, breaks, or leaks in the force main, and
 2. The flow is reaching the distribution outlet at the appropriate flow rate.

5.03 *Drainfield Site Criteria*

A. Location and Access

1. Remote Drainfield areas shall be accessible by an all-weather roadway.
 - a. The roadway shall be provided from a hard surface road.
 - b. Wherever practicable, no portion of the roadway shall be located below the 100-year flood elevation as identified on the most recent FEMA Flood Insurance Rate map when available or as established through appropriate modeling techniques.
 - c. The roadway shall be designed to accommodate the largest vehicle expected to service the pump station. In no case shall the roadway be less than 12 feet in width. Roadway widths may be reduced in order to mitigate wetland impacts.
 - d. At a minimum, the roadway shall be constructed from a six-inch layer of compacted aggregate base course (ABC) stone. In no case shall uncompacted gravel or stone material be allowed for roadway construction.

B. Security

- a. All access hatches to the pump station structures, control panels, and valve accesses shall be protected from tampering.
- b. Placards notifying of the presence of wastewater system components shall be provided and be readily visible.

**Minimum Design Criteria Summary
for
Effluent Pump Stations and Force Mains**

- A. Discharge piping within the pump chamber shall be at least 2 inches in diameter
- B. The ultimate pump and discharge piping size shall be selected such that a velocity of at least two feet per second (minimum scour velocity) and eight feet per second (to minimize water hammering) is achieved.
- C. An accessible ball valve and a check valve (vertical position) shall be provided on the pump discharge piping.
- D. Adequate anti-siphon devices (preferably a swing check valve that opens to atmosphere upon pump shutoff) shall be provided whenever the discharge orifice is at a lower elevation than the pump shutoff level.
- E. Watertight, flexible pipe seals (boots) shall be used on pipes exiting the pump tank.
- F. Force mains shall be a minimum of 3" diameter and constructed of
 - a. Ductile iron pipe,
 - b. PVC pipe with solvent welded joints or
 - c. HDPE pipe with butt fusion joints.

All pipe, fittings, joints, and installation and testing methods shall be in conformance with the appropriate ASTM or ANSI/AWWA standards as referenced in the appendix. Anchoring and thrust blocks shall be provided as indicated. Provisions for flushing the accumulation of solids shall be provided by one of the methods outlined in the appendix.

- G. All pipe used for force main construction shall be labeled or otherwise identified as conveying wastewater.
- H. An air release valve shall be provided at all high points to prevent air locking of the force main whenever the distance between the low point and high point in the force main exceeds 10 vertical feet or if the length of the force main exceeds 1000 feet.
- I. A minimum burial depth of three feet as measured from the crown of the pipe to the ground surface shall be provided throughout the length of the force main.
- J. Force mains shall be pressure tested and leak tested according to the protocol outlined in the appendix. Testing results must be verified by either a P.E. or the LHD representative. Valves shall be provided if the force main is tested in segments.
- K. The actual pump delivery rate must be measured and a witness of the delivery to the discharge orifice verified prior to the system approval.

EXAMPLE OF TRI-PARTY AGREEMENT

NORTH CAROLINA

[07-08-2005]

_____ COUNTY

[SAMPLE] AGREEMENT

THIS AGREEMENT made and entered into this the _____ day of _____, 20____, by the _____ County Health Department, hereinafter referred to as the "Department"; _____ hereinafter referred to as the "Developer"; and _____, a North Carolina non-profit corporation, hereinafter referred to as the "Association":

WITNESSETH:

1. The Developer is the owner of certain lands lying in _____ County, North Carolina, more fully described in the attached Exhibit A which is incorporated by this reference, upon which it is erecting or will erect facilities and other improvements, said lots being known as Lots _____ in _____ [subdivision or development].
2. The Developer desires to construct a wastewater collection, treatment and disposal system, or portions of a wastewater collection, treatment and disposal system to serve the lots and other improvements on said lands.
3. The Developer has applied to the Department for the issuance of permits pursuant to G.S. 130A-336 and 130A-337 to construct, maintain, and operate said wastewater collection treatment and disposal system.
4. The Developer has created a Homeowners Association by filing Articles of Incorporation for said Homeowners Association with the _____ County Register of Deeds and the North Carolina Secretary of State.
5. The Developer has formed the _____ [Special Homeowners Association], a non-profit corporation organized and existing under the laws of the State of North Carolina, for the purpose, among others, of assuring the operation, maintenance, and repair of the

wastewater collection, treatment and disposal system; and of collecting dues and assessments to provide funds for such operation, maintenance, and repair.

6. All parties desire to assure that the wastewater collection, treatment and disposal system serving Lots _____, in _____ [*subdivision or development*] is properly constructed, maintained, operated, and repaired in accordance with laws, rules, and permit conditions in order to protect the public health, the quality of the waters of the State and the public interests therein

NOW, THEREFORE, for and in consideration of the premises and the benefits to be derived by each of the parties hereto, the Department, the Developer, and the Association do hereby mutually agree as follows:

1. The Developer shall construct the wastewater collection treatment and disposal system in accordance with the permit, applicable rules, and plans and specifications hereafter issued and approved by the Department; and shall thereafter properly operate, maintain, and repair such systems in accordance with applicable permit provisions, rules, and laws until the entire system has been transferred to the Association.
2. The Developer shall not transfer ownership of the wastewater collection, treatment and disposal system to the Association until the system has been inspected, permitted, and determined to be operating in accordance with applicable rules and permit conditions.
3. The Association, after transfer of ownership of the wastewater collection, treatment and disposal system to it by the Developer, shall thereafter properly maintain, operate, and repair the system in accordance with laws, rules, and the conditions of the permit. The Association shall levy and collect the assessments provided for in its bylaws, including special or additional assessments; and, in the event that the sum realized by the levy of such assessments shall not be adequate to maintain, operate, and repair the system as required by laws and conditions of the permit, the Association shall take such action as is necessary to secure funds adequate for such purposes.
4. The Association, in its duly filed bylaws, shall identify the entire wastewater collection, treatment and disposal system as a common area which will receive the highest priority for expenditures by the Association, except for Federal, State, and local taxes and insurance.

5. The Association, upon dissolution, shall provide for the continued proper operation, maintenance, and repair of its wastewater collection, treatment and disposal system.
6. The Association, except upon dissolution , shall not transfer, convey, assign, or otherwise relinquish or release its responsibility for the operation, maintenance, and repair of its wastewater collection, treatment, and disposal system.
7. A copy of this agreement and the Articles of Incorporation of the Association shall be filed with the Register of Deeds of _____ County and with the Office of the Secretary of State of North Carolina.
8. A. copy of the certified Articles of Incorporation of the Association from the Secretary of State of North Carolina shall be filed with the Department.

IN WITNESS WHEREOF, this agreement was executed in triplicate originals by the duly authorized representative of the parties hereto on the day and year written as indicated by each of the parties names below:

THIS the ____ day of _____, 20_____.

BY AUTHORITY OF THE _____ HEALTH DEPARTMENT.

Health Director of _____ County Health Department

[Name of Developer]

By: _____

Attest: _____

[Name of Association]

By: _____

Attest: _____

EXAMPLE OF EASEMENT AGREEMENT

County Health Department
Environmental Health Section

EASEMENT NOTICE

The use of easements to grant permission for disposal of wastewater generated on one piece of property and disposed of on another site can be legally allowed by the _____ County Health Department if all of the following conditions are met:

- The property on which the wastewater is disposed has a site approved by the _____ County Health Department for an on-site wastewater system that does not interfere with any existing wastewater system or repair areas.
- All easements are reviewed for approval by the _____ County Attorney.
- An easement document has been properly executed and recorded at the _____ County Register of Deeds office. The easement shall be drawn by an attorney and shall be sufficient to pass title.
- The attorney shall also provide a “state of the title” document which details any existing liens or encumbrances. If there are any liens against the burdened property, all lien holders will be required to subordinate the easement to avoid complications in the future if one of the liens is defaulted on. In this case the subordination statement must be completed and recorded.

This packet contains the easement forms which will be used by your attorney to prepare the instrument to be recorded. This is a several step process of execution, review, approval and recordation. Please allow several weeks before the Construction Authorization is needed to allow sufficient time for this. A surveyor and a plat will be required if only a portion of the land is to be dedicated in the easement. Allow additional time for this. Below is an abbreviated process to follow, you will find a more detailed procedure within this packet.

1. Your attorney will fill out the form, with the appropriate legal description from the deed and/or surveyed plat.
2. Both property owners will sign and execute the easement, then the original and one copy of all the material from this packet, including the subordination statement and the opinion statement draft, needs to be returned to the Health Department for review.
3. After the review, the documents will be returned to you for your attorney to record and your attorney will provide the _____ County attorney with a statement to that effect.
4. Provided all other conditions have been met, the Construction Authorization can then be issued.

Prepared by:
Return to:

STATE OF NORTH CAROLINA

COUNTY OF _____

EASEMENT FOR
GROUND ABSORPTION SEWAGE
DISPOSAL SYSTEM

Know all men by these presents, that _____, hereinafter called GRANTORS, in consideration of One Dollar (\$1.00) and other good and valuable consideration paid by _____, hereinafter called GRANTEES, the receipt of which is hereby acknowledged, does hereby grant, bargain, sell, transfer and convey unto GRANTEES, their heirs and assigns, a perpetual easement with the right to erect, construct, install and prepare and thereafter use, operate, maintain, inspect, repair, replace and improve a sewage disposal system over and across the following servient land owned by GRANTORS in _____ Township, _____ County [description of lot or tract on which system easement is to be located]:

The easement for a sewage disposal system is specifically described as follows [description of easement for system]:

together with the right of ingress, egress and regress thereon for the benefit of the property of GRANTEES, which property is described in a deed recorded at Book _____, Page _____ in the County Registry.

The consideration recited herein shall constitute payment in full for any damages to the land of the GRANTORS, their successors and assigns, by reason of the construction, erection, installation, preparation, operation and maintenance of the structures or improvements referred to herein. GRANTEES covenant to maintain the easement and structures or improvements therein in good repair so that no unreasonable damages will result from GRANTEES' use of the adjacent land of GRANTORS. GRANTORS and

GRANTEES agree that neither shall erect, construct, implant or place any building or structure on the above-described easement, save and except a ground absorption sewage disposal system.

This agreement, together with other provisions of this grant shall constitute a covenant running with the above-described land of GRANTEES for the benefit of GRANTEES, their heirs and assigns, it being agreed that the right and easement hereby granted is appurtenant to and runs with the land of GRANTEES. GRANTORS covenant and warrant that they are the sole owners of the easement property; that it is free of all encumbrances; that they solely have the right to condition and restrict the easement property as herein described and that they will forever warrant and defend the title to the same against the lawful claims of all persons whomsoever.

IN TESTIMONY WHEREOF, GRANTORS and GRANTEES have hereunto set their hands and seals this the _____ day of _____, 20____.

L] [SEA
(Grantor)

L] [SEA
(Grantor)

L] [SEA
(Grantee)

L] [SEA
(Grantee)

STATE OF NORTH CAROLINA
COUNTY OF _____

I, a Notary Public of said State and County, do hereby certify that _____ personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and notarial seal, this the _____ day of _____, 20__.

Notary Public

My commission expires:

STATE OF NORTH CAROLINA
COUNTY OF _____

I, a Notary Public of said State and County, do hereby certify that _____ personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and notarial seal, this the _____ day of _____, 20__.

Notary Public

My commission expires:

lsg:_____county\easement form

Exhibit A

DRAFT OF OPINION STATEMENT

To be prepared and signed by the declarant's attorney and submitted with the Easement.

County Attorney

Dear *County Attorney*:

This opinion is given to you as _____ County attorney, to _____ County and/or whom it may concern, as requested and required, on behalf of _____ and _____. This is to certify that a certain Easement for Ground Absorption Sewage Disposal System has been recorded this day, _____, 20____, at _____ AM/PM in Book _____, Page _____, _____ County Registry.

This is to also certify that there are no prior liens which could adversely affect or cut off the effect of said Easement.

This is to also certify that the Easement is the same document submitted to _____ County for approval.

Sincerely,

SUBORDINATION STATEMENT

_____, Trustee for _____, (bank) beneficiary and note holder, execute this Declaration for the sole purpose of subordinating the lien created by their Deed of Trust, recorded in Book _____ at Page _____, _____ County Registry, which encumbers the subject property to the terms of the subject Declaration.

In testimony whereof, said _____ as Trustee and _____ have hereunto set their hands and seals, the day and year first above written.

_____, (SEAL) Trustee

_____, (bank)

By: _____ President

ATTEST:

_____, (CORPORATE SEAL) Secretary

NORTH CAROLINA _____ COUNTY

I, _____, a Notary Public for said County and State, do hereby certify that _____, Trustee for _____, personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal, this the _____ day of _____, _____.

_____, Notary Public

My commission expires: _____

NORTH CAROLINA _____ COUNTY

I, _____, a Notary Public for said County and State aforesaid, do hereby certify that _____, personally appeared before me and acknowledged that he is _____ Secretary of (bank)

_____, and that by authority duly given and as an act of the corporation the foregoing instrument was signed in its name by its _____ President, affixed with its corporate seal and attested by ___self as its _____ Secretary.

Witness my hand and official seal, this the _____ day of _____, _____.

My commission expires:

Notary Public

Inspection Form for Local Health Department

Permit # _____

TAX REFERENCE # _____

COUNTY HEALTH DEPARTMENT
WASTEWATER SYSTEM INSPECTION REPORT

SYSTEM OWNER : _____ SYSTEM OPERATOR: _____

ADDRESS: _____

LOCATION: _____ Installer _____

DATE OF INSTALLATION: _____ DATE OF THIS INSPECTION: _____ TIME _____

Conventional System
Innovative System

DATE OF LAST INSPECTION: _____

Pump Conventional-Pressure Manifold

LPP System Class: _____
OTHER

FACILITY:

Type, size, and sewage flow in accordance with permit?

Y N

TANKAGE:

Risers accessible, surface water diverted?

Risers structurally sound, watertight? Riser Type C TT EZ

Sanitary tee in good condition, effluent filter cleaned as needed?

Sludge _____ Scum _____ Tank solids under 1/3 full?

FILTER: Type _____ Free of solids?

In Place? Y N Secured? Y N

EFFLUENT DOSING SYSTEM:

Sludge _____ Scum _____ Tank needs pumping (over 1/3)?

Required pumps present, operating, and cycling properly?

High-water alarm present and operating properly?

Vent/floats/pipe/valves/disconnects in good working condition?

Control panel/electrical components in good condition?

SUPPLY LINE & GROUND ABSORPTION FIELDS:

Supply line easement/corridor evaluated, no line breaks?

No evidence of effluent surfacing/reaching surface waters?

Minimal ponding in subsurface trenches?

Surface water diverted around fields, no depressions ?

Line cover/vegetation adequate/maintained as needed?

Protected from traffic, destructive uses?

Distribution devices accessible, working properly, good condition?

Nitrification fields alternated if required?

Repair area properly reserved, maintained?

Turn-ups/cleanouts/valves intact and accessible?

No effluent standing in lower laterals?

Laterals free of excess solids, flushed as needed?

OPERATOR REPORTS RECEIVED / UP TO DATE?

DELIVERY RATE / PRESSURE HEAD (For systems with Pumps)

Design Rate

Measured Rate

PT- _____

_____ gpm @ _____ ft. _____ "/ _____ min. x _____ gpi = _____ gpm @ _____ ft. head

Left @ _____ ft. _____ "/ _____ min. x _____ gpi = _____ gpm @ _____ ft. head

Percent Efficiency of Delivery = _____%

etm(this) _____ - etm(last) _____ [X 60min]= _____ min X _____ gpm= _____ gals / _____ days = _____ gpd avg

IMPROVEMENTS NEEDED: _____

STATUS OF SYSTEM:

Compliant

Structurally Non-compliant

Malfunctioning

Incomplete Inspection

Needs Maintenance

If you have questions regarding this inspection report, contact The _____ County Health Department, Environmental Health Division at 919- _____ 8 AM - 5 PM

Environmental Health Specialist

Date

Inspection Form for Operator

Permit # _____

TAX REFERENCE # _____

COUNTY HEALTH DEPARTMENT
WASTEWATER SYSTEM INSPECTION REPORT

SYSTEM OWNER: _____ SYSTEM OPERATOR: _____

ADDRESS: _____

LOCATION: _____ Installer: _____

DATE OF INSTALLATION: _____ DATE OF THIS INSPECTION: _____ TIME _____

Conventional System DATE OF LAST INSPECTION: _____

Innovative System LPP System Class: _____

Pump Conventional-Pressure Manifold OTHER

6 month inspection Annual inspection

FACILITY:

Type, size, and sewage flow in accordance with permit?

Y	N
<input type="checkbox"/>	<input type="checkbox"/>

TANKAGE:

Risers accessible, surface water diverted?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Risers structurally sound, watertight? Riser Type C TT EZ

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------	--------------------------

Sanitary tee in good condition, effluent filter cleaned as needed?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Sludge _____ Scum _____ Tank solids under 1/3 full?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

FILTER: Type _____ Free of solids?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

 In Place? Y N Secured? Y N

EFFLUENT DOSING SYSTEM:

Sludge _____ Scum _____ Tank needs pumping (over 1/3)?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Required pumps present, operating, and cycling properly?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

High-water alarm present and operating properly?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Vent/floats/pipe/valves/disconnects in good working condition?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Control panel/electrical components in good condition?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

SUPPLY LINE & GROUND ABSORPTION FIELDS:

Supply line easement/corridor evaluated, no line breaks?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

No evidence of effluent surfacing/reaching surface waters?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Minimal ponding in subsurface trenches?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Surface water diverted around fields, no depressions?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Line cover/vegetation adequate/maintained as needed?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Protected from traffic, destructive uses?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Distribution devices accessible, working properly, good condition?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Nitrification fields alternated if required?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Repair area properly reserved, maintained?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Turn-ups/cleanouts/valves intact and accessible?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

No effluent standing in lower laterals?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

Laterals free of excess solids, flushed as needed?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

OPERATOR REPORTS RECEIVED / UP TO DATE?

<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	--------------------------

DELIVERY RATE / PRESSURE HEAD (For systems with Pumps)

Design Rate _____ Measured Rate _____ PT- _____

_____ gpm @ _____ ft. _____ "/ _____ min. x _____ gpi = _____ gpm @ _____ ft. head

Left @ _____ ft. _____ "/ _____ min. x _____ gpi = _____ gpm @ _____ ft. head

Percent Efficiency of Delivery = _____%

etm(this) _____ - etm(last) _____ [X 60min]= _____ min X _____ gpm= _____ gals / _____ days = _____ gpd avg

IMPROVEMENTS NEEDED: _____

STATUS OF SYSTEM: Compliant Structurally Non-compliant Malfunctioning

Incomplete Inspection Needs Maintenance

A copy of this report will be submitted to: The _____ County Health Department, Environmental Health Division,

_____, _____, NC _____

Certified Operator

Date