BEFORE THE TENNESSEE PUBLIC UTILITY COMMISSION
NASHVILLE, TENNESSEE

IN RE: **APPLICATION OF LIMESTONE WATER UTILITY OPERATING COMPANY, LLC, FOR AUTHORITY TO EXPAND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY TO INCLUDE THE LAUREL CREEK SUBDIVISION AND MOTION TO WAIVE COMMISSION RULE 1220-.04-13.17(c)(3)**	**DOCKET NO.** 22-00059

APPLICATION OF LIMESTONE WATER UTILITY OPERATING COMPANY, LLC, FOR: (1) AUTHORITY TO EXPAND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY TO INCLUDE THE LAUREL CREEK SUBDIVISION AND (2) MOTION TO WAIVE COMMISSION RULE 1220.04-13-.17(c)(3)

Pursuant to Tenn. Code Ann. §§ 65-4-104; § 65-4-201 and TPUC Rules 1220-01-01-.03, and 1220-04-13-.17, Limestone Water Utility Operating Company, LLC, ("Limestone" or "Applicant") respectfully submits this: (1) Application requesting the Tennessee Public Utility Commission ("TPUC" or "Commission") to authorize Limestone to expand its Certificate of Convenience and Necessity to provide wastewater services to customers in Sevier County, Tennessee in a subdivision known as Laurel Creek and (2) Motion to Waive Commission Rule 1220-.04-13.17(c)(3).

In support of its Application, Limestone submits the following:

I. Introduction

1. The full names, addresses, and contact information for the Applicant is as follows:

Limestone Water Utility Operating Company, LLC
c/o Josiah Cox
Central States Water Resources, Inc.[1]
1630 Des Peres Rd., Suite 140
Des Peres, MO 63131
(314) 736-4672
jcox@cswrgroup.com

2. All correspondence, notices, inquiries, questions, and other communications regarding the Application should be directed to the persons or entities identified in the preceding paragraph, with copies to the following counsel for applicant:

For Limestone:
Charles B. Welch, Jr.
Tyler A. Cosby
Farris Bobango PLC
414 Union Street
Suite 1105
Nashville, TN 37219

3. In support of this Application, the following appendices and exhibits are attached hereto:

a. Appendix 1 - Direct Testimony of Todd Thomas;
b. Appendix 2 - Requirements of 1220-04-13-.17;
Exhibit 1.1: Name and Address Information
Exhibit 1.2: Organization Chart
Exhibit 1.3: Owners, Officers and Members
Exhibit 1.4: Affiliates
Exhibit 1.5: Corporate Information
Exhibit 1.6: Business License
Exhibit 1.7: Geographic Territory
Exhibit 1.8: Proposed Wastewater System Type
Exhibit 1.9: Estimated Wastewater Construction Dates
Exhibit 1.10: Proposed Building Phases
Exhibit 1.11: Developer Identification
Exhibit 2.1: Letter from Existing Utilities

[1] Limestone is an "affiliate" of Central States Water Resources, Inc., as that term defined in TPUC Rule 1220-04- 13-.16(2)(a).

Exhibit 2.2: City and County Franchise Agreement
Exhibit 2.3: Developer / Utility Contracts
Exhibit 3.1: Biographies
Exhibit 3.2: State Wastewater Provider Status
Exhibit 3.3: Pending Mergers or Acquisitions (Waiver Sought)
Exhibit 3.4: Construction Contractor's License
Exhibit 4.1: TDEC State Operating Permit
Exhibit 4.2: State Operator Certificate
Exhibit 4.3: Contact Information
Exhibit 4.4: Complaints, Notices or Administrative Actions
Exhibit 4.5: Design Engineer Certification
Exhibit 5.1: Financial Statements
Exhibit 5.2: Pro-Form Income Statement
Exhibit 5.3: Chart of Accounts
Exhibit 5.4: Plant In Service
Exhibit 5.5: Depreciation Rates
Exhibit 5.6: Estimated Construction Cost
Exhibit 5.7: Ownership Statement
Exhibit 5.8: Wastewater Tariff
Exhibit 5.9: Estimated Annual Customer Additions
Exhibit 5.10: Local Bonding Requirements
Exhibit 5.11: Performance Bond for Construction
Exhibit 5.12: Funding Sources
Exhibit 5.13: TPUC Financial Security Requirement

I. Description of Limestone

4. Limestone is a Tennessee limited liability company. Its principal office and place of business is at 1630 Des Peres Rd., Suite 140, Des Peres, MO 63131. Having previously been found to have the necessary technical, financial and managerial expertise to operate as a water / wastewater utility, Limestone currently provides water and wastewater services to approximately 455 water customers and 1,558 wastewater customers in Tennessee. A certified copy of Limestone's articles of organization, operating agreement, and certificate of existence, as filed with or issued by the Tennessee Secretary of State's office, are attached to this Application as **Exhibit 1.5** and are incorporated herein by reference. Limestone's sole member is Limestone Water Utility Holding Company, LLC, ("LWUHC"), a Tennessee limited liability company, whose sole officer is its president, Josiah Cox.

Limestone and LWUHC are part of a group of affiliated companies that own and operate water or wastewater systems in Missouri, Arkansas, Kentucky, Louisiana, Texas, Mississippi, North Carolina, Arizona, Florida and Tennessee and provide water / wastewater services to approximately 87,498 customers throughout the nation. Each company within the group is an "affiliate" of each other company, as defined by TPUC Rule 1220-04-13-.16(2)(a). A corporate organization chart showing all affiliate relationships within the group is attached to the Application as **Exhibit 1.4.**

III. Description of the Expansion

5. As more fully described in Exhibits 1.7 and 1.8, Laurel Creek is an 11-lot residential subdivision on a 9.8 acre parcel in Sevier County. Public water supply to the development will be provided by Sevier County Water. Through this application, Limestone seeks to provide the necessary wastewater service to the subdivision. Wastewater services will be provided through a to-be constructed wastewater system. That system will utilize watertight, precast concrete septic tanks for each home with STEP system pumps and controls and PVC pipe collection force mains. Overall, the proposed force main length is nearly 945 linear feet. The second process wastewater treatment will be located in the west of the property and will consist of a Orenco System Advantex packed bed reactor sized at 5,000 GPD treatment capacity. Treated final effluent by the fixed film treatment process will then be pump dispersed into the shallow soil horizon drip field system on gradual slopes on the west side of the parcel. The written testimony of Todd Thomas describing this project is attached to the Application as **Appendix 1**. That testimony includes a signed affidavit that all information submitted in the Application and in Mr. Thomas' written testimony is true and correct to the best of the witness' knowledge and belief.

IV. Limestone Possesses the Technical, Managerial and Financial Expertise Necessary to Provide Utility Services

6. As reflected in previous applications, and more detailed in Appendix 2, Limestone possesses the requisite technical, financial, and managerial capabilities to operate as a utility services provider. These capabilities are further explained in detail below and in Mr. Thomas' direct testimony. As previously noted, in addition to the water and wastewater services Limestone already provides in Tennessee, CSWR-affiliated companies currently operate water or wastewater systems in 10 states. For each of these systems, CSWR provides the technical, managerial, and financial resources necessary to acquire and operate those systems. CSWR will continue to provide similar support for this expansion.

V. Approval of Limestone's Application is in the Public Interest

7. Granting Limestone's Application is consistent with the public interest. In that regard, Applicant makes the following representations to the Commission:

a. Limestone possesses the technical, financial, and managerial resources sufficient to provide the services requested;

b. Limestone's expanded certificate area services will meet the service standards required by the Commission;

c. The approval of the expanded certificate area will allow for the development of the area as more fully reflected in the Exhibits.

Limestone proposes to charge the rates currently being charged in the Cartwright Creek subdivision as provided in **Exhibit 5.8**.

VI. Motion for Waiver of Commission Rule 1220-.04-13.17(c)(3)

8. Commission Rule 1220-.04-13.17(2)(c)(3)(c) requires an applicant to provide "[c]opies of all contracts related to any pending merger or acquisition of the applicant, corporate parent or

affiliate." Regarding pending acquisitions involving Limestone, copies of required agreements can be found in the Commission's files for Docket Nos. 21-00059 (Candlewood Lakes Property Owners Association, Inc.), 21-00060 (Chapel Woods Homeowners' Association), and 21-00055 (Shiloh Falls Utilities, Inc.). For documents related to acquisition transactions involving Limestone's affiliates, Applicant seeks a waiver of the rule's requirements. For the reasons stated below, the requirement to produce copies of all pending acquisitions is unduly burdensome and will not provide information relevant to the issues the Commission must decide in this case – i.e., whether Limestone has the managerial, technical, and financial resources necessary to operate a wastewater utility in the area that is the subject of this application.

As the Commission knows from its consideration of Applicant's previous Tennessee acquisition applications, Limestone is part of a CSWR affiliate group providing water and/or wastewater services in 10 states. Pending applications in South Carolina will, if approved, increase that number to 11. Including Applicant's pending Tennessee applications and the South Carolina applications referenced in the preceding sentence, as of the date of this waiver request Limestone's affiliates have 45 acquisition applications pending in nine states. In addition, those affiliates have under contract 36 additional transactions that have not yet been submitted for regulatory commission approval. And because the CSWR affiliates continue to aggressively search for additional acquisition opportunities, still more such contracts are expected within the upcoming weeks and months. Therefore, strict compliance with Commission Rule 1220-.04-13.17(2)(c)(3)(c) would require Limestone to provide a copy of the purchase agreement in each of those transactions and may require supplemental filings as similar agreements are signed during the pendency of this case.

Although purchase agreements used for each of the aforementioned transactions are

substantially similar to one another, final terms are based on arms-length negotiations between Central States Water Resources (on behalf of its utility affiliates) and the sellers of each water and/or wastewater system the affiliate group seeks to acquire. Differences in terms from contract to contract are primarily attributable to the subjective circumstances and objectives of each individual seller, the totality of circumstances surrounding the proposed acquisition (e.g. the age and condition of plant assets, its location, debt or other obligations of the seller, and regulatory and environmental concerns. Therefore, because final contract terms are transaction-specific, it is a virtual certainty a contract for an unrelated acquisition transaction in another state would provide no information useful to the Commission in evaluating Limestone's request to expand its service area to include the Laurel Creek subdivision.

The general purpose of the Commission's *Minimum Requirements for New and Amendments to Certificate of Convenience and Necessity* is to "demonstrate to the Commission that [an applicant] possesses sufficient managerial, financial, and technical capabilities, to provide the wastewater services for which it has applied," and the specific purpose of Commission Rule 1220-.04-13.17(2)(c)(3) is to provide "[e]vidence that the applicant possesses sufficient managerial ability." For the reasons previously stated, requiring copies of all contracts related to pending acquisition transactions involving any Limestone affiliate does little or nothing to achieve that objective. In two prior cases – Docket Nos. 19-00062 and 2100053 – the Commission determined Limestone has the managerial, technical, and financial wherewithal to own and operate water and wastewater utilities in Tennessee. This application merely seeks to extend those capabilities to an expanded service area that includes the Laurel Creek subdivision. Examining contracts for transactions from other states that are completely unrelated to Limestone's Tennessee operations or the Laurel Creek subdivision would provide no information useful in evaluating

operational and financial capabilities the Commission already has determined Limestone possesses.

Consequently, for the reasons previously stated the Commission should grant Applicant's request for a waiver from the requirements of Commission Rule 1220-.04-13.17(2)(c)(3)(c) as they relate to purchase agreements involving affiliates. In lieu of copies of all such agreements, Limestone can provide – if the Commission believes it would be helpful and relevant – a list of all pending acquisition cases outside Tennessee involving a Limestone affiliate, including their respective docket numbers, so interested parties can review public records for whatever information from those cases the parties believe is germane.

VIII. Conclusion

9. Limestone believe it is in the best interests of the future customers, in the requested service area, for Limestone to expand its certificated area. Limestone has the capability and resources to ensure that the system is appropriately constructed and operated. Limestone is familiar with the requirements of TPUC Rules 122-04-13-.07 and .08 and 1220-04-13-.17(2)(e) regarding the need for wastewater utilities to demonstrate acceptable financial security to comply with those rules, and has previously secured a corporate surety bond, in the form prescribed in TPUC 1220-04-13-.08. Therefore, the issuance of the expanded CCN to Limestone serves the public interest.

WHEREFORE, for the reasons previously stated, Limestone requests the Commission issue an order:

a. Authorizing Limestone to expand its certificated service area to include the area described herein.

Dated: June 28, 2022

Respectfully submitted,

Charles B. Welch, Jr., Esq.
Tyler A. Cosby, Esq.
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Nashville, TN 37219
(615) 726-1200 (telephone)
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Attorneys for Applicant Limestone Water Utility Operating Company, LLC

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing has been served via either U.S. Mail, postage prepaid, or electronically to the following this 27 day of June, 2022.

Vance Broemel Karen H. Stachowski Terra Allen Consumer Protection and Advocate Division Office of the Attorney General P.O. Box 20207 Nashville, TN 37202	

Tyler A. Cosby

Tyler A. Cosby, Esq.

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IN RE: **APPLICATION OF LIMESTONE WATER UTILITY OPERATING COMPANY, LLC, FOR AUTHORITY TO EXPAND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY TO INCLUDE THE LAUREL CREEK SUBDIVISION AND MOTION TO WAIVE COMMISSION RULE 1220-.04-13.17(c)(3)**	**DOCKET NO. _____**

VERIFICATION

STATE OF MISSOURI)

COUNTY OF ST. LOUIS)

I, Todd Thomas, being first duly sworn, am authorized to represent and warrant, on behalf of Limestone Water Utility Operating Company, LLC, in the above-referenced docket. To the best of my knowledge, the statements in the Application filed in this Docket are true and correct. Limestone will comply with all applicable laws, regulations, and Commission rules. I declare under the penalty of perjury that the foregoing is true and correct.

Todd Thomas

Sworn and subscribed before me this 27th day of June, 2022.

Notary Public

DANIEL RYAN JANOWIAK
Notary Public, Notary Seal
State of Missouri
St. Charles County
Commission # 20374795
My Commission Expires 05-04-2024

My Commission Expires: 5/4/24

DIRECT TESTIMONY

OF TODD THOMAS

LIMESTONE WATER UTILITY OPERATING COMPANY, LLC

WITNESS INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Todd Thomas. My business address is 1630 Des Peres Road, Suite 140, St. Louis Missouri, 63131.

Q. PLEASE DESCRIBE CSWR, LLC AND GREAT RIVER UTILITY OPERATING COMPANY.

A. CSWR, LLC ("CSWR") is a holding company that currently operates utility operating companies in 10 states. Great River Utility Operating Company ("Great River" or "Company") is the CSWR utility operating company in the State of Mississippi.

Q. WHAT IS YOUR POSITION WITH CSWR?

A. I am Senior Vice President of CSWR, the affiliated company that has operational oversight over the CSWR operating companies including Great River. At CSWR, my responsibilities include the acquisition, development, and operation of CSWR-affiliated utilities. Among other duties, and relevant to this testimony, I am responsible for engaging and overseeing management and maintenance service providers including those contractors responsible for day-to-day operations and maintenance ("O&M") of CSWR operating affiliates like Great River. In addition, I am responsible for engaging and overseeing customer service and billing service providers. At the present time, I oversee

such activities for affiliated operating companies providing water or wastewater utility services to approximately 80,000 customers / connections in Kentucky, Missouri, Arkansas, Tennessee, Louisiana, Texas, Mississippi, North Carolina, Arizona, and Florida. As Mr. Cox mentions in his direct testimony, CSWR has additional applications pending in most of these states as well as South Carolina seeking authorization to acquire even more systems and customers. If those applications are approved, my oversight responsibilities will extend to those additional systems and customers.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL EXPERIENCE.

A. My education includes a Bachelor of Science in Civil Engineering from the Missouri University of Science and Technology, and a Master of Business Administration from Washington University in St. Louis.

Before joining CSWR, I was President of Brotcke Well and Pump (the 2nd largest well driller and service provider in the Midwest); Vice President of Operations and Business Development of the Midwest for American Water Contract Operations; and General Manager of Midwest Operations for Environmental Management Corporation. I currently serve on the East Central Missouri Board of Directions and am an Advisory Board member for the Public Water Supply District 2 of St. Charles County, Missouri which is the largest water and sewer district in the State of Missouri serving approximately 60,000 connections.

Brotcke Well and Pump serves municipal potable, regulated potable, and industrial ground water suppliers in the states of Missouri, Illinois, Kansas, Tennessee, Kentucky,

and Arkansas. Its total number of clients exceeds 200 and they range in size from the City of Bloomington, Illinois, with 31,000 water customers, to 230 customers in the City of Eminence, Missouri. Brotcke Well and Pump drills wells, cleans and treats wells, installs pumps, services pumps, rebuilds pumps, tests wells for regulatory compliance, and installs and services well controls. As President of Brotcke Well and Pump, I was involved in the design, maintenance, and repair of all client well systems. I have firsthand experience with how much damage can be done by lack of maintenance on a well system and how much money and effort is required to restore a well system after neglect.

As Vice President of Operations and Business Development of the Midwest for American Water Contract Operations, I was responsible for the water and wastewater operations and maintenance contracts for municipal and industrial clients. These clients included wastewater systems owned and operated by the City of St. Charles, in Missouri, and the cities of Godfrey, Mount Vernon, Quincy, Litchfield, Lincoln, Pittsfield, and Elwood in Illinois. These clients also included water and wastewater systems owned and operated by the City of Foristell, Missouri, and the Illinois cities of Brighton, and Monmouth. At one time I had responsibility for operating water and wastewater systems serving approximately 64,000 residential connections. My responsibilities included the direction and management of annual budgeting for each plant's operations and maintenance, design and planning of plant upgrades and maintenance projects, regulatory reporting, plant operations, and regulatory compliance of these systems.

My position as General Manager of Midwest Operations for Environmental Management Corporation was similar to my position with American Water Contract Operations with regard to the size and scope of the systems the company managed.

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS CASE?

A. The purpose of my testimony is to support the application filed in this case ("Application") through which Limestone asks that the Commission expand the company's CCN to allow it to own and operate a wastewater system to serve the Laurel Creek subdivision in Sevier County. My testimony describes the proposed expansion and explains why Limestone believes the expansion is in the public interest. Specifically, I will discuss the development envisioned for the proposed service area, as well as the need for the CCN expansion so that Limestone can operate the wastewater treatment system to be constructed for the proposed development.

I also describe Limestone's relationship to CSWR, the role CSWR would play in Limestone's operation of the wastewater system at issue in this case, and the benefits Limestone' relationship with CSWR would bring to customers served by that system. Finally, to the extent applicable, I provide the Commission information required by TPUC Rule 1220-04-13-.17(2) and other rules applicable to the Application. In this testimony, I also adopt the Application and verify that all information included there is true and correct to the best of my information and belief.

BACKGROUND INFORMATION REGARDING LIMESTONE AND ITS AFFILIATES

Q. PLEASE PROVIDE SOME BACKGROUND INFORMATION ABOUT LIMESTONE AND CSWR.

A. Limestone is a limited liability company formed to acquire water and wastewater assets in Tennessee and to operate those assets as a regulated public utility. In Docket No. 19-00062, involving Limestone's acquisition of Aqua, the Commission first authorized Limestone to operate in Tennessee. There the Commission held:

> Based on the evidentiary record, the Hearing Panel found that Limestone has the requisite managerial, technical, and financial capabilities to operate the water system and wastewater system in Hardin County serving Points of Pickwick, The Preserve, and Northshore (Phases 1, 2, and 3) now owned by Aqua.

The Commission subsequently repeated its finding regarding the managerial, technical and financial capabilities of Limestone when it approved the acquisition of Cartwright Creek and the expansion of the Limestone CCN.

> The Commission found that Limestone demonstrated that it has sufficient financial, managerial, and technical expertise to operate the Williamson County wastewater systems at issue.

As a result of these acquisitions, Limestone now serves approximately 455 water customers and 1,558 wastewater customers.

Limestone is a subsidiary of CSWR, a Missouri limited liability company formed to provide managerial, technical, and financial support to its utility operating affiliates. A corporate organization chart illustrating that relationship is included as **Exhibit 1.4** to the Application.

To date, CSWR-affiliated utility operating companies have acquired and are operating water or wastewater systems in Missouri, Arkansas, Kentucky, Louisiana, Texas, Mississippi, North Carolina, Arizona, Florida, and Tennessee. Furthermore, CSWR-affiliated entities have additional acquisitions pending in several of these states as well as in the state of South Carolina.

Q. WHAT IS CSWR'S BUSINESS PLAN WITH REGARD TO THE ACQUISITION AND OPERATION OF SMALL AND DISTRESSED WATER AND WASTEWATER SYSTEMS?

A. CSWR's business plan is to pursue the purchase and recapitalization of small water and wastewater systems and to operate those systems as investor-owned regulated utilities. Many of those systems are not currently regulated. Of those that are regulated, many, if not most, are out of compliance with utility commission rules and with federal or state pollution and safety laws and regulations. Indeed, many systems that CSWR acquires do not even have federal or state permits required to lawfully operate those systems. CSWR also has found that many regulated systems that it has acquired have not increased their rates for a decade or more and, as a result, lack the financial resources necessary to build, maintain, and replace assets used to provide service or bring operations into compliance with rapidly changing environmental and water quality regulations. Some systems that CSWR acquires are in receivership and, therefore, lack the ability to raise capital necessary to improve their systems. In contrast, since CSWR has found investors willing to make investments and take risks necessary to bring small water and wastewater systems into compliance with current statutes, rules, and regulations, it has been able to acquire distressed systems, upgrade or repair physical facilities, and operate those systems in a way that satisfies customers, regulators, and investors alike.

Q. PLEASE DESCRIBE CSWR-AFFILIATES' EXPERIENCE WITH WASTEWATER SYSTEMS.

A. If this application is approved, Limestone has the financial, technical, and managerial ability to serve the Laurel Creek subdivision in a manner that fully complies with applicable health, safety, and environmental protection laws and regulations and provides reliable, safe, and adequate service to customers.

Specifically, on the wastewater side of the business, CSWR affiliates (including Limestone) have purchased wastewater treatment plants with associated sewer pumping stations, gravity force mains, and gravity conveyance lines. With the approval of state wastewater regulatory authorities, since March 2015, CSWR-affiliated companies have designed, permitted, and completed construction, of numerous sanitary sewer system improvements. These improvements include wastewater line repairs to remove infiltration and inflow, building sewer main extensions, the repair of multiple lift stations, the construction of lift stations, the closure of an existing regulatory impaired wastewater system, building fully activated sludge plants, constructing moving bed bio-reactor plants ("MBBR"), converting multiple failing wastewater systems into sludge storage/flow equalization and treatment basins, converting failed mechanical systems to I-Fast systems, and constructing various other wastewater supporting improvements.

Q. DOES CSWR HAVE PERSONNEL QUALIFIED TO PERFORM THE SERVICES YOU IDENTIFIED IN YOUR PRECEDING ANSWER?

A. Yes. This fact is evidenced by the fact that CSWR is already providing those and other similar services for wastewater systems in Tennessee, as well as 9 other states. While I have already described my background and experience in the water and wastewater utility industry, the resumes of the other key members of CSWR's senior team who would be involved in Limestone's operations are included as **Exhibits 1.2 and 3.1**. The resumes of the CSWR senior team shows that Limestone is well-qualified to meet the demands of Limestone and its customers as well as any requirements of this Commission and other regulators charged with overseeing Limestone's operations. The types and quality of services that CSWR provides to Limestone are not typically available to small systems like

that at issue in this case. However, CSWR's business model was developed specifically to provide that expertise and experience to affiliates and to do so while achieving economies of scale attributable to CSWR's centralized management structure.

Q. PLEASE DESCRIBE THE CUSTOMER SERVICES THAT CSWR PROVIDES TO ITS AFFILIATE CUSTOMERS.

A. In addition to these operational capabilities, CSWR also provides customer service to customers that meet or exceed regulatory commission rules. CSWR provides 24/7 access to customer service representatives via phone and email. Similarly, CSWR provides around the clock emergency response to operational problems. Furthermore, through its website, CSWR customers can access information regarding advisories, payment options and customer education items. If the Application is approved, Limestone would provide this same level of customer service to the Laurel Creek customers.

Q. DO LIMESTONE AND CSWR HAVE THE FINANCIAL CAPACITY TO PROVIDE WASTEWATER SERVICE TO THE LAUREL CREEK SUBDIVISION?

A. Yes, Limestone and CSWR have the financial capacity to provide wastewater services to the Laurel Creek subdivision. The CSWR-affiliated group, of which Limestone is a member, has been able to secure an ongoing commitment from Sciens Capital Management, a Wall Street private equity firm. This capital commitment allows CSWR entities to not only purchase small, oftentimes distressed, water and wastewater systems, but to also make the investments necessary to bring those systems into compliance with applicable health, safety, and environmental protection laws and regulations. This

investment commitment also includes working capital necessary to operate until an application for compensatory rates can be prepared and prosecuted.

Q. HOW DOES LIMESTONE PROPOSE TO PROVIDE OPERATIONAL SUPPORT TO THE LAUREL CREEK SUBDIVISION?

A. As it currently does for its other Tennessee service areas, Limestone would hire a local, non-affiliated third-party Operations and Maintenance ("O&M") firm that has knowledgeable and experienced personnel, possesses requisite state licenses, and carries insurance coverage necessary to operate the Laurel Creek system.

In addition to its service obligations during normal business hours, the O&M firm would also be required to have a 24-hour emergency service line to deal with customers experiencing service disruptions. CSWR has developed a centralized computerized maintenance management system ("CCMS") that monitors the performance of both its drinking water and wastewater systems and allows it to track the ongoing maintenance and testing work performed by its O&M contractors. In addition, CSWR uses geographic information system ("GIS") survey information to accurately map all infrastructure assets, which allows the Company to specifically target ongoing infrastructure re-investment as part of the overall managerial and technical support CSWR provides each of its utility operating affiliates.

While day-to-day operational functions would be provided by non-employee contractors, all management, financial reporting, underground utility safety and location services, Commission regulatory reporting, environmental regulatory reporting and management, operations oversight, utility asset planning, engineering planning, ongoing utility maintenance, utility record keeping, and final customer dispute management would

be performed by personnel at CSWR's corporate office. CSWR personnel also would monitor the activities of the non-employee contractors to make sure the system is being operated and maintained properly and customers' needs are being met. As mentioned, the resumes of CSWR personnel who, in addition to me, would be responsible for providing services or oversight to Limestone's operation, are attached to the Application as **Exhibits 1.2 and 3.1**.

DESCRIPTION OF THE PROPOSED SERVICE AREA EXPANSION

Q. PLEASE DESCRIBE THE CERTIFICATE EXPANSION THAT LIMESTONE SEEKS IN THIS APPLICATION.

A. As more fully described in **Exhibit 1.8**, the proposed service area expansion is approximately 9.8 acres in Sevier County which consists of an 11-lot residential subdivision. Maps and aerial photographs showing the location of this system are provided as **Exhibit 1.7 and 1.8** to the Application. The subdivision is being developed by Westpark Investments ("Westpark").

Q. DOES THE PROPOSED SUBDIVISION FALL WITHIN THE SERVICE AREA OF ANY WATER / WASTEWATER PROVIDERS?

A. While public water supply will be provided to the subdivision by Sevier County Water, the proposed subdivision does not fall within the service area of any current wastewater providers. Specifically, the subdivision does not fall within the service area of either the Gatlinburg Utility District or the Sevier County Utility District.

For this reason, Westpark, developer of the Laurel Park subdivision, proposes to construct its own wastewater treatment facilities. As more fully described in **Exhibits 1.7 and 1.8**, the decentralized wastewater system will utilize watertight, precast concrete septic

tanks for each home with STEP system pumps and controls and PVC pipe collection force mains. Overall, the proposed force main length is nearly 945 linear feet of watertight PBV schedule 40 pipe. The secondary fixed film treatment system will be located in the west of the parcel and would consist of an Orenco System Advantex packed bed reactor sized at 5,000 gallons / day treatment capacity. Treated final effluent by the fixed film treatment process will then be pump dispersed into the shallow soil horizon drip field system on gradual slopes on the west of the parcel.

Q. WHAT IS LIMESTONE'S ROLE IN THIS PROJECT?

A. While Westpark plans to construct the wastewater treatment assets, it does not wish to be the ongoing operator of the treatment system. For this reason, Limestone was asked to accept ownership of the treatment system and accept ongoing responsibility for the operation of the system as well as providing wastewater services to the customers within this service area.

Q. IF THE COMMISSION APPROVES THE APPLICATION, IS LIMESTONE WILLING AND ABLE TO OPERATE THE WASTEWATER SYSTEM IN A MANNER THAT COMPLIES WITH APPLICABLE REGULATIONS?

A. Yes. If the Commission grants Limestone the authority it seeks in the Application, Limestone and CSWR are willing and able to operate the system in a manner that complies with applicable laws and regulations. As I described previously, the affiliate group of which Limestone and CSWR are part has access to capital adequate to operate that system in a manner that is in the public interest and complies with applicable statutes, rules, and regulations.

Q. WHAT RATES, RULES, AND REGULATIONS WOULD BE IN EFFECT FOR THE LAUREL CREEK SUBDIVISION?

A. Initially, Limestone proposes to utilize the rates, rules and regulations that are currently applicable to its Cartwright Creek service area. The applicable tariff is attached to the Application as **Exhibit 5.8**. That tariff would be applicable at least until Limestone files a Tennessee rate case. At that time, Limestone may seek to adjust the rates, rules or regulations for this service area. Limestone may also seek authority to consolidate the rates of this system with those of other systems it operates in Tennessee.

Q. ARE LIMESTONE AND CSWR FAMILIAR WITH THE COMMISSION'S RULES AND REGULATIONS GOVERNING WASTEWATER UTILITIES AND DO THOSE COMPANIES PLEDGE TO OPERATE THE SYSTEM AT ISSUE IN THIS CASE IN A MANNER THAT COMPLIES WITH THOSE RULES AND REGULATIONS?

A Yes, As indicated, Limestone currently operates in the state of Tennessee. Therefore, CSWR and Limestone are familiar with the Commission's rules and regulations and pledge to continue to operate the system in a manner that complies with all Commission requirements and all applicable state statutes and regulations.

Q. HOW DOES LIMESTONE PROPOSE TO SATISFY THE FINANCIAL SECURITY REQUIREMENTS IMPOSED BY TPUC RULES 122-04-13-.07 AND 1220-04-13-.08?

A. To demonstrate financial security as required by the Commission's rules, Limestone has already secured a corporate surety bond in the maximum required under the Commission's rule ($300,000) in a form that complies with TPUC Rule 1220-04-13-.08.

Q. DO YOU BELIEVE THE PROPOSED SERVICE AREA EXPANSION IS IN THE PUBLIC INTEREST?

A Yes. I believe Limestone's proposed expansion of its certificated service area, to include the Laurel Creek service area, would be consistent with and would promote the public interest. Limestone and CSWR are fully qualified, in all respects, to own and operate that system and to otherwise provide safe and adequate service. Furthermore, as previously explained, this approximately 10-acre tract is currently undeveloped. Through the operation of the wastewater facility to be constructed by Westpark, Limestone's service area expansion allows for the development of this land.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

BEFORE THE TENNESSEE
PUBLIC UTILITY COMMISSION
NASHVILLE, TENNESSEE

PETITION OF LIMESTONE WATER UTILITY OPERATING COMPANY, LLC TO AMEND ITS EXISTING SERVICE TERRITORY IN SEVIER COUNTY	)	**DOCKET NO. _____**

AFFIDAVIT

I, Todd Thomas, on behalf of Limestone Water Utility Operating Company, LLC hereby certify that the attached direct testimony represents my opinion in the above referenced case and is true and accurate to the best of my knowledge.

Todd Thomas Sr Vice President

Todd Thomas, Sr. Vice-President

Sworn to and subscribed before me this 27th day of June, 2022.

Notary Public

My Commission expires: 5/4/24

DANIEL RYAN JANOWIAK
Notary Public, Notary Seal
State of Missouri
St. Charles County
Commission # 20374795
My Commission Expires 05-04-2024

APPENDIX 2

TPUC CCN REQUIREMENTS

EXHIBIT 1
APPLICANT AND SYSTEM INFORMATION

Exhibit 1.1	Name and Address Information
Exhibit 1.2	Organization Chart
Exhibit 1.3	Owners, Officers and Members
Exhibit 1.4	Affiliates
Exhibit 1.5	Corporate Information
Exhibit 1.6	Business License
Exhibit 1.7	Geographic Territory
Exhibit 1.8	Proposed Wastewater System Type
Exhibit 1.9	Estimated Wastewater Construction Dates
Exhibit 1.10	Proposed Building Phases
Exhibit 1.11	Developer Identification

Provide the legal corporate name, physical address and mailing address of the applicant.

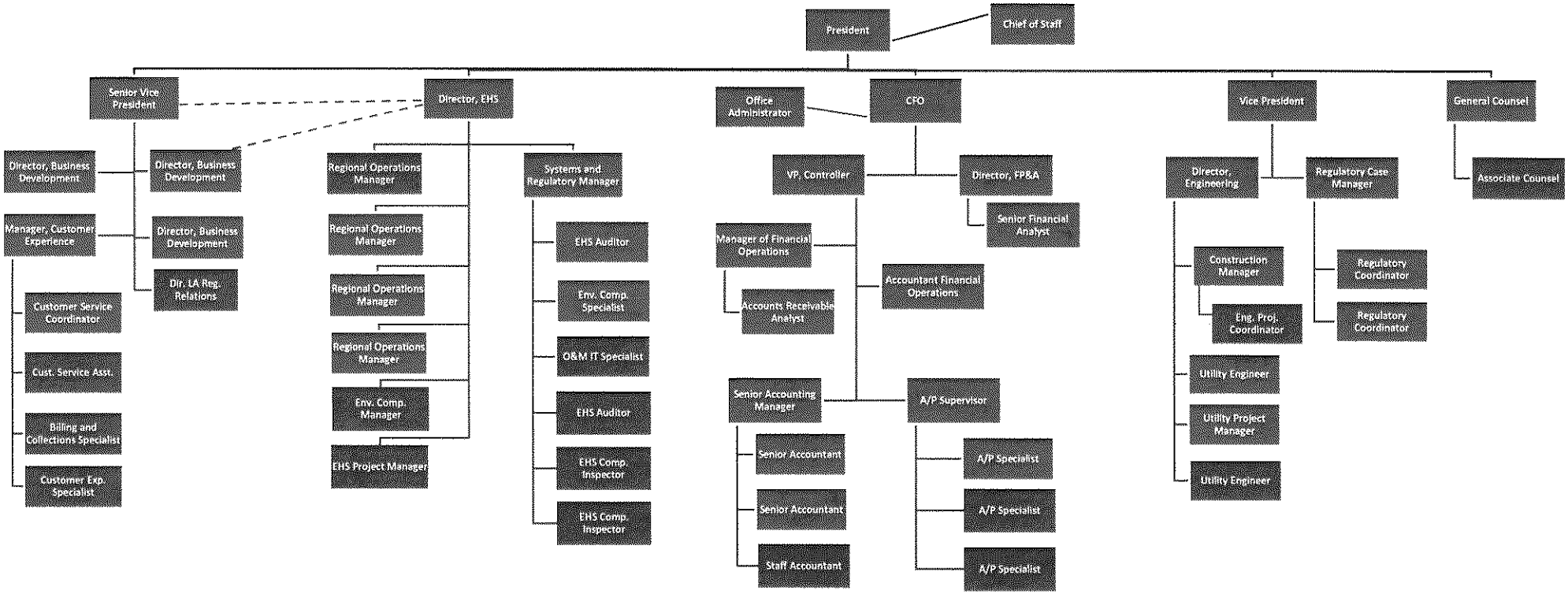
RESPONSE:

Limestone Water Utility Operating Company, LLC is a Tennessee limited liability company. Its principal office and place of business is at 1630 Des Peres Rd., Suite 140, St. Louis, MO 63131 which is the Company's physical and mailing address.

Provide an organizational chart showing each officer and any other key personnel by name and title.

RESPONSE: Please see the attached documentation.

CSWR EMPLOYEES



ATTACHMENT C

Josiah Cox – President

Mr. Cox is President of Red Bird Utility Operating Company, LLC, Red Bird Utility Holding Company, LLC, and also of CSWR, LLC, ("CSWR"). Both companies are part of an affiliated group that provide water or wastewater utility services to more than 40,000 customers in six states.

Mr. Cox received a Bachelor of Science with a major in Environmental Science from the University of Kansas. Professionally he has worked at the Kansas state biological survey, where he performed a wildlife habitat study. He then worked at a civil engineering firm where he was involved in various facets of the land development process including permitting, entitlement, civil design, project management, and construction management. He focused mainly on the water and wastewater side of the civil engineering business and participated in every part of that business from waste- load allocation studies (now known as the anti- degradation processes), design, permitting, project management, and construction management. He also ran the firm's environmental consulting division and was the second private consultant to submit a water quality impact study in the state of Missouri in 2003. He joined the engineering firm's executive leadership team and helped run all the firm's operations.

Beginning in 2005, he formed a full-service civil engineering, environmental consulting, general contracting, and construction management firm. He obtained extensive experience with rural communities in every facet of the water and wastewater compliance process, including environmental assessment, permitting, design, construction, operation and community administration of the actual water and wastewater (sewerage) systems. The firm performed stream sampling and built waste-load allocation models to determine receiving water-body protective permit- able effluent pollutant loads. They did full engineering design of multiple whole community wastewater and water infrastructure systems including wells, water distribution, water treatment, water storage, wastewater conveyance, and wastewater treatment plants and taken these designs through federal and state administered permitting processes in Missouri. The engineering firm also administered the construction of these water and wastewater systems from green field site selection all the way through system startup and final engineering sign-off. During this time, he also began the Master of Business Administration (MBA) program at Washington University in St. Louis, from which he graduated in 2007.

In addition, starting in 2008, he took over the operations of an existing rural sewer district, and he still operates a system managing the functioning, testing, and maintenance of the system. He also acts as the administrator for this municipal system performing all the billing, emergency response, accounts payable/accounts receivable, collections, budgeting, customer service, and public town meetings required to service the community.

In late 2010, after working on several small, failing water and wastewater systems, Mr. Cox created a business plan to acquire and recapitalize failing systems as investor-owned regulated water and wastewater utility companies. In early 2011, he went to the capital markets to raise money to implement my plan, and over a period of approximately three years met with over fifty- two infrastructure investment groups trying to raise necessary financing. In February 2014, he was able to raise sufficient debt and equity capital to start CSWR. In 2018, he attracted an additional large institutional private equity investor, which allowed CSWR to expand the scope of its business plan. Since its formation, CSWR has acquired, and currently is operating more than 257 water and/or wastewater systems in Missouri, Kentucky, Louisiana, Texas, Tennessee, and Arkansas.

Marty Moore – Chief Financial Officer

Marty Moore is the Chief Financial Officer of CSWR, LLC, and has held this position since April 2020. As CFO, Mr. Moore provides leadership, direction, and management to the finance and accounting teams, manages the process for financial forecasting, budgeting, and reporting and oversees the human resources and risk management functions.

After receiving a Bachelor of Business Administration in Accounting from Abilene Christian University, he gained a wide range of experience. Moore's extensive senior-level finance and operational experience includes serving as CFO of international automation equipment manufacturer Baldwin Technology Co., a company he helped Barry-Wehmiller/Forsyth Capital take private in 2012. Prior to that, Mr. Moore held senior leadership positions with Summit Marketing, Consolidated Terminals, Barnhill's Buffet Inc., and Global Materials Services. He began his career at Arthur Andersen. Moore most recently led finance and corporate services as CFO of Gardner Capital, a national affordable housing and renewable energy developer, investor, and tax credit syndicator. He has an extensive background in mergers and acquisitions and will work alongside Mr. Cox in accelerating the company's already rapid growth trajectory.

Todd Thomas – Vice President

Todd Thomas holds the office of Senior Vice President of CSWR, LLC. Mr. Thomas received his Bachelor of Science in Civil Engineering from The Missouri University of Science and Technology, and a Master of Business Administration from Washington University in St. Louis.

Before joining CSWR, Mr. Thomas was President of Brotcke Well and Pump, Vice President of Operations and Business Development of the Midwest for American Water Contract Operations, and General Manager of Midwest Operations for Environmental Management Corporation. Mr. Thomas currently serves on the Technical Advisory Team for the Public Water Supply District 2 of St. Charles County, MO.

Mr. Thomas's previous employment provided him extensive experienced in water and sewer utilities. He has extensive firsthand experience with how much damage can be done by lack of maintenance on a well system and how much money and effort is required to restore a well system after neglect.

In his position as Senior Vice President at CSWR, Mr. Thomas's main responsibilities include utility operations along with the acquisition, development, and rate stabilization of CSWR- affiliated utilities. Those duties include operations, maintenance, capital planning, and regulatory compliance for all affiliate-owned facilities. He is responsible for the management of all operations and maintenance service providers, customer service and billing service providers, and engineering firms.

Mike Duncan –Vice President

Mike Duncan is the Vice President of CSWR, LLC, and was promoted to that position in October 2020. As Vice President, he has played an integral role in preparing, filing, and processing acquisition applications in Missouri, Kentucky, Tennessee, Louisiana, Texas, North Carolina, and Mississippi. He also has taken a leading role in preparing and filing rate cases in Missouri, Kentucky, and Louisiana.

After receiving a Bachelor of Arts degree from Washington University in St. Louis, the first eleven years of his career were spent as an administrator and later director at a non-profit organization in St. Louis Missouri. As Director he oversaw accounting, finance, human resources, IT, and communications for the organization. During his employment he received a master's in business administration from Olin School of Business at Washington University. Prior to his employment with CSWR, he spent two years as Director of Operation with Auto Tire & Parts Napa, a partner-owned chain of auto parts stores, overseeing projects related to distribution, logistics, IT, and general management.

Jake Freeman – Director of Engineering

Jake Freeman is the Director of Engineering of CSWR, LLC, and has held this position since January 2019. As Director of Engineering, he oversees all engineering, surveying, and facility construction upgrades for all newly acquired CSWR water and sewer utilities including those in Missouri, Arkansas, Kentucky, Louisiana, Texas, Mississippi, Tennessee, and North Carolina. He also oversees ongoing capital upgrade projects on all CSWR affiliated and operated facilities.

After receiving a Bachelor of Science degree in Mechanical Engineering from the University of Missouri – Columbia, he spent the first two years of his career working for Corrigan Mechanical, a design-build mechanical contractor in St. Louis designing, estimating, and managing plumbing, HVAC and process piping construction projects in Missouri and southern Illinois. He then spent eleven years performing similar tasks for Brotcke Well & Pump, a well and pump service contractor servicing water wells and water treatment equipment throughout Missouri, Illinois, Kentucky, and Kansas. Prior to his employment with CSWR, he was serving as Vice President of Brotcke Well & Pump and Principal for their engineering services and managing their newly opened office in Kansas City.

Jo Anna McMahon - Director, Environmental Health and Safety

Jo Anna McMahon holds the office of Environmental Health and Safety Director of CSWR, LLC. Mrs. McMahon holds several top water and wastewater certifications throughout the country. She also has received her Bachelor of Business Administration degree from the University of Arkansas at Little Rock. She is currently pursuing an Executive Master's of Business Administration at Washington University in St. Louis, Missouri.

Before joining CSWR, Mrs. McMahon worked for both public and private utilities, respectively serving a municipality and military installations. Mrs. McMahon has extensive experience as both an Operations Coordinator and as a Specification Specialist.

Mrs. McMahon's responsibilities included managing daily operations of wastewater and water treatment facilities of various sizes, from 3,600 gallons per day (gpd) to 64,000,000 gpd. Throughout, Mrs. McMahon led teams of operators in creating and executing infrastructure improvement plans, managing and developing employees, and providing a standard of excellence in customer service while keeping facilities and operations within regulatory compliance.

Mrs. McMahon's previous employment provided her extensive experience in water and sewer utilities. She has a wide range of firsthand experience in managing water and wastewater treatment facilities safely and in a financially and operationally sound manner.

In her position as Environmental Health and Safety Director at CSWR, Mrs. McMahon's main responsibilities include overseeing the development of safety and regulatory compliance programs, budgeting/financial accountability, planning and executing capital improvements projects, and database management for operations and regulatory activity, for all 300+ CSWR-affiliated facilities, as well as managing third party Operations and Maintenance contractors of CSWR facilities.

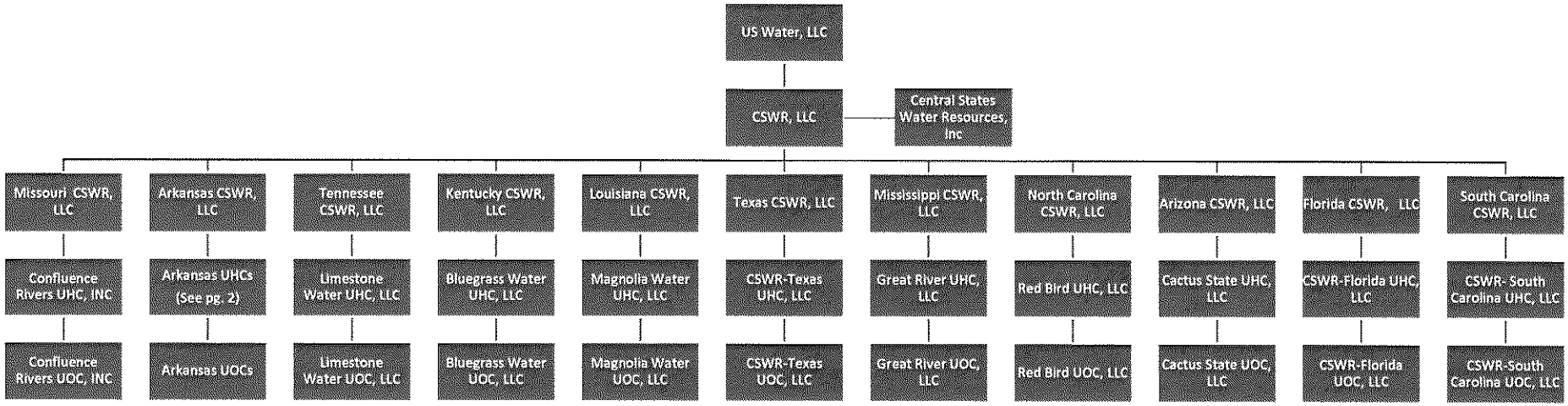
Provide a list of owners, members and officers of the wastewater utility. Provide the address, telephone number and percentage ownership of each individual. If different, list the names of owners, members and officers located in Tennessee.

RESPONSE: Limestone's sole member is Limestone Water Utility Holding Company, LLC, ("LWUHC"), a Tennessee limited liability company, whose sole officer is its president Josiah Cox.

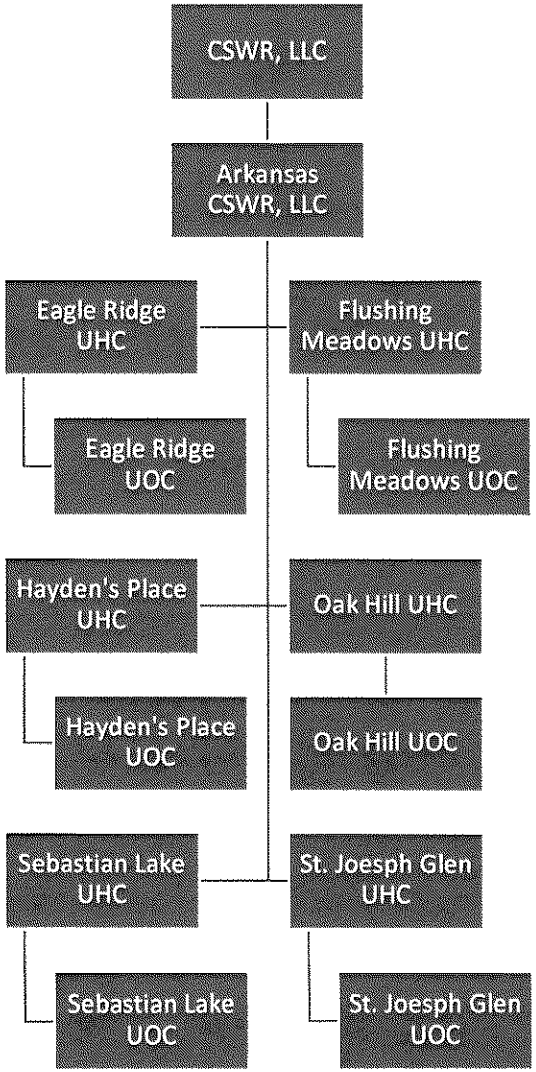
If the applicant has affiliated companies, provide a corporate organization chart showing all affiliate relationships. Describe in detail any transactions, direct or indirect, that occur or that are expected to occur between affiliated entities.

RESPONSE: Please see the attached organization chart. One of Limestone's affiliates, CSWR, LLC, ("CSWR"), provides financial, technical, and managerial expertise and services to each of the group's utility operating affiliates and will manage Limestone and the System at issue if the Commission approves the Transaction that is the subject of the Application. CSWR is the only company within the group that has employees and is the only affiliate that would provide services to Limestone.

Central States Water Resources Corporate Entity Organizational Chart



Arkansas CSWR Organizational Chart Detail



LIMESTONE WATER UTILITY OPERATING COMPANY **EXHIBIT 1.5**
Petition to Amend CCN to provide service to Laurel Creek
Exhibit 1.5 – Corporate Information

Provide a copy of the applicant's articles of incorporation, partnership agreement, and/or by-laws.

RESPONSE: Please see the attached documentation.

000997814

ARTICLES OF ORGANIZATION
LIMITED LIABILITY COMPANY

SS-4270

Tre Hargett
Secretary of State

Division of Business Services
Department of State
State of Tennessee
312 Rosa L. Parks AVE, 6th FL
Nashville, TN 37243-1102
(615) 741-2286

Filing Fee: $50.00 per member
(minimum fee = $300.00, maximum fee = $3,000.00)

For Office Use Only
-FILED-
Control # 000997814

The Articles of Organization presented herein are adopted in accordance with the provisions of the Tennessee Revised Limited Liability Company Act.

1. The name of the Limited Liability Company is: Limestone Water Utility Operating Company, LLC

(Note: Pursuant to the provisions of T.C.A. §48-249-106, each Limited Liability Company name must contain the words "Limited Liability Company" or the abbreviation "LLC" or "L.L.C.")

2. Name Consent: (Written Consent for Use of Indistinguishable Name)
☐ This entity name already exists in Tennessee and has received name consent from the existing entity.

3. This company has the additional designation of: None

4. The name and complete address of the Limited Liability Company's initial registered agent and office located in the state of Tennessee is:
C T CORPORATION SYSTEM
300 MONTVUE RD
KNOXVILLE, TN 37919-5546
KNOX COUNTY

5. Fiscal Year Close Month: December

6. If the document is not to be effective upon filing by the Secretary of State, the delayed effective date and time is:
(none) (Not to exceed 90 days)

7. The Limited Liability Company will be:
☐ Member Managed ☑ Manager Managed ☐ Director Managed

8. Number of Members at the date of filing: 1

9. Period of Duration: Perpetual

10. The complete address of the Limited Liability Company's principal executive office is:
300 MONTVUE RD
KNOXVILLE, TN 37919-5546
KNOX COUNTY

ARTICLES OF ORGANIZATION
LIMITED LIABILITY COMPANY

SS-4270

Tre Hargett
Secretary of State

Division of Business Services
Department of State
State of Tennessee
312 Rosa L. Parks AVE, 6th FL
Nashville, TN 37243-1102
(615) 741-2286

Filing Fee: $50.00 per member
(minimum fee = $300.00, maximum fee = $3,000.00)

For Office Use Only
-FILED-
Control # 000997814

The name of the Limited Liability Company is: Limestone Water Utility Operating Company, LLC

11. The complete mailing address of the entity (if different from the principal office) is:
STE 500
500 NORTHWEST PLAZA DR
SAINT ANN, MO 63074-2220

12. Non-Profit LLC (required only if the Additional Designation of "Non-Profit LLC" is entered in section 3.)
☐ I certify that this entity is a Non-Profit LLC whose sole member is a nonprofit corporation, foreign or domestic, incorporated under or subject to the provisions of the Tennessee Nonprofit Corporation Act and who is exempt from franchise and excise tax as not-for-profit as defined in T.C.A. §67-4-2004. The business is disregarded as an entity for federal income tax purposes.

13. Professional LLC (required only if the Additional Designation of "Professional LLC" is entered in section 3.)
☐ I certify that this PLLC has one or more qualified persons as members and no disqualified persons as members or holders.
Licensed Profession:

14. Series LLC (optional)
☐ I certify that this entity meets the requirements of T.C.A. §48-249-309(a) & (b)

15. Obligated Member Entity (list of obligated members and signatures must be attached)
☐ This entity will be registered as an Obligated Member Entity (OME) Effective Date: (none)
☐ I understand that by statute: THE EXECUTION AND FILING OF THIS DOCUMENT WILL CAUSE THE MEMBER(S) TO BE PERSONALLY LIABLE FOR THE DEBTS, OBLIGATIONS AND LIABILITIES OF THE LIMITED LIABILITY COMPANY TO THE SAME EXTENT AS A GENERAL PARTNER OF A GENERAL PARTNERSHIP. CONSULT YOUR ATTORNEY.

16. This entity is prohibited from doing business in Tennessee:
☐ This entity, while being formed under Tennessee law, is prohibited from engaging in business in Tennessee.

17. Other Provisions:

Electronic	Attorney
Signature	Title/Signer's Capacity
Caroline M. Johnson as authorized representative for Limestone Wate	Dec 4, 2018 10:37AM
Printed Name	Date

OPERATING AGREEMENT OF LIMESTONE WATER UTILITY OPERATING COMPANY, LLC

THIS OPERATING AGREEMENT (this "Agreement") is signed as of the 1st day of January, 2019 (the "Effective Date"), by Limestone Water Utility Holding Company, LLC, a Tennessee limited liability company as the sole Member of LIMESTONE WATER UTILITY OPERATING COMPANY, LLC, a Tennessee limited liability company (the "Company").

RECITALS

WHEREAS, on December 4, 2018, the Company was organized a limited liability company under the laws of Tennessee pursuant to the Tennessee Revised Limited Liability Company Act, Title 48, Chapter 249 (the "Act") for the purpose of, among other things, of investing in and operating water and waste water utilities;

WHEREAS, the aforementioned Member desires to adopt this Operating Agreement setting forth the Member's desire for the management and operation of such limited liability company.

NOW THEREFORE, in consideration of the mutual covenants and other good and valuable consideration, the receipt and legal sufficiency of which are hereby acknowledged, the Member hereby states as follows:

ARTICLE I. ORGANIZATION

1.1. Certain Definitions. As used herein, the following terms have the following meanings:

(a) "Act" is defined in Section 1.2 hereof.

(b) "Agreement" means this Operating Agreement, as the same may be amended from time to time.

(c) "Business Property" means all properties, assets and interests (whether real or personal, tangible or intangible) now or hereafter owned or held by the Company.

(d) "Capital Account" means the Capital Account maintained by the Company for each Member in accordance with Treasury Regulations Section 1.704-1(b)(2)(iv), as amended from time to time.

(e) "Capital Contributions" means with respect to the Member, the total amount of money and the fair market value of the other property, if any, to be contributed to the Company by the Member in accordance with Article II hereof. The Member's "Paid-In Capital Contribution" means the amount of the Member's Capital Contribution actually paid in cash or other property actually contributed to or on behalf of the Company. With respect to the Company, such terms shall mean the aggregate

Capital Contributions and aggregate Paid-In Capital Contributions, respectively, of the Member.

(f) "Capital Transaction" means any of the following items or transactions: a sale, transfer or other disposition of all or substantially all of the assets of the Company, condemnation actions, net insurance recoveries (other than for temporary loss of use), the refinancing of the mortgage or other indebtedness of the Company. The payment of Capital Contributions by the Member shall not be included within the meaning of the term "Capital Transaction."

(g) "Code" means the Internal Revenue Code of 1986, as amended from time to time, or any successor statute.

(h) "Company" means this limited liability company and any successors hereto.

(i) "Depreciation" means for each fiscal year, an amount equal to the depreciation, amortization or other cost recovery deduction allowable with respect to an asset for such fiscal year. In the event the book value of an asset differs from its adjusted tax basis at the beginning of such year, then the Depreciation shall be an amount which bears the same ratio to the fair market value (as may be adjusted pursuant to Treasury Regulations Section 1.704-1(b)(2)(iv)(f) and (g)) as the Depreciation determined for federal income tax purposes bears to the beginning adjusted tax basis.

(j) "Dissolution Proceeds" is defined in Section 10.2 hereof.

(k) "Net Profits" or "Net Losses" for the applicable period means the gross income of the Company minus (a) all net cash outlays of any kind, whether capital in nature or not, to the extent the same are not depreciable or amortizable for federal income tax purposes (or, as the context may require, to the extent the same are not depreciated or amortized for federal income tax purposes), including, without limiting the generality of the foregoing, all operating expenses payable by the Company, salaries, life insurance premiums on policies owned by the Company, and interest on any Company indebtedness; and (b) all Depreciation allowable for federal income tax purposes. In the event that such sum is a positive number, it shall be considered "Net Profits" and if the sum is a negative number, it shall be considered "Net Losses."

(l) "Person" is defined in Section 1.9 hereof.

(m) "Treasury Regulation(s)" means the Income Tax Regulations promulgated under the Code, as such Treasury Regulations may be amended or supplemented from time to time.

1.2. Formation. The Member has formed the Company under and pursuant to the provisions of the Act, for the limited purposes and scope set forth in this Agreement. The Member has filed in the appropriate governmental office(s) Articles of Organization which conform to the requirements of the Act in order to constitute the

Company as a valid limited liability company under the Act. The costs and expenses associated with such filing shall be borne by the Company.

1.3. Name. The business and affairs of the Company shall be conducted solely under the name of "**LIMESTONE WATER UTILITY OPERATING COMPANY, LLC**", and such name shall be used at all times in connection with the business and affairs of the Company; provided that the Member may operate the Company under any other name necessary or convenient to qualify it to do business in any state or jurisdiction.

1.4. Term. The Company shall continue in existence perpetually, or until dissolved by the Member under the terms of this Agreement.

1.5. Business of the Company. The business of the Company is to: (i) invest in and operate water and waste water utilities; (ii) own, finance, hold, manage, manufacture, sell, exchange or otherwise deal with and dispose of all or any part of the Business Property; and (iii) transact any and all lawful business for which a limited liability company may be organized under the Act and exercise all rights and engage in all activities related thereto (the "Business").

1.6. Principal Office. The principal office of the Company shall be at 500 Northwest Plaza Drive, Suite 500, St. Ann, MO 63074, or such other location as may be hereafter determined by the Manager.

1.7. Registered Office and Registered Agent. The name of the Company's registered agent for service of process in Tennessee and the address of the Company's registered office in Tennessee shall be as provided in the Articles of Organization. The Manager may in his sole discretion and from time to time change the address of the registered office and the registered agent by filing the documents required by law.

1.8. Articles of Organization and Other Instruments. The Member has executed or has authorized the execution of the Articles of Organization in accordance with the Act, and shall execute such other documents and instruments and take all such other actions as may be deemed by the Manager to be necessary or appropriate to effectuate and permit the continuation of the Company under the laws of the State of Tennessee or the laws of any other state in any other state which the Member deems necessary or appropriate. The Manager shall, from time to time, take appropriate action, including the preparation and filing of such other amendments to the Articles of Organization and other certificates as may be required under the laws of the State of Tennessee or any other state, to enable the Company to do business in the State of Tennessee or any other state.

1.9. Additional Definitions. The definitions in Section 1.1 shall apply equally to both the singular and plural forms of the terms defined. Whenever the context may require, any pronoun used herein shall include the corresponding masculine, feminine and neuter forms. The term "Person" includes individuals, partnerships, corporations, limited liability companies, trusts, and other associations and entities. The words "include," "includes," and "including" shall be deemed to be followed by the phrase

"without limitation." The words "herein," "hereof," "hereunder," and similar terms shall refer to this Agreement, unless the context otherwise requires.

ARTICLE II.
CAPITAL CONTRIBUTIONS

2.1. Initial Capital Contributions. The Member shall make the Capital Contribution to the Company as reflected on Exhibit A attached hereto and incorporated herein by reference.

ARTICLE III.
DISTRIBUTIONS

3.1. Distributions. Except as otherwise requested by the Member or required by law, cash distributions shall be made to the Member on the following bases at such time (but at least annually) and in such amounts as the Manager in his sole discretion shall determine:

(a) Distributions, other than from a Capital Contribution, shall be made in the following order of priority:

(i) To the payment of liabilities of the Company then due and owing to Persons other than the Member;

(ii) To the Member, in an amount equal to the unpaid balance of principal and accrued interest of any loan by the Member to the Company;

(iii) The balance, if any, shall be distributed to the Member.

(b) The proceeds of any Capital Transaction and the distribution upon liquidation under Section 10.2 shall be made in the following order of priority:

(i) To the payment of liabilities of the Company then due and owing to Persons other than the Member;

(ii) To establish such reserves as the Manager in his discretion determines to be reasonably necessary for any contingent or foreseeable liability or obligation of the Company; provided, however, that the balance of any such reserve remaining at such time as the Manager shall reasonably determine shall be distributed in accordance with subparagraphs (iii) through (v) of this Section 3.1(b);

(iii) To the payment to the Member of an amount equal to the unpaid balance of principal and accrued interest of any Loan by the Member;

(iv) To the Member, an amount equal to its Capital Contributions reduced (but not below zero) by the amount of all prior distributions to it under this Section 3.1;

(v) The balance, if any, shall be distributed to the Member.

3.2. Distributions to Be Made In Cash. Unless otherwise determined by the Member, all distributions to the Member shall be made in cash.

ARTICLE IV.
ALLOCATION OF NET PROFITS AND NET LOSSES

4.1. Profits and Losses. Net Profits and Net Losses incurred and/or accrued shall be allocated to the Member.

ARTICLE V.
ACCOUNTING; RECORDS

5.1. Accounting Methods. The Company books and records shall be prepared in accordance with generally accepted accounting principles, consistently applied. All Federal, state and local tax returns of the Company shall be prepared by the Company's certified public accountants, under the direction of the Manager.

5.2. Fiscal Year. The fiscal year of the Company shall be the twelve calendar month period ending December 31.

5.3. Tax Status. The Member shall elect such tax status that it deems appropriate for each tax year by notifying the Manager of such election.

ARTICLE VI.
POWERS, RIGHTS AND DUTIES OF THE MEMBER AND MANAGER

6.1. Restriction of the Member's Rights to Participate in Management. Except as otherwise expressly provided herein, the Member shall have no voice in, take any part in, nor interfere with, the conduct, control, or management of the business of the Company in its capacity as the Member, nor shall the Member have any authority or power to act for, or on behalf of, the Company, or to bind the Company in any respect whatsoever.

6.2. Member Consent. (a) The affirmative vote, approval or consent of the Member shall be required to: (i) alter the primary purposes of the Company as set forth in Section 1.5; (ii) do any act in contravention of this Agreement or cause the Company to engage in any business not authorized by the Articles of Organization or the terms of this Agreement; (iii) do any act which would make it impossible to carry on the usual course of business of the Company; (iv) change or reorganize the Company into any other legal form; (vi amend this Agreement; (vi) issue an Interest in the Company to any Person and admit such Person as a Member; (vii) approve a merger or consolidation with another Person, (viii) change the status of the Company from one in which management is vested in the one or more Managers to one in which management is vested in the Member, or vice versa; (ix) possess any Company property or assign the rights of the Company in specific Company property for other than a Company purpose; (x) perform any act (other than an act required by this Agreement or any act taken in good faith reliance upon counsel's opinion) which would, at the time such act occurred, subject the Member to liability as a general

partner in any jurisdiction; (xi) operate the Company in such a manner as to have the Company classified as an "investment company" for purposes of the Investment Company Act of 1940; (xii) have an order for relief entered against the Company under applicable federal bankruptcy law; OR (xiii) file a voluntary petition in bankruptcy or a petition or an answer seeking reorganization or an arrangement with creditors or taking advantage of any insolvency law or any answer admitting the material allegations of a petition filed against the Company in any bankruptcy, reorganization or insolvency proceeding.

(b) The Member shall have the right to replace a Manager of the Company and name its successor at any time by providing written notice to the Manager being replaced of such decision in which the successor Manager is also set forth.

6.3. Manager.

(a) The Manager shall have the power to do all things necessary or convenient to carry out the business affairs of the Company. The initial Manager shall be Central States Water Resources, Inc., a Missouri corporation.

(b) The Manager shall not have any contractual right to such position and shall serve until the earliest of (i) the withdrawal of the Manager, or (ii) the removal of the Manager. The Manager may be removed and replaced in accordance with the provisions of Section 6.2(b).

(c) Except to the extent provided herein, the Member hereby agrees that only the Manager and agents of the Company authorized by the Manager shall have the authority to bind the Company. The Member shall not take any action to bind the Company without notifying the Manager of such action. If the Member takes any action to bind the Company, it shall indemnify and hold harmless the Manager against any claim, loss, expense or liability (including, without limitation, attorneys' fees and expenses, whether or not litigation is commenced) incurred by the Manager as a result of the unauthorized action of such Member.

(d) The Manager's duty of care in the discharge of the duties of the Manager to the Company and the Member is limited to discharging his duties pursuant to this Agreement in good faith, with the care a corporate officer of like position would exercise under similar circumstances, in the manner he reasonably believes to be in the best interests of the Company. In discharging his duties, the Manager shall not be liable to the Company or to the Member for any mistake or error in judgment or for any act or omission believed in good faith to be within the scope of authority conferred by this Agreement or by separate written instrument executed by the Member.

(e) The Manager's compensation shall be established by the Member, and the Manager shall be entitled to reimbursement of any general overhead expenses incurred in the regular course of his duties.

6.4. Indemnification

(a) The Company, except as provided in Section 6.4(b), shall indemnify any Person who is or was a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether criminal, civil, administrative or investigative, including without limitation any action by or in the right of the Company, by reason of the fact that he/it was or is a Member or Manager of the Company or is or was a Member or Manager of the Company who is or was serving at the request of the Company as a member, manager, director, officer, agent, employee, partner or trustee of another limited liability company, corporation, partnership, joint venture, trust or other enterprise; against expenses, including attorneys' fees, judgments, fines, taxes and amounts paid in settlement, actually and reasonably incurred by him in connection with such action, suit or proceeding if such Person's conduct is not finally adjudged to be knowingly fraudulent, deliberately dishonest or willful misconduct. The right to indemnification conferred in this paragraph shall be a contract right and shall include the right to be paid by the Company expenses incurred in defending any actual or threatened civil or criminal action, suit or proceeding in advance of the final disposition of such action, suit or proceeding. Such right will be conditioned upon receipt of an undertaking by or on behalf of the Member or manager to repay such amount if it shall ultimately be determined that he/it is not entitled to be indemnified by the Company as authorized in this Article. Such right shall survive any amendment or repeal of this Article with respect to expenses incurred in connection with claims, regardless of when such claims are brought, arising out of acts or omissions occurring prior to such amendment or repeal. The Company may, by action of the Member, provide indemnification to employees and agents of the Company with the same scope and effect as the foregoing indemnification of Member and Manager.

(b) If a claim under Section 6.4(a) is not paid in full by the Company within thirty (30) days after a written claim has been received by the Company, the claimant may at any time thereafter bring suit against the Company to recover the unpaid amount of the claim and, if successful in whole or in part, the claimant shall be entitled to be paid also the expense, including reasonable attorneys' fees and costs, of prosecuting such claim. It shall be a defense to any such action (other than an action brought to enforce a claim for expenses incurred in defending any proceeding in advance of its final disposition where the required undertaking, if any is required, has been tendered to the Company) that the claimant has not met the standards of conduct which make it permissible under the limited liability company law of Tennessee for the Company to indemnify the claimant for the amount claimed, but the burden of proving such defense shall be on the Company. Neither the failure of the Company (including the Member or independent legal counsel) to have made a determination prior to the commencement of such action that indemnification of the claimant is proper in the circumstances because he/it has met the applicable standard of conduct set forth in the limited liability company law of Tennessee, nor an actual determination by the Company (including its Member or independent legal counsel) that the claimant has not met such applicable standard of conduct, shall be a defense to the action or create a presumption that the claimant has not met the applicable standard of conduct.

(c) The indemnification provided by this Section 6.4 shall not be deemed exclusive of any other rights to which those seeking indemnification may be entitled under any agreement, consent of the Member or otherwise, both as to action in his/its official capacity and as to action in another capacity while holding such office, and shall continue as to a Person who has ceased to be a Member, Manager, employee, partner, trustee or agent and shall inure to the benefit of the heirs, executors and administrators of such a Person.

(d) The Company may purchase and maintain insurance on behalf of any Person who is or was a Member, Manager, employee or agent of the Company, or is or was serving at the request of the Company as a member, manager, director, officer, employee, partner, trustee or agent of another limited liability company, corporation, partnership, joint venture, trust or other enterprise against any liability asserted against him and incurred by him in any such capacity or arising out of his/its status as such, whether or not the Company would have the power to indemnify him against such liability under the provisions of this Section 6.4.

(e) For the purposes of this Section 6.4, references to the Company includes the resulting or surviving entity in any merger or consolidation so that any Person who is or was a Member, Manager, employee or agent of such a constituent entity or is or was serving at the request of such constituent entity as a member, manager, director, officer, employee, partner, trustee or agent of another limited liability company, corporation, partnership, joint venture, trust or other enterprise shall stand in the same position under the provisions of this Section 6.4 with respect to the resulting or surviving entity as he/it would if he/it had served the resulting or surviving entity in the same capacity.

(f) For purposes of this Section 6.4, the term "other enterprise" shall include employee benefit plans; the term "fines" shall include any excise taxes assessed on a Person with respect to any employee benefit plan; and the term "serving at the request of the Company" shall include any service as a member, manager, director, officer, employee, partner, trustee or agent of, or at the request of, the Company which imposes duties on, or involves services by, such member, manager, director, officer, employee, partner, trustee or agent with respect to an employee benefit plan, its participants, or beneficiaries.

(g) In the event any provision of this Section 6.4 shall be held invalid by any court of competent jurisdiction, such holding shall not invalidate any other provision of this Section 6.4 and any other provisions of this Section 6.4 shall be construed as if such invalid provision had not been contained in this Section 6.4. In any event, the Company shall indemnify any Person who is or was a Member or Manager of the Company, or is or was a Member or Manager of the Company who is or was serving at the request of the Company as a member, manager, director, officer, agent, employee, partner or trustee of another limited liability company, corporation, partnership, joint venture, trust or other enterprise, to the full extent permitted under Tennessee law, as from time to time in effect.

6.5. Liability of the Member. The Member shall not be liable as such for the liabilities of the Company. The failure of the Company to observe any formalities or

requirements relating to the exercise of its powers or management of its business or affairs under this Agreement or the Act shall not be grounds for imposing personal liability on the Member or a Manager for liabilities of the Company.

ARTICLE VII.
DETERMINATIONS BY THE MEMBER

7.1. Actions by the Member. The Member shall have the right to take any action set forth herein in accordance with the terms of the Agreement. In addition, if the Member determines that it wants to take an action that is not expressly granted to it within this Agreement, it shall take such action only after notifying the Manager in writing of the intended action.

ARTICLE VIII.
ACTIONS OF THE MANAGER

8.1. Actions by the Manager. The Manager shall decide any question related to the operations of the Company, unless the question is one upon which, by express provision of the Act, the Articles of Organization or this Agreement, the Member is required to consent, in which case such express provision shall govern and control the decision on such question.

ARTICLE IX.
TRANSFER OF MEMBER'S INTEREST

9.1. Transfer of Member's Interest. The Member shall have the right to transfer all or part of its Interest to another Person upon such terms that the Member deems acceptable. Prior to the effective date of the transfer of all or part of the Interest, the Member must notify the Manager of the transfer in writing.

9.2. Effect of Assignment; Documents. All Interests in the Company transferred pursuant to the provisions of this Article shall be subject to the restrictions and obligations set forth in this Agreement. As a condition to any Person being admitted as an additional Member or a substituted Member, such Person must execute this Agreement and agree to be bound by all of its terms and provisions as a substituted Member or additional Member.

ARTICLE X.
DISSOLUTION OF THE COMPANY

10.1. Dissolution Acts.

(a) No act, thing, occurrence, event or circumstance shall cause or result in the dissolution of the Company except that the happening of any one of the following events shall work as an immediate dissolution and termination of the Company:

(i) A determination by Member to dissolve and terminate the Company; and

(ii) The event of the death of the Member.

(b) Without limiting the other provisions hereof, the transfer of all or any part of a Member's Interest, in accordance with the provisions of this Agreement or the admission of a new Member, shall not work the dissolution of the Company.

10.2. Distribution of Proceeds on Dissolution; Reserves. Upon the dissolution and termination of the Company, a the Member or such other Person designated by the Member (the "Winding-Up Member") shall file a Notice of Winding Up pursuant to the Act and shall proceed with the liquidation and termination of the Company as promptly as possible, but in an orderly and businesslike manner so as not to involve undue sacrifice, and the proceeds therefrom and any other funds and assets of the Company (the "Dissolution Proceeds"), shall be applied and distributed pursuant to the provisions of Section 3.1.b.

ARTICLE XI.
GENERAL

11.1. Notices. Any notice, request, approval, consent, demand or other communication required or permitted hereunder shall be given in writing by (1) personal delivery, (2) expedited delivery service with proof of delivery, (3) United States Mail, postage prepaid, registered or certified mail, return receipt requested, or (4) email or facsimile (provided that such email or facsimile is confirmed as received), and shall be deemed to have been given and received either at the time of personal delivery or, in the case of delivery service or mail, as of the date of first attempted delivery at the last known address, or in the case of email or facsimile, upon receipt.

11.2. Amendments. This Agreement may be amended by a written agreement of amendment executed by the Member.

11.3. Miscellaneous. Except as herein otherwise specifically provided, this Agreement shall be binding upon and inure to the benefit of the parties and their respective heirs, legal representatives, successors and assigns. Captions contained in this Agreement in no way define, limit, or extend the scope or intent of this Agreement. If any provision of this Agreement or the application of such provision to any Person or circumstance shall be held invalid, the remainder of this Agreement, or the application of such provision to any other Persons or circumstances, shall not be affected thereby.

11.4. Remedies. If the Company or any party to this Agreement obtains a judgment against any other party by reason of breach of this Agreement or failure to comply with the provisions hereof, reasonable attorneys' fees as fixed by the court shall be included in such judgment. No remedy conferred upon the Company or the Member in this Agreement is intended to be exclusive of any other remedy herein or by law provided or permitted, but each shall be cumulative and shall be in addition to every other remedy given hereunder or now or hereafter existing at law or in equity or by statute. No waiver by the Member or the Company of any breach of this Agreement shall be deemed to be a waiver of any other breach of any kind or nature and no acceptance of payment or performance by a Member or the Company after any such

breach shall be deemed to be a waiver of any breach of this Agreement, whether or not such Member or the Company knows of such breach at the time it accepts such payment or performance. If the Member has the right herein to approve or consent to any matter or transaction, such approval or consent may be withheld in the sole discretion of the Member for any reason or no reason. No failure or delay on the part of the Member or the Company to exercise any right it may have shall prevent the exercise thereof by the Member or the Company at any time such other may continue to be so in default, and no such failure or delay shall operate as a waiver of any default.

11.5. Compliance with Securities Laws. Notwithstanding anything herein contained to the contrary, no transfer or disposition of Interests in the Company pursuant to the terms hereof shall be made unless such transfer or disposition complies in all respects with the provisions of the Securities Act of 1933 and the securities laws of any and all states with jurisdiction over such transfer or disposition, and the rules and regulations promulgated thereunder.

11.6. Binding Effect. This Agreement and any amendment hereto made as provided herein shall be binding upon and inure to the benefit of the Company and its successors and assigns, and the Member, its heirs, executors, administrators, and legal or personal representatives.

11.7. Governing Law. This Agreement and the rights of the parties hereunder shall be governed by and interpreted in accordance with the laws of the State of Tennessee.

IN WITNESS WHEREOF, the undersigned has executed this Agreement as of the date first above written.

Limestone Water Utility Holding Company, LLC

DocuSigned by:

By: _____
144D2DD1440B4DC...

Josiah M. Cox, President of
Central States Water Resources, Inc.,
Manager

Agreed and Accepted by:

DocuSigned by:

_____
144D2DD1440B4DC...

Josiah M. Cox, President of
Central States Water Resources, Inc.,
Manager

EXHIBIT A
INITIAL CAPITAL CONTRIBUTIONS

Member's Name and Address	Member's Interest	Capital Contribution
Limestone Water Utility Holding Company, LLC	100%	Kept by Company Accountant

LIMESTONE WATER UTILITY OPERATING COMPANY **EXHIBIT 1.6**
Petition to Amend CCN to provide service to Laurel Creek
Exhibit 1.6 – Business License

Provide a copy of the applicant's license to engage in business within the State of Tennessee registered with the Secretary of State, inclusive of any assumed names of the Company.

RESPONSE: Please see the attached documentation

Tre Hargett
Secretary of State

Division of Business Services
Department of State
State of Tennessee
312 Rosa L. Parks AVE, 6th FL
Nashville, TN 37243-1102

LIMESTONE WATER UTILITY OPERATING COMPANY, LLC
KRIS WHITTEN
SUITE 303
1650 DES PERES ROAD
DES PERES, MO 63131

May 3, 2021

Request Type: Certificate of Existence/Authorization
Request #: 0415492

Issuance Date: 05/03/2021
Copies Requested: 1

Document Receipt

Receipt # : 006338914	Filing Fee: $20.00
Payment-Credit Card - State Payment Center - CC #: 3806073067	$20.00

Regarding:	**Limestone Water Utility Operating Company, LLC**		
Filing Type:	Limited Liability Company - Domestic	Control # :	997814
Formation/Qualification Date:	12/04/2018	Date Formed:	12/04/2018
Status:	Active	Formation Locale:	TENNESSEE
Duration Term:	Perpetual	Inactive Date:	
Business County:	KNOX COUNTY		

CERTIFICATE OF EXISTENCE

I, Tre Hargett, Secretary of State of the State of Tennessee, do hereby certify that effective as of the issuance date noted above

Limestone Water Utility Operating Company, LLC

* is a Limited Liability Company duly formed under the law of this State with a date of incorporation and duration as given above;

* has paid all fees, interest, taxes and penalties owed to this State (as reflected in the records of the Secretary of State and the Department of Revenue) which affect the existence/authorization of the business;

* has filed the most recent annual report required with this office;

* has appointed a registered agent and registered office in this State;

* has not filed Articles of Dissolution or Articles of Termination. A decree of judicial dissolution has not been filed.

Tre Hargett
Secretary of State

Processed By: Cert Web User

Verification #: 046029631

LIMESTONE WATER UTILITY OPERATING COMPANY **EXHIBIT 1.7**
Petition to Amend CCN to provide service to Laurel Creek
Exhibit 1.7 – Geographic Territory

Provide a complete description of the geographic territory to be served by the applicant, including the name and location of development (subdivision) and the number of acres. Include the name of the subdivision or development and the name of the wastewater system as stated in the TDEC permit. In addition, provide a legible map of the area with the proposed service territory clearly and accurately plotted. The map should include:

i. The location of the wastewater system, i.e. treatment plant, pre-application treatment facilities, collection infrastructure, building(s) for equipment, drip fields, disposal fields and/or wetland cells. Include the physical address of the wastewater system and the associated latitude and longitude coordinates.
ii. Names of surrounding streets and roads.
iii. Map to show access roads and names of access roads (if available) and other utilities necessary to provide wastewater service.
iv. All residences and habitable structures served by the wastewater system.
v. Show any portion of the area that will not be served when the wastewater system becomes operational. If the wastewater system will be operational in phases, show the phases on the map.

RESPONSE: Please see the information provided in response to Exhibit 1.8.

LIMESTONE WATER UTILITY OPERATING COMPANY EXHIBIT 1.8
Petition to Amend CCN to provide service to Laurel Creek
Exhibit 1.8 – Proposed Wastewater System

Provide a description of the type of proposed wastewater system to be constructed including the design capacity and the maximum potential number of customers the Utility will service in the proposed service area. Indicate the technology used for the wastewater system (e.g. membrane, sand filter, wetland cell and/or lagoon). The type of system and design capacity should match the type and design capacity of the associated TDEC permit and permit application.

RESPONSE: Please see the attached documentation.

March 3, 2022

Jennifer Dodd
Director, Division of Water Resources
Attn: Engineering Services Unit
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, TN 37243

RERERENCE: **Bio management Sevierville – LAUREL CREEK**
Permit Number: TN????, SOP????
McMahan Sawmill Rd, Sevier County, Tennessee

Dear Ms. Dodd:

Please find attached an SOP submittal package for Laurel Creek project.

Sincerely,

Douglas S. Hodge

Douglas S. Hodge, Ph.D., PMP
DSH & Associates, LLC
2099 Thunderhead Road, Suite 204
Knoxville, TN 37922
865-755-8066

cc: Vojin Janjic, Manager of Water Based Systems
Brad Harris, Manager of Land Based Systems

Engineering Report
Wastewater System Design For

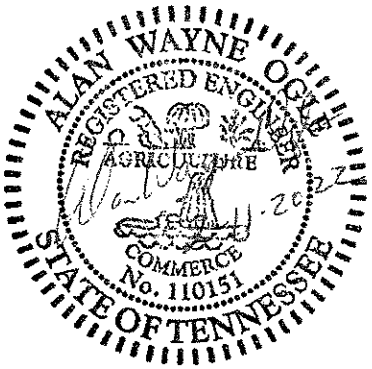
Laurel Creek Subdivision

SOP – to be assigned
1/20/22

Prepared For:
Tennessee Department of Environmental and Conservation
Division of Ground & Water Pollution Control
401 Church Street, 6th Floor L&C Annex
Nashville, TN 37243-1534
615-532-0625
Prepared by:

Doug Hodge, PhD, PMP
DSH & Associates, LLC
A Consulting/Construction Company
2099 Thunderhead Road, Suite 204
Knoxville, TN 37722
Phone: 865-755-8066
e-mail: hodge.dsh@gmail.com

Alan Ogle, PE
TAO Engineering, LLC
An Engineering Company
948 Horton Road
Cleveland, TN 37323
e-mail: awogle@gmx.com



Property Owner:
Westpark Investments, LLC
6001 Headwaters Dr. Franklin, TN 37064

Contents

I Introduction & Site Location

The proposed project is an 11 lot residential subdivision of a 9.8ac parcel in Sevier County. The lots consist of 4 to 6 bedroom homes with aggregate of no more than 50 bedrooms. Public water supply is provided by Sevier County Water, TN.

The proposed decentralized wastewater system for the project will be owned by Westpark Investments and operated by *Biomanagment*. The decentralized wastewater system will utilize watertight, precast concrete septic tanks for each home with STEP system pumps and controls and PVC pipe collection force mains. Overall, the proposed force main length is nearly 945 linear feet of watertight PVC sch 40 pipe. The secondary process wastewater treatment will be located in the west of the property. Treated final effluent by the fixed film treatment process will then be pump dispersed into the shallow soil horizon drip field system on gradual slopes around the turning circle on the west of the parcel.

The secondary fixed film treatment system will be a Orenco System Advantex packed bed reactor sized at 5,000 GPD treatment capacity. Treated effluent will be reused on the property by a NetaFim drip irrigation system utilizing a 0.25 gpd/ft^2 soil load rate. The proposed treatment location and drip field irrigation plots are shown on the attached map. Given the available soil area and soil loading rate, the total loading rate for the drip field will be 5,100 gpd.

A State Operation Permit application is included with this preliminary engineering report (PER). This PER includes an analysis of alternative wastewater services considered, the treatment process considered and hydraulic loading analysis of the drip irrigation plots. Final detailed information on the STEP collection, treatment and drip designs are included with final engineering drawings and report submitted for construction approval.

Figure 1 presents the location of property in relation to surrounding areas.

II Ownership

Legal ownership of the property is held by:

Westpark Investments, LLC
6001 Headwaters Dr. Franklin, TN 37064

III Planning

In the planning and analysis for providing sewer service for the project, DSH & Associates performed an analysis of the typical options available to provide sewer for a project of this scope. Options considered were:

1. Conventional Onsite Septic Tank Drain fields Per Lot.
2. Connection to local POTW via conventional sewage collection sewer system
3. Decentralized wastewater collection system and treatment with Surface Water Discharge
4. Decentralized wastewater collection system and treatment with Subsurface Drip Dispersal.

Option (1), Conventional Onsite Septic Tank Drainfields Per Lot

This type of conventional wastewater treatment provision was evaluated and deemed unacceptable due to the lack of available land, steepness of slopes, and size of lots.

Option (2) Connection to local POTW via conventional sewage collection sewer system.

Gatlinburg Utility District and Sevier County Utility District were contacted by phone. Neither utility district covers the area of this project

Option (3) Decentralized wastewater collection system and treatment with SubSurface Drip Dispersal.

The STEP collection, Advantex Packed Bed Reactor treatment and Drip Dispersal option presents itself as the most logical option to provide the needed wastewater. These types of systems are considered by TDEC to be "zero discharge" of effluent to waters of the State of Tennessee. The treated effluent is applied sub-surface to soil irrigation plots within proposed project boundaries and any residual nutrients are effectively taken up by the vegetation present through transpiration. Further, the soil column in these old growth wooded irrigation plots provide additional nutrient re-use/removal and any remaining water is diffused through denitrification capable soils. Finally, a Tennessee State Operation Permit (SOP) provides for oversight, inspection, and regulation pathways for reliable and consistent performance. This SOP mandates inspection requirements coupled with monitoring requirements to be performed and reported by Paul Clevenger on an ongoing basis. In addition, the protection of public health by this option has significant effect on its analysis. Therefore, this option was selected.

IV Design Basis & Description

Project overview and parameters

Table 1: Project summary

Project name	Laurel Creek
Total available drip field SF	40,289.6
Total number buildings	11
Total number units	50
Total flow rate GPD	5000

The proposed system includes:

1. **Primary Treatment & Collection** - Collection of solid wastes in a combined watertight STEP septic tank effluent collection system with a pumps and tanks located at each home. The collection system piping will be Sch. 40 PVC and the force main system from the collection tanks to the Secondary Treatment System will be PVC.
2. **Secondary Treatment**-Biological degradation and treatment of the wastewater via an un-submerged, aerobic, packed bed reactor wastewater treatment process.
3. **Tertiary Filtration and Dispersal**-The highly treated effluent will be pressure dosed through a final mechanical disc filter, followed by UV disinfection, and then out to a subsurface drip dispersal field.

Review and Approval documents, prepared by Orenco for a similar subdivision, are attached in Attachment 6.a.

The proposed number of units is shown in table 1. The design flow basis utilized is:

Table 2: Influent Flow Parameters

Source	Units	# of Units	GPD/unit	Total GPD	Total GPM
Phase 1	Beds	50	100	5000	3.5
			TOTAL	**5,000**	**3.5**

Primary Treatment & Collection

The gravity collection system piping will be Sch. 40 PVC and the force main system from the collection tanks to the wastewater treatment facility will be PVC. The location of each home and associated STEP Collection tanks is outlined in Figure C-5.0).

Residential Influent Concentrations

Since the system has not been constructed, the influent wastewater flow characteristics are taken from published values as follows:

Table 3: Residential Influent Concentrations

Pollutant	Concentration, mg/l
BOD	240
TSS	270
TKN	60
TP	10
FOG	70

*Derived from: TDEC's On-site Decentralized Wastewater Treatment System Design Criteria Manual: Chapter 15.

It is expected that the on-lot septic tanks (STEP Systems), sized at a minimum 3 day HRT, will provide primary treatment of the residential wastewater. In the primary tanks of the STEP system, the raw sewage separates into three distinct zones: a scum layer, a sludge layer, and a clear layer. Heavy solids settle to the bottom to form the sludge layer, while the lighter material floats to the top to create the scum layer. Facultative and anaerobic digestion converts the organic matter to volatile acids while strict anaerobes ferment the volatile organic acids to gases (methane, carbon dioxide, etc.).

Effluent from the clear zone is then passed through a effluent filter before being transported to the secondary treatment system including the recirculation/blend tank.

Based on values that Orenco has seen on similar projects, the effluent from the STEP tanks will have approximately the following characteristics:

Table 4: Effluence from STEP tanks characteristics

Pollutant	Concentration, mg/l
BOD	150
TSS	50
FOG	25

Effluent Pumps convey the screened effluent under pressure through a network of 2 and 4 inch diameter PVC piping to secondary treatment system. Hydraulic calculation used to design the force main system in association with the STEP tanks is included in Appendix 7.

The collection system will consist of precast, watertight septic tanks located at each home. Effluent from each home site will be collected in concrete tanks linked in series with a duplex effluent pumping system. The effluent pumps will have an expected pump rating of 10 GPM peak and be housed in a pump vault with filtering capability. Additional on-lot components will be a 1.5" service lateral with isolation ball valve and ball check valve. See attached design drawings for location and layout. Also, detail operating instructions and diagrams for the STEP systems in included in attachment 6b. The collection system will use duplex pumps at each home location. The run times for these pumps are based on a three float system as follows:

Top Float: High Water Alarm
Second Float: Secondary Pump Activation
Third Float: Primary Pump Activation

Therefore, as the water rises in the tank it will first engage the third float that turns on the primary pump. If influent flow is more than the primary pump can handle, the second float will be engaged activating the secondary pump. The top float is engaged if both pumps cannot keep up with the influent flow and both a audible and visual alarm is activated. As pumps drop the water level in the tank, the floats are dis-engaged, which shuts off the pumps in the reverse manner that they were activated. The alarm switch is automatically disengaged/shut off after water levels drop.

Secondary Treatment

The Primary Tank Sizing Recommendations states that the recommended primary tankage for a subdivision treatment system should be sized to at a minimum of 3 days of hydraulic retention time at the Design Max Day Flow. Therefore, the configuration and specifications of the primary treatment tanks in the Final Design satisfy Orenco's recommendation for primary tankage. This pre-anoxic tank should be sized equal to one day at maximum day design flow and is considered part of the overall primary tank volume.

The Final Design further specifies the use of 1 - 10,000 U.S. Gallon fiberglass tank for recirculation and blending of the AdvanTex-treated effluent with primary tank effluent. Using the flow data specified on the Plans the tank is sized to be equal to 196% of the Maximum Day Design Flow. The recirculation tank for the standard stage should be sized at a minimum of 75% of the Maximum Day Design Flow. Therefore, the specification of the recirculation-blend tank in the Final Design satisfies Orenco's design criteria.

The STEP Collection system effluence will be conveyed to an Orenco Systems Advantex fixed film, packed bed reactor (PBR) treatment system. The treatment system will be located in the middle of the property (see figure C-1.0). The wastewater will enter the recirculation/blend tank first and then be dosed in small doses throughout the day by a computer controlled PLC system with telemetry to the Advantex packed bed reactors. The Advantex system is designed around a 5:1 recycle rate where wastewater is dosed onto the non-woven synthetic textile PBR material 5 times before it then travels to the drip field dose tank. The 5:1 recycle rate is controlled by a flow splitter valve located in the recirculation/blend tank. Total storage volume of the recirculation/blend tank is shown in table 7. Each AX100 Pod will have its own dedicated recirculation pump. For this configuration, Orenco PF5000712 pumps were selected (sheet C4.0).

Orenco, Inc. lists the Advantex pod to be capable of handling an 8 lbs/BOD/max/day load rate at 5,000 GPD for each POD. Table 5 and 7 show the loading rate for this project and the capacity of the proposed secondary treatment system.

The total loading for this project is shown in table 2. The associated loading rate is in table 5 (based on 150 mg/L BOD). Using published data from Orenco, the AX-100 pods would have an effective max load capability shown in table 7

Table 5: Secondary Treatment loading rate

Flow (MGD) x Concentration (mg/L) x 8.34 lbs/gal = lbs/BOD/day

Flowrate	5000	gpd
Flowrate	0.005	mgd
Concentration	150	mg/l
Conversion	8.34	lbs/gal
Total Loading	**6.255**	**lbs (BOD)/day**

Orenco's review of the design specifies that the design satisfactorily complies with Orenco's design criteria to meet the follow effluent limits at a 95% confidence level:

Table 6: Expected effluence quality

Constituent	Average (mg/L)
BOD5	10
TSS	10
Ammonia	5

It would be expected that the treated effluent from the Advantex Treatment system would correlate with these published performance values based on the above mass loadings. Further, the Orenco, Inc. design criteria for the Advantex treatment unit targets at 10/10/5 effluent standard for BOD/TSS/Ammonia using these published design guidelines (Attachment 6.a).

Table 7: WWTP principal components

Num collection tanks	1
Size of collection tanks	5k GAL
Num dosing tanks	1
Size of dosing tanks	5k GAL
Number AX100 pods	2
Total treatment GPD	5,000

Tertiary Filtration & Drip Dispersal

The highly treated effluent from the Advantex treatment process would ultimately be conveyed by gravity from the Orenco pods to the dripfield dose tank for pressured dosing to the drip irrigation plots. The computerized control system for the treatment process will provide time based dosing of the treated effluent to the network of separate solenoid control valves in the drip area to provide uniform application of the treated wastewater. Nearly equally sized irrigation plots will utilize NetaFim pressure compensating emitters hydraulically loaded at 0.25 gpd/ft^2 soil load rate.

The buildout design storage volume for the drip field dose tank is shown in table 7. The drip dose pumps will be Orenco Model PF505012. These pumps will pressure dose the drip dose zones and provide pumped flow through a 2" NetaFim Arkal filter, an instantaneous read & totalizing flowmeter (Flowmotion MS2500) and then thru an ultraviolet disinfection (Lutz Jessco). The UV system is designed based on 20/20 standards and 65% transmittance. Specifications for these components are attached in Appendix 6.c.

The Orenco Treatment system is controlled by a computerized control panel that includes telemetry. The telemetry includes a Verizon 3G access point with associated modem. All system alarms are logged within the control panel local hard drive and alarms are transmitted to the waste water operator via the Verizon access point to any/or all of the following: phone, pager, email, or text messaging. Orenco telemetry information is attached in appendix 6.d.

This project has proposed to provide ultraviolet disinfection. The irrigation drip fields (plots) will be located along the western edge of the project boundary. Based on the combination of ultraviolet disinfection, under current permitting standards, no effluent bacterial monitoring will be required.

The total number of drip zones and area is shown in table 9. Table 8 shows the minimum physical requirements of the drip field. The drip irrigation soils will be divided into near equally sized zones with Netafim pressure compensated drip tube emitters. The NetaFilm drip tube will be 0.57" I.D. tubing with 24" orifice spacing operating @ 0.61 gal/hr per orifice. Maximum topographic change in the field will be 4-5 ft on along individual line lengths. Drip tube line lengths have been designed around a maximum line length of 200 lineal feet, shallow installation in the top 6-8" of the soil and the drip tube to be on 5' centers. Per NetaFilm design guideline recommendations, the Flush Velocity selected will be 2 FPS resulting in a 1.6 GPM additional flow at the distal end.

As part of the drip system design, water resources soil mapping was also done on the proposed drip irrigation plots by Certified Soils Scientist Grant Dunn (results attached, Appendix 3) to identify the best location for the drip system. Copies of the soils map along with the pit descriptions are attached to this report. For the investigation, a total of four inspection pits were excavated for soils evaluations with their locations shown on the enclosed maps. The soils are located on along the western boundary of the property.

See the attached Soils Map, pit descriptions and slope descriptions in Appendix 3.

Based on the soil type, conversion table presented in Chapter 17, these soils in the potential drip field area are broken down into 2 classifications. Table 10 shows the measured soil rating from the soil scientist report as well as the rating used in our calculations

Table 8: Drip field requirements

Area #	Source	Units	# of Units	GPD/unit	Total GPD	Total GPM	Drip Field Size Req't (acres)	Drip Field Size Req't (Sq. ft.)
Phase 1	Bedrooms	beds	50	100	5,000	3.5	1.02	**20,000**

Table 9: Drip field provided areas

Zone	Area SF	Area AC
1	10,205	0.23
2	10,212	0.23
TOTAL	**20,417**	**0.47**

Table 10: Soil rating

Measured average soil rating gpd/ft2	0.70
Used soil rating gpd/ft2	0.25

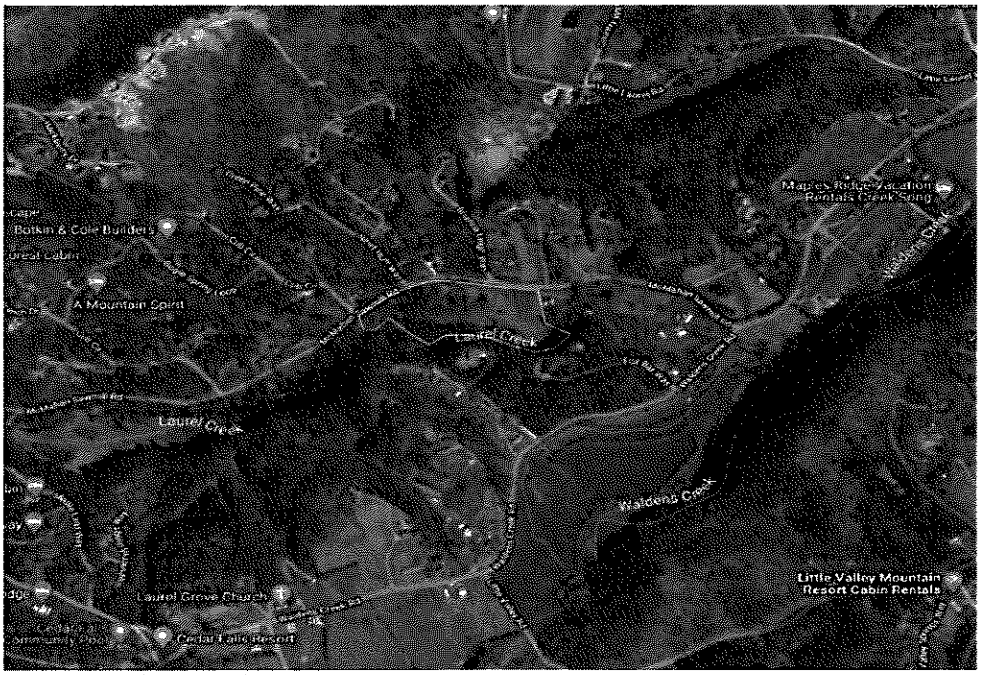
State Operation Permit

Upon completion and acceptance, the sewage collection, treatment, and disposal system will be owned Westpark Investments and operated by *Biomanagement*. An SOP application accompanies this report.

Attachment 1:
Site Location Map

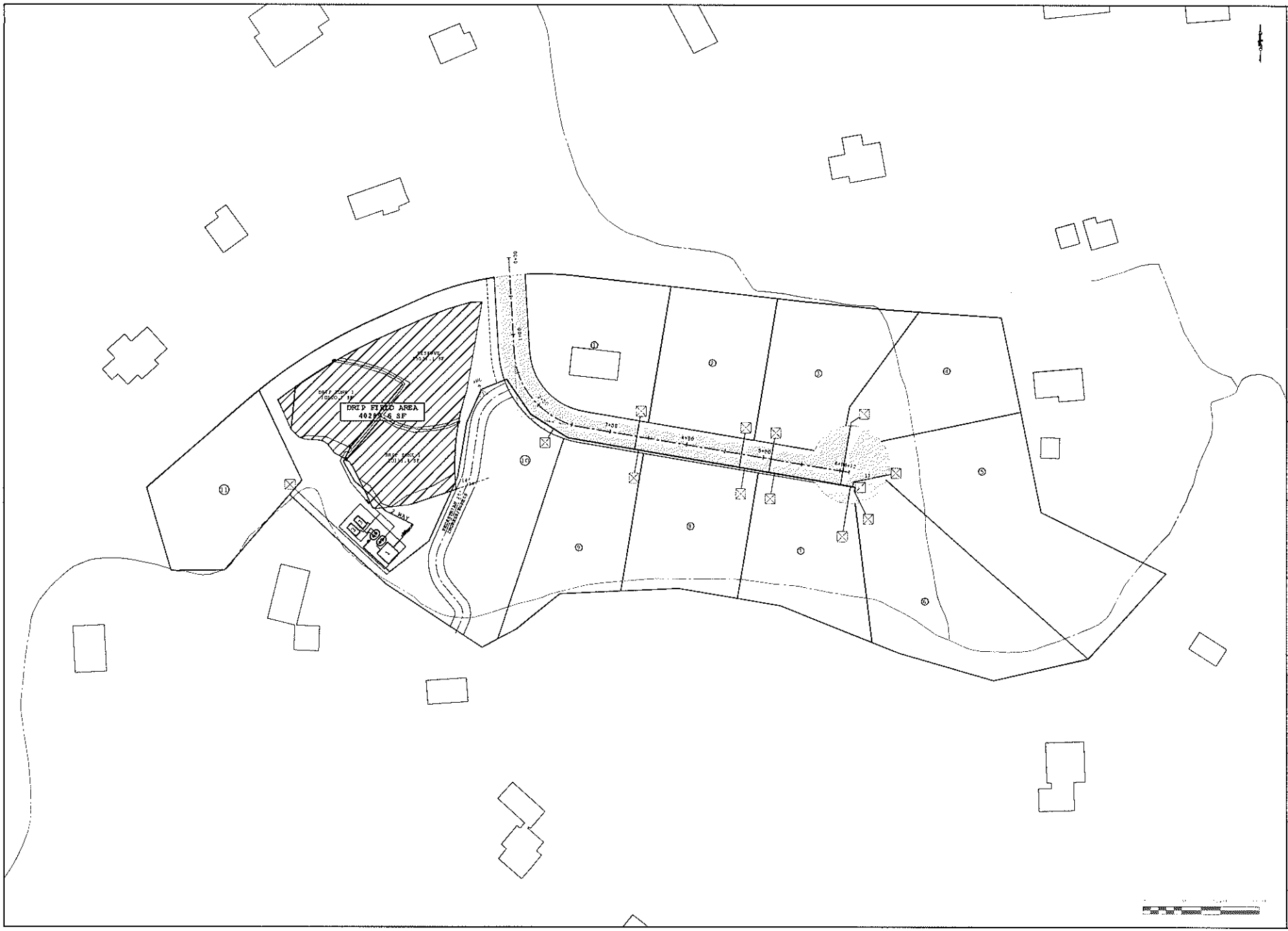
<Map Pin>

Parcel map



Aerial image

Attachment 2:
Site Layout



DSH ASSOCIATES

NOTES

SHEET SET GROUP: WWTP

ENGINEER
ALAN OGLE

TAO ENGINEERING LLC 948 HORTON ROAD S.E. CLEVELAND, TN 37323

CLIENT
CRAIG G. HOSTERT
WESTPARK INVESTMENTS, LLC 6001 HEADWATERS DR. FRANKLIN, TN 37064

PROJECT
LAUREL CREEK

McMAHAN SAWMILL RD SEVIERVILLE

DATE CREATED 12/19/21
DATE PRINTED 2/17/22
DATE REVISION 1/3/22
SCALE 1" = 50'
DESIGNED BY AWO
DRAWN BY CD
CHECKED BY AWO
PROJECT NUMBER 170

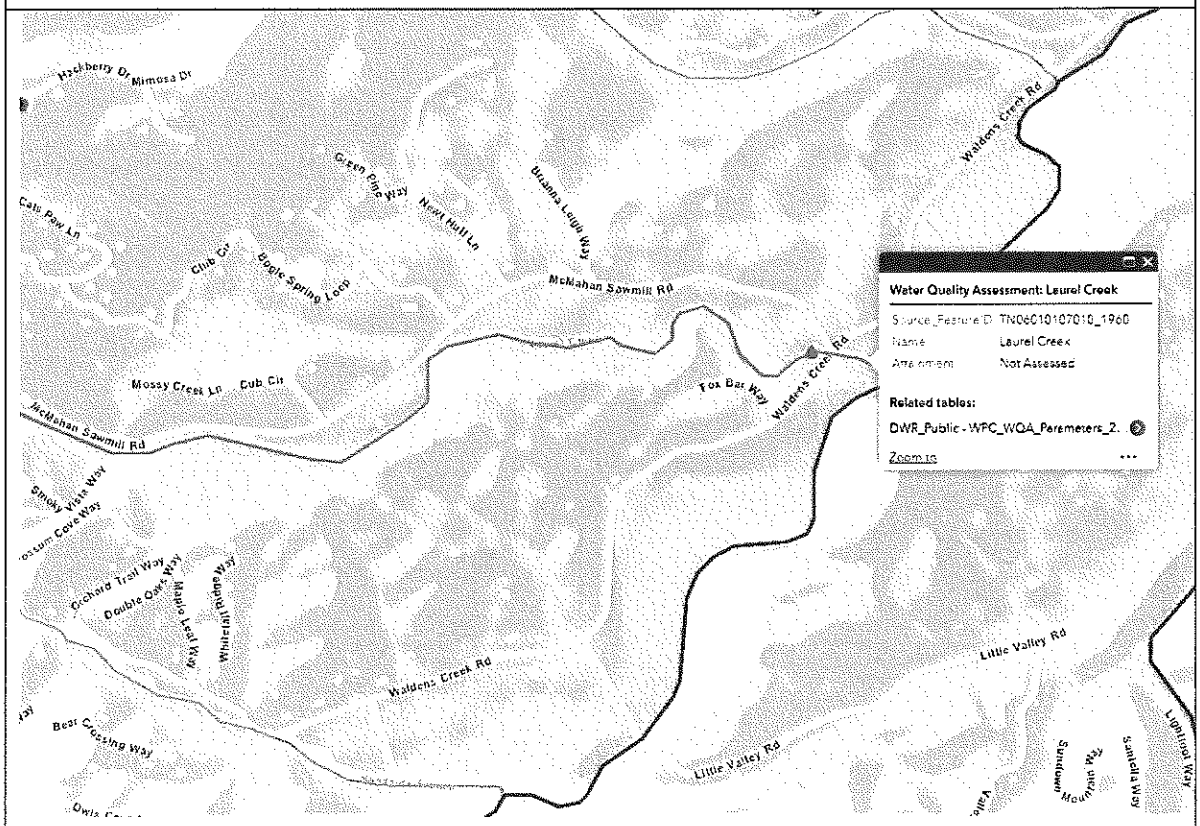
SHEET TITLE
SITE PLAN

SHEET NUM.	REV.
C1.2	00

Attachment 3:
Soil Consultant Map
Water Resources Soils Map

DIVISION OF WATER RESOURCES
WEB MAP REPORT

WEB MAP



URL	https://tdeconline.tn.gov/dwr/
DATE	January 21 2022
ADDRESS	McMahan Sawmill Rd / Biranna Leigh Way, Sevier County
FEATURES	**ID**: TN06010107010_1960 **NAME**: LAUREL CREEK **ATTAINMENT**: NOT ASSESSED
ARAP	No

TDEC- DWR Soil Pedon Description Form

Described by: A. Grant Dunn — Date: 11/30-2021

Site Name & Location: Laurel Creek Subdivision — County: Sevier 16th District

Map or Plat: [illegible] — SOP# (office use only):

Soil Series: [illegible] — Drainage Class: Well Drained

Soil Control Section: 20-40" — Ground Water or Water Table: None

Parent Material: Colluvium — Erosion: None

Climate: Humid Subtropical — Land Cover: Forest

Geomorphic Description: [illegible] Slope — Long. [illegible]

Physiographic [illegible]: West

Additional Notes: [illegible]

Soil Pedon Description

Horizon	Depths	Matrix Color	Depletions/Concentrations Redox/Mottles, etc.	Depth to Low Chroma Mottles	Soil Texture	Soil Structure Grade	Soil Structure Size	Soil Structure Type	Soil Horizon Notes
A	0-4"	10YR4/3			Sandy Loam	2- Moderate		Granular	
B/A	4-7"	10YR4/6			Sandy Loam	1- Weak		Sub Angular Blocky	
Bt1	7-12"	10YR5/6			Loam	2- Moderate		Sub Angular Blocky	
Bt2	12-22"	10YR6/6			Clay Loam	2- Moderate		Sub Angular Blocky	
Bt3	26-37"	10YR6/6	7.5YR6/6	26	Clay Loam	2- Moderate		Sub Angular Blocky	
Bt4	37-48"	10YR6/8	10YR6/4	37	Clay Loam	2- Moderate		Sub Angular Blocky	

Described By: A. Grant Dunn

Date: 11-30-2021

Site Name & Location: Laurel Creek Subdivision

County: Sevier 16th District

Stop or Pit #: 2

SOPR office use only

Soil Series: Lost Cove

Drainage Class: Well Drained

Soil Control Section: 20-40"

Ground Water or Water Table: None

Parent Material: Colluvium

Erosion: None

Climate: Humid Subtropical

Land Cover: Forest

Geomorphic Description: Foot Slope

Longitude/Latitude (Center of Soil Area): -83.6571, [illegible]

Physiographic Location: West

Additional Notes: 5% Quartzite Cobbles

Soil Pedon Description

Horizon	Depths	Matrix Color	Depletions/Concentrations Redox/Mottles, etc.	Depth to Low Chroma Mottles	Soil Texture	Soil Structure Grade	Soil Structure Size	Soil Structure Type	Soil Horizon Notes
A	0-5"	10YR4/4			Sandy Loam	2- Moderate		Granular	
B/A	5-11"	10YR5/6			Loam	1- Weak		Sub Angular Blocky	
Bt1	11-27"	7.5YR6/6			Clay Loam	2- Moderate		Sub Angular Blocky	
Bt2	27-45"	7.5YR5/8	15% Fragments		Clay Loam	2- Moderate		Sub Angular Blocky	

Described By: A. Grant Dunn Date: 11/30/2021

Site Name & Location: Laurel Creek Subdivision County: Sevier 16th District

Site or Pit #: 3 SCPR office use only:

Soil Series: Lost Cove Drainage Class: Well Drained

Soil Control Section: 20-40" Ground Water or Water Table: None

Parent Material: Colluvium Erosion: None

Climate: Humid Subtropical Land Cover: Forest

Geomorphic Description, Side Slope: Longitude, Latitude: Center of Soil Area: (-83.6572, 35.7769)

Physiographic Location: West

Additional Notes: Chroma 2 mottles are interpreted to be relic in nature

Soil Pedon Description

Horizon	Depths	Matrix Color	Depletions/Concentrations Redox/Mottles, etc.	Depth to Low Chroma Mottles	Soil Texture	Soil Structure			Soil Horizon Notes
						Grade	Size	Type	
A	0-4"	10YR4/3			Sandy Loam	2-Moderate		Granular	
B/A	4-8"	10YR4/4			Loam	1- Weak		Sub Angular Blocky	
Bt	8-13"	10YR5/8			Clay Loam	2-Moderate		Sub Angular Blocky	
Bt2	13-30"	10YR6/6			Clay Loam	2-Moderate		Sub Angular Blocky	
Bw	30-40"	7.5YR6/6			Loam	2-Moderate		Sub Angular Blocky	
Bt3	40-48"	7.5Yr5/8	10YR7/2	40	Clay Loam	1- Weak		Sub Angular Blocky	

Described By: A. Grant Dunn Date: 11/30/2021

Site Name & Location: Laurel Creek Subdivision County: Sevier 36th District

Site or Pit #: 4 SOPs (office use only)

Soil Series: Lost Cove Drainage Class: Well Drained

Soil Control Section: 20-10" Ground Water or Water Table: None

Parent Material: Colluvium Erosion: None

Climate: Humid Subtropical Land Cover: Forest

Geomorphic Description: Side Slope Longitude, Latitude, Center of Soil Area): -83.6571, 35.7763

Physiographic Location: West

Additional Notes: Chroma 2 mottles e. : eared to be relic in nature

Soil Pedon Description

Horizon	Depths	Matrix Color	Depletions/Concentrations Redox/Mottles, etc.	Depth to Low Chroma Mottles	Soil Texture	Soil Structure			Soil Horizon Notes
						Grade	Size	Type	
A	0-6"	10YR4/4			Sandy Loam	2-Moderate		Granular	
A/B	6-10"	10YR5/6			Sandy Loam	1- Weak		Sub Angular Blocky	
Bt1	10-15"	10YR5/8			Loam	2-Moderate		Sub Angular Blocky	
Bt2	15-28"	10YR6/8			Clay Loam	2-Moderate		Sub Angular Blocky	
Bt3	28-44"	10YR6/6	10YR7/2	28	Clay Loam	2-Moderate		Sub Angular Blocky	
Bt4	44-50"	10YR6/8	10YR7/2	44	Clay Loam	2-Moderate		Sub Angular Blocky	

Described By: B. Grant Dunn Date: 11/30/2021

Site Name & Location: Laurel Creek Subdivision County: Xavier 16th District

Site or Pit #: 5 SOP# (office use only):

Soil Series: Lost Cove Drainage Class: Well Drained

Soil Control Section: 20-40" Ground Water or Water Table: None

Parent Material: Colluvium Erosion: None

Climate: Humid Subtropical Land Cover: Forest

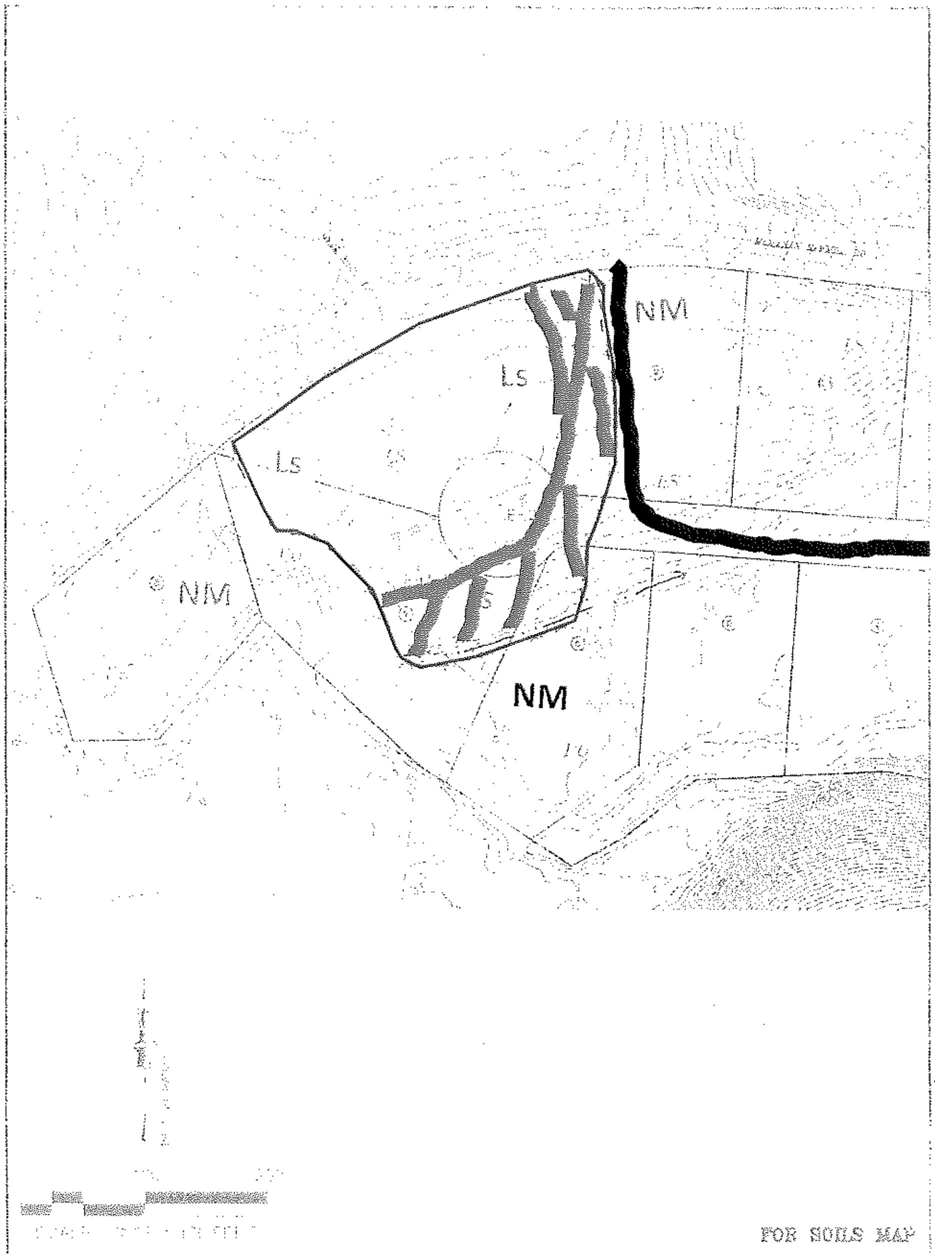
Geomorphic Description: Foot Slope Longitude, Latitude, Center of Soil Area: -83.8571, 35.7789

Physiographic Location: West

Additional Notes: Chroma 2 mott as appeared to be relic in nature

Soil Pedon Description

Horizon	Depths	Matrix Color	Depletions/Concentrations Redox/Mottles, etc.	Depth to Low Chroma Mottles	Soil Texture	Soil Structure			Soil Horizon Notes
						Grade	Size	Type	
A	0-4"	10YR3/3			Sandy Loam	2-Moderate		Granular	
A/B	4-8"	10YR4/3			Sandy Loam	1- Weak		Sub Angular Blocky	
Bt1	8-13"	10YR5/6			Loam	2-Moderate		Sub Angular Blocky	
Bt2	13-17"	10YR6/6			Clay Loam	2-Moderate		Sub Angular Blocky	
Bt3	17-34"	7.5YR5/6			Clay Loam	1- Weak		Sub Angular Blocky	
Bt4	34-48"	10YR6/8	10YR7/2	34	Clay Loam	2-Moderate		Sub Angular Blocky	



Soil Series

Taxonomic Class

Soil Legend

Sevier County, Tn

District 16

Attachment 4:
Basic Drip field Sizing Analysis

Laurel Creek

TOTAL PROJECT AREA (ac): 9.8

			PHASE 1	PHASE 2
House type	**Size**	**# beds/house**	**# houses**	**# houses**
Mid sized		4.5	11	
		TOTAL UNITS	**50**	**0**

DISPERSAL AREAS

REQ'D DRIPFIELD AREA:	20,000	-	SF
SEVIER RESERVE 50% OF PRIMARY:	10,000	-	SF
WWTP AREA:	10,000	-	SF
15% FOR BUFFERS AND SETBACKS:	4,500	-	SF
TOTAL SF	**44,500**	-	**SF**
TOTAL ACRES	**1.0**	-	**AC**

COLLECTION SYSTEM SPECS

House type	# beds/house	GPD per bed	STEP vol	Tank size	
Mid sized	4.545454545	100	1363.636364	2000	
0	0	100	0	2500	
0	0	100	0	2000	
0	0	100	0	2500	

WWTP CALCS

TOTAL DAILY FLOWRATE GPD:	5,000	-	GPD
NUMBER OF AX100 PODS:	1	0	Num
RECIRCULATION VOLUME:	5,000	-	GAL
DOSING VOLUME:	1,667	-	GAL

TANK SELECTION

RECIRCULATION SECONDARY TREATMENT				
Number of tanks:	5000	1		Num
Number of tanks:	10000			Num
Number of tanks:	15000			Num
Number of tanks:	20000			Num
	CHECK:	-	-	
DOSING				
Number of tanks:	5000	1		Num
Number of tanks:	10000			Num
Number of tanks:	15000			Num
Number of tanks:	20000			Num
	CHECK:	3,333	-	

Attachment 5:
Pump Specifications

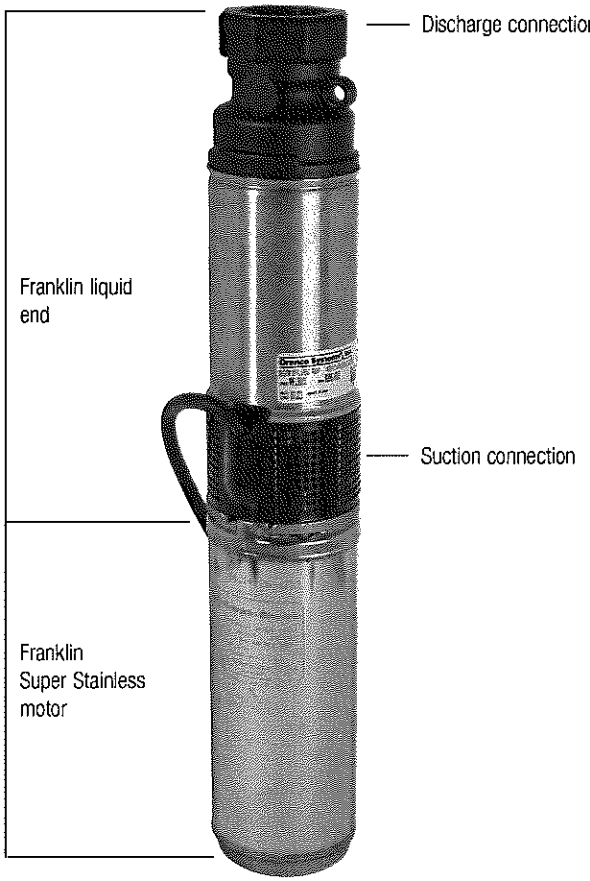
Orenco SYSTEMS *Technical Data Sheet*

PF-Series Submersible Effluent Pumps: 1-Phase, 60-Hz, 4-inch (100-mm)

Applications

Our PF-Series 4-inch (100-mm) Submersible Effluent Pumps are designed to transport screened effluent (with low TSS counts) from septic tanks or dosing tanks. These pumps are constructed of lightweight, corrosion-resistant stainless steel and engineered plastics, and are field-serviceable and repairable with common tools. They're also CSA- and UL-certified to U.S. and Canadian safety standards for effluent pumps.

PF-Series pumps are used in a variety of applications, including pressurized drainfields, packed-bed filters, mounds, aerobic units, effluent irrigation, liquid-only (effluent) sewers, wetlands, lagoons, and more. These pumps are designed to be used with a Biotube® pump vault or after a secondary treatment system.



Powered by **Franklin Electric**

C SP US
LR80980
LR2053896

Features/Specifications

To specify this pump for your installation, require the following:

- Minimum 24-hour run-dry capability (liquid end) with no deterioration in pump life or performance*
- 1/8-inch (3-mm) bypass orifice to ensure flow recirculation for motor cooling and to prevent air bind
- Liquid-end repair kits available for better long-term cost of ownership
- TRI-SEAL™ floating impeller design on 10, 20, and 30 gpm (0.6, 1.3, and 1.9 L/sec) models; floating stack design on 50 and 75 gpm (3.2 and 4.7 L/sec) models
- Franklin Electric Super Stainless motor, rated for continuous use and frequent cycling
- Type SOOW 600-V motor cable (model PF751512 uses 14 AWG, SJOOW, 300-V cord)

** Not applicable for 5-hp (3.73 kW) models*

Standard Models

See specifications chart on page 2 for a list of standard pumps. For a complete list of available pumps, call Orenco.

Product Code Diagram

PF ☐ ☐ ☐ ☐ ☐ - ☐ - ☐

- ☐ (Pump, PF Series)
- ☐ (Nominal flow, gpm (L/sec)): 10 = 10 (0.6); 20 = 20 (1.3); 30 = 30 (1.9); 50 = 50 (3.2); 75 = 75 (4.7)
- ☐ (Horsepower (kW)): 05 = ½ hp (0.37); 07 = ¾ hp (0.56); 10 = 1 hp (0.75); 15 = 1½ hp (1.11); 20 = 2 hp (1.50); 30 = 3 hp (2.24); 50 = 5 hp (3.73)
- ☐ (Frequency): 1 = single-phase 60 Hz
- ☐ (Voltage, nameplate): 1 = 115*; 2 = 230
- ☐ (Check valve): Blank = no internal check valve; CV = internal check valve†
- ☐ (Cord length, ft (m):‡ Blank = 10 (3); 20 = 20 (6); 30 = 30 (9); 50 = 50 (15)
- ☐ (CLK = ClickTight™ compatible)

* ½-hp (0.37 kW) only
† Available for 10 gpm (0.6 L/sec), 1/2 hp (0.37 kW)
‡ Note: 20-ft cords are available only for pumps through 1½ hp

Specifications

Pump Model	Design gpm (L/sec)	Horsepower (kW)	Phase	Nameplate voltage	Actual voltage	Design flow amps	Max amps	Discharge size and material[1]	Length in. (mm)	Min. liquid level in. (mm)	Weight lb (kg)	Rated cycles per day
PF100511 [9]	10 (0.6)	0.50 (0.37)	1	115	120	12.7	12.7	1 ¼ in. GFP	23.0 (660)	16 (406)	26 (12)	300
PF100511CV [9]	10 (0.6)	0.50 (0.37)	1	115	120	12.7	12.7	1 ¼ in. GFP	23.0 (660)	16 (406)	26 (12)	300
PF100512 [9]	10 (0.6)	0.50 (0.37)	1	230	240	6.3	6.3	1 ¼ in. GFP	23.0 (660)	16 (406)	26 (12)	300
PF100712 [4,5,9]	10 (0.6)	0.75 (0.56)	1	230	240	8.3	8.3	1 ¼ in. GFP	25.9 (658)	17 (432)	30 (14)	300
PF101012 [5,6,9]	10 (0.6)	1.00 (0.75)	1	230	240	9.6	9.6	1 ¼ in. GFP	27.9 (709)	18 (457)	33 (15)	100
PF200511 [9]	20 (1.3)	0.50 (0.37)	1	115	120	12.3	12.5	1 ¼ in. GFP	22.3 (566)	18 (457)	25 (11)	300
PF200512 [9]	20 (1.3)	0.50 (0.37)	1	230	240	6.4	6.5	1 ¼ in. GFP	22.5 (572)	18 (457)	26 (12)	300
PF201012 [4,5,9]	20 (1.3)	1.00 (0.75)	1	230	240	10.5	10.5	1 ¼ in. GFP	28.4 (721)	20 (508)	33 (15)	100
PF201512 [4,5]	20 (1.3)	1.50 (1.11)	1	230	240	12.4	12.6	1 ¼ in. GFP	34.0 (864)	24 (610)	41 (19)	100
PF300511 [9]	30 (1.9)	0.50 (0.37)	1	115	120	11.8	11.8	1 ¼ in. GFP	21.3 (541)	20 (508)	28 (13)	300
PF300512 [9]	30 (1.9)	0.50 (0.37)	1	230	240	6.2	6.2	1 ¼ in. GFP	21.3 (541)	20 (508)	25 (11)	300
PF300712 [9]	30 (1.9)	0.75 (0.56)	1	230	240	8.5	8.5	1 ¼ in. GFP	24.8 (630)	21 (533)	29 (13)	300
PF301012 [4,9]	30 (1.9)	1.00 (0.75)	1	230	240	10.4	10.4	1 ¼ in. GFP	27.0 (686)	22 (559)	32 (15)	100
PF301512 [4,5]	30 (1.9)	1.50 (1.11)	1	230	240	12.6	12.6	1 ¼ in. GFP	32.8 (833)	24 (610)	40 (18)	100
PF302012 [5,6,7]	30 (1.9)	2.00 (1.49)	1	230	240	11.0	11.0	1 ¼ in. SS	35.5 (902)	26 (660)	44 (20)	100
PF303012 [5,6,7,8]	30 (1.9)	3.00 (2.23)	1	230	240	16.8	16.8	1 ¼ in. SS	44.5 (1130)	33 (838)	54 (24)	100
PF305012 [5,6,7,8]	30 (1.9)	5.00 (3.73)	1	230	240	25.6	25.8	1 ¼ in. SS	66.5 (1689)	53 (1346)	82 (37)	100
PF500511 [9]	50 (3.2)	0.50 (0.37)	1	115	120	12.1	12.1	2 in. SS	20.3 (516)	24 (610)	27 (12)	300
PF500512 [9]	50 (3.2)	0.50 (0.37)	1	230	240	6.2	6.2	2 in. SS	20.3 (516)	24 (610)	27 (12)	300
PF500712 [9]	50 (3.2)	0.75 (0.56)	1	230	240	8.5	8.5	2 in. SS	23.7 (602)	25 (635)	31 (14)	300
PF501012 [9]	50 (3.2)	1.00 (0.75)	1	230	240	10.1	10.1	2 in. SS	27.0 (686)	26 (660)	35 (16)	100
PF501512 [4]	50 (3.2)	1.50 (1.11)	1	230	240	12.5	12.6	2 in. SS	32.5 (826)	30 (762)	41 (19)	100
PF503012 [4,5,7,8]	50 (3.2)	3.00 (2.23)	1	230	240	17.7	17.7	2 in. SS	43.0 (1092)	37 (940)	55 (25)	100
PF505012 [5,6,7,8]	50 (3.2)	5.00 (3.73)	1	230	240	26.2	26.4	2 in. SS	65.4 (1661)	55 (1397)	64 (29)	100
PF751012 [9]	75 (4.7)	1.00 (0.75)	1	230	240	9.9	10.0	2 in. SS	27.0 (686)	27 (686)	34 (15)	100
PF751512	75 (4.7)	1.50 (1.11)	1	230	240	12.1	12.3	2 in. SS	33.4 (848)	30 (762)	44 (20)	100

1 *GFP = glass-filled polypropylene; SS = stainless steel. The 1 ¼-in. NPT GFP discharge is 2 7/8 in. octagonal across flats; the 1 ¼-in. NPT SS discharge is 2 1/8 in. octagonal across flats; and the 2-in. NPT SS discharge is 2 7/8 in. hexagonal across flats. Discharge is female NPT threaded, U.S. nominal size, to accommodate Orenco® discharge hose and valve assemblies. Consult your Orenco Distributor about fittings to connect hose and valve assemblies to metric-sized piping.*

2 *Minimum liquid level is for single pumps when installed in an Orenco Biotube® Pump Vault or Universal Flow Inducer. In other applications, minimum liquid level should be top of pump. Consult Orenco for more information.*

3 *Weight includes carton and 10-ft (3-m) cord.*

4 *High-pressure discharge assembly required.*

5 *Do not use cam-lock option (Q) on discharge assembly.*

6 *Custom discharge assembly required for these pumps. Contact Orenco.*

7 *Capacitor pack (sold separately or installed in a custom control panel) required for this pump. Contact Orenco.*

8 *Torque locks are available for all pumps and are supplied with 3-hp and 5-hp pumps.*

9 *ClickTight™ compatible.*

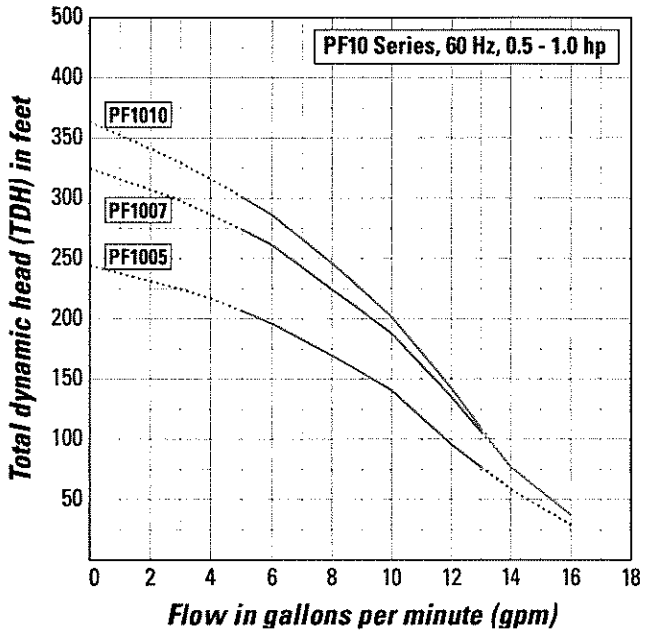
Materials of Construction

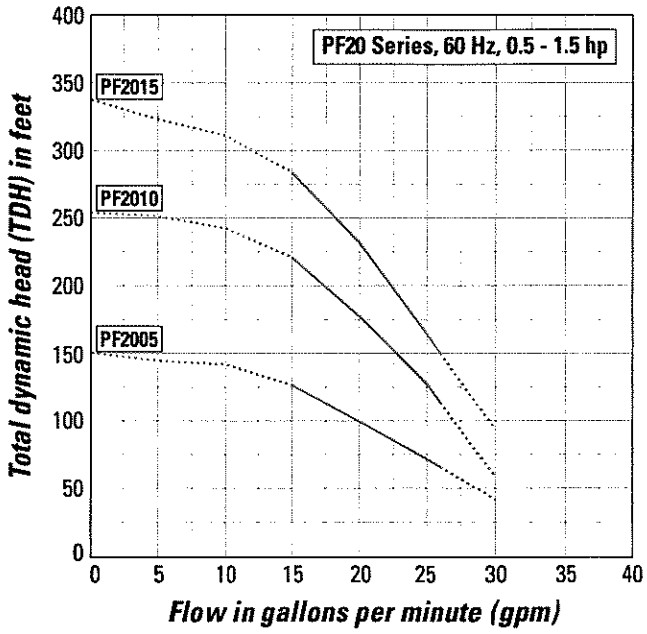
Discharge	Glass-filled polypropylene or stainless steel
Discharge bearing	Engineered thermoplastic (PEEK)
Diffusers	Glass-filled PPO (Noryl GFN3)
Impellers	Celcon® acetal copolymer on 10-, 20-, and 30-gpm models; 50-gpm impellers are Noryl GFN3
Intake screen	Polypropylene
Suction connection	Stainless steel
Drive shaft	7/16-in. hexagonal stainless steel, 300 series
Coupling	Sintered stainless steel, 300 series
Shell	Stainless steel, 300 series
Motor	Franklin motor exterior constructed of stainless steel. Motor filled with deionized water and propylene glycol for constant lubrication. Hermetically sealed motor housing ensures moisture-free windings. All thrust absorbed by Kingsbury-type thrust bearing. Rated for continuous duty. Single-phase motors are equipped with surge arrestors for added security. Single-phase motors through 1.5 hp (1.11 kW) have built-in thermal overload protection, which trips at 203-221° F (95-105° C).

Using a Pump Curve

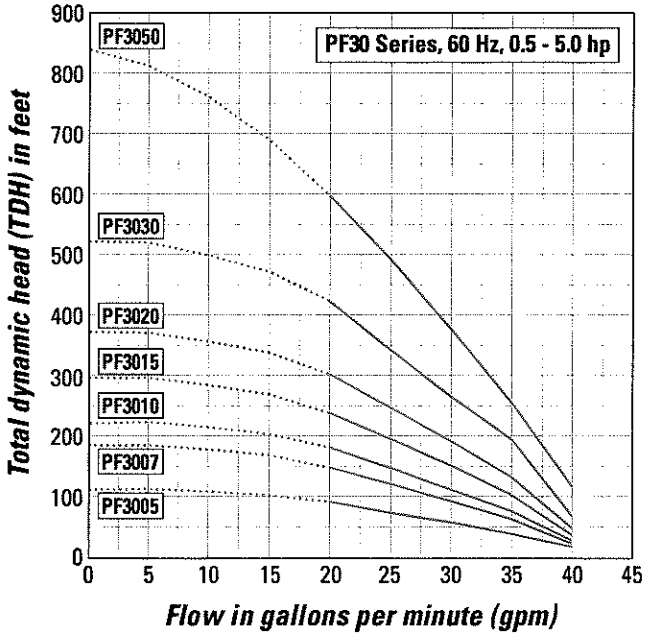
A pump curve helps you determine the best pump for your system. Pump curves show the relationship between flow and pressure (total dynamic head or "TDH"), providing a graphical representation of a pump's optimal performance range. Pumps perform best at their nominal flow rate. These graphs show optimal pump operation ranges with a solid line and show flow rates outside of these ranges with a dashed line. For the most accurate pump specification, use Orenco's PumpSelect™ software.

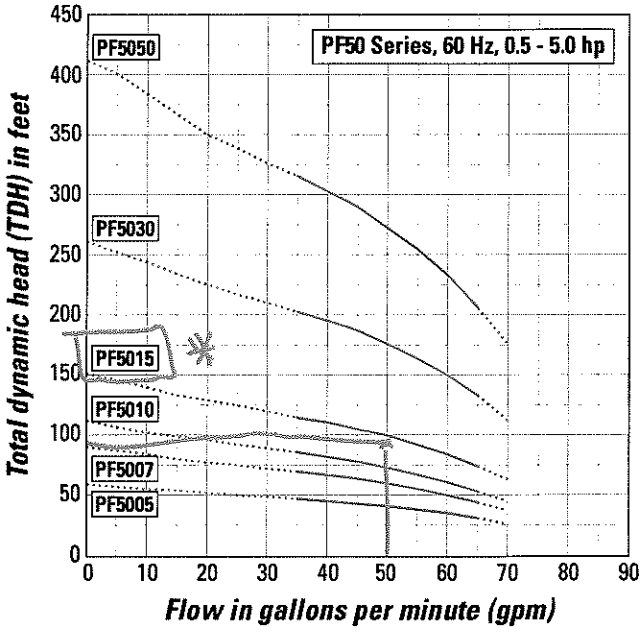
Pump Curves

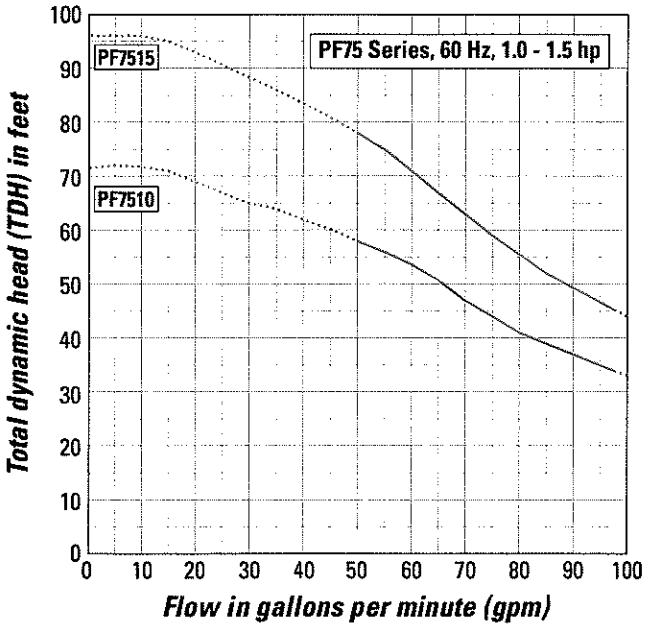




Pump Curves, cont.







Attachment 6a:
Orenco Project Review/Approval

Orenco® PROTECTING THE WORLD'S WATER

January 20, 2022

Alan Ogle
TAO Engineering LLC
948 Horton Road S.E.
Cleveland, TN, 373323

Subject: Final Design Review of Laurel Creek Subdivision

Alan Ogle,

Orenco Systems, Inc. ("Orenco") has received the Plans with all required fields completed (attached to this letter), a copy of the plan set showing the designed site layout and configuration plans, and other documents that comprise the Final Design for the Laurel Creek Subdivision project. Orenco staff reviews the Final Design of all wastewater collection and treatment systems for commercial applications to ensure that the design is compliant with the most current version of the system's applicable design criteria published by Orenco for the specified parameters provided by the system's designer in the Plans. The findings and conclusions of my review of this Final Design are as follows:

Design Basis

The system has been designed for a Type 2, Subdivision application. Influent flow and constituent concentrations and effluent constituent concentration requirements have been provided by the system's designer on the attached Plans and were used in my review of the Final Design.

The influent flow on the Plans were not extrapolated from the metered flows from the subject site, but in our experience, they are consistent with influent flows from other, similar Type 2, Subdivision systems that Orenco has previously observed. As such, I have no reason to doubt the accuracy of the designer's findings and assumptions as to the influent flow and find that it was reasonable for the designer to use them as the design basis for the system.

System Design

The proposed Final Design of the system consists of twelve (12) STEP packages serving 51campsites. Each collection site will utilize 2-1,500 U.S. Gallon STEP tanks in series. Wastewater will be pumped from the STEP systems to a single 10,000 U.S. Gallon recirculation tank. Water will be dosed to two (2)-AX-A100 pods for secondary treatment. Treated effluent will flow from the pods back to the recirculation tank where a MM6FRP valve will either allow the treated water to return into the recirculation tank, or seat and divert water to a single 5,000 U.S. Gallon dose tank depending on the liquid level of the recirculation tank. The dose tank will pump the treated water through a UV unit for disinfection prior to drip dispersal.

Design Criteria

The applicable design criteria for this system, which I used to conduct the review of its Final Design, is revision 7.0 of document NDA-ATX-1, titled *Orenco® AdvanTex® Design Criteria, Commercial Treatment Systems,*

which was published by Orenco in October, 2020. A copy of the design criteria can be downloaded from Orenco's online document library at www.orenco.com/corporate/doclibrary.cfm.

Findings

The findings of my review as to whether the Final Design complies with Orenco's design criteria for treating wastewater to the effluent constituent concentration requirements provided in the Plans are as follows:

Primary Treatment

Primary Tank(s) Hydraulic Retention Time (HRT)[1]				
Design Average Flow (gpd)	Design Maximum Day Flow (gpd)	Effective Combined Primary Tankage (gpd)	Avg HRT (days)	Max Day HRT (days)
2,250	5,100	36,000	16	7.1

[1] Design Max Day Flow is the maximum daily flow a facility is expected to receive no more than one day within any week's time.

The Primary Tank Sizing Recommendations states that the recommended primary tankage for a Subdivision treatment system should be sized to at a minimum of 3 days of hydraulic retention time at the Design Max Day Flow. Therefore, the configuration and specifications of the primary treatment tanks in the Final Design satisfy Orenco's recommendation for primary tankage for this Subdivision application. This pre-anoxic tank should be sized equal to one day at maximum day design flow and is considered part of the overall primary tank volume.

Recirculation Tank — Standard Stage

The Final Design further specifies the use of 1 - 10,000 U.S. Gallon fiberglass tank for recirculation and blending of the AdvanTex-treated effluent with primary tank effluent. Using the flow data specified on the Plans the tank is sized to be equal to 196% of the Maximum Day Design Flow. The recirculation tank for the standard stage should be sized at a minimum of 75% of the Maximum Day Design Flow. Therefore, the specification of the recirculation-blend tank in the Final Design satisfies Orenco's design criteria.

Hydraulic Load — Standard Stage

The Final Design specifies the use of (2) AX100, which contain a nominal surface area of 200 square feet of treatment media. Using the flow data specified on the Plans the hydraulic loading rate for the system calculates as follows:

Hydraulic Loading Rate (HLR) — Standard Stage				
Design Average Flow (gpd)	Design Maximum Day Flow (gpd)	Nominal Textile Area (sq. ft.)	Average HLR (gal. per day/sq. ft.)	Peak HLR (gal. per day/sq. ft.)
2,250	5,100	200	11.3	25.5

According to the AdvanTex System Loading Chart in the applicable design criteria, the standard AdvanTex treatment system (Stage 1) should not be hydraulically loaded more than 25 gpd/square foot at Design Average Flow or 50 gpd/square foot at Design Max Day Flow. Therefore, the specified type and number of AdvanTex pods in the Final Design satisfies Orenco's design criteria to achieve the effluent quality listed in the design criteria at a 95% confidence level for this Type 2, Subdivision application.

Organic Load — Standard Stage

The following influent characteristics provided on the Plans were estimated and not derived from direct sampling. Even though the influent characteristics were not derived from direct sampling, the values provided are consistent with values we have seen in other, similar Type 2, Subdivision applications.

Influent (Primary Tank Effluent) Characteristics — Loading to Textile		
Average BOD_5 (mg/L)	Average TSS (mg/L)	Max FOG (mg/L)
180	180	25

Based on the average influent biochemical oxygen demand (BOD_5) concentration and flow data specified on the Plans, the system will receive approximately 3.9 pounds of BOD_5 per day at Design Average Flow, and 7.7 pounds of BOD_5 per day at Maximum Day Design Flow. Using this information, the organic loading rate of the system calculates as:

Organic Loading Rate (OLR) — Standard Stage				
Average Organic Load (lbs/day)	Maximum Organic Load (lbs/day)	Nominal Treatment Area (sq. ft.)	Average OLR (lbs BOD/sq. ft./day)	Maximum OLR (lbs BOD/sq. ft./day)
3.9	7.7	200	0.02	0.04

According to the Organic Load Requirements in the applicable design criteria, an AdvanTex Treatment System should not be organically loaded more than 0.04 pounds BOD_5/square foot at Design Average Flow or 0.08 pounds BOD_5/square foot at Design Peak Flow. Therefore, the specified type and number of AdvanTex pods in the final design satisfy Orenco's design criteria to achieve the effluent quality listed in the design criteria at a 95% confidence level for this Type 2, Subdivision application.

Conclusions

I have reviewed the Final Design of the Laurel Creek Subdivision wastewater treatment system and have found that the design is compliant with the most current version of the system's applicable design criteria published by Orenco for the specified parameters provided by the system's designer in the Plans following the intended increase in recirculation tank volume and reduction of number of sites.

Compliance Table — Meets Minimum Design Standards	
	Standard Stage
Recirc Tank Size	Yes
Hydraulic Load	Yes
Organic Load	Yes

The system as designed satisfactorily complies with Orenco's design criteria to meet the following effluent limits specified in the Plans at a 95% confidence level, provided that all influent flows and constituent concentrations specified in the Plans are not exceeded:

Expected Effluent Quality	
Constituent	**Average (mg/L)**
BOD5	20
TSS	20

It is important to note that even though the AdvanTex Treatment System has the capability to meet or exceed the required treatment parameters, there is no way that Orenco can guarantee that a particular system will be operated or maintained in a manner consistent with the Final Design reviewed. Once the facility is placed into operation, the influent flows and constituent concentrations to the facility should be monitored, and if flow or any of the influent constituent concentrations exceed those listed in the Plans, measures should be taken to reduce the

flow or constituent concentration to those listed. However, if additional treatment capacity becomes necessary, the system is designed to have the capability to expand to account for the new flow or constituent concentration.

Proper air ventilation is a critical feature of all commercial AdvanTex Treatment Systems, and as such, adequate active ventilation is required for all systems.

In addition, please note that disposing of toxics or chemicals into the system is strictly prohibited. Examples of toxics include restaurant degreasers, cleansers, wax strippers for linoleum, carpet shampoo, waste products, or any other toxins. Furthermore, water softener brine discharge is prohibited from being discharged into the AdvanTex Treatment System. Failure to adhere to these policies will void Orenco's limited product warranties.

If you have any questions about my review process, findings, or conclusions, please feel free to call or e-mail me.

Sincerely,

Stephenie Wright
Systems Engineering
Orenco Systems, Inc.

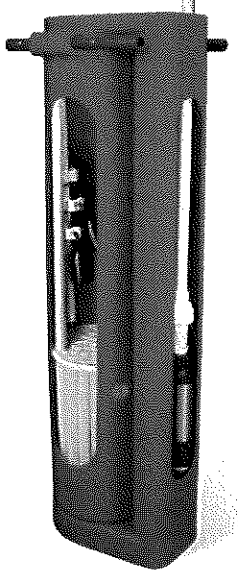
814 Airway Avenue
Sutherlin, OR 97479
P: (800) 348-9843 ext. 416
swright@orenco.com

Attachment 6b:
STEP System Operating Instructions

PrOSTEP™

Effluent Pumping Systems

for Onsite Wastewater Collection and Treatment



Ideal for:

- Effluent sewers
- Drainfields
- Textile filters
- Sand filters
- Peat filters
- Mounds
- Trickling filters
- Aerobic units
- Wetlands
- Lagoons
- Effluent irrigation
- Other applications

Orenco® SYSTEMS

Changing the Way the World Does Wastewater®

1-800-348-9843 • +1 541-459-4449

orenco.com • vericomm.net

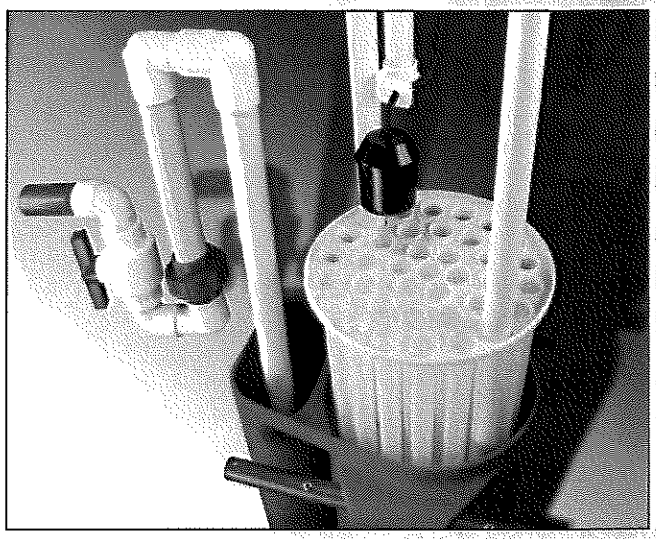
PROSTEP™ Protects, Transports, Filters

Thirty years ago, Orenco Systems®, Inc. pioneered and packaged the modern filtering pump vault for onsite wastewater collection and treatment. Today, more than 185,000 of Orenco's filtering vaults — including its patented Biotube® Pump Vault — are in service all over the world. They transport and filter wastewater from watertight septic tanks and dosing tanks, protecting "downstream" lines, drainfields, and other treatment systems. The Biotube® Pump Vault's patented* Biotube filter has several times the capacity of other filters and removes about two-thirds of suspended solids, on average.

"Easy-Access" Design Aids Maintenance

The Biotube Pump Vault's "easy-access" design allows service providers to remove the Biotube filter cartridge without pulling the pump or vault. And the float assembly's quick-release float stem and adjustable float collars make it easy to remove and adjust.

Easy access design



Quality Components Outlast Others

ProSTEP™ Effluent Pumping Systems are superior in quality[5] and outlast other brands.[6] Constructed of stainless steel, thermoplastic, and fiberglass, they're corrosion-resistant and durable, reducing lifetime system costs.

Advanced Controls Available

For a modest incremental cost, advanced control panels are available . . . control panels that give peace of mind to property owners, system designers, contractors, service providers, and regulators. MVP digital programmable panels allow easy, accurate setting of multiple parameters and the use of one type of float for all functions. VeriComm® remote telemetry panels are coupled with the web-based VeriComm® Monitoring System, which verifies, monitors, records, and communicates system operation round-the-clock, while remaining invisible to the homeowner.

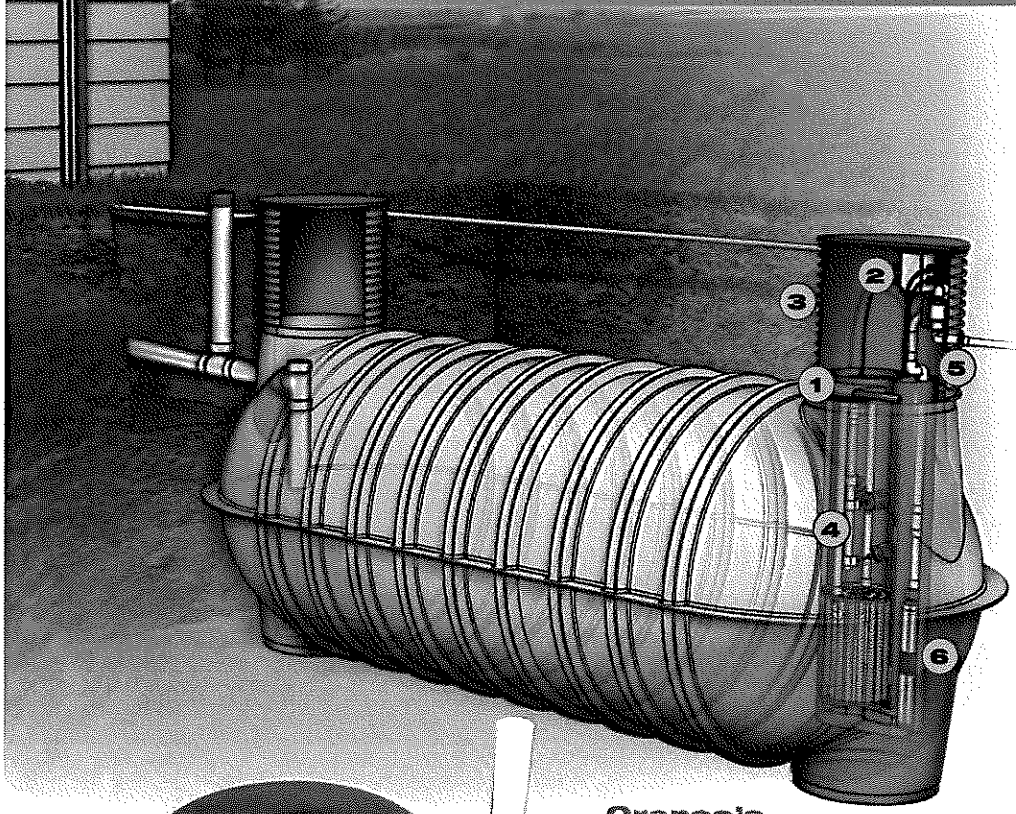
* Covered by U.S. patents 4,439,323 and 5,492,635. Foreign patents pending.

"We've had more than 500 Orenco ProSTEP Effluent Pumping Systems in operation since 1987. They're simple, dependable, and easy to maintain."

Larry Garwood
Diamond Lake Water & Sewer District
Newport, Washington

[5] *Orenco Product Fact Sheet, AFL-FT-2, 07/13.*
[6] *North Carolina State University Cooperative Extension. "Pump Longevity and Troubleshooting," accessed September 6, 2016, http://www.ces.ncsu.edu/plymouth/septic/BO5Bannister.pdf.*

ProSTEP™ Effluent Pumping Systems



Complete, Lightweight Package

ProSTEP™ Effluent Pumping Systems are fully integrated packages with seven compatible components. No need to shop for parts and pieces. In-tank equipment is lightweight, comes preassembled, and installs neatly into our tanks and most others, saving time and money.

Orenco's Injection-Molded Fiberglass Tanks

are designed to be 100% watertight and each is water-tested. They're also designed to withstand 4-foot (1.2-meter) burial, empty, with groundwater to grade. Available in 1000-gal and 1500-gal sizes (3800-L and 5700-L).

1 Biotube® Pump Vault

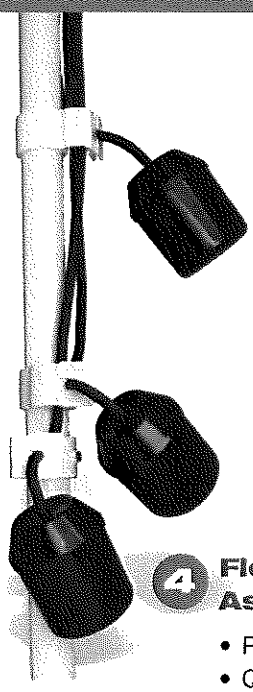
- Pump vault comes in standard and custom heights
- Handle assembly aids removal of filter cartridge
- Filter goes longer between cleanings than other brands[1]
- External flow inducer accommodates one or two pumps
- Removable float stem keeps floats in proper positions

2 Splice Box

- Two kinds available:
  - ~ Internal (see drawing)
  - ~ External (see photo)
- Advantages of the External Splice Box:
  - ~ Mounts outside riser, flush-to-ground
  - ~ Protects external wiring
  - ~ Easy to access, install, maintain
  - ~ Designed to be completely watertight; UL listed, NEMA 6p rated

[1] *Orenco Product Fact Sheet, AFL-FT-2, 07/13.*

PrOSTEP™ Effluent Pumping Systems



4 Float Switch Assembly

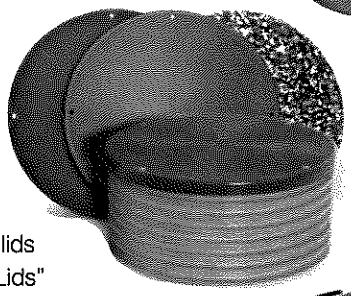
- Provides level control
- Quick-release stem
- Adjustable float collars
- Variety of floats (including mercury-free) and float arrangements

6 Effluent Pump

- Life of 25+ years with routine cleaning[2]
- Lasts 3-4 times longer than conventional effluent pumps[3]
- Minimum 24-hour run-dry capability[4]
- Lightweight — about 25 lb (11 kg)
- Easy to service in the field
- Low power costs
- Noncorroding stainless steel construction
- UL and CSA listing for wastewater applications
- A variety of models available
- Five-year limited warranty

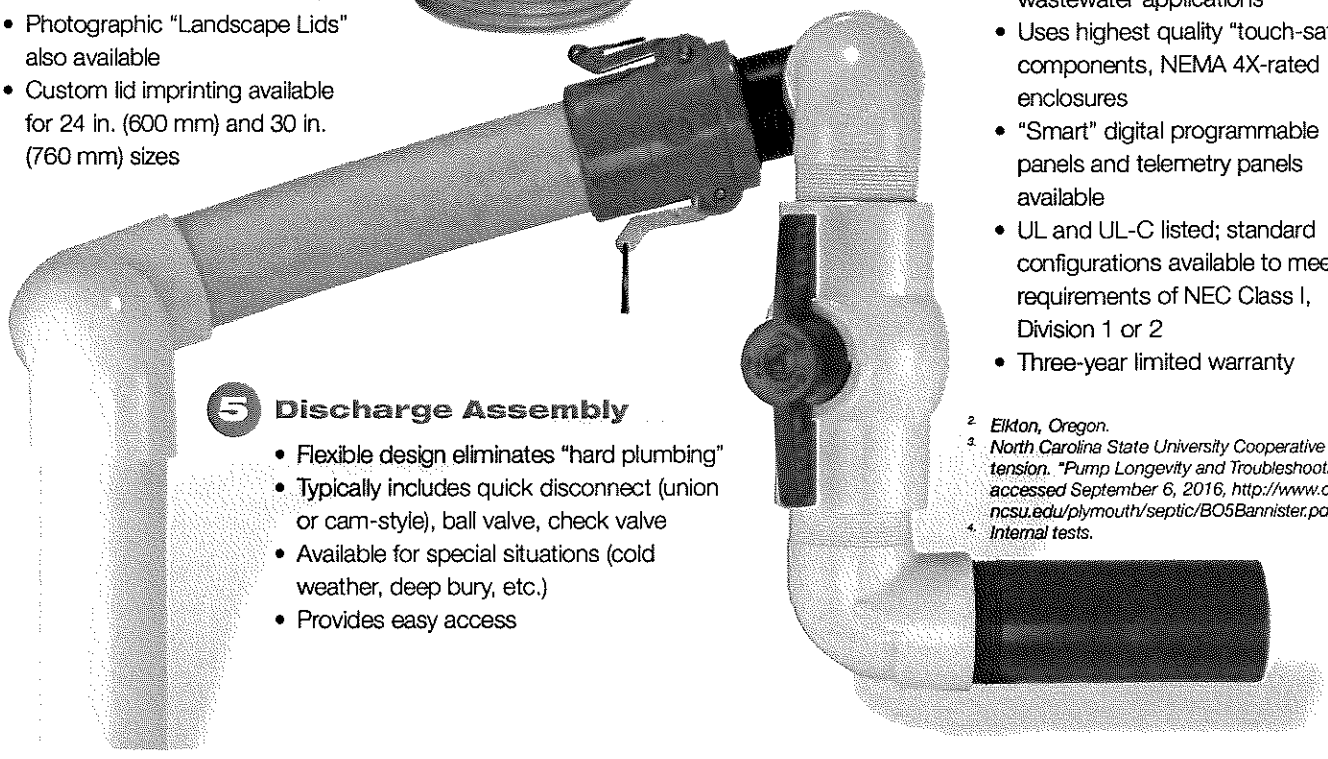
3 Risers, Lids, and Accessories

- Allow easy access to tank
- Strong and lightweight
- Tamper-resistant
- Green and brown non-skid lids
- Photographic "Landscape Lids" also available
- Custom lid imprinting available for 24 in. (600 mm) and 30 in. (760 mm) sizes



7 Control Panel

- Engineered specifically for wastewater applications
- Uses highest quality "touch-safe" components, NEMA 4X-rated enclosures
- "Smart" digital programmable panels and telemetry panels available
- UL and UL-C listed; standard configurations available to meet requirements of NEC Class I, Division 1 or 2
- Three-year limited warranty



5 Discharge Assembly

- Flexible design eliminates "hard plumbing"
- Typically includes quick disconnect (union or cam-style), ball valve, check valve
- Available for special situations (cold weather, deep bury, etc.)
- Provides easy access

2. *Elkton, Oregon.*
3. *North Carolina State University Cooperative Extension. "Pump Longevity and Troubleshooting," accessed September 6, 2016, http://www.ces.ncsu.edu/plymouth/septic/BO5Bannister.pdf.*
4. *Internal tests.*

Unmatched Technical Support

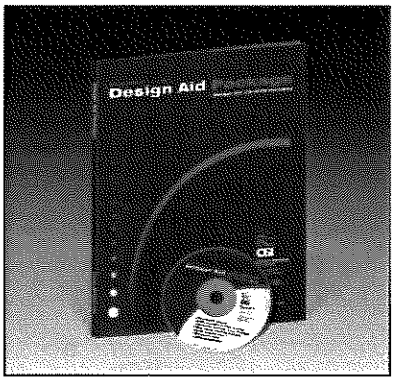
When you specify, purchase, install, or service Orenco products, you tap into a wide range of technical support services.

Distributor Network

Orenco's products are available from about 300 different Distributor locations. Distributors stock products, provide customer service, and help with system design, product takeoffs, ordering, shipping, and more. For a list of Distributors, go to www.orenco.com.

Orenco Technical Sales and Engineering

If there isn't a Distributor in your region, Orenco's Tech Sales and Engineering staff provide professional customer service, including plan reviews. When you call our toll-free number for information and assistance, you'll talk to a wastewater specialist with practical experience in effluent pumping system design, construction, and maintenance.

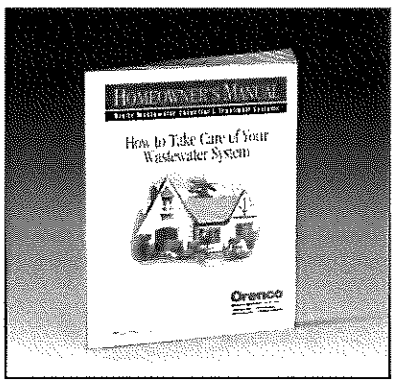


Design Aid Package

Our "Design Aid Package" and CD-ROM saves layout and drafting time. The CD-ROM includes more than 200 scaled AutoCAD® and PDF drawings, media gradation charts, and our General Specifications document. Most importantly, it includes our exclusive PumpSelect® software, which is designed to provide fast, accurate hydraulic calculations for sizing Orenco pumps. You can order a Design Aid Package from Orenco or you can quickly and easily download the latest version of PumpSelect from the home page of our website — orenco.com — under "Technical Resources" / "Design Tools."

Supportive Literature

Each ProSTEP™ Effluent Pumping System comes with installation and maintenance instructions. There's also a "Homeowner's Manual" for the property owner (available in English and Spanish), with do's and don'ts for preventive maintenance. Spec sheets, product sheets, and additional color brochures are also available, by request.



Web Sites

Orenco maintains two web sites

- **www.orenco.com** includes an extensive document library, allows you to submit questions, request literture, find a local distributor, and view and print product and system information round-the-clock.
- **www.vericomm.net** (coupled with our VeriComm® telemetry control panels), allows password-holders to manage alarms and monitor/control their onsite systems remotely. (See our online demo at www.vericomm.net/demo2/FlashDemo/demo.cfm; no password required.)

PROSTEP™ Effluent Pumping Systems

Orenco Systems is owned and managed by engineers who develop wastewater systems that work — systems based on sound science.

Clockwise from left: Eric Ball, P.E., Jeff Ball, P.E., Hal Ball, P.E., (front) Terry Bounds, P.E.

Powered by Franklin Electric

Carefully Engineered by Orenco

Your health is our priority. At Orenco Systems, we are committed to "Changing the Way the World Does Wastewater®."

Orenco Systems has been researching, designing, manufacturing, and selling leading-edge products for small-scale wastewater treatment systems since 1981. The company has become an industry leader, with about 300 employees and with more than 300 points of distribution in North and Central America, Australasia, Europe, and Africa. Our products and technologies have been installed in more than 70 countries, all over the world.

Orenco has a maintenance division and an environmental lab and employs dozens of scientists and civil, structural, agricultural, electrical, mechanical, and manufacturing engineers. Orenco's systems are based on sound scientific principles of chemistry, biology, mechanical structure, and hydraulics. As a result, our research appears in numerous publications and our engineers are regularly asked to give workshops and offer trainings.

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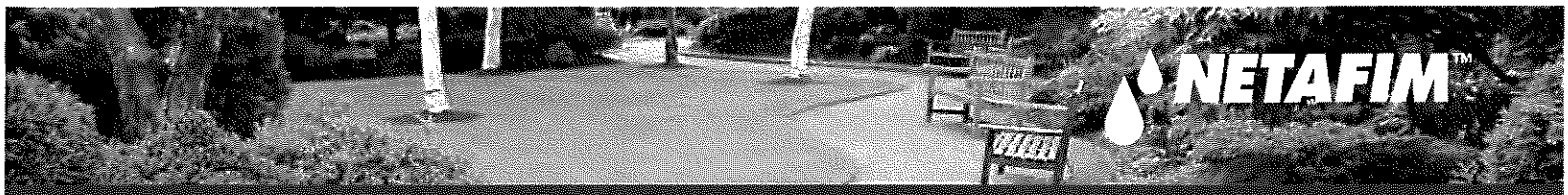
www.vericomm.net

ABR-STP-1
Rev. 5.3, © 07/17

Attachment 6c:
Arkal Filter/UV/Flowmotion Specifications



MANUAL DISC FILTERS

APPLICATIONS

- Residential
- Commercial
- Municipal
- Institutional

SPECIFICATIONS

- Maximum pressure:
  ¾", 1", 1 ½": 140 psi
  2" Dual Lite: 115 psi
  2" Dual HP: 174 psi
- Flow range:
  ¾" - 1 to 17 GPM
  1" - 5 to 26 GPM
  1 ½" - 10 to 35 GPM
  1 ½" Long - 10 to 52 GPM
  2" Dual Lite - 40 to 110 GPM
  2" Dual HP - 40 to 120 GPM

MATERIALS

- Filter body and cover: reinforced polyamide
- Disc rings: polypropylene
- O-Rings: EPDM rubber
- Clamps: stainless steel

FEATURES & BENEFITS

DISC FILTER DESIGN

Collects debris along the depth of the discs, not just at the surface like screen filters. Disc helps filtration with calcium build up.

100% THERMOPLASTIC DISCS

Corrosion resistant. Disc screens prevents element collapsing.

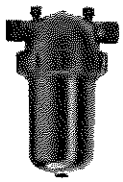
REPLACEMENT FILTER RINGS AVAILABLE

Color-coded for easy mesh identification.

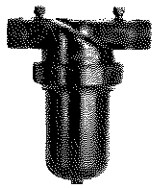
EXTRA LARGE FILTRATION CAPACITY

Requires less cleaning.

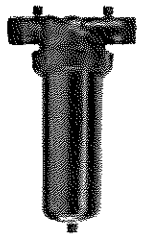
3/4" FILTER



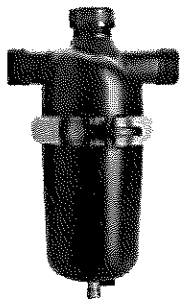
1" FILTER



1 1/2" FILTER



1 1/2" LONG FILTER



2" DUAL LITE FILTER

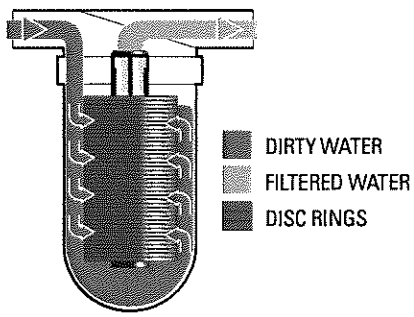
2" DUAL HP FILTER

DISC FILTER TECHNOLOGY

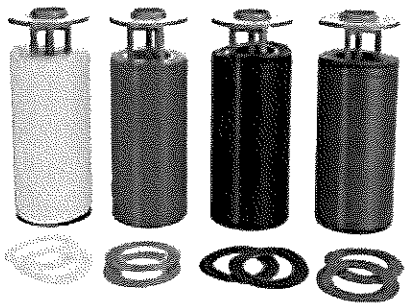
Grooves in the disc rings criss-cross to form a network that traps debris between and on the outside of the discs.

HOW IT WORKS

As dirty water is pumped into the filter, and pressure increases, the water compresses the disc rings together tightly. The water is then forced to flow through the grooves of the disc rings, where debris is trapped, releasing only clean water to the irrigation system.

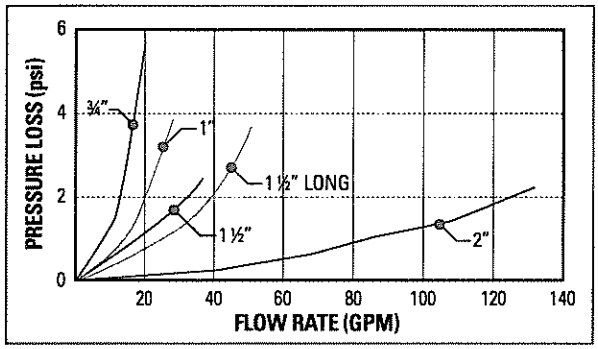


DISC FILTER RINGS



YELLOW	RED	BLACK	GREEN
80 MESH 200 MICRON	120 MESH 130 MICRON	140 MESH 115 MICRON	200 MESH 55 MICRON (2" ONLY)

FLOW RATE VS. PRESSURE LOSS



FLOW RATE VS. PRESSURE LOSS

FLOW RATE (GPM)	PRESSURE LOSS (psi)					
	3/4"	1"	1 1/2"	1 1/2" LONG	2" DUAL LITE	2" DUAL HP
5	0.60	0.25				
10	2.50	0.60				
13	3.40	1.34				
17	5.87	2.10				
22		3.24	1.10			
26			1.30	1.50		
31			1.70	2.10		
35			2.30	2.50		
44				4.20	0.30	0.30
66					0.63	0.63
88					1.03	1.03
110					1.47	1.47

Losses shown are for filters with 140 mesh.

LEGEND

- River, ditch, lake or reservoir water
- Well water containing sand only
- Municipal supply

DIMENSIONS & WEIGHT

SIZE	LENGTH	WIDTH	WEIGHT (LBS)
3/4"	5 22/32"	7 15/32"	.66
1"	9 11/32"	6 7/32"	2.2
1 1/2"	10 5/8"	7 7/8"	2.4
1 1/2" LONG	14 1/2"	7 7/8"	3.3
2" DUAL LITE	16 5/16"	10 1/4"	6.6
2" DUAL HP	14 3/4"	10 1/4"	11

ORDERING INFORMATION

FILTER SIZE	MESH	DISC FILTER MODEL NUMBER	REPLACEMENT FILTER RINGS MODEL NUMBER
3/4"	40	DF075-040	DFR075040
	80	DF075-080	DFR075080
	120	DF075-120	DFR075120
	140	DF075-140	DFR075140
1"	40	DF100-040	DFR150040*
	80	DF100-080	DFR150080*
	120	DF100-120	DFR150120*
	140	DF100-140	DFR150140*
1 1/2"	40	DF150-040	DFR150040*
	80	DF150-080	DFR150080*
	120	DF150-120	DFR150120*
	140	DF150-140	DFR150140*
1 1/2" LONG	40	DF150S-040	DFR150L040*
	80	DF150S-080	DFR150L080*
	120	DF150S-120	DFR150L120*
	140	DF150S-140	DFR150L140*
2" DUAL LITE	40	DF2DL-040	DFR200040
	80	DF2DL-080	DFR200080
	120	DF2DL-120	DFR200120
	140	DF2DL-140	DFR200140
	200	DF2DL-200	DFR200200
2" DUAL HP	40	DF200-040	DFR200040
	80	DF200-080	DFR200080
	120	DF200-120	DFR200120
	140	DF200-140	DFR200140
	200	DF200-200	DFR200200

* Ring set and filter spine.
140 Mesh: Standard for LVCZ Kit.

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W.02.11/12

NETAFIM™

3" ANGLE MANUAL DISC FILTER

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

FEATURES

- A right angle reinforced plastic filter with 3" flanged or grooved connections.
- Filter element consists of grooved discs, mounted on a spine, forming a cylindrical filter element.
- Clamp-on filter cover.
- Resistant to chemicals and liquid fertilizers.
- Available filtration grades: 040, 080, 120, 140 and 200.

TECHNICAL DATA	
FLOW RANGE	80 - 220 GPM
MAXIMUM PRESSURE	140 psi
FILTERING SURFACE AREA	287 sq. in.
FILTERING VOLUME	108 cu. in.
LENGTH	24 7/8"
WIDTH	12 3/32"
WEIGHT	31 lbs.
INLET/OUTLET DIAMETER	3"
MAXIMUM TEMPERATUR	158° F
pH	5 - 11

MESH/MICRON		
MESH	MICRON	DISC COLOR
040	400	Blue
080	200	Yellow
120	130	Red
140	115	Black
200	55	Green

INSTALLATION

1. Mount filter horizontally or vertically.
2. Use Teflon tape on filter threads - Do Not Use Pipe Dope.
3. Ensure correct inlet/outlet direction.
4. A shut-off valve should be installed at the filter inlet in order to close the water supply for servicing.
5. When connecting filter to pipe, do not overtighten.

MAINTENANCE AND CLEANING

DISMANTLING

1. Ensure system is turned off and no pressure remains in the pipeline or the filter.
2. Open clamp and remove filter cover from filter body.
3. Release the tightening nut slightly.
4. Pull out entire filter element.
5. Unscrew the tightening nut, pull out the spine extension and proceed with cleaning.

CLEANING

1. Flush discs with pressurized water.
2. If discs are not clean after flushing with water:
   a. If the discs have an accumulation of algae in the grooves, soak the discs and spine in a small bucket of Clorox bleach for one hour and then reflush with fresh water.
   b. If the discs have an accumulation of iron in the grooves, soak the discs and spine in a small bucket of 10% Muriatic Acid for one hour and then reflush with fresh water. Muriatic Acid can be purchased at any pool supply store.

MAINTENANCE AND CLEANING

ASSEMBLY

1. If previously removed, assemble rings on spine and turn fixing nut clockwise to tighten.
2. Insert filter element and make sure it is seated correctly.
3. Turn fixing nut clockwise to tighten the filter element.
4. Replace filter cover.
5. Close safety catch on the clamp, place clamp on closing edge and close the safety catch.

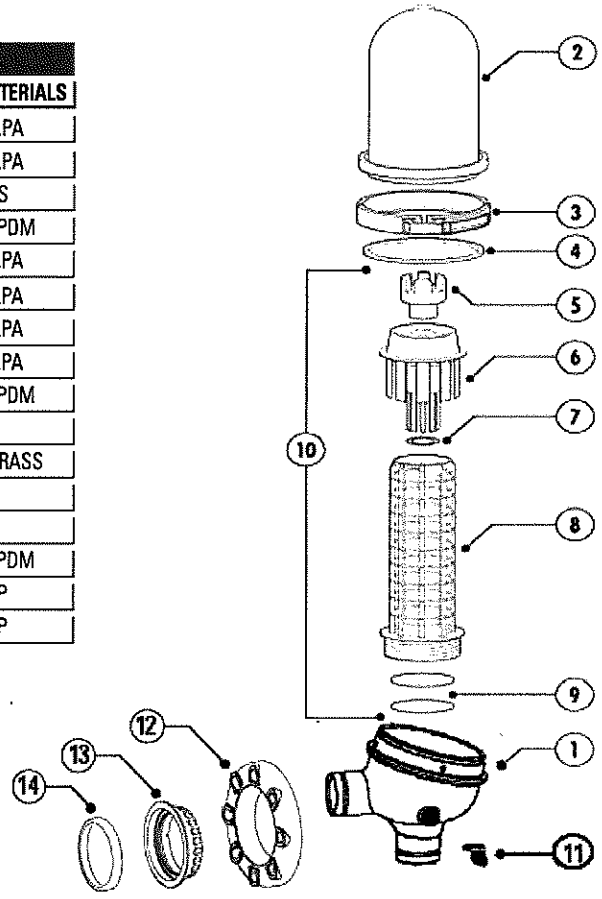
WINTERIZATION

Drain all the water from the filter to avoid cracking due to freezing.

PARTS BREAKDOWN - 3" ANGLE FILTER

KEY	MODEL NUMBER	DESCRIPTION	MATERIALS
1	25AP22371001	BODY GROOVED (NEW)	R.PA
2	25AP25010601	FILTER COVER (NEW)	R.PA
3	25AP50420060	CLAMP (NEW)	SS
4	25AP534341	HYDRAULIC COVER SEAL	EPDM
5	25AP25060302	TIGHTENING NUT	R.PA
6	25AP25060304	SPINE CAP	R.PA
7	25AP50032220	O-RING	R.PA
8	25AP25020302	SPINE	R.PA
9	25AP534141	O-RING	EPDM
10	25AP21990043	COMPLETE SPINE ASSY	-
11	25AP50540212	1/2" TAP	BRASS
12	25AP25100325	LOOSE FLANGE	-
13	25AP25070308	CONE FLANGE	-
14	25AP50052013	3" GASKET	EPDM
-	25AP1341-***	RING SET WITH SPINE	PP
-	25AP2341-***	RING SET	PP

Substitute *** for proper mesh size.



MATERIALS KEY

CODE	MATERIAL
SS	STAINLESS STEEL
PP	POLYPROPYLENE
R.PP	REINFORCED POLYPROPYLENE
R.PA	REINFORCED POLYAMIDE
EPDM	ETH. PROPY. RUBBER

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Ultra Mag
SUBMITTAL PACKAGE

Date:

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HEMET, CA 92545

PHONE (951) 652-6811
TOLL FREE (800) 800-8804
FAX (951) 652-3078

www.mccrometer.com

McCROMETER

PROJECT NOTES

Project Name: Center Hill Dam Left Bank Sanitary Waste System

Purchase Order No.: _____

Date: 2-7-17

Customer Name: Adams Contracting

Submitted By: Specialized Operations Services Inc

Equipment being purchased:

UM06 and Ground Rings

Included Items:

Ultra Mag sensor (UM06 or UM08 as noted above)
UltraLiner™ technology with NSF fusion bonded epoxy coating
Stainless Steel Electrodes
2-Year Warranty

Selectable Items:

Electrodes Material: 316 SS

Flanges: AWWA Flat Faced Flanges, 150 lbs

- [x] Meter Mount Converter
  or
- [ ] Remote Mounter Converter with feet of cable

Converter Power: (Check One) A/C Power [x] D/C Power [ ]

Special (Optional): [ ] Modbus Protocol RS485 Converter [ ] Hart Converter [ ] Profibus onverter

See Configu ation Sheet and drawings as follows for sizing and option details.

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ULTRA MAG

Ultra Mag And SIGNAL CONVERTER

MODEL UM06 AND UM08

ULTRA MAG ELECTROMAGNETIC FLOW METER

150 PSI FLANGED TUBE METER, SIZES 2" thru 48"

300 PSI FLANGED TUBE METER, SIZES 2" thru 48"

DESCRIPTION

MODELS UM06 AND UM08 FLANGED TUBE ULTRA MAG meters are manufactured to the highest standard available for magmeters. They incorporate microprocessor technology to offer very low fl ws and broad rangeability. The flanged end tube design permits use in a wide range of applications with up to 300 PSI working pressure. Flanged ends are Class "D" fl t face flanges (150 PSI) or Class "F" raised face flanges (300 PSI). The fabricated tube is stainless steel with steel or stainless steel flanges and is lined with UltraLiner™, an NSF approved, fusion bonded epoxy material.

INSTALLATION is made similar to placing a short length of flanged end pipe in the line. The meter can be installed vertically, horizontally, or inclined on suction or discharge lines. The meter must have a full pipe of liquid for proper operation. Fluid must be grounded to the downstream flange of the sensor either via internal grounding electrodes (4 - 12") or using McCrometer 316 SS Grounding Rings. For best performance, grounding rings are recommended for all sizes. Any 90 or 45 degree elbows, valves, partially opened valves, etc. should not be placed closer than one pipe diameters upstream and zero pipe diameters downstream. All blending and chemical injection should be done early enough so the fl w media is thoroughly mixed prior to entering the measurement area.

SIGNAL CONVERTER: The signal converter is the reporting, input and output control device for the sensor. The converter allows the measurements, functional programming, control of the sensor and data recording to be communicated through the display and inputs/outputs. The microprocessor-based signal converter has a curve-fittin algorithm to improve accuracy, dual 4-20mA analog outputs, an RS485 communication port, an 8 line graphical backlit LCD display with 3-key touch programming, and a rugged enclosure that meets IP67. In addition to a menu-driven self-diagnostic test mode, the converter continually monitors the microprocessor's functionality. The converter will output rate of fl w and total volume. The converter also comes standard with password protection and many more features.

ISOLATED POWER AND SIGNAL: The power and signal between the converter and sensor are isolated and placed in separate cables giving superior resistance to electrical signal noise compared to single cable designs. An added benefit f om the dual cable design is a maximum cable length of up to 500ft.

OPTIONAL:

DC powered converter (10-35 VDC, 21 W)
Meter mounted converter
Extended warranty
Hastelloy® electrodes
ANSI or DIN flange
Quick Connect cable fitting
Special lay lengths, including ISO standard lay lengths
Converter sun shield
Modbus Protocol RS485 converter; HART® Converter; Profibus Converter (No Dual 4-20mA on HART & Profibus); Panel mount converter (Not CSA approved)

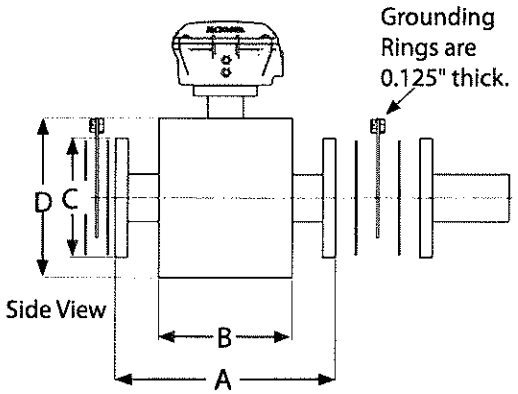
SPECIFICATIONS

WARRANTY	2 Years
ACCURACY TESTS	5-point wet fl w calibration of every complete fl w tube with its signal converter. If desired, the tests can be witnessed by the customer. The McCrometer test facilities are traceable to the National Institute of Standards & Technology. Uncertainty relative to fl w is ±0.15%
ACCURACY	Plus or minus 0.5% of actual fl w
REPEATABILITY	±0.05% or ±.0008ft/s (±0.25mm/s), whichever is greater
HEAD LOSS	None. No obstruction in line and no moving parts
PRESSURE RANGE	150 PSI maximum working pressure (UM06) 300 PSI maximum working pressure (UM08)
TEMPERATURE RANGE	Sensor Operating: -10 to 77°C (14 to 170°F) Sensor Storage: -15 to 77°C (5 to 170° F) Electronics: Operating and storage temperature: -4° to 140° F (-20° to 60° C)
VELOCITY RANGE	.2 to 32 FPS
BI-DIRECTIONAL FLOW	Forward and reverse fl w indication and forward, reverse, net totalization are standard with all meters
CONDUCTIVITY	5 µs/cm
LINER	UltraLiner NSF approved, fusion bonded epoxy
ELECTRODES	Type 316 stainless steel, others optional
POWER SUPPLY	AC: 90-265VAC/45-66 Hz (20W/25VA) or DC: 10-35VDC (21W). AC or DC must be specified at time of ordering.
OUTPUTS	Dual 4-20mA Outputs (Not available for Profibus or HART Converters): Galvanically isolated and fully programmable for zero and full scale (0-21mA). Four separate digital programmable outputs: open collector transistor usable for pulse, frequency, or alarm settings. • Volumetric Pulse • Hardware Alarm • Flow Rate (Frequency) • Empty Pipe • Directional Indication • Range Indication • High/Low Flow Alarms
CABLE LENGTH	Includes 20' of submersible and UV resistant cable. Additional cable up to 500' is available
EMPTY PIPE SENSING	Zero return when electrodes are uncovered
ALARMS	Programmable alarm outputs
DIGITAL TOTALIZER	Cubic Meter; Cubic Centimeter; Milliliter; Liter; Cubic Decimeter; Decaliter; Hectoliter; Cubic Inches; US Gallons; Imperial Gallons; Cubic Feet; Kilo Cubic Feet; Standard Barrel; Oil Barrel; US Kilogallon; Ten Thousands of Gallons; Imperial Kilogallon; Acre Feet; Megagallon; Imperial Megagallon; Hundred Cubic Feet, Megaliters
RATINGS	• Metering Tube: NEMA 6P/IP68 with remote converter (six foot depth continuous submersion) • Electronics enclosure: IP67
CERTIFICATIONS	• CE Certified (Converter only) • Listed by CSA to 61010-1: Certified y CSA to UL 61010-1 and CSA C22.2 No.61010-1-04 • ISO 9001:2008 certified quali y management system

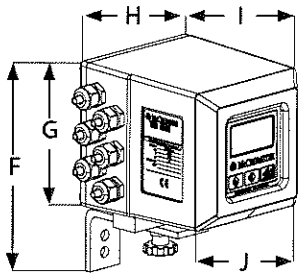
ULTRA MAG

MODEL UM06 AND UM08

ELECTROMAGNETIC FLOW METER



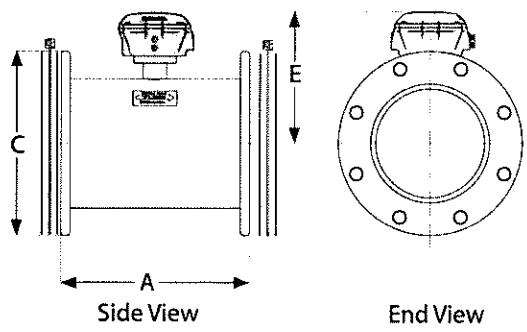
2" and 3" Models Body Style



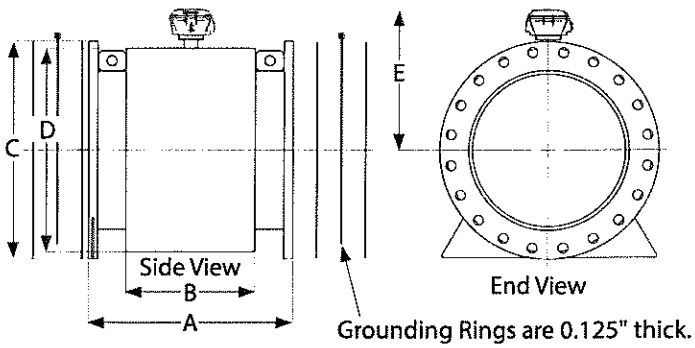
Bracket mounting holes are 0.27"

F	9.06"
G	5.75"
H	5.75"
I	6.69"
J	5.44"

Converter Dimensions



4" to 12" Models Body Style



14+" Models Body Style

Pipe Size (Nominal)	Meter Pipe ID	Flow Ranges GPM Standard .2 to 32 FPS Min - Max	DIMENSIONS (Lay Lengths)							Estimated Shipping Weight (lbs.)	
			A*		B	C		D	E		
			UM06	UM08		UM06	UM08			UM06	UM08
2"	2.117	2 - 340	11.00	11.00	6.70	6.00	6.50	7.90	9.26	93	107
3"	3.220	5 - 730	13.40	13.40	6.70	7.50	8.25	9.40	10.01	97	111
4"	3.720	8 - 1,140	13.40	13.40	n/a	9.00	10.00	n/a	8.06	78	108
6"	5.692	19 - 2,660	14.60	14.60	n/a	11.00	12.50	n/a	9.06	82	138
8"	7.692	33 - 4,870	16.10	17.25	n/a	13.50	15.00	n/a	10.06	115	195
10"	9.682	52 - 7,670	18.50	18.50	n/a	16.00	17.50	n/a	10.46	144	247
12"	11.682	74 - 11,180	19.70	19.70	n/a	19.00	20.50	n/a	12.31	193	342
14"	13.440	90 - 16,070	21.70	22.75	12.00	21.00	23.00	20.30	15.46	321	476
16"	15.440	118 - 20,900	23.60	25.25	14.20	23.50	25.50	21.10	16.21	390	645
18"	17.440	150 - 26,480	23.60	25.25	14.20	25.00	28.00	21.10	17.21	446	750
20"	19.440	185 - 32,720	25.60	28.25	16.20	27.50	30.50	24.80	18.26	588	874
24"	23.440	270 - 47,180	30.70	35.75	21.70	32.00	36.00	29.60	20.11	769	1,568
30"	29.190	420 - 73,620	35.80	41.75	26.50	38.75	43.00	35.90	23.26	1,261	2,317
36"	35.190	610 - 105,930	46.10	46.10	28.20	46.00	50.00	42.70	26.66	1,696	2,915
42"	41.190	830 - 144,370	48.05	**	32.10	52.75	**	48.35	29.99	**	**
48"	47.190	1,080 - 188,430	50.00	**	36.00	59.50	**	54.00	33.31	**	**

* Laying lengths for meters with ANSI Class 150 Flanges are equal to UM08 laying lengths

** Consult factory

Grounding And Electrical Interference

The sensor body must have electrical contact with the media. This is achieved via a grounding ring or grounding button.

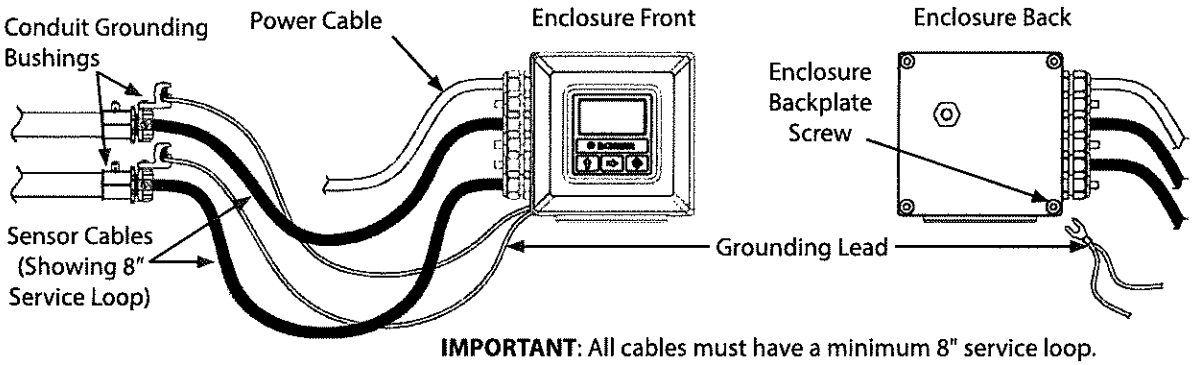
NOTE: The grounding ring is optional only on 4" through 12" models. For best performance, grounding rings are recommended for all sizes.

Always ensure that the converter and the sensor are grounded (earthed) correctly. The grounding of the sensor and converter ensures that the equipment and liquid have an equal potential. For most installations the quality of grounding by the provided cabling assures the sensor is properly grounded and additional grounding of the sensor is not required. However, in instances where this is not the case, i.e. the equipment and fluid do not have an equal potential, such as where the installation location and/or media is subjected to electrical interference, additional grounding steps may be required. Consult an electrician experienced with instrumentation installations to determine if electrical interference is present. For further information on installation environments and sensor grounding, please contact McCrometer Technical Support.

Lines With Cathodic Protection:

On meters installed on a line with cathodic protection it may be necessary to insulate the meter from the line. Consult your cathodic protection vendor for instructions.

WARNING: Do not connect any form of conduit directly to the converter enclosure. Doing so will allow moisture and potentially dangerous gasses to enter directly into the converter. Attaching any conduit to the enclosure, or altering the enclosure in any way will void the warranty.



IMPORTANT: All cables must have a minimum 8" service loop.

Cable Installation, Service Loop And Bonding To Metallic Conduit

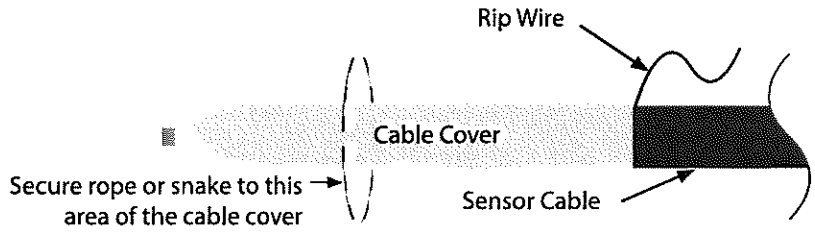
Pulling Sensor Cable Through Electrical Conduit

It is very important to protect the end of the sensor cable when pulling it through a conduit. Water can accumulate in low portions of conduit. Always use the factory supplied cable cover, or similar method, to seal the end of the cable against water when pulling the cable through conduit. *See Figure 5.* This will ensure proper operation of the meter.

Pulling The Sensor Cable:

1. Tie a rope or cable-snake securely around the middle of the cable cover.
2. Carefully pull the rope or snake until the sensor cable end clears the conduit.
3. Bring the cable end to the converter location. If necessary, secure the cable so that it does not fall back through the conduit.
4. Remove the cable cover by pulling the rip wire. The cable cover will tear off (disca d the cover).

CAUTION: Do not cut the cable cover off. Doing so may damage the sensor cable and adversely effect the calibration of the meter.



Cable Cover

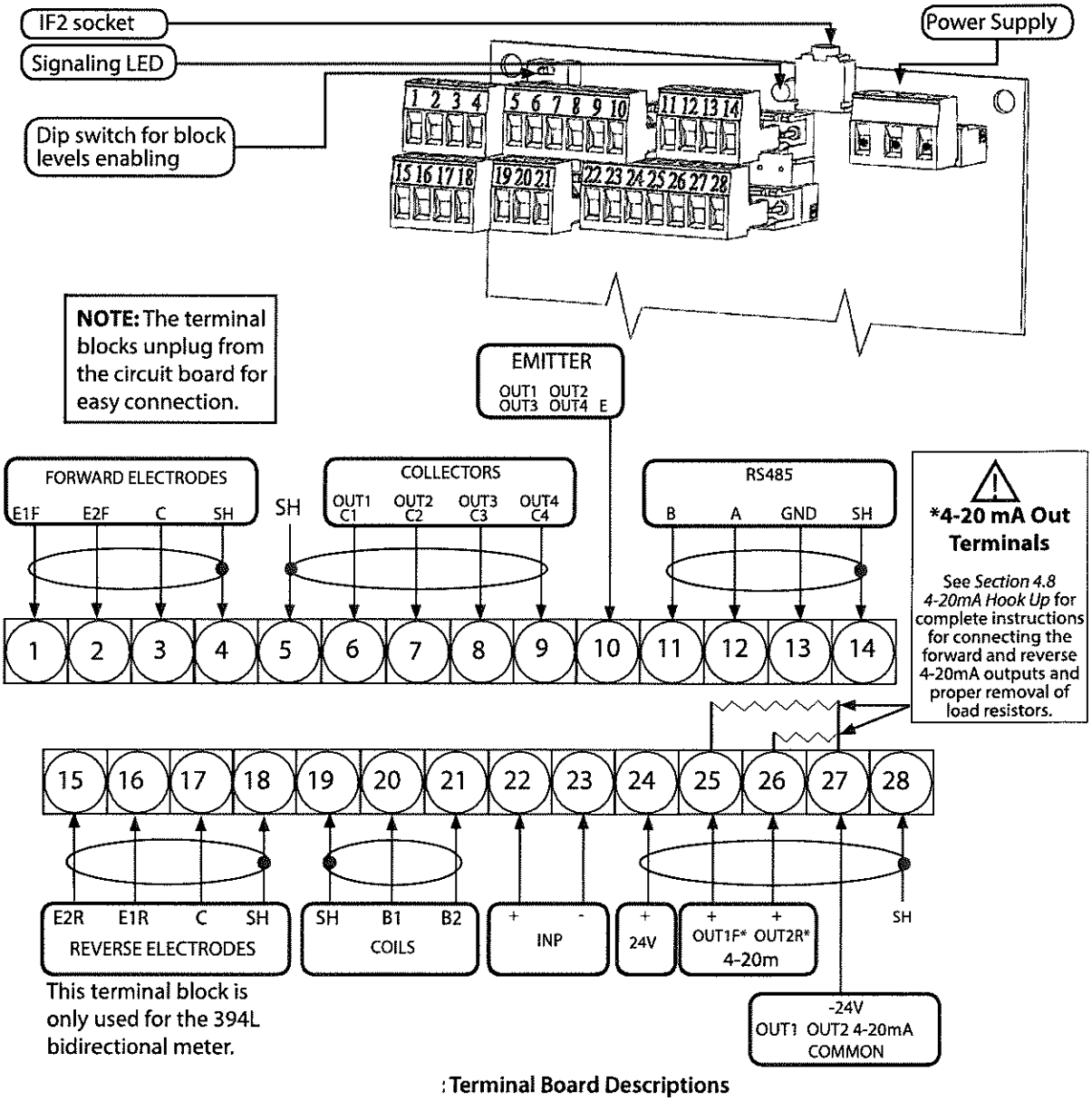
4.1 Converter Electrical Cable Connections

CAUTION - Always disconnect the power cord before attempting any electrical connections.

All electrical cables enter the converter through compression fittings loc ted on the side of the converter. Ensure that all compression glands are properly tightened and all unused fittings a e plugged so the case remains sealed.

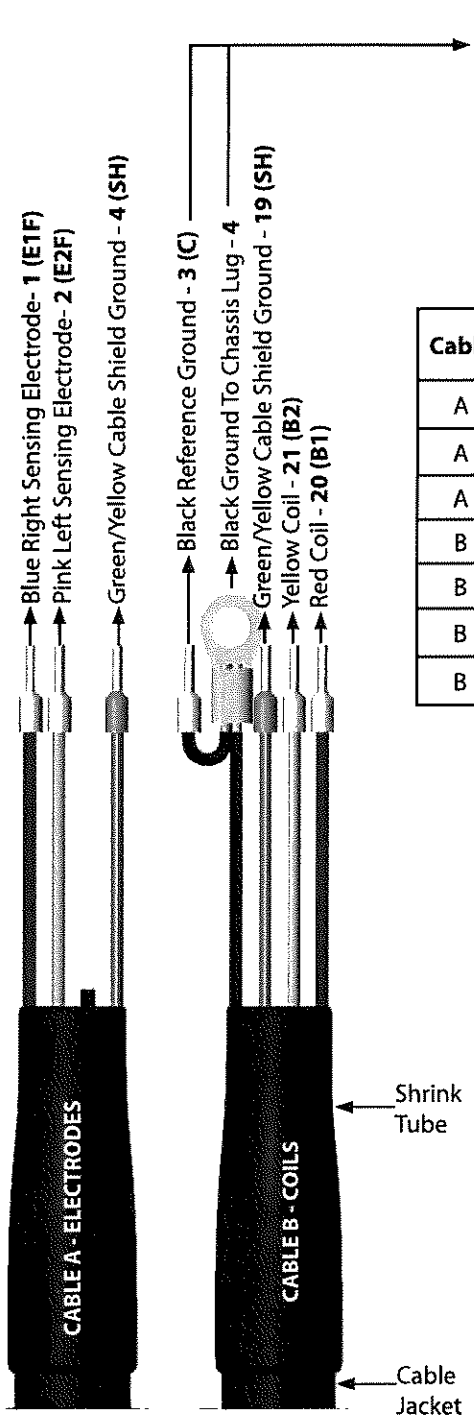
Terminal Board

All connections are made on the terminal board. To access the terminal board, loosen the four screws on the back of the converter to remove the rear cover.



Terminal Board Descriptions

Ultra Mag and Mx Ultra Mag Body Style 1 - 2", 3" And 14+"

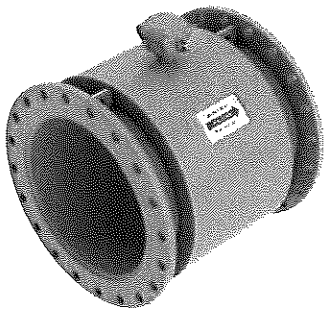


Ultra Mag And Mx Ultra Mag Body Style 1 Sensor Cable Connections

***IMPORTANT:** See *Section 4.7 Converter Grounding* for instructions on attaching the chassis ground wire to the converter ground lug.

Cable	Terminal	Wire Color	Connected To
A	#1 (E1F)	Blue	Right Sensing electrodes
A	#2 (E2F)	Pink	Left Sensing Electrodes
A	#4 (SH)	Green/Yellow	Cable Shield Ground
B	Chassis Lug	Black	Ground To Chassis Lug*
B	#20 (B1)	Red	Coil
B	#21 (B2)	Yellow	Coil
B	#19 (SH)	Green Yellow	Cable Shield Ground

Terminal Block M1 Assignments

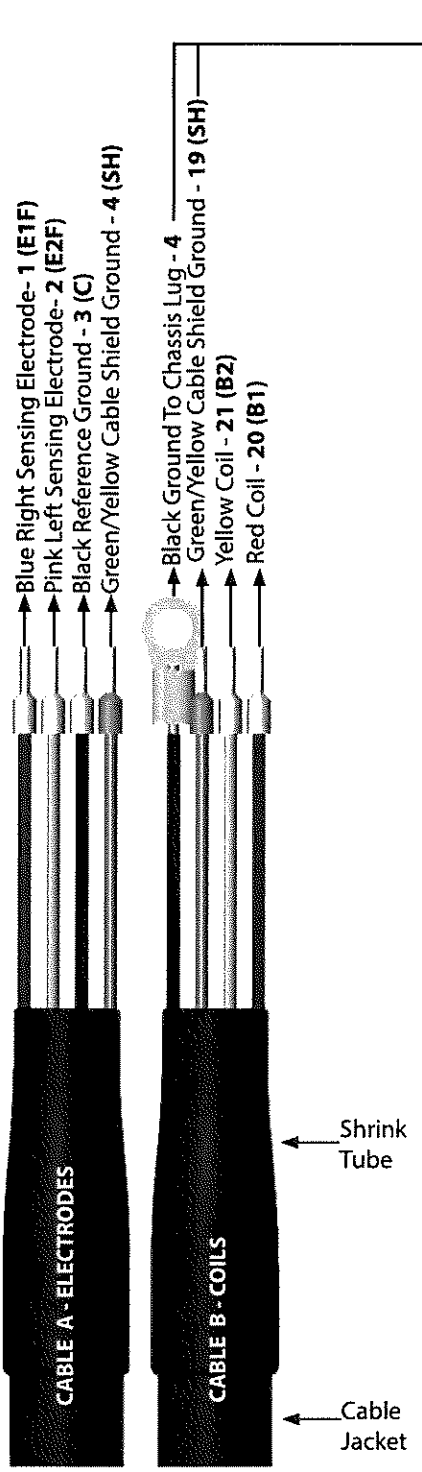


Ultra Mag And Mx Ultra Mag Body Style 1 - 2", 3" and 14+"

Cable Diameters:

Cable A (15035): 0.248"
Cable B (15036): 0.248"

Ultra Mag and Mx Ultra Mag Body Style 2 - 4" through 12"

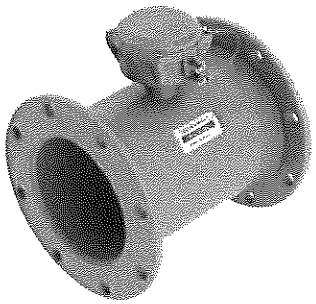


Ultra Mag And Mx Ultra Mag Body Style 2 Sensor Cable Connections

***IMPORTANT:** See *Section 4.7 Converter Grounding* for instructions on attaching the chassis ground wire to the converter ground lug.

Cable	Terminal	Wire Color	Connected To
A	#1 (E1F)	Blue	Right Sensing electrodes
A	#2 (E2F)	Pink	Left Sensing Electrodes
A	#3 (C)	Black	Reference Ground
A	#4 (SH)	Green/Yellow	Cable Shield Ground
B	Chassis Lug	Black	Ground To Chassis Lug*
B	#20 (B1)	Red	Coil
B	#21 (B2)	Yellow	Coil
B	#19 (SH)	Green Yellow	Cable Shield Ground

: Terminal Block M1 Assignments



Ultra Mag And Mx Ultra Mag Body Style 2 - 2 - 4" - 12"

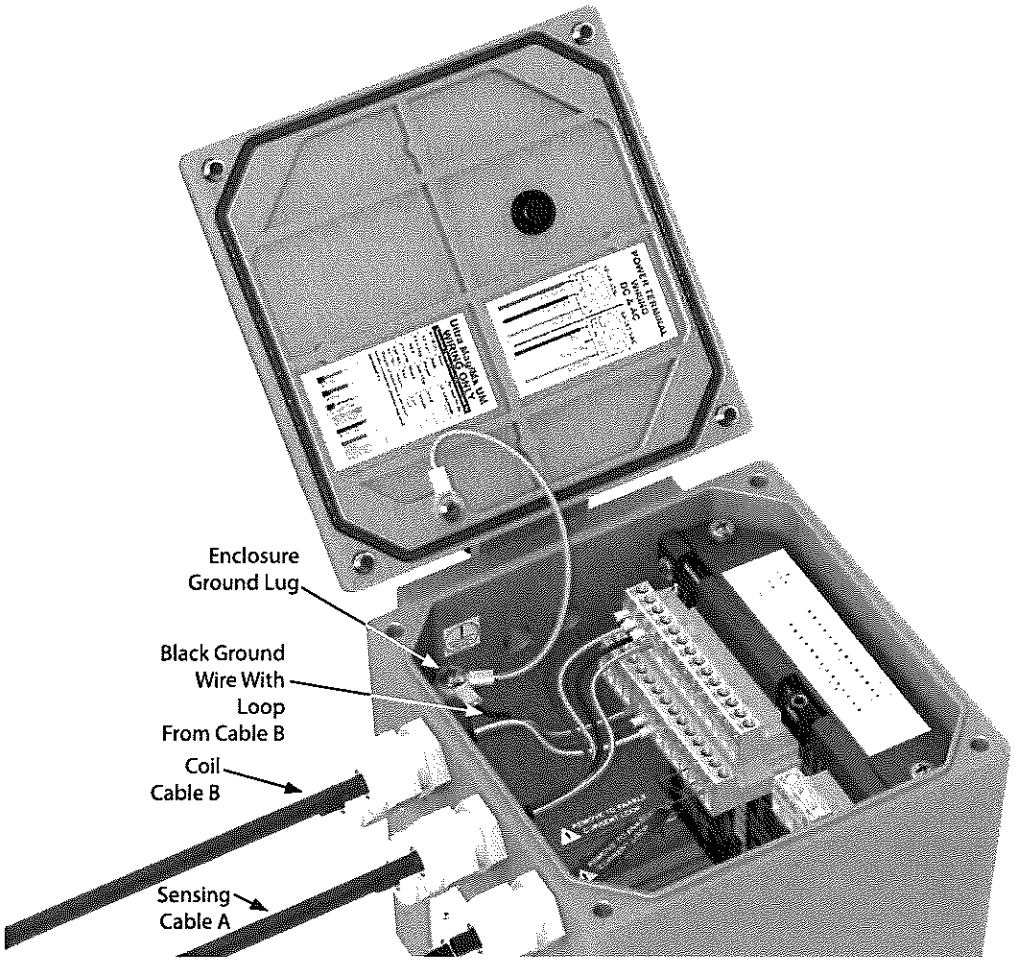
Cable Diameters:

Cable A (15035): 0.248"
Cable B (15036): 0.248"

Converter Grounding

Converter Grounding For Multi Mag 394L, 395L, And Ultra Mag Or Mx Ultra Mag Body Style 2

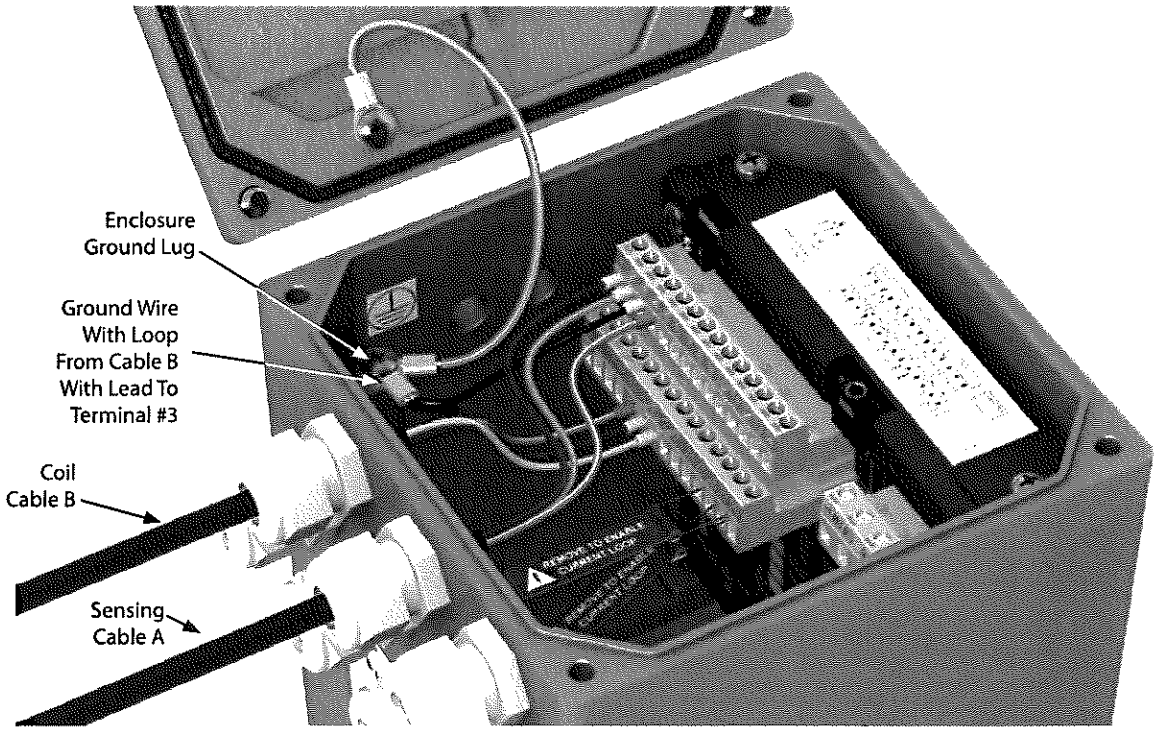
On converters attached to the 394L, 395L and Ultra Mag or the Mx Ultra Mag body style 2 fl w meters, the sensor cable has a ground wire fit ed with a loop. Attach the wire with the loop to the enclosure's ground terminal lug as shown in below.



Converter Grounding With Cable Lug For Multi Mag 394L And 395L, And Ultra Mag And Mx Ultra Mag Body Style 2

Converter Grounding For Ultra Mag or Mx Ultra Mag Body Style 1

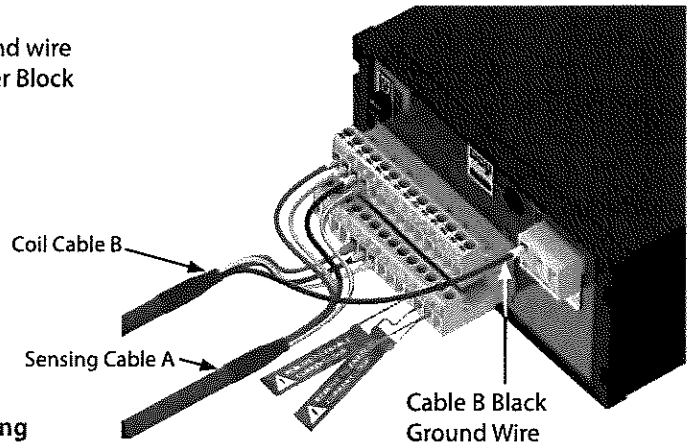
On converters attached to the Ultra Mag or the Mx Ultra Mag body style 1 fl w meters, the sensor cable has a ground wire fit ed with a loop and a terminal extension. Attach the wire to the enclosure's ground terminal lug as shown below via the wire end loop, then connect the wire extension to Terminal #3.



Converter Grounding With Cable Lug And Ground Lead For Ultra Mag and Mx Ultra Mag Body Style 1

Grounding For Panel Mount Converters

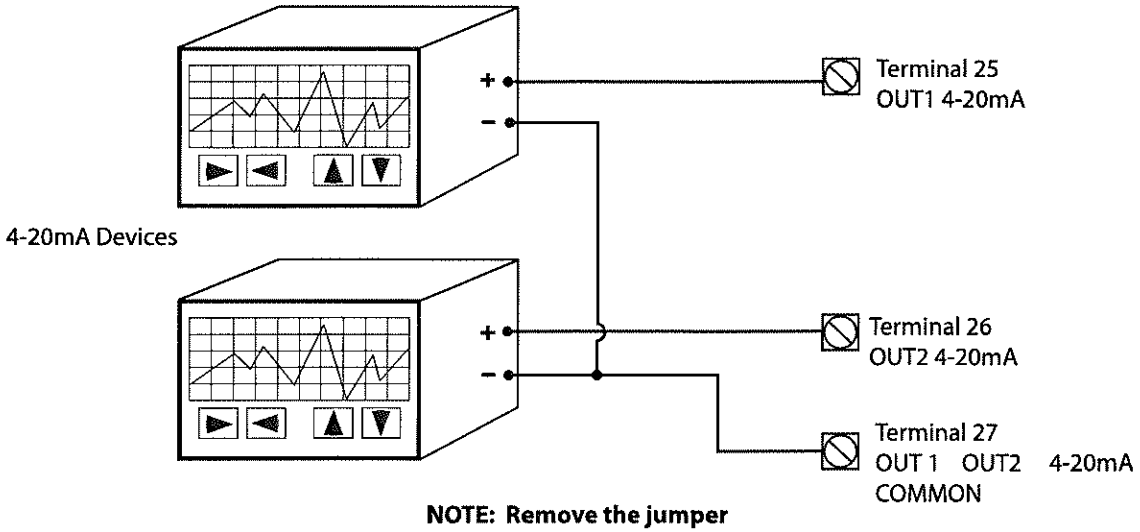
For panel mount converters, insert the Black Ground wire from Cable B into the Ground terminal in the Power Block as shown in *Figure 21.*



: **Panel Mount Converter Grounding**

4-20mA Hook-Up

Isolated 4-20mA current loops are used to output fl w data to external devices. Maximum load impedance is 1,000Ω, and the maximum voltage without load is 27VDC. The converter has the capability to detect a loss of load on this output. To disable this function set the value "mA Val. Fault" under the ALARMS menu to zero (*See Section 8.4.6*). A graphical example of the usage of the current loop with external device is shown below:



NOTE: Remove the jumper from terminals 25 & 27 and/ or 26 & 27 before attaching 4-20mA cables. *See Figure 5.*

4-20mA Hook-Up

If the external device requires a voltage input, a precision resistor placed across the input terminals of the external device will change the current to voltage. Calculate the required resistor using Ohm's law (V = I x R). For example, a 250Ω resistor will provide an input voltage of one to fi e volts with the transmitter range being set from 4mA to 20mA. An additional 4 to 20mA loop output is available.

IMPORTANT

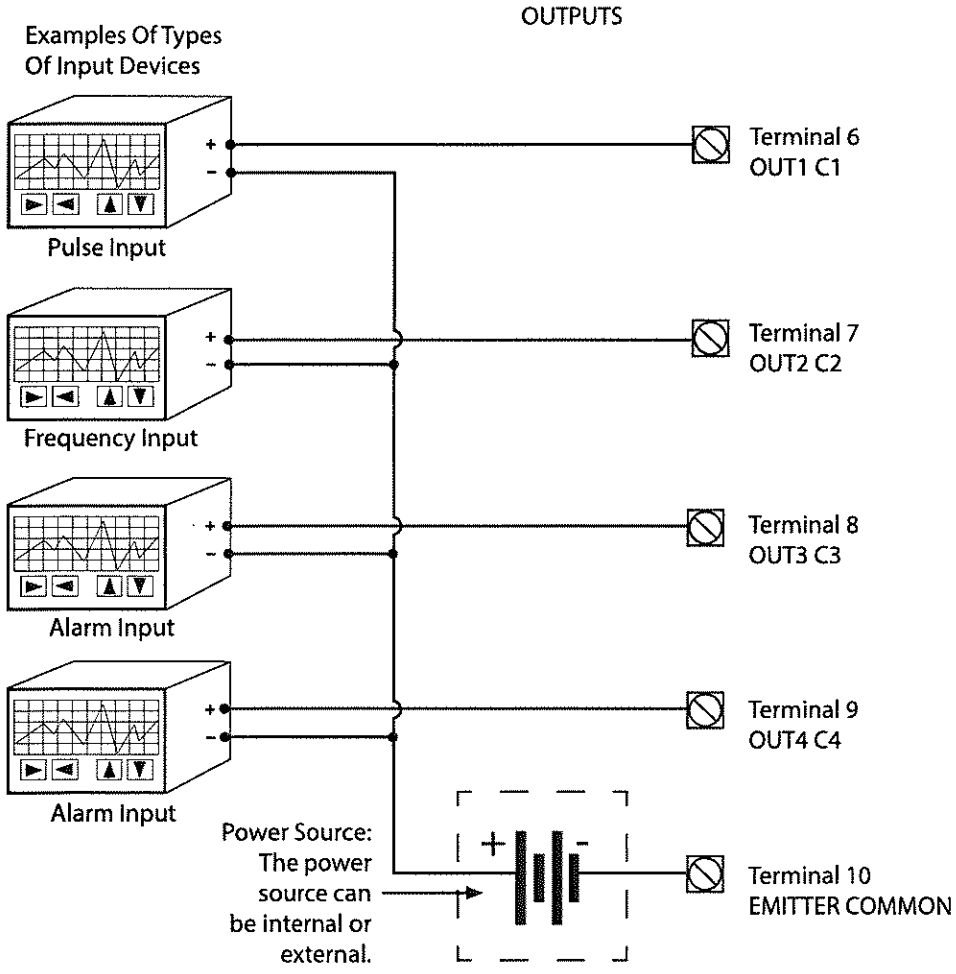
The converter powers the 4-20mA loops. Do not use external power for the 4-20mA loop as it may cause permanent damage to the converter.

Opto-Isolated Pulse Output Hook-Up

The four outputs are open collector transistor outputs used to communicate with or activate external devices when the fl w reaches a predetermined set point.

- Opto-isolated output with collector and emitter terminals flo ting and freely connectable
- Maximum switching voltage: 40 VDC
- Maximum switching current: 100mA
- Maximum saturation voltage between collector and emitter 1.2V@100mA
- Maximum switching frequency (load on the collector or emitter, RL=470Ω, VOUT=24VDC): 1250Hz
- Maximum reverse current bearable on the input during an accidental polarity reversion (VEC): 100mA
- Insulation from other secondary circuits: 500 V

A common application of outputs should be connected as follows:



IMPORTANT

Outputs are not isolated from each other. All outputs MUST use the same power source.

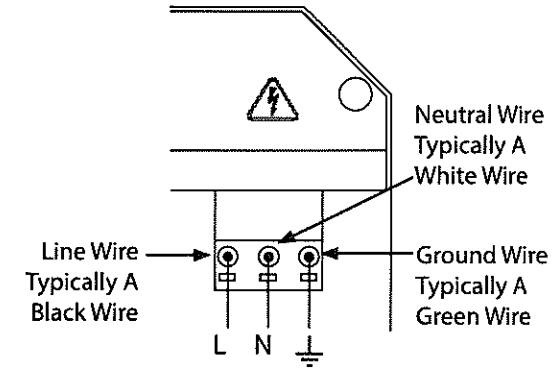
Opto-Isolated Pulse Output Diagram

Converter Power Hook-Up

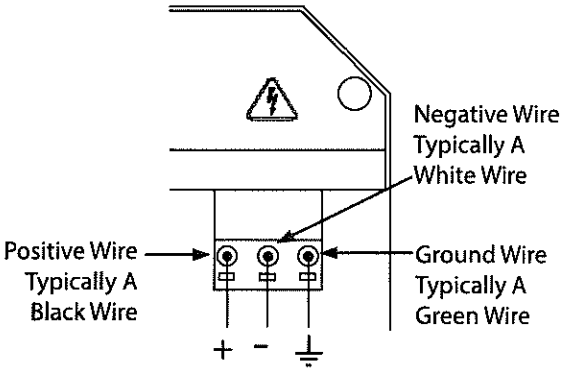
WARNING!! Hazardous supply voltage can shock, burn, or cause death.

The power supply line must be equipped with external surge protection for current overload (fuse or circuit breaker with limiting capacity not greater than 10A). It must be easily accessible for the operator and clearly identifie .

Power connection is made using the power terminal block on the upper right side of the terminal board. **NOTE**: The terminal block uplugs from the circuit board for easy connection. Connect earth ground to the protective grounding terminal before making other connections. The power supply of a standard converter is 90-265VAC, 44-66Hz at maximum 20W. DC converter is available as an option.

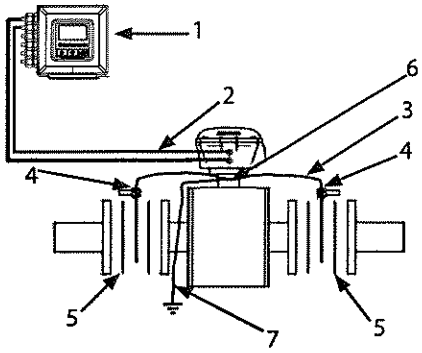


AC Power Supply Terminal Block

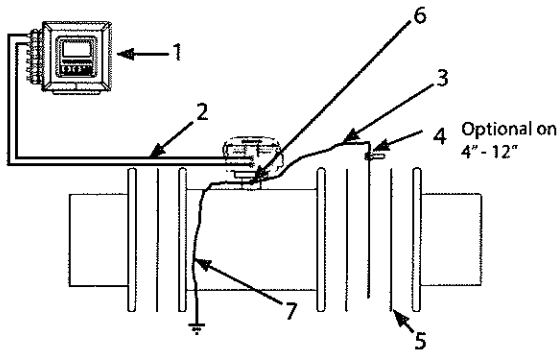


Optional DC Power Supply Terminal Block

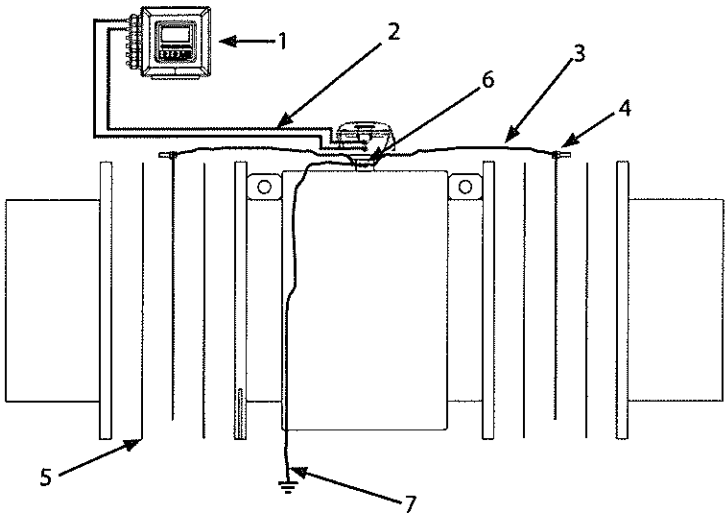
Parts List With Remote Mount Converter



2"- 3" Model



4" - 12" Model



14" And Larger Model

NO.	PART NUMBER	DESCRIPTION
1	880003032	AC Converter (Dual 4-20mA Output)
1	880003042	DC Converter (Dual 4-20mA Output)
1	880003043	AC Converter w/ Modbus RS485 Communications Protocol
2	1-1701-11	Dual Cables - Submersible
3	3-2757-‡‡	Grounding Wire Assembly
4	3-2781-*	Grounding Rings, Stainless Steel (Optional on 4"-12")
5	1-1557-*	Gaskets (Optional)
6	1-1201-10	Nut, Hex, Brass
7	15029	Earth Ground Wire

*** INSERT METER SIZE TO COMPLETE PART NUMBER - INSERT -02 FOR 2", -04 FOR 4", -06 FOR 6", ETC.**

‡‡ 2" - 6" INSERT -02; 8" - 12", INSERT -08; 14" -20", INSERT -14; 24" -30", INSERT -24; 36", INSERT -36

When ordering replacement parts, please specify: Meter Size • Meter Model • Meter Serial Number

JESCO
Lutz-JESCO America Corp.

A measured step forward™

Operations & Maintenance Manual

JESCO UV 405-412-440-450-480-550-80

2 LCD – LCD PLUS

Total Fluid Management

Contents

1. Introduction

This manual is for the following models of LCD SERIES:

UV 405-412-440-450-480-550-80/2 LCD-LCD PLUS

Warning: This equipment requires regular maintenance to ensure the requirements of the drinking water treated and the maintenance of the improvements as stated by the manufacturer.

These operating instructions contain important information for the operation and maintenance of the equipment.

Please ensure that these operating instructions are carefully read by all relevant persons before putting into operation, to ensure the safe use of the UV system. The operating instructions are an integral part of the equipment supply.

Before putting into operation, all the conditions necessary for safe operation of the equipment must be fulfilled.

The installation, commissioning and maintenance of the equipment should only be carried out by qualified personnel.

The equipment should only be operated by authorized personnel who have been trained accordingly.

No modifications should be made to the equipment without consulting Jesco, as this could affect the safe operation of the unit. Jesco shall not be held responsible for damage resulting from unauthorized modifications.

INSTRUCTION:

The operating instructions are to be kept where they will be accessible for operating and maintenance personnel.

2. General Principles and Safety Instructions

Information about UV irradiation:

The UV disinfection system of the LCD series has been designed specifically for destroying harmful bacteria and viruses present in your water.

The UV light emitted by special mercury vapor lamps (UV-C rays l= 254nm) is highly germicidal because it interacts with DNA and RNA at a molecular level.

The deep bio-structural disorder caused by such irradiation interferes with the ability of micro-organisms to develop and reproduce, rendering them harmless.

Generally, it is better to mount a pre-filter onto the UV sterilizer in order to remove contaminates and particles that could interfere with the ultraviolet process.

This system is necessary if a high degree of sterilization is required. In fact, the nonfiltration and removal of suspended particles in water has, as a consequence, a decrease in the sterilizer's efficiency.

If the water to be treated contains sulphydric acid or more than 0.3 p.p.m. of iron or filtrable solids, once passed through the sterilizer, it leaves a residual sediment on the quartz sleeve which must be cleaned periodically (the frequency depends on the quantity and quality of water treated).

General directions:

According to the European rules EN 60204-1 (safety of the set-up off the electrical equipment-general rules) the low tension electrical instruments (rule 2006/95/CE) must be connected to a current-tap provided with grounding.

Electrical Safety Instructions:

The lightning flash and arrowhead symbol is to alert the user to the presence of un-insulated "DANGEROUS VOLTAGE" within the enclosure. The equipment may only be opened if main supply is isolated. The main supply must not be restored as long as the equipment is open. This applies to both the electrical panel and the UV reactor vessel.

ATTENTION: Working on live equipment is prohibited.

UV Light Danger:

The light of ultra-violet lamps can cause serious burns to unprotected skin and eyes, therefore it is recommended not to connect it to the current tap without before having ensured that the UV lamp is in its housing and inserted in the PVC cover.

Pressure Danger:

The UV chamber could be under water pressure. Max working pressure is 145 psig (10 bar). UV chamber must be installed in accordance with our installation and commissioning instructions and used in accordance with operating and maintenance instructions.

ATTENTION: Ensure that system is depressurized before attempting any service or repair.

Indications for the disposal:

Please note that, according to what is outlined by D.L.25 July 2005, № 151 "Accomplishment of directives 2002/CE, 2002/96/CE and 2003/108/CE, concerning the reduction of the use of dangerous substances in electric and electronic equipment, and the disposal of waste" both mercury vapor lamps and electrical panels, when no longer in use, must be treated as special waste, and as such disposed of.

To do that, please contact specialized centers for the recycling of dangerous materials, or contact our technical department directly.

3. Instructions for Installation and Setting at Work

General premise: The installation of the DOMESTIC SERIES disinfection units must be carried out by specialized staff, exactly following the instructions hereby provided. Moreover, it is necessary to provide some general information about electrical and water connections.

Caution: check that the UV panel is not connected to the power supply and that the tap of the water to be treated is turned off.

- Connect the delivery of the water to be treated to the special water connection
- Turn on water and check for possible leaks in any part of the unit
- Connect the plug to the current tap
- Check that the disinfected water comes out and that the LEDS on the panel on the control board, signal correct functioning

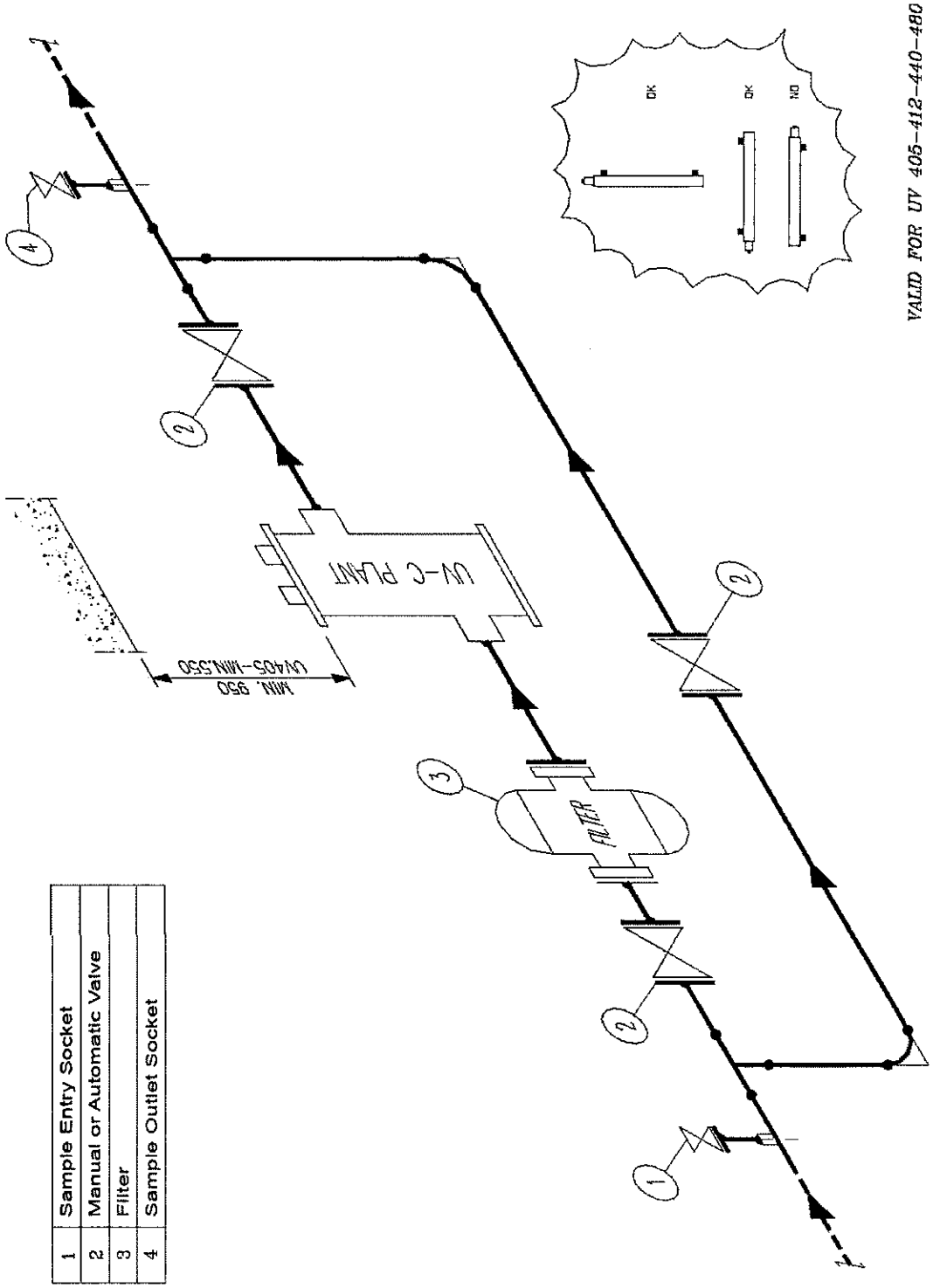
Allow the disinfected water flow down to outlet for at least 10 minutes before utilization, in order to allow possible impurities present in the unit to drain out.

NOTE: it is recommended to mount a water filter directly onto the UV sterilizer in order to remove suspended particles, potentially present in the water to be treated, which could limit the efficiency of sterilization.

CHECKS

The DOMESTIC SERIES is ready for producing disinfected water, once the connection to the water system and to the electrical grid is carried out. The unit works automatically, the electronic boards which control the signals reaching the control panel, allow the visualizing (or the sounding) of the correct functioning or of anomalies which may occur during the operation of the unit.

3.1 Suggested Install Scheme



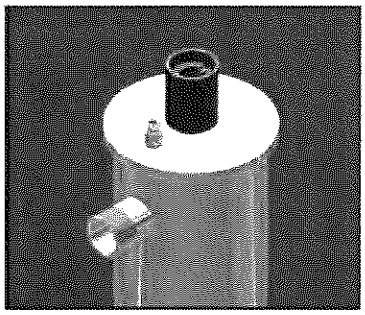
1	Sample Entry Socket
2	Manual or Automatic Valve
3	Filter
4	Sample Outlet Socket

4. UV Chamber Installation

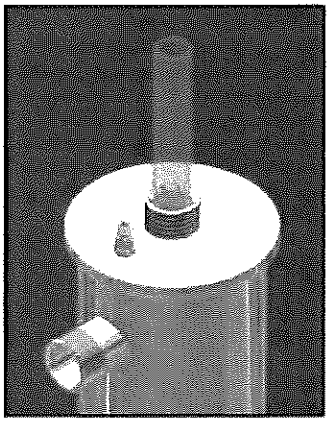
4.1 UV Chamber Assembling

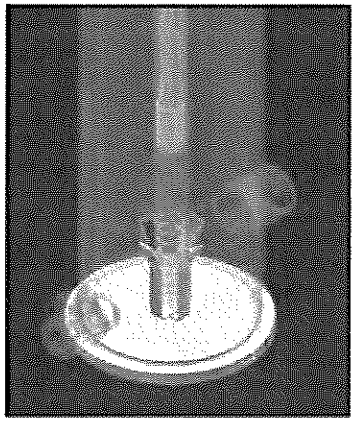
Mount the valve kit supplied with the system.

Unscrew the sleeve bolts:

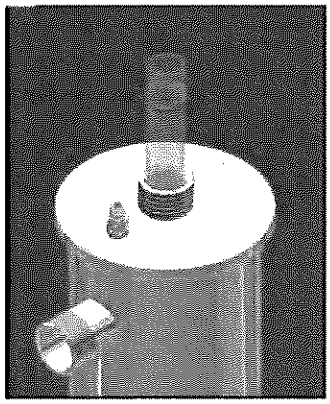


Insert the quartz sleeves carefully centering the spring at the bottom plate of the UV chamber:

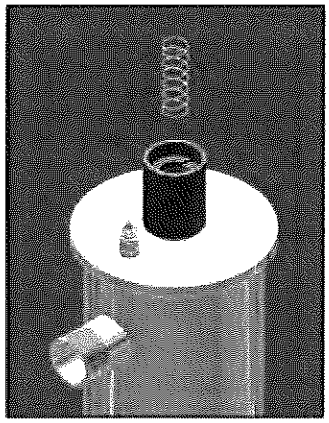




Insert the o-ring Ø 23x4 into the quartz sleeve:

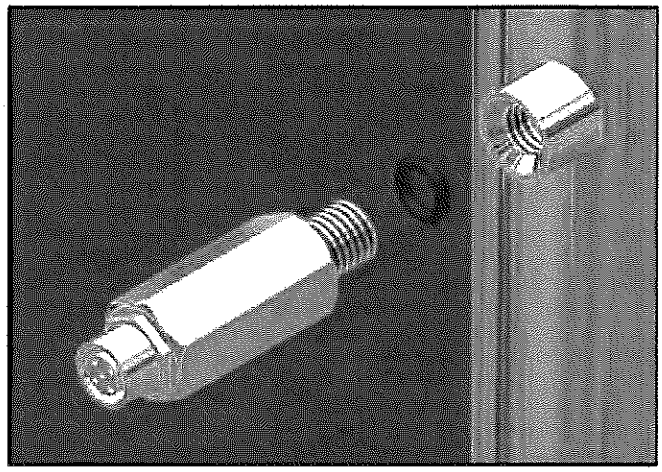


Screw the sleeve bolts and insert the lamp holder spring into the sleeve:



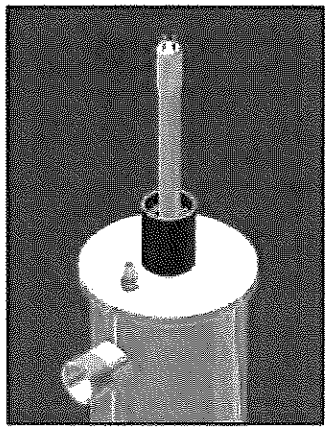
For the LCD PLUS UV system: Mount the o-ring (3043 type) on the probe holder and screw this one on the Ø ¼" bush welded in the middle part of the UV chamber.

Finally, connect the appropriate electrical cable:



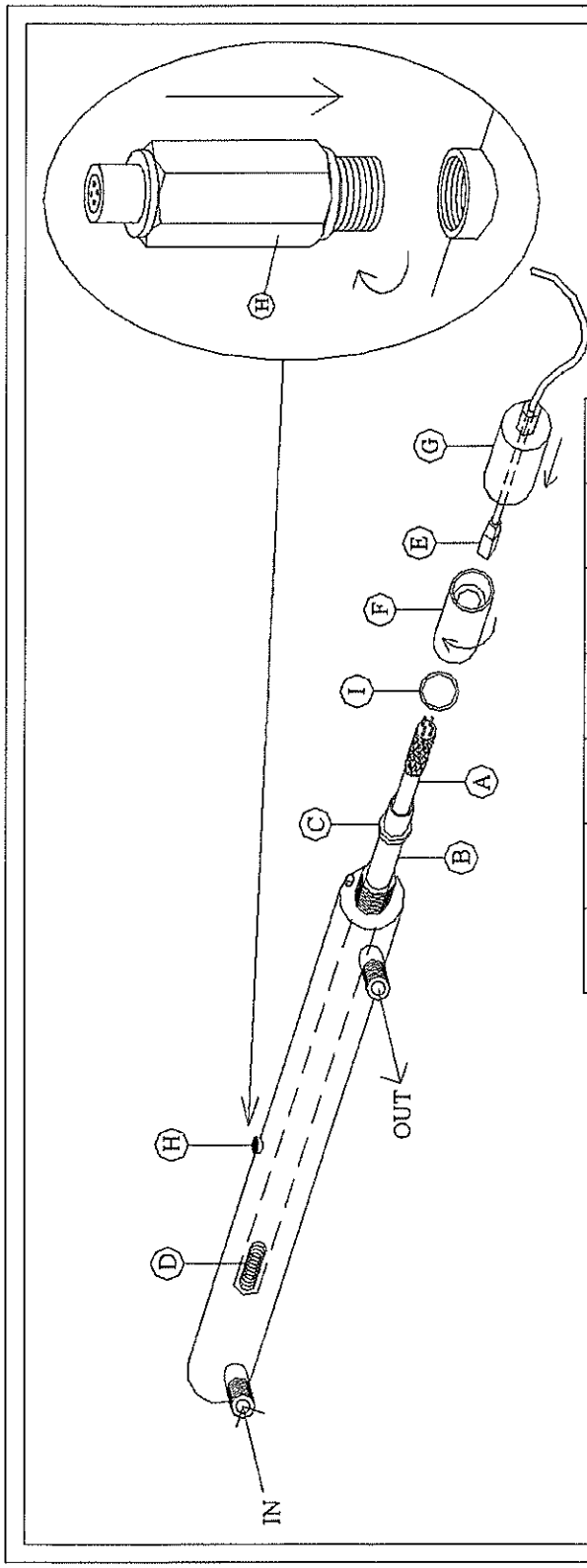
Carry out the hydraulic test, verifying that the o-rings are watertight and that there are not water leaks outside the sleeve bolts or inside the quartz sleeves.

Insert the UVC lamp into the quartz sleeve:



Important!
Handle the lamps using gloves

4.2 UV Chamber Detailed Drawing



REF.	Description	CODE						
		UV 405	UV 412	UV 440	UV 480	UV 450	UV 550	UV 80/2
A	UV Lamp	028102	028104	028104	028124	028104	028104	028124
B	Quartz Sleeve	028103			028105			
C	O-Ring Ø 23x4				028061			
D	Lamp Holder Spring				028036			
E	Four-Pin Socket				028088			
F	Nylon Sleeve Bolt				028060			
G	PVC Contact Cover				028034			
H	Sensor Ø 1/4"				UV737			
I	Gasket				V140			

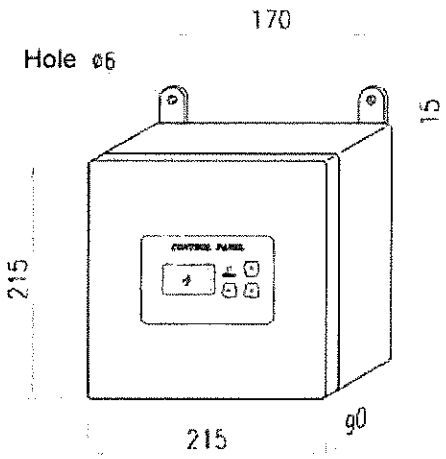
5. Electrical Panel Installation and Operation

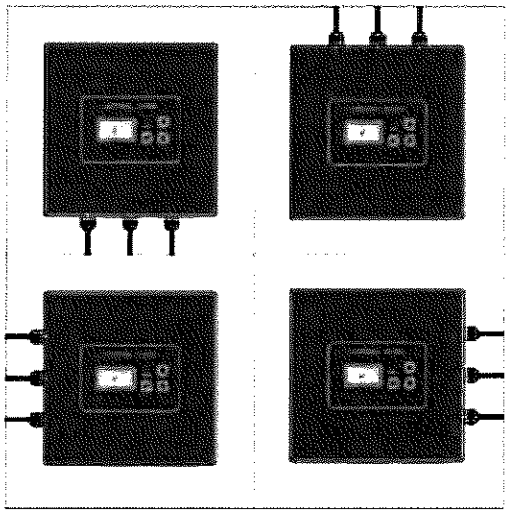
5.1 Control Panel Description

Control Panel	LCD (PLUS)
Material and colour	Black Polypropylene
Dimensions	8 x 8 x 3 in.
Protection class	IP 55 (IP 65 on request)
Ambient temperature range	41 – 113 °F
Power supply	230 V - 50/60 Hz (115V – 50/60 Hz on request)
Lamp cable	3 ft.
Power supply cable	3 ft.
Monitor display	LCD
Hour meter	Yes for total system life
Resettable hour meter	Yes for lamp life control
Lamp function control	Yes
Alarm led	Yes
Free contact (NO - NC)	Yes – general alarm
230 V output (NO - NC)	Yes – general alarm
Remote ON/OFF contact	Yes (settable)
ON/OFF Timer	Yes (settable)
Reactor temperature measurement and alarm	Yes (°F) – settable value (shut off for high temperature) on PLUS MODELS
UV Irradiance measurement and alarm	Yes (% or W/m2 optional) – settable value on PLUS MODELS
4/20 mA output	Optional – for Irradiance and water temperature on PLUS MODELS
Audio alarm	Optional

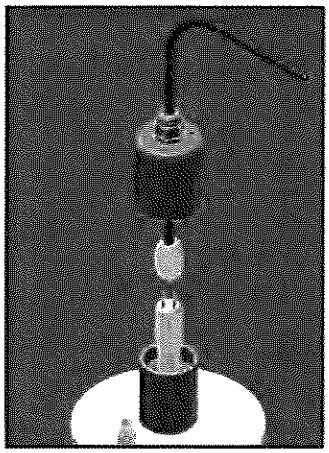
5.2 Electrical Panel Installation and Operation

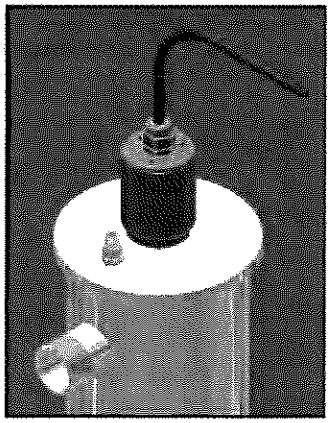
The electrical panel of the LCD series is equipped with 2 fixing brackets for wall mounting. Rotating the panel cover, the user can have the cable out on the desired sides of the panel.





Connect the lamp socket to the lamp and close the contact cover cap, then connect the power supply plug to the main supply.





Once connected to the power supply the UV lamp will light up.

Do the following at the first start up and with every lamp replacement:

1) Activate the lamp life count down hour meter (see display description)

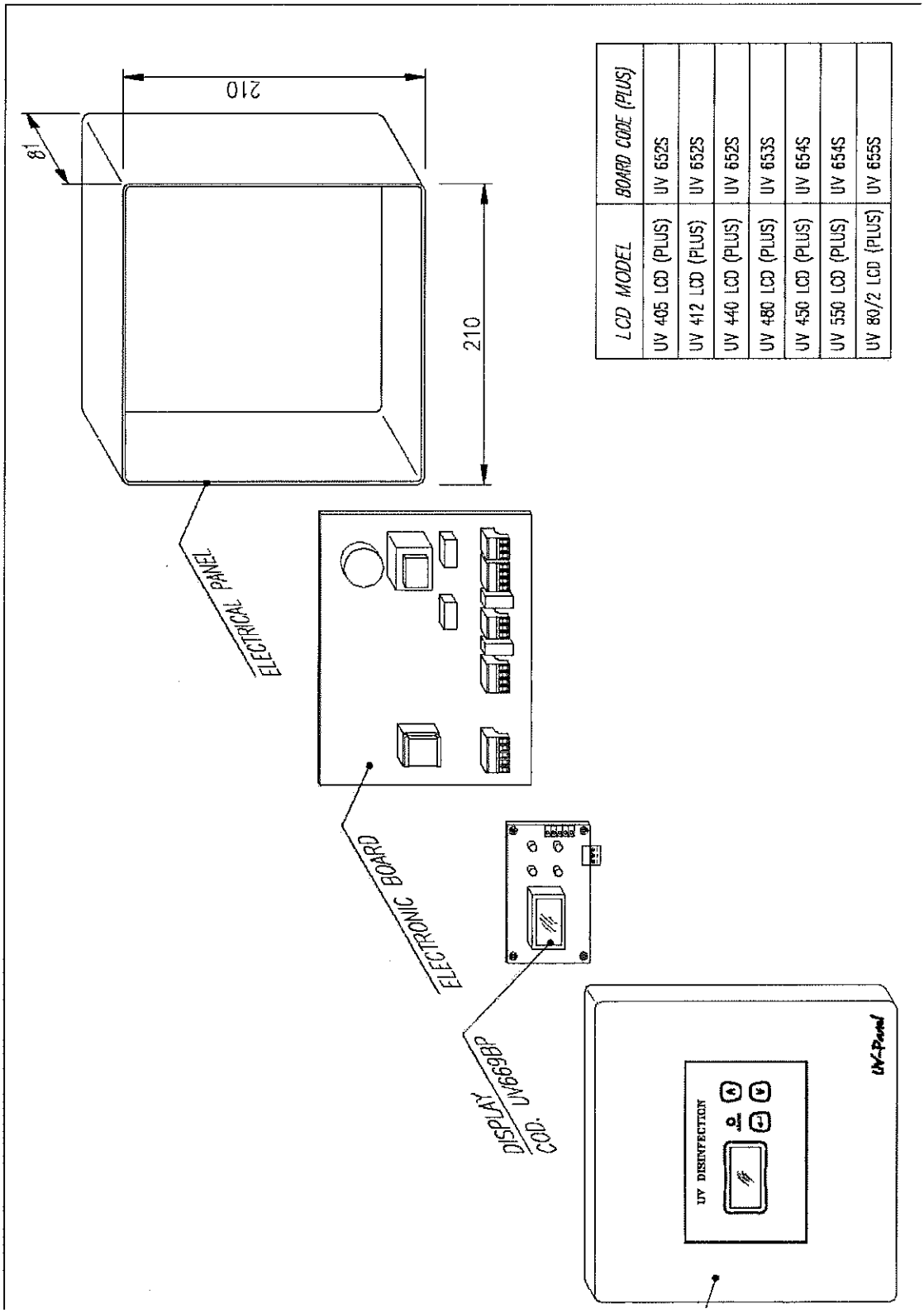
2) For the LCD PLUS system with UV sensor: operate the sensor calibration. This operation must be conducted after at least 5 minutes of lamp start, with quartz sleeve clean, with sensor measuring window clean and with steady water flow.

5.3 Switch ON / Switch OFF the lamps

Because of the small power of the electrical panel this is not equipped with power selector. Therefore, the panel is always powered but lamps can be switched ON/OFF in the following ways:

1. Holding down the OK (◄┘) button for 5 seconds (see display description)
2. Closing the remote ON/OFF contact (see electrical scheme)
3. Setting the timer (see display description)

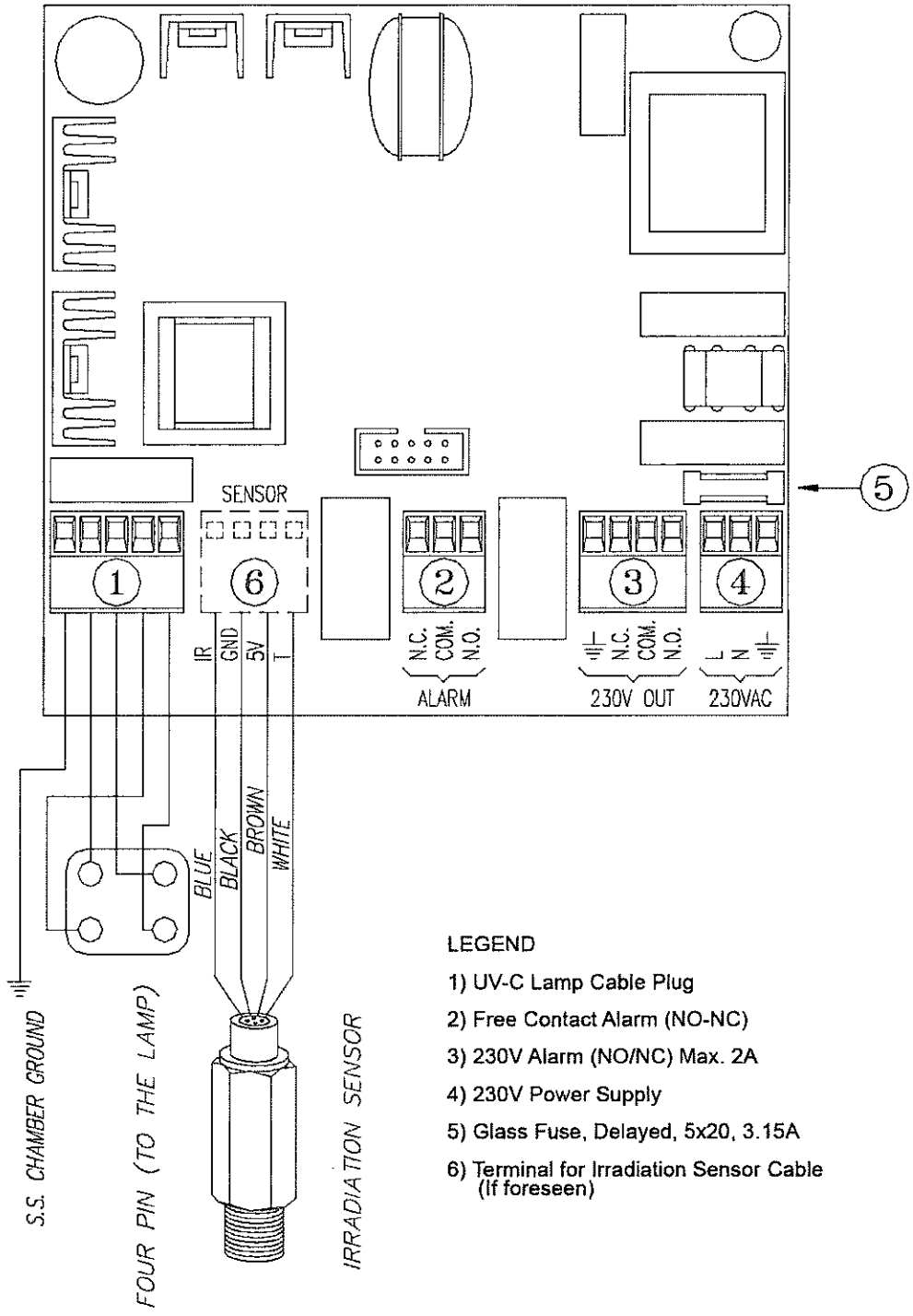
5.2 Control Panel Detailed Drawing



LCD MODEL	BOARD CODE (PLUS)
UV 405 LCD (PLUS)	UV 652S
UV 412 LCD (PLUS)	UV 652S
UV 440 LCD (PLUS)	UV 652S
UV 480 LCD (PLUS)	UV 653S
UV 450 LCD (PLUS)	UV 654S
UV 550 LCD (PLUS)	UV 654S
UV 80/2 LCD (PLUS)	UV 655S

6. LCD Electrical Board Description

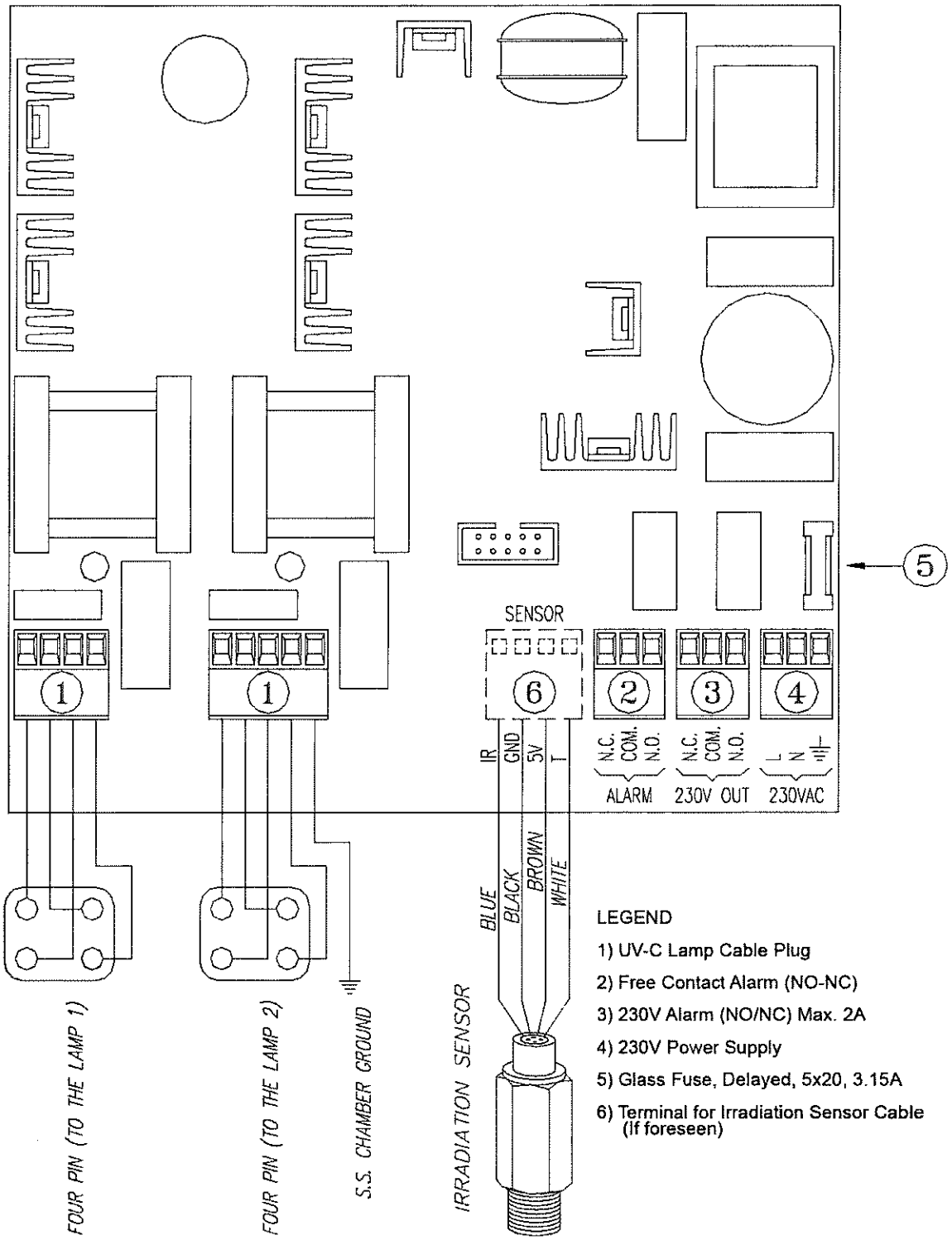
6.1 Single-lamp LCD Electrical Board Description (UV 405, 412, 440, 480)



LEGEND

1) UV-C Lamp Cable Plug
2) Free Contact Alarm (NO-NC)
3) 230V Alarm (NO/NC) Max. 2A
4) 230V Power Supply
5) Glass Fuse, Delayed, 5x20, 3.15A
6) Terminal for Irradiation Sensor Cable (If foreseen)

6.2 Two-Lamp LCD Electrical Board Description (UV 450, 550, 80/2)



LEGEND

1) UV-C Lamp Cable Plug
2) Free Contact Alarm (NO-NC)
3) 230V Alarm (NO/NC) Max. 2A
4) 230V Power Supply
5) Glass Fuse, Delayed, 5x20, 3.15A
6) Terminal for Irradiation Sensor Cable (If foreseen)

6.3 LCD Display Board Description

The standard and optional terminal connections to the display board are as follows:

- It is possible to connect the sensor cable (usually this is connected on the main board).
- It is possible to connect the REMOTE ON/OFF contact, this is powered with 5Vdc that if closed to the RMT contact shuts of the lamps. The user can set the working of the remote ON/OFF contact by the display between N/O and N/C. The factory setting is N/O because it let the system working with nothing connected to the remote ON/OFF terminal.
- In case of LCD PLUS systems with optional 4/20 mA output then it's possible to connect to the 4/20 mA terminal. This signal is available for the water temperature and the UV irradiance.

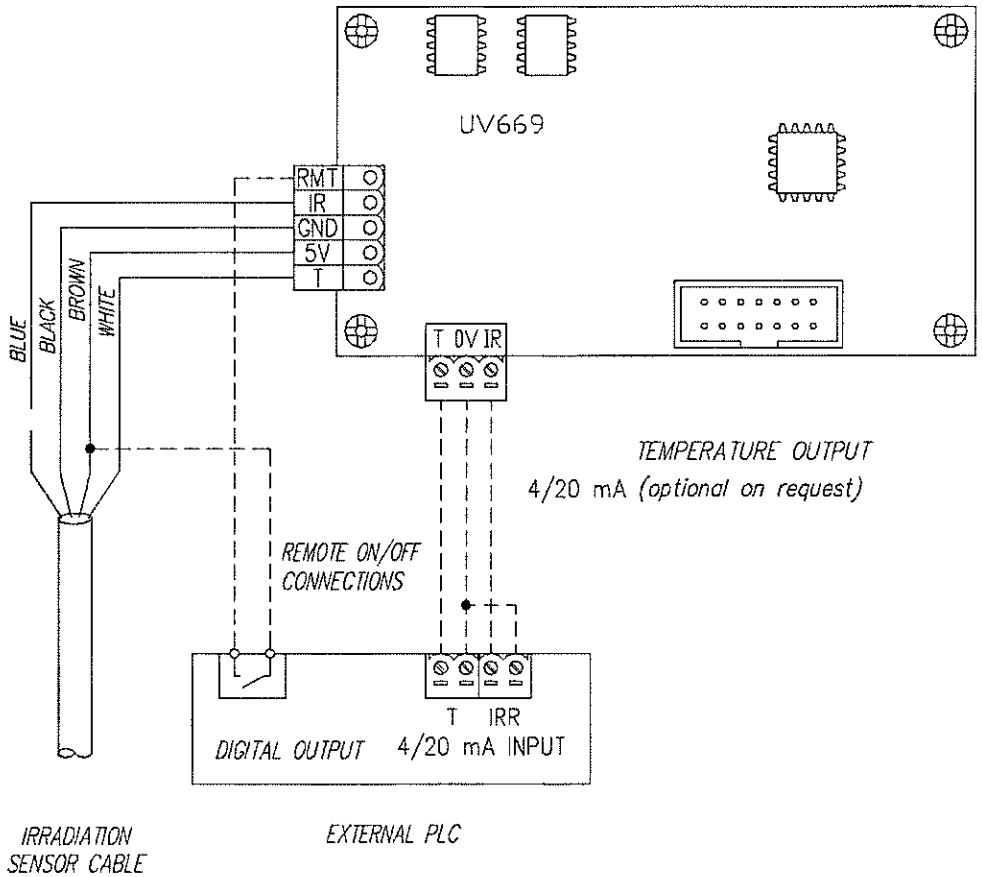
The temperature signal has the following correspondence:

4mA = 32 °F (0°C)
20 mA = 212 °F (100 °C)

The irradiance signal has the following correspondence:

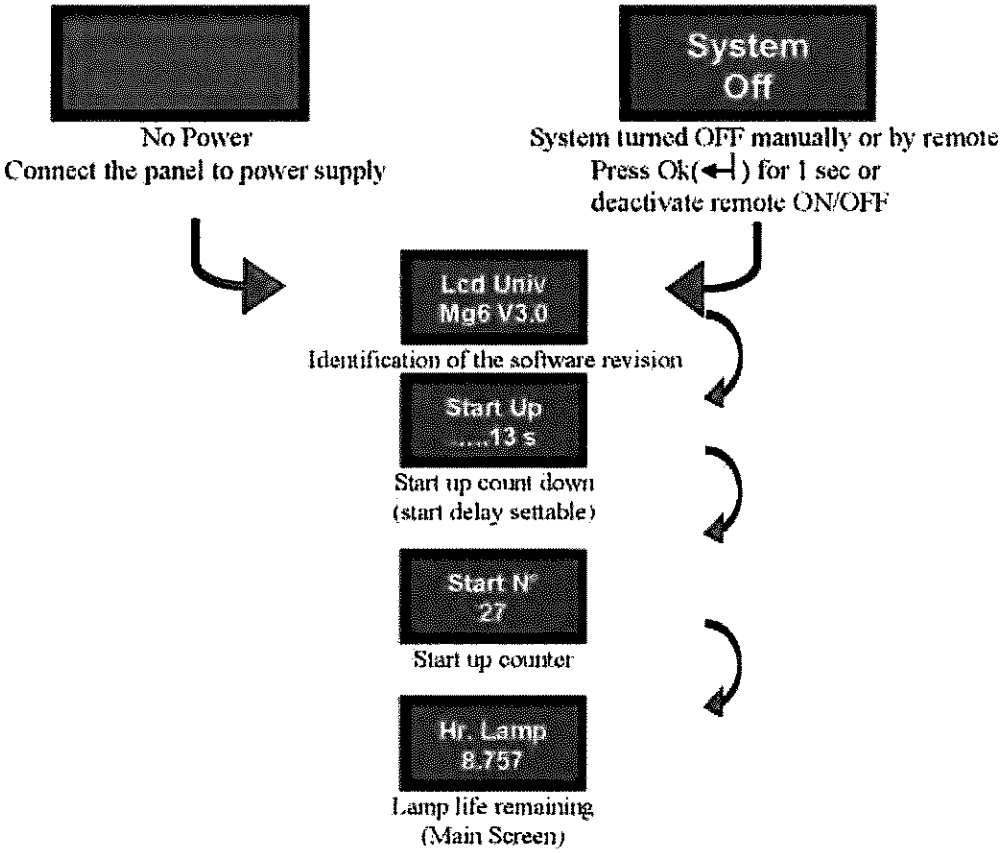
4mA = 0%
20 mA = Settable value on the display (factory setting 20 mA= 100%)

Important
The 4/20 mA output signal can work with a max load of 150 ohm

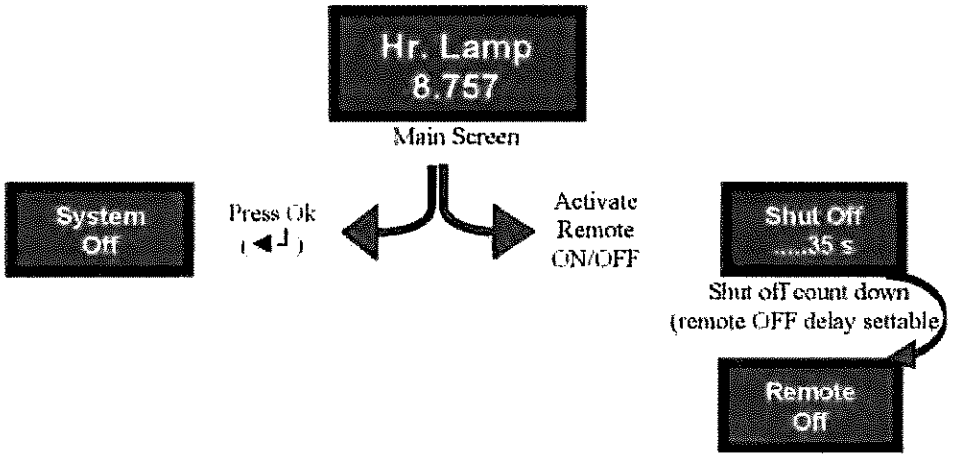


7. Display Information (Troubleshooting)

LCD DISPLAY MESSAGES – Start up:

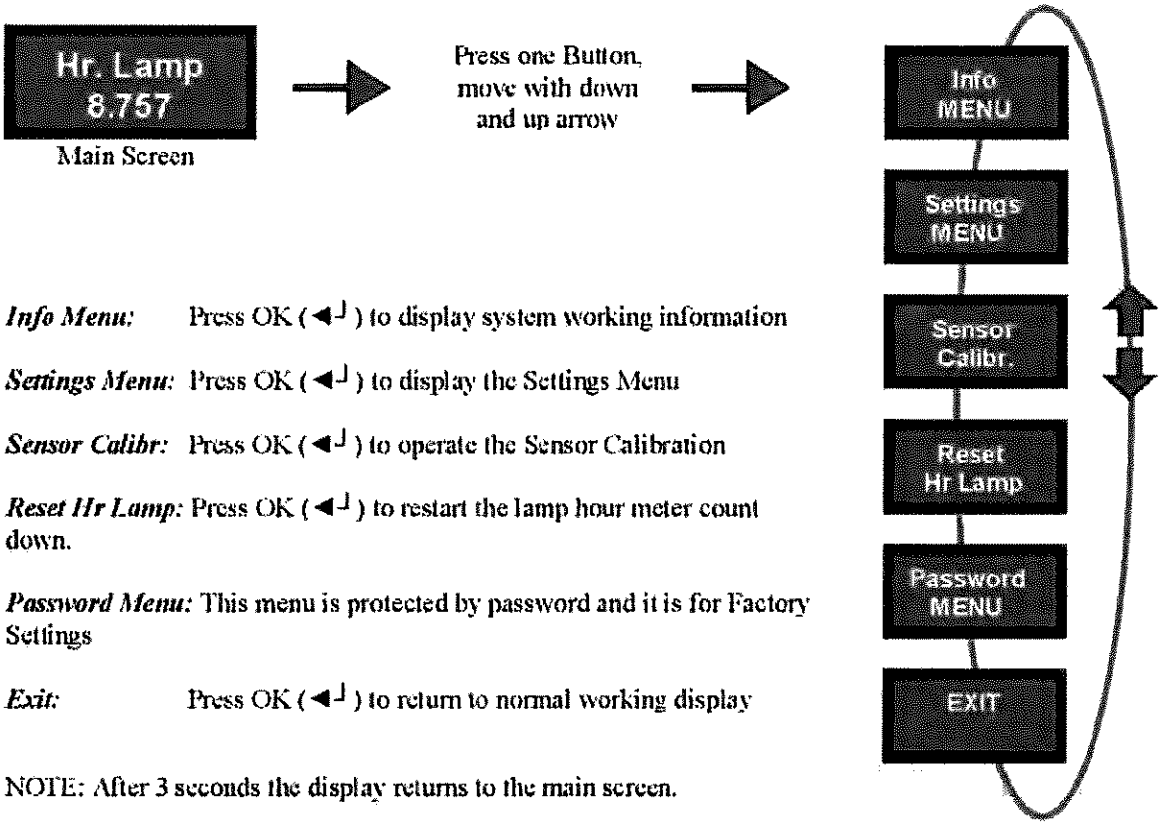


LCD DISPLAY MESSAGES – Shut Off:



LCD DISPLAY MESSAGES – Main MENU:

The main MENU describes the main functions of the control Panel
To enter the main menus push one of the 3 buttons. Move trough the menus using up and down arrow buttons.



Info Menu: Press OK (◄┘) to display system working information

Settings Menu: Press OK (◄┘) to display the Settings Menu

Sensor Calibr: Press OK (◄┘) to operate the Sensor Calibration

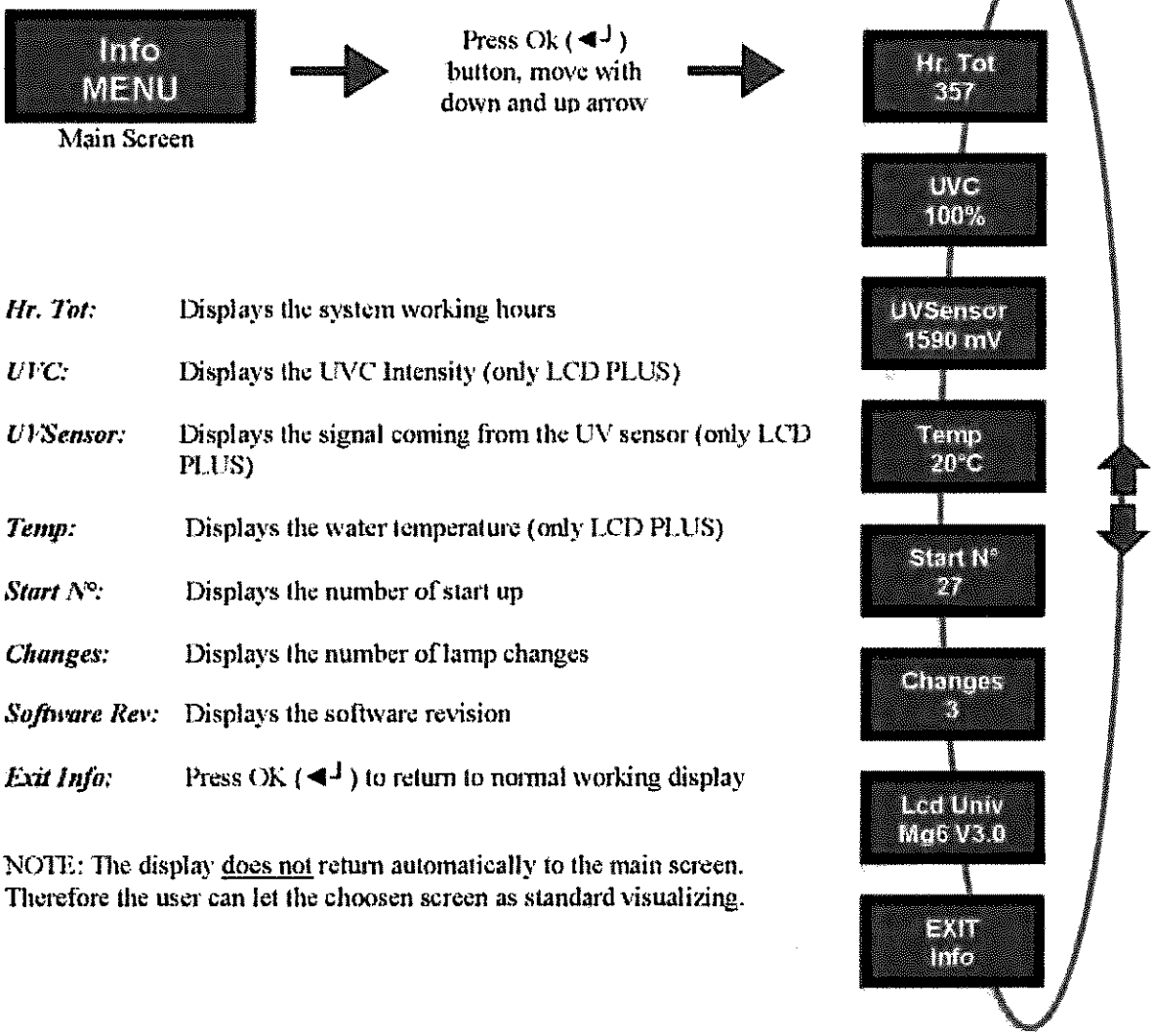
Reset Hr Lamp: Press OK (◄┘) to restart the lamp hour meter count down.

Password Menu: This menu is protected by password and it is for Factory Settings

Exit: Press OK (◄┘) to return to normal working display

NOTE: After 3 seconds the display returns to the main screen.

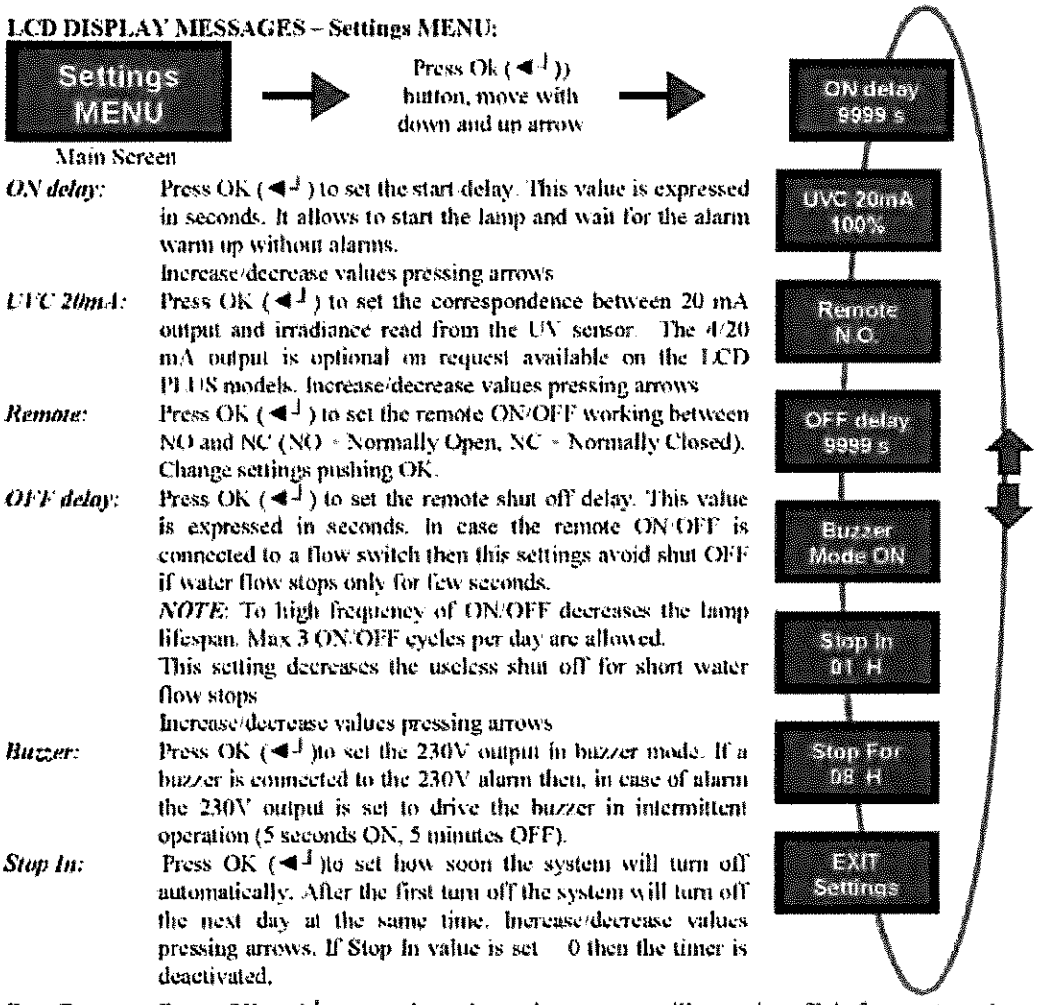
LCD DISPLAY MESSAGES – Info MENU:



Hr. Tot:	Displays the system working hours
UVC:	Displays the UVC Intensity (only LCD PLUS)
UVSensor:	Displays the signal coming from the UV sensor (only LCD PLUS)
Temp:	Displays the water temperature (only LCD PLUS)
Start N°:	Displays the number of start up
Changes:	Displays the number of lamp changes
Software Rev:	Displays the software revision
Exit Info:	Press OK (◄┘) to return to normal working display

NOTE: The display does not return automatically to the main screen. Therefore the user can let the choosen screen as standard visualizing.

LCD DISPLAY MESSAGES – Settings MENU:



Main Screen

ON delay: Press OK (◄┘) to set the start delay. This value is expressed in seconds. It allows to start the lamp and wait for the alarm warm up without alarms.
Increase/decrease values pressing arrows

UVC 20mA: Press OK (◄┘) to set the correspondence between 20 mA output and irradiance read from the UV sensor. The 4/20 mA output is optional on request available on the LCD PLUS models. Increase/decrease values pressing arrows

Remote: Press OK (◄┘) to set the remote ON/OFF working between NO and NC (NO = Normally Open, NC = Normally Closed). Change settings pushing OK.

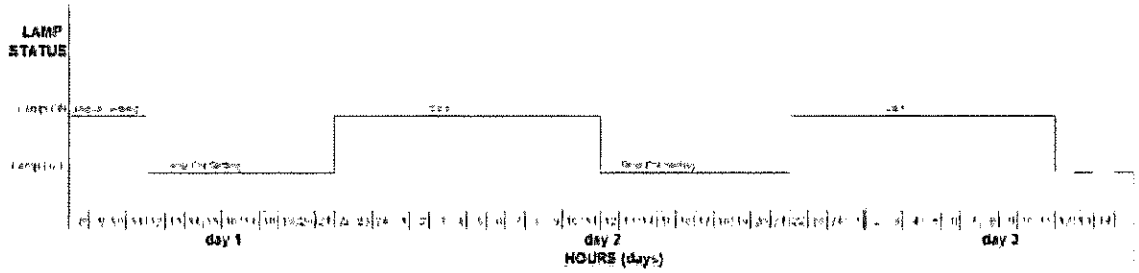
OFF delay: Press OK (◄┘) to set the remote shut off delay. This value is expressed in seconds. In case the remote ON/OFF is connected to a flow switch then this settings avoid shut OFF if water flow stops only for few seconds.
NOTE: To high frequency of ON/OFF decreases the lamp lifespan. Max 3 ON/OFF cycles per day are allowed.
This setting decreases the useless shut off for short water flow stops
Increase/decrease values pressing arrows

Buzzer: Press OK (◄┘)to set the 230V output in buzzer mode. If a buzzer is connected to the 230V alarm then, in case of alarm the 230V output is set to drive the buzzer in intermittent operation (5 seconds ON, 5 minutes OFF).

Stop In: Press OK (◄┘)to set how soon the system will turn off automatically. After the first turn off the system will turn off the next day at the same time. Increase/decrease values pressing arrows. If Stop In value is set = 0 then the timer is deactivated.

Stop For: Press OK (◄┘)to set how long the system will remain off before automatic restart. Increase/decrease values pressing arrows. If Stop In value is set = 0 then the timer is deactivated.

Timer Diagram example with Stop In set to 4 hours and Stop For set to 10 hours:

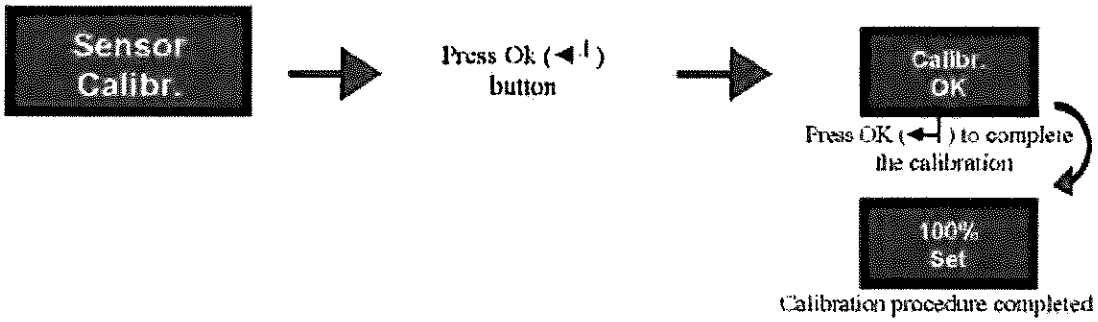


Exit: Press OK (◄┘) to return to normal working display

NOTE: After 3 seconds the display returns to the main screen.

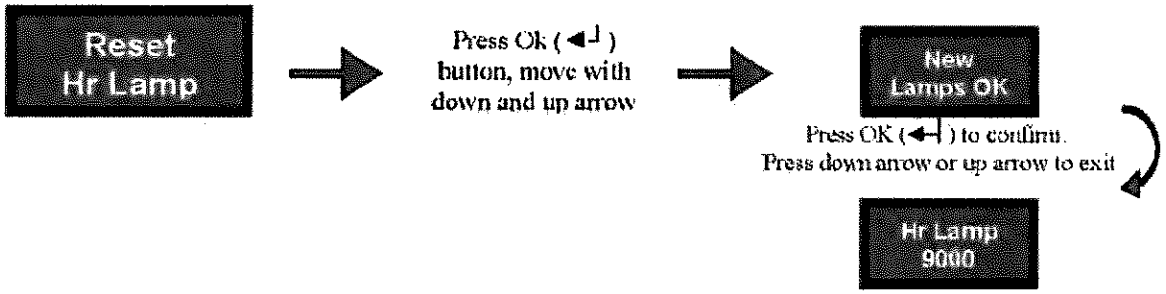
LCD DISPLAY MESSAGES – Sensor Calibr. (Only PLUS version):

This operation must be done at the first start up and on every lamp replacement, with quartz sleeves and sensor measuring window clean. Wait 5 minutes from the lamp start before operating the sensor calibration.

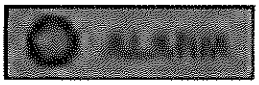


LCD DISPLAY MESSAGES –Reset Hr Lamp.:

This operation starts the count down of the lamp life hour meter. This operation must be done at the first lamp start and on every lamp replacement

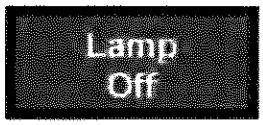


LCD DISPLAY MESSAGES – Alarms/troubleshooting:



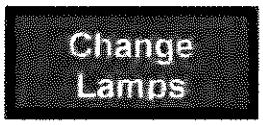
In case of any alarm the red LED is flashing.

List of alarms:



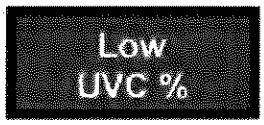
Indicates the lamp failure. If the system has 2 lamps the failed lamp is identified. Check:

- Connection to the lamp
- If lamp has failed
- If lamp starter has failed.



Indicates that the count-down hour meter of lamps life comes to zero. In such case replace the lamps and restart lamp hour.

Only for Plus

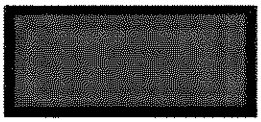


Indicates low irradiation. Check:

- If lamp life has expired
- If quartz sleeves are dirty
- If sensor windows is dirty
- If water quality has changed

Indicates high temperature in the UV chamber. This may happen when either there is no flow or there is air in the UV chamber. In such cases the system switches off.
Reset the alarm: Push OK(◄┘) for 5 sec to put the system in standby then press OK (◄┘) again to restart the UV system.
NOTE: In case of high temperature the panel turns off the lamp and this remains off even if temperature drops below the threshold level. This is necessary in case of no flow to avoid this cycling:
Lamp ON→ High Temperature→lamp turned off→Temperautre lower then threshold→ lamp started again→ High Temperature→....
This can destroy the UV lamp, in case the user can accept this risk then ask the factory for setting change instructions.

LCD DISPLAY MESSAGES – Other Problems:



Display OFF in case of no electrical feeding or burned fuses

8. Maintenance

The UV System of DOMESTIC SERIES has been designed and realized by Jesco with simple and functional principles which make the checking procedures and the periodical servicing particularly easy.

The main points which characterize the standard servicing are the following: check quarterly the quartz sleeves, which contain the UV lamps, in order to ensure maximum disinfection for cleaning.

Maintenance work may only be carried out by personnel who have been trained and authorized for this work by the owner and/or user. The owner and/or user must ensure that the maintenance personnel are familiar with the safety measures and regulations, and that they also comply with them; in addition to having read and understood the operating instructions.

Only original replacement parts from the supplier must be used.

The following are the recommended service intervals for replacement parts:

UV lamp change - once per 9000 hours
UV quartz sleeve clean - frequency depends on the quality of the water
O-ring for quartz sleeve-once per year

Procedure for UV lamp replacement (9000 h max.)

1) Disconnect the electrical box from the electrical power supply
2) Lift the cover slightly by turning, carefully loosening the electrical 4-pins connection and extract the lamp from the quartz sleeve
3) Remove the lamp from the packing, handling it carefully by its ends or by using gloves
4) Insert the new lamp into the quartz sleeve of the sterilizer
5) Connect the lamp to the electrical connection and replace the cover
6) Connect the equipment

Important!

For lamp replacement, it is not necessary to stop the water flow and drain the UV chamber.

Procedure for quartz sleeve cleaning

1) Disconnect the electrical box from the electrical grid and turn off water
2) Remove the lamp, following the lamp replacement instructions.
3) Depressurize and drain the UV system
4) Unscrew the sleeve-bolt and extract the quartz sleeve with care
5) Clean the quartz sleeve by wiping it with a cloth soaked with an acid solution such as vinegar or lemon
6) Reassemble the sleeve being sure to center the guide-spring fixed on the bottom, put the o-ring on the quartz sleeve, then tighten the sleeve-bolt; place the o-ring in the seat of the sleeve-bolt, insert the sleeve inside it, till it leans, then screw on the S/S chamber
7) Turn on water checking for possible leaks
8) Remount lamp, electrical connection and cover
9) Turn on the UV system

9. Warranty Conditions

JESCO works in compliance with ISO 9001-2008 quality procedures and subjects all equipment to accurate checks and tests.

JESCO products are guaranteed only within the limits of technical specifications and request and/or of the certificates and/or of the specific checks as agreed, for 24 months from the delivery date or 30 days from the purchase date, provided that defects are reported immediately.

The stainless steel chamber is covered by a 5-year warranty only if used with compatible liquids and correctly installed.

In no case is the integral replacement of the product foreseen and any responsibility of JESCO is excluded for delays in the delivery of the goods to the customer, for claims of third parties against the customer, for losses of goods, costs (installation, servicing and maintenance, transport, and etc.) and damages of the customer due to the defect.

Moreover, the product repaired or tampered with by non-authorized third parties, and the product on which an intervention has been made for defect or for convenience tests, is excluded from the warranty.

Repairs are normally carried out in the JESCO facility or in authorized after-sales service centers approved by JESCO.

The warranty does not cover:

1. Accidental breakages due to transport.
2. Breakages due to the use of equipment not in compliance with what is indicated on the use and maintenance manual or due to carelessness.
3. Breakages to the connection to a power grid fed with a tension different than the foreseen one (±10% of the nominal value as fixed by CEI rules)

DO NOT TAMPER WITH THE ADHESIVE IDENTIFICATION LABELS

The adhesive label with the QC (Quality Control) number must remain intact and legible; such number allows to enter the data bank of tests and to find the values obtained in the electrical test of the equipment.

The adhesive label with the S/N (Serial Number) number must remain intact and legible; such number allows to enter the data bank of tests and to find the values obtained in the hydraulic test of the equipment.

February 2016

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Internet: www.lutzjescoamerica.com
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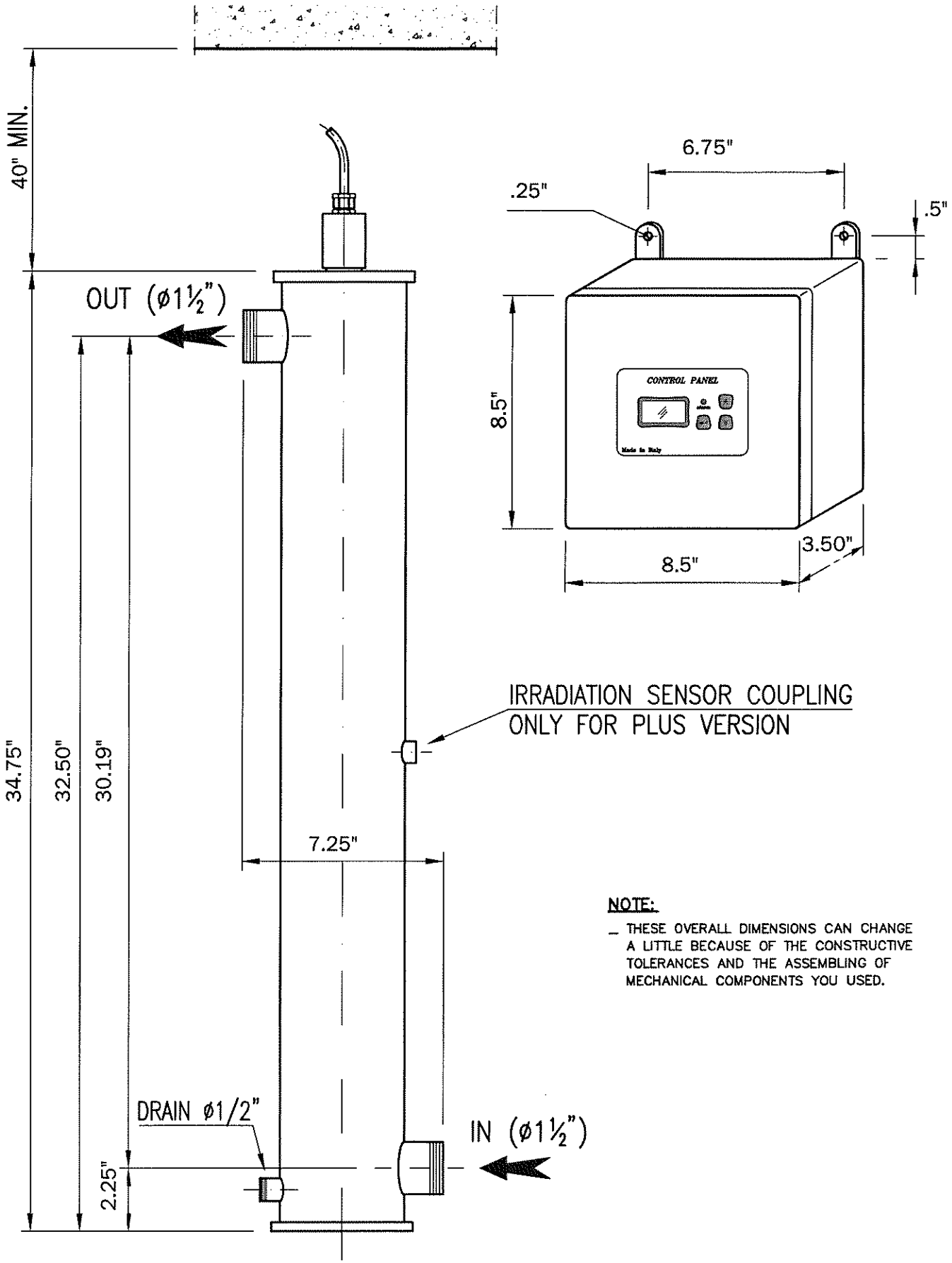
1-800-554-2762



NOTE:

_ THESE OVERALL DIMENSIONS CAN CHANGE A LITTLE BECAUSE OF THE CONSTRUCTIVE TOLERANCES AND THE ASSEMBLING OF MECHANICAL COMPONENTS YOU USED.

REVISIONE	DESCRIZIONE	DATA	DISEGNATO	VERIFICATO
A	FIRST ISSUE	30/10/14	SCHENONE	MAZZONE

CODICE

TITOLO: **UV-C DISINFECTION UV 80/2 LCD MODEL LAY-OUT**

Disegnato	UFFICIO TECNICO	Foglio	01
Data	21/07/14	Segue	/
Scala	/	Totale Fg.	01

Leiz-JESCO America Corp

Attachment 6d:
Orenco Telemetry Description

1.4.7 Event Notification Using Mailboxes

The ATRTU-TCOM system can be configured to notify external systems when specific events have occurred. The external system to be notified is referred to as a "mailbox". The events that trigger a notification are defined by the control program. When a mailbox is defined, the type of mailbox is also specified.

Supported mailbox types include:

- Phone
- Pager
- Modem
- Email
- Text

The primary objective of the event notification is to inform support personnel that something in the system may require operator attention. Actual message content is limited by the technology hosting the destination mailbox. Depending on the technology, the event notification may be a call showing up on caller ID or a pager, or include an actual message.

Mailbox Technology	Destination Address Format	Notification Type and/or message	Dependencies
Phone/Pager	Phone number	Caller ID. No message.	Requires installed phone line. Must be enabled, configured, and connected.
Email	Email address	Email with limited message.	Requires network connection using either Ethernet or cellular network. Must be enabled, configured, and connected.
SMS Text	Phone number	Text with limited message.	Requires optional cellular module Must be enabled, configured, and connected.

Table 4: Mailbox Types, Event Notification, and Messages

Successful event notification requirements include:

- One or more mailbox types are defined by the control program and associated with an event.
- The mailbox is enabled.
- All components required to communicate between the ATRTU-TCOM system and an external device are connected and functioning.
- The mailbox must be configured with valid information. If it's a phone, pager, or SMS text mailbox, the target phone number must be valid. If it's an email address, URL, or IP address, it must be valid.

2 Web Server

The ATRTU-TCOM controller hosts a web site that can be used to monitor and adjust various system settings. Hosting a web site increases the range of devices and operating systems that can be used to interact with the ATRTU-TCOM system to virtually any device that has a web browser, a network connection, and can access a web site.

Examples include, but are not limited to, Android smart phones, iPhones, iPads, Windows© laptops and PC's, Mac© laptops and PC's, Amazon Kindle Fire©, etc.

The range of features supported by the web site is primarily intended to facilitate remote monitoring and adjustment from a wide range of mobile devices therefore making it simpler for support personnel to access the systems on the go.

The web site includes support for:

- Logon mechanisms requiring credentials and access permission controls.
- Remote monitoring and adjustment of system settings.
- View logs and download select logs.
- View and modify notification mailbox settings.
- Adjust date and time settings.

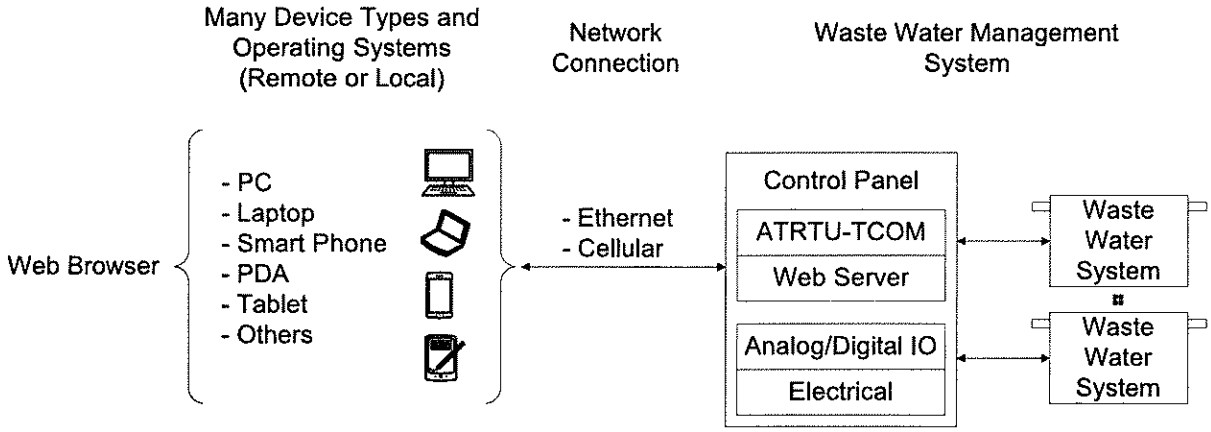


Figure 2: Web Server Overview

2.1 Device and Browser Support

Due to rapidly evolving technology, evolving standards, and the vast range of devices, browsers, and operating systems, Orenco Controls cannot guarantee compatibility with every combination of browser and device. However, if an incompatibility is encountered it can typically be resolved by updating the web browser on the user's system.

Supported browsers include (not limited to):

- Google Chrome:
  - Version: 58.0.3029.83, on Android mobile phone.
  - Version: 54.0.2840.99 (64 bit), Windows© 10.
  - Version: 58.0.3029.110 (64 bit), Windows© 7

- Microsoft Edge:
  - Version: 38.14393.1066.0 Windows© 10

- Firefox:
  - Version: 50.0.2 Windows© 10
- Safari:
  - Version 5.1.7 Windows© 10
  - iPhone, Mac iOS
  - Version: 5.1.10, Mac OS X 10.6.8
  - Version: 10.1.1, Mac OS 10.12.5
- Internet Explorer:
  - Version 11.0.9600.18638, Windows© 7
  - Version: 11.447.14393.0, Windows© 10
- Silk: Kindle Fire

2.2 Web Server Connection Requirements

Connection to the web site requires a functioning network connection between the user's device and the ATRTU-TCOM.

On the ATRTU-TCOM side of the link, the network connection must use either:

1) The hardwired Ethernet interface directly on the main controller board.
2) The internal cellular modem module.

The internal cellular modem module plugs into a connector on the main controller circuit board within the ATRTU-TCOM system. Current ATRTU-TCOM systems include a hardwired 10/100 base-T Ethernet interface. The internal cellular modem module is an optional device that may or may not be installed depending on the target site and how it is configured.

For the web server to be used, at least one of the network interfaces must be enabled, properly configured, and have a valid network connection. See section 3.2 "TCOM Viewer Communication Interfaces" on page 47 for more information.

To successfully access the web server:

1) The ATRTU-TCOM system must be connected to either a private or public network.
2) The ATRTU-TCOM network subsystem must be enabled and configured with a valid IP address and HTTP port number.
3) The client device must be connected to either a private or public network which can be hardwired, wireless, or a mixture of both.
4) If the client device and the ATRTU-TCOM system are connected to separate networks, there must be a connection between the networks and access controls must be set by the network administrators to allow communication between the two subsystems (i.e., VPN's, firewalls, router settings, etc.).
5) The client user must know the IP address and HTTP port number that has been assigned to the ATRTU-TCOM system. This is typically determined by the network administrator of the installation site.
6) The client user must have a valid username and password that can be authenticated by the ATRTU-TCOM system.
7) The client browser must have JavaScript enabled.
8) The client browser must have popup's enabled.

2.3 Connecting a Web Browser to the Web Server

To logon on to the web server:

1) Open the web browser on the client device.
2) In the navigation field enter:

   http://<IP address or hostname>:<port number>

   For example, assuming the IP address is 192.168.0.10 and the port number is 2080, the user would enter the following into the URL bar of their browser:

   http://192.168.0.10:2080

   Note: The IP address above is for example only. The correct address and port number are determined by the local network administrator.

Figure 3: Example Browser Connection to the Web Server

Attachment 7:
Hydraulic Force Main Calculations

Ref	Description	Identifier			Unit	Value	Value
PROJECT SPECIFIC INPUTS							
1	Drip zone reference number	DZN			NUM	1	2
2	Elevation at collection tank	CTZ			FT	1093.30	1093.30
3	Plan area of drip zone	DZA			SF	10205.00	10212.00
4	Elevation at entry to drip zone	DZZ			FT	1101.60	1106.60
5	Length longest lateral	DZL			FT	137.00	182.00
6	Length supply to drip zone	DZS			FT	70.00	191.00
7	Length supply header	DZH			FT	96.70	93.10
8	Length return line	DZR			FT	92.60	144.00
9	Diameter supply & return line	DIS			IN	2.00	2.00
10	Diameter PVC 40 supply & return manifold	DIP			IN	2.00	2.00
Physical parameters							
51	Drip line spacing	DLS			FT	2.00	2.00
52	Emitter spacing	EES			FT	2.00	2.00
53	Friction loss in drip lines	FLD			FT	1.50	1.50
54	UV & flow meter pressure loss	FLM			FT	2.50	2.50
55	Flow rate per emitter	FRE			gph	0.60	0.60
56	2" PVC Sch 40 Check Valve pressure loss	FLV			FT	6.00	6.00
57	2" PVC Sch 40 Return Check Valve pressure loss	FLR			FT	6.00	6.00
58	Pressure Needed @ Beginning of dripfield	PBD			FT	57.80	57.80
59	323 solenoid valve pressure loss	FLS			FT	7.00	7.00
Intermediate calculations		**Identifier**	**Long Formula**	**Formula**	**Unit**	**Value**	**Value**
101	Length of drip line in zone	DLL	Area of drip zone / DLS	DZA/DLS	FT	5102.50	5106.00
102	Number of emitters	DZE	Length drip line / EES	DLL/EES	NUM	2551.25	2553.00
103	Total flow	DTF	Emitter flow rate x number emitters	FRE x DZE	gph	1530.75	1531.80
104	Number of drip lines	DNL	Length drip line / longest lateral	DLL / DZL	NUM	37.24	28.05
105	Flush Volume @ 2 ft/sec = 1.6 gpm/line X	FV	Total flow x 2	DTF x 2	gph	3061.50	3063.60
106	Total pumping req'ts (dosing) gpm	TPD	Total flow / 60	DTF / 60	gpm	25.51	25.53
107	Total pumping req'ts (flushing) gpm	TPF	Total dosing req'ts x 2	TPD x 2	gpm	51.03	51.06
108	Static head to drip field	DSH	Elv @ collection tank - elv @ entry	CTZ - DZZ	FT	-8.30	-13.30
109	Supply line head loss (DOSING)	SLH	0.2083*((100/145)^1.852)*(TPD^1.852)/(DIS^4.8655)*(DZS/100)		FT	1.01	2.77
110	Supply manifold head loss (DOSING)	SMH	0.2083*((100/145)^1.852)*(TPD^1.852)/(DIP^4.8655)*(DZH/100)		FT	1.40	1.35
111	Two outlet Distribution Valve (V6402A) head loss	DVT	0.0045*TPD^2+3.5*(1-EXP(-0.06*TPD))		FT	5.67	5.68
112	Six Outlet Distribution Valve (V6606A) head loss	DVS	0.0049*TPD^2+5.5*(1-EXP(-0.1*TPD))		FT	8.26	8.27
113	Sub total head loss (DOSING)	STH	FLM+DSH+SLH+SMH+DVT+DVS+PBD+FLV		FT	74.34	71.06
114	10% head loss due to fittings (DOSING)	HLF	10% of sub total head loss	STH / 10	FT	7.43	7.11
115	PUMP REQUIREMENT DURING DOSING	PRD	Total all loses	STH + HLF	FT	81.78	78.16
116	Supply line head loss (FLUSHING)	SLF	0.2083*((100/145)^1.852)*(TPF^1.852)/(DIS^4.8655)*(DZS/100)		FT	3.66	9.99
117	Supply manifold head loss (FLUSHING)	SMF	0.2083*((100/145)^1.852)*(TPF^1.852)/(DIP^4.8655)*(DZH/100)		FT	5.05	4.87
118	Two outlet DV head loss (FLUSHING)	DVU	0.0045*TPFF^2+3.5*(1-EXP(-0.06*TPF))		FT	15.05	15.07
119	Six Outlet DV head loss (FLUSHING)	DVV	0.0049*TPFF^2+5.5*(1-EXP(-0.1*TPF))		FT	18.22	18.24
120	Return line pressure loss (FLUSHING)	RLL	(0.2083*((100/140)^1.852)*(TPF^1.852)/(DIS^4.8655)*(DZR/100))		FT	5.16	8.04
121	Return manifold pressure loss (FLUSHING)	RML	(0.2083*((100/145)^1.852)*(TPF^1.852)/(DIP^4.8655)*(DZH/100))		FT	5.05	4.87
122	Sub total head loss (FLUSHING)	STF	FLM+SLF+SMF+DVU+DVV+FLS+FLV+FLR+FLD+RLL+RML		FT	75.20	84.08
123	10% head loss due to fittings (FLUSHING)	HLD	10% of sub total head loss	STF / 10	FT	7.52	8.41
124	PUMP REQUIREMENT DURING FLUSHING	PRF	Total all loses	STF + HLD	FT	82.72	92.48

Provide the estimated dates for the commencement and completion of the construction of the system and the estimated date the wastewater system will be placed into service. If the wastewater system will be constructed or placed into service in phases, provide the anticipated dates for each phase.

RESPONSE: Currently, Limestone estimates to have the development and wastewater system construction to be completed by November 2022 provided there are no material delivery delays.

If portions of the wastewater system will be built in phases, provide how many phases and the number of houses or units to be connected in each phase.

RESPONSE: The wastewater system will not be built in phases.

Identify the builder or developer that has requested the utility to provide wastewater service.

RESPONSE: The developer that has requested the utility to provide wastewater services is as follows; Douglas S. Hodge, Ph.D., PMP of DSH & Associates, LLC.

EXHIBIT 2
PROPERTY RIGHTS & PUBLIC NEED INFORMATION

Exhibit 2.1	Letter from Existing Utilities Declining to Provide Service
Exhibit 2.2	City and County Franchise Agreement
Exhibit 2.3	Developer/Construction Contractor/Utility Contracts

Provide a letter(s) from local government(s) and public wastewater utilities in or near the proposed service area stating that they do not provide wastewater service to the proposed service area and that they are unable or unwilling to provide wastewater service to the proposed service area within the ensuing twelve (12) months.

RESPONSE: As indicated in Exhibit 1.8, the Developer contacted both the Gatlinburg Utility District and the Sevier County Utility District and was informed that the area of this project did not fall with the applicable utility district.

As applicable, provide a copy of any application for a franchise and the franchise agreement issued by a city or county.

RESPONSE: Limestone Water Utility Operating Company, LLC will be obtaining a waiver for the franchise agreement issued by the city or county.

Provide all contracts or agreements between the builder(s) of the treatment and/or collection system, the utility, and the property and/or subdivision developer that show entitlement or ownership to the land, system specifications, cost for the wastewater system and timeline for the system to be built, and rights to the system once it is completed. Documents presented should be signed by all parties and bear marks or stamps, such as those provided by notaries or public officials, as necessary.

RESPONSE: Please see the attached documentation.

UTILITY SERVICES AGREEMENT

This agreement to provide water utility services ("Agreement") is entered into this 21st day of June, 2022 between **LIMESTONE WATER UTILITY OPERATING COMPANY, LLC** ("Utility") and **WESTPARK LAUREL CREEK, LLC** ("Developer") (each a "Party" and jointly "the Parties").

WHEREAS, Utility is a limited liability company, organized and existing under the constitution and the laws of the State of Tennessee, with all the requisite power necessary to enter into the Agreement;

WHEREAS, Developer is a limited liability company, organized and existing under the constitution and the laws of the State of Tennessee, with all the requisite power necessary to enter into the Agreement;

WHEREAS, Developer has acquired or will acquire property in the State of Tennessee, County of Sevier, being known as **LAUREL CREEK** (hereinafter "the Property"), as set out herein on **EXHIBIT A**, attached hereto and incorporated herein; and

WHEREAS, Developer desires to develop the Property as a residential subdivision in accordance with applicable state and local zoning and development regulations and provide all dwellings within the Property with central water service; and

WHEREAS, Utility is authorized to provide water service to the area where the Property is located and desires to own and operate water facilities and equipment constructed or installed by Developer to serve structures within the Property;

NOW THEREFORE, for the consideration expressed in the Agreement and subject to all its terms and conditions, the sufficiency of which is hereby acknowledged, the Parties contract and agree as follows:

1. DEFINITIONS

1.1 **"Environmental Regulator"** means all state or local governmental agencies regulating the construction of Infrastructure (herein defined) within the Property.

1.2 **"Final Property Plan"** means the as-recorded official and fully-approved (if governmental approvals are required) map and plat of the Property.

1.3 **"Infrastructure"** means:

Water infrastructure, including but not limited to, lines, pipes, conduits, tubing, systems, pumps, tanks and structures, mechanical apparatus, and facilities constructed, placed or located by Developer for the transmission of water to the Property from Utility's existing facilities.

1.4 **"Services"** means:

Water services, which is the furnishing of potable drinking water in accordance with all state, federal, and local rules and regulations.

1.5 **"User"** means a customer utilizing Services within the Property.

1.6 **"Utility Construction Requirements"** means Utility's construction specifications, notes and details for Infrastructure for the Property.

2. WATER SYSTEM

2.1 Developer shall design and construct, at its sole expense, all Infrastructure within the Property in accordance with engineering plans and specifications of the Developer's engineer prepared in accordance with all applicable governmental standards and regulations and Utility's Utility Construction Requirements. Plans and specifications shall be submitted to Utility for review, and must have received Utility's written approval before construction begins, which approval shall not be reasonably withheld or delayed.

2.2 All Infrastructure shall be constructed by a contractor that is selected by Developer and approved by Utility prior to beginning construction, which approval shall not be unreasonably withheld or delayed. The contractor must hold all required state and local licenses and, if required by Utility, must produce a valid Certificate of Insurance showing Utility as an additional insured during construction of the Infrastructure.

2.3 Developer must submit, at no charge to Utility, all construction plans and specifications for the Infrastructure. The plans submitted in accordance with this section shall be Developer's plans which have received all required governmental approvals.

2.4 Upon completion of the Infrastructure, Developer must submit to Utility, at no charge, three (3) sets of "As Built" construction plans and specifications as well as an electronic copy of all plans in a format acceptable to Utility.

3. EASEMENTS/SERVITUDES AND REAL PROPERTY

3.1 By its execution of the Agreement, Developer grants, conveys, sets over, and assigns unto Utility a non-exclusive easement/servitude of use and passage within all utility easements/servitudes, rights of ways, and streets within the Property as shown on the final subdivision plan or similar document. The easement/servitude of passage shall be used by Utility exclusively in connection with the maintenance, construction, and operation of the Infrastructure within the Property. Notwithstanding the foregoing, Developer further agrees to execute assignments, easements/servitudes, and any additional documents requested by Utility in order to memorialize this grant of easement/servitude.

3.2 Developer agrees to add the following wording to the final subdivision plan or similar document as recorded in the official real estate records of each county/parish where the Property is located: "LIMESTONE WATER UTILITY OPERATING COMPANY, LLC its successors and assigns, is hereby granted the right to construct, maintain, and provide water services within the street rights of way, both public and private, and easements and servitudes set forth herein and/or hereafter granted and is further granted the exclusive right to provide water services as a non-public, investor-owned utility. No private water supply

for potable household use may be drilled or otherwise constructed within the Property while water service is available from LIMESTONE WATER UTILITY OPERATING COMPANY, LLC."

3.3 Upon completion and acceptance by Utility of the facilities to be constructed and installed by Developer in accordance with the Agreement, all Infrastructure shall become the property of Utility, as installed and without the requirement of written documents of transfer. Utility shall own, operate, and maintain such facilities at its sole cost and responsibility and shall have all right, title, and interest as sole owner of those facilities. Notwithstanding the foregoing, Developer shall execute a deed(s), bill of sale and/or other documents reasonably requested by Utility as necessary or desirable, in its sole opinion, to convey to Utility and ensure Utility's ownership of, ready access to, and operations and maintenance of the Infrastructure.

4. WARRANTIES AND REPRESENTATIONS

4.1 Upon final acceptance and transfer to Utility of the Infrastructure at Closing (hereinafter defined), Utility will provide Services to Users within the Property.

4.2 Upon final acceptance and transfer to Utility of the Infrastructure at Closing, Utility agrees to indemnify and hold harmless Developer from all liability for Services provided to Users.

4.3 Developer represents that the Infrastructure is free of real property tax liens, federal or state tax liens, judgment liens, utility liens, assessment liens and that Utility take the Property free of any liens, mortgages, pledges, leases, options, rights of first refusal, conditional sales agreements, encumbrances or other charges. Developer further agrees to indemnify and hold harmless Utility from any and all liability related to construction and transfer of the Infrastructure, including but not limited to all liens and encumbrances that may be filed and/or attached to the Infrastructure at the time of their transfer to Utility in accordance with the Agreement and agrees to cure any title issues related to the same, at the sole cost of Developer.

5. RIGHTS & OBLIGATIONS OF UTILITY AND DEVELOPER

5.1 Following final transfer of the Infrastructure at Closing, Utility shall be entitled to charge monthly user fees and connection fees for Services within the Property as set and established by state utility regulatory authorities.

5.2 Prior to Closing, Developer or Developer's engineer shall inspect the Infrastructure within the Property during construction and shall be responsible for notifying Utility of any and all deviations from the plans and specifications approved by Utility for construction of the Infrastructure.

5.3 Prior to Closing, Developer or Developer's approved contractor shall chlorinate, pressure test, and flush the Infrastructure related to the water system at Developer's sole cost and expense. Developer shall deliver to Utility a certification from the appropriate governmental authority that the Infrastructure related to the water system is ready for domestic use. A representative of Utility must be present for all testing.

5.4 Prior to Closing, and upon substantial completion of the Infrastructure within the Property, Developer or Developer's approved contractor shall provide a notice of completion to Utility that all work has been substantially completed in accordance with the approved plans and specifications, and further certifying the Infrastructure have been tested in accordance with this section and are approved for use. Utility shall have a period of **fourteen (14) days** from the date of such notice and receipt of the as-built drawings from Developer's approved contractor to provide Developer a written list of any objections or defects of the Infrastructure. In the event Utility provides a notice and listing of objections and defects within the time specified, then Developer shall have a reasonable period of time within which to take such corrective measures as may be necessary to remove such objections and defects. The standard for any review of objections and defects of the Infrastructure shall be the plans and specifications for Infrastructure approved by Utility. Developer shall provide notice to Utility of completion of work required to remove all objections and defects set forth in Utility's notice, and thereafter Utility shall have **seven (7) days** within which to provide notice of any additional defects or objections to the Infrastructure. This process of notification by Utility and corrective action by Developer shall continue until all defects and objections have been remedied or corrected to the reasonable satisfaction of Utility.

5.5 Upon the transfer from Developer to Utility in accordance with this section, all warranties Developer may have from vendors, manufacturers, contractors, or subcontractors in connection with construction of the Infrastructure shall be assigned and transferred to Utility. Developer further agrees to execute an assignment and any additional documents requested by Utility in order to memorialize this transfer and assignment of warranty.

5.6 Each Party agrees to provide reasonable support and assistance required by the other Party to secure governmental approvals, authorizations, and certificates necessary to effectuate the objectives of this Agreement.

6. RATES AND CHARGES

6.1 In accordance with its approved rates and tariffs, Utility will charge a water tie-in fee, a monthly water rate, and any other authorized fees and charges to each builder or User within the Property. Monthly service charges shall begin when the User connects to the Infrastructure.

6.2 Utility shall be entitled to charge each builder or User a deposit for water tap fees in accordance with its approved tariff.

7. REGULATORY APPROVAL; CLOSING

7.1 Upon receipt of all regulatory approvals, in a form satisfactory to Utility in Utility's sole and absolute discretion, and approval of the Infrastructure by Utility, pursuant to Section 5.6, the Parties shall schedule a Closing on a mutually agreed-upon date and place ("Closing"). At the Closing, Developer shall execute and deliver instruments of conveyance, transferring to Buyer the and any real property interests, including but not

limited to easements/servitudes, required Infrastructure for Utility to provides Services to the Property, free of any and all liens and encumbrances.

8. SPECIFIC PERFORMANCE; DAMAGE; VENUE

8.1 If Developer fails to perform its obligations under the Agreement, Utility shall be entitled, at its option, to exercise one or more of the following remedies: (i) specific performance, (ii) compensatory damages, and (iii) rescission and cancellation of this agreement. If Utility elects to exercise its rights under this Section 8, Developer shall pay all costs, attorneys fees, consulting fees and engineering fees, if Utility prevails.

8.2 Any and all disputes hereunder shall be exclusively heard in a federal or state court located in St. Louis County, Missouri.

9. NOTICES

9.1 Any notice required or permitted to be given or served by any Party to the other Party shall be deemed given in accordance with the provisions of this Agreement upon the addressee's receipt by the addressee by certified mail, return receipt requested, addressed as follows:

If to Utility: **LIMESTONE WATER UTILITY OPERATING COMPANY, LLC**
c/o Josiah Cox, President
1630 Des Peres Road, Suite 140
St. Louis, Missouri 63131

With a Copy to: James A. Beckemeier
Beckemeier LeMoine Law
13421 Manchester Road, Suite 103
St. Louis, MO 63131
Facsimile: (314) 965-0127
Email: jim@bl-stl.com

If to Developer: **WESTPARK LAUREL CREEK, LLC**
Doug Hodge
6001 Headwaters Drive
Franklin, TN 37064
Phone: 865-755-8066

9.2 Any Party may change its address by delivering written notice of such change to the other Party in the manner specified above, with the effective date of the change being **ten (10) days** from the date of the receipt of the notice of change.

10. CAPTIONS; HEADINGS

10.1 The paragraph headings or captions appearing in this Agreement are for convenience and direction only, are not a part of this Agreement, and are not to be considered in interpreting this Agreement.

11. ENTIRE CONTRACT MODIFICATION

11.1 This written Agreement constitutes the entire and complete agreement among the Parties and supersedes any prior oral or written agreements, letters, or correspondence between the parties regarding matters covered by the Agreement. It is expressly agreed that there are no verbal understandings or agreements that in any way change the terms, covenants, and conditions set forth here, and no modification of this Agreement or waiver of any of its terms and conditions shall be effective unless made in writing and duly executed by all Parties.

12. ASSIGNMENT

12.1 This Agreement shall not be assigned by Developer to any third party without the prior written consent of Utility, which consent shall not unreasonably be withheld. Any assignment must include the express written assent by assignee to assume all obligations of Developer and to be bound by all terms and conditions of this Agreement. Utility shall be permitted to assign its rights in this Agreement to an affiliated entity that Utility controls without need of consent by the Developer by providing written notice to the Developer of such assignment.

13. WARRANTIES

13.1 All covenants, agreements, warranties, representations, and other provisions of the Agreement shall be binding upon and inure to the benefit of the Parties and also to their respective heirs, executors, administrators, representatives, successors, and permitted assigns.

14. SEVERABILITY

14.1 If any of the terms or conditions of this Agreement shall for any reason be held to be invalid, unlawful, or unenforceable in any respect, such invalidity, unlawfulness, or unenforceability shall not affect the other terms and conditions, and thereafter the terms and conditions of the Agreement shall thereafter be construed as if such invalid, illegal or unenforceable terms or conditions had never been included.

IN WITNESS WHEREOF, the Parties have duly executed this Agreement as of the day and year first above written.

UTILITY:

LIMESTONE WATER UTILITY OPERATING COMPANY, LLC

By: Todd Thomas

Name: Todd Thomas

Title: Sr Vice President

DEVELOPER:

WESTPARK LAUREL CREEK, LLC

By: [signature]

Name: Craig Hostert

Title: Managing Partner

EXHIBIT A

EXHIBIT 3
MANAGERIAL CAPABILITIES
OF LIMESTONE WATER UTILITY OPERATING COMPANY, LLC

Exhibit 3.1	Biographies of Officers & Key Staff
Exhibit 3.2	State Wastewater Provider Status
Exhibit 3.3	Pending Mergers or Acquisitions
Exhibit 3.4	Construction Company Contractor's License

LIMESTONE WATER UTILITY OPERATING COMPANY **EXHIBIT 3.1**
Petition to Amend CCN to provide service to Laurel Creek
Exhibit 3.1 – Biographies of Officers and Key Staff

Provide a biography of all officers and/or key wastewater utility staff that demonstrate managerial ability. Include a list of certifications or professional licenses earned by officers or wastewater utility staff with documentation.

RESPONSE: Please see Exhibit 1.2.

Identify all states where the applicant is certified as a wastewater provider and/or the status of certification in states where an application is pending.

RESPONSE: Please see Exhibit 1.4.

Provide copies of all contracts related to any pending merger or acquisition of the applicant, corporate parent or affiliate.

RESPONSE: Please see the requested waiver of this rule that is contained in the Application.

Provide proof that the party contracted to install the proposed system has a valid and current contractor's license by the applicable licensing board of the State of Tennessee.

RESPONSE: Please see the attached documentation.

STATE OF TENNESSEE
DEPARTMENT OF
COMMERCE AND INSURANCE

DSH & ASSOCIATES, LLC

390266

ID NUMBER: 64260
LIC STATUS: ACTIVE
EXPIRATION DATE: October 31, 2022

BOARD FOR LICENSING CONTRACTORS
CONTRACTOR
THIS IS TO CERTIFY THAT ALL REQUIREMENTS
OF THE STATE OF TENNESSEE HAVE BEEN MET

ATTN:DOUGLAS HODGE
DSH & ASSOCIATES, LLC
2099 THUNDERHEAD RD. STE. 204
KNOXVILLE, TN 37922

State of Tennessee

390266 13001351

BOARD FOR LICENSING CONTRACTORS
CONTRACTOR
DSH & ASSOCIATES, LLC

This is to certify that all requirements of the State of Tennessee have been met.

ID NUMBER: 64260
LIC STATUS: ACTIVE
EXPIRATION DATE: October 31, 2022
UNLIMTED; BC; MU-A; MU-C

IN-1313
DEPARTMENT OF
COMMERCE AND INSURANCE

EXHIBIT 4
TECHNICAL CAPABITIES OF SWS

Exhibit 4.1	TDEC State Operating Permit Application
Exhibit 4.2	State Operator Certificate
Exhibit 4.3	Contact Information
Exhibit 4.4	Complaints, Notices or Administrative Actions
Exhibit 4.5	Design Engineer Certification

Provide a copy of the application for State Operating Permit ("SOP") filed with TDEC. Include the letter from TDEC indicating the receipt of a complete application. Include any engineering and/or design reports submitted to TDEC, such as the Design Development Report and the Detailed Soils Investigation Report. If an operating permit has been issued, provide a copy of the permit. The utility shall file a copy of the TDEC permit in the docket file prior to providing service.

RESPONSE: Please see Exhibit 1.8.

Provide the name, address, and telephone number of the technical contact person responsible for and knowledgeable about the applicant's proposed operations in Tennessee.

RESPONSE: The contact person responsible for and knowledgeable about the applicant's proposed operations in Tennessee is as follows; Aaron Silas, located at 1630 Des Peres Rd., Suite 140, St. Louis, MO 63131, and reached at (314) 380-8510.

Provide a list of any complaint(s), notices of violations or administrative action filed with or issued by a regulatory agency. Identify the nature of the complaint, notices of violation or administrative action, which agency is involved, and how the issue was or is being resolved.

RESPONSE: None.

Provide a certification from a design engineer that the wastewater system was constructed in accordance with the TDEC approved construction plans and specifications. The certification shall be filed in the docket prior to providing service.

RESPONSE: Limestone Water Utility Operating Company, LLC will provide this certification once construction of the wastewater system has commenced, and prior to providing service.

EXHIBIT 5
FINANCIAL
CAPABILITIES

Exhibit 5.1	2021 Financial Statements
Exhibit 5.2	10-Year Pro Forma Income Statement
Exhibit 5.3	Chart of Accounts
Exhibit 5.4	Plant in Service
Exhibit 5.5	Depreciation Rates
Exhibit 5.6	Estimated Wastewater Construction Cost
Exhibit 5.7	Wastewater Ownership Statement
Exhibit 5.8	Wastewater Tariff
Exhibit 5.9	Estimated Annual Customer Additions
Exhibit 5.10	Local Bonding Requirements
Exhibit 5.11	Wastewater System Performance Bond for Construction
Exhibit 5.12	Funding Sources
Exhibit 5.13	Compliance with TPUC Financial Security Requirement

LIMESTONE WATER UTILITY OPERATING COMPANY **EXHIBIT 5.1**
Petition to Amend CCN to provide service to Laurel Creek
Exhibit 5.1 – 2019 Financial Statements

Provide the financial statements for the applicant covering the most recent year ended. Include a balance sheet, income statement and statement of cash flows.

RESPONSE: Please see the attached confidential documentation.

LIMESTONE WATER UTILITY OPERATING COMPANY **EXHIBIT 5.2**
Petition to Amend CCN to provide service to Laurel Creek
Exhibit 5.2 – Pro Forma Income Statement

Provide a pro forma income statement for the wastewater utility for the first three (3) years of operations or for an expanded amended CCN, the first three years after the latest year-end financials. In the calculations of utility revenues show the number of consumers and the rates used in the calculations. Show operation and maintenance expenses by account number and provide the basis and/or assumptions used to arrive at these amounts.

RESPONSE: Please see the attached confidential documentation.

LIMESTONE WATER UTILITY OPERATING COMPANY **EXHIBIT 5.3**
Petition to Amend CCN to provide service to Laurel Creek
Exhibit 5.3 – Chart of Accounts

Provide a chart of accounts for the wastewater utility, following the NARUC Uniform System of Accounts (USOA) for wastewater utilities.

RESPONSE: Please see the attached documentation.

CSWR, LLC - Limestone UOC
Chart of Accounts

Account Name
106.000-05-013 - Utility Plant Purchased/Sold (TN, Limestone)
107.001-05-013 - CIP (Plant) (TN, Limestone)
107.002-05-013 - CIP (Engineering) (TN, Limestone)
107.003-05-013 - CIP (Legal) (TN, Limestone)
107.004-05-013 - CIP (Startup) (TN, Limestone)
107.005-05-013 - CIP (Debt Carry) (TN, Limestone)
108.000-05-013 - AccumDepre Plant in Service (TN, Limestone)
108.100-05-013 - Accum Deprec Salvage Reserve (TN, Limestone)
108.300-05-013 - Accum Amort Plant in Service (TN, Limestone)
114.000-05-013 - Utility Plant Acq Adj (TN, Limestone)
123.000-05-013 - Investment in Associated Companies (TN, Limestone)
131.100-05-013 - Cash Operating (TN, Limestone)
131.200-05-013 - Cash Receipts (TN, Limestone)
141.000-05-013 - Customer AR (TN, Limestone)
143.000-05-013 - AR Other (TN, Limestone)
144.000-05-013 - Accum Prov for Uncoll Accts (TN, Limestone)
145.000-05-013 - N/R from Assoc Companies (TN, Limestone)
146.000-05-013 - A/R from Assoc Companies (TN, Limestone)
166.000-05-013 - Prepayments (TN, Limestone)
181.000-05-013 - Unamortized Debt Disc/Exp (TN, Limestone)
183.000-05-013 - Preliminary Survey and Investigation Charges (TN, Limestone)
183.001-05-013 - PSI - Engineering (TN, Limestone)
183.002-05-013 - PSI - Legal (TN, Limestone)
186.000-05-013 - Misc Deferred Debits (TN, Limestone)
201.000-05-013 - Common Stock Issued (TN, Limestone)
204.000-05-013 - Preferred Stock Issued (TN, Limestone)
211.000-05-013 - APIC (TN, Limestone)
215.000-05-013 - Retained Earnings (TN, Limestone)
216.000-05-013 - Unappropriated Retained Earnings (TN, Limestone)
218.000-05-013 - Capital (TN, Limestone)
221.000-05-013 - Bonds (TN, Limestone)
224.000-05-013 - LT Debt (Other) (TN, Limestone)
231.000-05-013 - Notes Payable (TN, Limestone)
232.000-05-013 - Accounts Payable (TN, Limestone)
233.000-05-013 - Notes Payable Associated Companies (TN, Limestone)
235.000-05-013 -Customer Deposits (TN, Limestone)
236.000-05-013 - Taxes Payable (TN, Limestone)
242.000-05-013 - Misc Current & Accrued Liab (TN, Limestone)
242.001-05-013 - LT Debt (Current Portion) (TN, Limestone)
265.000-05-013 - Misc Operating Reserves (TN, Limestone)
271.000-05-013 - CIAC (TN, Limestone)
272.000-05-013 - CIAC Accum Amort (TN, Limestone)
283.000-05-013 - Accumulated Deferred Income Taxes (TN, Limestone)

304.000-05-013 - Structures & Improvements (TN, Limestone)
305.000-05-013 - Collecting & Impound Reservoirs (TN, Limestone)
306.000-05-013 - Lake, River & Other Intakes (TN, Limestone)
307.000-05-013 - Wells and Springs (TN, Limestone)
308.000-05-013 - Infiltration Galleries & Tunnels (TN, Limestone)
309.000-05-013 - Supply Mains (TN, Limestone)
310.000-05-013 - Power Generating Equipment (TN, Limestone)
311.000-05-013 - Pumping Equipment (TN, Limestone)
320.000-05-013 - Water Treatment Equipment (TN, Limestone)
330.000-05-013 - Distb'n Reservoirs & Standpipes (TN, Limestone)
331.000-05-013 - Transmission & Distbution Mains (TN, Limestone)
333.000-05-013 - Services (TN, Limestone)
334.000-05-013 - Meter & Meter Installations (TN, Limestone)
335.000-05-013 - Hydrants (TN, Limestone)
339.000-05-013 - Other Plant & Misc. Equipment (TN, Limestone)
340.000-05-013 - Office Furniture & Equipment (TN, Limestone)
341.000-05-013 - Transportation Equipment (TN, Limestone)
342.000-05-013 - Stores Equipment (TN, Limestone)
343.000-05-013 - Tools, Shop & Garage Equipment (TN, Limestone)
344.000-05-013 - Laboratory Equipment (TN, Limestone)
345.000-05-013 - Power Operated Equipment (TN, Limestone)
346.000-05-013 - Communication Equipment (TN, Limestone)
347.000-05-013 - Miscellaneous Equipment (TN, Limestone)
348.000-05-013 - Other Tangible Plant (TN, Limestone)
351.000-05-013 -Organization (TN, Limestone)
352.000-05-013 - Franchises (TN, Limestone)
353.000-05-013 - Land & Land Rights (TN, Limestone)
354.000-05-013 - Structures & Improvements (TN, Limestone)
360.000-05-013 - Collection Sewers-Force (TN, Limestone)
361.000-05-013 -Collection Sewers-Gravity (TN, Limestone)
362.000-05-013 -Special Collection Structures (TN, Limestone)
363.000-05-013 -Services to Customers (TN, Limestone)
364.000-05-013 - Flow Measuring Devices (TN, Limestone)
365.000-05-013 - Flow Measuring Installations (TN, Limestone)
370.000-05-013 - Receiving Wells (TN, Limestone)
371.000-05-013 - Puming Equipment (TN, Limestone)
380.000-05-013 - Treatment & Disposal Equipment (TN, Limestone)
381.000-05-013 - Plant Sewers (TN, Limestone)
382.000-05-013 - Outfall Sewer Lines (TN, Limestone)
389.000-05-013 - Other Plant & Miscellaneous Equipment (TN, Limestone)
390.000-05-013 -Office Furniture & Equipment (TN, Limestone)
391.000-05-013 - Transportation Equipment (TN, Limestone)
392.000-05-013 - Stores Equipment (TN, Limestone)
393.000-05-013 - Tools, Shop & Garage Equipment (TN, Limestone)
394.000-05-013 - Laboratory Equipment (TN, Limestone)
395.000-05-013 - Power Operated Equipment (TN, Limestone)
396.000-05-013 - Communication Equipment (TN, Limestone)

397.000-05-013 - Miscellaneous Equipment (TN, Limestone)
398.000-05-013 - Other Tangible Plant (TN, Limestone)
403.000-05-013 - Depreciation Expense (TN, Limestone)
403.100-05-013 - Depreciation Expense CIAC (TN, Limestone)
403.200-05-013 - Depreciation Expense Salvage Reserve (TN, Limestone)
405.000-05-013 - Amortization Expense (TN, Limestone)
408.100-05-013 - Taxes (Other) (TN, Limestone)
408.120-05-013 - Taxes SS & Med (TN, Limestone)
408.140-05-013 - Taxes Unemployment (TN, Limestone)
408.160-05-013 - Taxes Property (TN, Limestone)
409.000-05-013 - Taxes Income (TN, Limestone)
410.000-05-013 - Provision for Deferred Income Tax (TN, Limestone)
414.000-05-013 - Gains(Losses) on Disposal of Utility Property (TN, Limestone)
420.000-05-013 - AFUDC (TN, Limestone)
426.000-05-013 - Miscellaneous Income Deductions (TN, Limestone)
427.000-05-013 - Interest Long (TN, Limestone)
428.000-05-013 - Amortization of Debt Discount & Expense (TN, Limestone)
433.000-05-013 - Extraordinary Income (TN, Limestone)
434.000-05-013 - Extraordinary Expense (TN, Limestone)
461.100-05-013 - Water Revenue Residential (TN, Limestone)
461.200-05-013 - Water Revenue Commercial (TN, Limestone)
461.300-05-013 - Water Revenue Industrial (TN, Limestone)
461.400-05-013 - Water Revenue Multi-Family (TN, Limestone)
470.000-05-013 - Late Fees Water (TN, Limestone)
471.000-05-013 - Miscellaneous Service Revenues (TN, Limestone)
471.100-05-013 - Tap Fees (TN, Limestone)
521.100-05-013 - Sewer Revenue Residential (TN, Limestone)
521.200-05-013 - Sewer Revenue Commercial (TN, Limestone)
521.300-05-013 - Sewer Revenue Industrial (TN, Limestone)
521.400-05-013 - Sewer Revenue Multi-Family (TN, Limestone)
532.000-05-013 - Late Fees Sewer (TN, Limestone)
536.000-05-013 - Miscellaneous Service Revenues (TN, Limestone)
536.100-05-013 - Tap Fees (TN, Limestone)
600.000-05-013 - Operation Supervision and Engineering (TN, Limestone)
601.000-05-013 - Salaries & Wagers - Employees (TN, Limestone)
603.000-05-013 - Miscellaneous (TN, Limestone)
603.000-05-013 - Salaries & Wagers - Officers, Directors & Stockholders (TN, Limestone)
604.000-05-013 - Employee Pension & Benefits (TN, Limestone)
610.000-05-013 - Purchased Water (TN, Limestone)
611.000-05-013 - Maintenance S&I (TN, Limestone)
612.000-05-013 - Maintenance Collecting and Impounding Reservoirs (TN, Limestone)
613.000-05-013 - Maintenance Lake, River and Other Intakes (TN, Limestone)
614.000-05-013 - Maintenance Wells and Springs (TN, Limestone)
615.000-05-013 - Purchased Power (TN, Limestone)
616.000-05-013 - Fuel for Power PRoduction (TN, Limestone)
618.000-05-013 - Chemicals (TN, Limestone)
620.000-05-013 - Materials & Supplies (TN, Limestone)

621.000-05-013 - Fuel for Power Production (TN, Limestone)
622.000-05-013 - Power Production Labor and Expense (TN, Limestone)
623.000-05-013 - Fuel/Power Purchased for Pump (TN, Limestone)
624.000-05-013 - Pumping Labor and Expense (TN, Limestone)
626.000-05-013 - Miscellaneous Expenses Water Pumping (TN, Limestone)
630.000-05-013 - Contractual Services (TN, Limestone)
631.000-05-013 - Maintenance S&I (TN, Limestone)
632.000-05-013 - Maintenance Power Production Equipment (TN, Limestone)
633.000-05-013 - Maintenance Pumping Equipment (TN, Limestone)
640.000-05-013 - Rents (TN, Limestone)
641.000-05-013 - Chemicals (TN, Limestone)
642.000-05-013 - Operation Labor and Expense (TN, Limestone)
643.000-05-013 - Miscellaneous Expenses Wtr Trtm (TN, Limestone)
650.000-05-013 - Transportation Expense (TN, Limestone)
652.000-05-013 - Maintenance Equipment (TN, Limestone)
655.000-05-013 - Insurance Expense (TN, Limestone)
660.000-05-013 - Operation Supervision and Engineering (TN, Limestone)
661.000-05-013 - Storage Facilities Expense (TN, Limestone)
662.000-05-013 - Transm and Distr Lines Expenses (TN, Limestone)
663.000-05-013 - Meter Expenses (TN, Limestone)
664.000-05-013 - Customer Installations Expenses (TN, Limestone)
665.000-05-013 - Regulatory Commission Expense (TN, Limestone)
670.000-05-013 - Bad Debt Expense (TN, Limestone)
671.000-05-013 - Maintenance Stuctures and Improvements (TN, Limestone)
672.000-05-013 - Miscellaneous Expense (TN, Limestone)
673.000-05-013 - Maintenance Transmission & Distrtibution Mains (TN, Limestone)
674.000-05-013 - Maintenance Fire Mains (TN, Limestone)
675.000-05-013 - Maintenance Services (TN, Limestone)
676.000-05-013 - Maintenance Meters (TN, Limestone)
677.000-05-013 - Maintenance Hydrants (TN, Limestone)
678.000-05-013 - Maintenance Miscellaneous Plant (TN, Limestone)
700.000-05-013 - Collection Supervision and Engineering (TN, Limestone)
701.000-05-013 - Salaries & Wages - Employees (TN, Limestone)
702.000-05-013 - Services to Customers (TN, Limestone)
703.000-05-013 - Salaries & Wages - Officers, Directors & Stockholders (TN, Limestone)
704.000-05-013 - Employee Pensions & Benefits (TN, Limestone)
710.000-05-013 - Sludge Removal Expense (TN, Limestone)
711.000-05-013 - Maintenance Collection Structures and Improvements (TN, Limestone)
712.000-05-013 - Maintenance Collection Sewers (TN, Limestone)
713.000-05-013 - Maintenance Services to Cust (TN, Limestone)
714.000-05-013 - Maintenance Flow Measuring Devicies (TN, Limestone)
715.000-05-013 - Purchased Power (TN, Limestone)
716.000-05-013 - Fuel for Power Production (TN, Limestone)
720.000-05-013 - Materials & Supplies (TN, Limestone)
721.000-05-013 - Fuel and Power Purchased for Pumping (TN, Limestone)
722.000-05-013 - Pumping Labor & Expenses (TN, Limestone)
724.000-05-013 - Miscellaneous Expenses (TN, Limestone)

730.000-05-013 - Contractual Services (TN, Limestone)
731.000-05-013 - Maintenance Pumping Structures and Improvements (TN, Limestone)
732.000-05-013 - Maintenance Sewer Pump Equip (TN, Limestone)
740.000-05-013 - Rents (TN, Limestone)
741.000-05-013 - Sewer Treatment Chemicals (TN, Limestone)
742.000-05-013 - Treatment Labor & Expense (TN, Limestone)
743.000-05-013 - Fuel & Power Sewage T&P (TN, Limestone)
744.000-05-013 - Miscellaneous Expense (TN, Limestone)
750.000-05-013 - Transportation Expense (TN, Limestone)
751.000-05-013 - Maintenance T&D Structures & Improvements (TN, Limestone)
752.000-05-013 - Maintenance T&D Plant (TN, Limestone)
753.000-05-013 - Maintenance T&D Other (TN, Limestone)
755.000-05-013 - Insurance Expense (TN, Limestone)
765.000-05-013 - Regulatory Commission Expense (TN, Limestone)
770.000-05-013 - Bad Debt Expense (TN, Limestone)
775.000-05-013 - Miscellaneous Expense (TN, Limestone)
903.100-05-013 - Cust Record Collect (Billing) (TN, Limestone)
903.200-05-013 - Cust Record Collect (Postage) (TN, Limestone)
903.280-05-013 - Cust Record Collect (Bank Fees) (TN, Limestone)
904.000-05-013 - Uncollectible Accounts (TN, Limestone)
905.000-05-013 - Miscellaneous Customer Accounts Expense (TN, Limestone)
907.000-05-013 - Cust Service & Inform Ex (TN, Limestone)
920.000-05-013 - Salaries Admin & General (TN, Limestone)
921.000-05-013 - Office Supp Exp (TN, Limestone)
921.110-05-013 - Office Supp Exp (Meals, Travel) (TN, Limestone)
921.500-05-013 - Office Supp Ex (Communication) (TN, Limestone)
921.800-05-013 - Office Supplies Expense (TN, Limestone)
922.000-05-013 - Administrative Expenses Transferred (TN, Limestone)
923.100-05-013 - Outside Services (Bank Fees) (TN, Limestone)
923.300-05-013 - OutsideService (Eng Consult) (TN, Limestone)
923.400-05-013 - OutsideService (Legal Fees) (TN, Limestone)
923.500-05-013 - OutsideService (Audit/Accounting) (TN, Limestone)
923.600-05-013 - OutsideService (Manage Consult) (TN, Limestone)
923.800-05-013 - Outside Services (Payroll Fees) (TN, Limestone)
923.900-05-013 - Outside Services (IT) (TN, Limestone)
924.000-05-013 - Property Insurance (TN, Limestone)
924.200-05-013 - Property Insurance Environmental (TN, Limestone)
924.300-05-013 - Property Insurance Worker's Comp (TN, Limestone)
924.400-05-013 - Property Insurance Commercial (TN, Limestone)
926.100-05-013 - EE Benefits Keyman (TN, Limestone)
926.200-05-013 - EE Benefits Healthcare (TN, Limestone)
926.300-05-013 - EE Benefits Retirement (TN, Limestone)
926.400-05-013 - EE Benefits Life/STD/LTD/ADD (TN, Limestone)
928.100-05-013 - Regulatory Expense DNR (TN, Limestone)
928.200-05-013 - Regulatory Expense PSC (TN, Limestone)
928.400-05-013 - Regulatory Expense Business License (TN, Limestone)
930.200-05-013 - Misc General Expense (TN, Limestone)

931.000-05-013 - Rents Admin & General (TN, Limestone)

Provide a list of all plant-in-service account numbers with account names and estimated account balances as of the start of operations.

RESPONSE: Please see the attached documentation.

Limestone Water Utility Operating Company
Account Balances at acquisition for Laurel Creek Service Area

Acct Name	Acct #	Balance
Structures & Improvements-Sewer	354.000	28,000
Collection Sewers-Force	360.000	9,270
Flow Measuring Devices	364.000	13,922
Treatment & Disposal equipment	380.000	224,796
		275,988

Provide the depreciation rates the applicant intends to use for each plant account that will be on the wastewater utility's books. Include the estimated useful life of each account. If no depreciation study has been performed, explain the basis for these rates.

RESPONSE: Please see the attached documentation.

Asset Type	Depreciation Years
301.000 Organization - Water	0 years 0 months
302.000 Franchises - Water	10 years 0 months
303.000 - Land and Land Rights - Water	0 years 0 months
304.000 Structures and Improvements - Water	40 years 0 months
305.000 Collecting and Impounding Reservoirs - Water	10 years 0 months
306.000 Lake, River and Other Intakes - Water	50 years 0 months
307.000 Wells and Springs - Water	50 years 0 months
308.000 Infiltration Galleries and Tunnels - Water	30 years 0 months
309.000 Supply Mains - Water	50 years 0 months
310.000 Power Generation Equipment - Water	10 years 0 months
311.000 Pumping Equipment - Water	10 years 0 months
320.000 Water Treatment Equipment - Water	10 years 0 months
330.000 Distribution Reservoirs and Standpipes - Water	40 years 0 months
331.000 Transmission and Distribution Mains - Water	40 years 0 months
333.000 Services - Water	40 years 0 months
334.000 Meters and Meter Installation - Water	10 years 0 months
335.000 Hydrants - Water	50 years 0 months
336.000 Backflow Prevention Devices - Water	10 years 0 months
339.000 Other Plant and Miscellaneous Equipment - Water	10 years 0 months
340.000 Office Furniture and Equipment	10 years 0 months
341.000 Transportation Equipment - Water	40 years 0 months
342.000 Stores Equipment - Water	40 years 0 months
343.000 Tools, Shop and Garage Equipment - Water	50 years 0 months
344.000 Laboratory Equipment - Water	20 years 0 months
345.000 Power Operated Equipment - Water	40 years 0 months
346.000 Communication Equipment - Water	10 years 0 months
347.000 Miscellaneous Equipment - Water	50 years 0 months
348.000 Other Tangible Plant - Water	50 years 0 months
349.000 Other Transmission & Distribution Plant	10 years 0 months
351.000 - Organization	0 years 0 months
353.000 Land & Land Rights	0 years 0 months
354.000 Structures & Improvements	40 years 0 months
360.000 Collection Sewere - Force	50 years 0 months
361.000 Collection Sewers (Gravity)	50 years 0 months
371.000 Pumping Equipment	10 years 0 months
380.000 Treatment & Disposal Equipment	20 years 0 months
381.000 Plant Sewers	40 years 0 months
382.000 Outfall Sewer Lines	50 years 0 months
390.000 Office Furniture & Equipment	20 years 0 months
391.000 Transportation Equipment	7 years 0 months
393.000 Tools, Shop & Garage Equipment	20 years 0 months
395.000 Power Operated Equipment	15 years 0 months
396.000 Communication Equipment	15 years 0 months
397.000 Misc Equipment	50 years 0 months

Provide the total estimated detailed cost of construction of the wastewater system to be constructed for the proposed service area. If the wastewater system will be constructed in phases, provide detailed construction cost estimates for each phase. Indicate whether the developer or the applicant will pay for the construction of the system.

RESPONSE: Please see the attached confidential documentation.

Indicate the identity of the owner of the wastewater system once construction is complete. If a party other than the utility pays the cost of construction and transfers ownership of the wastewater system to the applicant, provide a detailed breakdown of the estimated amount of contributed capital that will be recorded on the applicant's financial books.

RESPONSE: Once constructed, the owner of the wastewater system will become Limestone Water Utility Operating Company, LLC.

Provide a tariff showing products, services, terms, conditions, and proposed rates to be charged for wastewater service. The tariff should include all pass-through fees, including but not limited to, customer deposits, disconnect or reconnect fees, late fees, tap fees, escrow fees, bond fees, franchise fees and taxes.

RESPONSE: Limestone seeks to utilize the same rates, terms, and conditions as those currently being used in the accompanying tariff sheet for Cartwright Creek.

CARTWRIGHT CREEK, LLC

DOCKET NO. 21-00053 – LIMESTONE PURCHASE OF CARTWRIGHT CREEK, LLC

FIRST DISCOVERY REQUEST OF THE CONSUMER ADVOCATE

ATTACHMENT 1-17A – TARIFF

Cartwright Creek

Wastewater Service Tariff

TRA #1
Rate Schedules

SCHEDULE OF RATES & CHARGES
GRASSLAND SERVICE TERRITORY

Residential Monthly Wastewater Service:

1-2 Bedroom	$42.00
2 Bedroom	$42.00
3 Bedroom	$46.50
4 Bedroom	$52.00
5 Bedroom	$55.25

Commercial Monthly Wastewater Service:

Rate per 1,000 Gallons per Month (Actual or Estimated Flow)	$8.75
Minimum Monthly Charge	37.00

Miscellaneous Charges:

Monthly Capital Recovery Surcharge	$7.50
Returned Check Charge	$25.00
Disconnection Charge	$10.00
Reconnection Charge	$15.00
Late Payment Penalty	5.00%

All customers are also required to provide a refundable security deposit equal to twice the estimated monthly bill prior to obtaining service.

Property Owner/Builder/Developer Fees:

Residential Tap Fee	$10,000.00
Commercial Tap Fee per Gallon per Day Peak Usage	$14.29*
Construction Inspection Fee	$250.00
Construction Reinspection Fee	$50.00

A property owner, builder or developer may apply to the Company for a Service Connection to an existing wastewater treatment facility owned and operated by the Company. If acceptable to the Company, the applicant shall sign the Contracts for Service and pay the Company the required Tap Fees and other applicable fees pursuant to this Tariff.

**- Commercial Tap Fees are computed by multiplying the peak daily usage (estimated or known) * $14.29 or $10,000.00, whichever is greater.*

SCHEDULE OF RATES & CHARGES
ARRINGTON RETREAT SERVICE TERRITORY

Residential Monthly Wastewater Service:

All Residential Customers	$55.25

Commercial Monthly Wastewater Service:

Rate per 1,000 Gallons per Month (Actual or Estimated Flow)	$8.75
Minimum Monthly Charge	37.00

Miscellaneous Charges:

Monthly Capital Recovery Surcharge	$7.50
Returned Check Charge	$25.00
Disconnection Charge	$10.00
Reconnection Charge	$15.00
Late Payment Penalty	5.00%

All customers are also required to provide a refundable security deposit equal to twice the estimated monthly bill prior to obtaining service.

Property Owner/Builder/Developer Fees:

Residential Tap Fee	$10,000.00
Commercial Tap Fee per Gallon per Day Peak Usage	$14.29*
Construction Inspection Fee	$250.00
Construction Reinspection Fee	$50.00

A property owner, builder or developer may apply to the Company for a Service Connection to an existing wastewater treatment facility owned and operated by the Company. If acceptable to the Company, the applicant shall sign the Contracts for Service and pay the Company the required Tap Fees and other applicable fees pursuant to this Tariff.

**- Commercial Tap Fees are computed by multiplying the peak daily usage (estimated or known) * $14.29 or $10,000.00, whichever is greater.*

SCHEDULE OF RATES & CHARGES
HIDEAWAY SERVICE TERRITORY

Residential Monthly Wastewater Service:

All Residential Customers	$55.25

Commercial Monthly Wastewater Service:

Rate per 1,000 Gallons per Month (Actual or Estimated Flow)	$8.75
Minimum Monthly Charge	37.00

Miscellaneous Charges:

Monthly Capital Recovery Surcharge	$7.50
Returned Check Charge	$25.00
Disconnection Charge	$10.00
Reconnection Charge	$15.00
Late Payment Penalty	5.00%

All customers are also required to provide a refundable security deposit equal to twice the estimated monthly bill prior to obtaining service.

Property Owner/Builder/Developer Fees:

Residential Tap Fee	$10,000.00
Commercial Tap Fee per Gallon per Day Peak Usage	$14.29*
Construction Inspection Fee	$250.00
Construction Reinspection Fee	$50.00

A property owner, builder or developer may apply to the Company for a Service Connection to an existing wastewater treatment facility owned and operated by the Company. If acceptable to the Company, the applicant shall sign the Contracts for Service and pay the Company the required Tap Fees and other applicable fees pursuant to this Tariff.

**- Commercial Tap Fees are computed by multiplying the peak daily usage (estimated or known) * $14.29, or $10,000.00 whichever is greater.*

SCHEDULE OF RATES & CHARGES
HARDEMAN SPRINGS SERVICE TERRITORY

Residential Monthly Wastewater Service:

All Residential Customers	$55.25

Commercial Monthly Wastewater Service:

Rate per 1,000 Gallons per Month (Actual or Estimated Flow)	$8.75
Minimum Monthly Charge	37.00

Miscellaneous Charges:

Monthly Capital Recovery Surcharge	$7.50
Returned Check Charge	$25.00
Disconnection Charge	$10.00
Reconnection Charge	$15.00
Late Payment Penalty	5.00%

All customers are also required to provide a refundable security deposit equal to twice the estimated monthly bill prior to obtaining service.

Property Owner/Builder/Developer Fees:

Residential Tap Fee	$10,000.00
Commercial Tap Fee per Gallon per Day Peak Usage	$14.29*
Construction Inspection Fee	$250.00
Construction Reinspection Fee	$50.00

A property owner, builder or developer may apply to the Company for a Service Connection to an existing wastewater treatment facility owned and operated by the Company. If acceptable to the Company, the applicant shall sign the Contracts for Service and pay the Company the required Tap Fees and other applicable fees pursuant to this Tariff.

**- Commercial Tap Fees are computed by multiplying the peak daily usage (estimated or known) * $14.29 or $10,000.00, whichever is greater.*

Cartwright Creek

Wastewater Service Tariff

TRA #2
Rules and Regulations

RULES AND REGULATIONS

Statement of Purpose

The general purposes of these rules and regulations are to establish procedures for furnishing sewerage and sewage treatment services on a uniform basis to customers within the service area boundary of Cartwright Creek, LLC.

Definition of Terms

1. Company - The word Company shall mean the Cartwright Creek, LLC.
2. Engineer - The word Engineer shall mean the consulting engineer of Cartwright Creek, LLC.
3. Customer - The word Customer shall mean any person, firm, corporation, association or government unit furnished sewerage services by the Company.
4. Property-The word Property shall mean all facilities owned and operated by the Company.
5. Commission - The word Commission shall mean the Tennessee Regulatory Authority.
6. Sewer – Piping, both gravity and pressure type, not on the customer's property, that collect and transport wastewater, including valves, manholes, access boxes, valve vaults, cleanouts, and other devices on the sewer.
7. Collection lines – See Sewer.
8. Lateral Sewer – The words Lateral Sewer shall mean the piping extending from the Collection lines to the Customer's property line (for customers with gravity only sewer connections) or to the Service Box (for customers with grinder pumps).
9. Service Box – For Customers with grinder pumps, a below ground valve assembly installed at each individual customer's property that connects to the Company's lateral sewer and where the customer's Service line is connected.
10. Service line – For customers with gravity sewer connections, the piping on the Customer's property extending from the Lateral Sewer to the customer's place of business or residence. For customer's with grinder pumps, the piping on the customer's property that connects the Grinder Pump to the Service Box, including the cleanout and connection to the pump.
11. Grinder Pump – The individual grinder pump installed at each residential or non-residential service location that receives and pumps sewage from the customer to the Company's sewer. This includes the pump, the pump sump, electrical control panel, and interconnecting wiring.
12. Residential Service - The words Residential Service shall mean the provision of wastewater service to a customer whose primary use is for the customer's personal dwelling.
13. Commercial Service – The words Commercial Service shall mean the provision of wastewater service to a customer whose primary use is for other than the customer's personal dwelling.

Authorization of Rules and Regulations

Cartwright Creek, LLC, a corporation organized and engaged in business as a public utility in the State of Tennessee under a transferred Certificate of Convenience and Necessity approved by the Tennessee Regulatory Authority on November 8, 2004, under Docket No. 04-00358, submits the following statement of its rules and regulations.

Effect of Rules and Regulations

All provisions of these rules and regulations shall be incorporated in each contract with each sewerage Customer of the Company.

Utility Items on Private Property

1. For Customers with gravity connections, the Customer shall own and maintain all piping within the residence or commercial building and exterior piping and Service Line.
2. For Customers with grinder pumps, the Customer shall own and maintain all piping within the residence or commercial building and external piping connecting to the grinder pump. The Company shall maintain the grinder pump and service line and the Customer shall be responsible for the cost of repair and maintenance of the grinder pump and service line. The Customer shall be responsible for furnishing and maintaining electrical power to the grinder pump.

Discontinuance of Service

Service under any application may be discontinued for the following reasons:

1. Non-payment of bill as hereinafter set forth.
2. For misrepresentation in the application.
3. For modifying or repairing any Property of the Company.
4. For failure to protect the connections, service lines or fixtures in good order.
5. For damaging any service pipes or any property of the Company in any way whatsoever.
6. Vacancy of premises.
7. For disconnecting or re-connecting service by any party other than a duly authorized agent of the Company without the consent of the Company.

Non-payment Penalties

A penalty of five (5%) percent of the monthly charge will be due after the 15th day of each month for which a bill has been rendered. After twenty (20) days non-payment after the first day of the month in which the bill is payable, the Company may shut-off the customer's service; provided, however, the Company will give the customer an additional fifteen (15) days' notice before discontinuation. A fee of Ten and No/100 ($10.00) Dollars will be charged for disconnection and a Fifteen and No/100 ($15.00) Dollars fee will be charged for re-connection of service, plus the actual cost of remedying any damage to the shut-off valve or other facilities. No service shall be turned on again if discontinued for non-payment (or any other valid reason) until all charges have been paid, including disconnection and re-connection fees.

Change in Ownership, Tenancy of Service

A new application and agreement must be made and approved by the Company on any change in ownership of property, or in tenancy, or in the service as described in the application. In the event of failure of a new owner or tenant to make such application, the Company shall have the right to discontinue service until such new application is made and approved.

Security Deposits

Each new Customer, before connection or re-connection, of the service may be required to make a refundable deposit to secure payment of sewerage bills in an amount double the monthly bill for that particular type of customer.

Engineering Materials and Construction Standards

To be provided upon written request.

Special Pretreatment Sewage Requirements

For all sewerage connections, in addition to the customary tap fees, the Company reserves the right to require any non-residential user to provide special treatment for any high strength effluent before discharge into its sewerage system. The Company may, upon the basis of recognized engineering standards and treatment costs, increase the tap fees or flat rate charges to cover the cost of treatment of high strength effluent or industrial waste, and may impose recognized engineering standards as to the maximum size of solids and constituents in such waste discharged into its sewerage system.

Additionally, if excessive volumes or high strength of sewage are received, the Company may require the Customer to monitor flow volume in order to adjust the monthly sewer service rate.

Damages

The Company shall in no event be responsible for maintaining any service line owned by the Customer, nor for damages created by sewage escaping therefrom, nor for defects in lines or fixtures on the property of the Customer. The Customer shall at all times comply with all regulations of the Tennessee Regulatory Authority, and of the Company, relating to the service lines and shall make all changes in his line required on account of grade or otherwise.

All leaks in any pipe or fixture on the premises of the Customer shall be immediately repaired. If the Customer fails to repair any such leak, the service may be discontinued until repairs are made.

Inspection

All pipes, valves and fixtures shall be subject to inspection at all reasonable hours by the Company or its duly authorized agent.

In Event of Emergency

The Company shall not be liable to the Customer for interruption of service, or for damages or inconveniences as a result of any interruption, stoppage, etc., which was beyond the reasonable control of the Company.

Extension Plan

The Company may furnish sewer services to additional property owners. The sewer service charges and tap fees identified in the Company's Tariff do not include costs for constructing new sewers. Any collector and/or lateral sewers required to service such properties shall be constructed at the cost of those parties desiring same, and these sewers shall become the property of the Company, to be credited to the account for contributions in aid of construction.

Contracts for Service

Each Customer before installation of service shall be required to execute on the appropriate forms furnished by the Company:

1. A sewer service contract.
2. The application and contract for sewer tap services (when applicable).

Customer Billing Forms

All customer billings shall be on a standard form whether residential, commercial or industrial.

Public Contact

Billing:
Cartwright Creek, LLC
Bruce Meyer
1551 Thompson's Station Road West
Thompson's Station, TN 37179
615-261-8615

Plant Operations:
Cartwright Creek, LLC
Bruce Meyer
1551 Thompson's Station Road West
Thompson's Station, TN 37179
615-261-8600

Tennessee Regulatory Authority Regulations

The utility in its operation shall conform with all the applicable rules and regulations promulgated from time to time by the Tennessee Regulatory Authority.

Returned Checks

Any Customer whose personal check is returned by the bank shall pay the Company an additional fee of $25.00, which will be clearly indicated on the bill.

Payment Plans

The Company offers each customer the opportunity to resolve any past due balances to avoid "Non-payment Penalties". Customer may pay a past due bill, including returned check fees and other charges, disconnection and reconnection charges in a payment plan over a three to six-month billing cycle. Customers that desire to take advantage of this plan should submit their written request to the Company's business office.

If service has been disconnected, service will be reconnected within 2 days of receiving the first payment. The Company will offer one such payment plan within a full calendar year.

In the event that a customer on a payment plan fails to pay a monthly installment as per the terms of the plan and is more than fifteen (15) business days late on any payment, then the customer's service is subject to disconnection and all past due charges in addition to disconnect/reconnect fees would become due and payable prior to having service restored.

Alternative Address Notification

Customers can provide an alternative address for notification for potential disconnection that will also receive the required notices of disconnection. Customers shall submit alternative notification requests to the Company in writing.

Cartwright Creek, L.L.C.
1551 Thompson's Station Road West
Thompson's Station, TN 37179
615-261-8600

SEWER SERVICE CONTRACT

_____Number of Bedrooms _____Square Feet

Responsible Party for paying the bill:

Customer Name _____

Address of Service _____

_____
CITY STATE ZIP

Mailing Address (if different) _____

_____
CITY STATE ZIP

Phone: Home # _____ Work # _____

Email address: _____
(Cartwright Creek does not sell or provide customer contact information to third parties.)

Contact Person (if different from Customer) _____

I hereby make application to Cartwright Creek, LLC for connection with the mains of the sewer system and agree to pay for access, tap and service fees according to prevailing rates as identified in the Company's Tariff.

The Customer understands that the Company will provide a monthly bill to the Customer for sewerage services furnished. A penalty provision of five (5%) percent of the monthly charge applies to all bills after the 15th day of each month for which a bill has been rendered and will give the Company the right to collect such penalty. The failure to pay said bill the 20th day of the month following said bill will give the Company the immediate right to discontinue the furnishing of service, or to enforce a lien against the applicant's property. The Customer understands and acknowledges that failure to pay the monthly service or other charges when due may result in a lien against his property. If the Customer elects to terminate service, such termination shall be done by written notice to the Company 30 days prior to the requested termination date.

I understand that all service is subject to the rules and regulations of Cartwright Creek, LLC tariff, which may be amended from time to time and that these rules and regulations are part of this agreement.

Date _____ Signed _____

Contract approved and issued:

Date _____ By _____ Cartwright Creek, LLC

Office Use Only:

Account # _____

Provide estimated costs and customers added by month for the first five (5) years based upon the construction build-out schedule for developments in the service area of the proposed wastewater system. For each year, by month, provide an estimated number of customers by customer class anticipated to be served by the wastewater system. Include the utility's basis and assumptions used for this projection. Provide this information in a spreadsheet in Microsoft Excel format with all assumptions clearly documented.

RESPONSE: Limestone expects all applicable customers will be added immediately upon completion of the system construction. As such, Limestone does not expect any additional costs or customers to be added in the next five years. In addition, please see the Company's response and documentation for Exhibit 1.8.

Provide documentation describing bonding requirements imposed by municipal governments for the proposed wastewater system.

RESPONSE: Limestone is not aware of any municipal government bonding requirements that would be applicable to the proposed wastewater system.

Demonstrate that the applicant has acquired a performance bond from the developer or builder of the wastewater system made payable to the Utility to ensure construction of the wastewater system. The performance bond should be for an amount equal to or greater than the cost of the system as provided in contracts between the builder, developer and/or utility.

RESPONSE: Limestone will supplement this response with the performance bond once it has been received by the developer.

List all funding sources available to the applicant for the wastewater system proposed by the applicant.

RESPONSE: Limestone's parent company, CSWR, LLC, will provide equity funding to cover the acquisition and improvement cost.

Provide information demonstrating compliance with the financial security requirement of Rule 1220-4-13-.07.

RESPONSE: Please see the attached documentation.

TENNESSEE PUBLIC UTILITY COMMISSION
PUBLIC UTILITY SERVICE PROVIDER'S SURETY BOND
Limestone Utility Operating Company, LLC

Bond #: RCB0036021

WHEREAS, Limestone Utility Operating Company, LLC ("Principal"), holds a Certificate of Public Convenience and Necessity ("CCN") with amendments to operate public wastewater utilities in each extended territory approved by the Tennessee Public Utility Commission, subject to the laws of the State of Tennessee and rules and regulations of the Tennessee Public Utility Commission ("Commission") relating to the operation of a public wastewater utility; and

WHEREAS, under the provisions of Title 65, Chapter 4, Section 201 (e) of the Tennessee Code Annotated, a public utility providing wastewater service is required to post a bond in order to maintain such authority and to ensure the proper operation and maintenance of the public utility, conditioned as prescribed in Tenn. Comp. R. & Regs. Chapter 1220-4-13; and

WHEREAS RLI Insurance Company ("Surety"), a corporation licensed to do business in the State of Tennessee and duly authorized by the Tennessee Commissioner of Insurance to engage in the surety business in this state pursuant to Title 56, Chapter 2 of the Tennessee Code Annotated, has agreed to issue this bond in order to permit the Principal to comply with the provisions of Title 65, Chapter 4, Section 201 of the Tennessee Code Annotated and Tenn. Comp. R. & Regs. Chapter 1220-4-13.

NOW THEREFORE, BE IT KNOWN, that we the Principal and the Surety are held and firmly bound to the STATE OF TENNESSEE, in accordance with the provisions of Tennessee Code Annotated, Title 65, Chapter 4, Section 201 and Tenn. Comp. R. & Regs. Chapter 1220-4-13 in the full amount of Three Hundred Thousand and 00/100 ($300,000.00) lawful money of the United States of America to be used to enable the continued operation of the public wastewater utility for the full and prompt payment of any monetary obligation imposed against the Principal, its representatives, successors or assigns, in any contested case proceeding brought under Title 65 of Tennessee Code Annotated or by Tenn. Comp. R. & Regs. Chapter 1220-4-13 on behalf of the TPUC, for which obligation we bind ourselves, our representatives, successors and assigns, each jointly and severally, firmly and unequivocally by these presents.

This bond shall become effective on the 19th of January, 2022, and shall be continuous; provided, however, that each annual renewal period or portion thereof shall constitute a new bond term. Regardless of the number of years this bond may remain in force, the liability of the Surety shall not be cumulative, and the aggregate liability of the Surety for any and all claims, suits or actions under this bond shall not exceed Three Hundred Thousand and 00/100 ($300,000.00). The Surety may cancel this bond by giving sixty (60) days written notice of such cancellation to the Commission and Principal by certified mail, it being understood that the Surety shall not be relieved of liability that may have accrued under this bond prior to the date of cancellation.

PRINCIPAL

Limestone Utility Operating Company, LLC
Name of Company authorized by the TPUC

1650 Des Peres Rd., Suite 303, St. Louis, MO 63131
Address of Principal

SIGNATURE OF PRINCIPAL

Name:
Title:

SURETY

RLI Insurance Company
Name of Surety

9025 N. Lindbergh Drive, Peoria, IL 61615
Address of Surety

SIGNATURE OF SURETY AGENT

Trudy Whitrock

Name: Trudy Whitrock
Title: Attorney-in-Fact

Address of Surety Agent:
Charles L. Crane Agency
100 N. Broadway, Suite 900
St. Louis, MO 63102

THIS BOND IS ISSUED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 201, CHAPTER 4, TITLE 65 OF THE TENNESSEE CODE ANNOTATED AND TENN. COMP. R. & REGS. CHAPTER 1220-4-13. SHOULD THERE BE ANY CONFLICT WITH THE TERMS HEREOF AND THE STATUTE OR REGULATIONS PROMULGATED THEREUNDER, THE STATUTE OR REGULATIONS SHALL PREVAIL. (POWER OF ATTORNEY FROM AN APPROVED INSURANCE COMPANY MUST BE ATTACHED.)

ACKNOWLEDGMENT OF PRINCIPAL

STATE OF ~~TENNESSEE~~ Missouri
COUNTY OF St. Louis

Before me, a Notary Public of the State and County aforesaid, personally appeared Josiah Cox _____ with whom I am personally acquainted and who, upon oath, acknowledged himself to be the individual who executed the foregoing bond on behalf of Limestone Utility Operating Co, and he acknowledged to me that he executed the same.

WITNESS my hand and seal this 20th day of January, 2022.

My Commission Expires:

May 4th, 2024

Notary Public

DANIEL RYAN JANOWIAK
Notary Public, Notary Seal
State of Missouri
St. Charles County
Commission # 20374795
My Commission Expires 05-04-2024

ACKNOWLEDGMENT OF SURETY

STATE OF MISSOURI
COUNTY OF St. Louis

Before me, a Notary Public of the State and County aforesaid, personally appeared Trudy Whitrock with whom I am personally acquainted and who, upon oath, acknowledged himself to be the individual who executed the foregoing bond on behalf of RLI Insurance Company, the within named Surety, a corporation licensed to do business in the State of Tennessee and duly authorized by the Tennessee Commissioner of Insurance to engage in the surety business in this state pursuant to Title 56, Chapter 2 of the Tennessee Code Annotated, and that he as such an individual being authorized to do so, executed the foregoing bond, by signing the name of the corporation by himself and as such individual.

WITNESS my hand and seal this 19th day of January, 2022.

My Commission Expires:

April 9th, 2022

Notary Public

DAVID CHRISTOPHER JAMES
NOTARY PUBLIC - NOTARY SEAL
STATE OF MISSOURI
COMMISSIONED FOR ST. LOUIS COUNTY
MY COMMISSION EXPIRES APR. 09, 2022
ID #18737572

APPROVAL AND ENDORSEMENT

This is to certify that I have examined the foregoing bond and found the same to be sufficient and in conformity to law, that the sureties on the same are good and worth the penalty thereof, and that the same has been filed with the Tennessee Public Utility Commission, State of Tennessee, this _____ day of _____, 20___.

_____
Name:
Title:

POWER OF ATTORNEY

RLI Insurance Company
Contractors Bonding and Insurance Company

9025 N. Lindbergh Dr. Peoria, IL 61615
Phone: 800-645-2402

Know All Men by These Presents:

That this Power of Attorney is not valid or in effect unless attached to the bond which it authorizes executed, but may be detached by the approving officer if desired.

That **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, each an Illinois corporation, (separately and together, the "Company") do hereby make, constitute and appoint:

Theresa A. Hunziker, Gregory L. Stanley, Michael T. Reedy, Linda McCarthy, Gerald M. Rogers, Harold F. James, Stephen J. Alabach, Joel Karsten, Karen Speckhals, Cindy Rohr, Terri Hunziker, Christopher J. O Hagan, Brandi L. Bullock, Don K. Ardolino, Kimberly Ann Connell, Trudy Whitrock, Michelle Wilson, jointly or severally

in the City of Saint Louis, State of Missouri its true and lawful Agent(s) and Attorney(s) in Fact, with full power and authority hereby conferred, to sign, execute, acknowledge and deliver for and on its behalf as Surety, in general, any and all bonds and undertakings in an amount not to exceed **Twenty Five Million** Dollars (**$25,000,000.00**) for any single obligation.

The acknowledgment and execution of such bond by the said Attorney in Fact shall be as binding upon the Company as if such bond had been executed and acknowledged by the regularly elected officers of the Company.

RLI Insurance Company and/or **Contractors Bonding and Insurance Company**, as applicable, have each further certified that the following is a true and exact copy of a Resolution adopted by the Board of Directors of each such corporation, and is now in force, to-wit:

> "All bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation shall be executed in the corporate name of the Company by the President, Secretary, any Assistant Secretary, Treasurer, or any Vice President, or by such other officers as the Board of Directors may authorize. The President, any Vice President, Secretary, any Assistant Secretary, or the Treasurer may appoint Attorneys in Fact or Agents who shall have authority to issue bonds, policies or undertakings in the name of the Company. The corporate seal is not necessary for the validity of any bonds, policies, undertakings, Powers of Attorney or other obligations of the corporation. The signature of any such officer and the corporate seal may be printed by facsimile."

IN WITNESS WHEREOF, the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, as applicable, have caused these presents to be executed by its respective Vice President with its corporate seal affixed this 19th day of February, 2021.

CONTRACTORS BONDING AND INSURANCE COMPANY CORPORATE SEAL ILLINOIS

RLI INSURANCE COMPANY CORPORATE SEAL ILLINOIS

RLI Insurance Company
Contractors Bonding and Insurance Company

By: _____
Barton W. Davis — Vice President

State of Illinois }
County of Peoria } SS

On this 19th day of February, 2021, before me, a Notary Public, personally appeared Barton W. Davis, who being by me duly sworn, acknowledged that he signed the above Power of Attorney as the aforesaid officer of the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company** and acknowledged said instrument to be the voluntary act and deed of said corporation.

By: _____
Catherine D. Glover — Notary Public

CATHERINE D. GLOVER
OFFICIAL SEAL
Notary Public - State of Illinois
My Commission Expires
March 24, 2024

CERTIFICATE

I, the undersigned officer of **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company**, do hereby certify that the attached Power of Attorney is in full force and effect and is irrevocable; and furthermore, that the Resolution of the Company as set forth in the Power of Attorney, is now in force. In testimony whereof, I have hereunto set my hand and the seal of the **RLI Insurance Company** and/or **Contractors Bonding and Insurance Company** this 19th day of January, 2022.

RLI Insurance Company
Contractors Bonding and Insurance Company

By: _____
Jeffrey D. Fick — Corporate Secretary

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