COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC APPLICATION OF GREEN RIVER VALLEY WATER DISTRICT FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO INSTALL THE AMI PROJECT PURSUANT TO THE PROVISIONS OF KRS 278.020 AND KAR 5:001.	))))))))	**CASE NO. 2026-00092**

VERIFIED APPLICATION

Pursuant to KRS 278.020(1) and 807 KAR 5:001, and following a successful Pilot Project, Green River Valley Water District ("Green River Valley District" or "the District") applies to the Public Service Commission ("Commission") for an Order, granting Green River Valley District a certificate of public convenience and necessity ("CPCN") to deploy Advanced Metering Infrastructure technology ("AMI") throughout its distribution system.

The District proposes to begin system-wide deployment with an initial purchase and installation of approximately 5,000 Kamstrup flowIQ® 2200 model, 5/8 x 3/4-inch, customer water meters, and three Kamstrup AMI data collectors ("receivers"), along with subscriptions to Kamstrup's Leak Detector and AMI

Standard software packages ("the AMI Project"). The estimated cost to purchase the meters and receivers required for the initial installation is approximately **$1,435,500**. The cost of annual subscriptions to Kamstrup's AMI Standard and Leak Detector software packages to serve the initial installation and continue service to the Pilot Project area is approximately **$48,244.96**. The District's maintenance staff will install the equipment, therefore there are no installation costs associated with the AMI Project.

Because Green River Valley District desires to install as many AMI meters as possible before the onset of cold weather, should the Commission grant a CPCN for the AMI Project, the District respectfully requests that the Commission enter a final Order in this proceeding on or before **August 28, 2026**. Green River Valley District is **not** seeking a rate increase or financing approval in connection with its proposed AMI Project.

In support of its Application,[1] Green River Valley District provides the following:

A. General Information

[1] To facilitate the Commission's initial review of this Application, Green River Valley District has attached to this Application **Exhibit 1,** a "Filings Requirements List" that consists of two pages, lists each statutory and regulatory requirement for an application for a certificate of public convenience and necessity and identifies the exhibit or paragraph that satisfies the requirement.

1. The full name and post office address of Green River Valley District is: Green River Valley Water District, 1180 East Main Street, P.O. Box 460, Horse Cave, Kentucky 42749. Its email address is grvwd@scrtc.com.

2. Copies of all orders, pleadings and other communications related to this proceeding[2] should be directed to:

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[2] On April 13, 2026, pursuant to 807 KAR 5:001, Section 8, Green River Valley District notified the Commission of its election of the use of electronic filing procedures for this proceeding.

3. Green River Valley District is not a corporation, limited liability company or limited partnership. It has no articles of incorporation or partnership agreements.

4. Green River Valley District is a water district created under the provisions of KRS Chapter 74 by the Hart County Fiscal Court.

5. As of December 31, 2025, Green River Valley District provided retail water service to approximately 7,479 residential customers and 297 commercial customers in Barren, Edmonson, Green, Hardin, Hart, Larue, and Metcalfe counties, Kentucky.[3]

6. In addition to providing retail water service, Green River Valley District also supplies wholesale water service to seven wholesale customers, including the cities of Horse Cave and Munfordville in Hart County.[4]

7. Green River Valley District owns and operates 13 water storage tanks, 21 pump stations, approximately 900 miles of water mains, and the Green River Valley Water Treatment Plant, which treats water from the Green River and Rio Spring.

8. Currently, Green River Valley District operates Edmonson County Water District's ("Edmonson District") Hart County distribution system and the Wax

[3] *Annual Report of Green River Valley Water District to the Kentucky Public Service Commission for the Year-Ended December 31, 2025* ("2025 Annual Report") at 12 and 49.

[4] 2025 Annual Report at 49 and 56.

Water Treatment Plant, (collectively, "Edmonson's Hart County System") which is located near the Grayson-Hart county line, under an operating agreement with Edmonson District.[5]

9. The Joint Application of Green River Valley District and Edmonson District for transfer of Edmonson's Hart County System to Green River Valley District is currently pending before the Commission in Case No. 2025-00329.[6]

10. On April 16, 2026, Green River Valley District's Board of Commissioners adopted Resolution No. 2026-04-02 authorizing the District's Chairman to prepare, execute, verify, and submit this Application. A copy of the Resolution is attached as **Exhibit 2**.

B. The AMI Pilot Project

11. Green River Valley District has historically utilized mechanical, manual-read meters in its system. Although manual-read meters were once standard in the water service industry, their use is declining. This is due to the adoption of

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[5] *See: Electronic Joint Application of Green River Valley Water District and Edmonson County Water District for an Order Approving the Transfer of Ownership of Edmonson County Water District's Hart County System and the Wax Water Treatment Plant and Approving Green River Valley Water District's Assumption of Certain Debt Obligations of Edmonson County Water District Pursuant to the Provisions of KRS 278.020, KRS 278.300, and 807 KAR 5:001,* Case No. 2025-00329, Application, Exhibit 5, Operating Agreement (Ky. PSC. Nov. 3, 2025).

[6] *See: Electronic Joint Application of Green River Valley Water District and Edmonson County Water District for an Order Approving the Transfer of Ownership of Edmonson County Water District's Hart County System and the Wax Water Treatment Plant and Approving Green River Valley Water District's Assumption of Certain Debt Obligations of Edmonson County Water District Pursuant to the Provisions of KRS 278.020, KRS 278.300, and 807 KAR 5:001,* Case No. 2025-00329, Application (Ky. PSC. Nov. 3, 2025). Green River Valley District and Edmonson District have filed a Joint Application to transfer the Hart County Assets of Edmonson District and the Wax Water Treatment Plant to Green River Valley District. The case is currently pending before the Commission.

Advanced Meter Reading ("AMR") and AMI technologies. Manual-read meters require a meter reader to physically visit each meter every month to obtain a meter reading. If there is snow or ice covering the meter, the meter cannot be accessed for reading and estimated bills must be issued.

12. In order to read all of its meters within a 20-day period, Green River Valley District utilizes four (4) members of its maintenance staff as meter reading technicians. The District must maintain a sufficient number of service trucks to read meters, perform routine tasks such as meter taps, service connections, and disconnections, and respond to emergencies, such as line breaks After having explored the possibility of deploying AMI technology in its system by reading journal articles, attending equipment demonstrations, and consulting with utilities using AMI technology, the District developed a plan to study the use of AMI customer meters in its system to address its water loss, which had begun to creep past 15 percent.[7]

13. In 2024 the District installed 300 Kamstrup AMI meters in a remote area of its system. This area is located southeast of Cave City and was chosen because it presents geographic challenges for leak detection and line maintenance as well as routine manual meter reading. The area consists of numerous hills and hollows, and the District was concerned that the radio signal upon which AMI

[7] *See* 2023 Annual Report at 58, which provides that water loss for 2023 was 17.65 percent.

technology relies could not be consistently transmitted from meters located in this area and collected by the receivers. Before devoting time and resources to deploying AMI in its entire system, Green River Valley District needed to know whether the system would operate reliably in one of its most challenging service areas. A map of Green River Valley District's service area showing the location of the pilot area in light blue is attached as **Exhibit 3**.

14. The District was encouraged when the meters and receivers were installed and the signal from the meters was reliably collected by the receivers. Green River Valley District has been reading the AMI meters in the Pilot Project area using the radio frequency and networking technology employed by the AMI system for approximately 24 months and has experienced no significant problems. Green River Valley District considers the use of AMI technology an important tool in water loss reduction and a very significant improvement in meter reading methodology.

15. Green River Valley District's Water loss for 2024 was reduced to 16.90 percent,[8] and for 2025 it was 15.46 percent.[9] Even though the number of meters in the Pilot Project was small, the District believes its use of the "Leak Detection" software available for use with the AMI meters it installed in its Pilot

[8] 2024 Annual Report at 58.

[9] 2025 Annual Report at 58.

Project greatly contributed to the reduction in water loss. This is further explained in the Written Direct Testimony of Green River Valley District's General Manager, Andrew Tucker, which is attached as **Exhibit 4.**

16. Additionally, Green River Valley District reviewed its billing records from the Pilot Project area and found that in the 17 months following AMI deployment in the pilot area it experienced a revenue increase of **$143.44 per active customer account** when compared to the revenue received from the same area in the 17 months prior to AMI deployment.[10] The Billing Registers for the pilot area for April 1, 2023 through August 31, 2024 and October 1, 2024 through February 28, 2026 are attached as **Exhibit 5**.

17. Following the successful AMI Pilot Project, Green River Valley District caused an advertisement for bids for furnishing the customer metering equipment necessary to expand the deployment of AMI technology throughout the District to be published in the local newspaper. A copy of the tear sheet, and the Affidavit of Publication from *The Hart County News-Herald* is attached as **Exhibit 6**.

[10] *See* **Exhibit 4**, prior to deployment there were 361 active accounts in the pilot area and $302,347.91 in revenue was generated ($302.347.91 ÷ 361 = $837.53 per active account). Following AMI deployment there were 403 active accounts in the pilot area and $395,332.52 in revenue was generated ($395,332.52 ÷ 403 = $980.97). ($980.97 - $837.53 = $143.44).

18. Core & Main, LP ("Core & Main") submitted the lowest and best bid of **$1,435,500** for the necessary equipment, and the District's Board of Commissioner's awarded the contract to Core & Main contingent upon the District receiving a CPCN from the Commission to install the AMI Project. A copy of Core & Main's bid on the equipment is attached as **Exhibit 7**.[11] The Resolution awarding the contract contingent upon the District securing a CPCN is attached as **Exhibit 8**. Core & Main has agreed to honor the $282 per meter price appearing in the bid for 24 months contingent upon Green River Valley District making an initial purchase of at least 5,000 meters. Green River Valley District intends to initially order 5,000 meters, and to order additional meters within the 24-month period once the initial meters are installed.

C. The Proposed AMI Project

19. The Project consists of fully deploying AMI throughout Green River Valley District's service territory. The Project will begin with an initial purchase and installation of 5,000 5/8 x 3/4-inch Kamstrup customer water meters, three Kamstrup AMI receivers, and the purchase and utilization of Kamstrup Leak Detector and AMI Standard software subscriptions.

[11] Green River Valley District considers the software subscriptions to be a component of the annual cost to operate the AMI system.

20. Green River Valley District currently has approximately 7,824 active 5/8 x 3/4-inch customer meters in its system.[12] Of this total, approximately 4,464 customer meters are 10 years-old or older. Therefore, 4,464 active customer meters must be tested and returned to service (if they pass the accuracy requirement test) or replaced (if they fail the accuracy requirement test).[13] According to Green River Valley District's records 11 customer meters will reach 10 years of age in 2027, and 736 meters reach 10 years of age in 2028. Because of the successful AMI Pilot Project, Green River Valley District has decided it is in the best interests of it and its customers to replace these aging meters by expanding its deployment of AMI technology, rather than testing the meters. Testing aging meters and returning to service those that meet the accuracy standards and replacing those that do not would take more time for the District to do than simply replacing all of the aging meters with AMI meters.

21. The District does not have any debt associated with its current meters.

22. The District is **not** proposing to issue any long-term debt to pay for the AMI Project.

[12] This total does not include the customer meters in Edmonson District's Hart County System that Green River Valley District intends to acquire. The meters in the Hart County System are relatively new and not currently in need of replacement.

[13] 807 KAR 5:066, Section 16. Customer water meters 1-inch and less in diameter cannot remain in service for longer than 10 years without testing or replacement.

23. The District is **not** requesting a change in its rates as a result of the AMI Project.

24. **Locations of Expansion Areas.** Pursuant to 807 KAR 5:001, Section 15(2)(c) and 15(2)(d)(1), attached as **Exhibit 9** is a map of Green River Valley's service area which depicts Green River Valley District's plan for AMI expansion. There are four (4) Expansion Areas, which correspond to the meter-reading territories of the District's four meter-readers. The District will expand its AMI deployment in the area that surrounds the Pilot Project area first. The meters in this area will be replaced and three receivers will be installed. The receivers will be placed on the Echo Tank, the Node Tank, and the Hiseville Tank to collect data from the meters installed in Expansion Area 1. Green River Valley District will then move on to Expansion Area 2, which is located west of Expansion Area 1 and replace the customer meters in that area. The District will continue installing AMI meters and receivers on its storage tanks to collect data in Expansion Areas 3, and 4 as depicted on the map. The District estimates it will take approximately 24 months to completely deploy AMI meters throughout its system and to make the necessary adjustments to its computer system to fully utilize data for each of the meters.

25. **Competition with Other Public Utilities.** The AMI Project does not compete with other public utilities. Green River Valley District is the only provider of potable water in the AMI Project area.

26. **Estimated Cost of the AMI Project.** The estimated cost to fully deploy AMI technology in Green River Valley District's system is approximately **$2,900,000.** The estimated cost for the initial purchase of 5,000 meters and three receivers is **$1,435,500**. The annual cost for the subscriptions to the Leak Detector and AMI Standard software systems is **$48,244.96.** The District considers the cost of the software subscriptions an operating cost, not a cost of installing the Project. The importance of these software systems is discussed below and is also discussed in detail in **Exhibit 4**, the written direct testimony of General Manager, Andrew Tucker. Attached as **Exhibit 10** is the subscription cost sheet from the manufacturer.

27. **Permits or Franchises**. The Federal Communications Commission ("FCC") requires operators of AMI systems that communicate data via radio frequencies to obtain FCC licenses. Kamstrup, the manufacturer of the equipment the District used in its Pilot Project, assists with this process when a utility purchases AMI equipment. Kamstrup has obtained the appropriate licenses on behalf of Green River Valley District. Reference copies of these licenses are attached as **Exhibit 11**. Currently, Kamstrup is the licensee, but when deployment of AMI is complete and

the locations of all the receivers are final the licenses will be transferred to the District. The AMI Project does not require Division of Water approval, any other permits, or any additional easements.

28. **Estimate of Acquired Property.** A detailed estimate of the acquired property, arranged according to the Uniform System of Accounts for Class A and B Water Districts and Associations is attached to this Application as **Exhibit 12**.

29. **Estimated Annual Cost to Operate.** The software subscriptions necessary to fully utilize all of the features of the AMI meters the District proposes to install will cost the District approximately **$48,244.96** a year. There is no expected change to purchased power cost or any other maintenance or operations cost. The District plans to reduce its field staff and vehicle fleet by attrition once AMI is fully deployed. However, because these changes are not expected to be immediate, but rather will occur over a period of years, the District has not provided any estimated operations and maintenance savings calculations. The anticipated savings is purely speculative at this point. However, the District does expect a reduction in labor and vehicle expense over time.

30. **Engineering Plans, Drawings, Specifications, and Reports.** Because the AMI Project does not involve any construction, only installation of AMI meters and receivers, there are **no** engineering plans, specifications, or drawings applicable to the Project. However, attached to this Application as **Exhibit 13**, are product data

sheets for Kamstrup flowIQ® 2200 meters and Kamstrup Leak Detector software. These documents contain diagrams and drawings of the meters, accuracy information, and a detailed explanation of the features of the meters and software.

31. **Proposed Financing for Project.** Green River Valley District proposes to finance the AMI Project with short-term financing from a local bank. The District anticipates it will be able to retire the short-term debt through increased revenues as a result of the AMI meters' accurate measurement of customer usage. However, should the District require financing beyond that which is described in KRS 278.300(8) it will seek Commission approval before obtaining such financing.

32. **AMI Project Summary.** Although Green River Valley District is currently planning to purchase only 5,000 meters and three receivers, it is seeking a CPCN to fully deploy AMI technology throughout its system. Green River Valley District will require time to make this transition gradually, but it seeks approval for its plan to fully deploy AMI throughout its distribution system. The District's deployment plan is to replace all of its customer meters with AMI meters within 24 months. The District will begin by replacing its 5/8 x 3/4-inch customer meters and will replace larger sized meters as they require testing or replacement. The District will utilize AMI technology and accompanying tools, such as the Leak Detector software available for use with its AMI meters, to operate its system as efficiently as possible.

33. **Edmonson District's Hart County System.** The meters in the Hart County System, which Green River Valley District proposes to acquire from Edmonson District, are not yet nearing 10 years of age. Should the Commission approve the transfer and Green River Valley District assumes ownership of the infrastructure of the Hart County System, Green River Valley District will install AMI in the area when the current meters are due to be tested or replaced.

D. Need for Project

34. Because reading manual-read meters requires physically accessing the meter and manually recording the number of gallons it has registered, it is not possible to read manual-read meters when snow or ice is covering the meters. This necessitates issuing estimated bills. To many in the utility industry eliminating estimated bills and the customer confusion and dissatisfaction that often accompanies them is sufficient justification to invest in an AMI system. However, AMI technology also has many other advantages. The meters are more accurate, especially at low flow. Therefore, revenues are often seen to increase when AMI is deployed. Green River Valley District experienced this with its Pilot Program

35. Green River Valley District needs to employ AMI technology throughout its system now because a significant number of Green River Valley District's meters must either be replaced or tested within the next 24 months. Of the

District's 7,949 active customer meters, 7,824 are 5/8 x 3/4-inch meters,[14] and over half of them (4,464) are currently 10 years-old or older.[15] By 2028, another 747 meters, or a combined total of 66.6 percent of the District's 5/8 x 3/4-inch meters will be 10 years old or older. Therefore, the District needs to address the issue of aging meters.

36. The District has considered the option of testing its aging meters and returning to service those that meet the accuracy standards of 807 KAR 5:066, Section 15. However, removing the meters from service, testing them, and then returning those that test "good" and replacing those that test "bad" is very labor intensive and time consuming. This option requires traveling to the distant locations of approximately 5,000 meters located across the District's service area and removing them, which will take considerable time and labor. Once the meters are removed and taken to the meter lab, it also takes approximately one hour to test each meter under the flow rates required by the regulation. The District has a meter test bench and can do some meter testing in-house. Doing this also requires dedicating a trained staff member to work exclusively on meter testing until it is complete. If the District chooses to send the meters to a third-party test lab in order

[14] Green River Valley District also has 2-inch customer meters in its system. 807 KAR 5:066, Section 16 requires that 2-inch meters be tested every 4 years.

[15] 4,464 5/8 x 3/4-inch meters are 10 years old or older. 4,464 ÷ 7,824 = 57.055, 57.055 x 100 = 57.055 percent.

to test more meters at once and free its employees to work on other matters, the cost is $50.00 per meter, or $250,000 for approximately 5,000 meters.

37. Because of the success of its AMI Pilot Project, the District concluded that replacing its aging meters as a component of fully deploying AMI technology in its system was a more reasonable and efficient use of its resources.

38. The AMI Project is also needed to combat water loss. As discussed above, Green River Valley District is actively and intentionally battling water loss creep. The loss of accuracy inherent with aging meters is one source of water loss. Aging meters often fail to register water used at low flow rates. The increase in revenue per active account that Green River District realized in the AMI Pilot Project serves to demonstrate this. However, water lost through meters on inactive accounts is also significant. Green River Valley District's practice is to check its inactive manual-read meters periodically for evidence of any damage or tampering. In doing so Green River Valley District discovered it had lost 6,046,337 gallons of water due to water theft from inactive meters from late 2023 until mid-2025. A number of inactive meters had been tampered with and were being used to steal water. The meter readings taken upon discovery indicated a total of 6,046,337 gallons of water was lost to theft.

39. By far the greatest source of water loss is through leaks in transmission mains and service lines. Some leaks are more difficult to detect, locate, and repair

than others. For instance, leaks occurring in remote areas or running into creeks or other water ways are almost always very difficult to locate. Even if a distribution system is divided into zones and zone meters are read daily to identify increased amounts of water entering the zone, locating the leak within the zone is often difficult if the terrain is challenging or the leak is located in water.

40. The AMI system that the District utilized in its AMI Pilot Project includes acoustic leak detection and other features that alert the District to any meter tampering, meter theft, constant water flow, consistently high consumption, change in water temperatures, and occurrence of backflow. The ability to have virtual "eyes and ears" constantly focused and tuned into its distribution system is what Green River Valley District considers the most significant advantage of the AMI system it tested in its Pilot Project. This is why the District decided to fully deploy AMI throughout its system. The acoustic leak detection possible through the use of the Leak Detector software will "listen" for leaks in the District's system by measuring noise levels in the water lines. If consistently large volumes of water are running through the line, the District will be alerted. The system will generate a map and provide the District with the location of the leak. The District will not need to spend valuable time searching for the leak while thousands of gallons of water are lost. The system will direct the District to the location of the leak and repairs can begin much sooner than they otherwise would. Attached as **Exhibit 14** are five weekly

leak reports generated by the AMI system. The meters appearing in the report under "Meters of Interest" are on the report because there is some irregularity in the functioning of the meter. Either it has stopped running, been removed, or is malfunctioning in some other way. The meters appearing in the report under "Meters in High Noise Level" are on the report because there was an unusual amount of noise in the water line indicating the possibility of a leak. An example of how the District can use reports of high noise to address leaks is included **Exhibit 4**.

41. The system also sends the District an alert if the meter is removed (stolen) and if water is flowing through the line in the wrong direction (backflow). Backflow is caused by sudden changes in water pressure and can lead to the contamination of clean water with unsecured water from hoses and fixtures. Exposure to contaminated water can cause illness. When the AMI system chosen by Green River Valley District detects backflow in the system, it sends an alert and generates a map of the location where the backflow is occurring.

42. Given its need to replace or test over half of its meters within the next 24 months and having experienced the advantages of AMI technology in its Pilot Project, Green River Valley District believes it would be imprudent and improper for it to invest its resources testing existing meters rather than in transitioning its system to utilize AMI technology.

E. Alternatives Considered

43. The cost of replacing the 4,464 customer meters in Green River Valley District's system that are currently 10 years old or older with manual-read meters is **$1,110,643.20**.[16] Green River Valley District does not believe it is a reasonable or proper use of its resources to invest this heavily in antiquated technology. The District has tested AMI in one of its most challenging areas and not only did the system perform reliably, but it also exceeded the District's expectations by generating maps and aiding the District to address leaks that might never have been located in the remote area of the system in which they occurred.[17]

44. Green River Valley District did consider forgoing installation of the receivers and utilizing the Kamstrup meters as "drive-by" AMR meters. The cost of installing 5,000 AMR meters is $1,410,000. The cost of installing 4,464 AMR meters (only the meters currently 10 years old or older) is **1,258,848**. The AMR option would reduce the amount of staff time devoted to meter reading, but it would still require the District's meter readers to drive by every meter in the system in order to get the readings to generate customer bills. The AMR meters would also not have the capability of sending the alerts of high usage, constant flow, or meter tampering to the District like AMI meters do.

[16] The meters are Badger Manual Read meters that cost $248.80 each.

[17] *See* Exhibit 4, Written Direct Testimony of Andre Tucker.

45. By fully employing AMI technology across its system the District and its customers gain the advantages of having the system monitored for leaks and tampering 24 hours a day and freeing up technicians who spend 20 days of every month reading meters to work on other matters. This benefits the District by reducing water loss, and it also benefits customers. Because the AMI system sends daily alerts of high of constant usage, District personnel can contact customers immediately upon noticing such unusual usage. This allows the customer the opportunity to check their plumbing for leaks. Toilets often malfunction and use water continuously. These are called “silent leaks” because the water is running at such a low flow it is often not detectible without using dye to find the leak. This type of leak often results in a water bill that is hundreds of dollars in excess of normal usage. Receiving the alert from the AMI system allows the District’s staff to reach out and advise the customer to check for such leaks *before* a large water bill occurs. Technicians who currently spend most of their working days reading meters can be utilized in other areas of the system to provide even better customer service.

46. Given the advantages to the District and its customers associated with fully deploying AMI, the District is convinced this is the best possible choice. The District must replace a large number of meters relatively soon. This is the best time to transition the system to utilize the benefits of AMI technology.

Wherefore, Green River Valley Water District requests that the Commission:

1. Issue a decision in this matter by **August 28, 2026.**

2. Grant Green River Valley District a CPCN to purchase and install the AMI Project as described in this Application.

3. Grant any and all such other relief to which Green River Valley District may be entitled.

Dated: June 10, 2026

Respectfully submitted,

/s/ Tina C. Frederick
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Counsel for Green River Valley Water District

CERTIFICATE OF SERVICE

In accordance with the Commission's Order of July 22, 2021 in Case No. 2020-00085 (Electronic Emergency Docket Related to the Novel Coronavirus COVID-19), this is to certify that the electronic filing has been transmitted to the Commission on June 10, 2026; and that there are currently no parties in this proceeding that the Commission has excused from participation by electronic means.

/s/ Tina C. Frederick
Tina Frederick

GREEN RIVER VALLEY WATER DISTRICT'S VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS
COUNTY OF HART)

The undersigned, John F. Bunnell, being duly sworn, deposes and states that he is the Chairman of Green River Valley Water District, the Applicant in the above proceeding; that he has read this Verified Application and has noted its contents; that the same is true of his own knowledge, except as to those matters which are stated on information or belief, and as to those matters, he believes same to be true.

IN TESTIMONY WHEREOF, witness the signature of the undersigned on this 10th day of June 2026.

John F. Bunnell, Chairman
Green River Valley Water District

Subscribed and sworn to before me, a Notary Public in and for said County and State, by John F. Bunnell, in his capacity as Chairman of Green River Valley Water District, on this 10th day of June 2026.

Notary Public, State at Large

Notary ID: KYNP69867

My Commission expires: 05/09/27

TABLE OF EXHIBITS

Exhibit No.	Description
1	Filings Requirement Checklist
2	Board Resolution Authorizing Application
3	Map of Pilot Project Area
4	Written Direct Testimony of General Manager, Andrew Tucker
5	Billing Registers Showing Increased Revenue Following AMI
6	Affidavit of Publication and Tear Sheet, Advertisement for Bids
7	Core & Main Bid on Equipment
8	Board Resolution Conditionally Awarding Contract
9	Map Showing AMI Expansion Plan
10	Leak Detector and AMI Standard Software Subscription Cost
11	FCC Licenses
12	Detailed Estimate of Acquired Property
13	Data Sheets for Meters and Software

Exhibit No.	Description
14	Leak Reports Generated by Kamstrup

Exhibit 1

Filing Requirements

FILING REQUIREMENTS

FILING REQUIREMENTS FOR AN APPLICATION FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY

Green River Valley Water District – CPCN Application to Deploy AMI

Source Authority	Requirement	Location
807 KAR 5:001, § 14(1)	Applicant's name, mailing address and e-mail address	Page 3, Para 2
807 KAR 5:001, § 14(1)	Statutory Reference – KRS 278.020 and 807 KAR 5:001, Section 15	Page 1
807 KAR 5:001, § 4(3)	Signature of Applicant's Attorney	Page 22
807 KAR 5:001, § 4(3)	Name, Address, Telephone Number, Fax Number, and e-mail address of Applicant's Attorney	Page 3, Para 2
807 KAR 5:001, § 14(2)	If Applicant is corporation: State and date of incorporation, attestation of good standing in state of incorporation, statement regarding authorization to transact business in Kentucky	Page 4, Para 3 **Not Applicable**
807 KAR 5:001, § 14(3)	If Applicant is a limited liability company: State and date of organization, attestation of good standing in state of incorporation, statement regarding authorization to transact business in Kentucky	Page 4, Para 3 **Not Applicable**
807 KAR 5:001, § 14(4)	If the Applicant is a limited partnership: a certified copy of limited partnership agreement and all amendments or statement identifying prior Commission proceedings in which limited partnership agreement, and all amendments filed	Page 4, Para 3 **Not Applicable**
807 KAR 5:001, § 15(2)(a)	The facts relied upon to show that the public convenience and necessity requires the proposed construction	Pages 5-11, Paras 11-23 Pages 15-21, Paras 33-46 Exhibits 4 & 5
807 KAR 5:001, § 15(2)(b)	Copies of franchises or permits for the proposed construction or extension	Pages 12-13 Para 27 Exhibit 11
807 KAR 5:001, § 15(2)(c)	A full description of the proposed location, route, or routes of the proposed construction or extension, including a description of the manner in which same will be constructed, and the names of all public utilities, corporations, or persons with whom the proposed construction or extension is likely to compete	Page 11, Para 24 Page 12, Para 25 Exhibit 9

Source Authority	Requirement	Location
807 KAR 5:001, § 15(2)(d)(1)	Maps to suitable scale showing the location or route of the proposed construction or extension, as well as the location to scale of like facilities owned by others located anywhere within the map area with adequate identification as to the ownership of the other facilities (Only one copy submitted pursuant to Commission order of July 28, 2017)	Page 11, Para 24 Exhibit 9
807 KAR 5:001, § 15(2)(d)(2)	Plans and specifications and drawings of the proposed plant, equipment, and facilities	Pages 13-14, Para 30 **Not Applicable**
807 KAR 5:001, § 15(2)(e)	The manner in detail in which the Applicant proposes to finance the proposed construction or extension.	Page 14, Para 31
807 KAR 5:001, § 15(2)(f)	An estimated annual cost of operation after the proposed facilities are placed into service	Page 12, Para 29
KRS 322.340	Engineering plans, specifications, drawings, plats and reports for the proposed construction or extension prepared by a registered engineer, must be signed, sealed, and dated by an engineer registered in Kentucky	Pages 13-14, Para 30 Exhibit 13 **Not Applicable**
KRS 323.095	All Working drawings, specifications, and reports prepared by, or under the supervision of licensed engineer shall be imprinted with the licensed engineer's seal	Pages 13-14, Para 30 Exhibit 13 **Not Applicable**

Exhibit 2

Board Resolution Authorizing Application

RESOLUTION NO. 2026-04-02

RESOLUTION OF GREEN RIVER VALLEY WATER DISTRICT AUTHORIZING DISTRICT CHAIRMAN TO APPLY TO THE KENTUCKY PUBLIC SERVICE COMMISSION FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO INSTALL AN ADVANCED METERING INFRASTRUCTURE SYSTEM

WHEREAS, Green River Valley Water District ("the District") is a water district organized pursuant to the provisions of KRS Chapter 74;

WHEREAS, KRS 278.015 provides that a water district is a utility and is subject to the jurisdiction of the Kentucky Public Service Commission (the "Commission") in the same manner and to the same extent as any other utility;

WHEREAS, KRS 278.020(1) prohibits any utility from commencing the construction of any plant or facility or installing any equipment to provide utility service, except for that in the ordinary course of business, until that utility has obtained a certificate of public convenience and necessity (the "CPCN") from the Commission;

WHEREAS, the District proposes to install an Advanced Metering infrastructure system for metering water sales to its customers ("the AMI Project" or the "Contract");

WHEREAS, the District has advertised for bids for the AMI Project and awarded the Contract for furnishing the customer meters and other equipment to Core & Main, LP contingent upon obtaining a CPCN for the Project; and

WHEREAS, the District has, or soon will have, obtained all the necessary approvals to install the AMI Project, except for a CPCN.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COMMISSIONERS OF GREEN RIVER VALLEY WATER DISTRICT AS FOLLOWS:

Section 1. The facts, recitals, and statements contained in the foregoing preamble of this Resolution are true and correct and are hereby affirmed and incorporated as a part of this Resolution.

Section 2. The Chairman is authorized and directed to take any and all actions reasonably necessary to prepare, execute, and submit an application to the Commission for a CPCN to purchase and install the AMI Project.

Section 3. This Resolution shall take effect upon its adoption.

Adopted by the Board of Commissioners of Green River Valley Water District at a meeting held on April 16, 2026, signed by the Chairman and attested by the Secretary.

GREEN RIVER VALLEY WATER DISTRICT

By: _____
John F. Bunnell, Chairman

ATTEST:

_____
Adrian Gossett, Secretary

CERTIFICATION

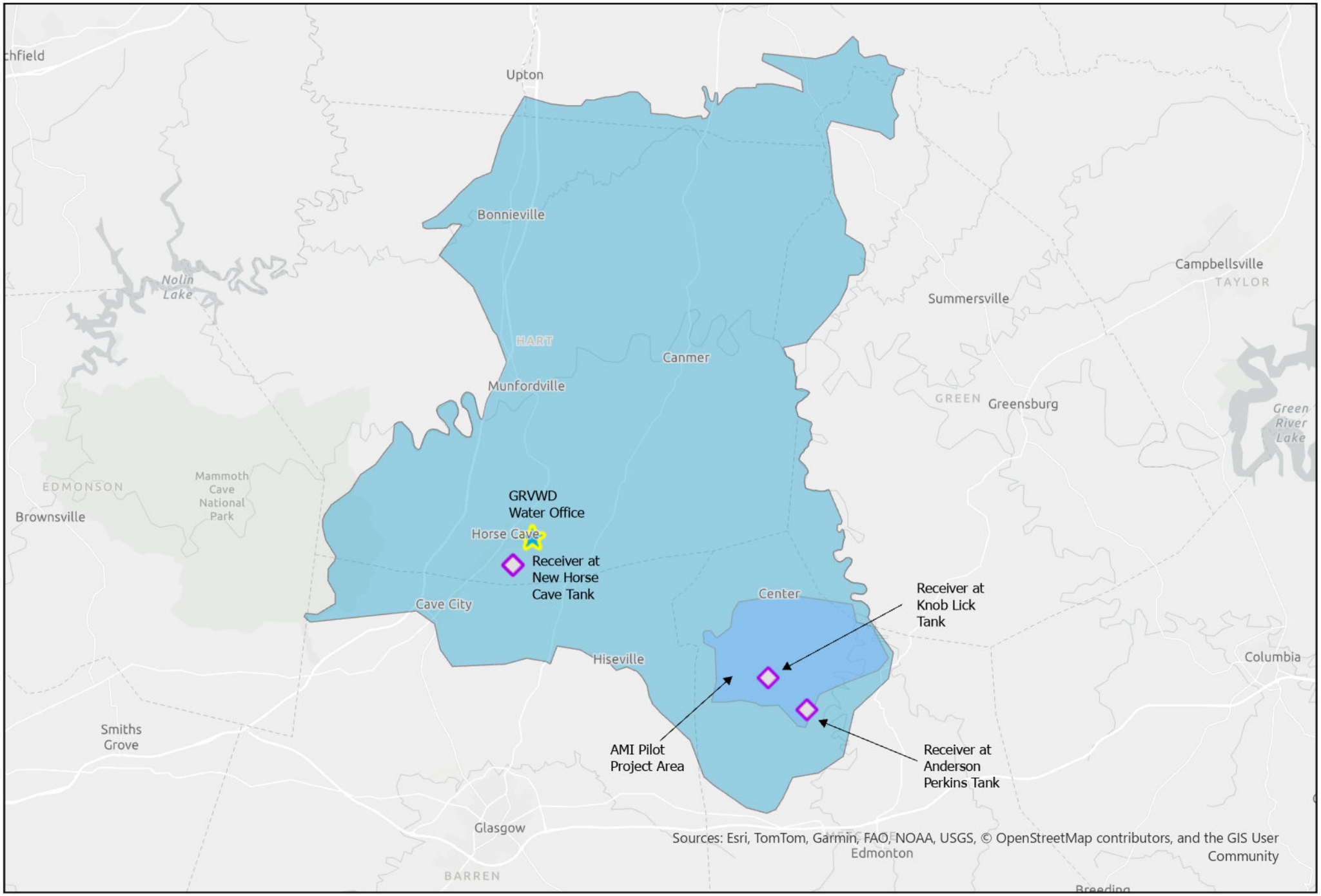
The undersigned Secretary of Green River Valley Water District (the "District") does hereby certify that the foregoing is a true copy of a Resolution duly adopted by the District's Board of Commissioners at a meeting properly held on April 16, 2026, signed by the Chairman of the Board of Commissioners, attested by the Secretary of the Board of Commissioners, and now in full force and effect.

WITNESS my hand this 16th day of April 2026.

Adrian Gossett, Secretary

Exhibit 3

Map of Pilot Project Area



AMI Pilot Project for Kamstrup Meters

0 3.25 6.5 13 Miles

Exhibit 4

Written Direct Testimony of Andrew Tucker,
General Manager, Green River Valley District

Introduction

Q. Please state your name, business address, and position with Green River Valley Water District.

A. My name is Andrew Tucker. My business address is 1180 East Main Street, Horse Cave, Kentucky 42749. I am the General Manager of Green River Valley Water District. In my testimony I will refer to my employer as "Green River Valley District" or simply, "the District."

Q. How long have you been the General Manager of Green River Valley Water District?

A. I have been the General Manager of Green River Valley District since July 2022.

Professional Experience and Background

Q. Other than your work for Green River Valley Water District, what is your vocational and professional background?

A. I began my career by working in electrical service. I am a licensed electrician and worked for Gerald's Electric Inc. ("Gerald's Electric") in Cave City, Kentucky from 2007 – 2020. Beginning in 2010, my work with Gerald's Electric became more of a part-time endeavor after I began work for Green River Valley District as a master electrician and Distribution System Manager in May 2010. In this role I oversaw the maintenance of the water storage tanks,

pump station, and telemetry system. I also managed the day-to-day work of the field distribution system field employees. I held this position through January 2020.

In February 2020, I accepted the position as General Manager for Green-Taylor Water District in Greenburg, Kentucky. I managed the utility and oversaw several construction projects to expand service. In addition to maintaining the distribution system, I supervised all employees, conducted performance evaluations, developed the budget, and worked closely with local government leaders as well as the water district's board of commissioners. I held this position until I returned to Green River Valley District as Interim General Manager in July 2022. In November 2022, the board of commissioners appointed me to the position permanently. Currently, I oversee the daily operations of the District as well as working closely with our consulting engineers, the board of commissioners, and local government.

In addition to my professional endeavors, I am active in our local community. I am on the Board of Directors of Leadership Hart County and the Hart County Planning Commission. I am also a past-president and current member of the Horse Cave Rotary Club, and I take an active role in the Hart County Repair Affair. This project involves many organizations in the community coming together to make sure our less fortunate and elderly

neighbors get assistance with home repairs and wheelchair ramps to make their lives a little easier. I am very invested in the success of Green River Valley District and in ensuring the District, as well as the community it serves, is responsive to the needs of its citizens.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is: (1) to explain how and why Green River Valley District decided that Kamstrup AMI meters and the accompanying software was the best alternative for replacing the District's manual-read meters; (2) to explain how Kamstrup's AMI system aided the District in locating leaks in the Pilot Project area; and (3) to explain how the Kamstrup AMI system benefits our customers.

Why AMI and Why Now

Q. How and why did Green River Valley District decide to convert its distribution system to AMI using Kamstrup equipment?

A. Finding an effective and efficient means to combat water loss creep was one significant motivating factor in making this choice. As manager of Green River Valley District, I am responsible for overseeing all operations within the District. One of the main issues my staff and I have attacked since I joined the team is water loss. Operating efficiently is our goal, and this is hard to do when you don't have accurate, complete, and current data. Presently we have

two billing cycles and four meter-readers that read meters manually. Our billing stays one month behind which makes it difficult to match usage with what the water treatment plant produces. Another disadvantage of manually reading meters is that it takes 30 days to notify customers of high usage that indicates they may have a leak on their side of the meter. This is unfair to rate payers and the District. The rate payer must wait until a large bill has been amassed before being alerted to a problem, and the District loses money when it makes leak adjustments on customer bills after a leak has been fixed.

From my past employment with the District I knew that a large percentage of the District's customer meters would turn 10 years of age between 2025 and 2026. Because of this I expected that the District would be making a large investment in replacing meters very soon. We needed to investigate possible alternatives to reduce the time spent meter reading and to enable the District to issue bills closer in time to when water is consumed. While attending multiple conferences I questioned the managers of many districts concerning their metering systems and meter-reading practices. I knew that eliminating manual read meters would be a challenge because of the expense involved. I started looking for a meter that would eliminate multiple tasks, not just meter reading to help the District operate more efficiently and to justify the cost of transition. Kamstrup kept coming up in

conversation, so I looked into this meter and the features it had along with the testimonies from managers of districts that used this meter. Not only did this meter offer AMI, but it offered features that help prevent theft, backflow, frozen meters, and most importantly it enabled the District to notify customers immediately when they have a leak. I then reached out to Kamstrup to come and speak with our board.

Representatives of Kamstrup came and spoke with our board on more than one occasion. They explained how their AMI system works. The representatives answered all of the questions put to them by our board members. Following the meetings with representatives of Kamstrup, the board approved conducting a Pilot Project to study the performance and effectiveness of the AMI system. A 300-meter Pilot Project in one of the most rural parts of the District was conducted to see if this would be a positive option for the District. The Pilot Project area was chosen because it is very remote and has numerous hills and hollows. At the time, our thinking was “if it will work here, it will work anywhere.” We wanted to challenge the capabilities of the system.

The AMI Pilot Project Experience

Q. What did you learn during the Pilot Project?

A. Once the 300 meters were installed and online in the Pilot Project area of the Sulphur Well community, we immediately experienced the advantages of this particular AMI system. Withing 24 hours of the AMI system becoming fully operational we realized we had long-term service line leaks that were being recognized by the leak detection feature in the new meters. Not only does the Kamstrup meter that the District tested detect leaks on the customer side of the meter, but it also detects leaks and other activity on the utility side of the meter.

The District received an alert concerning constant flow through a particular District-owned service line in mid-June 2024. We were very skeptical there was a leak in this area due to the fact that the ground was so dry but, we began excavating the area and located a small leak. We would have likely **not** found this leak without the AMI system. The leak was repaired and the next day we checked the software to see if the alert was gone, the alert was still there. Because the software was new to us we were unsure what to do. However, we sent the crews back out to excavate the area again to make sure they repaired the leak. The repair we had made the prior day was good, but we found another leak under the road that we did not hear or see. This

made us very happy and confident in the AMI system's capabilities. This meter also alerted the District to a leak in November 2024, which was also repaired. Attached as **Tucker-Attachment-1** is a copy of a graph showing the acoustic noise levels detected by this meter from June 2024 through November 2024.

We also had many customers who contacted us that their bill had gone up since we installed the new Kamstrup AMI metering system. Although customers may be upset with higher bills because all of their water usage is being captured by the new system, each customer paying the full cost of their consumption benefits the District as a whole. The District saw an increase in revenue per active meter in the Pilot Project area following the installation of the AMI system. Customers are more likely to repair small leaks when they are being billed for the usage. This reduces the demand on the water treatment plant. We have also found numerous leaks on service lines to inactive meters by using the Kamstrup AMI metering system. In these situations, the leaks are on the District's side of the meter, and we would have been unaware of the leak without the alerts sent to the District by the inactive meters.

We are able to obtain a meter reading and a noise level every 16 minutes sent directly to our office. We can access a usage report for any individual customer's meter and show the customer times of usage, usage amount, and

graphs to help them understand their bill. This builds customer confidence and trust in the District. We are here to serve our community to the best of our ability. AMI technology helps us do that better. The Kamstrup AMI metering system also reports when a meter has been taken out of operation or placed in operation when it is inactive. This aids the District in detecting theft of meters and theft of water. Having constant “eyes and ears” on our distribution system helps us manage our system, proactively track leaks, monitor usage, and conserve for the future of our community and the rate payers that we serve.

Q. Does this conclude your testimony?

A. Yes, it does.

VERIFICATION

COMMONWEALTH OF KENTUCKY)
) SS:
COUNTY OF HART)

The undersigned, Andrew Tucker, being duly sworn, deposes and states: that he is the Manager of Green River Valley Water District in Horse Cave, Kentucky; that he has personal knowledge of the matters set forth in the foregoing testimony; and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

Andrew Tucker, Manager
Green River Valley Water District

Subscribed, sworn to, and acknowledged before me, a Notary Public in and for said County and State, this 10th day of June 2026.

Notary Public

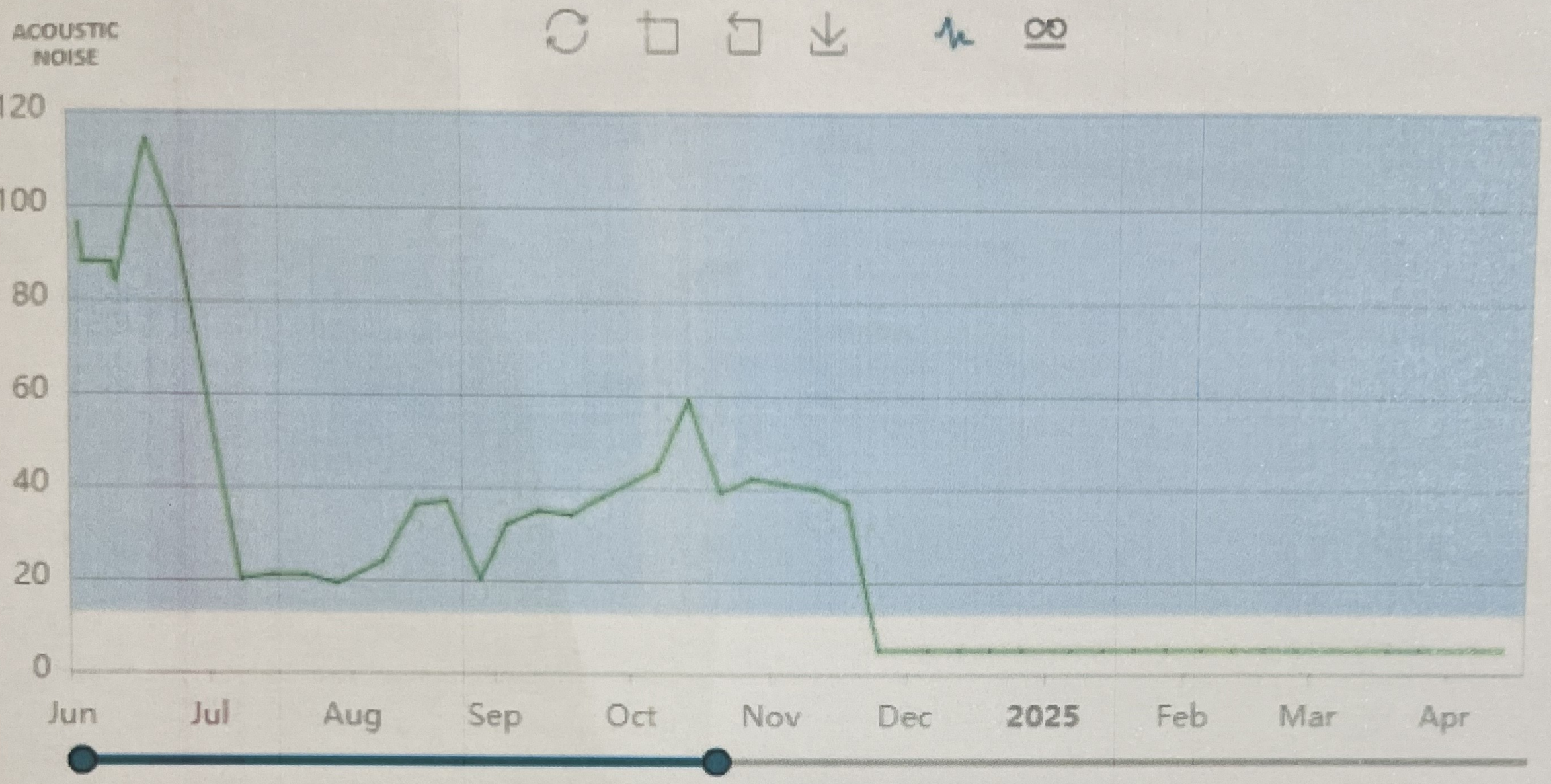
My Commission Expires: 06-20-2028

Notary ID: KYNP89791

Tucker-Attachment-1

Acoustic Noise Graph

SELECTED METERS



Address and serial no.	Event date	Ev...	Info code	Tra
2941 Sul Well Kno... Center 42214 55257049	-	-	+	

Exhibit 5

Billing Registers Showing Increased Revenue

Green River Valley Water Dist

Billing Register

Cycle(s)	*03 Cycle 3*	Break Out Service Credit	☐	Billing Register Sort Order	*Account Number*
Customer Type(s)	*All*	Print Budget Actual Amounts	☐	Use Reading Factor	☑
Service Type(s)	*WT WATER*	Space Between Accounts	*0"*	Print Final Bills First	☑
Print Billing Register For	*Historical Billing*	AddOn Type Reporting Group	*Add On Reporting Group*	Include Inactive Services	☑
Address To Print	*Billing Address*	Transaction Date Range	*4/1/2023 To 8/31/2024*	Inactive Services To Include	*All*
Totals Format	*Gross Totals*	Print Format	*Totals Only*		
Account Number Range	*3016-00000-000 To 3016-99999-999*	Print Rate Codes	☐		
		Filter By Reporting Groups	☐		

	Service	Budget	Final	Active	Inactive	Usage	Deposits	Charge	Surcharge 1	Local Tax	State Tax	Net	Arrears	Penalty	Gross
Route 3016 Totals															
	WATER	0	8	352	68	33206500	192.05	280,246.21	204.00	8,390.87	1,527.79	290,368.87		5,638.15	302,347.91
		0	**8**	**352**	**68**	**33206500**	**192.05**	**280,246.21**	**204.00**	**8,390.87**	**1,527.79**	**290,368.87**		**5,638.15**	**302,347.91**
												Number of Active Accounts			361
												Number of Inactive Accounts			28
Report Totals															
	WATER	0	8	352	68	33206500	192.05	280,246.21	204.00	8,390.87	1,527.79	290,368.87		5,638.15	302,347.91
		0	**8**	**352**	**68**	**33206500**	**192.05**	**280,246.21**	**204.00**	**8,390.87**	**1,527.79**	**290,368.87**		**5,638.15**	**302,347.91**
												Number of Active Accounts			361
												Number of Inactive Accounts			28

Green River Valley Water Dist

Billing Register

Cycle(s)	*03 Cycle 3*	Break Out Service Credit	☐	Billing Register Sort Order	*Account Number*
Customer Type(s)	*All*	Print Budget Actual Amounts	☐	Use Reading Factor	☑
Service Type(s)	*WT WATER*	Space Between Accounts	*0"*	Print Final Bills First	☑
Print Billing Register For	*Historical Billing*	AddOn Type Reporting Group	*Add On Reporting Group*	Include Inactive Services	☑
Address To Print	*Billing Address*	Transaction Date Range	*10/1/2024 To 2/28/2026*	Inactive Services To Include	*All*
Totals Format	*Gross Totals*	Print Format	*Totals Only*		
Account Number Range	*3016-00000-000 To 3016-99999-999*	Print Rate Codes	☐		
		Filter By Reporting Groups	☐		

Service	Budget	Final	Active	Inactive	Usage	Deposits	Charge	Surcharge 1	Local Tax	State Tax	Net	Arrears	Penalty	Gross
Route 3016 Totals														
WATER	0	53	398	51	32075600	1,397.27	298,159.40	204.00	8,933.95	1,613.37	308,910.72		6,668.20	395,332.52
	0	**53**	**398**	**51**	**32075600**	**1,397.27**	**298,159.40**	**204.00**	**8,933.95**	**1,613.37**	**308,910.72**		**6,668.20**	**395,332.52**
												Number of Active Accounts		403
												Number of Inactive Accounts		9
Report Totals														
WATER	0	53	398	51	32075600	1,397.27	298,159.40	204.00	8,933.95	1,613.37	308,910.72		6,668.20	395,332.52
	0	**53**	**398**	**51**	**32075600**	**1,397.27**	**298,159.40**	**204.00**	**8,933.95**	**1,613.37**	**308,910.72**		**6,668.20**	**395,332.52**
												Number of Active Accounts		403
												Number of Inactive Accounts		9

Exhibit 6

Tear Sheet and Affidavit of Publication
Advertisement for Bids

e Area Tourism ınce 2026 Caveland lebration

EVENT FEATURES ;M ATTRACTIONS

and discounts to participating local tourism businesses, and they will be eligible for door prizes.

"We love hosting the Celebration here at the Cave Area Conference Center," says Jennifer McNett, Cave City Tourism & Convention Commission Executive Director. "It's free and open to the public from 11 am to 7 pm. "Participants should plan to spend about an hour visiting the booths and attending the customer service training."

"Tourism is a vital part of the economy of our area that brings more than $174 million economic impact annually and supports more than 1,350 jobs. Our front line tourism employees are the best ambassadors for our industry," says MacLean Lessenberry, Executive Director of the Glasgow-Barren County Tourist & Convention Commission. "We want to make sure they have the most current information about the area so they can share that with our visitors."

Community CALENDAR

CANDLELIGHT COMMUNION AT MT. OLIVET

Mt. Olivet Baptist Church will have Candlelight Communion on Thursday, April 2, 2026, at 7:00 pm. The church is located on Cub Run Hwy, three miles west of Munfordville.

3RD ANNUAL EASTER EGG HUNT

The 3rd annual Easter egg hunt will be held 1:00 pm, Saturday, April 4 at the Hart County Veterans Club, 3324 S Dixie Highway, Horse Cave. Free and open to all ages. Bring a bucket. Please bring a non-perishable food item for our free food cabinet.

AFFIDAVIT

This is to certify that the 02 day of April, 2024 an ad for Green River Valley Water District was published in the regular edition of the Hart County News Herald, a newspaper published for general circulation in the City of Horse Cave, Hart County and adjoining counties.

Pam Wright

COMMONWEALTH OF KENTUCKY

County of Hart

The foregoing was subscribed and sworn to before me by Pam Wright on this 07 day of April, in _____.

Lesia Logsdon

Notary Public, Kentucky, State-At-Large

My commission expires: 02-09-27

Exhibit 7

Core & Main Bid on Equipment
Kamstrup Subscription Information

Bid Proposal for GRVWD Kamstrup Meters & Collectors 2026

CUSTOMER

GREEN RIVER VALLEY WATER
1180 E Main St
Horse Cave, KY 42749
Contact: Andrew Tucker

Job
GRVWD Kamstrup Meters & Collectors 2026
Horse Cave, KY
Bid Date: 04/16/2026 02:00 pm
Bid #: 4875137

CONTACT

Sales Representative
Sanjin Grabus
(T) 270-783-8721
(F) 270-783-8723
Sanjin.Grabus@coreandmain.com

Core & Main
3352 Industrial Dr
Bowling Green, KY 42101
(T) 2707838721

NOTES

Bid Proposal for GRVWD Kamstrup Meters & Collectors 2026

GREEN RIVER VALLEY WATER
Job Location: Horse Cave, KY
Bid Date: 04/16/2026 02:00 pm
Core & Main Bid #: 4875137

Core & Main
3352 Industrial Dr
Bowling Green, KY 42101
Phone: 2707838721
Fax: 2707838723

Seq#	Qty	Description	Units	Price	Ext Price
20	5000	5/8X3/4 FLOWIQ 2200 USG ALD 7-1/2"LL COMPOSITE BODY	EA	282.00	1,410,000.00
		02-K-02-D-1-8B-8UB			
30	3	KAMSTRUP AMI RF COLLECTOR SET	EA	8,500.00	25,500.00
				Sub Total	**1,435,500.00**
				Tax	0.00
				Total	**1,435,500.00**

Branch Terms:
This quotation represents Core & Main's interpretation of the plans and specifications as of the date of this document and is provided solely as an aid to bidding. Customers are responsible for verifying all materials and quantities prior to bidding or ordering. Prices are based on purchase of the quoted materials in their entirety and assume full truckload freight-paid releases; lesser quantities may incur additional shipping and handling charges. All quoted prices exclude applicable sales taxes. Prices are subject to change if scope, specifications, or quantities are altered, or due to factors such as government regulations, tariffs, transportation, fuel, and raw material costs.

PVC pipe pricing is based on availability at the time of shipping unless otherwise noted. HDPE pricing is valid for 10 days from the quote date and may be revised if quantities change. Quoted prices are firm for shipment within 30 days of the quote date unless otherwise noted. Special-order or non-stock item

UNLESS OTHERWISE SPECIFIED HEREIN, PRICES QUOTED ARE VALID IF ACCEPTED BY CUSTOMER AND PRODUCTS ARE RELEASED BY CUSTOMER FOR MANUFACTURE WITHIN THIRTY (30) CALENDAR DAYS FROM THE DATE OF THIS QUOTATION. CORE & MAIN LP RESERVES THE RIGHT TO INCREASE PRICES TO ADDRESS FACTORS, INCLUDING BUT NOT LIMITED TO, GOVERNMENT REGULATIONS, TARIFFS, TRANSPORTATION, FUEL AND RAW MATERIAL COSTS. DELIVERY WILL COMMENCE BASED UPON MANUFACTURER LEAD TIMES. ANY MATERIAL DELIVERIES DELAYED BEYOND MANUFACTURER LEAD TIMES MAY BE SUBJECT TO PRICE INCREASES AND/OR APPLICABLE STORAGE FEES. THIS BID PROPOSAL IS CONTINGENT UPON BUYER'S ACCEPTANCE OF SELLER'S TERMS AND CONDITIONS OF SALE, AS MODIFIED FROM TIME TO TIME, WHICH CAN BE FOUND AT: https://coreandmain.com/terms-of-sale/

THIS BID MAY INCLUDE GLOBALLY SOURCED (IMPORTED) MATERIALS THAT ARE SUBJECT TO CHANGING TARIFFS. PRICES ARE SUBJECT TO CHANGE DUE TO POTENTIAL ADDITIONAL TARIFFS IMPOSED BY THE U.S. GOVERNMENT. IF IMPOSED, PRICES WILL INCREASE BY THE SAME PERCENTAGE AND WILL BE EFFECTIVE ON THE DATE THAT THE NEW TARIFFS ARE IMPLEMENTED. THESE ITEMS SHOULD BE PURCHASED WITH HASTE TO AVOID ANY ADDITIONAL RISING TARIFF COSTS.

Exhibit 8

Resolution Conditionally Awarding Contract

RESOLUTION NO. 2025-04-01

RESOLUTION OF GREEN RIVER VALLEY WATER DISTRICT ACCEPTING LOWEST AND BEST BID AND AWARDING CONTRACT FOR ADVANCED METERING INFRASTRUCTURE CUSTOMER WATER METERS

WHEREAS, Green River Valley Water District (the "District") caused to be published in the April 2, 2026 edition of *The Hart County News-Herald,* an advertisement for bids for furnishing the Advanced Metering Infrastructure customer metering equipment (the "AMI Project" or "Contract") in accordance with the provisions of KRS Chapter 424;

WHEREAS, Core & Main, LP's ("Core & Main") bid of $1,435,500.00 for the AMI Project was the lowest bid submitted;

WHEREAS, the District's General Manager has recommended that the District award the Contract for the AMI Project to Core & Main.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COMMISSIONERS OF GREEN RIVER VALLEY WATER DISTRICT AS FOLLOWS:

Section 1. The facts, recitals, and statements contained in the foregoing preamble of this Resolution are true and correct and are hereby affirmed and incorporated as a part of this Resolution.

Section 2. The Board of Commissioners hereby accepts the recommendation of the General Manager.

Section 3. The Board of Commissioners hereby declares the bid of Core & Main in the amount of $1,435,500.00 for furnishing the customer meters and other equipment for the AMI Project to be the lowest and best bid.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COMMISSIONERS OF GREEN RIVER VALLEY WATER DISTRICT AS FOLLOWS:

Section 1. The facts, recitals, and statements contained in the foregoing preamble of this Resolution are true and correct and are hereby affirmed and incorporated as a part of this Resolution.

Section 2. The Chairman is authorized and directed to take any and all actions reasonably necessary to prepare, execute, and submit an application to the Commission for a CPCN to purchase and install the AMI Project.

Section 3. This Resolution shall take effect upon its adoption.

Adopted by the Board of Commissioners of Green River Valley Water District at a meeting held on April 16, 2026, signed by the Chairman and attested by the Secretary.

GREEN RIVER VALLEY WATER DISTRICT

By: _____
John F. Bunnell, Chairman

ATTEST:

_____
Adrian Gossett, Secretary

CERTIFICATION

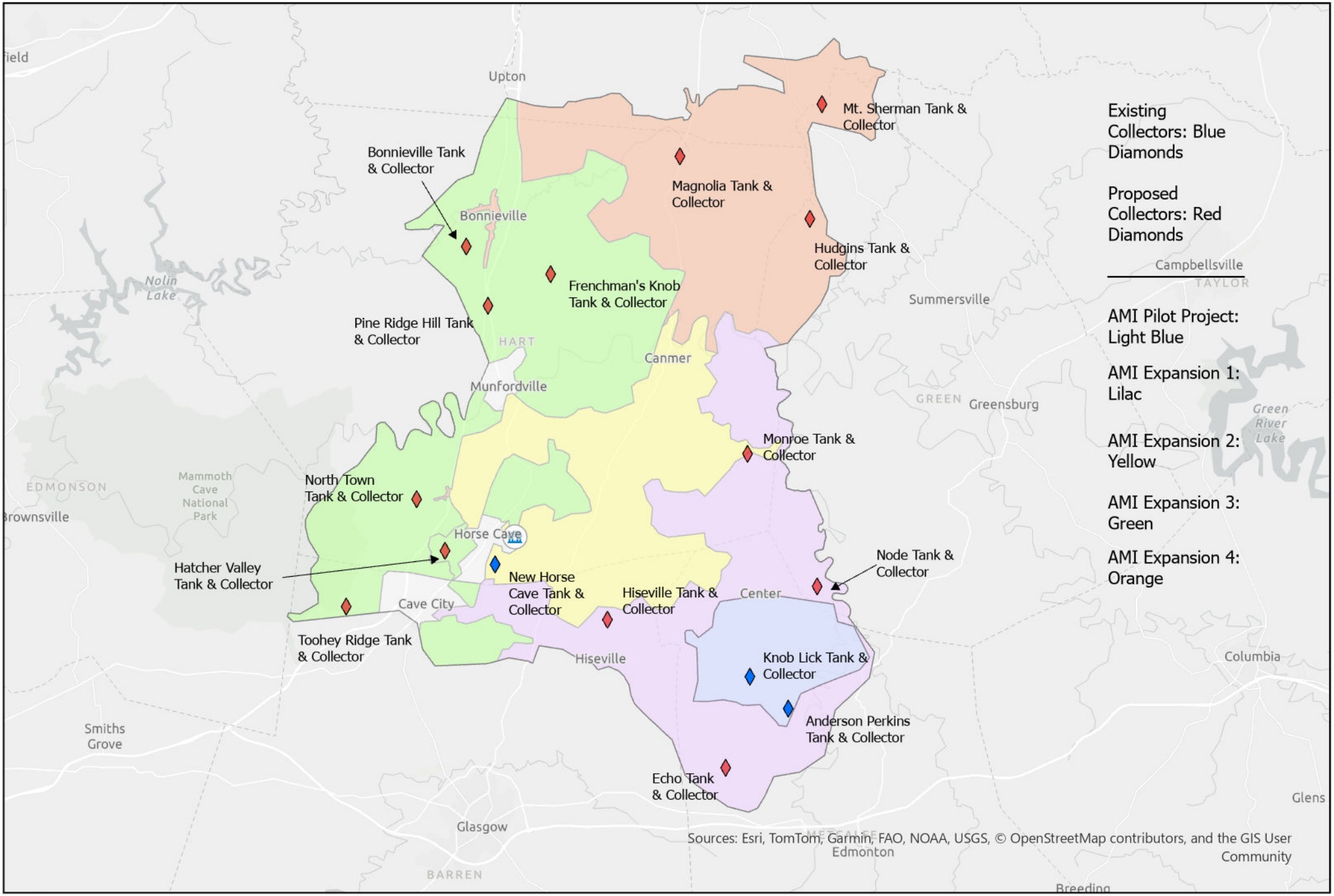
The undersigned Secretary of Green River Valley Water District (the "District") does hereby certify that the foregoing is a true copy of a Resolution duly adopted by the District's Board of Commissioners at a meeting properly held on April 16, 2026, signed by the Chairman of the Board of Commissioners, attested by the Secretary of the Board of Commissioners, and now in full force and effect.

WITNESS my hand this 16th day of April 2026.

Adrian Gossett, Secretary

Exhibit 9

Map Showing AMI Expansion Plan



GRVWD AMI Deployment Plan

GRVWD Office
GRVWD Office

Municipalities
Municipalities

0 2.5 5 10 Miles

Exhibit 10

Subscription Information for
AMI Standard and Leak Detector Software from
Kamstrup

Annual Subscription

Includes yearly software license, support and hosting (recurrent fee subject to annual escalation rate for years 2-20)

AMR CORE annual subscription includes READy Manager, Additional Users, Notifications, Meters Exchange

AMI STANDARD annual subscription includes READy Manager, Additional Users, Notifications, Meter Exchange, API Access and READy+

For existing READy customers that buy additional meters and move them into the next meter tier, please contact your RSM for increased pricing.

Metering points		AMR CORE		AMI STANDARD		
Hosting Subscription	≤ 100	6696051FH	**765.00**	6696451FH	**2,493.97**	USD
Hosting Subscription	≤ 250	6696052FH	**1,338.00**	6696452FH	**3,596.70**	USD
Hosting Subscription	≤ 800	6696053FH	**1,867.00**	6696453FH	**5,337.85**	USD
Hosting Subscription	≤ 1,600	6696054FH	**2,080.00**	6696454FH	**8,333.14**	USD
Hosting Subscription	≤ 2,400	6696055FH	**2,861.00**	6696455FH	**10,552.90**	USD
Hosting Subscription	≤ 3,200	6696056FH	**3,633.00**	6696456FH	**13,697.91**	USD
Hosting Subscription	≤ 4,000	6696057FH	**4,497.00**	6696457FH	**15,360.00**	USD
Hosting Subscription	≤ 5,000	6696058FH	**4,641.00**	6696458FH	**17,007.48**	USD
Hosting Subscription	≤ 7,500	6696059FH	**7,055.00**	6696459FH	**24,585.96**	USD
Hosting Subscription	≤ 10,000	6696060FH	**9,559.00**	6696460FH	**36,588.00**	USD
Hosting Subscription	≤ 15,000	6696061FH	**14,599.00**	6696461FH	**51,413.00**	USD
Hosting Subscription	≤ 20,000	6696062FH	**17,415.00**	6696462FH	**66,472.00**	USD
Hosting Subscription	≤ 25,000	6696063FH	**18,560.00**	6696463FH	**69,447.00**	USD
Hosting Subscription	≤ 30,000	6696064FH	**20,737.00**	6696464FH	**75,366.00**	USD
Hosting Subscription	≤ 35,000	6696065FH	**22,193.00**	6696465FH	**81,087.00**	USD
Hosting Subscription	≤ 40,000	6696066FH	**23,384.00**	6696466FH	**86,160.00**	USD
Hosting Subscription	≤ 45,000	6696067FH	**24,296.00**	6696467FH	**90,127.00**	USD
Hosting Subscription	≤ 50,000	6696068FH	**23,333.00**	6696468FH	**93,412.00**	USD
Hosting Subscription	≤ 60,000	6696069FH	**25,812.00**	6696469FH	**101,587.00**	USD
Hosting Subscription	≤ 70,000	6696070FH	**27,887.00**	6696470FH	**110,024.00**	USD
Hosting Subscription	≤ 80,000	6696071FH	**29,606.00**	6696471FH	**118,790.00**	USD
Hosting Subscription	≤ 90,000	6696072FH	**31,012.00**	6696472FH	**127,478.00**	USD
Hosting Subscription	≤ 100,000	6696073FH	**30,771.00**	6696473FH	**133,423.00**	USD

Prices for more metering points are available on request. Please contact the product manager.

Leak Detector & Services

Leak Detector, Subscription

The price consists of yearly software license and a support agreement and will be invoiced on a yearly basis.

Leak Detector is compatible with both AMI and AMR.

As a first time user, please remember to order Up & Running for Leak Detector.

Type No.		USD
BCUS30302.101W	Subscription price, Leak Detector ≤100 metering points	369.00
BCUS30302.102W	Subscription price, Leak Detector ≤250 metering points	899.00
BCUS30302.103W	Subscription price, Leak Detector ≤800 metering points	2,829.00
BCUS30302.104W	Subscription price, Leak Detector ≤1,600 metering points	5,559.00
BCUS30302.105W	Subscription price, Leak Detector ≤2,400 metering points	8,179.00
BCUS30302.106W	Subscription price, Leak Detector ≤3,200 metering points	10,689.00
BCUS30302.107W	Subscription price, Leak Detector ≤4,000 metering points	13,109.00
BCUS30302.108W	Subscription price, Leak Detector ≤5,000 metering points	16,079.00
BCUS30302.109W	Subscription price, Leak Detector ≤7,500 metering points	23,659.00
BCUS30302.110W	Subscription price, Leak Detector ≤10,000 metering points	30,949.00
BCUS30302.111W	Subscription price, Leak Detector ≤15,000 metering points	45,539.00
BCUS30302.112W	Subscription price, Leak Detector ≤20,000 metering points	59,569.00
BCUS30302.113W	Subscription price, Leak Detector ≤25,000 metering points	73,049.00
BCUS30302.114W	Subscription price, Leak Detector ≤30,000 metering points	85,989.00
BCUS30302.115W	Subscription price, Leak Detector ≤35,000 metering points	98,419.00
BCUS30302.116W	Subscription price, Leak Detector ≤40,000 metering points	110,339.00
BCUS30302.117W	Subscription price, Leak Detector ≤45,000 metering points	116,689.00
BCUS30302.118W	Subscription price, Leak Detector ≤50,000 metering points	121,869.00
BCUS30302.119W	Subscription price, Leak Detector ≤60,000 metering points	137,469.00
BCUS30302.120W	Subscription price, Leak Detector ≤70,000 metering points	150,759.00
BCUS30302.121W	Subscription price, Leak Detector ≤80,000 metering points	161,959.00
BCUS30302.122W	Subscription price, Leak Detector ≤90,000 metering points	171,279.00
BCUS30302.123W	Subscription price, Leak Detector ≤100,000 metering points	178,889.00

Exhibit 11

Reference Copies of FCC Licenses

Federal Communications Commission
Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: KAMSTRUP WATER METERING, LLC

ATTN: JOHN HEINE
KAMSTRUP WATER METERING, LLC
: 2855 FORSYTH COMMERCE CENTRE WY
CUMMING, GA 30040

Call Sign	File Number
WSBR349	0011457793

Radio Service
IG - Industrial/Business Pool, Conventional

Regulatory Status
PMRS

Frequency Coordination Number
25022012206901

FCC Registration Number (FRN): 0026415570

Grant Date	Effective Date	Expiration Date	Print Date
03-06-2024	03-24-2025	03-06-2034	03-25-2025

STATION TECHNICAL SPECIFICATIONS

Fixed Location Address or Mobile Area of Operation

Loc. 1 **Address:** 1045 PLEASANT VALLEY CHURCH RD
City: HORSE CAVE **County:** METCALFE **State:** KY
Lat (NAD83): 37-05-26.6 N **Long (NAD83):** 085-42-04.8 W **ASR No.:** **Ground Elev:** 27.0

Loc. 2 **Area of operation**
Operating within a 26.0 km radius around 37-05-26.6 N, 085-42-04.8 W,
HORSE CAVE, METCALFE county, KY

Loc. 3 **Address:** 778 ANDERSON PERKINS RD
City: CENTER **County:** METCALFE **State:** KY
Lat (NAD83): 37-04-14.5 N **Long (NAD83):** 085-40-16.3 W **ASR No.:** **Ground Elev:** 288.6

Loc. 4 **Address:** 1263 HISEVILLE BEAR WALLOW RD
City: CAVE CITY **County:** BARREN **State:** KY
Lat (NAD83): 37-07-35.4 N **Long (NAD83):** 085-48-47.8 W **ASR No.:** **Ground Elev:** 254.5

Loc. 5 **Address:** 254 ECHO RD
City: KNOBB LICK **County:** METCALFE **State:** KY
Lat (NAD83): 37-02-00.7 N **Long (NAD83):** 085-43-13.5 W **ASR No.:** **Ground Elev:** 302.1

Loc. 6 **Address:** 225 MONROE DR
City: HARDYVILLE **County:** HART **State:** KY
Lat (NAD83): 37-13-49.2 N **Long (NAD83):** 085-42-11.7 W **ASR No.:** **Ground Elev:** 252.1

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

Licensee Name: KAMSTRUP WATER METERING, LLC

Call Sign: WSBR349 **File Number:** 0011457793 **Print Date:** 03-25-2025

Fixed Location Address or Mobile Area of Operation

Loc. 7 **Address:** 1532 HIGHWAY 1048
City: CENTER **County:** GREEN **State:** KY
Lat (NAD83): 37-08-50.4 N **Long (NAD83):** 085-38-54.4 W **ASR No.:** **Ground Elev:** 281.9

Antennas

Loc No.	Ant No.	Frequencies (MHz)	Sta. Cls.	No. Units	No. Pagers	Emission Designator	Output Power (watts)	ERP (watts)	Ant. Ht./Tp meters	Ant. AAT meters	Construct Deadline Date
1	1	000451.67500000	FXO	1		11K0F1D	7.700	7.700	17.0	39.6	03-06-2025
2	1	000456.67500000	FXOT	2000		11K0F1D	0.200	0.800			

Control Points

Control Pt. No. 1

Address: 245 HEMBREE PARK DRIVE, STE. 110
City: ROSWELL **County:** FULTON **State:** GA **Telephone Number:** (404)835-6716

Associated Call Signs

<NA>

Waivers/Conditions:

Antenna structures for land, base and fixed stations authorized for operation at temporary unspecified locations may be erected without specific prior approval of the Commission where such antenna structures do not exceed a height of 60.96 meters (200 feet) above ground level; provided that the overall height of such antennas more than 6.10 meters (20 feet) above ground, including their supporting structures (whether natural formation or man-made), do not exceed any of the slope ratios set forth in Section 17.7(b). Any antenna to be erected in excess of the foregoing limitations requires prior Commission approval. Licensees seeking such approval should file application for modification of license. In addition, notification to the Federal Aviation Administration is required whenever the antenna will exceed 60.96 meters (200 feet) above the ground and whenever notification is otherwise required by Section 17.7 of the Commission's Rules. Such notification should be given by filing FAA Form 7460-1, Notice of Proposed Construction or Alteration, in duplicate, with the nearest office of the Federal Aviation Administration, which form is available from that office.

04/29/2026: The following frequency is in a termination pending status for failure to meet the buildout requirements and, therefore, is not reflected on the authorization: frequency 451.67500000, antenna 1, location 3, CENTER, KY.

04/29/2026: The following frequency is in a termination pending status for failure to meet the buildout requirements and, therefore, is not reflected on the authorization: frequency 451.67500000, antenna 1, location 4, CAVE CITY, KY.

04/29/2026: The following frequency is in a termination pending status for failure to meet the buildout requirements and, therefore, is not reflected on the authorization: frequency 451.67500000, antenna 1, location 5, KNOBB LICK, KY.

04/29/2026: The following frequency is in a termination pending status for failure to meet the buildout requirements and, therefore, is not reflected on the authorization: frequency 451.67500000, antenna 1, location 6, HARDYVILLE, KY.

04/29/2026: The following frequency is in a termination pending status for failure to meet the buildout requirements and, therefore, is not reflected on the authorization: frequency 451.67500000, antenna 1, location 7, CENTER, KY.

Federal Communications Commission
Wireless Telecommunications Bureau

RADIO STATION AUTHORIZATION

LICENSEE: KAMSTRUP WATER METERING, LLC

ATTN: AMY NEWMAN
KAMSTRUP WATER METERING, LLC
2855 FORSYTH COMMERCE CENTRE WY
CUMMING, GA 30040

Call Sign	File Number
WSIM960	0011543487

Radio Service
IG - Industrial/Business Pool, Conventional

Regulatory Status
PMRS

Frequency Coordination Number
25042412208097

FCC Registration Number (FRN): 0026415570

Grant Date	Effective Date	Expiration Date	Print Date
06-02-2025	06-02-2025	06-02-2035	06-03-2025

STATION TECHNICAL SPECIFICATIONS

Fixed Location Address or Mobile Area of Operation

Loc. 1 **Address:** 2000 OLD GLASGOW RD
City: HORSE CAVE **County:** HART **State:** KY
Lat (NAD83): 37-09-40.1 N **Long (NAD83):** 085-54-05.6 W **ASR No.:** **Ground Elev:** 244.8

Antennas

Loc No.	Ant No.	Frequencies (MHz)	Sta. Cls.	No. Units	No. Pagers	Emission Designator	Output Power (watts)	ERP (watts)	Ant. Ht./Tp meters	Ant. AAT meters	Construct Deadline Date
1	1	000451.67500000	FXO	1		11K0F1D	7.700	7.700	14.0	12.3	06-02-2026

Control Points

Control Pt. No. 1

Address: 2855 FORSYTH COMMERCE CENTRE WY
City: CUMMING **County:** FORSYTH **State:** GA **Telephone Number:** (404)835-6716

Associated Call Signs

Conditions:
Pursuant to §309(h) of the Communications Act of 1934, as amended, 47 U.S.C. §309(h), this license is subject to the following conditions: This license shall not vest in the licensee any right to operate the station nor any right in the use of the frequencies designated in the license beyond the term thereof nor in any other manner than authorized herein. Neither the license nor the right granted thereunder shall be assigned or otherwise transferred in violation of the Communications Act of 1934, as amended. See 47 U.S.C. § 310(d). This license is subject in terms to the right of use or control conferred by §706 of the Communications Act of 1934, as amended. See 47 U.S.C. §606.

Licensee Name: KAMSTRUP WATER METERING, LLC

Call Sign: WSIM960 **File Number:** 0011543487 **Print Date:** 06-03-2025

<NA>

Waivers/Conditions:

NONE

Exhibit 12

Acquired Property

Detailed Estimate of Acquired Property Classified According To The Uniform System of Accounts for Class A/B Water Districts and Associations

Green River Valley Water District
Total AMI Project

Account No.	Account Description	Estimate
334	Meters & Meter Installations	$2,900,000
	TOTAL	**$2,900,000**

Exhibit 13

Data Sheets for Meters & Software

kamstrup

The Smarter Water Meter

Know your water. Know your network.

---

flowIQ® 2200

For residential applications.
Available in sizes 5/8” to 1”.

Next-Gen Water Management

Meet the flowIQ® 2200, an advanced water meter designed for efficiency and accuracy. Its state-of-the-art low-flow detection capabilities ensure precision in billing and improve leak detection, making it a cost-effective solution to save water.

Additionally, the flowIQ® 2200 is equipped with embedded Acoustic Leak Detection (ALD) and non-revenue water analytics tools. These features convert your water distribution network into a data-driven system, allowing for swift problem identification and resolution. This innovative device gives you more control and insight into water consumption, providing a comprehensive solution for residential water metering.

Setting a new standard, the flowIQ® 2200 offers uncompromising accuracy, remote reading support, and intelligent features. It is hermetically sealed, providing IP68 protection against water ingress, and has a robust battery that lasts up to 20 years.

Start exploring the benefits of the flowIQ® 2200 for your water management needs today.

A Word from Our Customers

By 2019, we had about a million more dollars in revenue from the meters just registering the water that was going through the meter and was able to be billed to the customer.”

– Mike Jones, General Manager,
Milcrofton Utility District, Tennessee

Smart Metering Simplified

The flowIQ® 2200 offers:

Industry-Leading Reliability
With its IP68-rated hermetically sealed housing and patented ultrasonic measurement technology, the flowIQ® 2200 is engineered to maintain accuracy and performance for 20+ years, even in harsh conditions. It's a meter you can count on.

Embedded Acoustic Leak Detection (ALD)
The flowIQ® 2200 is the industry's only meter that listens for leaks. No sensors or external hardware are required. Kamstrup's ALD is embedded in the meter and can identify potential leaks in both service and main lines. The flowIQ® 2200's ALD capabilities may be activated anytime through a software-based upgrade without impacting the meter's battery life or warranty. This allows our customers to manage water loss on a timeline that meets their needs and budget.

Flexible Communications
The flowIQ® 2200 is available in RF (AMR/AMI) and Encoded Output options, enabling utilities to improve metering efficiency, capture near real-time data, make informed decisions and enhance customer satisfaction.

Easy Installation & Maintenance
The meter is compact, easy to install with flexible mounting options, and features an intuitive LCD interface. It can be mounted horizontally or vertically without any pipe-length restrictions. The meter also includes advanced diagnostics and self-checking functions to identify potential issues for proactive maintenance and minimal downtime.

The flowIQ®2200 At a Glance

For detailed technical documentation, refer to the flowIQ® 2200 datasheet and documentation available at kamstrup.com.

Features	Applications	Sizes	Communications	Intelligent Alarms	Battery Lifetime
flowIQ® 2200	Potable Water Reclaimed	⅝", ¾", 1"	RF (AMR/AMI) Encoded Output	Leak Burst Tamper Dry Reverse Flow Low Battery	Up to 20 years

Operating Characteristics

Meter Size Inches	**Material** Composite PPS	**Material** Stainless	**Start Flow** GPM L/h	**Min Flow** GPM L/h	**Transition Flow**[1] GPM L/h	**Max Flow** GPM m3/h	**Pressure Loss SMOC**[2] PSI bar	**Connection on Meter** Inches	**Lay Length** Inches mm
⅝ x ½"	✓		**0.008 GPM** *2*	**0.05** *11.4*	**0.1** *22.7*	**25** *5.68*	**6.2** *0.43*	**¾"**	**7.5"** *190*
⅝ x ¾"	✓		**0.008 GPM** *2*	**0.05** *11.4*	**0.1** *22.7*	**25** *5.68*	**7.7** *0.53*	**1"**	**7.5"** *190*
⅝ x ¾"	✓		**0.008 GPM** *2*	**0.05** *11.4*	**0.1** *22.7*	**25** *5.68*	**7.7** *0.53*	**1"**	**5.1"** *130*
¾"	✓		**0.011 GPM** *2.5*	**0.05** *11.4*	**0.1** *22.7*	**32** *7.27*	**9.0** *0.62*	**1"**	**7.5" / 9"** *190 / 229*
⅝ x ¾"		✓	**0.013 GPM** *3*	**0.10** *22.8*	**0.15** *34.1*	**25** *5.68*	**3.8** *0.26*	**1"**	**7.5"** *190*
¾"		✓	**0.013 GPM** *3*	**0.10** *22.8*	**0.15** *34.1*	**35** *7.95*	**3.9** *0.27*	**1"**	**7.5"** *190*
¾"		✓	**0.013 GPM** *3*	**0.10** *22.8*	**0.15** *34.1*	**35** *7.95*	**3.9** *0.27*	**1"**	**9"** *229*
1"		✓	**0.022 GPM** *5*	**0.25** *56.8*	**0.4** *90.8*	**55** *12.49*	**3.1** *0.21*	**1.25"**	**10.75"** *273*

[1] At flows between "Start flow" and "Maximum flow," measurement occurs - however the accuracy is only guaranteed in the range from minimum flow to maximum flow.
[2] SMOC = Safety Maximum Operating Capacity (pressure).

KAMNA2200_040925

Take the next step in optimizing your water resource management.
Contact your Kamstrup distributor today at kamstrup.com/en-us/find-a-distributor.

kamstrup

kamstrup

Data sheet

flowIQ® 2200

» **RF**
» **Encoded**
» **Cellular**

- Multiple radio options available
- Ultrasonic measurement
- Sustainable measurement accuracy
- Temperature measurement
- IP68 Vacuum sealed construction
- Lead free and certified to NSF/ANSI 61
- Flow measurement in display
- Acoustic leak detection in service and distribution lines

Contents

Electronic ultrasonic cold-water meter for measurement of cold-water consumption in households, multi-unit buildings and industry

Sustainable accuracy
Ultrasonic flow measurement guarantees sustainable accuracy and longevity. Ultrasonic flow measurement is based on the transit time method, and all measurements, references, readings, calculations and data communication are controlled by an advanced, specially designed electronic circuit. Thus, the meter includes no moving parts, which makes flowIQ® 2200 less sensitive to wear and tear and impurities in the water.

Construction
The meter is hermetically closed and vacuum-sealed to prevent humidity from reaching the electronics and avoid condensation between the glass and display. The meter is IP68 (submersible) type tested and suitable for installation in meter pits.

Installation
flowIQ® 2200 is easy to install in all operating environments, horizontally as well as vertically, independent of piping and installation conditions. Consumption data can be read visually from the display, using an optical eye, and remotely read by various integrated communication protocols.

Specific features
flowIQ® 2200 measures the water and environment temperatures and it includes acoustic leak detection, securing that water loss is discovered quickly.

The unique combination of all the flowIQ® 2200 features reduce current operating costs to measure water usage and minimizes unexpected expenses in connection with possible leakage.

Environmentally friendly
The meter has been approved according to Drinking Water Standards and is certified to NSF/ANSI 61. The meter housing and measuring part are made of the high-performance thermoplastic material polyphenylene sulfide (PPS) with 40% fiberglass, which is free from lead and other heavy metals. The environmental report, Carbon Footprint, documents the meter's high reusability and low environmental impact, including recycling of materials.

Hygiene
To protect the health of the consumers Kamstrup has a hygienic manufacturing process of the water meters.

Kamstrup also has a highly automated manufacturing process and only uses materials approved for drinking water. Furthermore, the products get disinfected before dispatch. The hygiene is being controlled by external accredited laboratories and by frequent audits.

General description
flowIQ® 2200 is a hermetically sealed water meter intended for measurement of cold and *reclaimed water consumption in residentials and multi-unit buildings.

flowIQ® 2200 employs the ultrasonic measurement principle, based on Kamstrup's experience since 1991, with the initial development and production of static ultrasonic meters.

flowIQ® 2200 is available in an Encoded Output version with 2 x A-cell battery supply and a RF and Cellular version with 1 x D-cell battery supply.

One of flowIQ® 2200's many advantages is the fact that it has no wearing parts, which ensures a high and stable accuracy throughout its lifetime. flowIQ® 2200 complies with all the AWWA C715-18 guideline for Ultrasonic Water Meters.

flowIQ® 2200 measures the water consumption electronically, as a volume, using a pair of ultrasonic signals. Through two ultrasonic transducers, an ultrasonic signal is sent with and against the flow direction. A transducer serves both as a 'speaker' when transmitting and as a 'microphone' when a signal is received. The ultrasonic signal traveling with the flow will be the first to reach the opposite transducer, while the signal running against the flow will be received a little later.

The time difference between the two signals can be converted into flow velocity, and thereby also into a volume. The measuring principle is a proven, long-term stable and accurate measuring principle.

In addition to volume reading, an indication of current flow and several other information codes are displayed. All registers are saved daily in the meter data logger (EEPROM) and are kept for 460 days. Furthermore, monthly data for the latest 36 months (3 years), hourly data for the latest 100 days (about 3 and a half months) and 50 info code events are saved.

flowIQ® 2200 is powered by an internal lithium battery which can provide up to 20 years operating life.

flowIQ® 2200 is available with a choice of integrated data communication options:

- 912.5, 915 or 918.5 MHz - RF
- 450-470 MHz - RF
- Cellular
- Encoded Output

The meter is fitted with an optical eye which makes it possible to read saved consumption data and info codes, stored in the meter's data logger. Using an optical reading head, it is also possible to change the meter configuration, e.g. data packages.

flowIQ® 2200 can and must only be opened by Kamstrup A/S. If the meter has been opened and the sealing has been broken, the meter is no longer valid for billing purposes and the warranty is void.

** For information concerning reclaimed water we refer to document no.: FILE100003532*

Technical data

Electrical data

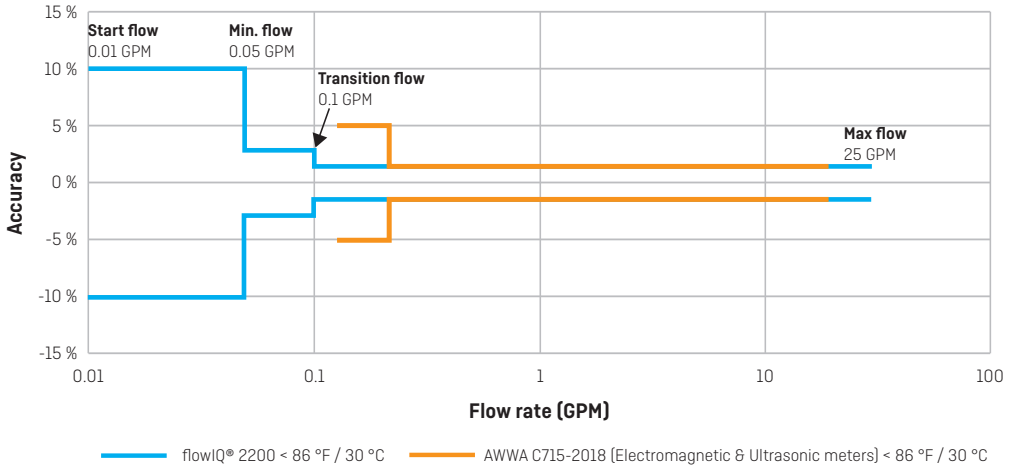
Battery (flowIQ® 2200 RF and Cellular)	1 x D-Cell battery, 3.6V, 19Ah. The battery warranty does not apply at meter temperatures above t_{BAT} > 95 °F / 35° C
Battery (flowIQ® 2200 E0)	2 x A-Cell battery, 3.6V, 3.6Ah. The battery warranty does not apply at meter temperatures above t_{BAT} > 95 °F / 35° C

Mechanical data

Protection class	IP68-rated (waterproof/submersible)
Mechanical environment	Class M1 (Measuring Instruments Directive classification)
Ambient/meter temperature	
- flowIQ® 2200, composite	35... 130 °F / 1.5... 55 °C
- flowIQ® 2200, metal	35... 130 °F / 1.5... 55 °C
Water temperature	
- flowIQ® 2200, composite	33... 120 °F / 0.5... 50 °C
- flowIQ® 2200, metal	33... 120 °F / 0.5... 50 °C
Storage temp. empty sensor	-10... 140 °F / -20... 60 °C
Maximum operating pressure	250 PSI (17 bar)

Accuracy

Accuracy limits for 5/8" meters



Note: At flows between 'Start flow' and 'Maximum flow' measurement occurs – however the accuracy is only guaranteed in the range from minimum flow to maximum flow

Approved meter data

Certified to NSF/ANSI 61
Complies to part 15 of the FCC rules, ISED, IFT and with AWWA C715-18

Material

Wetted parts (composite model)

Meter housing and flow part	Polyphenylene sulfide (PPS) with fiberglass (40 %) reinforcement, PSU, extenders made from PA12
Reflectors	Stainless steel 316

Wetted parts (2-part body)

Flow part, threaded	Stainless Steel 316L
O-ring/gasket	EPDM
Measuring tube	PPS with fiberglass
Reflectors	Stainless steel

External meter parts

Top ring (sealing)	Polycarbonate (gray)

Meter sizes

flowIQ® 2200 is available in the sizes shown in table below:

XX = Communication module Y = Battery suply ZZ = Country code

Type number	Meter size Inches	Start flow[1] (S) [GPM]/ [L/h]	Min. flow[1] [GPM]/ [L/h]	Transition flow [GPM]/ [L/h]	Max flow [GPM]/ [m³/h]	Sat. flow rate [GPM]/ [m³/h]	Pressure loss SMOC [PSI]/ [bar]	Connection on meter NPSM thread	Lay length [Inches] /[mm]	Strainer	Temp. measurement of water
02-K-XX-Y-1-8A-8ZZ	⅝" x ½"	0.01/ 2.27	0.05/ 11.4	0.1/ 22.7	25/ 5.68	35/ 7.95	6.2/ 0.43	¾"	7½"/ 190	Yes	Yes
02-K-XX-Y-1-8B-8ZZ	⅝" x ¾"	0.01/ 2.27	0.05/ 11.4	0.1/ 22.7	25/ 5.68	35/ 7.95	7.7/ 0.53	1"	7½"/ 190	Yes	Yes
02-K-XX-Y-1-8R-8ZZ	⅝" x ¾"	0.01/ 2.27	0.05/ 11.4	0.1/ 22.7	25/ 5.68	35/ 7.95	7.7/ 0.53	1"	5.1"/ 130	Yes	Yes
02-K-XX-Y-1-8C-8ZZ	¾"	0.015/ 3.4	0.05/ 11.4	0.1/ 22.7	32/ 7.27	45/ 10.22	9.0/ 0.62	1"	7½" or 9"/ 229	Yes	Yes
02-L-XX-Y-1-8B-8ZZ	⅝" x ¾"	0.015/ 3.4	0.10/ 22.8	0.15/ 34.1	25/ 5.68	35/ 7.95	3.8/ 0.26	1"	7½"/ 190	No	Yes
02-L-XX-Y-1-8N-8ZZ	¾"	0.025/ 5.68	0.10/ 22.8	0.15/ 34.1	35/ 7.95	49/ 11.13	3.9/ 0.27	1"	7½"/ 190	No	Yes
02-L-XX-Y-1-8L-8ZZ	¾"	0.03/ 6.8	0.10/ 22.8	0.15/ 34.1	35/ 7.95	49/ 11.13	3.9/ 0.27	1"	9"/ 229	No	Yes
02-L-XX-Y-1-8D-8ZZ	1"	0.04/ 9.1	0.25/ 56.8	0.4/ 90.8	55/ 12.49	77/ 17.49	3.1/ 0.21	1¼"	10¾"/ 273	No	Yes

Note! 02-K-02-D-1-8C-8UB can be ordered with a 1½" extension and washer (installed by the customer) to fit 7½" or 9" lay lengths

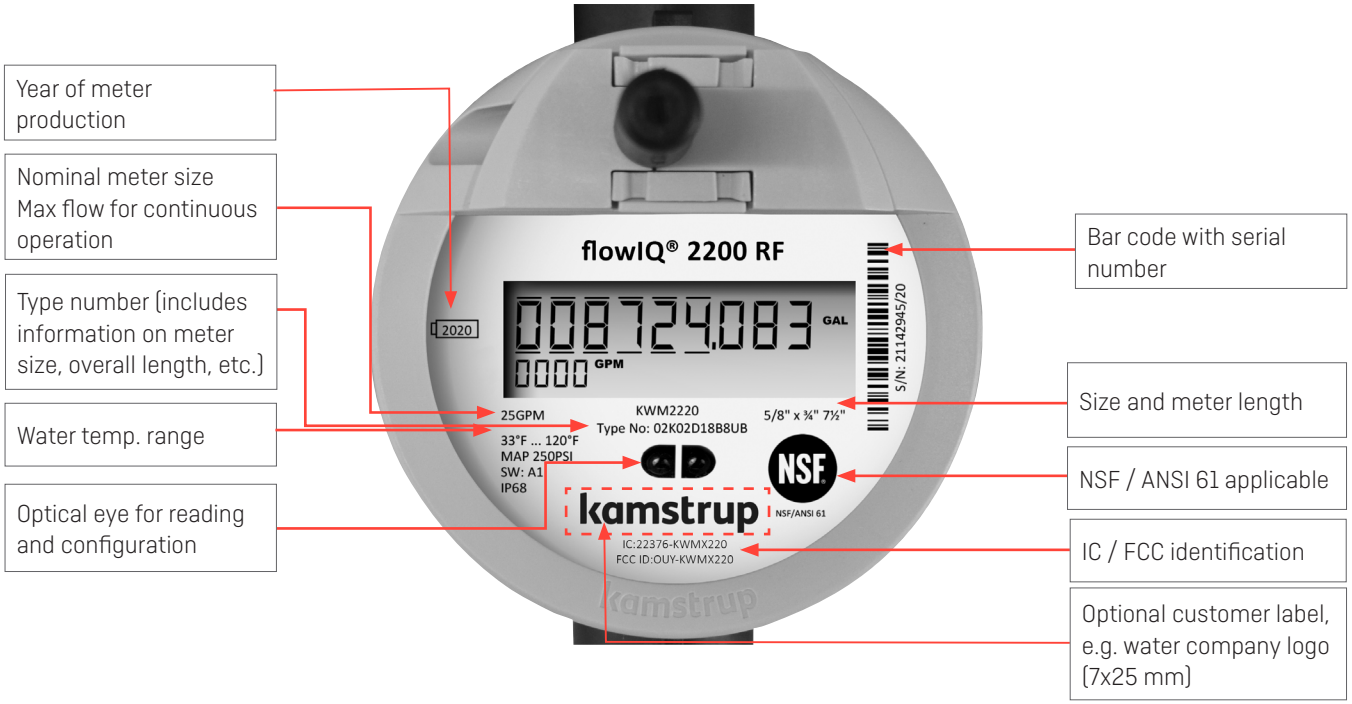
Note! Flow specifications only apply at temperatures below 86 °F / 30 °C

[1] At flows between 'Start flow' and 'Maximum flow' measurement occurs – however the accuracy is only guaranteed in the range from minimum flow to maximum flow

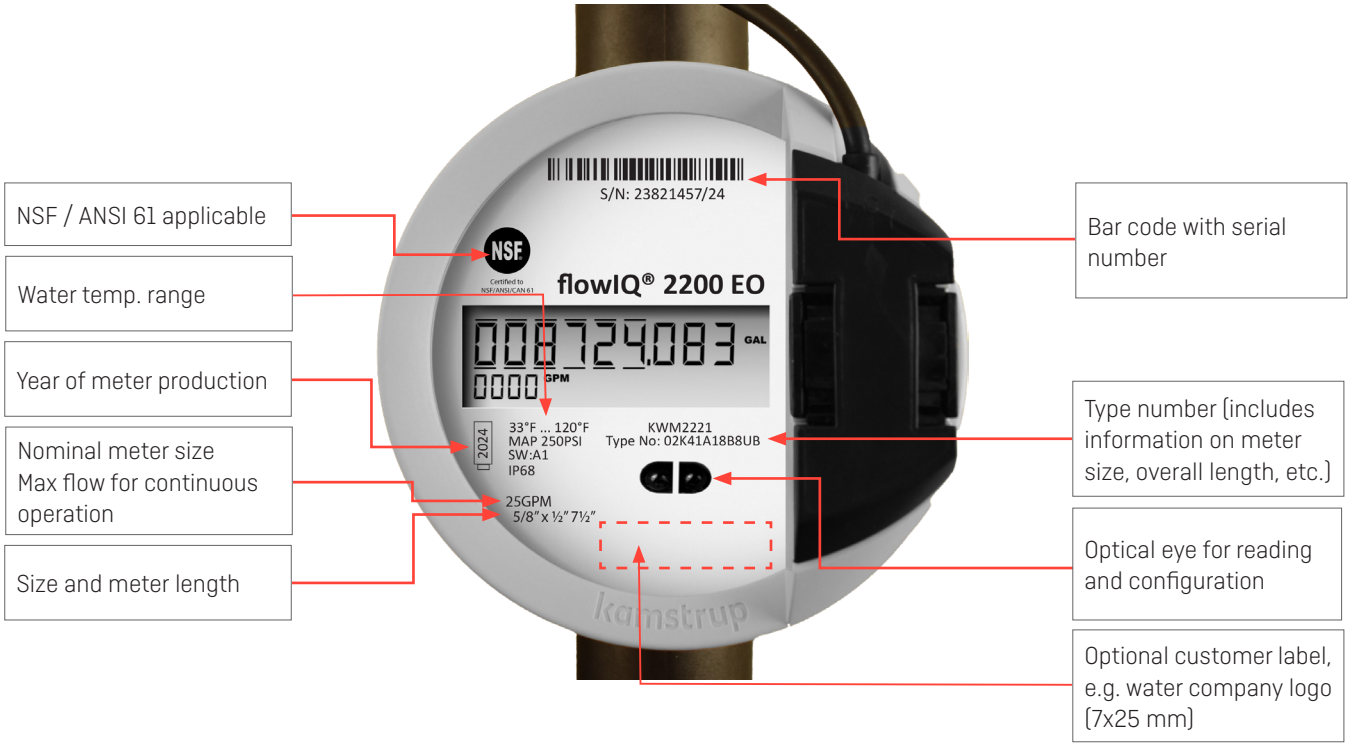
Meter face details

Meter information in permanent laser engraved text

RF top label

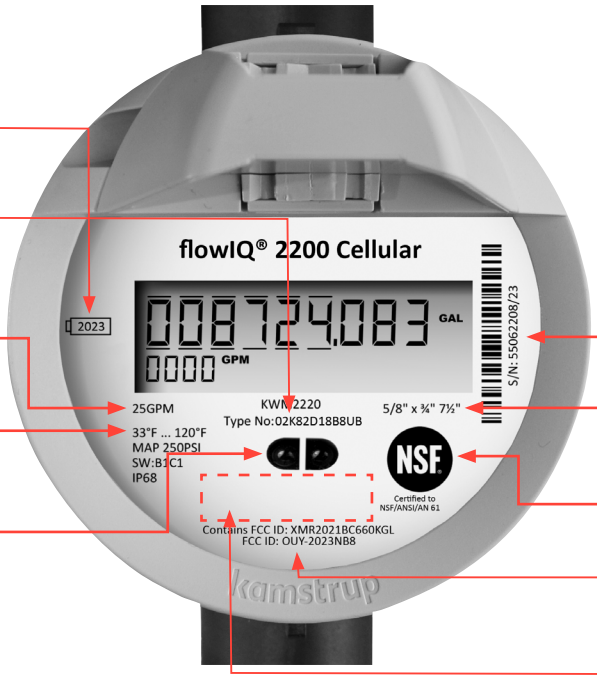


Encoded top label



Meter face details

Cellular top label



- Year of meter production
- Type number (includes information on meter size, over all length, etc.)
- Nominal meter size
  Max flow for continuous operation
- Water temp. range
- Optical eye for reading and configuration
- Bar code with serial number
- Size and meter length
- NSF / ANSI 61 applicable
- IC / FCC identification
- Optional customer label, e.g. water company logo (7x25 mm)

Core features

Water meters placed throughout the network make it possible to gather information that can be of vital importance for an effective water supply, asset management and improved customer service.

Acoustic leakage detection
flowIQ® 2200 water meter introduces integrated acoustic leak detection that allows you to monitor your service connections for possible leaks. Like a fine-meshed network of noise-loggers, all your meters monitor the noise in the distribution lines and service connections to detect possible leaks – 24/7.

Temperature monitoring
flowIQ® 2200 measures water and ambient temperatures respectively. Information on temperatures above or below the configured temperature in the meter will warn the utility of potential frost damage or quality issues. These measurements can be used to monitor the installation and will indicate the water's quality.

Current flow display
Besides the consumed volume, flowIQ® 2200 also shows the current flow in the display. The flow display has been designed with user experience in mind, where it can be advantageous, for example during installation, to be able to see the current consumption. In this context, it is important to stress that the metrological approval of the water meter is related to the volume reading only. Due to the meter's update time, the flow display, in case of rapidly increasing/decreasing flow, may turn out to be slower than the real flow and not a one-to-one correlation between the flow display and the volume growth. In general, one would expect the flow display to stabilize after about half a minute of constant flow and thereafter to be consistent with volume growth.

Consumption above max flow

The meter logs information on consumption above max flow. This information can be used to indicate if the meter size for a given installation is correct.

Consumption histogram
The meter tracks consumptions in different flow intervals for further analysis of the consumption patterns for the specific installation.

Meter modes

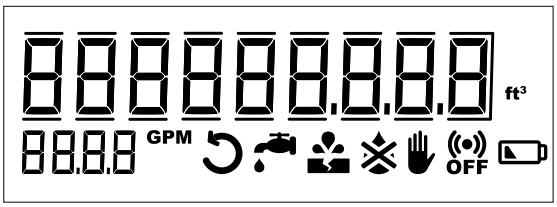
flowIQ® 2200 can operate in two modes, Normal and Verification mode.

Verification mode is only used by authorized laboratories during verification.

flowIQ® 2200 RF and flowIQ® 2200 Cellular	Normal mode	Verification mode
Flow measurement and flow display update	1 s	0.125 s
Volume integration and volume display update	8 s	1 s

flowIQ® 2200 EO	Normal mode	Verification mode
Flow measurement and flow display update	2 s	0.125 s
Volume integration and volume display update	16 s	1 s

Display and info codes



The large display with totalized volume, flow rate and intuitive info codes on flowIQ® 2200 makes it easy for end users to understand their own consumption data.

flowIQ® 2200 includes a large number of intelligent info codes and alarms. An info code indicates a special condition in the meter. If the info code is available in the display, the related symbol is on when it has been activated. If the 'condition' is not active, the sign is OFF. The info codes provide you with the exact knowledge you need to target your efforts within operations optimization, customer information, water loss and tampering. The info codes in the display have the following meaning and function:

Info code	Meaning
	The water in the meter has not been stagnant for one continuous hour during the last 24 hours. This can be a sign of a leaky faucet or toilet cistern or indicate a leakage after the meter.
	The water consumption has been consistently high for half an hour, which indicates a pipe burst.
	Attempt of fraud. The meter is no longer valid for billing.
	The meter is dry. In this case nothing will be measured.
	The water flows through the meter in the wrong direction.
OFF	RADIO OFF flashes. The meter is still in transport mode with the built-in radio transmitter turned off. The transmitter turns on automatically when water runs through the meter for the first time.*
OFF	RADIO OFF lights permanently. The radio is switched off permanently. Can be activated via METERTOOL.*
	The symbol appears when the expected capacity left is 6 months or less.

	Switch off automatically when the condition that activated them no longer exists.
	Disappears when the water has been stagnant for one hour.
	Disappears when the consumption falls to normal level.
	Disappears when the water no longer flows in the wrong direction.
	Disappears when the meter is filled with water.

**RADIO OFF is not available for Encoded Output meters*

Data registers

The water meter has a permanent memory, in which the values of various data loggers are saved. The loggers can be read via the meter's optical eye and from communications protocols

The following registers are logged:

Description	Yearly logger	Monthly logger	Daily logger	Hourly logger
Logger depth	20 years	36 months	460 days	2400 hours
Operating hours	✓	✓	✓	✓
Info codes incl. hour counter	✓	✓	✓	✓
Volume	✓	✓	✓	✓
Volume reverse	✓	✓	✓	✓
Volume net	✓	✓	✓	✓
Acoustic Noise Value Day			✓	
Flow max incl. date	✓	✓		
Flow min incl. date	✓	✓		
Flow max day incl. Timestamp			✓	
Flow min day incl. Timestamp			✓	
Water temp. max	✓	✓	✓	
Water temp. min.	✓	✓	✓	
Water temp. avg.	✓	✓	✓	
Ambient temp. max	✓	✓	✓	
Ambient temp. min.	✓	✓	✓	
Ambient temp. avg.	✓	✓	✓	

Every time the information code changes, date and info codes are logged. Thus, it is possible to data read the latest 50 changes of the information code as well as the date the change was made.

Integrated communication

The meter supports a variety of different communication options depending on meter type. All radio supported meters can be used with Kamstrup's external antenna. Transmission properties and data packages are defined in the configuration number YY-ZZZ. These can be changed with METERTOOL, MeterToolX or READy App through the optical IR interface or with a READy converter.*

**Depending on communication protocol*

RF

Kamstrup RF is based on Wireless M-Bus which is a mature and proven technology for remote reading of smart meters. Wireless M-Bus provides a robust, simple and secure reading of meters and requires a low initial investment, but is flexible enough to be expanded whenever desired. Wireless M-Bus is based on an European standard (EN 13757-4) applicable to devices for reading consumption of water, electricity or energy. The data encryption consists of a 128-bit AES counter mode encryption. Both AMR 912.5, 915 and 918.5 MHz and AMI 450-470 MHz are available.

For additional information about the Kamstrup RF communication module, please refer to the module data sheet, document no.: FILE100003480.

Cellular

NB-IoT (Narrowband Internet of Things) is one of the most popular LPWA (Low-Power, Wide-Area) technologies offered by most mobile network operators worldwide via the established 4G and 5G network infrastructures, meaning that no network ownership is required. Unlike 2G and 3G, which are designed for mobile broadband communication at the expense of high-power consumption, NB-IoT offers affordable data communication for power constrained IoT devices. Most 4G and 5G networks support NB-IoT technology.

For additional information about the Kamstrup Cellular communication module, please refer to the Cellular module data sheet, document no.: FILE100003864.

Encoded Output

The Sensus Encoded Output and TouchRead are implemented based on Sensus specification UI-1203 and UI1204. Encoded Output is compatible with several 3rd party RF network systems. Kamstrup Encoded Output supports Sensus Encoded Output systems and Sensus TouchRead systems. In addition, Neptune ProRead, Neptune E-coder systems and others are supported.

For additional information about the Kamstrup Encoded Output communication module, please refer to the Encoded Output module data sheet, document no.: FILE100003729.

State of the art meter reading system (READy)

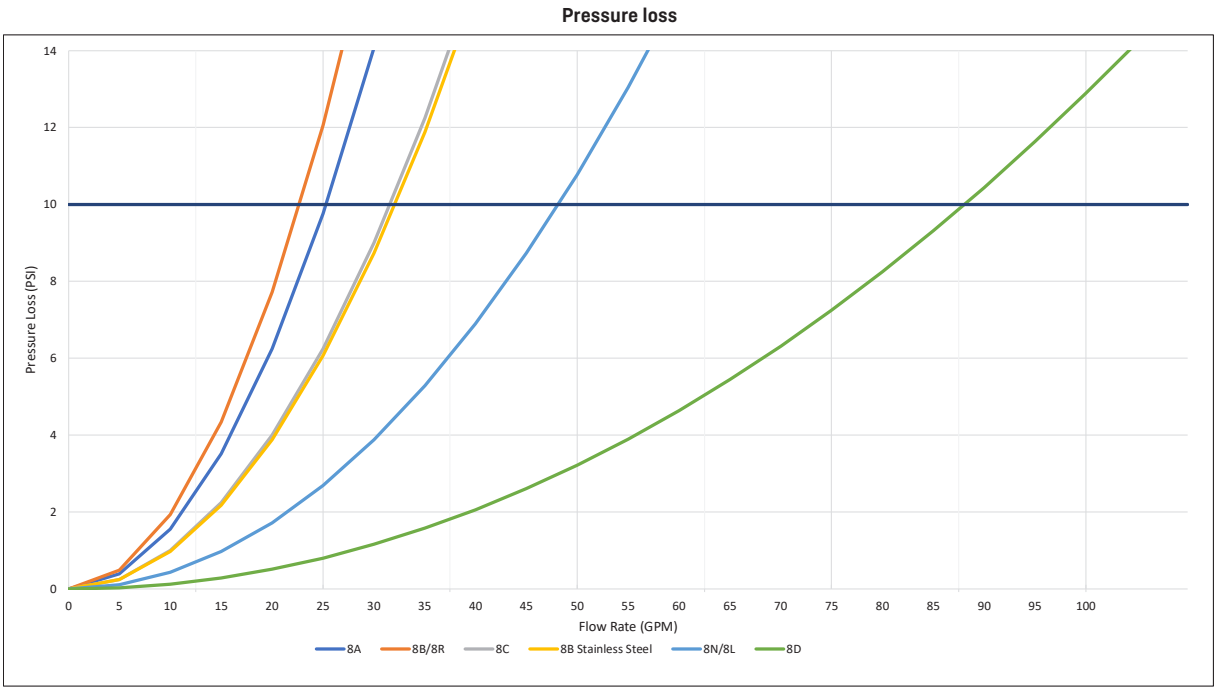
Standardized and open communication

902-928 MHz band RF is an open standard, following EN13757-4:2010, which means that while the flowIQ® 2200 can be configured with or without encryption of the transmitted signal, encryption is required in the United States.

Encryption protects personal data against unauthorized monitoring. Furthermore, the encryption file provides easy access to import meter data for reading programs.

Pressure loss

According to AWWA C715-18 Type I guideline the maximum pressure loss must not exceed 10 PSI (0.69 bar) at SMOC.
The following graph shows pressure loss with respect to flow rate:



See Technical description for Water Meters North America: Document no.: FILE100001331, for more information about pressure loss.

Ordering details

Start your order by stating the type number of the selected model of flowIQ® 2200.

The type number includes information on meter type, meter version, size, lay length, service connection and time zone.

Subsequently the meter configuration, which determines customer-specific requirements such as number of digits in display etc., is selected. The configuration is completed during programming of the final meter.

Accessories are enclosed separately to be mounted by the installer.

Meter type - flowIQ® 2200

Type	□□	□	□□	□	□	□□	□	□□
Meter generation								
Second generation	02							
Mechanical design								
Composite, PPS		K						
Stainless steel		L						
Communication								
RF			02					
Encoded Output			41					
Cellular			82					
Power supply								
D-cell				D				
2 x A-cell				A				
Dynamic range								
AWWA C715-18					1			
Meter size								
⅝" x ½" (25GPM); ¾" NPSM; 7½"						8A		
⅝" x ¾" (25GPM); 1" NPSM; 7½"						8B		
⅝" x ¾" (25 GPM); 1" NPSM; 5.1"						8R		
¾" (32GPM); 1" NPSM; 7½" or 9"; includes 1½" extension						8C		
¾" (35GPM); 1" NPSM; 7½"						8N		
¾" (35GPM); 1" NPSM; 9"						8L		
1" (55GPM); 1¼" NPSM; 10¾"						8D		
Meter type								
Cold water							8	
Reclaimed water							9	
Country code								
North America, FCC and NSF approved								UB
Canada, ISED and NSF approved								CA
Mexico, IFT and NSF approved								MX

The features included in the type number cannot be changed once the meter has been produced.

Configuration - flowIQ® 2200

Config	DDD □□□	JJ □□	LLL □□□	MMMM □□□□	N □	P □	S □	U □	RR □□	CCC □□□	V □	T □	YY □□	ZZZ □□□
Display views														
Standard	810													
GMT offset (time zone)														
USA Eastern (GMT-5)		28												
USA Central (GMT-6)		24												
USA Mountain (GMT-7)		20												
USA Pacific (GMT-8)		16												
Target date (handled as order data)														
Max values averaged over time (1..120 min.)														
2 minutes			002											
Customer label														
Alphanumeric (2060-MMMM)				0000										
Leakage message limit														
OFF					9									
Flow continuously > 0.25% of max flow					2									
Flow continuously > 0.5% of max flow					3									
Flow continuously > 1.0% of max flow					4									
Flow continuously > 2.0% of max flow					5									
Pipe burst limit														
OFF						0								
Flow > 5% of max flow for 30 minutes						1								
Flow > 10% of max flow for 30 minutes						2								
Flow > 20% of max flow for 30 minutes						3								
Ambient Temperature low limit														
OFF							0							
Ambient temperature < 2 °C/ 36 °F							2							
Ambient temperature < 3 °C / 37 °F							3							
Ambient temperature < 6 °C / 43 °F							6							
Ambient Temperature high limit														
OFF								0						
Ambient temperature > 35 °C / 95 °F								3						
Ambient temperature > 45 °C / 113 °F								6						
Data logger profile														
Standard RF									04					
Standard Encoded Output									15					
Standard Cellular									16					

To be continued on next page...

Configuration - flowIQ® 2200

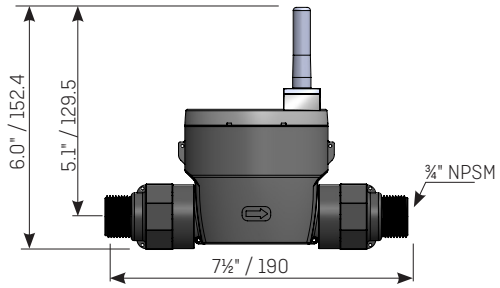
Config	DDD □□□	JJ □□	LLL □□□	MMMM □□□□	N □	P □	S □	U □	RR □□	CCC □□□	V □	T □	YY □□	ZZZ □□□
...continued from previous page														
Display resolution (alphanumeric)														
0000000.00 USgal - 0.01 GPM - Billing in 1,000s (recommended for residential meters)										220				
000000000 ft³ - 0000 GPM - Billing in 1,000s (recommended for district meters)										154				
For additional options please refer to FILE100002712														
Temperature units of measure														
Fahrenheit											1			
Celsius											0			
Encryption level														
Encryption with separately forwarded key												3		
Communication														
For communication protocols please refer to the section "Integrated Communication"														

	DDD	JJ	LLL	MMMM	N	P	S	U	RR	CCC	V	T	YY	ZZZ
Unless otherwise stated in the order, Kamstrup supplies the following:	810	□□	002	0000	4	3	3	3	04	220	1	3	YY	ZZZ

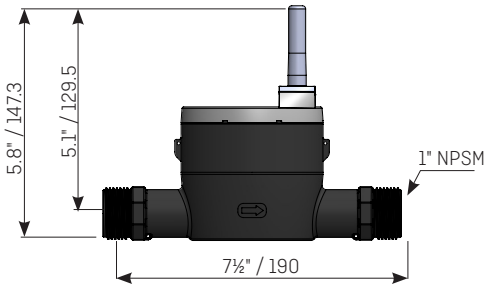
Note: JJ (time zone) and target date are not predefined and has to be chosen in the ordering system.

Dimensional sketches – flowIQ® 2200

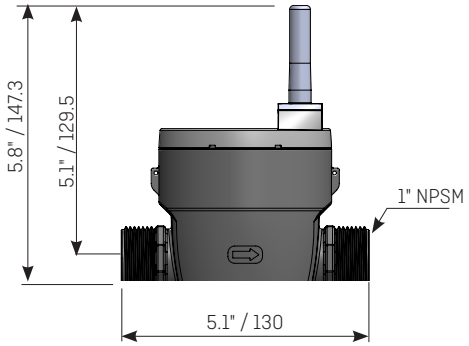
Type: 8A – Size: 25 GPM ⅝" x ½" x 7½"



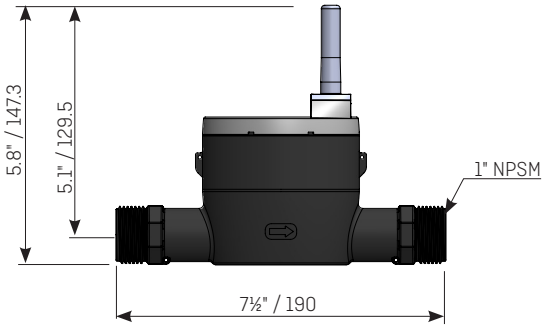
Type: 8B – Size: 25 GPM ⅝" x ¾" x 7½"



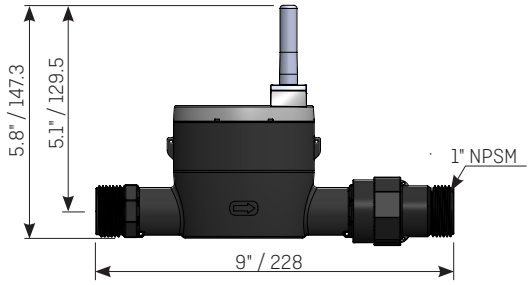
Type: 8R – Size: 25 GPM ⅝" x ¾" x 5.1"



Type: 8C – Size: 32 GPM ¾" x ¾" x 7½"



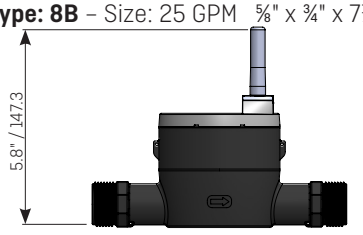
Type: 8C+ – Size: 32 GPM ¾" x ¾" x 9"

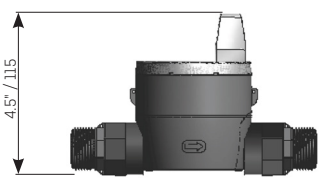


Encoded Output has the exact same dimensions as RF and Cellular – apart from the meter cup height.

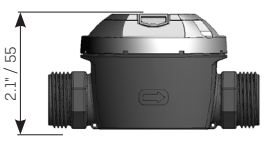
Examples:

Type: 8B – Size: 25 GPM ⅝" x ¾" x 7½"



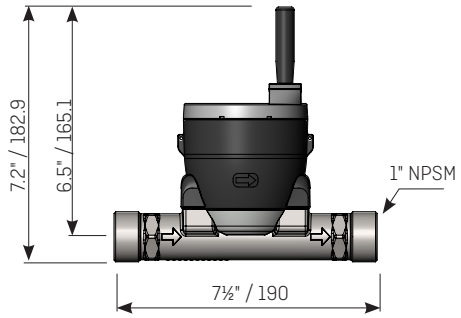


Type: 8R – Size: 25 GPM ⅝" x ¾" x 5.1"

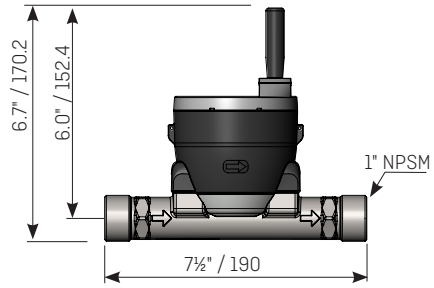


Dimensional sketches – flowIQ® 2200

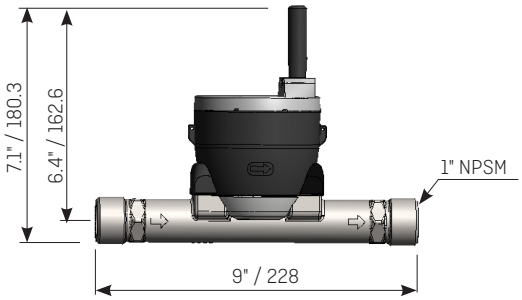
Type: 8B – Size: 25 GPM ⅝" x ¾" x 7½"



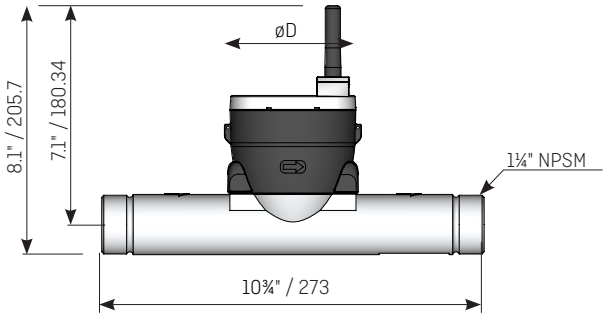
Type: 8N – Size: 35 GPM ¾" x 1" x 7½"



Type: 8L – Size: 35 GPM ¾" x 1" x 9"



Type: 8D – Size: 55 GPM 1" x 1¼ " x 10¾"



NOTE! Same threads for in- and outlet. / Dimensions: Inches/mm

Dimensions

flowIQ® 2200 RF and Cellular

Mechanical design	Meter type	Meter size GPM	NPSM thread	L	H	øD	Weight approx. [Lbs / Kg]
				[Inches / mm]			
Composite	8A	25	¾"	7½" / 190	RF 6.0" / 152.4 Cellular 4.5" / 115	3.6" / 91.4	1.08 / 0.49
Composite	8B	25	1"	7½" / 190	RF 5.8" / 147.3 Cellular 4.5" / 115	3.6" / 91.4	1.01 / 0.46
Composite	8R	25	1"	5.1" / 130	RF 5.8" / 147.3 Cellular 4.5" / 115	3.6" / 91.4	1.01 / 0.46
Composite	8C	32	1"	7½" / 190	RF 5.8" / 147.3 Cellular 4.5" / 115	3.6" / 91.4	1.01 / 0.46
Composite	8C+	32	1"	9" / 228	RF 5.8" / 147.3 Cellular 4.5" / 115	3.6" / 91.4	1.10 / 0.50
Stainless steel	8B	25	1"	7½" / 190	RF 7.2" / 182.9 Cellular 4.5" / 115	3.6" / 91.4	1.01 / 0.46
Stainless steel	8N	35	1"	7½" / 190	RF 6.7" / 170.2 Cellular 4.5" / 115	3.6" / 91.4	2.2 / 1.0
Stainless steel	8L	35	1"	9" / 228	RF 7.1" / 180.3 Cellular 4.5" / 115	3.6" / 91.4	2.5 / 1.13
Stainless steel	8D	55	1¼"	10¾" / 273	RF 8.1" / 205.7 Cellular 4.5" / 115	3.6" / 91.4	4.1 / 1.86

flowIQ® 2200 EO

Mechanical design	Meter type	Meter size GPM	NPSM thread	L	H	øD	Weight approx. [Lbs / Kg]
				[Inches / mm]			
Composite	8A	25	¾"	7½" / 190	2.1" / 55	3.6" / 91.4	0.90 / 0.41
Composite	8B	25	1"	7½" / 190	2.1" / 55	3.6" / 91.4	0.86 / 0.39
Composite	8R	25	1"	5.1" / 130	2.1" / 55	3.6" / 91.4	0.86 / 0.39
Composite	8C	32	1"	7½" / 190	2.1" / 55	3.6" / 91.4	1.01 / 0.46
Composite	8C+	32	1"	9" / 228	2.1" / 55	3.6" / 91.4	0.93 / 0.42
Stainless steel	8B	25	1"	7½" / 190	3.9" / 101	3.6" / 91.4	1.87 / 0.85
Stainless steel	8N	35	1"	7½" / 190	3.9" / 101	3.6" / 91.4	1.87 / 0.85
Stainless steel	8L	35	1"	9" / 228	3.9" / 101	3.6" / 91.4	2.09 / 0.95
Stainless steel	8D	55	1¼"	10¾" / 273	4.2" / 109	3.6" / 91.4	2.82 / 1.28

Accessories

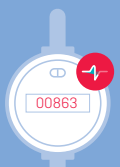
See accessories for water meters, document no.: FILE100000644.
Accessories are ordered separately in CPQ (Kamstrup ordering system) and will be delivered as single parts in the packaging.

Kamstrup Water Metering, LLC
2855 Forsyth Commerce Way, Building 200
Cumming, GA 30040, USA
T: +1 (404) 835-6716
info-us@kamstrup.com
kamstrup.com

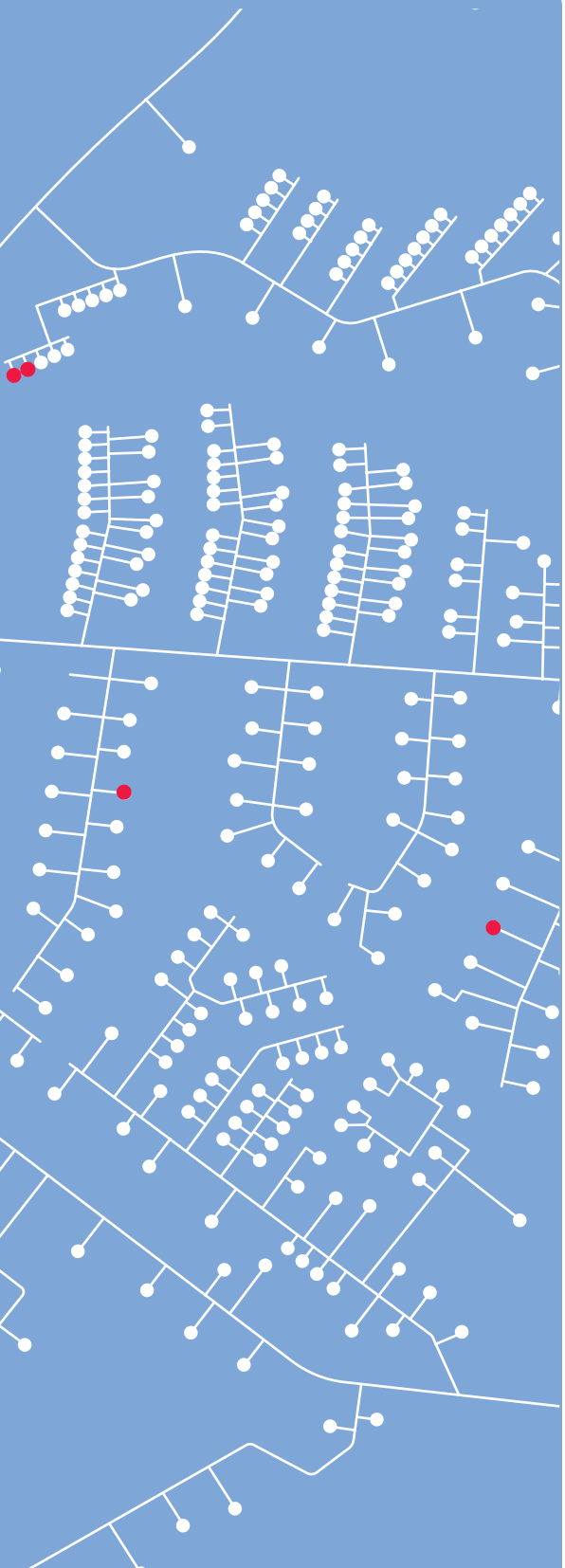
kamstrup

Acoustic Leak Detection

With the flowIQ® 2200, Leak Detector Software and Kamstrup Services



Preserving water resources is everyone's responsibility, but as a water professional, minimizing water loss and Non-Revenue Water is literally your business.



A proactive approach to fighting water loss

Today ...

Leak detection is often a time-consuming inefficient and expensive task as service connections are often on private property. With limited knowledge about what goes on in your distribution network and the state of your service connections, locating leaks can be like finding a needle in a haystack.

And when you cannot identify where the leaks in your distribution network are coming from, how do you optimize and prioritize your daily work? How do you assess the need for maintenance and future investments?

Just imagine ...

Instead, what if you had real-time data and insight that enabled you the ability to identify and verify potential leaks before they developed into bursts? Or, if you could efficiently prioritize your time and target your resources where you knew they would deliver the most value?

With Kamstrup's next generation solution for acoustic leak detection, which detects leaks upstream of the meter, you'll have full transparency of your distribution network, which ultimately allows you to have the tools you need for an efficient and proactive approach to leak detection and fighting water loss.

Less Non-Revenue Water

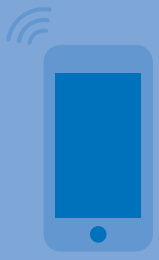
Faster and more efficient leak detection enables you to reduce your level of Non-Revenue Water. By lowering operational costs as you distribute less water, you are more likely to meet legislative and environmental goals and requirements. And, with detailed knowledge on leaks and the overall condition of your network, you can better prioritize - perhaps even postpone - investments in maintenance, renovation or additional capacity.

Acoustic Leak Detection

The solution

flowIQ® 2200

flowIQ® 2200 raises the bar for what you can expect from a residential water meter. You get uncompromising accuracy, state-of-the-art built-in acoustic leak detection, full support for remote reading and a host of other intelligent features in one superior meter that is protected from water ingress and has up to 20 years battery-lifetime.



Remote reading

The flowIQ® 2200 offers full support for both drive-by and network remote reading. This ensures efficient, stable and secure meter reading and significantly reduces the time, costs and administration involved in your data collection.

Leak Detector

The accompanying analytics module, Leak Detector, assists you in locate leaks in service connections and distribution mains based on acoustic noise levels registered by flowIQ® 2200 meter. Leak Detector generates a visual map and provides you with insightful data about your distribution network, allowing you to narrow down areas and focus your efforts.

Service & Support

Implementation is done in close cooperation with Kamstrup to ensure that you get off to the best possible start, and you can choose between different options for how much support and training you need. This ranges from standard set-up and onboarding, to service packages where we monitor your network and provide you with a list of possible leaks for further investigation.

$12
per MP

On average the water lost in service connection has a value of $12 per meter point every year*

**European statistics.*

22%
leaks on service line*

29%
leaks on service mains*

**Results from Kamstrup conducted in 2020*

Raising the bar for residential water meters based on proven ultrasonic technology

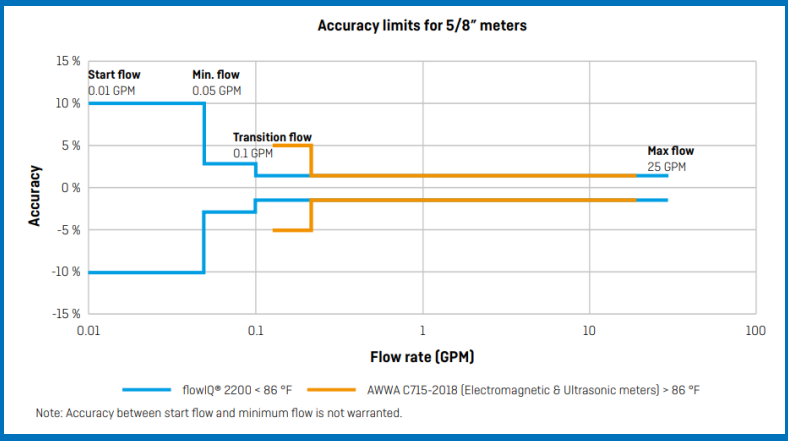
The flowIQ® 2200 smart water meter is the first of its kind with integrated acoustic leak detection. The meter monitors noise patterns that indicate possible leaks in the adjacent pipes and allows you to identify high-risk installations and find leaks in both service connections and distribution mains.

Containing no moving parts, the meter maintains the same high-level of pinpoint accuracy throughout the meter's lifetime. With full support for remote reading, the flowIQ® 2200 offers a number of configurable data packages, both well-known and new intelligent alarms as well as a number of target volumes, volumes, maximum and minimum flows and temperature values.

In addition, the flowIQ® 2200 comes with a new display that shows flow rate and updates every twenty seconds.

Ability to improve customer service

Acting like a fine-meshed network of noise-loggers, the meters listen to the distribution lines and service connections to detect possible leaks. Through early detection of leaks, the flowIQ® 2200 enables you to provide more proactive customer service due to the real-time data that can warn about possible leaks before scale bursts which ultimately can limit the amount of consequential property damage.



flowIQ® 2200 – Technical features

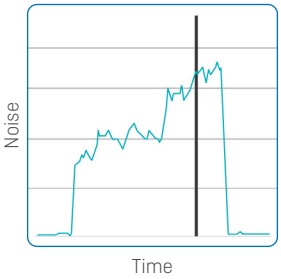
Accuracy and reliability that customers know today, but with add-on functionality of acoustic leak detection.

- Acoustic leak detection
- Flow rate shown in display
- Histogram
- Hourly log
- Remote reading
  - 3 Channel
  - AMR (912.5, 915, 918.5 MHz)
  - AMI (450-470 MHz)
- Intelligent alarms
  - Leak
  - Burst
  - Tamper
  - Dry
  - Reverse Flow
  - Low Battery
  - High ambient temperature
  - Low ambient temperature
  - Overflow
- Flow measurement/display update
  - 1 sec/20 sec (>0.05 GPM)
- Water ingress protection
  - IP68
- Sizes
  - ⅝" x ¾" x 7½" (1" thread, PPS) 25 GPM
  - ⅝" x ¾" x 5.1" (1" thread, PPS) 25 GPM
  - ⅝" x ½" x 7½" (¾" thread, PPS) 25 GPM
  - ¾" x 7½" (1" thread, PPS) 32 GPM
  - ¾" x 9" (1" thread, PPS) 32 GPM (incl. PPS extender)
  - ⅝" x ¾" x 7½" (1" thread, stainless steel) 25 GPM
  - ¾" x 7½" (1" thread, stainless steel) 35 GPM
  - ¾" x 9" (1" thread, stainless steel) 35 PGM
  - 1" x 10¾" (1¼" thread, stainless steel) 55 PGM
- Battery lifetime
  - 20 years
- AWWA C715-18 Compliance

5 examples of leaks found by the flowIQ® 2200

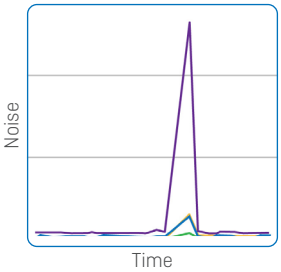
1 Leak turning into a burst on a service connection

When something escalates in the distribution network, it is important to act in time. The example shows a case where a leak was detected the moment the meter was installed, but after a short while this leak quickly rose to be in potential risk of bursting. The leak was discovered before it actually ended up with a burst, saving both money and valuable water.



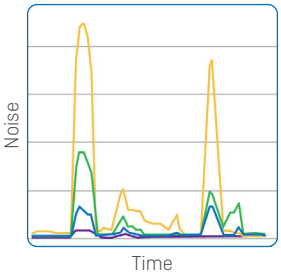
2 Burst inside consumer's home

A sudden spike of high acoustic values indicates that something has deviated - likely either due to extremely high consumption or a burst. The example shows a burst inside a consumer's home, which was also detected by the neighboring meters. This kind of correlation is particularly interesting as it will be able to detect acoustic changes far out in the distribution network.



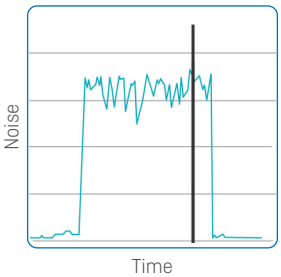
3 Simulated leak on service connections

This example shows a simulated leak on a service connection close to the main pipe. This leak was approximately 2.2 GPM to 3.3 GPM, and therefore a relatively large leak that would have had a costly effect. In the figure there is a clear representation of the spikes in the acoustic noise created by the leak as it was "turned on" which could be detected by several meters.



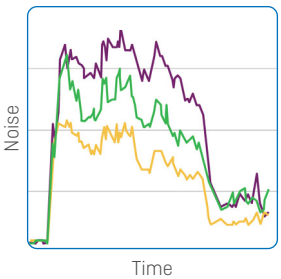
4 Leak on service connection

Leaks on service connections can be a black-box for many utilities, and they often require a lot of time and effort to find. This example shows multiple leaks discovered on service connections and a rapid increase in acoustic values. This spike happened just after the flowIQ® 2200 was installed, and a leak was detected instantly.



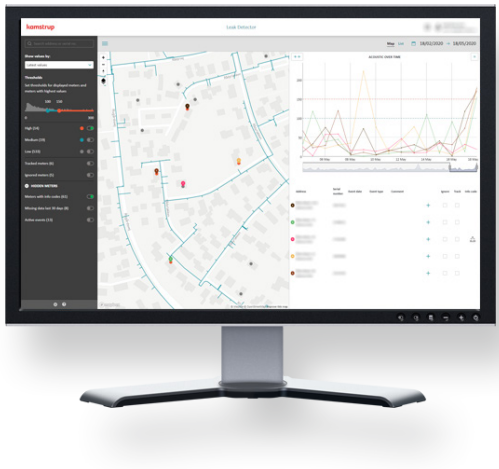
5 Leaking fire hydrant

The flowIQ® 2200 can also register leaking fire hydrants. In the figure, one of the leaky fire hydrants was registered by several meters in close proximity, which can be seen in the similar pattern in the acoustic values. The leak was repaired and the noise fell to a normal level again.



Leak Detector

Easily identify leaks on service connections and distribution mains based on acoustic data noise in a cloud-based platform aimed at analyzing data



Leaks can be caused by a variety of reasons and often difficult to detect. With acoustic noise data from your water meters, leaks can now be detected in an entirely new way. Leak Detector, the analytics module in conjunction with the flowIQ® 2200, enables you to locate leaks based on acoustic noise levels registered by the meter, which means time can be spent fixing leaks instead of searching blindly for them.

Leak Detector provides a map-based overview of your supply area and shows your meters with intuitive color coding representing the noise level registered by each, with graphs visualizing the development over time. The module enables you to easily identify high-risk installations where elevated noise levels indicate possible leaks or bursts.

With faster and more efficient leak detection, you can reduce the cost per identified leak and also reduce Non-Revenue Water. Detailed knowledge about high-risk installations with possible leaks and the overall condition of your network will also enable you to prioritize your daily efforts to when and where they will have the biggest impact.

Identifying high-risk installations
The map in Leak Detector shows your meters with intuitive color coding representing the acoustic noise level in the surrounding pipes registered by each meter.

Filters and customizable thresholds let you control what meters are shown on the map. You can filter out meters with low noise levels, so you can focus on the meters where the risk of a leak is highest. You can also correlate the noise data from one meter with that of others to look for nearby meters with similar noise patterns, which could indicate a possible leak on a distribution main.

Noise data visualized
As you select one or more meters, graphs visualize the registered acoustic noise over time, allowing you to follow the development.

This enables you to take action as soon as the noise reaches a critical level. It also helps you to distinguish meters with a noise level caused by a leak from meters in which the noise is caused by something else, such as a circulation pump.

Increased transparency
Leak Detector provides the ability to increase overall transparency in your supply area.

A reduction in water loss will lower your operational costs. It also will limit your overall costs, and help you to meet environmental and legislative goals and requirements.

Set-up for success

Implementation of a smart meter solution with acoustic leakage detection including flowIQ® 2200 water meters and the Leak Detector analytics module is done in close cooperation with Kamstrup to ensure that you get off to the best possible start. You can choose between different options for how much support and training you need.

A range of services and training offerings are available to support you in fighting Non-Revenue Water. By working in close cooperation with Kamstrup you can choose between different options for services, support and training to scale and customize your needs for not only today, but also the future.

Up & Running Service
With Up & Running Service, you get off to a better – and faster – start utilizing the Leak Detector module by having Kamstrup provide set-up and dedicated guidance on module overview.

Who is this for?
Up & Running Leak Detector is for those who want turnkey help creating the right foundation for maximizing the Leak Detector module.

What's in it for you?
- Minimal time investment and hassle
- Proper foundation for efficient use
- Faster time to use

Leak Monitoring Service
With Leak Monitoring Service, Kamstrup monitors your service connections through the Leak Detector module and then notifies you of potential leaks to give you the information you need to efficiently verify and locate them.

Who is this for?
Leak Monitoring Service is for those who want to improve detection of leaks in service connections by having someone else monitor them.

What's in it for you?
- Efficient use of field time
- High hit rate for beating leaks
- Improved customer service and satisfaction

Pipeline Integration Service
Pipeline Integration for Water Intelligence provides an improved overview of your assets, the ability to pinpoint incidents and a better understanding of potential improvements to pipeline design. With Pipeline Integration Service, your pipeline layout will be integrated into your water intelligence module.

Who is this for?
Pipeline Integration Service is for utilities that want better transparency of their distribution network through the various Water Intelligence modules but want to outsource the integration.

What's in it for you?
- Increased transparency
- Preventive maintenance

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Exhibit 14

Kamstrup Weekly Leak Reports

Examples of leaks found on services

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Green River Valley Water District

Weekly Leak report from 09/07/2025 - 09/13/2025

September 14, 2025

Meters of interest

11 meters

City

Address	Serial number	Start date	End date	Ignore
302 E Dale Heights, Horse Cave, 42749	55641447	09/13/2025	09/14/2025	
506 Old Glasgow Rd, Horse Cave, 42749	55651967	09/13/2025	09/14/2025	
206 College St., Horse Cave, 42749	55641030	09/12/2025	09/13/2025	
206 College St., Horse Cave, 42749	55641030	09/10/2025	09/11/2025	
206 College St., Horse Cave, 42749	55641030	09/07/2025	09/08/2025	
524 Old Glasgow Rd, Horse Cave, 42749	55651968	09/13/2025	09/14/2025	
307 S Dixie Hwy, Horse Cave, 42749	55641078	08/04/2025	09/14/2025	
302 E Dale Heights, Horse Cave, 42749	55641447	09/05/2025	09/12/2025	
882 New Circle, Horse Cave, 42749	55651744	08/18/2025	09/11/2025	
524 Old Glasgow Rd, Horse Cave, 42749	55651968	08/29/2025	09/10/2025	
166 Countryside Dr, Horse Cave, 42749	55652001	08/28/2025	09/09/2025	

Meters in high noise level

4 meters

District

Address	Serial number	High	Average value	Latest reading	Track	Ignore
3056 Sulphur Well Center	55257060	193	174	192	12 GPM	
115 Green St	55641310	116	109	101		
302 E Dale Heights	55641447	309	289	301		
111 E Main St - Thomas Ho	55651868	169	161	175	Service with no meter.	

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Weekly Leak report from 09/14/2025 - 09/20/2025

Green River Valley Water District

September 21, 2025

Meters of interest

4 meters

Address	Serial number	Start date	End date	Ignore
302 E Dale Heights, Horse Cave, 42749	55641447	09/13/2025	09/18/2025	
506 Old Glasgow Rd, Horse Cave, 42749	55651967	09/13/2025	09/16/2025	
524 Old Glasgow Rd, Horse Cave, 42749	55651968	09/13/2025	09/20/2025	
307 S Dixie Hwy, Horse Cave, 42749	55641078	08/04/2025	09/21/2025	

Meters in high noise level

5 meters

Address	Serial number	High	Average value	Latest reading	Track	Ignore
317 Pleasant Valley Ch Rd	55257011	112	106	110		
3056 Sulphur Well Center	55257060	214	187	160		
208 College St	55641025	136	126	125		
115 Green St	55641310	112	107	113		
111 E Main St - Thomas Ho	55651868	183	169	181		

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Weekly Leak report from 10/05/2025 - 10/11/2025

Green River Valley Water District

October 12, 2025

Meters of interest

7 meters

Address	Serial number	Start date	End date	Ignore
506 Old Glasgow Rd, Horse Cave, 42749	55651967	10/11/2025	10/12/2025	
506 Old Glasgow Rd, Horse Cave, 42749	55651967	10/09/2025	10/10/2025	
506 Old Glasgow Rd, Horse Cave, 42749	55651967	10/06/2025	10/08/2025	
307 S Dixie Hwy, Horse Cave, 42749	55641078	10/06/2025	10/12/2025	
307 S Dixie Hwy, Horse Cave, 42749	55641078	10/04/2025	10/05/2025	
111 E Main St - Thomas Ho, Horse Cave, 42749	55651868	10/05/2025	10/06/2025	
524 Old Glasgow Rd, Horse Cave, 42749	55651968	09/29/2025	10/12/2025	

Meters in high noise level

6 meters

Address	Serial number	High	Average value	Latest reading	Track	Ignore
53 Sulphur Well Center Rd	55256869	434	391	440	25 GPM in Creek	
230 Edwin Williams Rd	55257084	193	167	178	3 GPM	
6931 Sul Well Knob Lick R	55536629	421	369	350	20 GPM	
208 College St	55641025	150	115	114		
115 Green St	55641310	118	112	110		
111 E Main St - Thomas Ho	55651868	190	179	174		

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Weekly Leak report from 10/12/2025 - 10/18/2025

Green River Valley Water District

October 19, 2025

Meters of interest

6 meters

Address	Serial number	Start date	End date	Ignore
506 Old Glasgow Rd, Horse Cave, 42749	55651967	10/18/2025	10/19/2025	
506 Old Glasgow Rd, Horse Cave, 42749	55651967	10/14/2025	10/17/2025	
524 Old Glasgow Rd, Horse Cave, 42749	55651968	10/14/2025	10/19/2025	
307 S Dixie Hwy, Horse Cave, 42749	55641078	10/06/2025	10/19/2025	
506 Old Glasgow Rd, Horse Cave, 42749	55651967	10/11/2025	10/13/2025	
524 Old Glasgow Rd, Horse Cave, 42749	55651968	09/29/2025	10/13/2025	

Meters in high noise level

8 meters

Address	Serial number	High	Average value	Latest reading	Track	Ignore
53 Sulphur Well Center Rd	55256869	477	448	452		
105 Ratliff Mitchell Rd	55256887	163	151	144		
3056 Sulphur Well Center	55257060	301	264	290		
6931 Sul Well Knob Lick R	55536629	350	262	219		
208 College St	55641025	136	122	140		
390 N Dixie St	55641090	113	106	109		
115 Green St	55641310	120	113	108		
111 E Main St - Thomas Ho	55651868	186	171	171		

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Weekly Leak report from 10/19/2025 - 10/25/2025

Green River Valley Water District

October 26, 2025

Meters of interest

9 meters

Address	Serial number	Start date	End date	Ignore
226 Countryside Dr, Horse Cave, 42749	55651965	10/25/2025	10/26/2025	
506 Old Glasgow Rd, Horse Cave, 42749	55651967	10/25/2025	10/26/2025	
524 Old Glasgow Rd, Horse Cave, 42749	55651968	10/24/2025	10/26/2025	
307 S Dixie Hwy, Horse Cave, 42749	55641078	10/06/2025	10/26/2025	
402 College, Horse Cave, 42749	55641200	10/19/2025	10/20/2025	
226 Countryside Dr, Horse Cave, 42749	55651965	10/19/2025	10/20/2025	
226 Countryside Dr, Horse Cave, 42749	55651965	10/22/2025	10/24/2025	
506 Old Glasgow Rd, Horse Cave, 42749	55651967	10/18/2025	10/20/2025	
524 Old Glasgow Rd, Horse Cave, 42749	55651968	10/14/2025	10/20/2025	

Meters in high noise level

9 meters

Address	Serial number	High	Average value	Latest reading	Track	Ignore
105 Ratliff Mitchell Rd	55256887	168	146	153		
3056 Sulphur Well Center	55257060	306	278	258		
6931 Sul Well Knob Lick R	55536629	220	213	206		
208 College St	55641025	147	140	149		
390 N Dixie St	55641090	118	110	112		
115 Green St	55641310	118	111	119		
108 Edwards Ave	55641477	227	173	239		
110 E Main	55651735	290	239	224		
111 E Main St - Thomas Ho	55651868	177	169	168		