# A Qualified Infrastructure Improvements Plan

by the

# Powells Valley Water District

# Clay City, KY

presented by
Powells Valley Water District
31 Adams Ridge Road
Clay City, KY

A Qualified Infrastructure Improvements Plan
for the
Powells Valley Water District
Clay Ciy, KY

On December 9, 2024, in its decision in Case No. 2024-00314 the Public Service Commission ordered Powells Valley Water District to file a QIIP on or before April 15, 2025 in Case No. 2024-00314. Powells Valley Water District submits the following QIIP.

The Powells Valley Water District is located in the Mountain foothills of the Eastern Kentucky in the physiographic region know as the Eastern Kentucky Coal Field which is dominated by forested hills and highly dissected by V-shaped valleys. The area is noted to have several thick, resistant sandstones separated by less resistant shales. The manner in which the sandstones weather and are eroded along an escarpment results in sheer cliffs, steep-walled gorges, rock shelters, waterfalls, natural bridges and arches, and some of the most scenic areas in Kentucky. It contains the Red River Gorge and Natural Bridge State Park which are examples of some of the scenic areas along the escarpment. Theses same features are also examples of the difficult terrain encountered for serving water supply to the residents of the area. Recent developments in the area from popular expansion by people desiring the natural beauty of the region has put a strain on the water supply and distribution facilities. The expansions are fueled by the construction of many Bed and Breakfast units and many individual cabins located in the higher elevations and hilltops.

The Powells Valley Water District owns and operates water distribution facilities to serve over 2500 customers. They purchase their water from the Beachfork Water Commission who draws its raw water from the Beachfork Reservoir and the Red River. The purchase agreement allows for 20 million gallons per month and during one peak month the District purchased approximately 15 MG/month. The Powells Valley Water District operates over 350 miles of water mains, 6 water boosting pump stations and 6 water storage tanks. As with any industry, all require maintenance and upkeep. The District has applied for funding for a water system improvements project to improve and expand these facilities including replacement of pump stations and tanks as well as sandblasting and painting tanks, replacing water mains and water meters with leak detection capabilities. A portion of the funds have been committed by State grants and the balance is still pending and requested from USDA Rural Development.

Below is an inventory of the District's water supply facilities:

Water Mains
8" PVC 6 miles
6" PVC 200 miles
4" PVC 70 miles
3" PVC 80 miles
plus various 1" and 3/4" service lines

Pump Stations

| | |
|---|---|
| 2 centrifugal duplex pumps | 300 GPM @ 20 HP |
| 2 centrifugal duplex pumps | 40 GPM @ 5HP |
| 2 centrifugal duplex pumps | 20 GPM @ 10HP |
| 2 centrifugal duplex pumps | 200 GPM @ 15 HP |
| 2 vertical turbine pumps | 200 GPM @ 50 HP |
| 2 centrifugal turbine pumps | 40 GPM @ 5 HP |

Water Storage Tanks

| | | |
|---|---|---|
| Steel ground storage | 100,000 gallons capacity | 720-722 Elevation |
| Steel ground storage – | 100,000 gallons capacity | 800-845 Elevation |
| Steel ground storage | 200,000 gallons capacity | 662-722 Elevation |
| Steel ground storage | 100,000 gallons capacity | 1026-1048 Elevation, |
| Steel ground storage | 200,000 gallons capacity | 1550—1650 Elevation |
| Steel ground storage | 100,000 gallons capacity | 1050-1072 Elevation. |
| Steel ground storage | 80,000 gallons capacity | |

The problematic terrain and subsurface conditions present issues with the integrity of the plastic water mains. The unaccounted for water loss as reported in the latest PSC Annual Report was 23.8%. It is above the general acceptable loss of 15% which is used for all systems regardless of the terrain and soil conditions. Efforts have been ongoing to reduce the loss but the District lacks the manpower, equipment and resources to effectively make a significant impact.

| Year | Reported Water Loss | Purchased Water Cost | Cost of Water Loss > 15% | Total Cost of Water Loss |
|---|---|---|---|---|
| 2020 | 26.6% | $409,205 | $47,857 | $109,665 |
| 2021 | 29.3% | $446,229 | $64,217 | $131,536 |
| 2022 | 27.6% | $408,141 | $51,927 | $113,809 |
| 2023 | 18.7% | $564,537 | $17,660 | $89,747 |
| 2024 | 23.8% | $522,746 | $45,815 | $124,227 |

In a recent PSC rate case and order, the District was granted a water loss reduction sur-charge of $2.28 per customer for a 4 year period. The estimated monthly revenues for the sur-charge based on February 2024 billings are $5715. This planning document utilizes the monthly revenues of $5,715 and calculates an estimated annual revenue of $68,580 for its proposed operations.

The Powells Valley Water District intends to use the water loss surcharge funds to locate, target and eliminate or reduce water loss issues in its system and work in conjunction with the anticipated water system improvements project. The RD Water System Improvements Project includes new meters and setters that will eliminate the old service settings that are not in compliance with the Lead and Copper rule as well as provide for more accurate readings and billings.. They will have the iTron leak detection device and be AMR capable. The iTron sonic sensors can detect leaks on the customer's side of the meter and in the mains on the Powells Valley Water District side of the meter.

# Water Loss Reduction Plan

The water loss reduction plan involves installation of strategically located metering equipment, the purchase and use of leak detection equipment and hiring of a new employee for more intense monitoring, locating and repair of distribution system leaks.

**Metering**

The Powells Valley Water District intends to purchase and install 1" bypass meters located as to isolate small sections of the water system to be able to compare the metered use in the zone to the sales through the service meters to determine a loss factor for various sections of the system. Currently the District has one master meter to compare to the total sales preventing determining where water losses may be occurring. The meters will be AMR with sonic listening devices to further aid in detection and elimination. Installation of the meters requires valves, a valve box, a mega lug pack and PVC knock ons. See Appendix 1 detailing the meters specifications and a cost estimate for purchase and installation.

**Isolation Valves**

In order to install the meters and isolate sections of the mains, gate valves will need to be installed. The isolation gate valves will also help limit the service disruptions when the District is repairing the locate leaks by shutting down smaller sections of the mains. See Appendix 1 detailing the valves and a cost estimate for purchase and installation.

**Leak Detection Equipment**

To locate and eliminate leaks once they are isolated by metering zones, a leak detection sensing system is required. PVWD proposes to utilize the LD-18 Digital Water Leak Detector by Pipehorn Locating Technology. It includes sensors for direct contact with hydrants, pipes, valves and appurtenances as well as surface sensitive piezo electric ceramic sensor with base plate for asphalt or concrete directly over pipes. It has five high-frequency filters, three low-frequency filters and two notch filters to ensure continuous removal of interfering noises from A/C hum, motors, wind, etc. See Appendix 1 detailing the leak detection unit specifications and a cost estimate for purchase.

PVWD is proposing to purchase and use a SubSurface LC-5000 Digital Dual Leak Correlator to improve detection. The logger mode includes a timer for delayed short-term or overnight deployment, so you can choose the best time to run your tests. In addition to enhanced correlations, the high-sensitivity sensors have a distance resolution of 8" in high-precision mode. The correlator has a GPS locator. See Appendix 1 detailing the leak detection equipment and a cost estimate for purchase.

**Additional Maintenance Personnel**

The work load on existing employees does not allow for the appropriate more intensive time allocated for leak detection and repairs. PVWD proposes to hire a new employee to provide the service. PVWD estimates it will take 75% of the new employee's time dedicated to leak detection. See Appendix 1 calculations for the annual expense for a new employee.

**Utility Truck**
In order to provide for additional help performing leak detection, the new employee will need a truck for transportation and storage of the leak detection equipment. PVWD proposes purchase of a new Truck. See Appendix 1 for a cost estimate of a new Double Cab 1500 Silverado truck.

The following is a table of proposed projects and scheduling of same:

# A Qualified Infrastructure Improvements Plan
## Projects and Schedule

| Year | Item | Purpose | Quantity | Unit Price | Cost |
|---|---|---|---|---|---|
| Annual Water Loss Surcharge Revenues | | | | | $68,580 |
| Year 1 | Install 1" bypass meters | Install 1" bypass meters at stratigic locations to isolate the system into zones. Materials include meters, setters, meter boxes, gate valves, a mega lug pack and PVC knock ons. | 10 | $1,887 | $18,870 |
| | install isolation valves | In order to install the meters and isolate sections of the mains, gate valves will need to be installed. The isolation gate valves will also help limit the service disruptions when the District is repairing the located leaks by shutting down smaller sections of the mains. | 3 | $2,508 | $7,524 |
| | purchase new truck | In order to provide for additional help performing leak detection, the new employee will need a truck for transportation and storage of the leak detection equipment. PVWD proposes purchase of a new Truck. | 1 | $41,398 | $41,398 |
| | Total Expenditures Year 1 | | | | $67,792 |
| | Balance | | | | $788 |

# A Qualified Infrastructure Improvements Plan
## Projects and Schedule

| Year | Item | Purpose | Quantity | Unit Price | Cost |
|---|---|---|---|---|---|
| Annual Water Loss Surcharge Revenues | | | | | $68,580 |
| Carry Over Balance | | | | | $788 |
| Total Funds with Carryover | | | | | $69,368 |
| Year 2 | hire emplyee (75% water loss) | The work load on existing employees does not allow for the appropriate more intensive time allocated for leak detection and repairs. PVWD proposes to hire a new employee to provide the service. PVWD estimates it will take 75% of the new employee's time dedicated to leak detection. See Appendix 1 for calculation of cost. | | Lump Sum | $40,716 |
| | Install 1" bypass meters | See Year 1 meterspurpose | 10 | $1,887 | $18,870 |
| | purchase digital leak detector | To locate and eliminate leaks once they are isolated by metering zones, a leak detection sensing system is required. PVWD proposes to utilize the LD-18 Digital Water Leak Detector and SubSurface LC-5000 Digital Dual Leak Correlator | 1 | $6,900 | $6,900 |
| | Total Expenditures Year 2 | | | | $66,486 |
| | Balance | | | | $2,882 |

# A Qualified Infrastructure Improvements Plan
## Projects and Schedule

| Year | Item | Purpose | Quantity | Unit Price | Cost |
|---|---|---|---|---|---|
| Annual Water Loss Surcharge Revenues | | | | | $68,580 |
| Carry Over Balance | | | | | $2,882 |
| Total Funds with Carryover | | | | | $71,462 |
| Year 3 | New emplyee (75% water loss) | The work load on existing employees does not allow for the appropriate more intensive time allocated for leak detection and repairs. PVWD proposes to hire a new employee to provide the service. PVWD estimates it will take 75% of the new employee's time dedicated to leak detection. | | | $40,716 |
| | Install 1" bypass meters | See Year 1 meters purpose | 10 | $1,887 | $18,870 |
| | install isolation valves | See Year 1 valves purpose | 4 | $2,508 | $10,032 |
| | Total Expenditures Year3 | | | | $69,618 |
| | Balance | | | | $1,844 |

# A Qualified Infrastructure Improvements Plan
## Projects and Schedule

| Year | Item | Purpose | Quantity | Unit Price | Cost |
|---|---|---|---|---|---|
| Annual Water Loss Surcharge Revenues | | | | | $68,580 |
| Carry Over Balance | | | | | $1,844 |
| Total Funds with Carryover | | | | | $70,424 |
| Year 4 | New emplyee (75% water loss) | See year 3 purpose | | | $40,716 |
| | Subsurface Dual Leak Correlator | PVWD is proposing to purchase and use a SubSurface LC-5000 Digital Dual Leak Correlator to improve detection, provide for delayed short-term or overnight deployment, enhanced correlations with high-sensitivity sensors with resolution of 8" in high-precision mode. | | | $25,500 |
| | Total Expenditures Year 4 | | | | $66,216 |
| | Balance | | | | $4,208 |

See Appendix 1 for details and costs

# Appendix 1

Details, Cost Estimates and Justifications for:
1" Bypass Meters
Isolation Valves
Leak Detection Truck
Additional Employee
Digital Leak Detector
Dual Leak Correlator

# 1" Bypass Meters

Gmail

Randy Ledford <randy.ledford@pvwd.org>

# 1" BY-PASS METER PROJECT

1 message

**Skip Marion** <Skip.Marion@cpspipe.com>
To: "Randy.Ledford@pvwd.org" <Randy.Ledford@pvwd.org>

Tue, Mar 4, 2025 at 10:43 AM

| | | |
|---|---|---|
| 2 | 6" X 1" SADDLE | 79.00 EA |
| 2 | 1" CORP STOP | 84.00 EA |
| 4 | 1" SS INSERT | 2.60 EA |
| 1 | 1" BDL VALVE SETTER | 493.00 EA |
| 1 | 18" X 24" METER BOX | 52.72 EA |
| 1 | 18" H/D FLAT LID W/TR | 79.00 EA |

| | |
|---|---|
| SUB TOTAL FOR ONE SET | $ 985.12 |
| 6% TAX | $ 58.11 |
| TOTAL | $ 1044.23 |

**Skip Marion**
Outside Sales

T: (606) 298-0333
M: (859) 353-1333
Skip.Marion@cpspipe.com - www.consolidatedpipe.com
907 Honey Branch Indl Park, Debord, KY 41214

Contractor

Labor $550.00

# Bid Proposal for POWELL VALLEY WATER DISTRICT 1" METERS

**POWELL VALLEY WATER DISTRICT**
**Job Location:** Clay City, KY
**Bid Date:** 03/06/2025
**Core & Main Bid #:** 4060718

**Core & Main**
2141 Christian Rd
Lexington, KY 40509
**Phone:** 8592533464
**Fax:** 8592530848

| Seq# | Qty | Part Number | Description | Units | Price | Ext Price |
|---|---|---|---|---|---|---|
| | | | | | | |
| 20 | 6 | 4310G02L02D18D8UB | 1 FLOWIQ 2200 USG ALD 10-3/4"LL SS BODY 02-L-02-D-1-8D-8UB | EA | 351.89 | 2,111.34 |
| | | | | | **Sub Total** | **2,111.34** |
| | | | | | **Tax** | 0.00 |
| | | | | | **Total** | **2,111.34** |

**Branch Terms:**
This quote represents our interpretation of the plans & specifications and is offered as an aid to bidding only.
Customers should verify all materials & quantities prior to bidding or ordering.
Unless otherwise noted, PVC pipe prices are based on availability at the time of shipping.
HDPE prices are good for 10 days from quote date and price per foot might be revised if quantity changes.
Pricing is subject to change if the scope of the quote is altered, at the discretion of the branch.
Special order material or other non-stock items may be non-refundable or subject to a cancellation/restock charge.
Special order non-stock items must be shipped to customer within 30 days of receipt by Core & Main.

**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/TandC/

**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.**

# Isolation Valves

Randy Ledford <randy.ledford@pvwd.org>

# FW: 1" BY-PASS METER PROJECT AND 6" CUT IN GATE VALVE

1 message

**Skip Marion** <Skip.Marion@cpspipe.com>
To: "randy.ledford@pvwd.org" <randy.ledford@pvwd.org>

Fri, Mar 7, 2025 at 9:56 AM

| | | |
|---|---|---|
| 1 | 6" MJ GATE VALVE | 1117.00 EA |
| 1 | VALVE BOX | 97.00 EA |
| 2 | 6" MEGA LUG PACK | 75.00 EA |
| 2 | 6" PVC KNOCK ON | 124.00 EA |

| | |
|---|---|
| SUB TOTAL | 1612.00 |
| 6% TAX | ~~96.72~~ |
| TOTAL | ~~1708.72~~ |

Contractor Labor
$ 800.00


**Skip Marion**
Outside Sales

T: (606) 298-0333
M: (859) 353-1333
Skip.Marion@cpspipe.com - www.consoli
907 Honey Branch Indl Park, Debord, KY 41214


**From:** Randy Ledford <randy.ledford@pvwd.org>
**Sent:** Thursday, March 6, 2025 12:41 PM
**To:** Skip Marion <Skip.Marion@cpspipe.com>
**Subject:** Re: 1" BY-PASS METER PROJECT

**[EXTERNAL EMAIL]**

Thank You sir. Will you do me another quote with a 6"gate valve and 2 - 6" knock ons with a valve pipe stand?

On Tue, Mar 4, 2025 at 10:43 AM Skip Marion <Skip.Marion@cpspipe.com> wrote:

| | | |
|---|---|---|
| 2 | 6" X 1" SADDLE | 79.00 EA |
| 2 | 1" CORP STOP | 84.00 EA |
| 4 | 1" SS INSERT | 2.60 EA |
| 1 | 1" BDL VALVE SETTER | 493.00 EA |
| 1 | 18" X 24" METER BOX | 52.72 EA |
| 1 | 18" H/D FLAT LID W/TR | 79.00 EA |

| | |
|---|---|
| SUB TOTAL FOR ONE SET | $ 985.12 |
| 6% TAX | $ 59.11 |
| TOTAL | $ 1044.23 |

**Skip Marion**
Outside Sales

Leak Detection Truck

Order Workbench

MANN CHEVROLET LLC
BU: US | BAC: 259274 | BFC: 1

# Order Details - Stored Configuration <DRZN3X>

Customer Dealer

## BAC Information

**Contact Name**
**Contact Phone**

DAN | Stock No. | Update

Double Cab V8

## Model/Order Information

| | |
|---|---|
| **Model Year** | 2025 |
| **Division** | CHEVROLET |
| **Distribution Entity** | FLT Fleet |
| **Order Type** | FNR - Fleet Commercial |
| **Allocation Group** | CLDDBL |
| **Model** | CK10753 - 1500 Silverado: 4WD Standard Box Double Cab |
| **TPW** | |
| **Requested TPW** | 9/2/24 |
| **VIN** | |
| **Request ID** | DRZN3X |
| **MSRP w/DFC** | $47,190.00 |

Your Price
$41,398.00

## Vehicle Specifications

| | |
|---|---|
| **PEG** | 1WT - Work Truck Preferred Equipment Group |
| **Color** | GAZ - Summit White |
| **Trim** | H1T - 1WT/1FL-Cloth, Jet Black, Interior Trim |
| **Engine** | L84 - Engine: 5.3L, EcoTec3 V-8, DI, Dynamic Fuel Mgt, V V T |
| **Transmission** | MHT - 10-Speed Automatic |
| **Emissions** | FE9 - Federal Emissions |

**Ordered Options**

1WT - Work Truck Preferred Equipment Group
AQQ - Keyless Remote Entry
AZ3 - Seats: Front 40/20/40 Split-Bench, Full Feature
BG9 - Floor Covering: Rubberized Vinyl, Black
C5W - GVW Rating 7000 Lbs
E63 - Durabed
FE9 - Federal Emissions
GAZ - Summit White
GU5 - Rear Axle: 3.23 Ratio
H1T - 1WT/1FL-Cloth, Jet Black, Interior Trim
IOR - Chevrolet Infotainment, 7" Color Screen
K34 - Cruise Control
KC4 - Cooler, Engine Oil
KNP - Transmission Cooling System
KW7 - Alternator, 170 AMP
L84 - Engine: 5.3L, EcoTec3 V-8, DI, Dynamic Fuel Mgt, V V T

Additional Employee

Estimate of Cost of New Employee

| | | |
|---|---|---|
| Annual Wages | $18/hour x 2080 Hours | $17440 |
| Fringe Benefits | annual wages x 45% | $16,848 |
| Estimated Annual Cost of 1 new Employee | | $54,288 |

# Digital Leak Detector





+ Hover to zoom | Click to enlarge

# SubSurface LD-18 Digital Water Leak Detector

| Item number | 24892 |
|---|---|
| Brand Name | Subsurface Locators & Leak Detection |
| Catalog Page | 923 |
| Net weight | 20 |
| Condition | New |

$6,900.00 price per each excl. tax

In Stock

– 1 +

Add to cart ›

Add to Order Template

Add to wish list

**Need Help? Call 800-548-1234**

## Product Details

- **Automatic noise reduction blocks out intermittent sounds**
- **5 high-frequency filters & 3 low-frequency filters for removing continuous interferences**
- **Graphic backlit display—store and view up to 250 leak records**

Conduct leak surveys at hydrants valves and meters as well as ground miking on asphalt or concrete directly over pipes. The SubSurface LD-18 digital leak detector comes standard with a highly sensitive piezo electric ceramic sensor with base plate and magnet base.

The all-digital amplifier lets you easily hone in on leak sounds, while automatic noise reduction clears intermittent sounds like footsteps, voices and vehicle traffic. Five high-frequency filters, three low-frequency filters (plus off) and two notch filters (plus off) ensure continuous removal of interfering noises from A/C hum, motors, wind, etc.

Store up to 250 sound records and view them easily via the graphic backlit display. View sound levels at different locations over the pipe as well as bar graphs and numeric displays of loudness levels. To find the location of the loudest leak sound simply save leak sound levels at 5 to 10 spots over the pipe and graph them to see which spot is loudest. It's that easy.

Easily transfer stored data from the leak detector to your computer for record keeping and further analysis. Simply upload the included PC software onto your computer and transfer data using the USB cable.

Includes: amplifier with padded case and 40" belt ground microphone and hand switch magnetic base nut driver aviation-grade stereo headphones PC software USB cable and heavy-duty ABS plastic carrying case.

Note: For applications requiring a direct connection to deep pipes or valves an optional sensor with strong magnet and 9.75' cable is available as special order. Contact USABlueBook for more information.

## Tech Specs:

Bandwidth: 30 to 2,200 Hz

Filters: 10

Filter types: 5 high, 3 low and 2 notch

Output indicators:

– Audio: high-performance headphones

– Visual: digital LCD display

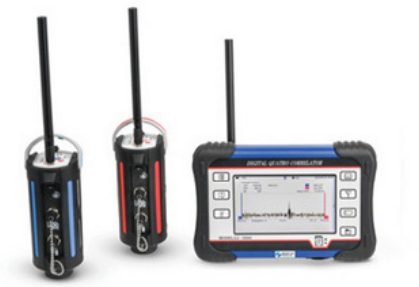
Battery test: digital

Battery type: four C batteries (included)

Battery life: 24 hours (continuous use)

Dimensions (amplifier/display): 6.4"W x 3.0"H x 5.7"D

Dual Leak Correlator



+ Hover to zoom | Click to enlarge

# SubSurface LC-5000 Digital Dual Leak Correlator

| Item number | 24940 |
|---|---|
| Brand Name | Subsurface Locators & Leak Detection |
| Catalog Page | 922 |
| Net weight | 44 |
| Condition | New |

$25,500.00 price per each excl. tax

**Call for availability**

– 1 +

Add to cart ›

Add to Order Template

Add to wish list

**Need Help? Call 800-548-1234**

## Product Details

- **Main processor unit weighs less than 5 lbs!**
- **Includes 2 Pre-Amplifier Sensors**

SubSurface has made leak detection easier than ever with the LC-5000 correlator. This compact, lightweight system is easily set up and operated as a real-time correlator or as a correlating data logger system. With the wireless sensor integrated into the pre-amp, you have many options for real-time, short-term or overnight logger deployment.

The LC-5000 features simple three-step programing and GPS. Manipulate the data and input from the processor screen—there's no need for additional set-ups for secondary verifications, which saves you time. Logger mode offers a timer for delayed short-term or overnight deployment, so you can choose the best time to run your tests. In addition to enhanced correlations, the high-sensitivity sensors have a distance resolution of 8" in high-precision mode.

The LC-5000 also has programmable frequencies specifically for PVC—there's no need to purchase separate low-frequency sensors to run correlations on PVC pipes. Use the included 3-ft long antenna extenders for deep valve deployments.

If you don't need relay mode or the distance that the four-sensor package offers, the LC-5000 Dual correlator is a robust, budget-friendly option. Use this economical model for straight line-of-sight shoots. If your needs change, you can add additional sensors at any time.

Includes: two wireless integrated pre-amplifier sensors, two 3'L antenna extenders, battery charging cables, software (available for download), manual, and heavy-duty carrying case. 5-year warranty.

## Documents

› Manual