

Tina Kotek, Governor

September 17, 2024

Emilio Pereira
emilio@willamettehazelnuts.com

Willamette Hazelnut
14975 NE Tangen Rd
Newberg, OR 97132

Letter sent via email only.

**Re: 2 Wells, 11,000-Gallon Tank, & Residual Maintenance ([PR#90-2024](#))
Willamette Hazelnut, Inc. (PWS ID# [95718](#))
Conditional Approval**

Dear Mr. Pereira,

Thank you for your submittal to the Oregon Health Authority's Drinking Water Services (DWS) of plan review information for the water system (described below) for Willamette Hazelnut, Inc. which is licensed and regulated by the Oregon Dept. of Agriculture. On August 19, 2024 our office received a plan review fee of \$825 to accompany well logs and photos previously submitted in various emails.

The project includes a review of:

- Pre-existing facilities consisting of:
 - Two wells (Exempt Use – no water right needed)
 - Two pressure tanks, and
 - One 11,000-gallon steel ground-level tank with new modifications to the inlet/outlet configuration.
- New treatment consisting of sodium hypochlorite injection for residual maintenance only (not for primary 4-log viral disinfection), which is being added to address persistent total coliform bacteria in distribution system sampling completed in the fall of 2023 and spring of 2024.
- A new system Capacity Assessment is also being completed in conjunction with this plan review. The system was previously operating for many years, but was activated as a new transient non-community water system on September 6, 2023 as shown on our website at: <https://yourwater.oregon.gov/inventory.php?pwsno=95718>.

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Under OAR 333-061-0060(1)(b), submittals must be prepared by a Professional Engineer registered in Oregon, unless exempted by DWS. An exemption was granted for this submittal. **Note that by utilizing this exemption, the water system takes full responsibility for the design of the project.**

Based upon the submitted information, **well #1 (SRC-AA) was determined by our geologist, Tom Pattee, to be adequately constructed into a confined aquifer.**

The construction of well #2 (SRC-AB) called the “Davis Well” could not be verified and no well log could be found. Therefore, the Davis Well cannot be approved as a drinking water source without further verification of its construction (e.g., verify the presence of annular grout seal, casing depth, static water level, etc.). A well driller may be able to assist with this verification. If the well’s construction cannot be verified, it may ultimately have to be reconstructed or physically disconnected from the rest of the system. **If the Davis well remains connected, monthly source assessment coliform monitoring should begin immediately due to the proximity of a pond within 240-ft of the well.**

The Davis well (or any other water well) will need to be **constructed or reconstructed in accordance with Oregon Water Resources Department (OWRD) general standards** for the construction and maintenance of water wells in Oregon as prescribed in OAR chapter 690, divisions 200 through 220, viewable online at:
<https://www.oregon.gov/owrd/Documents/Ch%20690%20Div%20200;%2020230206.pdf> ;

Notwithstanding the Davis Well, the remainder of the project is granted Conditional Approval, which means that for Final Approval, the following 21 conditions will need to be met:

Note that the following conditions are required under our construction standards as indicated in the Oregon Administrative Rules (OAR) cited below as found under [OAR 333-061-0050\(1\)](#) - general requirements, [-0050\(2\)\(a\)](#) – wells, [-0050\(6\)\(b\)](#), [-0050\(5\)](#) disinfectant residual maintenance, [-0050\(6\)\(a\)](#) – storage tanks, and [-0050\(6\)\(b\)](#) – pressure tanks:

OAR 333-061-0050(1) – General:

1. **Materials** in contact with well water are designed for potable water service and **meet NSF Standard 61**.
2. **Chemicals** such as sodium hypochlorite shall be desinged for potable water use and **meet NSF Standard 60**

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OAR 333-061-0050(2)(a) – Wells:

3. **The area within 100 feet of the well shall be owned by the water supplier, or a perpetual restrictive easement shall be obtained** by the water supplier for all land (with the exception of public rights-of-way) within 100 feet of the well. The easement shall be recorded with the county in which the well is located and with the recorded deed to the property. A certified true copy shall be filed with the Authority.
4. The area in the vicinity of a well, particularly uphill or upstream, shall be **surveyed or otherwise evaluated to determine any existing or potential hazards**;
5. **The following sanitary hazards are not allowed within 100 feet of a well** which serves a public water system unless waived by the Authority:

Any existing or proposed pit privy, subsurface sewage disposal drain field; cesspool; solid waste disposal site; pressure sewer line; buried fuel storage tank; animal yard, feedlot or animal waste storage; untreated storm water or gray water disposal; chemical (including solvents, pesticides and fertilizers) storage, usage or application; fuel transfer or storage; mineral resource extraction, vehicle or machinery maintenance or long-term storage; junk/auto/scrap yard; cemetery; unapproved well; well that has not been properly abandoned or of unknown or suspect construction; source of pathogenic organisms or any other similar public health hazards.

No gravity sewer line or septic tank shall be permitted within 50 feet of a well which serves a public water system. Clearances greater than indicated above shall be provided when it is determined by the Authority that the aquifer sensitivity and degree of hazard require a greater degree of protection.

Above-ground fuel storage tanks provided for emergency water pumping equipment may be exempted from this requirement by the Authority provided that a secondary containment system is in place that will accommodate 110 percent of the fuel tank storage.

6. **A raw water sampling taps** shall be provided on the pump discharge line of the well, prior to treatment or storage tanks and as close to the wellhead as possible.
7. **A sample tap after treatment** and any tanks is also required should continuous chlorination be added with the final design.
8. **Test results taken of the well's raw water** (prior to treatment or storage tank) for **nitrate, arsenic, and coliform bacteria**.

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9. The pump installation, piping arrangements, other appurtenances, and well house details at wells which serve as the source of supply for a public water system, shall meet the following requirements:
- a) Where submersible pumps are installed, the top of the casing shall be provided with a **watertight sanitary seal**;
 - b) **A casing vent** shall be provided and shall be fitted with a screened return bend (**wells equipped with a pitless adapter may have a screened pitless adapter cap**);
 - c) Piping arrangements shall include **provisions for pumping the total flow from the well to waste**;
 - d) A method of determining the total output of the well (e.g., a **flow meter**) shall be provided. This requirement may be waived by the Authority at confined wells which serve as the source of supply for transient non-community water systems);
 - e) A **reinforced concrete slab** shall be poured around the well casing at ground surface such that the top of the well casing extends at least 12 inches above the slab and where the slab is sloped to drain away from the casing and the ground surface around the well slab graded so that drainage is away from the well (**wells equipped with a pitless adapter do not need a concrete slab**);
 - f) Provisions shall be made for protecting pump controls and other above-ground appurtenances at the well head. Where a **wellhouse** is installed for this purpose, it shall meet applicable building codes and shall be insulated, heated and provided with lights, except that where the wellhouse consists of a small removable box-like structure the requirement for lights may be waived by the Authority;
 - g) The wellhouse shall be constructed so that the well pump can be removed (**wells equipped with pitless adapters do not need to be enclosed in a well house**).

OAR 333-061-0050(5) – Facilities for Residual Disinfectant Maintenance:

10. The **disinfectant is applied in proportion to water flow**;
11. The disinfectant shall be **capable of leaving a residual** in the water which can be readily measured and which continues to serve as an active disinfectant;
12. The disinfectant shall be **applied at every entry point** so a residual is present throughout the distribution system;

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13. A DPD type **chlorine test kit** is available for measuring the free chlorine residual (these test kits are typically advertised as “EPA Compliant”).
14. Sodium hypochlorite (**chlorine**) **meets NSF Standard 60** for potable use.
15. **Chlorine pump and solution tank meet NSF Standard 61** for potable use.

OAR 333-061-0050(6)(a) – Storage tanks

16. The storage tank is capable of withstanding external and internal forces which may act upon it and constructed in conformance with the AWWA Standards D100 and D103;
17. The tank is constructed on undisturbed soil, bedrock or other stable foundation material capable of supporting the structure when full;
18. If the interior surface of the water storage tank has a protective coating, the coating shall meet the requirements of NSF Standard 61: Drinking Water System Components - Health Effects or equivalent.
19. The tank is equipped with:
 - a) a **watertight roof**;
 - b) An **access hatch** to permit entry to the interior for cleaning and maintenance. When the access hatch is on the roof of the tank there shall be a curbing around the opening and a **lockable watertight cover that overlaps the curbing**;
 - c) An **internal ladder** of durable material if the only hatch is on the roof;
 - d) **One or more screened vents** shall be provided above the highest water level to permit circulation of air above the water in the tank and exclude insects, birds, and rodents;
 - e) **A drain** shall be provided at the lowest point in the bottom of the tank;
 - f) **An overflow** of sufficient diameter to handle the maximum flow into the tank shall be provided at or near the top of the sidewall.
 - g) The **outlet ends of the drain and overflow shall be fitted with angle-flap valves** or equivalent protection and shall discharge to a watercourse or storm drain capable of accommodating the flow with a vertical separation between the bottom of the pipe and top of the receiving body or structure;
 - h) A **siltstop** shall be provided at the outlet pipe;

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- i) Where a single inlet/outlet pipe is to remain and the tank floats on the system, provisions shall be made to insure an **adequate exchange of water** and to prevent degradation of the water quality and to assure disinfection levels are detectable throughout the distribution system;
- j) A **fence or other method of vandal deterrence** shall be provided around the tank;

OAR 333-061-0050(6)(b) – Pressure Tanks:




20. **The pressure tanks shall be provided with:**
- a) A drain,
 - b) Pressure gauge,
 - c) An air blow-off valve,
 - d) a means for adding air, and
 - e) pressure switches for controlling the operation of pump(s).

OAR 333-061-0050(10) – Disinfection of Facilities:


21. New facilities such as the reconfigured piping inlet/outlet are **disinfected, flushed, and tested** (coliform bacteria presence/absence test) following construction in conformance with OAR 333-061-0050(10).

Conditions in this letter are all required in our construction standards for wells (pdf pages 1-5), continuous residual disinfection (pdf page 16), storage tanks (pdf page), pressure tanks (pdf page 21), and disinfection and testing of new facilities (pdf page 24-26) online at the link below:

<https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/PLANREVIEW/Documents/OAR-333-061-0050.pdf>

As provided under  [OAR 333-061-0055 \(end of page 26\)](#), Drinking Water Services may grant waivers from construction standards under some conditions (e.g., the absence of pressure tank bypass piping or an internal tank ladder). The construction standards waiver application is available as a  [fillable MS Word](#) or a  [PDF document](#).

Until documentation showing how these conditions have been met and Final Approval has been granted, the system is not approved for use.

To close out this project and request final approval, please fill out the Project Final Approval  [request form](#) and email it me at evan.e.hofeld@oha.oregon.gov along with any supplemental documentation showing how the above conditions have been met (be sure to reference Plan Review #90-2024 and public water system (PWS) ID #95718).

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Supplemental documentation may include one or more of the following:

- ✓ Well log or video report for the Davis well.
- ✓ Laboratory test results for arsenic, nitrate, and coliform bacteria from the raw well water.
- ✓ NSF-60 certification of the sodium hypochlorite and solution tank along with the product specification sheets and make/model # provided by manufacturer.
- ✓ Photos of the
 - wellhead,
 - sample taps (pre- and post-treatment),
 - yard piping showing the tank inlet/outlet piping,
 - pump-to-waste piping (used to pump the output of the well to waste for flushing following disinfection or well output testing),
 - etc.
- ✓ A description of how the well and new facilities were disinfected, flushed, and tested (coliform bacteria presence/absence test) following construction in conformance with OAR 333-061-0050(10) – see pdf pages 24-26 of our construction standards online at:

<https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/PLANREVIEW/Documents/OAR-333-061-0050.pdf>.

You may also find it helpful to refer to this guidance for assistance with disinfection:

<https://www.oregon.gov/oha/PH/HealthyEnvironments/DrinkingWater/Operations/Pages/shockchlorination.aspx>.

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Information contained on subsequent pages of this letter includes maps and photos of the water system along with:

- ✓ A general system description including information regarding water rights,
- ✓ Source information including:
 - An evaluation from our geologist on the previously constructed wells #1 (SRC-AA) and #2 (SRC-AB – Davis Well),
 - Well and pressure tank descriptions and/or photos
 - water quality test results,
- ✓ 11,000-gallon storage tank information, and
- ✓ A description of the proposed disinfection system

If you have any questions, please feel free to email me at evan.e.hofeld@oha.oregon.gov or call me at 971-200-0288.

Sincerely,



Evan Hofeld, PE
Regional Engineer
Drinking Water Services

CC: Michael Severeid, Willamette Hazelnut, Inc. - michael@whazelnut.com
Mitchell Olston, Orchard and Vineyard Supply (OVS) - Mitchell.Alston@ovs.com
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Description of facilities reviewed under Plan Review #90-2024

General water system description:

The system is considered a transient non-community system and is licensed by the Oregon Dept of Agriculture.

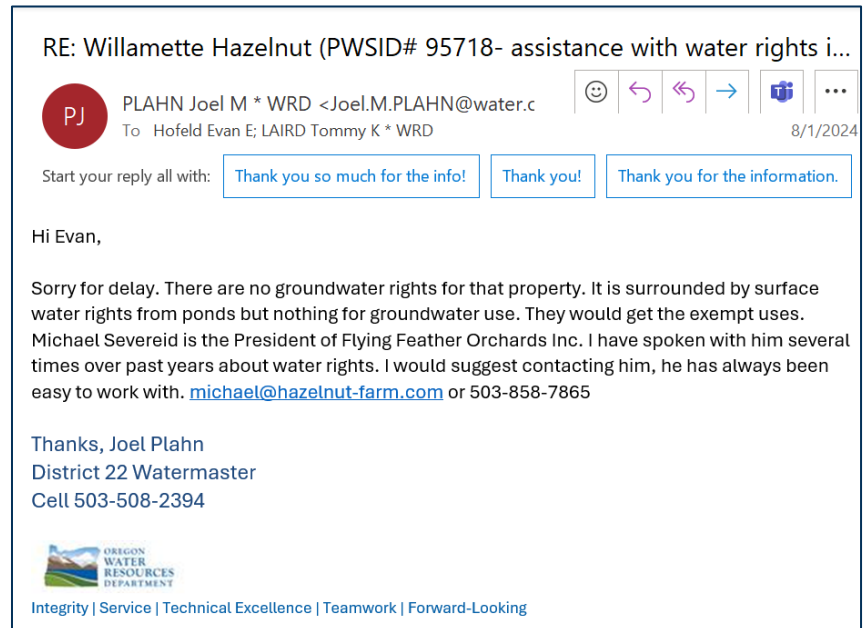
The system is primarily a seasonal hazelnut processing facility that has been in operation since the 1970's. There are also 3 houses with about 8 total residents using the well water.

The water system consists of

- Two drilled wells in service (Well 1 drilled in 1988 and later altered in 2014 and Well 2 without a well log and of unknown age).
- A third well has been used in the past, but is currently disconnected (located more than 100-ft from the other two wells), but not abandoned – no well log and is not a part of PR 90-2024.
- an 11,000-gallon above ground steel storage tank purchased 30 years ago (~1994) from Corvallis, and
- 2 pressure tanks (ca. ~2023).

Based on the anticipated use of less than 5,000 gallons per day for commercial use, the planned use meets the Exempt Use criteria, and no water right would be needed for the well at this time as indicated by Joel Plahn, Water Master with the Oregon Water Resources Dept. in an email dated 8/1/2024.

This project has been assigned plan review #90-2024 and can be tracked online at: <https://yourwater.oregon.gov/planreview.php?pwsno=95718>. As a new transient non-community water system, this system has been assigned Public Water System (PWS) ID# 95718 as viewable online at: <https://yourwater.oregon.gov/inventory.php?pwsno=95718>. All new systems must undergo a Capacity Assessment, which will be completed concurrently with this plan review process.



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Well #1 Evaluation Results Received from OHA Geologist Tom Pattee on 9-11-24:

SRC-AA – Well #1 (L112369, YAMH56744, YAMH4121):

As Built Well Construction Evaluation for Plan Review and/or Setback Waiver:

- Well/Spring meets current construction standards.
- WRD special construction standards, see well log or Comments.
- Well/Spring construction does not meet construction standards.
- Not sealed to appropriate depth. Recommended depth: _____
- Not appropriate seal materials
- Open to more than one aquifer
- Seal info missing or unknown
- Seal not constructed properly (Insufficient sealant volume Insufficient annular space)
- Susceptible construction, but grandfathered source. Consider for reconstruction if nitrate \geq 5mg/L or confirmed *E. coli* at source.
- Susceptible well construction, **not approved for use.**

Comments: This well was drilled to a depth of 360 ft. The casing and casing seal extend to a depth of 207.5 ft below ground level, through a 44 ft thick silt (clay) layer and 9.9 ft into sandstone bedrock that overlies the water-bearing zone. The well was altered in January 2014 and a narrow diameter screened liner was installed that extends from the bottom of the hole to a depth of 16 ft below ground level. The purpose of a liner is mostly to help protect the well from sloughing or caving. Water can enter the well through the uncased portion of the borehole below a depth of 207.5 ft below ground level. Sensitivity Analysis results suggest that well construction does not contribute to the overall sensitivity of this water source to nearby land use practices.

Nature of Aquifer Evaluation:

Aquifer Nature: Confined aquifer Semi-confined aquifer Unconfined aquifer

Comments: This well draws water from a confined sedimentary bedrock aquifer. The water-bearing zone is reported to occur between 211 ft to the bottom of the hole at 360 ft. The water-bearing zone is overlain by 13 ft of sandstone and 44 ft of silt (clay) that have a low permeability and act as a confining layer. Water within the aquifer is under pressure, rising 127 ft above the identified water-bearing zone to a final static water-level of 84 ft below ground. Sensitivity Analysis results suggest that the aquifer is not highly sensitive to nearby land use practices.

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Well #2 Evaluation Results Received from OHA Geologist Tom Pattee on 9-11-24:

SRC-AB – Well #2 - Davis Well (no well log or well ID)

As Built Well Construction Evaluation for Plan Review and/or Setback Waiver:

- Well/Spring meets current construction standards.
- WRD special construction standards, see well log or Comments.
- Well/Spring construction does not meet construction standards.
- Not sealed to appropriate depth. Recommended depth: _____
- Not appropriate seal materials
- Open to more than one aquifer
- Seal info missing or unknown
- Seal not constructed properly (Insufficient sealant volume Insufficient annular space)
- Susceptible construction, but grandfathered source. Consider for reconstruction if nitrate \geq 5mg/L or confirmed *E. coli* at source.
- Susceptible well construction, not approved for use.

Comments: At this time, there does not appear to be a well log for this well. Therefore the construction of the well can not be evaluated with respect to current Water Resource Department construction standards. Sensitivity Analysis results suggest that wells of unknown construction are highly sensitive to nearby land use practices. Recommend not approving for use due to the absence of a well log describing well construction.

Nature of Aquifer Evaluation:

Aquifer Nature: Confined aquifer Semi-confined aquifer Unconfined aquifer

Comments: At this time, there does not appear to be a well log for this well. Therefore, aquifer characteristics can not be determined and evaluated. Sensitivity Analysis results suggest that the unknown nature of the aquifer is highly sensitive to nearby land use practices.

GWUDI Review Results:

- New system/source **or** surface water is inside sanitary setback, initiate **monthly source assessment monitoring when source goes into production or as soon as possible.**
- Fractured bedrock, < 500 ft to surface water
- Coarse sand, gravel, and boulders, < 200 ft to surface water
- Sand and gravel, < 100 ft to surface water
- Sand, < 75 ft to surface water
- Pre-existing source, initiate **monthly source assessment monitoring as part of annually generated monthly assessment monitoring list.**
- Fractured bedrock, < 500 ft to surface water
- Coarse sand, gravel, and boulders, < 200 ft to surface water
- Sand and gravel, < 100 ft to surface water
- Sand, < 75 ft to surface water
- Source may be sensitive to GWUDI but approved for use. Source must be included as one of repeat coliform sampling sites, consider for GWUDI if *E. coli* ever confirmed in the source.
- Do not need to consider for GWUDI.

Comments: A pond is within 240 ft of the wellhead. Due to the absence of a well log describing the construction of the well and the aquifer characteristics, both the well construction and aquifer that the well captures water from are considered sensitive to nearby land uses. Therefore this well, if connected to the water system, would be considered susceptible to GWUDI and the system would need to initiate monthly source assessment monitoring immediately upon this well going into production.

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SRC-AA – Well #1 – L112369 (YAMH56744, Original Well Log is YAMH4121)

YAMH56744 is a well log for an alteration to L112369 (originally YAMH4121) to clean, redevelop, install a 4” diameter Sch 40 PVC threaded liner from 16-ft to 376-ft, conduct a 3-hr pump test at 25 gpm, measured TDS at 202 ppm, and measured the static water level at 270-ft below land surface which was completed 1/29/14. There is a 2nd well (SRC-AB Well #2 “Davis Well”) they use, that does not have a well log, but it is more than 500-ft away. There is also a 3rd well located approximately 188-ft to the south of L112369 that has been disconnected (no well log).

Wells showing 100-ft radius around each well:



**Pressure tank and
Disconnected 3rd well (no well log) >>**

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Approximate 100- and 500-ft radii around well:



SRC-AB Well #2 “Davis Well”
(no well log)

SRC-AA Well #1 –
[L112369](#) [YAMH56744](#)
original log [YAMH4121](#)

Well #1 – [L112369](#) ([YAMH56744](#)) is shown below (photo from 8/31/23 water system survey by ODA)



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Test Results for Well #1:

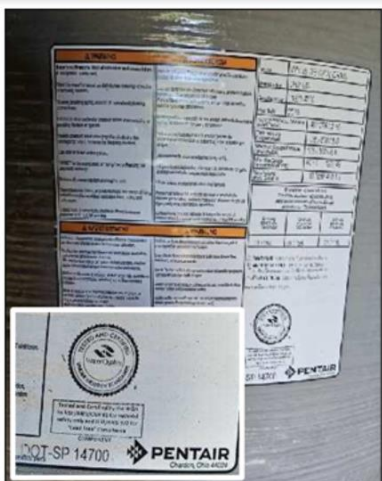
Sample Date	Sample Type	Analyte	Result	Sample ID	Sample Site	Facility	Received Date
Jun 28, 2024	TG	Total Coliform	Absent	24-36734	WELL	SRC-AA	Jun 30, 2024
Dec 22, 2023	TG	Total Coliform	Absent	23-78133	WELL	SRC-AA	Dec 25, 2023
Sep 21, 2023	TG	Total Coliform	POSITIVE	23-57767	WELL	SRC-AA	Sep 23, 2023
	TG	E. coli	Absent	23-57767	WELL	SRC-AA	
December 22, 2023	Routine	Arsenic	0.0025 mg/l	23-78129-I	EP FOR WELL	EP-A	January 8, 2024
December 22, 2023	Routine	Nitrate	1.88 mg/l	23-78129	EP FOR WELL	EP-A	January 8, 2024

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SRC-AB – Well #2 - Davis Well (no well log or well ID) & Pressure Tank:

The 119.7-gallon NSF-61 Pentair pressure tank at the Davis well was provided by Orchard and Vineyard Supply (OVS)/Cascade Water.

Well #2 (SRC-AB) Davis Well photos received 8-28-24 – note cracked slab around well casing:



Model	WM-35 MB CPVC DRAW
Part Number	CH31052
Serial Number	11623 4200
Year Built	2023
Factory Package Pressure (psig/Pa/bar)	40 / 276 / 2.76
Test Pressure (psig/Pa/bar)	125 / 860 / 8.6
Maximum Design Pressure (psig/Pa/bar)	125 / 860 / 8.6
Min - Max Design Temperature (F/C)	40 / 4 - 120 / 49
Tank Volume (Fluid Group 2)	119.7gal / 453.1 l
Drainage - (Gallons/Liter) Ore d'eau soudee - (Gallons/Liter) Aspiracion adicional - (Gallons/Liter) Abenkung - (Gallons/Liter)	
20-40 psig 138-276 kPa 1.26-2.76 bar	30-60 psig 207-414 kPa 2.07-4.14 bar
40-60 psig 276-414 kPa 2.76-4.14 bar	
41 / 154	36 / 136
	31 / 118

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11,000-gallon steel tank:

The storage tank was acquired 30 years ago from Corvallis.

Changes to the tank include modifying the single inlet/outlet pipe to be just the outlet and then bring the inlet up the outside wall of the tank to enter the tank at the top. Water from the two active wells will combine first prior to being chlorinated (for residual maintenance only) and then to the new inlet at the top of the 11,000-gallon tank.

Photos provided by the water system:



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New sodium hypochlorite system:

Purpose:

New treatment consisting of sodium hypochlorite injection is for residual maintenance only (not for primary 4-log viral disinfection), added to address persistent total coliform bacteria in distribution system sampling completed in the Fall of 2023 and Spring of 2024.

Configuration:

The preliminary plan calls for a Blue-White FlexFlow® Peristaltic metering pump to deliver liquid sodium hypochlorite. The system will be flow-paced based off a Seametrics flow meter.



Engineering and Technical Data

A1

FLEXFLO® Peristaltic Metering Pump

Features

- > Tube Failure Detection (TFD+) senses tube rupture
- > Heavy duty display shield protects pump controls
- > SCADA Inputs include: 4-20mA (on "V" model), Remote Start/Stop
- > SCADA Outputs include: 4-20mA (on "V" model), single 250V/3A Relay (TFD+/FVS), and a single solid state (Motor On)
- > FDA compliant tubing




Highlights

Flow range 0.003 – 5.60 GPH 0.011 – 21.2 LPH	Pressures 100 PSI (6.89 bar)	Turndown ratio 2,000 : 1
Exclusive Tube Failure Detection (TFD+) System	Motor Brushless DC	Warranty 2 Years

Control Methods

Control Methods	Manual Control	4-20mA Input	Remote Start/Stop	4-20mA Output	Alarm Output	FVS	Motor Status Output
A1F	•		•		•	•	•
A1V	•	•	•	•	•	•	•



For more help and information regarding A1, please visit www.blue-white.com or scan this QR code.



EX800-SERIES
 INSERTION ELECTROMAGNETIC FLOW SENSOR

Features

- Electronics Module, Cover and Data Logger (Optional)
- Housing Screw (connect ground wire to one)
- Data Logger Port
- Cable Gland Strain Relief
- Powder-Coated Cast Aluminum Housing
- Retaining Slot (for U-Clip) (for easy installation at correct depth setting)
- O-Ring, EPDM (Viton® optional)
- Sensor Body (Stainless, Brass, PVC)
- PVDF Electrode Cap
- Hastelloy Electrodes



Specifications*

Pipe Size	1" to 12"	
Power	Full Power: 12 - 24 Vdc, 250mA	Low Power: 12 - 24 Vdc, 40mA average with 250mA peaks
Materials	Housing	Powder-coated cast aluminum
	Sensor Body	316 Stainless Steel, Brass, or PVC
	O-ring	EPDM (Viton® optional)
	Electrodes	Hastelloy
	Electrode Cap	PVDF (Kynar®)
Maximum Pressure	Brass/Stainless Steel	PVC (See Pressure vs. Temp. Chart)
	200 psi (14 bar)	150 psi (10 bar) @ 75° F (24° C)
Temperature	Ambient	0° to 160° F (-17° to 72° C)
	Fluid	32° to 200° F (0° to 93° C)
Minimum Conductivity	Standard 18" (6m), #22 shielded twisted pair, 4-con. Max. cable run at 24 Vdc = 1000' (300m); at 12 Vdc = 500' (150m). For other circumstances, contact the factory.	32° to 130° F (0° to 55° C) @ 0 psi
	20 microSiemens/cm	
Flow Velocity	0.28 to 20 ft/sec (0.08 - 6.09 m/sec)	
Accuracy	± 1% of full scale	
Output	Square wave pulse, opto-isolated, 500 Hz @ 20 ft/sec	
Empty Pipe Detection	Software, defaults to zero flow	
Cable	Standard 18" (6m), #22 shielded twisted pair, 4-con. Max. cable run at 24 Vdc = 1000' (300m); at 12 Vdc = 500' (150m). For other circumstances, contact the factory.	
Environmental	See meter mounted electronic specification for rating.	
Regulatory	CE Mark (applies to full power sensor only configuration and full power FT 430/440 mounted configurations). Certified to NSF/ANSI standard 61 and NSF 372 (Stainless only with EPDM O-ring, Viton pending)	

Flow Range

Nominal Pipe Size	1"	1½"	2"	3"	4"	6"	8"	10"	12"
Min GPM	69	1.5	2.7	6.2	11	25	43	68	99
Min LPM	2.6	5.6	10.2	23.4	41	94	162	257	374
Max GPM	49	110	196	440	783	1760	3130	4900	7050
Max LPM	185	416	741	1665	2963	6662	11848	18548	26687

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