PUBLIC HEALTH DIVISION
Drinking Water Services
Tina Kotek, Governor

Oregon Health Authority

800 NE Oregon Street, Ste 640
Portland, OR 97232
Phone: (971) 673-0405
Fax: (971) 673-0694
www.healthoregon.org/DWP

January 19, 2024

Paul Stull, PE
stullp@aks-eng.com - 503-563-6151
AKS Engineering and Forestry, LLC
12965 SW Herman Road, Suite 100

Re: **Bay City Water System (PWS #00079) – Well #3 (L143505) – Phase I Conditional Approval (PR #84-2022)**

Dear Mr. Stull:

Thank you for your submittal to the Oregon Health Authority's Drinking Water Services (DWS) of plan review information for the constructing a new well (Well #3 – L143505 (TILL53266) on behalf of the Bay City Water System. The plans, Land Use Compatibility statement, and $3,300 review fee were received on 5/19/22.

The Project Final Approval Request form, well log (TILL_53266), signed Land Use Compatibility Statement (Conditional Use Review pending), and as-builts were received on January 8, 2024.

The project seeks approval to develop a 3rd well on Tax Lot 2400 owned by Bay City. The well is to be added as SRC-AC under their existing entry point (EP-A), receiving the same treatment as wells #1 (SRC-AA) and #2 (SRC-AB) provided at their existing treatment plant (WTP-A). See page 7 of this letter for more details.

Treatment consists of sodium hypochlorite for 4.0-log viral disinfection with a previously established minimum entry point chlorine residual of 0.2 mg/l. Treatment also consists of caustic soda for corrosion control with a previously established minimum pH of 7.4 for both EP-A and the distribution system.

OHA-DWS geologist evaluation summary:

A regional geologist in our program, Tom Pattee, reviewed the well construction and noted in his evaluation on January 12, 2024 that the well was adequately constructed into an unconfined shallow sand and gravel aquifer and within approximately 160-ft of the Kilches River, therefore **monthly source assessment sampling of coliform bacteria from sampling taken at the wellhead (prior to treatment) will be needed for 12 consecutive months once the well is placed into service**. see page 5 of this letter for more details.

Conditional Approval:

The project is granted Conditional Approval (this letter does not constitute approval for use or approval on behalf of any other county or state agency). Final Approval may be granted once the following conditions are met:

Conditions for Final Approval:

1. Requirements for Conditional Use review and approval have been met per Tillamook County as referenced in my Site Plan Approval letter dated June 3, 2022 (online at: https://yourwater.oregon.gov/docs/prletters/00079-PR-2022-84-SPA.pdf) and as discussed during our meeting with Melissa Jenck on January 17, 2024. Questions regarding this process can be referred to Melissa Jenck (cc'd on this letter).

   Melissa Jenck (she/her) | Senior Planner
   TILLAMOOK COUNTY | Community Development
   1510-B Third Street
   Tillamook, OR 97141
   Phone (503) 842-3408 x 3301
   Melissa.Jenck@tillamookcounty.gov

2. The applicable water rights required by the Water Resources Department are obtained and/or applied for. Questions regarding this requirement may be referred to Nikki Hendricks, Water Master (cc'd on this letter).

   Nikki Hendricks
   District 1 Watermaster
   4000 Blimp Blvd Ste 400
   Tillamook, OR 97141
   Office: 503-815-1967
   Cell: 503-457-8989
   Nikki.M.Hendricks@water.oregon.gov

3. Raw, untreated, well sampling results for SOC, VOC, IOC, Uranium, Radium 226/228, Gross Alpha, and coliform bacteria (presence/absence test) are submitted. (Subsequent monitoring requirements anticipated after the well is constructed are summarized in Table 1 on page 4 of this letter.)

Evidence showing the above conditions for final approval should reference Plan Review #84-2022 and can be emailed to me at evan.e.hofeld@oha.oregon.gov.

A revised Project Final Approval Request Form we have on our website may be used to convey this information, along with any relevant attachments (e.g., Conditional Use approval, water rights permit/application, and well testing results).

If you have any questions, please feel free to call me at 971-200-0288.

Sincerely,

Evan Hofeld, PE
Oregon Health Authority – Drinking Water Services

cc: Brian Bettis, City of Bay City
bbettis@ci.bay-city.or.us

Nicole Alfafara, Oregon Health Authority – Drinking Water Services
Nicole.H.Alfafara@oha.oregon.gov

Jaime Craig, Tillamook County Environmental Health
Jaime.Craig@tillamookcounty.gov

Melissa Jenck, Tillamook County Dept of Community Development
mjenck@co.tillamook.or.us

Sarah Absher, Tillamook County Dept of Community Development
Sarah.Absher@tillamookcounty.gov

Nikki Hendricks, Oregon Water Resources Department
Nikki.M.HENDRICKS@water.oregon.gov

<table>
<tr><th colspan="4">Table 1 – Anticipated Initial Monitoring for Well #3 (SRC-AC) and Entry Point A (EP-A)</th><th></th><th></th></tr>
<tr><td colspan="4">Year 1</td><td rowspan="2">Year 2</td><td rowspan="2">Year 3</td></tr>
<tr><td>Sampling to be completed prior to Final Approval as requested in the Conditional Approval letter</td><td>Sample by the end of the first quarter of operation (after Final Approval)</td><td>2nd Quarter of Operation</td><td>3rd Quarter of operation</td></tr>
<tr><td>Sample at the Source Prior to Treatment (Well #3)</td><td colspan="4">Sample at the Entry Point (EP-A) to the distribution system served by the new source (after treatment)</td></tr>
<tr><td rowspan="4">Coliform
Nitrate, Nitrite
IOC, VOC, SOC
Arsenic
Radiological including uranium, gross alpha, and radium 226/228</td><td>Radiological
Lead and copper tap samples</td><td>Radiological if initial sampling has radiological detections</td><td>Radiological if initial sampling has radiological detections</td><td>Annual:
Nitrate
VOC
SOC</td></tr>
<tr><td colspan="4">Lead and Copper Tap Sampling in the Distribution System
(to assess impact of the new well on distribution system corrosion*).</td></tr>
<tr><td>Sample at 20 Tier 1 sites (1st 6-months of operation)
Sample for pH (2 sets at 2 sites each and 2 weeks apart around the time of lead and copper tap sampling).
Entry point sampling for pH at EP-A remains unchanged at once every 14 days.</td><td></td><td>Sample at 20 Tier 1 sites (second 6 months of operation)
Sample for pH (2 sets at 2 sites each and 2 weeks apart around the time of lead and copper tap sampling).
Entry point sampling for pH at EP-A remains unchanged at once every 14 days.</td><td>Reduction to 10 tap samples every 3 years is possible depending upon results</td></tr>
<tr><td colspan="3">Monthly raw water source assessment sampling for coliform bacteria (Although properly constructed, the well is in a highly susceptible shallow unconfined aquifer)</td><td>Annual Source Assessment sampling</td></tr>
<tr><td colspan="6">*Changes in water quality due to the addition of a new source may impact the corrosivity of the water, therefore, two 6-month demonstration rounds of lead and copper tap samples at an increased number of 20 Tier 1 sample sites are needed to verify that the well does not adversely contribute to lead and copper corrosion. Water quality parameters sampling for pH for the previously established minimum pH of 7.4 for the same entry point (EP-A) and in the distribution system at the time of lead and copper tap sampling is done remains unchanged as Well #3 (SRC-AC) is a new source under the existing entry point (EP-A).</td></tr>
</table>

OHA-DWS Geologist Evaluation:

Comments from OHA-DWS geologist Tom Pattee regarding Well #3 (TILL53266, L143505) constructed on 2/7/2023 in the revised new location as shown at right is provided as follows:

Well Construction Evaluation (meets current construction standards):

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 ≥ 5mg/L or confirmed *E. coli* at source.
- ☐ Susceptible well construction, **not approved for use**.

Comments: This well was drilled to a depth of 55 ft and contains casing to the bottom of the hole. The casing contains a section of screen from 19.6 to 50 ft below ground. The casing is sealed from the surface to a depth of 18 ft. Water can enter the well through the screen via the gravel filter pack that was placed around the outside of the casing from 18 to 55 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.

Aquifer Evaluation (Unconfined shallow gravel and sand aquifer – high sensitivity):

Nature of Aquifer Evaluation:

Aquifer Nature: ☐ Confined aquifer ☐ Semi-confined aquifer ☒ Unconfined aquifer

Comments: This well draws water from an unconfined shallow gravel and sand aquifer (gravel is assummed to be the most abundant material present). Potential water-bearing materials are exposed at the surface. Although the static water-level in the well rose above the depth at which it was reported to have first been encountered, the water-level response is likely due to (1) slow drainage into the well from some of the shallow materials that are reported to contain "some clay" or (2) an increasing static-water level as the well was drilled to greater depths, which is common in areas where groundwater is moving from greater depths toward the surface to discharge to the local surface water body. Sensitivity Analysis results suggest that the aquifer is highly sensitive to nearby land use practices due to it's shallow unconfined nature.

Groundwater Under the Direct Influence of Surface Water (GWUDI) Evaluation: (Monthly raw water coliform bacteria assessment sampling required for 12 months)

GWUDI Review Results:

☒ New system/source **or** surface water is inside GWUDI 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

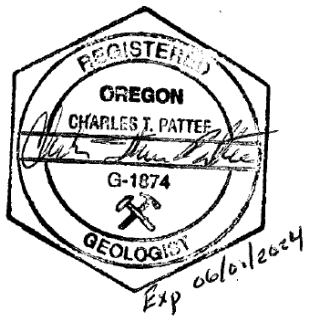
☐ Pre-existing source, initiate **monthly source assessment monitoring as part of annually generated monthly assessment monitoring list.**
- ☐ Fractured bedrock, < 500 ft to surface water
- ☐ Coarse sand, gravel, and boulders, < 200 ft to surface water
- ☐ Sand and gravel, < 100 ft to surface water
- ☐ 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.

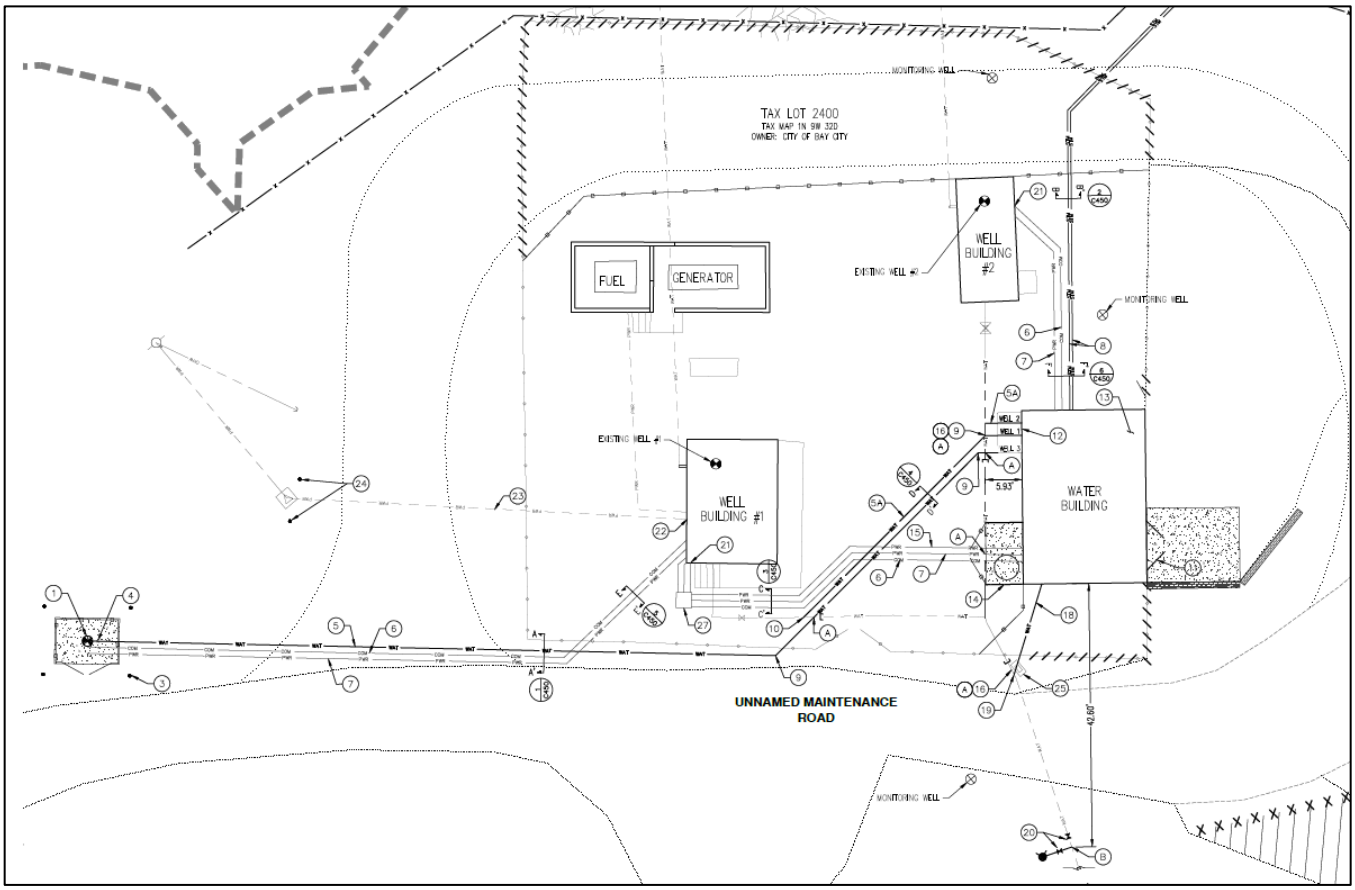
Comments: The Kilchis River is within 160 ft of this well. This distance is within the GWUDI concern setback for aquifers that contain coarse sand, gravel, and/or boulders. Sensitivity Analysis results suggest that the aquifer is highly sensitve to nearby contaminant sources such as surface water bodies. Therefore, to address the potential for GWUDI at this well, monthly source assessment monitoring should be initiated when the well is connected to the system and goes into production or as soon as possible after the well goes into production.

Reviewed by: Tom Pattee, R. G. Date: 01/12/2024



Project Description:

Bay City's Well #3 – Phase I included the construction of a new well completed 1/5/2023 (SRC-AC 2023 Well #3 – TILL53266, L143505) and related improvements to disinfection and corrosion control to facilitate the well's incorporation with the existing wells #1 TILL222 (SRC-AA) and well #2 TILL535 (SRC-AB) under their existing entry point (EP-A). As-builts are shown below.



Grundfos submersible well pump model #17BG3502 & wellhead details:

625S400-2 Model number 17BG3502

Variants | Specifications | Sizing results | Drawings

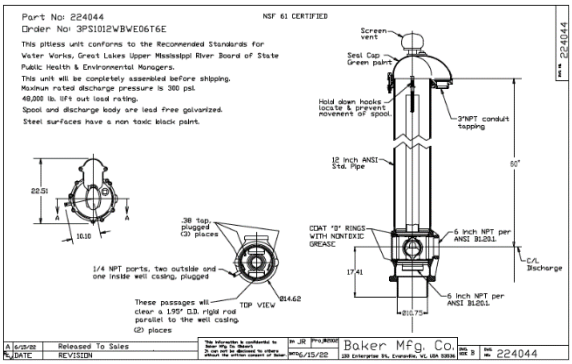
Product name	625S400-2
Product No.	17BG3502
EAN	5711496939211

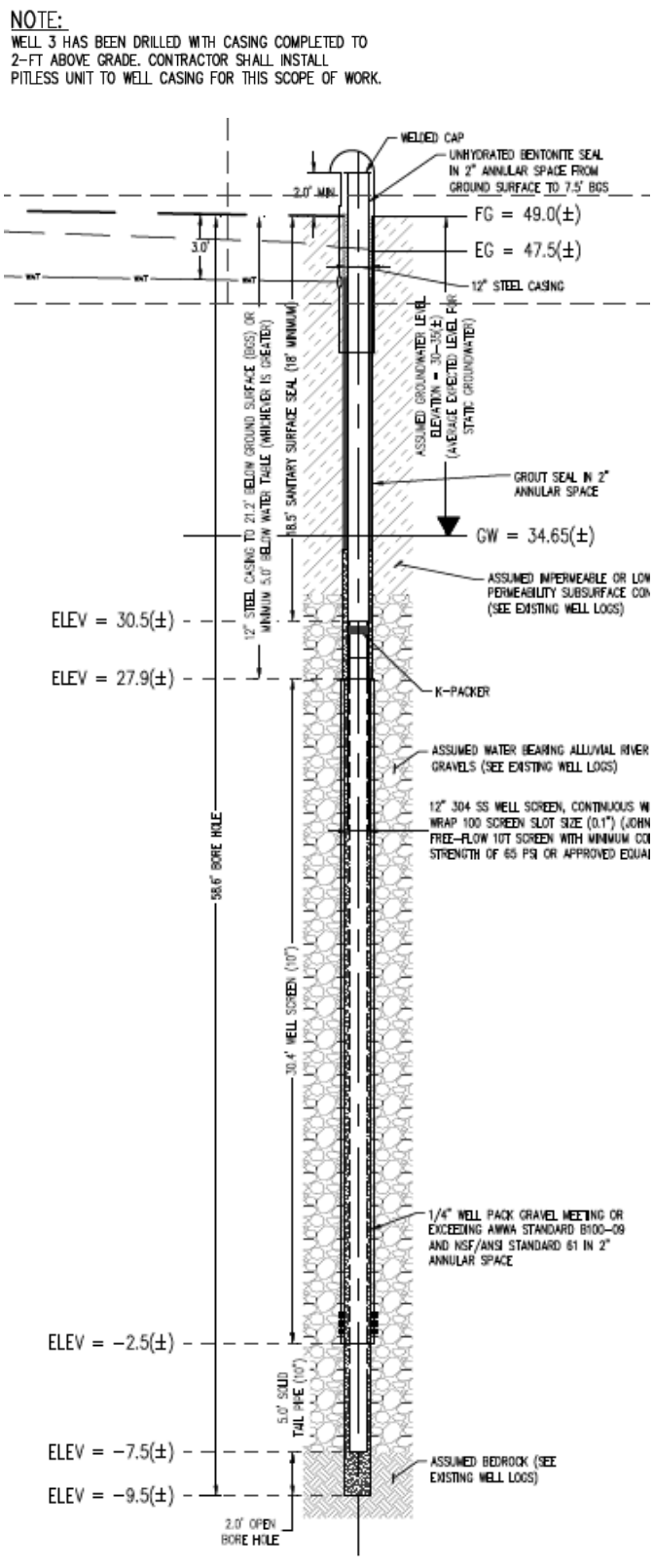
Technical

Pump speed on which pump data is based	3450 rpm
Actual calculated flow	701 US gpm
Resulting head of the pump	180 ft
Stages	2
Impeller reduc.	NONE
Shaft seal for motor	SIC/SICNBR
Curve tolerance	ISO9906:2012 3B
Model	D
Valve	YES
Motor version	T40

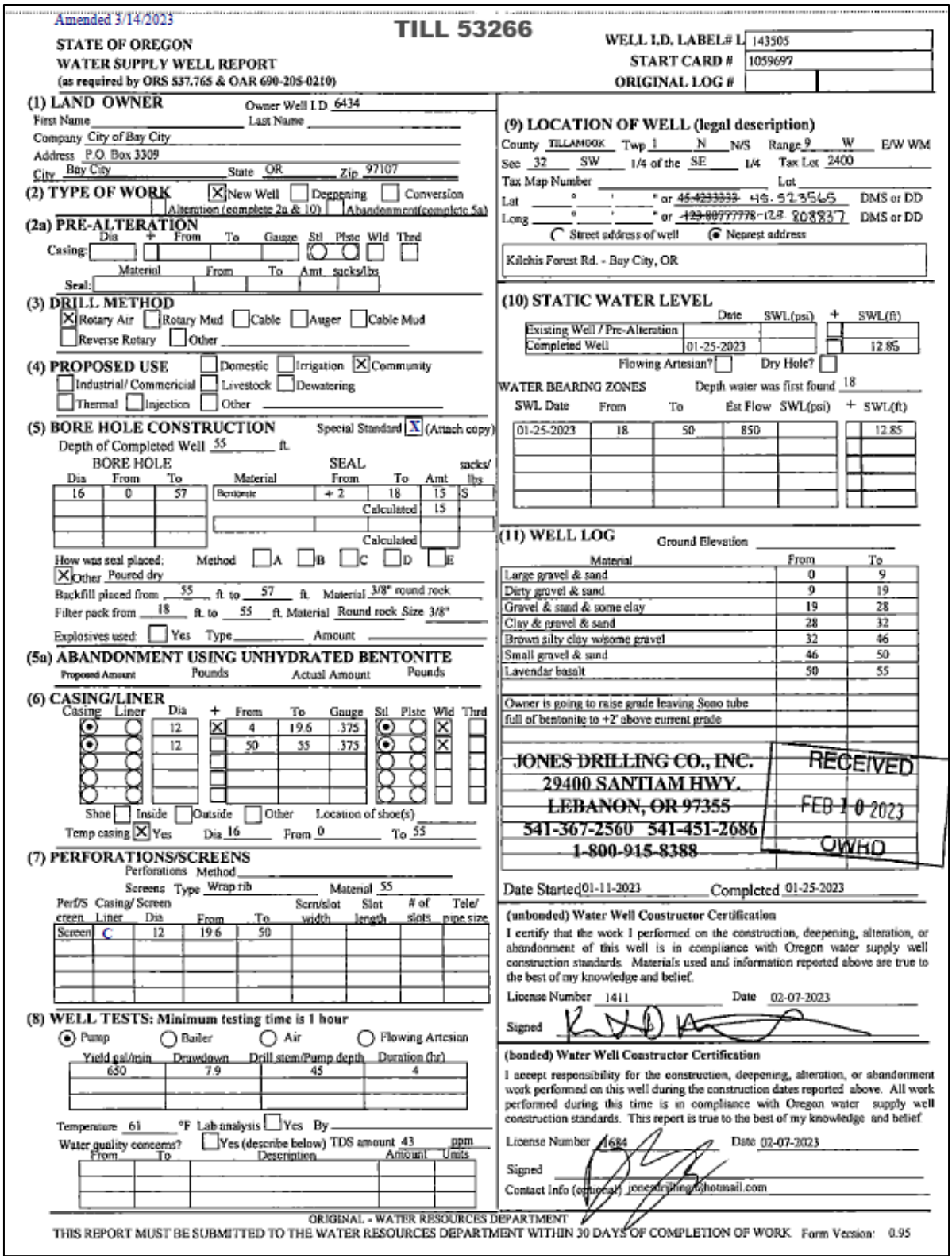
Materials

Pump	Stainless steel EN 1.4301 AISI 304
Impeller	Stainless steel EN 1.4301 AISI 304
Motor	Stainless steel DIN W.-Nr. 1.4301 AISI 304





Well #3 water well constructor log:



Amended 3/14/2023

TILL 53266

STATE OF OREGON
WATER SUPPLY WELL REPORT
(as required by ORS 537.765 & OAR 690-205-0210)

WELL I.D. LABEL# L 143505
START CARD # 1059697
ORIGINAL LOG #

(1) LAND OWNER Owner Well I.D 6434
First Name ____ Last Name ____
Company City of Bay City
Address P.O. Box 3309
City Bay City State OR Zip 97107

(2) TYPE OF WORK [X] New Well [ ] Deepening [ ] Conversion [ ] Alteration (complete 2a & 10) [ ] Abandonment (complete 5a)

(2a) PRE-ALTERATION
Casing: Dia | + | From | To | Gauge | Stl | Plstc | Wld | Thrd
Seal: Material | From | To | Amt | sacks/lbs

(3) DRILL METHOD
[X] Rotary Air [ ] Rotary Mud [ ] Cable [ ] Auger [ ] Cable Mud
[ ] Reverse Rotary [ ] Other ____

(4) PROPOSED USE [ ] Domestic [ ] Irrigation [X] Community
[ ] Industrial/ Commericial [ ] Livestock [ ] Dewatering
[ ] Thermal [ ] Injection [ ] Other ____

(5) BORE HOLE CONSTRUCTION Special Standard [X] (Attach copy)
Depth of Completed Well 55 ft.

BORE HOLE Dia	From	To	SEAL Material	From	To	Amt	sacks/lbs
16	0	57	Bentonite	+ 2	18	15	S
					Calculated	15	
					Calculated		

How was seal placed: Method [ ] A [ ] B [ ] C [ ] D [ ] E
[X] Other Poured dry
Backfill placed from 55 ft. to 57 ft. Material 3/8" round rock
Filter pack from 18 ft. to 55 ft. Material Round rock Size 3/8"
Explosives used: [ ] Yes Type ____ Amount ____

(5a) ABANDONMENT USING UNHYDRATED BENTONITE
Proposed Amount ____ Pounds Actual Amount ____ Pounds

(6) CASING/LINER

Casing	Liner	Dia	+	From	To	Gauge	Stl	Plstc	Wld	Thrd
[X]	[ ]	12	[X]	4	19.6	375	[X]	[ ]	[X]	[ ]
[X]	[ ]	12	[ ]	50	55	375	[X]	[ ]	[X]	[ ]
[ ]	[ ]		[ ]				[ ]	[ ]	[ ]	[ ]
[ ]	[ ]		[ ]				[ ]	[ ]	[ ]	[ ]
[ ]	[ ]		[ ]				[ ]	[ ]	[ ]	[ ]

Shoe [ ] Inside [ ] Outside [ ] Other Location of shoe(s) ____
Temp casing [X] Yes Dia 16 From 0 To 55

(7) PERFORATIONS/SCREENS
Perforations Method ____
Screens Type Wrap rib Material 55

Perf/Screen	Casing/Liner	Dia	From	To	Scrn/slot width	Slot length	# of slots	Tele/pipe size
Screen	C	12	19.6	50				

(8) WELL TESTS: Minimum testing time is 1 hour
[X] Pump [ ] Bailer [ ] Air [ ] Flowing Artesian

Yield gal/min	Drawdown	Drill stem/Pump depth	Duration (hr)
650	7.9	45	4

Temperature 61 °F Lab analysis [ ] Yes By ____
Water quality concerns? [ ] Yes (describe below) TDS amount 43 ppm

From	To	Description	Amount	Units

(9) LOCATION OF WELL (legal description)
County TILLAMOOK Twp 1 N N/S Range 9 W E/W WM
Sec 32 SW 1/4 of the SE 1/4 Tax Lot 2400
Tax Map Number ____ Lot ____
Lat ° ' " or ~~45.4233333~~ 45.523565 DMS or DD
Long ° ' " or ~~-123.80777778~~ -123.808857 DMS or DD
[ ] Street address of well [X] Nearest address
Kilchis Forest Rd. - Bay City, OR

(10) STATIC WATER LEVEL

	Date	SWL(psi)	+	SWL(ft)
Existing Well / Pre-Alteration				
Completed Well	01-25-2023			12.85

Flowing Artesian? [ ] Dry Hole? [ ]

WATER BEARING ZONES Depth water was first found 18

SWL Date	From	To	Est Flow	SWL(psi)	+	SWL(ft)
01-25-2023	18	50	850			12.85

(11) WELL LOG Ground Elevation ____

Material	From	To
Large gravel & sand	0	9
Dirty gravel & sand	9	19
Gravel & sand & some clay	19	28
Clay & gravel & sand	28	32
Brown silty clay w/some gravel	32	46
Small gravel & sand	46	50
Lavendar basalt	50	55
Owner is going to raise grade leaving Sono tube		
full of bentonite to +2' above current grade		

JONES DRILLING CO., INC.
29400 SANTIAM HWY.
LEBANON, OR 97355
541-367-2560 541-451-2686
1-800-915-8388

RECEIVED
FEB 10 2023
OWRD

Date Started 01-11-2023 Completed 01-25-2023

(unbonded) Water Well Constructor Certification
I certify that the work I performed on the construction, deepening, alteration, or abandonment of this well is in compliance with Oregon water supply well construction standards. Materials used and information reported above are true to the best of my knowledge and belief.
License Number 1411 Date 02-07-2023
Signed ____

(bonded) Water Well Constructor Certification
I accept responsibility for the construction, deepening, alteration, or abandonment work performed on this well during the construction dates reported above. All work performed during this time is in compliance with Oregon water supply well construction standards. This report is true to the best of my knowledge and belief.
License Number 1684 Date 02-07-2023
Signed ____
Contact Info (optional) joneswilling@hotmail.com

ORIGINAL - WATER RESOURCES DEPARTMENT
THIS REPORT MUST BE SUBMITTED TO THE WATER RESOURCES DEPARTMENT WITHIN 30 DAYS OF COMPLETION OF WORK. Form Version: 0.95