



January 30, 2019

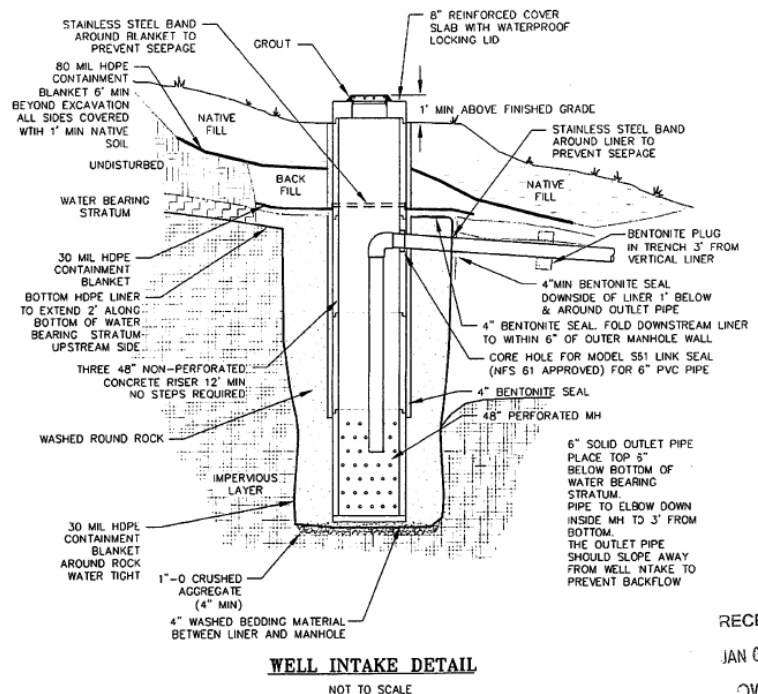
Aaron Yoder
 Camp Cooper BSA
 2145 SW Naito Parkway
 Portland, OR 97201

**Re: New Well and Tank (PR#46-2018)
 Camp Cooper BSA (PWS ID#92088)
 Site Plan Approval – Revised 1-30-19**

Dear Mr. Yoder:

Thank you for your original submittal to the Oregon Health Authority’s Drinking Water Services (DWS) of plan review information for the new well and tank for Camp Cooper BSA and revisions provided by Corby Boatwright on January 23, 2019. I will be taking over the plan review from Carrie Gentry and am issuing a revised Site Plan Approval letter based on the recent revisions in the submittals described below.

On April 4, 2018, our office received plans and a land use compatibility statement for a dug well and small poly tank. A plan review fee of \$825 was also received. Additional plans were received on April 6, 2018. Plans were subsequently revised and received on January 23, 2019. A Final Order dated January 9, 2019 was also issued by the Oregon Water Resources Department (OWRD) regarding a Special Standards Request for the revised well design (shown in the well detail at right) and received in our office on January 15, 2019.



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Tom Pattee, a regional geologist in our program reviewed the revised well construction and provided comments in the e-mail to Carrie Gentry shown below.

From: PATTEE Tom
Sent: Thursday, January 10, 2019 2:50 PM
To: GENTRY Carrie L <Carrie.L.GENTRY@dhsoba.state.or.us>; Hofeld Evan E <EVAN.E.HOFELD@dhsoba.state.or.us>
Subject: RE: New Well Camp **Cooper** BSA PR#46-2018

Carrie,

Thanks for keeping me in the loop on this. Based on the diagram they provided, it looks like the only real change is the depth to the water-bearing stratum and the depth at which the 30 Mil HDPE – Bentonite cap will overlie the washed round rock. So, my original comments should still be valid – Since, based on the geology, this well can't be constructed to meet current OWRD standards, they should submit designs to OWRD and request a Special Construction Standard. If OWRD issues the Special Construction Standard, it should be included in the materials they submit to us, otherwise we won't be able to approve it for public water supply use. Note that due to the shallow nature of the water-bearing stratum, we are likely to require monthly raw water bacteria samples (to start) either as a part of distribution system monitoring or as source assessment monitoring if residual maintenance chlorination is to be continued.

Thanks!

Tom

Tom Pattee's following original comments were relayed to you in the first Site Plan Approval from Carrie Gentry dated April 23, 2018, which should be shared with the well driller:

- Based on available data, it is difficult to determine if groundwater at this location originates within the unconfined sediments at the surface or within the fractured bedrock below the sediments. Based on the technical specifications provided, it's assumed that the dug well will be 17 feet deep (12 feet of grouted manhole sections plus 5 feet of perforated manhole base.) Oregon Administrative Rules (OARs) concerning the construction of dug wells can be found in OAR 690-210-0400. It requires dug wells that are 21 feet or less in depth to be sealed with grout to within 3 feet of the bottom of the well.
- If it is unreasonable to seal the well to within 3 feet of the well bottom, a Special Construction Standard should be obtained from Water Resources Department as per OAR 690-200-0021 and submitted to DWS along with the required items below.

The project is granted Site Plan Approval. Once construction of the well is complete, please submit:

1. The well driller's report (well log).
2. Raw (Untreated) Water Quality Data including coliform bacteria, nitrate and arsenic. These are to be taken from the new well's raw water sample tap, located below the well.
3. A copy of the Water Right Permit from OWRD, if a water right permit is required, or documentation from OWRD that a water right is not needed.
4. Documentation showing that all components in contact with potable water meet ANSI/NSF Standard 61 or equivalent for use in potable water applications.

5. Written documentation that OWRD approves of the well construction in conformance with the Final Order for the Special Standards Request dated January 9, 2019.
6. Documentation of disinfection of new facilities according to applicable AWWA Standards (e.g. AWWA C651-C654) and related coliform sampling results are submitted.
7. Photos taken during construction of the well showing placement of the concrete rings, containment blanket (and related steel band), impervious liner, gravel, discharge piping, and finished wellhead are submitted (can be e-mailed digital photos).

The above items should reference Plan Review #46-2018 and can be emailed to me at evan.e.hofeld@state.or.us or mailed to:

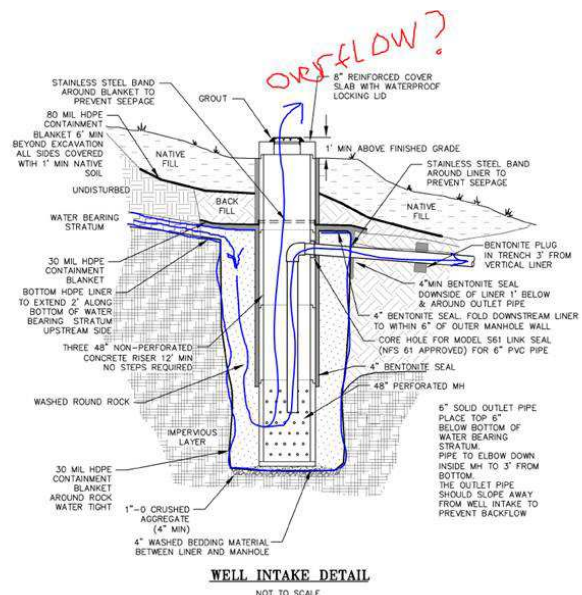
Attn: Evan Hofeld
OHA-Oregon Drinking Water Program
PO Box 14450
Portland, OR 97293-0450

Note that based on the well log evaluation and test results, it may be possible to discontinue chlorination. That evaluation will take place once the above items are received.

A method of determining the total output of the well must be provided (typically, this requirement is met by installation of a flowmeter.) Note that we can waive this requirement if the well is determined to be in a confined aquifer.

There are some concerns about the vulnerability of the flapper valve on the 6” line from the well. This will require ongoing routine maintenance to ensure the operation of the flapper valve is not compromised. Given the nature of the well construction, gravity flow, and site gradient, this overflow is needed to prevent water in the well from erupting out the lid (see sketch to the right) or disrupting the casing seal and containment blanket should demands be less than flow into the well and the downstream overflow flapper malfunction.

Waterlines installed as part of this project will be subject to local plumbing code rather than DWS’ rules.



January 30, 2019

After we receive the well log for review, a conditional approval letter may be issued. That conditional approval letter will also address the conditions for the small tank (1500 or 3000 gallons), and related components. Note that the tank is required to have vandal deterrence, a screened vent, a lockable watertight lid with curbing, meet ANSI/NSF-61 or equivalent and be disinfected per AWWA C652 standards. A tank effluent flow meter is also recommended should disinfection be required in the future. See pages 5-7 of this letter for additional construction standards regarding reservoirs, pressure tanks, and pumping facilities (if applicable).

If you have any questions, please feel free to call me at (971) 673-0191.

Sincerely,



Evan Hofeld
Regional Engineer
Drinking Water Services

cc: Annette Pampush, Tillamook County Environmental Health
Corbey Boatwright, PE, Boatwright Engineering, Inc.

OAR 333-061-0050(6) – Construction Standards Regarding Reservoirs and Pressure Tanks

(6) Finished water storage:

- (a) Distribution reservoirs and treatment plant storage facilities for finished water shall be constructed to meet the following requirements:
 - (A) They shall be constructed of concrete, steel, wood or other durable material capable of withstanding external and internal forces which may act upon the structure;
 - (B) Ground-level reservoirs shall be constructed on undisturbed soil, bedrock or other stable foundation material capable of supporting the structure when full;
 - (C) Steel reservoirs, standpipes and elevated tanks shall be constructed in conformance with the AWWA Standards D100 and D103;
 - (D) Concrete reservoirs shall be provided with sufficient reinforcing to prevent the formation of cracks, and waterstops and dowels shall be placed at construction joints. Poured-in-place wall castings shall be provided where pipes pass through the concrete;
 - (E) Wooden reservoirs shall be redwood or other equally durable wood and shall be installed on a reinforced concrete base. Where redwood reservoirs are used, separate inlet and outlet pipes are required and the water entering the reservoir must have a disinfectant continuously applied so as to result in a detectable residual in the water leaving the reservoir;
 - (F) Start-up procedures for new redwood tanks shall consist of filling the tank with a solution of water containing a minimum of two pounds of sodium carbonate per 1,000 gallons of water and retaining this solution in the tank a minimum of seven days before flushing;
 - (G) Where ground-level reservoirs are located partially below ground, the bottom shall be above the ground water table and footing drains discharging to daylight shall be provided to carry away ground water which may accumulate around the perimeter of the structure;
 - (H) The finished water storage capacity shall be increased to accommodate fire flows when fire hydrants are provided;
 - (I) Finished water storage facilities shall have watertight roofs;

- (J) An access manhole shall be provided to permit entry to the interior for cleaning and maintenance. When the access manhole is on the roof of the reservoir there shall be a curbing around the opening and a lockable watertight cover that overlaps the curbing;
- (K) Internal ladders of durable material, shall be provided where the only access manhole is located on the roof;
- (L) Screened vents shall be provided above the highest water level to permit circulation of air above the water in finished water storage facilities;
- (M) A drain shall be provided at the lowest point in the bottom of the storage facility and an overflow of sufficient diameter to handle the maximum flow into the tank shall be provided at or near the top of the sidewall. 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;
- (N) A silt stop shall be provided at the outlet pipe;
- (O) Where a single inlet/outlet pipe is installed and the reservoir 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 the disinfection levels required in subparagraph (5)(c)(D) of this rule;
- (P) A fence or other method of vandal deterrence shall be provided around distribution reservoirs;
- (Q) When interior surfaces of finished water storage tanks are provided with a protective coating, the coating shall meet the requirements of NSF Standard 61: Drinking Water System Components - Health Effects or equivalent.
- (R) Reservoirs and clearwells that are to be used for disinfection contact time to treat surface water shall use a tracer study to determine the actual contact time. The Authority must approve procedures and protocols for the tracer study prior to the initiation of the study. The Authority recommends the US EPA Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources for a tracer study procedure and protocol.
- (S) Reservoirs and clearwells that are to be used for disinfection contact time to treat surface water shall have a means to adequately determine the flow rate on the effluent line.

- (b) Pressure tanks for finished water shall meet the following requirements:
 - (A) Pressure tanks shall be installed above normal ground surface;
 - (B) Bypass piping around the pressure tank shall be provided to permit operation of the system while the tank is being maintained or repaired;
 - (C) Pressure tanks greater than 1,000 gallons shall be provided with an access manhole and a water sight-glass.
 - (D) All pressure tanks shall be provided with a drain, a pressure gauge, an air blow-off valve, means for adding air and pressure switches for controlling the operation of the pump(s);
 - (E) Pressure tanks shall be constructed of steel or an alternative material provided the tank is NSF 61 certified and shall be designed for pressure at least 50 percent greater than the maximum system pressure anticipated.

OAR 333-061-0050(7) – Pumping facilities:

- (7) Pumping facilities:
 - (a) Wherever possible, booster pumps shall take suction from tanks and reservoirs to avoid the potential for negative pressures on the suction line which result when the pump suction is directly connected to a distribution main;
 - (b) Pumps which take suction from distribution mains for the purpose of serving areas of higher elevation shall be provided with a low pressure cut-off switch on the suction side set at no less than 20 psi;
 - (c) Suction lift at pumping stations shall be avoided as far as possible, and pumps shall be installed so that the suction line is under a positive head. If suction lift cannot be avoided, provision shall be made for priming with water which does not exceed MCLs;
 - (d) Pumping stations shall be located above maximum anticipated 100-year (1 percent) flood level, and the area around the pumping station shall be graded so that surface drainage is away from the station;
 - (e) Pumping stations shall be of durable construction so as to protect the equipment from the elements. The door to the pumping station shall be lockable, and facilities for heating and lighting shall be provided. The floor of the pumping station shall be sloped to provide adequate drainage.