NorthWest Colorado Consultants, Inc.
Geotechnical / Environmental Engineering • Materials Testing

November 6, 2024

Stephen Jones and Amy Baxter
7171 Dry Creek Court
Niwot, CO 80503

Job Number: 22-12605

Subject: On-Site Wastewater Treatment System Observations, Jones Residence, 28395 Yellow Jacket Drive, Routt County, Colorado.

Stephen and Amy,

As requested, NWCC, Inc. (NWCC) visited the project site on June 28 and October 18, 2023 to observe the On-site Wastewater Treatment System (OWTS) being installed for the Jones Residence under construction at 28395 Yellow Jacket Drive in Routt County, Colorado. NWCC previously designed the OWTS under this job number, dated September 12, 2022.

**Site Observations:** At the time of our site visit on June 28, 2023, the installer, Giovani Construction, had placed a 1,500 gallon– three compartment concrete septic tank approximately 20 feet to the west of the residence, which was under construction. The installer had installed the 4-inch solid sewer piping (ASTM 3034: SDR35) from the residence to the septic tank. The piping appeared to meet the minimum grade requirement. The inlet and outlet 'T' connections to the septic tank had been completed and appeared to be properly constructed. An effluent filter had been placed in the outlet 'T' connection in the second chamber of the septic tank. A FD 417 dosing siphon was installed in the third chamber of the septic tank. The installer had also installed the 4-inch solid sewer piping (ASTM 3034: SDR35) from the dosing siphon in the third compartment of the septic tank to the distribution box, near the Soil Treatment Area (STA). The piping met the minimum grade requirement.

The installer had completed three runs of 16 and one run of 15 Quick-4 Standard Infiltrator chambers for a total of 63 Quick-4 Standard Infiltrator chambers for the residence. Each run of chambers had been installed level in the upper 2 to 12 inches of natural topsoil and organic materials. Galvanized mesh had been installed under and up the sides of the chambers. The installer had also placed inspection pipes at the inlet and terminal end of each run of chambers. A concrete distribution box had been placed near the southeast corner of the soil treatment area. The installer had also placed the 4-inch piping (ASTM 3034: SDR 35) from the distribution box to each run of chambers. The piping appeared to meet the minimum grade requirements. Flow levelers had been installed in each of the outlet pipes in the distribution box.

We advised the installer that they should backfill the piping, tank and chambers in accordance with the manufacturer's recommendations. We also advised them that a minimum of 18 inches and a maximum of 36 inches of soil cover should be placed over the tops and sides of the chambers. If sufficient amounts of fill are not placed over the chambers, seepage may occur during high usage periods. We also recommended a minimum of 24 inches of soil cover over the distribution lines, after the piping was properly bedded and a minimum of 12 inches of soil cover over the septic tank. The disturbed areas should be heavily seeded with a drought tolerant grass.

At the time of our site visit on October 18, 2023, the installer had completed backfilling the OWTS. Risers had been installed on the septic tank, dosing tank and distribution box access and the lids were accessible at the finished ground surface. It appeared that sufficient cover had been placed over the piping, septic tank and chambers. An as-built drawing taken from field measurements of the system is presented in Figure #1.

Based on our part time observations, it appears that the portions of the system for the residence, which were completed at the time of our site visits, had been constructed in general accordance with the design previously completed by our firm with the noted exceptions. We believe that the system should function properly with proper care and maintenance, as outlined below. If extended periods of inactivity occur at the residence, the chambers must be periodically flooded with water, every 30 days, to prevent rodents from nesting and burrowing in the chambers, which could result in another premature failure of the system.

**Operation and Maintenance:** Observing the operation and performing routine maintenance of the OWTS is essential for proper, long term functioning of the system. NWCC recommends the operation be periodically monitored and a qualified, licensed maintenance contractor perform system maintenance.

1. *Septic Tank*: The scum and sludge accumulation in the septic tank should be monitored yearly. Once the scum or sludge thickness reaches 25% of the chamber depth, the septic tank should be pumped. A pumping frequency of 1 to 3 years is likely at the design flows. Depending on use, pumping may only be required every 3 to 5 years.
2. *Effluent Filter and Dosing Siphon*: The effluent filter at the septic tank outlet should be cleaned when the septic tank is inspected or as required. The siphon should be checked semi-annually to ensure it is functioning properly.
3. *Soil Treatment Area*: The soil treatment area should be fenced off to vehicular traffic and livestock. The surface area around the soil treatment area should be observed monthly for signs of failure, such as lush vegetation growth or ponding. Liquid levels in the chambers should be observed through the inspection pipes.
4. *Treated Water*: NWCC does not recommend water softeners or water treatment systems be allowed to discharge to the OWTS. The chemical and hydraulic loading from the backwash of these treatment systems can be detrimental to the OWTS. If a treatment system is used, a separate dry well should be constructed for the backwash waste. In

addition, chemically treated water from a swimming pool or spa must not be discharged into the OWTS.

5. *Floor Drains*: Garage floor drain systems **must not** be connected to the OWTS. Oils, grease and chemicals from vehicles may be detrimental to the OWTS. NWCC recommends garage floor slab be sloped to drain to the garage door. If a garage floor drain is constructed, NWCC recommends the drain be connected to a separate sand/oil interceptor tank, which can be pumped as required, or be properly daylighted in accordance with current regulations.

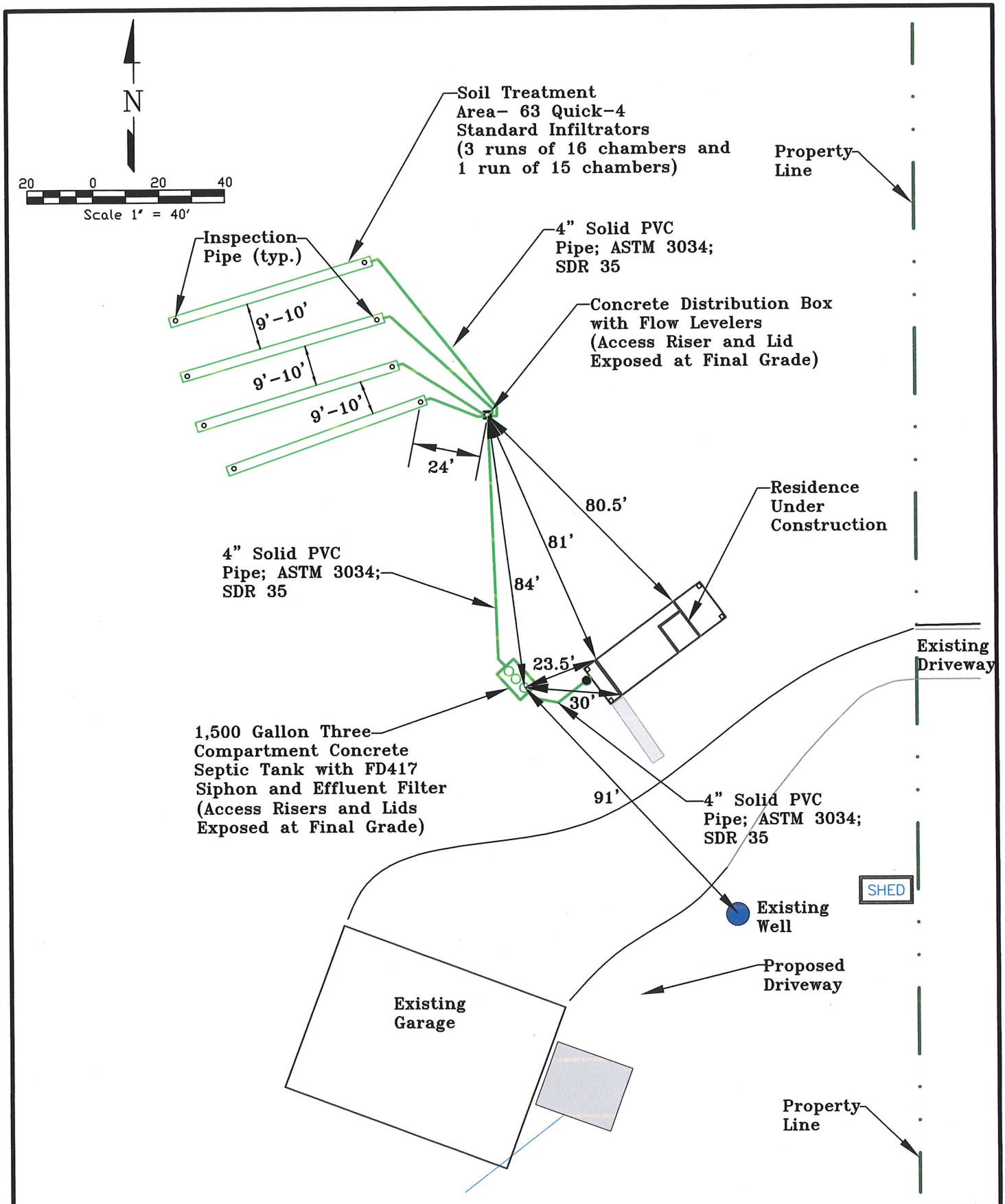
6. *General Notes*: The owner should be aware that the operation of the OWTS is different from a public sewer service. Plastic and other non-biodegradable materials should not be placed into the system. Water use should be monitored so fixtures are not allowed to run if a seal malfunctions. Allowing fixtures to flow continuously to prevent water lines from freezing or a malfunctioning faucet or toilet can consume in excess of 1,000 gallons per day. Excessive flows could flood and cause premature failure of the system. No plastic or landscaping that requires additional irrigation should be placed over the soil treatment area.

If you have any questions regarding this report, our observations or recommendations or if we may be of further service, please contact this office.

Sincerely,
**NWCC, INC.,**


Timothy S. Travis, P.E.
Sr. Project Engineer

Reviewed by Brian D. Len, P.E.
Principal Engineer

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| **Title:** OWTS – AS BUILT SITE PLAN | **Date:** 11/6/2024 | NWCC North West Colorado Consultants, Inc. Geotechnical / Environmental Engineering · Materials Testing |
| **Job Name:** Jones Residence | **Job No.** 22-12605 | (970)879-7888 · Fax (970)879-7891 2580 Copper Ridge Drive Steamboat Springs, Colorado 80487 |
| **Location:** 28395 Yellow Jacket Drive, Routt County, Colorado | **Figure** #1 | |