Wickstrom Engineering, LLC.

27756 Rd. T.5

Dolores, CO 81323

(970) 749-5334

ON-SITE WASTEWATER TREATMENT SYSTEM

for the EXISTING

Single Family Residence

Located at

34100 Hwy 184

Mancos, CO 81328

Replaces #2896

Prepared for:

Fawn Ferguson

(Wuerdemann)

Nuce Townsan

Prepared by:

Craig Wickstrom, PE

10/31/24



Conclusions and Recommendation

This is a design for an EXISTING two (2) bedroom primary residence on a ten-acre parcel northeast of Cortez Colorado. The address is 34100 Hwy 184, Mancos Colorado within Montezuma County. The area has accommodating grades, and geology for a standard type of gravity flow onsite waste-water disposal system. There is an existing OWTS that need replacement. The property is served by the local domestic water company that will have an adequate distance from all components of the OWTS. The Montezuma County Health Department requires a permit and an associated fee for the permitting of the System. Montezuma County may require development fees and permits which are not addressed in this report.

The topography and geologic structure of the site is accommodating for a standard OWTS. The land drains positively to the south and east from the residence as well as away from the STA location at a low grade. The area where the STA is to be located is to the south of the home. Sufficient room is found down gradient that allows the system to meet the required setbacks to the property lines, water line(s) and foundation. Sufficient percolation medium for the leach field is available in this area. All setbacks will be observed in the construction of the system by the installer and have been considered in the design. Test pits were observed near the STA with an excavator under clear & sunny conditions with the Owner and Engineer. The Soils observed were Type 2A silt Loam (LTAR 0.5) in the area where the STA is located. No limiting layer or groundwater was observed during testing.

This design is in compliance with all rules and regulations pertaining to OWTS currently in effect at Montezuma County Health Department and State of Colorado. It is my opinion, based on topography, geology and test results that this site is suitable for a standard system incorporating gravel and perforated pipe, standard two compartment 1,000 gallon water tight septic tank and distribution box with speed levelers. The existing OWTS will be decommissioned per Regulation 43.

Limitation of Liability: utilization of this design for construction and remitting the fees for said design to the Engineer, the Owner agrees through those actions to limit the liability of the Engineer for any claims or losses, costs or damages, including outside fees or costs to the total compensation received for this design and associated work/inspections. Design done without contract.

Installation Notes for Construction

1. A 4" diameter effluent filter (OPTIONAL) may be installed on the outflow pipe of new 1,000 gallon septic tank(s) prior to allowing effluent to enter the absorption bed. IF installed it shall be in a way that allows for proper support of the filter and easy access for future filter maintenance and inspection. IF INSTALLED THE FILTER MUST BE INSPECTED AND CLEANED ANNUALLY or more frequently as needed.

2. Minimum pipe slopes to the septic tank and absorption bed must be maintained in order to ensure a properly functioning gravity flow septic system (MINIMUM 2%).

3. A **minimum** of 12"of clean cover (1 ½" minus) shall be placed over all effluent lines, native material onsite with oversize removed. - estimated 12"+ of cover to ensure proper geology at base of field

4. Minimum setbacks from any potable water lines to the septic tank (10') and to the absorption bed (25') shall be observed during construction of the septic system.

5. Minimum clearances from the building foundation to the absorption bed (20') and septic tank (5') shall be observed.

6. Minimum setbacks to the property lines (10') shall be observed and (50') setback from surface water.

7. Driving any type of machinery over the septic tank, distribution box, effluent line or absorption bed shall be avoided entirely.

8. All effluent pipes are to be 4" diameter SDR 35 grade PVC or better.

9. Sewer lines from the residence to the tank and from the tank to a minimum of 6' from the outlet of the tank will be 4" Schedule 40 PVC or better.

10. All sewer lines and effluent lines will be properly bedded to prevent settling and potential shearing of the lines.

11. Seal all tank to PVC connections with water tight butyl or water tight grout. Check all connections for watertight seals after application and before inspection.

12. STA PREPARATION: Excavate the STA in the area delineated to the south-east of the residence. Bed depth must be able to maintain minimum 2% grade on lines and to ensure sufficient percolation medium, approximately 24" (ave – 48" Max) below the existing surface elevation. Bases of the trenches are in the native silt loam material observed during site investigation – do not compact the ground below the trench base prior to installing gravel and perforated pipe. Scratch base of runs with excavator teeth to break-up material for leaching and fine grading purposes.

13. Avoid compacting base soils while excavating the absorption trenches and ensure the floor of the excavation is level and evenly graded in soils observed. If soil conditions change please contact Wickstrom Engineering to evaluate soil conditions.

14. Install infiltrators as per manufacturer's recommendations.

15. Infiltrators must have endcaps and inspection ports at far corners.

16. Notify Wickstrom Engineering & MCHD prior to completing back-filling activities.

17. Ensure the distribution box is set level on compacted native soils or a concrete/block pad to prevent settling, install risers to surface for access.

18. Outlet piping from the distribution box must evenly charge each run of chambered units. This may be accomplished by use of speed levelers. Additional distribution boxes will be necessary to evenly split effluent flow to all eight trenches.

19. Grade the surface above the absorption trenches to positively drain away from the field and to prevent the ponding of water above or along the edges of the bed.

20. All tank lid access rises shall be water tight and accessible for future maintenance and inspections of the system.

21. Provide a 4" diameter SDR 35 inspection portal at the beginning and end of the absorption line(s) and place an UNGLUED cap over the portal.

22. Provide 4" SCH 40 PVC clean-outs with street type sweeps in the line between the residence(s) and the tank(s). Sweeps should point towards each other so the entire line may be cleaned if necessary or a single clean-out that can be use both directions is acceptable. Clean-out must be within 5' of foundation stem-wall.

23. Wickstrom Engineering as well as MCHD shall monitor the excavation, construction and installation of the septic system. All stages are to be signed off and inspected as detailed on the Inspection Sheet included in this report.

Inspection Form

For

Fawn Ferguson

34100 Hwy 184

Mancos, CO 81328

Please call 24 hours PRIOR to the time when inspection will be required and NOT before the stage to be inspected is completed (PRIOR TO BACKFILL)

(970) 749-5334 Craig Wickstrom, PE

Note: All stages must be signed off by designing Engineer prior to covering components or the design will be null and void.

1. Excavation _____
   Max Depth _____
   Minimum Depth _____
   Soil conditions _____
2. Tank and components _____
3. Construction of Lines _____
4. Final _____
5. MCHD Permit _____

NOTES:

Fawn Ferguson

Location: 34100 Hwy 184 Mancos, CO 81328

TABLE # 1
Test Results

The LTAR rate for results from the local geology:

LTAR = 0.5 (Silt loam material – Type 2A)

DESIGN CALCULATIONS: Two (2) bedroom primary

Design flow PER TABLE 6-2: Two Bedroom

2 bedroom (total) 4 persons @ 75 gal/person Q = 300 gpd

Absorption Area Formula: A = Q/LTAR = 300/0.5 = 600 SF

Size Factor for Chambered Units (0.7) per table 10-3 so: 600 x 0.7 = 420

USE 432 square feet STA - use 36 Units; 4 trenches separated by 48" sidewall to sidewall – cover 90% of trench with units

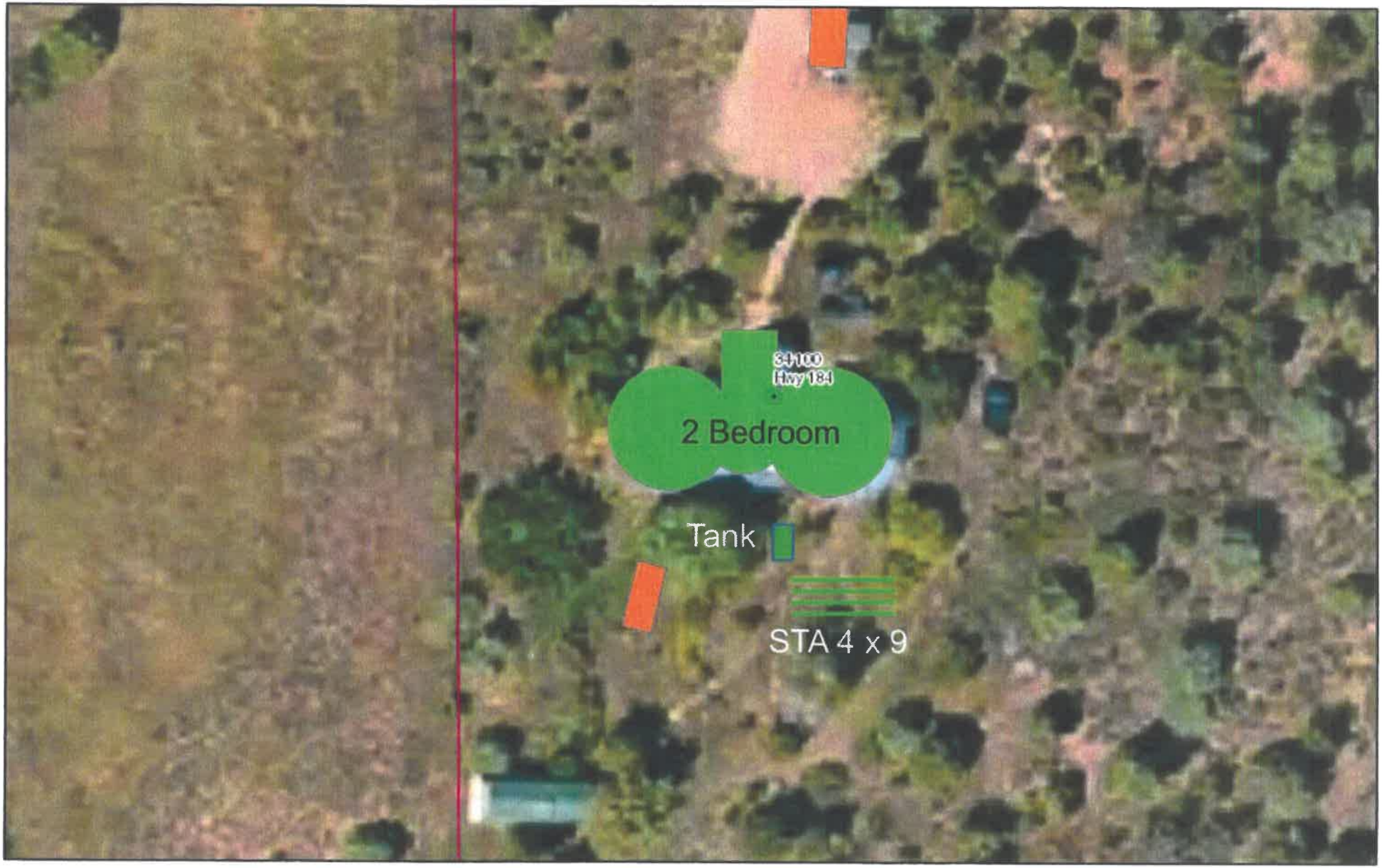
Align four trenches of infiltrators at nine units long each.

Run Length = 39' long at approx. 24"-32" ave. depth where material was silt loam as seen in testing.

2 bedroom residence = 1,000 (minimum) gallon 2 compartment water tight tank with risers to the surface.

EXISTING 1,000 gallon tank to be decommissioned by pumping and removal OR crushing.

34100 Hwy 184 Mancos; OWTS Layout



10/31/2024, 10:35:10 AM

Override 1
Override 1
Public Lands & BIA Land
BIA
BLM
CANM
CO State
NPS
USFS
Other (USBR)
Irrigation Canals
Rivers
Water Bodies
Parks

1:600

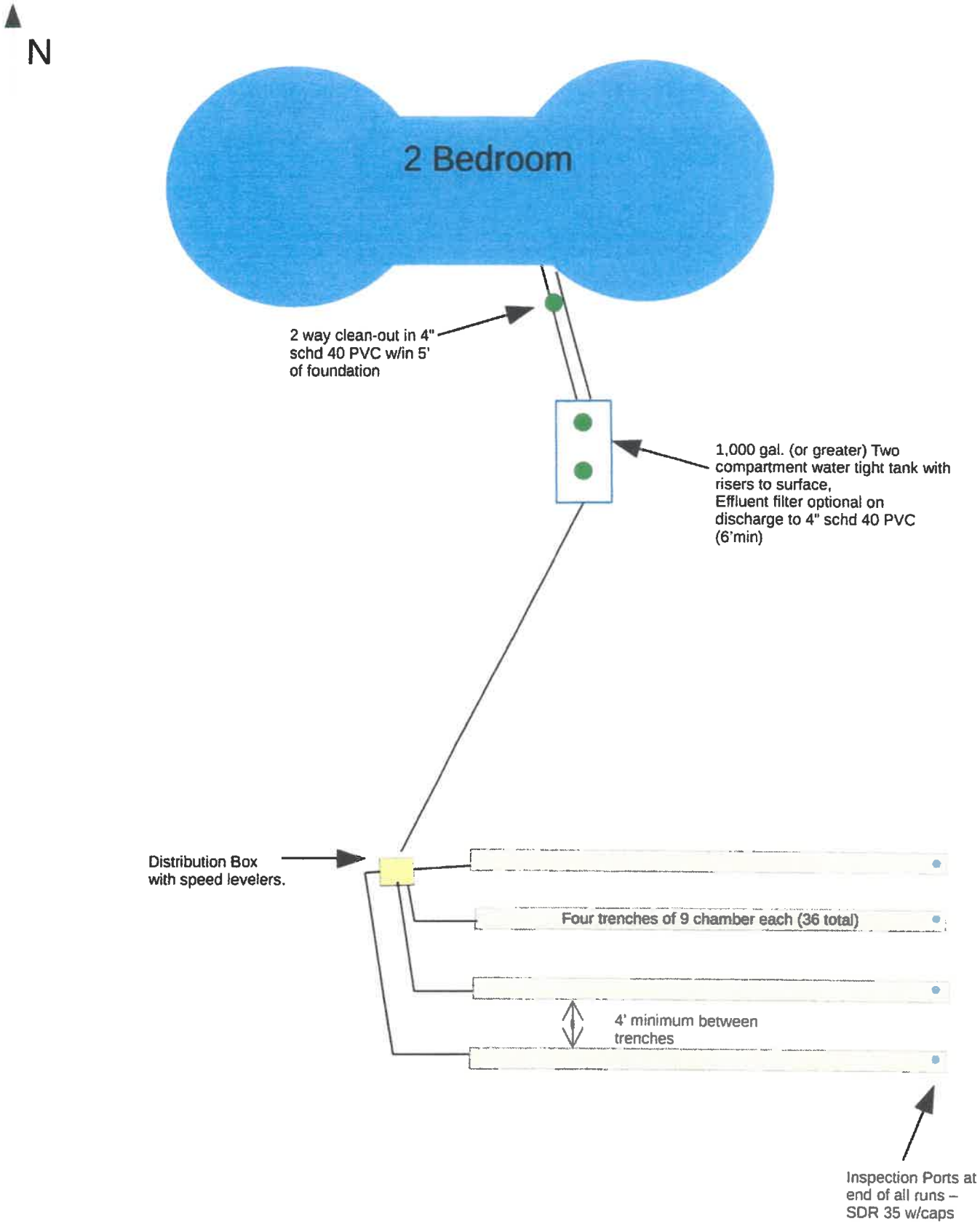
0 0 0.01 0.02 mi

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NAIP Program

Montezuma County

Site Location Map – 19094 Rd. W, Lewis CO

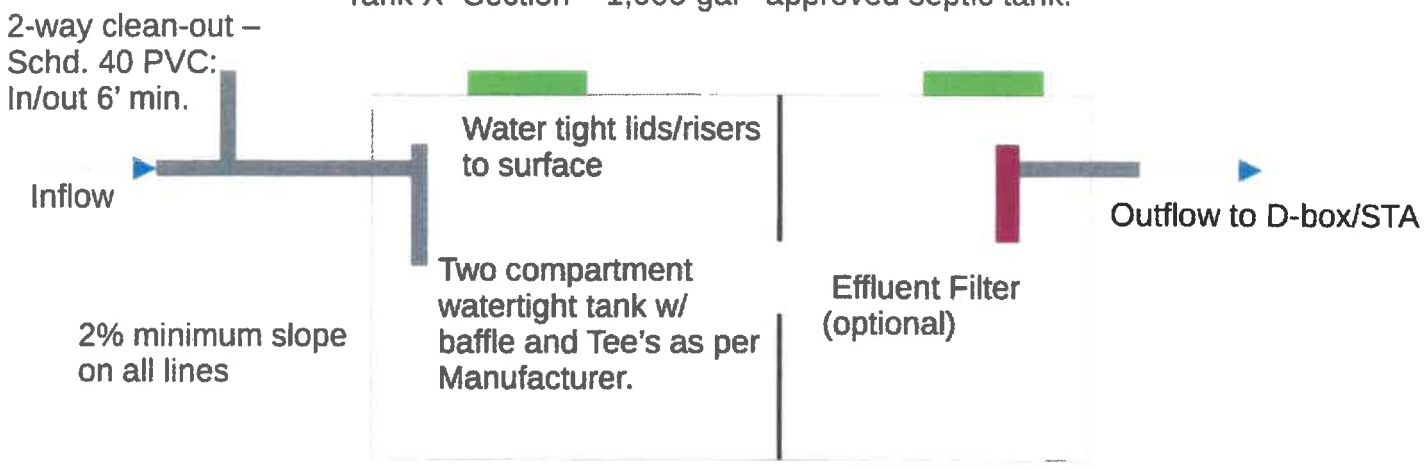


ALIGN TRENCHES IN AREA NEAR TEST PITS

Drawing not to scale

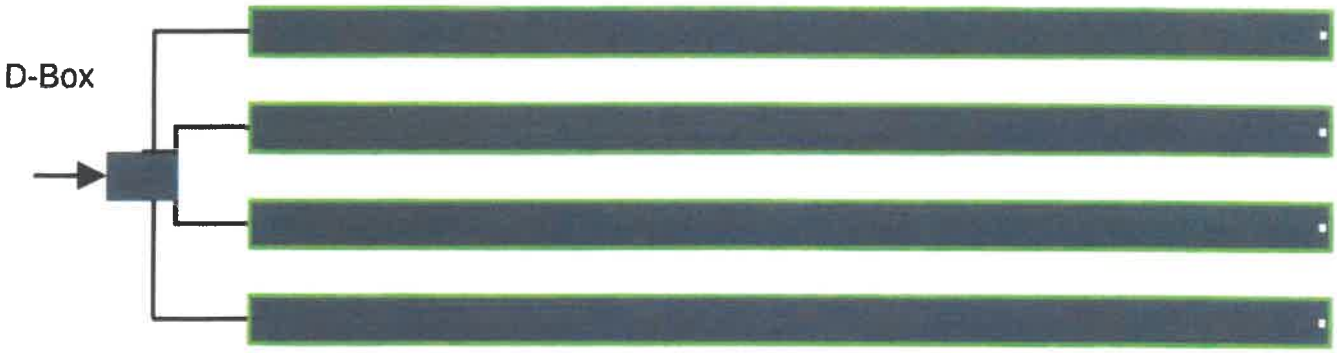
34100 Hwy 184, Mancos; System Layout

Tank X- Section – 1,000 gal approved septic tank.



STA Top- View

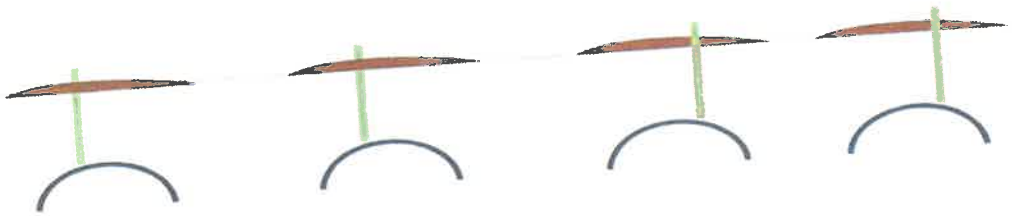
4 Trenches (4 x 9) units each 36 total w/ endcaps



Inspection ports at both ends of all trenches

STA Cross Section- View

Inspection ports at ends of all runs with slip on caps (unglued)



Base of STA at 18"-30" with slope – backfill with clean native
12" minimum cover over all trenches – Heap soil for settlement

Not to Scale

Profile Hole 1 & 2
34100 Hwy 184, Mancos CO

Testing performed with an excavator Oct. 2024
P.E. Onsite and observed work



0"-6" Top Soil – brown loam with organics- loose

6"-60" silt loam – Red brown loam with granular structure
TYPE 2A

60"-84" silt loam with minor decomposed sandstone, clay fraction in mottled matrix



0"-6" Top Soil – brown loam with organics- loose

6"-48" silt loam – Red brown loam with granular structure
TYPE 2A

48"-84" silt loam with minor decomposed sandstone, clay fraction in mottled matrix