Class II Permit Application #WY21098-07393,

Tribal C-13 Well (API: 49-013-06464),

Completeness and Preliminary Technical Review:

Application Form:

1. Please provide a copy of the 7520-6 permit application form that is signed by a responsible corporate officer, as required and defined 40 Code of Federal Regulations 144.32(a).

Area of Review (AOR) and Corrective Action:

2. Formations and perforation depths presented in Exhibit B appear to suggest that the Tribal C-10 well is perforated in the Chugwater, Dinwoody, Phosphoria, and Tensleep Formations. Please verify that the formation top and bottom depths in the table are correct and that no conduit for movement of fluid out of zone injection exists at the location of this well.

3. The table in Exhibit B indicates that the top of cement behind production casing in the Tribal C-14 well is 16 feet and the bottom of cement is 3,084 feet; whereas, the well schematic in Exhibit B-2 indicates that the top of cement behind the production casing is ~2,444 feet. Please revise and correct exhibits as necessary.

4. The table in Exhibit B indicates that the Tribal C-45 well has open perforations from 4,226 feet to 4,237 feet in the Muddy Sandstone, and the Muddy Sandstone has been identified as an Underground Source of Drinking Water (USDW) with TDS concentrations ranging from 7,292 to 7,553 milligrams per Liter (mg/L). The well schematic for the Tribal C-45 well in Appendix B-2 indicates that the well is temporarily abandoned with a cement retainer set at 6,639 feet, above perforations in the Phosphoria and Tensleep Formations. Please describe the purpose of the April 20, 2017 work-over identified in the well schematic and verify whether the perforations in Muddy Sandstone remain open.

5. Exhibit A depicts the Tribal C-47 well on the line of the ¼ mile AOR; please provide an updated table and well schematic in Exhibit B and B-2 to include the Tribal C-47 as an AOR well.

6. Exhibit B-1 indicates that the status of the Tribal C-10, Tribal C-42, and Tribal C-45 wells are temporarily abandoned. If available, please provide the results of the most recent casing pressure test since the wells were temporarily abandoned.

7. Exhibit B-1 indicates cement bond logs (CBLs) are attached for the Tribal C-44 and C-45 wells; please provide a copy of the logs.

8. Please provide the current list of landowners and addresses within ¼ mile of the Tribal C-14 facility boundary as required in 40 CFR 144.31(e)(9).

9. In support of a determination regarding corrective action under 40 CFR 146.7, please provide an indication as to whether any existing, proposed, or plugged and abandoned well conditions exist that represent a potential pathway for out of zone injection.

Injection and Confining Zone Geology:

10. As provided in 40 CFR 146.24(5), please provide the following geologic data to support the application:
    a. Estimates of the average effective porosity, permeability (if available), and net thickness of the porous/permeable portion of the injection zone.

    b. An estimate of the net shale/impermeably unit thickness and permeability of the upper and lower confining zones.

    c. Describe any known or suspected faults or fracture systems (e.g. Steamboat Butte Fault System to the west of the Tribal C-13 well) and provide the proximity to the injection zone and the effect the fault or fracture system may have on injection activities.

    d. A description of the nearest out-crop of the Phosphoria and/or Tensleep Formations relative to the Tribal C-13 well with accompanying geologic map.

    e. North-to-south and west-to-east oriented stratigraphic cross-sections using well logs from off-set wells extending through the ¼ mile AOR. The cross-sections should depict formation tops, upper and lower confining zones, injection zone, and known or potential USDWs above and below the injection zone.

    f. Known or estimated top and bottom depths for the lower confining zone.

    g. Any available structural geologic or formation isopach maps for the injection zone or confining zones within the AOR.

11. In support of a determination that continued operation of the well as a Class II Salt-water Disposal (SWD) well conforms to the prohibition of fluid movement contained in 40 CFR 144.12(a), please provide an evaluation as to whether the upper and lower confining zones consist of impermeable barriers of sufficient thickness and lateral extent to prevent movement of fluid out of the proposed injection zone within the AOR.

Underground Source of Drinking Water (USDW) Evaluation:

12. Please provide an updated summary of formation water quality data (i.e. maximum, minimum, median) available for the Steamboat Butte Field. One source of information pertaining to formation water quality sample results may be found at https://www.usgs.gov/centers/eersc/science/oil-and-gas-waters-project?qt-science_center_objects=0#qt-science_center_objects.

13. Information submitted to EPA in the original permit application indicates that the Dakota Sandstone is a USDW with a reported TDS of 6,080; however, the table of possible USDWs in Section E of the 2021 permit application does not include the Dakota Sandstone. Please provide an indication as to whether any new information exists regarding the USDW status of the Dakota Sandstone.

Faults, Fractures, Seismicity:

14. As provided under 40 CFR 146.24, please provide a brief evaluation of seismic risk associated with the proposed injection well, whether by injection induced seismicity or damage to the well potentially resulting from regional seismic events. Information pertaining to seismic risk and historically recorded seismic events in the region may be obtained from https://earthquake.usgs.gov/.

Well Construction:

15. Exhibit G only includes a scan of the cover page for the CBL dates March 18, 2009; please provide a copy of the entire scanned CBL for the Tribal C-13 well.

16. The well diagram included in the existing WY21098-07393 permit indicates that the approved well construction for the seven (7) inch production casing includes cement from 717 to 6,864 feet. However, the current wellbore diagram included in the application indicates that the top of cement behind the seven (7) inch production casing is only 4,610 feet. Please confirm the correct top of cement and explain why cement was not expanded to 717 feet as identified in the final permit conditions to isolate shallow USDWs in the area.

    As required in 40 CFR 146.22(b)(1), all Class II injection wells shall be cased and ***cemented*** to prevent movement of fluids ***into or between*** USDWs. Information provided in Exhibit B of the application indicates that USDWs identified in sands of the Cody Shale, the Frontier Sandstone, Muddy Sandstone, and Dakota Sandstone are not isolated from one another by cement behind the seven (7) inch production casing. As a result, the existing well construction does not appear to meet the requirement in the WY21098-07393 Permit, or the standards contained in 40 CFR 146.22(b)(1).

If the presence of cement cannot be demonstrated within this interval, please provide a plan to isolate USDWs within the Cody Shale, Frontier Sandstone, Muddy Sandstone, and Dakota Sandstone behind the seven (7) inch production case. Alternatively, a monitoring plan to periodically assess for the presence of fluid movement behind the production casing within this interval may be considered as a permit condition in lieu of corrective action.

Operating Conditions:

17. Please provide a flow diagram of fluid flow through the facility and a diagram of the facility surface construction, as described in Section K of the application. The diagram of the facility surface construction should depict the approximate location of devices to monitor the nature of the injected fluids, injection pressure, annulus pressure, flow rate, etc.

18. Based on a review of historical permit files for the Tribal C-13 well, the step rate test (SRT) presented in Exhibit G was not considered valid because it was not consistent with EPA Region 8, SRT Guideline Document dated January 12, 1999. Specifically, the test began at relatively high injection rates, the results do not account for friction loss, and the test does not appear to have been conducted with equal time steps. As a result, and according to records in the permit file, the current approved MAIP is 0 pounds per square inch (psi). The previous operator requested and subsequently received approval to run a new SRT in 2014; however, EPA does not have record that a new SRT was run to justify a higher MAIP. If records of a 2014 SRT were passed on to Merit Energy Company by the previous operator, please provide the results of the test.

Plugging and Abandonment:

19. The Plugging and Abandonment (P&A) Procedure contained in Exhibit I is incomplete. Please provide a revised procedure and accompanying diagram that includes the following:
    h. Type and number of plugs to be used;
    i. Type and density of fluid that will be left in place in between plugs;
    j. Placement of each plug including the elevation of top and bottom
    k. Type, grade, and quantity of cement to be used; and
    l. Method of placement of the plugs.

    Additionally, please be advised that in order to satisfy the requirements of 40 CFR 146.10, the procedure must include provisions for isolating USDWs within the uncemented portion of the seven (7) inch production casing described in comment no. 16. Further, the plugging abandonment procedure should be consistent with standards contained in Bureau of Land Management Onshore Order No. 2 and any applicable state or local standards (e.g. Wyoming Oil and Gas Rules and Regulations Chapter 3, Section 18).

    EPA Region 8 UIC Guidance Document #40 may be used as a reference when preparing a P&A Procedure; it can be found at https://www.epa.gov/uic/underground-injection-control-epa-region-8-co-mt-nd-sd-ut-and-wy.

Financial Responsibility:

20. Please provide an itemized break-down of the $80,000 P&A cost estimate presented in Exhibit I and two (2) additional third-party cost estimates based on the revised P&A procedure requested in comment no. 18 above. If P&A cost estimates are greater than the $64,000 financial assurance currently held by EPA for the Tribal C-13 well, an increase in the financial assurance will be requested.

National Historic Preservation Act and Endangered Species Act Considerations:

21. Please describe whether the proposed conversion will result in any new surface disturbances outside of the existing well pad.