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October 15, 2019

Bernadette Tsosie
Site Manager – Bluewater Disposal Site
US Department of Energy
2597 Legacy Way
Grand Junction, CO 87503

RE: NMED comment on *Review of 2017 Uranium Plumes in the San Andres-Glorieta and Alluvial Aquifers at the Bluewater, New Mexico, Disposal Site –February 2019*

Dear Ms. Tsosie,

Thank you for providing the New Mexico Environment Department (NMED) with the opportunity to review and comment on the document “*Review of 2017 Uranium Plumes in the San Andres-Glorieta and Alluvial Aquifers at the Bluewater, New Mexico, Disposal Site – February 2019*” (Report). As NMED has stated previously, the New Mexico Water Quality Act and the Water Quality Control Commission (WQCC) Regulations require abatement of subsurface water so that all groundwater of the State of New Mexico that has a background concentration of 10,000 mg/L or less total dissolved solids meets applicable standards. Although the Department of Energy (DOE) maintains control over groundwater resources at the Bluewater Disposal Site within the DOE Site Boundary, impacts to groundwater quality outside the site boundary are not subject to DOE control. Failure to meet the standards of Subsection A of 20.6.2.3103 NMAC in groundwater outside the site boundary poses a “hazard to public health” as defined at 20.6.2.7.H NMAC.

NMED has reviewed the Report and provides the following comments to DOE and the Nuclear Regulatory Commission (NRC) and requests collaboration moving forward to ensure adequate characterization of the groundwater contamination plume associated with the Bluewater Site.

General Comments

- A) NMED is concerned that the full nature and extent of the groundwater plume within the San Andres-Glorieta (SAG) aquifer has not been defined. Our concern is informed by the lack of a comprehensive monitoring well network and the questionable construction of the

wells evaluated for this Report. Although NMED appreciates DOE efforts to collect opportunistic samples from available wells, groundwater investigations are more effectively conducted using a set of wells that have been carefully located and constructed with the appropriate data objectives in mind. Many of the wells used for this study were not constructed with the intent of monitoring groundwater quality, and existing well spacing results in gaps in coverage.

- B) NMED is concerned that the groundwater investigation did not consider potential contaminants of concern other than uranium. Have previous investigations been conducted by DOE, NRC, or other entities that demonstrated that other contaminants associated with the Bluewater site (e.g., selenium, molybdenum, nitrate, total dissolved solids, sulfate) have not migrated outside the DOE Site Boundary? Other contaminants may move through the aquifer at different rates than uranium and, therefore, may be impacting a larger portion of the aquifer.
- C) While NMED understands that the nearest drinking water well completed in the SAG is approximately two miles south of the estimated limits of the Bluewater Disposal Site SAG uranium groundwater plume, all groundwater in the state of New Mexico is protectable for current and reasonably foreseeable future use. An approach that simply monitors groundwater pollution in a limited set of wells in the hope that it never reaches a private or public supply well is contrary to the New Mexico Water Quality Act and the WQCC Regulations. Under New Mexico law, groundwater pollution is required to be abated to meet applicable standards regardless of whether an existing drinking water well is impacted.
- D) The “site-specific health-based concentration limit” of 0.44 mg/L uranium established for point of exposure wells associated with the Bluewater Disposal Site is significantly higher than the Environmental Protection Agency health-based Maximum Contaminant Level for drinking water systems of 0.03 mg/L total uranium, as well as the New Mexico WQCC health-based groundwater standard, which is 0.03 mg/L dissolved uranium. A concentration limit above 0.03 mg/L of uranium creates a direct health risk for New Mexico residents and visitors and is contrary to well-established State law.

Specific Comments

- 1) Section 2.1, Figure 7, and Figure 8: Interpretations on the behavior of the faults acting as barriers to ground water flow are conjectural given the limited number of monitoring wells, the distance between the wells, and distance from the wells to the faults. While there is evidence that suggests that the East-West fault serves to limit flow across the fault, the elevated uranium concentrations south of the East-West fault indicate there is flow across the fault within the DOE Site Boundary, although the boundary effect appears to diminish with distance eastward from the disposal cell. Paired wells placed

as close as practicable on either side of the fault(s) would provide a better understanding of the behavior of the fault(s) with respect to groundwater flow.

In addition, although NMED is in agreement that groundwater withdrawals can dramatically effect groundwater elevations and that active pumping wells should not be used to determine a potentiometric surface, groundwater elevation maps should be constructed using all available water level data from wells known to be completed within the SAG. DOE compared groundwater flow directions for 2012 and 2017 using a different set of wells, including fewer wells in 2017 which results in low confidence regarding overall trends in groundwater flow direction. This reinforces our general comment above, regarding DOE's reliance on supply wells for characterization of the nature and extent of uranium contamination in groundwater.

- 2) Section 2.2, Figure 9: The discussion of well 928 and the timing of impacts from the Chinle Aquifer suggests this data should not be used for comparative purposes when evaluating the possible movement of the plume to the east. Additional wells are needed to better define the eastern extent of the contamination in the SAG.

Using analytical data collected from different wells over a time frame exceeding 5-years, as was done in creating Figure 9, is not an appropriate approach for determining the extent of groundwater impacts.

- 3) Page 19 & 20, Table 1: NMED notes various inconsistencies in the data used by DOE (e.g., construction information, installation information, sample dates, and analytes). It does not appear that DOE has conducted an evaluation that compares various well construction methods and subsequent zones from where groundwater is drawn to water quality results.

In addition, Table 1 does not specify whether the laboratory results displayed are for total or dissolved uranium.

- 4) Page 21, discussion of well 928: As stated in our previous comments, additional wells are necessary to better define the eastern extent of groundwater impacts from the Bluewater site.
- 5) Section 2.4: NMED notes that uranium concentrations have increased in three SAG wells (14(SG), 18(SG), 13(SG)) located along the southern DOE Site Boundary. Additional wells are necessary to determine the extent of groundwater impacts in the SAG south of the site boundary. The Report does not include data for the Bluewater Village supply well located southeast of well 14(SG) on the 2017 plume map (Figure 12). Data from this well was provided on the 2013 plume map (Figure 9).

- 6) Page 25, Figure 12: NMED has sampled multiple SAG wells under the cooperative agreement between DOE and NMED for a more comprehensive list of constituents. In particular, wells BSAG-13 and BSAG-9 provide information relative to defining the SAG plume. The dissolved uranium concentration for BSAG-13 was 0.027 mg/L in 2018, an increase over the concentration of 0.020 mg/l in 2017. BSAG-9 had a dissolved uranium concentration of 0.0086 mg/L in 2018, an increase over the concentration of 0.00786 mg/L in 2017. Inclusion of these wells could help to define the northeastern limit for the SAG plume.
- 7) Page 29, Section 3.1: The Report does not explain the basis for the following statement: "The alluvial aquifer outside the groundwater contours is interpreted to be mostly unsaturated."
- 8) Page 29 & Figure 18: The Report does not explain the basis for truncating the alluvial plume at well 649 since there are apparently no monitoring wells south of this location.

Definition of groundwater impacts outside of the DOE Site Boundary is not supported by the Report for the reasons state above. NMED notes DOE's recognition of the evaluation's limitations, as stated on page 39: "The extent of the uranium plume remained unchanged because concentrations and data density available to define the extent to the north, west, and south remained relatively constant from 2013 to 2017 and no data exists to define the east and northeast areas of the plume." DOE's plans to install two new SAG monitoring wells in 2021 will assist in plume definition, but they will not provide the complete coverage necessary to adequately define the nature and extent of groundwater impacts. Given the significant amount of time between the previous report (2014) and this current report (2019), NMED has concerns that the timeline for installing additional wells and completing additional groundwater investigation will not result in timely actions to ensure protection of human health and the environment.

Collaboration is one of NMED's core tenants. NMED looks forward to increased collaboration with DOE and NRC to more fully characterize and monitor the Bluewater groundwater plumes. A minimum of 4-6 wells are necessary as a next step to better understand and monitor the groundwater impacts in the SAG. NMED will work within the framework of the existing cooperative agreement with DOE to achieve this goal. Further collaboration among NMED and the appropriate federal agencies will be necessary to ensure protection of human health and the environment.

New Mexico residents rely on groundwater for much of their domestic, irrigation, and livestock watering needs. This is particularly true in this region of New Mexico where there are essentially no surface water resources available. The San Andres-Glorieta aquifer is the primary water resource in this area, as evidenced by the presence of municipal supply wells completed in the SAG serving Bluewater Village, the Village of Milan, and the Town of Grants. Failure to

adequately address the impacts to the alluvium and the SAG from the mill sites in the area poses an unacceptable risk to these communities.

If you have any questions please contact me at (505) 827-0195, or Amber Rheubottom at (505) 827-2754.

Sincerely,



Kurt Vollbrecht, Manager
Mining Environmental Compliance Section
New Mexico Environment Department

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