



Department of Energy

Washington, DC 20585

September 3, 2020

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Deputy Director
Mail Stop T8-F5
Washington, DC 20555-0001

Subject: Evaluating the Influence of High-Production Pumping Wells on
Impacted Groundwater at the Bluewater, New Mexico, Disposal Site
(Docket No. 40-8902)

To Whom It May Concern:

In a letter from the U.S. Nuclear Regulatory Commission (NRC) to the U.S. Department of Energy (DOE) Office of Legacy Management dated May 24, 2018, regarding groundwater contamination and disposal cell performance concerns at the DOE Bluewater, New Mexico, Disposal Site, NRC requested DOE to provide its planned approaches for addressing:

“uncertainty in flow and contaminant transport due to pumping from high-production municipal, industrial, and irrigation wells.”

The enclosed report *Evaluating the Influence of High-Production Pumping Wells on Impacted Groundwater at the Bluewater, New Mexico, Disposal Site*, completed in August 2020, addresses this request, as well as addressing stakeholder concerns regarding potential movement of the plume as a result of high-volume pumping wells. The report evaluates existing data and identifies correlations between the pumping and observed groundwater level, flow, and transport behavior.

Evaluation of high-production pumping impacts included the review of groundwater-level monitoring data to evaluate pumping influences and changes in flow directions. Available water chemistry data were then used to assess the transport of indicator species. Data for 42 wells within the study area were reviewed: 10 Bluewater site wells and 32 offsite wells. Continuous groundwater-level monitoring data collected at the Bluewater site were used to evaluate groundwater-level patterns and calculate flow directions and gradients. Several distinct groundwater-level patterns were observed in the continuous groundwater data including long-term trends, seasonal trends, and shorter-term trends of various lengths. The seasonal trends show groundwater levels decline as much as 5 feet in some wells in the spring, summer, and fall. Temporal flow directions show the seasonal shift in flow direction correlates with the seasonal decline in water levels. Flow directions shift to the south, toward the location where most pumping occurs, during late spring, summer, and early fall. During this period, calculated gradients typically show more variability than non-pumping periods.



Pumping records were tabulated for the period 2012–2018 for the industrial and municipal high-production pumping wells. Pumping records indicate the timing of higher pumping correlates with the local seasonal drawdown of the water levels, shift in flow directions, and change in hydraulic gradient within areas of the Bluewater site.

Statistical trend analysis was conducted for uranium, sulfate, and TDS. The trend analysis was conducted with the Mann-Kendall statistical test in both Bluewater site and offsite wells for wells with eight or more samples. In total, eight Bluewater site wells and seven out of 32 offsite wells had more than eight valid data points. The analysis identified increasing trends in three Bluewater site wells and one offsite well (951). Available water chemistry data were then used to assess the transport of indicator species.

Several limitations and uncertainties were identified as part of the analysis and are detailed in the report. The conclusions from this evaluation are as follows:

- Groundwater levels and flow directions at the Bluewater site suggest high-production pumping southeast of the site seasonally influences site groundwater levels and flow directions.
- Contaminant trend data suggests there is no clear evidence high-production pumping is impacting groundwater quality at wells outside of the 2017 uranium plume; from the available data, geochemical conditions appear to be stable.
- The data used for this evaluation are temporally and spatially sparse. Routine, comprehensive sampling would better inform long-term contaminant concentration trends at nearby, high-production pumping wells.

DOE will continue to monitor groundwater at the Bluewater site, maintain a cooperative agreement with the New Mexico Environment Department for offsite private well sampling, and evaluate data collected by Homestake Mining Company.

Please call me at (970) 248-6550 or email bernadette.tsosie@lm.doe.gov if you have any questions. Please address any correspondence to:

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Sincerely,

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Bernadette Tsosie
Bluewater Site Manager

Enclosure

cc: w/enclosure

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