

## Department of Energy Washington, DC 20585 May 21, 2021

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

Subject: Department of Energy Office of Legacy Management Response to U.S. Nuclear Regulatory Commission Staff Review of Site Status Reports for the Bluewater, New Mexico, Disposal Site

To Whom It May Concern:

The U.S. Department of Energy (DOE) Office of Legacy Management (LM) has received and reviewed, the U.S. Nuclear Regulatory Commission (NRC) May 24, 2018 letter<sup>1</sup> documenting their review and response to the following LM reports: a) *Site Status Report: Groundwater Flow and Contaminant Transport in the Vicinity of the Bluewater, New Mexico, Disposal Site, dated November 2014*<sup>2</sup>; b) the 2017 UMTRCA Title II Sites Annual Report<sup>3</sup>; c) Evaluation of Disposal Cell Topography Using LiDAR Surveys Bluewater, New Mexico, Disposal Site<sup>4</sup>; d) the November 2016 Data Validation Package<sup>5</sup>; and e) the online DOE Geospatial Environmental Mapping System (GEMS) for the Bluewater, New Mexico, Disposal Site (Bluewater Site). In their letter, the NRC requested LM's planned approach on the following five issues:

- 1. Uncertainty in the location of the leading edge of the uranium plume, which NRC suspects could be farther advanced towards areas north of Grants than currently estimated
- 2. Uncertainty in flow and contaminant transport which NRC suspects may be due to pumping from high-production municipal, industrial, and irrigation wells

Bluewater, New Mexico, Disposal Site, Office of Legacy Management, LMS/BLU/S14703, April.

<sup>&</sup>lt;sup>1</sup> Whited, 2018. Jeffrey Whited, Project Manager, Materials Decommissioning Branch, Division of Decommissioning, Uranium Recovery and Waste Programs, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, letter (about NRC Staff Review of Site Status Reports for the Bluewater, New Mexico, Disposal Site) to Bernadette Tsosie, Project Manager, Office of Legacy Management, U.S. Department of Energy, May 24.

<sup>&</sup>lt;sup>2</sup> DOE (U.S. Department of Energy), 2014. *Site Status Report: Groundwater Flow and Contaminant Transport in the Vicinity of the Bluewater, New Mexico, Disposal Site*, Office of Legacy Management, LMS/BLU/S11381, November.

<sup>&</sup>lt;sup>3</sup> DOE (U.S. Department of Energy), 2017. 2017 Annual Site Inspection and Monitoring Report for Uranium Mill Tailings Radiation Control Act Title II Disposal Sites, Office of Legacy Management, LMS/ S16940, December. <sup>4</sup> DOE (U.S. Department of Energy), 2017. Evaluation of Disposal Cell Topography Using LiDAR Surveys

<sup>&</sup>lt;sup>5</sup> DOE (U.S. Department of Energy), 2016. *Data Validation Package*, Office of Legacy Management, LMS/BLU/S01116, November.

- 3. Uncertainty in potential contamination of drinking water wells as NRC is concerned that DOE was not able to sample all wells in the immediate vicinity of the Bluewater site
- 4. The State of New Mexico requirements pursuant to the New Mexico Water Quality Act
- 5. The depressions on the north end of the disposal cell

The purpose of this letter is to articulate the paths forward on those issues and provide LM's response to additional questions/topics raised. Please see LM's response below for each issue identified by NRC:

1. Uncertainty in the location of the leading edge of the uranium plume, which NRC suspects could be farther advanced towards areas north of Grants than currently estimated

LM Response: As indicated in the January 2018 LM letter to NRC, LM developed the 2017 Uranium Plumes in the San Andres-Glorieta and Alluvial Aquifers at the Bluewater, New *Mexico*, *Disposal Site*<sup>6</sup>, which provides an update of the spatial configuration of the uranium plumes in both the San Andres/Glorieta (SAG) and alluvial aquifer. The report was sent to NRC, the New Mexico Environment Department (NMED), the New Mexico Office of the State Engineer (NMOSE), the U.S. Environmental Protection Agency (EPA), and stakeholder groups on March 20, 2019, and is publicly available on the LM website at https://www.lm.doe.gov/Bluewater/Documents.aspx. The report notes that the interpreted extents of the 2017 uranium plumes in the SAG and alluvial aquifers were similar to those of the 2013 uranium plumes. Localized changes in the southwest corner of the SAG uranium plume were observed during the interim period from 2013 to 2017. The uranium plume in the SAG aquifer, however, remains approximately 2 miles north of the nearest drinking water supply well, which extracts groundwater from the SAG aquifer to serve the Village of Milan. The extent of the plume is not well-defined to the east and northeast because there are no wells in that area and hence, no uranium concentration data. To address this gap, LM will be providing funding to NMED in its new cooperative agreement to install offsite monitoring wells. The offsite wells will provide more information on the configuration of the plume offsite. In coordination with LM, NMED will investigate and decide where to locate the wells.

2. Uncertainty in flow and contaminant transport which NRC suspects may be due to pumping from high-production municipal, industrial, and irrigation wells.

LM Response: LM has developed a report evaluating the influence of high-volume pumping wells on impacted SAG groundwater derived from the Bluewater site<sup>7</sup>. The report compiles pumping data from the Bluewater site area, analyzes onsite water levels to determine seasonal variation, and evaluates concentration trends of potential indicator analytes in key wells. The report was released in August 2020. Copies were provided to NRC, NMED, NMOSE, EPA, and stakeholder groups, and the report is available on the LM website.

<sup>&</sup>lt;sup>6</sup> DOE (U.S. Department of Energy), 2019. 2017 Uranium Plumes in the San Andres-Glorieta and Alluvial Aquifers at the Bluewater, New Mexico, Disposal Site, Office of Legacy Management, LMS/BLU/S19565, February. <sup>7</sup> DOE (U.S. Department of Energy), 2020. Evaluating the Influence of High Production Pumping Wells on Impacted Groundwater at the Bluewater, New Mexico, Disposal Site, Office of Legacy Management, LMS/BLU/S24765, August.

3. Uncertainty in potential contamination of drinking water wells as NRC is concerned that DOE was not able to sample all wells in the immediate vicinity of the Bluewater site

LM Response: In response to this concern, LM completed an inventory of all permitted SAG wells in the vicinity and downgradient of the Bluewater site. This inventory is included in the 2017 Uranium Plumes in the San Andres-Glorieta and Alluvial Aquifers at the Bluewater, New Mexico, Disposal Site as Appendix A, "Crosswalk for SAG Wells in the Grants-Bluewater Valley Region." Based upon this inventory and the spatial configuration of the 2017 uranium SAG plume, there were no wells found permitted for domestic use within the extent of the SAG aquifer uranium plume.

LM maintains a cooperative agreement with NMED to help address the State's concerns including sampling private wells in the vicinity of the Bluewater site at the request of well owners. Domestic wells sampled by NMED near the SAG uranium plume include B-518 (BSAG-7), B-1771 (BSAG-13), and B-1458 (BSAG-9). Apart from two exceedances in BSAG-13, uranium concentrations in these domestic wells have remained at or below the EPA drinking water standard and the New Mexico groundwater standard of 0.03 milligrams per liter (mg/L). The completion of B-1771 (BSAG-13) in the SAG aquifer is in question and the source of the contamination is unknown.

Regarding municipal wells, the SAG uranium plume remains approximately two miles north of the nearest drinking municipal supply well (Milan Well #4) that extracts groundwater from the SAG aquifer to serve the Village of Milan. No increases in uranium concentration were observed in Milan Well #4, nor in any other municipal well, between 2013 and 2017. The high-volume pumping report provides additional analyses of trends in the municipal and private wells in the vicinity and downgradient of the Bluewater site.

Regarding the alluvial aquifer, there are no permitted domestic wells between the Bluewater site and the paleochannel confluence zone of the Ancestral Rio San Jose alluvial aquifer and the San Mateo Creek alluvial aquifer. With LM participation, NMOSE issued a well prohibition in the alluvial aquifer near the Bluewater site in May 2018, restricting the permitting and drilling of new wells in the alluvial aquifer.

4. The State of New Mexico requirements pursuant to the New Mexico Water Quality Act

**LM Response:** In the Spring 2021, the New Mexico Office of General Counsel and DOE Office of General Counsel discussed the Bluewater Uranium Mill Tailings Radiation Control Act Site offsite groundwater 11e.(2) byproduct material (byproduct material), and whether the State of New Mexico had jurisdiction over it. Following their review, and has further discussed below, the New Mexico Office of General Counsel concluded they did not have jurisdiction.

LM is committed to upholding its statutory and regulatory responsibility under the necessary requirements at the Bluewater site. In addition, LM will continue to partner with NMED through the cooperative agreement, including expanding the agreement to install new offsite monitoring wells to resolve the State's and stakeholders' concerns.

LM's interpretation of New Mexico State rules is as follows:

- It would appear that between NRC and the State of New Mexico, NRC should have the jurisdiction over onsite and offsite groundwater contamination at the Bluewater site under its Atomic Energy Act authority to regulate nuclear and non-nuclear materials (which include source and byproduct materials) and constituents of processing of such material(e.g., uranium ore concentrates). NRC approved the current groundwater standards<sup>8</sup> in February 1996 and amended the site license accordingly prior to the site transferring to LM for long term surveillance and maintenance. These standards were subsequently incorporated into the long-term surveillance plan (LTSP)<sup>9</sup> for the site, which NRC accepted.
- At the time of the license amendment and LTSP, the offsite contamination had already occurred. The standards incorporated into the license amendment were determined to be protective. They also were in accordance with New Mexico standards in effect at that time (including the uranium standard of 5 mg/L).
- LM notes from the New Mexico regulations for groundwater and surface water protection (NMAC 20.6.2) that the state definition of "water contaminant" under the state's Clean Water Act equivalent excludes byproduct material (as does EPA's Clean Water Act), which is the source of the groundwater contamination at the Bluewater site. This exempts the groundwater contamination at Bluewater from New Mexico jurisdiction whether it is within or outside of the Bluewater Site boundary.
- Furthermore, New Mexico exempts sites from abatement plan requirements (e.g., Stage 1 and Stage 2) if groundwater is addressed under the authority of the NRC or DOE pursuant to the Atomic Energy Act (AEA) (NMAC 20.6.2.4105A.(4)). DOE's long-term custody of the Bluewater site (including matters concerning groundwater) is conducted according to Chapter 8, Section 83 of the AEA (42 U.S.C. § 2113) and under the regulatory authority of NRC; consequently, the groundwater is exempt from the New Mexico abatement requirements.

The LM view is groundwater at the Bluewater site is exempt from State regulation and the State rules do not apply, the groundwater is regulated under UMTRCA (and the AEA). LM remains in compliance with the LTSP between LM and NRC.

5. The depressions on the north end of the disposal cell

**LM Response:** LM is working with the U.S. Army Corps of Engineers (USACE) to finalize a conceptual design for the repair of the main tailings disposal cell, finalize the design, and oversee construction of the repair. LM would like NRC to be involved in this process to ensure the repair specifications satisfy all its requirements. LM sent NRC a letter on September 23, 2020 to coordinate NRC's review points for draft drawings and documents.

<sup>&</sup>lt;sup>8</sup> NRC (U.S. Nuclear Regulatory Commission), 1996. Hoseeph Holonich, Chief, Uranium Recovery Branch, Division of Waste Management, Office of Nuclear Material Safety and Safeguards, letter (Subject: Approval of Groundwater Alternate Concentration Limits, Amendment 30 to Source Material License SUA-1470, to Mr. R. S. Ziegler, Project Manager, Atlantic Richfield Company, February 22.

<sup>&</sup>lt;sup>9</sup> US Department of Energy, 1997. *Long-Term Surveillance Plan for the DOE Bluewater (UMTRCA Title II) Disposal Site near Grants, New Mexico*, Grand Junction Office, Grand Junction, Colorado, July.

In the May 2018 letter, NRC also raised several other questions and specific issues. LM's responses to these remaining issues are documented below:

a. NRC states "The NRC staff also reviewed other recent data and notes that uranium concentrations have been increasing in wells 806, 806R, 943, 986, and 951R."

LM Response: For several reasons, as identified below, only two of these wells are available for trend analysis. Enough data were available for LM to conduct a Mann-Kendall statistical analysis of trends in 806R using monitoring results from Homestake Mining Company (Homestake) and NMED and 951R using Homestake monitoring results. LM also analyzed indicator parameters in addition to uranium. LM did not identify increasing uranium trends in either well nor any increasing trend for an indicator species (i.e. nitrate, sulfate, and total dissolved solids [TDS]) (see Enclosure 1). LM provide additional information on this analysis in the report on high-volume pumping report.

Not all the wells had information appropriate for trend analysis. Well 806 was abandoned in late 2014 due to a casing breach. Because of that breach, monitoring results from October 2014 do not represent the SAG aquifer. As detailed in the *Well 943 Hydrologic Test Report*<sup>10</sup>, water quality analyses have indicated that uranium concentrations in well 943 are not representative of the SAG aquifer. The source of uranium in well 943 is believed to be leakage from an overlying aquifer. Well 943 was plugged in July 2018. Well 986 was previously sampled by NMED through the cooperative agreement, but NMED has been unable to access the well since 2012.

b. NRC states "The increasing concentrations are a concern to the NRC and it is requested that DOE reaffirms its access through an agreement with the well owner that allows access to the well for sampling in order to monitor the impacted well and take appropriate actions as necessary consistent with the Long-Term Surveillance Plan to protect public health and safety if the MCL is exceeded for drinking water wells."

LM Response: LM reaffirms its commitment to offsite well sampling through the cooperative agreement with NMED. LM will provide funding for sampling of SAG aquifer wells and alluvial aquifer wells impacted by the Bluewater site. If wells are determined to be completed in the Chinle aquifer or in the alluvial aquifer and are not impacted by the Bluewater site, LM will discontinue provision of funding for sampling. NMED continues to maintain an access agreement to sample well 806R and is available to make agreements with other well owners who wish to be included in the program. LM also affirms its commitment to work with NMED to the extent permissible under DOE's authority and to take any action, available to LM consistent with the Bluewater site LTSP.

c. NRC states "The development of an enhanced land-use survey by the DOE would help reduce the uncertainty in the potential contamination of drinking water sources in the vicinity of the Bluewater site..."

<sup>&</sup>lt;sup>10</sup> Homestake Mining Company, 2018. Well 943 Hydrologic Test Report, April.

LM Response: LM has obtained information about the land parcel ownership in the vicinity of the Bluewater site and specifically of the land over the 2017 SAG uranium plume (Enclosure 2). The land is primarily owned by Homestake, with portions belonging to Atlantic Richfield Company (ARCO), the State of New Mexico, with one private landowner within the footprint of the plume. In addition to the land survey, LM completed an inventory of all permitted SAG wells downgradient of and in the vicinity of the Bluewater site and there are no permitted nor known municipal or domestic wells within the footprint of the plume. The nearest active municipal well (Milan Well #4) is located two miles south and outside of the plume.

d. Finally, NRC requested "that DOE provide additional data concerning indicator species (e.g., (TDS), sulfates) in its well measurements going forward."

LM Response: LM conducts sampling of all Bluewater site monitoring wells. Chloride, nitrate, sulfate, and TDS are included in the analyte suite and all data are made publicly available on the LM Geospatial Environmental Mapping System (GEMS) website (https://gems.lm.doe.gov/#site=BLU). Chloride, nitrate, sulfate, and TDS are also included in the analyte suite for NMED's offsite well sampling and the results are provided to the individual well owners. LM includes trend analyses of indicator species in both onsite and offsite wells (where enough data are available) in the high-volume pumping report.

LM looks forward to continuing work under NRC's general license at Bluewater to ensure the protectiveness of the Bluewater site and appreciates the partnership with NMED through the cooperative agreement. If you have any questions regarding this letter, please contact me at (970) 248-6550 or by email at Bernadette. Tsosie@lm.doe.gov. Please address any correspondence to:

U.S. Department of Energy Office of Legacy Management 2597 Legacy Way Grand Junction, CO 81503

> Sincerely, BERNADET Digitally signed by BERNADETTE TSOSIE TE TSOSIE Bernadette Tsosie Bluewater Site Manager

Date: 2021.05.21 10:11:40 -06'00'

Enclosure

cc w/enclosure via email: Ron Linton, NRC Mark Purcell, EPA Amber Rheubottom, NMED Kirk Vollbrecht, NMED Chris Burrus, NMOSE Randy Tormey, DOE-EM Mark Kautsky, DOE-LM Paul Kerl, DOE-LM Alison Kuhlman, RSI DOE Read File File: E/20/1025