



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 EAST LAMAR BOULEVARD
ARLINGTON, TEXAS 76011-4511

June 15, 2018

MEMORANDUM TO: Docket File 070-00925

THROUGH: Ray L. Kellar, P.E., Chief /RA by RBrowder Acting for/
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

FROM: Martha R. Poston, Health Physicist /RA/
Fuel Cycle and Decommissioning Branch
Division of Nuclear Materials Safety

SUBJECT: CIMARRON SITE VISIT, CRESENT, OKLAHOMA

On May 16-17, 2018, staff from the U.S. Nuclear Regulatory Commission (NRC) Region IV office conducted a visit at the Cimarron site to assess the current status of the site, including compliance with license conditions and discuss the proposed changes to the Decommissioning Plan as a result of the completed pilot tests. Enclosed to this memorandum is the NRC's trip report for this site visit.

No significant regulatory issues or safety concerns were identified during the site visit.

Docket: 070-00925
License: SNM-928

Enclosure: NRC Trip Report

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**U.S. NUCLEAR REGULATORY COMMISSION
REGION IV**

Docket: 070-00925

License: SNM-925

Licensee: Cimarron Environmental Response Trust

Facility: Cimarron/Kerr-McGee Uranium Plant
Logan County
Crescent, Oklahoma

Dates: May 16-17, 2018

Inspector: Martha R. Poston, Health Physicist
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Approved by: Ray L. Kellar, P.E. Chief
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Division of Nuclear Materials Safety

Enclosure

NRC Trip Report

1. Background

The Cimarron site was used to fabricate enriched uranium and mixed oxide fuels for nuclear reactors from 1965-1975. On site, there were several buildings, collection ponds, sanitary lagoons, storage area and burial areas. Originally, the site was owned and operated by Kerr-McGee Corporation. The site was later operated by Cimarron Corporation, a fully owned subsidiary of Kerr McGee. In 2005, ownership of Cimarron Corporation was fully transferred to Tronox Incorporated, who subsequently filed for bankruptcy in 2009. In 2011, Cimarron Environmental Response Trust assumed responsibility for the Cimarron site, including completion of decommissioning activities.

The Cimarron site is approximately 340 hectares (840 acres) along the southern bank of the Cimarron River about 1 kilometer (0.5 miles) north of the intersection of Oklahoma State Highways 33 and 74, and approximately 40 kilometers (25 miles) north of Oklahoma City.

Decommissioning efforts were initiated in 1976. Characterization activities and decommissioning were first conducted at the mixed oxide fuel fabrication (MOFF) building and associated areas, which included evaporation ponds, emergency ponds, sanitary lagoons, underground tanks, a septic tank, and a fenced area around the MOFF building. In 1990, Cimarron Corporation submitted a final survey report of the MOFF building and associated areas to the NRC and requested termination of the MOFF license. The NRC completed a confirmatory survey and terminated the MOFF license consistent with the regulations in place in 1993. However, the lands and the MOFF building were not released for unrestricted use because they were located within the bounds of the uranium fuel fabrication license.

Characterization activities and decommissioning plans were developed and approved by the NRC for facilities associated with the uranium fuel fabrication license. The site was divided into three areas that included affected areas and unaffected areas. Less than 20 percent of the site was impacted by nuclear operations. These areas were further divided into subareas. Cimarron Corporation submitted a final status survey report for each subarea when decommissioning activities were complete for that area. Following NRC review and acceptance, subareas were released for unrestricted use and removed from the uranium fuel fabrication license. By early 2000s, the majority of the site had been released for unrestricted use.

Uranium concentrations in the groundwater were in excess of release criteria for some subareas – Burial Area #1 (BA1), Western Alluvial Area, and Western Upland Area. Plans were developed to lower the uranium concentrations through groundwater remediation. Progress in this area was delayed when Tronox filed for bankruptcy in 2009. Cimarron Environmental Response Trust took responsibility for the site in 2011. A preliminary remediation plan was submitted to the NRC in 2015. Since 2015, the licensee has proposed additional changes to the remediation plan to address changes in the site characterization.

2. Site Status

On May 16, 2018, the NRC team arrived onsite and toured the site with the licensee's representative to verify the current site conditions. The site tour included the Uranium Pond 1 (UP1) pilot test site, the Uranium Pond 2 (UP2) pilot test site, the BA1 pilot testing area and the 1206 Drainage Area. The pilot tests for BA1, UP1 and UP2 were completed and the areas have been restored to the pre-testing conditions, with the exception of the abandonment of old monitoring wells. The pilot tests expenditures were below the estimated testing budget, so the licensee applied the surplus funds to conduct characterization of the 1206 Drainage Area.

On May 17, 2018, the NRC team met with the Burns & McDonnell staff and its contractors at the corporate office in downtown Oklahoma City to discuss the results of the pilot tests, and the associated changes to the Decommissioning Plan.

The licensee identified the following information as a result of the pilot tests and indicated that changes will be made to the Decommissioning Plan to address the new information. The revised Decommissioning Plan will be submitted to the NRC for review.

For Burial Area #1

- BA1 will remain the critical driver for the remediation schedule, due to its complexity and the level of contamination.
- Transition zone drains quicker than modelled (modelled at 30 gallons/minute (gpm) will be adjusted down to 20 gpm). This will result in a design change to include two extraction trenches, rather than one.
- The injection trench will be reconfigured to feed both extraction trenches.
- Groundwater Extraction Trench (GETR)- BA1-02 will be reviewed for possible relocation

For Uranium Pond #2

- Capture rate for injected fluids is the limiting factor rather than aquifer acceptance as originally modelled, (Licensee was able to inject 12 gallons/day (gpd) per ft², versus the 2-5 gpd per ft² modelled)
- The north and south lateral injection trenches will be eliminated from the design.
- Reconfiguration and length reduction will be performed for Groundwater Injection (GWI)-UP-2-01 and GWI-UP-2-04.
- A liner will be installed on the southern and eastern faces of GWI-UP-2-01 and GWI-UP-2-04.
- Reduction of approximately 600 feet of trenching.
- Changes will be made to timing of injected water arrival at Western Alluvial Area (WAA) extraction wells and impact on the Western Area Transition Flow (WATF) influent concentration levels.

For Uranium Pond #1

- Capture rate for injected fluids is the limiting factor rather than aquifer acceptance as originally modelled, (Licensee was able to inject 4 gpd per ft² rather than the 1-2 gpd per ft² modelled).
- Dye tracer indicated preferential flow towards areas of lower elevation (i.e., flow distribution appears to be dependent on trench water level elevation).
- The length of GW1-UP1-03 through GW1-UP1-06 will be changed (either shortened or lengthened) based on the elevation at each location.
- Trenches will be reconfigured within the former UP1 footprint.
- Changes will be made to timing of injected water arrival at Western Alluvial Area (WAA) extraction wells and impact on the Western Area Transition Flow (WATF) influent concentration levels.

The 1206 Drainage Area was part of Burial Area #2 (BA2). Remediation of BA2 was not initially required. However, sampling of groundwater in the 1206 Drainage Area indicated that the west sample location is above the DEQ uranium criteria and east sample location is above both the DEQ and NRC uranium criteria. Based on these results, the volume of soils impacted needed to be determined to allow the licensee to assess options for remediation. Total volume of impacted soils for the western drainage path and the eastern drainage area is just over 2000 cubic yards. Injection and Extraction remediation technology for clean-up of the 1206 Drainage Area was rejected due to the minimal saturation thickness, low volume of material and low permeability. The licensee proposes excavation and removal of the soils in the 1206 Drainage Area.

3. Conclusions

The NRC staff did not identify any significant safety issues during the site tour.

070-00925 - CIMARRON SITE VISIT, CRESENT, OKLAHOMA – DATED JUNE 15, 2018

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