



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

March 28, 2017

MEMORANDUM TO: Christopher McKenney, Chief
Performance Assessment Branch
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

FROM: A. Christianne Ridge, Sr. Systems Performance Analyst **/RA/**
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Office of Nuclear Material Safety
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SUBJECT: SUMMARY OF FEBRUARY 16, 2017, TELECONFERENCE
RELATED TO POTENTIAL CONSTRUCTION OF A STORMWATER
DETENTION POND AT THE FORMER KAISER ALUMINIUM AND
CHEMICAL CORPORATION SITE, TULSA, OKLAHOMA

On February 16, 2017, the U.S. Nuclear Regulatory Commission (NRC) held a teleconference with representatives of the City of Tulsa Engineering Services Department (Tulsa ESD) and the State of Oklahoma Department of Environmental Quality (Oklahoma DEQ) regarding the former Kaiser Aluminum and Chemical Corporation Site in Tulsa, Oklahoma (Kaiser Site). The Kaiser facility processed magnesium-thorium alloy from 1958 through 1970. In 1993, the NRC detected thorium (Th), radium, and lead surface contamination on, and adjacent to, the Kaiser property. Kaiser conducted on-site decommissioning activities from June 2003 to June 2006. During decommissioning, soil with less than 31.3 picocuries per gram (pCi/g) Th-232 was used to backfill a retention pond onsite and covered with 3.05 meters (10 feet) of clean soil. In 2007, the NRC concluded the site was suitable for unrestricted release.

By email dated November 30, 2016, the Tulsa ESD indicated that it might build a stormwater detention pond on the Kaiser Site and asked about the radiological implications of removing the 3-meter (10-foot) clean soil cover. To evaluate this question, NRC staff considered the dose to detention pond construction workers as well as an off-site resident using water from a well immediately downgradient of the property. That analysis, dated February 7, 2017, is available from NRC's Agencywide Documents Access and Management System (ADAMS) under

Docket No.: 40-2377
Enclosure: Technical Summary of February 16, 2017 Teleconference

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Accession Number ML17013A381. The teleconference provided an opportunity for representatives of the Tulsa ESD and the Oklahoma DEQ to ask questions about that NRC evaluation. A summary of the call is enclosed for your use. Key points of the call were as follows:

- The Tulsa ESD explained that the detention pond was intended to be dry most of the year and to hold water only during and immediately after storm events.
- Because the pond was intended to be dry most of the year, the Tulsa ESD asked about the potential dose to an individual who spends time in the dry pond for recreation. NRC staff explained that the hourly projected dose to a worker in the pond provided in the NRC analysis could be used to bound the projected dose to an individual in the pond for recreation.
- The Tulsa ESD and Oklahoma DEQ discussed the potential for contaminated sediment to leave the detention pond and enter Fulton Creek, as well as various engineered features that could limit erosion.
- The Oklahoma DEQ expressed the opinion that restricting the depth of the excavation so that some clean cover remained above the contaminated soil seemed prudent. The Oklahoma DEQ also suggested that the bottom of the pond be lined.
- In response to a question from the Oklahoma DEQ, NRC staff explained that the site had been released under unrestricted release, and that NRC would not impose any requirements on the site unless NRC became aware of new information that demonstrated a safety hazard associated with the site. NRC staff indicated that the NRC analysis provided to the Tulsa ESD in response to their November 30 request did not show any potential safety hazard that would require further NRC involvement.
- The Tulsa ESD indicated that it would be useful to have more precise information about the location of and radionuclide concentrations in the contaminated soil.
- NRC staff committed to determining whether the Final Status Survey Report (FSSR) for the site could be made publicly available in ADAMS and, if so, to providing the Tulsa ESD with the accession numbers.

Participants

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			Fenton Rood
			Michael Moe
			Mike Stickney
			Kevin Sampson
			Micheal Jordon

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**SUMMARY OF FEBRUARY 16, 2017, TELECONFERENCE RELATED TO POTENTIAL
CONSTRUCTION OF A STORMWATER DETENTION POND AT THE FORMER KAISER
ALUMINIUM SITE, TULSA, OKLAHOMA**

The Kaiser facility processed magnesium-thorium alloy from 1958 through 1970. In 1993, the NRC detected thorium (Th), radium, and lead surface contamination on, and adjacent to, the Kaiser property. Kaiser conducted on-site decommissioning activities from June 2003 to June 2006. During decommissioning, soil with less than 31.3 picocuries per gram (pCi/g) Th-232 was used to backfill a retention pond onsite and covered with 3.05 meters (10 feet) of clean soil. In 2007, the NRC concluded the site was suitable for unrestricted release.

By email dated November 30, 2016, the City of Tulsa Engineering Services Department (Tulsa ESD) indicated that it might build a stormwater detention pond on the Kaiser Site and asked about the radiological implications of removing the 3-m (10-foot) clean soil cover. To evaluate this question, NRC staff considered the dose to detention pond construction workers as well as an off-site resident using water from a well immediately downgradient of the property. That analysis, dated February 7, 2017, is available from NRC's Agencywide Documents Access and Management System (ADAMS) with Accession Number ML17013A381.

On February 16, 2017, the U.S. Nuclear Regulatory Commission (NRC) held a teleconference with representatives of the Tulsa ESD and the State of Oklahoma Department of Environmental Quality (Oklahoma DEQ). The teleconference provided an opportunity for representatives of the Tulsa ESD and the Oklahoma DEQ to ask questions about the NRC evaluation.

After introductions, the Tulsa ESD explained that the stormwater detention pond it considered developing would be dry most of the year and only hold water during and immediately after storm events. Because the dry pond would be accessible to the public, the Tulsa ESD asked about the potential dose to a recreational user in the dry pond. NRC staff explained that the hourly projected dose to a worker in the pond that was provided in the NRC analysis included the projected dose from direct radiation, dust inhalation, and incidental ingestion, and could be used to bound the projected dose in various scenarios.

The Tulsa ESD asked specifically about the dose to a child who plays in the detention pond and digs into contaminated soil. NRC staff explained that age-specific doses were not calculated, but that most of the assumptions made in the construction-site scenario were likely to be conservative in a recreational scenario. Specifically, the NRC staff explained that the analysis considered direct radiation from the entire bottom of the excavation (i.e., 710 square meters) as well as the walls of the excavation, which would bound the radiation from a small exposed area of contaminated soil (e.g., a child digging a small hole). Furthermore, the inhalation portion of the calculation assumed the amount of airborne dust typical of a construction site, which is expected to be greater than the amount of dust encountered in a recreational scenario. Although the analysis did not include the higher incidental soil ingestion rate for a child as compared to an adult, NRC staff noted that for an adult, soil ingestion accounted for less than 2 percent of the dose in the hourly dose rate. Furthermore, NRC staff reminded the Tulsa ESD that, based on the NRC analysis, a worker had to spend a full work year (i.e., 2000 hours) in the excavation site with no clean soil cover for the dose to approach the site release dose criterion (i.e., 0.25 mSv/yr [25 mrem/yr]).

In response to a question from the Oklahoma DEQ, the Tulsa ESD indicated the site would not be considered a brownfield site. The Oklahoma DEQ urged the Tulsa ESD to consider using an

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engineered liner if the Tulsa ESD decided to develop the detention pond and stated that would likely improve the public perception of the project. The Tulsa ESD and Oklahoma DEQ then discussed the potential for contaminated sediment to wash out of the detention pond into Fulton creek. The discussion included a description of engineered features to limit erosion and the flow rate of the creek (i.e., approximately 42 cubic meters per second [1,500 cubic feet per second]).

The Tulsa ESD then asked the Oklahoma DEQ what would happen to any contaminated soil that was accidentally excavated and whether it could be put back in the excavation site. The Oklahoma DEQ indicated the soil could not be disposed of in Oklahoma. The Oklahoma DEQ expressed the opinion that restricting the depth of the excavation so that some clean cover remained above the contaminated soil seemed prudent. The Tulsa ESD indicated it would be useful to have more precise information about the location of the contaminated soil. NRC staff indicated that the Final Status Survey Report (FSSR) for the site includes detailed maps and records of soil borings including contaminant concentrations at various depths. NRC staff indicated that the files were not publicly available in ADAMS but that the staff would review them to determine if they could be made publicly available. NRC committed that headquarters staff would review the files and Region IV staff would communicate with the Tulsa ESD to let them know the outcome of the review and, if the files were made public, the accession numbers for the FSSR files in ADAMS.

The Oklahoma DEQ asked NRC staff if NRC would require the Tulsa ESD to have a Radiation Safety Officer on site during the construction. NRC staff explained that the site had been released under unrestricted release, and that there was no longer an active NRC license associated with the site. NRC staff explained this meant that NRC would not impose any requirements on the site unless NRC became aware of new information that demonstrated a safety hazard associated with the site, and that the NRC analysis provided to the Tulsa ESD in response to their November 30 request did not show any potential safety hazard that would require further NRC involvement.

The Oklahoma DEQ asked the Tulsa ESD to keep it informed of any plans for development of the pond. The Oklahoma DEQ indicated it expected it would ask the Tulsa ESD to use a liner for the pond and may consider requiring discharge monitoring. In response to a question from the Oklahoma DEQ, the Tulsa ESD indicated the timeline for the project would be about five years, if the project was pursued.