



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

February 7, 2017

K. Michelle Barnett, Coordinator
Brownfields Program
Planning and Coordination
City of Tulsa Engineering
Services Department
2317 S. Jackson Ave., Room S309
Tulsa, OK 74107

**SUBJECT: RESPONSE TO REQUEST FOR GUIDANCE REGARDING POTENTIAL
LOCATION OF A STORMWATER DETENTION POND AT THE KAISER
ALUMINUM AND CHEMICAL CORPORATION SITE, TULSA, OKLAHOMA**

Dear Ms. Barnett:

Thank you for contacting the NRC Region IV Regional State Liaison Officer, Bill Maier, regarding the Kaiser Aluminum and Chemical Corporation Site in Tulsa, Oklahoma (Kaiser Site). By email dated November 30, 2016, you indicated that the City of Tulsa is evaluating the Kaiser Site for potential stormwater detention pond construction. Your email referenced the presence of soil contaminated with thorium buried onsite 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. NRC staff determined that the projected worker dose depends on the time spent in the excavation itself, the time spent in the vicinity of contaminated excavation spoils, and whether the depth of the excavation exceeds the 3.05 m (10 foot) clean cover depth. Most of the construction scenarios evaluated do not cause a worker dose concern. Specifically, if at least 0.305 m (1 foot) or more of the clean cover remains in place, the projected worker dose is significantly less than the dose criterion for unrestricted release (i.e., 25 millirem per year (mrem/yr)), even if conservative assumptions are made about radionuclide concentrations, shielding, and time spent on the site (i.e., an entire work year spent in the excavation site). If the excavation removes all of the clean cover and proceeds into the contaminated material, the projected dose is still expected to remain less than 25 mrem/yr if a worker spends less than a full work year (i.e., less than 2000 hours) in the excavation site after the clean cap is removed.

The NRC Safety Evaluation Report (SER) for the Phase 2 Kaiser Decommissioning Plan indicates that at the time of the SER, the future use of the site was expected to be commercial or light industrial use. Construction of a stormwater detention pond on the site was not envisioned in the Kaiser Decommissioning Plan or NRC's SER. Therefore, although the analysis Kaiser submitted in support of its Decommissioning Plan addressed potential groundwater contamination, it did not evaluate the possibility of a standing body of water, such as a stormwater detention pond, above the buried contaminated soil. Based on evidence of significant infiltration from the former Kaiser facility retention pond into the shallow and deep aquifers at the site, NRC staff determined that the effects of the proposed stormwater detention

pond on local hydrology should be considered. NRC analyses showed that, if the water table does not rise over the contaminated soil, projected doses from groundwater contamination are expected to remain below 25 mrem/yr. However, simplified screening analyses indicated the potential for doses above 25 mrem/yr to result if the contaminated soil is submerged below the water table. This result depends on the potential effect of the proposed detention pond on local groundwater flow, which was evaluated with a relatively simple approach in response to this request. Based on the currently-envisioned construction of a stormwater detention pond above the contaminated soil, it appears that more detailed groundwater flow modeling may be useful to reduce the uncertainty in the potential groundwater contamination.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

If you have any questions regarding this letter or the enclosed technical report, please contact the project manager, Christianne Ridge, at (301) 415-5673 or Christianne.Ridge@nrc.gov.

Sincerely,

/RA R. Chang for/

Theodore Smith, Chief (Acting)
Materials Decommissioning Branch
Division of Decommissioning, Uranium Recovery,
and Waste Programs
Office of Nuclear Material Safety
and Safeguards

Docket No. 40-2377

Enclosure:
Technical Evaluation

cc: Bill Robinson, Lead Engineer
Stormwater Project Coordination
City of Tulsa, Engineering Services Department
2317 S. Jackson Ave.
Room S-310
Tulsa, OK, 74107

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| NAME | ARidge | CMcKenney | CHolston | TSmith(RChang acting for) |
| DATE | 1/12/17 | 1/13/17 | 1/13/17 | 2/07/17 |

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