

**From:** Bryan Davidson <Bryan.Davidson@tn.gov>  
**Sent:** Tuesday, December 6, 2022 4:35 PM  
**To:** KairosHermes-CPEIS Resource  
**Subject:** [External\_Sender] TDEC Comment on the U.S. NRC Draft EIS for the Construction Permit for the Kairos Hermes Test Reactor  
**Attachments:** TDEC NEPA Comment on the U.S. NRC Draft EIS for the Construction Permit for the Kairos Hermes Test Reactor\_FINAL.pdf

Good afternoon,

Attached you will find the Tennessee Department of Environment and Conservation's comment letter on the Kairos Hermes Test Reactor Construction Permit Draft EIS. Please reach out to me if you have any questions pertaining to the contents of the letter.

Thanks,



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Department of  
**Environment &  
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STATE OF TENNESSEE  
DEPARTMENT OF ENVIRONMENT AND CONSERVATION  
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DAVID W. SALYERS, P.E.  
COMMISSIONER

BILL LEE  
GOVERNOR

December 6, 2022

**Via Electronic Mail to KairosHermes-CPEIS@nrc.gov**

Draft Environmental Impact Statement for Kairos "Hermes" Test Reactor Construction Permit Comment.  
Program Management  
Announcements and Editing Staff  
U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

Mr. Burnell:

The Tennessee Department of Environment and Conservation (TDEC) appreciates the opportunity to provide comments on the United States Nuclear Regulatory Commission (NRC) draft *Environmental Impact Statement for the Construction Permit for the Kairos Hermes Test Reactor* (Draft EIS), concerning Kairos Power's application for a permit to build a test version of the company's advanced reactor design, called "Hermes," in Oak Ridge, Tennessee. Kairos filed an application on Sept. 29, 2021, seeking a permit to build a 35-megawatt, non-power reactor, which uses molten salt to cool the reactor core. Kairos plans to build and operate Hermes to demonstrate key elements of the Kairos Power Fluoride Salt-Cooled, High Temperature Reactor (KP-FHR) technology for possible future commercial deployment. The company will have to submit a separate application for an operating license for the test reactor in the future.

This Draft EIS evaluates the environmental impacts of the proposed action and considers the following two alternatives to the proposed action:

- Alternative 1: The No-Action Alternative – The NRC would not issue a construction permit to Kairos to build a test reactor to demonstrate the KP-FHR technology, and Kairos could not build the proposed Hermes reactor.
- Alternative 2: Building the Proposed Hermes Non-Power Test Reactor at a Site Near Idaho Falls, Idaho – The NRC would issue a construction permit for Kairos to build the Hermes reactor on a federally owned property in eastern Idaho, approximately twenty miles west of Idaho Falls, Idaho.

TDEC is the environmental and natural resource regulatory agency in Tennessee with delegated responsibility from the U.S. Environmental Protection Agency (EPA) to regulate sources of air pollution; solid and hazardous waste; underground storage tanks; and water resources. TDEC has reviewed the Draft EIS and has the following comments regarding the proposed project:

## **Water Resources**

The proposed project will require an individual stormwater construction permit (CGP), including a project-specific Surface Water Pollution Prevention Plan (SWPPP).<sup>1</sup> A Tennessee Multi-Sector Permit will also be required.<sup>2</sup> It is unclear from the Draft EIS if any discharges into the Oak Ridge municipal sewer system would require pre-treatment; Kairos should consult with the Oak Ridge pre-treatment coordinator as well as the TDEC Division of Water Resources pre-treatment coordinator before making any discharges into the Oak Ridge municipal sewer system.

## **Air Pollution Control**

TDEC appreciates Kairos' proposed measures to mitigate air quality impacts from fugitive dust and their commitment to minimize the impacts of the project on air quality. TDEC also recommends that all construction equipment employed on site be well maintained and equipped with the latest emissions control equipment, and that unnecessary vehicle idling be discouraged.

The initial project will not involve the demolition or renovation of facilities, but the Draft EIS projects that the facilities built as part of this project will be demolished at the end of the test period. Be advised that there are federal regulations enforced by the EPA and TDEC regarding asbestos renovation and demolition activity.<sup>3</sup> These regulations apply to any facilities proposed to be demolished. When any structures are proposed to be demolished, an asbestos demolition notification must be provided in advance, and proper pre-demolition surveys should be conducted to identify any regulated asbestos containing material (ACM) present. Prior to any demolition, all facilities must be examined for ACM, and all potential ACM in the buildings proposed for demolition must be handled and disposed of according to the applicable federal, state, and local regulations.

Table 3-3 of the Draft EIS provides estimates of air emissions during facility operation. This table projects annual emissions of nitrogen oxides (NOx) of 20.65 tons per year (TPY). Be advised that construction and operating permits may be required, and any fuel-burning sources with potential NOx emissions of five TPY or more will be required to utilize low-NOx burners. Note that the header of the second column is mislabeled as "Emissions During Construction (TPY)."

## **Remediation – Oak Ridge**

TDEC notes that the Draft EIS does not include a discussion of the ongoing Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) activities occurring within or around the Project Site area. The Draft EIS states several times that "DOE has remediated the land environmentally and released it for industrial use." TDEC encourages NRC to clarify this statement in the final EIS by detailing that soils have been designated for industrial use to 10 feet below ground surface (ft bgs). Groundwater and media below 10 feet have not been mentioned in the Draft EIS and are currently being addressed within ongoing CERCLA activities.

The Draft EIS notes that significant excavation below 10ft bgs is planned for this site to support the Kairos Hermes test reactor. Excavation at this depth will require an Excavation/Penetration Permit (EPP) from the United

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<sup>1</sup> <https://www.tn.gov/environment/permit-permits/water-permits1/npdes-permits1/npdes-stormwater-permitting-program/npdes-stormwater-construction-permit.html>

<sup>2</sup> <https://www.tn.gov/environment/permit-permits/water-permits1/npdes-permits1/npdes-stormwater-permitting-program/npdes-industrial-stormwater-general-permit/npdes-stormwater-multi-sector-general-permit-for-industrial-activities-tnr050000.html>

<sup>3</sup> See [TAPCR 1200-03-11-.02](https://www.epa.gov/asbestos/asbestos-laws-and-regulations); <https://www.epa.gov/asbestos/asbestos-laws-and-regulations>.

States Department of Energy (DOE) for this site. TDEC encourages NRC to include a discussion of this permitting requirement, as well as a soil management plan which may be addressed through the EPP program, in the final EIS. Groundwater and other environmental media below 10ft bgs will not be addressed until current and future CERCLA actions are completed. Based on unknown conditions below 10ft bgs, TDEC recommends baseline sampling to determine if there are CERCLA contaminants that may be mobilized by site preparations.

The Draft EIS identifies existing infrastructure on the site in Figure 1-1 on page 1-2 and notes "...stormwater collected in the stormwater pond would be discharged to an existing outfall" on page 2-16 of the supporting document Kairos 2021-TN7880. The Final EIS should include a detailed discussion of stormwater management plans at the site to confirm alignment with DOE CERCLA activities. These stormwater management plans can be addressed through the EPP program. Two of the identified outfalls (outfalls 694 and 690, respectively) have been recorded discharging mercury and PCBs that exceed human health ambient water quality criteria (AWQC). Outfall 694 was plugged and abandoned in Federal FY22.<sup>4</sup> The K-897-A oil/water separator was evaluated as a source of PCBs. TDEC has been informed the entirety of the outfall 690 collection system will be grouted in place.<sup>5</sup> The footprint of the proposed stormwater pond falls on top of the outfall 690 stormwater collection network. Considering this infrastructure will be grouted in-place, TDEC requests that the Final EIS address how this may affect the construction of a stormwater pond in this area. TDEC also encourages the NRC to clarify in the Final EIS whether previous storm drain system sampling results been taken into consideration with the blending of future construction and operational discharges covered by the NPDES permits.

TDEC encourages the NRC to consider including a statement under the Hydrogeology and water resources row in Table ES-1 of the Executive Summary (Page xvi) detailing how dewatering activities may impact groundwater flow in the area. It is unclear from the Draft EIS how the proposed stormwater pond will be constructed. If the stormwater pond will allow for infiltration of stormwater into the subsurface, will this impact existing CERCLA groundwater activities? For example, the footprint of the proposed stormwater pond and potential subsurface infiltration of water falls within an area of CERCLA groundwater action (existing monitoring well UNW-083) that may impact the proposed monitored natural attenuation (MNA) remedy for groundwater in this general area. The Final EIS should evaluate whether monitoring well UNW-083 must be abandoned to allow for pond construction.

TDEC encourages the NRC to edit Section 3.3.2.1 Affected Environment (Page 3-22; Paragraph starting at Line 34) in the Final EIS to acknowledge that, although current water quality is expected to be poor, CERCLA actions are underway to remediate and restore groundwater within the Project Site area to beneficial reuse. Any actions taken at this site will be required to comply with state and federal water regulations. As such, this section would benefit from a discussion about the ongoing CERCLA groundwater activities and include the list of contaminants that are present in groundwater at concentrations greater than federal and state numerical standards if relevant.

In Section 3.3.2.2 Environmental Consequences of Construction (Page 3-24; Line 7), the excavation depths for the ancillary buildings are estimated to be approximately 10 ft bgs. Based on the reported encountered depth to water of 6 to 8 ft bgs (TN7880), is it anticipated that dewatering will be necessary during construction of these ancillary buildings, and will dewatering continue during operations? If so, the Final EIS should discuss management of potentially contaminated groundwater and coordination with the EPP program.

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<sup>4</sup> United Cleanup Oak Ridge, LLC prepared for the US Department of Energy. 2022 Remediation Effectiveness Report for the U.S. Department of Energy Oak Ridge Site Oak Ridge, Tennessee (DOE/OR/01-2916&D2). August 2022. Pg. E-20.

<sup>5</sup> Ibid. Pg. E-23 and E-25.

In Section 3.3.2.2 Environmental Consequences of Construction (Page 3-24; Line 14), an estimated 2.2 million gallons of water may be extracted as a consequence of dewatering of the reactor excavation pit. TDEC encourages the Final EIS to elaborate on plans for dewatering and under what permit authority this groundwater will be discharged, as the construction stormwater permit is limited to stormwater controls.

As outlined in Section 3.3.2.2 Environmental Consequences of Construction (Page 3-24; Line 17), temporary dewatering of the reactor excavation pit could potentially create a gradient towards the excavation impacting planned CERCLA activities. Evaluation of the impacts to CERCLA groundwater operations should be considered through the EPP program.

TDEC notes that the OF200 Mercury Treatment Facility is not operational and is not planned to be operational until 2025 (Referenced Document Kairos 2021-TN-7880, Section 3.4.3.1.1, Page 3-69).

TDEC appreciates the opportunity to comment on this Draft EIS. Please note that these comments are not indicative of approval or disapproval of the proposed project, nor should they be interpreted as an indication regarding future permitting decisions by TDEC. Please contact me should you have any questions regarding these comments.

Sincerely,



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