

COMMENTS REGARDING THE DRAFT FINAL ENVIRONMENTAL INVESTIGATION REPORT FOR GREAT KILLS PARK OPERABLE UNIT 2 GATEWAY NATIONAL RECREATION AREA, NEW YORK

U.S. Nuclear Regulatory Commission (NRC) staff and its contractor, Oak Ridge Associated Universities, reviewed the submittal referenced above and prepared the following comments for consideration by the National Park Service (NPS) for use in finalizing the subject Environmental Investigation Report (EIR) as well as planning future phases of environmental investigation for Operable Unit 2 (OU2) at Great Kills Park (GKP) as it pertains to radiological contamination. The comments were prepared as part of the Memorandum of Understanding between the NPS and NRC regarding confirmed radium contamination at NPS sites. The purpose of NRC's monitoring is to ensure that NPS' remedy at GKP meets the dose criterion in Title 10, *Code of Federal Regulations* (CFR) 20.1402 (i.e., 25 millirem per year [0.25 millisievert per year]) for sites or portions of the sites that will be released for unrestricted use or is consistent with the requirements in 10 CFR 20.1403(b) for sites or portions of the sites that will be released for restricted use. These comments are provided as part of NRC's monitoring to assist in finalizing the document and planning future phases toward those purposes; a response letter to NRC staff is not necessary.

COMMENT 1: CONCEPTUAL MODEL FOR RADIONUCLIDES OF POTENTIAL CONCERN

Radionuclide contamination at GKP has been typically observed to be contained within discrete artifacts rather than integrated into the soil matrix—i.e., this is not diffuse soil contamination. The NPS should describe why discrete sources of radium-226 (Ra-226) are not like other (environmental) contaminants and discuss methods to address these discrete Ra-226-bearing artifacts as well as clearly describing how presence/absence decisions are made.

Description: Section 7 of the EIR lists radionuclides of potential concern (ROPCs), where ROPCs are selected based on a standard CERCLA¹-based screening process. That is, if a measured concentration is above the conservative screening level, then the constituent is retained for additional evaluation—i.e., it is a radionuclide of potential concern. The screening process described in the EIR for identifying ROPCs used screening values from NUREG-1757, Volume 2, Revision 1, "Consolidated Decommissioning Guidance – Characterization, Survey, and Determination of Radiological Criteria."²

Basis: The screening values from NUREG-1757 used by NPS in the EIR as part of its screening process were developed for diffuse soil contamination present above background levels. Radium-containing artifacts are distributed as discrete items, which is unlike the distribution of other contaminants at GKP. These discrete sources of Ra-226 also are not a fit for the conceptual model utilized in NUREG-1757 for developing dose-based screening levels. For instance, artifacts may be distributed such that surface scans or scans of the existing boreholes/trenches conducted by NPS would not identify the artifacts. If the EIR is utilizing a CERCLA risk-based criteria, it should describe a conceptual model that assesses risk from

¹ Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended.

² Available in the NRC's Agencywide Documents Access and Management System [ADAMS] at Accession No. ML063000252.

radium artifacts and utilize that as an input to the data quality objectives for surveying and/or remediating the site.

COMMENT 2: GENERAL, BACKGROUND/REFERENCE AREA DATA

Describe more thoroughly any background or reference data. Clearly describe how presence/absence of contaminant decisions are made, including the genesis and basis for quantitative screening values and the location or sources used to compile reference data.

Description: The EIR contains multiple references to background or reference datasets. In some cases, the citation is to other investigators or investigations, but any background/reference data used to compare results from this investigation should be more thoroughly described.

Basis: Section A.1 of Appendix A of NUREG-1757, Volume 2, Revision 1 and Section 4.5 of NUREG-1575, Revision 1, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM),"³ describe the process for selecting appropriate reference areas. The primary relevance here is that direct comparisons to background (presumably an average) are made in the context of presence/absence decisions. For example, at the end of Section 4.1.1 of the EIR, first paragraph: "Radiological and PID measurements collected during the completion of the test pits were not elevated above background levels."

While it is generally inappropriate to compare soil background concentrations to the concentrations in radium-containing artifacts (see Comment 1 above), NRC staff notes that a defensible background dataset can still be useful for demonstrating that, if true, the removal of the artifacts completely removes the hazard (i.e., de minimus leaching). It is also useful to avoid attempts to remediate areas where the background concentrations and the criteria being compared to are effectively indistinguishable.

COMMENT 3: BOUNDARY CONDITIONS

Clearly describe the boundary conditions for known and anticipated radiological contamination. The extent of coverage of historical surveys should be clearly described. Also, the identified and anticipated distribution of Ra-226 contamination (i.e., artifacts) should be described at a minimum in Section 7.1.5 of the EIR.

Description: The text of the EIR provides information about the discovery of sources of radiological contamination. However, limited information as to the location of those sources is provided and the reader is unable to evaluate the spatial distribution. A map noting the historical survey coverage and location of known discrete sources of Ra-226, even if removed, should be provided. For example, the interim response action report⁴ presents maps illustrating the location of sources and pictures of some individual items.

Section 4.1.2 of the EIR, for example, states, "...radiological artifacts are known to be present and potentially scattered throughout the waste fill within OU2...". However, artifacts have been identified in some areas, and those areas should be identified in the EIR. As stated, the

³ Available in ADAMS at Accession No. ML003761445.

⁴ Cabrera Services, "Interim Response Action Report, Radiological Material Removal and Disposal, Great Kills Park, Staten Island, New York City, New York," Prepared for the U.S. Army Corps of Engineers, Baltimore, Maryland, November 2010.

“...probability of encountering an artifact immediately adjacent to a non-biased borehole is low...”, thus the EIR should at least start to set up boundary conditions that “supports the sample design for subsequent investigations.” Further, information presented in the EIR does not clearly describe the extent of survey coverage of OU2 to demonstrate that adequate coverage has been attained to identify potentially scattered artifacts. At minimum, the EIR should identify areas that have been previously remediated as “Class 1” survey units that require a 100% scan to verify radium containing artifacts have been removed. Adjacent areas could be considered “Class 2” survey units with less scanning, and so on.

Basis: Step 4 of the Data Quality Objectives (DQO) process is to define study boundaries of the study area. The EIR does provide administrative boundaries, the extent of fill, and other relevant information. However, the EIR should at least attempt to set bounds on the distribution of discrete sources of Ra-226. This type of information is necessary to develop the conceptual site model that discrete sources of radium can be randomly distributed anywhere within OU2. If there are no bounds at this time, the limitations of the conceptual model should be clearly stated. This information would support whether the next investigation should classify the entirety or only portions of OU2 as an impacted survey unit (i.e., Class 1 in MARSSIM terminology).