

the kriging calculations yielded a total volume of 113,504 cubic meters (m^3) [4,007,909 cubic feet (ft^3)] of material with Th-232 + Th-228 concentrations greater than 370 milli Becquerels per gram (mBq/g) (10 picocuries per gram (pCi/g)), and a volume of 143,288 m^3 (5,059,614 ft^3) of material with concentrations greater than 222 mBq/g (6 pCi/g). With the addition of stockpiled soils, (8071 m^3 (285,000 ft^3) of material moved on-site during the Adjacent Land Area Remediation project), the kriging estimate for the total volume of affected soil in the Retention Pond and Reserve Pond areas is 151,370 m^3 (5,345,000 ft^3). The thorium concentration for on-site material ranges from approximately 74 mBq/g to 15.4 Bq/g (2 pCi/g to 416 pCi/g) for Th-232 + Th-228.

In the DP, Kaiser identified the potential for radioactive material under concrete paved surfaces and building floor areas in the operations area. Subsequently, Kaiser submitted a report on additional site characterization activities conducted to identify radioactive material located beneath structures in the operations area (Ref. 4). Kaiser has determined that modifications of on-site buildings/structures during operations resulted in surface and subsurface soil contamination beneath concrete paved surfaces and building floor areas in the operations area. Residual radioactive material exists in the following areas: (1) Beneath a significant portion of the Flux Building structure; (2) beneath the northern portion of the concrete pad which was once used as a slag storage area; (3) beneath the north portion of the Crusher Building structure and the paved area north/northeast of the Crusher Building; (4) beneath the concrete paving area located west of the Maintenance Building; and (5) beneath a portion of the concrete area inside of the Warehouse Building. Kaiser estimates that approximately 1699 m^3 (60,000 ft^3) of material will be excavated during decommissioning activities in the former operational area.

The purpose of the proposed action is to reduce residual radioactivity at the Kaiser facility to a level that permits release of the property for unrestricted use. NRC is fulfilling its responsibilities under the Atomic Energy Act to make a decision on a proposed action for decommissioning that ensures protection of the public health and safety of the environment.

The Proposed Action

Kaiser is proposing to remediate its facility to meet the unrestricted release criteria of 10 CFR Part 20, Subpart E, by

identifying, excavating, and disposing material with Th-232 concentrations greater than 1151 mBq/g (31.1 pCi/g). Specifically, Kaiser proposes to conduct excavation activities in four phases:

Phase 1—remove material stockpiled from the adjacent land remediation. Materials from the existing stockpile will be transported to a new storage area and sorted. Materials above 1151 mBq/g (31.1 pCi/g) will be shipped to a disposal site licensed to receive the material.

Phase 2—excavate material from the former operational area and transport to the pond parcel. Material with Th-232 concentrations greater than 1151 mBq/g (31.1 pCi/g) will be segregated and shipped to a disposal site licensed to receive the material. Material below criteria will be placed in the pond parcel as backfill.

Phase 3—excavate and transport material from the reserve pond area to the stockpile area for processing. Material above 1151 mBq/g (31.1 pCi/g) will be shipped to a disposal site licensed to receive the material. Below-criteria material will be returned to the excavation.

Phase 4—excavate material from the retention pond area and former spillway. Material will be transported to the stockpile area and processed/disposed as in previous phases. It is estimated that approximately 170,592 m^3 (6,028,000 ft^3) of material will be excavated during decommissioning activities. Of this volume, 33,984 m^3 (1,200,000 ft^3) will have Th-232 concentration greater than 1151 mBq/g (31.1 pCi/g), and will require off-site disposal.

A detailed discussion of the proposed decommissioning activities at the site is presented in Chapter 8 of the DP, and Chapter 8 of the DP Addendum.

Alternatives to the Proposed Action

The proposed remediation approach allows Kaiser to meet NRC's requirements for unrestricted release of the site, uses proven technology, and is protective of human health and the environment. However, there are two alternatives to the proposed action of excavating and disposing of above-criteria material at a licensed disposal facility; (1) To take no action, and (2) to excavate contaminated material such that the site would be suitable for restricted release. The no-action alternative is not acceptable because soil contains thorium at levels which would cause a dose exceeding NRC's limits presented in 10 CFR 20.1402 (25 mrem/yr (25 mSv/yr) plus ALARA). Kaiser does not consider the restricted release alternative to be advantageous at this

time for environmental, technical and economic reasons. Therefore, these alternatives are not considered further in this EA.

The Affected Environment and Environmental Impacts

The Kaiser facility is located at 7311 East 41st Street in Tulsa, Oklahoma. It is situated in Tulsa County, Oklahoma, about 5 miles southeast of the downtown center of the City of Tulsa. The site initially occupied approximately 23 acres of land on both sides of 41st Street. The remediation area is bounded by the south fence line, the freshwater pond embankment on the west, Fulton Creek ditch on the north, the east fence line, and the northern and western edges of the flux building and paved area. The areas to be remediated include a portion of the 4-acre operational area south of the railroad, and a large portion of the 14-acre pond parcel located north of the railroad. The pond parcel is divided into three parts—the unaffected freshwater pond to the west (approximately 4 acres), the affected retention pond/reserve pond area to the east (approximately 9 acres), and the area containing the flux building and paved area (approximately 1 acre).

Remediation of the Kaiser property could result in both radiological and non-radiological environmental impacts. Radiological environmental impacts that could result from the remediation of the facility include exposure, inhalation, and ingestion hazards to workers and the public. These hazards could occur during excavation, transport, or backfilling of the contaminated soil.

Potential radiological impacts during excavation and backfilling include: (1) Exposure; (2) inhalation and ingestion to workers; and (3) inhalation and ingestion to the public. Kaiser has committed to perform work activities in accordance with the Health & Safety Plan (HSP) (Chapter 10 of the DP), and the Environmental Health and Safety Plan (EHSP) (Appendix E of the DP).

Worker doses due to direct exposure to the contaminated soil are expected to be small. Site characterization revealed that 95 percent of the material contains less than 1850 Bq/kg (50 pCi/g) thorium. Since worker exposure time will be short, and thorium concentrations are relatively low, Kaiser estimates that doses due to direct contact with soil will be less than 1 millisievert per year (mSv/yr) [100 millirem per year (mrem/yr)].

Inhalation and ingestion impacts will be minimized to the workers and public by controlling airborne material levels.