

May 8, 2003

Mr. Michael Broderick
Land Protection Division
Oklahoma Department of Environmental Quality
P.O. Box 1677
Oklahoma City, OK 73101-1677

SUBJECT: REVIEW OF DRAFT ENVIRONMENTAL ASSESSMENT FOR THE KAISER
ALUMINUM & CHEMICAL CORPORATION SITE IN TULSA, OK

Dear Mr. Broderick:

On March 7, 2002, the U.S. Nuclear Regulatory Commission (NRC) approved Kaiser Aluminum & Chemical Corporation's (Kaiser's) Final Status Survey Report for the land area adjacent to its Tulsa, OK, facility, and concluded that this area was suitable for unrestricted release. Kaiser is now prepared to begin remediation of its facility. NRC is considering approval of Kaiser's "Decommissioning Plan" and "Decommissioning Plan Addendum" for its facility. NRC is taking this action in response to Kaiser's request for approval of their decommissioning plan and addendum submitted to NRC on May 25, 2001, and May 9, 2002, respectively.

In accordance with 10 CFR 51.21, NRC has performed an Environmental Assessment (EA) of the effects of this action. A copy of NRC's draft Finding of No Significant Impact (FONSI), including the EA, is attached for your review. Should you have any comments or suggestions on this draft, please provide them to me within 20 days from the date of this letter. Also, should you have any questions, please do not hesitate to contact me, at (301) 415-6607.

Sincerely,

/RA/

John T. Buckley, Project Manager
Decommissioning Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

Attachment: Draft FONSI

Docket No.: 40-2377
License No.: STB-472 (terminated)

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NUCLEAR REGULATORY COMMISSION

[Docket No. 40-2377]

**ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT RELATED
TO THE APPROVAL OF THE DECOMMISSIONING PLAN FOR KAISER ALUMINUM &
CHEMICAL CORPORATION, TULSA FACILITY, TULSA, OKLAHOMA**

I. Introduction

The U.S. Nuclear Regulatory Commission (NRC) is considering approval of the Decommissioning Plan (DP) for Kaiser Aluminum & Chemical Corporation (Kaiser), Tulsa Facility, Tulsa, Oklahoma (Ref. 1), and DP Addendum (Ref. 2) submitted to NRC on May 25, 2001, and May 9, 2002, respectively. Kaiser is obligated to remediate the Tulsa, Oklahoma facility to meet the release criteria established in 10 CFR Part 20, Subpart E. Kaiser has proposed a decommissioning approach that will achieve unrestricted release of the site.

II. Environmental Assessment

Introduction

On March 7, 1958, NRC issued Source Material License No. C-4012 to Standard Magnesium Corporation (Standard Magnesium), a Division of Kaiser Chemical Company, for possession of magnesium-thorium alloy. Standard Magnesium purchased magnesium-thorium scrap metal for reclaiming purposes. The end product from Standard Magnesium's manufacturing process was magnesium anodes used for cathodic protection on items such as tanks and pipelines. NRC License No. STB-472 superceded License No. C-4012 on November 22, 1961. On June 5, 1968, License No. STB-472 was amended to include the possession of uranium, so that Standard Magnesium could process magnesium slag containing uranium. It does not appear that uranium was ever received or processed on site. On March 16, 1971, License No. STB-472 was terminated at the licensee's request.

In 1991, Oak Ridge National Laboratory (ORNL) was contracted, by NRC, to review and evaluate all nuclear material licenses terminated by NRC or its predecessor agencies since inception of material regulation in the late 1940s. One of the objectives of this review was to identify sites with a potential for meaningful residual contamination, based on information in the license documentation. ORNL identified the Kaiser site as having the potential for residual contamination. On November 17, 1993, an NRC inspector surveyed the Kaiser facility to assess the potential for residual contamination at the site. The inspector found contamination

on the surface, indicating that waste magnesium-thorium slag was improperly disposed of in the past. Off-site residual thorium contamination was first identified during a subsequent NRC inspection conducted on June 29, 1994. The off-site thorium contamination is due to slag dumping in areas to the east and south of the current Kaiser property boundary, on property which belonged to Standard Magnesium during licensed operations. NRC notified Kaiser on August 19, 1994, that the site had been added to the Site Decommissioning Management Plan (SDMP). Kaiser has agreed to conduct remediation activities in accordance with current regulations and release limits, even though it is not currently a licensee.

A detailed discussion of the contamination present at the site is presented in Chapter 4 of the DP, and Chapter 4 of the DP Addendum.

Purpose and Need For Proposed Action

The Kaiser property contains thorium contaminated dross/soil. This property was owned and operated by Kaiser's predecessor, Standard Magnesium. Standard Magnesium extracted magnesium from magnesium thorium alloys. The thorium-bearing slag was disposed of on-site and onto, what is now, land adjacent to the Kaiser property. Kaiser has completed remediation of the adjacent property and is now proposing plans to remediate its property.

Extensive site characterization studies conducted by Kaiser (Ref. 3 and Ref. 4), indicate that Th-228, Th-230 and Th-232 are present in dross/soil on the Kaiser property. In 1995, an investigation was performed to characterize soils and sludges in the Retention and Reserve Pond areas containing thorium with respect to criteria used by the NRC for release of sites for unrestricted use, as set forth in the NRC Branch Technical Position, Disposal or On-Site Storage of Residual Thorium or Uranium Wastes From Past Operations (Ref. 5). From the characterization data, affected material volumes were estimated by performing kriging calculations. The estimate from 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 m³ (60,000 ft³) 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 (31.1pCi/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 m³ (6,028,000 ft³) of material will be excavated during decommissioning activities. Of this volume, 33,984 m³ (1,200,000 ft³) 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 (25mSv/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. Kaiser has determined that in order to reach 10 percent of the derived air concentration (DAC) limit, the soil must exceed 7.4 Bq/g (200 pCi/g) Th-232 + Th-228. Based on characterization information, Kaiser has a good database to identify where soil exceeds 7.4 Bq/g (200 pCi/g) Th-232 + Th-228. If the Th-232 + Th-228 is less than

7.4 Bq/g (200 pCi/g) soil, Kaiser will perform occasional air sampling near the dust source. If the soil exceeds 7.4 Bq/g (200 pCi/g) Th-232 + Th-228 where airborne dust from nearby soil might reach 0.1 DAC, Kaiser will perform continuous, stationary air sampling near the dust source while workers are present.

Air sampling will also be conducted at work area boundaries to evaluate off-site releases. Action will be taken if radioactivity levels exceed 50 percent of the regulatory limit at the work area boundary.

Kaiser's DP includes controls for keeping radiation exposures to workers, and the public, "as low as is reasonably achievable" (ALARA). These controls include implementing: (1) the HSP and EHSP; (2) radiation worker training; (3) a respiratory protection program; (4) safety work permit procedures; and (5) radioactive material storage and handling procedures. In addition, Kaiser presented an ALARA analysis (Chapter 7 of the DP) which compared dose and cost of the planned action with the cost benefits of incremental soil removal to further reduce the dose. The analysis demonstrates that removal of additional soil/dross is not cost beneficial.

The potential for radiological impacts during transportation is limited. Spillage during transportation is the only credible scenario for workers receiving a potential dose. Since any spills could be immediately recovered, doses due to direct exposure will be minimal. The potential exists for contaminated material to become airborne during loading, unloading, or as a result of accidental spills. In the DP, Kaiser commits to using a controlled material handling/processing/storage area to package waste for disposal. Packaging will include Department of Transportation and disposal facility approved containers. After packaging, waste will be transferred to a secured on-site storage area or loaded directly for shipping. Potential radiological impacts to workers and the public due to airborne material will be controlled as described above.

Potential radiological impacts resulting from the stockpiling of the contaminated soil on Kaiser property include doses to the public from airborne material and precipitation runoff. In the DP, Kaiser commits to minimize the spread of contamination by lining the stockpile area with a high density polyethylene liner, or equivalent. In addition, berms or ditches will be constructed at the stockpile perimeter to control precipitation falling on the stockpile. Kaiser has committed to minimize storm water contact with stockpiled soil. Contact may be minimized

by: (1) diverting water around remediation and stockpile areas; (2) covering stockpiles; or (3) performing work during dry season.

The potential for groundwater contamination at the site is minimal. Site characterization sampling at the site indicates that the vertical migration of the thorium is limited. Sampling revealed that thorium concentrations dropped quickly in undisturbed soil.

Potential non-radiological impacts include; increased traffic from transportation of waste, esthetic degradation, and economic impacts. Waste will be transported by either rail or truck. Kaiser estimates that approximately 33,984 m³ (1,200,000 ft³) of material will be generated for off-site disposal. This volume of material will require less than 1000 rail cars, which will be spread over a three year time period. Therefore, the impact from transportation should be insignificant.

The Kaiser facility is located in an area which is completely developed with no pre-settlement vegetation existing. Land use within a one mile radius from the site is a mixture of commercial, industrial, and residential. Commercial or industrial properties in the area include Union Pacific Railroad (right-of-way), Specific Systems, Beejay Inc., Smalley Equipment, and Red Man. Kaiser has committed to restore the site following remediation. Restoration will include; placement of vegetative cover, seeding and mulching, permanent surface water controls, and permanent erosion and sedimentation controls. U.S. Fish and Wildlife Service has determined that the proposed action will not have an adverse impact on threatened and endangered species. The Oklahoma Historical Society informed Kaiser that there are no historic properties affected by the project. The Oklahoma Archeological Survey has stated that no archeological sites are listed as occurring within the project area and no archeological materials are likely to be encountered. Further, the Creek Nation of Oklahoma informed Kaiser, that there are no religious or sacred sites within the project area that will be affected by the undertaking of this project. Therefore, the esthetic impact from decommissioning activities should be insignificant.

The residential population within a 3 km (1.9 miles) radius of the site is approximately 24,000. Additionally, in 1990, there were approximately 3500 business entities within the same area. The facility lies within two separate zones; the Industrial Moderate District and Industrial Light District. Zoning within the vicinity of the facility is not expected to change. According to Chapter 15.0 of the DP, less than 15 workers will be required to perform decommissioning

activities. Due to the small number of workers required for decommissioning, and the short duration of the project, this effort should have minimal socioeconomic impact on the community.

Air quality and noise impacts will result from excavation and transport of waste. Kaiser will use appropriate dust control measures during excavation. These activities will be sporadic in nature and relatively short in duration; and, therefore, will have minimal impact on the surrounding community and environment.

NRC has found no other activities in the area that could result in cumulative impacts.

Agencies and Persons Consulted

NRC staff provided a draft of the EA to Oklahoma Department of Environmental Quality (ODEQ) for review. By facsimile dated XXXXXX, ODEQ agreed with NRC's conclusion that the proposed action will not have any significant affect on the quality of the human environment.

NRC contacted the U.S. Fish and Wildlife Service to ensure that the proposed action will not have an adverse impact on threatened and endangered species. Mr. Ken Frazier informed the NRC on April 16, 2003, that the proposed action will have no impact on threatened and endangered species.

Prior to approval of the Kaiser Phase 1 DP, NRC contacted the Oklahoma Historical Society to determine if the proposed action would have any adverse impacts on sacred or historical properties near the Kaiser site. The Oklahoma Historical Society informed Kaiser, by letter dated August 31, 1999, that there are no historic properties affected by the project.

The Oklahoma Archeological Survey informed NRC, by letter dated August 6, 1999, that no archeological sites are listed as occurring within the project area and no archeological materials are likely to be encountered.

The Creek Nation of Oklahoma informed Kaiser, by letter dated August 5, 1999, that there are no religious or sacred sites within the project area that will be affected by the undertaking of this project.

Conclusions

Kaiser has committed to perform remediation activities in accordance with an acceptable DP. NRC staff believes the DP provides adequate controls to keep potential doses to workers and the public from direct exposure, airborne material, and released effluents, ALARA.

NRC staff also believes that the remediation alternative proposed by Kaiser minimizes the potential dose to members of the public, and other environmental impacts. Potential doses to members of the public will be minimized by removing contaminated soil from Kaiser property and making the site suitable for unrestricted release. The proposed remediation alternative also minimizes the potential environmental impacts. Kaiser will excavate and dispose of soil with Th-232 concentrations greater than 1151 mBq/g (31.1 pCi/g), thereby removing a significant source of contamination from the local environment. Therefore, the potential environmental impact from the proposed action is insignificant.

List of Preparers

John Buckley, Project Manager, Division of Waste Management

J.C. Dehmel, Health Physicist, Division of Waste Management

Adrienne Lester, Environmental Scientist, Division of Waste Management

References

1. Kaiser Aluminum and Chemical Corporation, "Decommissioning Plan," June 2001.
2. Kaiser Aluminum and Chemical Corporation, "Decommissioning Plan Addendum," May 2002.
3. Advanced Recovery Systems/Nuclear Fuel Services, Inc., Kaiser Aluminum Specialty Products, "Field Characterization Report," April 18, 1995.
4. Kaiser Aluminum and Chemical Corporation, "Additional Site Characterization Activities," November 2001.
5. NRC, Branch Technical Position, "Disposal or Onsite Storage of Thorium or Uranium Wastes from Past Operations," 1981.

III. Finding of No Significant Impact

Pursuant to 10 CFR Part 51, NRC has prepared this EA related to the approval of Kaiser's DP. On the basis of this EA, NRC staff has concluded that there are no significant environmental impacts on the quality of the human environment. Accordingly, the staff has determined that preparation of an Environmental Impact Statement is not warranted.

IV. Further Information

The licensee's request for the proposed action (ADAMS Accession No: ML011570507) and other related documents to this proposed action are available for public inspection and copying for a fee at NRC's Public Document Room at NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852. These documents, along with most others referenced in the EA, are available for public review through ADAMS, the NRC's electronic reading room, at: <http://www.nrc.gov/reading-rm/adams.html>.

Any questions with respect to this action should be referred to John Buckley, Decommissioning Branch, Mailstop T-7F19, Division of Waste Management, Office of Nuclear Materials Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Telephone: (301) 415-6607.

Dated at Rockville, Maryland, this _____ day of May, 2003.

For the Nuclear Regulatory Commission,

Daniel M. Gillen, Chief
Decommissioning Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

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