UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

February 1, 2002

Mr. J. William Vinzant
Regional Environmental Manager
Corporate Environmental Affairs
Kaiser Aluminum and Chemical Corporation
9141 Interline Avenue, Suite 1A
Baton Rouge, Louisiana 70809-1957

SUBJECT: NRC INSPECTION REPORT 040-02377/02-01

Dear Mr. Vinzant:

This refers to the inspection conducted on January 9-10, 2002, at the former Kaiser Aluminum Specialty Products facility in Tulsa, Oklahoma. The purpose of the inspection was to determine whether decommissioning and remediation activities were being conducted in accordance with the commitments made in your Remediation Plans and other documents. Within these areas, the inspection consisted of selected examination of procedures and representative records, observations of activities, and interviews with personnel. The enclosed report presents the results of that inspection. No response to this letter is required.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Should you have any questions concerning this inspection, please contact Mr. Robert J. Evans at (817) 860-8234 or Dr. D. Blair Spitzberg at (817) 860-8191.

Sincerely,

/RA/

Dwight D. Chamberlain, Director
Division of Nuclear Materials Safety

Docket No.: 040-02377
License No.: STB-472 (terminated)

Enclosure:
NRC Inspection Report
040-02377/02-01

cc w/enclosure:
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Kaiser Aluminum & Chemical Corporation
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ENCLOSURE

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket No.:	040-02377
License No.:	STB-472 (Terminated in March 1971)
Report No.:	040-02377/02-01
Property Owner:	Kaiser Aluminum & Chemical Corp. (Kaiser)
Facility:	Former Kaiser Aluminum Specialty Products Facility
Location:	7311 East 41st Street Tulsa, Oklahoma
Inspection Dates:	January 9-10, 2002
Inspectors:	Robert J. Evans, PE, CHP, Health Physicist Fuel Cycle & Decommissioning Branch Judith L. Walker, Health Physicist Fuel Cycle & Decommissioning Branch
Accompanied By:	Linda M. Psyk, Health Physicist Materials Safety and Inspection Branch Division of Industrial and Medical Nuclear Safety Office of Nuclear Material Safety and Safeguards
Approved By:	D. Blair Spitzberg, Ph.D., Chief Fuel Cycle & Decommissioning Branch
Attachments:	Supplemental Inspection Information Photographs Taken at the Kaiser Facility

EXECUTIVE SUMMARY

Former Kaiser Aluminum Specialty Products Plant
NRC Inspection Report 040-02377/02-01

This was an announced inspection of the Kaiser Aluminum Specialty Products facility, formerly occupied by the Standard Magnesium Company. This inspection included a review of the site status, decommissioning activities, and selected radiation protection program attributes.

Closeout Inspection and Surveys

- Kaiser was conducting a site characterization survey in the former operational area. Kaiser's contractor was implementing the field work as stipulated in the work plan that was previously submitted to the NRC. Survey equipment was calibrated and appeared to be fully functional. Areas indicating elevated radiological sample results were being flagged for additional investigations (Section 1).

- Preliminary sample results suggest that some residual radioactive contamination was situated below paved surfaces and building floors in the former operational area. Kaiser plans to submit the final survey results to the NRC in the near future. Kaiser also plans to update the Phase II remediation plan to account for the radioactive contamination being identified during this site characterization survey (Section 1).

Radiation Protection

- Radioactive material signs were conspicuously posted around the site as required by 10 CFR 20.1902. Material control was adequate. Personnel exposures were well below the limits of 10 CFR Part 20 requirements. Kaiser's radiation protection program was appropriate for the activities being conducted onsite (Section 2).

- Kaiser had not completed its assessment of dose to members of the public for 2001. The NRC will conduct a followup review of this assessment during a future inspection (Section 2).

Report Details

Summary of Site Status

From 1958 until 1971, Standard Magnesium Corporation, and later Kaiser Magnesium, possessed thorium for use in the manufacture of magnesium anodes. License STB-472 was terminated by the U.S. Atomic Energy Commission during March 1971. During November 1993, an NRC inspector toured the Kaiser facility and determined that the site was still contaminated with radioactive material. The site was subsequently added to the NRC's Site Decommissioning Management Plan during August 1994.

Remediation of the site was anticipated to occur in phases. Phase I involved remediation of offsite contamination, while Phase II involved remediation of onsite contamination. The Phase I Adjacent Land Remediation Plan was approved by the NRC on April 4, 2000. Offsite remediation was conducted between October 2000 and May 2001. Approximately 285,000 cubic feet of potentially contaminated soil was relocated from offsite into Kaiser's restricted area. The Phase I final radiological status survey was recently submitted to the NRC but has not been approved by the NRC. The Phase II Remediation Plan was also recently submitted to the NRC and is currently under review.

During this inspection, Kaiser was conducting a radiological characterization survey in the former operational area. The operational area was the location where plant operations previously occurred, including the smeltering and crushing processes. The characterization survey was being conducted to determine the nature and extent of residual radioactive contamination within the former operational area.

In the near future, Kaiser plans to conduct concrete drilling and core sampling to further delineate the extent of the subsurface contamination in the former operational area. Past modifications and expansions to the facility may have resulted in the covering of residual radioactive material beneath the paved surfaces and building floors. Following completion of the survey, Kaiser will submit an addendum to the Phase II Remediation Plan to account for the residual contamination that is currently located in the former operational area.

1 Closeout Inspection and Surveys (83890)

1.1 Scope

The objective of the inspection was to verify that the Kaiser facility was being adequately surveyed to assure that all radioactive contamination has been identified so the facility will not present a radiation hazard to future occupants.

1.2 Observations and Findings

By letter dated December 21, 2001, Kaiser submitted a work plan to the NRC for the radiological characterization survey of the former 3.5-acre operational area. The work plan was based on the guidance provided in NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)." Kaiser's contractor began implementing the work plan on January 2, 2002.

During the inspection, Kaiser was conducting radiological characterization surveys for fixed and removable contamination inside the existing site structures. Kaiser was surveying for gross alpha contamination at 200 fixed locations using gas flow proportional detector assemblies (Ludlum Model 2360 scalar/rate meters coupled with Model 43-68 probes). Swipe samples were taken at each fixed location for offsite laboratory analysis of removable alpha contamination. The action levels were established at 21.5 disintegrations per minute per 100 square centimeters (dpm/100 cm^2) above background for average total surface contamination and 2.15 dpm/100 cm^2 above background for removable contamination.

Kaiser was also conducting gross gamma characterization surveys of both the indoor and outdoor areas using scintillation detectors (Ludlum Model 2221 rate meters coupled with Model 44-10 probes having 2-inch by 2-inch sodium iodide scintillation detectors). Any location identified with a count rate greater than 2,500 counts per second (cps) above background was flagged for further sampling.

Based on preliminary sample results, Kaiser did not identify any fixed location within the site structures that exceeded the gross alpha action level for total surface contamination. However, Kaiser identified about 15 locations in 3 buildings that exceeded the gross gamma action level. These locations varied from 2,500 cps to 33,600 cps above background values. Kaiser suspected that these locations may represent residual radioactive contamination below the respective concrete floors. These areas were flagged for future core sampling.

During the site tours, the NRC inspectors obtained independent measurements of radioactivity in selected portions of the former operational area using two Ludlum Model 19 microRoentgen meters and one Ludlum Model 12 count rate meter. One Model 19 meter (NRC No. 015518) was calibrated to cesium-137, while the second meter (NRC No. 015525) was calibrated to radium-226. The Model 12 count rate meter was calibrated to cesium-137.

The survey results obtained by the inspectors was comparable to the results obtained by Kaiser at the same locations. The highest measurement obtained outdoors was 60 microRoentgens per hour (μR/hr) at a location in the northeast corner of the property. Background was about 10 μR/hr. The highest measurement obtained indoors was 35 μR/hr. This measurement was obtained at the location where Kaiser measured a 33,600 cps “hot spot” in the warehouse.

At the conclusion of the onsite inspection, Kaiser was conducting gross gamma surveys of the outdoor areas. Areas above the gross gamma action level (2,500 cps) were being identified and flagged for soil sampling. Core drilling and soil sampling were scheduled to occur immediately following the conclusion of this site inspection. The number of soil samples collected will depend on the number of elevated “hot spots” identified during the characterization survey. All sample results will be presented to the NRC in a future site characterization survey report.

The inspectors reviewed the work plan and inspected the equipment in use by Kaiser. The survey equipment was properly calibrated and appeared fully functional during the inspection. Kaiser appeared to be adequately controlling the custody of the samples

and the data collected in the field. Several minor work plan discrepancies were noted and reported to Kaiser. For example, the inspectors noted that the gross gamma action level was not documented in the work plan and Kaiser's implementation of the quality assurance/quality control requirements for smear samples appeared incomplete.

1.3 Conclusions

Kaiser was conducting a site characterization survey in the former operational area. Kaiser's contractor was implementing the field work as stipulated in the work plan that was previously submitted to the NRC. Survey equipment was calibrated and appeared to be fully functional. Areas indicating elevated radiological sample results were being flagged for additional investigations.

Preliminary sample results suggest that some residual radioactive contamination was situated below paved surfaces and building floors in the former operational area. Kaiser plans to submit the final survey results to the NRC in the near future. Kaiser also plans to update the Phase II remediation plan to account for the radioactive contamination being identified during this site characterization survey.

2 Radiation Protection (83822)

2.1 Scope

Section 1.2 of the NRC-approved Phase I Remediation Plan states, in part, that although Kaiser is not a holder of an NRC license for the possession and use of thorium, remediation activities and the related survey and sampling methods must conform to the regulations and guidance including the Code of Federal Regulations, Title 10. The inspectors examined Kaiser's radiation protection program for consistency with the requirements of 10 CFR Part 20 and the Remediation Plan.

2.2 Observations and findings

a. Site Tours

The inspectors conducted site tours and made observations regarding radioactive material sign postings, the potential for exposure to workers, and the potential for the loss of radioactive material control. The inspectors observed that radioactive material signs were conspicuously posted around the site as required by 10 CFR 20.1902, and the Kaiser property fenceline was in adequate condition. As such, security and control of the radioactive material was deemed adequate and in compliance with 10 CFR 20.1801 requirements. Posting of safety work permits for ongoing activities was also observed by the inspectors during the tours.

b. Personnel Exposures

Section 4 of the site remediation plan describes the external radiation exposure control program. The site continues to provide optically stimulated luminescent dosimeter monitoring of persons entering the controlled area. The inspectors reviewed the

personnel dosimeter records for the first, second, and third quarters of 2001. The results revealed that all workers received less than 10 percent of the occupational dose limit specified in 10 CFR 20.1201.

c. Training/Audits

The Kaiser training program is stated in Section 4 of the site remediation plan. The inspectors reviewed the training records and found that the last radiation worker training was provided during 2000. Training was also provided to new employees requiring routine site access in 2001. The next onsite training session is scheduled for January 2002, before the site begins concrete drilling and core sampling.

The inspectors reviewed the annual audit in accordance with the Kaiser Audit Procedure KAI-09. All audit items were reviewed in accordance with the procedure. The inspector followed up on the audit findings and found that the site had responded appropriately to each audit recommendation.

d. Dose to the Public

Kaiser utilized four area radiation dosimeters to determine the dose to the public from site activities. The area dosimeters were posted on the west, north, east, and south fences. During 1999, the site reported an area maximum annual dose of 99 millirems to the public based on the conservative assumption of a 75 percent occupancy factor. The inspectors reviewed the area dosimeter results for the first three quarters of 2001. Based on three quarters of information, the occupancy factor used during 1999 may not be acceptable for use with calender year 2001 data. At the time of the inspection, Kaiser had not conducted the public dose assessment for 2001. Accordingly, this issue will be reviewed during a future inspection (NRC Inspection Followup Item 040-02377/0201-01).

2.3 Conclusion

Radioactive material signs were conspicuously posted around the site as required by 10 CFR 20.1902. Material control was adequate. Personnel exposures were well below the limits of 10 CFR Part 20 requirements. Kaiser's radiation protection program was appropriate for the activities being conducted onsite. Kaiser had not completed its assessment of dose to members of the public for 2001. The NRC will conduct a followup review of this assessment during a future inspection.

3 Exit Meeting Summary

The inspectors reviewed the scope and findings of the inspection during the exit briefing that was conducted at the conclusion of the onsite inspection on January 11, 2002. Kaiser did not identify as proprietary any information provided to, or reviewed, by the inspectors.

ATTACHMENT 1

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Kaiser Aluminum & Chemical Corp.

D. Baker, Health Physicist, Earth Sciences Consultants, Inc.
P. Handa, Site Administrator, Kaiser Aluminum & Chemical Corp.
B. Vinzant, Manager, Corporate Environmental Affairs, Kaiser Aluminum & Chemical Corp.

INSPECTION PROCEDURES USED

IP 83890	Closeout Inspection and Surveys
IP 83822	Radiation Protection

ITEMS OPENED, CLOSED AND DISCUSSED

Opened

040-02377/0201–01 IFI Review Kaiser's public dose assessment for 2001.

Closed

None.

Discussed

None.

LIST OF ACRONYMS USED

CFR	Code of Federal Regulation
cps	counts per second
dpm/100 cm^2	disintegrations per minute per 100 square centimeters
IFI	Inspection Followup Item
IP	Inspection Procedure
µR/hr	microRoentgens per hour
NRC	Nuclear Regulatory Commission

ATTACHMENT 2

CHARACTERIZATION SURVEY SAMPLING AT KAISER ALUMINUM & CHEMICAL CORP.

NRC Inspector observing Kaiser's collection of background values using gas flow proportional detector inside of administration building.

Kaiser representative performing gross gamma survey in former operational area using a scintillation detector assembly.