



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

MEMORANDUM FOR: DOCKET FILE 40-2377

THROUGH: C. L. Cain, Chief
Fuel Cycle and Decommissioning Branch

FROM: R. J. Evans, Health Physicist
Fuel Cycle and Decommissioning Branch *RJ Evans*

SUBJECT: NRC VISIT OF THE KAISER ALUMINUM SPECIALTY PRODUCTS FACILITY

This memorandum documents an NRC visit to the Kaiser Aluminum Specialty Products facility on November 16, 1994.

Original Licensee: Standard Magnesium
7500 East 41st Street
Tulsa, Oklahoma

Current Facility: Kaiser Aluminum Specialty Products
7311 East 41st Street
Tulsa, Oklahoma 74147-0170

License: STB-472 (terminated March 1971)

Docket: 40-2377

Visit Conducted: November 16, 1994

Visitors : R. J. Evans, Health Physicist
Fuel Cycle and Decommissioning Branch
Division of Radiation Safety and Safeguards, Region IV

C. L. Cain, Chief
Fuel Cycle and Decommissioning Branch
Division of Radiation Safety and Safeguards, Region IV

R. H. Turtill, Project Manager
Low-Level Waste Management Branch
Division of Waste Management
Office of Nuclear Material Safety and Safeguards

P. L. DeWoody, Senior Environmental Specialist
Waste Management Division/Radiation Management
Department of Environmental Quality
State of Oklahoma

cc: See next page

Kaiser Aluminum Specialty Products -2-

cc:

P. L. DeWoody, Senior Environmental Specialist
Waste Management Division/Radiation Management
Department of Environmental Quality
State of Oklahoma
1000 N.E. 10th Street
Oklahoma City, OK 73117-1212

Details of the Visit

A brief site visit was made on November 16, 1994, principally to allow for site familiarization by the FCDB Branch Chief. Measurements of the direct radiation levels during the site tour were made using a microRoentgen/hour ($\mu\text{R/hr}$) meter. Background exposure rates were measured at about 10 $\mu\text{R/hr}$. The exposure rates measured in the areas that were previously visited were comparable to past measurements.

The areas behind the former Reserve Pond (east and north sides) and Retention Pond, formerly called the Sludge Pond (north side), were reviewed. (The Reserve Pond had been previously filled with soil and no longer resembled an actual pond. The backfilling of the pond may have taken place in the early 1970's.) These locations were accessible because the areas had been recently mowed for site radiological characterization. A drainage gully is located between the east side of the former Reserve Pond and the site boundary. Since the area had just experienced rain, groundwater appeared to flow into the gully, and then into No Name Creek, a drainage slough that ran along the north side of the property. Area exposure rates measured over 100 $\mu\text{R/hr}$ on the western side of the gully (Reserve Pond and Retention Pond side) and about 40 $\mu\text{R/hr}$ on the eastern side of the gully (site boundary side). Additionally, an exposure rate of 90 $\mu\text{R/hr}$ was measured in the drainage gully just upstream of the location where the gully runoff entered No Name Creek. The exposure rate at the east-side site boundary measured about 20 to 30 $\mu\text{R/hr}$. Additionally, the location where No Name Creek left the site measured around 15-20 $\mu\text{R/hr}$.

The northern side of the Retention Pond was also reviewed. Exposure rates were significantly lower on the northern side than was measured on the southern or eastern sides of the pond. The exposure rates hovered around background level just north of the pond. Further north of the pond (roughly 30-40 feet), No Name Creek runs east-west across the property. Although access to the creek is limited in most areas because of the steep creek slope, the southern slope of the creek (bank between creek and Retention Pond) did measure above background, 20-30 $\mu\text{R/hr}$, in two areas.

The area between the Freshwater Pond and the Retention Pond (west side of the Retention Pond, east side of Freshwater Pond) was also visited. No elevated exposure rate readings were observed in this area of the facility. This finding was expected because the Freshwater Pond appears to be above the elevation of the Retention Pond (flow would be into the Retention Pond), and because the Freshwater Pond is less convenient than the Retention Pond for magnesium-thorium process slag disposal. The western side of the Freshwater Pond and areas outside of the property boundary were not visited.

Since the last NRC visit of the facility, Kaiser Aluminum personnel installed new signs on the fences (see photograph) and removed miscellaneous scrap material from inside the fenced area enclosing the ponds. Additionally, as a conservative measure, the facility now requires all visitors who enter the

pond area to wash their shoes upon exit (rubber boots are issued for access to the pond area).

Summary of Licensee Discussions

The contractor, Advanced Recovery Systems, recently completed the characterization survey at the facility during October 1994. The work lasted about 2 weeks. The contractor was analyzing the data obtained during the site visit and was expected to provide a final report to Kaiser Aluminum by the end of the 1994 calendar year. Kaiser Aluminum representatives stated that copies of the characterization survey report will be submitted to the NRC around the beginning of 1995. Additionally, the facility would submit a decommissioning schedule to the NRC about the same time as the survey report.

During a meeting with Kaiser Aluminum held on July 14, 1994, the NRC recommended that a site characterization plan be submitted for review to ensure that the scope of remediation work is fully defined. Although site characterization plans are not required to be submitted to the NRC, plan submittal is beneficial to both the facility and the NRC because it allows the NRC to identify missing components in the plan. Also, the NRC stated at the July 14, 1994, meeting their concerns with taking survey readings at the site boundary and the on-site production facility. The NRC recommended that these areas be addressed in the characterization plan, to determine if a significant amount of contamination has migrated off site.

Kaiser Aluminum chose to not submit a site characterization plan to the NRC prior to the on-site characterization work (Kaiser Aluminum did submit a copy of the contractor's bid proposal to the NRC). During this site visit, the NRC informed Kaiser Aluminum that the characterization report, being developed by the contractor at the time of the inspection, should include the areas immediately adjacent to the property line and off site, as appropriate, to address NRC concerns with offsite migration of radioactive material. Additionally, Kaiser Aluminum was informed that the survey was performed "at risk" because significant NRC concerns with the final survey report could result in additional sampling being necessary. Following this visit of the facility, the NRC concerns about offsite migration of radioactive material remain valid concerns.

Preliminary results from the site characterization report were presented to the NRC during the site visits. According to the raw data, the licensee appears to have roughly 100,000 cubic feet of thorium-228, 230, and 232 at soil concentration levels between background and 10 picocuries/gram (pCi/g), 200,000 cubic feet between 10-50 pCi/g, and 1,000,000 cubic feet of material with concentrations above 50 pCi/g. The thorium-contaminated soil appears to be up to 10 feet deep. Strata (horizontal layers) of clay were found just below the contaminated soil. This natural clay boundary would tend to inhibit contaminated soil migration below this layer. This finding would suggest that

the contamination may not have migrated lower than the clay barrier, which is located roughly 10 feet below the surface.

Kaiser Aluminum also planned to obtain aerial photographs dating back to the 1940's of the area in an attempt to recreate the history of the site.

Change in Facility Organization and Point of Contact for NRC Correspondence

During the visit, the Acting Plant Manager informed the NRC that the former Plant Manager was no longer employed at the Kaiser Aluminum facility. The Acting Plant Manager assumed the position during October 1994.

Additionally, the acting plant manager stated that all future NRC correspondence should be addressed to:

Bobby A. Holmes
Safety, Health and Environmental Manager
Kaiser Aluminum and Chemical Corporation
Dallas Extrusion Division Office
14651 Dallas Parkway, Suite 814
Dallas, Texas 75240

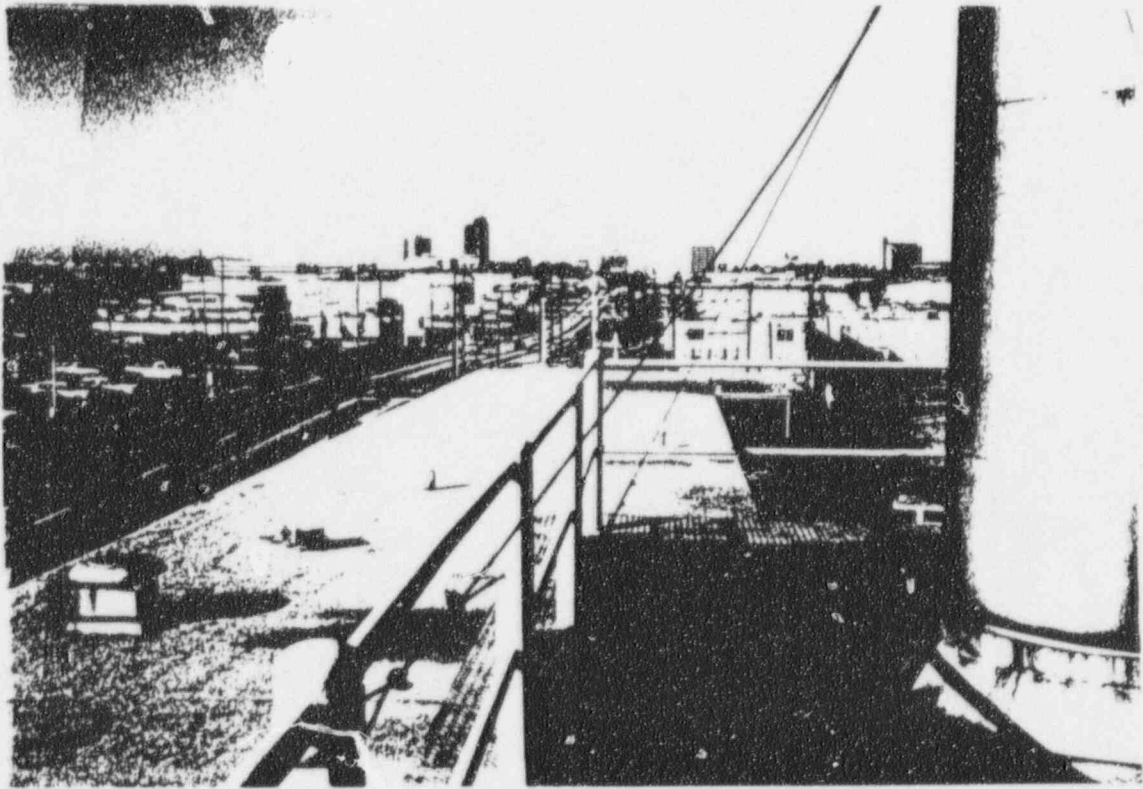
Persons Contacted

Kaiser Aluminum Facility Personnel

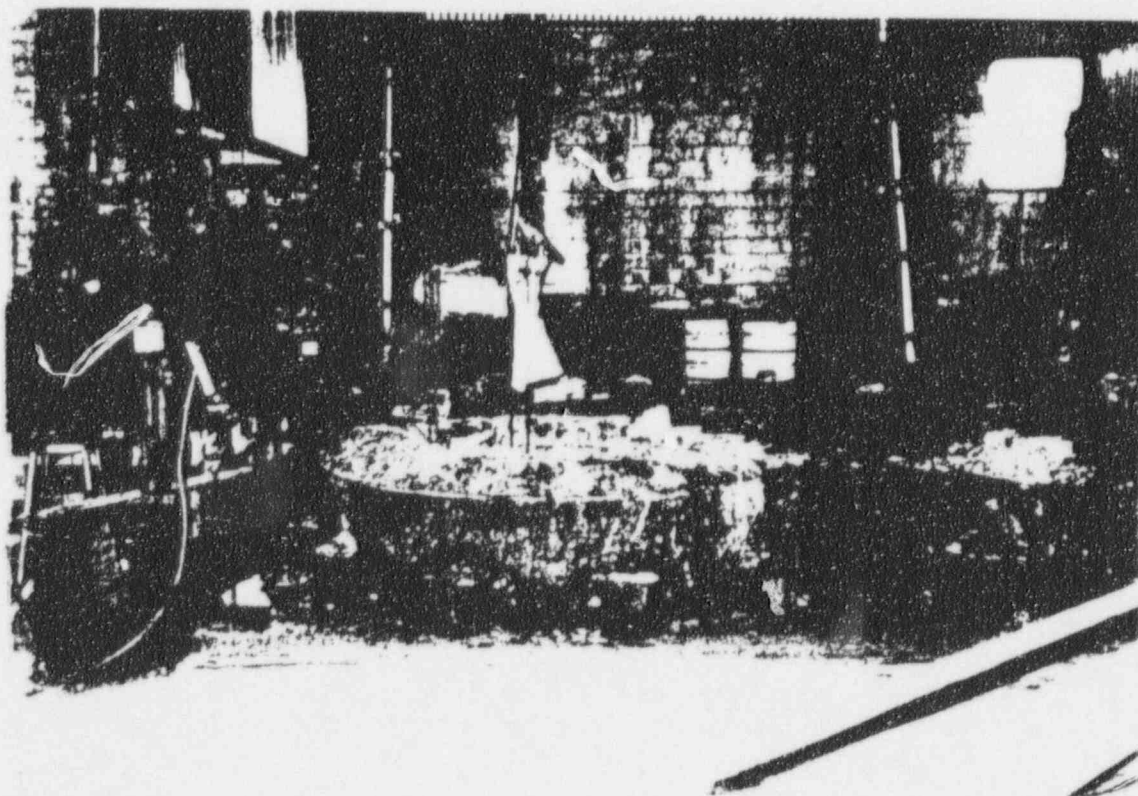
F. Ewton, Safety and Health Coordinator
R. Teel, Manager, Operations Planning; Plant Manager (acting)

ATTACHMENT 1





Photograph 2: The 7000 block of Saint Alit Street, looking west.



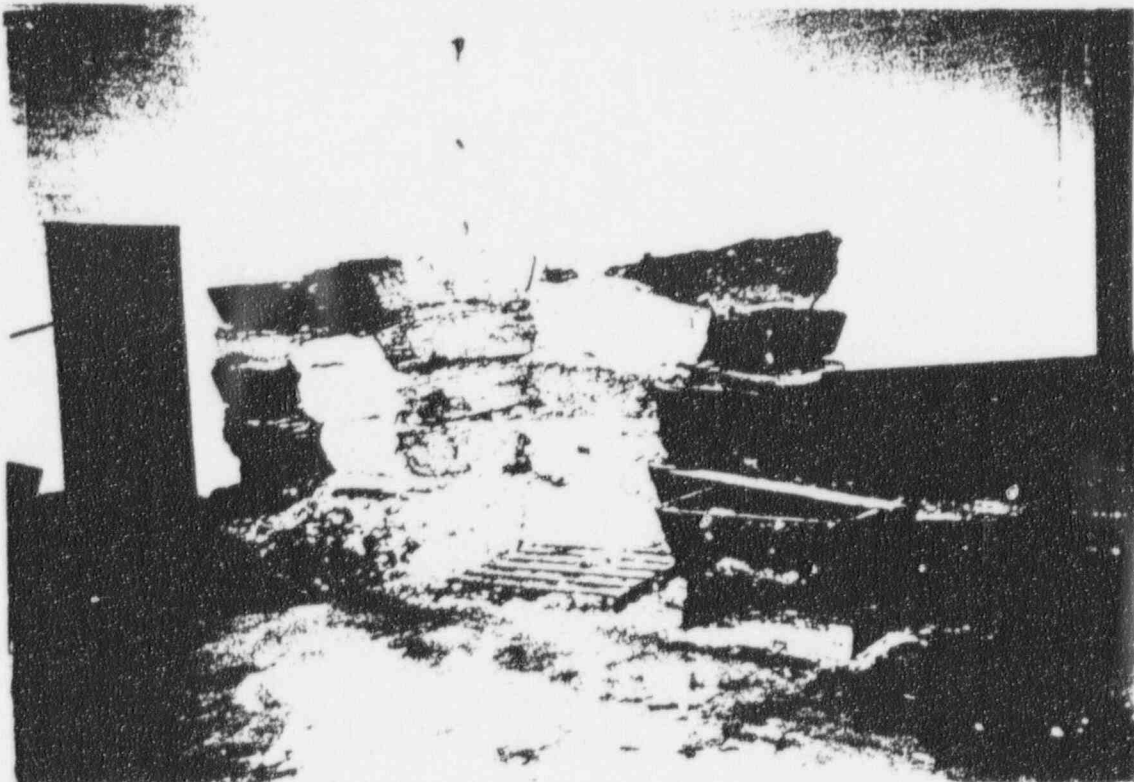
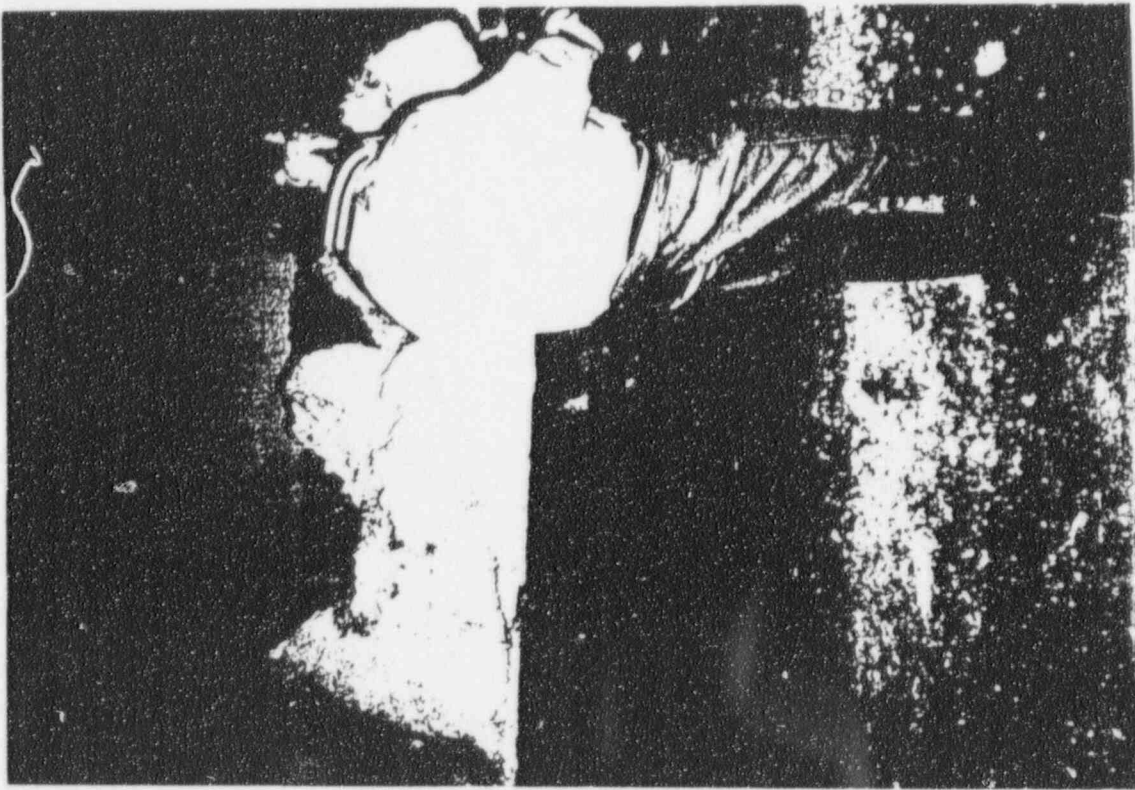
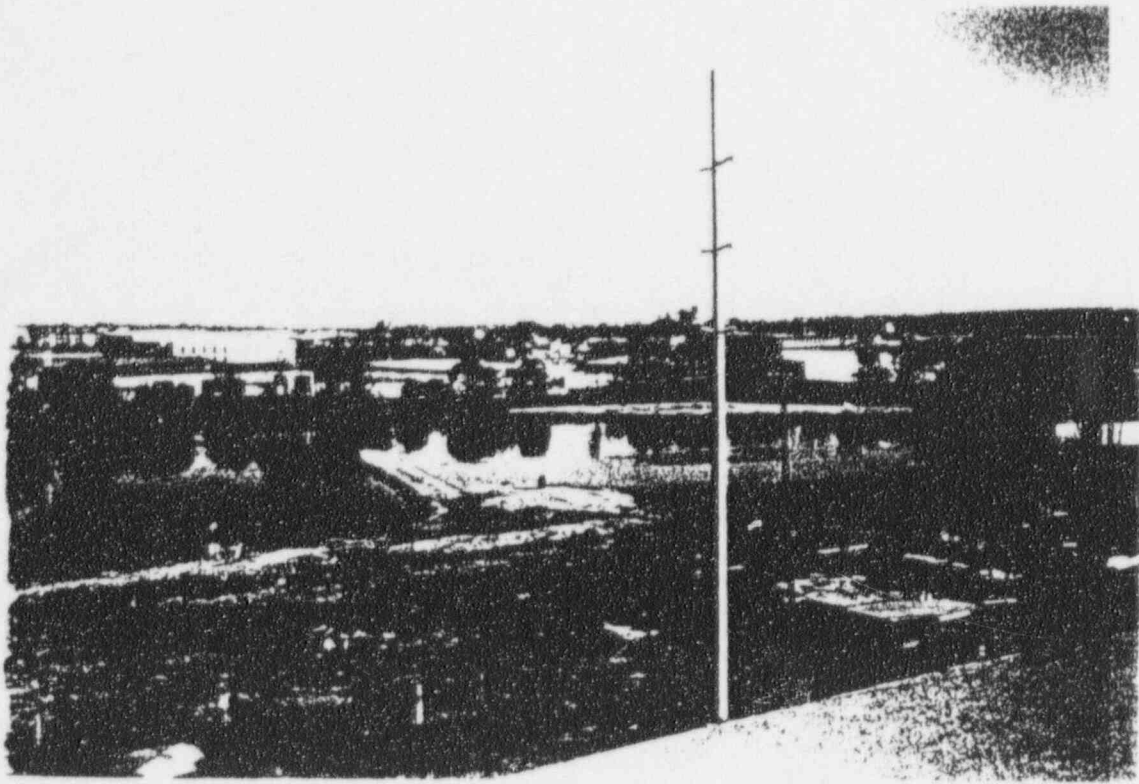
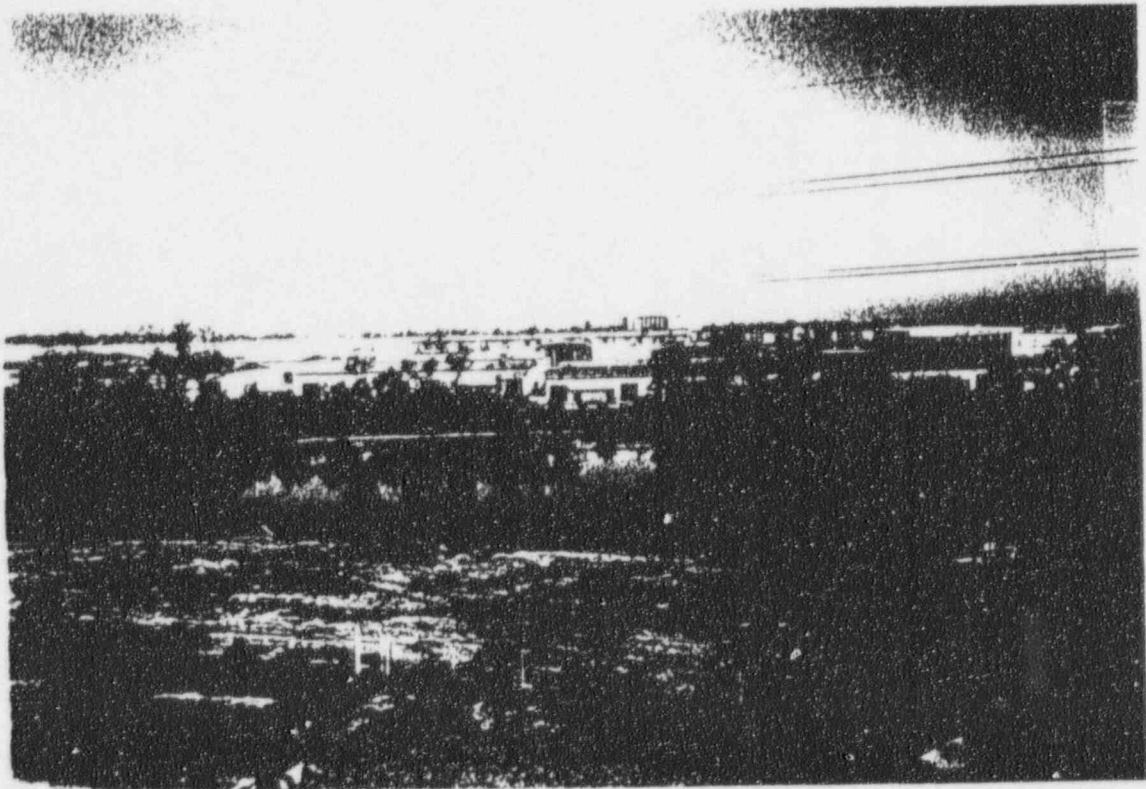


Figure 4: View of slagging furnace from Mill 2, following smelting process.





Photograph 6: Retention Pond, west side.



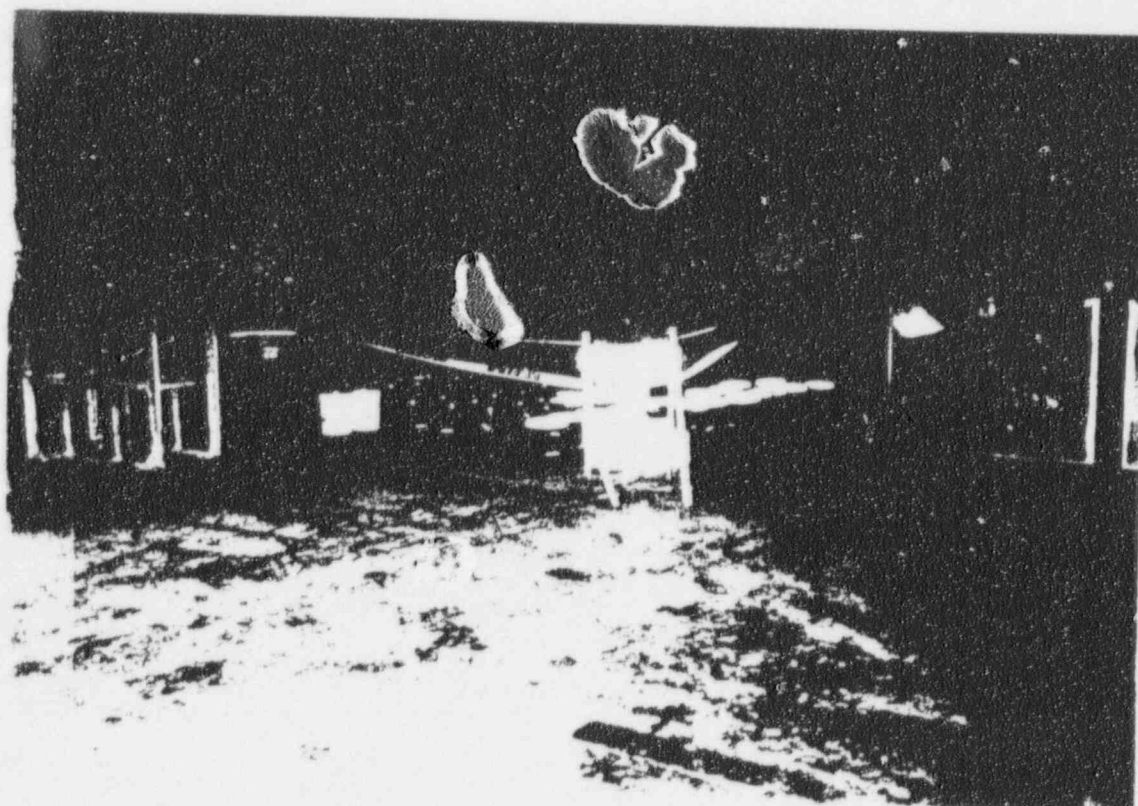
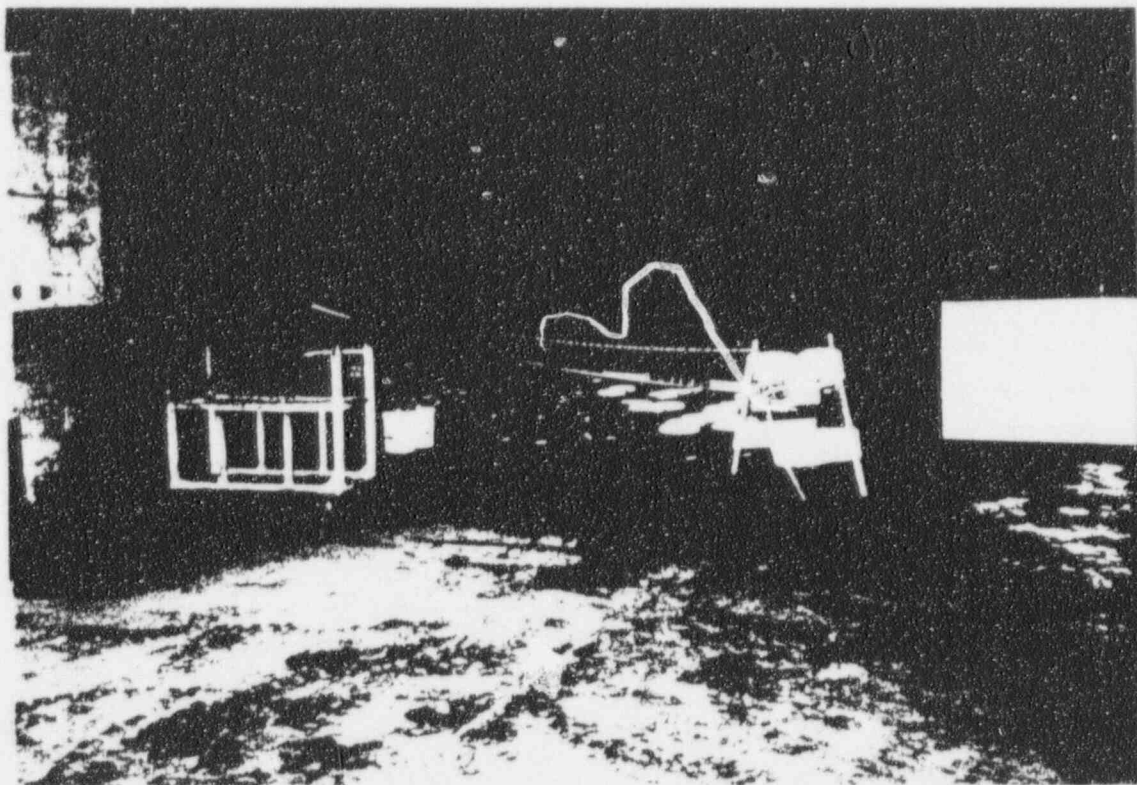


Figure 1. A person lying in bed, stored in the





Photograph 10: Drainage Gully, which flows to No Name Creek in background (Reserve Pond area is located on left side of the gully).



Photograph 11: Caution Sign (Caution signs recently added to fenced area enclosing the ponds).



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011 8064

JAN 10 1994

Docket: 40-2377
License: STB-472 (terminated)

Kaiser Aluminum Specialty Products
ATTN: Robert Jackson, Plant Manager
7311 East 41st Street
Tulsa, Oklahoma 74147

SUBJECT: NRC VISIT OF KAISER ALUMINUM

This refers to the special, announced orientation visit conducted by Mr. R. J. Evans of this office on November 19, 1993. The visit was conducted at the Kaiser Aluminum facility located in Tulsa, Oklahoma. At the conclusion of the visit, the findings were discussed with you and Mr. C. Fielder, Product Development Engineer.

The visit was performed to independently assess the potential for residual radioactive contamination at Kaiser Aluminum. Specifically, the inspector wanted to locate the old Standard Magnesium scrap magnesium-thorium alloy burial pit. The visit consisted of a records review of the former license file, interviews with current plant personnel, independent measurements, and a site visit. One disposal pit was identified, based on changes in background exposure rates. This pit was previously called the "Sludge Pond." The NRC inspector concluded that no immediate health hazard currently exists at the Kaiser Aluminum facility; however, the residual radioactivity levels measured were up to 100 times background levels.

It is our understanding that you plan to discuss the findings of this visit with a Kaiser safety and environmental representative. We request that you provide us in writing within 45 days the results of the discussion(s) with the safety and environmental representative, any pertinent records or documentation associated with the Sludge Pond, and any short and long-term plans for the Sludge Pond.

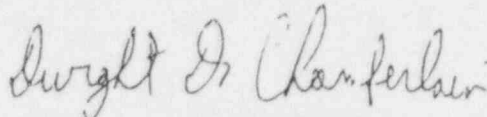
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IE07
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H/R

Kaiser Aluminum Specialty Products -2-

Should you have any questions concerning this letter, please contact the inspector identified above at (817) 860-8100.

Sincerely,

A handwritten signature in cursive script, reading "Dwight D. Chamberlain".

Dwight D. Chamberlain,
Acting Division Director,
Division of Radiation Safety and
Safeguards

Enclosure:
Appendix - NRC Visit of Kaiser Aluminum

cc w/enclosure:
Oklahoma Radiation Control Program Director

APPENDIX

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Docket: 40-2377

License: STB-472 (terminated March 1971)

Licensee: Standard Magnesium
7500 East 41st Street
Tulsa, Oklahoma 74145

Visit At: Kaiser Aluminum Specialty Products
7311 East 41st Street
Tulsa, Oklahoma 74147

Visit Conducted: November 19, 1993

Inspector: R. J. Evans, Radiation Specialist

Approved: W. L. Fisher
W. L. Fisher, Chief, Nuclear Materials
Licensing Section

12/13/93
Date

Visit Summary

Areas Inspected: Special, announced orientation visit to the Kaiser Aluminum Specialty Products facility, formerly occupied by the Standard Magnesium Company. The visit was performed using the general guidance of NRC Inspection Procedures 83895, "Followup on Expired Licenses," and 83890, "Closeout Inspection and Survey."

Results:

- Residual radioactivity was found at Kaiser Aluminum in an area called the "Sludge Pond." The radioactive material was not clearly identified but was suspected to be thorium-232 (Section 3.1).
- The radioactive material detected at the facility was not an immediate health hazard. The highest measured exposure rate was 1000 microroentgen/hour on the south shore. The pond exposure rate varied from 75 microroentgen/hour on the west side to 400 microroentgen/hour on the southeast side. The background radioactivity level was about 10 microroentgen/hour (Section 3.1).
- The discovery of residual radioactivity on the surface suggested that the waste magnesium-thorium alloy was improperly disposed of. The material should have been buried at least 4 feet below the surface to comply with regulations in effect at that time (Section 3.1).

Attachment:

- Attachment - Persons Contacted and Exit Meeting

DETAILS

1 LICENSE HISTORY

On March 7, 1958, the Standard Magnesium Corporation, located in Tulsa, Oklahoma, was issued Source Material License C-4012 for possession of 20,000 pounds of magnesium-thorium alloy containing up to 4 percent thorium.

On November 22, 1961, the maximum quantity of source material which the licensee may possess was increased to 30,000 pounds of alloy, which was equivalent to 1200 pounds of thorium. Additionally, License STB-472, which superseded License C-4012, was issued to Standard Magnesium.

On June 5, 1968, License STB-472 was amended to include uranium. Standard Magnesium planned to process a magnesium slag containing about 2 percent uranium from the National Lead Company of Ohio.

On February 12, 1971, Kaiser Magnesium, formerly called Standard Magnesium, requested that the AEC cancel the source material license. The licensee stated that they had not processed any source material in the past year and had decided to discontinue purchasing this material.

On March 18, 1971, Source Material License STB-472 was terminated at the licensee's request.

2 BACKGROUND

Standard Magnesium was a Division of the Kaiser Chemical Company. Standard Magnesium purchased magnesium-thorium scrap material for reclaiming purposes. The resultant product from the manufacturing process was magnesium anodes, which were used for cathodic protection on items such as tanks and pipelines. The licensee employed 75-100 people in the smelter (melting of ores to separate the metallic constituents) operation.

The licensee received the magnesium-thorium scrap material in 55-gallon drums. During the smelting process, the scrap was added to the bottom of a melt pot with regular magnesium alloys containing no thorium. The melt pots were open air containers that would hold up to 4000 pounds of material. The mixture was heated to over 1000 degrees Fahrenheit. The mixture was agitated during the melt process in such a way as to keep the scrap alloy at the bottom of the pot and to prevent the alloy from burning. The impurities, part of which was thorium, settled on the bottom of the melt pots as sludge. The thorium contained in the alloy was considered a waste impurity and served no purpose in the finished product. The waste sludge was removed from the melting pot and was allowed to cool in open containers. Following the melting process, the purified magnesium material was cast into anodes of various shapes, weighing from 1 to 50 pounds each. Although no attempt was made to determine the thorium content in the waste material, the sludge probably contained a higher percentage of thorium than was in the original scrap material. The increase in thorium content was the result of the smelting process, which allowed heavier elements to settle out at the bottom of the melt pots.

Between 1958 and 1963, the sludge material remaining in the bottom of the melt pots was recycled in order to recover all usable magnesium in the sludge. The recycling process consisted of crushing the solidified sludge (called slag) and returning the crushed slag into the melting pots. An airborne survey, performed by the Oklahoma State Health Department, showed that the air concentration of thorium during the crushing process was above the maximum permissible concentration; therefore, the recycling of the slag was discontinued.

Following the smelting process, approximately 20 percent of the melted material ended up as waste material. The waste material was thought to contain about 50 percent magnesium-thorium alloy. The waste material was disposed of by burial in an area immediately behind the plant. An AEC inspection was performed on November 15, 1965. In the November 15, 1965, inspection report, the Metal Procurement Director for Standard Magnesium was quoted as saying that approximately 50 tons of magnesium-thorium slag material was disposed of by burial. The Metal Procurement Director also stated that all waste material was bulldozed to a depth greater than 4 feet and was considered nonrecoverable. The AEC inspector performed a survey of the direct radiation in the plant. The external radiation varied from 0.05 milliroentgen/hour (mR/h) for the general plant area to 1.5 mR/h from the castings and slag. Survey measurements were also made at the slag dump. There were no radiation levels measured in excess of 0.1 mR/h at the dump.

During the same inspection in 1965, one item of noncompliance was noted involving 10 CFR 20.401, "Records of Surveys, Radiation Monitoring, and Disposal." Specifically, during the period of July 16, 1958 (date of previous inspection), through November 15, 1965, records were not maintained involving the disposal of the magnesium-thorium waste slag in order to show compliance with 10 CFR 20.304, "Disposal by Burial in Soil." An AEC inspection was performed again in April of 1968. The inspector concluded that records of surveys or disposal were not properly maintained in accordance with 10 CFR 20.401. The licensee apparently had a chronic problem in maintaining records of surveys and disposals.

During May 1968, the licensee requested a modification to the License STB-472. Standard Magnesium wanted to process a magnesium slag that contained about 2 percent uranium. The licensee stated that the material would be melted with the same equipment and personnel that was used for the magnesium-thorium materials. The licensee would separate the material for the National Lead Company of Ohio and would return the resultant metal and slag back to the firm. There was no information in the docket files that could be used to determine if this process was performed as stated.

An additional AEC inspection was performed in July 1970. No items of noncompliance were identified, suggesting that the inspector was satisfied with the survey and disposal records (assuming this area was inspected).

3 KAISER ALUMINUM FACILITY VISIT

An onsite visit to the Kaiser Aluminum facility was performed using the general guidance of NRC Inspection Procedures 83895, "Followup on Expired Licenses," and 83890, "Closeout Inspection and Survey." The survey instrument used was the Ludlum Model 19 microroentgen/hour ($\mu\text{R/h}$) meter which measures exposure rates. The NRC inspector took pictures of the facility during the tour.

3.1 Details of the Visit

On November 17, 1993, an NRC inspector visited the Kaiser Aluminum facility. The inspector met with the Product Development Engineer in the Offices Building. The inspector discussed the reasons for the visit with the Engineer and provided him with a complete copy of the docket file. A site tour was not performed at this time.

On November 19, 1993, the inspector returned to the facility and toured the plant. The Acting Section Manager, Hazardous Waste Division, Oklahoma State Department of Environmental Quality, accompanied the NRC inspector and Product Development Engineer on the tour. At the inspector's request, the engineer provided the NRC with a copy of the current organization chart and circa-1971 site layout drawings. The outdoor background exposure rate was about 10 $\mu\text{R/h}$ at the Offices Building.

The first building visited was the Smelter Building which was not in use at that time. Four melting pots and many blocks of slag were observed. Selected slag blocks were noted to have an exposure rate of about 20 $\mu\text{R/h}$ on contact. No elevated exposure rates were measured inside the building. The area outside the building along the ground of the back fence had an exposure rate of about three times background in selected areas. The source of the increased exposure rates in the soil was not clearly evident. The Crusher and Slag Buildings were not inspected because they were in use at that time. Residual radioactivity was not expected in these buildings because the buildings had been remodeled since the facility was in operation in the 1960's.

The ponds that were located across the railroad tracks from the Smelter Building were inspected. The ponds were labelled the Freshwater Pond, Sludge Pond, and Reserve Pond on a circa-1971 plant layout drawing. The Sludge Pond looked more like a sludge pit with rain water on it than an actual pond. The material in the pond looked metallic in color and consistency. The Product Development Engineer stated that he had conversed with an employee who believed the Sludge Pond was the only location at the facility where waste material was buried. The Sludge Pond appeared to be several thousand square feet in size. The pond was generally shaped like a horseshoe with a man-made peninsula in the middle. The engineer did not know how deep the pond was.

The inspector noted that a large, sturdy metal fence was installed around the pond area. The Product Development Engineer stated that the gate to the pond area was left unlocked during normal business hours but was locked at all other times. This area of the facility was not routinely traversed by plant personnel.

Residual radioactivity was identified in and around the Sludge Pond. The material was not clearly identified but was suspected to be thorium-232. The exposure rates measured were:

- 30 μ R/h on the west side of the pond
- 75 to 90 μ R/h on the southwest side of the pond
- 180 μ R/h on the west side of the peninsula
- 275 μ R/h on the east side of the peninsula
- 400 μ R/h on the southeast side of the pond
- 800 to 1000 μ R/h on the shore south of the pond

Higher levels of residual radioactive materials were found on the shore than in the pond itself. The highest exposure rate measured was 1000 μ R/h (about 1 mR/h). The area with the highest exposure rate was noted to only be on the surface because the exposure rate dropped significantly when the material on the surface was pushed aside.

The inspector concluded the material was improperly disposed of because the licensee was supposed to bury the material under at least 4 feet of soil to comply with the requirements of 10 CFR 20.304. The location of the material suggested that plant personnel may have dumped waste material on the shore of the pond, which was generally at a higher elevation than the pond, to allow the material to flow into the pond. The inspector also concluded that magnesium-thorium slag was also buried in or near the Sludge Pond, based on the findings of the 1965 AEC inspection. The north side of the Sludge Pond and the Reserve Pond were not easily accessible; therefore, they were not surveyed at this time. No metallic material was noted in the Freshwater Pond, which was immediately adjacent to the Sludge Pond.

3.2 Conclusions

The NRC inspector concluded that no immediate health hazard existed at the Kaiser Aluminum facility. However, the residual radioactivity levels were up to 100 times background levels. Additionally, residual radioactivity was located on the surface, which indicated that the material was improperly disposed of.

ATTACHMENT

1 PERSONS CONTACTED

1.1 Kaiser Aluminum Facility Personnel

C. Fielder, Product Development Engineer
R. Jackson, Plant Manager

1.2 State of Oklahoma

L. Kirk, Acting Section Manager, Hazardous Waste Division, Oklahoma State
Department of Environmental Quality

2 EXIT MEETING

An exit meeting was conducted on November 19, 1993, at the Kaiser Aluminum facility in Tulsa. During this meeting, the inspector reviewed the scope and findings of the visit with the participants. The inspector provided detailed information related to NRC cleanup criteria. The participants did not identify as proprietary any information provided to, or reviewed by, the inspector.



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV

611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

May 13, 1996

Kaiser Aluminum Specialty Products
ATTN: Sam Romeo, Plant Manager
7311 East 41st Street
Tulsa, Oklahoma 74147

SUBJECT: NRC SITE VISIT REPORT 40-2377/96-01 FOR KAISER ALUMINUM

This refers to the special, announced site visit conducted by Mr. L. C. Carson II of this office on March 5, 1996. During this visit, Mr. K. L. Kalman of the Office of Nuclear Material Safety & Safeguards accompanied our inspector.

The visit was conducted at the Kaiser Aluminum facility located in Tulsa, Oklahoma. At the conclusion of the visit, the findings were discussed with Mr. F. Ewton, Health and Safety Coordinator.

On April 16, 1996, our inspector and the NRC project manager, Mr. R. Turtill, held a telephonic discussion with you and Mr. B. Holmes of your corporate staff concerning the results of the Kaiser Corporation's recent planning meeting for the Tulsa, Oklahoma site.

Areas reviewed during the visit are identified in the enclosed report. Within these areas, the visit consisted of selected examination of procedures and representative records, interviews with personnel, and observation of activities in progress.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be placed in the NRC Public Document Room.

Should you have any questions concerning this site visit, we will be pleased to discuss them with you.

Sincerely,

Dwight S. Chamberlain
for Ross A. Scarano, Director
Division of Nuclear Materials Safety

Docket: 40-2377
License: STB-472 (Terminated March 1971)

Kaiser Aluminum
Specialty Products

-2-

Enclosure:
NRC Site Visit Report
40-2377/96-01

cc w/enclosure:
Kaiser Aluminum and Chemical Corporation
ATTN: Bobby Holmes
Safety, Health, and Environmental Manager
Dallas Extrusion Division Office
14651 Dallas Parkway, Suite 814
Dallas, Texas 75240

P. L. DeWoody
Senior Environmental Specialist
Radiation Management Section
Waste Management Division
Department of Environmental Quality
State of Oklahoma
1000 N.E. Tenth Street
Oklahoma City, Oklahoma 73117-1212

Oklahoma Radiation
Control Program Director
Mike Broderick
Radiation Management Section
Waste Management Division
Department of Environmental Quality
State of Oklahoma
1000 N.E. Tenth Street
Oklahoma City, Oklahoma 73117 212

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION
REGION IV

Report Number: 40-2377/96-01

License: STB-472 (Terminated)

Former Licensee: Kaiser Aluminum Specialty Products

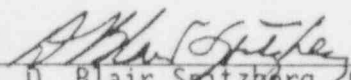
Site Visit Location: Kaiser Aluminum Facility, Tulsa, Oklahoma

Site Visit Conducted: March 5, 1996

Inspector: Louis C. Carson II, Health Physicist
Nuclear Materials Licensing Branch

Accompanied By: Richard H. Turtill, Project Manager
Low Level Waste and Decommissioning Projects Branch
Office of Nuclear Material Safety and Safeguards

Approved:


Dr. D. Blair Spitzberg, Chief
Nuclear Materials Licensing Branch

5/6/96
Date

Site Visit Summary

Areas Reviewed: Special, announced site visit to the Kaiser Aluminum Specialty Products facility, formerly occupied by the Standard Magnesium Company. The visit was performed using the general guidance of NRC Inspection Procedure 83895, "Followup on Expired Licenses," Temporary Instruction 2800/026, "Followup Inspection of Formerly-Licensed Sites Identified as Potentially Contaminated," and Procedure 83890, "Closeout Inspection and Survey."

Results:

- Radioactive material signs were conspicuously posted around the site as required by 10 CFR Part 20.1902.
- All water samples from the Fulton Creek outflow from the Kaiser property measured less than limits specified in 10 CFR Part 20.
- The on-site soil characterization report provided useful information for Kaiser's reclamation planning, but more soil characterization is needed off-site.
- Kaiser Aluminum was making adequate progress in developing a comprehensive reclamation program for the Tulsa, Oklahoma, site.

9605170079 8PP

- No immediate health hazard currently exists at the Kaiser Aluminum facility.

Attachment:

- Persons Contacted and Exit Meeting

DETAILS

1 SITE TOUR

On March 5, 1996, NRC staff visited the Kaiser Aluminum facility, met with the Health and Safety Coordinator and the Plant Manager, discussed the reasons for the visit, and conducted a site tour. This site visit was performed to assess the scope of residual radioactive contamination at the Tulsa, Oklahoma, Kaiser Aluminum Facility, and to gain an understanding of Kaiser's plans regarding the reclamation of the site. The inspector toured the old Standard Magnesium scrap magnesium-thorium alloy burial pit, the three site ponds, Fulton Creek, and the property fenceline.

During the site tour, the inspector observed that radioactive material signs were conspicuously posted around the site as required by 10 CFR Part 20.1902. Inspector observed that the Kaiser property fenceline was in adequate condition, however, the inspector found indications that property erosion extended beyond the property fenceline. Also, it seemed that access under the fence by members of the public would not be precluded by the fence in the eroded areas and around the Fulton Creek drainage area. This was discussed with Kaiser personnel for any action they deem appropriate. The inspector observed evidence of animal habitants, particularly beavers and large birds, around the creek and ponds.

2 RECORDS REVIEW

The inspector's visit included a records review of the former licensee's files and discussions with the Health and Safety Coordinator. The inspector reviewed Kaiser letters on file regarding licensed material found at Kaiser, radiochemical analysis of water samples, and the final "Field Characterization Report" on soil contamination at Kaiser.

2.1 Kaiser Letter

A letter dated June 21, 1995, informed the area business community that Kaiser was working with the NRC to address the thorium residue issue. The letter explained that the hazard was radioactive metallic thorium, Kaiser would be posting "Caution Radiation" signs around the property, and the issue posed no immediate health or safety hazard. According to the Safety and Health Coordinator, the business community had a positive response to their efforts.

The inspector reviewed an NRC letter dated August 5, 1995, which identified that the Kaiser facility was formerly licensed by the Atomic Energy Commission and needed to be remediated before it could be released for unrestricted use. The NRC letter also stated that the Kaiser facility presented "No imminent health and safety risk" to the public.

2.2 Radiochemical Water Analysis

The inspector reviewed 1994 and 1995 radiochemical analysis of water samples that were collected from Fulton Creek outfall which flows through the Kaiser facility and from monitoring wells around the site ponds. Kaiser does not have requirements to perform such radiochemical analysis, however, they analyzed for gross alpha, gross beta radiation, and measured the amount of thorium-228 and thorium-232 radioactivity suspended in water. The inspector noted that the amount of thorium-228 and thorium-232 detected in the pond monitoring well was 163 and 185 picoCuries/liter, respectively. Fulton Creek outfall water samples measured less than 1 picoCuries/liter thorium-228 and thorium-232. Gross alpha and gross beta from the Fulton Creek outfall measured 6 and 30 picoCuries/liter, respectively.

The inspector concluded that all the Fulton Creek samples analyzed were less than NRC regulatory limits specified in 10 CFR Part 20.

2.3 Field Characterization of Soil Contamination

The inspector reviewed the report on the soil contamination at the Kaiser facility "Field Characterization Report," dated April 18, 1995. The report documented the amount of contaminated soils and sludges found at the facility in Tulsa, Oklahoma. In the report, Kaiser used as reference, the NRC Branch Technical Position (BTP), "Disposal or On-Site Storage of Residual Thorium or Uranium From Past Operations." This NRC-BTP establishes the following criteria for thorium and uranium in soil:

- Option-1 specific activities of 10 picoCuries/gram or less
- Option-2 specific activities of greater than 10 picoCuries/gram but less than 50 picoCuries/gram.

From the investigation, Kaiser determined that the following volumes of Thorium 228, 230, and 232 contaminated soil exists on site:

- 275,616 cubic feet of Option-1
- 1,113,241 cubic feet of Option-2
- 2,035,638 cubic feet of greater than Option-2 (>50 picoCuries/gram)
- A total of 3,447,495 cubic feet of contaminated soil.

The investigation included the following four areas on site:

- Area-1: Land between the Retention Pond and the southern fence boundary
- Area-2: Bermed areas located north and east of the Flux Plant
- Area-3: Backfilled Reserve Pond
- Area-4: Retention Pond

Kaiser estimated that 575,000 cubic feet of the contamination exists in the Area-4 Retention Pond and 500,000 cubic feet exist in the Reserve Pond in

facility and from monitoring wells around the site ponds. Kaiser does not have requirements to perform such radiochemical analysis, however, they analyzed for gross alpha, gross beta radiation, and measured the amount of thorium-228 and thorium-232 radioactivity suspended in water. The inspector noted that the amount of thorium-228 and thorium-232 detected in the pond monitoring well was 163 and 185 picoCuries/liter, respectively. Fulton Creek outfall water samples measured less than 1 picoCuries/liter thorium-228 and thorium-232. Gross alpha and gross beta from the Fulton Creek outfall measured 6 and 30 picoCuries/liter, respectively.

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Area-3 that has been backfilled with dirt. Another 240,000 cubic feet of contaminated soil existed, specifically, in Area-1, just west of Flux Plant.

The inspector noted that the investigation analyzed very few measurements outside the Kaiser property fenceline. Characterization beyond the immediate property of the Kaiser facility has been part of ongoing discussions between the NRC and Kaiser. Kaiser detected radioactivity in soil outside their fenceline that measured 23 picocuries/gram. Kaiser plans to collect more samples outside their fenceline later in 1996 and will include such information in future characterization data.

The inspector concluded that the on-site soil characterization report provided useful information for Kaiser's reclamation planning, but more soil characterization is needed off-site.

3 CHARACTERIZATION AND REMEDIATION PLANNING

During this site visit, Kaiser management revealed that they were having a meeting on April 11, 1996, to develop a plan of action to supplement the final Field Characterization Report. On April 16, 1996, a telephonic conversation was held between Kaiser representatives (Kaiser Facility Plant Manager and the Kaiser Safety, Health, and Environmental Manager) and NRC staff (Project Manager and Region IV Inspector) to discuss the results of the April 11th planning meeting.

Kaiser management explained that the next phase in the characterization program was to implement a groundwater hydrology study of the Tulsa, Oklahoma, site. Kaiser management explained that contamination mobility, uniformity, and solubility are important factors to know before they can proceed with a Decommissioning Plan submittal. Kaiser management provided the following schedule:

- Develop the Phase-I action strategy for site hydrology by June 1, 1996
- Have a defined hydrology scope and incorporate benchmarking factors from other licensees by July 1, 1996.
- Issue bids for the hydrology characterization by August 15, 1996.
- Start hydrology characterization by November 15, 1996.
- Issue the Hydrology Characterization Report by December 31, 1996.
- Submit a Decommissioning Plan by July 1, 1997.

Kaiser management expressed their desire to meet with the NRC staff several times before submitting the Decommissioning Plan. NRC staff encouraged Kaiser to meet with NRC personnel as they needed.

4 CONCLUSIONS

The NRC inspector concluded that no immediate health hazard currently exists at the Kaiser Aluminum facility and the licensee was making adequate progress in developing a comprehensive reclamation program at the facility.

ATTACHMENT

1 PERSONS CONTACTED

1.1 Kaiser Corporation

F. Ewton, Site Health and Safety Coordinator
B. Holmes, Corporate Safety, Health, and Environmental Manager
S. Romeo, Plant Manager

1.2 Contractor Personnel

M. Scott, Health Physicist (Consultant)

1.3 NRC Personnel

*L. Carson II, Health Physicist, Region IV
*K. Kalman, Project Manager, Low Level Waste and Decommissioning Projects
Branch

(*) Denotes the personnel above that attended the exit meeting. In addition to the personnel listed above, the inspector contacted other personnel during the inspection.

2 EXIT MEETING

An exit meeting was conducted on March 7, 1996, at the Kaiser facility in Tulsa, Oklahoma. During this meeting, the inspector reviewed the scope and findings of the site visit. The participants did not identify as proprietary any information provided to, or reviewed by, the inspector.