

AUG 19 1993

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MEMORANDUM FOR: John Austin, Chief
Decommissioning and Regulatory
Issues Branch, NMSS

THROUGH: Michael Weber, Section Leader
Regulatory Issues Section, LLDR/NMSS

FROM: Chad Glenn, Project Manager
Regulatory Issues Section, LLDR/NMSS

SUBJECT: TRIP REPORT FOR MAY 18-19, 1993, SITE VISIT TO THE CABOT
READING AND REVERE, PA SITES AND MAGNESIUM ELEKTRON, SITE IN
FLEMINGTON, NEW JERSEY

Enclosed, for your information, is a trip report documenting observations of Michael Weber and myself during a May 18-19, 1993, visit to the Cabot Corporation's Reading and Revere sites in Pennsylvania. At the request of the Division of Fuel Cycle Safety and Safeguards, we also visited the Magnesium Elektron Inc. facility in Flemington, New Jersey.

If you have any questions regarding this site visit, or would like to discuss the information presented in this trip report, please let me know.

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Chad Glenn, Project Manager
Regulatory Issues Section, LLDR/NMSS

Enclosure: As stated

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NRC MAY 18-19, 1993 SITE VISIT TO CABOT CORPORATION'S READING
AND REVERE FACILITIES IN PENNSYLVANIA AND THE
MAGNESIUM ELEKTRON, INC. FACILITY IN FLEMINGTON, NEW JERSEY

On May 18-19, 1993, Michael Weber and Chad Glenn of the Nuclear Regulatory Commission staff visited 3 Site Decommissioning Management Program (SDMP) sites. These sites included the Cabot Corporation's sites in Reading and Revere, Pennsylvania and the Magnesium Elektron, Inc. facility in Flemington, New Jersey. The objective of this trip was to observe these sites and meet Company representatives involved in site remediation activities. Project management responsibility for the two Cabot sites was recently transferred from the Division of Fuel Cycle Safety and Safeguards to the Division of Low-Level Waste Management and Decommissioning. At the request of the Division of Fuel Cycle Safety and Safeguards, we also visited the Magnesium Electron, Inc. facility. In touring these sites, we used a Ludlum Model 19 Micro R meter to monitor radiation exposure rates at these facilities.

Cabot, Reading Site

At noon on May 18th we met Mr. William Gannon (Cabot Corporation) in Reading, Pennsylvania and proceeded to Cabot's Reading site. Mr. Gannon accompanied us on a walking tour of the site. The Reading site covers an area of approximately 5 acres. The site is bounded by the Reading Railroad tracks on the West, Tulpenhocken Street on the North, and the Schuylkill River and railroad tracks on the South. The site consists of the former Processing Building, the Slag Dump, and the surrounding yard and parking lot.

Cabot operated an ore processing plant at this site between 1967 and 1968 under Source Material License No. SMB-920. An electric arc furnace was used at this site to increase the percentage of tantalum in low grade tantalum ores from 2% to 15% by weight. NRC conducted two confirmatory radiological surveys of the site (1985 and 1991) to ensure that residual contamination levels were below NRC guideline levels. The results of the latest confirmatory survey indicates that residual radiological contamination exists above NRC guideline levels.

The first stop on this tour was the Slag Dump located on the extreme south end of the facility. This Slag Dump is located on a thickly wooded embankment between the Reading Railroad, Schuylkill River, and the Cabot facility. According to Mr. Gannon, this area was originally separated from the rest of the facility by a fence. The fence has since been removed and other non-radioactive waste have been dumped over this area. Originally, large pieces of slag from the furnace operations were disposed in the Slag Dump. Contaminated sand from a Cabot site in Baltimore, Maryland was later dumped over this slag. In addition, other uranium and thorium-contaminated material was disposed in the dump in the course of facility decontamination operations in the 1970's. According to Mr. Gannon, four feet of uncontaminated clay was deposited over the Slag Dump. Mr. Gannon offered to provide NRC with photographs of previous decommissioning activities at this facility including photographs of the placement of slag and other material in the slag dump.

Based on a radiological survey prepared by the Oak Ridge Institute For Science and Education (ORISE), and measurements during this site visit, the background radiation level at this site is approximately 10 μ R/h. Elevated radiation levels were noted over limited areas of the site. The highest exposure rate

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measured (160 $\mu\text{R}/\text{h}$ at one meter above the surface) on this site visit occurred over a limited area of the Slag Dump. An anomalous instantaneous measurement of about 1300 $\mu\text{R}/\text{h}$ was also noted in walking over the Slag Dump; the source of this elevated reading was attributed to the X-ray radiography operations onsite. Elevated readings up to 75 $\mu\text{R}/\text{h}$ were also noted at the base of this embankment adjacent to the railroad tracks indicating that contaminated material may have spread down the embankment. These elevated readings occurred for some distance adjacent to the railroad tracks. Some of the elevated exposures rates, however may have been caused by slag that is not associated with the license activities at this site. NRC staff measured exposure rates of up to 30 $\mu\text{R}/\text{h}$ on contact on an outcrop of slag beneath the bridge over the railroad tracks and Schuylkill River west of the slag dump.

From the Slag Dump, we walked across the plant yard and parking lot to the former Processing Building. The Processing Building was used for smelting, crushing, and storage of ore materials. This building occupies an area of over 30,000 ft^2 . In a brief walk-through of this area, several slightly elevated exposure rates (20 $\mu\text{R}/\text{h}$ and 30 $\mu\text{R}/\text{h}$) were noted over limited areas in the south half of the building. The building is presently being used to store material for the radiography operations and to manufacture components for fire and rescue trucks.

Before leaving the Reading site, we provided Mr. Gannon with two recent NRC letters to the Cabot Corporation. One letter requested Cabot's consent to splitting its existing source material license (SMB-920) into three separate licenses - one each for the Boyertown, Reading, and Revere sites. The second letter transmitted ORISE's 1991 radiological survey report for the Revere site. This letter also requested that Cabot proceed to develop a plan for site remediation and decommissioning of the Revere site. Mr. Gannon indicated that a new remediation contractor had not yet been selected. However, Cabot is presently evaluating 4 different contractors for the remediation work at these two Cabot facilities. Mr. Gannon stated that the selection of the remediation contractor is expected to be completed within the next several weeks.

Cabot Revere Site

On the morning of May 19, 1993, we met Mr. Gannon and proceeded to Cabot's facility in Revere, Pennsylvania. This site visit began with about a half-hour meeting with Frederick White, Cabot's Revere Plant Manager. According to Mr. White, the source of the radiological contamination at the site was from past experimental processing of columbium-tantalum ore, which contained uranium and natural thorium. The ore processing employed a thermite reduction process that produced a columbium-tantalum alloy and a waste slag, which contained traces of natural uranium and thorium. The waste slag was disposed of in several pits on the site. Mr. White stated that the completion of site remediation work at the Revere site and removal of the site from their license is a high priority to the Cabot Corporation. NRC staff stressed the agency's desire to complete site remediation in a timely manner so the site may be decommissioned and released for unrestricted use. NRC and Cabot representatives thought it may be productive to meet to discuss site remediation work after Cabot selects a remediation contractor. A timeframe for the proposed meeting was tentatively set for the end of June 1993.

After this meeting, we visited the Old Pit area, a pit excavated adjacent to the Sand Blasting area, the drum storage area, the storage pad behind Buildings 4 and 5, the warehouse and loading dock area. Based on a recent ORISE confirmatory survey of this site, background radiation levels are between 12-18 $\mu\text{R}/\text{h}$. However, background exposures rates over certain portions of the site may be higher based on observations at the site. We measured exposure rates of up to 35 $\mu\text{R}/\text{h}$ on contact with an outcrop of red mudstone and shale in the bed of the road between the Old Pit area and the Sand Blasting area.

In the Old Pit area, we noted several discrete pieces of slag with elevated exposures levels ranging from 30-50 $\mu\text{R}/\text{h}$ on contact. The Old Pit is a former slag disposal area where some contaminated slag is mixed with a much larger quantity of uncontaminated slag. General area exposure rates were at background levels (12 to 18 $\mu\text{R}/\text{h}$). Walking east from the Old Pit area, we stopped at a second pit excavated near the sand blasting station. In this pit, we also noted several discrete pieces of slag with elevated radiation exposures levels of 30-50 $\mu\text{R}/\text{h}$ on contact. After leaving this area, we proceeded east to the drum storage area. This was also a former disposal area for contaminated slag that has been subsequently covered with gravel and is currently a storage area for non-radioactive materials. Several areas with elevated radiation levels were noted in the range of 30-70 $\mu\text{R}/\text{h}$ on contact. General area exposure rates were at background levels (12 to 18 $\mu\text{R}/\text{h}$). From this area, we proceeded north to Buildings 4 and 5, and the Warehouse loading area where we were unable to detect elevated radiation levels in our brief walk-through of these areas. At approximately 11:00 a.m., we completed our site visit and departed for the Magnesium Elektron, Inc. site in New Jersey.

Follow-up Items For Cabot Sites:

- Cabot to respond to NRC letters.
- NRC and Cabot to schedule meeting to discuss site decommissioning (completed 7/14/93; meeting scheduled for 8/18/93).
- NRC to send Cabot ORISE's draft confirmatory survey report for Reading site after we provide our comments on this report to ORISE (completed 5/28/93).

Magnesium Elektron, Inc. Site

The Magnesium Elektron, Inc (MEI) site is located in the rural area of Flemington, New Jersey. This is a 113 acre site of which approximately 30 acres is used in the production of zirconium chemicals. The site contains various buildings and effluent/sludge control ponds. MEI separates the byproducts from the ore of zirconium and manufactures zirconium chemicals for other industries. According to MEI, the feed ore contains less than 0.05 percent by weight of uranium and thorium. However, the sludge may contain concentrations that exceed 0.05 weight percent uranium and thorium resulting from the precipitation and separation of impurities. The effluent/sludge, containing the uranium and thorium generated from this process, is stored in on-site ponds. MEI possesses about 1,600,000 ft^3 of sludge.

This visit consisted of a brief tour of the zirconium production operations followed by a walk around the sludge ponds on the south side of the process buildings. The background exposure rate at 1 meter above the ground appeared to be in the range of 9-13 $\mu\text{R}/\text{h}$. Elevated exposure rates were noted at

isolated locations in the processing buildings. The highest measurement noted (135 $\mu\text{R/h}$) inside the processing buildings occurred on contact with the zirconium feed stock. In our brief walk around the pond area, we measured gamma exposure rates around the perimeter of Pond 6 Upper and Pond 6 Lower (including measurements on top of the sludge in the ponds), and Pond 7. The exposure rates measured around and in these impoundments ranged from 50-170 $\mu\text{R/h}$. We recorded the exposure rates on a map of the facility that was provided to us by MEI. The annotated map is attached.

We terminated the visit by meeting briefly with the plant Production Manager and discussing the exposure rates we had measured during our site visit. We also briefly discussed the status of NRC's review of the sludge sampling plan that had previously been submitted by MEI.

Attachment: Map of MEI Facility