



UNITED STATES  
**NUCLEAR REGULATORY COMMISSION**  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

August 13, 2001

Docket No. 04009027

License No. SMC-1562

Timothy M. Knapp  
Radiation Safety Officer  
Cabot Corporation  
P.O. Box 1608  
Boyertown, PA 19512

SUBJECT: INSPECTION 04009027/2001001, CABOT CORPORATION, READING AND  
REVERE SITES, PENNSYLVANIA, AND NOTICE OF VIOLATION

Dear Mr. Knapp:

On April 23, 2001 and July 19, 2001, Anthony Dimitriadis of this office conducted a safety inspection at the above address of activities authorized by the above listed NRC license. The inspection was an examination of your licensed activities as they relate to radiation safety and to compliance with the Commission's regulations and the license conditions. The inspection consisted of observations by the inspector, interviews with personnel, and a selected examination of representative records. The findings of the inspection were discussed with you at the conclusion of the inspection. The enclosed report presents the results of this inspection.

Based on the results of this inspection, it appears that your activities were not conducted in full compliance with NRC requirements. A Notice of Violation is enclosed that categorizes the violation by severity level in accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," (Enforcement Policy), NUREG 1600. You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. In your response, you should document the specific actions taken and any additional actions you plan to prevent recurrence. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. After reviewing your response to this Notice, including your proposed corrective actions and the results of future inspections, the NRC will determine whether further NRC enforcement action is necessary to ensure compliance with NRC regulatory requirements.

In accordance with 10 CFR 2.790, a copy of this letter will be placed in the NRC Public Document Room and will be accessible from the NRC Web site at  
<http://www.nrc.gov/NRC/ADAMS/index.html>.

T. Knapp  
Cabot Corporation

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Your cooperation with us is appreciated.

Sincerely,

***Original signed by Ronald R. Bellamy***

Ronald R. Bellamy, Chief  
Decommissioning and Laboratory Branch  
Division of Nuclear Materials Safety

Enclosures:

1. Inspection Report No. 04009027/2001001
2. Notice of Violation

cc:  
Commonwealth of Pennsylvania

T. Knapp  
Cabot Corporation

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NAME	Adimitriadis AXD1		Rbellamy RRB1					
DATE	8/9/01		8/10/01					

OFFICIAL RECORD COPY

## **NOTICE OF VIOLATION**

Cabot Corporation  
Boyertown, PA

Docket No. 04009027  
License No. SMC-1562

During an NRC inspection conducted on April 23, 2001 and July 19, 2001, one violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," (Enforcement Policy), NUREG-1600, the violation is listed below:

- A. 10 CFR 20.1902(e) requires in part, that the licensee shall post each area in which there is used or stored an amount of licensed material exceeding 10 times the quantity of such material specified in Appendix C to 10 CFR Part 20 with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, RADIOACTIVE MATERIAL(S)."

Contrary to the above, as of July 19, 2001, the licensee had not posted the fenced area at the Reading site storing the licensed material with the required posting.

This is a Severity Level IV violation (Supplement IV ).

Pursuant to the provisions of 10 CFR 2.201, Cabot Corporation is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555, with a copy to the Regional Administrator, Region I, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001. Under the authority of Section 182 of the Act, 42 U.S.C. 2232, any response which contests an enforcement action shall be submitted under oath or affirmation.

Your response will be placed in the NRC Public Document Room (PDR) and on the NRC Web site at <http://www.nrc.gov/NRC/ADAMS/index.html>. To the extent possible, it should, therefore, not include any personal privacy, proprietary, or safeguards information so that it can be made publically available without redaction. However, if you find it necessary to include such information, you should clearly indicate the specific information that you desire not to be placed in the PDR, and provide the legal basis to support your request for withholding the information from the public.

Notice of Violation  
Cabot Corporation

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In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 13<sup>th</sup> day of August 2001

U.S. NUCLEAR REGULATORY COMMISSION  
REGION I

INSPECTION REPORT

Inspection No. 04009027/2001001  
Docket No. 04009027  
License No. SMC-1562  
Licensee: Cabot Corporation  
Address: P.O. Box 1608  
Boyertown, PA 19512  
Locations Inspected: Reading and Revere Sites  
Inspection Dates: April 23, 2001 and July 19, 2001

Inspector:	_____ Anthony Dimitriadis Health Physicist	_____ date
	<b><i>Original signed by Ronald R. Bellamy</i></b>	<b><i>August 13, 2001</i></b>
Approved By:	_____ Ronald R. Bellamy, Chief Decommissioning and Laboratory Branch Division of Nuclear Materials Safety	_____ date

## **EXECUTIVE SUMMARY**

Cabot Corporation  
NRC Inspection Report No. 04009027/2001001

This inspection was conducted to determine if the slag pile characterization and proposed Decommissioning Plans at the Revere and Reading sites are in accordance with NRC requirements. The inspection included a review of the site history, decommissioning planning and characterization activities; equipment and instrumentation; posting and labeling; status surveys; and independent measurements.

Decommissioning activities at the Revere and Reading sites have not yet commenced. The licensee submitted Decommissioning plans for the two sites to the NRC in August 1998 and November 1997 respectively, including Revision 1 for the Reading, PA site in March 2000. In its decommissioning plans, the licensee is proposing to leave the soil in its present locations at each respective site as on-site disposal. These plans are currently under review.

On-site inspections were performed on April 23, 2001 and July 19, 2001.

### **Site History**

The licensee had adequately documented the site history, characterized the boundaries of the affected areas and took good precautions in identifying areas that were cleared of other obvious physical hazards.

### **Characterization and Decommissioning Activities**

Decommissioning and remediation activities at the Reading and Revere sites have been limited as the licensee has completed characterization activities. The licensee is proposing in their decommissioning plans for on-site disposal at both sites. The licensee's surveys have been documented in their decommissioning plans which are currently under review.

### **Equipment and Instrumentation**

The inspection verified that the licensee used suitable equipment and properly calibrated radiation detection instrumentation for surveys and characterization activities.

### **Posting and Labeling**

Posting and labeling of radioactive material and radiation areas were effective at the Revere site for radiation control. The licensee failed to post the restricted area at the Reading site as required in 10 CFR 20.1902 (e).

### **Independent Measurements**

The NRC performed independent measurements on April 23, 2001 and July 19, 2001. The inspector took gamma exposure rate measurements during the inspection, at four affected area locations at the Revere facility, and in the unaffected areas, around the Southeast fence gate and Northeast fence at the Reading facility. The independent measurements taken by the inspector are listed in Attachment 1 and Attachment 2 of this report.

Within the scope of this inspection, one violation of NRC requirements was identified.



## **REPORT DETAILS**

### **I. Site History**

#### **a. Site History**

There are two Cabot facilities possessing NRC licenses. The Cabot Reading facility is located in an industrial part of Reading, Pennsylvania, approximately 100 meters from the Schuylkill River, on Buttonwood Street. From 1967 through 1969, Cabot used a building on the site to process tin slag, extracting niobium and tantalum. As a result of this process, natural uranium and thorium were present in the slag in sufficient concentrations to require a source material license. The slag is a black, glass-like material with very low solubility. Cabot stopped processing this ore in 1969, and ores and slag were stored at this location for some time thereafter. No licensed activities have occurred since that time and only a large slag pile remains at this location.

The Cabot Revere facility is located in eastern Pennsylvania about 60 km (36 miles) north of Philadelphia and about 26 km (16 miles) southeast of Allentown. The company processed ores and slags at the site to extract tantalum and columbium. Natural uranium and thorium were present in the ores and slags in sufficient concentrations to require a source material license. Although non-licensable material is actively processed at this site, no source material processing has occurred in years, and Cabot does not plan any licensed activities in the near future.

#### **b. Observations and Findings**

Reading: The slag pile sits on the side of an embankment located on the rear of an industrial property on the edge of the property boundary. Railroad tracks abut the site on River Road, on property owned by Consolidated Rail Corporation adjacent to a former Schuylkill Canal. The site is fenced and in the summer months the vegetation is overgrown.

Revere: Four locations are considered "affected areas" at this site where slag is present: the Old Pit Area, the Parking Area, Building 4 & 5 Area, and the Former Container Storage Area. The affected areas were within the boundaries/property line of the site and the contamination appeared to be in piles of bricks, soil and other building materials that have been abandoned.

#### **c. Conclusions**

The uranium and thorium were contained in insoluble slag. These sites posed no immediate threat to the public health and safety.

## **II. Characterization and Decommissioning Activities**

### **a. Inspection Scope**

The inspector reviewed the licensee's documentation of surveys and characterization of the affected areas as described in the licensee's decommissioning plans. The inspector reviewed topographic drawings of the affected and surrounding areas of the two sites.

### **b. Observations and Findings**

Two separate Decommissioning Plans (DP) have been submitted by Cabot Corporation for the Reading and Revere sites.

#### Revere Site

In 1993, the Oak Ridge Institute for Science and Education (ORISE) performed a confirmatory survey at the Revere site and found that the site contained material below the surface that exceeded the release criteria. ORISE identified four areas at the Revere facility with elevated radiation levels. The four areas include: (1) Parking Area; (2) Former Container Storage Area; (3) Building 4 & 5 Area; and (4) Old Pit Area.

Beginning in 1994, the licensee's contractors performed a characterization survey including subsurface sampling that revealed that slag remained on site, but no contamination had leached into the soil. The licensee's characterization and proposed Decommissioning Plan identified the radionuclides present, estimated volume, and leachability of the material. The characterization information was used to develop parameters for RESRAD modeling of the sites for the decommissioning plan. The parameters used included site topography, local climate, geology, description of soil, surface water and groundwater hydrology, and stability of the slag piles. The characterizations were supported by borings, radiological analysis of the surface and subsurface soil samples, groundwater samples, and surface gamma measurements.

#### Reading Site

Characterization work of the Reading site began in 1996 by NES Inc., and continued in 1998 with additional characterization work performed by ST Environmental Professionals, Inc., of the area between the slag pile area and the Schuylkill River known as the River Road right-of-way. The Reading site is approximately 2/3 acre, completely enclosed by chain link fence. It contains no buildings or structures and access is controlled by a fence with security patrolling the site. Surveying procedures implemented by NES Inc., followed the guidelines established in NUREG/CR-5849 "Manual for Conducting Radiological Surveys in Support of License Termination".

### **c. Conclusions**

Characterization of the four affected areas at the Revere site and the Reading site clearly identified the radionuclides present, nature and extent of the radiological constituents, and estimated the volume and leachability of the contaminated soil.

### **III. Facilities and Equipment**

#### **a. Inspection Scope**

The inspector reviewed the facility diagrams and drawings, and performed a site tour of both of the Reading and Revere facilities. The inspector also performed a review of the licensee's equipment and instrumentation used for routine surveys.

#### **b. Observations and Findings**

The inspector visited and performed a walkover of the licensed facilities. The slag pile at Reading was covered with large trees, bushes and overgrown with brush. The inspector observed a fence surrounding the restricted area. The edge of the pile leads to a cliff approximately 20 feet from the fence separating the pile from the remaining area. The four piles at the Revere site were observed to be clear of brush and the material appeared to be in a mixture of various soils, bricks and other discarded masonry building materials.

The inspector examined the survey instruments used by the licensee and observed that they were operable, suitable for the survey and calibrated. The inspector reviewed a sample of the licensee's instrument calibration records. The exposure rate and reference source serial numbers were clearly listed on each instrument calibration record. The instruments were calibrated at five locations with exposure rates ranging from 25 to 5000 micro roentgens per hour ( $\mu\text{R/hr}$ ) and 0.15 to 150 milliroentgens per hour ( $\text{mR/hr}$ ). Background radiation levels were typically around 15  $\mu\text{R/hr}$ .

The inspector also observed the licensee use a portable radiation survey instrument, Bicon micro analyst and a Ludlum MicroR meter, during the inspection of the Revere and Reading sites. The instrument was held approximately 1m above the surface of the ground in the restricted area where radioactive contamination exists. The radiation levels measured approximately 15 micro roentgens per hour ( $\mu\text{R/hr}$ ), which closely coincided with the inspector's measurements.

#### **c. Conclusions**

The inspection verified that the licensee used suitable equipment and properly calibrated radiation detection instrumentation.

### **IV. Posting and Labeling**

#### **a. Inspection Scope**

Posting and labeling of site and restricted areas were reviewed.

b. Observations and Findings

Revere Site

The inspector observed that the restricted areas at the Revere site had been established and that the restricted areas were conspicuously posted with the appropriate caution signs. The inspector also observed that the licensee posted an NRC Form 3 in the office area of the Revere facility along with a copy of the NRC license and a notice identifying where 10 CFR Parts 19 and 20 could be reviewed in accordance with 10 CFR 19.11.

Reading Site

The inspector observed that the licensee failed to post the restricted area at the Reading site with the appropriate posting. 10 CFR 20.1902(e) requires that the licensee shall post each area or room in which there is used or stored an amount of licensed material exceeding 10 times the quantity of such material specified in Appendix C to 10 CFR Part 20 with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, RADIOACTIVE MATERIAL(S)."

Contrary to the above, as of July 19, 2001, the licensee had not posted the fenced area storing the licensed material with the required posting.

c. Conclusions

Posting and labeling of radioactive material and radiation areas were effective at the Revere site for radiation control. The licensee failed to post the restricted area at the Reading site as required in 10 CFR 20.1902 (e).

## **V. Independent Measurements**

a. Inspection Scope

The inspector acquired numerous independent gamma surface readings to verify that the licensee's results were valid and reproducible. The independent measurements were taken on April 23, 2001 at the Revere site, and on July 19, 2001, at the Reading site.

b. Observations and Findings

Revere Site:

On April 23, 2001, the inspector took independent gamma surface readings at the four affected areas known as the Old Pit Area, the Building 4 & 5 area, the Parking area, and the Former Container Storage area. Typical radiation levels outside the affected areas were 10 - 14  $\mu\text{R/hr}$  taken with a Ludlum Model 19 MicroR meter, and 30  $\mu\text{R/hr}$  inside the affected areas known as the Old Pit Area and the Former Container Storage Area. The highest reading was taken from a piece of slag found in the Old Pit Area with a reading of 170  $\mu\text{R/hr}$  at contact.

### Reading Site

The highest exposure rate in an unrestricted area was 80  $\mu\text{R/hr}$  due to shine from the slag pile on River Road, adjacent to an area of a former Schuylkill Canal and the background exposure rate was 11-12  $\mu\text{R/hr}$ . The measurements were made with Ludlum micro R meters ( NRC Serial Nos. 033510 and 033515 ) calibrated to cesium-137.

#### c. Conclusions

Gamma surface readings are listed in Attachment 1 for the Revere Site and Attachment 2 for the Reading Site.

## **VI. Exit Meeting**

### Inspection Scope

The inspector presented the inspection results to members of licensee management at the conclusion of the inspection on July 19, 2001. The licensee acknowledged the findings presented.

## **PARTIAL LIST OF PERSONS CONTACTED**

### **Licensee**

- \* Timothy Knapp - Radiation Safety Officer, Cabot Performance Materials
- Michael C. Northrup - Manager, Revere Plant, Cabot Performance Materials
- \* Bradley A. Okoniewski - Manager, Environmental Programs, Cabot

The asterisk denotes the individuals present at the Exit Meeting conducted on July 19, 2001.

Attachment 1

Independent Exposure measurements taken at 1 meter by the NRC inspector on April 23, 2001 at the Cabot Corporation, Revere Pennsylvania site.

Docket No. 040-09027

License No. SMC-1562

Location	Exposure reading $\mu\text{R/hr}$ (Micro R per hour)
A	12 $\mu\text{r/hr}$
B	12
C	14
D	12
E	16
F	18
G	14
H	15
J	15
K	17
L	170*
M	12
N	14
P	12
Q	14
R	14
S	12
T	11
U	12
V	14

\* Measurement is taken of a piece of slag in the "Old Pit Area" at contact.

Attachment 2

Independent Exposure measurements taken at 1 meter by the NRC inspector on July 19, 2001 at the Cabot Corporation, Reading, Pennsylvania site.

Docket No. 040-09027

License No. SMC-1562

Location	Exposure reading $\mu\text{R/hr}$ (Micro R per hour)
A	11 $\mu\text{r/hr}$
B	10
C	11
D	10
E	11
F	22
G	24
H	55
J	50
K	35
L	34
M	34
N	30