ENVIRONMENTAL ASSESSMENT
FOR
CABOT CORPORATION
CABOT SUPERMETALS
BOYERTOWN, PENNSYLVANIA

IN CONSIDERATION OF AN AMENDMENT REQUEST TO ALLOW RECYCLING OF FILTERCAKE IN A CEMENT KILN UNDER SOURCE MATERIAL LICENSE NO. SMB-920

PREPARED BY

THE U.S. NUCLEAR REGULATORY COMMISSION
DIVISION OF FUEL CYCLE SAFETY AND SAFEGUARDS
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

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Enclosure

ENVIRONMENTAL ASSESSMENT FOR RECYCLING FILTERCAKE IN CEMENT UNDER SOURCE MATERIAL LICENSE NO. SMB-920 AT THE CABOT FACILITY BOYERTOWN, PENNSYLVANIA

1.0 INTRODUCTION

1.1 Background

The facility, located near Boyertown, Pennsylvania (PA), is owned and operated by a subsidiary of Cabot Corporation that was known as Cabot Performance Materials, but changed its name to Cabot Supermetals (CSM) in March 2003. The Boyertown facility was first licensed to possess source material on January 21, 1963, (License Number STC-681). The current Source Material License Number SMB-920 was first issued to Cabot Corporation on March 17, 1967. The U.S. Nuclear Regulatory Commission (NRC) staff last renewed the license on May 26, 2004.

At the Boyertown facility, CSM processes tantalite and columbite ores to extract non-radioactive tantalum (Ta) and niobium (Nb) for use in several segments of U.S. industry. Other operations, related to the Ta/Nb processing, include fabrication of products, treatment of industrial liquid waste prior to release to the environment, and storage of the generated waste water filtercake/sludge and ore residue presscake. The ore and presscake resulting from the initial ore processing contain, in addition to valuable rare earth components, uranium and thorium (in combination) in excess of 0.05 percent by weight and as such is source material as defined and regulated under Title 10 of the Code of Federal Regulations (CFR) Part 40, by the NRC.

On November 29, 2004, the NRC received the CSM amendment request and application dated November 24, 2004, to allow recycling of the waste water filtercake as cement feed material under NRC License SMB-920 for the Boyertown facility. The staff requested additional information on December 22, 2004, and CSM responded by letter dated January 28, 2005.

The NRC staff prepared this environmental assessment (EA) pursuant to 10 CFR Part 51,, which implements the requirements of the National Environmental Policy Act (NEPA) of 1969, and the Council of Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508). The purpose of the EA is to assess the environmental consequences of the proposed action. Approval of the proposed action also would exempt the low-contaminated material authorized for recycle from further Atomic Energy Act (AEA) and NRC licensing requirements.

1.2 Description of Current Operation

The CSM facility is located in the southeastern part of Pennsylvania. The facility is authorized under NRC Source Material License No. SMB-920 to possess a maximum of 360 metric tons (400 tons) of elemental uranium (U) and thorium (Th). Plant operation includes the receipt of feed material as ore, containing an average of 0.165 percent by weight of uranium oxide (U_3O_8), and 0.057 percent by weight of thorium dioxide (ThO_2). The plant ore feed rate is approximately 4,350 kilograms per day (9,600 pounds per day) five days per week, or approximately 1,219,260 kilograms (1,200 tons) per year. Ta and Nb are recovered in a two-

stage extraction process. CSM generates gaseous, liquid, and solid effluent streams. The details of the facility operation are in CSM's license renewal application, dated March 24, 2004.

CSM produces approximately 19,304,950 kilograms (19,000 tons) per year of waste water sludge (filtercake) which is currently being shipped off site to a landfill as a residual waste. The waste water is treated with lime (which contributes radioactivity) so the resulting filtercake (residue after water is pressed out) is mainly calcium fluoride. The filtercake is composite sampled and analyzed for uranium and thorium to ensure that the total concentration remains below the approved release limit[1] of 10 pCi/g to the landfills.

Historically, the average concentrations of uranium and thorium residue released to a landfill have been 4.21 and 0.14 parts per million (2.85 and 0.015 pCi/g), respectively. From 1999 through September 2003, the uranium and thorium content averaged 3.0 and 0.2 pCi/g, respectively. A few monthly averages have been above 6 pCi/g (uranium plus thorium). Other radionuclides are mostly contained in the ore residue (presscake).

By letter dated August 1, 2002, CSM stated its plans to upgrade the waste water treatment system and indicated that the upgraded system should not significantly affect the characteristics of the filtercake. The Pennsylvania Department of Environmental Protection (PA DEP) indicated by letter of July 8, 2002, that the changes had been reviewed. The NRC staff indicated on August 27, 2002, that there was no objection to the changes to the system. CSM is currently completing the necessary PA DEP permit process, and the upgraded system should be online in 2007.

1.3 Review Scope

In preparing this EA, the staff used information submitted by the applicant, and from the EA prepared for the 2004 license renewal. In accordance with 10 CFR Part 51, this EA serves to: (1) present information and analysis for determining whether to issue a Finding of No Significant Impact (FONSI) or to prepare an Environmental Impact Statement (EIS); (2) fulfill the NRC's compliance with the NEPA when no EIS is necessary; and (3) facilitate the preparation of an EIS when one is necessary. Should the NRC issue a FONSI, no EIS would be prepared.

Some of the proposed actions, e.g., truck loading and waste transport, are consistent with activities and conditions analyzed in the EA for the renewal of Source Material License No. SMB-920, dated April 12, 2004. The staff has verified existing conditions, and addressed requested changes that may have a public safety or environmental impact.

2.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

CSM is seeking a license amendment to authorize filtercake produced at the Boyertown facility, to be sent to cement kilns for use as feedstock. Approval of this request would allow CSM, along with the currently-approved option of disposal at local landfills, a second disposal option for the filtercake. Approval of the NRC license amendment request allows lower operating costs, and is therefore important for CSM to be commercially competitive. The proposed action

[1] license condition 20

would also meet PA DEP goals under the "co-product" program[2] to reduce the amount of material going to landfills by beneficial re-use of wastes.

3.0 THE PROPOSED ACTION

The proposed action consists of the amendment of NRC License No. SMB-920 to allow the recycling of waste water filtercake as feed material in a cement kiln. This would be an alternative to landfill disposal. The other licensed activities will not change.

4.0 ALTERNATIVES TO THE PROPOSED ACTION

4.1 Approve the Requested Action as Amended by NRC

The NRC could, by license condition, require modification of the process or operation if the health, safety, and protection of the public and environment could be significantly impacted. License condition changes beyond what was requested are not anticipated. Discussions concerning the proposed license change have already been held with the licensee and will be incorporated into the amended license. Impacts from this alternative would be the same or very similar to the proposed action and are not distinguished in the following sections.

4.2 Denial of License Amendment (No-action Alternative)

Another alternative is denial of the request (i.e., the no-action alternative) which would require the licensee to continue shipping the filtercake to landfills. Shipments to landfills were discussed in the April 2004 license renewal EA. As a consequence, a commercial resource is lost and the filtercake will continue to take up landfill space.

5.0 AFFECTED ENVIRONMENT

The environment in the vicinity of the Boyertown facility is described in detail in the NRC staff's April 12, 2004, EA prepared in support of the May 2004 license renewal.

6.0 ENVIRONMENTAL IMPACTS

6.1 Radiological Dose and Safety

As discussed in the April 2004 license renewal EA, scans of trucks loaded with filter cake indicated dose rates at background levels therefore, radiological effects to the public would be similar regardless of the transportation distances to either the proposed kilns or current landfills. Radiation control at the facility and during transportation by truck were also addressed in the 2004 license renewal EA. The trucking of filtercake to a different location would not affect the local environment unless there was a spill. In the past decade there has been only one truck accident which resulted in spilled filtercake. That spill was detected, evaluated and cleaned by

[2]The co-product regulations contained in 25 PA Code 287.1 were established to reduce the amount of waste going to landfills by finding ways to beneficially re-use wastes such as filtercake.

the transporter's response team, with CSM oversight, within 30 minutes. CSM and its transporters have committed to maintain the response teams. As stated above, the average concentration of uranium and thorium in the filtercake is within the range of soil background levels, therefore small releases of the material would not affect the environment. After a review of the potential impacts of transportation accidents, the staff has concluded that any spill of filtercake would not adversely affect the public.

Handling filtercake at a Cement Kiln will be governed by specific license conditions. These conditions will require that Cabot enforce contractual compliance by the cement kiln to ensure that the minimum dilution factors were met. Dilution would be required to be at least 1 part filtercake to 100 parts other feed material (100:1). Exposure to filtercake dust during storage and handling would be limited by contract provisions to control drying of the filtercake and to require use of remote handling (i.e., use equipment to either move filtercake to the feed material hopper or for mixing). These activities would be required to maintain public doses as low as reasonably achievable (ALARA), not because of any health hazard. CSM has proposed additional controls of the filtercake, at a cement kiln storage area, during extreme weather conditions[3].

Potential Radiation Doses

The proposed action has been reviewed by the NRC and found to result in doses for all scenarios of less than 0.01 milliSievert per year (mSv/yr) [1 millirem/yr]. These doses are consistent with NRC's policy on recycling of material under 10 CFR 20.2002. Scenarios considered by either the licensee's analysis or NRC review include the transportation of the material to the plant, a worker in the bagging operation, a resident of a concrete building, and a farmer using land that contains an abandoned-in-place concrete building. The material to be recycled is similar in concentration to natural occurring materials currently used by the local concrete plant and similar in concentration to coal ash feed material, which can also be used as a feed material. The licensee has conditioned its transfer of the material to a concrete plant so that the filtercake will be limited to be less than 1 percent of the resulting concrete. The resulting concrete will likely have negligible increases in radiation levels as the natural occurring uranium and thorium in the natural feed stock will dominate.

6.2 Cumulative Effects

The staff has reviewed the potential impacts from the proposed action to determine if there might be any significant cumulative impacts to the environment from past, current, or reasonably foreseeable future recycling at cement kilns. Past and current area activities include the gravel pit 1.9 kilometers (1.2 miles) away from the CSM site. Minor contributions to area dust levels are expected by the proposed action and would not be distinguishable from transporting and handling of other types of cement kiln feed material. The change to traffic volume with a change in roads used to deliver filtercake to a kiln versus a landfill is anticipated to be minimal. Also, typical suburban growth in the general area is foreseeable in the future with the impacts assumed to be mitigated by local authorities. Therefore, staff determined there would be no significant cumulative impact.

[3] It would be covered on the top and three sides

7.0 MONITORING

Occupational and environmental monitoring were discussed in the renewal EA. Also, discussed was the monitoring of the radionuclide content of the incoming ore. The filtercake from the liquid waste treatment system is sampled and analyzed at least monthly under the renewed license. If the analysis indicates a combined uranium and thorium content of less than the 10 pCi/g release limit, the material is cleared for release to a landfill or kiln. From 1999 through September 2003, the uranium and thorium content averaged 111 Bq/kg and 7.4 Bq/kg (3.0 pCi/g and 0.2 pCi/g), respectively. The highest annual concentration was in 2001 with 274 Bq/kg uranium and 19 Bq/kg thorium (4.7 pCi/g and 0.5 pCi/g). The filtercake is now sent to three different landfills so that when averaged with the other materials, the radioactivity levels would be less than levels in local soils of 59 Bq/kg uranium and 63 Bq/kg thorium (1.6 pCi/g and 1.7 pCi/g). The loaded trucks are surveyed on site by portal monitors similar to those used at landfills to confirm that the gamma levels are background.

8.0 CONCLUSIONS

This EA has been prepared to evaluate the environmental impacts associated with CSM's proposal to recycle the waste water filtercake as feed material in a cement kiln as an alternative to landfill disposal. Based upon the technical review (documented in a safety evaluation report) and impact evaluations, the NRC is considering approval of CSM's request to amend SMB-920. The alternatives available to the NRC are the following:

- Approve the license amendment as requested; or

- Deny the request.

Based on its review, the NRC staff has concluded that the environmental impacts associated with the proposed action (approve license amendment as requested) will not have a significant effect on the human environment, and therefore no basis was found for denial of the license renewal request. In addition, denial of the request could have significant economic impacts on CSM.

Based upon the above assessment, the staff concludes that the proposed action will not have a significant effect on the quality of the human environment. Accordingly, the staff has determined that preparation of an EIS is not warranted, and that a Finding of No Significant Impact is appropriate.

9.0 CONSULTATIONS

The NRC staff has provided the EA to, and requesting comments of, various agencies and stakeholders. The licensee has consulted with staff of PA DEP Bureau of Radiation Protection and Division of Municipal and Residual Waste, and the U.S. Environmental Agency (EPA) Region III, Waste Minimization Team . Mr. Wayne Naylor, Deputy Director for Waste and Chemicals Management Division in that regional office, indicated by letter dated December 22, 2004 (ML043640417) that the filtercake lead levels are substantially below the toxicity characteristic regulatory level for lead, and that recycling the filtercake is consistent with the EPA effort to conserve our national resources.

10.0 REFERENCES

Renewal of Source Materials License No. SMB-920 for Cabot Corporation's Boyertown, Pennsylvania Facility, (TAC L52515) Adams Accession Number ML041530313

Acknowledgment of the Cabot Supermetals Inc. Request to Amend License SMB-920 to Allow Recycling of Filtercake in Cement (TAC LU0072) and a request for additional information. December 22, 2004, ADAMS Accession Number ML 043570238

Cabot Supermetals and Weston Solutions, Inc. *Application for Renewal of Source Material License No. SMB-920*. March 24, 2004. ADAMS Accession Number ML040860628 (Weston Solutions, Inc. letter), ADAMS Accession Number ML040860633 (application and form 313), ADAMS Accession Number ML040930203 (CSM transmittal letter)

Response to NRC Comments Dated December 22, 2004 Concerning the Request to Allow Filtercake To Be Used As Cement Kiln Feed Material-Cabot Supermetals, Inc. Boyertown Facility. Docket No. 40-6940, ADAMS Accession Number ML050330142

Cabot Supermetals Letters on Waste Water Treatment. ADAMS Accession Number ML022180032

U.S. Nuclear Regulatory Commission. *Cabot Corp., Waste water treatment*. Washington, DC: August 27, 2002. ADAMS Accession No. ML022820478

U.S. Nuclear Regulatory Commission, letter to CSM conveying the final Environmental Assessment for the Cabot license renewal, dated April 12, 2004. ADAMS Accession Number ML041030379.

Cabot Supermetals via Weston Solutions, Inc., "Page Changes to License Renewal Application dated March 23, 2004," dated May 24, 2004. ADAMS Accession Number ML041460211

Cabot Supermetals via Weston Solutions, Inc., amendment request to allow recycling of filtercake in a cement kiln dated November 24, 2004. ADAMS Accession Number for the package ML043350415, for the application ML043350423

U.S. Department of Interior, Fish and Wildlife Service. *Responds to NRC letter date 07/25/02, requesting information about Federally listed and proposed endangered and threatened species within the vicinity of Cabot Corporation*. October 29, 2002. ADAMS Accession Number ML023160534

U.S. Nuclear Regulatory Commission. *NUREG-1748, Environmental Review Guidance for Licensing Actions Associated with NMSS Programs*. Washington, DC: August 2003 www.nrc.gov/reading-rm/doc-collections/nuregs/staff/

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