



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

October 13, 2000

Mr. Timothy Knapp
Radiation Safety Officer
Cabot Corporation
P.O. Box 1608
County Line Road
Boyetown, Pennsylvania 19512-1508

**SUBJECT: CABOT'S REQUEST TO SEND WASTE CONTAINING LESS THAN
0.05 PERCENT BY WEIGHT SOURCE MATERIAL TO WASTE
CONTROL SPECIALISTS (TAC NO. L31364)**

Dear Mr. Knapp:

I am responding to your letter dated June 7, 2000, informing the US Nuclear Regulatory Commission (NRC) of your plan to transfer approximately 750 cubic meters of waste under 10 CFR 40.13, "Unimportant Quantities of Source Material," to Waste Control Specialists, Inc. (WCS), in Texas. We have completed a technical review of the information you submitted by letters dated June 7, and supplements dated August 22, and August 31, 2000. 10 CFR 40.13(a) states that, "Any person is exempt from the regulations in this part and from requirements for a license set forth in section 62 of the Act to the extent that such person receives, possesses, uses, transfers or delivers source material in any chemical mixture, compound, or alloy in which the source material is by weight less than one-twentieth of one percent (0.05 percent) of the mixture, compound, solution, or alloy." In "Staff Requirements - SECY 99 - 259 - Exemption in 10 CFR Part 40 for Materials less than 0.05 percent Source Material - Options and Other Issues Concerning the Control of Source Material," dated March 9, 2000, the Commission instructed the NRC staff to consider the calculated dose associated with the transfer of unimportant quantities of source material, when reviewing requests such as yours. Based on that directive, NRC staff will allow transfers containing less than 0.05 percent by weight source material for permanent disposal if the expected dose does not exceed 100 mrem/yr and notify the Commission when the expected dose exceeds 25 mrem/yr.

In the letter dated August 22, 2000, Cabot defined the waste material as a heterogeneous mixture made up of plastic, fiberglass, steel, soil, brick, concrete, wood, and sludge. The waste materials are presently contained within 22 trailer trucks ready for shipment. There is approximately 5.7 cubic meters of "high activity residue" material distributed among the trailers. NRC staff reviewed the dose assessment and consequences to radiation workers and the general public. The maximum uranium and thorium concentrations found in the waste material averaged over each trailer were 94 pCi/gm and 32 pCi/gm, respectively. NRC staff has concluded that the Cabot dose assessment is sufficient to demonstrate that potential doses to the general public will not exceed 25 mrem/yr. In future requests, Cabot should provide sufficient evidence that items exceeding a direct contact reading of 200 micro-R/ hour be segregated, and decontaminated. Any waste material that cannot be decontaminated should be shipped as low level waste.

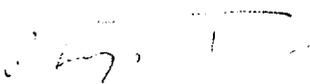
Cabot used the TSD-DOSE computer code to estimate potential dose to the general public attributable to disposal of the material at the WCS facility. The doses calculated by the total volume of the material to be transferred are below one mrem/yr. Cabot used the RESRAD computer code to evaluate the potential dose to a member of the public following closure of the WCS facility. The conservative resident farmer scenario, using hydrogeologic parameters specific to the WCS facility, was analyzed. The maximum resulting dose, calculated out to 1000 years, was significantly less than 25 mrem/yr.

Since the waste contains source material under 0.05 percent by weight as specified in 10 CFR 40.13(a), and the disposal of the material would not result in a dose to the public exceeding 25 mrem/yr, no additional NRC action is required for the transfer of this material for disposal at WCS. It is noted, however, that the other requirements, such as those imposed by the Texas Natural Resource Conservation Commission and the Texas Department of Health, may apply to the transfer and disposal of the material. Therefore, we suggest you contact the Texas officials on this matter.

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

If you have any further questions, please contact Leslie Fields of my staff at 301-415-6267.

Sincerely,



Philip Ting, Chief
Fuel Cycle Licensing Branch
Division of Fuel Cycle Safety
and Safeguards, NMSS

Docket 40-6940
License SMB-920

Enclosures:

1. Ltr requesting review of technical approach of 40.13 dose dtd 6/7/00
2. Ltr requesting transfer of waste stream RAI dtd 8/22/00
3. Memo from T.Essig to PTing regarding Cabot 40.13 disposal dtd 8/25/00
4. Ltr providing additional information to the waste stream dtd 8/31/00

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Distribution: w/encls. (Control No. 320S) {Closed} {Accession No. } {Template NMSS keep - NMSS }
Docket 40-6940 Region I FCLB r/f JOlivier JKinneman, RI *see previous concurrence

OFC	FCLB	E	FCLB	E	EPAB		STP		OGC	
NAME	LFields*		PShea*		JDanna*		PLohaus*via email		Streby* via email	
DATE	09/05/00		09/06/00		09/11/00		10/11/00		09/08/00	
OFC	IMNS	E	DWM			FCLB		FCLB		
NAME	DCool*		LCamper*			LRoché*		PTing*		
DATE	10/13/00		09/06/00			10/13/00		10/13/00		

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NAME	LFields	PShea	JDanna				PLohaus		STreby	
DATE	09/6/00	09/6/00	09/ /00				09/ /00		09/ /00	

OFC	IMNS		DWM		FCLB		FCLB	
NAME	DCool		LCamper		LRoché		PTing	
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NAME	LFields	PShea	JDanna	PLohaus	STreby		
DATE	09/16/00	09/16/00	09/16/00	09/ /00	09/ /00		
OFC	IMNS	DWIM	FCLB	FCLB			
NAME	DCool	LCamper	LBoché	PTing			
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OFC	FCLB	E	FCLB	E	EPAB		STP		OGC	
NAME	LFields	RC	PShea	PWS	JDanna		PLohaus		STreby	
DATE	09/6/00		09/6/00		09/ /00		09/ /00		09/ /00	

OFC			DWM		FCLB		FCLB	
NAME			LCamper		LRoché		PTing	
DATE		10/12/00		09/ /00		09/ /00		09/ /00

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no legal objection subject to incorporation of change noted

OFC	FCLB	E	FCLB	E	EPAB		STP		OGC	E
NAME	LFields	PShea	JDanna	PLohaus	STreby					
DATE	09/6/00	09/6/00	09/ /00	09/ /00	09/6/00					

OFC	IMNS		DWM		FCLB		FCLB	
NAME	DCool		LCamper		LRoché		PTing	
DATE	09/ /00		09/ /00		09/ /00		09/ /00	

From: Lance Rakovan
To: Fields, Leslie
Date: Wed, Oct 11, 2000 3:25 PM
Subject: Concurrence

Please consider this e-mail to be STP concurrence on the Cabot Corporation response.

Let me know if you have any other questions.

-Lance Rakovan

From: Maria Schwartz
To: Leslie Fields
Date: Thu, Sep 7, 2000 2:41 PM
Subject: Additional comment on Cabot letter

Leslie,

In addition to the OGC comments you have already included, we would like to add one more. Because this letter may well be used as the "boiler plate" for other, like requests, we thought it important to add the following to make sure that the requester understands why, in addition to the regulation, we are looking at transfers. Therefore, at the end of the first paragraph, we are providing this revision:

..... The calculated dose of the material is bounded by requirements set forth in "Staff Requirements - SECY 99-259-Exemption in 10 CFR Part 40 for Materials less than 0.05 percent Source Material - Options and Other Issues Concerning the Control of Source Material," dated March 9, 2000, **the Commission instructed the NRC staff to consider the calculated dose associated with the transfer of unimportant quantities of source material, when reviewing requests such as yours. Based on that directive,** Therefore, NRC staff will allow....

With the incorporation of this revision, the letter has OGC's NLO.

Maria

CC: Stuart Treby

CABOT

June 7, 2000

U.S. Nuclear Regulatory Commission
Ms. Leslie Fields
2 White Flint North
11545 Rockville Pike
Rockville, MD 20852-2738

RE: LICENSE SMB-920

Dear Ms. Fields:

Cabot proposes to transfer certain of its process and other solid wastes containing less than 0.05w% (weight percent) of source material from its Boyertown, Pennsylvania, plant to Waste Control Specialists' (WCS) facility located in Andrews, Texas, in accordance with 10 CFR Part 40.13, "Unimportant Quantities of Source Material". An evaluation of potential radiological dose that might result from such disposition has been prepared by WCS and Cabot. Estimates of dose to members of the public are less than 25 mrem/yr. Thus, the evaluation demonstrates that the potential dose to members of the public as a consequence of the propose waste disposal will be substantially less than 100 mrem/hr.

Cabot believes that the proposed disposal will satisfy our mutual interests in disposing of waste safely and in accordance with applicable regulations. Cabot will appreciate it if you will confirm the acceptability of this proposed disposition of waste as soon as you reasonably can.

If you have any questions or comments about the enclosed analysis, please contact me at 610-369-8520.

Sincerely,
CABOT PERFORMANCE MATERIALS



Timothy M. Knapp
Radiation Safety Officer

Enclosure

/car
NRC-SMB-920-060700.tmk



Cabot Performance Materials
P.O. Box 1603
County Line Road
Boyertown, Pennsylvania 19510-1603
Phone: 610-367-2121

ENCLOSURE 1

CABOT

August 22, 2000

U.S. Nuclear Regulatory Commission
Ms. Leslie Fields
Licensing Section
Fuel Cycle Licensing Branch
Division of Fuel Cycle Safety and Safeguards, NMSS
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Dear Ms Fields:

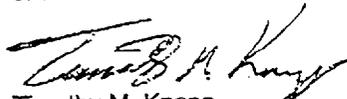
Per our discussion on Tuesday, August 15, 2000 regarding the disposal of "unimportant quantities" of radioactive materials, attached is the tabulation for the material slated for disposal at WCS' facility in Andrews, Texas.

As mentioned in our conversation there is quite a bit of urgency in having the NRC expedite their review of Cabot's Safety Analysis submittal. The urgency stems from a phone call received from the contracted trucking firm. The trucking firm's trailers have been on site for 4 weeks and they have implied that they are quite anxious to retrieve their trailers from the Cabot site. While no action has been taken to date, I would like to avoid any conflict with the carriers of our waste.

All trucks are currently loaded and ready to ship. We have approval from WCS on all waste streams as of August 18, 2000. However, the Texas Department of Health will not approve WCS' receiving our shipments until the Nuclear Regulatory Commission gives their "approval". Our position is that the submitted safety analysis for the material that is ready to ship is quite similar to Mallinckrodt's, which the Commission recently approved, and we hope the Commission considers this in their review and approval process of Cabot's submittal.

Due to the current situation at the site I am requesting, if at all possible, the NRC's approval of the submitted Safety Analysis by the end of next week, September 1, 2000. I am available for any further questions or concerns regarding this issue and am willing to meet with your staff if needed.

Sincerely,
CABOT PERFORMANCE MATERIALS


Timothy M. Knapp
Radiation Safety Officer

NRC-082200.tmk.doc



Cabot Performance Materials
P.O. Box 1608
County Line Road
Boyertown, Pennsylvania 19512-1508
Phone: 610-367-2181

ENCLOSURE 2

Cabo Performance Materials
Summary of Profiles of Waste to be Shipped to WCS

Material Type	Approximate Density (g/cc)	Total U (pCi/g)	Total Th (pCi/g)
Plastic/Fiberglass	1.25	8	2
Steel	7.9	0.8	0.2
Macadam/Soil	1.6	132	26
Other (Trash)	1.25	8	2
Wood	0.9	8	2
Sludge	2	105	28
Brick/Concrete	2.2	78	47
Carbon Brick	2.5	85	13
High Activity Residue	2	800	200

Note: There were several sample values with total U and Total Th that were on the order of several hundred pCi/g. These samples came from individual drums or residues with a total volume less than 200 ft³. These high activity samples were evenly distributed throughout each trailer. For the calculation it was conservatively assumed that 1% of each trailer volume included this high activity material. High activity materials that exceeded RCRA TCLP concentrations are not part of this shipment and were not included in the calculations.

Trailer #	Volume (m ³)	Plastic Fiberglass	Steel	Macadam/Soil	Other (Trash)	Wood	Sludge	Brick/Concrete	Carbon Brick	High Activity Residues	Total	Ratio to Total Th	Ratio to Total U	Total
55	30.5	70.0%	10.0%	10.0%	3.0%	5.0%	0.0%	0.0%	1.0%	1.0%	100.0%	0.05	0.07	0.12
60	30.5	60.0%	0.0%	20.0%	15.0%	0.0%	0.0%	0.0%	4.0%	1.0%	100.0%	0.10	0.15	0.25
261	15.6	0.0%	0.0%	50.0%	39.0%	0.0%	0.0%	0.0%	10.0%	1.0%	100.0%	0.17	0.27	0.43
51	30.5	0.0%	70.0%	15.0%	11.0%	0.0%	0.0%	0.0%	3.0%	1.0%	100.0%	0.02	0.03	0.05
823	38.2	40.0%	20.0%	0.0%	11.0%	0.0%	0.0%	39.0%	0.0%	1.0%	100.0%	0.14	0.08	0.22
249	15.6	0.0%	0.0%	50.0%	39.0%	0.0%	0.0%	0.0%	10.0%	1.0%	100.0%	0.17	0.27	0.43
619	38.2	79.0%	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	100.0%	0.10	0.14	0.24
179	38.2	0.0%	30.0%	10.0%	15.0%	40.0%	0.0%	0.0%	4.0%	1.0%	100.0%	0.03	0.05	0.08
168	38.2	39.0%	25.0%	25.0%	0.0%	10.0%	0.0%	0.0%	0.0%	1.0%	100.0%	0.05	0.07	0.12
161	38.2	0.0%	30.0%	40.0%	15.0%	10.0%	0.0%	0.0%	4.0%	1.0%	100.0%	0.06	0.09	0.15
171	38.2	0.0%	20.0%	0.0%	0.0%	0.0%	20.0%	59.0%	0.0%	1.0%	100.0%	0.21	0.14	0.35
165	38.2	0.0%	40.0%	0.0%	15.0%	0.0%	0.0%	40.0%	4.0%	1.0%	100.0%	0.10	0.06	0.16
146	38.2	0.0%	30.0%	60.0%	7.0%	0.0%	0.0%	0.0%	2.0%	1.0%	100.0%	0.08	0.12	0.20
447	30.5	49.0%	20.0%	0.0%	0.0%	0.0%	0.0%	30.0%	0.0%	1.0%	100.0%	0.12	0.07	0.19
439	30.5	49.0%	20.0%	0.0%	0.0%	0.0%	0.0%	30.0%	0.0%	1.0%	100.0%	0.12	0.07	0.19
123	38.2	39.0%	0.0%	20.0%	0.0%	0.0%	0.0%	20.0%	0.0%	1.0%	100.0%	0.29	0.22	0.51
100	38.2	39.0%	20.0%	20.0%	0.0%	0.0%	0.0%	20.0%	0.0%	1.0%	100.0%	0.11	0.10	0.21
625	38.2	9.0%	10.0%	40.0%	0.0%	0.0%	0.0%	40.0%	0.0%	1.0%	100.0%	0.23	0.20	0.43
347	38.2	20.0%	40.0%	30.0%	7.0%	0.0%	0.0%	0.0%	2.0%	1.0%	100.0%	0.04	0.06	0.10
365	38.2	30.0%	30.0%	0.0%	7.0%	0.0%	0.0%	30.0%	2.0%	1.0%	100.0%	0.09	0.06	0.16
7181	38.2	19.0%	30.0%	0.0%	0.0%	20.0%	0.0%	30.0%	0.0%	1.0%	100.0%	0.10	0.06	0.15
9254	38.2	19.0%	30.0%	0.0%	0.0%	20.0%	0.0%	30.0%	0.0%	1.0%	100.0%	0.10	0.08	0.15

AUG-22-00 10:20 AM CRDO: WOLF: JEFF: WJS



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

August 25, 2000

MEMORANDUM TO: Philip Ting, Chief
Fuel Cycle Licensing Branch
Division of Fuel Cycle Safety
and Safeguards, NMSS

FROM: Thomas H. Essig, Chief
Environmental and Performance *TH Essig*
Assessment Branch
Division of Waste Management, NMSS

SUBJECT: TECHNICAL ASSISTANCE REQUEST REGARDING THE CABOT-
BOYERTOWN SITE AND DISPOSAL OF UNIMPORTANT QUANTITIES
OF SOURCE MATERIAL UNDER 10 CFR 40.13

James Danna, of my staff, has completed the actions described in the Technical Assistance Request (TAR) regarding the Cabot-Boyertown site, dated July 14, 2000. The NRC-HQ Project Manager for the site and the point-of-contact for the TAR is Leslie Fields, NMSS/FCSS. Our committed completion date for the TAR is August 31, 2000.

The requested action, as stated in the TAR, was to review Cabot Performance Materials' (Cabots') request for U.S. Nuclear Regulatory Commission approval to dispose of waste containing less than 0.05 weight percent and provide written feedback to the Fuel Cycle Licensing Branch in the form of an evaluation of the Cabot dose assessment. Cabot proposes to ship the material to the Waste Control Specialists site, located near Andrews, Texas.

Mr. Danna evaluated the Cabot dose assessment, and supplemental information provided by Cabot by letter dated August 22, 2000, regarding the radiological and physical characteristics of the material requiring disposal. Mr. Danna's evaluation is provided in the attached document.

In summary, the Cabot dose assessment and supplemental information is adequate to demonstrate that potential doses to members of the general public will be significantly less than 25 millirem.

Attachment: Technical Evaluation Report for the Cabot-Boyertown Site:
Transfer of Unimportant Quantities of Source Material
Under 10 CFR 40.13.

Contact: James Danna, NMSS/DWM/EPAB
301-415-6253

ENCLOSURE 3

TECHNICAL EVALUATION REPORT FOR CABOT-BOYERTOWN SITE:
TRANSFER OF UNIMPORTANT QUANTITIES OF SOURCE MATERIAL
UNDER 10 CFR 40.13

Licensee: Cabot Performance Materials
Reviewer: James Danna, NMSS/DWM/EPAB

On June 7, 2000, Cabot Performance Materials (Cabot) submitted a proposal to the U.S. Nuclear Regulatory Commission (NRC) to transfer certain of its process and other solid wastes under 10 CFR 40.13, "Unimportant Quantities of Source Material." The material to be transferred would contain less than 0.05 weight percent of source material, in accordance with 10 CFR 40.13. Cabot proposes to transfer the material from its Boyertown, Pennsylvania, plant to the Waste Control Specialists (WCS) facility located near Andrews, Texas, for disposal in the operating disposal cells. In support of the proposal, Cabot submitted an assessment of potential doses to workers involved in the transfer and disposal of the material, and an assessment of potential doses to members of the public in the vicinity of the WCS facility.

In response to a Technical Assistance Request regarding the Cabot proposal (P. Ting, NMSS/FCSS, to T. Essig, NMSS/DWM; July 14, 2000), I have reviewed the Cabot dose assessment. I have also reviewed additional information sent to the NRC by Cabot by letter, regarding the physical and radiological characterization of the material Cabot proposes to transfer (T. Knapp, Cabot Performance Materials, to L. Fields, U.S. NRC; August 22, 2000).

I have concluded that the dose assessment and supplemental characterization information is sufficient to demonstrate with reasonable confidence that potential dose to individual members of the public attributable to the transfer of the Cabot material to the WCS facility would be significantly less than 25 millirem. I provide the following discussion regarding my review and conclusion.

Characterization of the Material to be Transferred

Cabot estimates the total quantity of material to be transferred at approximately 750 cubic meters (990 cubic yards). The materials are presently contained within 22 trailer trucks, ready for transfer. Based on volume, the material is mostly plastic/fiberglass, steel, macadam/soil, brick/concrete, wood, and "other" trash. The material also includes small volumes of sludge and carbon brick. There is approximately 5.7 cubic meters (200 cubic feet) of "high activity residue" material distributed among the trailers.

For uranium (U-238, U-234 and U-235), 0.05 weight percent is approximately 339 pCi/g. For thorium (Th-232 and Th-228), 0.05 weight percent is approximately 116 pCi/g. Based on the supplemental characterization information provided by Cabot, I calculated the uranium and thorium concentrations in the individual trailers and in the overall volume of material, and compared these concentrations to the allowable concentrations. Uranium concentration in each trailer ranges from 10 pCi/g to 94 pCi/g, averaging 39 pCi/g over all the trailers. Thorium concentration in each trailer ranges from 2 pCi/g to 32 pCi/g, averaging 12 pCi/g over all the trailers. Using the sum of fractions, the uranium and thorium concentrations in each trailer range from 5 to 50 percent of the allowable concentrations, averaging 22 percent over all the trailers.

Attachment

Description of the WCS Andrews Facility

The WCS facility is located near Andrews, Texas, about 30 miles east of the U.S. Department of Energy's Waste Isolation Pilot Plant facility. The WCS facility is located on a 15,215-acre site with an arid to semi-arid climate, with 1338 acres of the site being permitted for the treatment, storage and disposal of Resource Conservation and Recovery Act (RCRA) and Toxic Substances Control Act (TSCA) wastes. The WCS Andrews facility is also licensed by the Texas Health Department as a radioactive waste storage and treatment facility. The closest communities to the WCS Andrews facility are the city of Andrews 50 kilometers (30 miles) to the east (1990 population was 10,678) and the city of Eunice 10 kilometers (6 miles) to the west (1990 population was 2676).

The material would be disposed of in a RCRA cell with double plastic and clay liners and a double leachate collection system. The cell is underlain by 240 to 300 meters (800 to 1000 feet) of continuous, predominantly low permeability red-bed clay. The cell will be capped by a five-meter (sixteen-foot) thick engineered cover that satisfies the 10 CFR Part 60 intruder-barrier requirements for Class-C waste. In accordance with the radioactive waste treatment and storage license, all operations involving radioactive materials are performed under the existing radiation safety program. All on-site personnel are trained and badged as radiation workers. A comprehensive environmental monitoring program is in place under the requirements of the RCRA/TSCA permits and the radioactive material license.

Protection of Workers During Facility Operations

Cabot used the TSD-DOSE computer code (Version 2.22) to evaluate potential dose to workers involved in the transport, receipt, storage, treatment, and disposal of the material transferred from the Cabot-Boyertown site to the WCS Andrews facility. The TSD-DOSE code was developed by Argonne National Laboratory to evaluate dose attributable to the treatment, storage and disposal of material containing small quantities of radioactive material. The TSD-DOSE code is used primarily by the U.S. Department of Energy.

i obtained the TSD-DOSE code and supporting documentation from John Arnish at Argonne National Laboratory. I reviewed the supporting documentation to gain an understanding of the conceptual and mathematical models underlying the code, and to understand the bases of the default parameter values. The TSD-DOSE is reasonable to provide an approximation of potential worker dose and dose to offsite individuals.

Cabot's dose assessment using TSD-DOSE was based on the transport, handling and disposal of one shipment of 20 cubic yards of material. The Cabot analysis assumed bounding concentrations of uranium and thorium, each being analyzed separately at the maximum concentration of 0.05 weight percent. Cabot then interpolated doses based on a uranium-to-thorium concentration ratio of 3.6.

Two scenarios were considered: (1) the Cabot material is transported, received and unloaded directly into the disposal cell, and (2) the Cabot material is stored and treated prior to disposal. The TSD-DOSE analyses indicate that dose from a single shipment of the Cabot material to a worker could be 1.7 millirem under scenario 1 (to the driver transporting the material to the

WCS facility), and 4.6 millirem under scenario 2 (to the worker receiving and processing the material prior to disposal).

Cabot reports that the total volume of material to be transferred is approximately 750 cubic meters (990 cubic yards). Therefore, maximum dose to workers are estimated to be approximately 85 millirem to the driver under scenario 1, and 230 millirem to the worker under scenario 2. These estimates are well below the applicable occupational exposure limit of 5000 millirem.

Dose to the General Public During Facility Operations

Cabot used the TSD-DOSE code to estimate potential dose to the general public attributable to disposal of the material at the WCS facility. The TSD-DOSE code estimates the dose that an offsite individual may potentially receive when the material is unloaded into the disposal cell. The code assumes a fraction of the material is released into the atmosphere and is transported to the location of the offsite individual. The atmospheric transport model used in TSD-DOSE is based on the transport models and parameters used in CAP88-PC, a widely-used computer code developed by the U.S. Environmental Protection Agency for the U.S. Department of Energy.

The parameter assumptions underlying the TSD-DOSE offsite dose model (e.g., distance to receptor, fraction of wind blowing in direction of receptor, waste release fraction) are conservative for the Cabot material and the WCS site. The single-shipment doses calculated by the TSD-DOSE code, even when increased by the total volume of material to be transferred, are well under one millirem, and are, therefore, reasonable.

Protection of the General Public After Site Closure

Cabot used the RESRAD computer code to evaluate potential dose to a member of the public following closure of the WCS facility. Cabot assumed the RESRAD resident-farmer scenario, where a hypothetical individual resides on the site, grows food on the site, and uses well water drawn from an aquifer underlying the site, for drinking and agricultural needs.

The aquifer underlying the site is at the base of the red-bed clay, at approximately 300 meters (1000 feet) below the ground surface. The analysis indicates that no radionuclides reach the aquifer in the 1000-year time frame. Therefore, potential doses through the water-dependent pathways (e.g., drinking, crop irrigation, livestock watering) are zero. Also, the five-meter thick engineered cover effectively eliminates potential doses through the water-independent exposure pathways (e.g., external exposure, inhalation, soil ingestion, plant/meat/milk ingestion).

Inadvertent Intrusion Scenario

In addition to the postclosure resident-farmer scenario, the Cabot dose assessment considers potential dose to an inadvertent intruder. The inadvertent-intruder scenario is modeled after the scenario described in the NRC's IMPACTS guidance document (NUREG/CR-4370, 1986). The scenario assumes that buried radioactive material is brought to the ground surface by drilling activity. The scenario assumes the drilling cuttings and fluids are deposited in a muck pit, and

the driller is exposed to the radioactive material in the muck pit for three working days. After the three days, the muck pit is filled in with uncontaminated soil.

The calculated dose to the driller is approximately 0.003 millirem. This assumes that the driller drills through 14 to 19 meters of waste, down to the aquifer 330 meters below the ground surface. Even if the diluting effect of the uncontaminated drill cuttings are ignored, the estimated dose is well below one millirem.



August 31, 2000

U.S. Nuclear Regulatory Commission
Ms. Leslie Fields
Licensing Section
Fuel Cycle Licensing Branch
Division of Fuel Cycle Safety and Safeguards, NMSS
One White Flint North
11555 Rockville Pike
Rockville, MD 20852

Dear Ms Fields:

Per our discussion on Tuesday, August 22, 2000 regarding the disposal of "unimportant quantities" of material from the Cabot site, the following is a clarification on the columns of the "Summary of Profiles of Waste to be shipped to WCS". In addition I have included a brief description of how this material was generated.

Spreadsheet calculations

The column "Ratio to Total Th" is the sum of the fraction of total thorium activity, relative to the WCS acceptance criteria of 110 pCi/g, weighted by density, for each material type. The total thorium activity is provided elsewhere on the spreadsheet as "Total Th (pCi/g)" for each "Material Type". In short, the density of the material type needs to be included in the derivation of "Ratio to Total Th" and "Ratio to Total U" in order that the lower density material will not be "over-accounted" for in the sum of fraction calculation; i.e. since the material types are physically significantly different, volume by itself would be a biased weighting factor.

The same applies to the column "Ratio to Total U" except the WCS criteria is, respectively, 355 pCi/g.

The columns "Ratio to Total Th" and "Ratio to Total U" are intermediate calculations. They are neither directly nor independently necessary to evaluate compliance. The point of compliance, in this case, is evaluated at the column "Total".

The column "Total" is the sum of the columns "Ratio to Total Th" and "Ratio to Total U". This column is the result of the sum-of-ratios or unity calculation; i.e. when more than one parameter must be simultaneously compared to it's respective limit, the sum of the ratios of the value (in this case concentration) of each parameter compared to it's respective limit (in this case WCS criteria) may not exceed "1".



Cabot Performance Materials
P.O. Box 1503
County Line Road
Boyertown, Pennsylvania 19512-1503
Phone: 610-367-2187

ENCLOSURE 4

Material generation

The material being disposed was generated primarily from two operations, the "Ore Residue Project" and Plant processes.

The Ore residue project involved transporting Cabot's ore residue to International Uranium Corporation in Utah. The project took over three months and utilized a large amount of resources and equipment. At the completion of the project all potentially contaminated material was placed into one of the empty storage bins. This material consisted of tarps, structural supports for the tarps, wood, tires, heavy equipment, PPE, tools, etc.

Due to the inherent nature of Cabot's NRC licensed processes, process equipment is often contaminated with low levels of naturally occurring Uranium and Thorium. Some of these items include 1,000 to 10,000 gallon tanks, piping, presses, press plates, ore bags, bag-house bags, concrete, structural metal, and kiln brick. These materials have also been accumulated over time awaiting final disposition.

Please contact me if any further information is needed for the Commissions timely approval of Cabot's submitted Safety Analysis.

Sincerely,
CABOT PERFORMANCE MATERIALS


Timothy M. Knapp
Radiation Safety Officer

NRC-083100.tmk.doc

Cabot Performance Materials Tabulation of Waste Streams to be Sent to WCS

Waste Stream / Material Type	Approximate Density (g/cc)	Total U (pCi/g)	Total Th (pCi/g)
Plastic/Fiberglass	1.25	8	2
Steel	7.9	0.8	0.2
Macadam/Soil	1.6	132	28
Other (Trash)	1.25	8	2
Wood	0.9	8	2
Sludge	2	105	29
Brick/Concrete	2.2	78	47
Carbon Brick	2.5	85	13
High Activity Residue	2	800	200

Note: There were several sample values with total U and Total Th that were on the order of several hundred pCi/g. These samples came from individual drums or residues with a total volume less than 200 ft³. These high activity samples were evenly distributed throughout each trailer. For the calculation it was conservatively assumed that 1% of each trailer volume included this high activity material. High activity materials that exceeded RCRA TCLP concentrations are not part of this shipment and were not included in the calculations.

Trailer #	Volume of material in trailer (m ³)	Percent of Total Volume per "Material Type" in Each Trailer										Total	Ratio to Total Th	Ratio to Total U	Total
		Plastic Fiberglass	Steel	Macadam/Soil	Other (Trash)	Wood	Sludge	Brick/Concrete	Carbon Brick	High Activity Residues	Total				
55	30.5	70.0%	10.0%	10.0%	3.0%	5.0%	0.0%	0.0%	1.0%	1.0%	100.0%	0.05	0.07	0.12	
60	30.5	60.0%	0.0%	20.0%	15.0%	0.0%	0.0%	0.0%	4.0%	1.0%	100.0%	0.10	0.15	0.25	
261	15.6	0.0%	0.0%	50.0%	39.0%	0.0%	0.0%	0.0%	10.0%	1.0%	100.0%	0.17	0.27	0.43	
51	30.5	0.0%	70.0%	15.0%	11.0%	0.0%	0.0%	0.0%	3.0%	1.0%	100.0%	0.02	0.03	0.05	
623	38.2	40.0%	20.0%	0.0%	0.0%	0.0%	0.0%	39.0%	0.0%	1.0%	100.0%	0.14	0.08	0.22	
249	15.6	0.0%	0.0%	50.0%	39.0%	0.0%	0.0%	0.0%	10.0%	1.0%	100.0%	0.17	0.27	0.43	
619	38.2	79.0%	0.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%	100.0%	0.10	0.14	0.24	
179	38.2	0.0%	30.0%	10.0%	15.0%	40.0%	0.0%	0.0%	4.0%	1.0%	100.0%	0.03	0.05	0.08	
168	38.2	39.0%	25.0%	25.0%	0.0%	10.0%	0.0%	0.0%	0.0%	1.0%	100.0%	0.05	0.07	0.12	
161	38.2	0.0%	30.0%	40.0%	15.0%	10.0%	0.0%	0.0%	4.0%	1.0%	100.0%	0.08	0.09	0.15	
171	38.2	0.0%	20.0%	0.0%	0.0%	0.0%	20.0%	59.0%	0.0%	1.0%	100.0%	0.21	0.14	0.35	
165	38.2	0.0%	40.0%	0.0%	15.0%	0.0%	0.0%	40.0%	4.0%	1.0%	100.0%	0.10	0.06	0.16	
146	38.2	0.0%	30.0%	60.0%	7.0%	0.0%	0.0%	0.0%	2.0%	1.0%	100.0%	0.08	0.12	0.20	
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439	30.5	49.0%	20.0%	0.0%	0.0%	0.0%	0.0%	30.0%	0.0%	1.0%	100.0%	0.12	0.07	0.19	
123	38.2	39.0%	0.0%	20.0%	0.0%	0.0%	0.0%	40.0%	0.0%	1.0%	100.0%	0.29	0.22	0.51	
100	38.2	39.0%	20.0%	20.0%	0.0%	0.0%	0.0%	20.0%	0.0%	1.0%	100.0%	0.11	0.10	0.21	
625	38.2	9.0%	10.0%	40.0%	0.0%	0.0%	0.0%	40.0%	0.0%	1.0%	100.0%	0.23	0.20	0.43	
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7181	38.2	19.0%	30.0%	0.0%	0.0%	20.0%	0.0%	30.0%	0.0%	1.0%	100.0%	0.10	0.06	0.15	
9254	38.2	19.0%	30.0%	0.0%	0.0%	20.0%	0.0%	30.0%	0.0%	1.0%	100.0%	0.10	0.06	0.15	