



50-54/
70-687

UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

March 8, 1995

Mr. James J. McGovern
President/Plant Manager
Cintichem, Inc.
P.O. Box 816
Tuxedo, New York 10987

Dear Mr. McGovern:

This is in response to your letter, dated January 6, 1995, regarding the methods Cintichem proposes to use to determine residual radioactive contamination criteria for bedrock at your Tuxedo, New York, facility. You indicated that you are developing these criteria because you have concluded that the contamination criteria discussed in the U.S. Nuclear Regulatory Commission's Regulatory Guide (RegGuide) 1.86, "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material," are inappropriate for bedrock that will be located below the ground surface of the Cintichem facility at the end of the decommissioning project. NRC staff has reviewed your proposal and agrees that the surficial contamination criteria in RegGuide 1.86 is not applicable to situations where the residual radioactive contamination is not readily accessible to the general public, as will be the case at the Cintichem facility.

NRC staff has also concluded that the conceptual method for determining the residual contamination criteria proposed by Cintichem (i.e., determining the most likely post-remediation scenarios for the site and determining the hypothetical doses associated with these scenarios) is reasonable. However, additional information on the manner in which this method was developed and how it will be used, as well as more detailed information about the scenarios that will be used in developing the residual contamination criteria, is needed by the staff to complete the evaluation of your proposed method. Additional information on radionuclide distribution in the site bedrock is also needed by the NRC staff to fully evaluate the final unrestricted release criteria when they are developed by Cintichem. Finally, the staff believes that Cintichem may not have fully evaluated the impact from all reasonable potential exposure pathways in developing the hypothetical doses discussed in the request. Enclosure 1 contains the NRC staff's detailed comments. In addition, by letter dated February 2, 1995, staff of the New York State Department of Environmental Conservation (NYSDEC) provided the NRC staff with their comments on Cintichem's proposed methods (see Enclosure 2). Cintichem should include its responses to the NYSDEC comments with its responses to NRC staff's comments.

Cintichem should pursue the resolution of the enclosed issues with the NRC and NYSDEC staffs in order to expedite the approval of the final proposed criteria. The staff believes that it would be beneficial for all parties to discuss these comments, and your intended responses, as soon as possible. Therefore, we suggest that we hold a teleconference with all interested parties as soon as you have developed responses to the staff's comments.

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NRC STAFF COMMENTS ON CINTICHEM'S
PROPOSED METHODOLOGY TO DEVELOP RESIDUAL CONTAMINATION
CRITERIA FOR BEDROCK

1. It is unclear how Cintichem estimated the hypothetical doses associated with the radionuclide concentration or surficial derived limits for the industrial scenario discussed in the proposed method. Discussions with Cintichem staff indicated that the differences in the derived limits observed in the reactor monolith and hot lab areas were almost exclusively the result of the difference in the amount of potentially contaminated bedrock (i.e., a 5-fold increase in derived limit vs. a 3-fold increase in the volume of contaminated bedrock). Please provide a detailed explanation of the derivation of these limits, as well as the calculations used to develop the derived limits.
2. It is unclear how the derived limits for the residential scenario were developed or will be applied to the bedrock. Cintichem lists the derived limits, in dpm/100cm², for each affected area at the site but does not indicate how these limits were derived. In addition, it is unclear how surficial limits will be used to demonstrate compliance with the drinking water criteria. Please provide a detailed explanation of the manner in which this information will be used, including the calculations used to develop the hypothetical doses and provide a rationale for the reason to develop surficial limits when volumetric limits appear to be more realistic.
3. The description of the development of hypothetical doses in the industrial scenario appears to exclude the potential contribution from direct radiation exposure. Please provide a rationale for excluding the potential external dose from 26,700 ft³ of contaminated bedrock.
4. Please provide any current information about the actual radionuclide distribution at the site.
5. In the past, Cintichem and NRC staff have used the RESRAD computer code to estimate potential doses to future on-site residents from residual radioactive material left at the Cintichem site. In developing the proposed limits for bedrock in the industrial scenario Cintichem indicated that they used the dose conversion factors in NUREG/CR-5512. It is unclear from the discussion how Cintichem intends to validate the contamination limits against the hypothetical doses (i.e., does Cintichem intend to use the RESRAD code or an alternative method to demonstrate that the potential doses from residual radioactive material left at the site are less than a few mRem/year).



Langdon Marsh
Commissioner

February 2, 1995

Mr. Dominick Orlando
US Nuclear Regulatory Commission
1 White Flint North
11555 Rockville Pike
Rockville, MD 20852

Dear Mr. Orlando:

Re: Cintichem, Inc. Decommissioning
Proposed Bedrock Criteria

We received a copy of Mr. McGovern's January 6, 1995 letter to the NRC regarding Cintichem's proposed decontamination criteria for bedrock. Mr. McGovern's letter transmitted a document entitled, "Analysis Summary of Hypothetically Projected Dose Due to Bedrock Contamination."

We have reviewed both the letter and the Analysis Summary and offer the following comments for your consideration:

1. In the transmittal letter, Mr. McGovern writes,

This pro-forma calculation is presented to demonstrate the proposed methodology that will be used for determining the acceptance criteria for any bedrock as necessary. . . . Final criteria will be different and will depend on the actual characteristics of the bedrock that are found at the time of the final survey.
(underlining added)

This implies that the proposed calculations will be done after the bedrock decontamination is completed. However, Section 5.6 of the Analysis Summary appears to contradict that statement:

The surface contamination limits that were derived along with the bedrock concentration limits will be used for go-nogo screening during remaining D&D work before final rock sampling is performed.

Cintichem should clearly explain when the actual limits will be derived and applied.

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Enclosure 2

Mr. Orlando
February 2, 1995

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2. In Section 5.6, Cintichem proposes to use the derived surface limits for screening bedrock. It is very doubtful that surface radiation readings would correlate with either the total activity or the concentration of radionuclides in cracks that extend more than a foot into bedrock, particularly when the orientation of the cracks appears to be unpredictable. Unless the surfaces of the cracks are exposed, a surface survey will not provide any reliable information about material buried in the rock. The only relevant measure is the concentration of radioactive material in the rock.

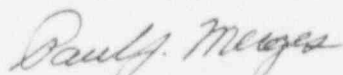
Cintichem should characterize the contamination that currently remains in the bedrock. If the concentrations and total activity are sufficiently low that plausible uses of this material would not result in a significant dose, it should be left where it is. In order to answer this question, cores should be taken from the areas of highest suspected contamination. To determine the concentration profile, the cores should be broken into one-foot segments for analysis. (It may not be necessary to analyze each segment. For example, every third core could be analyzed initially, and others analyzed as needed to complete the profile.)

3. The Analysis Summary contains references to preliminary core data. Cintichem should include that data in the Summary or provide it separately to DEC.

4. The industrial intruder scenario is assumed to last only six months, and it ends with loading the bedrock for sale. Cintichem should evaluate the potential doses due to reasonable uses of the crushed rock after it is sold. For example, if the rock were used for a driveway, the time of exposure would be longer than six months. The doses may not be significant, but this should be confirmed.

If you have any questions, please call Barbara Youngberg or John Kadlecik of this Bureau (518-457-2225).

Sincerely yours,



Paul J. Merges, Ph.D.
Chief, Bureau of Radiation
Division of Hazardous Substances
Regulation

cc: J. McGovern, Cintichem
T. Dragoun, NRC Region I

Please contact Nick Orlando, of my staff, at (301) 415-6749 to set up this teleconference. In addition, please provide your written responses to the staff's comments within 60 days of the date of this letter. Finally, when Cintichem has developed proposed residual contamination criteria for bedrock at the Tuxedo, New York, facility, they should be forwarded to NRC and NYSDEC for review and approval.

If you have any questions, please contact Nick Orlando, at (301) 415-6749. Development of this letter and comments has been coordinated with the NYSDEC staff.

Sincerely,

[Original signed by]

Michael F. Weber, Chief
Low-Level Waste and Decommissioning
Projects Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

License Nos. SNM-639
R-81

Docket Nos. 70-687
50-54

Enclosures: As stated

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SUBJECT: CINTICHEM - BEDROCK CRITERIA AT TUXEDO, NY

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James J. McGovern

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resolution of the issues in the attached with the NRC and NYSDEC staffs in order to expedite the approval of the final proposed criteria. Development of this letter and comments have been coordinated with the NYSDEC staff.

If you have any questions, please contact Nick Orlando, at (301) 415-6749.

Sincerely,

Michael F. Weber, Chief
Low-Level Waste and Decommissioning
Projects Branch
Division of Waste Management
Office of Nuclear Material Safety
and Safeguards

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