

November 17, 2005

Mr. Jim Grant
C-T Decommissioning Project Manager
Mallinckrodt Chemical, Inc.
Mallinckrodt & Second Streets
P.O. Box 5439
St. Louis, MO 63147

SUBJECT: MEETING SUMMARY NOTES

Dear Mr. Grant:

On October 5, 2005, representatives of Mallinckrodt, Inc. (Mallinckrodt) met with representatives of the U.S. Nuclear Regulatory Commission (NRC) to discuss Mallinckrodt's responses to NRC's request for additional information, dated June 29, 2005, on the Mallinckrodt Phase II Decommissioning Plan dose modeling approach. We have enclosed a copy of our meeting summary notes.

In accordance with Title 10 of the Code of Federal Regulations (10 CFR) Part 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room). This information is also available on NRC's website at: <http://www.nrc.gov/materials/decommissioning/public-involve.html>

If you have any questions or comments regarding the enclosed, please contact me at (301) 415-8580.

Sincerely,

/RA/

Amy M. Snyder, Senior Project Manager
Materials Decommissioning Section
Nuclear Material Safety
and Safeguards
Division of Waste Management
and Environmental Protection

Docket No.: 40-6563
License No: STB-401

Enclosure: Meeting Summary Notes

cc: Mallinckrodt Service List

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NAME	ASnyder	MThaggard	KGruss		
DATE	10/27/05	11/1/05	11/09/05		

OFFICIAL RECORD COPY

MEETING REPORT

DATE: October 5, 2005

TIME: 9:00 a.m. - 11 a.m.

PLACE: U.S. Nuclear Regulatory (NRC), Headquarters
One White Flint North
Room: O-04B4
11555 Rockville Pike
Rockville, MD 20852-2738

PURPOSE: Mallinckrodt proposes to perform Phase II of Decommissioning at its facility in Saint Louis, Missouri. The U.S. Nuclear Regulatory Commission (NRC) discussed Mallinckrodt's responses to NRC's request for additional information (RAI), dated June 29, 2005, on the Mallinckrodt Phase II Decommissioning Plan (DP) dose modeling approach.

ATTENDEES: Refer to Attachment

BACKGROUND: The Mallinckrodt site has been in operation since 1867 and has produced a wide range of products. In addition to the extraction of columbium and tantalum carried out under NRC Nuclear Material License No. STB-401, various uranium compounds were extracted under contract to the Manhattan Engineering District and the Atomic Energy Commission (MED-AEC). Remediation of MED-AEC radiological constituents is currently being performed under the U.S. Department of Energy's Formerly Utilized Site Remediation Program (FUSRAP) by the United States Army Corps of Engineers (USACE). Decommissioning at the Mallinckrodt site will take place in two phases. Phase I addresses the decommission of the buildings and equipment to the extent that whatever remains on-site will be released for unrestricted use. Phase I was completed in December 2004. Phase II will complete the decommissioning of the building slabs and foundations, paved surfaces, and all subsurface materials. Staff is now evaluating the Phase II DP for the Mallinckrodt site. Contaminants at the Mallinckrodt site are: U-238; U-235; U-234 and progeny; Th-230; Ra-226; Th-232; Th-228 and progeny; Ra-228; and K-40.

DISCUSSION:

The following NRC key messages were communicated to Mallinckrodt.

Presently, there is not a clear resolution delineating clean-up responsibilities between the USACE and Mallinckrodt. This issue would need to be resolved prior to NRC taking any action to terminate Nuclear Materials License No. STB-401.

To facilitate the cleanup of the Mallinckrodt site, Mallinckrodt would not need to include the residual dose from MED-AEC activities in its dose calculations to demonstrate compliance with the License Termination Rule (LTR), if Mallinckrodt provided a clear and unambiguous delineation of the areas where NRC-licensed activities were conducted and the areas that are the responsibility of FUSRAP involving MED-AEC activities.

Mallinckrodt has indicated to NRC staff that USACE is cleaning up to levels that should meet the radiological criteria of the LTR for unrestricted release. Therefore, if NRC requires Mallinckrodt to include the areas of the Mallinckrodt facility being cleaned-up under FUSRAP in its dose compliance demonstration, it may be possible for the whole Mallinckrodt site to comply with the LTR.

OTHER ITEMS DISCUSSED:

Mallinckrodt is planning to meet with the USACE tentatively during the week of November 7, 2005, to discuss areas of contamination overlap and site clean-up responsibilities between the two organizations. Subsurface contamination clean up boundaries will also be addressed. As of the date of this letter, Mallinckrodt and USACE did not meet.

RAI #45: Derivation of radionuclide specific Derived Concentration Guideline Level (DCGLw) based on the radionuclide Guideline (G(i,t)) at the time of the total peak dose. NRC discussed why the licensee's approach was non-conservative and contrary to the recommended NRC guidance in NUREG-1757, Vol. 2, Section 2.7. The licensee explained the basis for its approach. The licensee assumed that the ratio of radionuclides used for its DCGL evaluation will be the same at the time of final status survey. NRC's position is that assumptions about the ratio of radionuclides must be verified to be valid for the final status survey. The licensee stated that its approach would not result in a dose that is higher than the 25 mrem standard and that the results of dose analyses it performed supported this. However, the concentrations of radionuclides used in these dose assessments were determined based on the average ratio of radionuclides present at the site, and the site data show heterogeneity in the ratios of radionuclides present. Deviations in the ratio of the radionuclides present from the assumed amount could result in a higher dose than the one that was calculated.

RAI #41: NRC discussed the fact that the licensee should provide a basis for the independence for soil and pavement scenarios related to the ratios issue in RAI #45. In the derivation of the DCGLs for pavement, the licensee accounted for the dose from contaminated soil underneath the pavement by performing a dose assessment to determine the maximum dose that could be received from soil that is cleaned up to meet the DCGLs. However, this dose assessment was based on the same assumptions about the ratio of radionuclides present as was discussed above.

RAI # 43: Indoor gamma shielding factor. The NRC informed the licensee that its selection of an indoor shielding factor is important to the dose analysis. NRC stated that it was not realistic of the licensee to assume that concrete floors and walls will be always available and well maintained to shield from gamma radiation. NRC discussed the merits of using a distribution to better represent this parameter. NRC stated that the licensee should consider the probability of limited shielding in assigning a probability distribution. The licensee used a distribution for the indoor gamma shielding factor that corresponded to concrete floors of various thicknesses. However, the licensee did not include the possibility of the floor not existing (thickness=0) in its distribution. As stated in action item #2 below, we asked the licensee to add this to its distribution.

RAI #49: Area Factor for Elevated Measurements. NRC explained the need to assess a range for elevated measurement using area factors and its importance to the final status survey (final measurement data set). This RAI indicated that since some of the parameters used in the dose modeling could have changed, the calculation of the area factors may need to be redone with the new parameters. In the response to the RAI, this was done. However, in our meeting, we asked Mallinckrodt to change some of the parameters again, which means that the calculation of the area factors may need to be updated.

RAI #83: Release criteria for sewer (September 2005 RAI response). NRC discussed the need for the licensee to provide a more detailed and concise response addressing what release criteria it plans on applying to the sewerage system. NRC also stated that it does not plan to evaluate the USACE Sewer Report. NRC will review the report to evaluate the DP license application once Mallinckrodt has defined dose compliance boundaries as discussed above.

Amy Snyder, NRC Mallinckrodt Project Manager, stated that remaining RAI responses (55, 56, 67, 68, 81, 88, 89,93,97,98,99,100 and 101) are being reviewed now by staff and she believes that they do not relate to dose or health physics issues. She noted that they may involve non-radiological issues, such as identification of all non-radiological contamination for NRC's Environmental Assessment. These RAI responses will be addressed in the near future and hopefully can be resolved by teleconference is necessary.

OPPORTUNITY FOR COMMENT:

Mr. Patrick S. Cannon, a student from the Villanova Law School, stated that he appreciated the opportunity to observe the meeting.

Ms. Joanne Wade, a Project Manager from the Missouri Department of Natural Resources, observed via teleconference and had no comments.

ACTIONS:

1. NRC is to: 1) review the strategy in the NRC approved Mallinckrodt Phase I DP for determination of surface DCGLs; 2) review the strategy in the draft Mallinckrodt Phase II DP for the determination of DCGL ratios; 3) begin to develop a draft license condition statement regarding verification of DCGL ratios at the time of final status survey; and 4) coordinate a follow-on teleconference with Mallinckrodt to discuss the draft license condition (Relates to RAI #4, 45, and 49).
2. Mallinckrodt will perform additional shielding factor analysis assuming a cover of zero concrete floor thickness at a reasonable probability that Mallinckrodt can defend (Related to RAI #43).
3. NRC will note in its Safety Evaluation Report the inconsistency in the thickness of the contamination layer in the Mallinckrodt dose assessment.
4. Mallinckrodt will clarify the basis for the soil and pavement scenarios related to the ratios issue in RAI #45. In their response to RAI 41, it estimated that there could be a few mrem dose from the soil through the pavement. The exact value of this dose depends on the ratio of radionuclides in the soil though.

5. Mallinckrodt will make a decision on whether it will include the FUSRAP dose to demonstrate compliance with 10 CFR 20 Subpart E and will reflect its decision in the DP.
6. Mallinckrodt will provide a more detailed and concise response addressing what release criteria it plans on applying to the sewerage system.
7. NRC will schedule a teleconference to discuss the remainder of the RAIs which are non-dose assessment and non-HP related.

ATTACHMENT: Meeting Attendees

Docket No.: 40-6563

License No.: STB-401

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