

APPENDIX A

MATERIALS DECOMMISSIONING INSPECTION FIELD NOTES FOR FACILITIES NEEDING SIGNIFICANT DECOMMISSIONING EFFORT

Region III

Inspection Report No. 040-06563/2003-001
License No. STB-401
Docket No. 040-06563

Licensee (Name & Address) **Mallinckrodt Chemical, Inc.
Mallinckrodt & Second Streets
P.O. Box 5439
St. Louis, Missouri 63147**

Licensee Contact **Mark Puett, Environmental Affairs Manager**
Telephone No. **(314)-654-1344**

Date of Last Inspection **September 20, 2002 with continuing NRC review
through November 19, 2002**
Date of This Inspection **January 7-9, 2003 with continuing NRC review
through July 8, 2003**
Date of Next Inspection **Estimated: August, September or October 2003**

Type of Inspection: ☒ Announced ☐ Unannounced
 ☒ Routine ☐ Special
 ☐ Initial Decomm. ☒ Reinspection of Decomm.

Brief Description of Inspection Activities:

Mallinckrodt was first issued License No. STB-401 on June 26, 1964, for the processing of ore to extract Columbium and Tantalum (CT). The license authorized the possession of thorium and uranium in natural or synthetic ores up to 30,000 kg of each. The licensee was utilizing the Plant 5 facilities until October 1985. After 1985, the licensee discontinued the processing of ores and the facility was placed in a standby status. The licensee's contractor packaged and shipped drums containing processing residues to an authorized radioactive waste disposal facility and conducted a general cleanup of Plant 5 buildings during 1992. The cleanup consisted of removing and cleaning debris from the floor of the buildings and packaging the material in drums for waste disposal. Contaminated equipment was either packed for disposal or left in the buildings to be addressed during future decommissioning activities. The licensee conducted a radiological characterization of the Plant 5 area from September 1994 to March 1995.

The licensee submitted a Decommissioning Plan (DP) for the CT Decommissioning Project (CTDP) to the NRC on November 11, 1997. The licensee will submit the CTDP in two parts because the licensee will conduct the C-T decommissioning project in two phases. The licensee's Phase 1 plan will consist of decommissioning the buildings and equipment. The licensee will be releasing buildings and equipment for unrestricted use based on an industrial use scenario. Phase two will complete the decommissioning of the building

slabs and foundations, paved surfaces, and all subsurface materials to the extent that the licensee can release them for restricted use.

In addition to the CTD, the U.S. Army Corps of Engineers is performing remediation of radiological contaminants in other areas of the St. Louis Plant (USACE) under the Formerly Utilized Sites Remedial Action Program (FUSRAP).

The licensee submitted a January 18, 2001 revision to its initial Phase 1 submission. In addition to this routine inspection, the NRC conducted general discussion with the licensee and its consultants regarding the CTD.

The NRC approved the licensee's Decommissioning of the C-T process Phase 1 plan on January 10, 2002 with two revisions submitted on February 13, 2002 and March 8, 2002.

Brief Description of Findings and Action:

During the inspection, the NRC reviewed three areas. These were a review of: 1) the licensee's Quality Implementing Procedures (QIP's); 2) the procedures supporting the implementation of MARSSIM Final Status Surveys; and 3) general radiation safety practices at the facility.

During this inspection, the inspectors closed six (6) unresolved items and one observation during the QIP review, 40 findings during the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) Final Status Surveys (FSS) review; and one (1) violation of NRC requirements. In addition, the inspectors noted, and the licensee agreed, that the final status surveys and documentation for the phase 1 program that was discussed with the inspectors during the inspection would not be completed as originally scheduled.

Summary of Findings and Action:

- ☐ No violations cited, clear NRC Form 591 or regional letter issued
- ☐ Violation(s), clear NRC Form 591 issued
- ☒ Violation(s), regional letter issued
- ☐ Followup on previous violations

Inspector: 
Michael LaFranze, Radiation Specialist

Date: 7/17/03

Inspector: Telephonically Concurred
John Buckley, Project Manager

Date: 7/17/03

Inspector: Telephonically Concurred
Jean-Claude Dehmel, Health Physicist

Date: 7/17/03

Approved: 
Christopher G. Miller, Chief, Decommissioning Branch

Date: 7/22/03

[Field notes are to be used by the inspector to assist with the performance of the inspection. Note that all areas indicated in the field notes are not required to be addressed during each inspection. However, for those areas not covered during the inspection, a notation ("Not Reviewed") should be made in each section where applicable. Additionally, all areas covered during the inspection should be documented in sufficient detail to describe what activities and/or records the inspector observed. The fieldnotes to the "Decommissioning Inspection Procedure for Materials Licensees" should be supplemented with: (1) the applicable inspection procedures for operating facilities provided in the Inspection Procedure (IP) 87100 series; and (2) other written documentation of the inspection, as necessary.]

1. SUMMARY OF DECOMMISSIONING STATUS

The checklist below is intended to provide, in a written outline format, summary documentation of the status of the licensee's facility in the decommissioning process. This documentation will be filed as part of the inspection report. The inspector should use this information to develop each inspection plan(s) for the various stages of decommissioning, namely, before dismantlement, during dismantlement and site remediation, and after site remediation.

- | | |
|--|-------------|
| A. Licensee ceased operational program. | (X) Y () N |
| B. Required decommissioning financial assurance mechanisms in place. | (X) Y () N |
| C. Decommissioning Plan (DP) required. | (X) Y () N |
| D. Licensee final survey required. | (X) Y () N |
| E. NRC confirmatory survey required. | (X) Y () N |
| F. NRC closeout inspection required. | (X) Y () N |
| G. Licensee doing decommissioning planning and preparation before dismantlement. | (X) Y () N |
| H. Licensee actively remediating site. | (X) Y () N |
| I. Licensee completed site remediation. | () Y (X) N |

Description of Facility Status:

Phase 1 Decommissioning Plan was approved earlier in 2002. During the inspection, the licensee had developed a plan to complete all phase 1 remediation by August 2003. However based upon the workload and a violation identified during the inspection, the inspectors do not believe that the licensee can complete the remediation by 2003. The licensee agreed with the inspectors assessment and is currently reevaluating the program schedule.

2. INSPECTION OF KEY DECOMMISSIONING ACTIVITIES

The following is a generic checklist of major licensee activities occurring at various stages of decommissioning. From this generic checklist and from facility-specific activities you identify, develop the set of licensee activities to be inspected - for each individual inspection throughout the decommissioning process. Plan to inspect licensee activities that present potential high-risk conditions. Then apply the standard health and safety inspection areas in Section 3 of these fieldnotes (taken from the applicable 87100 series IP for the licensee's operational program) to the specific licensee decommissioning activities that are being inspected.

To complete the licensee activities checklist, the inspector will need to obtain information from the Licensing Project Manager, review the DP, make observations at the licensee's facility, review licensee records, take measurements and samples of contaminants, and undertake other investigative measures, to determine whether the licensee is meeting all regulatory and DP commitments for each decommissioning activity the licensee is performing.

A. LICENSEE ACTIVITIES INSPECTED BEFORE DISMANTLEMENT

- | | |
|---|--------------|
| 1. Licensed material used during operations has been removed from site. | (Y) Y () N |
| 2. Facility license conditions are in place and met by licensee. | (X) Y () N |
| 3. Site security and control of contaminated material being maintained in compliance with 10 CFR 20.1801 and 20.1802. | (X) Y () N |
| 4. Support systems and services (e.g., lighting, water supply) are in place. | (X) Y () N |
| 5. Decommissioning schedules are consistent with timeliness requirements in 10 CFR 30.36, 40.42, and 70.38. | (X) Y () N |
| 6. Licensee's recordkeeping is consistent with 10 CFR 30.35, 40.36, and 70.25. | (X) Y () N |
| 7. Financial assurance requirements are being maintained in accordance with 10 CFR 30.35, 40.36, and 70.25. | () Y (X) NR |
| 8. Licensee is conducting site characterization in accordance with applicable radiation protection procedures. | (X) Y () N |
| 9. Construction of new site features (e.g., roads, rail spurs, staging areas, sediment control ponds) conforms to DP and does not compromise health and safety of workers and public. | (X) Y () N |
| 10. Licensee activities conform to specific license conditions and licensee programs and procedures. | See Below |

Basis for Findings:

The licensee's facility is still an active and fully functional industrial site. Buildings that the licensee is utilizing for chemical production operations surround Plant 5. Therefore, the licensee is constantly monitoring decommissioning and plant operations to ensure industrial hazards do not occur.

Condition 18 of License No. STB-401 states that the Decommissioning of the Columbium and Tantalum (C-T) process buildings shall be done in accordance with the Phase 1 Plan for C-T Decommissioning submitted on January 10, 2002.

Attachment 2 of the Phase 1 Plan for C-T Decommissioning titled Administrative Controls Plan states, in part, that the main administrative controls to ensure safety and regulatory compliance during C-T decommissioning are Plans and Field Instructions.

Section 2.4.4 of the Phase 1 Plan for C-T Decommissioning states, in part, that the decommissioning activities will be performed in accordance with written instructions. These instructions include Plans and Field Instructions. These procedures and field instructions are required to be reviewed and approved by the contractor operations representative, the Environmental Safety & Health (ES&H) representative and the Mallinckrodt Project Manager or his designated representative.

Section 9.1 of the Administrative Controls Plan states that Field Instructions (FI) are approved by (at a minimum) the MI Project Manager, Contractor Project Manager, and the Mallinckrodt RSO. Section 9.3 of the Administrative Controls Plan states that the Functional Area Manager is to issue a FI once approved and initial personnel training is completed.

Section 21.1 of the Administrative Controls Plan states, in part, that users of Final Status Survey Plans will be instructed to perform each survey task in accordance with the approved Plan.

During a representative review of the licensee's Field Instructions (FI) and Survey Plans, the inspectors noted that licensee management had not approved and/or reviewed FI CT-FI-001 or Survey Plan for Building 91 Crane Pad prior to implementation and completion. The CT-FI-001 was started on or about December 11, 2002 and completed on or about January 8, 2003. The Survey Plan for Building 91 Crane Pad was started on or about December 5, 2002 and completed on or about December 6, 2002. As of January 9, 2003, neither the FI nor the Survey Plan was reviewed or approved by licensee management. Since neither plan was approved by licensee management, appropriate training to the technicians could not be provided by the Radiation Safety Officer.

Failure to obtain approval prior to issuance of the FI and Survey Plan is a violation of NRC requirements.

Licensee management explained to the inspectors that the FI and Survey Plan were in the final stages of development but that to keep the decommissioning project on schedule, licensee management directed the work to be performed without the approving signatures. Licensee management further explained to the inspectors they knew that licensee management was required to approve the FI and Plan prior to implementation, but that any changes in the FI or Plan would have been minor in nature; therefore, they did not see any harm in implementing the FI or Plan prior to approval. During a review of the FI and Survey Plan, the inspectors did not identify any deficiencies in the unapproved documents.

At the conclusion of the inspection, the licensee committed to discard all survey data from the FI and Survey Plan, approve both the FI and Survey Plan and implement both the FI and the Survey Plan. In telephonic conversations with the licensee, the inspectors understood that no additional radiological conditions were identified while conducting the surveys. In addition, the licensee has

retrained all managers to ensure that all final status survey FI's and Plans are reviewed and approved prior to implementation.

Because the inspectors did not identify any deficiencies in the FI or Survey Plan and the licensee did not identify any unknown radiological conditions from the first survey, the NRC would have determined that the violation noted above should have been of minor safety significance. However, the NRC has determined that the reason for the violation was willful in nature. Therefore, in accordance with the Enforcement Policy, the NRC has characterized this violation as a Severity Level IV issue. The NRC has determined that the licensee's corrective actions are appropriate and will issue this violation with no required response from the licensee unless the licensee indicates that the corrective actions documented in this inspection record are not correct.

As documented within the 2002-001 inspection record, inspectors reviewed seven procedures supporting the implementation of MARSSIM FSS. The selected procedures are listed below. The NRC's review indicated that some technical elements of the procedures were internally inconsistent with some requirements of the Decommissioning Plan (DP) and MARSSIM.

During this inspection, the inspectors reviewed each item. The results of the review are documented below.

a. CT-RP-26, Rev. 0 - Radiation Protection Training

Item:

The HP Technician's qualification matrix (Attachment 26-3) requires mandatory FSS training (under HP Task No. 21) only for Senior HP technicians, the FSS training is optional for Junior HP Technicians. However, the licensee may conduct FSS under the direction or supervision of the Senior HP Technician (Attachment 26-2). However, the NRC expects that, in practice, Junior HP Technicians will conduct most of the FSS's. Consequently, providing direction and supervision to multiple surveys being conducted simultaneously at different locations will be impractical for the Senior HP Technician. Surveys conducted under such conditions may later complicate the review of final status survey reports by NRC staff due to questions regarding the validity of the survey.

NRC Review:

In response to this item, the licensee has revised the procedure (Section 7.9.2 and Attachment 26-3) making it mandatory that the task qualification training be conducted before implementing the task. Accordingly, this item is closed at this time, but its implementation will be subject to review in future NRC inspections.

b. CT-RP-36, Rev. 1 - Unconditional Release of Materials and Equipment

Item:

In defining the scope, the discussion of Section 2.1 (page 2 of 11) does not apply to volumetrically contaminated materials and instead the section should refer the reader to Section 2.2.4 of the DP for specific requirements. The unconditional release criteria presented in Table 5-1 (page 3 of 11) of the procedure are only for surface contaminated items. The procedure needs clarification to ensure that volumetrically contaminated materials are not inadvertently released by using the wrong process and release criteria. One of the footnotes (either "a" or "b") to Table 5-1 (page 3 of 11) needs to refer the reader to the requirements of

Section 5.2 of Appendix H to the DP for specific details. Section 5.2 addresses considerations for surface efficiency and surveys conducted on items with coatings that would shield alpha particles.

NRC Review:

In response to these items, the licensee has revised the procedure (Section 1.1 and 2.1) making it clear that it only applies to the survey and release of surface contaminated material. Accordingly, this item is closed at this time, but their implementation may be subject to review in future NRC inspections.

c. CT-RP-39, Rev. 1 - Performance of Radiation, Contamination, and Airborne Radioactivity Surveys

Item:

The procedure attempts to cover the requirements for the full range of surveys (e.g., radiation protection, environmental monitoring, and FSS) expected to be conducted during Phase I remediation activities. The inspector's review indicates that the sections of the procedure addressing the conduct of FSS simply refer the reader to instructions and requirements identified in the FSS Plan developed for each survey unit. However, a review of the first FSS Plan prepared for survey unit No. 2501-1 indicates that the document refers the user to this procedure for details on how to conduct such surveys. Accordingly, neither the FSS Plan nor CT-RP-39 clearly presents detailed guidance through such circuitous referencing. Given that the conduct of FSS addresses requirements that are unique and have different objectives than surveys conducted for radiation protection purposes or environmental monitoring, the requirements for FSS should be presented in a separate section of this procedure; Or, alternatively, the requirements should be contained in a separate procedure that is solely devoted to this subject.

The references (Section 3, page 2 of 19) did not, but should, include the FSS Design Guide and the FSS Plan to the existing list.

Section 7.1.2 (page 5 of 19) does not identify which sections and tables of the DP the licensee is referring to in identifying instrumentation detection limits. The DP presents three tables with instrumentation detection limits, that is Table 3-2 in Section 3, and Tables 4-1 and 4-2 in Section 4. In addition, the section does not state whether the corresponding list maintained by the Radiation Protection Health and Safety (RPHS) Manager supersedes the instrumentation detection limits presented in the DP.

In Section 7.2.4 (page 9 of 19), the steps should refer the user to the FSS Plan to comply with the requirements for removable surface activity, that is not to exceed 20% of the Derived Concentration Guideline Levels (DCGL) based on the conditions identified in Attachment C (Section 3.10, p.C-7) of the DP.

A comparison of Attachment 39-1 (page 17 of 19) as documented in this procedure against Attachment C to the FSS Plan prepared for survey unit No. 2501-1 indicates that the origin of the final status survey forms presented in the FSS Survey Plan is not documented, but should be, in a procedure or the FSS Design Guide. The survey forms as mentioned above include the FSS Direct Measurement Survey Form, the FSS Scan

Measurement Survey Form, and the FSS Supplemental Data Request Form.

NRC Reviewed:

In response to these items, the licensee has revised the procedure (Section 3.12 and 7.1.2) in referencing other appropriate procedures and documents [such as CT-QA-6.1, Calibration and Control of Measuring and Survey Equipment, Final Status Survey Design Guide, and the Final Status Survey Plan (FSSP)] in providing guidance and directions for the conduct of final status surveys. As opposed to providing technical details in the procedure, the licensee committed to include information and directives to survey technicians in the FSS Plan to reflect the unique conditions of each survey unit and to include all relevant details in each FSS report. The NRC finds this approach acceptable. Accordingly, these items are closed at this time, but will be the subject of NRC evaluations during the review of FSS Plans and FSS reports.

d. CT-RP-40, Rev. 1 - Survey Documentation and Review

Item:

Section 3, page 2 of 7 does not, but should, include the DP, the FSS Design Guide, and the FSS Plan to the list.

In addressing survey distribution and review of completed survey forms, Section 7.3 (page 5 of 7) does not, but should, address specific requirements for final status surveys. Specifically, the section does not provide clear instructions on the processing and review of FSS, which have different objectives than routine radiation protection surveys. As written, the focus is on the requirements for other types of surveys (namely radiation protection and environmental monitoring).

NRC Review

These items are closed with the response and approach used by the licensee to address the NRC concerns noted in item c. for CT-RP-39.

e. CT-RP-66, Rev. 1 - Operation of Scalers, Ratemeters, and Contamination Detectors

Item:

In defining the scope, Section 2.1.1 (page 2 of 22) does not, but should, state that the procedure does not apply to the survey of volumetrically contaminated materials. However, the licensee addresses the specific requirements in Section 2.2.4 of the DP for specific requirements. The document needs clarification to ensure that volumetrically contaminated materials are not inadvertently released using the incorrect process.

Section 7.6.3.2 (page 11 of 22) does not, but should, address radiation detection instrumentation failing daily source checks. Specifically, the section does not address whether any of the prior survey measurements need to be discarded and conducted again or if the instruments need to be recalibrated. As written, the discussion only addresses the role of the RPHS Manager in evaluating the results of failed daily source checks and deciding whether to reject or accept the results.

In Section 7.10.3 (page 14 of 22), one term of the equation is missing (surface efficiency, ϵ_s). In addition, the nomenclature and method used to calculate the area density of surface activity does not match with Section

3 of App. D of the DP and NEXTEP Memorandum dated July 16, 2002 (Basis for Detector Sensitivity for Mallinckrodt C-T Project). Such changes should be checked against the corresponding algorithm used in the Final Status Survey Database to ensure that they are the same.

Section 7.10.5 (page 15 of 22) does not, but should, address periodic instrumentation response checks for detector efficiency and effective area of detectors used for the FSS. Specifically, the section does not indicate that the instrumentation calibrated by a facility or manufacturer was using flood sources. Rather, the section mentions that periodic instrumentation response checks will be conducted onsite using electroplated disc sources instead. In addition, the section should refer to the DP (Attachment D and H) and NEXTEP Memorandum dated July 16, 2002 (Basis for Detector Sensitivity for Mallinckrodt C-T Project) in deriving the appropriate efficiency for the detector being used. A review of the memo and Section 3 of App. D indicates that the equation terms and nomenclature are inconsistent.

Section 7.11.3 (page 17/18 of 22) does not, but should, discuss the beta detector efficiency, as compared with the response of a reference detector as documented in the DP (Attachment D and H) and NEXTEP Memorandum dated July 16, 2002 (Basis for Detector Sensitivity for Mallinckrodt C-T Project). A review of the memo and Section 3 of Appendix D indicates that the equation terms and nomenclature are inconsistent.

NRC Review:

In response to these items, the licensee has revised the procedure (Section 7.6.3.2) addressing the evaluation and rejection of suspect survey data due to instrument malfunctions and the need to acquire replacement measurements. The balance of the concerns were addressed for the resolution of related issues in two other procedures (CT-QA-6.1, Calibration and Control of Measuring and Survey Equipment, and CT-RP-36, Unconditional Release of Materials and Equipment). Accordingly, these items are closed at this time, but their implementation may be subject to review in future NRC inspections.

f. CT-QA-4.1, Rev. 1 - Instructions and Procedures

Item:

In defining the scope, the discussion in Section 2.1 (page 2 of 6) needs to state that it does apply to the design of FSS Plan and conduct of final status surveys. Accordingly, the references (Section 3, page 2 of 6) need to include the DP, the FSS Design Guide, and the FSS Plan for completeness.

NRC Review:

In response to this item, the licensee has opted to revise the Final Status Survey Design Guide (Section 4.6.1), instead of the procedure in order to make it clear that the design process needs to consider procedure CT-QA-4.1 in addition to the others (CT-RP-39 and CT-RP-40). The NRC finds this approach acceptable. Accordingly, this item is closed at this time, but its implementation may be subject to review in future NRC inspections.

g. CT-QA-6.1, Rev. 2 - Calibration and Control of Measuring and Survey Equipment

Item:

Section 7.1.1 (page 3 and 4 of 10) is not clear regarding the readiness of survey instrumentation. Specifically, the procedural steps do not indicate that in some instances, instruments are made up of multiple components that the units must be calibrated and operated as a matched set.

Section 7.4.2 (page 5 of 10) does not, but should, address the use of instrumentation under suspect conditions. Specifically, the section only addresses a decision on whether to reject or accept the results and not regarding whether any of the prior survey measurement results need to be discarded and conducted over again.

In Attachment 6.1-2 (page 10 of 10), the steps for deriving lower limit of detections for survey instrumentation are not consistent with Attachment D (page D-17) of the DP. As written in Attachment 6.1-2, the steps omit to address possible extraneous responses of the AB-100 or 43-89 gas proportional detectors to ambient gamma radiation. Under such conditions, a need may exist to re-derive the lower limit of detection and determine whether the new detection limits meet the survey design objectives.

NRC Review:

In response to these items, the licensee has revised procedure CT-QA-6.1 (Section 7.1.1) to address the evaluation and rejection of suspect survey data due to instrument malfunctions or reconfiguration. The licensee also changed conditions in Attachment 6.1-2 in order to flag the need to redetermine instrument minimum detectable concentration levels when conducting surveys in areas characterized by elevated ambient radiation exposure rates. Accordingly, these items are closed at this time, but their implementation may be subject to review in future NRC inspections.

1.2 Final Status Survey Design Guide

The licensee has prepared a Final Status Survey Design Guide using the elements identified in Section 4.6 of the DP. The NRC reviewed the version dated July 14, 2002, Rev. 1 during the inspection. The FSS Design Guide provides further elaboration on design consideration topics that are covered in the DP (Section 4.6). Also, the FSS Design Guide now includes an administrative release limit as an ALARA goal. However, during a review of the FSS Design Guide, the inspectors identified the following items:

- Item A:** The introduction (page 3 of 28) did not note that the FSS Design Guide is a document originating from the DP, that the FSS Design Guide will be revised periodically to reflect the collective knowledge gained over Phase I remediation activities, and that revisions to the FSS Design Guide will be conducted in accordance with DP requirements (Section 2 and Administrative Control Plan, Attachment 2).
- Item B:** The inspectors found that Section 1.4.2 (page 4 of 28) is missing two DP conditions and another one is not consistent with its counterpart cited in the DP. The inspectors review identified that Section 1.4.2 (page 4. of 28) is inconsistent with the DP. Specifically, items "g."

and "k." of Section 2.6 of the DP were not part of Section 1.4.2. Item "g." addresses changes in derived concentration guideline levels and related scan and fixed MDCs. Item "k" places a condition against downgrading the classification of survey units. In addition, Section 1.4.2.1 does not qualify the requirement in changing the Type I decision error rate to be consistent with Sect. 4.4.4 of the DP (p.4-10). In general, the NRC expects the initial target value for the error rate is 0.05 and cannot exceed 0.15.

- Item C:** Section 2.2.3 (page 5 of 28) is not, but should be, consistent with DP Section 4.6.3 (page 4-31). Specifically, the licensee did not include "paint and/or coated surfaces" in Section 2.2.3.
- Item D:** Section 2.4.6 is not, but should be, consistent with the DP. Specifically, the DP indicates that specifications to all fixed measurements are based on a "random start and systematic" grid to be consistent with the DP. As written, the Section 2.2.3 only refers to the use of "systematic" measurements.
- Item E:** The designation and physical boundaries of FSS units are different from those described in Attachment A of the DP. The DP should note that the difference may be attributed to the final configurations mandated by remediation activities and survey design considerations. In addition, the DP should note that any differences should be described and included in the FSS report.
- Item F:** Footnote "11" to Section 3.9 (page 8 of 28) does not, but should, address the maximum paint thickness as defined in Appendix D of the DP. Without this qualifier, the footnote could be interpreted to apply to any number of paint coatings with yet different beta particle attenuation properties. For types of paints not described in the DP or characterized by other attenuation properties, the DP requires that the detectable beta fraction be derived anew.
- Item G:** The licensee has not addressed the requirement of Section 4.1.4 (page 9 of 28) in the Final Status Survey Database. Addressing this issue should act as a flag to ensure that a survey unit meeting this criterion is reconsidered as to its classification, whether the results are within the specified fraction of the $DCGL_w$, and whether the size of the survey unit has changed and needs to be identified as a new one and evaluated separately.
- Item H:** Table 4.2 (page 11 of 28) does not, but should, refer the reader to other requirements of the DP, that is Section 4.4.8.4 (page 4 of 23) and Footnote No. 25 (page 4 of 24). The requirements noted in this concern address the determination of background reference areas and number of background measurements, which should be determined using the guidance of NUREG-1505 and App. E to NUREG-1727.
- Item I:** Footnotes No. 23 and 24 on the bottom of page 15 of 28 refer the reader to the wrong section of the FSS Design Guide. The appropriate section should be Section 2.4 instead of 2.7.
- Item J:** The discussion in Section 5.4.5 (page 16 of 28) on the upper limit of the elevated measurements comparison (EMC) test and an area factor is inconsistent with that of the DP (App. C, page C-10). The

FSS Design Guide caps the area factor to a value of 12, while the DP limits it to 10. The licensee should reconcile this difference. In addition, the licensee should expand the requirements to include the sum-of-the-fraction rule of equation 8.2 of MARSSIM or equation E1 in App. E of NUREG-1727.

- Item K: Section 7.2.3 (page 19 of 28) addressing the conduct of measurements in covered or hidden areas should include further technical elaboration. The Section does not, but should, address the conditions of the survey unit where the licensee takes samples at alternate locations (e.g., using professional judgment or a bias scheme) and the current conditions of the obstructions and alternate sampling or measurement locations in the FSS Design Guide.
- Item L: Section 7.3.8, page 23 of 28) does not, but should, acknowledge the possibility that radioactivity might be sandwiched in one or more layers of roofing tar. The discussions should inform the reader that this possibility needs to be considered unless building maintenance records indicate otherwise. If it were determined that contamination was present or suspected in roofing tar, the section should address specific considerations in the choice of the measurement system and/or sampling methods.
- Item M: The method in Section 9, page 26 and 27 of 28 used to calculate the area density of surface activity is not consistent, but should be, with Section 3 of Appendix D of the DP and NEXTEP Memorandum dated July 16, 2002 (Basis for Detector Sensitivity for Mallinckrodt C-T Project). In addition, the revision should be checked against the corresponding algorithm used in the Final Status Survey Database to ensure that they are the same.

NRC Review:

In response to these items, the licensee has revised the FSS Design Guide. The relevant sections where revisions were made include: Section 1.4 (for two items), 2.2.4, 2.4.6, 2.7 (new), 3.10 (with note 12), 4.3.2, 5.3.5 (with notes 25 and 26), 5.4.5, 7.2.3, and 7.3.8. Regarding item g., the licensee has committed to address this aspect of the evaluation in the FSS Plan to reflect the unique conditions of each survey unit and to include the relevant details in each FSS report. With respect to item m., the licensee has updated the basis for calculating surface activity levels by revising and issuing new technical memoranda developed by its contractor (NEXTEP). The memos are: Paint Attenuation Factor Calculations (No. 0212, November 2002), Separation of Backscatter and Derivation of Instrumentation Sensitivity (No. 0215, November 2002), and Beta Scattering Factors for Several Materials at the Mallinckrodt Site (No. 0213, November 2002). The NRC finds this approach acceptable. The licensee's implementation may be subject to future NRC inspections, and evaluation during the review of FSS Plans and FSS reports. Accordingly, these items are closed at this time.

1.3 Final Status Survey Plan for Survey Unit 2501-1

The licensee has prepared its first final status survey plan (FSSP) for a survey unit in Building 250 (No. 2501-1, dated July 14, 2002). The inspectors reviewed the FSSP and identified the following items:

- Item A:** The designation and physical boundaries of the survey unit shown in Tables 2-1 and 2-2 (page 4 and 5 of 23) and Attachment A of the FSSP (p.15 of 23) are different from the ones described in Attachment A of the DP (page A-18). Specifically, there are inconsistencies in the above documents that may need further explanation for any differences in the definition of boundaries and room designations of the survey unit. In addition, the descriptions appear to omit some areas and include others not listed in Appendix A of the DP.
- Item B:** The surface area units in Table 2-1 (page 4 of 23) are inconsistent with the FSS Design Guide, and MARSSIM nomenclature. Specifically, the Table uses square feet where the other documents use square meters.
- Item C:** Footnote "a" to Table 2-4 (Release Criteria) does not reflect that the maximum paint thickness is limited to a maximum of four coatings with beta particle attenuation properties defined in Appendix D of the DP. Without this qualifier, an individual could interpret the footnote to apply to any number of paint coatings or paints with other beta attenuation properties. For types of paints not described in the DP or characterized by other attenuation properties, the DP requires that the detectable beta fraction be derived anew.
- Item D:** The release criteria (Table 2-4, page 6 of 23) does not refer to the FSS Plan in demonstrating compliance with the requirements for removable surface activity, i.e., not to exceed 20% of the DCGL based on the conditions identified in the DP, Attachment C (Section 3.10, page C-7).
- Item E:** The background reference data presented in Table 2-6 does not address the source of the values and factors used to convert from beta per minute per 100 cm² to disintegration per minute per 100 cm², as based from Table 4-3 of the DP (page 4-5). If the values are not from Table 4-3, a similar comparison with the data of Table 4-3 of the DP may be necessary to ensure consistency.
- Item F:** Section 2.4.8 or 3.1.3 are not consistent with the DP and the FSS Design Guide. Specifically, fixed measurements are not based on a "random start and systematic" pattern or grid.
- Item G:** Parameters used to derive the relative shift were not, but should be, addressed in the DQO input parameters listed in Table 3-1 (page 10 of 23) concerning the development of the specifications for any survey unit. In addition, the DQO does not indicate, but should, that the above approach is a default design, and, alternatively, actual data from the survey unit may be substituted in deriving the relative shift as conditions warrant to ensure an appropriate sampling density.
- Item H:** The total number of data points between Section 3.1.3 (page 10 of 23) and Table 3-2 (page 12 of 23) is inconsistent. Specifically, Section

3.1.3 states that 29 are required and Table 3-2 specifies 36. In addition, a technical basis is required if the difference in the number of samples is valid to address specific physical configurations of the survey unit.

NRC Review:

In response to items in Section 1.3(a-f), the licensee has revised the FSS Plan for Survey Unit 2501-1. The relevant sections where revisions were made include: Sect. 2.1 and Table 2.1 (for two items); 2.2.2 with note 5; 2.3.1 with Table 2.6 and note 7; 3.1.3 with note 11; and 3.2.1 with Table 3.2 with note 12 (for two items). Regarding item d., the licensee has addressed this aspect in the FSS Design Guide (revised Section 3.3) and has included the relevant results in the FSS Report for Survey Unit 2501-1 (Section 4.3). The NRC finds this approach acceptable. The licensee's implementation may be subject to future NRC inspections, and evaluation during the review of FSS Plans and FSS reports. Accordingly, these items are closed at this time.

1.4 Final Status Survey Database

Project personnel (NEXTEP staff) provided a demonstration of the computerized database (using a "beta" version of the software) that will be used to evaluate FFS results and demonstrate compliance with the cleanup criteria. The demonstration addressed the software platform, file structures, data input using pre formatted tables and queries, output screens showing results, use of built-in flags in checking data entries, a date-entry process relying on 100% verification, and data evaluation against the site-specific cleanup criteria. Project personnel indicated that some features being demonstrated are still in developmental stages, have not yet been fully tested, and the software program still needs validation by the licensee. In addition, a user's manual still needs to be prepared to reflect the final operational features of the program and its database management system. Finally, a training program has yet to be developed and administered to all potential users.

NRC Review:

The staff performed a limited evaluation of the database by using survey results compiled for survey unit 2501-1. The process involved tracing one measurement result (No. 5014 for Room 103, made on Nov. 22, 2002) from field survey data sheets to the database, identifying the relevant input parameters to reduce the raw field data (counts) to meaningful results directly comparable to the release criterion (dpm/100 cm²), and conducting the calculation manually and comparing that result with the one generated by the software. The following input parameters were traced within the data base or were calculated manually: open and closed instrument readings, measurement time, instrument sensitivity, backscatter factor, paint attenuation factor, and geometry factor. Other checks included tracing the instrumentation used in the survey and confirming its calibration status, and QA/QC verification of measurements in the database against original field survey data entries. The manual calculation yielded a result of 291 dpm/100 cm² (assuming an instrument sensitivity of 1.013 and a paint attenuation factor of 0.234) against a value of 290 dpm/100 cm² generated by the software. This check confirms that the database is performing the calculation correctly. The NRC will evaluate other related functions of the database in a future inspection once the licensee has finalized the documentation package and user's manual. Beyond this and other inspections, the NRC will continue to review such results as part of the evaluation of FSS Plans and FSS reports submitted by the licensee.

1.5 Onsite Field Radiological Laboratory

Project personnel (NEXTEP staff) provided a walk-through of the field radiological laboratory being setup to support Phase I remediation activities. The licensee will use the laboratory for evaluating radioactivity levels in samples collected in support of the implementation of the radiation protection program, environmental monitoring program, waste characterization and segregation for disposal purposes, and conduct of final status surveys. In the context of final status surveys (FSS), the laboratory equipment is still in the process of being setup and calibrated. The licensee has yet to finalize and approve procedures. In addition, the licensee has not administered training to designated users. The laboratory is being setup with instrumentation that will provide the capability to perform low resolution alpha, beta and gamma spectroscopy. The systems being assembled include a surface barrier detector and Na(I) and beta scintillation detectors, all operated via personal computers. Other bench-top instrumentation included alpha/beta scalers and an automatic gas-flow proportional counter. The laboratory possessed a number of calibration standards, including KCl, U_3O_8 , and Th as bulk liquids and powders; and Th-230, Tc-99, and Sr-90/Y-90 as electroplated discs. The standards included NIST-traceable certificates issued by the suppliers.

Other instrumentation used to conduct FSS were noted by the NRC to include portable survey meters connected to gas-flow proportional and G-M probes, and micro-R-meters to measure ambient gamma radiation. The NRC found the list of equipment to be consistent with that indicated in the DP, while the commitment to use low resolution alpha, beta and gamma spectroscopy systems and a surface barrier detector was noted to be an augmentation of analytical capabilities.

Project personnel indicated that analytical capabilities are still in developmental stages, and have not been fully tested or calibrated, and the computer programs still need to be validated. In addition, user's manuals and procedures still need to be prepared and approved. The NRC will evaluate these and related items in a future inspection once the instrumentation is fully operational and calibrated, the supporting software packages have been validated, and procedures and user's manuals are available to the NRC. The NRC intends to independently test the validity of sample results analyzed onsite using the services of its own contractor (ORISE, Oak Ridge, TN).

NRC Review:

Given scheduling constraints, a full evaluation of the laboratory program and procedures could not be performed during this inspection. A walkthrough of the facility and discussions with project personnel (NEXTEP) indicated that a number of procedures have been developed, and laboratory and field instrumentation were found to be calibrated. The laboratory possesses a number of radioactive standards used to calibrate the instrumentation for different type of sample configuration and media. Some of the radioactive standards were produced at the facility, while others were purchased commercially. The surface barrier detector and beta scintillation detection systems were removed from the facility, and the automatic gas-flow proportional counter was placed out of service pending repairs. As noted above, the NRC will evaluate these and related items in future inspections.

B. LICENSEE ACTIVITIES INSPECTED DURING DECONTAMINATION,
DISMANTLEMENT, AND SITE REMEDIATION

0.1 Site security and control of contaminated material being maintained in compliance with 10 CFR Part 20. (X) Y () N

0.2 Decontamination and dismantlement of structures are being performed consistent with DP and sound industry practice (structures include buildings, utilities, treatment lagoons, etc.). See Below

3. Decontamination and remediation of the following are being performed consistent with DP and sound industry practice:

- | | |
|--------------------|-------------|
| a. Soil. | () Y () N |
| b. Sediment. | () Y () N |
| c. Surface waters. | () Y () N |
| d. Groundwater. | () Y () N |
| e. Other mediums: | () Y () N |

Phase 2 of the Decommissioning Plan will address the above areas. Currently, the licensee is working on providing NRC with the Phase 2 plans.

4. Licensee release and disposal of decommissioning wastes are consistent with DP and approved by NRC for:

- | | |
|--|--------------|
| a. Liquid wastes (e.g., groundwater, surface water, liquid from treatment ponds, process liquids). | () Y (X) NR |
| b. Solid wastes (e.g., building materials, process and other facility equipment, concrete rubble, soil). | (X) Y () N |
| c. Other wastes: | () Y () N |

5. Temporary, on-site storage of low-level radioactive wastes from decommissioning meets license conditions and guidance in IP 84890. (X) Y () N

6. Packaging and shipment of radioactive waste materials meet requirements in 40 CFR Parts 173-178 and 10 CFR Part 71. () Y (X) NR

7. Restoration of site - Licensee has restored site to meet license conditions and NRC-approved plans. () Y () N

8. Licensee survey of material and equipment for free release sufficient to demonstrate compliance with release criteria.

Basis for Findings:

During the inspection, the inspectors verified Mallinckrodt's resolution of the six Unresolved Items as documented in the 2002-001 inspection record. Based on licensee actions, the inspectors determined that Mallinckrodt has adequately addressed the six Unresolved items. The NRC has documented the Unresolved items and the basis for closure follows.

Unresolved Item 1

Referencing CT-QA-4.1, Section 6 has many procedures that have "effective dates" which precede the procedure approval dates by the executors. Specifically, Section 6.2.2 states that, "Directives will be published by transmittal when final approval signatures have been obtained from the executors" All 11 QA procedures have effective dates that precede the final approval date of the Mallinckrodt Project Manager.

Resolution

Mallinckrodt revised the procedure review and approval process described in Sections 7.4, 7.5, and 7.6 of procedure CT-QA-4.1, to ensure that all management reviews and approvals are obtained before procedure becomes effective. The inspectors did not identify any violations of NRC requirements and considers this unresolved item closed.

Unresolved Item 2

Referencing CT-QA-4.2, Section 7.1 does not possess information that includes; (1) identification of the issues resulting from calculation errors; and (2) assumptions that affect the calculation. Specifically, the inspectors examined four calculations for compliance with the procedure; (1) Decay Corrected Source Activities, (2) Minimum Detectable Activity Determination, (3) Tennelec 5100 Calibration Sheet, and (4) CT-RP-66 Chi Squared Spreadsheet. These procedures did not possess the information necessary to ensure compliance with industry standards.

Resolution

The licensee generated a Corrective Action Request (CAR) No. 03-01 to resolve this issue. The inspectors reviewed the CAR and determined the CAR was written appropriately. The inspectors did not identify any violations of NRC requirements and considers this unresolved item closed.

Unresolved Item 3

Referencing CT-QA-5.1, Section 1, Mallinckrodt does not treat the approved DP as a controlled document. Specifically, Section 1.1 of the Document Control procedure states that the purpose of the procedure is to, "Establish a procedure for the change, distribution and control of project directives (i.e. written procedures, field instructions, safety work permits (SWPs), and drawings) - to ensure that only current documents are being used to project personnel." Since the DP is not a controlled document, the NRC did not find evidence that Mallinckrodt personnel are working in accordance with the approved DP.

Resolution

Mallinckrodt has revised procedure CT-QA-5.1, to identify the Decommissioning Plan (DP) as a controlled document. The inspectors verified that the licensee's DP was a controlled document and that the licensee was working in accordance with the approved DP. The inspectors did not identify any violations of NRC requirements and considers this unresolved item closed.

Unresolved Item 4

Referencing CT-QA-6.1, Section 7.1, Measuring and Survey equipment does not have appropriate calibration stickers. Specifically, Section 7.1.1.3 of the procedure says that measuring and survey equipment (M&SE) must "display a calibration sticker indicating the calibrator, calibration date, and the calibration due date. If a calibration sticker is missing, apply one and transfer the required information from the calibration certificate." Calibration stickers on the M&SE were inconsistent. For example - Detector Model 19, Serial No. 182637, has two calibration stickers with different calibration due dates.

Resolution

Mallinckrodt took action to correct calibration sticker inconsistencies identified during the last inspection. Inspectors verified that Detector Model 19, Serial No. 182637, had the appropriate calibration sticker. This failure constituted a violation of minor safety significance and is not subject to formal enforcement action.

Unresolved Item 5

Referencing CT-QA-6.1, Section 7.5.2, Calibration, Repair and History Records do not exist for all M&SE. Specifically, Section 7.5.2 states "Document the following information about each item of M&SE on a Calibration, Repair and History Record ...". No Repair and History Record was prepared for Model 2360/43-89, Serial No. 1771888/188702, even though the equipment is currently out for repair.

Resolution

Mallinckrodt prepared and inspectors examined a repair history record for Model 2360/43-89, Serial No. 1771888/188702, dated 8/8/02. During the review, the inspectors did not identify any regulatory issues concerning the repair history. This failure constituted a violation of minor safety significance and is not subject to formal enforcement action.

Unresolved Item 6

Referencing CT-QA-7.1, Section 7 the Radiation Safety Audit Report for the audit conducted on July 1-3, 2002, does not contain audit finding forms, personnel contacted during the audit, and the auditors signatures. In addition, an audit notification letter was not prepared. Specifically, Section 7.3 requires that the QA Manager or designee, "Provide audit notification to the appropriate functional manager." Section 7.7 requires that the auditor document any

condition that does not meet a requirement on an Audit Finding Form. Section 7.10 requires that the auditor prepare a report which contains .."7.10.3 Personnel contacted during the audit" and "7.10.4 The auditors signature."

In addition, the report for the QA Readiness Audit conducted on May 28 - 30, 2002, has not been finalized.

Resolution

The inspectors found that Mallinckrodt took appropriate action to document the July 1-3, 2002 audit findings. The inspectors examined Audit Finding Forms generated as a result of NRC's inspection and did not identify any regulatory issues. In addition, Mallinckrodt generated Corrective Action Reports (CAR's) for audit findings.

C. LICENSEE ACTIVITIES INSPECTED AFTER COMPLETION OF SITE REMEDIATION

Basis for Findings:

This section is not applicable.

3. INSPECTION OF STANDARD HEALTH AND SAFETY AREAS FROM THE OPERATIONAL INSPECTION PROGRAM

Identify the standard inspection areas (from the inspection program of the licensee's operational program) to be covered during each decommissioning inspection. [Inspection areas A through L below correspond to the typical inspection areas in the 87100 series IPs that are applicable to decommissioning.] Then identify the new activities within the standard inspection areas undertaken by the licensee during decommissioning. Some of the new activities given below, as well as any other activities the inspector identifies, should be considered inspection items under the general set of health and safety inspection areas used in the applicable 87100 series IP.

Minimum inspection areas for the initial decommissioning inspection: decommissioning organization (A.1); decommissioning activities in compliance with NRC-approved DP (A.2); licensee procedures for implementing the DP (A.3); Radiation Safety Committee (RSC) and Radiation Safety Officer (RSO) responsibilities (A.4); and the licensee's decommissioning training program (E.1).

A. GENERAL OVERVIEW

1. Describe the licensee's decommissioning organizational structure:

The decommissioning organization is as described in the DP. Mark Puett is the licensee's Environmental Safety and Health & Safety (ES&H) Manager who has been designated as responsible for overall operations of the program. Tim Woodford is the Radiation Safety Officer. The licensee has reduced the number of staff and contractors as the Phase 1

process is nearing completion. At this time, only two radiation technicians are performing final status survey work.

- | | |
|---|-----------------------|
| 2. Licensee is performing decommissioning activities in compliance with its approved DP. | See Below () Y () N |
| 3. Licensee has implemented procedures for the decommissioning activities identified in the DP. | (X) Y () N |
| 4. The RSC and RSO fulfill license requirements to deal with all decommissioning activities. | (X) Y () N |

Basis of Findings:

During the inspection, the inspectors obtained a representative sample of the licensee's Corrective Action Request (CAR) documents. These documents are generated as a part of the licensee's C-T Administrative Controls Plan under Procedures CT-QA-4.1 and CT-QA-9.1. The CAR's are generated when a deficiency within the licensee's program is noted. Information within the CAR's includes the description of the issue, root cause of the issue, corrective actions for the issue and a management approval sheet.

Of the two CAR's (CAR-02-05 and CAR-02-06) that were reviewed, the inspectors noted that the licensee's description and the management approval sheet were appropriately completed. However, the inspectors noted that each root cause was a statement of fact of what happened rather than the root cause of the issue. Although the licensee stated that the above CARs were completed as required by procedure, the licensee agreed with the inspectors assessment that previous root cause analyses were not as complete as they should have been to ensure the prevention of similar future deficiencies. The licensee committed to generate a CAR to address the issue. As part of the root cause analysis, the licensee identified that licensee staff who were required to identify the root cause did not have the appropriate skills to perform a root cause analysis. As part of the licensee's corrective actions, the licensee committed to provide specific training to site personnel who would be involved in the root cause evaluation. The inspectors reviewed CAR-03-03 and determined that the licensee had made a complete assessment.

B. FACILITIES

1. Describe, from field observation, the licensee-identified facilities and outdoor areas to be decommissioned:

The licensee is implementing the Phase 1 portion of the DP. Earlier in 2002, the NRC earlier in 2002 approved Phase 1. During the inspection, the licensee performing final status surveys for the Phase 1 program.

- | | |
|--|-------------|
| 2. The licensee's remediation plan includes all the contaminated facilities and areas on-site and off-site. | () Y (X) N |
| 3. All essential systems and services (e.g., electrical power, water supply, communications systems) are in place and functional for the planned decommissioning activities. | (X) Y () N |

4. Licensee's emergency plan is in place and operative for the duration of decommissioning. ☐ Y ☐ N

This area was not reviewed during this inspection.

5. For complex sites needing site characterization, describe the key site characterization activities to be performed by the licensee to determine the nature and extent of contamination:

The NRC discussed Phase 1 characterization plans with the licensee. The licensee is currently developing the Phase 2 program that will deal with surface and subsurface contamination.

6. Licensee's characterization activities performed in conformance with good industry practice. ☒ Y ☐ N

C. EQUIPMENT AND INSTRUMENTATION

1. Survey instruments are applicable to contaminants of interest. ☒ Y ☐ N
2. Use of survey instruments appropriate for site. ☒ Y ☐ N

Basis for Findings:

During a previous inspection, the inspectors identified that an individual was not adequately trained to analyze results from a portable radiation survey instrument. The inspectors verified that all individuals were knowledgeable in the use of survey instruments. See section E for details.

D. MATERIALS

1. Radioactive materials licensed during operations have been removed offsite; residual quantities conform to license conditions. ☒ Y ☐ N
2. Security and control of licensed materials, including contaminated areas, is being maintained. ☒ Y ☐ N

Basis for Findings:

The licensee did not inform the inspectors of any loss of control of licensed material since the last inspection. The inspectors did not independently identify any loss of control of licensed material.

E. TRAINING

1. Licensee has developed training program for new decommissioning activities (e.g., demolition of structures, excavation of soil); program is adequate. ☒ Y ☐ N
2. Training program being effectively implemented. ☐ Y ☒ N

Basis for Findings:

As documented in the 2002-001 inspection record, a violation of NRC requirements was identified concerning the licensee's failure to appropriately train a radiation technician.

Since that inspection, the licensee has significantly reduced the staff performing work under the Phase 1 program. Currently, two radiation technicians are performing the final status surveys required to complete the Phase 1 program. The inspectors interviewed each individual and determined that both individuals possessed the knowledge to use and appropriately interpret survey meter results. In addition, the inspector noted the licensee's corrective actions when the violation was identified in 2002 and determined that the corrective actions were adequate to ensure compliance with NRC requirements. The NRC considers this issue closed.

F. AREA RADIATION SURVEYS AND CONTAMINATION CONTROL

1. Area surveys are being performed in areas being decommissioned. (X) Y () N
2. Where active remediation (e.g., demolition of structures, excavation of soil) is being performed, radiation levels in unrestricted areas do not exceed 2 mrem in any one hour. (X) Y () N

Basis for Findings:

The inspectors observed the licensee's radiation technicians perform radiation surveys. The inspectors did not identify any deficiencies in the individuals survey techniques.

G. RADIATION PROTECTION

1. The licensee's approved health physics program is being implemented in the field for new decommissioning activities. (X) Y () N
2. Site security and control of contaminated material are in compliance with 10 CFR 20.1801 and 20.1802. (X) Y () N

H. RADIOACTIVE WASTE MANAGEMENT/EFFLUENTS/ENVIRONMENTAL MONITORING

1. Offsite disposal of decommissioning wastes conforms to free release criteria and disposal site requirements. () Y () N

This area was not reviewed during this inspection.

2. All new effluent releases conform to DP and applicable regulations. () Y () N

This area was not reviewed during this inspection.

3. The licensee's environmental monitoring program is being implemented in conformance with the DP and all applicable limits are being met. ☐ Y ☐ N

This area was not reviewed during this inspection.

4. Temporary storage/staging areas for radioactive wastes from building demolition, equipment dismantlement, soil excavation, etc., are adequately posted and protected. ☒ Y ☐ N

Basis for Findings:

I. RECORDKEEPING FOR DECOMMISSIONING

1. Copies of the licensee's decommissioning cost estimates and funding methods are on file. ☐ Y ☐ N
2. Licensee has adequate records for decommissioning activities performed (e.g., for decontamination and dismantlement of structures; decontamination and remediation of soil, sediment, surface waters, groundwater; surveys of remediated facilities). ☐ Y ☐ N
3. Licensee's financial assurance conforms with the financial assurance requirements of NRC-approved possession limits and NRC regulations. ☐ Y ☐ N

Basis for Findings:

This section was not reviewed during this inspection.

J. TRANSPORTATION

1. Describe the licensee's program to package and ship decommissioning waste materials: **See Below**
2. Licensee's program meets all applicable 10 CFR and 49 CFR requirements for marking labeling, placarding, and shipping paper requirements for radioactive waste shipments. **See Below**

Basis for Findings:

The licensee is currently developing procedures to ensure proper waste transport and transfer. The NRC is currently reviewing the licensee's proposals to transfer radioactive waste to Envirocare which is located in Utah.

K. POSTING AND LABELING

1. All contaminated areas, waste processing areas, and waste handling areas are posted in conformance with regulations. ☒ Y ☐ N

2. Packaged radioactive waste materials are labeled in accordance with regulations.

(X) Y () N

Basis for Findings:

While reviewing some of the licensee's health physics practices, the inspector noted that posting and labeling were properly addressed in the areas inspected.

L. OCCUPATIONAL HEALTH AND SAFETY

1. Describe the occupational health and safety observations made at the licensee's facilities:

Safety shoes, glasses, helmets and other safety equipment were required in areas inspected. All personnel working in these areas were provided with the appropriate equipment.

2. Licensee and Occupational Safety and Health Administration were informed of occupational health and safety issues observed during the inspection.

(X) Y () N

4. **VIOLATIONS, NON-CITED VIOLATIONS, FOLLOWUP ITEMS, AND OTHER ISSUES**

Briefly state (1) the requirements and (2) how and when the licensee violated the requirement. For non-cited violations, indicate why the violation was not cited. Briefly describe followup items and other issues.

During the inspection, 40 findings were identified (see section A.2 for details), six unresolved items were identified (see section 2.B for details) and one violation of NRC requirements was identified (see section 3.E for details). The NRC has reviewed the licensee's corrective actions concerning the violation of NRC requirements and determined that no further licensee responses are necessary.

Failure to obtain approval prior to issuance of the FI and Survey Plan is a violation of NRC requirements. See section 2A for details.

END