

Phase II Final Status Survey Report Mallinckrodt Columbium-Tantalum Plant

St. Louis, Missouri

Chapter 2

Project No. 137131

Revision 0

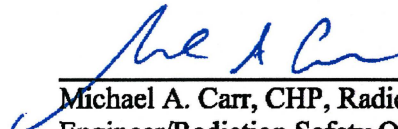
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ABBREVIATIONS AND ACRONYMS

ACE	U.S. Army Corps of Engineers
AECOM	AECOM Technical Services
APM	Assistant Project Manager
C-T	columbium-tantalum
COC	chain of custody
DC	Data Coordinator
DOT	U.S. Department of Transportation
DP	Decommissioning Plan
EnergySolutions	EnergySolutions, LLC
FSS	final status survey
FSSR	Final Status Survey Report
FT	Field Technician
FUSRAP	Formerly Utilized Sites Remedial Action Program
HASP	Health and Safety Plan
MPP	Master Project Plan
NRC	U.S. Nuclear Regulatory Commission
OM	Operations Manager
PD	Project Director
PHP	Project Health Physicist
PM	Project Manager
POC	point of contact
POD	plan-of-the-day
PQCM	Project Quality Control Manager
PRSO	Project Radiation Safety Officer
PTM	Project Technical Manager
QA	quality assurance
QAM	Quality Assurance Manager
QAPP	Quality Assurance Project Plan
QAQCM	QA/QC Manager
QC	quality control
RC	Remedial Constructor
RPP	Radiation Protection Program
RSO	Radiation Safety Officer
SLRT	Site Lead Radiation Technician

ABBREVIATIONS AND ACRONYMS (continued)

SLRT	Site Lead Radiation Technician
SOHM	Safety & Occupational Health Manager
SOP	standard operating procedure
SRSO	Site Radiation Safety Officer
SS	Site Superintendent
SSM	Site Safety Manager
SSO	Site Safety Officer
STM	Site Technical Manager
WAC	waste acceptance criteria
WC	Waste Coordinator
WCB	Waste Coordinator / Broker
WP	Work Plan

2.0 ORGANIZATION AND RESPONSIBILITIES

This chapter of the Phase II Final Status Survey Report (FSSR) for the Mallinckrodt Columbium-Tantalum (C-T) Plant provides background information on the organization and responsibilities for the Phase II remediation and final status survey (FSS) of the C-T Plant. Phase II remediation and FSS of the C-T Plant were performed by two decommissioning contractors. AECOM Technical Services (AECOM) was on site from January 2011 through July 2012. EnergySolutions, LLC (EnergySolutions) mobilized to the site at the end of July 2012 and completed remediation and FSS activities in February 2013. As on June 2013, all on-site activities (including restoration) have been completed. Chapter 4 of this FSSR details the C-T Plant areas completed by each decommissioning contractor.

2.1 MALLINCKRODT

The follow sections discuss the key Mallinckrodt personnel and responsibilities.

2.1.1 C-T Project Manager

The Mallinckrodt C-T Project Manager (C-T PM) provided overall leadership and management for the Phase II decommissioning. The C-T PM served as the primary point of contact for all interactions between Mallinckrodt and the decommissioning contractors and was the designated contact with the U.S. Nuclear Regulatory Commission (NRC). Responsibilities of the C-T PM included:

- Ensuring that the overall C-T decommissioning project, including the work performed by contractors and subcontractors, was accomplished in conformance with the Phase II Decommissioning Plan (DP) and with applicable health, safety, quality, technical, and contractual requirements;
- Assuring that NRC requirements were met;
- Coordinating activities between plant operations and the decommissioning contractors, using other Mallinckrodt staff or consultants as appropriate to perform this coordination;
- Halt any operation that he or she believed had the potential to threaten the health and safety of site or contractor personnel, the public, or the environment, was not in conformance with the Phase II DP, or was otherwise not meeting NRC requirements; and,
- Ensuring that established environmental programs and contractor environmental programs were in compliance with applicable and relevant laws and regulations.

2.1.2 C-T Radiation Safety Officer

The Mallinckrodt C-T Radiation Safety Officer (C-T RSO) reported to the Mallinckrodt Site Environmental Manager. Responsibilities of the C-T RSO included:

- Ensuring that radiation safety programs were in compliance with applicable and relevant laws and regulations and for auditing the decommissioning contractor's compliance with these programs;
- Advising the C-T PM on matters pertaining to radiation safety; and,
- Halting any operation which he or she believed has the potential to threaten the health and safety of personnel, the public, or the environment.

2.1.3 C-T Site Safety Manager

The Mallinckrodt C-T Site Safety Manager (C-T SSM) reported to the Site Environmental Manager and advises the Mallinckrodt C-T Project Manager on matters pertaining to occupational safety. Responsibilities of the C-T SSM included:

- Ensuring that the C-T Phase II occupational safety program was in conformance with applicable and relevant laws, regulations, and NRC requirements.
- Auditing decommissioning contractor performance to ensure compliance with this Phase II DP and other generally applicable requirements.
- Halting any operation that he or she believed has the potential to threaten the health and safety of personnel, the public, or the environment.

2.2 AECOM

Figure 2-1 provides the key Mallinckrodt and AECOM project personnel. The follow sections discuss the key AECOM personnel and responsibilities.

2.2.1 Project Manager

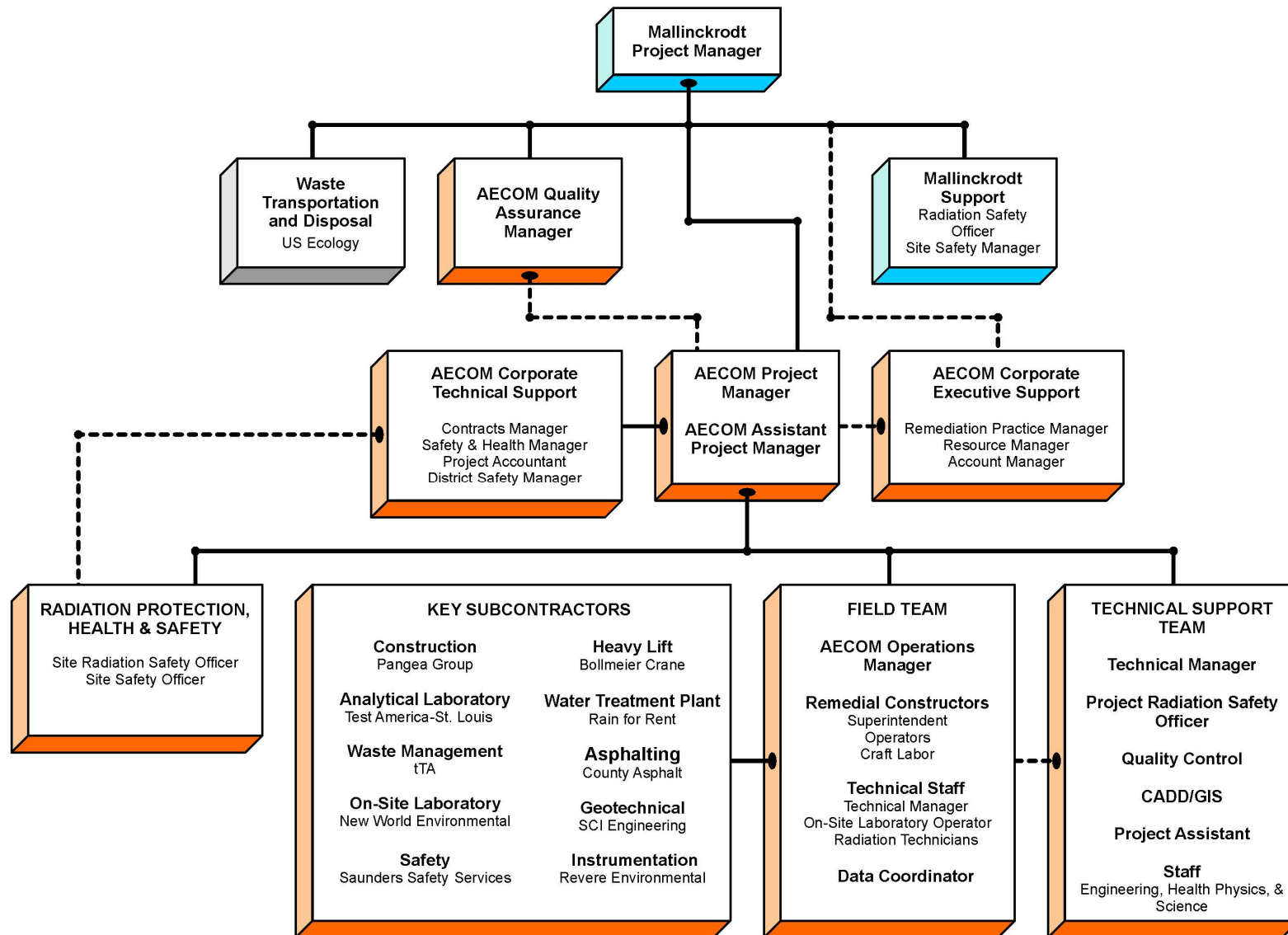
The AECOM Project Manager (AECOM PM) was responsible for all decommissioning activities, and was the primary interface with the Mallinckrodt PM. Primary responsibilities of the AECOM PM included:

- Evaluating the quality of technical services provided for the project, developing AECOM's technical approaches, and determining the level of effort required for each task, and
- Halting any operation that was not being conducted according to health, safety, technical, or contractual requirements.

Additional responsibilities of the AECOM PM included:

- Coordinating the AECOM technical disciplines, AECOM supporting disciplines, Mallinckrodt, and subcontractors, as necessary to ensure that the project progressed on schedule;
- Ensuring that all necessary documents, reviews, and notifications were performed before field-related activities began;

- Initiating project activities;
- Directing project planning activities;
- Ensuring that technical personnel and subcontractors were qualified for their assigned tasks;
- Identifying and fulfilling equipment and other resource requirements;
- Monitoring project activities to ensure compliance with established scopes, schedules, and budgets; and,
- Ensuring overall technical quality and consistency of project activities and deliverables.



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Figure 2-1 AECOM Project Organizational Chart

2.2.2 Project Technical Manager

The AECOM Project Technical Manager (AECOM PTM) was the project technical liaison to the AECOM PM for all technical activities involving engineering and radiological science. The AECOM PTM provided technical guidance and monitoring of field staff ensuring that all personnel adhered to the requirements of the AECOM Master Project Plan (MPP). The AECOM PTM communicated frequently with the AECOM PM and AECOM Field Team leadership, serving as the primary technical authority on engineering issues. The AECOM PTM had the following additional responsibilities:

- Assisting the AECOM PM in implementation of the AECOM MPP;
- Providing consultation to the AECOM PM on all technical matters;
- Ensuring compliance with all applicable regulations concerning the handling and transportation of radioactive materials;
- Assisting with preparation of Corrective Action Reports;
- Reviewing and providing radiological oversight for all construction activities and environmental activities;
- Reviewing and providing technical input for all proposed field changes to project plans;
- Ensuring that field activities were conducted in accordance with project plans and applicable procedures and regulations; and,
- Ensuring proper FSS design, execution, and assessment.

2.2.3 Project Radiation Safety Officer

The AECOM Project Radiation Safety Officer (AECOM PRSO) was responsible for the acceptance of the portion of the AECOM Health and Safety Plan (HASP) that addressed radioactive material and/or radiological contamination. Responsibilities of the AECOM PRSO included:

- Ensuring that the AECOM HASP complied with all Federal, State, and local requirements related to the handling and transportation of radioactive and/or radiologically contaminated materials;
- Overseeing implementation of the AECOM Radiation Safety Program, which included all issues involving licensed radioactive material;
- Ensuring that the AECOM Site Lead Radiation Technicians (AECOM SLRT) were appropriately qualified and trained to implement the portions of the AECOM HASP related to radiation safety and providing direction to the AECOM Site Radiation Safety Officer (AECOM SRSO) on any significant radiation safety issues that arise in the field;
- Assisting in the identification and mitigation of site-specific radiation hazards;
- Providing guidance and oversight in the design and development of the FSS and other radiation surveys;

- Providing review and interpretation for all radiological data derived from field surveys and laboratory analyses; and
- Conducting periodic site radiation safety inspections.

2.2.4 Assistant Project Manager

The AECOM Assistant Project Manager (AECOM APM) assisted in coordination between the AECOM technical disciplines, AECOM supporting disciplines, Mallinckrodt, and subcontractors, as necessary to ensure that the project progresses on schedule. Responsibilities of the AECOM APM included:

- Assisting in project planning activities;
- Ensuring that technical personnel and subcontractors are qualified for their assigned tasks, including routine audits, and reporting to the AECOM PM on exceptions and findings;
- Monitoring project activities to ensure compliance with established scopes, schedules, and budgets;
- Ensuring overall technical quality and consistency of project activities and deliverables;
- Monitoring contracting and purchases to ensure compliance with client and AECOM best practices, as well as facilitating the contracting process;
- Reviewing invoices prior to presenting to AECOM PM for payment; and,
- Reporting directly to the AECOM PM on issues regarding health, safety and compliance with AECOM procedures, and working closely with the AECOM Site Safety Officer (AECOM SSO).

2.2.5 Project Quality Control Manager

The AECOM Project Quality Control Manager (AECOM PQCM) was responsible for overseeing the implementation of quality control (QC) procedures required for both characterization and construction activities for the project. Responsibilities of the AECOM PQCM included:

- Reviewing planning documents to ensure completeness and consistency;
- Overseeing implementation of construction QC measures in accordance with the AECOM Work Plan (WP); and,
- Imposing proper procedures or halting work, as specified in the AECOM Quality Assurance Project Plan (QAPP).

2.2.6 Quality Assurance Manager

The AECOM Quality Assurance Manager (AECOM QAM) was responsible for establishing and assuring overall implementation of the quality assurance (QA) program for this

decommissioning project. The AECOM QAM was independent of Operations and reported directly to the Mallinckrodt C-T PM. Responsibilities of the AECOM QAM included:

- Conducting periodic audits of on-site procedures and was responsible for the proper determination and implementation of corrective actions;
- Ensuring that QC procedures required for both characterization and construction activities were properly implemented and the results documented;
- Approving, controlling, and distributing project documents, material, and data essential to decommissioning, including plans, directives, and field instructions; and,
- Imposing proper procedures or halting work, as specified in the AECOM QAPP.

2.2.7 Field Team

In addition to the AECOM personnel listed above, the AECOM Field Team members and their responsibilities are discussed below.

2.2.7.1 Operations Manager

The AECOM Operations Manager (AECOM OM) served as the primary point of contact (POC) during all field operations, reporting directly to the AECOM PM. Responsibilities of the AECOM OM included:

- Coordinating with the Mallinckrodt C-T PM, St. Louis Plant management, and subcontractors for field implementation of the AECOM WP;
- Maintaining communication with the field crew personnel;
- Overseeing environmental remediation and construction activities, field-generated documentation of decommissioning activities, and control of daily decommissioning operations;
- Working with the AECOM project and corporate management to control costs, meet the schedule goals, and complete the work in a timely and efficient manner with zero accidents; and,
- Halting any activity that has the potential to threaten the health and safety of personnel, the public, or the environment.

Additional responsibilities of the AECOM OM included:

- Ensuring that all personnel are properly trained to perform assigned decommissioning tasks and that the training was documented appropriately;
- Having direct responsibility to ensure that all field activity is protective of the health and safety of project personnel, St. Louis Plant employees, the public, and the environment;
- Preparing daily activity reports and submitting them to the AECOM PM;

- Participating in coordination meetings with the Mallinckrodt project management staff, St. Louis Plant representatives, Formerly Utilized Sites Remedial Action Program (FUSRAP) contractors, other St. Louis Plant contractors, and U.S. Army Corps of Engineers (ACE) representatives;
- Conducting pre-construction meetings prior to initiating each defined feature of work;
- Conducting periodic inspections during decommissioning activities;
- Managing adherence to schedule and budgets; and,
- Managing subcontractor activities.

2.2.7.2 Site Radiation Safety Officer

The AECOM SRSO was responsible for implementation of radiation safety protection for all activities associated with decommissioning operations. The AECOM SRSO reported directly to the AECOM PM, was fully independent of decommissioning operations, and had the authority to halt any operation that, in the AECOM SRSO's professional judgment, had a potential threat to the health and safety of personnel, the public, or the environment. Responsibilities of the AECOM SRSO included:

- Reviewing and accepting the AECOM HASP, including portions covering radioactive material and/or radiological contamination;
- Ensuring that the AECOM HASP complies with all Federal, State, and local requirements related to the handling and transportation of radioactive and/or radiologically contaminated materials;
- Implementing and overseeing AECOM's Radiation Safety Program, which includes all issues involving licensed radioactive material;
- Ensuring that the AECOM SLRT was appropriately qualified and trained to implement the portions of the AECOM HASP related to radiation safety, and that communication was maintained to ensure proper implementation of the AECOM HASP and providing direction on any significant radiation safety issues that arose in the field;
- Conducting periodic site radiation health and safety inspections;
- Providing on-site training of field personnel to convey site-specific radiation protection requirements related to the Radiation Protection Plan (RPP) and applicable standard operating procedures (SOPs);
- Ensuring proper implementation of the AECOM HASP during field activities, including requirements for radiological control measures, decontamination procedures, and personal dosimetry;
- Maintaining all communication necessary to ensure proper AECOM HASP implementation;

- Providing daily updates during the morning safety briefings to review applicable radiological procedures, and alerting the field crew to any change conditions or additional radiation safety issues that may arise that day;
- Overseeing and documenting all radiological surveys, field instrument QC checks, and personnel radiation monitoring;
- Maintaining applicable documentation, and ensuring that the AECOM PM and AECOM RSO received copies of all documentation on a daily basis;
- Maintaining communication with the AECOM PRSO during field activities and coordinating on any radiological issues that may arise;
- Investigating incidents involving radioactive or radiologically-contaminated material, and coordinating with the AECOM RSO to ensure that all reporting requirements were met; and,
- Continuously monitoring the work place for radiologically-unsafe acts or conditions, and initiating corrective actions as necessary.

2.2.7.3 Site Safety Officer

The AECOM SSO was responsible for verifying that the AECOM HASP was followed and that C-T Site personnel were appropriately trained as required. The AECOM SSO reported directly to the AECOM Safety & Occupational Health Manager (SOHM) and had the authority to issue stop work orders on-site tasks that he/she believed may be unsafe. When stopped, work was not resumed until the Project Safety and Health Manager, AECOM RSO and AECOM PM approved the restart. Responsibilities of the AECOM SSO included:

- Reviewing and maintaining personnel training certificates and medical monitoring files (as needed);
- Preparing accident investigation forms;
- Monitoring site security to include the Exclusion Zone boundaries and Support Zone office and field laboratory;
- Conducting appropriate occupational monitoring throughout the project, such as personal air sampling, area air sampling, dust monitoring, and noise monitoring;
- Implementing and overseeing the project AECOM HASP with regard to health and safety;
- Ensuring that field staff were qualified and trained to implement the portions of the AECOM HASP related to health and safety;
- Ensuring that communication was maintained to facilitate proper implementation of the AECOM HASP and providing direction on any significant health and safety issues that arose in the field;
- Conducting periodic site health and safety inspections;

- Providing on-site training of field personnel to convey site-specific health and safety requirements and applicable SOPs;
- Ensuring proper implementation of the AECOM HASP during field activities, including requirements for radiological control measures, decontamination procedures, and personal dosimetry;
- Providing daily updates during the morning safety briefings to review applicable safety procedures and alerting the field crew to any changed conditions or additional safety issues that may arise that day;
- Conducting daily tailgate safety meetings;
- Maintaining applicable documentation, and ensuring that the AECOM PM, AECOM OM, AECOM RSO, and AECOM SRSO receive copies of all documentation on a daily basis;
- Maintaining communication with the AECOM SRSO during field activities and coordinating on any radiological issues that may arise;
- Investigating incidents involving radioactive or radiologically-contaminated material, and coordinating with the AECOM RSO to ensure that all reporting requirements are met;
- Continuously monitoring the work place for unsafe acts or conditions, and initiating corrective actions as necessary; and,
- Ensuring that the Support Zone office, field laboratory, and associated storage locations are locked and secured at the end of each work day.

2.2.7.4 Site Superintendant

The AECOM Site Superintendant (AECOM SS) served as the primary supervisor for construction operations, reporting directly to the AECOM OM. Responsibilities of the AECOM SS included:

- Supporting the AECOM OM with coordination with St. Louis Plant management and subcontractors for field implementation of the AECOM WP;
- Maintaining communication with the field crew personnel;
- Ensuring the technical quality of environmental remediation and construction activities;
- Documenting construction activities;
- Working with the AECOM OM to control costs, meet the schedule goals, and complete the work in a timely and efficient manner with zero accidents;
- Halting any activity that has the potential to threaten the health and safety of personnel, the public, or the environment;
- Ensuring that all personnel were properly trained to perform assigned decommissioning tasks and that the training was documented appropriately;

- Having direct responsibility to ensure that field activity is protective of the health and safety of project personnel, St. Louis Plant employees, the public, and the environment;
- Preparing daily activity reports and submitting them to the AECOM OM;
- Participating in coordination meetings with the Mallinckrodt project management staff, and St. Louis Plant representatives;
- Providing construction safety input for daily tailgate safety meetings;
- Providing construction safety input for pre-construction meetings prior to initiating each defined feature of work;
- Conducting periodic inspections during decommissioning activities; and,
- Supporting the AECOM OM in managing schedule, budgets, and subcontractor activities.

2.2.7.5 Site Technical Manager

The AECOM Site Technical Manager (AECOM STM) was responsible for the efficient and compliant execution of technical activities involving radiological engineering, health physics, and data collection. The AECOM STM was responsible for ensuring that all data collection activities were conducted in accordance with the C-T Phase II DP, the AECOM MPP, and appropriate SOPs. This included radiological surveys conducted to support remediation activities, release of materials and equipment, and FSS; environmental media sampling for on-site and offsite laboratory analysis, and on-site laboratory operations. The STM oversaw the proper operation of the on-site radiological laboratory, including sample preparation, gamma spectroscopy, smear counting, data quality, and data record keeping. In addition, the STM worked with the AECOM Data Coordinator (AECOM DC) to log and track all on-site sample analyses.

The AECOM STM provided technical guidance and monitoring of field staff ensuring that all personnel adhere to the requirements of the C-T Phase II DP, the AECOM MPP, and appropriate SOPs. The AECOM STM was in frequent communication with the AECOM OM, AECOM Field Team leadership, and the AECOM PTM serving as the primary on-site technical authority for radiological activities. The AECOM STM had the following additional responsibilities:

- Assist the AECOM OM in implementation of the AECOM MPP;
- Provide consultation to the AECOM OM on all technical matters;
- Ensure compliance with all applicable regulations concerning the handling and transportation of radioactive materials;
- Assist with preparation of Corrective Action Reports;
- Review and provide radiological oversight for all construction activities and environmental activities; and,
- Review and provide technical input for all proposed field changes to project plans.

2.2.7.6 Data Coordinator

The AECOM DC was responsible for the collection, organization, distribution, and management of all site-survey, analytical, and construction QC data collected during the project. The AECOM DC collected and maintained all completed survey forms, chains of custody (COCs), field log sheets, and other data sheets. The AECOM DC tracked construction and technical metrics to include in weekly reports prepared by the AECOM PM. The AECOM DC was responsible for shipping and receiving of project goods and materials, with AECOM OM approval and oversight. The AECOM DC had the following additional responsibilities:

- Manage personnel records and onsite invoices;
- Track and log all on-site and off-site analytical data;
- Coordinate the regular calibration and checking of laboratory instruments, as necessary;
- Ensure that on-site laboratories are supplied and maintained as necessary; and,
- Collect and maintain records of instrument calibration and laboratory maintenance.

2.2.7.7 Waste Coordinator

The AECOM Waste Coordinator (AECOM WC) ensured the waste was adequately characterized to meet the disposal facility waste acceptance criteria (WAC) and certified that all aspects of sample management, data collection, and corresponding records were compliant with disposal facility data traceability requirements. The AECOM WC was responsible for ensuring that all waste profiles, hazardous waste manifests, bills of lading, and other related documents needed for shipping and acceptance of waste by the disposal facility were properly and accurately completed. The AECOM WC also ensured that all documents requiring signature by a representative of Mallinckrodt (the generator) were properly executed prior to shipment. In addition, the AECOM WC was responsible for ensuring all requirements for shipments by public conveyance were met to such that the containers could eventually be shipped to an approved offsite waste disposal facility.

2.2.7.8 Field Staff

Field Technicians – AECOM Field Technicians (AECOM FTs) were primarily responsible for assisting with site layout tasks, radiological/chemical surveying, sample collection and packaging, support for the field laboratory, and shipping samples to offsite laboratories. Additional duties included performing periodic instrument checks and radiological surveys (e.g., scans of waste containers and remediation equipment). The AECOM FTs also maintained radiological zones and controls, performed surveys of personnel and equipment, and completed instrument and data records with oversight by the AECOM TM.

Remedial Constructors – AECOM Remedial Constructors (AECOM RCs) included heavy equipment operators, truck drivers, and laborers who were primarily responsible for conducting activities associated with site set up, excavation, earth moving, waste handling and packaging, waste storage, waste load out and local transportation, site restoration, and site tear down.

AECOM RCs reported directly to the AECOM SS and worked in accordance with all approved plans, and safety and health regulations.

2.2.7.9 Subcontractors

AECOM was supported by a team of subcontractor firms who provided specialized services throughout the Phase II decommissioning project. Key subcontractor firms that were planned to participate in the project included the following:

- Construction Services – Pangea Group, a St. Louis-based engineering and construction firm, provided labor and heavy equipment for demolition, earthwork, reconstruction, and material handling activities associated with decommissioning operations.
- Waste Management – tTA, a Veteran-owned small business, provided characterization, classification, packaging, marking, and labeling service for radioactive, hazardous, and mixed waste/material streams; in addition tTA provided the AECOM WC who coordinated waste shipments with the railroad and other the FUSRAP contractor sharing the rail siding.
- On-Site Field Laboratory Services – New World Environmental provided on-site radiological laboratory services consisting of gamma spectroscopy (including operator and instrumentation), sample preparation, smear counting, and data management.
- Off-site Laboratory Services – Test America (St. Louis), a Missouri Certified off-site laboratory, provided laboratory analysis on all soil samples collected as part of the characterization and waste profile surveys. The off-site laboratory was responsible for samples received and the associated QA and QC of those samples.
- SCI Engineering – SCI Engineering, Inc., a St. Louis-based engineering firm provided environmental, geotechnical, subsurface investigation, geophysical services, and materials testing services to support this decommissioning project.
- Shoring – Helitech, a union commercial waterproofing, piercing and foundation stabilization contractor, was responsible for design and installation of all shoring required for support of excavated areas. Helitech provided all labor, materials, and equipment to install deep sheet piling, soil netting, and any other form of shoring found to be necessary in support of soil remediation and transport.
- Waste Water Treatment – Rain for Rent has been providing complete liquid handling solutions since 1934. Rain for Rent designed and installed the on-site wastewater treatment system for groundwater and precipitation that collected in the excavation areas.

2.3 ENERGY SOLUTIONS

Figure 2-2 provides the key Mallinckrodt and EnergySolutions project personnel. The following sections discuss the key EnergySolutions personnel and responsibilities.

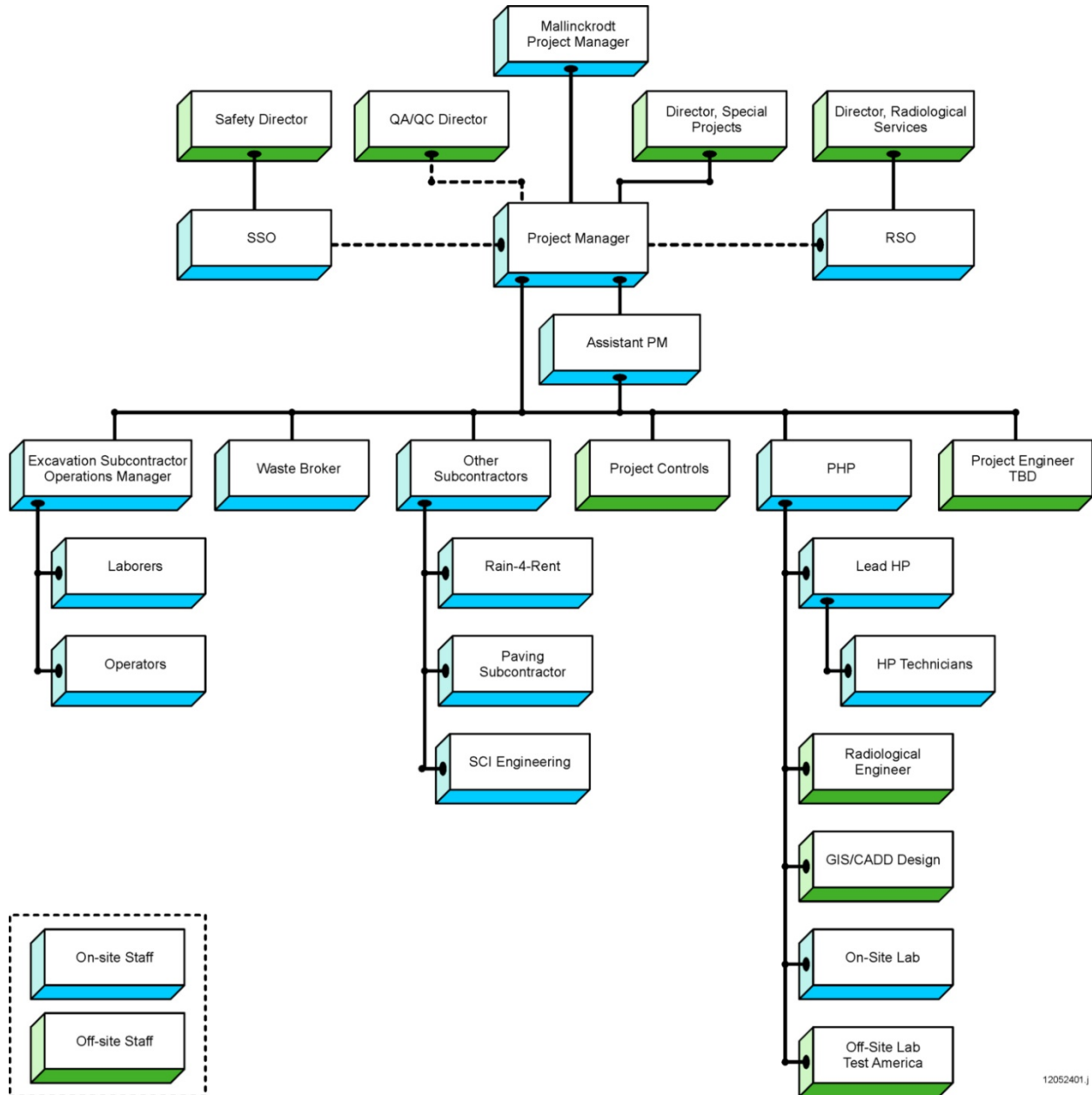


Figure 2-2 EnergySolutions Project Organizational Chart

All EnergySolutions project personnel had the authority to halt any operation that was not being conducted in compliance with Health and Safety practices and procedures.

2.3.1 Project Director

The *EnergySolutions* Project Director (*EnergySolutions* PD) provided single-point accountability to Mallinckrodt. The *EnergySolutions* PD was responsible for:

- Ensuring the transition phase was executed safely, compliantly, and efficiently;
- Demonstrating “readiness” to receive the transfer of operational responsibility; and,
- Identifying and assembling the project organization.

2.3.2 Project Manager

The *EnergySolutions* PM focused on implementation, safety, and compliance and was responsible for all decommissioning activities and being the primary interface with the Mallinckrodt C-T PM. The *EnergySolutions* PM evaluated the quality of technical services provided for the project and determined the level of effort required for each task. In addition, the *EnergySolutions* PM had the authority to halt any operation that was not being conducted according to technical or contractual requirements.

The *EnergySolutions* PM was also responsible for coordination between the *EnergySolutions* technical disciplines, *EnergySolutions* supporting disciplines, Mallinckrodt, and subcontractors, as necessary to ensure that the project progressed on schedule and in budget. The *EnergySolutions* PM worked with the *EnergySolutions* corporate management to control costs, meet the schedule goals, and complete the work in a timely and efficient manner with zero accidents. The *EnergySolutions* PM ensured that all necessary documents, reviews, and notifications were performed before field-related activities began and ensured that all personnel adhered to the requirements of the *EnergySolutions* MPP. Specific responsibilities of the *EnergySolutions* PM included:

- Ensuring the required project plans were reviewed, developed (as necessary), approved, and ready for implementation;
- Performing a self-assessment to demonstrate “readiness” to receive the transfer of operational responsibility;
- Ensuring the integration of some AECOM’s workforce (including subcontractors and vendors);
- Developing and updating the project schedule to support the remaining project activities and deliverables;
- Initiating and directing project activities;
- Ensuring that technical personnel and subcontractors were qualified for their assigned tasks and all training was documented;
- Identifying and fulfilling equipment and other resource requirements;
- Monitoring project activities to ensure compliance with established scopes, schedules, and budgets;

- Ensuring overall technical quality and consistency of project activities and deliverables;
- Monitoring contracting and purchases to ensure compliance with client and EnergySolutions best practices; as well as facilitating the contracting process; and,
- Coordinating daily plan-of-the-day (POD) meetings.

2.3.3 Assistant Project Manager

The EnergySolutions APM supported the on-site Project Management as delegated by the EnergySolutions PM. Specific responsibilities of the EnergySolutions APM included:

- Assisting the EnergySolutions PM in implementation of the EnergySolutions MPP;
- Assisting in project planning activities;
- Performing routine audits, and reporting to the EnergySolutions PM on exceptions and findings;
- Monitoring project activities to ensure compliance with established scopes and schedules;
- Reviewing invoices prior to presenting to EnergySolutions PM for payment;
- Reporting directly to the EnergySolutions PM on issues regarding health, safety and compliance with EnergySolutions procedures; working closely with the EnergySolutions SSO; and,
- Shipping and receiving of project goods and materials with EnergySolutions OM/ EnergySolutions Project Health Physicist (PHP) review and EnergySolutions PM approval.

2.3.4 Site Safety Officer

The EnergySolutions SSO reported directly to the EnergySolutions SOHM. The EnergySolutions SSO focused on the health and safety aspects of the project operations including the health and safety of the public, environment, and project workforce while performing site activities, excavations, and all associated work activities. The EnergySolutions SSO was responsible for reviewing and maintaining personnel training certificates and medical monitoring files (as needed). The EnergySolutions SSO prepared accident investigation forms in accordance with the accident avoidance and reporting procedures of the EnergySolutions HASP. The EnergySolutions SSO was responsible for conducting appropriate occupational monitoring throughout the project, such as physiological, dust, and noise monitoring. Specific responsibilities of the EnergySolutions SSO included:

- Implementing and overseeing the EnergySolutions HASP with regard to health and safety;
- Ensuring that communication was maintained to facilitate proper implementation of the EnergySolutions HASP and providing direction on any significant health and safety issues that arose in the field;
- Conducting periodic site health and safety inspections;

- Providing on-site training of field personnel to convey site-specific health and safety requirements and applicable SOPs;
- Providing input and participating in the daily POD meetings to review applicable safety procedures and alert the field crew to any changed conditions or additional safety issues;
- Continuously monitoring the work place for unsafe acts or conditions, and initiating corrective actions as necessary;
- Ensuring that the Support Zone office, field laboratory, and associated storage locations were locked and secured at the end of each work day; and,
- Maintaining all Health and Safety instrument calibration and QA/QC records.

2.3.5 Radiation Safety Officer

The EnergySolutions RSO ensured implementation of the Radiation Protection Program (RPP). Additional responsibilities included:

- Assisting with preparation of Corrective Action Reports;
- Reviewing and providing radiological oversight for all construction and environmental activities;
- Reviewing and providing technical input for all proposed field changes to project plans;
- Ensuring that field activities were conducted in accordance with project plans and applicable procedures and regulations;
- Assisting in the identification and mitigation of site-specific radiation hazards;
- Conducting periodic site radiation safety inspections;
- Providing on-site training of field personnel to convey site-specific radiation protection requirements related to the RPP and applicable SOPs;
- Providing input and participating in the daily POD meetings; and,
- Ensuring all radiologically controlled areas were properly demarcated, posted, and controlled.

2.3.6 Quality Assurance / Quality Control Manager

The EnergySolutions QA/QC Manager (EnergySolutions QAQCM) was responsible for establishing and assuring overall implementation of the QA program for this decommissioning project. The EnergySolutions QAQCM was independent of Operations and supported the EnergySolutions PM in regards to compliance. Specific responsibilities included:

- Conducting periodic audits of on-site procedures and was responsible for the proper determination and implementation of corrective actions;
- Ensuring that QC procedures required for both characterization and construction activities were properly implemented and the results documented;

- Overseeing the implementation of QC procedures required for both characterization and construction activities for the project;
- Reviewing planning documents to ensure completeness and consistency; and,
- Overseeing implementation of construction QC measures in accordance with the *EnergySolutions* WP.

2.3.7 Waste Coordinator / Broker

The *EnergySolutions* Waste Coordinator / Broker (*EnergySolutions* WCB) ensured the waste was adequately characterized to meet the disposal facility WAC and certified that all aspects of sample management, data collection, and corresponding records were compliant with disposal facility data traceability requirements. The *EnergySolutions* WCB was responsible for:

- Ensuring that all waste profiles, hazardous waste manifests, bills of lading, and other related documents needed for shipping and acceptance of waste by the disposal facility were properly and accurately completed;
- Ensuring all requirements for shipments by public conveyance were met such that the containers could eventually be shipped to an approved offsite waste disposal facility;
- Ensuring compliance with all applicable regulations concerning the handling and transportation of radioactive materials; and,
- Providing input to and participating in daily POD meetings.

2.3.8 Operations Manager

The *EnergySolutions* OM served as the primary POC during all field operations, reporting directly to the *EnergySolutions* PM. Additional responsibilities of the *EnergySolutions* OM included:

- Supervising all equipment operators and laborers in support of site remediation, excavation and waste shipment;
- Ensuring that all field activities were performed safely to ensure the protection of project personnel, St. Louis Plant employees, the public, and the environment;
- Completing work in a timely and efficient manner with zero accidents;
- Preparing daily activity reports and submitting them to the *EnergySolutions* PM;
- Participating in coordination meetings with the Mallinckrodt project management staff, St. Louis Plant representatives, FUSRAP contractors, other Plant contractors, and ACE representatives;
- Providing input and participate in the daily POD meetings;
- Conducting periodic inspections during decommissioning activities; and,
- Supporting the *EnergySolutions* PM in managing schedule and subcontractor activities.

2.3.9 Project Health Physicist

The EnergySolutions PHP focused on the execution of the C-T Phase II DP, the FSS and FSSR. The EnergySolutions PHP was the on-site project technical lead and was the liaison to the EnergySolutions PM for all health physics and radiological activities. The EnergySolutions PHP provided technical guidance in support of site remediation. Additional responsibilities included:

- Provided consultation to the EnergySolutions PM on all health physics matters;
- Ensured proper FSS design, execution, and assessment;
- Provided review and interpretation for all radiological data derived from field surveys and all laboratory analyses;
- Directed the EnergySolutions Lead Health Physicist in the coordination and performance of radiological surveys and sampling, field instrument QC checks and compliance with the C-T Phase II DP, EnergySolutions MPP, and applicable SOPs;
- Maintained and tracked all radiological survey and sample data;
- Maintained all radiological instrument calibration and QA/QC records; and,
- Identified soils requiring remediation and excavation.

2.3.10 Subcontractors

EnergySolutions was supported by a team of subcontractor firms who provided specialized services throughout the Phase II decommissioning project. Key subcontractor firms included the following:

- Construction Services – DEMCO, Inc.¹ provided labor and heavy equipment for demolition, earthwork, reconstruction, and material handling activities associated with decommissioning operations.
- On-Site Laboratory Services – Revere Environmental Services, Inc. provided on-site radiological laboratory services consisting of gamma spectroscopy (including operator and instrumentation), sample preparation, smear counting, and data management.
- Off-site Laboratory Services – Test America St. Louis, a Missouri Certified off-site laboratory, provided laboratory analysis on all soil samples collected as part of the characterization and waste profile surveys. The off-site laboratory was responsible for samples received and the associated QA and QC of those samples.
- Soil Testing – SCI Engineering, Inc., a St. Louis-based engineering firm provided environmental, geotechnical, subsurface investigation, geophysical services, and materials testing services to support this decommissioning project.

¹In August 2012, the company became William Specialty Services, LLC (a subsidiary of Williams Industrial Services Group, LLC).

- Waste Water Treatment – Rain for Rent designed and installed the on-site wastewater treatment system for groundwater and precipitation that collected in the excavation areas.
- Asphalt Paving – County Paving of St. Louis, Mo provided the equipment, labor, and materials to install the Flexible Concrete (Asphalt) in accordance with St. Louis County U.S. Department of Transportation (DOT) standards.

2.4 REFERENCES

AECOM Technical Services, *Decommissioning Mallinckrodt C-T Plant, St. Louis, Missouri, Master Project Plan*, Rev. 1, January 2012.

AECOM Technical Services, *Decommissioning Mallinckrodt C-T Plant, St. Louis, Missouri, Health and Safety Plan*, Rev. 1, January 2012.

AECOM Technical Services, *Decommissioning Mallinckrodt C-T Plant, St. Louis, Missouri, Work Plan*, Rev. 1, January 2012.

AECOM Technical Services, *Decommissioning Mallinckrodt C-T Plant, St. Louis, Missouri, Quality Assurance Project Plan*, FINAL, December 2010.

Mallinckrodt, *Mallinckrodt Columbium-Tantalum Phase II Decommissioning Plan*, Revision 2, August 2008.

EnergySolutions, LLC, *Master Project Plan, Phase II Decommissioning Project, Mallinckrodt C-T Plant, St. Louis, Missouri*, CS-PM-PN-057, Rev. 0, July 27, 2012.

EnergySolutions, LLC, *Health and Safety Plan, Phase II Decommissioning Project, Mallinckrodt C-T Plant, St. Louis, Missouri*, CS-RS-PN-033, Rev. 0, July 26, 2012.

EnergySolutions, LLC, *Work Plan, Phase II Decommissioning Project, Mallinckrodt C-T Plant, St. Louis, Missouri*, CS-RS-PN-033, Rev. 0, July 31, 2012.

EnergySolutions, LLC, *Quality Assurance Project Plan, Phase II Decommissioning Project, Mallinckrodt C-T Plant, St. Louis, Missouri*, CS-QA-PN-025, Rev. 0, July 27, 2012.