

August 31, 2010

Mr. Glenn Marshall, Corporate RSO
Philotechnics Limited
201 Renovare Blvd.
Oak Ridge, TN 37830

SUBJECT: NRC ROUTINE INSPECTION REPORT 150-00020/09-05(DNMS) –
PHILOTECHNICS LIMITED

Dear Mr. Marshall:

On November 4-5, 2009 and May 17-18, 2010, the U.S. Nuclear Regulatory Commission (NRC) conducted an on-site reciprocity inspection of decommissioning activities being performed under your Massachusetts Agreement State Materials License No. 56-0543, at the Sigma-Aldrich Chemical Company's Fort Mims Facility in Maryland Heights, Missouri. At the conclusion of the May 18, 2010, inspection, the NRC discussed the preliminary findings with members of your staff and representatives of the Sigma-Aldrich Chemical Company. On August 10, 2010, the inspectors completed an in-office review of the NRC inspection findings and your sample results, and held a final exit meeting by telephone with you.

This inspection examined decommissioning activities conducted under your license as they relate to radiation safety and to compliance with the Commission's rules and regulations and with the conditions of your license. The inspection evaluated licensing and reciprocity documentation and an examination of project specific procedures, worker training, and interviews with personnel. Specific areas examined during the inspection are identified in the enclosed report.

Based on the inspection findings, no violations of NRC requirements were identified.

In accordance with Title 10 Code of Federal Regulations 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System (ADAMS), accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

G. Marshall

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We will gladly discuss any question you may have regarding this inspection.

Sincerely,

/RA/

Christine Lipa, Chief
Materials Control, ISFSI, and
Decommissioning Branch
Division of Nuclear Materials Safety

Massachusetts Agreement State License No. 56-0543
Docket No. 150-00020

Enclosure:
Inspection Report No. 150-00020/09-05(DNMS)

cc w/encl: R. Gallagher, Massachusetts Department of Public Health
K. Henke, Missouri Department of Health and Senior Services (MDHSS)
J. Langston, MDHSS

G. Marshall

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cc w/encl: R. Gallagher, Massachusetts Department of Public Health
K. Henke, Missouri Department of Health and Senior Services (MDHSS)
J. Langston, MDHSS

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U.S. NUCLEAR REGULATORY COMMISSION
REGION III

Docket No.: 150-00020

License No.: 56-0543

Report No.: 150-00020/09-05(DNMS)

Licensee: Philotechnics Limited

Facility: Sigma-Aldrich Chemical Company
Fort Mims Facility

Location: 11542 Fort Mims Drive
Maryland Heights, Missouri

Dates: November 4 - 5, 2009 (on-site)
May 17 - 18, 2010 (on-site)
In-office review until August 10, 2010
Final exit August 10, 2010

Inspectors: Katie Streit, Health Physicist
Mike McCann, Senior Health Physicist
Lionel Rodriguez, General Engineer

Approved by: Christine Lipa, Chief
Materials Control, ISFSI,
and Decommissioning Branch
Division of Nuclear Materials Safety

Enclosure

EXECUTIVE SUMMARY

Philotechnics Limited Inspection Report No. 150-00020/09-05(DNMS)

Philotechnics is a Massachusetts Agreement State licensee working under U.S. Nuclear Regulatory Commission (NRC) reciprocity to conduct decontamination and decommissioning (D&D) activities at the Sigma-Aldrich Chemical Company (SAC) facility located at 11542 Fort Mims Drive, Maryland Heights, Missouri. Philotechnics was authorized to perform these activities in conjunction with SAC's decommissioning plan, which was approved by the NRC on May 12, 2009. The SAC decommissioning plan approved a phased decommissioning approach for D&D of the facility and the site. The first two phases involved the remediation, decontamination, and subsequent demolition of the building to its concrete slab and were completed in October 2009. The third phase involved locating an historic septic tank and the removal of the facility's concrete pad and was the focus of this inspection. The final, fourth phase, is to complete final status surveys for the release for unrestricted use for the facility and SAC's surrounding land.

In November 2009, the licensee used a ground penetrating radar (GPR) to locate an unused septic tank identified in past licensee documentation. The GPR survey failed to identify the septic tank. However, during the building slab removal activities a concrete septic tank was discovered under a facility stairwell on May 2010. To minimize potential spread of residual contamination, the licensee stopped the concrete pad removal in the immediate area around the newly discovered septic tank.

The NRC inspection focused on evaluating the D&D activities performed by Philotechnics, including; radiation protection practices, conduct of surveys, and transportation. During the inspection, the inspectors discussed the status of the decommissioning activities with Philotechnics and SAC personnel, examined the Agreement State license, reviewed procedures, and observed soil sampling and concrete pad removal activities.

Radiation Protection (IP 83822)

- The inspectors concluded that the licensee was in compliance with NRC regulations and Agreement State license requirements relating to radiation protection. The inspectors further determined that the licensee was compliant with SAC's NRC approved decommissioning plan. (Section 1.0)

Decommissioning Inspection Procedure for Material Licensees (IP 87104)

- The inspectors concluded that the licensee was in compliance with NRC regulations and Agreement State license requirements relating to the concrete pad removal decommissioning activities. The inspectors also determined the licensee was compliant with the SAC's NRC approved decommissioning plan. (Section 2.0)

Inspection of Transportation Activities (IP 86740)

- The inspectors concluded that the licensee complied with NRC and U.S. Department of Transportation (DOT) regulatory requirements for the handling and transportation of radioactive waste. (Section 3.0)

Report Details

1.0 Radiation Protection (IP 83822)

a. Inspection Scope

The inspectors observed licensee radiation protection activities during the conduct of soil sampling and the building's concrete pad removal. Specific radiation protection areas reviewed included use of protective clothing, use of a radiation work permit, access control, and calibration and daily checks of radiological survey equipment. The inspectors also interviewed licensee personnel to determine understanding and knowledge pertaining to radiation protection requirements and practices.

The inspectors reviewed licensee's on-site documentation, which included Sigma-Aldrich Company's (SAC) U.S. Nuclear Regulatory Commission (NRC) approved decommissioning plan, licensee's radiation protection operating procedures, worker training records, radiation work permit, and instrument calibration and daily check records.

b. Observations and Findings

The licensee maintained oversight and access control of the concrete pad removal in accordance with the radiation operating procedures and the SAC NRC approved decommissioning plan. The radiation work permit was modified during the concrete pad removal in accordance with the radiation operating procedures. The licensee was observed wearing appropriate protective clothing during surveys, soil sampling, and handling of potentially contaminated equipment.

The licensee's health physics personnel demonstrated an adequate understanding of radiation safety training and operational safety requirements. Instrument calibration and daily checks were completed in accordance with the licensee's procedures.

c. Conclusion

The inspectors concluded that the licensee was in compliance with NRC regulations and Agreement State license requirements relating to radiation protection. The inspectors further determined that the licensee was compliant with SAC's NRC approved decommissioning plan.

2.0 Decommissioning Inspection Procedure for Material Licensees (IP87104)

a. Inspection Scope

The inspectors observed the licensee's conduct of soil sampling activities, the use of a ground penetrating radar (GPR) to locate a historic septic tank, and the health physics oversight of the former production building's concrete pad removal. The inspectors evaluated the licensee's GPR results and interviewed licensee personnel regarding the failure to discover of the septic tank prior to the concrete pad removal. The inspectors evaluated the licensee's septic tank liquid and sediment sample results supplied to the NRC on August 6, 2010.

The inspectors observed the licensee's survey of concrete pad debris prior to release from the site. The inspectors observed the licensee's survey of four trucks used to haul the debris away and the NRC performed independent confirmatory surveys on two of the trucks.

b. Observations and Findings

The licensee collected and documented locations of soil samples in accordance with SAC's NRC approved decommissioning plan and their procedures. The licensee washed all sample collection tools to minimize cross contamination. The licensee maintained an adequate chain-of-custody and documentation of the samples.

The licensee utilized a GPR to locate a septic tank that had been identified in the licensee's decommissioning documentation. The inspectors observed the GPR operator survey the site by making linear passes approximately two feet apart in accordance with the licensee's procedure. The GPR results and analysis did not identify a buried septic tank.

During building pad removal activities, the septic tank was unexpectedly located under a concrete stairwell. The licensee believed that due to the amount of concrete associated with two concrete footers and the stairwell, that the GPR was not able to detect the concrete septic tank at this location. The licensee stopped excavating in the area immediately adjacent to the concrete pad once the septic tank was discovered to avoid spreading potential residual contamination. The licensee performed liquid and sediment sampling in the septic tank and soil sampling around the septic tank to characterize potential residual contamination. The licensee's survey results indicate residual contamination in both the liquid and surrounding soil at levels comparable with other areas around the site, with a maximum of 161 picocuries per gram of carbon-14 found in the septic tank sediment.

The licensee performed surveys on debris throughout the removal of the concrete pad. The licensee surveyed all pipes discovered during the demolition. Approximately two to three pipes were identified to be contaminated and were subsequently removed and packaged as radiological waste. The licensee performed external surveys on all trucks loaded with debris prior to them leaving the site. The licensee performed fixed and removable surveys on the trucks after they had been emptied to ensure they were free from contamination. The NRC performed confirmatory surveys on two of the trucks and both the licensee and the NRC's surveys identified no contamination.

c. Conclusion

The inspectors concluded that the licensee was in compliance with NRC regulations and Agreement State license requirements relating to soil sampling and decommissioning. The inspectors further determined that the licensee was compliant with SAC's NRC approved decommissioning plan.

3.0 Inspection of Transportation Activities (IP 86740)

a. Inspection Scope

The inspectors evaluated the licensee's packaging and radiological survey activities for radioactive waste shipment. The inspectors also interviewed licensee personnel and reviewed transport documentation.

The NRC inspectors performed an external survey of the transport container and vehicle with an internal Geiger-Mueller survey detector to ensure no unknown contamination was present.

b. Observations and Findings

The licensee prepared contaminated pipes for transport in accordance with their operating procedures and NRC regulations. Waste was placed in 55 gallon transport drums and secured. The licensee performed adequate surveys of the waste and the shipping container prior to shipment. The shipping manifest was completed in accordance with regulations and procedures prior to the shipment. The driver possessed a current driver's license and hazardous waste medical certificate as required by the U.S. Department of Transportation. The licensee's personnel demonstrated adequate knowledge of transportation requirements regarding shipment of radioactive material.

The NRC independent external survey of the transport container and vehicle did not identify any levels greater than the ambient background radiation levels.

c. Conclusion

The inspectors concluded that the licensee complied with the NRC and DOT regulatory requirements and Agreement State license requirements for the handling and transportation of radioactive waste.

4.0 Exit Meetings

The inspectors presented preliminary inspection findings to the licensee's project manager at the conclusion of the onsite inspection on November 4-5, 2009 and May 18, 2010. A final telephone exit was conducted on August 10, 2010 with the Radiation Safety Officer. The licensee did not identify any documents or processes reviewed by the inspectors as proprietary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

*Ryan Fahay, Philotechnics Limited, Project Manager

*Tom Spenser, Sigma-Aldrich Chemical Company, Radiation Safety Officer

#Glenn Marshall, Philotechnics Limited, Corporate Radiation Safety Officer

* Persons present at the preliminary exit meetings on November 5, 2009 and May 18, 2010.

Persons present at the telephonic exit meeting on August 10, 2010.

INSPECTION PROCEDURES USED

IP 83822	Radiation Protection
IP 87104	Decommissioning Inspection Procedure for Material Licensees
IP 86740	Inspection of Transportation Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened None

Closed None

Discussed None

PARTIAL LIST OF DOCUMENTS REVIEWED

Licensee documents reviewed and utilized during the course of this inspection are specifically identified in the "Report Details" above.

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
CFR	Code of Federal Regulations
D&D	decontamination and decommissioning
DOT	U.S. Department of Transportation
GPR	Ground Penetrating Radar
IP	Inspection Procedure
NRC	U.S. Nuclear Regulatory Commission
RSO	Radiation Safety Officer
SAC	Sigma-Aldrich Chemical Company