December 2, 2005

Mr. Ben Baker
Project Manager
The Dow Chemical Company
47 Building
Midland, MI 48674

SUBJECT: NRC INSPECTION REPORT 040-00017/05-001(DNMS)
THE DOW CHEMICAL COMPANY BAY CITY SITE (THORAD PROJECT),
BAY CITY, MICHIGAN

Dear Mr. Baker:

On November 9, 2005, the NRC completed an inspection at the Dow Chemical Company Bay City site (Thorad Project), Bay City, Michigan. The purpose of the inspection was to determine whether decommissioning activities were conducted in accordance with your decommissioning plan (DP), radiological health and safety plan (RHASP), and NRC regulations. Specifically, during an on-site inspection on September 29, 2005, the NRC inspector evaluated the performance of your final status surveys, sample collection and analysis, and field laboratory operations. The inspector also obtained soil samples previously analyzed by your on-site lab to be counted at the NRC's contract laboratory in Oak Ridge, Tennessee. At the conclusion of the on-site inspections, the NRC inspector discussed the preliminary findings with members of your staff. On November 9, 2005, the inspector completed an in-office review of the laboratory data results for the soil samples that were collected during the inspection and conducted a telephone exit interview with Mr. David Fauver.

This inspection consisted of an examination of decommissioning activities at the Thorad Project site as they relate to safety and compliance with the Commission's rules and regulations. Areas examined during the inspection are identified in the enclosed report. Within these areas, the inspection consisted of a selective examination of representative records, interviews with personnel, and independent confirmatory measurements.

Based on the results of this inspection, the NRC did not identify any violations of NRC regulatory requirements.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). The NRC's document system is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

/RA by W. Snell Acting for/

Jamnes L. Cameron, Chief
Decommissioning Branch
Division of Nuclear Materials Safety

License No. STB-527
Docket No. 040-00017

Enclosure: Inspection Report 040-00017/05-001(DNMS)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No.:	040-00017
License No.:	STB-527
Report No.:	040-00017/05-001(DNMS)
Licensee:	The Dow Chemical Company (TDCC)
Facility:	TDCC Bay City (Thorad Project) Site
Location:	Bay City, MI
Dates:	September 29, 2005 (on-site inspection) November 9, 2005 (in-office review and telephone exit)
Inspector:	Gene Bonano, Health Physicist
Approved By:	Jamnes L. Cameron, Chief Decommissioning Branch Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

The Dow Chemical Company (TDCC)
Bay City (Thorad Project) Site, Bay City, MI
Inspection Report No. 040-00017/05-001(DNMS)

The radioactive material at the Bay City site consists of foundry slag containing magnesium with up to 2 percent of thorium-232 (Th-232). This material was produced between 1940 and 1970 as residual from the production of magnesium-thorium alloy for defense purposes (including aircraft engines and aeronautical structural components). Portions of the process slag have been mixed with soil or limited amounts of construction debris (about 1 percent of the total volume). As a result of the mixing, the thorium concentrations vary from 2 to 7,000 picocuries per gram (pCi/g) at the Bay City site. The estimated total activity of 9.7 Ci of Th-232 is distributed through approximately 60,000 yards of slag, soil, and construction debris. TDCC contracted the URS Corporation (formerly Radian International) to remove the thoriated material from the site.

The inspector evaluated the performance of the contractor's: 1) remediation and radiological final status surveys, and 2) sample collection, analysis, and field laboratory operation to determine if work was being conducted in accordance with the licensee's, "Supplement To The Decommissioning Plan For Removal Of Magnesium-Thorium Slag From The Dow Chemical Company's Bay City, Michigan Site," Revision 2, dated March 17, 2005, and the "Radiological Health And Safety Plan (RHASP)," Revision 3, dated May 2005.

Close-out Inspection and Survey

- The inspector concluded that the licensee and its contractor conducted the remediation and final status surveys, sample collection, analysis, and field laboratory operation in accordance with the approved decommissioning plan.

Decommissioning Inspection Procedure for Materials Licensees

- The inspector concluded that the licensee conducted all decommissioning activities safely and in accordance with their RHASP and NRC regulations.

Report Details

1 Closeout Inspection and Survey (83890)

1.1 Inspection Scope

The inspector evaluated the performance of the licensee's remediation, final status surveys (FSS), sample collection, analysis, and field laboratory operation, to verify that work was done in accordance with the licensee's procedures, decommissioning plan (DP) and the supplement to the DP titled, "Supplement To The Decommissioning Plan For Removal Of Magnesium-Thorium Slag From The Dow Chemical Company's Bay City, Michigan Site," Revision 2, dated March 17, 2005. The inspector interviewed contractor personnel, and obtained soil samples previously analyzed by the licensee's on-site lab to be counted at the NRC's contract laboratory in Oak Ridge, Tennessee.

1.2 Observations and Findings

During the inspection, the licensee's contractor completed a 100 percent walkover survey of the affected site and collected soil samples in accordance with procedure, "SOP 1.2 Revision 01 - Radiological Surveys," and the supplement to the DP. The contractor performed quality assurance on the field and laboratory instruments, and analyzed soil samples in accordance with their approved written procedures, "SOP 1.21 Revision 01 - Soil Sample Counting and Gamma Spectroscopy Analysis," "SOP 1.22 Revision 01 - Calibration of the Dow THORAD Project Gamma Spectrometer," and "SOP 1.23 Revision 0 - Quality Assurance for Gamma Spectroscopy Counting System." The licensee's procedures were consistent with the DP, no problems were noted.

The inspector did not identify any deficiencies with the contractor's surface scan results, or the radiological analytical results of the soil samples counted in the contractor's on-site laboratory. The contractor implemented a laboratory quality assurance program, which consisted of sending 5 percent of the soil samples (duplicates) to an independent third party laboratory for analysis. The inspector did not identify any concerns with the laboratory quality assurance program.

The inspector obtained five of the licensee's soil samples (previously analyzed by the licensee's on-site lab) and sent them to the NRC's contract lab, the Environmental Survey and Site Assessment Program (ESSAP) of the Oak Ridge Institute for Science and Education (ORISE), for analysis to verify the adequacy of the licensee's analytical counting capability.

The analytical results of the soil samples obtained by the NRC showed good agreement and are listed below:

DOW Sample ID	ESSAP Sample ID	NRC Region III Sample ID	DOW's Radionuclide Concentrations (pCi/g)	ESSAP's Radionuclide Concentrations (pCi/g)
			Thorium-232 (by Lead-212)	**Thorium-232** (by Actinium-228)
C3-5B-U-I-1	1675S0001	NRC-1	10.36 ± 1.04	8.39 ± 0.75
C3-5B-U-B-1	1675S0002	NRC-2	4.31 ± 0.55	3.96 ± 0.39
C3-5B-U-B-2	1675S0003	NRC-3	8.91 ± 0.83	8.50 ± 0.71
C3-5B-U-B-3	1675S0004	NRC-4	3.98 ± 0.69	4.56 ± 0.42
C3-5B-U-B-4	1675S0005	NRC-5	3.58 ± 0.57	3.15 ± 0.31

1.3 Conclusions

The inspector concluded that the licensee and its contractor conducted the remediation and final status surveys, sample collection, analysis, and field laboratory operation in accordance with the approved DP.

2 Decommissioning Inspection Procedure for Materials Licensees (87104)

2.1 Inspection Scope

The inspector evaluated the licensee's decommissioning activities to determine if activities were conducted safely and in accordance with their, "Radiological Health and Safety Plan (RHASP)," Revision 3, dated May 2005. The Inspector also observed and evaluated: postings, security and control of contaminated material, off-site environmental monitoring (air samplers), management organization and controls, occupational health and safety issues related to non-radiological safety hazards (OSHA), radioactive waste management, and low-level radioactive waste storage. The inspector interviewed Dow and contractor personnel, and reviewed related documents and procedures.

2.2 Observations and Findings

The licensee's decommissioning activities consisted of: 1) characterizing the thorium clean-up site; 2) performing daily/weekly area surveys of the field office laboratory complex, and final status surveys of the affected site; 3) soil and water sample collection and analysis; 4) remediation (excavation and removal of contaminated soils from the affected site); and 5) transferring contaminated soil from the work site to the licensee's railroad loading area (temporary storage site). The licensee maintained radiation work permits (RWPs) for all work performed on site. All RWPs were complete and thorough in addressing the radiological hazards present, and maintained ALARA goals as stated in the RHASP. Radiation workers received pre-job briefings, and their training records were complete and up to date. The licensee conducted an annual radiation protection

program assessment. The inspector reviewed the calendar year 2005 report of the licensee's latest assessment and determined that the licensee was thorough in their assessment of their program, and no problems were noted. An annual review of the decommissioning procedures and ALARA committee meetings results performed in accordance with the licensee's RHASP.

The licensee maintained appropriate safeguards to ensure security and control of material on site are in accordance with their procedures and regulatory requirements. All postings were in accordance with 10 CFR Part 20. The licensee also maintained an offsite environmental monitoring program using air samplers on a routine basis. The inspector did not identify any problems with the air sample results or the placement of the air samplers. In the area of management organization and controls, the licensee maintained proper levels of expertise and independence for job positions. The inspector did not note any OSHA concerns during the inspection.

The licensee demonstrated proper use of survey instruments, and radiological survey records were detailed and complete. The licensee ensured that areas are free from contamination, especially the path between the truck loading area and the railroad loading area. During calendar year 2006, the licensee intends to load contaminated soil into railcars for disposal to an authorized waste disposal facility. Until then, the licensee will protect the waste pile (temporary storage site) from the weather to prevent any contaminated soil from being dispersed by the wind or rain.

2.3 Conclusions

The inspector concluded that the licensee conducted all decommissioning activities safely and in accordance with their RHASP and NRC regulations.

3 Exit Meeting

The inspector presented preliminary inspection results to the licensee at the conclusion of the on-site inspection on September 29, 2005. A final exit meeting was conducted by telephone on November 9, 2005, with the Project Health Physicist (PHP) to discuss the NRC's in-office review of the analytical results of the soil sample analyses. The PHP acknowledged the findings presented, and did not identify any materials that could be included in the inspection report as proprietary.

PARTIAL LIST OF PERSONS CONTACTED

D. Nelson, NRC Project Manager, NMSS, DWM
D. Gruben, Michigan Department of Natural Resources (MDNR)
B. Baker, Dow Project Manager
D. Richards, Dow Project Radiation Safety Officer (RSO)
D. Fauver, Dow Project Health Physicist (PHP)

INSPECTION PROCEDURES USED

IP 83890	Closeout Inspection and Survey
IP 87104	Decommissioning Inspection Procedure for Materials Licensee

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened	None
Closed	None
Discussed	None

LIST OF ACRONYMS USED

ADAMS	Agencywide Documents Access and Management System
ALARA	As Low As Reasonably Achievable
CFR	Code of Federal Regulations
DNMS	Division of Nuclear Materials Safety
DP	Decommissioning Plan
ESSAP	Environmental Survey and Site Assessment Program
FSS	Final Status Survey
NRC	Nuclear Regulatory Commission
ORISE	Oak Ridge Institute for Science and Education
OSHA	Occupational Safety and Health Administration
PARS	Publicly Available Records
pCi/g	picrocuries per gram
RHASP	Radiological Health and Safety Plan
RSO	Radiation Safety Officer
RWP	Radiation Work Permit