

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 999-90063/94002(DRSS)

Terminated License Nos. SMB-0833 and STC-0833

Facility: Formerly the Michigan Chemical Corporation
St. Louis, Michigan

Inspection Conducted: March 28 and 29, 1994

Inspectors:

M. F. Kurth
M. F. Kurth
Radiation Specialist

July 1, 1994
Date

D. G. Wiedeman
D. G. Wiedeman
Senior Health Physicist

07/07/94
Date

Approved By:

G. M. McCann
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Fuel Facilities and Decommissioning
Section

07/07/94
Date

Inspection Summary

Inspection on March 28 and 29, 1994 (Report No. 999-90063/94002(DRSS))

Areas Inspected: This was a special inspection to verify that the proper access controls surrounded the thorium and uranium storage site, thorium and uranium concentrations were not in excess of NRC requirements for surface soil (0-15 cm), onsite groundwater or the adjacent river water or sediment, the proper postings were utilized, and excessive exposure rates did not exist from the storage of the thorium and uranium in the ground.

Results: The NRC inspectors verified that the proper access controls surrounded the thorium and uranium storage site, no levels were identified above NRC requirements of uranium and thorium for onsite surface soil, onsite groundwater or river water or sediment samples, and the proper postings were utilized. Also, no exposure rate measurements were identified above natural background [natural background \approx 7-10 microroentgen/hour (μ R/hr) or 1.8-2.5 nanocoulombs/kilogram/hr (nC/kg/hr)].

DETAILS

1. Persons Contacted

- *Randy Gentry, Memphis Environmental Center, Inc.
- *Jim Mitchell, Health Physicist, Environmental Protection Agency (EPA), Region V
- *Timothy Prendiville, Life Scientist, EPA, Region V
- *Robert Skowronek, Health Physicist, Michigan Department of Public Health
- *Waleigh Wagaw, Environmental Quality Analyst, Michigan Department of Natural Resources
- *David Iacovone, Ecology and Environment, Inc.

*Indicates those present at the preliminary onsite exit meeting held on March 28, 1994.

2. Background

The Michigan Chemical Corporation (MCC), now Velsicol Chemical Corporation (Velsicol), owned and operated a plant in St. Louis, Michigan, for the manufacturing of chemical products. The products were a variety of fire retardants and insecticides (halogenated hydrocarbons including DDT, PBB, and Tris), animal food supplements, and rare earth oxides. The plant was shutdown in September 1978, and upon request of the Michigan Department of Natural Resources (MDNR), a study was made to investigate the extent of chemical contamination on the 55 acre site. The study concluded that the site was contaminated with toxic organic compounds. Therefore, the MDNR requested Velsicol to develop a Site Environmental Security Plan to stabilize the site soils. The plan called for the following: the demolition of all onsite structures; the installation of a slurry wall; an upgradient groundwater interceptor drain; a clay cap; a fence surrounding the site; signs inside the fence warning that the site contains toxic chemicals; and a granite marker at each gate warning that the site contains hazardous chemicals.

These requirements and specific land use restrictions were imposed on Velsicol by a Consent Judgement issued by a U.S. District Court on December 27, 1982.

From 1965 to 1971 MCC extracted rare earth metals at the St. Louis site using rare earth concentrates, which contained licensable quantities of source material. MCC applied for and on May 18, 1965, was issued Source Material License No. STC-0833 for possession only of thorium. The license was later amended to authorize possession and use of uranium and thorium and Source Material License No. STC-0833 was changed to Source Material License No. SMB-0833. The plant operated until April 1971 when License No. SMB-0833 was terminated. No radiological survey was made by MCC or the Atomic Energy Commission (AEC) prior to license termination.

In January 1981, NRC Region III personnel visited the site and found radiation levels in the buildings and on the grounds in excess of current NRC guidelines for unrestricted areas. At the request of the NRC, Velsicol performed a comprehensive radiological survey of the site to determine the extent of the contamination.

In October 1981, the NRC published a Branch Technical Position to provide guidance for the disposal of uranium and thorium residues. The position identified 5 options for decontaminating and disposing of soil contaminated with source and special nuclear material. Option 1 specifies acceptable levels of contamination in unrestricted areas; Options 2 through 4 specify allowable concentrations, burial requirements, and future land restrictions for material disposed in soil. The radiological survey report from Velsicol indicated that less than 2 percent of the St. Louis, Michigan site exceeds the criteria in Option 1 and only a small area ($\approx 500 \text{ ft}^2$) exceeds the concentration in Option 4. Also, the stabilization plan imposed by the Consent Judgement meets the burial requirements and land use restrictions specified in Option 4 of the Branch Technical Position.

3. Independent Measurements

The NRC inspectors conducted radiological surveys of the 55 acre site, performing general surveys around the perimeter of the site, several general areas within the site, and particular areas identified where uranium and thorium were previously stored and used. The survey instruments used were a Ludlum Model 19 microR meter, last calibrated August 10, 1993, and a Victoreen Model No. 190 with attached pancake probe, last calibrated February 14, 1994. The inspectors did not identify any areas above natural background [natural background $\approx 7\text{--}10$ microroentgen/hour ($\mu\text{R/hr}$) or $1.8\text{--}2.58$ nanocoulombs/kilogram/hr (nC/kg/hr)].

No violations of NRC requirements were identified.

4. Access Control

Access to the 55 acre site is controlled by a chain-link security fence. A visual inspection of the fence verified that it was securely in place. Also, the entrance gate is chained with a padlock.

No violations of NRC requirements were identified.

5. Postings

Due to the chemical hazard associated with the 55 acre site, the perimeter fence line had signs posted which read, "Warning Toxic Chemical Burial Area Keep Out." These signs are posted in numerous areas on the fence. Velsicol is not required by the NRC to post caution signs for radioactive materials, therefore, none are in place.

A permanent marker is in place at the entrance gate to the 55 acre site. The marker reads, "Warning. Do Not Enter. This Fenced Area Was The Site Of A Chemical Plant. The Ground Contains Chemicals Which May Be Toxic Or Hazardous And Also Contains Low Level Radioactive Waste. The Area Has Been Capped and Secured. Trespassing Strictly Prohibited."

No violations were identified.

6. Surface Soil, Groundwater, River Water, and River Sediment Analysis

On March 28 and 29, 1994, surface soil, groundwater, river water, and river sediment samples were taken for analysis from the 55 acre site. A surface soil sample (0-15 cm) was taken from an area, identified in Attachment No. 2, where uranium and thorium was previously used and stored. Three groundwater monitoring wells were sampled. The wells, identified in Attachment No. 2, are located in particular areas where thorium and uranium were stored and used. Also, a river water sample and river sediment sample were taken from an area identified in Attachment No. 2. The Oak Ridge Institute for Science and Education (ORISE) analyzed the water samples for radioactive contaminants. The Region III laboratory analyzed the soil and sediment samples.

The groundwater analysis identified one sample, Monitoring Well No. GWM-11, which contained small traces of uranium-234 and uranium-238. The concentrations are 9.6 picocuries per liter (pCi/l) [0.35 becquerel per liter (Bq/l)] of uranium-234 and 9.36 pCi/l (0.35 Bq/l) of uranium-238. These concentrations are below the 10 CFR Part 20.1302, Compliance with dose limits for individual members of the public, concentrations in water listed in Part 20, Appendix B, Table 2, Column 2, which for uranium-234 and uranium-238 is 3.0×10^{-7} microcuries per milliliter ($\mu\text{Ci/ml}$) [0.01 Bq/ml].

The health and safety significance is minimal. The 10 CFR Part 20 Appendix B, Table 2, Column 2 water concentrations are based on the principle that if the water were continuously ingested over the course of a year the individual would receive a total effective dose equivalent of 0.05 rem [0.5 millisieverts]. This dose is 1/100 the dose allowed for occupational workers as regulated by the NRC. Also, the groundwater is currently stored onsite and will be chemically treated prior to its release.

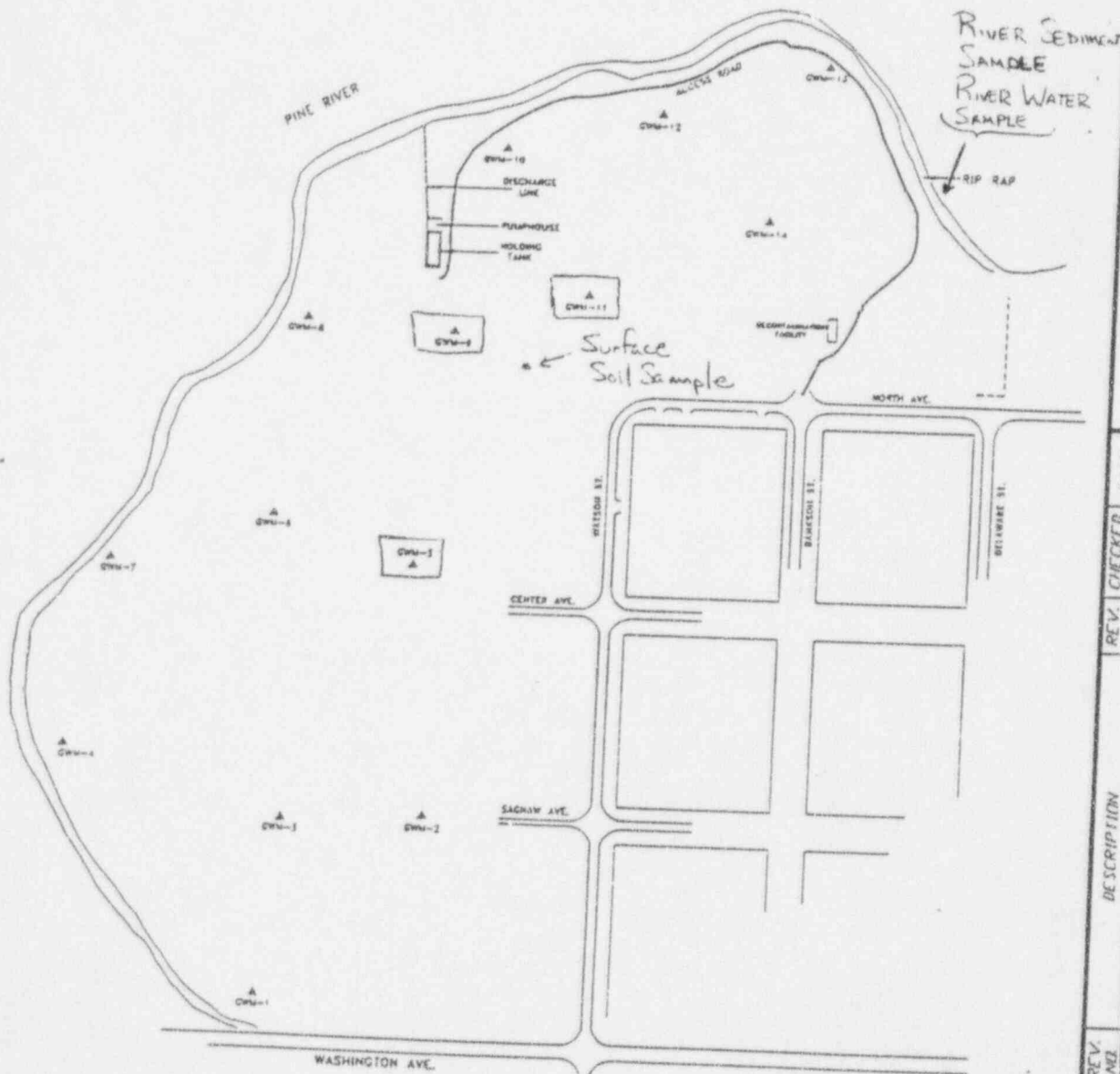
The other groundwater well samples identified no radionuclide concentrations above the minimal detectable limits. Also, the surface soil sample, river water sample and river sediment sample analyses identified no concentrations of radionuclides above the minimal detectable levels.

No violations of NRC requirements were identified.

7. Exit Meeting

During the onsite inspection on March 28, 1994, the inspectors met with Mr. Gentry of the Memphis Environmental Center, Inc., Mr. Skowronek of the Michigan Department of Public Health, and Mr. Miller of the EPA and other representatives identified in Section No. 1 of this report. A summary of the areas inspected and the forthcoming letter were discussed. Mr. Gentry did not indicate that any information provided during the inspection was proprietary.

ATTACHMENT No. 2



Ground Water Monitoring
Wells Sampled:

GWM-5
GWM-9
GWM-11



MONITORING WELL LOCATION DIAGRAM
VELSICOL CHEMICAL CORPORATION
ST. LOUIS PLANT SITE
701 WASHINGTON STREET
ST. LOUIS, MICHIGAN

REV. NO.	DESCRIPTION	REV. BY	CHECKED BY	DATE

MEMPHIS ENVIRONMENTAL CENTER, INC.
8003 Poplar Avenue, Suite 100
Memphis, Tennessee 38122

DATE: 11/15/93
DRAWN BY: DKB
CHECKED BY: [Signature]
DATE: 11/15/93