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**CYPRESS CREEK SUB-AREA III
2005 INTERIM MEASURES INVESTIGATION**

Prepared For:



Velsicol Chemical Corporation
1199 Warford Street
Memphis, Tennessee 38108

Prepared By:

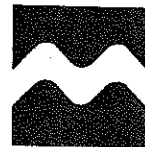


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OCTOBER 2005

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October 28, 2005

Mr. J. M. Apple, Director
Tennessee Department of Environment and Conservation
Division of Solid Waste Management
L&C Tower, 5th Floor
401 Church Street
Nashville, Tennessee 37243-1535

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**Re: Cypress Creek Sub-Area III
2005 Interim Measures Investigation
Velsicol Chemical Corporation, Memphis, Tennessee
Tennessee Permit No. TNHW-109**

Dear Mr. Apple:

Enclosed, on behalf of Velsicol Chemical Corporation, is the Sub-Area III 2005 Interim Measures Investigation Report. This document describes the soil sampling and testing that Velsicol performed during August 2005.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions on this report, please contact me at 901-380-9995, ext. 120.

Sincerely,

Memphis Environmental Center, Inc.

Gary J. Hermann, P.E.
Senior Environmental Projects Manager

Enclosures

c: Mike Apple, TDEC (3 copies and one electronic copy)
Jon Johnston, EPA
Phillip Davis, TDEC Memphis Field Office
Ronald Loving, Velsicol
Paul Patterson, City of Memphis Public Works
Norman LaChapelle, Memphis and Shelby County Health Department
Chris Saranko, GeoSyntec Consultants

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1.0 INTRODUCTION AND BACKGROUND

This report presents the methods and findings of an environmental investigation performed by Velsicol Chemical Corporation (Velsicol) of Cypress Creek Sub-Area III in Memphis, Tennessee on August 11-12, 2005 (the "2005 Investigation"). The investigation was performed as directed by the Tennessee Department and Environment and Conservation (TDEC). The investigation is part of an ongoing Resource Conservation and Recovery Act (RCRA) Corrective Action Program related to Velsicol's manufacturing plant at 1199 Warford Street in Memphis. It follows Velsicol's investigations of the area along most of Cypress Creek performed during 2001, the Cypress Middle School - University Park area during 2002, and Sub-Area III during 2003 and 2004.

Based on the results of the 2004 Investigation, TDEC directed Velsicol to perform Interim Measures to further assess the extent of contamination in Sub-Area III (Ref. Interim Measures directive dated June 9, 2005). The objective of this 2005 Investigation was to determine pesticide contamination at residential properties adjacent to three of the previously tested properties that exhibited greater than 3.0 parts per million (ppm) representative dieldrin. TDEC subsequently directed Velsicol to also collect and test soil samples at the day care facility at 1005 Meagher St.

The investigation work was performed in accordance with Velsicol's July 7, 2005 Work Plan, which was approved by TDEC on July 15, 2005. This report also includes information on soil samples that Velsicol collected from along Cypress Creek at University Park in cooperation with the City of Memphis in support of their Drain Maintenance Department's concrete liner repair work. This report was prepared by Premier Environmental Services, Inc. (Premier), who supported Velsicol's Memphis Environmental Center, Inc. (MEC) in the soil sample collection work and who performed the data quality review.

Section 2 of this report describes the soil sampling methods and locations and analytical methods used in the investigation. **Section 3** presents the analytical results and data quality.

2.0 SAMPLE COLLECTION AND ANALYSES

2.1 Sample Locations

A total of 11 soil samples (plus duplicates) were collected and analyzed. Of the 11 soil samples, seven were collected from six different residential properties, two were collected from a day care center, one was collected from a break in the concrete bottom liner near University Park, and one was collected from the overbank near the break in the concrete liner. The location of the 2005 soil samples are shown on *Figures 2* through *4* along with the previous and relevant 2001, 2003, and 2004 samples.

MEC obtained prior resident and/or landowner permission to sample each property. During the 2005 Investigation the general sample collection approach was to collect a five point composites from specific properties. If the property was large or of special interest then two samples were collected. There were exceptions to this approach due to property shape and size.

2.2 Sample Collection and Handling Methods

Soil samples were collected by Premier and MEC on August 11 and 12, 2005. TDEC provided oversight and support each day of sample collection. *Table 1* lists the sample locations and collection dates. The locations of the duplicate sample collected and other pertinent information are noted. Additional details on the 2005 sample locations are presented in *Appendix A*.

With the exception of the grab samples collected at University Park, near the break in the concrete liner, each sample was a 5-point composite sample. The 5-point composite was collected and thoroughly mixed in equal proportions in stainless steel bowls and then placed in glass jars for transportation and laboratory testing. Hand-drawn sketches with survey tape measurements from permanent structures, photographs and global positioning satellite (GPS) coordinates were used to document the sample locations.

The samples collected at the break in the concrete liner of Cypress Creek near University Park were both grab samples. The University Park Overbank sample was collected 8 feet deep on the bank of the channel. The University Park Bottom sample was collected at the bottom of the channel where the concrete was missing. The Bottom sample was a surface sample from about two inches deep.

The sample collection and handling methods, including equipment decontamination procedures, were performed in accordance with the TDEC approved Sampling and Analysis Procedures for the RCRA Corrective Action Program (the SAP), as revised January 30, 2003, and the April 8, 2004 Interim Measures Work Plan, unless otherwise noted. The soil samples, excluding the University Park samples, were collected from the 0- to 9-inch depth interval using hand operated soil augers. Where vegetated sod was encountered, the soil was shaken from the roots into the sample-mixing bowl and organic matter, such as roots and leaves, and inert material, such as gravel, was discarded.

As noted on *Table 1*, Premier collected one duplicate soil sample. A field rinse blank was also collected from sampling tools on August 12, 2005. The samples were placed in coolers on ice in the field. The samples were transported on ice and under chain of custody protocols by Premier to GTW Analytical Services, LLC in Memphis for laboratory testing.

2.3 Soil Testing

GTW Analytical Services, LLC of Memphis, Tennessee analyzed the soil and rinse blank samples. All of the soil samples were analyzed in accordance with the TDEC-approved SAP, using the Gas Chromatography (GC) method, EPA SW-846 Method 8081A, as was used for all of Velsicol's previous Corrective Action Program testing. All of the soil samples were also analyzed for moisture content, using EPA SW-846 Method 3550B.

3.0 SOIL ANALYTICAL RESULTS

3.1 Laboratory Analytical Results

The laboratory analytical results from the 2005 soil testing are summarized in *Table 2*. Copies of the GTW laboratory reports were submitted to TDEC as follows:

- August 11, 2005 samples, GTW report # R-250719 reported on August 22, 2005.
- August 12, 2005 samples, GTW report # R-250720 reported on August 22, 2005.

3.2 Data Quality Evaluations

The quality of the laboratory analytical data were evaluated by Premier, in accordance with the SAP, to achieve Data Quality Objective Level III prior to incorporation into the project database. Premier's Analytical Data Quality Assessment and Validation Report (Data Validation Report) is provided in *Appendix B*. With the exception of two results for the University Park – Overbank sample, all analytical data were acceptable with some sample results requiring qualifications. The results for aldrin and 4,4'-DDT (both non-detect) in the above referenced sample were rejected due to zero MS/MSD recoveries.