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July 8, 2002

Mr. William Lowe
RCRA Permits and Compliance Branch
U.S. Environmental Protection Agency
Region VII
901 North 5th Street
Kansas City, Kansas 66101

Re: RFI/CMS Quarterly Progress Report No. 61
Harcros Chemicals Inc.
Kansas City, Kansas

Dear Mr. Lowe:

On behalf of Harcros Chemicals Inc. and T H Agriculture & Nutrition, L.L.C., we are enclosing three copies of the quarterly progress report for the RCRA Facility Investigation/Corrective Measures Study at the Harcros facility in Kansas City, Kansas. This progress report addresses the April through June 2002 reporting period.

Please do not hesitate to contact either Mr. John P. Cleary at THAN (913-888-2922) or Mr. Bob Chaney at Harcros (913-621-7772) if you have any questions or comments.

Very truly yours,
URS Corporation

Mary Huntsman for
Kathy Kissick-Davenport
Senior Project Manager

Enclosure

cc: Jack Cleary, THAN
Bob Chaney, Harcros
Mostafa Kamal, KDHE

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RCRA RECORDS CENTER

QUARTERLY PROGRESS REPORT NO. 61
APRIL – JUNE 2002

RCRA FACILITY INVESTIGATION/CORRECTIVE MEASURES STUDY
HARCROS CHEMICALS INC.
KANSAS CITY, KANSAS FACILITY
EPA Docket No. VII-90-H-0028

This progress report summarizes completed activities and upcoming tasks on the RCRA Facility Investigation/Corrective Measures Study at the Harcros Chemicals Inc. facility in Kansas City, Kansas. In accordance with the Administrative Order on Consent, progress reports will be submitted on a quarterly basis. This report addresses the period of April through June 2002.

I. WORK COMPLETED AND ACTIVITIES CONDUCTED

Work Directly Related to the Administrative Order on Consent

- **Soil Vapor Extraction System**

  The SVE system was returned to operation on April 3, 2002. Harcros is evaluating a catalytic thermal oxidizer for destruction of VOC's in exhaust vapors from the SVE system. The thermal oxidizer would provide a second alternative to the current method of conditioning SVE vapors through the plant boiler. Use of a thermal oxidizer would reduce the consumption of natural gas during warmer summer months when the need for process steam at the plant decreases significantly.

- **Corrective Action Objectives Development Report**

  The preliminary results of the second round of indoor air data collected on March 14, 2002 were forwarded to EPA on April 2, 2002. The validated results were submitted to EPA on May 18, 2002. Based upon a general consistency in the findings of the two rounds of indoor air sampling, the SVE system was returned to operation. As mentioned in the previous reporting period, EPA acknowledged their intent to reevaluate the EI Determination based upon the real indoor air data collected.

  Harcros submitted an Addendum to the CAO Report on April 19, 2002. EPA approved the CAO Report on April 26, 2002. On May 2, 2002 Harcros withdrew their dispute on issues relating to establishment of corrective action objectives.

- **Groundwater Plume Control**

  Wells to confirm the results of the direct push investigation were installed and developed in April and May 2002. These wells were sampled concurrently with the quarterly facility wide groundwater sampling program in May/June 2002.

  Harcros notified EPA of the technology selected for groundwater stabilization. Details of the approach were discussed in a meeting with EPA on May 31, 2002. The groundwater stabilization system allows the ongoing biodegradation processes to continue while controlling the migration of parent compounds above MCL's. An extraction well will be installed north of the levee on the downgradient edge of the Mid-Area plume of parent compounds. Extracted groundwater will be treated and discharged. Several options for discharge of groundwater are being evaluated including discharge to surface waters through an NPDES permit, reinjection, and discharge to the POTW. Other lower concentration plumes identified during the investigations will also be monitored.

  Several telephone conversations were held with KDHE to discuss the NPDES permit application submitted in December 2001. KDHE provided proposed permit limits to Harcros on June 18, 2002. The proposed limits addressed two options for discharge: to the ground near the levee or directly to the Kansas River. Harcros met with KDHE to discuss the proposed NPDES limits on June 28, 2002. Harcros also met that same day with KDHE staff regarding potential reinjection of the extracted groundwater.

- **Groundwater Sampling and Analysis**

  In accordance with the AOC Amendment, the fourth round of facility-wide quarterly groundwater sampling was conducted between May 28, 2002 and June 14, 2002. Results are pending.

  The validated results of the facility-wide quarterly groundwater sampling conducted in March 2002 are attached.

- **Corrective Measures Study**

  EPA's approval of the CAO Report established the timetable for submission of the Draft CMS Report. In accordance with the AOC and subsequent agreements, Harcros will submit the Draft CMS Report to EPA within 180 days of receipt of EPA's approval of the CAO Report (October 23, 2002). CMS activities were initiated during this reporting period.

Other Work Completed

- Performed second quarter 2002 groundwater sampling at the closed Surface Impoundment concurrently with the May/June facility-wide groundwater sampling event.

- In late April/early May a new monitoring was installed downgradient of the closed Surface Impoundment per KDHE's request and in accordance with the approved Well Installation Work Plan.

II. SUMMARY OF FINDINGS

A summary of the mass removed by the SVE system through May 31, 2002 is attached. An estimated 7,122 pounds of total VOC's has been removed since the system was installed.

Validated analytical results from the March 2002 groundwater sampling event are attached.

The preliminary analytical results of the second round of indoor air sampling conducted in March 2002 were forwarded to EPA on April 2, 2002. The validated results were transmitted to the Agency on May 18, 2002.

The selected approach to groundwater stabilization was presented to EPA in a meeting held on May 31, 2002.

III. SUMMARY OF PROBLEMS OR POTENTIAL PROBLEMS ENCOUNTERED

With agreement reached on the disputed CAO issues, EPA approved the CAO Report and Harcros withdrew the dispute.

IV. PROJECTED WORK FOR THE NEXT REPORTING PERIOD

Work Related to the Administrative Order on Consent

- Analytical results from the May/June 2002 facility-wide groundwater sampling and confirmation well sampling will be compiled and forwarded to EPA. This event completes the fourth round of quarterly sampling specified in the AOC amendment. Harcros will submit a proposal for a modified sampling program to monitor plume stability.

- Harcros will continue communications with KDHE regarding the NPDES permit application as well as discharge of treated groundwater via reinjection.

- The groundwater stabilization extraction and treatment system will be designed. A design document will be submitted to EPA. A pilot hole for the extraction well will be installed. Pilot holes will also be advanced at two additional locations should future monitoring of the low concentration plumes indicate the need for additional extraction wells. Piezometers will be installed and a well efficiency and pumping test performed. Construction of the extraction well and treatment system will proceed. Construction of this project will also include coordination with agencies such as the Kaw Valley Drainage District and Corps of Engineers.

- Evaluation of corrective measures technologies for soil and groundwater will proceed. Shallow soil samples will be collected in the Restricted Zone for use in treatability studies.

Other Work

- Harcros will develop a modified groundwater monitoring program for the closed Surface Impoundment for KDHE review and approval.

- Sampling of the closed Surface Impoundment will be conducted to obtain information to be used in evaluating long-term monitoring needs and options for remediation.

FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-1S			MW-2			MW-2D			MW-3		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)												
Ethylbenzene	ND		1	ND		1	ND		1	ND		1
1,2-Dichloroethane	ND		1	ND		1	ND		1	ND		1
Toluene	ND		1	ND		1	ND		1	ND		1
Chlorobenzene	ND		1	ND		1	ND		1	ND		1
Tetrachloroethene	ND		1	ND		1	ND		1	ND		1
Xylenes (total)	ND		2	ND		2	ND		2	ND		2
cis-1,2-Dichloroethene	0.67	J	1	ND		1	1.4		1	0.44	J	1
trans-1,2-Dichloroethene	ND		0.5	ND		0.5	ND		0.5	ND		0.5
1,2-Dichloroethene (total)	0.76	J	1	ND		1	1.6		1	0.54	J	1
Carbon tetrachloride	ND		1	ND		1	ND		1	ND		1
Acetone	ND		10	ND		10	ND		10	ND		10
Chloroform	ND		1	ND		1	ND		1	ND		1
Benzene	ND		1	ND		1	ND		1	ND		1
1,1,1-Trichloroethane	ND		1	ND		1	ND		1	ND		1
Chloromethane	ND		2	ND		2	ND		2	ND		2
Vinyl chloride	ND		1	0.32	J	1	0.38	J	1	0.34	J	1
Methylene chloride	ND		1	ND		1	ND		1	ND		1
1,1-Dichloroethane	ND		1	ND		1	ND		1	ND		1
1,1-Dichloroethene	ND		1	ND		1	ND		1	ND		1
Trichloroethene	ND		1	ND		1	ND		1	ND		1

ND =Not Detected at or above RL
J = Estimated result less than RL
Q = Elevated Reporting limit
B = Method Blank contamination
D = Result obtained from dilution

FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-203			MW-5			MW-5D			MW-6		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)												
Ethylbenzene	ND		1	ND		10	ND		40	ND		1
1,2-Dichloroethane	ND		1	ND		10	ND		40	ND		1
Toluene	ND		1	ND		10	ND		40	ND		1
Chlorobenzene	ND		1	4.2	J	10	ND		40	0.26	J	1
Tetrachloroethene	ND		1	ND		10	ND		40	ND		1
Xylenes (total)	ND		2	ND		20	ND		80	ND		2
cis-1,2-Dichloroethene	0.44	J	1	210		10	450		40	23		1
trans-1,2-Dichloroethene	ND		0.5	3.9	J	5	ND		20	0.85		0.5
1,2-Dichloroethene (total)	ND		1	210		10	450		40	24		1
Carbon tetrachloride	ND		1	ND		10	ND		40	ND		1
Acetone	ND		10	ND		100	ND		400	ND		10
Chloroform	ND		1	ND		10	ND		40	ND		1
Benzene	ND		1	9.6	J	10	24	J	40	5.4		1
1,1,1-Trichloroethane	ND		1	ND		10	ND		40	ND		1
Chloromethane	ND		2	ND		20	ND		80	ND		2
Vinyl chloride	0.34	J	1	400		10	660		40	37		1
Methylene chloride	ND		1	ND		10	ND		40	ND		1
1,1-Dichloroethane	ND		1	64		10	ND		40	4.7		1
1,1-Dichloroethene	ND		1	4.1	J	10	ND		40	ND		1
Trichloroethene	ND		1	7.6	J	10	ND		40	ND		1

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FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-7			MW-9S			MW-10			MW-11B		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)												
Ethylbenzene	ND		2	ND		1	ND		1	ND		1
1,2-Dichloroethane	ND		2	ND		1	ND		1	ND		1
Toluene	ND		2	ND		1	ND		1	ND		1
Chlorobenzene	ND		2	ND		1	ND		1	1.7		1
Tetrachloroethene	67		2	ND		1	ND		1	0.44	J	1
Xylenes (total)	ND		4	ND		2	ND		2	ND		2
cis-1,2-Dichloroethene	1.1	J	2	2.6		1	0.77	J	1	ND		1
trans-1,2-Dichloroethene	ND		1	ND		0.5	ND		0.5	ND		0.5
1,2-Dichloroethene (total)	1.1	J	2	2.6		1	0.87	J	1	ND		1
Carbon tetrachloride	ND		2	ND		1	ND		1	ND		1
Acetone	ND		20	ND		10	ND		10	ND		10
Chloroform	ND		2	ND		1	ND		1	ND		1
Benzene	ND		2	ND		1	ND		1	5.7		1
1,1,1-Trichloroethane	ND		2	ND		1	ND		1	ND		1
Chloromethane	ND		4	ND		2	ND		2	ND		2
Vinyl chloride	1.3	J	2	ND		1	ND		1	11		1
Methylene chloride	ND		2	ND		1	ND		1	ND		1
1,1-Dichloroethane	ND		2	0.68	J	1	ND		1	ND		1
1,1-Dichloroethene	ND		2	ND		1	ND		1	ND		1
Trichloroethene	3.9		2	0.38	J	1	1.5		1	ND		1

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FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-11D			MW-12			MW-14			MW-17SA		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)												
Ethylbenzene	ND		1	ND		1	ND		1	ND		1
1,2-Dichloroethane	ND		1	ND		1	ND		1	ND		1
Toluene	ND		1	0.32	J	1	ND		1	ND		1
Chlorobenzene	ND		1	2.4		1	ND		1	ND		1
Tetrachloroethene	0.34	J	1	5.2		1	ND		1	0.86	J	1
Xylenes (total)	ND		2	ND		2	ND		2	ND		2
cis-1,2-Dichloroethene	1.4		1	4.0		1	6.1		1	2.8		1
trans-1,2-Dichloroethene	ND		0.5	ND		0.5	ND		0.5	ND		0.5
1,2-Dichloroethene (total)	1.6		1	4.1		1	6.3		1	2.8		1
Carbon tetrachloride	ND		1	ND		1	ND		1	ND		1
Acetone	ND		10	ND		10	ND		10	ND		10
Chloroform	ND		1	ND		1	ND		1	ND		1
Benzene	ND		1	22		1	ND		1	ND		1
1,1,1-Trichloroethane	ND		1	ND		1	ND		1	ND		1
Chloromethane	ND		2	ND		2	ND		2	ND		2
Vinyl chloride	0.53	J	1	35		1	0.38	J	1	0.40	J	1
Methylene chloride	ND		1	ND		1	ND		1	ND		1
1,1-Dichloroethane	ND		1	0.44	J	1	0.41	J	1	ND		1
1,1-Dichloroethene	ND		1	ND		1	ND		1	ND		1
Trichloroethene	ND		1	3.9		1	ND		1	0.37	J	1

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FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-17D			MW-217D			MW-18S			MW-19S		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)												
Ethylbenzene	ND		1	ND		1	2.9	J	4	ND		5
1,2-Dichloroethane	ND		1	ND		1	ND		4	ND		5
Toluene	ND		1	ND		1	ND		4	ND		5
Chlorobenzene	ND		1	ND		1	ND		4	ND		5
Tetrachloroethene	ND		1	ND		1	ND		4	24		5
Xylenes (total)	ND		2	ND		2	17		8	ND		10
cis-1,2-Dichloroethene	17		1	19		1	8.4		4	160		5
trans-1,2-Dichloroethene	1.9		0.5	2.0		0.5	ND		2	ND		2.5
1,2-Dichloroethene (total)	19		1	21		1	8.4		4	160		5
Carbon tetrachloride	ND		1	ND		1	ND		4	ND		5
Acetone	ND		10	ND		10	ND		40	ND		50
Chloroform	ND		1	ND		1	ND		4	ND		5
Benzene	0.50	J	1	0.56	J	1	2.3	J	4	ND		5
1,1,1-Trichloroethane	ND		1	ND		1	ND		4	ND		5
Chloromethane	ND		2	ND		2	ND		8	ND		10
Vinyl chloride	8.9		1	9.3		1	160		4	1.5	J	5
Methylene chloride	ND		1	ND		1	ND		4	ND		5
1,1-Dichloroethane	1.4		1	1.4		1	4.5		4	ND		5
1,1-Dichloroethene	ND		1	ND		1	ND		4	ND		5
Trichloroethene	ND		1	ND		1	ND		4	40		5

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FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-19D			MW-20S			MW-20D			MW-21S		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)												
Ethylbenzene	ND		1	ND		1	ND		2	ND		1
1,2-Dichloroethane	ND		1	ND		1	ND		2	ND		1
Toluene	ND		1	ND		1	ND		2	ND		1
Chlorobenzene	ND		1	ND		1	ND		2	ND		1
Tetrachloroethene	ND		1	ND		1	96		2	5.4		1
Xylenes (total)	ND		2	ND		2	ND		4	ND		2
cis-1,2-Dichloroethene	ND		1	ND		1	5.8		2	ND		1
trans-1,2-Dichloroethene	ND		0.5	ND		0.5	ND		1	ND		0.5
1,2-Dichloroethene (total)	ND		1	ND		1	5.8		2	ND		1
Carbon tetrachloride	ND		1	0.87	J	1	ND		2	ND		1
Acetone	ND		10	ND		10	6.2	J	20	ND		10
Chloroform	ND		1	0.63	J	1	ND		2	ND		1
Benzene	ND		1	ND		1	ND		2	ND		1
1,1,1-Trichloroethane	ND		1	ND		1	ND		2	ND		1
Chloromethane	ND		2	ND		2	ND		4	ND		2
Vinyl chloride	ND		1	ND		1	ND		2	ND		1
Methylene chloride	ND		1	ND		1	ND		2	ND		1
1,1-Dichloroethane	ND		1	ND		1	ND		2	ND		1
1,1-Dichloroethene	ND		1	ND		1	ND		2	ND		1
Trichloroethene	ND		1	ND		1	16		2	0.74	J	1

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FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-221S			MW-22S			MW-22D			MW-23S		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)												
Ethylbenzene	ND		1	ND		20	ND		1	1.0		1
1,2-Dichloroethane	ND		1	ND		20	ND		1	ND		1
Toluene	ND		1	ND		20	ND		1	ND		1
Chlorobenzene	ND		1	ND		20	ND		1	0.33	J	1
Tetrachloroethene	5.8		1	41		20	0.94	J	1	ND		1
Xylenes (total)	ND		2	ND		40	ND		2	ND		2
cis-1,2-Dichloroethene	ND		1	310		20	24		1	9.1		1
trans-1,2-Dichloroethene	ND		0.5	ND		10	0.65		0.5	0.27	J	0.5
1,2-Dichloroethene (total)	ND		1	310		20	25		1	9.4		1
Carbon tetrachloride	ND		1	ND		20	ND		1	ND		1
Acetone	ND		10	ND		200	ND		10	ND		10
Chloroform	ND		1	ND		20	ND		1	ND		1
Benzene	ND		1	ND		20	1.7		1	0.89	J	1
1,1,1-Trichloroethane	ND		1	29		20	ND		1	ND		1
Chloromethane	ND		2	ND		40	ND		2	ND		2
Vinyl chloride	ND		1	97		20	12		1	34		1
Methylene chloride	ND		1	ND		20	ND		1	ND		1
1,1-Dichloroethane	ND		1	80		20	2.0		1	6.8		1
1,1-Dichloroethene	ND		1	19	J	20	0.41	J	1	ND		1
Trichloroethene	0.77	J	1	65		20	2.1		1	ND		1

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FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-24S			MW-25S			MW-25D			MW-26S		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)												
Ethylbenzene	550		29	ND		80	ND		1	ND		130
1,2-Dichloroethane	ND		29	ND		80	ND		1	ND		130
Toluene	ND		29	ND		80	ND		1	ND		130
Chlorobenzene	ND		29	ND		80	ND		1	ND		130
Tetrachloroethene	ND		29	ND		80	ND		1	ND		130
Xylenes (total)	950		57	ND		160	ND		2	ND		270
cis-1,2-Dichloroethene	ND		29	1,700		80	3.3		1	6,500		130
trans-1,2-Dichloroethene	ND		14	23	J	40	ND		0.5	50	J	67
1,2-Dichloroethene (total)	ND		29	1,700		80	3.3		1	6,500		130
Carbon tetrachloride	ND		29	ND		80	ND		1	ND		130
Acetone	ND		290	ND		800	ND		10	ND		1,300
Chloroform	ND		29	ND		80	ND		1	ND		130
Benzene	11	J	29	120		80	ND		1	ND		130
1,1,1-Trichloroethane	ND		29	ND		80	ND		1	ND		130
Chloromethane	ND		57	ND		160	ND		2	ND		270
Vinyl chloride	13	J	29	3,000		80	2.0		1	1,700		130
Methylene chloride	ND		29	ND		80	ND		1	ND		130
1,1-Dichloroethane	ND		29	46	J	80	ND		1	ND		130
1,1-Dichloroethene	ND		29	ND		80	ND		1	ND		130
Trichloroethene	ND		29	ND		80	ND		1	ND		130

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FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-226S			MW-27S			MW-27D			MW-28S		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)												
Ethylbenzene	ND		130	ND		100	ND		1	ND		1
1,2-Dichloroethane	ND		130	ND		100	ND		1	ND		1
Toluene	ND		130	ND		100	ND		1	ND		1
Chlorobenzene	ND		130	ND		100	ND		1	ND		1
Tetrachloroethene	ND		130	4,400		100	2.2		1	ND		1
Xylenes (total)	ND		270	ND		200	ND		2	ND		2
cis-1,2-Dichloroethene	6,600		130	1,100		100	0.42	J	1	ND		1
trans-1,2-Dichloroethene	52	J	67	ND		50	ND		0.5	ND		0.5
1,2-Dichloroethene (total)	6,600		130	1,100		100	ND		1	ND		1
Carbon tetrachloride	ND		130	ND		100	ND		1	ND		1
Acetone	ND		1,300	ND		1,000	3.6	J	10	ND		10
Chloroform	ND		130	ND		100	ND		1	ND		1
Benzene	ND		130	ND		100	ND		1	ND		1
1,1,1-Trichloroethane	ND		130	ND		100	ND		1	ND		1.0
Chloromethane	ND		270	ND		200	ND		2	ND		2
Vinyl chloride	1,700		130	40	J	100	ND		1	ND		1
Methylene chloride	ND		130	ND		100	ND		1	ND		1
1,1-Dichloroethane	ND		130	ND		100	ND		1	ND		1
1,1-Dichloroethene	ND		130	ND		100	ND		1	ND		1
Trichloroethene	ND		130	4,800		100	0.40	J	1	ND		1

ND =Not Detected at or above RL
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D = Result obtained from dilution

FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-29S			MW-30S			MW-31S			MW-32S		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)												
Ethylbenzene	ND		1	ND		40	ND		1	ND		1
1,2-Dichloroethane	ND		1	ND		40	ND		1	ND		1
Toluene	ND		1	ND		40	ND		1	ND		1
Chlorobenzene	0.86	J	1	28	J	40	ND		1	ND		1
Tetrachloroethene	ND		1	68		40	ND		1	ND		1
Xylenes (total)	ND		2	ND		80	ND		2	ND		2
cis-1,2-Dichloroethene	0.42	J	1	870		40	13		1	5.0		1
trans-1,2-Dichloroethene	ND		0.5	12	J	20	0.40	J	0.5	ND		0.5
1,2-Dichloroethene (total)	0.56	J	1	890		40	14		1	5.1		1
Carbon tetrachloride	ND		1	ND		40	ND		1	ND		1
Acetone	ND		10	ND		400	ND		10	ND		10
Chloroform	ND		1	45		40	ND		1	ND		1
Benzene	ND		1	41		40	ND		1	ND		1
1,1,1-Trichloroethane	ND		1	ND		40	ND		1	ND		1
Chloromethane	ND		2	ND		80	ND		2	ND		2
Vinyl chloride	3.6		1	1200		40	0.87	J	1	ND		1
Methylene chloride	ND		1	ND		40	ND		1	ND		1
1,1-Dichloroethane	ND		1	16	J	40	0.70	J	1	ND		1
1,1-Dichloroethene	ND		1	ND		40	ND		1	ND		1
Trichloroethene	ND		1	82		40	ND		1	ND		1

ND =Not Detected at or above RL
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FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-33S			MW-34D			MW-234D			TMW-1		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)												
Ethylbenzene	ND		1	ND		10	ND		10	ND		1
1,2-Dichloroethane	ND		1	ND		10	ND		10	ND		1
Toluene	ND		1	ND		10	ND		10	ND		1
Chlorobenzene	ND		1	3.9	J	10	3.6	J	10	ND		1
Tetrachloroethene	ND		1	ND		10	ND		10	ND		1
Xylenes (total)	ND		2	ND		20	ND		20	ND		2
cis-1,2-Dichloroethene	2.5		1	440		10	410		10	ND		1
trans-1,2-Dichloroethene	ND		0.5	8.0		5	7.8		5	ND		0.5
1,2-Dichloroethene (total)	2.5		1	450		10	420		10	ND		1
Carbon tetrachloride	ND		1	ND		10	ND		10	ND		1
Acetone	ND		10	ND		100	ND		100	ND		10
Chloroform	ND		1	ND		10	ND		10	ND		1
Benzene	ND		1	8.9	J	10	8.5	J	10	ND		1
1,1,1-Trichloroethane	ND		1	ND		10	ND		10	ND		1
Chloromethane	ND		2	ND		20	ND		20	ND		2
Vinyl chloride	ND		1	270		10	250		10	ND		1
Methylene chloride	ND		1	ND		10	ND		10	ND		1
1,1-Dichloroethane	ND		1	10		10	9.7	J	10	ND		1
1,1-Dichloroethene	ND		1	ND		10	ND		10	ND		1
Trichloroethene	ND		1	3.5	J	10	3.4	J	10	ND		1

ND =Not Detected at or above RL
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FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	TMW-2			TMW-4			RGW-1S			RGW-1D		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)												
Ethylbenzene	ND		1	ND		1	40		4	ND		1
1,2-Dichloroethane	ND		1	ND		1	ND		4	ND		1
Toluene	ND		1	ND		1	8.5		4	ND		1
Chlorobenzene	ND		1	ND		1	16		4	0.37	J	1
Tetrachloroethene	ND		1	ND		1	ND		4	1.1		1
Xylenes (total)	ND		2	ND		2	500		8	ND		2
cis-1,2-Dichloroethene	1.7		1	ND		1	7.7		4	31		1
trans-1,2-Dichloroethene	ND		0.5	ND		0.5	ND		2	0.6		0.5
1,2-Dichloroethene (total)	1.7		1	ND		1	8.3		4	31		1
Carbon tetrachloride	ND		1	ND		1	ND		4	ND		1
Acetone	ND		10	ND		10	180		40	ND		10
Chloroform	ND		1	ND		1	ND		4	ND		1
Benzene	ND		1	ND		1	3.4	J	4	1.5		1
1,1,1-Trichloroethane	ND		1	ND		1	ND		4	ND		1
Chloromethane	ND		2	ND		2	ND		8	ND		2
Vinyl chloride	ND		1	ND		1	74		4	18		1
Methylene chloride	ND		1	ND		1	ND		4	ND		1
1,1-Dichloroethane	ND		1	ND		1	1.5	J	4	1.1		1
1,1-Dichloroethene	ND		1	ND		1	ND		4	0.37	J	1
Trichloroethene	ND		1	ND		1	ND		4	0.45	J	1

ND =Not Detected at or above RL
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FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	TB-030502			TB-030602			TB-030702A			TB-030702B		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)												
Ethylbenzene	ND		1	ND		1	ND		1	ND		1
1,2-Dichloroethane	ND		1	ND		1	ND		1	ND		1
Toluene	ND		1	ND		1	ND		1	ND		1
Chlorobenzene	ND		1	ND		1	ND		1	ND		1
Tetrachloroethene	ND		1	ND		1	ND		1	ND		1
Xylenes (total)	ND		2	ND		2	ND		2	ND		2
cis-1,2-Dichloroethene	ND		1	ND		1	ND		1	ND		1
trans-1,2-Dichloroethene	ND		0.5	ND		0.5	ND		0.5	ND		0.5
1,2-Dichloroethene (total)	ND		1	ND		1	ND		1	ND		1
Carbon tetrachloride	ND		1	ND		1	ND		1	ND		1
Acetone	ND		10	ND		10	ND		10	ND		10
Chloroform	ND		1	ND		1	ND		1	ND		1
Benzene	ND		1	ND		1	ND		1	ND		1
1,1,1-Trichloroethane	ND		1	ND		1	ND		1	ND		1
Chloromethane	ND		2	ND		2	ND		2	ND		2
Vinyl chloride	ND		1	ND		1	ND		1	ND		1
Methylene chloride	ND		1	ND		1	ND		1	ND		1
1,1-Dichloroethane	ND		1	ND		1	ND		1	ND		1
1,1-Dichloroethene	ND		1	ND		1	ND		1	ND		1
Trichloroethene	ND		1	ND		1	ND		1	ND		1

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FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	TB-030802			TB-031102			TB-031502			TB-031402		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)												
Ethylbenzene	ND		1	ND		1	ND		1	ND		1
1,2-Dichloroethane	ND		1	ND		1	ND		1	ND		1
Toluene	ND		1	ND		1	ND		1	ND		1
Chlorobenzene	ND		1	ND		1	ND		1	ND		1
Tetrachloroethene	ND		1	ND		1	ND		1	ND		1
Xylenes (total)	ND		2	ND		2	ND		2	ND		2
cis-1,2-Dichloroethene	ND		1	ND		1	ND		1	ND		1
trans-1,2-Dichloroethene	ND		0.5	ND		0.5	ND		0.5	ND		0.5
1,2-Dichloroethene (total)	ND		1	ND		1	ND		1	ND		1
Carbon tetrachloride	ND		1	ND		1	ND		1	ND		1
Acetone	ND		10	4.1	J	10	ND		10	ND		10
Chloroform	ND		1	ND		1	ND		1	ND		1
Benzene	ND		1	ND		1	ND		1	ND		1
1,1,1-Trichloroethane	ND		1	ND		1	ND		1	ND		1
Chloromethane	ND		2	ND		2	ND		2	ND		2
Vinyl chloride	ND		1	ND		1	ND		1	ND		1
Methylene chloride	ND		1	ND		1	ND		1	ND		1
1,1-Dichloroethane	ND		1	ND		1	ND		1	ND		1
1,1-Dichloroethene	ND		1	ND		1	ND		1	ND		1
Trichloroethene	ND		1	ND		1	ND		1	ND		1

ND =Not Detected at or above RL
J = Estimated result less than RL
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B = Method Blank contamination
D = Result obtained from dilution

FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	TB-031302			TB-031202			TB-031602		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Volatile Organics (µg/L)									
Ethylbenzene	ND		1	ND		1	ND		1
1,2-Dichloroethane	ND		1	ND		1	ND		1
Toluene	ND		1	ND		1	ND		1
Chlorobenzene	ND		1	ND		1	ND		1
Tetrachloroethene	ND		1	ND		1	ND		1
Xylenes (total)	ND		2	ND		2	ND		2
cis-1,2-Dichloroethene	ND		1	ND		1	ND		1
trans-1,2-Dichloroethene	ND		0.5	ND		0.5	ND		0.5
1,2-Dichloroethene (total)	ND		1	ND		1	ND		1
Carbon tetrachloride	ND		1	ND		1	ND		1
Acetone	ND		10	3.9	J	10	ND		10
Chloroform	ND		1	ND		1	ND		1
Benzene	ND		1	ND		1	ND		1
1,1,1-Trichloroethane	ND		1	ND		1	ND		1
Chloromethane	ND		2	ND		2	ND		2
Vinyl chloride	ND		1	ND		1	ND		1
Methylene chloride	ND		1	ND		1	1.1		1
1,1-Dichloroethane	ND		1	ND		1	ND		1
1,1-Dichloroethene	ND		1	ND		1	ND		1
Trichloroethene	ND		1	ND		1	ND		1

ND =Not Detected at or above RL
J = Estimated result less than RL
Q = Elevated Reporting Limit
B = Method Blank contamination
D = Result obtained from dilution

FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-1S			MW-2			MW-2D			MW-3		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Dissolved Metals (mg/L)												
Lead-DISS	ND		3	2.5	B	3	ND		3	2.2	B	3
Arsenic-DISS	190		10	ND		10	7.2	B	10	5.0	B	10
Barium-DISS	499		10	151		10	320		10	155		10
Cadmium-DISS	ND		5	0.83	B	5	ND		5	ND		5
Selenium-DISS	ND		5	7.8		5	ND		5	5.1		5
Total Metals (mg/L)												
Lead	9.2		3	5.0		3	2.7	B	3	ND		3
Arsenic	182		10	6.8	B	10	ND		10	ND		10.7
Barium	478		10	160		10	322		10	157		10
Cadmium	ND		5	ND		5	ND		5	ND		5
Selenium	ND		5	7.6		5	ND		5	ND		5
Organochlorine Pesticides (µg/L)												
Heptachlor epoxide	ND		0.05	ND		0.05	ND		0.05	ND	UJ	0.05
Hexachlorobenzene	ND		0.05	ND		0.05	ND		0.05	ND	UJ	0.05
Toxaphene	ND		2	ND		2	ND		2	ND	UJ	2
Semivolatile Organic Compounds (µg/L)												
bis(2-Ethylhexyl)phthalate	ND	UJ	6.0	2.6	J; J	6.0	5.7	J; J	6.0	ND	UJ	6.0

Notes:

(1) UJ = Not detected with an estimated quantitation limit

(2) J; J = estimated concentration for first and second analyses

ND =Not Detected at or above RL
J = Estimated result less than RL
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B = Method Blank contamination
D = Result obtained from dilution

FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-203			MW-11B			MW-11D			MW-12			MW-14		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Dissolved Metals (mg/L)															
Lead-DISS	ND		3	ND		3	ND		3	ND		3	2.2	B	3
Arsenic-DISS	ND		10	21.1		10	ND		10	128		10	11.6		10
Barium-DISS	153		10	249		10	341		10	315		10	301		10
Cadmium-DISS	ND		5	ND		5	ND		5	ND		5	ND		5
Selenium-DISS	ND		5	ND		5	ND		5	ND		5	ND		5
Total Metals (mg/L)															
Lead	ND		3	ND		3	ND		3	2.2	B	3	ND		3
Arsenic	ND		10	24.2		10	10.9		10	127		10	20.1	J	10
Barium	152		10	242		10	355		10	307		10	306		10
Cadmium	ND		5	ND		5	ND		5	ND		5	0.39	B	5
Selenium	ND		5	ND		5	ND		5	ND		5	ND		5
Organochlorine Pesticides (µg/L)															
Heptachlor epoxide	ND	UJ	0.05	ND		0.05	ND		0.05	ND		0.05	ND	UJ	0.05
Hexachlorobenzene	ND	UJ	0.05	ND		0.05	ND		0.05	ND		0.05	ND	UJ	0.05
Toxaphene	ND	UJ	2	ND		2	ND		2	ND		2	ND	UJ	2
Semivolatile Organic Compounds (µg/L)															
bis(2-Ethylhexyl)phthalate	ND	UJ	6.0	ND	UJ	6.0	ND	UJ	6.0	ND	UJ	6.0	ND	UJ	6.0

Notes:

(1) UJ = Not detected with an estimated quantitation limit

(2) J; J = estimated concentration for first and second analyses

ND =Not Detected at or above RL
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FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-5			MW-6			MW-7		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Water Quality Parameters (mg/L)									
Calcium	414,000		200	172,000		200	132,000		200
Hardness, as CaCO3	1450	J Q	25	510	J	5	420	J Q	12.5
Total Dissolved Solids	1990		10	763		10	526		10

ND =Not Detected at or above RL
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B = Method Blank contamination
D = Result obtained from dilution

FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-20S			MW-20D			MW-22S		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Water Quality Parameters (mg/L)									
Calcium	127,000		200	160,000		200	207,000		200
Hardness, as CaCO3	364	J	5	464	J	5	550	J Q	12.5
Total Dissolved Solids	520		10	660		10	771		10

ND =Not Detected at or above RL
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B = Method Blank contamination
D = Result obtained from dilution

FINAL ANALYTICAL RESULTS
MARCH 2002
HARCROS, KANSAS CITY, KS

	MW-22D			MW-27S			MW-30S		
	Result	Note	Rep. Limit	Result	Note	Rep. Limit	Result	Note	Rep. Limit
Water Quality Parameters (mg/L)									
Calcium	199,000		200	186,000		200	231,000		200
Hardness, as CaCO3	545	J	5	597	J Q	25	741	J Q	25
Total Dissolved Solids	787		10	738		10	1530		10

ND =Not Detected at or above RL
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Q = Elevated Reporting limit
B = Method Blank contamination
D = Result obtained from dilution

THAN/Harcros Chemicals Inc

5200 Speaker Road, Kansas City, Kansas

Summary - SVE System Operating Data and Mass Removal

Date	Days after initial start	Run Time Hours	Cumulative Run Time Hours	SVE Flow SCFM	Total VOC's **mg/m^3**	VOC's **lb's/hour**	VOC's **lb's/day**	Running Total VOC's **lb's**
01-May-02	240	24.0	1534.5	296	3,427	3.79	91.06	5,687.1
02-May-02	241	24.0	1558.5	296	3,377	3.74	89.73	5,776.9
03-May-02	242	24.0	1582.5	296	3,327	3.68	88.39	5,865.3
04-May-02	243	10.0	1592.5	296	3,276	3.63	36.27	5,901.5
05-May-02	244	6.8	1599.3	296	3,226	3.57	24.29	5,925.8
06-May-02	245	14.0	1613.3	296	3,176	3.52	49.22	5,975.0
07-May-02	246	24.0	1637.3	296	3,126	3.46	83.05	6,058.1
08-May-02	247	24.0	1661.3	296	3,075	3.40	81.71	6,139.8
09-May-02	248	24.0	1685.3	296	3,025	3.35	80.38	6,220.2
10-May-02	249	24.0	1709.3	296	2,975	3.29	79.04	6,299.2
11-May-02	250	0.0	1709.3	296	2,925	3.24	0.00	6,299.2
12-May-02	251	2.0	1711.3	296	2,874	3.18	6.36	6,305.6
13-May-02	252	24.0	1735.3	296	2,824	3.13	75.03	6,380.6
14-May-02	253	23.0	1758.3	296	2,774	3.07	70.63	6,451.2
15-May-02	254	18.0	1776.3	296	2,723	3.02	54.27	6,505.5
16-May-02	255	23.0	1799.3	296	2,673	2.96	68.07	6,573.6
17-May-02	256	24.0	1823.3	296	2,623	2.90	69.69	6,643.3
18-May-02	257	1.0	1824.3	296	2,573	2.85	2.85	6,646.1
19-May-02	258	0.0	1824.3	296	2,522	2.79	0.00	6,646.1
20-May-02	259	10.0	1834.3	296	2,472	2.74	27.37	6,673.5
21-May-02	260	24.0	1858.3	296	2,422	2.68	64.35	6,737.8
22-May-02	261	24.0	1882.3	296	2,372	2.63	63.01	6,800.8
23-May-02	262	21.0	1903.3	296	2,321	2.57	53.97	6,854.8
24-May-02	263	24.0	1927.3	192	2,271	1.63	39.14	6,893.9
25-May-02	264	12.0	1939.3	192	2,221	1.59	19.14	6,913.1
26-May-02	265	0.0	1939.3	192	2,170	1.56	0.00	6,913.1
27-May-02	266	14.8	1954.1	192	2,120	1.52	22.53	6,935.6
28-May-02	267	24.0	1978.1	286	2,070	2.21	53.15	6,988.8
29-May-02	268	24.0	2002.1	286	2,070	2.21	53.15	7,041.9
30-May-02	269	24.0	2026.1	286	2,070	2.21	53.15	7,095.1
5/31/2002 (NOTE 1)	270	12.0	2038.1	286	2,070	2.21	26.57	7,121.6

NOTE:

1. Through 1:30 PM today, Friday May 31, 2002