DETROIT TOOL
SUMMARY REPORT OF SITE INVESTIGATION

Site DETROIT TOOL
ID # MOD981205837
Break 1.6
Other
7-24-89

RECEIVED
JUL 25 1989
WASTE MANAGEMENT
PROGRAM

Prepared for

Detroit Tool Metal Products and
Detroit Tool and Engineering Company

Lebanon, Missouri

Prepared by

Woodward-Clyde Consultants
2322 Millpark Drive
Maryland Heights, Missouri 63043

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SUPERFUND RECORDS

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2 1 SITE DESCRIPTION - RAILROAD POND

The Railroad Pond is an irregular-shaped drainage feature, covering about 2 to 4 acres in the northwest portion of the Detroit Tool property It is shown in Figure 1 The Burlington Northern Railroad right-of-way forms the northwestern border of the pond The Silo backfill area forms the southern border and the Backfill area forms the northern border Two surface drainage ditches form the eastern border and flow into the pond At this time only the lower elevations flood routinely

2 2 SAMPLING PROGRAM AND ANALYTICAL RESULTS

Fourteen locations were sampled during the Phase 1 and 2 investigations This resulted in 15 samples which were analyzed for various parameters The analyses performed on individual samples are shown in **Table 2-2** In the first phase, one surface soil sample was collected from the lower, cattail area of the Railroad Pond The sample was analyzed for organics by GC/MS and for total metals and EP toxic metals, and cyanide, phenols, and dioxin Some low-level organics were found, as shown in **Table 2-1** Chlordane was also found in the sample at 350 ug/kg (ppb) Detroit Tool did not use chlordane in its operations

The second phase was designed to investigate these compounds further and to characterize the site geology The only parameter found at an elevated concentration in the surface samples was

chlordane The Railroad Pond was divided into four areas, A, B, C, and D The results of analyses are contained on **Table 2-1** under the heading RP-A, RP-B, RP-C and RP-D Composite soil samples were taken at depths of 6 in and 3 ft Chlordane was found only in the 6 in layer of the A and B composites Chlordane was not found at a depth of 3 ft The results of the A and B samples were 210 ug/kg (ppb) and 620 ug/kg (ppb) Also, a grab sample of water was taken from the pond which showed no contaminants Two boring/wells were installed, BW-8 and BW-10 The water from the wells did not show any contaminants

2 3 DISCUSSION

The City of Lebanon is located in a region of karst geology The Railroad Pond at the site is located at the low point of the immediate area Borings BW-8 and BW-10 were used to evaluate the vertical extent of contamination and to provide information on the subsurface geology BW-8 was drilled to bedrock at 122 ft BW-10 was drilled to a depth of 30 ft to obtain information on perched water The depth to bedrock across the site is estimated to range from 40 ft to 122 ft Because of the karst geology, the site appears to have many variations in the subsurface features It appears that there are high points of rock along with deep valleys Sinkholes are known to exist in the Lebanon area None were identified by WCC at the Detroit Tool site at the time of exploration Local zones of perched water are present in the soil profile but they appear to be discontinuous and yield only small

amounts of water It appears that the uppermost saturated zone lies within the bedrock, at a depth of about 150 ft or more

Based on the laboratory test results, it appears that the contamination in the Railroad Pond is limited to the surface contamination

TABLE 2 1
SUMMARY OF COMPOUNDS DETECTED
IN SOIL AND WATER SAMPLES IN THE
THE RAILROAD POND AREA

SAMPLE NO RP 1 AREA RAILROAD POND SAMPLE MATRIX SOIL DATE SAMPLED 04/12/89

PARAMETERS	CONCENTRATION	REMARKS
PURGEABLE ORGANICS (ug/kg)		(EPA METHOD 8240)
BENZENE	52	
TOLUENE	39	
ETHYLBENZENE	15	
XYLENES TOTAL	43	
BASE/NEUTRAL ACID EXTRACTABLE ORGANICS (mg/kg)		(EPA METHOD 8270)
FLUORANTHENE	0 6	
BENZO(B)FLUORANTHENE	0 6	
PESTICIDES/PCB S (ug/kg)		(EPA METHOD 8080)
CHLORDANE	350	
TOTAL METALS (mg/kg)		(EPA METHODS 6000 7000)
ARSENIC	2	
BERYLLIUM	0 2	
CADMIUM	0 76	
CHROMIUM	9 8	
COPPER	13	
LEAD	130	
MERCURY	0 1	
NICKEL	4 4	
SELENIUM	0 2	
SILVER	0 07	
ZINC	210	
EP TOX METALS (mg/kg)		(EPA METHODS 1320 200)
CADMIUM	0 03	
CHROMIUM	0 15	
COPPER	0 05	
LEAD	0 23	
ZINC	5 12	
FLASHPOINT (FAHRENHEIT)	NOT <200	(EPA METHOD 1010)

TABLE 2 1 (CONTINUED)

BORING/WELL NO BW 8 AREA RAILROAD POND SAMPLE MATRIX SOIL DATE SAMPLED 05/19/89

PARAMETER	SAMPLE DEPTH (FT) 8 5	9 0	27 0
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)			
ACETONE	35	26	*22

BORING/WELL NO BW 8 AREA RAILROAD POND SAMPLE MATRIX WATER DATE SAMPLED 06/02/89

PARAMETER	CONCENTRTRATION
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 624)	ND

BORING/WELL NO BW 10 AREA RAILROAD POND SAMPLE MATRIX SOIL DATE SAMPLED 05/24/8

PARAMETER	SAMPLE DEPTH (ft) 14 5	28 0
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)		
METHYLENE CHLORIDE	15	15

BORING/WELL NO BW 10 AREA RAILROAD POND SAMPLE MATRIX WATER DATE SAMPLED 06/03/89

PARAMETER	CONCENTRATION
PURGEABLE ORGANICS (ug/L) (EPA METHOD 624)	ND

DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

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TABLE 2 1 (CONTINUED)

HAND AUG R SAMPLE RP A AREA RAILROAD POND SAMPLE MATRIX SOIL DATE SAMPLED 05/24/89

PARAMETER	SAMPLE DEPTH ft 0 0	3 0
PESTICIDES/PCB S (ug/kg)		
(EPA METHOD 8080)		
CHLORDANE	210	ND (80)

ND NOT DETECTED AT THE DETECTION LEVEL IN PARENTHESES

HAND AUGER SAMPLE RP B AREA RAILROAD POND SAMPLE MATRIX SOIL DATE SAMPLED 05/24/89

PARAMETER	SAMPLE DEPTH ft 0 0	3 0
PESTICIDES/PCB S (ug/kg)		
(EPA METHOD 8080)		
CHLORDANE	620	ND (250)

ND NOT DETECTED AT THE DETECTION LEVEL IN PARENTHESES

HAND AUGER SAMPLE RP C AREA RAILROAD POND SAMPLE MATRIX SOIL DATE SAMPLED 05/24/89

PARAMETER	SAMPLE DEPTH ft 0 0
PESTICIDES/PCB S (ug/kg)	
(EPA METHOD 8080)	
CHLORDANE	ND (80)

ND NOT DETECTED AT THE DETECTION LEVEL IN PARENTHESES

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TABLE 2 1 (CONTINUED)

HAND AUGER SAMPLE RP D AREA RAILROAD POND SAMPLE MATRIX SOIL DATE SAMPLED 05/24/89

PARAMETER	SAMPLE DEPTH ft 0 0
PESTICIDES/PCB $ (ug/kg) (EPA METHOD 8080)	
CHLORDANE	ND (250)

ND - NOT DETECTED AT THE DETECTION LEVEL IN PARENTHESES

GRAB SAMPLE SW 1 AREA RAILROAD POND SAMPLE MATRIX WATER DATE SAMPLED 06/03/89

PARAMETER	CONCENTRATION
PURGEABLE ORGANICS (ug/L) (EPA METHOD 624)	ND

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TABLE 2 2 SUMMARY OF LABORATORY ANALYSIS PARAMETERS RAILROAD POND AREA

AREA	BORING OR SAMPLE NO	SAMPLE INTERVAL	SAMPLE MATRIX	PURGEABLE ORGANICS =	BTEX	BNAs	PESTICIDE/ PCB S	TOTAL METALS	DISSOLVED METALS	EP TOX METALS	CYANIDE	PHENOLS	DIOXIN	TPH	PCP
RAILROAD POND	BW 8	8 5	SOIL	X			X								
		9 0	SOIL	X			X								
		27 0	SOIL	X			X								
		GRAB	WATER	X			X								
	BW 10	14 5	SOIL	X			X								
		28 0	SOIL	X			X								
		GRAB	WATER	X			X								
	RP 1	GRAB	SOIL	X		X	X	X		X	X	X	X		
	RP 1A 0	0 0	SOIL		X										
	RP 1A 4	4 0	SOIL		X										
	RP A 0	0 0	SOIL				X						X		X
	RP A 3	3 0	SOIL				X						X		X
	RP 1B 0	0 0	SOIL		X										X
	RP 1B 3	3 0	SOIL		X										X
	RP B 0	0 0	SOIL				X						X		X
	RP B 3	3 0	SOIL				X						X		X
	RP 1C 0	0 0	SOIL		X										
	RP C 0	0 0	SOIL				X						X		X
	RP 1D 0	0 0	SOIL		X										
	RP D 0	0 0	SOIL				X						X		X
	SW 1	GRAB	WATER	X			X								

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3 1 SITE DESCRIPTION - SILO AREA

Four silos are believed to be located in this area The silos may have dimensions ranging from 40 to 60 ft in length, 10 to 20 ft in width, and about 10 ft in depth These silos were used to contain paint solids from the painting operation prior to 1980 The paint was placed in the silos in drums and in bulk along with trash Periodically, the material in the silos was open burned

It is estimated that between 400 and 1100 drums may have been placed in the silos between 1956 and 1979

3 2 SAMPLING PROGRAM AND ANALYTICAL RESULTS

Ten borings were drilled in the silo area, along with 3 boring/ wells A sample of what was visually identified as typical paint sludge was also analyzed along with the soil and water samples from the borings and boring/wells A total of 52 samples were analyzed for various parameters **Table 3-4** shows the analytical parameters for each sample

The analysis of the paint sludge indicated that the concentration of EP toxic metals, cadmium and lead, were below the RCRA hazardous limits With the exception of low level toluene in Boring BW-3 and BW-7, the soils were free of organics Total petroleum hydrocarbons were found at the surface of Boring BW-4 See **Tables 3-1, 3-2, and 3-3**

3 3 DISCUSSION

Groundwater was encountered at some of the wells It is presumed to be "perched" water because the wells remained dry after initial sampling The water sample from BW-3 contained low level organics acetone and trans-1,2-dichlorethene Water samples from Well BW-4 contained low levels of vinyl chloride, trans-1,2-dichloroethene, trichloroethene and 4-methyl-2-pentanone The water samples from BW-11A and from BW-7 did not show any organic compounds These areas of "perched" water were at a depth of approximately 30 ft, and we believe the results should be considered representative of soil contamination, rather than groundwater

TABLE 3 1
SUMMARY OF COMPOUNDS DETECTED
IN THE SOILS FROM THE SILO AREA

BORINGS/WELLS BW 3 BW 4 B 2 BW 7 B 11 BW 11A B 12 B 13 B 14 B 15 B 16 AND BW 17

BORING/WELL NO BW 3 AREA SILO SAMPLE MATRIX SOIL DATE SAMPLED 04/12/89

PARAMETER	SAMPLE DEPTH (ft) 1 5	4 0	7 5	11 5	16 5	21 5
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)						
ACETONE				35	20	
CHLOROFORM		5		6		
METHYLENE CHLORIDE	13	42	20	31	20	21
TOLUENE		28	16	11	13	9
TOTAL METALS (mg/kg) (EPA METHODS 6000 7000)						
ANTIMONY	1	1 4	1	1 2	1 8	
ARSENIC	3 1	2 8	2	3 4	3 8	1 5
BERYLLIUM	0 18	0 31	0 08	0 16	0 24	0 23
CADMIUM	0 7	0 31	0 13	0 16	0 23	0 11
CHROMIUM	14	14	12	18	9 6	4 8
COPPER	6 7	5 1	2 2	3 5	7	7 4
LEAD	12	17	4 2	6 2	10	3 7
MERCURY				0 03		
NICKEL	4 2	4 5	1 9	3 4	5 5	7 7
SELENIUM	0 5	0 3				
ZINC	19	16	3 2	4 6	9 8	7 3
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	11	8	4			

DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

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TABLE 3 1 (CONTINUED)

BORING/WELL NO BW 4 AREA SILO SAMPLE MATRIX SOIL DATE SAMPLED 04/13/89

PARAMETER	SAMPLE DEPTH (ft) 1 5	4 0	7 5	11 5	20 0	21 5	26 5
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)							
ACETONE	15	13			12	27	31
ETHYLBENZENE		6					
METHYLENE CHLORIDE			18			34	33
XYLENES TOTAL		8					
BASE/NEUTRALS AND ACIDS (mg/kg) (EPA METHOD 8270)							
BIS(2 ETHYLHEXYL)PHTHALATE	1 6						
2 METHYLNAPHTHALENE		0 9					
PESTICIDES/PCB S (ug/kg) (EPA METHOD 8080)							
AROCLOR 1254	2 400						
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	2 700	310	4			25	
TOTAL METALS (mg/kg) (EPA METHODS 6000 7000)							
ANTIMONY	3 8	1 2					
ARSENIC	4 9	2	1 4	1 3	1 4	0 7	0 7
BERYLLIUM	0 1	0 09	0 09		0 09		0 06
CADMIUM	1 3	0 17	0 15	0 2	0 18	0 17	0 09
CHROMIUM	110	17	6 8	11	6	4 3	3 4
COPPER	210	2 2	2 5	3 1	3 5	2	1 8
L AD	130	5 4	5 3	3 7	6 2	3 7	1 9
MERCURY	0 03		0 1				
NICKEL	28	2 4	2 8	2 8	4 4	1 6	2 3
SELENIUM		0 12					
SILVER	0 24						
ZINC	1 900	4 8	3 8	2 9	5 6	4 7	3 9
EP TOX METALS (mg/L) (EPA METHOD 1310 00)							
COPPER			0 03				
LEAD			0 06				
ZINC			0 18				

DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

TABLE 3 1 (CONTINUED)

BORING/WELL NO B 2 AREA SILO SAMPLE MATRIX SOIL DATE SAMPLED 04/14/89

PARAMETER	SAMPLE DEPTH (ft) 5 5	10 0	15 0
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)			
ACETONE		87	
METHYLENE CHLORIDE		35	8
BASE NEUTRALS/ AND ACID (mg/kg) (EPA METHOD 8270)			
BIS(2 ETHYLHEXYL)PHTHALATE		0 5	
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)		13	
TOTAL METALS (mg/kg) (EPA METHODS 6000 7000)			
ANTIMONY	1 1	3	2 2
ARSENIC	3 8	1 7	1
BERYLLIUM	0 09	0 14	0 19
CADMIUM	0 15	0 21	0 11
CHROMIUM	8 8	93	69
COPPER	4 4	87	5 4
LEAD	11	9 2	8 4
MERCURY	0 06		
NICKEL	3	21	23
SELENIUM	0 11		
SILVER			0 06
ZINC	13	11	9 2

BORING/WELL NO BW 7 AREA SILO SAMPLE MATRIX SOIL DATE SAMPLED 05/18/89

PARAMETER	SAMPLE DEPTH (ft) 33 3	44 0	48 0
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)			
TRANS 1 2 DICHLOROETHENE	5		11
TRICHLOROETHENE	30	14	230
ACETONE			12

DENOTES SAMPLE COLLECTED AT BEDROCK SURFACE

DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

TABLE 3 1 (CONTINUED)

BORING/WELL NO B 11 AREA SILO SAMPLE MATRIX SOIL DATE SAMPLED 05/25/89

PARAMETER	SAMPLE DEPTH (ft) 42 5	53 2	64 7
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)			
ACETONE		11	

BORING/WELL NO B 12 AREA SILO SAMPLE MATRIX SOIL DATE SAMPLED 05/25/89

PARAMETER	SAMPLE DEPTH (ft) 19 5	31 0	38 0
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)			
CHLOROFORM		5	5
TRICHLOROETHENE			5

BORING/WELL NO B 13 AREA SILO SAMPLE MATRIX SOIL DATE SAMPLED 05/25/89

PARAMETER	SAMPLE DEPTH (ft) 11 5	21 5	29 5
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)			
CHLOROFORM	8	7	6

DENOTES SAMPLE COLLECTED AT BEDROCK SURFACE
DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

TABLE 3 1 (CONTINUED)

BORING/WELL NO B 14 AREA SILO SAMPLE MATRIX SOIL DATE SAMPLED 05/25/89

PARAMETER	SAMPLE DEPTH (ft) 10 5	20 0	30 0
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)			
CARBON TETRACHLORIDE		36	
ACETONE			10
CHLOROFORM			8

BORING/WELL NO B 15 AREA SILO SAMPLE MATRIX SOIL DATE SAMPLED 05/26/89

PARAMETER	SAMPLE DEPTH (ft) 10 0	19 5	29 5
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)			
METHYLENE CHLORIDE		6	

BORING/WELL NO B 16 AREA SILO SAMPLE MATRIX SOIL DATE SAMPLED 05/26/89

PARAMETER	SAMPLE DEPTH (ft) 10 0	20 0	30 0
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)			
METHYLENE CHLORIDE	5		

DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

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TABLE 3 1 (CONTINUED)

BORING/WELL NO BW 17 AREA SILO SAMPLE MATRIX SOIL DATE SAMPLED 05/30/89

PARAMETER	SAMPLE DEPTH (ft) 10 5	17 5
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)		
ACETONE	14	

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TABLE 3 2
SUMMARY OF COMPOUNDS DETECTED
IN GRAB SAMPLES FROM THE SILO AREA

GRAB SAMPLE NO PS 1 AREA SILO SAMPLE MATRIX PAINT SLUDGE DATE SAMPLED 04/12/89

PARAMETER	CONCENTRATION
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)	
ETHYLBENZENE	2 300
TOLUENE	8 400
XYLENES TOTAL	22 000
METALS TOTAL (mg/kg) (EPA METHODS 6000 7000)	
ANTIMONY	14
ARSENIC	0 65
CADMIUM	14 000
CHROMIUM	970
COPPER	17
LEAD	5800
MERCURY	0 09
NICKEL	3
SELENIUM	1600
ZINC	13 000
EP TOX METALS (mg/L) (EPA METHODS 1310 200)	
CADMIUM	0 95
CHROMIUM	0 44
COPPER	0 06
LEAD	4 46
ZINC	100
PHENOLS (mg/kg) (EPA METHOD 9066)	1 2

GRAB SAMPLE NO WP 1 AREA SILO SAMPLE MATRIX OILY WATER FROM SILO 3 DATE SAMPLED 04/13/89

PARAMETER	CONCENTRATION
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	32

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TABLE 3 3
SUMMARY OF COMPOUNDS DETECTED
IN SILO AREA WATER SAMPLES

WELLS BW 3 BW 4 AND BW 11A

WELL NO BW 3 AREA SILO SAMPLE MATRIX WATER DATE SAMPLED 04/18/89

PARAMETER	CONCENTRATION	REMARKS
PURGEABLE ORGANICS (ug/L) (EPA METHOD 624)		
ACETONE	71	
TRANS 1 2 DICHLOROETHENE	36	
PURGEABLE ORGANICS (ug/L) (EPA METHOD 624) (VERIFICATION SAMPLE)		SAMPLED 05/02/89
TRANS 1 2 DICHLOROETHENE	*29*	
TOTAL METALS (mg/L) (EPA METHOD 200)		
COPPER	0 07	
LEAD	0 02	
ZINC	0 06	
DISSOLVED METALS (mg/L) (EPA METHOD 200)		
ZINC	0 02	
TOTAL PETROLEUM HYDROCARBONS (mg/L) (EPA METHOD 418 1)	0 3	

DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

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TABLE 3 3 (CONTINUED)

WELL NO BW 4 AREA SILO SAMPLE MATRIX WATER DATE SAMPLED 04/18/89

PARAMETER	CONCENTRATION	REMARKS
PURGEABLE ORGANICS (ug/L) (EPA METHOD 624)		
VINYL CHLORIDE	10	
TRANS 1 2 DICHLOROETHENE	66	
TRICHLOROETHENE	110	
PURGEABLE ORGANICS (ug/L) (EPA METHOD 624) (VERIFICATION SAMPLE)		SAMPLED 05/02/89
VINYL CHLORIDE	11	
METHYLENE CHLORIDE	10	
TRANS 1 2 DICHLOROETHENE	65	
TRICHLOROETHENE	120	
4 METHYL 2 PENTANONE	22	
TOTAL METALS (mg/L) (EPA METHOD 200)		
ARSENIC	0 019	
CHROMIUM	0 03	
COPPER	0 09	
LEAD	0 11	
ZINC	0 19	
DISSOLVED METALS (mg/L) (EPA METHOD 200)		
ZINC	0 04	
TOTAL PETROLEUM HYDROCARBONS (mg/L) (EPA METHOD 418 1)	0 2	

DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

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TABLE 3 3 (CONTINUED)

WELL NO BW 11A AREA SILO SAMPLE MATRIX WATER DATE SAMPLED 06/01/89

PARAMETER	CONCENTRATION	REMARKS
PURGEABLE ORGANICS (ug/L) (EPA METHOD 624)		PRELIMINARY RESULTS RECEIVED 06/22/89
METHYLENE CHLORIDE	13	
ACETONE	15	

WELL NO BW 7 AREA SILO SAMPLE MATRIX WATER DATE SAMPLED 04/18/89
(DUPLICATE OF 88W 2)

PARAMETER	CONCENTRATION	REMARKS
PURGEABLE ORGANICS (ug/L) (EPA METHOD 624)		
BASE/NEUTRAL ACID EXTRACTABLE ORGANICS (ug/L) (EPA METHOD 624)		
PESTICIDES/PCBs (ug/L) (EPA METHOD 608)		
TOTAL METALS (mg/L) (EPA METHOD 200)		
COPPER	0 04	
LEAD	0 03	
DISSOLVED METALS (mg/L) (EPA METHOD 200)		
DIOXINS (2 3 7 8 TCDD LOW RESOLUTION)		
TOTAL PETROLEUM HYDROCARBONS* (mg/L) (EPA METHOD 418 1)	0 4	

* DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

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TABLE 3 4 SUMMARY OF LABORATORY ANALYSIS PARAMETERS SILO AREA

AREA	BORING OR SAMPLE NO	SAMPLE INTERVAL	SAMPLE MATRIX	PURGEABLE ORGANICS	BTEX	BNAs	PESTICIDE/ PCB S	TOTAL METALS	DISSOLVED METALS	EP TOX METALS	CYANIDE	PHENOLS	DIOXIN	TPH	PCP
SILO	B 2	5 5	SOIL	X				X							
		10 0	SOIL	X		X	X	X			X	X	X	X	
		15 0	SOIL	X		X	X	X			X	X	X	X	
	BW 3	1 5	SOIL	X			X	X						X	
		4 0	SOIL	X			X	X						X	
		7 5	SOIL	X			X	X						X	
		11 5	SOIL	X			X	X						X	
		16 5	SOIL	X			X	X						X	
		21 5	SOIL	X			X	X						X	
	BW 3	GRAB	WATER	X		X	X	X	X		X	X	X	X	
	BW 4	1 5	SOIL	X		X	X	X			X	X	X	X	
		4 0	SOIL	X		X	X	X			X	X	X	X	
		7 5	SOIL	X		X	X	X		X	X	X	X	X	
		11 5	SOIL	X		X	X	X			X	X	X	X	
		20 0	SOIL	X		X	X	X			X	X	X	X	
		21 5	SOIL	X		X	X	X			X	X	X	X	
		26 5	SOIL	X		X	X	X			X	X	X	X	
	BW 4	GRAB	WATER	X		X	X	X	X		X	X	X	X	
	BW 7	33 3	SOIL	X											
		44 0	SOIL	X											
		48 0	SOIL	X											
	B 11	42 5	SOIL	X											
		53 2	SOIL	X											
		64 7	SOIL	X											
	BW 11A	GRAB	WATER	X			X								

TABLE 3 4 SUMMARY OF LABORATORY ANALYSIS PARAMETERS SILO AREA (CONTINUED)

AREA	BORING OR SAMPLE NO	SAMPLE INTERVAL	SAMPLE MATRIX	PURGEABLE ORGANICS	BTEX	BNAs	PESTICIDE/ PCB S	TOTAL METALS	DISSOLVED METALS	EP TOX METALS	CYANIDE	PHENOLS	DIOXIN	TPH	PCP
SILO	B 12	19 5	SOIL	X											
		31 0	SOIL	X											
		38 0	SOIL	X											
	B 13	11 5	SOIL	X											
		21 5	SOIL	X											
	B 14	10 0	SOIL	X											
		20 0	SOIL	X											
		30 0	SOIL	X											
	B 15	10 5	SOIL	X											
		19 5	SOIL	X											
		29 5	SOIL	X											
	B 16	10 0	SOIL	X											
		20 0	SOIL	X											
		30 0	SOIL	X											
	BW 17	10 5	SOIL	X											
		17 5	SOIL	X											
	SC A	0 0	SOIL				X								
	SC B	0 0	SOIL				X								
	SC C	0 0	SOIL				X								
	SC D	0 0	SOIL				X								
	PS 1	GRAB	SOLID	X		X	X	X		X	X	X	X		
	WP 1	GRAB	SOLID											X	

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PS 1 ALSO ANALYZED FOR FLASHPOINT & BTU

4 1 SITE DESCRIPTION - BISHOP BUILDING UST SITE

Two abandoned UST's are located next to the northwest corner of the Bishop Building See **Figure 1** The tanks each have approximately 8000 gallon capacity From available records, it appears that the tanks were installed in approximately 1947 They reportedly contained heating oil for the Bishop Building The tanks were out of service when the property was acquired by Detroit Tool in approximately 1985 The tanks were never used by Detroit Tool Detroit Tool backfilled the tanks with gravel after purchase

4 2 SAMPLING AND ANALYTICAL RESULTS

One boring, B-9, and two boring/wells, BW-5 and BW-26, were installed around the Bishop Building USTs The results of laboratory testing are shown in **Table 4-1**

4 3 DISCUSSION

It appears that the tanks may have leaked prior to Detroit Tool's ownership and the backfilling of the tanks with gravel These tanks were reported to the UST Coordinator and to Missouri Department of Natural Resources (MDNR) Laboratory Services Program on June 14, 1989

TABLE 4 1
SUMMARY OF COMPOUNDS DETECTED
IN SOIL SAMPLES IN THE
BISHOP BUILDING UST AREA

BORINGS/WELLS BW 5 B 9 AND BW 26

BORING/WELL NO BW 5 AREA BISHOP BLDG UST SAMPLE MATRIX SOIL DATE SAMPLED 04/13/89

PARAMETER	SAMPLE DEPTH (FT) 3 0	7 5	11 5	16 5	21 5	26 5	31 5	36 5	41 5
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)									
ACETONE	60		30	25	20		36	69	41
ETHYLBENZENE	_							6	16
METHYLENE CHLORIDE	8				20		11		
TOLUENE			7			6	7	10	7
XYLENES TOTAL	5			8				18	75
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	830	75	72	100		4	9	190	340

BORING/WELL NO B 9 AREA BISHOP BLDG UST SAMPLE MATRIX SOIL DATE SAMPLED 05/23/89

PARAMETER	SAMPLE DEPTH (ft) 31 5	45 0
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)		
METHYLENE CHLORIDE	21	22
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	5	6

DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION
DENOTES SAMPLE COLLECTED AT BEDROCK SURFACE

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TABLE 4 1 (CONTINUED)

BORING/WELL NO BW 26 AREA BISHOP BLDG UST SAMPLE MATRIX SOIL DATE SAMPLED 06/01/89

PARAMETER	SAMPLE DEPTH (ft) 17 0	32 5	41 0	61 0
URGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)				
ACETONE	33			
ETHYLBENZENE	19			
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	310	21	12	12

DENOTES SAMPLE COLLECTED AT BEDROCK SURFACE

BORING/WELL NO BW 26 AREA BISHOP BLDG UST SAMPLE MATRIX WATER DATE SAMPLED 06/02/89

PARAMETER	CONCENTRATION
PURGEABLE ORGANICS (ug/L) (EPA METHOD 624)	
ETHYLBENZENE	7
TOTAL XYLENES	20

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TABLE 4 2 SUMMARY OF LABORATORY ANALYSIS PARAMETERS BISHOP USTs AREA

AREA	BORING OR SAMPLE NO	SAMPLE INTERVAL	SAMPLE MATRIX	PURGEABLE ORGANICS	BTEX	BNAs	PESTICIDE/ PCB S	TOTAL METALS	DISSOLVED METALS	EP TOX METALS	CYANIDE	PHENOLS	DIOXIN	TPH	PCP
BISHOP USTs	BW 5	3 0	SOIL	X										X	
		7 5	SOIL	X										X	
		11 5	SOIL	X										X	
		16 5	SOIL	X										X	
		21 5	SOIL	X										X	
		26 5	SOIL	X										X	
		31 5	SOIL	X										X	
		36 5	SOIL	X										X	
		41 5	SOIL	X										X	
	B 9	31 5	SOIL	X										X	
		45 0	SOIL	X										X	
	BW 26	17 0	SOIL	X										X	
		32 5	SOIL	X										X	
		41 0	SOIL	X										X	
		60 0	SOIL	X											
		61 0	SOIL	X										X	
	BW 26	GRAB	WATER	X											

5 1 SITE DESCRIPTION - LAGOON AREA

The lagoon area is located at the west side of the Garden Maid Building complex (see **Figure 1**) The area is gravel covered and currently used for truck loading and trailer storage The area was formerly an impoundment about 40 to 50 ft wide, 100 to 110 ft long and about 5 ft deep Wastewater from a water-wash paint overspray capture system mixed with rainwater was discharged to the lagoon Sludges accumulated on the floor of the lagoon while much of the water evaporated The lagoon was in use from about 1956 to approximately 1985 The lagoon was then backfilled with soil and gravel

5 2 SAMPLING AND ANALYTICAL RESULTS

Three sets of samples were taken in the lagoon area One boring, B-5, and one boring/well, BW-2, were drilled in the first phase of sampling Four borings were drilled in the second phase, B-19, B-20, B-21, and B-22 One sludge sample was composited from the four samples taken from the borings Eleven samples were analyzed from these borings for the parameters shown in **Table 5-2** A layer of sludge was identified at a depth of 5 5 to 6 5 ft Analytical results are presented in **Table 5-1** BW-19 contained levels of toluene (150 mg/kg), ethylbenzene (420 mg/kg), total xylenes (2,800 mg/kg) at a depth of 6 5 ft The sludge composite contained very low levels of EP toxic metals

BW-2, located immediately west of the lagoon, was sampled at an elevation that would correlate to the bottom of the lagoon B-5 soil samples were taken from inside the lagoon, also from the area beneath the lagoon BW-2 laboratory test results indicate level of metals low enough to pass the RCRA EP toxic levels TPH levels were 50 mg/kg at a depth of 3 5 ft and 300 mg/kg at a depth of 7 5 ft The results dropped to 1 mg/kg and 2 mg/kg at lower depths Low concentrations of ethylbenzene, methylene chloride, and total xylenes were found beneath the lagoon in Boring B-5 Concentrations of total metals were consistent with background concentrations A water sample taken at BW-2 indicated low concentrations of metals This water is presumed to be "perched"

5 3 DISCUSSION

Based on laboratory tests, results of soil samples taken from Boring B-5, some contamination has migrated vertically downward at least 15 ft below the bottom of the lagoon, however, the concentrations of contamination are low The contamination appears to be concentrated in the sludge layer in the lagoon The concentrations do not exceed RCRA characteristic limits

TABLE 5 1
SUMMARY OF COMPOUNDS
DETECTED IN SAMPLES
FROM THE LAGOON AREA

BORINGS/WELLS BW 2 B 5 AND SLUDGE COMPOSITE SAMPLE FROM B 19 B 20 B 21 & B 22

BORING/WELL NO BW 2 AREA LAGOON SAMPLE MATRIX SOIL DATE SAMPLED 4/18/89

PARAMETER	SAMPLE DEPTH (ft) 3 5	7 5	11 5	16 5	21 5
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)					
ACETONE	66				
METHYLENE CHLORIDE	14	17	12	16	17
TOLUENE	10				
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	50	300	1	2	
TOTAL METALS (mg/kg) (EPA METHODS 6000 7000)					
ANTIMONY		1 2	1 6	1 1	1
ARSENIC	1 6	3 3	3 3	2 6	2 1
BERYLLIUM		0 15	0 05	0 13	0 14
CADMIUM	0 14	0 19	0 19	0 13	0 29
CHROMIUM	8 2	23	25	9 1	10
COPPER	2	3 4	2	2 9	3 6
LEAD	4 3	8 8	5 8	8 6	7 2
MERCURY		0 04	0 02		
NICKEL	1 9	3 1	2 6	3	3 2
ZINC	9 6	29	3 6	3 7	15

DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

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TABLE 5 1 (CONTINUED)

BORING/WELL NO B 5 AREA LAGOON SAMPLE MATRIX SOIL DATE SAMPLED 4/14/89

PARAMETER	SAMPLE DEPTH (ft) 10 0	15 0	20 5
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)			
ACETONE		31	
ETHYLBENZENE	8	18	22
METHYLENE CHLORIDE	*7		
XYLENES TOTAL	100	120	170
TOTAL METALS (mg/kg) (EPA METHODS 6000 7000)			
ANTIMONY	2 3		1
ARSENIC	3 5	1 5	1 5
BERYLLIUM	0 11	0 11	0 15
CADMIUM	0 33	0 14	0 17
CHROMIUM	33	10	9 5
COPPER	2 5	2 1	3 5
LEAD	7 6	5 1	5 5
NICKEL	3 7	2 3	5 2
ZINC	4 9	11	7 3
EP TOX METALS (mg/L) (EPA METHODS 1310 200)			
COPPER	0 03	NA	NA
LEAD	0 05	NA	NA
ZINC	0 51	NA	NA
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	30	80	NA

NA = SAMPLE NOT ANALYZED FOR THIS COMPOUND
* DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

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TABLE 5 1 (CONTINUED)

BORING/WELL NO B 19 AREA LAGOON SAMPLE MATRIX SOIL DATE SAMPLED 5/30/89

PARAMETER	SAMPLE DEPTH (ft) 6 5
BTEX (mg/kg) (EPA METHOD 8020)	
BENZENE	
TOLUENE	150
ETHYLBENZENE	420
XYLENES TOTAL	2 800

SAMPLE SLUDGE COMPOSITE FROM B 19 B 20 B 21 & B 22 AREA LAGOON SAMPLE MATRIX SLUDGE DATE SAMPLED 5/31/89

PARAMETER	CONCENTRATION
EP TOX METALS (mg/L) (EPA METHODS 1310 200)	
ARSENIC	0 016
BARIUM	0 12
CHROMIUM TRIVALENT	0 11

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TABLE 5 2 SUMMARY OF LABORATORY ANALYSIS PARAMETERS LAGOON AREA

AREA	BORING OR SAMPLE NO	SAMPLE INTERVAL	SAMPLE MATRIX	PURGEABLE ORGANICS	BTEX	BNAs	PESTICIDE/ PCB S	TOTAL METALS	DISSOLVED METALS	EP TOX METALS	CYANIDE	PHENOLS	DIOXIN	TPH	PCP
LAGOON	BW 2	3 5	SOIL	X				X						X	
		7 5	SOIL	X				X						X	
		11 5	SOIL	X				X						X	
		16 5	SOIL	X				X						X	
		21 5	SOIL	X				X						X	
	BW 2	GRAB	WATER	X		X	X	X	X		X	X	X	X	
	B 5	10 0	SOIL	X		X	X	X		X	X	X	X	X	
		15 0	SOIL	X		X	X	X			X	X	X	X	
		20 5	SOIL	X				X							
	B 19	6 5	SLUDGE		X										
	LAGOON COMPOSITE	5 5 6 5	SLUDGE							X					

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* FROM SLUDGE LAYERS IN BORINGS B 19 B 20 B 21 & B 22

6 1 SITE DESCRIPTION - HAYSTACK AREA

The Haystack area is located south of the Garden Maid Building This area was formerly used to store a large pile of scrap metal shavings which were generated from metal cutting operations Cutting oils are thought to be associated with the shavings The area is about 10 to 15 ft in diameter and about 10 ft deep The haystack was started in the late 1950's Some time in the 1960's, the haystack was leveled and covered with soil and gravel fill

6 2 SAMPLING AND ANALYTICAL RESULTS

Two borings, B-3 and B-23, were drilled in the haystack area One soil sample was collected from B-3 below the fill to determine if any contaminants had collected beneath the fill Boring B-23 was completed to characterize the fill as nonhazardous Only low levels of total metals were found EP toxicity test results were far below the RCRA limits Analytical data are shown in **Table 6-1** **Table 6-2** indicates the analytical parameters for the samples

6 3 DISCUSSION

The results of the sampling and analysis program confirm that the haystack does not contain hazardous waste

TABLE 6 1
SUMMARY OF COMPOUNDS DETECTED
FROM THE HAYSTACK AREA

BORINGS B 3 AND B 23

BORING NO B 3 AREA HAYSTACK SAMPLE MATRIX SOIL DATE SAMPLED 04/14/89

PARAMETER	SAMPLE DEPTH (ft) 10 5 12 0
TOTAL METALS (mg/kg) (EPA METHODS 6000 7000)	
ANTIMONY	1 2
ARSENIC	1 8
BERYLLIUM	0 06
CADMIUM	0 16
CHROMIUM	10
COPPER	2 1
LEAD	4 7
NICKEL	2 3
ZINC	3 8
EP TOX METALS (mg/L) (EPA METHODS 1310 200)	
COPPER	0 04
LEAD	0 03
ZINC	0 08

BORING NO B 23 AREA HAYSTACK SAMPLE MATRIX SOIL DATE SAMPLED 05/31/89

PARAMETER	SAMPLE DEPTH (ft) 3 5
PURGEABLE ORGANICS (EPA METHOD 8240)	
ACETONE	310
2 BUTANONE	120
TOLUENE	5
EP TOX METALS (mg/L) (EPA METHODS 1310 200)	
BARIUM	0 75
CHROMIUM TRIVALENT	0 09

TABLE 6 2 SUMMAR OF LABORATORY ANALYSIS PARAMETERS HAYSTACK AREA

AREA	BORING OR SAMPLE NO	SAMPLE INTERVAL	SAMPLE MATRIX	PURGEABLE ORGANICS	BTEX	BNAs	PESTICIDE/ PCB S	TOTAL METALS	DISSOLVED METALS	EP TOX METALS	CYANIDE	PHENOLS	DIOXIN	TPH	PCP
HAYSTACK	B 3	12 0	SOIL	X				X		X				X	
	B 23	3 5	SOIL	X						X					

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7 1 SITE DESCRIPTION - DRUM STORAGE AREA

The Drum Storage Area (DSA) is located northwest of the plant buildings near the northern edge of the employee parking lot The DSA is a gravel covered area where empty 55 gallon product drums are placed prior to removal from the site The area is about 30 by 100 ft in size In the past, drums were positioned such that residual product drained onto the ground The drums contained such products as lubricating and cutting oils, and solvents The ground surface is discolored in the area of the drums

7 2 SAMPLING AND ANALYTICAL RESULTS

Surface soil samples were taken from the DSA at six locations These samples were composited into two samples for analysis The samples were collected from the area discolored by contaminants The analytical results are presented in **Table 7-1** The only parameters showing elevated results were the TPH samples at concentrations of 29,000 and 41,000 mg/kg However, free product was picked up in the samples

One boring/well, BW-18, was drilled off the edge of the pavement near the drums This boring was drilled as part of the Silo area investigation but the results appear to be applicable to the DSA Three samples were analyzed from Boring BW-18 The results of compounds detected are presented in **Table 7-2** The

following results were found at a depth of 6 7 ft acetone-2,200 ug/kg, 2-butanone (MEK)- 1500 ug/kg, trichloroethene-120 ug/kg, tetrachloroethene- 130 ug/kg, toluene-890 ug/kg, ethylbenzene-70 ug/kg, and total xylenes- 250 ug/kg At 29 5 ft, the results were acetone-240 ug/kg, and 2-butanone-660 ug/kg **Table 7-3** shows the analytical parameters for the samples

7 3 DISCUSSION

It is possible that the contaminants may have come from the DSA or from a sewer septic system that was reportedly used in the late 1950's and early 1960's In general, these are fairly low levels of organics

TABLE 7 1
SUMMARY OF COMPOUNDS DETECTED
IN THE DRUM STORAGE AREA

COMPOSITED SURFACE SOIL SAMPLES DSA 1 AND DSA 2

SAMPLE NOs DSA 1 & DSA 2 AREA DRUM STORAGE AREA SAMPLE MATRIX SOIL DATE SAMPLED 05/18/89

PARAMETER	CONCENTRATION DSA 1	CONCENTRATION DSA 2
BTEX (mg/kg) (EPA METHOD 8020)		
BENZENE		
TOLUENE		
ETHYLBENZENE		
XYLENES TOTAL		4
EP TOX METALS (mg/L) (EPA METHODS 1310 & 200)		
ARSENIC	0 005	0 005
CHROMIUM	0 16	0 10
COPPER	0 04	
LEAD	0 07	
NICKEL	0 16	0 07
ZINC	2 6	1 5
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	29 000	41 000
PCB S (ug/kg) (EPA METHOD 8080)	ND (500 000)	ND (500 000)
FLASHPOINT (FAHRENHEIT) (EPA METHOD 1010)	NOT < 200	NOT 200

ND NOT-DETECTED AT THE DETECTION LEVEL IN PARENTHESES
DETECTION LIMITS RAISED DUE TO MATRIX INTERFERENCE

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TABLE 7 2
SUMMARY OF COMPOUNDS DETECTED
IN THE DRUM STORAGE AREA

BORING/WELL NO BW 18

BORING/WELL NO BW 18 AREA DRUM STORAGE SAMPLE MATRIX SOIL DATE SAMPLED 05/30/89

PARAMETER	SAMPLE DEPTH (ft) 6 7	19 4	29 5
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)			
ACETONE	2 200		240
2 BUTANONE	1 500		660
TRICHLOROETHENE	120	6	
TETRACHLOROETHENE	130		
TOLUENE	890		
ETHYLBENZENE	79		
XYLENES TOTAL	250		
METHYLENE CHLORIDE		6	

DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

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TABLE 7 3 SUMMARY OF LABORATORY ANALYSIS PARAMETERS DRUM STORAGE AREA

AREA	BORING OR SAMPLE NO	SAMPLE INTERVAL	SAMPLE MATRIX	PURGEABLE ORGANICS	BTEX	BNAs	PESTICIDE/ PCB S	TOTAL METALS	DISSOLVED METALS	EP TOX METALS	CYANIDE	PHENOLS	DIOXIN	TPH	PCP
DRUM STORAGE	DSA 1	COMPOSITE	WASTE		X		X			X				X	
	DSA 2	COMPOSITE	WASTE		X		X			X				X	
	BW 18	6 7	SOIL	X											
		19 4	SOIL	X											
		29 5	SOIL	X											

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ALSO ANALYZED FOR FLASHPOINT DETERMINATION

8 1 SITE DESCRIPTION - HEAT TREAT SHOP

The Heat Treat Shop is an offsite facility leased by Detroit Tool It is located in Lebanon near the southwest corner of Elm and Jackson Streets The facility has two 1000 gallon USTs located on the east side of the building Reportedly, they were installed in 1947 One tank may have been replaced approximately 25 years ago when it was suspected of leaking One tank is currently in use and contains No 2 diesel fuel

8 2 SAMPLING AND ANALYTICAL RESULTS

Seven borings were installed to determine if the tanks had leaked Analytical results are presented in **Table 8-1** Ten samples were analyzed for the parameters shown in **Table 8-2** These results indicate levels of TPH concentrations at 11 mg/kg or less Two borings were installed initially The air monitoring instrument readings and fuel odors detected during drilling led to a second set of borings located further away from the tanks The TPH test results were similar to that obtained earlier During the initial drilling in April, the unused tank contained a small amount of water During the second sampling episode in the beginning of June, the tank was observed to be about 95% full of water

8 3 DISCUSSION

The tanks were reported to the MDNR UST Coordinator and to the MDNR Laboratory Services Program on June 14,1989

TABLE 8 1
SUMMARY OF COMPOUNDS
DETECTED IN SAMPLES FROM THE
HEAT TREATMENT SHOP UST AREA

BORINGS T 1 T 2 T 5 T 6 AND T 7

BORING NO T 1 AREA HEAT TREAT USTs SAMPLE MATRIX SOIL DATE SAMPLED 04/14/89

PARAMETER	SAMPLE DEPTH (FT) 9 5	13 5
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 8015)		
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	NA	NA

BORING NO T 2 AREA HEAT TREAT USTs SAMPLE MATRIX SOIL DATE SAMPLED 04/14/89

PARAMETER	SAMPLE DEPTH (FT) 9 5	12 5
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 8015)		
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	NA	NA

NA = NOT ANALYZED

TABLE 8 1 (CONTINUED)

BORING NO T 5 AREA HEAT TREAT USTs SAMPLE MATRIX SOIL DATE SAMPLED 06/02/89

PARAMETER	SAMPLE DEPTH (FT) 9 0	15 0
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 8015)	NA	NA
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	9	11
BTEX (EPA METHOD 8020) (mg/kg)	ND	ND

BORING NO T 6 AREA HEAT TREAT USTs SAMPLE MATRIX SOIL DATE SAMPLED 06/02/89

PARAMETER	SAMPLE DEPTH (FT) 8 0	15 0
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 8015)	NA	NA
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	8	9
BTEX (EPA METHOD 8020) (mg/kg)	ND	ND

NA = NOT ANALYZED ND = NOT DETECTED

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TABLE 8 1 (CONTINUED)

BORING NO T 7 AREA HEAT TREAT USTs SAMPLE MATRIX SOIL DATE SAMPLED 06/02/89

PARAMETER	SAMPLE DEPTH (FT) 8 0	12 0
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 8015)	NA	NA
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	12	7
BTEX (EPA METHOD 8020) (mg/kg)	ND	ND

NA = NOT ANALYZED ND = NOT DETECTED

TABLE 8 2 SUMMARY OF LABORATORY ANALYSIS PARAMETERS HEAT TREATMENT SHOP USTs

AREA	BORING OR SAMPLE NO	SAMPLE INTERVAL	SAMPLE MATRIX	PURGEABLE ORGANICS	BTEX	BNAs	PESTICIDE/ PCB S	TOTAL METALS	DISSOLVED METALS	EP TOX METALS	CYANIDE	PHENOLS	DIOXIN	TPH	PCP
HEAT TREATMENT SHOP	T 1	9 5	SOIL											X	
		13 5	SOIL											X	
	T 2	9 5	SOIL											X	
		12 5	SOIL											X	
	T 5	9 0	SOIL		X									X	
		15 0	SOIL		X									X	
	T 6	8 0	SOIL		X									X	
		15 0	SOIL		X									X	
	T 7	8 0	SOIL		X									X	
		12 0	SOIL		X									X	

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9 1 SITE DESCRIPTION - BACKFILL AREA

The Backfill Area is located in the northwest portion of the site This area was reportedly used by the City of Lebanon as a dump for rubble from the demolition of city streets and sidewalks A small area along the northwest edge of this fill may contain asbestos shingles hauled in from offsite The existence of the shingles was reported to the MDNR Regional office in Springfield A site visit was made by MDNR personnel on April 13, 1989 The area is generally soil covered, except near the edges where large slabs of concrete are exposed The fill ranges in thickness from less than 2 ft in the northwest to almost 10 ft in the southwest The surface of the fill is generally flat

9 2 SAMPLING AND ANALYTICAL RESULTS

Initially, an attempt was made to complete one boring in the fill, but the drill rig was not able to penetrate the rubble fill After several attempts, the boring was abandoned

During the second phase of the investigation, drilling was again attempted Five borings were completed B-28 through B-32 Boring depths ranged from about 6 to 12 ft Eighteen soil samples from the fill and underlying soils were analyzed for BTEX and EP toxic metals (see **Table 9-2**) The test results indicated

BTEX was not detected and the metals were well below the RCRA regulatory limits (see **Table 9-1**)

9 3 DISCUSSION

Neither field observations nor laboratory analyses indicate any significant problems in the backfill area The five borings were located in a line down the middle of the backfill area since borings could not be completed at the perimeter It appears that the fill is limited to demolition debris

TABLE 9 1
SUMMARY OF COMPOUNDS DETECTED
IN SOIL SAMPLES IN THE
BACKFILL AREA

BORINGS B 28 B 29 B 30 B 31 & B 32

BORING NO B 28 AREA BACKFILL SAMPLE MATRIX SOIL DATE SAMPLED 05/31/89

PARAMETER	SAMPLE DEPTH (FT) 0 0	2 0	4 0	8 0
EP TOX METALS (mg/L) (EPA METH 200)				
BARIUM	0 43	0 64		
CHROMIUM	0 05	0 05		

BORING NO B 29 AREA BACKFILL SAMPLE MATRIX SOIL DATE SAMPLED 05/31/89

PARAMETER	SAMPLE DEPTH (FT) 0 0	1 0	1 0	6 0
EP TOX METALS (mg/L) (EPA METH 200)				
BARIUM	0 36	0 47		
CHROMIUM	0 1	0 09		

BORING NO B 30 AREA BACKFILL SAMPLE MATRIX SOIL DATE SAMPLED 05/31/89

PARAMETER	SAMPLE DEPTH (FT) 0 0	5 0	5 0	6 5
EP TOX METALS (mg/L) (EPA METH 200)				
BARIUM	0 47	0 16		
CHROMIUM	0 05	0 06		
LEAD	0 02	ND		

TABLE 9 1 (CONTINUED)

BORING NO B 31 AREA BACKFILL SAMPLE MATRIX SOIL DATE SAMPLED 05/31/89

PARAMETER	SAMPLE DEPTH (FT) 0 0	7 0	7 0	12 5
EP TOX METALS (mg/L) (EPA METH 200)				
BARIUM	0 29	0 09		
CHROMIUM	0 14	0 07		

BORING NO B 32 AREA BACKFILL SAMPLE MATRIX SOIL DATE SAMPLED 05/31/89

PARAMETER	SAMPLE DEPTH (FT) 6 0	10 0
EP TOX METALS (mg/L) (EPA METH 200)		
BARIUM	0 41	
CHROMIUM	0 06	

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TABLE 9 2 SUMMARY OF LABORATORY ANALYSIS PARAMETERS BACKFILL AREA

AREA	BORING OR SAMPLE NO	SAMPLE INTERVAL	SAMPLE MATRIX	PURGEABLE ORGANICS	BTEX	BNAs	PESTICIDE/ PCB S	TOTAL METALS	DISSOLVED METALS	EP TOX METALS	CYANIDE	PHENOLS	DIOXIN	TPH	PCP
BACKFILL	B 28	2 0	SOIL							X					
		4 0	SOIL		X										
		6 0	SOIL		X										
		8 0	SOIL							X					
	B 29	1 0	SOIL		X					X					
		2 0	SOIL		X										
		6 0	SOIL							X					
	B 30	4 5	SOIL		X										
		6 5	SOIL		X										
		0 0 5 0	SOIL							X					
		5 0 6 5	SOIL							X					
	B 31	0 0 7 0	SOIL							X					
		6 5	SOIL		X										
		7 0 12 5	SOIL							X					
		12 3 12 5	SOIL		X										
	B 32	4 0	SOIL		X										
		8 0	SOIL		X										
		10 0	SOIL							X					

10 0 BACKGROUND SAMPLE LOCATION

10 1 SITE DESCRIPTION - BACKGROUND SAMPLES

Three boring/wells designated as BBW-1, BBW-2, and BW-1 were placed at different areas of the Detroit Tool site to determine background levels of parameters to be tested

10 2 SAMPLING AND ANALYTICAL RESULTS

The three borings ranged in depth from about 20 ft to 40 ft Analytical results are presented in **Table 10-1** Fourteen samples were taken from the three borings and analyzed for the parameters shown in **Table 10-2**

10 3 DISCUSSION

In general, concentrations of the compounds analyzed were either below detection limits or were in line with typical background levels encountered at the site

A water sample was taken from the Mid-America Dairy well which is located adjacent to the southwest Detroit Tool property line The well is reported to be 1151 ft deep The analytical results are presented in **Table 10-1** No contamination was shown

TABLE 10 1
SUMMARY OF COMPOUNDS DETECTED
IN SOIL SAMPLES IN BACKGROUND AREAS

BORINGS/WELLS BBW 1 BBW 2 AND BW 1

WELL NO BBW 1 AREA BACKGROUND SAMPLE MATRIX SOIL DATE SAMPLED 04/10/89

PARAMETER	SAMPLE DEPTH (ft) COMPOSITED INTERVALS 2 5 4 0 & 10 0 11 5	COMPOSITED INTERVALS 15 0 16 5 & 20 0 21 5
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)		
METHYLENE CHLORIDE	*7	*22
TOTAL METALS (mg/kg) (EPA METHODS 6000 7000)		
ANTIMONY	2	1 3
ARSENIC	4 4	3 1
BERYLLIUM	0 29	0 28
CADMIUM	0 28	0 19
CHROMIUM	8 9	9 0
COPPER	22	12
LEAD	15	9 6
MERCURY	0 02	
NICKEL	13	6 6
ZINC	11	11
EP TOX METALS (mg/kg) (EPA METHODS 1310 200)		
ZINC	0 05	
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	4	5

* DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

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TABLE 10 1 (CONTINUED)

WELL NO BBW 2 AREA BACKGROUND SAMPLE MATRIX SOIL DATE SAMPLED 04/11/89

PARAMETER	SAMPLE DEPTH (ft) COMPOSITED INTERVALS 2 5 4 0 & 6 0 7 5	COMPOSITED INTERVALS 10 0 11 5 & 20 0 21 5
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)		
METHYLENE CHLORIDE	*23	*19
BASE/NEUTRAL ACID EXTRACTABLE ORGANICS (mg/kg) (EPA METHOD 8270)		
NAPHTHALENE		80
DI N BUTYLPHTHALATE		11500
BUTYLBENZYLPHTHALATE		79
BIS(2 ETHYLHEXYL)PHTHALATE		140
PESTICIDES/PCB S (ug/kg) (EPA METHOD 8080)		
DIELDRIN	26	
TOTAL METALS (mg/kg) (EPA METHODS 6000 7000)		
ANTIMONY	1 3	
ARSENIC	3 9	2 7
BERYLLIUM	0 23	0 21
CADMIUM	0 29	0 19
CHROMIUM	20	11
COPPER	5 2	6 1
LEAD	29	8 2
MERCURY	0 03	0 03
NICKEL	5 1	6 8
SILVER		0 06
ZINC	32	6 8
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	5	5

! RESULT IS ESTIMATED VALUE AS CONCENTRATION EXCEEDS CALIBRATION RANGE
* DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

TABLE 10 1 (CONTINUED)

WELL NO BW 1 AREA BACKGROUND SAMPLE MATRIX SOIL DATE SAMPLED 04/11/89

PARAMETER	SAMPLE INTERVAL 2 5 4 0	8 0 9 5	13 0 14 5	20 0 21 5
PURGEABLE ORGANICS (ug/kg) (EPA METHOD 8240)				
METHYLENE CHLORIDE	*19	*24	*34	
CARBON DISULFIDE			10	
TOTAL PETROLEUM HYDROCARBONS (mg/kg) (EPA METHOD 418 1)	18	5	5	19
TOTAL METALS (mg/kg) (EPA METHODS 6000 7000)				
ANTIMONY	1 3	1 5	1 3	1 1
ARSENIC	2 5	2 5	2 7	1 6
BERYLLIUM	0 16	0 15	0 16	0 13
CADMIUM	0 18	0 19	0 17	0 11
CHROMIUM	16	8 2	8 1	6 8
COPPER	3 8	6 2	5 6	3 2
LEAD	7 9	11	7 8	4 9
MERCURY	0 03			0 03
NICKEL	3 3	5 3	5 6	3
ZINC	4 8	7 7	9 5	7 2

* DENOTES CONCENTRATION LIKELY ATTRIBUTABLE TO LABORATORY CONTAMINATION

TABLE 10 1 (CONTINUED)
SUMMARY OF COMPOUNDS DETECTED
WATER SAMPLES FROM BACKGROUND AREAS

BORINGS/WELLS BBW 1 BBW 2 AND BW 1 GRAB SAMPLES DT 1 & DW 1

WELL NO BBW 1 AREA BACKGROUND SAMPLE MATRIX WATER DATE SAMPLED 04/18/89

PARAMETER	CONCENTRATION
TOTAL METALS (mg/L) (EPA METHOD 200)	
ARSENIC	0 018
COPPER	0 11
LEAD	0 1
ZINC	0 06
DISSOLVED METALS (mg/L) (EPA METHOD 200)	
COPPER	0 02
ZINC	0 03
TOTAL PETROLEUM HYDROCARBONS (mg/L) (EPA METHOD 418 1)	1 0

WELL NO BBW 2 AREA BACKGROUND SAMPLE MATRIX WATER DATE SAMPLED 04/18/89

PARAMETER	CONCENTRATION
TOTAL METALS (mg/L) (EPA METHOD 200)	
ARSENIC	0 01
COPPER	0 06
LEAD	0 04
ZINC	0 02
TOTAL PETROLEUM HYDROCARBONS (mg/L) (EPA METHOD 418 1)	1 8

TABLE 10 1 (CONTINUED)

WELL NO BW 1 AREA BACKGROUND SAMPLE MATRIX WATER DATE SAMPLED 04/18/89

PARAMETER	CONCENTRATION
TOTAL METALS (mg/L) (EPA METHOD 200)	
COPPER	0 05
LEAD	0 02
TOTAL PETROLEUM HYDROCARBONS (mg/L) (EPA METHOD 418 1)	0 3

SAMPLE NO DT 1 AREA BACKGROUND SAMPLE MATRIX WATER DATE SAMPLED 04/12/89

PARAMETER	CONCENTRATION	REMARKS
TOTAL METALS (mg/L) (EPA METHOD 200)		SAMPLE OF DETROIT TOOL PLANT TAP WATER
CHROMIUM	0 02	
ZINC	0 3	

SAMPLE NO DW 1 AREA BACKGROUND SAMPLE MATRIX WATER DATE SAMPLED 04/12/89

PARAMETER	CONCENTRATION	REMARKS
TOTAL METALS (mg/L) (EPA METHOD 200)		SAMPLE FROM MID AN DAIRY WELL
CHROMIUM	0 02	
ZINC	0 14	

TABLE 10 2 SUMMARY OF LABORATORY ANALYSIS PARAMETERS BACKGROUND & SITE CHARACTERIZATION SAMPLES

AREA	BORING OR SAMPLE NO	SAMPLE INTERVAL	SAMPLE MATRIX	PURGEABLE ORGANICS	BTEX	BNAs	PESTICIDE/ PCB S	TOTAL METALS	DISSOLVED METALS	EP TOX METALS	CYANIDE	PHENOLS	DIOXIN	TPH	PCP
BACKGROUND & SITE CHARACTERIZATION	BBW 1	4 0 & 11 5	SOIL	X		X	X	X		X	X	X	X	X	
		16 5 & 21 5	SOIL	X		X	X	X			X	X	X	X	
	BBW 1	GRAB	WATER	X		X	X	X	X		X	X	X	X	
	BBW 2	4 0 & 7 5	SOIL	X		X	X	X			X	X	X	X	
		11 5 & 16 5	SOIL	X		X	X	X			X	X	X	X	
	BBW 2	GRAB	WATER	X		X	X	X	X		X	X	X	X	
	BW 1	4 0	SOIL	X		X	X	X			X	X	X	X	
		9 5	SOIL	X		X	X	X			X	X	X	X	
		14 5	SOIL	X		X	X	X			X	X	X	X	
		21 5	SOIL	X		X	X	X			X	X	X	X	
	BW 1	GRAB	WATER	X		X	X	X	X		X	X	X	X	
	DT 1	GRAB	WATER	X		X	X	X			X	X	X		
	DW 1	GRAB	WATER	X		X	X	X			X	X	X		

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11 0 CONCLUSION

In conclusion, the results of the extensive sampling and analysis indicate that contamination is limited to the soil at certain areas of the site Detroit Tool is in the process of preparing a soil remediation program in order to voluntarily remediate the site

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