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April 23, 1991
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Delta
Environmental
Consultants, Inc.

SUMMARY OF RESULTS - FIRST QUARTER

1991 GROUND WATER MONITORING PROGRAM

SUPERIOR TERMINAL

SUPERIOR, WISCONSIN

DELTA NO. 10-88-457

Delta
Environmental
Consultants, Inc.

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612/636-2427
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April 23, 1991

Mr. David A. Piotrowski
Amoco Oil Company
Mail Code B603
225 North Michigan Avenue
P.O. Box 7513
Chicago, IL 60680

Subject: Summary of Results - First Quarter
1991 Ground Water Monitoring Program
Superior Terminal
Superior, Wisconsin
Delta No. 10-88-457

Dear Mr. Piotrowski:

The purpose of this correspondence is to provide a summary of the first quarter results of the 1991 ground water monitoring program conducted by Delta Environmental Consultants, Inc. (Delta), at the Amoco Oil Company Terminal located in Superior, Wisconsin. In addition to the recently collected data, this correspondence contains a summary of previously reported information.

Ground Water Elevation Collection

Ground water elevation data was collected on January 30, 1991, from all monitoring and recovery wells except MW-28, which was unable to be accessed. The water level data sheets for this event may be found in Appendix A. A summary of all ground water elevation data collected at the site is presented in Table 1.

The ground water elevation data indicates that the water table lies approximately 17 to 19 feet below ground surface. Hydrographs constructed from this data (Figures 1 and 2) indicate that only minor fluctuations in ground water elevation have occurred over the course of the investigation.

A summary of the free product layer thickness in each monitoring well is presented in Figure 3. The data shows that the observed product thickness may vary considerably both across the site on a given measurement date and over time at a given measurement point.

A ground water contour map (Figure 4), prepared using the January 30, 1991, data, indicates that ground water flow is variable across the site, most likely the result of variable infiltration within the containment berms. The primary flow direction is to the north-northwest, with the average hydraulic gradient ranging from 0.0035 to 0.0046 foot per foot. When comparing this contour map to previous maps (not presented), it is apparent that the ground water flow direction and gradient do not exhibit significant seasonal variations.

Ground Water Sampling and Analysis

Ground water samples were collected on January 31, 1991, from all accessible monitoring wells not impacted by free phase product. Ground water samples from these monitoring wells were submitted to the Amoco GMS laboratory for benzene, toluene, ethylbenzene, xylenes, and total hydrocarbons as gasoline analyses. In addition, ground water samples from six selected wells (MW-6, MW-9, MW-15, MW-16, MW-17, and MW-30) were submitted to PACE, Incorporated (PACE), for analyses using EPA Methods 601, 602, and 610. Analytical reports from both laboratories may be found in Appendix B. Summarized results of the analyses are presented in Tables 2, 3, and 4.

These results still indicate that dissolved hydrocarbon contamination exists both on and off site. The successive ground water sampling events suggest that the dissolved hydrocarbons are migrating very slowly in a hydraulically downgradient direction to the north-northwest. For a further discussion of the ground water chemistry results, please refer to Delta's Supplemental Remedial Investigation Report.

As mentioned above, two different laboratories have been used for project analytical work. The results obtained from both the Amoco GMS laboratory and PACE show very similar results (Table 2).

Future Monitoring Plans

Quarterly ground water monitoring will continue with ground water elevation data collection during April 1991.

If you have any questions or comments regarding this information, please feel free to contact me at (612) 636-2427.

Sincerely,

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Paul L. Brookner, P.G.
Project Hydrogeologist

John C. Grams
Project Manager

PLB/jmp

cc: Mr. Erv Johnson - Amoco Oil Company
Mr. Kevin Heaton - Amoco Oil Company

bcc: Ms. Karen Severson - Delta Environmental Consultants, Inc.

TABLE 1

Ground Water Elevation Summary
Superior Terminal
Superior, Wisconsin
Delta No. 10-88-457

Well Number	Top of Casing Elevation (ft)	09/08/88	05/18/89	07/26/89	11/16/89	07/25/90	08/14/90	09/06/90	01/03/91
MW-1*	637.68	616.29	616.52	616.31	615.47	615.93	616.18	616.52	615.56
MW-2*	637.23	616.10	616.47	616.62	616.53	615.82	616.20	616.30	616.59
MW-3	636.13	618.24	620.33	618.75	618.41	617.87	617.90	619.11	618.17
MW-4	636.71	617.71	619.66	618.27	617.88	617.44	617.50	618.39	617.79
MW-5	636.78	617.28	618.72	617.82	617.43	617.02	617.15	615.44	617.58
MW-6	636.77	616.16	616.56	616.80	616.35	616.16	616.23	616.20	615.77
MW-7	636.73	615.19	615.37	615.73	615.46	615.37	615.35	615.43	615.75
MW-8	634.61	613.09	613.57	613.71	613.40	613.11	613.06	613.14	613.64
MW-9	631.57	616.35	616.48	615.90	617.80	616.07	615.82	616.48	616.31
MW-10	633.54	615.16	615.44	615.93	615.60	615.18	615.15	615.52	615.97
MW-11	632.40	614.90	615.04	615.39	615.25	615.10	615.01	615.28	615.41
MW-12*	633.04	615.61	615.61	616.12	616.32	615.49	616.15	613.81	615.89
MW-13	636.01	615.94	616.91	616.34	615.96	615.73	615.86	616.32	616.43
MW-14*	636.31	614.60	614.97	615.36	614.23	613.92	614.26	614.65	614.85
MW-15	632.65	612.73	613.04	613.13	612.73	612.56	612.47	612.47	612.55
MW-16	636.17	613.57	613.98	613.79	613.41	613.24	613.18	613.65	613.60
MW-17	632.83	613.57	614.02	614.24	613.85	613.37	613.33	613.65	613.90
MW-18	636.77	615.87	616.21	616.45	616.20	615.82	615.87	616.01	616.52
MW-19	635.29	---	---	612.20	611.87	611.91	611.36	611.95	611.65
MW-20	636.26	---	---	616.34	616.09	615.83	615.85	616.28	616.40
MW-21	637.11	---	---	616.58	616.31	615.81	615.78	616.09	616.59
MW-22*	638.82	---	---	616.21	616.17	615.48	615.46	615.67	616.22
MW-23*	636.73	---	---	618.32	618.40	617.80	617.24	618.30	617.98
MW-24*	638.32	---	---	616.86	616.50	615.85	615.46	616.52	616.56
MW-25*	637.49	---	---	616.23	615.88	615.42	614.81	615.92	615.95
MW-26*	635.83	---	---	615.34	614.80	614.46	615.83	614.61	615.08
MW-27*	637.96	---	---	615.25	614.19	614.86	615.27	615.75	615.61
MW-28	638.08	---	---	616.35	615.97	615.60	615.60	616.25	NM
MW-30	632.74	---	---	614.76	614.08	613.86	613.94	614.30	614.54
MW-31	635.05	---	---	614.82	614.51	614.11	614.04	614.78	614.52

Elevations expressed in feet relative to NGVD.
--- Monitoring well not installed at this date.
NM = water table elevation not measured.
* Water table elevation corrected for free phase hydrocarbons using a specific gravity of 0.78.
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TABLE 2

Monitoring Well Chemistry Data - BTEX Compounds
Superior Terminal
Superior, Wisconsin
Delta No. 10-88-457

Data Reported as mg/l

Date	Benzene	Toluene	Ethyl-benzene	Xylenes	Sum BTEX	Analytical Laboratory
			Well No. MW-3			
03/23/88	0.03	0.03	0.02	0.05	0.13	Amoco GMS
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.004	PACE Labs
04/27/89	3.73	5.01	0.049	7.18	16.0	Amoco GMS
08/29/90	0.128	0.236	0.034	0.858	1.26	Amoco GMS
01/31/91	**0.012**	**0.003**	**0.012**	**0.049**	**0.106**	**Amoco GMS**
			Well No. MW-4			
03/23/88	<0.001	<0.001	<0.001	<0.002	<0.005	Amoco GMS
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.004	PACE Labs
04/27/89	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
08/29/90	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
01/31/91	**<0.001**	**<0.004**	**<0.002**	**<0.002**	**0.004**	**Amoco GMS**
			Well No. MW-5			
03/23/88	<0.001	<0.001	<0.001	<0.002	<0.005	Amoco GMS
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.004	PACE Labs
04/27/89	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
08/29/90	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
01/31/91	**NS**	**NS**	**NS**	**NS**	**NS**	**No Sample**
			* **Well No. MW-6** Sampled for VOCs + PAH			
03/23/88	<0.001	<0.001	<0.001	<0.002	<0.005	Amoco GMS
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.004	PACE Labs
04/27/89	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
08/29/90	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
08/29/90	<0.001	<0.001	<0.001	<0.001	<0.004	PACE Labs
01/31/91	**0.003**	**<0.001**	**<0.001**	**<0.002**	**0.003**	**Amoco GMS**
01/31/91	**0.0026**	**<0.001**	**<0.001**	**NA**	**NA**	**PACE Labs**
			Well No. MW-7			
03/23/88	<0.001	<0.001	<0.001	<0.002	<0.005	Amoco GMS
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.004	PACE Labs
04/27/89	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
08/29/90	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
01/31/91	**<0.001**	**0.002**	**<0.001**	**0.003**	**0.005**	**Amoco GMS**

Table 2 Continued
Page 2

Date	Benzene	Toluene	Ethyl-benzene	Xylenes	Sum BTEX	Analytical Laboratory
			Well No. MW-8			
03/23/88	<0.001	<0.001	<0.001	<0.002	<0.005	Amoco GMS
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.004	PACE Labs
04/27/89	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
08/29/90	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
01/31/91	**<0.001**	**<0.001**	**<0.001**	**<0.002**	**<0.005**	**Amoco GMS**
			Well No. MW-9			
03/23/88	0.37	0.17	1.4	1.5	3.44	Amoco GMS
09/21/88	0.61	0.044	0.29	0.12	1.064	PACE Labs
04/27/89	0.261	1.28	1.6	3.65	6.79	Amoco GMS
08/29/90	13.8	14.2	5.71	19.1	52.7	Amoco GMS
01/31/91	**1.24**	**0.701**	**1.30**	**2.23**	**5.47**	**Amoco GMS**
01/31/91	**<0.050**	**<0.050**	**0.670**	**NA**	**NA**	**PACE Labs**
			Well No. MW-10			
03/23/88	0.23	<0.001	0.09	0.04	0.36	Amoco GMS
09/21/88	0.08	0.011	0.003	0.015	0.109	PACE Labs
04/27/89	0.26	0.042	0.018	0.045	0.365	Amoco GMS
08/29/90	0.235	0.027	0.069	0.063	0.394	Amoco GMS
01/31/91	**0.069**	**0.007**	**0.015**	**0.017**	**0.108**	**Amoco GMS**
			Well No. MW-11			
03/23/88	0.07	<0.001	0.007	0	0.077	Amoco GMS
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.004	PACE Labs
04/27/89	0.147	0.019	0.018	0.019	0.203	Amoco GMS
08/29/90	0.069	0.003	0.024	0.009	0.104	Amoco GMS
01/31/91	**0.125**	**0.014**	**0.040**	**0.012**	**0.191**	**Amoco GMS**
			Well No. MW-13			
03/23/88	<0.001	<0.001	<0.001	0.01	0.01	Amoco GMS
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.004	PACE Labs
04/27/89	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
08/29/90	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
01/31/91	**<0.001**	**<0.001**	**<0.001**	**<0.002**	**<0.005**	**Amoco GMS**
			Well No. MW-15			
03/23/88	NS	NS	NS	NS	NS	Amoco GMS
09/21/88	0.018	0.016	0.007	0.016	0.057	PACE Labs
04/27/89	0.036	0.002	0.005	0.006	0.049	Amoco GMS
08/29/90	0.004	<0.002	<0.002	<0.004	0.004	Amoco GMS
01/31/91	**0.002**	**0.003**	**<0.001**	**0.002**	**0.007**	**Amoco GMS**
01/31/91	**0.0019**	**<0.001**	**0.0018**	**NA**	**NA**	**PACE Labs**

Table 2 Continued
Page 3

Date	Benzene	Toluene	Ethyl-benzene	Xylenes	Sum BTEX	Analytical Laboratory
			Well No. MW-16			
03/23/88	NS	NS	NS	NS	NS	Amoco GMS
09/21/88	0.77	3.4	0.71	2.8	7.68	PACE Labs
04/27/89	1.54	2.38	0.358	3.41	7.69	Amoco GMS
08/29/90	0.195	2.34	0.36	3.13	6.02	Amoco GMS
08/29/90	1	3.4	0.66	3.5	8.56	PACE Labs
01/31/91	**0.169**	**2.869**	**0.599**	**3.41**	**7.05**	**Amoco GMS**
01/31/91	**1.200**	**4.200**	**6.70**	**NA**	**NA**	**PACE Labs**
			Well No. MW-17			
03/23/88	NS	NS	NS	NS	NS	Amoco GMS
09/21/88	<0.001	<0.001	<0.001	<0.001	<0.004	PACE Labs
04/27/89	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
08/29/90	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
08/29/90	<0.001	<0.001	<0.001	<0.001	<0.004	PACE Labs
01/31/91	**<0.001**	**<0.001**	**<0.001**	**<0.002**	**<0.005**	**Amoco GMS**
01/31/91	**<0.001**	**<0.001**	**<0.001**	**NA**	**NA**	**PACE Labs**
			Well No. MW-18			
03/23/88	NS	NS	NS	NS	NS	Amoco GMS
09/21/88	0.055	<0.001	0.001	0.009	0.065	PACE Labs
04/27/89	0.641	0.027	0.007	0.031	0.706	Amoco GMS
08/29/90	0.308	0.011	0.01	0.017	0.346	Amoco GMS
01/31/91	**0.166**	**0.013**	**<0.001**	**0.015**	**0.194**	**Amoco GMS**
			Well No. MW-19			
07/11/89	0.003	<0.002	0.009	0.009	0.021	Amoco GMS
08/29/90	<0.002	<0.002	0.009	0.036	0.045	Amoco GMS
08/29/90	0.0023	<0.001	0.0063	0.035	0.044	PACE Labs
01/31/91	**<0.001**	**<0.001**	**0.003**	**0.003**	**0.006**	**Amoco GMS**
			Well No. MW-20			
07/11/89	<0.002	<0.002	<0.002	<0.04	<0.01	Amoco GMS
08/29/90	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
01/31/91	**<0.001**	**<0.001**	**<0.001**	**<0.002**	**<0.005**	**Amoco GMS**
			Well No. MW-21			
07/11/89	1.97	0.031	0.027	0.05	2.08	Amoco GMS
08/29/90	0.045	<0.002	<0.002	0.007	0.052	Amoco GMS
01/31/91	**0.075**	**0.003**	**<0.001**	**0.005**	**0.083**	**Amoco GMS**
			Well No. MW-28			
07/11/89	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
08/29/90	<0.002	<0.002	<0.002	<0.004	<0.01	Amoco GMS
08/29/90	<0.001	<0.001	<0.001	<0.001	<0.004	PACE Labs
01/31/91	**NS**	**NS**	**NS**	**NS**	**NS**	**No Sample**

Table 2 Continued
Page 4

Date	Benzene	Toluene	Ethyl-Benzene	Xylenes	Sum BTEX	Analytical Laboratory
			Well No. MW-30			
07/11/89	2.67	0.282	0.008	0.368	3.33	Amoco GMS
08/29/90	1.85	0.293	0.03	0.374	2.55	Amoco GMS
08/29/90	1.7	0.25	0.023	0.28	2.25	PACE Labs
01/31/91	**0.578**	**0.073**	**0.003**	**0.084**	**0.737**	**Amoco GMS**
01/31/91	**0.850**	**0.100**	**<0.025**	**NA**	**NA**	**PACE Labs**
			Well No. MW-31			
07/11/89	0.003	<0.002	<0.002	<0.004	0.003	Amoco GMS
08/29/90	<0.002	0.032	0.005	0.029	0.066	Amoco GMS
01/31/91	**<0.001**	**0.003**	**<0.001**	**0.003**	**0.006**	**Amoco GMS**

Data expressed as milligrams per liter (mg/L).

Sum BTEX	Sum of the concentrations of benzene, toluene, ethylbenzene, and xylenes
NS	Not sampled
NA	Not analyzed

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TABLE 3

Monitoring Well Chemistry Data - Polynuclear Aromatic Hydrocarbons
Superior Terminal
Superior, Wisconsin
Delta No. 10-88-457

Parameter	MW-6		MW-9	MW-15	MW-16		MW-17		MW-19	MW-28	MW-30
	08/29/90	01/31/91	01/31/91	01/31/91	08/29/90	01/31/91	08/29/90	01/31/91	08/29/90	08/29/90	01/31/91
Naphthalene	<0.0015	<0.0015	0.086	<0.0015	0.045	0.120	<0.0015	<0.0015	0.023	<0.0015	0.075
Acenaphthylene	<0.0015	<0.0015	0.026	<0.00015	0.0054	0.056	<0.0015	<0.0015	<0.0015	<0.0015	0.041
Fluorene	<0.00031	<0.0003	0.0006	<0.0003	<0.00031	<0.0012	<0.00031	<0.00031	0.0012	<0.0031	<0.00062
Phenanthrene	<0.0002	<0.0002	<0.0004	<0.0002	0.0007	<0.0008	0.00089	<0.0002	0.0006	<0.0002	<0.0004
Anthracene	<0.00005	<0.00005	<0.0001	0.00007	0.00008	<0.0002	0.00011	<0.00005	<0.00005	<0.00005	<0.0001
Fluoranthene	<0.0003	<0.0003	<0.0006	0.0014	0.00034	<0.0012	0.00072	<0.0003	<0.0003	<0.0003	<0.0006
Pyrene	<0.0001	<0.0001	<0.0002	<0.0001	0.00019	<0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002
Benzo(a)anthracene	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0004	0.00041	<0.0001	<0.0001	<0.0001	<0.0002
Chrysene	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0004	0.00092	<0.0001	<0.0001	<0.0001	<0.0002
Benzo(b)fluoranthene	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	<0.0008	0.00083	<0.0002	<0.0002	<0.0002	<0.0004
Benzo(k)fluoranthene	<0.0005	<0.00005	<0.0001	<0.00005	<0.00005	<0.0002	0.00034	<0.00005	<0.00005	<0.00005	<0.0001
Benzo(a)pyrene	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0004	0.00075	<0.0001	<0.0001	<0.0001	<0.0002
Benzo(g,h,i)perylene	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	<0.0008	0.00067	<0.0002	<0.0002	<0.0002	<0.0004
Indeno(1,2,3-cd)pyrene	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	<0.0008	0.00034	<0.0002	<0.0002	<0.0002	<0.0004
Acenaphthene	<0.002	<0.002	0.073	<0.002	<0.002	0.0091	<0.002	<0.002	<0.002	<0.002	0.017

above ES

Data expressed as mg/L.
All samples were analyzed by Pace, Incorporated.
Each sample was analyzed using EPA Method 610.
Only those parameters which were detected in one or more wells are listed on the table.

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These wells correspond to the boundry of the Site. (approx.) However they are hit with Benzene.

TABLE 4

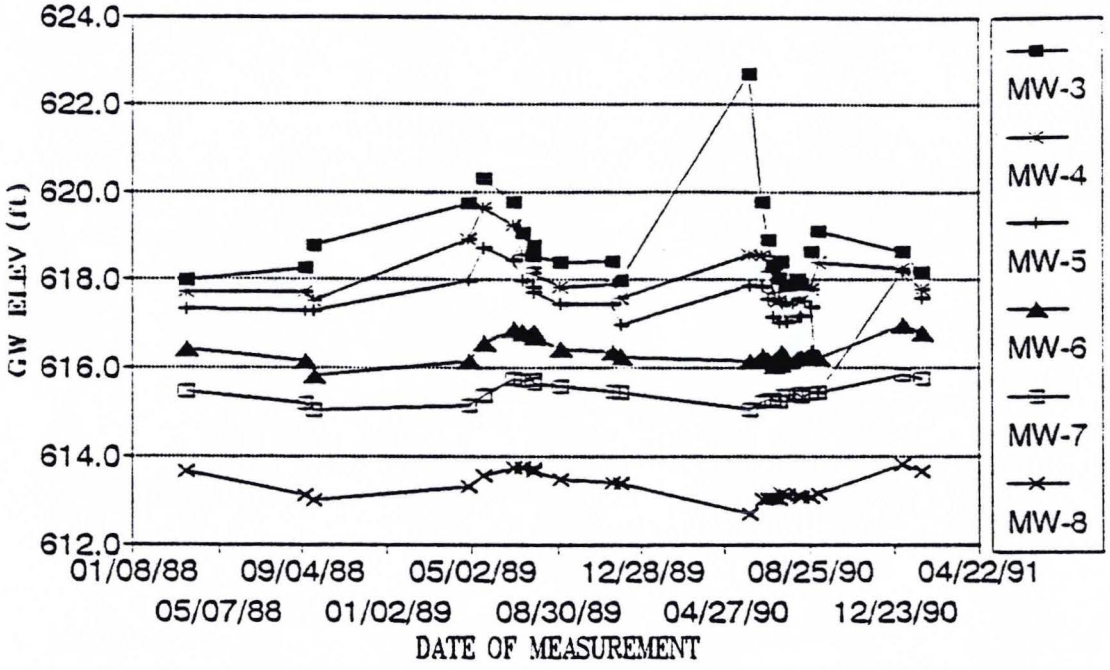
Monitoring Well Chemistry Data - Volatile Organic Compounds
Superior Terminal
Superior, Wisconsin
Delta No. 10-88-457

Parameter	MW-6		MW-9	MW-15	MW-16		MW-17		MW-19		MW-30	
	08/29/90	01/31/91	01/31/91	01/31/91	08/29/90	01/31/91	08/29/90	01/31/91	08/29/90	08/29/90	08/29/90	01/31/91
1,2-Dibromoethane	<0.004	<0.004	<0.2	<0.004	<0.40	<0.800	<0.004	<0.004	<0.004	<0.004	0.049	<0.100
1,2-Dichloroethane	0.0085	0.0095	<0.01	<0.0002	<0.02	<0.040	<0.0002	<0.0002	<0.0002	<0.0002	0.0009	<0.005
1,2-Dichloropropane	<0.0002	<0.0002	<0.01	<0.0002	<0.02	<0.040	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.005
1,1,2-Trichloroethylene	<0.0005	<0.0005	<0.025	<0.0005	<0.05	<0.100	<0.0005	<0.0005	<0.0005	<0.0005	0.0015	<0.012
Chloroform	<0.0005	<0.0005	<0.025	<0.0005	0.140	<0.100	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.012
Methylene Chloride	<0.001	<0.001	<0.05	<0.001	<0.10	<0.200	<0.001	<0.001	<0.001	<0.001	0.0012	<0.025
MTBE	<0.001	<0.020	1.70	<0.020	<0.10	0.51	<0.001	<0.001	<0.001	<0.001	0.0098	0.160

above ES

Data expressed as mg/L.
All samples were analyzed by PACE, Incorporated.
Each sample was analyzed using EPA Methods 601 and 602.
Only those parameters which were detected in one or more wells are listed on the table.

jmp.409



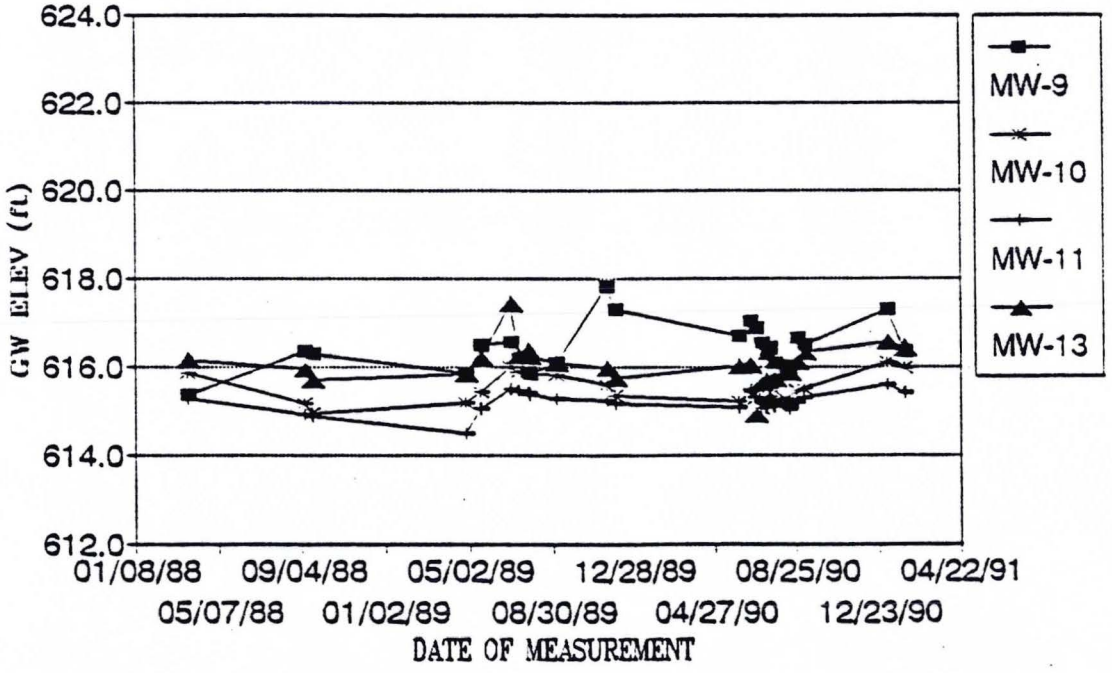
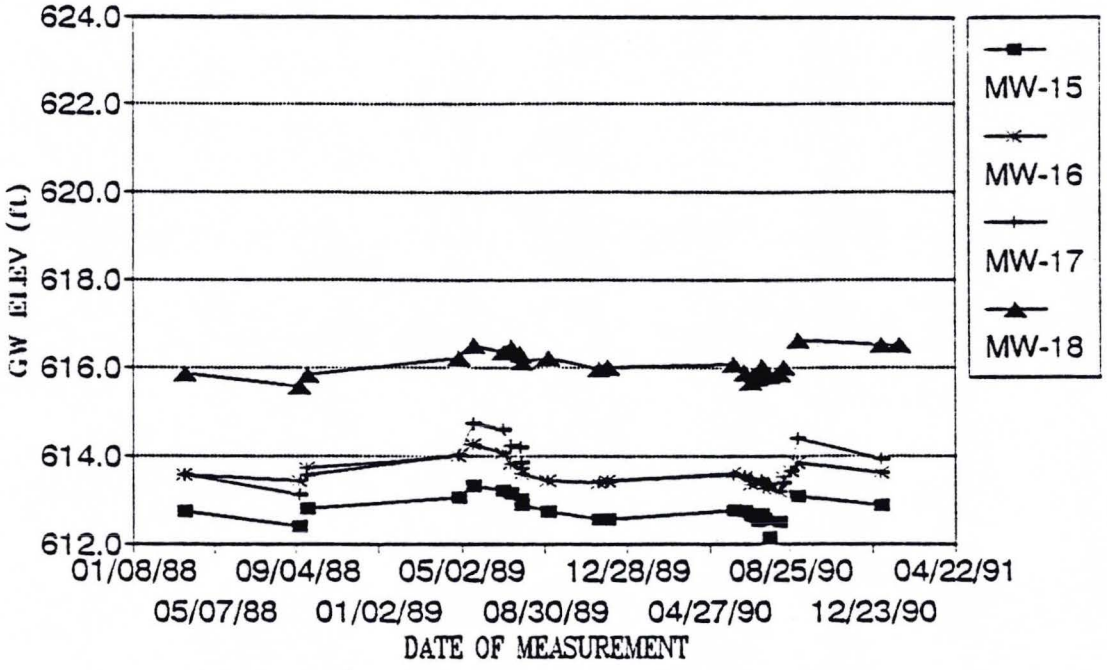


FIGURE 1
WELL HYDROGRAPHS
SUPERIOR TERMINAL
SUPERIOR, WISCONSIN

PROJECT NO.	PREPARED BY
10-88-457	KJS
DATE	REVIEWED BY
04/10/91	PWB

Delta Environmental Consultants, Inc.



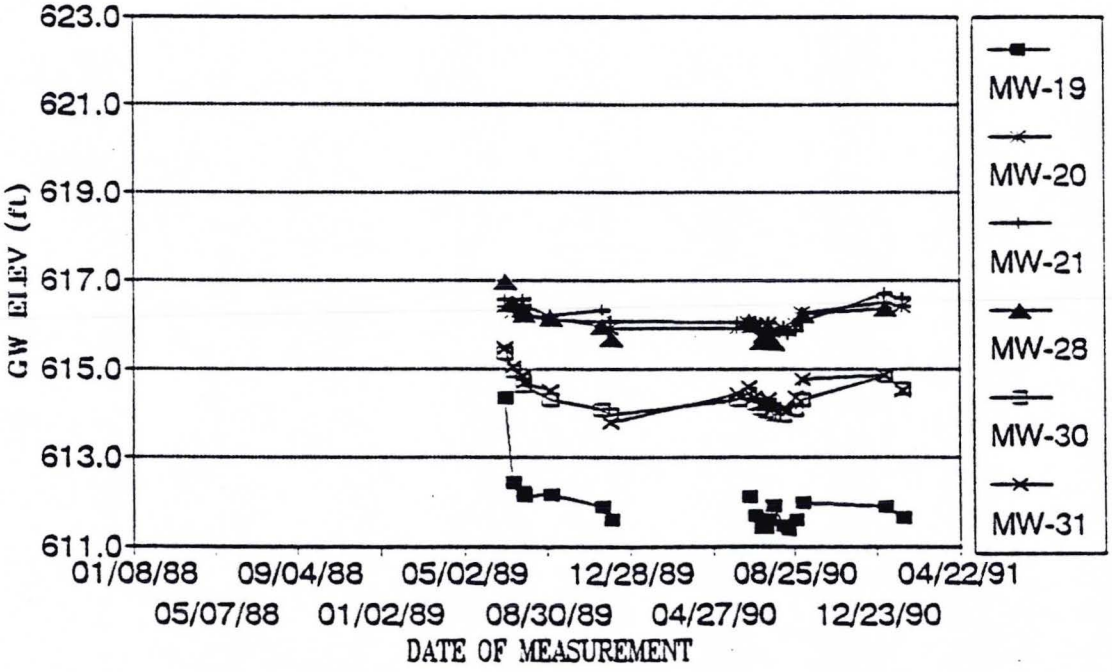
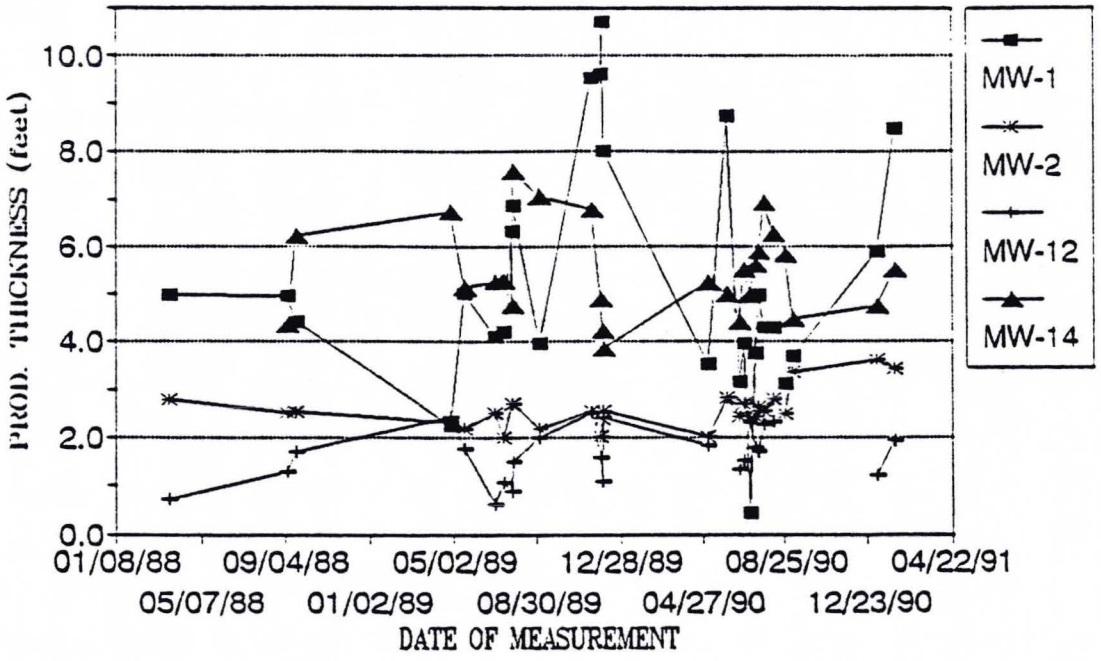


FIGURE 2
WELL HYDROGRAPHS
SUPERIOR TERMINAL
SUPERIOR, WISCONSIN

PROJECT NO.	PREPARED BY
10-88-457	KJS
DATE	REVIEWED BY
04/10/91	PCB

Delta Environmental Consultants, Inc.



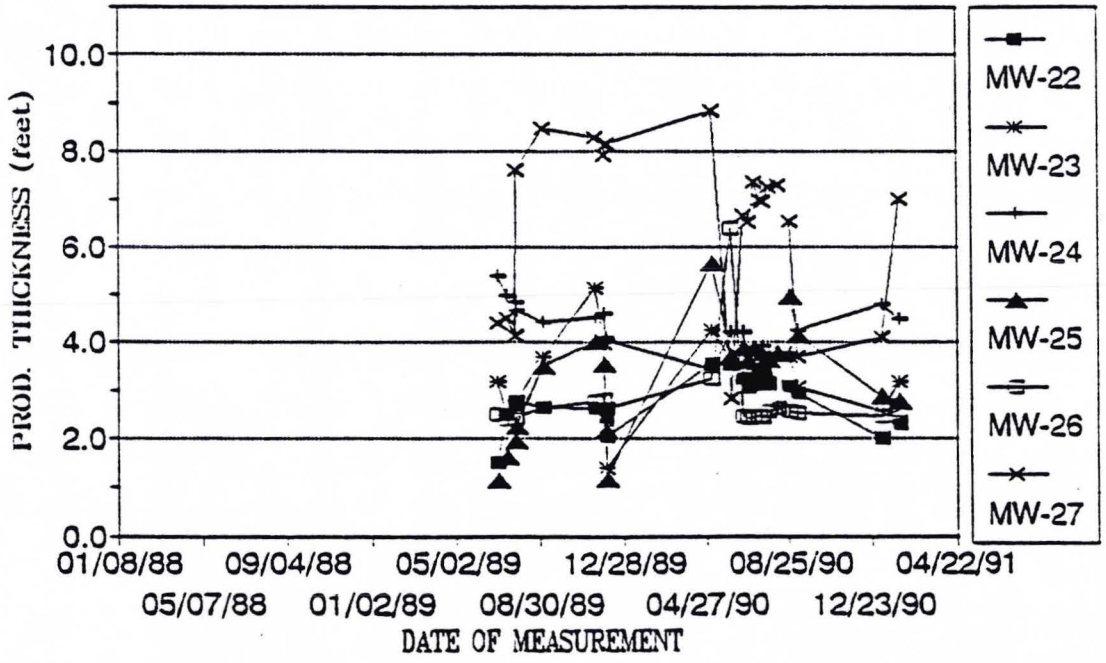
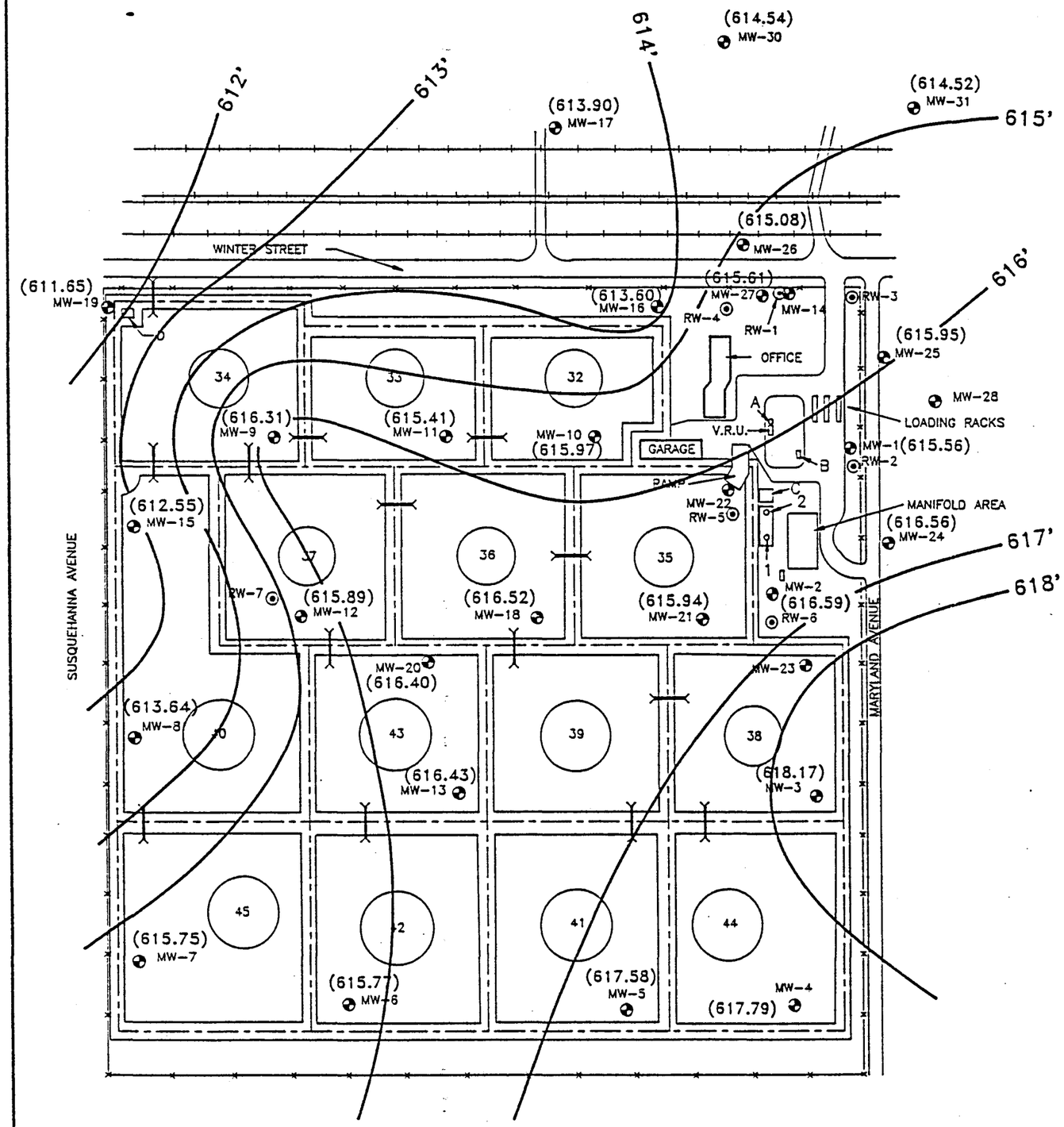


FIGURE 3
PRODUCT THICKNESSES
SUPERIOR TERMINAL
SUPERIOR, WISCONSIN

PROJECT NO.	PREPARED BY
10-88-457	KJS
DATE	REVIEWED BY
04/10/91	PCB

Delta Environmental Consultants, Inc.



LEGEND:

- MONITORING WELL LOCATION
- RECOVERY WELL LOCATION
- RAILROAD TRACKS
- DRAINAGE CULVERT
- FENCE LINE
- A — UNDERGROUND STORAGE TANK LOCATION
- 38 — ABOVE GROUND STORAGE TANK LOCATION
- (617.82) — WATER TABLE ELEVATION (IN FEET)
- 618' — WATER TABLE CONTOUR

NOTES:

1. WATER TABLE ELEVATIONS EXPRESSED IN FEET ABOVE MEAN SEA LEVEL.
2. DATA FROM WELLS CONTAINING FREE PRODUCT WERE CORRECTED USING A PRODUCT SPECIFIC GRAVITY OF 0.78.
3. WATER LEVEL MEASUREMENTS WERE COLLECTED JANUARY 3, 1991
4. CONTOUR MAP WAS PREPARED WITHOUT USING DATA FROM MW-22 AND MW-23

NORTH

0 200

SCALE IN FEET

FIGURE 4
WATER TABLE CONTOUR MAP
JANUARY 3, 1991
SUPERIOR TERMINAL
SUPERIOR, WISCONSIN

PROJECT NO.	PREPARED BY	REVIEWED BY	
10-88-457	KJS/PAJ	PWB	Delta Environmental Consultants, Inc.
DATE	REVISION NO.	FILE NAME	
4/17/91		88457-2	

APPENDIX A

APPENDIX A

GROUND WATER LEVEL DATA SHEETS

GROUND WATER LEVEL DATA

PROJECT: Amoco Terminal, Superior, WI DELTA PROJECT NO. 10-88-457

DATE: 1-30-91 RECORDED BY: MAL MEASURING DEVICE: W.L.I. Interface probe

WELL NO.	TIME	REFERENCE ELEVATION	DEPTH TO G.W.*	ELEVATION	FREE PRODUCT THICKNESS	PHYSICAL OBSERVATIONS/COMMENTS
MW-4	12:14	636.71	18.92'	617.79		N.O.
5	12:20	636.78	19.20'	617.58		N.O.
6	12:26	636.77	21.0'	615 77		N.O.
7	12:32	636.73	20.98'	615.75		N.O.
8	12:38	634.61	20.97'	613 64		N.O.
20	12:50	636.26	19.86'	616.40		N.O
28	*(Could	not get to	MW as	in tightly	locked	yard area)*
31	13:15	635.05	20.53'	614.52		N.O
17	13:24	632.83	18.93'	613.90		N.O.
13	13:33	636.01	19.58'	616.43		N.O.
19	13:40	635.29	23.64'	611.65		N.O.
15	13:48	632.65	19.80'	612.55		N.O.
11	13:56	632.40	16.99'	615 41		N.O.
10	14:01	633.54	17.57'	615 97		N.O.
18	14:05	636.77	20.25'	616.52		N.O.
21	14:10	637.11	20.52'	616.59		N.O.
30	14:20	632.74	18.20'	614.54		N.O.
9	14:30	631.57	15.26'	616.31		N.O.

* Measured from top of riser unless otherwise noted.

1012/10-88

GROUND WATER LEVEL DATA

PROJECT: Amoco Terminal, Superior, WI DELTA PROJECT NO. 10-88-457

DATE: 1-30-91 RECORDED BY: MAL MEASURING DEVICE: W.L.I., Interface probe

WELL NO.	TIME	REFERENCE ELEVATION	DEPTH TO G.W.*	ELEVATION	FREE PRODUCT THICKNESS	PHYSICAL OBSERVATIONS/COMMENTS
MW-3	14:40	636.13	17.96'	618.17		N.O.
MW-16	14:48	636.17	22.57'	613.60		N.O.

* Measured from top of riser unless otherwise noted.

1012/10-88

(All measurements taken with interface probe #5)

GROUND WATER LEVEL DATA

PROJECT: Amoco Terminal, Superior, WI DELTA PROJECT NO. 10-88-457

DATE: 1-30-91 RECORDED BY: MAL MEASURING DEVICE: W.L.I. Interface probe #5

WELL NO.	TIME	REFERENCE ELEVATION	DEPTH TO G.W.*	ELEVATION	FREE PRODUCT THICKNESS	PHYSICAL OBSERVATIONS/COMMENTS
MW-24	15:08	638.32	25.25'		4.47'	(P-20.78') strong odor
25	15:18	637.49	23.69'		2.76'	(P-20.93') strong odor
26	15:28	635.83	22.78'		2.60'	(P-20.18') strong odor
27	15:55	637.96	27.82'		7.01'	(P-20.81') strong odor
14	16:04	636.31	25.77'		5.52'	(P-20.25') strong odor
RW-1	16:15		31.26'		9.57'	(P-21.69') strong odor (corr=-2.25')
[redacted]4	16:30		23.55'		2.45'	(P-21.10') strong odor
[redacted]3	16:38		21.67'		"Film"	mod to strong odor
2	11:35		32.08'		11.50'	(P-20.58') strong odor
MW-1	16:48	637.68	28.73'		8.48'	(P-20.25') strong odor
22	16:57	638.82	24.39'		2.29'	(P-22.10') strong odor
RW-5	17:05		25.56'		3.34'	(P-22.22') strong odor
6	15:44		26.61'		6.14'	(P-20.47') strong odor
MW-2	17:13	637.23	23.32'		3.44'	(P-19.88') strong odor
23	17:20	636.93	21.23'		3.18'	(P-18.05') strong odor
12	17:30	633.04	18.67'		1.95'	(P-16.72') strong odor
RW-7	17:38		18.25'		"slight film"	moderate odor

* Measured from top of riser unless otherwise noted.

1012/10-88

APPENDIX B

APPENDIX B

LABORATORY ANALYSIS REPORTS

Amoco Corporation
Environmental Affairs & Safety
Groundwater Management Section
7201 East 38 Street
Space 7253
Tulsa, Oklahoma 74145

February 14, 1991 GMS 91-176

D. A. Piotrowski
Amoco Oil Company
225 N. Michigan
Mail Code B603
Chicago, IL 60680

Amoco Terminal, 2904 Winter St., Superior, Wisconsin

The Groundwater Management Section (GMS) laboratory received and analyzed water samples collected from the subject site on 1/31/91. The samples were analyzed for dissolved benzene, toluene, ethyl benzene and xylenes (BTEX), and (if requested) methyl tertiary butyl ether (MTBE) by capillary column gas chromatography. Results are shown on the attached table.

Please contact the GMS at 918/660-4420 if you have questions regarding these data.

Kevin P. Heaton

KPH/sac
91045ART0254
Attachment

J. Grams, Delta - Twin Cities
G. W. Schmidt - Tulsa

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR DISSOLVED HYDROCARBONS

Location: Amoco Terminal, 2904 Winter St, Superior, WI

Lab#: 91W0210 Method: Freon Extract

Sampling Date: 1/31/91 Analysis Date: 2/10/91

Sample ID	Benz	Tolu	EtBz	Xyls	BTEX TOTAL	MTBE
Trip blank	ND	ND	ND	ND	ND	ND
Duplicate-1	ND	ND	ND	ND	ND	ND
Duplicate-2	0.071	0.007	0.017	0.021	0.116	0.03
MW-3	0.042	0.003	0.012	0.049	0.106	0.02
MW-4	ND	ND	0.004	ND	0.004	ND
MW-6	0.003	ND	ND	ND	0.003	ND
MW-7	ND	0.002	ND	0.003	0.005	ND
MW-8	ND	ND	ND	ND	ND	ND
MW-9	1.24	0.701	1.30	2.23	5.47	1.70
MW-10	0.069	0.007	0.015	0.017	0.108	0.03
MW-11	0.125	0.014	0.040	0.012	0.191	0.02
MW-13	ND	ND	ND	ND	ND	ND
MW-15	0.002	0.003	ND	0.002	0.007	ND
MW-16	0.169	2.869	0.599	3.41	7.05	0.51
MW-17	ND	ND	ND	ND	ND	ND
MW-18	0.166	0.013	ND	0.015	0.194	0.08
MW-19	ND	ND	0.003	0.003	0.006	ND

MW-20	ND	ND	ND	ND	ND	ND
MW-21	0.075	0.003	ND	0.005	0.083	ND
MW-30	0.578	0.073	0.003	0.084	0.737	0.16
MW-31	ND	0.003	ND	0.003	0.006	ND

NOTES

1. ND = Not Detected at or above method detection limits.
2. Unit of data is mg/L.
3. Benz = benzene, Tolu = toluene, EtBz = ethylbenzene, Xyls = xylenes and MTBE = methyl tertiary butyl ether.
4. Detection limit for benzene, toluene and ethylbenzene is 0.001 mg/L.
5. Detection limit for the xylenes is 0.002 mg/L.
6. Detection limit for MTBE is 0.02 mg/L.

Comments: Septum on vial for sample MW-5 was upside down. MW-5 was not analyzed.

Checked By: T. G. Miller

AMOCO CORPORATION: GROUNDWATER MANAGEMENT SECTION

ANALYTICAL RESULTS FOR TOTAL PETROLEUM HYDROCARBONS

Location: Amoco Terminal, 2904 Winter St, Superior, WI

Sampling Date: 1-31-91 Lab#: 91W0210 Method: TPH by GC

Sample ID	TPH as Gasoline	TPH as Distillate
Trip blank	ND	ND
Duplicate-1	ND	ND
Duplicate-2	ND	ND
MW-3	ND	ND
MW-4	ND	ND
MW-6	ND	ND
MW-7	ND	ND
MW-8	ND	ND
MW-9	210 mg/L	33 mg/L
MW-10	ND	ND
MW-11	ND	ND
MW-13	ND	ND
MW-15	ND	8
MW-16	47	14
MW-17	ND	ND
MW-18	3	ND
MW-19	ND	ND
MW-20	ND	ND
MW-21	ND	ND

MW-30	7	4
MW-31	ND	ND

NOTES
1. ND = Not Detected.
2. The detection limit for TPH by GC is 1 mg/L for gasoline and distillate.

Analysis Date: 2/10/91 Checked By: T. G. Miller

GROUNDWATER MANAGEMENT SECTION
STANDARD OIL (INDIANA)
ENVIRONMENTAL AFFAIRS AND SAFETY

FLUID SAMPLE TRANSMITTAL
AND REQUEST FOR ANALYSES

ATTENTION: DIRECTOR, GROUNDWATER MANAGEMENT
RESEARCH CENTER
4502 E 41ST ST.
TULSA, OKLAHOMA 74135

PLEASE PROVIDE COMPLETE INFORMATION
IDENTIFY ALL ESTIMATES

FROM:(ORIGINATING LOCATION)
OFFICE: Delta Environmental Consl'ts
FILE: 10-88-457.05
SAMPLE NO. 19 Monitor wells
RESULTS TO: Kevin P. Heaton

ANALYSES REQUESTED: ☒ DISSOLVED HYDROCARBONS ☐ PRODUCT IDENTIFICATION OTHER: BTEX and Chromatograms

STATEMENT OF PROBLEM: Groundwater contamination at Amoco Terminal.

PRIORITY REQUESTED: URGENT ☐ ROUTINE ☒ DATE RESULTS REQUIRED ASAP

LOCATION SAMPLED:
REGION Wisconsin DISTRICT Twin Cities, MN
FACILITY Superior Amoco Terminal
LOCATION ADDRESS 2904 Winter St.
STATE WI CITY Superior
SERVICE STATION NUMBER N/A

SAMPLE TYPES: PRODUCT ☐ WATER ☒ OTHER —
NO. OF SAMPLES FROM TESTED INTERVAL OR LOCATION 19 MW's
COLLECTED FROM: OBSERVATION WELL ☒ RECOVERY WELL ☐ WATER WELL ☐ SEPARATOR ☐
TANK ☐ PIT ☐ STREAM ☐ DISCHARGE POINT ☐ WATER TAP ☐ OTHER —

DATE COLLECTED 1/31/91 BY Mike Lee DEPT. Environmental (Simp).
DATE SHIPPED 2/1/91 BY Mike Lee VIA Federal Express

SAMPLE DATA: FLUID SAMPLES FROM Surficial sediments FORMATION (IF KNOWN)
INTERVAL SAMPLED — TO — ☐ FT LITHOLOGY clay

ADDITIONAL INFORMATION OR REMARKS:
Chromatograms Please

CC:

REQUESTED BY: [signature] SIGNATURE DATE 2/1/91

Delta Environmental Consultants, Inc.

Sample Identification/Field Chain of Custody Record

Project: Amoco Terminal, Superior, WI
Shipped by: Delta Environmental Consultants, Inc.
Shipped to: Amoco Oil / GMS
Comments: Send results to Paul Brookner

W.O. # 10-88-457A
Attention of: Paul Brookner
Hazardous materials suspected? (yes/no)

Sampling Point	Location	Field ID #	Date	Sample Type	No. of Containers	Analysis Required
MW-3	Superior, WI	13191-1557 8457-3	1-31-91	H_2O	1-40ml	BTEX, THC MTBE, TPH
MW-4		13191-0755 8457-4				
MW-5		13191-0859 8457-5				
MW-6		13191-0900 8457-6				
MW-7		13191-0945 8457-7				
MW-8		13191-0942 8457-8				
Duplicate #1		13191-0730 8457-Dup #1				
MW-9		13191-1520 8457-9				

Sampler(s) (signature) Michael A. Lee

Field ID	Relinquished by: (signature)	Received by: (signature)	Date/Time		Comments
As above	Michael A. Lee	Robert Traynier	2-4-91		

Sealed for shipment by: (signature) Michael A. Lee Date/Time 2:00pm, 2-1-91 Shipment method: Federal Express

Received for Lab by: (signature) _____ Date/Time _____ Comments Sealed # 213

* (Chromatograms requested)

Receiving Laboratory: Please return original form after signing for receipt of samples.

Delta
Environmental
Consultants, Inc.

Sample Identification/Field Chain of Custody Record

Project: Amoco Terminal, Superior, WI
Shipped by: Delta Environmental Consultants, Inc.
Shipped to: Amoco Oil / BMS
Comments: Send results to Paul Brookner

W.O. # 10-88-457A
Attention of: Paul Brookner
Hazardous materials suspected? (yes/no)

Sampling Point	Location	Field ID #	Date	Sample Type	No. of Containers	Analysis Required
MW-10	Superior, WI	13191-1350 8457-10	1-31-91	H_2O	1-40ml	BTEX, THC MTBE, TPH
MW-11	↓	13191-1305 8457-11	↓	↓	↓	↓
Duplicate #2	↓	13191-0830 8457-Dup #2	↓	↓	↓	↓
MW-13	↓	13191-1140 8457-13	↓	↓	↓	↓
MW-15	↓	13191-1225 8457-15	↓	↓	↓	↓
MW-16	↓	13191-1605 8457-16	↓	↓	↓	↓
MW-17	↓	13191-1035 8457-17	↓	↓	↓	↓
MW-18	↓	13191-1345 8457-18	↓	↓	↓	↓

Sampler(s) (signature) Michael A. Lee

Field ID	Relinquished by: (signature)	Received by: (signature)	Date/Time		Comments
As above	Michael A. Lee	Robert Tajmir	2-4-91		

Sealed for shipment by: (signature) Michael A. Lee Date/Time 2:00pm, 2-1-91 Shipment method: Federal Express
Received for Lab by: (signature) _____ Date/Time _____ Comments sealed # 213

* (Chromatograms requested)

Receiving Laboratory: Please return original form after signing for receipt of samples.

Delta Environmental Consultants, Inc.

Sample Identification/Field Chain of Custody Record

Project: Amoco Terminal, Superior, WI
Shipped by: Delta Environmental Consultants, Inc.
Shipped to: Amoco Oil / GMS
Comments: Send results to Paul Brookner

W.O. # 10-88-457A
Attention of: Paul Brookner
Hazardous materials suspected? (yes/no)

Sampling Point	Location	Field ID #	Date	Sample Type	No. of Containers	Analysis Required
MW-19	Superior, WI	13191-1151 8457-19	1-31-91	H_2O	1-40ml	BTEX, THC MTBE, TPH
MW-20		13191-1024 8457-20				
MW-21		13191-1404 8457-21				
MW-30		13191-1430 8457-30				
MW-31		13191-1105 8457-31				
Travel Blank		Travel Blank		Freon	1-2.5ml	

Sampler(s) (signature) Michael A. Lee

Field ID	Relinquished by: (signature)	Received by: (signature)	Date/Time		Comments
As above	Michael A. Lee	Robert Traynier	2-4-91		

Sealed for shipment by: (signature) Michael A. Lee Date/Time 2:00pm, 2-1-91 Shipment method: Federal Express
Received for Lab by: (signature) _____ Date/Time _____ Comments Sealed # 213

* (Chromatograms requested)

Receiving Laboratory: Please return original form after signing for receipt of samples.

Reported on 8-FEB-1991 at 14:00
Modified on 8-FEB-1991 at 13:59

List Run Sequence File

ANALYST NAME..... ZSTN01
LIMS ANALYSIS ID..... 1-31-91
Amoco Terminal, 2904 Winter St, Superior, WI

ANALYSIS INFORMATION

Analysis name..... 91W0210
Method name..... MBTEX
Calibration name..... MBTEX
Calibration sequence..... Sequential Standard

SAMPLE SUMMARY

SAMPLE NUMBER	LIMS ID	SAMPLE NAME
1	Trip blank	W0210A Amoco Terminal, Superior, WI
2	Duplicate-1	W0210B Amoco Terminal, Superior, WI
3	Duplicate-2	W0210C Amoco Terminal, Superior, WI
4	MW-3	W0210D Amoco Terminal, Superior, WI
5	MW-4	W0210E Amoco Terminal, Superior, WI
6	MW-6	W0210G Amoco Terminal, Superior, WI
7	MW-7	W0210H Amoco Terminal, Superior, WI
8	S2	STD BTEX=0.025 & MTBE=0.125mg/l
9	MW-8	W0210I Amoco Terminal, Superior, WI
10	MW-9	W0210J Amoco Terminal, Superior, WI
11	MW-10	W0210K Amoco Terminal, Superior, WI
12	MW-11	W0210L Amoco Terminal, Superior, WI
13	MW-13	W0210M Amoco Terminal, Superior, WI
14	MW-15	W0210N Amoco Terminal, Superior, WI
15	MW-16	W0210O Amoco Terminal, Superior, WI
16	MW-17	W0210P Amoco Terminal, Superior, WI
17	MW-18	W0210Q Amoco Terminal, Superior, WI
18	S2	STD BTEX=0.025 & MTBE=0.125mg/l
19	MW-19	W0210R Amoco Terminal, Superior, WI
20	MW-20	W0210S Amoco Terminal, Superior, WI
21	MW-21	W0210T Amoco Terminal, Superior, WI
22	MW-30	W0210U Amoco Terminal, Superior, WI
23	MW-31	W0210V Amoco Terminal, Superior, WI

No.	Sample name	Bo	LIMS Id
1	W0210A Amoco Termin	43	Trip blank
2	W0210B Amoco Termin	44	Duplicate-1
3	W0210C Amoco Termin	45	Duplicate-2
4	W0210D Amoco Termin	46	MW-3
5	W0210E Amoco Termin	47	MW-4
6	W0210G Amoco Termin	48	MW-6
7	W0210H Amoco Termin	49	MW-7
8	STD BTEX=0.025 & MTB	50	S2 -

eported on 8-FEB-1991 at 14:00
odified on 8-FEB-1991 at 13:59

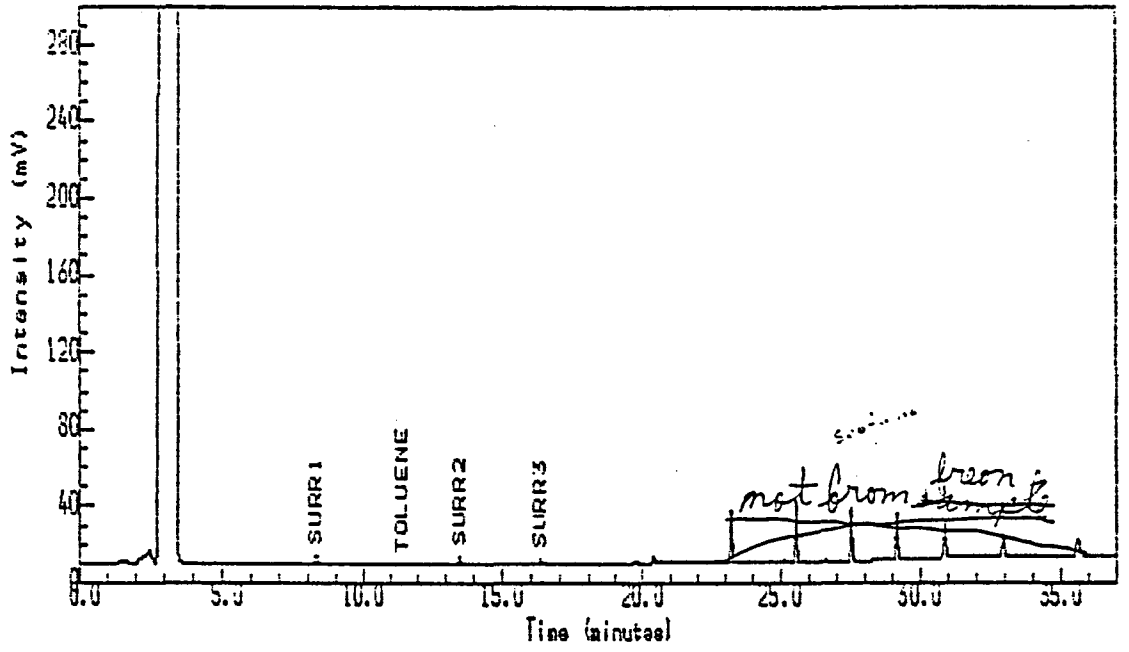
o.	Samole name	Bo	LIMS Id
9	W0210I Amoco Termin	51	MW-8
10	W0210J Amoco Termin	52	MW-9
11	W0210K Amoco Termin	53	MW-10
12	W0210L Amoco Termin	54	MW-11
13	W0210M Amoco Termin	55	MW-13
14	W0210N Amoco Termin	56	MW-15
15	W0210O Amoco Termin	57	MW-16
16	W0210P Amoco Termin	58	MW-17
17	W0210Q Amoco Termin	59	MW-18
18	STD BTEX=0.025 & MTB	60	S2
19	W0210R Amoco Termin	61	MW-19
20	W0210S Amoco Termin	62	MW-20
21	W0210T Amoco Termin	63	MW-21
22	W0210U Amoco Termin	64	MW-30
23	W0210V Amoco Termin	65	MW-31

INTERNAL/DILUTION STANDARDS

AMPLE NUMBER	ISTD1 AMOUNT	ISTD2 AMOUNT	ISTD3 AMOUNT	DIL1 AMOUNT	DIL2 AMOUNT
1	1.00000	1.00000	1.00000	1.00000	1.00000
2	1.00000	1.00000	1.00000	1.00000	1.00000
3	1.00000	1.00000	1.00000	1.00000	1.00000
4	1.00000	1.00000	1.00000	1.00000	1.00000
5	1.00000	1.00000	1.00000	1.00000	1.00000
6	1.00000	1.00000	1.00000	1.00000	1.00000
7	1.00000	1.00000	1.00000	1.00000	1.00000
8	1.00000	1.00000	1.00000	1.00000	1.00000
9	1.00000	1.00000	1.00000	1.00000	1.00000
10	1.00000	1.00000	1.00000	1.00000	1.00000
11	1.00000	1.00000	1.00000	1.00000	1.00000
12	1.00000	1.00000	1.00000	1.00000	1.00000
13	1.00000	1.00000	1.00000	1.00000	1.00000
14	1.00000	1.00000	1.00000	1.00000	1.00000
15	1.00000	1.00000	1.00000	1.00000	1.00000
16	1.00000	1.00000	1.00000	1.00000	1.00000
17	1.00000	1.00000	1.00000	1.00000	1.00000
18	1.00000	1.00000	1.00000	1.00000	1.00000
19	1.00000	1.00000	1.00000	1.00000	1.00000
20	1.00000	1.00000	1.00000	1.00000	1.00000
21	1.00000	1.00000	1.00000	1.00000	1.00000
22	1.00000	1.00000	1.00000	1.00000	1.00000
23	1.00000	1.00000	1.00000	1.00000	1.00000

Injection Report

Acquired on 9-FEB-1991 at 21:46



AMOCO

Sample Name : W0210A Amoco Terminal, Superior, WI
Sample Id : Trip blank
Sample Type : Sample Amount=1.00000
Bottle No : 43

PEAK INFORMATION

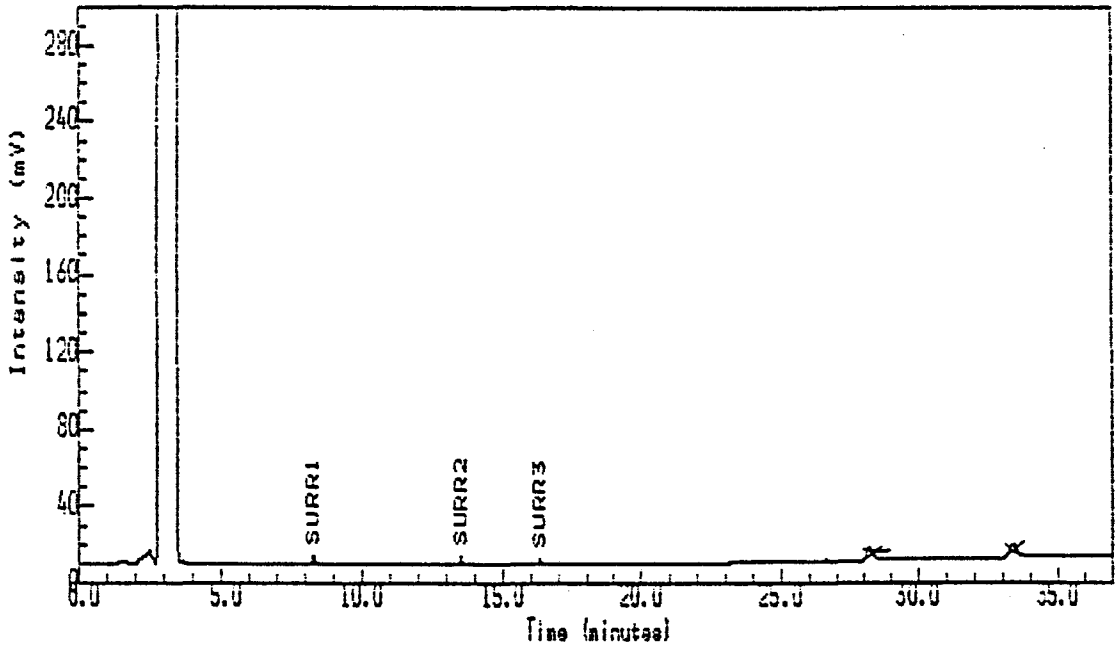
Peak	RT mins	Hght uV	Area uVs	%	Peak name	Width
2	8.280	4626	24207	1.0480	SURR1	5.3
4	11.404	159	707	0.0008	TOLUENE	4.5
7	13.489	4081	17830	1.0812	SURR2	4.5
9	16.311	2740	11786	0.9822	SURR3	4.3

Totals			
Unknowns	913	5480	N/A
Quantified	11605	54531	3.1121
Grand Total	12518	60011	3.1121

Reported on 9-FEB-1991 at 23:14

Injection Report

Acquired on 9-FEB-1991 at 22:36



AMOCO

ample Name : W0210B Amoco Terminal, Superior, WI
Sample Id : Duplicate-1
ample Type : Sample Amount=1.00000
ottle No : 44

PEAK INFORMATION

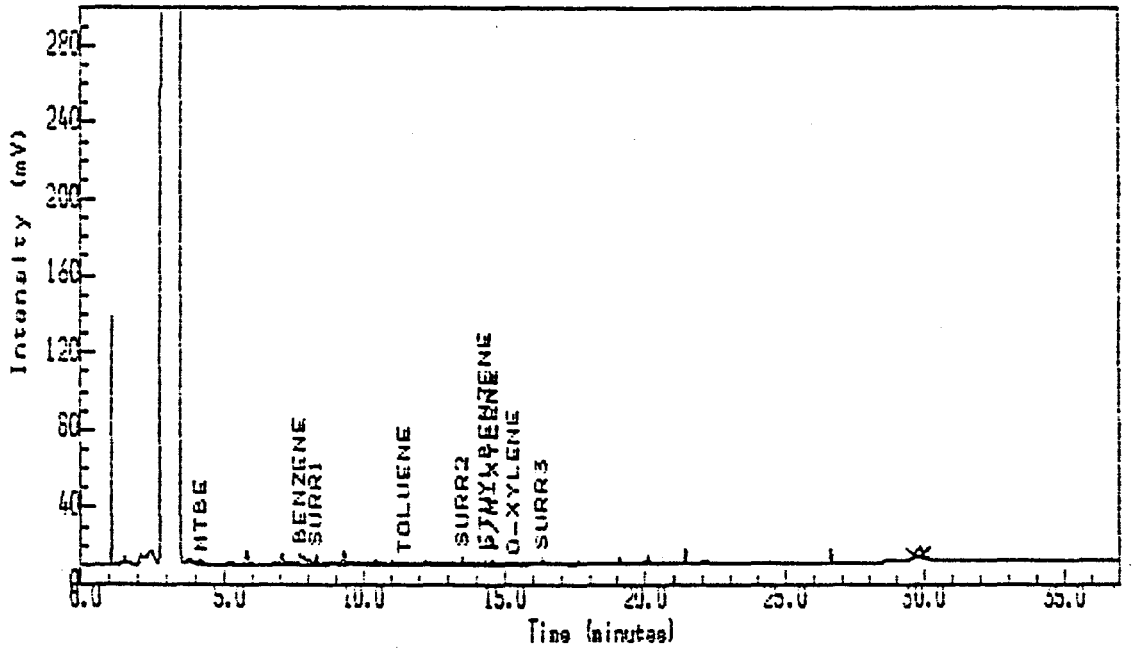
ak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	8.280	4577	22803	1.0305	SURR1	5.1
2	13.469	4106	18011	1.0922	SURR2	4.5
3	16.307	2748	11803	0.9835	SURR3	4.3

Totals

knowns	380	2188	N/A
antified	11432	53617	3.1063
Grand Total	11812	55805	3.1063

Injection Report

Acquired on 9-FEB-1991 at 23:24



AMOCO

Sample Name : W0210C Amoco Terminal, Superior, WI
Sample Id : Duplicate-2
Sample Type : Sample Amount=1.00000
Bottle No : 45

PEAK INFORMATION

Pk	RT mins	Hgnt uV	Area uVs	mg/L	Peak name	Width
1	4.182	2154	14071	0.0289	MTBE	6.4
12	7.707	5736	64395	0.0712	BENZENE	12.3
14	8.280	4491	23503	1.0175	SURR1	5.3
6	11.476	737	6468	0.0070	TOLUENE	11.7A
36	13.493	4440	24560	1.4893	SURR2	4.5
39	14.311	2557	15002	0.0165	ETHYLBENZENE	4.8
40	14.547	2320	16139	0.0179	P/M-XYLENE	4.8
43	15.298	522	2977	0.0032	O-XYLENE	4.8
47	16.311	3083	14710	1.2259	SURR3	4.3

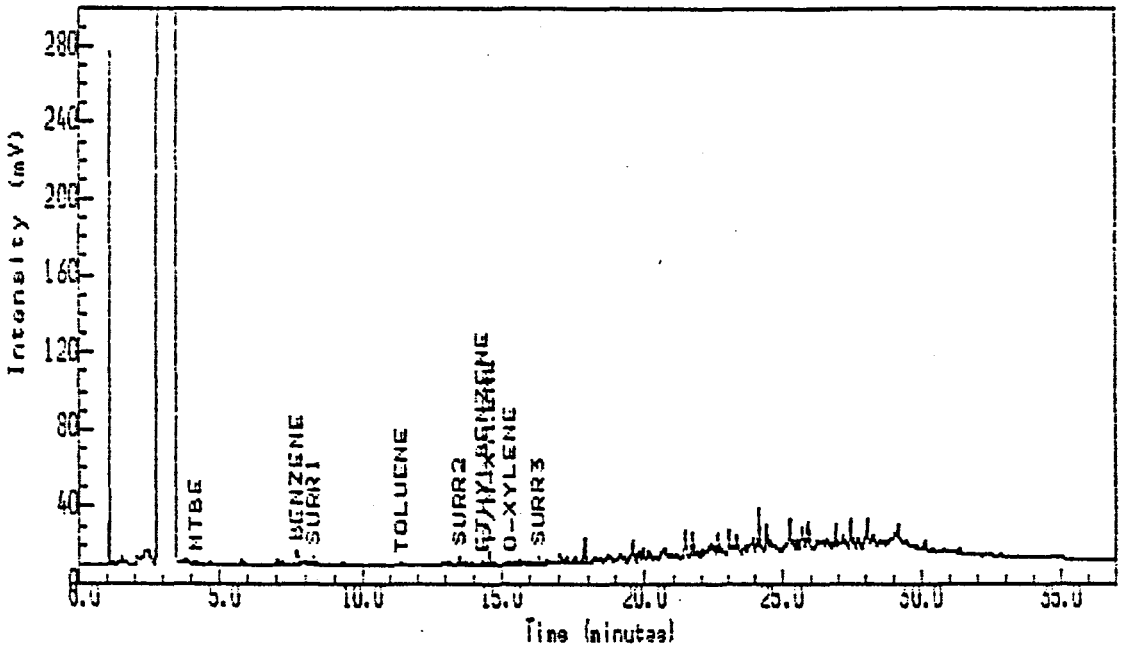
Totals

Unknowns	60162	399532	N/A
Identified	26039	181825	3.8774
Grand Total	86201	581356	3.8774

Reported on 10-FEB-1991 at 00:52

Injection Report

Acquired on 10-FEB-1991 at 00:13



[redacted]MOCO

Sample Name : W0210D Amoco Terminal, Superior, WI
Sample Id : MW-3
Sample Type : Sample Amount=1.00000
Bottle No : 46

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	4.178	1748	11462	0.0236	MTBE	6.4
10	7.702	6773	38158	0.0422	BENZENE	5.6
12	8.276	4441	23468	1.0160	SURR1	5.1
19	11.404	679	3222	0.0035	TOLUENE	4.5
25	13.489	4451	21649	1.3127	SURR2	4.5
29	14.307	2158	10490	0.0115	ETHYLBENZENE	4.5
30	14.542	7357	35979	0.0398	P/M-XYLENE	4.5
34	15.293	1229	8380	0.0091	O-XYLENE	5.1
38	16.311	3824	27449	2.2875	SURR3	5.9

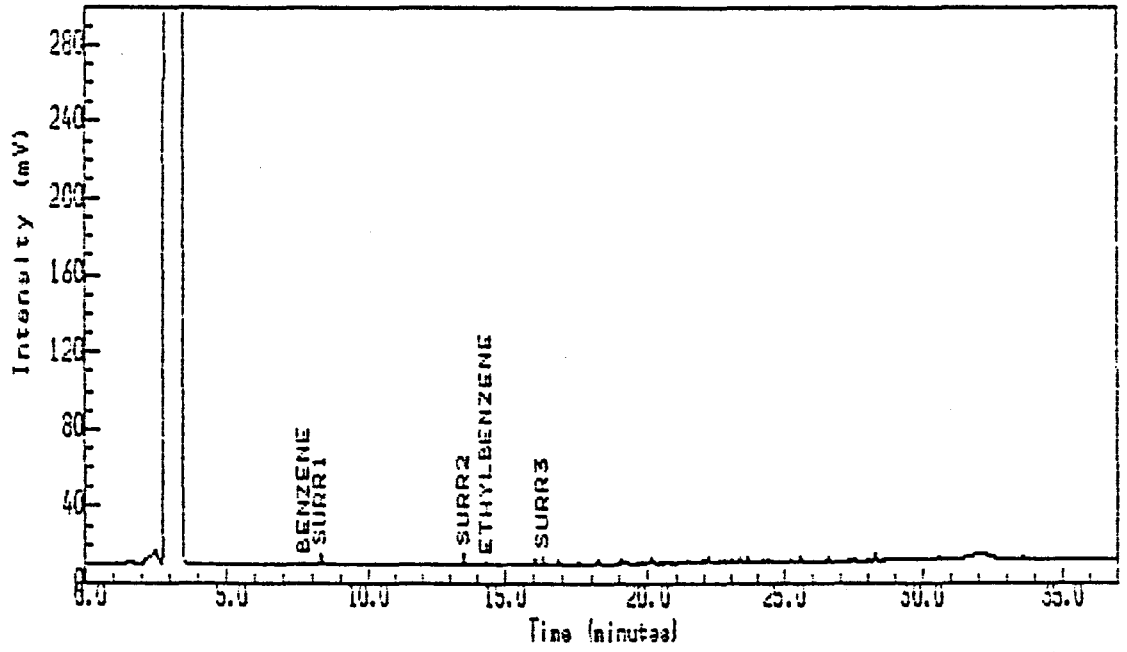
Totals

Unknowns	49104	317399	N/A
Quantified	32659	180257	4.7460
Grand Total	81763	497657	4.7460

Reported on 10-FEB-1991 at 01:41

Injection Report

Acquired on 10-FEB-1991 at 01:02



AMOCO

Sample Name : WO210E Amoco Terminal, Superior, WI
Sample Id : MW-4
Sample Type : Sample Amount=1.00000
Bottle No : 47

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	7.702	145	802	~~1.1309~~	BENZENE	5.3
2	8.276	4903	25604	1.1085	SURR1	5.1
5	13.489	4935	21592	1.3093	SURR2	4.3
6	14.311	890	3813	0.0042	ETHYLBENZENE	4.3
10	16.307	3579	15400	1.2833	SURR3	4.3

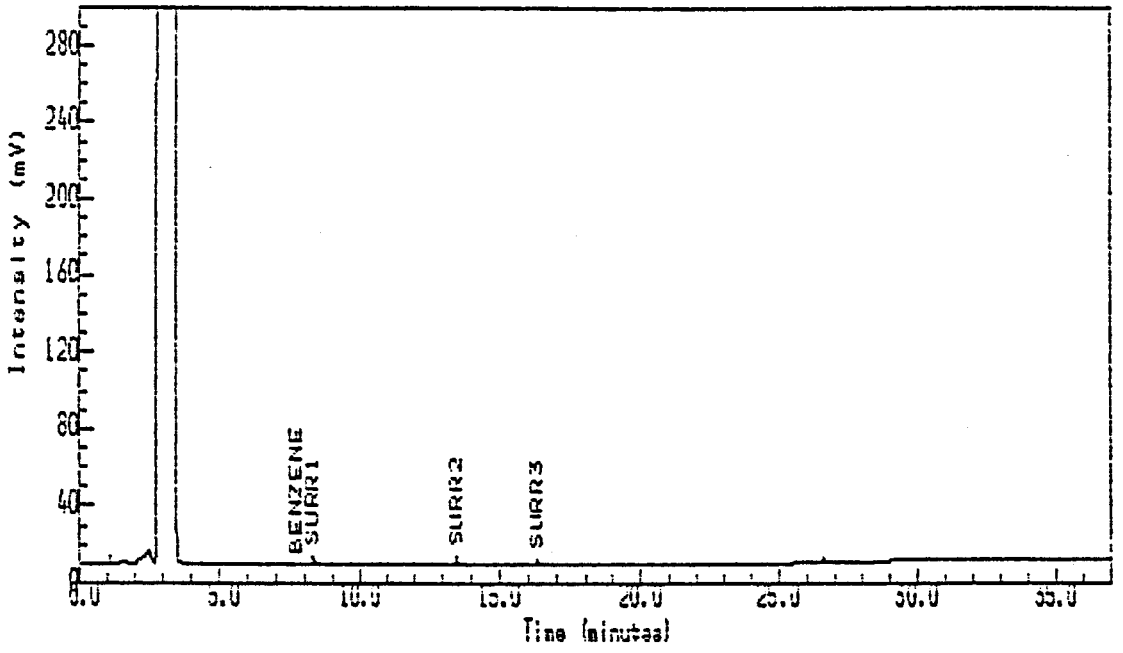
Totals

Unknowns	7663	37324	N/A
Quantified	14452	67210	3.7061
Grand Total	22116	104534	3.7061

Reported on 10-FEB-1991 at 02:29

Injection Report

Acquired on 10-FEB-1991 at 01:51



AMOCO

Sample Name : WO210G Amoco Terminal, Superior, WI
Sample Id : MW-6
Sample Type : Sample Amount=1.00000
Bottle No : 48

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	7.707	338	2522	0.0028	BENZENE	7.7
2	8.280	4604	24020	1.0399	SURR1	5.3
3	13.469	4173	18117	1.0986	SURR2	4.3
4	16.307	2979	12288	1.0240	SURR3	4.3

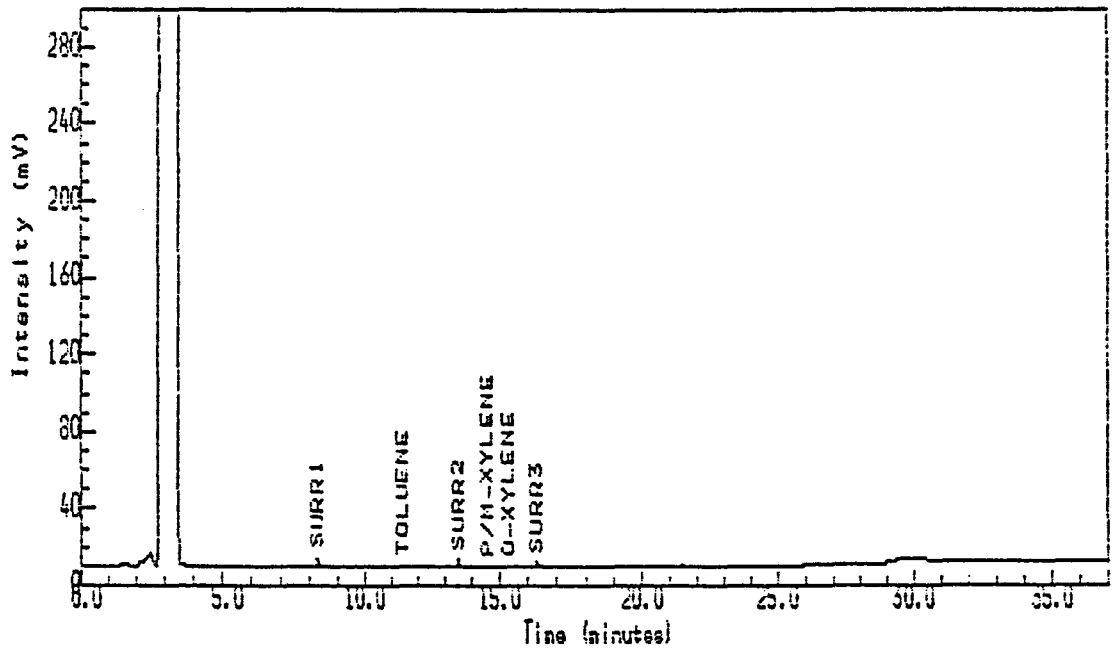
Totals

Unknowns	114	680	N/A
Quantified	11994	56946	3.1653
Grand Total	12108	57626	3.1653

Reported on 10-FEB-1991 at 03:18

Injection Report

Acquired on 10-FEB-1991 at 02:39



AMOCO

Sample Name : WOZ10H Amoco Terminal, Superior, WI
Sample Id : MW-7
Sample Type : Sample Amount=1.00000
Bottle No : 49

PEAK INFORMATION

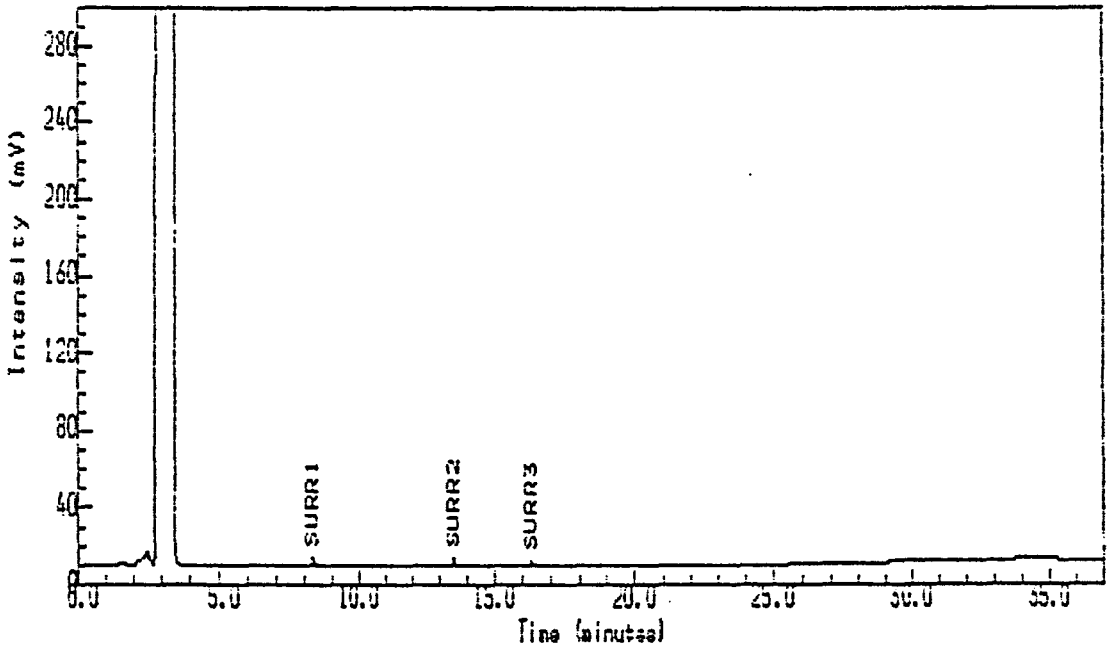
Peak	RT mins	Hght uV	Area uVs	ug/L	Peak name	Width
1	8.280	4207	22013	0.9530	SURR1	5.3
2	11.404	458	2101	0.0023	TOLUENE	4.5
3	13.489	3749	16346	0.9912	SURR2	4.3
4	14.542	612	2747	0.0030	P/M-XYLENE	4.5
5	15.293	164	763	~~0.0003~~	O-XYLENE	4.5
6	16.307	2578	11229	0.9357	SURR3	4.3

Totals			
Unknowns	434	2696	N/A
Quantified	11769	55199	2.8861
Grand Total	12203	57894	2.8861

Reported on 10-FEB-1991 at 04:54

Injection Report

cquired on 10-FEB-1991 at 04:16



=10CO

ample Name : W0210I Amoco Terminal, Superior, WI
ample Id : MW-8
Sample Type : Sample Amount=1.00000
ottle No : 51

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	8.276	4543	23738	1.0277	SURR1	5.1
2	13.489	4091	17878	1.0841	SURR2	4.3
3	16.307	2767	11930	0.9942	SURR3	4.3

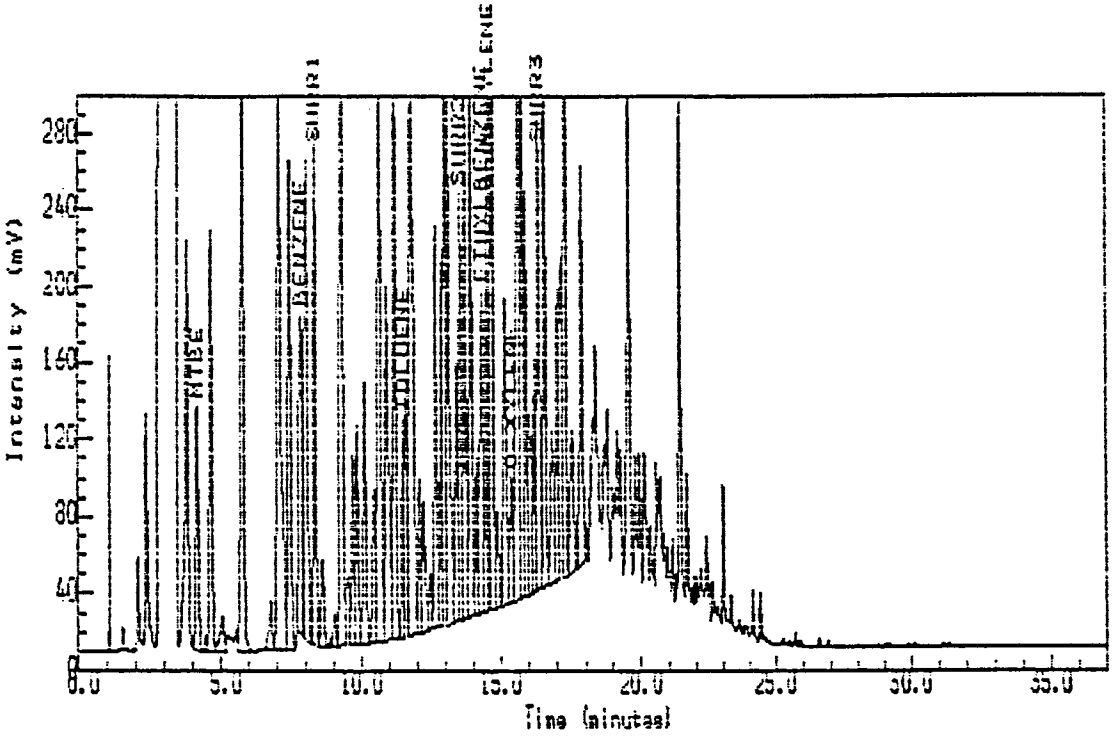
tals

Unknowns	315	1777	N/A
ntified	11401	53546	3.1060
nd Total	11715	55323	3.1060

Reported on 11-FEB-1991 at 09:26

Injection Report

Acquired on 10-FEB-1991 at 05:05



AMOCO

Sample Name : WO210J Amoco Terminal, Superior, WI
Sample Id : MW-9
Sample Type : Sample Amount=1.00000
Bottle No : 52

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	4.173	126338	828640	1.7042	MTBE	6.7
10	7.827	166540	1125727	1.2443	BENZENE	7.5A
12	8.333	265759	1486878	64.3724	SURR1	5.6
24	11.480	112397	646084	0.7007	TOLUENE	5.9A
33	13.516	221790	1347190	81.6908	SURR2	5.9
37	14.307	167654	1176148	1.2948	ETHYLBENZENE	7.2
39	14.551	281715	1518720	1.6803	P/M-XYLENE	6.4A
43	15.382	64734	501410	0.5467	O-XYLENE	8.8
49	16.360	271150	1923375	160.2811	SURR3	7.2

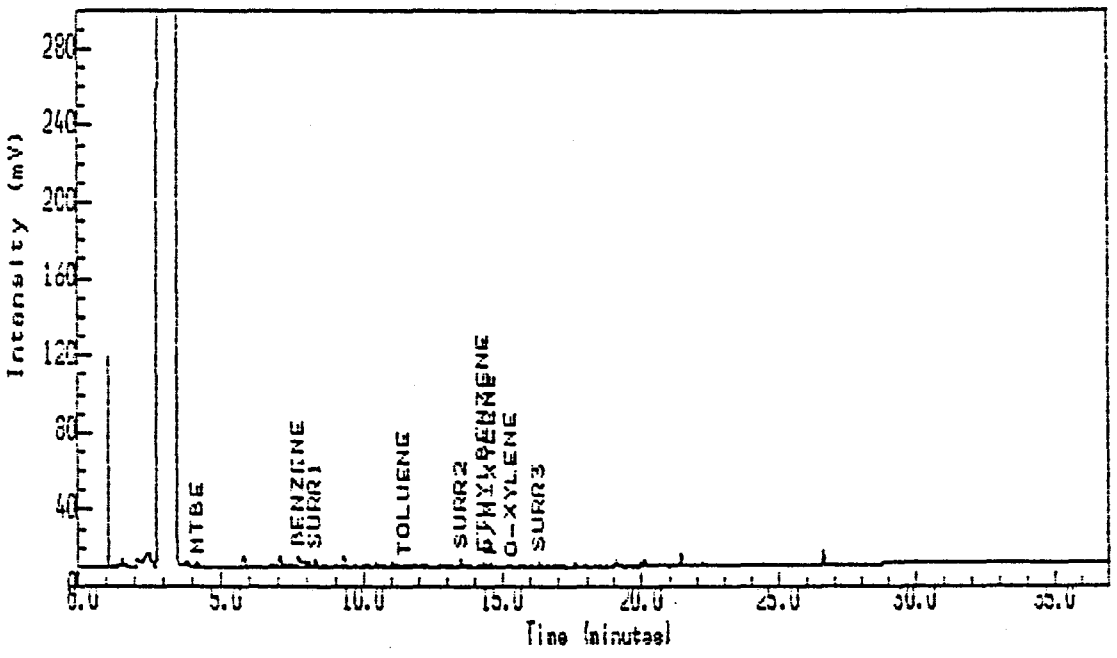
Totals

Unknowns	9769400	62559424	N/A
Quantified	1678078	10554173	313.5153
Grand Total	11447478	73113600	313.5153

Reported on 10-FEB-1991 at 06:31

Injection Report

Acquired on 10-FEB-1991 at 05:53



Amoco

Sample Name : WO210K Amoco Terminal, Superior, WI
Sample Id : MW-10
Sample Type : Sample Amount=1.00000
Bottle No : 53

PEAK INFORMATION

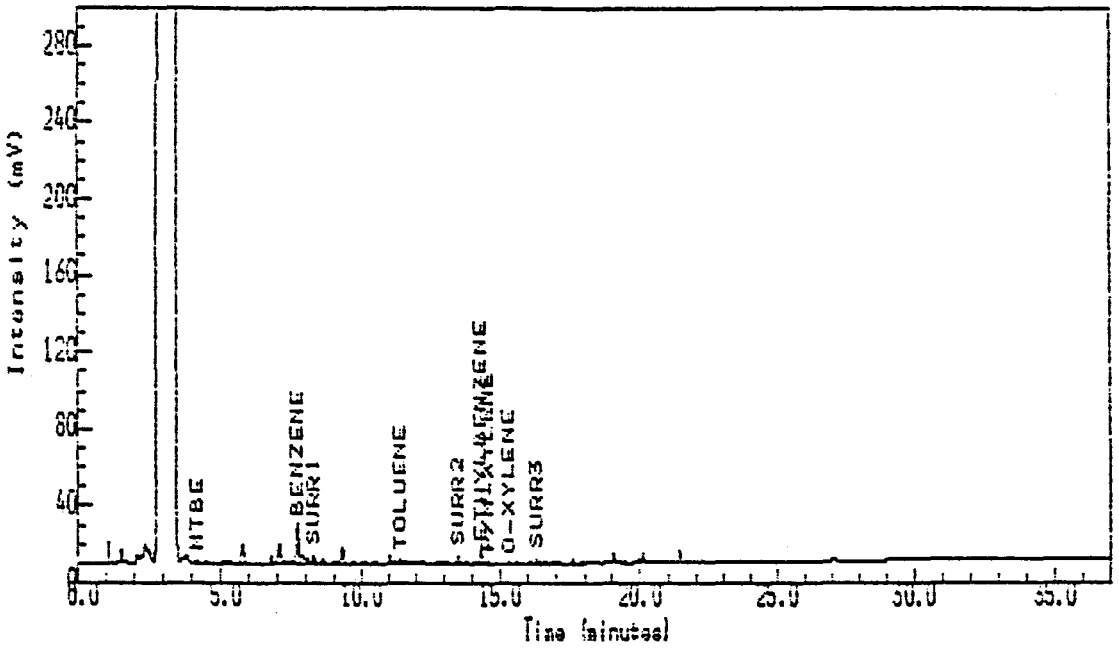
Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	4.182	2071	13561	0.0279	MTBE	6.4
12	7.707	5537	62473	0.0691	BENZENE	12.3
14	8.280	4478	23612	1.0222	SURR1	5.1
26	11.467	683	6005	0.0065	TOLUENE	11.2A
35	13.489	4399	24023	1.4567	SURR2	4.5
38	14.311	2455	13627	0.0150	ETHYLBENZENE	4.5
39	14.551	2149	13016	0.0144	P/M-XYLENE	4.8
41	15.298	488	2774	0.0030	O-XYLENE	5.1
46	16.307	3057	14700	1.2250	SURR3	4.5

Totals			
Unknowns	57535	380351	N/A
Identified	25319	173791	3.8398
Grand Total	82853	554142	3.8398

Reported on 10-FEB-1991 at 07:20

Injection Report

Acquired on 10-FEB-1991 at 06:41



AMOCO

Sample Name : WO210L Amoco Terminal, Superior, WI
Sample Id : MW-11
Sample Type : Sample Amount=1.00000
Bottle No : 54

PEAK INFORMATION

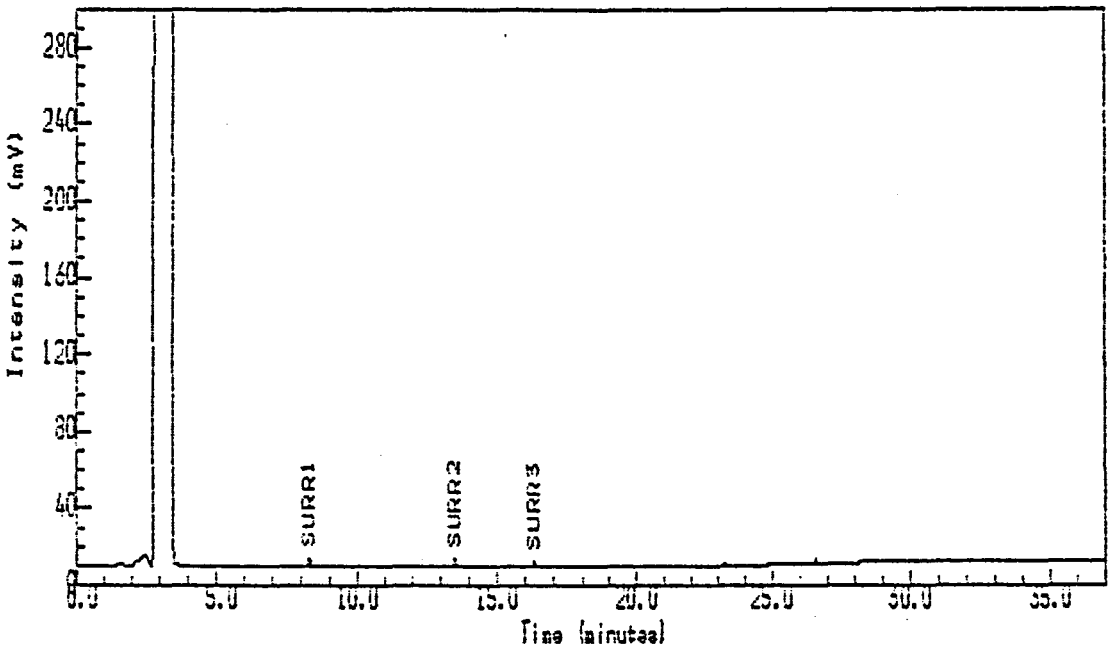
Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	4.182	1856	12101	0.0249	MTBE	6.4
12	7.702	20342	113222	0.1251	BENZENE	5.3
15	8.276	4622	24429	1.0576	SURR1	5.3
27	11.404	2094	12484	0.0135	TOLUENE	5.3
36	13.489	4308	21915	1.3289	SURR2	4.3
38	14.311	7826	36056	0.0397	ETHYLBENZENE	4.5
39	14.551	1136	8636	0.0096	P/M-XYLENE	8.3
42	15.298	556	2534	0.0028	O-XYLENE	4.5
46	16.307	3083	13750	1.1459	SURR3	4.3

Totals			
Unknowns	76656	520629	N/A
Identified	45824	245126	3.7479
Grand Total	122480	765755	3.7479

Reported on 10-FEB-1991 at 08:08

Injection Report

=quired on 10-FEB-1991 at 07:29



HOCO

ample Name : WO210M Amoco Terminal, Superior, WI
ample Id : MW-13
Sample Type : Sample Amount=1.00000
ottle No : 55

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	8.276	4599	24003	1.0392	SURR1	5.3
2	13.484	4159	18091	1.0970	SURR2	4.3
3	16.302	2847	12296	1.0247	SURR3	4.3

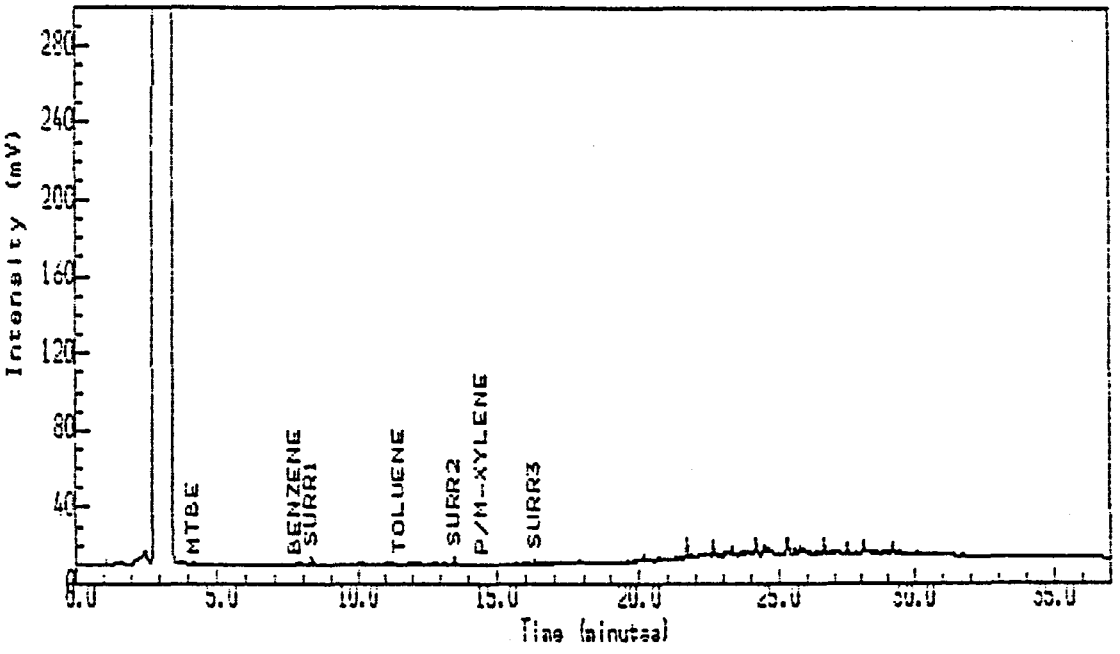
Totals

Unknowns	234	1499	N/A
ntified	11605	54391	3.1609
nd Total	11839	55869	3.1609

Reported on 10-FEB-1991 at 08:57

Injection Report

Acquired on 10-FEB-1991 at 08:18



AMOCO

Sample Name : W0210N Amoco Terminal, Superior, WI
Sample Id : MW-15
Sample Type : Sample Amount=1.00000
Bottle No : 56

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	4.182	327	2113	0.0043	MTBE	6.4
5	7.702	391	2078	0.0023	BENZENE	5.3A
7	8.276	4521	23437	1.0147	SURR1	5.1
17	11.480	270	2498	0.0027	TOLUENE	8.0
23	13.489	4264	20549	1.2460	SURR2	4.5
26	14.471	285	1875	0.0021	P/M-XYLENE	6.7
32	16.307	3021	13496	1.1247	SURR3	4.5

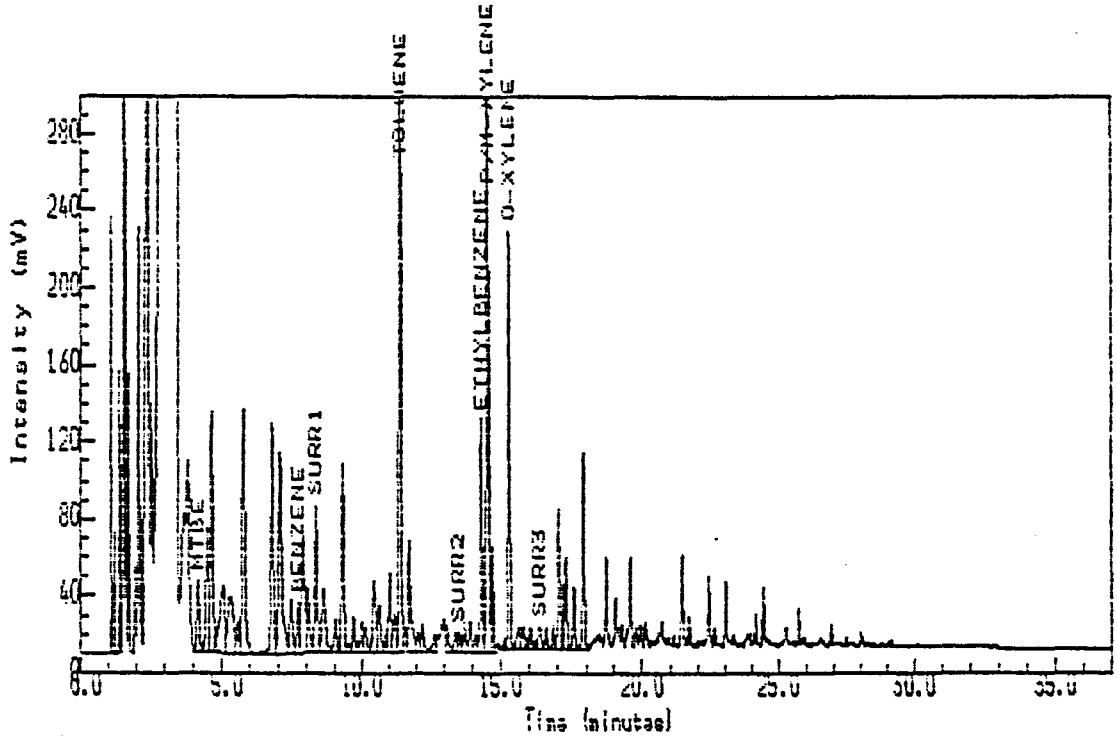
Totals

Unknowns	13130	87674	N/A
Quantified	13079	66047	3.3968
Grand Total	26209	153721	3.3968

Reported on 10-FEB-1991 at 09:46

Injection Report

Acquired on 10-FEB-1991 at 09:06



AMOCO

Sample Name : W02100 Amoco Terminal, Superior, WI
Sample Id : MW-16
Sample Type : Sample Amount=1.00000
Bottle No : 57

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	4.178	37627	247067	0.3081	MTBE	6.7
11	7.702	26083	153014	0.1691	BENZENE	5.9A
14	8.333	76535	462425	20.0201	SURR1	5.6
29	11.404	570268	2645303	2.8688	TOLUENE	4.5
36	13.502	9844	67419	4.0882	SURR2	6.9
40	14.311	120874	543763	0.5986	ETHYLBENZENE	4.5
41	14.542	483542	2141046	2.3688	P/M-XYLENE	4.3
45	15.293	217380	957542	1.0440	O-XYLENE	4.3
51	16.356	12178	97460	8.1217	SURR3	8.3

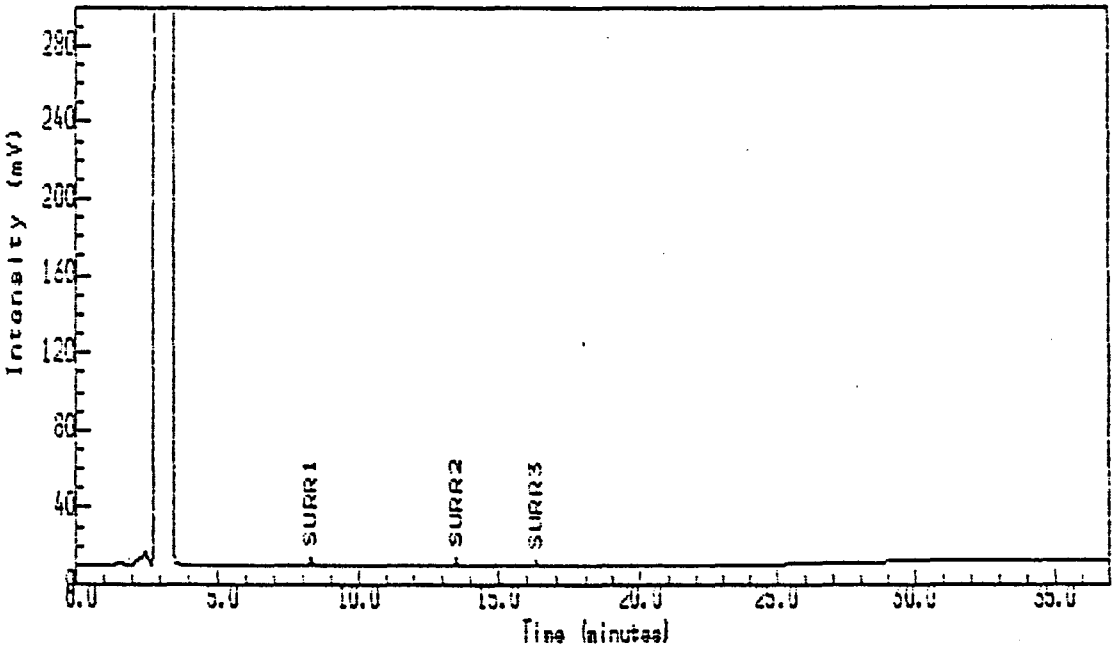
Totals

Unknowns	1657652	11136877	N/A
Identified	1554331	7315039	39.7874
Grand Total	3211983	18451916	39.7874

Reported on 10-FEB-1991 at 10:33

Injection Report

Acquired on 10-FEB-1991 at 09:55



AMOCO

Sample Name : WO210P Amoco Terminal, Superior, WI
Sample Id : MW-17
Sample Type : Sample Amount=1.00000
Bottle No : 58

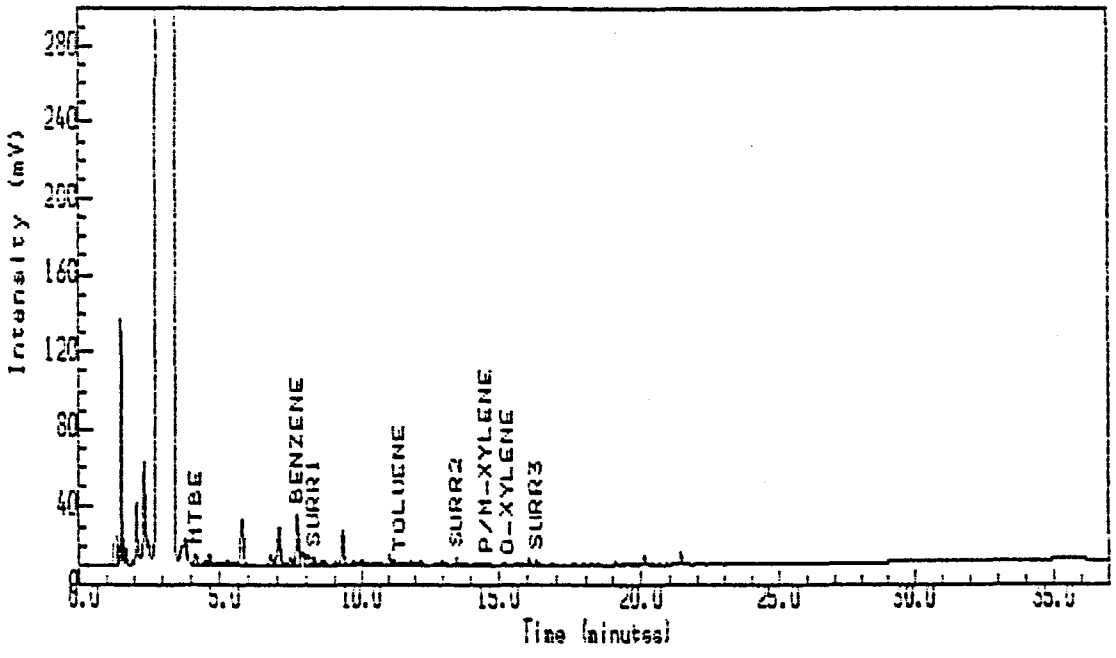
PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	8.276	4531	23588	1.0212	SURR1	5.1
2	13.489	4113	17817	1.0804	SURR2	4.3
3	16.307	2796	12004	1.0003	SURR3	4.3

Totals			
Unknowns	315	1891	N/A
Quantified	11440	53409	3.1019
Grand Total	11754	55300	3.1019

Injection Report

Acquired on 10-FEB-1991 at 10:44



AMOCO

Sample Name : W0210Q Amoco Terminal, Superior, WI
Sample Id : MW-18
Sample Type : Sample Amount=1.00000
Bottle No : 59

PEAK INFORMATION

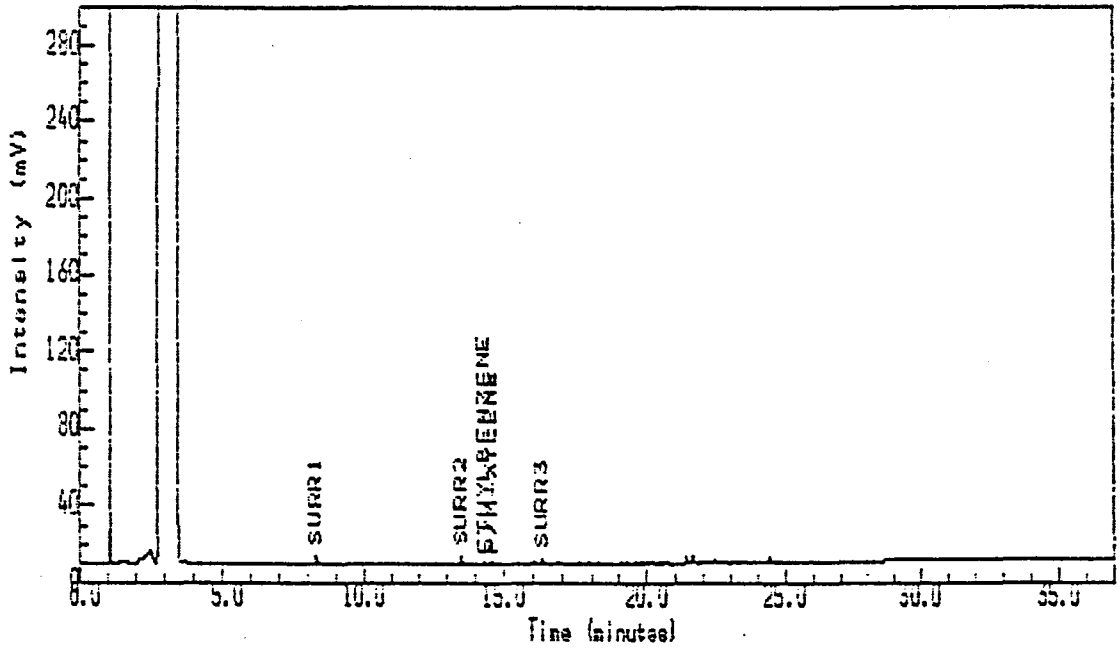
Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	4.178	5770	37636	0.0774	MTBE	6.4
12	7.702	26539	149884	0.1657	BENZENE	5.3
14	8.276	4051	21520	0.9317	SURR1	5.1
28	11.409	1635	12435	0.0135	TOLUENE	8.5
36	13.489	3853	19723	1.1960	SURR2	4.5
39	14.547	1611	12139	0.0134	P/M-XYLENE	5.3
42	15.302	290	1424	0.0016	O-XYLENE	5.1
46	16.307	2694	13090	1.0908	SURR3	4.5

Totals			
Knowns	131819	905851	N/A
Quantified	46442	267851	3.4900
Grand Total	178261	1173702	3.4900

Reported on 10-FEB-1991 at 12:59

Injection Report

Acquired on 10-FEB-1991 at 12:21



AMOCO

Sample Name : WO210R Amoco Terminal, Superior, WI
Sample Id : MW-19
Sample Type : Sample Amount=1.00000
Bottle No : 61

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	8.280	4581	23858	1.0329	SURR1	5.3
2	13.489	4105	18022	1.0928	SURR2	4.3
3	14.311	596	2666	0.0029	ETHYLBENZENE	4.3
4	14.551	674	3103	0.0034	P/M-XYLENE	4.3
6	16.307	2888	12473	1.0394	SURR3	4.3

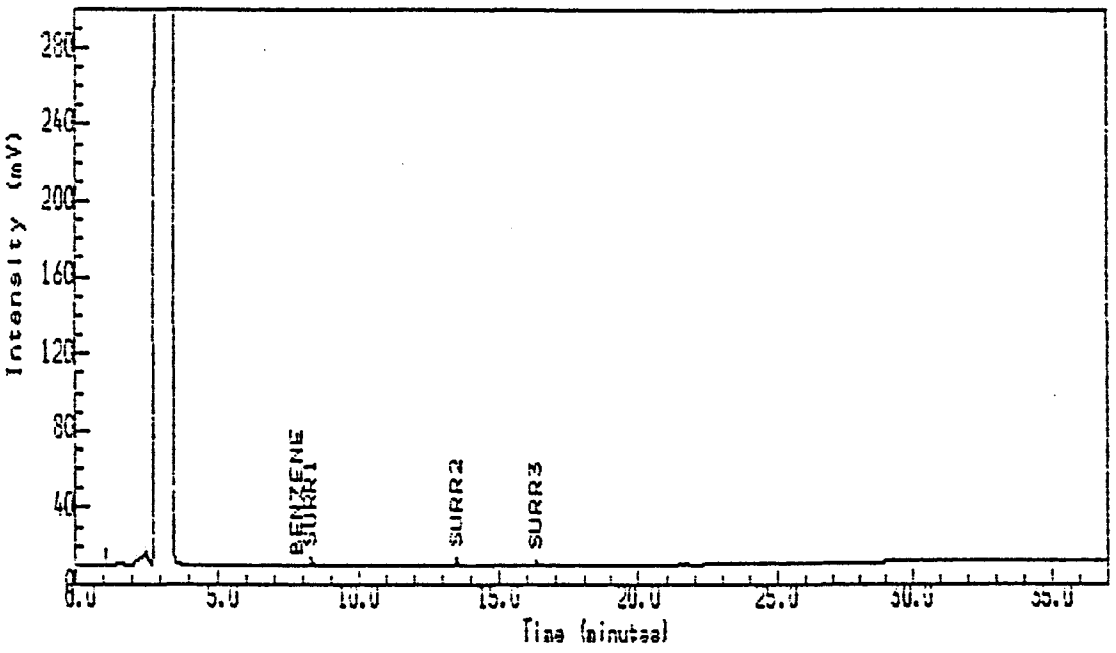
Totals

Unknowns	4969	23271	N/A
Quantified	12845	60122	3.1715
Grand Total	17814	83393	3.1715

Reported on 10-FEB-1991 at 13:48

Injection Report

cquired on 10-FEB-1991 at 13:10



MOCO

ample Name : WO210S Amoco Terminal, Superior, WI
ample Id : MW-20
Sample Type : Sample Amount=1.00000
ottle No : 62

PEAK INFORMATION

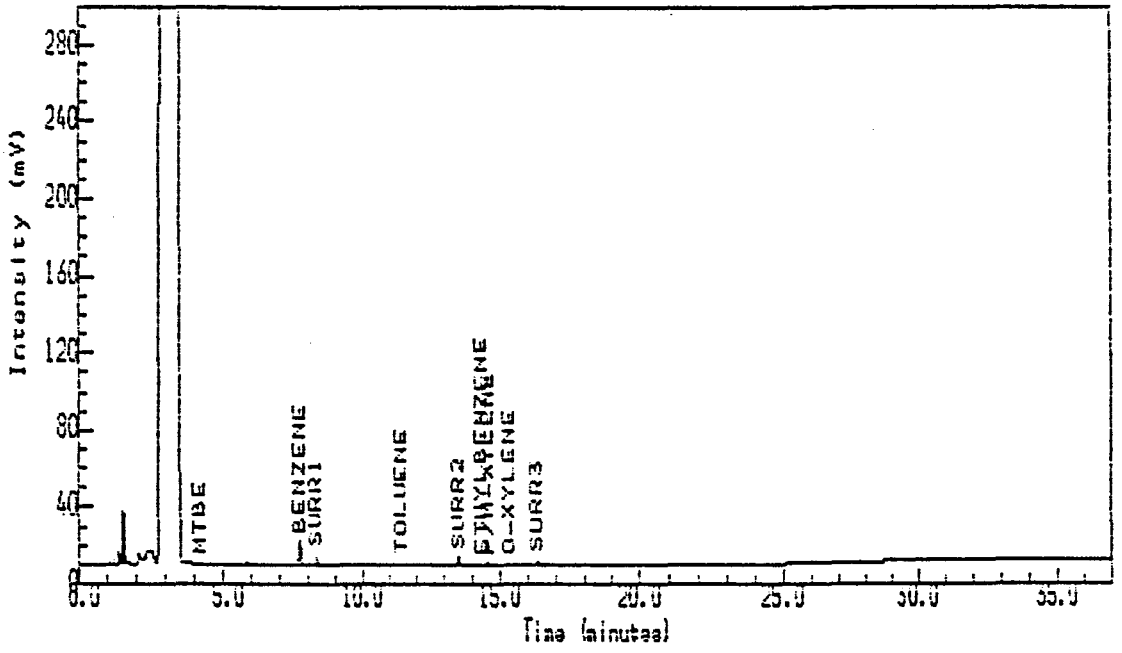
Peak	RT mins	Hont uV	Area uVs	mg/L	Peak name	Width
1	7.778	125	636	0.0007	BENZENE	5.3
2	8.276	4524	23576	1.0207	SURR1	5.1
3	13.489	4084	17746	1.0761	SURR2	4.3
4	16.307	2781	11922	0.9935	SURR3	4.0

Totals			
aknowns	186	875	N/A
uantified	11515	53880	3.0910
Grand Total	11701	54755	3.0910

Reported on 10-FEB-1991 at 14:38

Injection Report

Acquired on 10-FEB-1991 at 13:59



AMOCO

Sample Name : W0210T Amoco Terminal, Superior, WI
Sample Id : MW-21
Sample Type : Sample Amount=1.00000
Bottle No : 63

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	4.187	287	1821	0.0037	MTBE	6.4
7	7.707	12345	67862	0.0750	BENZENE	5.3
8	8.280	4246	22186	0.9605	SURR1	5.1
11	11.404	587	2637	0.0029	TOLUENE	4.5
12	13.489	3748	16253	0.9856	SURR2	4.5
13	14.316	177	757	0.0008	ETHYLBENZENE	4.5
14	14.547	877	3784	0.0042	P/M-XYLENE	4.3
15	15.298	204	909	0.0010	O-XYLENE	4.5
16	16.311	2506	11077	0.9231	SURR3	4.3

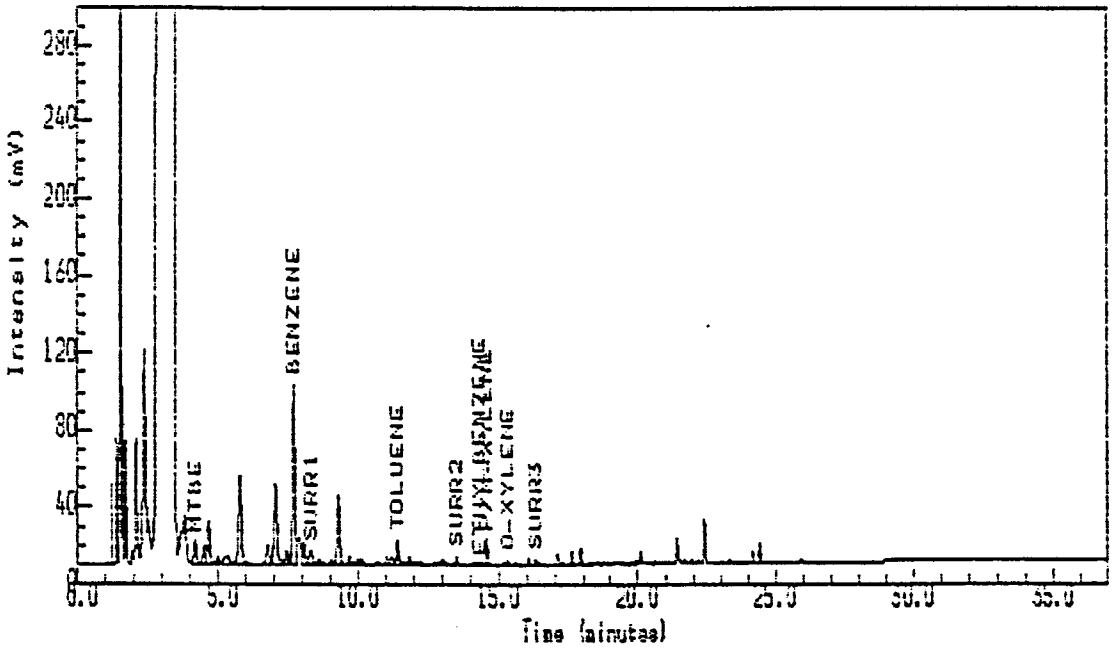
Totals

Unknowns	2768	17737	N/A
Quantified	24979	127285	2.9568
Grand Total	27746	145022	2.9568

Reported on 10-FEB-1991 at 15:26

Injection Report

Acquired on 10-FEB-1991 at 14:47



AMOCO

ample Name : W0210U Amoco Terminal, Superior, WI
Sample Id : MW-30
ample Type : Sample Amount=1.00000
ottle No : 64

PEAK INFORMATION

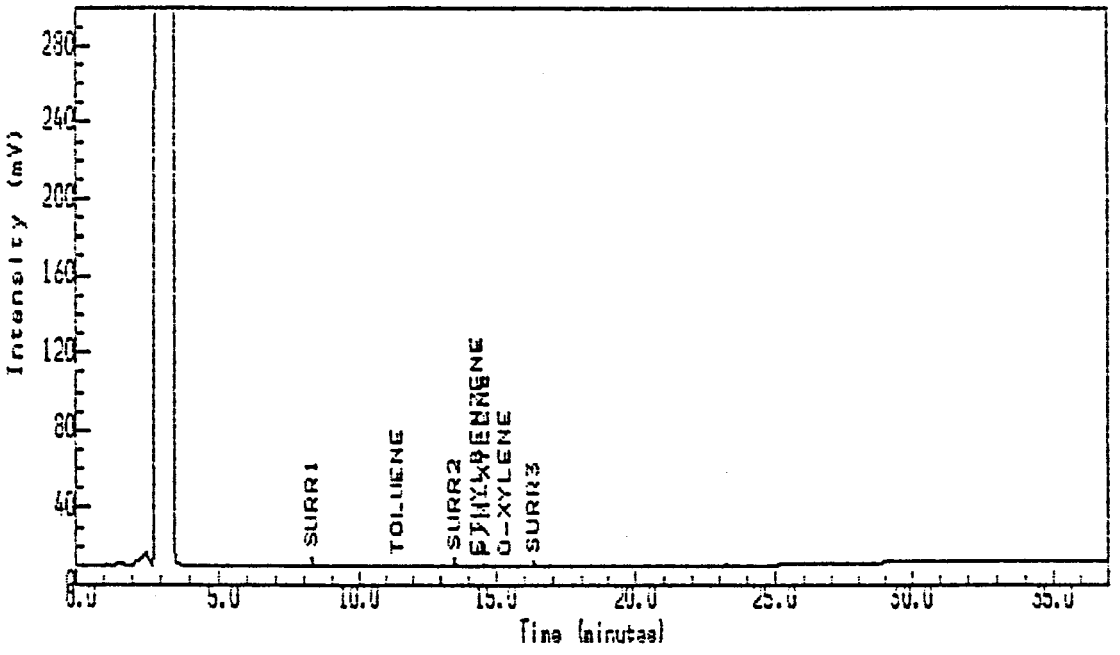
eak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	4.187	11726	76946	0.1582	MTBE	6.4
10	7.702	93670	522579	0.5776	BENZENE	5.3
12	8.307	6824	51514	2.2302	SURR1	7.5
24	11.404	12333	66953	0.0726	TOLUENE	4.8
31	13.489	4456	24113	1.4622	SURR2	4.5
34	14.316	583	3126	0.0034	ETHYLBENZENE	4.8A
35	14.551	13508	62372	0.0690	P/M-XYLENE	4.3
39	15.202	2605	13315	0.0145	O-XYLENE	5.1
44	16.311	3238	15682	1.3068	SURR3	4.5

otals			
Unknowns	257379	1749417	N/A
antified	148944	836599	5.8947
Grand Total	406323	2586016	5.8947

Reported on 10-FEB-1991 at 16:15

Injection Report

Acquired on 10-FEB-1991 at 15:36



AMOCO

Sample Name : W0210V Amoco Terminal, Superior, WI
Sample Id : MW-31
Sample Type : Sample Amount=1.00000
Bottle No : 65

PEAK INFORMATION

Peak	RT mins	Hght uV	Area uVs	mg/L	Peak name	Width
1	8.280	4110	21581	0.9343	SURR1	5.1
2	11.404	509	2292	0.0025	TOLUENE	4.5
3	13.489	3635	15748	0.9549	SURR2	4.5
4	14.311	147	628	0.0007	ETHYLBENZENE	4.5
5	14.547	671	3002	0.0033	P/M-XYLENE	4.3
6	15.298	176	794	~~0.0009~~	O-XYLENE	4.5
7	16.307	2441	10729	0.8940	SURR3	4.5

Totals

Unknowns	464	2828	N/A
Quantified	11689	54774	2.7907
Grand Total	12152	57602	2.7907

Injection Report

TPH → ND
for other Samples

Acquired on 10-FEB-1991 at 00:

AMOCO

Sample Name : W0210D Amoco WI
Sample Id : MW-3
Sample Type : Sample Amou...
Bottle No : 46

PEAK INFORMATION

Peak RT mins	Area uVs	mg/kg	Peak name
C2	2412545	18	DISTILLATE

Totals			
Unknowns	4298696	N/A	
Quantified	2412545	18	
Grand Total	6711241	18	

ANALYSIS SUMMARY

Method..... TPH9
Run sequence..... 91W0210
Calibration..... TPH9
External standard calibration using area
Uncalibrated peaks use user factor (0.0000)

Injection Report

Acquired on 10-FEB-1991 at 05:05

AMOCO

Sample Name : W0210J Amoco Terminal, Superior, WI
Sample Id : MW-9
Sample Type : Sample Amount=1.00000
Bottle No : 52

PEAK INFORMATION

Peak	RT mins	Area uVs	mg/kg	Peak name
C1		88649496	205	GASOLINE
5	5.782	2306558	6	- C1
8	7.071	3083444	8	- C1
16	9.280	4358996	10	- C1
21	10.636	2628440	6	- C1
23	11.182	2261076	6	- C1
25	11.742	4421957	11	- C1
33	13.702	2140701	5	- C1
34	13.924	2091766	5	- C1
38	14.693	5006362	12	- C1
41	15.636	2861509	7	- C1
42	15.769	1937991	5	- C1
45	16.360	2326097	6	- C1
46	16.591	1958540	5	- C1
49	17.298	3910164	9	- C1
56	19.578	3175414	8	- C1
C2		4590963	33	DISTILLATE

Totals		
Unknowns	48771424	N/A
Quantified	93240456	238
Grand Total	142011888	238

ANALYSIS SUMMARY

Method..... TPH9
Run sequence..... 91W0210
Calibration..... TPH9
External standard calibration using area
Uncalibrated peaks use user factor (0.0000)

Reported on 11-FEB-1991 at 10:25

Injection Report

Acquired on 10-FEB-1991 at 06:41

AMOCO

Sample Name : W0210L Amoco Terminal, Superior, WI
Sample Id : MW-11
Sample Type : Sample Amount=1.00000
Bottle No : 54

PEAK INFORMATION

Peak	RT mins	Area uVs	mg/kg	Peak name

Totals

Unknowns	1863610	N/A
Quantified	0	0
Grand Total	1863610	0

ANALYSIS SUMMARY

Method..... TPH9
Run sequence..... 91W0210
Calibration..... TPH9
External standard calibration using area
Uncalibrated peaks use user factor (0.0000)

Injection Report

Acquired on 10-FEB-1991 at 08:18

AMOCO

Sample Name : W0210N Amoco Terminal, Superior, WI
Sample Id : MW-15
Sample Type : Sample Amount=1.00000
Bottle No : 56

PEAK INFORMATION

Peak RT mins	Area uVs	mg/L	Peak name

Totals			
Unknowns	2254983	N/A	
Quantified	0	0	
Grand Total	2254983	0	

ANALYSIS SUMMARY

Method..... TPH9
Run sequence..... 91W0210
Calibration..... TPH9
External standard calibration using area
Uncalibrated peaks use user factor (0.0000)

Injection Report

Acquired on 10-FEB-1991 at 09:06

AMOCO

Sample Name : WQ2100 Amoco Terminal, Superior, WI
Sample Id : MW-16
Sample Type : Sample Amount=1.00000
Bottle No : 57

PEAK INFORMATION

Peak	RT mins	Area uVs	mg/L	Peak name
C1		20095190	47	GASOLINE
29	11.404	2650201	7	- C1
41	14.542	2148727	5	- C1
C2		1752275	14	DISTILLATE

Totals		
Unknowns	17048540	N/A
Quantified	21847466	61
Grand Total	38896008	61

ANALYSIS SUMMARY

Method..... TPH9
Run sequence..... 91W0210
Calibration..... TPH9
External standard calibration using area
Uncalibrated peaks use user factor (0.0000)

Injection Report

Acquired on 10-FEB-1991 at 10:44

AMOCO

Sample Name : W0210Q Amoco Terminal, Superior, WI
Sample Id : MW-18
Sample Type : Sample Amount=1.00000
Bottle No : 59

PEAK INFORMATION

Peak RT mins	Area uVs	mg/L	Peak name
Totals			
Unknowns	2715664	N/A	
Quantified	0	0	
Grand Total	2715664	0	

ANALYSIS SUMMARY

Method..... TPH9
Run sequence..... 91W0210
Calibration..... TPH9
External standard calibration using area
Uncalibrated peaks use user factor (0.0000)

Injection Report

Acquired on 10-FEB-1991 at 14:47

AMOCO

Sample Name : W0210U Amoco Terminal, Superior, WI
Sample Id : MW-30
Sample Type : Sample Amount=1.00000
Bottle No : 64

PEAK INFORMATION

Peak RT mins	Area uVs	mg/L	Peak name
C1	2717280	7	GASOLINE

Totals			
Unknowns	3422170	N/A	
Quantified	2717280	7	
Grand Total	6139450	7	

ANALYSIS SUMMARY

Method..... TPH9
Run sequence..... 91W0210
Calibration..... TPH9
External standard calibration using area
Uncalibrated peaks use user factor (0.0000)

pace
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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

February 20, 1991

Mr. Paul Brookner
Delta Environmental Consultants
1801 Old Highway 8
Suite 114
New Brighton, MN 55112

RE: Delta Project No. 10-88-457 A
PACE Project No. 910201.567

Dear Mr. Brookner:

Enclosed is the report of laboratory analyses for samples received February 01, 1991.

The organic analyses were performed February 04 - 18, 1991.

A copy of the chain of custody record for the samples and an invoice for services provided are also enclosed.

Please contact us if you have any questions regarding the enclosures.

Sincerely,

Lauren L. Larsen
Project Manager

Enclosures

1710 Douglas Drive North
Minneapolis, MN 55422
TEL: 612-544-5543
FAX: 612-525-3377

pace INCORPORATED
THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Delta Environmental Consultants
1801 Old Highway 8
Suite 114
New Brighton, MN 55112

February 20, 1991
PACE Project Number: 910201567

Attn: Mr. Paul Brookner

10-88-457 A

PACE Sample Number:			10 0044210	10 0044229	10 0044237
Date Collected:			01/31/91	01/31/91	01/31/91
Date Received:			02/01/91	02/01/91	02/01/91
Parameter	Units	MDL	MW-6	MW-9	MW-15
ORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
1,2-Dibromoethane	ug/L	200	-	ND	-
1,2-Dibromoethane	ug/L	4.0	ND	-	ND
PURGEABLE HALOCARBONS AND AROMATICS					
Date Analyzed			C/02/06/91	C 02/07/91	C 02/07/91
Chloromethane	ug/L	1.0	ND	-	ND
Chloromethane	ug/L	50	-	ND	-
Bromomethane	ug/L	1.5	ND	-	ND
Bromomethane	ug/L	75	-	ND	-
Dichlorodifluoromethane	ug/L	1.5	ND	-	ND
Dichlorodifluoromethane	ug/L	75	-	ND	-
Vinyl chloride	ug/L	1.5	ND	-	ND
Vinyl chloride	ug/L	75	-	ND	-
Chloroethane	ug/L	1.0	ND	-	ND
Chloroethane	ug/L	50	-	ND	-
Methylene chloride	ug/L	1.0	ND	-	ND
Methylene chloride	ug/L	50	-	ND	-
Trichlorofluoromethane	ug/L	0.4	ND	-	ND
Trichlorofluoromethane	ug/L	20	-	ND	-
1,1-Dichloroethylene	ug/L	0.3	ND	-	ND
1,1-Dichloroethylene	ug/L	15	-	ND	-
1,1-Dichloroethane	ug/L	0.2	ND	-	ND
1,1-Dichloroethane	ug/L	10	-	ND	-
trans-1,2-Dichloroethylene	ug/L	0.3	ND	-	ND
trans-1,2-Dichloroethylene	ug/L	15	-	ND	-
Chloroform	ug/L	0.5	ND	-	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.

1710 Douglas Drive North
Minneapolis, MN 55422
TEL: 612-544-5543
FAX: 612-525-3377

REPORT OF LABORATORY ANALYSIS

Mr. Paul Brookner
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February 20, 1991
PACE Project Number: 910201567

10-88-457 A

PACE Sample Number:			10 0044210	10 0044229	10 0044237
Date Collected:			01/31/91	01/31/91	01/31/91
Date Received:			02/01/91	02/01/91	02/01/91
Parameter	Units	MDL	MW-6	MW-9	MW-15
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS AND AROMATICS					
Chloroform	ug/L	25	-	ND	-
1,2-Dichloroethane	ug/L	0.2	9.5	-	ND
1,2-Dichloroethane	ug/L	10	-	ND	-
1,1,1-Trichloroethane	ug/L	0.5	ND	-	ND
1,1,1-Trichloroethane	ug/L	25	-	ND	-
Carbon tetrachloride	ug/L	0.3	ND	-	ND
Carbon tetrachloride	ug/L	15	-	ND	-
Bromodichloromethane	ug/L	0.2	ND	-	ND
Bromodichloromethane	ug/L	10	-	ND	-
1,2-Dichloropropane	ug/L	0.2	ND	-	ND
1,2-Dichloropropane	ug/L	10	-	ND	-
cis-1,3-Dichloro-1-propene	ug/L	0.5	ND	-	ND
cis-1,3-Dichloro-1-propene	ug/L	25	-	ND	-
1,1,2-Trichloroethylene	ug/L	0.5	ND	-	ND
1,1,2-Trichloroethylene	ug/L	25	-	ND	-
Benzene	ug/L	1.0	2.6	-	1.9
Benzene	ug/L	50	-	ND	-
Dibromochloromethane	ug/L	1.0	ND	-	ND
Dibromochloromethane	ug/L	50	-	ND	-
1,1,2-Trichloroethane	ug/L	1.0	ND	-	ND
1,1,2-Trichloroethane	ug/L	50	-	ND	-
trans-1,3-Dichloro-1-propene	ug/L	0.3	ND	-	ND
trans-1,3-Dichloro-1-propene	ug/L	15	-	ND	-
2-Chloroethylvinyl ether	ug/L	250	-	ND	-
2-Chloroethylvinyl ether	ug/L	5.0	ND	-	ND
Bromoform	ug/L	1.0	ND	-	ND
Bromoform	ug/L	50	-	ND	-
1,1,2,2-Tetrachloroethane	ug/L	1.0	ND	-	ND
1,1,2,2-Tetrachloroethane	ug/L	50	-	ND	-

MDL Method Detection Limit
ND Not detected at or above the MDL.

10-88-457 A

PACE Sample Number:			10 0044210	10 0044229	10 0044237
Date Collected:			01/31/91	01/31/91	01/31/91
Date Received:			02/01/91	02/01/91	02/01/91
Parameter	Units	MDL	MW-6	MW-9	MW-15
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS AND AROMATICS					
1,1,2,2-Tetrachloroethylene	ug/L	1.0	ND	-	ND
1,1,2,2-Tetrachloroethylene	ug/L	50	-	ND	-
Toluene	ug/L	1.0	ND	-	1.8
Toluene	ug/L	50	-	ND	-
Chlorobenzene	ug/L	1.0	ND	-	ND
Chlorobenzene	ug/L	50	-	ND	-
Ethyl benzene	ug/L	1.0	ND	-	ND
Ethyl benzene	ug/L	50	-	670	-
1,3-Dichlorobenzene	ug/L	200	-	ND	-
1,3-Dichlorobenzene	ug/L	4.0	ND	-	ND
1,2-Dichlorobenzene	ug/L	200	-	ND	-
1,2-Dichlorobenzene	ug/L	4.0	ND	-	ND
1,4-Dichlorobenzene	ug/L	200	-	ND	-
1,4-Dichlorobenzene	ug/L	4.0	ND	-	ND
cis-1,2-Dichloroethylene	ug/L	0.5	ND	-	ND
cis-1,2-Dichloroethylene	ug/L	25	-	ND	-
POLYNUCLEAR AROMATIC HYDROCARBONS-610					
Date Analyzed			02/11/91	02/18/91	02/11/91
Date Extracted			02/04/90	02/04/90	02/04/90
Naphthalene	ug/L	1.5	ND	-	ND
Naphthalene	ug/L	3.0	-	86	-
Acenaphthylene	ug/L	1.5	ND	-	ND
Acenaphthylene	ug/L	3.0	-	26	-
Acenaphthene	ug/L	2.0	ND	-	ND
Acenaphthene	ug/L	4.0	-	73	-
Fluorene	ug/L	0.31	ND	-	ND
Fluorene	ug/L	0.62	-	0.63	-
Phenanthrene	ug/L	0.20	ND	-	ND
Phenanthrene	ug/L	0.40	-	ND	-

MDL Method Detection Limit
ND Not detected at or above the MDL.

10-88-457 A

PACE Sample Number:			10 0044210	10 0044229	10 0044237
Date Collected:			01/31/91	01/31/91	01/31/91
Date Received:			02/01/91	02/01/91	02/01/91
Parameter	Units	MDL	MW-6	MW-9	MW-15
ORGANIC ANALYSIS					
POLYNUCLEAR AROMATIC HYDROCARBONS-610					
Anthracene	ug/L	0.050	ND	-	0.069
Anthracene	ug/L	0.10	-	ND	-
Fluoranthene	ug/L	0.30	ND	-	1.4
Fluoranthene	ug/L	0.60	-	ND	-
Pyrene	ug/L	0.10	ND	-	ND
Pyrene	ug/L	0.20	-	ND	-
Benzo(a)anthracene	ug/L	0.10	ND	-	ND
Benzo(a)anthracene	ug/L	0.20	-	ND	-
Chrysene	ug/L	0.10	ND	-	ND
Chrysene	ug/L	0.20	-	ND	-
Benzo(b)fluoranthene	ug/L	0.20	ND	-	ND
Benzo(b)fluoranthene	ug/L	0.40	-	ND	-
Benzo(k)fluoranthene	ug/L	0.050	ND	-	ND
Benzo(k)fluoranthene	ug/L	0.10	-	ND	-
Benzo(a)pyrene	ug/L	0.10	ND	-	ND
Benzo(a)pyrene	ug/L	0.20	-	ND	-
Dibenzo(a,h)anthracene	ug/L	0.20	ND	-	ND
Dibenzo(a,h)anthracene	ug/L	0.40	-	ND	-
Benzo(g,h,i)perylene	ug/L	0.20	ND	-	ND
Benzo(g,h,i)perylene	ug/L	0.40	-	ND	-
Indeno(1,2,3-cd)pyrene	ug/L	0.20	ND	-	ND
Indeno(1,2,3-cd)pyrene	ug/L	0.40	-	ND	-

MDL Method Detection Limit
ND Not detected at or above the MDL.

10-88-457 A

PACE Sample Number:			10 0044245	10 0044253	10 0044261
Date Collected:			01/31/91	01/31/91	01/31/91
Date Received:			02/01/91	02/01/91	02/01/91
Parameter	Units	MDL	MW-16	MW-17	MW-30
ORGANIC ANALYSIS					
INDIVIDUAL PARAMETERS					
1,2-Dibromoethane	ug/L	100	-	-	ND
1,2-Dibromoethane	ug/L	4.0	-	ND	-
1,2-Dibromoethane	ug/L	800	ND	-	-
PURGEABLE HALOCARBONS AND AROMATICS					
Date Analyzed			C 02/07/91	C 02/06/91	C 02/07/91
Chloromethane	ug/L	1.0	-	ND	-
Chloromethane	ug/L	200	ND	-	-
Chloromethane	ug/L	25	-	-	ND
Bromomethane	ug/L	1.5	-	ND	-
Bromomethane	ug/L	300	ND	-	-
Bromomethane	ug/L	38	-	-	ND
Dichlorodifluoromethane	ug/L	1.5	-	ND	-
Dichlorodifluoromethane	ug/L	300	ND	-	-
Dichlorodifluoromethane	ug/L	38	-	-	ND
Vinyl chloride	ug/L	1.5	-	ND	-
Vinyl chloride	ug/L	300	ND	-	-
Vinyl chloride	ug/L	38	-	-	ND
Chloroethane	ug/L	1.0	-	ND	-
Chloroethane	ug/L	200	ND	-	-
Chloroethane	ug/L	25	-	-	ND
Methylene chloride	ug/L	1.0	-	ND	-
Methylene chloride	ug/L	200	ND	-	-
Methylene chloride	ug/L	25	-	-	ND
Trichlorofluoromethane	ug/L	0.4	-	ND	-
Trichlorofluoromethane	ug/L	10	-	-	ND
Trichlorofluoromethane	ug/L	80	ND	-	-
1,1-Dichloroethylene	ug/L	0.3	-	ND	-
1,1-Dichloroethylene	ug/L	60	ND	-	-
1,1-Dichloroethylene	ug/L	7.5	-	-	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.

Mr. Paul Brookner
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February 20, 1991
PACE Project Number: 910201567

10-88-457 A

PACE Sample Number:			10 0044245	10 0044253	10 0044261
Date Collected:			01/31/91	01/31/91	01/31/91
Date Received:			02/01/91	02/01/91	02/01/91
Parameter	Units	MDL	MW-16	MW-17	MW-30
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS AND AROMATICS					
1,1-Dichloroethane	ug/L	0.2	-	ND	-
1,1-Dichloroethane	ug/L	40	ND	-	-
1,1-Dichloroethane	ug/L	5.0	-	-	ND
trans-1,2-Dichloroethylene	ug/L	0.3	-	ND	-
trans-1,2-Dichloroethylene	ug/L	60	ND	-	-
trans-1,2-Dichloroethylene	ug/L	7.5	-	-	ND
Chloroform	ug/L	0.5	-	ND	-
Chloroform	ug/L	100	ND	-	-
Chloroform	ug/L	12	-	-	ND
1,2-Dichloroethane	ug/L	0.2	-	ND	-
1,2-Dichloroethane	ug/L	40	ND	-	-
1,2-Dichloroethane	ug/L	5.0	-	-	ND
1,1,1-Trichloroethane	ug/L	0.5	-	ND	-
1,1,1-Trichloroethane	ug/L	100	ND	-	-
1,1,1-Trichloroethane	ug/L	12	-	-	ND
Carbon tetrachloride	ug/L	0.3	-	ND	-
Carbon tetrachloride	ug/L	60	ND	-	-
Carbon tetrachloride	ug/L	7.5	-	-	ND
Bromodichloromethane	ug/L	0.2	-	ND	-
Bromodichloromethane	ug/L	40	ND	-	-
Bromodichloromethane	ug/L	5.0	-	-	ND
1,2-Dichloropropane	ug/L	0.2	-	ND	-
1,2-Dichloropropane	ug/L	40	ND	-	-
1,2-Dichloropropane	ug/L	5.0	-	-	ND
cis-1,3-Dichloro-1-propene	ug/L	0.5	-	ND	-
cis-1,3-Dichloro-1-propene	ug/L	100	ND	-	-
cis-1,3-Dichloro-1-propene	ug/L	12	-	-	ND
1,1,2-Trichloroethylene	ug/L	0.5	-	ND	-
1,1,2-Trichloroethylene	ug/L	100	ND	-	-

MDL Method Detection Limit
ND Not detected at or above the MDL.

10-88-457 A

PACE Sample Number:			10 0044245	10 0044253	10 0044261
Date Collected:			01/31/91	01/31/91	01/31/91
Date Received:			02/01/91	02/01/91	02/01/91
Parameter	Units	MDL	MW-16	MW-17	MW-30
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS AND AROMATICS					
1,1,2-Trichloroethylene	ug/L	12	-	-	ND
Benzene	ug/L	1.0	-	ND	-
Benzene	ug/L	200	1200	-	-
Benzene	ug/L	25	-	-	850
Dibromochloromethane	ug/L	1.0	-	ND	-
Dibromochloromethane	ug/L	200	ND	-	-
Dibromochloromethane	ug/L	25	-	-	ND
1,1,2-Trichloroethane	ug/L	1.0	-	ND	-
1,1,2-Trichloroethane	ug/L	200	ND	-	-
1,1,2-Trichloroethane	ug/L	25	-	-	ND
trans-1,3-Dichloro-1-propene	ug/L	0.3	-	ND	-
trans-1,3-Dichloro-1-propene	ug/L	60	ND	-	-
trans-1,3-Dichloro-1-propene	ug/L	7.5	-	-	ND
2-Chloroethylvinyl ether	ug/L	1000	ND	-	-
2-Chloroethylvinyl ether	ug/L	120	-	-	ND
2-Chloroethylvinyl ether	ug/L	5.0	-	ND	-
Bromoform	ug/L	1.0	-	ND	-
Bromoform	ug/L	200	ND	-	-
Bromoform	ug/L	25	-	-	ND
1,1,2,2-Tetrachloroethane	ug/L	1.0	-	ND	-
1,1,2,2-Tetrachloroethane	ug/L	200	ND	-	-
1,1,2,2-Tetrachloroethane	ug/L	25	-	-	ND
1,1,2,2-Tetrachloroethylene	ug/L	1.0	-	ND	-
1,1,2,2-Tetrachloroethylene	ug/L	200	ND	-	-
1,1,2,2-Tetrachloroethylene	ug/L	25	-	-	ND
Toluene	ug/L	1.0	-	ND	-
Toluene	ug/L	200	4200	-	-
Toluene	ug/L	25	-	-	100
Chlorobenzene	ug/L	1.0	-	ND	-

MDL Method Detection Limit
ND Not detected at or above the MDL.

10-88-457 A

PACE Sample Number:			10 0044245	10 0044253	10 0044261
Date Collected:			01/31/91	01/31/91	01/31/91
Date Received:			02/01/91	02/01/91	02/01/91
Parameter	Units	MDL	MW-16	MW-17	MW-30
ORGANIC ANALYSIS					
PURGEABLE HALOCARBONS AND AROMATICS					
Chlorobenzene	ug/L	200	ND	-	-
Chlorobenzene	ug/L	25	-	-	ND
Ethyl benzene	ug/L	1.0	-	ND	-
Ethyl benzene	ug/L	200	670	-	-
Ethyl benzene	ug/L	25	-	-	ND
1,3-Dichlorobenzene	ug/L	100	-	-	ND
1,3-Dichlorobenzene	ug/L	4.0	-	ND	-
1,3-Dichlorobenzene	ug/L	800	ND	-	-
1,2-Dichlorobenzene	ug/L	100	-	-	ND
1,2-Dichlorobenzene	ug/L	4.0	-	ND	-
1,2-Dichlorobenzene	ug/L	800	ND	-	-
1,4-Dichlorobenzene	ug/L	100	-	-	ND
1,4-Dichlorobenzene	ug/L	4.0	-	ND	-
1,4-Dichlorobenzene	ug/L	800	ND	-	-
cis-1,2-Dichloroethylene	ug/L	0.5	-	ND	-
cis-1,2-Dichloroethylene	ug/L	100	ND	-	-
cis-1,2-Dichloroethylene	ug/L	12	-	-	ND
POLYNUCLEAR AROMATIC HYDROCARBONS-610					
Date Analyzed			02/18/91	02/18/91	02/18/91
Date Extracted			02/04/90	02/04/90	02/04/90
Naphthalene	ug/L	1.5	-	ND	-
Naphthalene	ug/L	3.0	-	-	75
Naphthalene	ug/L	6.0	120	-	-
Acenaphthylene	ug/L	1.5	-	ND	-
Acenaphthylene	ug/L	3.0	-	-	41
Acenaphthylene	ug/L	6.0	56	-	-
Acenaphthene	ug/L	2.0	-	ND	-
Acenaphthene	ug/L	4.0	-	-	17
Acenaphthene	ug/L	8.0	9.1	-	-

MDL Method Detection Limit
ND Not detected at or above the MDL.

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PACE Project Number: 910201567

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PACE Sample Number:			10 0044245	10 0044253	10 0044261
Date Collected:			01/31/91	01/31/91	01/31/91
Date Received:			02/01/91	02/01/91	02/01/91
Parameter	Units	MDL	MW-16	MW-17	MW-30
ORGANIC ANALYSIS					
POLYNUCLEAR AROMATIC HYDROCARBONS-610					
Fluorene	ug/L	0.31	-	ND	-
Fluorene	ug/L	0.62	-	-	ND
Fluorene	ug/L	1.2	ND	-	-
Phenanthrene	ug/L	0.20	-	ND	-
Phenanthrene	ug/L	0.40	-	-	ND
Phenanthrene	ug/L	0.80	ND	-	-
Anthracene	ug/L	0.050	-	ND	-
Anthracene	ug/L	0.10	-	-	ND
Anthracene	ug/L	0.20	ND	-	-
Fluoranthene	ug/L	0.30	-	ND	-
Fluoranthene	ug/L	0.60	-	-	ND
Fluoranthene	ug/L	1.2	ND	-	-
Pyrene	ug/L	0.10	-	ND	-
Pyrene	ug/L	0.20	-	-	ND
Pyrene	ug/L	0.40	ND	-	-
Benzo(a)anthracene	ug/L	0.10	-	ND	-
Benzo(a)anthracene	ug/L	0.20	-	-	ND
Benzo(a)anthracene	ug/L	0.40	ND	-	-
Chrysene	ug/L	0.10	-	ND	-
Chrysene	ug/L	0.20	-	-	ND
Chrysene	ug/L	0.40	ND	-	-
Benzo(b)fluoranthene	ug/L	0.20	-	ND	-
Benzo(b)fluoranthene	ug/L	0.40	-	-	ND
Benzo(b)fluoranthene	ug/L	0.80	ND	-	-
Benzo(k)fluoranthene	ug/L	0.050	-	ND	-
Benzo(k)fluoranthene	ug/L	0.10	-	-	ND
Benzo(k)fluoranthene	ug/L	0.20	ND	-	-
Benzo(a)pyrene	ug/L	0.10	-	ND	-
Benzo(a)pyrene	ug/L	0.20	-	-	ND

MDL Method Detection Limit
ND Not detected at or above the MDL.

REPORT OF LABORATORY ANALYSIS

Mr. Paul Brookner
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February 20, 1991
PACE Project Number: 910201567

10-88-457 A

PACE Sample Number:			10 0044245	10 0044253	10 0044261
Date Collected:			01/31/91	01/31/91	01/31/91
Date Received:			02/01/91	02/01/91	02/01/91
Parameter	Units	MDL	MW-16	MW-17	MW-30
ORGANIC ANALYSIS					
POLYNUCLEAR AROMATIC HYDROCARBONS-610					
Benzo(a)pyrene	ug/L	0.40	ND	-	-
Dibenzo(a,h)anthracene	ug/L	0.20	-	ND	-
Dibenzo(a,h)anthracene	ug/L	0.40	-	-	ND
Dibenzo(a,h)anthracene	ug/L	0.80	ND	-	-
Benzo(g,h,i)perylene	ug/L	0.20	-	ND	-
Benzo(g,h,i)perylene	ug/L	0.40	-	-	ND
Benzo(g,h,i)perylene	ug/L	0.80	ND	-	-
Indeno(1,2,3-cd)pyrene	ug/L	0.20	-	ND	-
Indeno(1,2,3-cd)pyrene	ug/L	0.40	-	-	ND
Indeno(1,2,3-cd)pyrene	ug/L	0.80	ND	-	-

MDL Method Detection Limit
ND Not detected at or above the MDL.

The data contained in this report were obtained using EPA or other approved methodologies. All analyses were performed by me or under my supervision.

Liesa A. Shanahan
Organic Chemistry Manager

1710 Douglas Drive North
Minneapolis, MN 55422
TEL: 612-544-5543
FAX: 612-525-3377

Delta Environmental Consultants, Inc.

Sample Identification/Field Chain of Custody Record

Project: Amoco Terminal, Superior, WI
W.O. # 10-88-457A
Shipped by: Delta Environmental Consultants, Inc.
Shipped to: PACE Laboratories
Comments: Send results to Paul Brookner
A8729
9102201.567
Attention of: Paul Brookner
Hazardous materials suspected? (yes/no)

Sampling Point	Location	Field ID #	Date	Sample Type	No. of Containers	Analysis Required
MW-6 ← 2 GV's Broken	Superior, WI	13191-0900 8457-6	1-31-91	H_2O	3-40ml	601/602 w/EDB
↓ ↓ ↓	4421.0	↓ ↓			1-liter	EPA 610
MW-9		13191-1520 8457-9			3-40ml	601/602 w/EDB
↓ ↓ ↓	22.9	↓ ↓			1-liter	EPA 610
MW-15		13191-1225 8457-15			3-40ml	601/602 w/EDB
↓ ↓ ↓	23.7	↓ ↓			1-liter	EPA 610
MW-16		13191-1605 8457-16			3-40ml	601/602 w/EDB
↓ ↓ ↓	24.5	↓ ↓	↓	↓	1-liter	EPA 610

Sampler(s) (signature) Michael A. Lee

Field ID	Relinquished by: (signature)	Received by: (signature)	Date/Time	Comments
As above	Michael A. Lee			

Sealed for shipment by: (signature) Michael A. Lee Date/Time 2:00pm, 2-1-91 Shipment method: PACE Courier
Received for Lab by: (signature) Date/Time Comments sealed # 215

MLW 2/1

(* No PACE bailers) * (Some 40ml vials not acidified)

Receiving Laboratory: Please return original form after signing for receipt of samples.

Delta
Environmental
Consultants, Inc.

Sample Identification/Field Chain of Custody Record

Project: Amoco Terminal, Superior, WI
Shipped by: Delta Environmental Consultants, Inc.
Shipped to: PACE laboratories
Comments: Send results to Paul Brookner

W.O. # 10-88-457A
Attention of: Paul Brookner
Hazardous materials suspected? (yes/no)

Sampling Point	Location	Field ID #	Date	Sample Type	No. of Containers	Analysis Required
MW-17	Superior, WI	13191-1035 8457-17	1-31-91	H_2O	3-40ml	601/602 w/EPB
↓ ↓ ↓	1442 EST	↓ ↓	↓	↓	1-liter	EPA 610
MW-30		13191-1430 8457-30			3-40ml	601/602 w/EPB
↓ ↓ ↓	1426 EST	↓ ↓	↓	↓	1-liter	EPA 610

Sampler(s) (signature) Michael A-Lee

Field ID	Relinquished by: (signature)	Received by: (signature)	Date/Time		Comments
As above	Michael A-Lee				

Sealed for shipment by: (signature) Michael A-Lee Date/Time 2:00pm, 2-1-91 Shipment method: PACE Courier
Received for Lab by: (signature) _____ Date/Time _____ Comments Sealed #215

X (19 - disposable bailers)

MLN 2/1

Receiving Laboratory: Please return original form after signing for receipt of samples.