391-4607

Delta Environmental Consultants, Inc.

3900 Northwoods Drive
Suite 200
St. Paul, MN 55112
612/486-8022
FAX: 612/486-8021

August 4, 1994

Ms. Jessica Ebertz
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155

Subject: QUARTERLY REPORT - THIRD QUARTER 1994
City of Minneapolis, 5000 Hiawatha Avenue
Minneapolis, Minnesota
MPCA Leak No. 5708
Delta No. A092-333-1

Dear Jessica:

Enclosed is the Site Monitoring Worksheet, Fact Sheet #7 for the above referenced site. The data presented is for the Third Quarter of 1994.

Benzene, toluene, ethylbenzene, and total xylenes concentrations at the site are currently below 100 time the Minnesota Department of Health, Health Risk Limits (HRLs) in MW-1, and below the HRLs to non detectable concentrations in MW-3, MW-4, MW-5, and MW-6. MW-2 was dry at the time of sampling, but has been below HRLs since 1993.

Development of the property is proceeding and MW-1, MW-2, MW-3 and MW-5 will be in the parking and drive area of the planned development. The City of Minneapolis and the property owner would like to move forward on the planned development of the property and would like the MPCA's permission to abandon MW-1 and MW-5.

If you have any questions regarding the enclosed information, please contact me at (612)486-5800.

Sincerely,

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Gary J. Schroeher
Project Manager

GJS/chu

Enclosures

cc: Mr. Don Thompson - City of Minneapolis
Ms. Karen Nordby - Minneapolis Pollution Control Agency
Mr. Don Mattson

SITE MONITORING WORKSHEET
Fact Sheet #7
Minnesota Pollution Control Agency
LUST Cleanup Program
April 1993

The Minnesota Pollution Control Agency (MPCA) staff expect this worksheet to simplify the required post-investigation site monitoring reports. Submit this worksheet:

- quarterly, after the remedial investigation (RI) is complete but before corrective action is taken.
- quarterly, during corrective action design (CAD) installation.
- quarterly, after CAD is operational, along with "CAD System Monitoring Worksheet," (fact sheet #11).

Completion and submittal according to the above schedule fulfills your quarterly site monitoring report requirements. You may include a short cover letter whenever circumstances require. However, you must still submit an annual progress report as described in "Petroleum Tank Release Reports" (fact sheet #3). [NOTE: MPCA staff may reduce the frequency of progress reporting on a site specific basis.]

Where attachments are requested (tables, maps, graphs, etc.), please check off those items attached. The only table not mandatory is that for dissolved oxygen.

MPCA Leak Number: *5708*
Delta No. A092-333-1
5000 Hiawatha Avenue, Minneapolis, MN
Third Quarter 1994

I. Ground Water Monitoring

Please attach the following:

_x_ Cumulative table of ground water monitoring results, including all sample blanks. *(TABLE 1)*

_x_ Copies of most recent laboratory reports for ground water analyses, including a copy of the Chain-of-Custody.

_x_ Cumulative table of ground water elevation and product thickness results. *(TABLE 2)*

_x_ Hydrograph for all monitoring and recovery wells.

_x_ Graph(s) showing contaminant concentrations over time for all monitoring and recovery wells. *(MW-1, MW-2, and MW-3)*

_x_ Ground water contour map based on the most recent ground water elevation data. *(July 28, 1994, Ground Water Contour Map included)*

_NA_ Table of dissolved oxygen sample results (if collected).

Please describe unusual circumstances that may have influenced the sampling results: *MW-2 was dry, subsequently a sample was not obtained.*

Please detail significant observations made at the site: *Benzene, toluene, ethylbenzene, xylene (BTEX) and gasoline range organics (GRO) concentrations are currently below laboratory detection limits in MW-4, MW-5, and MW-6. BTEX and GRO concentrations in MW-1, MW-2, and MW-3 have shown a substantial decrease since the wells were installed. BTEX concentrations are currently below the Minnesota Department of Health, Health Risk Limits (HRLs) in MW-3 and are currently below 100 times the HRLs in MW-1. MW-4 continues to show low levels of tetrachloroethene and is currently at a concentration of 2.1 µg/l. MW-5 has not contained detectable concentrations of any of the parameters sampled for (MDH 465D) in the past two quarters of sampling. Ground water elevations have dropped approximately one foot since April 1994.*

II. Vapor Impact Monitoring

If vapor impacts were detected during the remedial investigation, please attach:

_____ a cumulative table of vapor monitoring results. The table should identify the location of all vapor monitoring points (i.e., sewer manholes, basements, etc.).

_____ a map of vapor monitoring locations.

Sampling instrument used: _____

Sampling method: _____

_____

NOTE: If vapor concentrations exceed 10 percent of the lower explosive limit, exit the building and contact the local fire department immediately. Then contact the MPCA spills unit at voice (612) 297-8610, TDD (612) 297-5353 or Greater Minnesota TDD 1-800-627-3529.

Vapor mitigation is required.

III. Recommendations

Use this space to detail any recommendations for modifying the current monitoring schedule:

Development of the property is proceeding and MW-1, MW-2, MW-3, and MW-5 will be in the parking and drive area of the future development. Based on the presented project results, and on behalf of the City of Minneapolis and the property owner, Delta requests that the MPCA allow MW-1 and MW-5 to be abandoned so development of the site can proceed without further delay. MW-3, MW-4, and MW-6 would continue to be monitored quarterly for the next two quarters as requested by the MPCA. If the BTEX concentrations continue to decrease and remain below the MPCA closure goals, Delta will recommend closure of the site.

A search for possible off site sources was conducted and the following sources were identified:

Hiawatha Dry Cleaners and Launderers located at 4228 and 4230 50th Street (1950's to present)
Dry Cleaning Plus located at 4307 50th Street (Listed in 1993 City Directory)
Transprint, Inc. located at 4226 50th Street (1980's to present)
Twin City Leather and Glove Cleaners located at 4226 50th Street (Listed in 1953 City Directory)
Shell Petroleum Corp located at 4750 Hiawatha Avenue (1930's to 1960's)

TABLE 1
GROUND WATER CHEMISTRY DATA
CITY OF MINNEAPOLIS
5000 HIAWATHA AVENUE
MINNEAPOLIS, MINNESOTA
DELTA NO. A092-333-1

WELL NO.: MW-1

DATE SAMPLED	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	GRO	DRO	LEAD	MTBE
11/10/92	2000	2100	2000	6400	30000	NA	<200	<5.0
04/19/93	1200	860	1800	7900	24000	NA	NA	NA
05/14/93	1200	120	1600	5000	NA	4200	NA	<130
04/06/94	830	44	1200	1500	11000	NA	NA	NA
07/28/94	280	42	700	800	5600	NA	NA	NA

WELL NO.: MW-2

DATE SAMPLED	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	GRO	DRO	LEAD	MTBE
11/10/92	28	91	72	240	2400	NA	<200	<1.0
04/19/93	0.41	<0.5	1.3	1.5	46	NA	NA	NA
05/14/93	0.85	<0.6	0.26	0.86	NA	NA	NA	<5.0
04/06/94	0.67	<0.5	<0.02	<0.08	<20	NA	NA	NA
07/28/94	NS	NS	NS	NS	NS	NS	NS	NS

WELL NO.: MW-3

DATE SAMPLED	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	GRO	DRO	LEAD	MTBE
11/10/92	250	69	1800	5200	29000	NA	<200	<5.0
04/19/93	39	6.5	160	260	10000	NA	NA	NA
05/14/93	83	38	250	330	NA	12000	NA	<63
04/06/94	<5.0	20	310	110	23000	NA	NA	NA
07/28/94	5.1	<13	130	310	6500	NA	NA	NA

WELL NO.: MW-4

DATE SAMPLED	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	GRO	DRO	LEAD	MTBE
11/10/92	NS	NS	NS	NS	NS	NS	NS	NS
04/19/93	<0.2	<0.5	0.38	<0.8	<20	<10	NA	<5.0
05/14/93	0.3	<0.6	0.16	<0.5	NA	NA	NA	<5.0
04/06/94	<0.2	<0.6	<0.2	<0.5	<20	NA	NA	<5.0
07/28/94	<0.2	<0.6	<0.2	<0.5	<20	NA	NA	<5.0

TABLE 1
(Page 2)

WELL NO.: MW-1

DATE SAMPLED	n-BUTYL BENZENE	sec-BUTYL BENZENE	tert-BUTYL BENZENE	ISOPROPYL BENZENE	p-ISOPROPYL-TOLUENE	METHYL ETHYL KETONE	METHYL ISOBUTYL KETONE	NAPHTHALEN
11/10/92	110	26	650	86	27	250	51	800
04/19/93	NA	NA	NA	NA	NA	NA	NA	NA
05/14/93	140	12	<2.5	54	7.1	<380	<250	470
04/06/94	NA	NA	NA	NA	NA	NA	NA	NA
07/28/94	NA	NA	NA	NA	NA	NA	NA	NA

WELL NO.: MW-2

DATE SAMPLED	n-BUTYL BENZENE	sec-BUTYL BENZENE	tert-BUTYL BENZENE	ISOPROPYL BENZENE	p-ISOPROPYL-TOLUENE	METHYL ETHYL KETONE	METHYL ISOBUTYL KETONE	NAPHTHALEN
11/10/92	47	6.5	96	7.5	8.4	<4.0	<2.0	8.4
04/19/93	NA	NA	NA	NA	NA	NA	NA	NA
05/14/93	<0.3	0.35	<0.1	0.17	<0.1	<15	<10	0.57
04/06/94	NA	NA	NA	NA	NA	NA	NA	NA
07/28/94	NS	NS	NS	NS	NS	NS	NS	NS

WELL NO.: MW-3

DATE SAMPLED	n-BUTYL BENZENE	sec-BUTYL BENZENE	tert-BUTYL BENZENE	ISOPROPYL BENZENE	p-ISOPROPYL-TOLUENE	METHYL ETHYL KETONE	METHYL ISOBUTYL KETONE	NAPHTHALEN
11/10/92	470	54	1100	160	23	26	59	930
04/19/93	NA	NA	NA	NA	NA	NA	NA	NA
05/14/93	830	370	<1.3	250	50	<190	<130	170
04/06/94	NA	NA	NA	NA	NA	NA	NA	NA
07/28/94	NA	NA	NA	NA	NA	NA	NA	NA

WELL NO.: MW-4

DATE SAMPLED	n-BUTYL BENZENE	sec-BUTYL BENZENE	tert-BUTYL BENZENE	ISOPROPYL BENZENE	p-ISOPROPYL-TOLUENE	METHYL ETHYL KETONE	METHYL ISOBUTYL KETONE	NAPHTHALEN
11/10/92	NS	NS	NS	NS	NS	NS	NS	NS
04/19/93	<0.09	<0.1	<0.1	<0.1	<0.1	<15	<10	<0.2
05/14/93	<0.3	<0.1	<0.1	<0.1	<0.1	<15	<10	0.23
04/06/94	<0.2	<0.2	<0.2	<0.2	<0.2	<15	<30	<0.4
07/28/94	<0.2	<0.2	<0.2	<0.2	<0.2	<15	<30	<0.2

TABLE 1
(Page 3)

WELL NO.: MW-1

DATE SAMPLED	n-PROPYL-BENZENE	TETRAHYDRO-FURAN	1,2,4-TRIMETHYL-BENZENE	1,3,5-TRIMETHYL-BENZENE	o-XYLENE STYRENE	TETRA-CHLOROETHENE	CHLORO-BENZENE	cis-1,2-DI CHLOROETHENE
11/10/92	190	510	1600	580	2600	<1.0	<1.0	<0.8
04/19/93	NA	NA	1300	400	NA	NA	NA	NA
05/14/93	140	<380	1300	420	420	<13	1.3	6.9
04/06/94	NA	NA	NA	NA	NA	NA	NA	NA
07/28/94	NA	NA	NA	NA	NA	NA	NA	NA

WELL NO.: MW-2

DATE SAMPLED	n-PROPYL-BENZENE	TETRAHYDRO-FURAN	1,2,4-TRIMETHYL-BENZENE	1,3,5-TRIMETHYL-BENZENE	o-XYLENE STYRENE	TETRA-CHLOROETHENE	CHLORO-BENZENE	cis-1,2-DI CHLOROETHENE
11/10/92	25	63	250	65	73	<0.2	<0.2	<0.16
04/19/93	NA	NA	1.1	<0.8	NA	NA	NA	NA
05/14/93	0.12	<15	0.54	0.31	0.58	<0.5	<0.05	<0.06
04/06/94	NA	NA	NA	NA	NA	NA	NA	NA
07/28/94	NS	NS	NS	NS	NS	NS	NS	NS

WELL NO.: MW-3

DATE SAMPLED	n-PROPYL-BENZENE	TETRAHYDRO-FURAN	1,2,4-TRIMETHYL-BENZENE	1,3,5-TRIMETHYL-BENZENE	o-XYLENE STYRENE	TETRA-CHLOROETHENE	CHLORO-BENZENE	cis-1,2-DI CHLOROETHENE
11/10/92	200	2200	2800	1000	1600	<1.0	<1.0	<0.8
04/19/93	NA	NA	960	280	NA	NA	NA	NA
05/14/93	380	<190	1400	610	110	<6.3	<0.63	4.3
04/06/94	NA	NA	NA	NA	NA	NA	NA	NA
07/28/94	NA	NA	NA	NA	NA	NA	NA	NA

WELL NO.: MW-4

DATE SAMPLED	n-PROPYL-BENZENE	TETRAHYDRO-FURAN	1,2,4-TRIMETHYL-BENZENE	1,3,5-TRIMETHYL-BENZENE	o-XYLENE STYRENE	TETRA-CHLOROETHENE	CHLORO-BENZENE	cis-1,2-DI CHLOROETHENE
11/10/92	NS	NS	NS	NS	NS	NS	NS	NS
04/19/93	<0.1	<15	<0.1	<0.1	<0.6	1.4	<0.05	<0.06
05/14/93	<0.1	<15	0.22	<0.2	0.14	1.5	<0.05	<0.06
04/06/94	<0.2	<15	<0.6	<0.2	<0.5	1.8	<0.2	<0.1
07/28/94	<0.2	<15	<0.6	<0.2	<0.5	2.1	<0.2	<0.1

TABLE 1
(Page 4)

WELL NO.: MW-5

DATE SAMPLED	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	GRO	DRO	LEAD	MTBE
11/10/92	NS	NS	NS	NS	NS	NS	NS	NS
04/19/93	0.35	0.55	0.34	1.1	<20	32*	NA	<5.0
05/14/93	0.47	<0.6	0.11	1.6	<20	3200	NA	<5.0
04/06/94	<0.2	<0.6	<0.2	<0.5	<20	NA	NA	<5.0
07/28/94	<0.2	<0.6	<0.2	<0.5	<20	NA	NA	<5.0

WELL NO.: MW-5 DUPLICATE

DATE SAMPLED	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	GRO	DRO	LEAD	MTBE
11/10/92	NS	NS	NS	NS	NS	NS	NS	NS
04/19/93	0.44	0.7	0.36	2.5	<20	270*	NA	<5.0
05/14/93	NS	NS	NS	NS	NS	NS	NS	NS
04/06/94	<0.2	<0.5	<0.3	<0.8	<20	NA	NA	NA
07/28/94	NS	NS	NS	NS	NS	NS	NS	NS

WELL NO.: MW-6

DATE SAMPLED	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	GRO	DRO	LEAD	MTBE
11/10/92	NS	NS	NS	NS	NS	NS	NS	NS
04/19/93	<0.2	<0.5	<0.2	<0.8	<20	<10	NA	<5.0
05/14/93	<0.2	<0.5	<0.2	<0.8	<20	NA	NA	NA
04/06/94	<0.2	<0.5	<0.2	<0.8	<20	NA	NA	NA
07/28/94	<0.2	<0.5	<0.2	<0.8	<20	NA	NA	NA

HRL's ug/l	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	GRO	DRO	LEAD	MTBE
	10	1000	700	10000	--	--	20	

TABLE 1
(Page 5)

WELL NO.: MW-5

DATE SAMPLED	n-BUTYL BENZENE	sec-BUTYL BENZENE	tert-BUTYL BENZENE	ISOPROPYL BENZENE	p-ISOPROPYL-TOLUENE	METHYL ETHYL KETONE	METHYL ISOBUTYL KETONE	NAPHTHALEN
11/10/92	NS	NS	NS	NS	NS	NS	NS	NS
04/19/93	<0.09	<0.1	<0.1	<0.1	<0.1	<15	<10	<0.2
05/14/93	0.85	0.15	<0.1	<0.1	<0.1	<15	<10	1.1
04/06/94	<0.2	<0.2	<0.2	<0.2	<0.2	<15	<30	<0.4
07/28/94	<0.2	<0.2	<0.2	<0.2	<0.2	<15	<30	<0.2

WELL NO.: MW-5 DUPLICATE

DATE SAMPLED	n-BUTYL BENZENE	sec-BUTYL BENZENE	tert-BUTYL BENZENE	ISOPROPYL BENZENE	p-ISOPROPYL-TOLUENE	METHYL ETHYL KETONE	METHYL ISOBUTYL KETONE	NAPHTHALEN
11/10/92	NS	NS	NS	NS	NS	NS	NS	NS
04/19/93	<0.09	<0.1	<0.1	<0.1	<0.1	<15	<10	<0.2
05/14/93	NS	NS	NS	NS	NS	NS	NS	NS
04/06/94	NA	NA	NA	NA	NA	NA	NA	NA
07/28/94	NS	NS	NS	NS	NS	NS	NS	NS

WELL NO.: MW-6

DATE SAMPLED	n-BUTYL BENZENE	sec-BUTYL BENZENE	tert-BUTYL BENZENE	ISOPROPYL BENZENE	p-ISOPROPYL-TOLUENE	METHYL ETHYL KETONE	METHYL ISOBUTYL KETONE	NAPHTHALEN
11/10/92	NS	NS	NS	NS	NS	NS	NS	NS
04/19/93	<0.09	<0.1	<0.1	<0.1	<0.1	<15	<10	<0.2
05/14/93	NA	NA	NA	NA	NA	NA	NA	NA
04/06/94	NA	NA	NA	NA	NA	NA	NA	NA
07/28/94	NA	NA	NA	NA	NA	NA	NA	NA

HRL's ug/l	n-BUTYL BENZENE	sec-BUTYL BENZENE	tert-BUTYL BENZENE	ISOPROPYL BENZENE	p-ISOPROPYL-TOLUENE	METHYL ETHYL KETONE	METHYL ISOBUTYL KETONE	NAPHTHALEN
				300		300	300	30

TABLE 1

(Page 6)

WELL NO.: MW-5

DATE SAMPLED	n-PROPYL-BENZENE	TETRAHYDRO-FURAN	1,2,4-TRIMETHYL-BENZENE	1,3,5-TRIMETHYL-BENZENE	o-XYLENE STYRENE	TETRA-CHLOROETHENE	CHLORO-BENZENE	cis-1,2-DI CHLOROETHENE
11/10/92	NS	NS	NS	NS	NS	NS	NS	NS
04/19/93	<0.1	<15	0.54	<0.1	<0.6	<0.5	<0.05	<0.06
05/14/93	<0.1	<15	2.2	0.62	1.2	1.8	<0.05	<0.06
04/06/94	<0.2	<15	<0.6	<0.2	<0.5	<0.5	<0.2	<0.1
07/28/94	<0.2	<15	<0.6	<0.2	<0.5	<0.5	<0.2	<0.1

WELL NO.: MW-5 DUPLICATE

DATE SAMPLED	n-PROPYL-BENZENE	TETRAHYDRO-FURAN	1,2,4-TRIMETHYL-BENZENE	1,3,5-TRIMETHYL-BENZENE	o-XYLENE STYRENE	TETRA-CHLOROETHENE	CHLORO-BENZENE	cis-1,2-DI CHLOROETHENE
11/10/92	NS	NS	NS	NS	NS	NS	NS	NS
04/19/93	<0.1	<15	1.1	<0.1	0.95	<0.5	<0.5	<0.6
05/14/93	NS	NS	NS	NS	NS	NS	NS	NS
04/06/94	NA	NA	NA	NA	NA	NA	NA	NA
07/28/94	NS	NS	NS	NS	NS	NS	NS	NS

WELL NO.: MW-6

DATE SAMPLED	n-PROPYL-BENZENE	TETRAHYDRO-FURAN	1,2,4-TRIMETHYL-BENZENE	1,3,5-TRIMETHYL-BENZENE	o-XYLENE STYRENE	TETRA-CHLOROETHENE	CHLORO-BENZENE	cis-1,2-DI CHLOROETHENE
11/10/92	NS	NS	NS	NS	NS	NS	NS	NS
04/19/93	<0.1	<15	<0.1	<0.1	<0.6	<0.5	<0.5	<0.6
05/14/93	NA	NA	NA	NA	NA	NA	NA	NA
04/06/94	NA	NA	NA	NA	NA	NA	NA	NA
07/28/94	NA	NA	NA	NA	NA	NA	NA	NA

HRL's ug/l	n-PROPYL-BENZENE	TETRAHYDRO-FURAN	1,2,4-TRIMETHYL-BENZENE	1,3,5-TRIMETHYL-BENZENE	o-XYLENE STYRENE	TETRA-CHLOROETHENE	CHLORO-BENZENE	cis-1,2-DI CHLOROETHENE
		100			10000/10	7.0 (?)	100	70

RESULTS ARE PRESENTED IN MICROGRAMS PER LITER (ug/L)

NA - NOT ANALYZED FOR THIS PARAMETER

NS - WELL DID NOT EXIST AT THIS DATE OR THERE WAS INSUFFICIENT WATER TO SAMPLE

GRO - GASOLINE RANGE ORGANICS

DRO - DIESEL RANGE ORGANICS

MTBE - METHYL TERT-BUTYL EHTER

HRL - MINNESOTA DEPARTMENT OF HEALTH, HEALTH RISK LIMITS

Horizon
Laboratories, Inc.

5155 East River Road, Suite #416 Minneapolis, MN. 55421 Tel. (612) 572-0425 Fax (612) 572-0441

LABORATORY REPORT

Client:	Delta Environmental Consultants, Inc 3900 Northwoods Drive, Suite 200 St. Paul, MN 55112 Attn: Gary Schroeher	Date Sampled: Date Received: Date Analyzed: Physical State:	07/28/94 07/29/94 08/01/94 - 08/02/94 Aqueous
Project:	5000 Hiawatha St. Paul, MN	Report Date: Lab P.N.: Client P.N.:	08/03/94 1000-53.7 A092-333

RECEIVED
AUG 09 1994
MPCA, HAZARDOUS WASTE DIVISION

Quality Assurance / Quality Control Summary

Parameter: (Method)	QC Type	Percent Recovery	Acceptable Range	Percent Reproducibility	Acceptable Range
MtBE (MDH 465D)	M	97	120 - 80	100	120 - 80
Benzene (MDH 465D)	M	92	120 - 80	100	120 - 80
Toluene (MDH 465D)	M	89	120 - 80	100	120 - 80
Ethylbenzene (MDH 465D)	M	88	120 - 80	100	120 - 80
m,p-Xylenes (MDH 465D)	M	88	120 - 80	100	120 - 80
o-Xylene (MDH 465D)	M	90	120 - 80	101	120 - 80
Dibromomethane (MDH 465D)	M	109	120 - 80	96	120 - 80
4-Chlorotoluene (MDH 465D)	M	101	120 - 80	108	120 - 80
GRO (Wis. DNR)	M	93	117 - 85	110	115 - 84

M = Matrix Spike / Matrix Spike Duplicate L = Laboratory Control Sample

Reviewed Approved

Compounds were identified by column retention time and quantified by peak area to those of known standards using a Hewlett Packard ChemStation data system. The samples were received by HORIZON LABORATORIES, INC. and accompanied by the Chain-of-Custody Record. The Laboratory Report is the sole property of the client to whom it is addressed. The Laboratory Results are only a part of the Laboratory Report.

Horizon
Laboratories, Inc.

5155 East River Road, Suite #416 *Minneapolis, MN. 55421* *Tel. (612) 572-0425* *Fax (612) 572-0441*

LABORATORY RESULTS

Client: Delta Environmental Consultants, Inc
3900 Northwoods Drive, Suite 200
St. Paul, MN 55112
Attn: Gary Schroeher

Project: 5000 Hiawatha
St. Paul, MN

Date Sampled: 07/28/94
Date Analyzed: 08/01/94
Physical State: Aqueous

Report Date: 08/03/94
Lab P.N.: 1000-53.7
Client P.N.: A092-333

Sample I.D.	Benzene µg/l EPA 8020	Toluene µg/l EPA 8020	Ethyl-benzene µg/l EPA 8020	Total, Xylenes µg/l EPA 8020	GRO µg/l Wis. DNR
MW-1	280	42	700	800	5,600
MW-3	5.1	< 13	130	310	6,500
MW-4	---	---	---	---	< 20
MW-5	---	---	---	---	< 20
MW-6	< 0.20	< 0.50	< 0.20	< 0.80	< 20
MDL, µg/l	0.20	0.50	0.20	0.80	20

---: See MDH 465D results.

MDL: Method Detection Limit for undiluted samples.

GRO: Gasoline Range Organics

All results are in µg/l which is equal to parts-per-billion (ppb).

The Laboratory Results are only a part of the Laboratory Report.

Horizon
Laboratories, Inc.

5155 East River Road, Suite #416 Minneapolis, MN. 55421 Tel. (612) 572-0425 Fax (612) 572-0441

LABORATORY RESULTS

Client:	Delta Environmental Consultants, Inc 3900 Northwoods Drive, Suite 200 St. Paul, MN 55112 Attn: Gary Schroeher	Date Sampled: Date Analyzed: Physical State:	07/28/94 08/01/94 - 08/02/94 Aqueous
Project:	5000 Hiawatha St. Paul, MN	Report Date: Lab P.N.: Client P.N.:	08/03/94 1000-53.7 A092-333

MDH 465D

Sample I.D.	MW-4	MW-5	MDL
Parameter	µg/l	µg/l	µg/l
Acetone	<30	<30	30
Allyl Chloride	<0.8	<0.8	0.8
Benzene	<0.2	<0.2	0.2
Bromobenzene	<0.4	<0.4	0.4
Bromochloromethane	<0.5	<0.5	0.5
Bromodichloromethane	<0.6	<0.6	0.6
Bromoform	<0.2	<0.2	0.2
Bromomethane	<0.9	<0.9	0.9
n-Butylbenzene	<0.2	<0.2	0.2
sec-Butylbenzene	<0.2	<0.2	0.2
tert-Butylbenzene	<0.2	<0.2	0.2
Carbon Tetrachloride	<0.5	<0.5	0.5
Chlorobenzene	<0.2	<0.2	0.2
Chloroethane	<10	<10	10
Chloroform	<0.5	<0.5	0.5
Chloromethane	<10	<10	10
2-Chlorotoluene	<0.3	<0.3	0.3
4-Chlorotoluene	<0.7	<0.7	0.7
Dibromochloromethane	<0.4	<0.4	0.4
1,2-Dibromo-3-Chloropropane	<0.3	<0.3	0.3
1,2-Dibromoethane	<0.6	<0.6	0.6
Dibromomethane	<0.9	<0.9	0.9
1,2-Dichlorobenzene	<0.4	<0.4	0.4
1,3-Dichlorobenzene	<0.3	<0.3	0.3
1,4-Dichlorobenzene	<0.5	<0.5	0.5
Dichlorodifluoromethane	<6.0	<6.0	6.0
1,1-Dichloroethane	<0.4	<0.4	0.4
1,2-Dichloroethane	<1.1	<1.1	1.1
1,1-Dichloroethene	<1.2	<1.2	1.2
cis-1,2-Dichloroethene	<0.1	<0.1	0.1
trans-1,2-Dichloroethene	<0.5	<0.5	0.5
Dichlorofluoromethane	<20	<20	20
1,2-Dichloropropane	<0.5	<0.5	0.5
1,3-Dichloropropane	<0.4	<0.4	0.4

MDL; Method Detection Limit
All results are in µg/l which is equal to parts-per-billion (ppb).
The Laboratory Results are only a part of the Laboratory Report.

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LABORATORY RESULTS

Client: Delta Environmental Consultants, Inc
3900 Northwoods Drive, Suite 200
St. Paul, MN 55112
Attn: Gary Schroeher

Project: 5000 Hiawatha
St. Paul, MN

Date Sampled: 07/28/94
Date Analyzed: 08/01/94 - 08/02/94
Physical State: Aqueous

Report Date: 08/03/94
Lab P.N.: 1000-53.7
Client P.N.: A092-333

MDH 465D

Sample I.D.	MW-4	MW-5	MDL
Parameter	µg/l	µg/l	µg/l
*2,2-Dichloropropane	<0.7	<0.7	0.7
1,1-Dichloropropene	<0.5	<0.5	0.5
cis-1,3-Dichloropropene	<0.5	<0.5	0.5
trans-1,3-Dichloropropene	<0.3	<0.3	0.3
Ethyl Benzene	<0.2	<0.2	0.2
Ethyl Ether	<5.0	<5.0	5.0
Hexachlorobutadiene	<0.6	<0.6	0.6
Isopropyl Benzene	<0.2	<0.2	0.2
p-Isopropyltoluene	<0.2	<0.2	0.2
Methyl Ethyl Ketone	<15	<15	15
Methyl Isobutyl Ketone	<30	<30	30
Methyl tert-Butyl Ether	<5.0	<5.0	5.0
Methylene Chloride	<0.4	<0.4	0.4
Naphthalene	<0.2	<0.2	0.2
*n-Propylbenzene	<0.2	<0.2	0.2
o-Xylene	<0.3	<0.3	0.3
Styrene	<0.5	<0.5	0.5
1,1,1,2-Tetrachloroethane	<0.6	<0.6	0.6
1,1,2,2-Tetrachloroethane	<0.4	<0.4	0.4
Tetrachloroethene	2.1	<0.5	0.5
Tetrahydrofuran	<15	<15	15
Toluene	<0.6	<0.6	0.6
1,2,3-Trichlorobenzene	<1.0	<1.0	1.0
1,2,4-Trichlorobenzene	<0.3	<0.3	0.3
1,1,1-Trichloroethane	<1.0	<1.0	1.0
1,1,2-Trichloroethane	<0.4	<0.4	0.4
Trichloroethene	<0.6	<0.6	0.6
Trichlorofluoromethane	<5.0	<5.0	5.0
1,2,3-Trichloropropane	<0.4	<0.4	0.4
1,1,2-Trichlorotrifluoroethane	<0.8	<0.8	0.8
1,2,4-Trimethylbenzene	<0.6	<0.6	0.6
*1,3,5-Trimethylbenzene	<0.2	<0.2	0.2
Vinyl Chloride	<5.0	<5.0	5.0
m,p-Xylenes	<0.5	<0.5	0.5

*: coeluting compounds
MDL: Method Detection Limit
All results are in µg/l which is equal to parts-per-billion (ppb).
The Laboratory Results are only a part of the Laboratory Report.

CHAIN–OF–CUSTODY RECORD

Delta
Environmental
Consultants, Inc.
3900 Northwoods Dr., Suite 200
St. Paul, MN 55112

DELTA PROJECT NO. A092-333 INVOICE CODE

PROJECT MANAGER Gary Schroeher

PROJECT NAME 5000 Hiawatha

PROJECT LOCATION St. Paul

SAMPLER'S SIGNATURE Dean Krebs

PAGE OF

TURN AROUND REQUESTED:
- [x] NORMAL
- [ ] RUSH
- [ ] OTHER

LAB NAME Horizon

LAB USE ONLY

LABORATORY PROJECT NO. 1000-53.7

SAMPLE CONDITION AS RECEIVED: ON ICE
CHILLED YES/NO
SEALED YES/NO

SAMPLE ID	SAMPLE LOCATION/DESCRIPTION	DATE/TIME SAMPLED	SAMPLE MATRIX: SOIL(S): AIR(A): BULK(B): AQUEOUS(Q): SLUDGE(L): OTHER(O)	ANALYSIS REQUESTED: BTEX	GRO	MDH 465D				NUMBER OF CONTAINERS	ACCEPT (A) REJECT (R)	SAMPLE CONDITION/ COMMENTS	LABORATORY SAMPLE NUMBE
MW-1	2" MW-1	1610 7/28/94	Q	✓	✓					3			10064
MW-3	2" MW-3	1540 7/28/94	Q	✓	✓					3			10065
MW-4	2" MW-4	1510 7/28/94	Q		✓	✓				3			10066
MW-5	2" MW-5	1600 7/28/94	Q		✓	✓				3			10067
MW-6	2" MW-6	1630 7/28/94	Q	✓	✓					3			10068

GENERAL COMMENTS: Please Send RESULTS TO Gary Schroeher

15 ◀ TOTAL NUMBER OF CONTAINERS

1 RELINQUISHED BY (SIGNATURE) Dean Krebs	DATE 7/29/94	3 RELINQUISHED BY (SIGNATURE)	DATE	5 RELINQUISHED BY (SIGNATURE)	DATE
COMPANY Delta	TIME 1400	COMPANY	TIME	COMPANY	TIME
2 RECEIVED BY (SIGNATURE) Bruce Novotny	DATE 7/29	4 RECEIVED BY (SIGNATURE)	DATE	6 RECEIVED BY (SIGNATURE)	DATE
COMPANY Horizon	TIME 5:00	COMPANY	TIME	COMPANY	TIME

Original - Return with Report • Yellow - Lab Copy • Pink - Sampler Copy

TABLE 2
WATER TABLE ELEVATION
CITY OF MINNEAPOLIS
5000 HIAWATHA AVENUE
MINNEAPOLIS, MINNESOTA
DELTA NO. A092-333-1

WELL NO.: MW-1

DATE MEASURED	DEPTH TO WATER	GROUND WATER ELEVATION	PRODUCT THICKNESS
11/10/92	16.80	802.79	
02/10/93	17.27	802.32	
04/05/93	17.23	802.36	
04/19/93	17.10	802.49	
05/11/93	17.05	802.54	
05/14/93	16.98	802.61	
04/06/94	17.21	802.38	
07/28/94	18.30	801.29	

WELL NO.: MW-2

DATE MEASURED	DEPTH TO WATER	GROUND WATER ELEVATION	PRODUCT THICKNESS
11/10/92	17.09	802.82	
02/10/93	17.58	802.33	
04/05/93	17.55	802.36	
04/19/93	17.42	802.49	
05/11/93	17.38	802.53	
05/14/93	17.30	802.61	
04/06/94	17.53	802.38	
07/28/94	18.54	801.37	

WELL NO.: MW-3

DATE MEASURED	DEPTH TO WATER	GROUND WATER ELEVATION	PRODUCT THICKNESS
11/10/92	17.89	802.80	
02/10/93	18.35	802.34	
04/05/93	18.31	802.38	
04/19/93	18.18	802.51	
05/11/93	18.14	802.55	
05/14/93	18.07	802.62	
04/06/94	18.26	802.43	
07/28/94	19.37	801.32	

TABLE 2 (Page 2)

WELL NO.: MW-4

DATE MEASURED	DEPTH TO WATER	GROUND WATER ELEVATION	PRODUCT THICKNESS
11/10/92	NA		
02/10/93	NA		
04/05/93	24.76	802.32	
04/19/93	24.56	802.52	
05/11/93	24.50	802.58	
05/14/93	24.46	802.62	
04/06/94	24.68	802.40	
07/28/94	25.77	801.31	

WELL NO.: MW-5

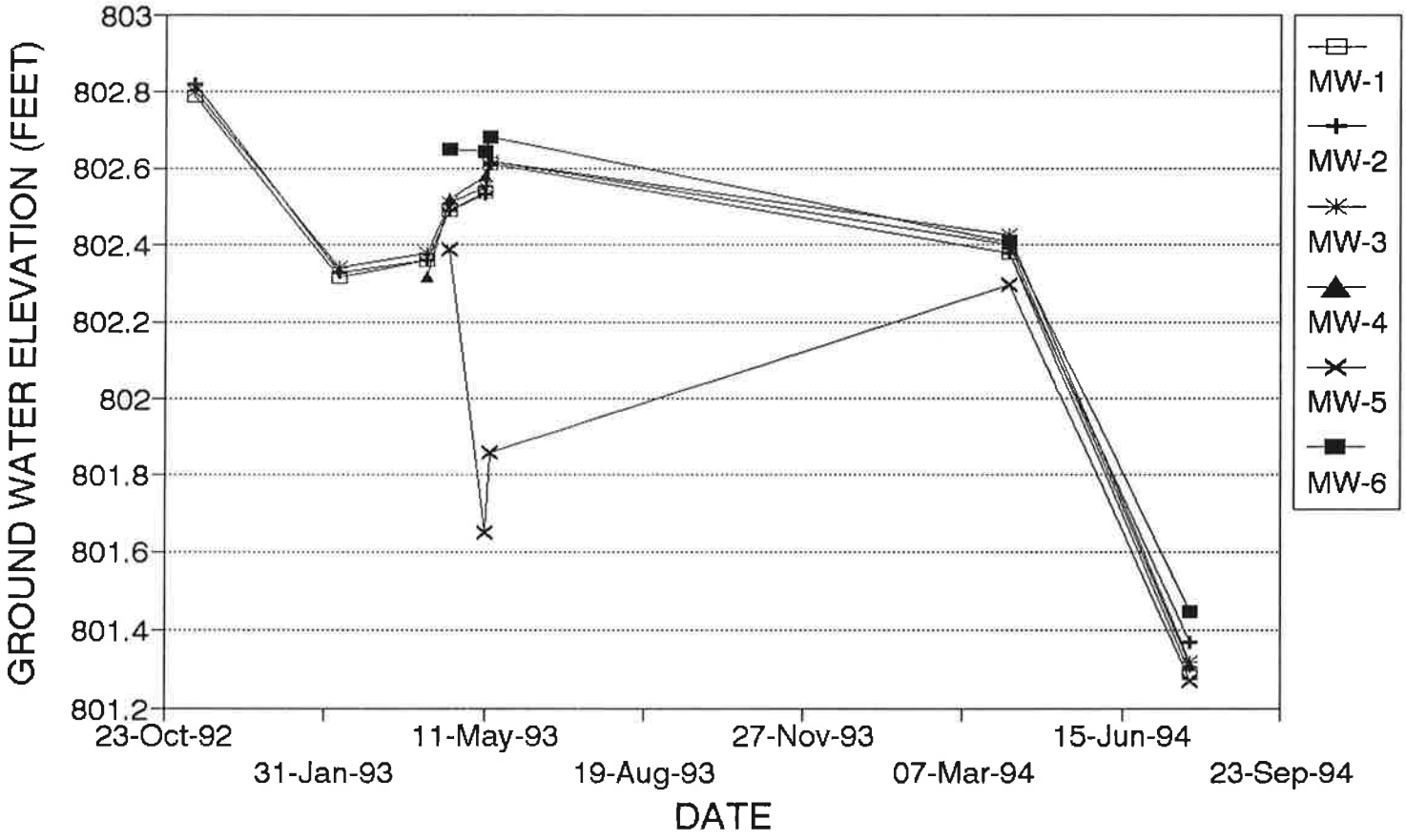
DATE MEASURED	DEPTH TO WATER	GROUND WATER ELEVATION	PRODUCT THICKNESS
11/10/92	NA		
02/10/93	NA		
04/05/93	NA		
04/19/93	16.83	802.39	
05/11/93	17.57	801.65	
05/14/93	17.36	801.86	
04/06/94	16.92	802.30	
07/28/94	17.95	801.27	

WELL NO.: MW-6

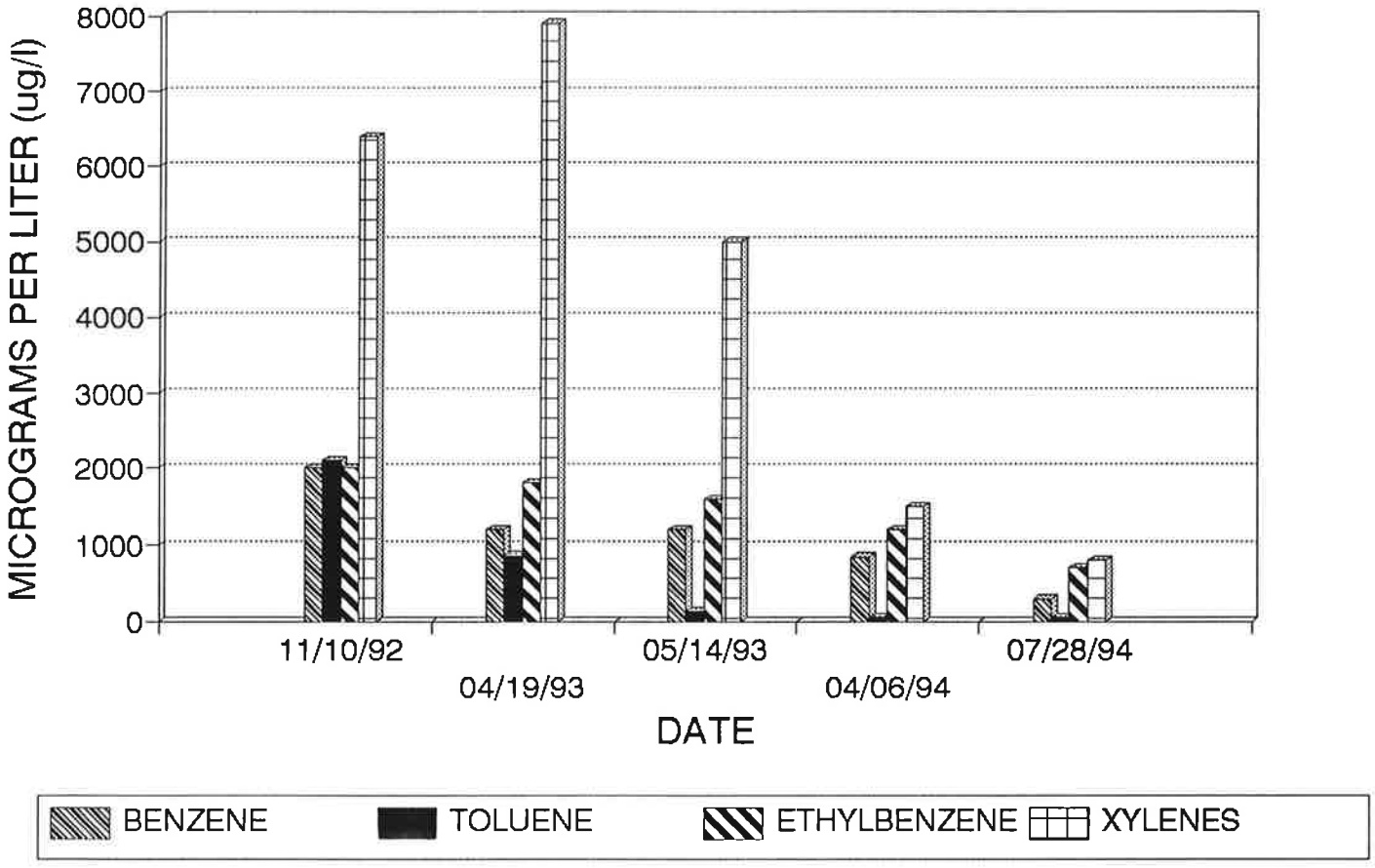
DATE MEASURED	DEPTH TO WATER	GROUND WATER ELEVATION	PRODUCT THICKNESS
11/10/92	NA		
02/10/93	NA		
04/05/93	NA		
04/19/93	13.75	802.65	
05/11/93	13.76	802.64	
05/14/93	13.72	802.68	
04/06/94	13.99	802.41	
07/28/94	14.95	801.45	

HYDROGRAPH

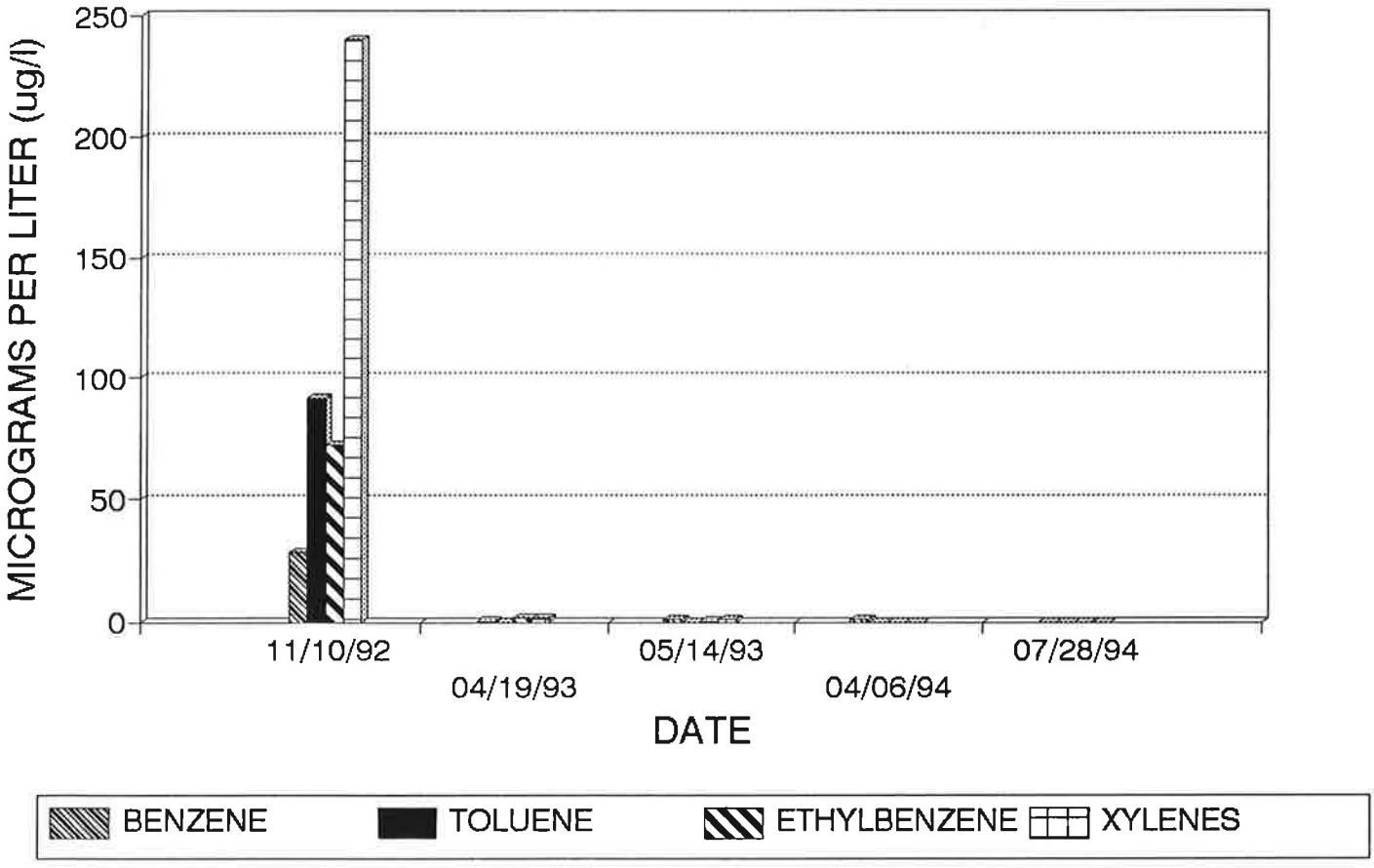
5000 HIAWATHA AVENUE, MINNEAPOLIS, MN



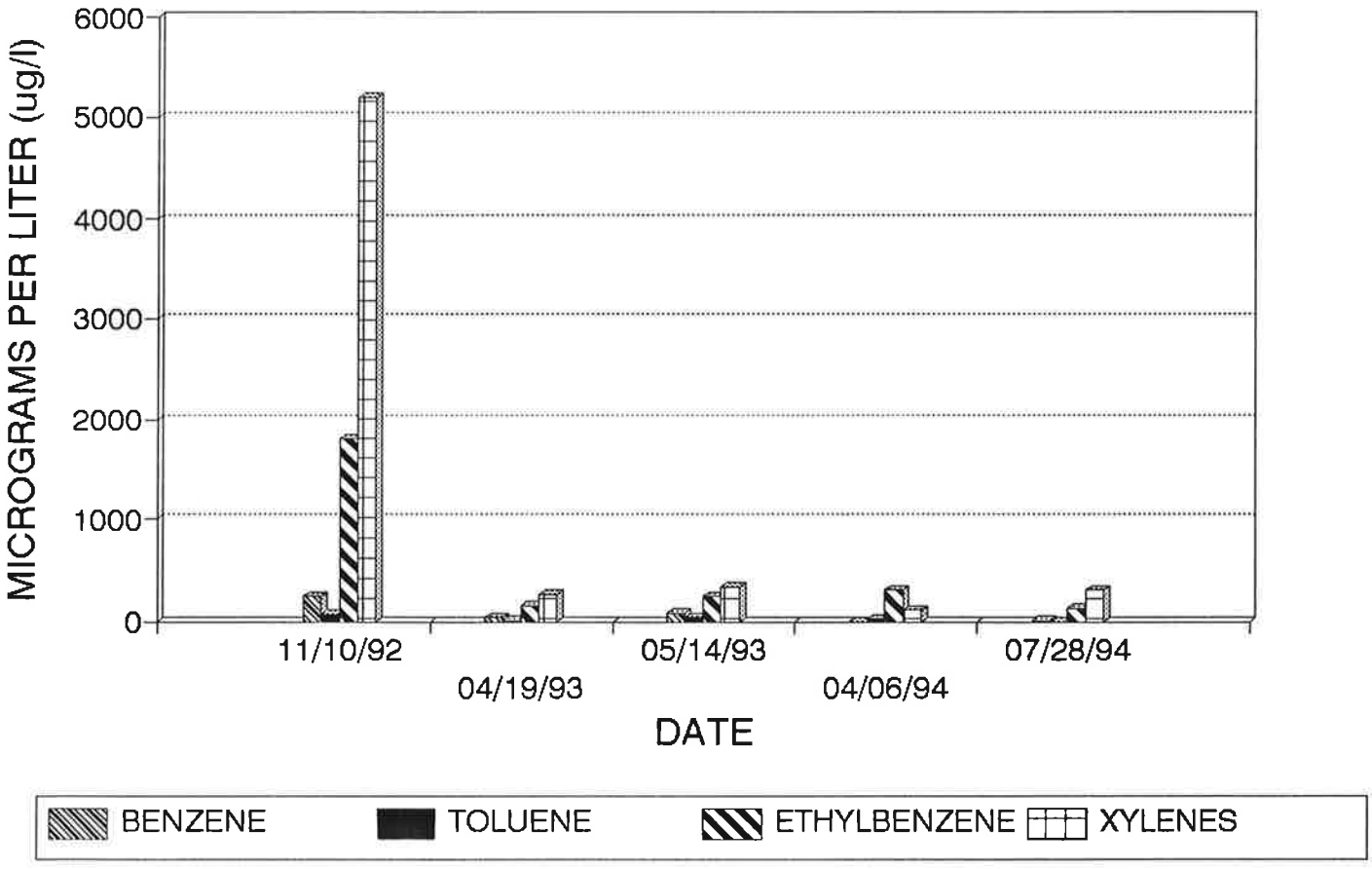
MW-1 BTEX CONCENTRATIONS HISTOGRAM
5000 HIAWATHA AVE, MINNEAPOLIS, MN



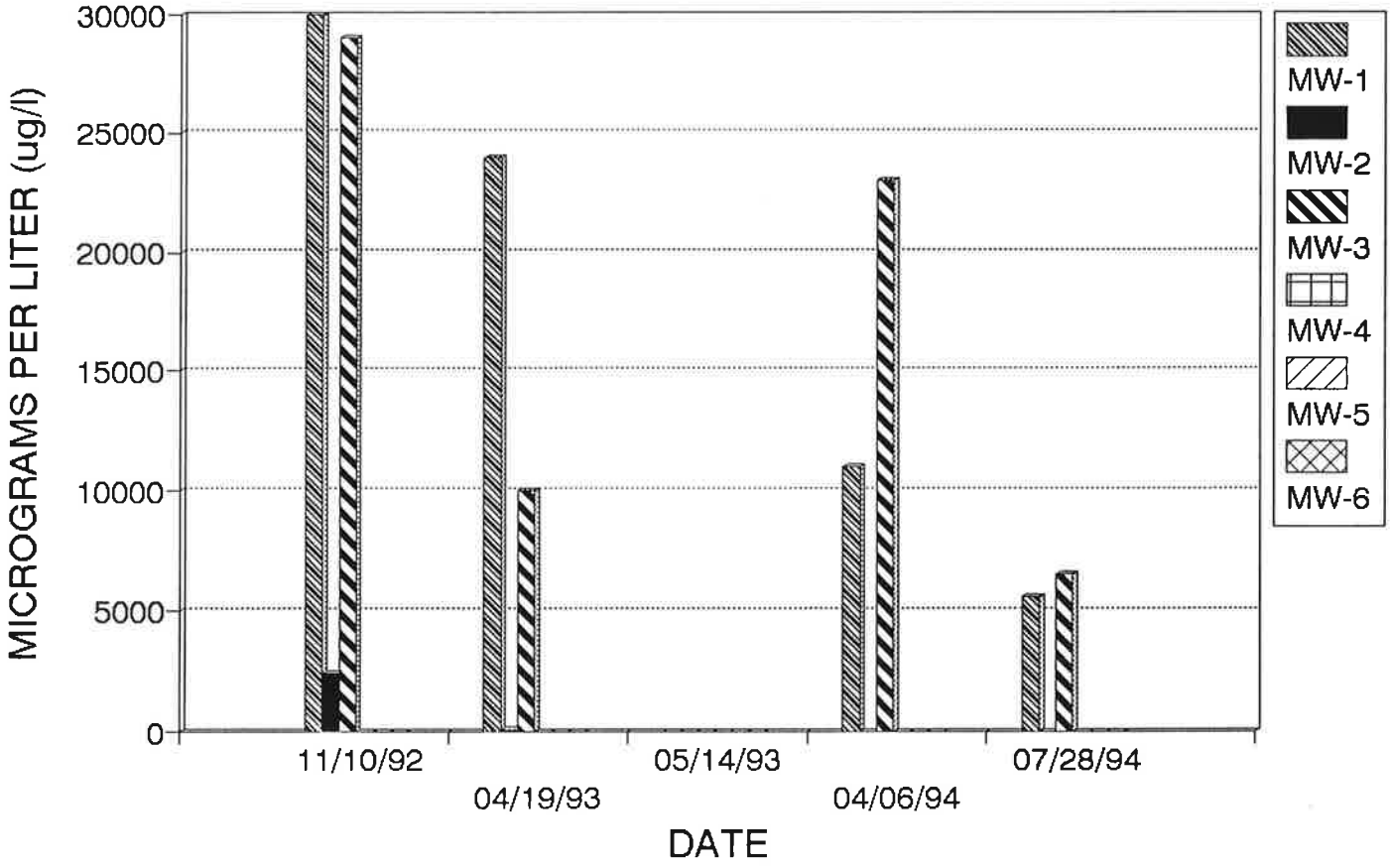
MW-2 BTEX CONCENTRATIONS HISTOGRAM
5000 HIAWATHA AVE, MINNEAPOLIS, MN



MW-3 BTEX CONCENTRATIONS HISTOGRAM
5000 HIAWATHA AVE, MINNEAPOLIS, MN



GRO CONCENTRATIONS HISTOGRAM
5000 HIAWATHA AVE, MINNEAPOLIS, MN



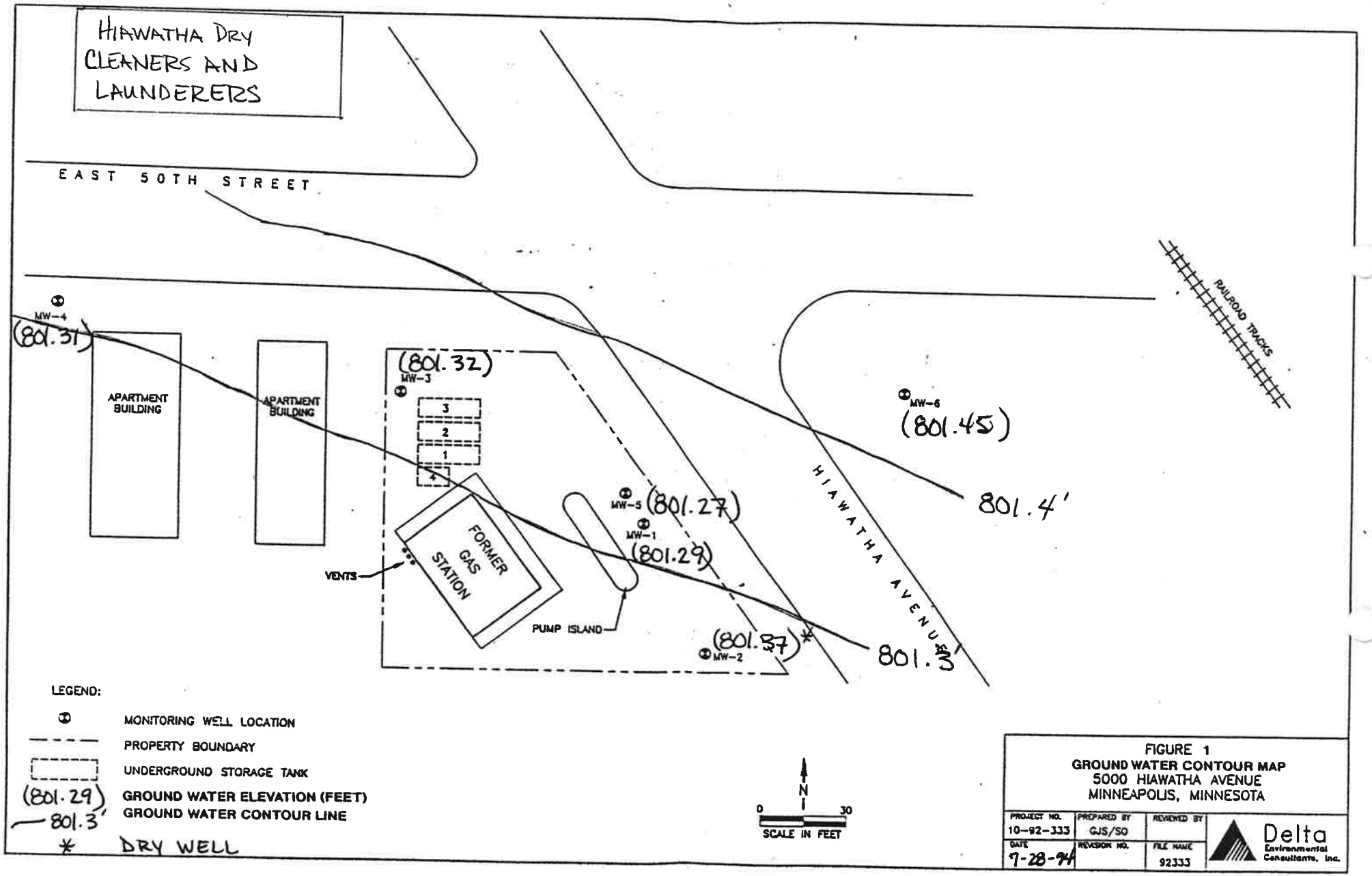


FIGURE 1
GROUND WATER CONTOUR MAP
5000 HIAWATHA AVENUE
MINNEAPOLIS, MINNESOTA

PROJECT NO.	PREPARED BY	REVIEWED BY
10-92-333	GJS/SO	
DATE	REVISION NO.	FILE NAME
9-28-94		92333

Delta Environmental Consultants, Inc.