GME CONSULTANTS, INC.
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November 4, 1994

Mr. Mark Koplitz
Minnesota Pollution Control Agency
Hazardous Waste Division
Tanks and Spills Section
520 Lafayette Road North
St. Paul, Minnesota 55155

GME Project No. C-2373-B

RE: Remedial Investigation (RI) Progress Report and Proposed Corrective Action Design (CAD) for the Dittmer Oil Company property located at the intersection of Highways 4 and 19 in Fairfax, Minnesota (MPCA Leaksite #1940)

Dear Mr. Koplitz:

We are writing on behalf of Mr. Robert Dittmer to provide you with this report. It summarizes information obtained since our August 19, 1993 Project Status Report, partly in response to the November 1, 1993 MPCA letter.

We have attached the following items to this letter (they are listed in their order of attachment):

* Regional and site diagrams showing the locations of monitoring wells and nearby private water supply wells;

* Groundwater table contour maps;

* Tables showing well construction, groundwater elevations, soil vapor results for well MW9, soil chemistry results, and water chemistry results;

* Permeability data and grain-size analysis results;

* Soil boring log and monitoring well construction details for well MW9;

* Additional groundwater receptor survey information (well logs); and,

* Recent analytical laboratory reports.

BACKGROUND

The site is located at the southeast corner of the intersection of Highways 4 and 19 in the City of Fairfax, Minnesota (Figures 1, 2 and 3).

In a letter dated November 1, 1993 you generally requested additional groundwater receptor survey information, and the installation of a monitoring well near the location of borings B6 or B7, and a pumping test on the Co-op well. Since receiving that letter, we have completed your requested work and have conducted additional groundwater sampling of the Co-op well and our monitoring wells. This report details our activities and findings since receiving your November 1, 1993 letter.

Please review our March 28, 1990 Gasoline Discharge Remediation Report and our August 19, 1993 Project Status Report (called "1993 Report" hereafter) for background information and for previous data collected at the site.

ADDITIONAL RI RESULTS

Monitoring Well MW9 Installation

On May 11, 1994, we installed groundwater table monitoring well MW9 (Figure 4). Monitoring well MW9 was installed to monitor the possible migration of the petroleum impacts to the south of the site and as a water level measurement point near the Co-op well for the pumping test. Monitoring well MW9 is located approximately 25 feet west of the Co-op water supply well. We were unable to place well MW9 near borings B6 and B7, due to logistical constraints (a corn storage area near B6 and B7 precluded placement of a permanent well there).

Additional Geologic Information

Well MW9 was installed to a depth of 12 feet below grade. We encountered a silty clay with trace to little sand and many mottled fractures from the ground surface to the end of boring. This is consistent with what has been found in the upper stratigraphic layer over the entire site.

Earlier in the study, we encountered three general stratigraphic units in our borings. They consist of: a light gray to light brown silty clay with trace to little sand and many fractures to approximately 8 to 14 feet below grade; a brown to dark brown silty clay with little sand and some fractures to a maximum of

approximately 16 feet below grade; and, a dark gray non-fractured silty clay with trace to little sand and trace gravel to the final extent of our exploration at approximately 40 feet below grade. There also were sand seams identified in several of the borings; the thickest sand layers were encountered in the gray clay at approximately 20 to 30 feet below grade in boring B8. The well log for the Co-op well indicates that the area is underlain by approximately 178 feet of clay; the well is completed in a sand layer below that depth.

In August of 1993, we collected several soil samples from our borings for grain-size analyses and several soil samples (with a Shelby tube) for permeability tests. The tests were not yet completed when we wrote our 1993 Report. These test results are attached to this letter.

Grain-size analyses of soil samples from the two upper stratigraphic layers encountered in boring B14 showed that the uppermost layer is a sandy clay with silt and the underlying layer is a silty clayey fine sand. A sample collected from 33 to 39 feet in boring B19 (the third layer) was classified as a sandy clay with silt, based on a grain size analysis.

Flexible-wall constant head permeability tests were conducted on 3 soil samples collected with Shelby tubes. These tests generally measure the vertical hydraulic conductivity component. Two soil samples were collected from boring B8 (6-8 feet and 11-13 feet) and one soil sample was collected from boring B21 (9-11 feet). The results ranged from 0.0004 feet/day to 0.002 feet/day. This range of values indicates that the samples have a relatively low permeability, as would be expected for clayey soils, and indicates that the fractures observed in the upper two layers may <u>not</u> significantly increase the <u>vertical</u> hydraulic conductivity. This is in contrast to our higher than anticipated average lateral hydraulic conductivity measurement of 0.022 feet/minute reported in our 1993 Report; the fractures apparently play a larger role in increasing the <u>lateral</u> hydraulic conductivity.

<u>Co-op Well Pumping Test and Groundwater Sampling</u>

On May 17, 1994, our Geological Engineer and Environmental Specialist mobilized to the site to collect groundwater samples and conduct a pumping test on the Co-op well. On the evening of May 17, we measured the water levels in all of our wells and we collected groundwater samples from all of our wells with the exception of deep monitoring well MW8 (this well was not sampled until after the pumping test, due to its very slow recharge). During the morning and afternoon of May 18, 1994, we monitored the

water levels in all of our monitoring wells to determine if they had recovered (stabilized) from our groundwater sampling event and to determine initial water levels just prior to the start of our pumping test. Slight fluctuations in water levels measured during the evening of May 17 and the day of May 18, both increases and decreases, were generally noted in all of the wells. These natural fluctuations were on the order of several hundredths of a foot.

At 8 p.m. on May 18, we began the pumping test. The Co-op well was pumped at its maximum discharge (approximately 6.6 gallons per minute) continuously for 16 hours. During this time, our Geological Engineer and Environmental Specialist monitored the water levels in the Co-op well and in our nine monitoring wells. After the start of the pumping test, we generally measured the water levels in well MW9 and the Co-op well approximately every five minutes for the first two hours; every hour for the next two hours; and, every few hours thereafter for the duration of the test. We measured the water levels in the other eight monitoring wells on a similar schedule, except that water levels were only measured every ten minutes during the first hour and every thirty minutes during the second hour. Also, we collected a water sample from the Co-op well for laboratory analysis approximately 1/2 hour into the pumping test. The water pumped from the Co-op well was discharged onto the ground surface approximately 200 feet west-southwest of the well, where its drainage course then followed a culvert to the west under Highway 4.

Water level measurements from the monitoring wells over the course of the pumping test indicated that the shallow groundwater table is not significantly affected by pumping of the Co-op well. Although there were slight water level fluctuations in the monitoring wells over the course of the pumping test, they were on the order of the natural fluctuations we had observed prior to conducting the pumping test, including in nearby well MW9. The water level in the Co-op well was depressed a maximum of approximately 10 feet during the pumping test.

Just prior to the end of the pumping test, we collected another water sample from the Co-op well. We also re-sampled wells MW4, MW6, MW8 and MW9 after completion of the pumping test on May 19, 1994. On June 17, 1994, our Geological Engineer again sampled wells MW4, MW8, MW9 and the Co-op well.

Additional Hydrogeologic Information

Table 1 summarizes construction details for monitoring wells at the site. Table 2 summarizes nine rounds of water level measurements. These measurements generally indicate that the shallow groundwater

flow under the site is to the south and southeast. Approximate shallow groundwater flow maps for our May 17 and June 17, 1994 data are shown as Figures 4 and 5.

As noted in our 1993 Report, the extremely slow recharge in well MW8 (screened at 35 to 40 feet) made it difficult to determine if water levels in that well were stabilized. The May 17, 1994 measurement likely represents a stabilized water level as the well had not been sampled for approximately 9 months. This elevation of 89.23 feet was approximately 3.3 feet lower than the water level elevation in the adjacent ("nested") groundwater table well MW4 on that date. This indicates that a downward groundwater gradient exists at that location. This downward gradient appears to be further confirmed by the water level elevation (53.29 feet site datum) in the Co-op well (screened at 179 to 192 feet).

Additional Soil Chemistry Information

Table 3 shows our headspace measurements for soil samples from boring MW9. All headspace readings were 0 ppm. Table 4 summarizes soil chemistry results for soil samples collected from all of our borings.

Historical and Recent Groundwater Chemistry Data

Groundwater chemistry results are summarized in Table 5. As indicated in our 1993 Report, very low concentrations of benzene, toluene, MTBE and dissolved lead were detected just above the laboratory method detection limits in the water sample collected from deep monitoring well MW8 on August 5, 1993. This sample had been collected only approximately one day after the well had been installed and it was unknown if these detections were the result of slight cross-contamination when installing that well. We had collected another sample from well MW8 on August 18, 1993, but at the time we submitted the 1993 Report we had not yet received the laboratory results. The results for the August 18, 1993, and May 19 and June 17, 1994 sampling events for well MW8 all showed no detections with the exception of a slight detection of lead in the August 18, 1993 sample.

Therefore, the initial petroleum parameter detections in soil and groundwater samples collected from boring/well MW8 appear to be the result of slight cross-contamination likely due to some leakage of contaminated groundwater from within the fractured clays near the water table into the borehole while drilling.

Groundwater table well MW9, installed on May 11, 1994, was sampled on May 17 (prior to the pumping test), on May 19 (just after the pumping test) and on June 17, 1994. The results for the sample collected prior to the pumping test indicate no detections, whereas the results for the sample collected just after the pumping test show small detections of GRO, toluene, ethylbenzene and total xylenes. The sample collected on June 17, 1994 showed only a slight detection of xylenes. It appears that well MW9 is on the southern edge of the plume and, based on laboratory results for the before and after pumping test samples, it appears that pumping of the Co-op well possibly affects the plume in the area of well MW9 (even though there were no discernible pumping test-induced water level changes).

A water sample collected from the Co-op well in August, 1993 showed no detections with the exception of 7.2 ppb dissolved lead. We also collected a sample from the Co-op well at approximately 1/2 hour into the pumping test and at the end of the pumping test. The sample collected at the start of the pumping test showed 300 ppb GRO and 1.1 ppb toluene. The sample collected at the end of the pumping test showed 400 ppb GRO, 3.0 ppb toluene, 1.1 ppb ethylbenzene, and 5.6 ppb total xylenes. We sampled the Co-op well again on June 17, 1994 and the results showed no detections for the parameters analyzed.

It is unknown why there were detections in the Co-op well samples collected during the pumping test. All of the water samples collected from that well were from the outdoor faucet, with the exception of the sample collected at the beginning of the pumping test which was collected from a garden hose connected to the outdoor faucet.

It is possible that the August, 1993 and June, 1994 samples did not show any detections, because of the amount of water that was discharged before collecting the samples. Prior to collecting the August, 1993 and June, 1994 Co-op well samples, we left the faucet open for approximately 10 minutes before collecting the samples, whereas the pumping test samples were collected after the faucet had been left open for approximately 1/2 hour and 16 hours, respectively.

Although its well log indicates that this well is grouted, it is possible that some leakage occurs down along the casing. This suspected leakage of shallow contaminated groundwater into the well would explain the increased detections seen after the pumping test in both well MW9 and the Co-op well. Leakage of shallow groundwater down the Co-op well could affect the groundwater table enough to draw the southern edge of the plume closer to well MW9 and the Co-op well. There were no petroleum parameter detections

in the August 18, 1993, or May 19 and June 17, 1994 water samples collected from deep well MW8. This indicates that shallow groundwater contamination is not naturally migrating vertically at this location.

Laboratory results for water samples collected from the remaining wells generally correspond with results from earlier in the study as summarized in our 1993 Report. Moderate impacts remain in wells MW2, MW4, MW5 and MW7, and slight impacts remain in wells MW1, MW3 and MW6.

Additional Groundwater Receptor Survey Information

As part of our additional groundwater receptor survey, we contacted the adjacent property owners to the north and east of the site concerning their water supply. We also conducted a survey of the area to determine the locations of the next nearest farmsteads or homes. Figure 3 shows the approximate nearby well and farmstead locations.

Mr. Tom Palmer, who owns the residence just north of Dittmer Oil, indicated that his residence is connected to municipal water and sewer, and he does not have a private water supply well.

We contacted the owner of the farmstead to the east of the site, Mr. Ralph Bemmels, and he indicated that he has a private water supply well. The well apparently is not registered and we were unable to obtain a well log for it. Mr. Bemmels indicated that the well is approximately 40 years old and is believed to be approximately 180 feet deep. He also indicated that they use bottled water for drinking and cooking, and that the well is used to supply water for their cattle operation. He indicated that they use bottled water due to the fact that the well water is very "hard".

The next nearest residence east of the Palmer and the Bemmels residences is a farmstead located approximately 1/2 mile east of the site. The nearest farmstead to the south of the site (on the east side of Highway 4, as the west side is serviced by municipal water) is located approximately 1000 feet south of the site. There also is a farmstead located approximately 2000 feet southeast of the site. It is likely that the next nearest farmsteads to the south and southeast of the site also rely on private water supply wells.

We obtained a well log for the Co-op well from Peterson Well Company of Sleepy Eye (see attached). Their log shows that the well was drilled in 1984 to a depth of 192 feet. The well is

screened in a fine sand between 179 and 192 feet and is grouted with bentonite and neat cement from a depth of 7 to 180 feet. The log indicates that clay was encountered from near the surface to a depth of 178 feet. A static water level of 60 feet below grade was recorded.

We also obtained two other well logs for Fairfax Farmers Elevator (these were referred to in our 1993 Report). One well was drilled in 1961 and one was completed in 1973. We discussed these with Mr. Chuck Felton, Co-op Manager, and he is unsure why there are three well logs. He indicated that the site was developed in 1961 and that it is possible that the logs represent the same well location. He indicated that the well we sampled is the only well that he is aware of on-site.

PROPOSED CORRECTIVE ACTIONS

Because slight petroleum impacts were encountered in the Co-op well while conducting the pumping test and no confirmed petroleum impacts have been encountered in deep well MW8, it appears that leakage may be occurring along the casing of the Co-op well when the well is heavily pumped. This is further indicated by the fact that contaminant concentrations increased in the Co-op well and nearby shallow well MW9 during the pumping test. These increases may indicate that shallow contaminated groundwater was being pulled toward the Co-op well during the pumping test.

Therefore, we recommend having a licensed water well contractor abandon the Co-op well, and we recommend either connecting the Co-op to a nearby municipal water main or installing a new carefully constructed and grouted well on the Co-op property at a location at least 200 feet west of the current well.

We also recommend quarterly sampling of groundwater monitoring wells MW2, MW4, MW5, MW7, MW8 and MW9 and annual sampling of the other three monitoring wells for one year. Groundwater samples would be analyzed for GRO, BTEX and MTBE, and dissolved oxygen would be analyzed using a down-well probe. Quarterly and annual reports would be submitted. After one year, we recommend that, if contaminant levels are generally stable or decreasing, the site be closed. Based on previous conversations with MPCA staff regarding active groundwater remediation at this clay soil site and based on the apparent low risk to other nearby groundwater receptors at this time, we recommend no other actions.

Please try to complete your review as soon as possible, as Mr. Dittmer is anxious to hear from you. We will continue to conduct quarterly sampling as described above until you respond regarding how to proceed.

If you have any questions regarding the information that we have provided, please telephone us at 218-546-6371. We appreciate your consideration and timely review of the data for this site.

Sincerely,

GME CONSULTANTS, INC.

Jay P. Brekke

Jay P. Brekke, E.I.T.
Geological Engineer
Project Manager

Mark D. Millsop

Mark D. Millsop
Senior Hydrogeologist
Corporate Environmental Division Manager

c: Mr. Robert Dittmer
Dittmer Oil Company

JPB:MDM:jlm

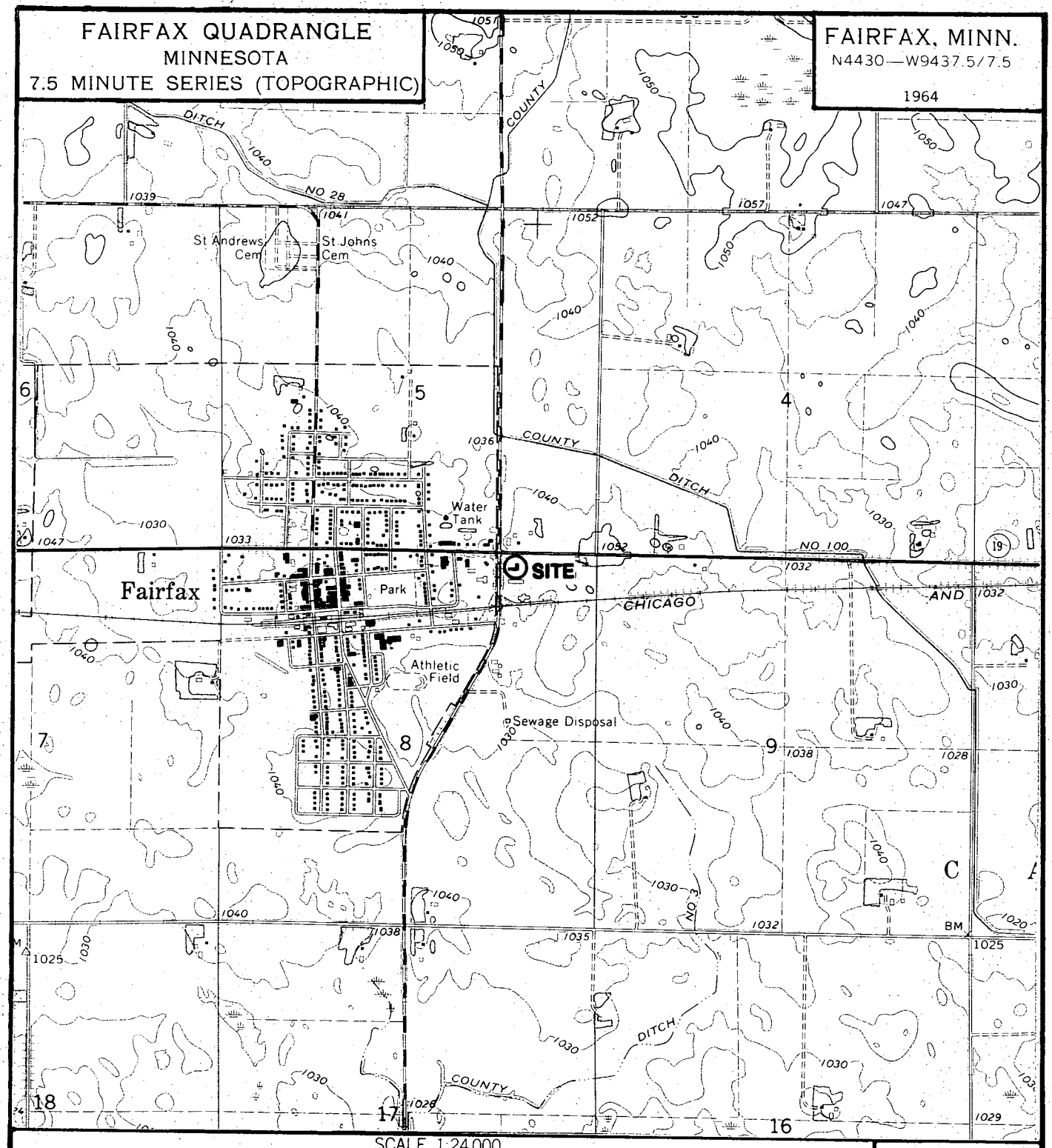

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FIGURE 1: Regional Location Diagram
Dittmer Oil Company, Inc.
Fairfax, Minnesota

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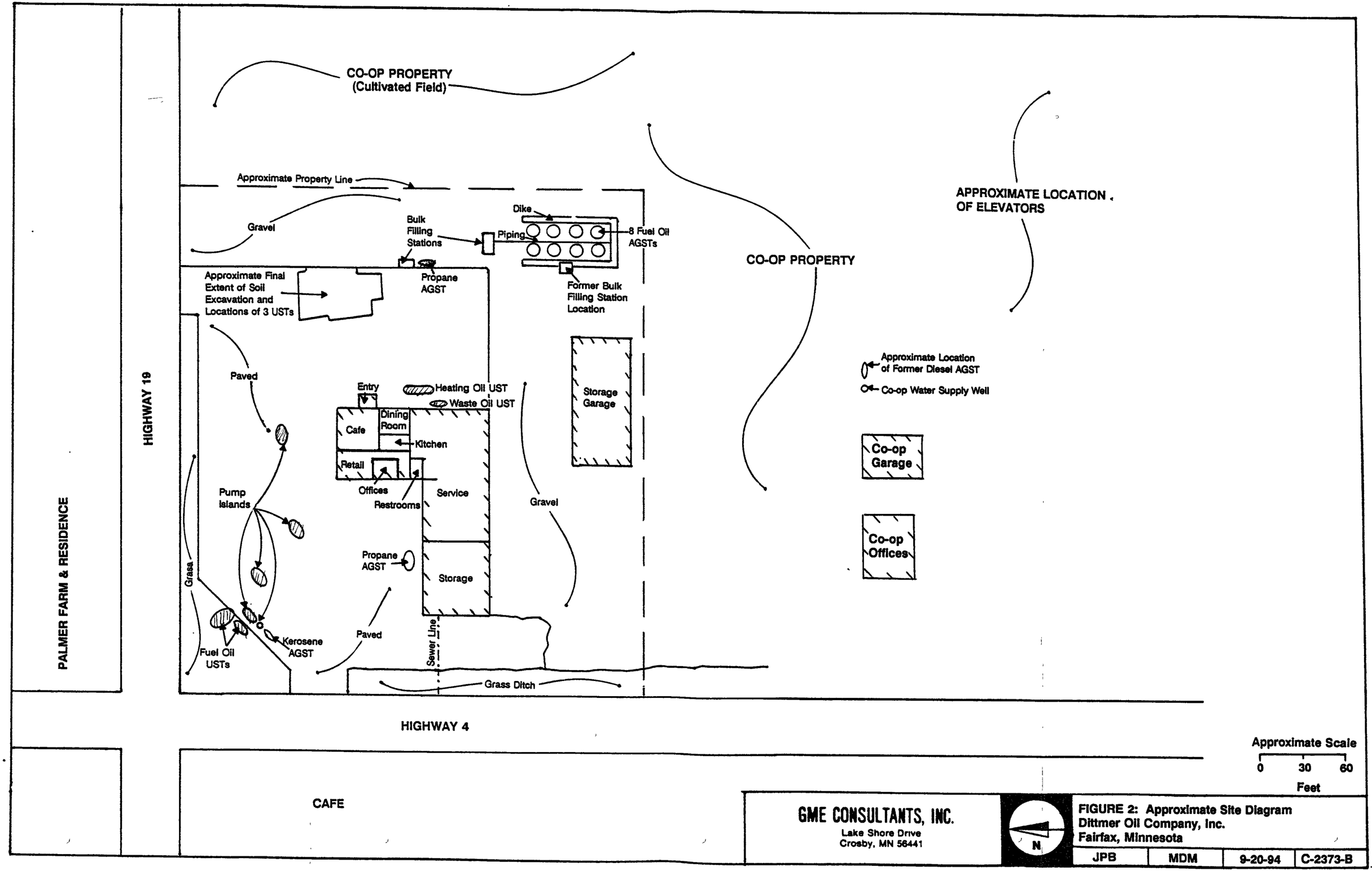

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FIGURE 2: Approximate Site Diagram
Dittmer Oil Company, Inc.
Fairfax, Minnesota

JPB	MDM	9-20-94	C-2373-B

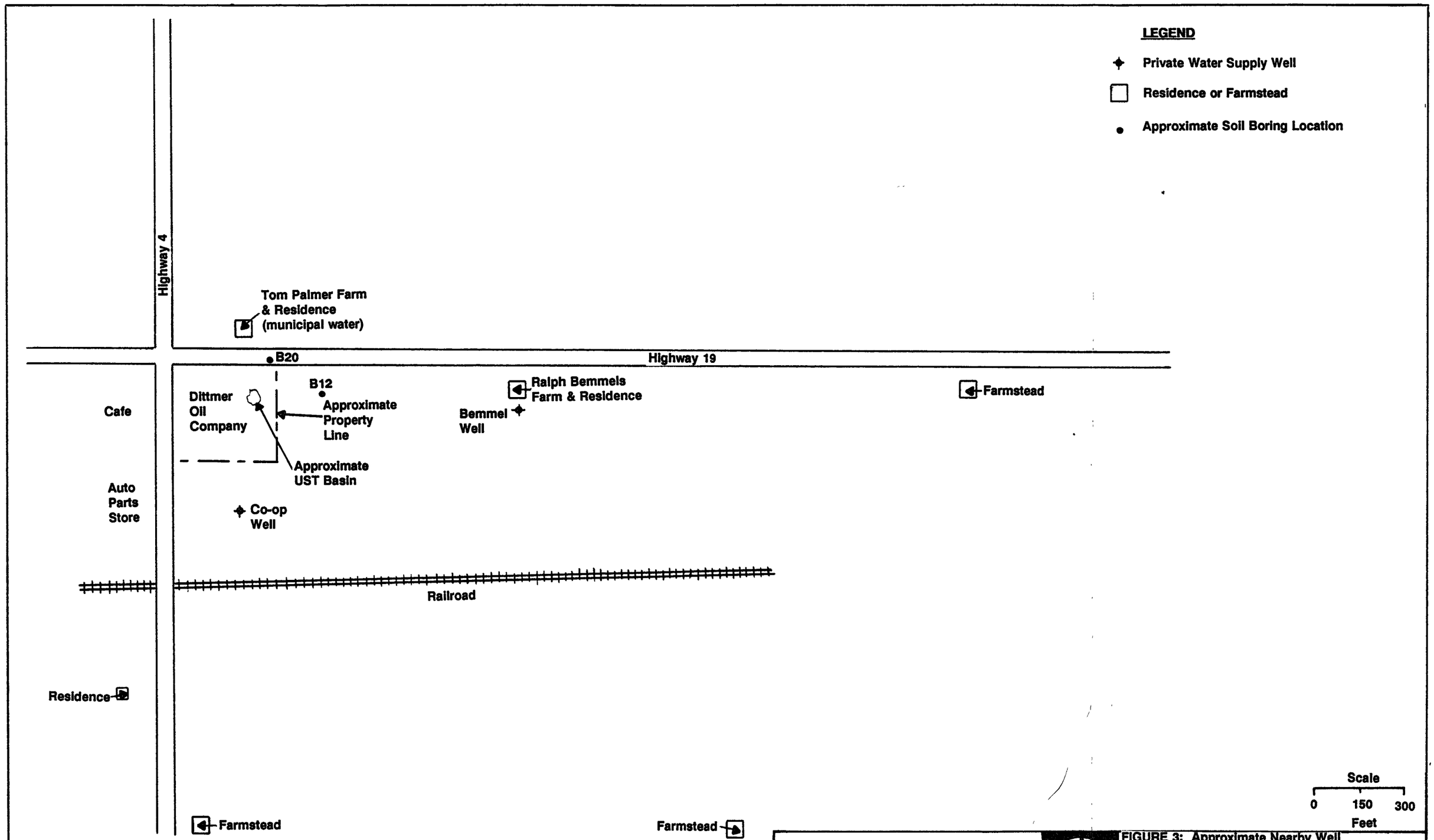

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FIGURE 3: Approximate Nearby Well and Farmstead Locations
Dittmer Oil Company, Inc.
Fairfax, Minnesota

JPB	MDM	9-20-94	C-2373-B

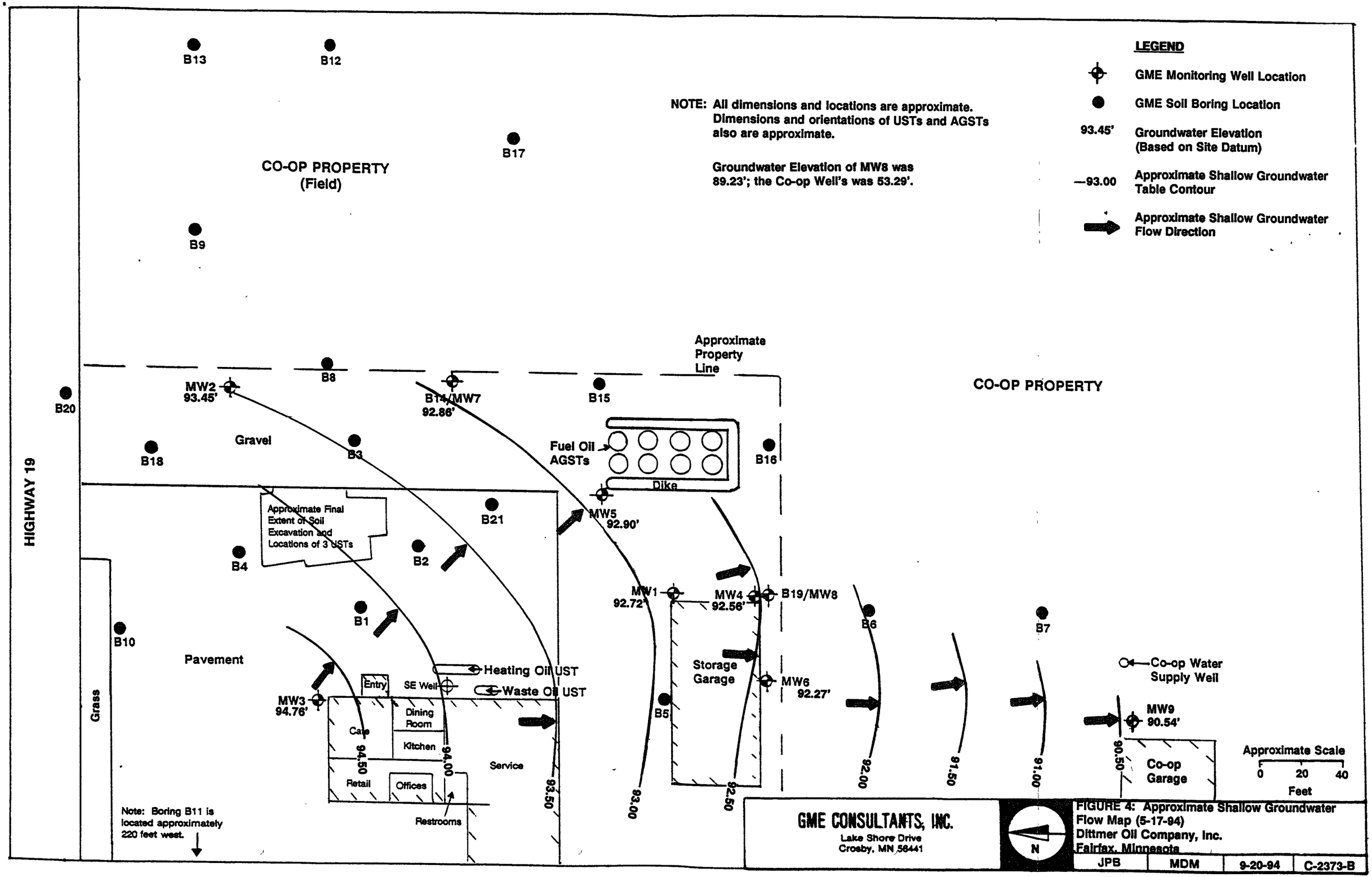
LEGEND
GME Monitoring Well Location
GME Soil Boring Location
93.45' Groundwater Elevation (Based on Site Datum)
—93.00 Approximate Shallow Groundwater Table Contour
Approximate Shallow Groundwater Flow Direction
NOTE: All dimensions and locations are approximate. Dimensions and orientations of USTs and AGSTs also are approximate.
Groundwater Elevation of MW8 was 89.23'; the Co-op Well's was 53.29'.
CO-OP PROPERTY (Field)
CO-OP PROPERTY
Approximate Property Line
HIGHWAY 19
B13
B12
B17
B9
B8
B15
B20
MW2 93.45'
B14/MW7 92.86'
Gravel
B18
B3
Fuel Oil AGSTs
B16
Dike
MW5 92.90'
B21
Approximate Final Extent of Soil Excavation and Locations of 3 USTs
B4
B2
MW1 92.72'
MW4 92.56'
B19/MW8
B6
B7
B1
B10
Pavement
Storage Garage
Co-op Water Supply Well
Heating Oil UST
Entry
SE Well
Waste Oil UST
MW3 94.76'
B5
MW6 92.27'
MW9 90.54'
Grass
Dining Room
Cafe
Kitchen
94.50
94.00
Service
Retail
Offices
93.50
Restrooms
93.00
92.50
92.00
91.50
91.00
90.50
Co-op Garage
Approximate Scale
0 20 40
Feet
Note: Boring B11 is located approximately 220 feet west.
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FIGURE 4: Approximate Shallow Groundwater Flow Map (5-17-94)
Dittmer Oil Company, Inc.
Fairfax, Minnesota
JPB | MDM | 9-20-94 | C-2373-B

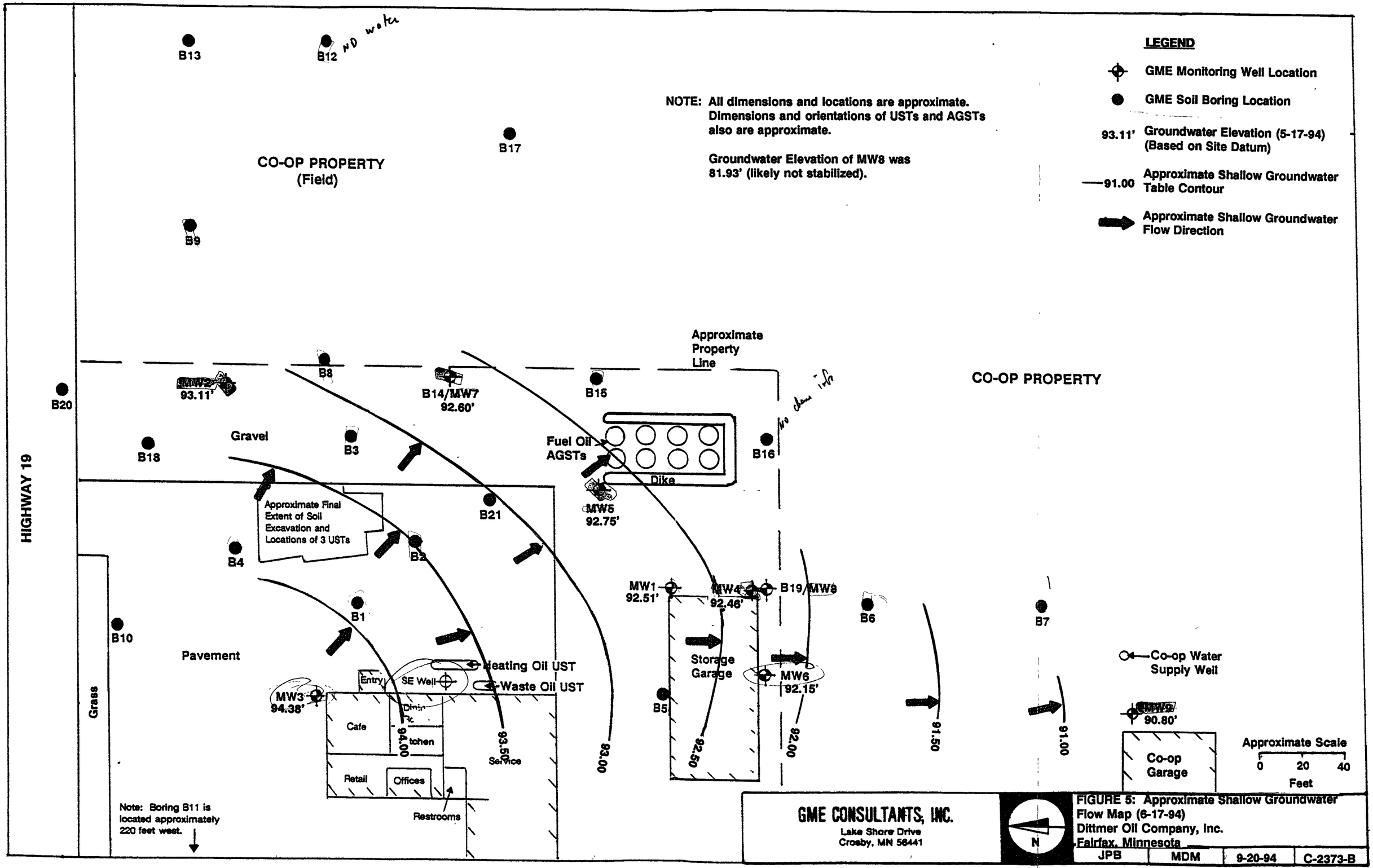

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FIGURE 5: Approximate Shallow Groundwater Flow Map (6-17-94)
Dittmer Oil Company, Inc.
Fairfax, Minnesota

JPB	MDM	9-20-94	C-2373-B

TABLE 1
WELL CONSTRUCTION SUMMARY
DITTMER OIL COMPANY
GME PROJECT NO. C-2373-B

	Elevations (Site Datum)										
	MW1	MW2	MW3	MW4	MW5	MW6	MW7	MW8	MW9	CO-OP WELL	SE WELL
Top of Riser	98.72	99.10	102.16	98.24	100.05	99.23	99.97	99.20	97.58	96.66	100.71
Ground Surface	97.14	97.14	100.24	96.32	97.96	97.12	96.90	96.66	95.61		
Top of Filter Pack	93.14	92.24	93.54	93.03	95.07	93.98	92.70	62.66	94.11		
Top of Well Screen	92.47	91.80	92.77	92.53	94.57	93.48	92.67	61.66	93.61		
Bottom of Well	86.47	85.80	86.77	82.53	84.57	83.48	82.67	56.66	83.61		
Minnesota Unique Well Number	475173	475174	475175	524148	524149	524150	523451	523452	523488		

Note: Elevations are referenced to concrete slab in doorway at northeast entrance to main building (cafe entrance).

TABLE 2
GROUNDWATER ELEVATION SUMMARY
DITTMER OIL COMPANY
GME PROJECT NO. C-2373-B

Monitoring Well Number	Groundwater Elevations (Site Datum)								
	12-6-91	1-21-92	6-3-93	6-17-93	7-15-93	8-4-93	8-17-93	5-17-94	6-17-94
MW1	91.98	91.41	93.30	93.65	92.84	92.63	92.60	92.72	92.51
MW2	92.87	93.51	94.00	96.00	93.03	94.57	94.49	93.45	93.11
MW3	93.31	92.45	94.41	96.61	94.86	94.61	94.40	94.76	94.38
MW4			92.92	93.91	92.53	92.50	92.52	92.56	92.46
MW5			93.25	93.95	93.16	93.20	92.78	92.90	92.75
MW6			92.33	94.04	92.22	92.21	92.22	92.27	92.15
MW7						93.58	93.14	92.86	92.60
MW8							75.61*	89.23	81.93*
MW9								90.54	90.80
TCT Well (SE Well)					93.43	93.42	93.48		
Co-op Well								53.29	

Note: Elevations referenced to concrete slab in doorway at northeast entrance to main building (cafe entrance).

*Water level likely not stabilized.

TABLE 3
SOIL VAPOR RESULTS FROM ENVIRONMENTAL SOIL BORING
DITTMER OIL COMPANY
GME PROJECT NO. C-2373-B

Boring No.	Depth (feet)	OVA Reading (ppm)
MW9	0 - 4 (AS)	0
	4 - 6	0
	6 - 8	0
	9 - 11	0

Definitions:

OVA = organic vapor analyzer (FID)
ppm = parts per million
AS = auger sample

TABLE 4
SOIL CHEMISTRY RESULTS
DITTMER OIL COMPANY
GME PROJECT NO. C-2373-B

Boring #, Sample #, & Date Sampled	Depth (feet)	MDL (ppm)	Parameter Analyzed	Concentration (ppm)
B1 (S-5) (10-16-91)	8-10	1.6	TPHCs as Gasoline	210
		1.4	TPHCs as Fuel Oil	8.8
		0.059	Benzene	3.2
		0.063	Toluene	7.4
		0.041	Ethylbenzene	4.1
		0.18	Total Xylenes	19
		5	Lead	8
B1 (S-6) (10-16-91)	10-12	1.6	TPHCs as Gasoline	3.3
		1.4	TPHCs as Fuel Oil	7.2
		0.059	Benzene	0.072
		0.063	Toluene	0.23
		0.041	Ethylbenzene	0.077
		0.18	Total Xylenes	0.38
B2 (S-5) (10-16-91)	8-10	1.6	TPHCs as Gasoline	160
		1.4	TPHCs as Fuel Oil	130
		0.059	Benzene	1.9
		0.063	Toluene	1.5
		0.041	Ethylbenzene	0.80
		0.18	Total Xylenes	10
		5	Lead	6
B2 (S-6) (10-16-91)	10-12	1.4	TPHCs as Fuel Oil	24
		5	Lead	8
B3 (S-5) (10-16-91)	8-10	1.6	TPHCs as Gasoline	140
		1.4	TPHCs as Fuel Oil	100
		0.059	Benzene	1.0
		0.041	Ethylbenzene	2.4
		0.18	Total Xylenes	4.6
		4	Lead	9
B3 (S-6) (10-16-91)	10-12	1.6	TPHCs as Gasoline	5.2
		1.4	TPHCs as Fuel Oil	3.9
		0.041	Ethylbenzene	0.066
		5	Lead	11

TABLE 4 (CONTINUED)
SOIL CHEMISTRY RESULTS
DITTMER OIL COMPANY
GME PROJECT NO. C-2373-B

Boring #, Sample #, & Date Sampled	Depth (feet)	MDL (ppm)	Parameter Analyzed	Concentration (ppm)
B3 (S-7) (10-16-91)	12-14	5	Lead	6
B4 (S-5) (10-16-91)	8-10	1.6	TPHCs as Gasoline	150
		1.4	TPHCs as Fuel Oil	48
		0.059	Benzene	2.2
		0.063	Toluene	2.4
		0.041	Ethylbenzene	1.5
		0.18	Total Xylenes	4.6
		5	Lead	7
B4 (S-6) (10-16-91)	10-12	1.6	TPHCs as Gasoline	72
		1.4	TPHCs as Fuel Oil	360
		0.059	Benzene	0.84
		0.041	Ethylbenzene	0.81
		0.18	Total Xylenes	2.5
		5	Lead	13
MW1 (S-6) (10-16-91)	10-12	1.6	TPHCs as Gasoline	40
		1.4	TPHCs as Fuel Oil	38
		0.041	Ethylbenzene	0.32
		0.18	Total Xylenes	2.8
		5	Lead	9
MW2 (S-5) (10-16-91)	8-10	1.4	TPHCs as Fuel Oil	2.1
		5	Lead	8
MW3 (S-7) (10-16-91)	12-14	5	Lead	7
MW4 (SS2) (5-19-93)	7-9	5.0	Gasoline Range Organics	109
		0.05	Benzene	*
		0.05	Toluene	1.62
		0.05	Ethylbenzene	0.69
		0.150	Total Xylenes	2.59
		0.05	MTBE	3.68
		NL	Lead	8.58

TABLE 4 (CONTINUED)
SOIL CHEMISTRY RESULTS
DITTMER OIL COMPANY
GME PROJECT NO. C-2373-B

Boring #, Sample #, & Date Sampled	Depth (feet)	MDL (ppm)	Parameter Analyzed	Concentration (ppm)
MW5 (SS2) (5-19-93)	9-11	NL	Lead	8.85
MW6 (SS2) (5-20-93)	7-9	NL	Lead	11
B5 (SS3) (5-19-93)	9-11	5.0	Gasoline Range Organics	10.0
		0.05	Benzene	0.315
		0.05	Toluene	0.479
		0.05	Ethylbenzene	0.615
		0.150	Total Xylenes	1.82
		0.05	MTBE	0.631
		NL	Lead	7.95
B6 (SS3) (5-20-93)	9-11	5.0	Gasoline Range Organics	55.3
		0.05	Benzene	0.265
		0.05	Toluene	0.546
		0.05	Ethylbenzene	1.01
		0.150	Total Xylenes	3.45
		0.05	MTBE	0.20
		NL	Lead	8.41
B7 (SS2) (5-20-93)	7-9	NL	Lead	18.6
B8 (SS2) (8-2-93)	4-6	1.0	Gasoline Range Organics	44.3
		5.0	Diesel Range Organics	8.2
		0.05	Benzene	0.478
		0.05	Toluene	0.411
		0.05	Ethylbenzene	0.719
		0.150	Total Xylenes	2.26
		0.05	MTBE	2.85
		NL	Lead	6.51

TABLE 4 (CONTINUED)
SOIL CHEMISTRY RESULTS
DITTMER OIL COMPANY
GME PROJECT NO. C-2373-B

Boring #, Sample #, & Date Sampled	Depth (feet)	MDL (ppm)	Parameter Analyzed	Concentration (ppm)
B8	24-26	1.0	Gasoline Range Organics	1.8
(SS6)		0.05	Toluene	0.058
(8-2-93)		NL	Lead	3.86
B9	4-6	1.0	Gasoline Range Organics	70.6
(SS2)		0.05	Benzene	0.406
(8-2-93)		0.05	Toluene	0.439
		0.05	Ethylbenzene	1.29
		0.150	Total Xylenes	2.34
		0.05	MTBE	7.0
		NL	Lead	7.52
B10	6-8	1.0	Gasoline Range Organics	16.5
(SS3)		0.05	Toluene	0.312
(8-2-93)		0.05	Ethylbenzene	0.076
		0.150	Total Xylenes	0.563
		0.05	MTBE	1.03
		NL	Lead	6.48
B11	6-8	NL	Lead	5.66
(SS3)				
(8-2-93				
B13	6-8	NL	Lead	5.98
(SS3)				
(8-2-93)				
B15	9-11	1.0	Gasoline Range Organics	102
(SS4)		5.0	Diesel Range Organics	5.3
(8-3-93)		0.05	Toluene	1.10
		0.05	Ethylbenzene	0.502
		0.150	Total Xylenes	3.40
		0.05	MTBE	10.5
		NL	Lead	8.09

TABLE 4 (CONTINUED)
SOIL CHEMISTRY RESULTS
DITTMER OIL COMPANY
GME PROJECT NO. C-2373-B

Boring #, Sample #, & Date Sampled	Depth (feet)	MDL (ppm)	Parameter Analyzed	Concentration (ppm)
B16 (SS2) (8-3-93)	4-6	NL	Lead	6.52
B17 (SS3) (8-3-93)	6-8	NL	Lead	6.86
B18 (SS3) (8-3-93)	6-8	1.0	Gasoline Range Organics	129
		5.0	Diesel Range Organics	6.7
		0.05	Benzene	3.6
		0.05	Toluene	5.0
		0.05	Ethylbenzene	3.1
		0.150	Total Xylenes	8.3
		NL	Lead	5.5
B19/MW8 (SS3) (8-4-93)	20-22	0.05	Benzene	0.213
		0.05	Toluene	0.592
		0.05	Ethylbenzene	0.111
		0.150	Total Xylenes	0.516
		NL	Lead	4.51
B19/MW8 (SS8) (8-4-93)	37-39	0.05	Benzene	0.115
		0.05	Toluene	0.438
		0.150	Total Xylenes	0.210
		NL	Lead	5.45
B20 (SS3) (8-4-93)	6-8	NL	Lead	6.48
B21 (SS3) (8-5-93)	11	1.0	Gasoline Range Organics	348
		5.0	Diesel Range Organics	34.1
		0.05	Benzene	1.2
		0.05	Toluene	4.02
		0.05	Ethylbenzene	2.09
		0.150	Total Xylenes	5.88
		0.05	MTBE	14.2
		NL	Lead	7.08

TABLE 4 (CONTINUED)
SOIL CHEMISTRY RESULTS
DITTMER OIL COMPANY
GME PROJECT NO. C-2373-B

Boring #, Sample #, & Date Sampled	Depth (feet)	MDL (ppm)	Parameter Analyzed	Concentration (ppm)
B21 (SS7) (8-5-93)	26-28	NL	Lead	4.74
B21 (SS8) (8-5-93)	28-30	1.0	Gasoline Range Organics	1.0
		NL	Lead	3.43
MW9 (SS2) (5-11-94)	4-6	0.8	Gasoline Range Organics	0.93
		1.2	Diesel Range Organics	7.4**
		6.7	Lead	6.7
MW9 (SS3) (5-11-94)	9-11	1.2	Diesel Range Organics	8.1**
		6.5	Lead	7.2

Notes: MDL = method detection limit
TPHCs = total petroleum hydrocarbons
All results given in parts per million (ppm).
Results for analyzed parameters not detected above the MDLs are not included in this table.
NL = not listed
* = masked
** = laboratory report indicates that the chromatographic pattern resembles that of a phthalate ester.

TABLE 5
GROUNDWATER CHEMISTRY RESULTS
DITTMER OIL COMPANY
GME PROJECT NO. C-2373-B

Well #	Parameter Analyzed	Sampling Date 12-6-91	1-21-92	6-3-93	6-17-93	8-3,4,5-93	8-18-93	5-17-94	5-18,19-94	6-17-94
		(Concentrations in parts per billion)								
MW1	GRO	29000*	27000*	ND	ND	ND	NS	ND	NS	NS
	DRO	20000**	8500**	ND	ND	ND	NS	ND	NS	NS
	Benzene	7300	6700	ND	ND	ND	NS	ND	NS	NS
	Toluene	3700	1700	ND	ND	ND	NS	1.5	NS	NS
	Ethylbenzene	ND	120	ND	ND	ND	NS	ND	NS	NS
	Total Xylenes	3000	2500	ND	ND	ND	NS	ND	NS	NS
	MTBE	ND	68	ND	7.8	12.0	NS	NA	NS	NS
	Dissolved Lead	ND	ND	3	4	2.9	NS	ND	NS	NS
MW2	GRO	ND*	ND*	35100	55400	41100	NS	38900	NS	NS
	DRO	ND**	ND**	6600	4900	2100	NS	1700	NS	NS
	Benzene	ND	ND	11300	7890	1390	NS	15200	NS	NS
	Toluene	ND	ND	6930	6180	1040	NS	6610	NS	NS
	Ethylbenzene	ND	ND	363	473	386	NS	710	NS	NS
	Total Xylenes	ND	ND	2830	3950	1540	NS	3510	NS	NS
	MTBE	25	26	2620	21.6	794	NS	NA	NS	NS
	Dissolved Lead	ND	ND	3	8	4.5	NS	0.002	NS	NS
MW3	GRO	ND*	ND*	ND	ND	ND	NS	ND	NS	NS
	DRO	ND**	ND**	ND	ND	ND	NS	NA	NS	NS
	Benzene	ND	ND	1.8	ND	ND	NS	ND	NS	NS
	Toluene	ND	ND	ND	ND	ND	NS	1.2	NS	NS
	Ethylbenzene	ND	ND	ND	ND	ND	NS	ND	NS	NS
	Total Xylenes	ND	ND	ND	ND	ND	NS	5.8	NS	NS
	MTBE	8.2	8.6	ND	10.3	6.2	NS	NA	NS	NS
	Dissolved Lead	ND	ND	4	5	1.5	NS	ND	NS	NS

TABLE 5 (CONTINUED)
GROUNDWATER CHEMISTRY RESULTS
DITTMER OIL COMPANY
GME PROJECT NO. C-2373-B

Well #	Parameter Analyzed	Sampling Date 12-6-91	1-21-92	6-3-93	6-17-93	8-3,4,5-93	8-18-93	5-17-94	5-18,19-94	6-17-94
		(Concentrations in parts per billion)								
MW4	GRO	NI	NI	11900	700	16000	NS	8500	6000	7000
	DRO	NI	NI	1100	1800	1300	NS	600	400	NA
	Benzene	NI	NI	99.6	37.8	78.3	NS	259	185	214
	Toluene	NI	NI	182	29.2	150.2	NS	156	88.9	28
	Ethylbenzene	NI	NI	37.1	8.2	31.8	NS	37.0	23.0	26
	Total Xylenes	NI	NI	309	154	425	NS	303	203	27
	MTBE	NI	NI	5.3	5.9	1281	NS	NA	NA	3074
	Dissolved Lead	NI	NI	7	4	3.2	NS	ND	ND	NA
MW5	GRO	NI	NI	400	500	500	NS	800	NS	NS
	DRO	NI	NI	ND	ND	ND	NS	100	NS	NS
	Benzene	NI	NI	8.9	9.7	16.6	NS	45.2	NS	NS
	Toluene	NI	NI	2.9	4.8	3.7	NS	17.5	NS	NS
	Ethylbenzene	NI	NI	3.0	ND	1.6	NS	7.1	NS	NS
	Total Xylenes	NI	NI	9.4	ND	5.9	NS	8.7	NS	NS
	MTBE	NI	NI	33.5	5.3	88.7	NS	NA	NS	NS
	Dissolved Lead	NI	NI	2	3	ND	NS	ND	NS	NS
MW6	GRO	NI	NI	ND	ND	ND	NS	ND	ND	NS
	DRO	NI	NI	ND	ND	ND	NS	NA	ND	NS
	Benzene	NI	NI	1.5	ND	ND	NS	ND	ND	NS
	Toluene	NI	NI	ND	ND	ND	NS	ND	ND	NS
	Ethylbenzene	NI	NI	ND	ND	ND	NS	ND	ND	NS
	Total Xylenes	NI	NI	ND	ND	ND	NS	5.1	ND	NS
	MTBE	NI	NI	ND	1.2	ND	NS	NA	NA	NS
	Dissolved Lead	NI	NI	2	4	0.0010	NS	ND	ND	NS

TABLE 5 (CONTINUED)
GROUNDWATER CHEMISTRY RESULTS
DITTMER OIL COMPANY
GME PROJECT NO. C-2373-B

Well #	Parameter Analyzed	Sampling Date 12-6-91	1-21-92	6-3-93	6-17-93	8-3,4,5-93	8-18-93	5-17-94	5-18,19-94	6-17-94
		(Concentrations in parts per billion)								
MW7	GRO	NI	NI	NI	NI	28900	NS	14500	NS	NS
	DRO	NI	NI	NI	NI	2300	NS	1300	NS	NS
	Benzene	NI	NI	NI	NI	74.9	NS	422	NS	NS
	Toluene	NI	NI	NI	NI	62.2	NS	89.3	NS	NS
	Ethylbenzene	NI	NI	NI	NI	556	NS	379	NS	NS
	Total Xylenes	NI	NI	NI	NI	608	NS	370	NS	NS
	MTBE	NI	NI	NI	NI	4770	NS	NA	NS	NS
	Dissolved Lead	NI	NI	NI	NI	2.4	NS	0.001	NS	NS
MW8	GRO	NI	NI	NI	NI	ND	ND	NS	ND	ND
	DRO	NI	NI	NI	NI	ND	ND	NS	NA	NA
	Benzene	NI	NI	NI	NI	2.9	ND	NS	ND	ND
	Toluene	NI	NI	NI	NI	2.8	ND	NS	ND	ND
	Ethylbenzene	NI	NI	NI	NI	ND	ND	NS	ND	ND
	Total Xylenes	NI	NI	NI	NI	ND	ND	NS	ND	ND
	MTBE	NI	NI	NI	NI	9.4	ND	NS	NA	ND
	Dissolved Lead	NI	NI	NI	NI	7	0.011	NS	ND	NA
MW9	GRO	NI	NI	NI	NI	NI	NS	NA	500	ND
	DRO	NI	NI	NI	NI	NI	NS	ND	ND	NA
	Benzene	NI	NI	NI	NI	NI	NS	ND	ND	ND
	Toluene	NI	NI	NI	NI	NI	NS	ND	2.3	ND
	Ethylbenzene	NI	NI	NI	NI	NI	NS	ND	1.6	ND
	Total Xylenes	NI	NI	NI	NI	NI	NS	ND	10.1	3.1
	MTBE	NI	NI	NI	NI	NI	NS	ND	NA	ND
	Dissolved Lead	NI	NI	NI	NI	NI	NS	ND	ND	NA

TABLE 5 (CONTINUED)
GROUNDWATER CHEMISTRY RESULTS
DITTMER OIL COMPANY
GME PROJECT NO. C-2373-B

Well #	Parameter Analyzed	Sampling Date 12-6-91	1-21-92	6-3-93	6-17-93	8-3,4,5-93	8-18-93	5-17-94	5-18-94 <Pumping Test>	5-19-94	6-17-94
		(Concentrations in parts per billion)									
Co-op Well	GRO	NS	NS	NS	NS	ND	NS	NS	300	400	ND
	DRO	NS	NS	NS	NS	ND	NS	NS	ND	ND	NA
	Benzene	NS	NS	NS	NS	ND	NS	NS	ND	ND	ND
	Toluene	NS	NS	NS	NS	ND	NS	NS	1.1	3.0	ND
	Ethylbenzene	NS	NS	NS	NS	ND	NS	NS	ND	1.1	ND
	Total Xylenes	NS	NS	NS	NS	ND	NS	NS	ND	5.6	ND
	MTBE	NS	NS	NS	NS	ND	NS	NS	NA	NA	ND
	Dissolved Lead	NS	NS	NS	NS	7.2	NS	NS	ND	ND	NA
SE-WS (TCT Well)	GRO	NS	NS	NS	NS	1200	NS	NS	NS		NS
	DRO	NS	NS	NS	NS	2700	NS	NS	NS		NS
	Benzene	NS	NS	NS	NS	ND	NS	NS	NS		NS
	Toluene	NS	NS	NS	NS	5.5	NS	NS	NS		NS
	Ethylbenzene	NS	NS	NS	NS	ND	NS	NS	NS		NS
	Total Xylenes	NS	NS	NS	NS	5.4	NS	NS	NS		NS
	MTBE	NS	NS	NS	NS	ND	NS	NS	NS		NS
	Dissolved Lead	NS	NS	NS	NS	2.3	NS	NS	NS		NS

TABLE 5 (CONTINUED)
GROUNDWATER CHEMISTRY RESULTS
DITTMER OIL COMPANY
GME PROJECT NO. C-2373-B

Well #	Parameter Analyzed	Sampling Date 5-20-93	8-3,4,5-93 (Concentrations in parts per billion)
B7-WS (Temp. Well)	GRO	960	
	DRO	ND	
	Benzene	Masked	
	Toluene	19.0	
	Ethylbenzene	5.83	
	Total Xylenes	18.6	
	MTBE	155	
	Dissolved Lead	2	
B12-WS (Temp. Well)	GRO		ND
	DRO		ND
	Benzene		ND
	Toluene		ND
	Ethylbenzene		ND
	Total Xylenes		ND
	MTBE		ND
	Dissolved Lead		ND

Definitions:
GRO = gasoline range organics
DRO = diesel range organics
MTBE = methyl tertiary butyl ether
ND = no detections
NI = not installed
NS = not sampled
*** = Total Petroleum Hydrocarbons as Gasoline**
**** = Total Petroleum Hydrocarbons as Fuel Oil**

GME Consultants, Inc.
Geotechnical • Materials •Environmental
14000 21st Avenue North
Minneapolis, Minnesota 55447
(612) 559-1859

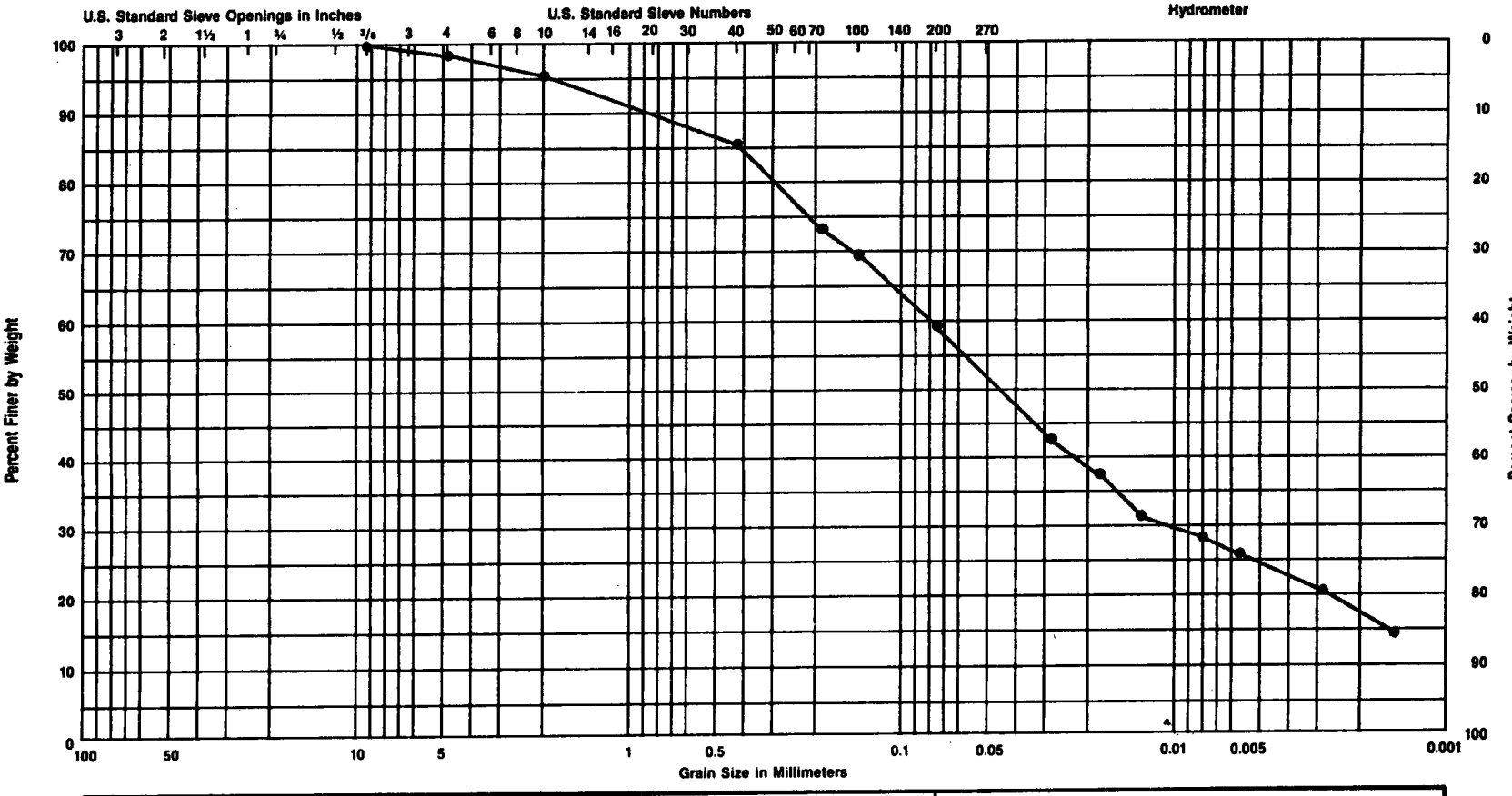
GME Project No. C-2373-B
Dittmer Oil
Fairfax, Minnesota
September, 1993

HYDRAULIC CONDUCTIVITY (PERMEABILITY) DATA
(In-Situ Tube Samples)

SAMPLE			PERMEABILITY TEST			
SAMPLE NUMBER	DEPTH (feet)	USCS	DRY DENSITY (pcf)	INITIAL MOISTURE (%)	TYPE TEST	HYDRAULIC CONDUCTIVITY (cm/sec)
B8-ST1	6-8	CL	99.7	23.0	Flex-Wall Constant	1.3×10^{-7}
B8-ST2	11-13	CL	104.0	21.3	Flex-Wall Constant	7.7×10^{-7}
B21-ST3	9-11	CL	98.2	23.4	Flex-Wall Constant	3.4×10^{-7}

Dittmer Oil Company

Fairfax, Minnesota



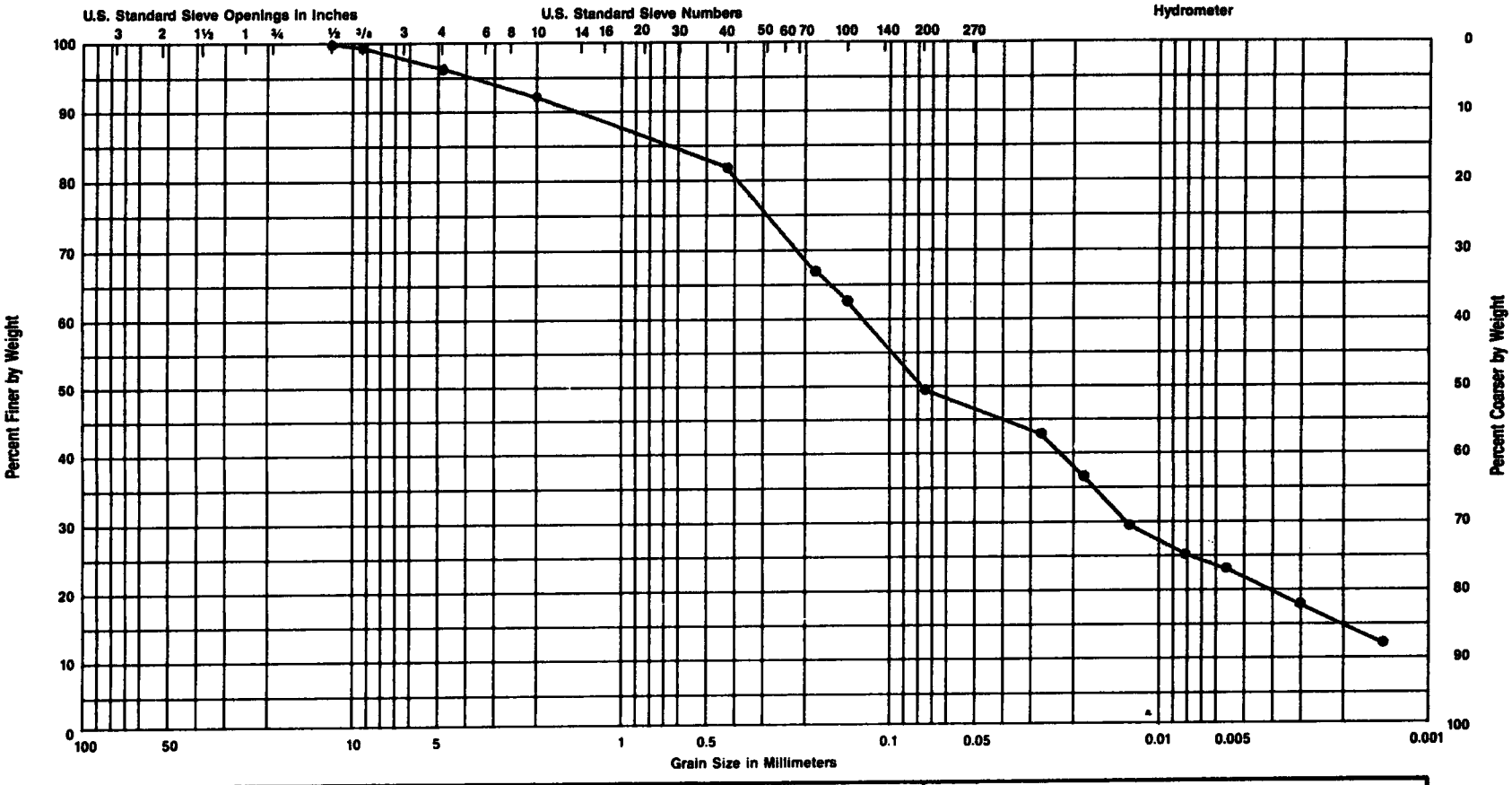
KEY SYMBOL	BORING NUMBER	SAMPLE NUMBER	DEPTH FEET	PLASTICITY DATA: LIQUID LIMIT (%)	PLASTICITY DATA: PLASTIC LIMIT (%)	PLASTICITY DATA: PLASTICITY INDEX (%)	NATURAL WATER CONTENT (%)	UNIFIED SOIL CLASSIFICATION	
—●—	B19		33-39				16.7	CL	SANDY CLAY WITH SILT SpG: 2.646

GME CONSULTANTS, INC.
Geotechnical • Materials • Environmental
314 Garfield Ave.
Duluth, MN 55806

T.L.	93-983	C2373B	Sept. 93

Dittmer Oil Company

Duluth, Minnesota



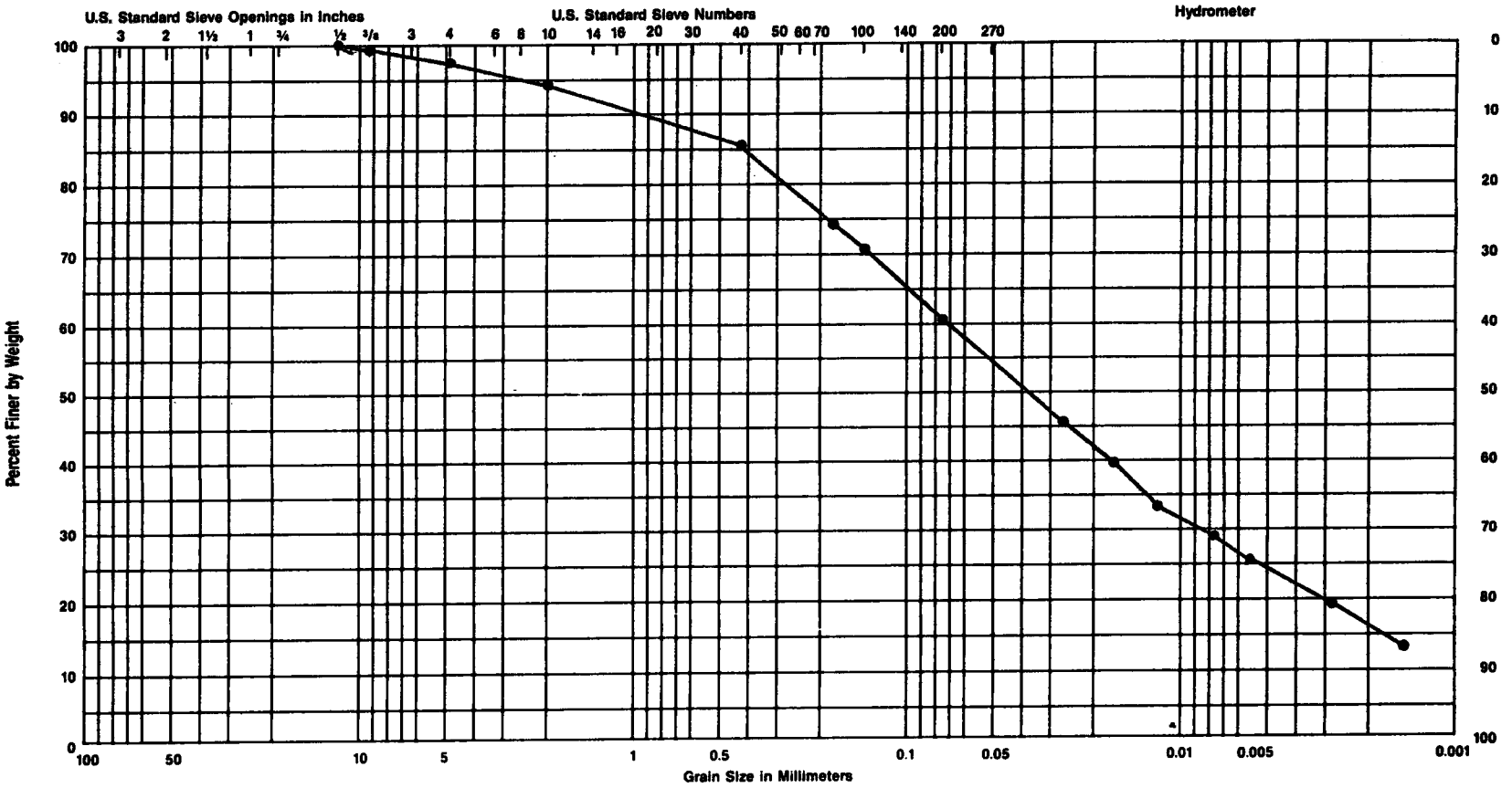
KEY SYMBOL	BORING NUMBER	SAMPLE NUMBER	DEPTH FEET	PLASTICITY DATA: LIQUID LIMIT (%)	PLASTICITY DATA: PLASTIC LIMIT (%)	PLASTICITY DATA: PLASTICITY INDEX (%)	NATURAL WATER CONTENT (%)	UNIFIED SOIL CLASSIFICATION	
—●	B14B		13-15				21.7	SC-SM	Fine SILTY CLAYEY SAND SpG: 2.598

GME CONSULTANTS, INC.
Geotechnical • Materials • Environmental
314 Garfield Ave.
Duluth, MN 55806

T.L.	93-985	C2373B	Sept. 93

Dittmer Oil Company

Fairfax, Minnesota



KEY SYMBOL	BORING NUMBER	SAMPLE NUMBER	DEPTH FEET	PLASTICITY DATA: LIQUID LIMIT (%)	PLASTICITY DATA: PLASTIC LIMIT (%)	PLASTICITY DATA: PLASTICITY INDEX (%)	NATURAL WATER CONTENT (%)	UNIFIED SOIL CLASSIFICATION	
—●—	B14A		4-8				23.8	CL	SANDY CLAY WITH SILT SpG: 2.639

GME CONSULTANTS, INC.
Geotechnical • Materials • Environmental
314 Garfield Ave.
Duluth, MN 55806

T.L.	93-984	C2373B	Sept. 93

LOG OF BORING MW9

PROJECT	SITE
Remedial Investigation	Dittmer Oil Company, Fairfax, MN
CLIENT: Dittmer Oil Company	ARCHITECT-ENGINEER

SURFACE ELEVATION 95.61'

DEPTH, FEET	SAMPLE NUMBER AND TYPE	WATER LEVEL	STRATA CHANGE, FEET	DESCRIPTION OF MATERIAL	OVA (ppm) SPECIAL TEST RESULTS	N-VALUE (BLOWS/FT.)
	1AS			Light gray to light brown silty clay (CL) - trace to little sand - many mottled fractures (primarily vertical) - soft - moist to wet at 6 feet	0	
5	2SS	▼			0	5
	3SS				0	7
10	4SS				0	9
12				End of boring at 12 feet. 8 inch O.D. hollow stem auger used full depth. OVA measurements in parts per million (ppm). Soil Samples MW9-SS2 (4-6 feet) and MW9 (9-11 feet) submitted for laboratory analysis. Installed monitoring well MW9.		

UNCONFINED COMPRESSIVE STRENGTH TONS/FT.^{2}
1 2 3 4 5
WATER CONTENT %
STANDARD PENETRATION (BLOWS/FOOT)
10 20 30 40 50

WATER LEVEL OBSERVATIONS
W.L. ▼ 6' While Sampling
W.L.
W.L.

GME CONSULTANTS, INC.
Geotechnical • Materials • Environmental
14000 21st Avenue No.
Minneapolis, MN 55447
Office (612) 559-1859

BORING STARTED 5-11-94
BORING COMPLETED 5-11-94
RIG CME 550 DRILLER KK
DRAWN JPB APPROVED MDM
PROJECT # C2373-B SHEET 1 of 1

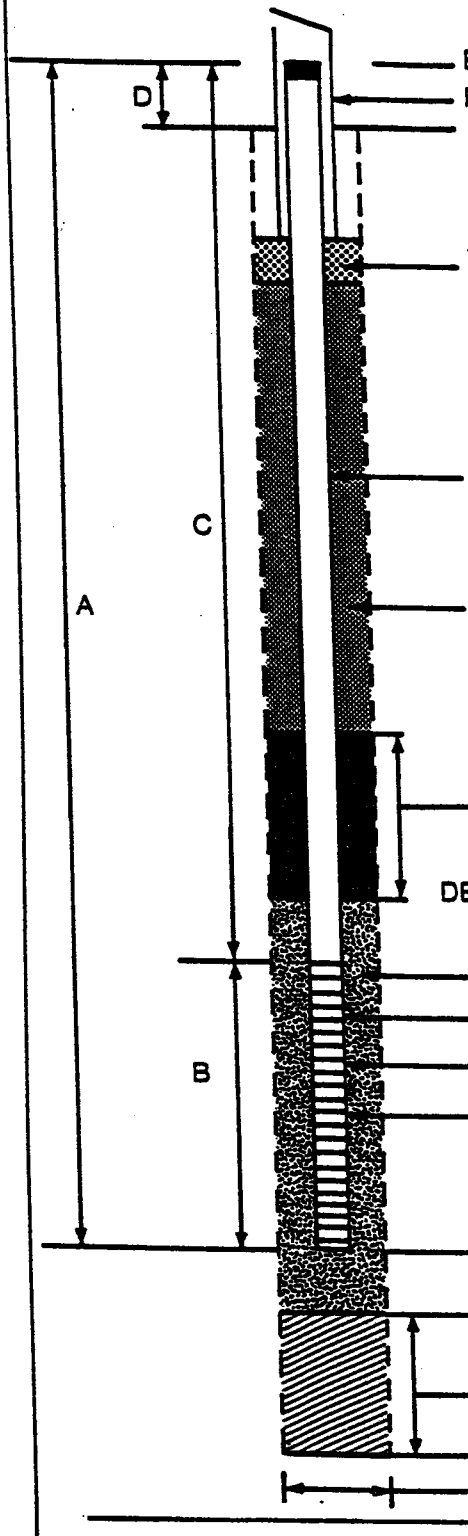
The stratification lines represent approximate boundaries between soil types; insitu the transition may be gradual.

A = total length of well 13.97 feet
B = length of well screen 10.00 feet
C = length of riser pipe 3.97 feet
D = stick-up at surface 1.97 feet

Minnesota Unique Well No. 523488

MONITORING WELL MW9
DATE INSTALLED 5-11-94
DRILLER/RIG KK/CME 550
GROUND SURFACE ELEV. 95.61'

WATER LEVELS
90.80 feet (6-17-94)



ELEVATION OF TOP OF RISER PIPE	97.58'
PROTECTION PIPE	6" diameter steel
THICKNESS AND TYPE OF SURFACE SEAL	1' neat cement grout
DIAMETER AND TYPE OF RISER PIPE	2" PVC
TYPE OF BACKFILL AROUND RISER PIPE	Neat Cement Grout
THICKNESS AND TYPE OF SEAL	0.5' Bentonite
DEPTH OF TOP OF FILTER SAND	1.5'
TYPE OF FILTER AROUND SCREEN	#45-55 Red Flint
TYPE OF WELL SCREEN	Johnson PVC
SLOT SIZES	10 slot
DIAMETER AND LENGTH OF SCREEN	2"/10'
DEPTH TO BOTTOM OF MONITORING WELL	12'
DEPTH TO BOTTOM OF FILTER SAND	12'
THICKNESS AND TYPE OF SEAL	None
DIAMETER AND DEPTH OF BOREHOLE	8"/12'

GME CONSULTANTS, INC.
Lake Shore Drive
Crosby, MN 56441

Monitoring Well Construction Log
Dittmer Oil Company
Fairfax, Minnesota

JPB	MDM	9-16-94	C-2373-B

STATE OF MINNESOTA DEPARTMENT OF HEALTH

WATER WELL RECORD

Minnesota Statutes 156A.01-.06

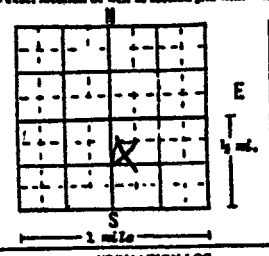
MINNESOTA UNIQUE WELL NO.

1. LOCATION OF WELL — County Name: Renville

Township Name: Cairo | Township Number: T-112 | Range Number: R 32 W | Section No.: 8 | Fraction

Distance and Direction from Road Intersections or Street Address and City of Well Location

Show exact location of well in section grid with "X." Sketch map of well location.



Addition Name | Block Number | Lot Number

3. PROPERTY OWNER — Name: Fairfax Farmers Elev.

Address: Fairfax

4. WELL DEPTH (completed): 192 ft. | Date of Completion: 4-20-84

5. 1☐ Cable tool 4☐ Reverse 7☐ Driven 10☐ Dug
2☐ Hollow rod 5☐ Air 8☐ Bored 11☐
3☑ Rotary 6☐ Jetted 9☐ Power Auger

6. USE
1☐ Domestic 4☐ Public Supply 7☐ Industry
2☐ Irrigation 5☐ Municipal 8☐ Commercial
3☐ Test Well 6☐ Air Conditioning 9☐

7. CASING — HEIGHT: Above/Below
1☐ Black 4☐ Threaded
2☐ Galv. 5☐ Welded
3☐ PVC 6☐
Surface 1' ft.
Drive Shoe? Yes ___ No ☑
___ in. to ___ ft. Weight ___ lbs./ft.
___ in. to ___ ft. Weight ___ lbs./ft.
___ in. to ___ ft. Weight ___ lbs./ft.

HOLE DIAM: 9 in. to 192 ft.

8. SCREEN — Or open hole from ___ ft. to ___ ft.
Make: Johnson
Type: S.S. Dia.: 4"
Slot/Gauge: 15 Length: 14
Set between 179 ft. and 192 ft.
___ ft. and ___ ft.
___ ft. and ___ ft.
FITTINGS: K. Packer

2. FORMATION LOG	COLOR	HARDNESS OF FORMATION	FROM	TO
Top Soil	Black		0	2
Yellow clay	Yellow		2	30
Blue clay	Blue		30	60
Rock			60	61
Blue Clay	Blue		61	178
Sand Fine			178	192

Use a second sheet, if needed.

9. STATIC WATER LEVEL: 60 ft. ☑ below ☐ above land surface | Date Measured: 4-20-84

10. PUMPING LEVEL (below land surface)
60 ft. after 1 hrs. pumping ~~30~~ g.p.m.
___ ft. after ___ hrs. pumping ___ g.p.m.

11. WELL HEAD COMPLETION
1☑ Pitless adapter 2☐ Basement offset 3☐ At least 12" above grade

12. Well grouted? ☐ Yes ☐ No | Cu. Yds. ___
1☐ Neat Cement 2☑ Bentonite 3☐ ___
Depth: from 180 ft. to 7 ft.
from ___ ft. to ___ ft.

13. Nearest sources of possible contamination
75 feet S direction ___ type
Well disinfected upon completion? Yes ☑ No ☐

14. PUMP
Date installed ___ ☐ Not installed
Manufacturer's Name: Pioneer
Model Number: 126PM HP: 1/2 Volts: 230
Length of drop pipe: 120 ft. capacity: 13 g.p.m.
Material of drop pipe: Steel
Type: ☑ Submersible 3☐ L. S. Turbine 5☐ Reciprocating
2☐ Jet 4☐ Centrifugal 6☐ ___

15. REMARKS, ELEVATION, SOURCE OF DATA, etc.

16. WATER WELL CONTRACTOR'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Peterson Well Co. — License Business Name — 64338 — License No.
Address: Sleepy Eye, Minn.
Signed: Jeffrey L. Peters — Date: 4/20/84
Authorized Representative
Signed: Jeffrey L. Peters — Date: 4/20/84
Licensed Driller

WORK COPY

1003 Fairfax QD

112-32-8adbba

209520 1K

OK

FREDERICKSON'S, INC.

Phone (612) 587-3111
HUTCHINSON, MINNESOTA 55350

Fairfax 8 elev. 1043

Owner Name Fairfax Grain & Supply Co. Telephone Date

City Fairfax 55332 County ~~McLeod~~ Renville State Minnesota Section 8 Township Cairo

Location 94-C

If occupied by renter, list name

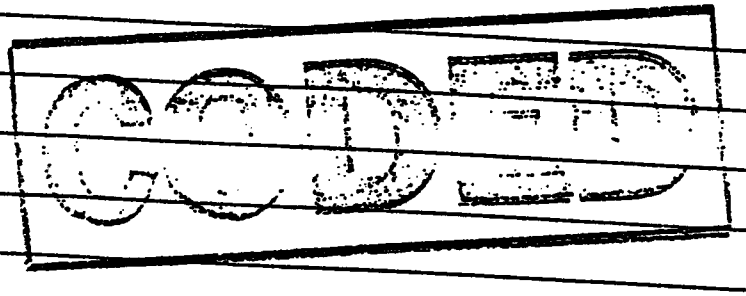
Change of ownership, name

Well diameter inside 5" Depth of well 186' Screen diameter 4" Length 8'

Screen slot 12 Screen fitting turned coupling, lead ~~packer~~ Material stainless steel

Static level 45' Pumping level 140' G. P. M. tested 15 With what? air packer

Additional information pertaining to well



Driller Raymond O. Nass Date completed February 24, 1964

Type of pump submersible Make Berkeley Model 4AM11 Serial No.

Size of motor ½ h.p. Voltage 230 Pump installed by Dan Brown

Length of drop pipe 126' Size and type material of drop pipe 1" galv. Total pump setting

Cylinder size Type Pump rod length Rod size

Size of tank Air charging system

Pit Frost proof house Pitless unit size 4" Pitless make Duplex

Pitless type Pitless bury depth

Additional information pertaining to pump and system

Date installed May 22, 1973

Holl #2

Frederickson's, Inc.

Hutchinson, Minnesota • West Fargo, North Dakota

:d for Fairfax Grain & Supply Coop.

Hole No. 2 Well No.

ite

nship

FORMATIONS PASSED THROUGH

Kind of Formation	Color of Formation	Started at What Depth	Ended at What Depth	Total Thickness of Formation
~~:p Soil~~ QUUU	SOIL, ORGD ~~Black~~	0	2	2
lay QTUU CLAY	Yellow	2	17	15
lay QTUU CLAY	Blue	17	55	38
lay, Sandy QFUU	CLAY, SAND Blue	55	77	22
and, Dirty QFUU	SAND, SILT Brown	77	80	3
lay, Sandy QFUU	CLAY, SAND Blue	80	136	56
lay, Soft & Sandy QFUU	CLAY, SAND Blue	136	170	34
and, Dirty QFUU	SAND, SILT Blue	170	173	3
and QFUU	SAND Blue	173	186	13
lay QTUU	CLAY Blue	186		

8/85

Aquifer QBOW - QBOW

Length 8'

al [illegible]

With what? [illegible]

Serial No.

Signed Ray Nass Driller

l by

: pump setting

linder size Type Pump rod length Rod size

:e of tank Air charging system

Frost proof house Pitless unit size Pitless make

tless type Pitless bury depth

dditional information pertaining to pump and system

(94C) 15725

FREDERICKSON'S, INC.

Phone (612) 587-3111
HUTCHINSON, MINNESOTA 55350

112-32 [6,5,4; can't locate Pairfax

Owner Name Fairfax Grain & Supply Co. Telephone Date

City Fairfax 55332 County Renville State Minnesota Section 5-8 Township Cairo

Location 112-32-8 AARADR

ELEV 1042±5

If occupied by renter, list name

Change of ownership, name

Well diameter inside 5" Depth of well 183' Screen diameter 4" Length 4'

Screen slot 18 Screen fittings coupling Material Everdur

Static level 42' Pumping level 120' G. P. M. tested 5 With what? air

Additional information pertaining to well 5" well with hanging shoe for 4" screen

CODED

Driller Clarence Pulkrabek Date completed July 21, 1961

Type of pump submersible Make Berkeley Model 4SOL10 Serial No. 6155572

Size of motor ½ h.p. Voltage 230 Pump installed by James Pessek

Length of drop pipe 126' Size and type material of drop pipe 1" galv. Total pump setting 132'

Cylinder size Type Pump rod length Rod size

Size of tank 120 gallon Air charging system Perma Pressure

Pit Frost proof house Pitless unit size 6" Pitless make Duplex

Pitless type submersible Pitless bury depth 6'

Additional information pertaining to pump and system

Date installed August 3, 1961 Installed by Frederickson's Inc.

Hole #1

21542S

Frederickson's, Inc.

Hutchinson, Minnesota

[Dril]led for Fairfax Grain and Supply Coop. — [Dat]e 6-22-61

[Tes]t Hole No. 1 — Well No. 1 — [Town]ship

FORMATIONS PASSED THROUGH

Kind of Formation	Color of Formation	Started at What Depth	Ended at What Depth	Total Thickness of Formation
Topsoil QUUU SOIL	ORGD black	G.L.	2'	2'
Clay QTUU CLAY	yellow	2'	23'	21'
Clay QTUU CLAY	blue	23'	109'	86'
Clay, soft QTUU	CLAY blue & brown	109'	162'	53'
Clay, hard QTUU	CLAY blue	162'	168'	6'
Sand, clean QFUU	SAND colored	168'	172'	4'
Clay QTUU	CLAY blue	172'	173'	1'
Sand QFUU SAND	brown	173'	183'	10'
[Cl]ay QTUU CLAY	blue	183'	192'	9'
Aquifer QBOW-QBOW			8/1880	

CODED

Length 4"

[J]ohnson Everdur

[W]ith what? Coup.

4" screen

[S]erial No.

[B]y Fredericksons Inc

[P]ump setting 132

Signed Clarence Pulkrabek Driller

Rod size

Pump rod length

120 gal. gems pressure tank

Size of tank 120 gal gems — Air charging system

Pitless unit size 6" — Pitless make Duplex

[P]it — Frost proof house

Pitless bury depth 6'

Pitless type Jab

Additional information pertaining to pump and system

Tom & Bill

330 SO. CLEVELAND ST.
P.O. BOX 349
CAMBRIDGE, MN 55008

MIDWEST ANALYTICAL SERVICES

MINNESOTA CERTIFIED LABORATORY
NUMBER 027-059-156

LAB (612) 689-2175
METRO (612) 444-9270
FAX (612) 689-3660

June 30, 1994

Jay Brekke
GME Consultants, Inc.
P.O. Box 250
Crosby, MN 56441

Project ID: C-2373-B
Chain of Custody: 10140
Date Sampled: 06-17-94
Date Received: 06-20-94
Date Analyzed: 06-29-94
Matrix: Water
Sample Identification:

Lab ID:		
	94-04241	MW4
	94-04242	MW8
	94-04243	MW9
	94-04244	Co-op Well
	94-04245	Field Blank
	94-04246	Field Duplicate

Samples were analyzed according to method GRO. The results are reported on the following page.

Sincerely,

Chad Holznagel 6/30

Chad Holznagel
Chemist

Parameter:	MTBE	Benzene	Toluene	Ethyl Benzene	Xylenes	Total Hydrocarbons as GRO
Units	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(mg/L)
Method Detection Limit	10.0	1.0	1.0	1.0	3.0	0.1
Sample Number						
94-04241 MW4	3074	214	28	26	27	7.0
94-04242 MW8	BDL	BDL	BDL	BDL	BDL	BDL
94-04243 MW9	BDL	BDL	BDL	BDL	3.1	BDL*
94-04244 Co-op Well	BDL	BDL	BDL	BDL	BDL	BDL
94-04245 Field Blank		BDL	BDL	BDL	BDL	BDL
94-04246 Field Duplicate		BDL	BDL	BDL	BDL	BDL

BDL = Below Detection Limit
* = Peaks present in range but below detection limit.

MIDWEST ANALYTICAL SERVICES

330 SO. CLEVELAND ST.
P.O. BOX 349
CAMBRIDGE, MN 55008

CHAIN OF CUSTODY RECORD
AND
REQUEST FOR ANALYSIS
(Instructions on Back of Form)

No. 10140

LAB (612) 689-2175
METRO (612) 444-9270
FAX (612) 689-3660

CLIENT: GME

SAMPLER NAME: Jay BreKke

PROJECT I.D.: C-2373-B

SAMPLER SIGNATURE: Jay Brekke

REPORTS TO BE SENT TO:

REMARKS:

SHADED AREAS FOR LABORATORY USE ONLY

NO. OF CONTAINERS	COMP.	GRAB	DATE	TIME	MATRIX: WATER	MATRIX: SOIL	MATRIX: OTHER	SAMPLE IDENTIFICATION: SAMPLE	SAMPLE NO.	LABORATORY I.D. NO.	GRO (Includes BTEX)	DRO	BTEX	VOC (465-D)	pH	Pb (Diss. or Total)	RCRA 8 METALS	BOD or CBOD	TSS	FCOL or TCOL	MTBE	PRESERVATIVE: HCl	HNO3	H2SO4	ICE	01-4
4			6/17		X			MW4		94-0241	X	X									X	3				
4					X			MW8		0242	X	X									X	3				
4					X			MW9		4243	X	X									X	3				
4					X			Co-Op Well		4244	X	X									X	3				
3					X			Field Blank		4245	X											3				
3			↓		X			Field Duplicate		4246	X											3				
								Not Run as per Jay Brekke 6/20/94																			

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Jay Brekke	6/17/94				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received by: Laboratory by: (Signature)	Date / Time	Temperature:	Comments:
	6/20 11:30		6/20/94 11:22	ICE	

CHECK HERE FOR DRINKING WATER DETECTION LIMITS ☐

TURNAROUND TIME REQUIRED:
☒ NORMAL ☐ RUSH
DATE REQUIRED:

330 SO. CLEVELAND ST.
P.O. BOX 349
CAMBRIDGE, MN 55008

MIDWEST ANALYTICAL SERVICES

MINNESOTA CERTIFIED LABORATORY
NUMBER 027-059-156

LAB (612) 689-2175
METRO (612) 444-9270
FAX (612) 689-3660

June 2, 1994

Jay Brekke
GME Consultants, Inc.
P.O. Box 250
Crosby, MN 56441

Project ID: Dittmer Oil Co. C-2373-B
Chain of Custody: 7054
Date Received: 05-23-94
Date Analyzed: 06-01-94
Matrix: Water

Sample Identification:			Date Sampled:
Lab ID:	94-03381	MW4	05-19-94
	94-03382	MW6	05-19-94
	94-03383	MW9	05-19-94
	94-03384	CO-OP-A	05-18-94
	94-03385	CO-OP-B	05-19-94
	94-03386	Field Blank	05-19-94
	94-03387	Field Duplicate	05-19-94

Samples were analyzed according to methods GRO and DRO. Samples were analyzed for lead by atomic absorption spectrophotometry. The results are reported on the following pages.

Sincerely,

6/2

Neil Weberg
Chemist

Sincerely,

6/2

Chad Holznagel
Chemist

Parameter:	Benzene	Toluene	Ethyl Benzene	Xylenes	Total Hydrocarbons as GRO	DRO
Units	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(mg/L)	(mg/L)
Method Detection Limit	1.0	1.0	1.0	3.0	0.1	0.1
Sample Number						
94-03381 MW4	185	88.9	23.0	203	6.0	0.4
94-03382 MW6	BDL	BDL	BDL	BDL	BDL	BDL
94-03383 MW9	BDL	2.3	1.6	10.1	0.5	BDL*
94-03384 CO-OP-A	BDL	1.1	BDL	BDL	0.3	BDL
94-03385 CO-OP-B	BDL	3.0	1.1	5.6	0.4	BDL
94-03386 Field Blank	BDL	BDL	BDL	BDL	BDL	
94-03387 Field Duplicate	173	93.4	23.7	210	5.8	

BDL = Below Detection Limit
* = Peaks present in range but below detection limit.

Parameter:	Dissolved Lead* (mg/L)	Date Analyzed
94-03381 MW4	<0.001	06-01-94
94-03382 MW6	<0.001	06-01-94
94-03383 MW9	<0.001	06-01-94
94-03384 CO-OP-A	<0.001	06-01-94
94-03385 CO-OP-B	<0.001	06-01-94

*0.45 µm filtered

NOTE: Samples will be retained 30 days from the date of report or until the holding time for analyzed parameters expires, whichever comes first. Samples will be returned if requested within that time.

MIDWEST ANALYTICAL SERVICES

330 SO. CLEVELAND ST.
P.O. BOX 349
CAMBRIDGE, MN 55008

CHAIN OF CUSTODY RECORD
AND
REQUEST FOR ANALYSIS
(Instructions on Back of Form)

No 7054

LAB (612) 689-2175
METRO (612) 444-9270
FAX (612) 689-3660

CLIENT: GME
SAMPLER NAME: Jay Brekke
PROJECT I.D.: Dittmer Oil Co. C-2373-B
SAMPLER SIGNATURE: Jay Brekke
REPORTS TO BE SENT TO: GME - Crosby
REMARKS:

SHADED AREAS FOR LABORATORY USE ONLY

NO. OF CONTAINERS	COMP.	GRAB	DATE	TIME	MATRIX: WATER	SOIL	OTHER	SAMPLE IDENTIFICATION: SAMPLE	SAMPLE NO.	LABORATORY I.D. NO.	GRO (Includes BTEX)	DRO	BTEX	VOC (465-D)	pH	Pb (DISS. OR TOTAL)	RCRA 8 METALS	BOD OR CBOD	TSS	FCOL OR TCOL	PRESERVATIVE: HCl	HNO3	H2SO4	ICE	C
4			5/19/94		X			MW4		9403381	X	X				X									
4			↓		X			MW6		3382	X	X				X									
4			↓		X			MW9		3383	X	X				X									
4			5/18		X			CO-OP - A		3384	X	X				X									
4			5/19		X			CO-OP - B		3385	X	X				X									
2			↓		X			Field Blank		3386	X														
2			↓		X			Field Duplicate		3387	X														

Note: Dissolved Lead Samples are unpreserved and unfiltered.

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Jay Brekke	5/19/94				
	5/20/94				
		Received for Laboratory by: (Signature)	Date / Time: 5/23/94 09:17	Cr	Temperature: 3.4°C

Comments:

CHECK HERE FOR DRINKING WATER DETECTION LIMITS ☐

TURNAROUND TIME REQUIRED:
☒ NORMAL ☐ RUSH

DATE REQUIRED:

330 SO. CLEVELAND ST.
P.O. BOX 349
CAMBRIDGE, MN 55008

MIDWEST ANALYTICAL SERVICES

MINNESOTA CERTIFIED LABORATORY
NUMBER 027-059-156

LAB (612) 689-2175
METRO (612) 444-9270
FAX (612) 689-3660

June 6, 1994

Jay Brekke
GME Consultants, Inc.
P.O. Box 250
Crosby, MN 56441

Project ID: Dittmer Oil C-2373-B
Chain of Custody: 7051
Date Sampled: 05-19-94
Date Received: 05-23-94
Date Analyzed: See below
Matrix: ~~Water~~ Soil
Sample Identification:
Lab ID: 94-03388 SP-1

Sample was analyzed according to methods GRO and DRO. Sample was analyzed for lead by atomic absorption spectrophotometry. The results are reported on the following page.

Sincerely,

Lon Jones
Senior Chemist

Sincerely,

Chad Holznagel
Chemist

Date Analyzed: 06-02-94 Parameter:	Benzene	Toluene	Ethyl Benzene	Xylenes	Total Hydrocarbons as GRO	Total Hydrocarbons as DRO	Percent Moisture
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(%)
Method Detection Limit	0.050	0.050	0.050	0.150	10.0	10.0	
Sample Number							
94-03388 SP-1	BDL	0.195	BDL	BDL	74.7	6190	11.2

BDL = Below Detection Limit

NOTE: Weight mL GRO and DRO is assumed to be 25 g. Containers not from Midwest Analytical Services.

Parameter:	Lead (mg/kg)	Date Analyzed
94-03388 SP-1	15.4	06-02-94

NOTE: Samples will be retained 30 days from the date of report or until the holding time for analyzed parameters expires, whichever comes first. Samples will be returned if requested within that time.

MIDWEST ANALYTICAL SERVICES

330 SO. CLEVELAND ST.
P.O. BOX 349
CAMBRIDGE, MN 55008

CHAIN OF CUSTODY RECORD
AND
REQUEST FOR ANALYSIS
(Instructions on Back of Form)

No. 7051

LAB (612) 689-2175
METRO (612) 444-9270
FAX (612) 689-3660

CLIENT: GME
SAMPLER NAME: Jay Brekke
PROJECT I.D.: Ditney Oil C-2373-B
SAMPLER SIGNATURE: Jay Brekke
REPORTS TO BE SENT TO: GME Crosby
REMARKS:

SHADED AREAS FOR LABORATORY USE ONLY

NO. OF CONTAINERS	COMP.	GRAB	DATE	TIME	MATRIX: WATER	MATRIX: SOIL	MATRIX: OTHER	SAMPLE	SAMPLE NO.	LABORATORY I.D. NO.	GRO (Includes BTEX)	DRO	BTEX	VOC (465-D)	pH	Pb (DISS. OR TOTAL)	RCRA 8 METALS	BOD OR CBOD	TSS	FCOL OR TCOL	PRESERVATIVE: HCl	PRESERVATIVE: HNO3	PRESERVATIVE: H2SO4	PRESERVATIVE: ICE	PRESERVATIVE: OTHER
			5/19/94			X		SP-1		94-03388	X	X				X									

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Jay Brekke	5/19/94				
	5/20/94				
		Received for Laboratory by: (Signature)	Date / Time: 5/23/94 10:20	Temperature: 3.4°C	Comments:

CHECK HERE FOR DRINKING WATER DETECTION LIMITS ☐

TURNAROUND TIME REQUIRED:
☒ NORMAL ☐ RUSH
DATE REQUIRED:

330 SO. CLEVELAND ST.
P.O. BOX 349
CAMBRIDGE, MN 55008

MIDWEST ANALYTICAL SERVICES

MINNESOTA CERTIFIED LABORATORY
NUMBER 027-059-156

LAB (612) 689-2175
METRO (612) 444-9270
FAX (612) 689-3660

June 6, 1994

Jay Brekke
GME Consultants, Inc.
P.O. Box 250
Crosby, MN 56441

Project ID: Dittmer Oil C-2373-B
Chain of Custody: 7050
Date Sampled: 05-19-94
Date Received: 05-23-94
Date Analyzed: See below
Matrix: Water
Sample Identification:
Lab ID: 94-03380 MW8

Sample was analyzed according to method GRO. Sample was analyzed for lead by atomic absorption spectrophotometry. The results are reported on the following page.

Sincerely,

Lon Jones
Senior Chemist

Sincerely,

Chad Holznagel
Chemist

Date Analyzed: 06-02-94 Parameter:	Benzene	Toluene	Ethyl Benzene	Xylenes	Total Hydrocarbons as GRO
Units	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(mg/L)
Method Detection Limit	1.0	1.0	1.0	3.0	0.1
Sample Number					
94-03380 MW8	BDL	BDL	BDL	BDL	BDL

BDL = Below Detection Limit

Parameter:	Dissolved Lead* (mg/L)	Date Analyzed
94-03380 MW8	<0.001	06-01-94

*0.45 µm filtered

NOTE: Samples will be retained 30 days from the date of report or until the holding time for analyzed parameters expires, whichever comes first. Samples will be returned if requested within that time.

MIDWEST ANALYTICAL SERVICES

330 SO. CLEVELAND ST.
P.O. BOX 349
CAMBRIDGE, MN 55008

CHAIN OF CUSTODY RECORD
AND
REQUEST FOR ANALYSIS
(Instructions on Back of Form)

No. 7050

LAB (612) 689-2175
METRO (612) 444-9270
FAX (612) 689-3660

CLIENT: GME

SAMPLER NAME: Jay Brekke

PROJECT I.D.: Dettmer Oil C-2373-B

SAMPLER SIGNATURE: Jay Brekke

REPORTS TO BE SENT TO: GME - Crosby

REMARKS:

SHADED AREAS FOR LABORATORY USE ONLY

NO. OF CONTAINERS	COMP.	GRAB	DATE	TIME	MATRIX: WATER	SOIL	OTHER	SAMPLE	SAMPLE NO.	LABORATORY I.D. NO.	GRO (Includes BTEX)	DRO	BTEX	VOC (465-D)	pH	Pb (DISS. OR TOTAL)	RCRA 8 METALS	BOD OR CBOD	TSS	FCOL OR TCOL	PRESERVATIVE: HCl	HNO3	H2SO4	ICE	OTHER
3			5/19		X			MW8		94-2382	X					X									

Note: Lead is unfiltered and unpreserved

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Jay Brekke	5/19/94				
	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Cr	Temperature:
			5/23/94 09:04		3.4°C

Comments:

CHECK HERE FOR DRINKING WATER DETECTION LIMITS ☐

TURNAROUND TIME REQUIRED:
☒ NORMAL ☐ RUSH
DATE REQUIRED: ____

330 SO. CLEVELAND ST.
P.O. BOX 349
CAMBRIDGE, MN 55008

MIDWEST ANALYTICAL SERVICES

MINNESOTA CERTIFIED LABORATORY
NUMBER 027-059-156

LAB (612) 689-2175
METRO (612) 444-9270
FAX (612) 689-3660

June 2, 1994

Jay Brekke
GME Consultants, Inc.
P.O. Box 250
Crosby, MN 56441

Project ID: Dittmer Oil C-2373-B
Chain of Custody: 7053
Date Sampled: 05-17-94
Date Received: 05-19-94
Date Analyzed: See below
Matrix: Water
Sample Identification:

Lab ID:		
	94-03316	MW1
	94-03317	MW2
	94-03318	MW3
	94-03319	MW4
	94-03320	MW5
	94-03321	MW6
	94-03322	MW7
	94-03323	MW9
	94-03324	Field Blank
	94-03325	Field Duplicate

Samples were analyzed according to methods GRO, DRO and 465-D. Samples were analyzed for lead by atomic absorption spectrophotometry. The results are reported on the following pages.

Sincerely,

6/2

Neil Weberg
Chemist

Sincerely,

6/2

Chad Holznagel
Chemist

Date Analyzed: 05-31-94 Parameter:	Benzene	Toluene	Ethyl Benzene	Xylenes	Total Hydrocarbons as GRO	Total Hydrocarbons as DRO
Units	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(mg/L)	(mg/L)
Method Detection Limit	1.0	1.0	1.0	3.0	0.1	0.1
Sample Number						
94-03316 MW1	BDL	1.5	BDL	BDL	BDL*	BDL
94-03317 MW2	15200	6610	710	3510	38.9	1.7
94-03318 MW3	BDL	1.2	BDL	5.8	BDL*	
94-03319 MW4	259	156	37.0	303	8.5	0.6
94-03320 MW5	45.2	17.5	7.1	8.7	0.8	0.1
94-03321 MW6	BDL	BDL	BDL	5.1	BDL*	
94-03322 MW7	422	89.3	379	370	14.5	1.3
94-03323 MW9						BDL*
94-03325 Field Duplicate	7710	5560	660	3250	35.3	

BDL = Below Detection Limit
* = Peaks present in range but below detection limit.

Parameter:	Dissolved Lead* (mg/L)	Date Analyzed
94-03316 MW1	<0.001	06-01-94
94-03317 MW2	0.002	06-01-94
94-03318 MW3	<0.001	06-01-94
94-03319 MW4	<0.001	06-01-94
94-03320 MW5	<0.001	06-01-94
94-03321 MW6	<0.001	06-01-94
94-03322 MW7	0.001	06-01-94
94-03323 MW9	<0.001	06-01-94

*0.45 µm filtered

NOTE: Samples will be retained 30 days from the date of report or until the holding time for analyzed parameters expires, whichever comes first. Samples will be returned if requested within that time.

Date Analyzed: 05-31-94 LAB ID:	(µg/L) DETECTION LIMITS	(µg/L) 94-03323 MW9	(µg/L) 94-03324 Field Blank
Dichlorodifluoromethane	2.0	BDL	BDL
Chloromethane	1.0	BDL	BDL
Vinyl chloride	1.0	BDL	BDL
Bromomethane	1.0	BDL	BDL
Chloroethane	1.0	BDL	BDL
Dichlorofluoromethane	2.0	BDL	BDL
Trichlorofluoromethane	1.2	BDL	BDL
Ethyl ether	2.0	18.5*	6.7*
Acetone	7.0	BDL	BDL
1,1-Dichloroethene	1.0	BDL	BDL
Methylene chloride	1.0	BDL	BDL
Allyl chloride	1.4	BDL	BDL
Trichlorotrifluoroethane	1.5	BDL	BDL
Methyl tert-butyl ether	1.0	BDL	BDL
trans-1,2-Dichloroethene	1.0	BDL	BDL
1,1-Dichloroethane	1.0	BDL	BDL
Methyl ethyl ketone	7.0	BDL	BDL
cis-1,2-Dichloroethene	1.0	BDL	BDL
Bromochloromethane	1.0	BDL	BDL
Chloroform	1.0	BDL	BDL
2,2-Dichloropropane	1.0	BDL	BDL
Tetrahydrofuran	6.0	BDL	BDL
1,2-Dichloroethane	1.0	BDL	BDL
1,1,1-Trichloroethane	1.0	BDL	BDL
1,1-Dichloropropene	1.0	BDL	BDL
Carbon tetrachloride	1.0	BDL	BDL
Benzene	1.0	BDL	BDL
Dibromomethane	1.0	BDL	BDL
1,2-Dichloropropane	1.0	BDL	BDL
Trichloroethene	1.0	BDL	BDL
Bromodichloromethane	1.0	BDL	BDL
cis-1,3-Dichloropropene	1.0	BDL	BDL
Methyl isobutyl ketone	1.7	3.3	BDL
trans-1,3-Dichloropropene	1.0	BDL	BDL

BDL = Below Detection Limit
* = Lab contamination

Date Analyzed: 05-31-94

LAB ID:	(µg/L) DETECTION LIMITS	(µg/L) 94-03323 MW9	(µg/L) 94-03324 Field Blank
1,1,2-Trichloroethane	1.0	BDL	BDL
Toluene	1.0	BDL	BDL
1,3-Dichloropropane	1.0	BDL	BDL
Dibromochloromethane	1.0	BDL	BDL
1,2-Dibromoethane	1.0	BDL	BDL
Tetrachloroethene	1.0	BDL	BDL
1,1,1,2-Tetrachloroethane	1.0	BDL	BDL
Chlorobenzene	1.0	BDL	BDL
Ethylbenzene	1.0	BDL	BDL
m- and p-Xylene	1.5	BDL	BDL
Bromoform	1.0	BDL	BDL
Styrene	2.0	BDL	BDL
O-Xylene	1.5	BDL	BDL
1,1,2,2-Tetrachloroethane	1.0	BDL	BDL
1,2,3-Trichloropropane	1.0	BDL	BDL
Isopropyl benzene	1.0	BDL	BDL
Bromobenzene	1.0	BDL	BDL
n-Propyl benzene	1.0	BDL	BDL
2-Chlorotoluene	1.0	BDL	BDL
4-Chlorotoluene	1.0	BDL	BDL
1,3,5-Trimethylbenzene	1.2	BDL	BDL
tert-Butyl benzene	1.0	BDL	BDL
1,2,4-Trimethylbenzene	1.0	BDL	BDL
sec-Butyl benzene	1.0	BDL	BDL
1,3-Dichlorobenzene	1.0	BDL	BDL
1,4-Dichlorobenzene	1.0	BDL	BDL
p-Isopropyl toluene	1.0	BDL	BDL
1,2-Dichlorobenzene	1.0	BDL	BDL
n-Butyl benzene	1.0	BDL	BDL
1,2-Dibromo-3-chloropropane	2.0	BDL	BDL
1,2,4-Trichlorobenzene	1.0	BDL	BDL
Naphthalene	3.0	BDL	BDL
Hexachlorobutadiene	1.1	BDL	BDL
1,2,3-Trichlorobenzene	2.0	BDL	BDL

BDL = Below Detection Limit

MIDWEST ANALYTICAL SERVICES

330 SO. CLEVELAND ST.
P.O. BOX 349
CAMBRIDGE, MN 55008

CHAIN OF CUSTODY RECORD
AND
REQUEST FOR ANALYSIS
(Instructions on Back of Form)

№ 7053

LAB (612) 689-2175
METRO (612) 444-9270
FAX (612) 689-3660

CLIENT: GME - Crosby
SAMPLER NAME: Jay BreKKe
PROJECT I.D.: Pittmer Oil C-2373-B
SAMPLER SIGNATURE: Jay Brekke
REPORTS TO BE SENT TO:
REMARKS:

SHADED AREAS FOR LABORATORY USE ONLY

NO. OF CONTAINERS	COMP.	GRAB	DATE	TIME	MATRIX: WATER	MATRIX: SOIL	MATRIX: OTHER	SAMPLE IDENTIFICATION: SAMPLE	SAMPLE NO.	LABORATORY I.D. NO.	GRO (Includes BTEX)	DRO	BTEX	VOC (465-D)	pH	Pb (DISS. OR TOTAL)	RCRA 8 METALS	BOD OR CBOD	TSS	FCOL OR TCOL	PRESERVATIVE: HCl	HNO3	H2SO4	ICE	ER
4			5/17/94		X			MW1		94-0316	X	X				X									
4					X			MW2		3317	X	X				X									
4 3					X			MW3		3318	X	X				X									
4					X			MW4		3319	X	X				X									
4					X			MW5		3320	X	X				X									
4 3					X			MW6		3321	X	X				X									
4					X			MW7		3322	X	X				X									
4					X			MW9		3323		X		X		X									
2					X			Field Blank		3324				X											
2			↓		X			Field Duplicate		3325	X														
								Liters for MW3 & MW6																	
								Not Rec'd 5/19/94																	

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Jay Brekke	5/18/94				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time: 5/19/94 11:50	Cr	Temperature: ICE

Comments:

CHECK HERE FOR DRINKING WATER DETECTION LIMITS ☐

TURNAROUND TIME REQUIRED:
☒ NORMAL ☐ RUSH
DATE REQUIRED:

Interpoll Laboratories, Inc.
4500 Ball Road N.E.
Circle Pines, Minnesota 55014-1819

TEL: (612) 786-6020
FAX: (612) 786-7854

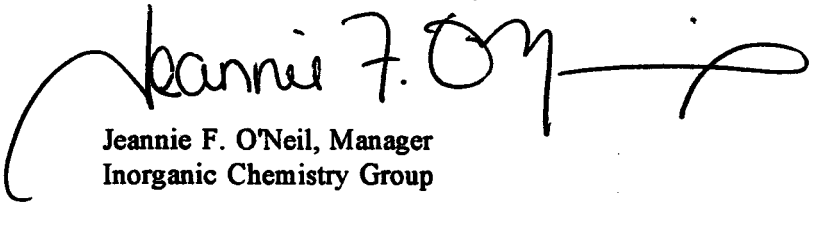
ANALYTICAL RESULTS
FOR GME CONSULTANTS, INC.
PROJECT #C-2373-B

Submitted to:

GME Consultants, Inc.
P.O. Box 250
Crosby, Minnesota 56441

Attention: Jay Brekke

Approved By:



Jeannie F. O'Neil, Manager
Inorganic Chemistry Group

Wayne A. Olson, Manager
Organic Chemistry Group

Laboratory Report #2912
June 7, 1994

PROJECT SUMMARY

The following laboratory report contains the analytical results for two soil samples and a methanol blank submitted to Interpoll Laboratories, Inc. (ILI) by GME Consultants, Inc. for GME's Project #C-2373-B. The samples were received on May 13, 1994 according to Interpoll Labs documented sample acceptance procedures. The samples were analyzed for the parameters requested on the Chain-of-Custody which accompanied the samples.

Sample Identificaiton	ILI Sample #
B20/MW9-SS2	2912-01
B20/MW9-SS4	2912-02
Field Blank	2912-03

Results are reported on a dry weight basis.

Footnotes:

[a]Although quantified as diesel range organics as requested, the chromatographic pattern more closely resembles that of a phthalate ester.

[b]Results are reported on an as received basis.

JFO/WAO/cg
BDL = below detection limit
Invoice Enclosed

Sample Identification: B20/MW9-SS2
Sample Type: Soil
Laboratory Log Number: 2912-01

Interpoll Laboratories, Inc.
Laboratory Report #2912
GME Consultants, Inc.

	Achieved Detection Limit (mg/Kg)	Analytical Result (mg/Kg)	Equivalent Method Blank
EPA Method 160.3:			
Total solids, %	0.1	80.8	
EPA Method SW-846-6010:			
Lead	6.7	6.7	BDL
EPA Method SW-846, 8020 :			
Benzene	0.030	BDL	BDL
Toluene	0.031	BDL	BDL
Ethylbenzene	0.020	BDL	BDL
Xylenes	0.087	BDL	BDL
Wisconsin DNR Method GRO:			
Gasoline range organics	0.80	0.93	BDL
Wisconsin DNR Method DRO:			
Diesel range organics	1.2	7.4 [a]	3.0

Sample Identification: B2/MW9-SS4
Sample Type: Soil
Laboratory Log Number: 2912-02

Interpoll Laboratories, Inc.
Laboratory Report #2912
GME Consultants, Inc.

	Achieved Detection Limit (mg/Kg)	Analytical Result (mg/Kg)	Equivalent Method Blank
EPA Method 160.3:			
Total solids, %	0.1	82.9	
EPA Method SW-846-6010:			
Lead	6.5	7.2	BDL
EPA Method SW-846, 8020 :			
Benzene	0.029	BDL	BDL
Toluene	0.030	BDL	BDL
Ethylbenzene	0.019	BDL	BDL
Xylenes	0.084	BDL	BDL
Wisconsin DNR Method GRO:			
Gasoline range organics	0.78	BDL	BDL
Wisconsin DNR Method DRO:			
Diesel range organics	1.2	8.1 [a]	2.9

Sample Identification: Field Blank
Sample Type: Methanol Blank
Laboratory Log Number: 2912-03

Interpoll Laboratories, Inc.
Laboratory Report #2912
GME Consultants, Inc.

	Target Detection Limit (mg/Kg)	Analytical Result (mg/Kg)	Equivalent Method Blank
Wisconsin DNR Method GRO:			
Gasoline range organics	0.65	BDL [b]	BDL

MIDWEST ANALYTICAL SERVICES

330 SO. CLEVELAND ST.
P.O. BOX 349
CAMBRIDGE, MN 55008

CHAIN OF CUSTODY RECORD
AND
REQUEST FOR ANALYSIS
(Instructions on Back of Form)

№ 7052

LAB (612) 689-2179
METRO (612) 444-9270
FAX (612) 689-3660

CLIENT: GME Consultants
SAMPLER NAME: Jay Brekke
PROJECT I.D.: C-2873-B
SAMPLER SIGNATURE: Jay Brekke
REPORTS TO BE SENT TO: Jay B. / Crosby
REMARKS:

SHADED AREAS FOR LABORATORY USE ONLY

NO. OF CONTAINERS	COMP.	GRAB	DATE	TIME	MATRIX: WATER	MATRIX: SOIL	MATRIX: OTHER	SAMPLE	SAMPLE NO.	LABORATORY I.D. NO.	GRO (Includes BTEX)	DRO	BTEX	VOC (465-D)	pH	Pb (DISS. OR TOTAL)	RCRA 8 METALS	BOD OR CBOD	TSS	FCOL OR TCOL	PRESERVATIVE: HCl	PRESERVATIVE: HNO3	PRESERVATIVE: H2SO4	PRESERVATIVE: ICE	PRESERVATIVE: OTHER
•			5/11/94			X		B20/MW9-SS2		2912-01	X	X				X									
			↓			X		B20/MW9-SS4		-02	X	X				X									
			↓				X	Field Blank		-03	X														

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Jay Brekke	5/12/94				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Contents Temperature:	Comments:
			5/13/94 0940		

CHECK HERE FOR DRINKING WATER DETECTION LIMITS ☐

TURNAROUND TIME REQUIRED:
☐ NORMAL ☐ RUSH

DATE REQUIRED: _____