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NORTHWEST REGION

RESULTS OF JANUARY 2001 GROUNDWATER SAMPLING EVENT

Tillamook Farmers Co-op
1920 Highway 101 North
Tillamook, Oregon
DEQ ECSIS No. 1410

Report Prepared For:

Tillamook Farmers Co-op
1920 Highway 101 North
Tillamook, Oregon 97141

Report Prepared By:

Bergeson-Boese & Associates, Inc.
29791 SW Kinsman Road
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March 15, 2001

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1.0 INTRODUCTION

On January 30, 2001, Bergeson-Boese & Associates, Inc. (BB&A) completed a groundwater monitoring event at the Tillamook Farmers Co-op (TFC) facility in Tillamook, Oregon. Nine (9) monitoring wells were sampled. Groundwater samples collected from those wells were analyzed for gasoline, lead (dissolved and total), and volatile organic compounds (VOCs). The results of that monitoring event are presented in this report. The sampling completed in January 2001 represents the third groundwater monitoring event completed since off-site monitoring wells MW-10 and MW-11 were installed in June 2000. On June 5, 2000, TFC and the Oregon Department of Environmental Quality (DEQ) entered into a voluntary agreement for a remedial investigation/feasibility study at the site. The January 2001 monitoring event was performed in accordance with a March 22, 2000 work plan prepared by BB&A.

Analyses for PAH compounds were not performed in January 2001 by prior agreement with the DEQ. Previous analyses had indicated that, with the exception of naphthalene, PAH compounds were not present at levels exceeding risk-based concentrations (RBCs) established for groundwater exposure pathways.

Temperature, pH, and conductivity measurements were not obtained as part of the well purging conducted in January 2001. Those measurements will be collected during future monitoring events.

BB&A's field technician did not purge monitoring well MW-8A in January 2001 due to the difficulty in obtaining a sufficient volume of water for sampling. The well is constructed of 3/4 inch diameter PVC and recharges slowly. In the future, monitoring well MW-8A will be purged dry prior to sampling. Samples will then be collected following well recharge.

Analyses of the groundwater samples collected in January 2001 revealed higher concentrations of gasoline and benzene in monitoring wells MW-6 and MW-9 relative to the concentrations detected in samples collected from those wells in June and October 2000. The increases in contaminant concentrations observed in monitoring wells MW-6 and MW-9 in January 2001 did not substantially change the configuration of the groundwater contaminant plume at TFC.

2.0 SITE INFORMATION

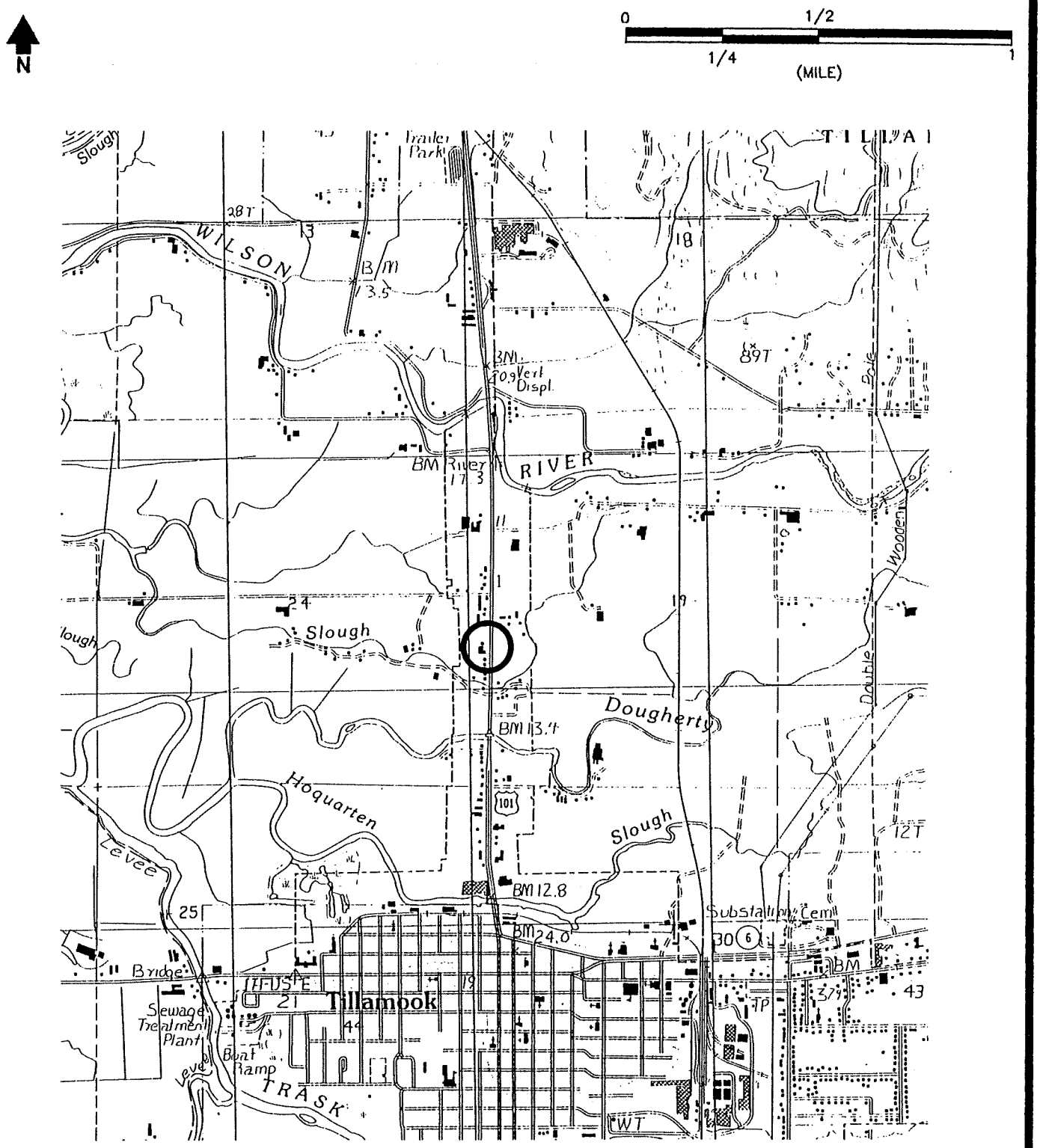
The subject facility is an operating retail service station and hardware store. The facility is located at 1920 Highway 101 North in Tillamook, Oregon. The legal description of the subject property is Tax Lot 1200, located in Section 24, Township 1 South, Range 10 West, Tillamook County. A site location map is presented as Figure 1. The subject facility is bordered immediately to the north by vacant land (formerly the Tillamook Inn), to the east by Highway 101 North, to the south by a residence, and to the west by a large, open pasture. The residence to the south is located over 300 feet from the existing TFC facility.

Restaurants and commercial businesses are located on the east side of Highway 101, directly across from the subject facility. These include a McDonald's restaurant, Oil Can Henry's (an automotive service shop), an undeveloped lot used by a local car dealership (Ford), and a Pizza Hut restaurant. A vicinity map showing the location of the subject facility with respect to surrounding properties is provided in Figure 2.

The subject facility is owned by TFC. Facility information is summarized below:

Facility Name:	Tillamook Farmers Co-op
Facility Address:	1920 Highway 101 North Tillamook, Oregon 97141
DEQ ECSIS No.:	1410
Facility Contact:	Bill Hoyt Tillamook Farmers Co-op 1920 Highway 101 North Tillamook, Oregon 97141 (503) 842-4457

The retail fueling portion of the facility consists of two (2) fuel islands, a diesel pump, and several above ground storage tanks (ASTs) which are located near the northwest corner of the property. The diesel pump is located next to the AST compound. Recently, the facility has expanded to the south to include properties formerly occupied by two (2) homes and a small market. Those properties are no longer occupied and have been cleared.



SITE LOCATION

FIGURE 1

OREGON

SOURCE: USGS TOPOGRAPHIC QUADRANGLE SERIES: 7.5 MINUTES, TILLAMOOK, OREGON

TILLAMOOK FARMERS COOP, 1920 Highway 101 N., Tillamook, OR

SITE LOCATION MAP

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Environmental Engineering

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Checked:	CHARLES SCHWARZ
Date:	6/10/98

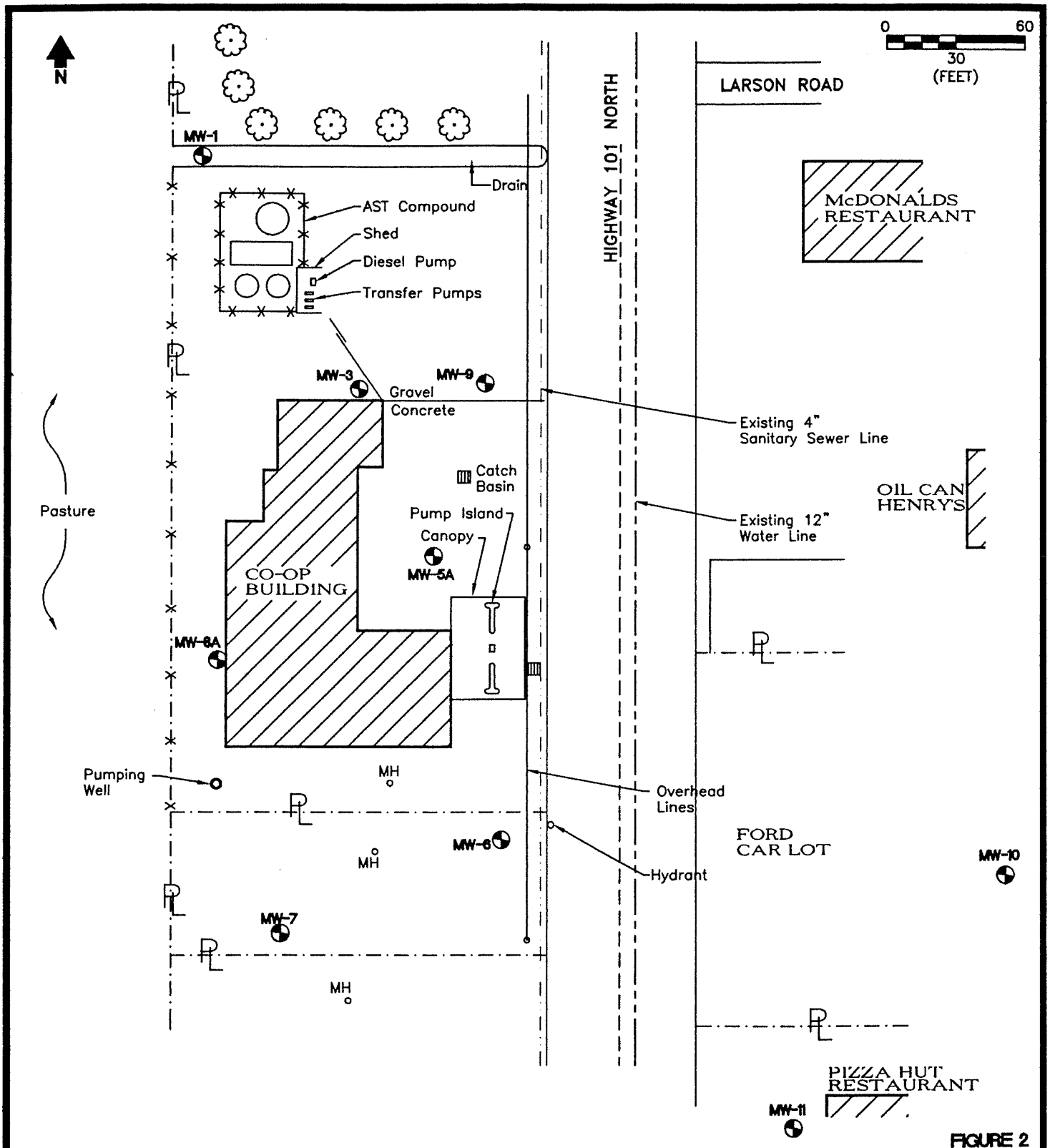

FIGURE 2

LEGEND

MH — Man Hole

MW-6 — Monitoring Well Location and Identification Number

TILLAMOOK FARMERS CO-OP, 1920 Highway 101 N., Tillamook, OR

VICINITY MAP

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3.0 HYDROGEOLOGIC SETTING

The subject facility is situated at an elevation of approximately 10 feet above mean sea level.[1] Tillamook Bay lies approximately 2.5 miles to the west of the site. Hall Slough, which is tidally influenced, is located approximately 400 feet to the south of the site. The Wilson River lies approximately 0.45 miles to the north/northwest of the site. The site topography is essentially level but with a slight dip to the north. The subject facility is also elevated approximately three (3) feet above the adjoining pasture along its western boundary.

The subject facility, and neighboring properties along Highway 101, appear to have been constructed upon a layer of gravel fill. Subsurface investigations performed by Neil Shaw indicate that the facility is underlain by a 30 to 60 inch layer of crushed rock. Neil Shaw reported encountering soft, low permeability clayey silt beneath that layer. Heterogeneous rocky fill material is thought to extend to the north of the site, onto the Tillamook Inn property. Native soils described as low permeability silt were found on property to the south of the facility and in the pasture to the west.

In March 1998, BB&A collected soil samples from several push probe borings drilled at the subject facility and also off-site, on the east side of Highway 101. A surficial layer of sandy gravel was encountered in 11 of the 13 borings that were completed. The thickness of that layer ranged from negligible to over three (3) feet. On the east side of Highway 101, the average thickness of the gravel layer was approximately two (2) feet. The gravel layer is potentially a controlling factor for contaminant migration given that the water table at the site has been measured at depths of less than 0.5 feet below land surface (BLS).

Eight (8) shallow monitoring wells were installed at the facility by Neil Shaw in October 1993. Depth-to-water measurements were collected from several of those wells by BB&A in October 1997 and April 1998. Those measurements, and measurements collected as part of subsequent monitoring events, have indicated the presence of a groundwater mound located to the north of the facility's fuel island with groundwater flowing radially outward from that location.

Monitoring wells MW-5A and MW-8A were installed in June 2000. Monitoring well MW-5, installed by Neil Shaw, was abandoned at that time.

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[1] From USGS Tillamook 7.5' quadrangle topographic map.

4.0 GROUNDWATER ANALYTICAL RESULTS

4.1 Water Table Measurements

Depth-to-water measurements were obtained on January 30, 2001, prior to collecting groundwater samples. A copy of the field data log listing those measurements is provided in Appendix A. Those measurements were subtracted from established reference elevations to determine the water table elevations which are presented in Table 1. A water table elevation contour map for the site, based upon those measurements, is presented in Figure 3. As shown on Figure 3, it appears that the direction of groundwater flow on January 30, 2001 was radially outward from a groundwater mound which is centered near monitoring well MW-5A. The pattern of groundwater flow observed in January 2001 is similar to that observed in previous monitoring events.

Table 1. Water Table Elevations
Tillamook Farmers Co-op

Depth to water measurements collected on January 30, 2001.
Elevations referenced to mean sea level.
Reference elevations are measured on north side of well casing rim.

Monitoring Well ID	Reference Elevation	Depth to Water	Water Table Elevation
MW-1	7.27	1.34	5.93
MW-3	9.27	0.45	8.82
MW-5A	9.10	0.88	8.22
MW-6	8.74	2.77	5.97
MW-7	9.01	2.83	6.18
MW-8A	10.76	2.79	7.97
MW-9	8.98	1.46	7.52
MW-10	10.83	4.05	6.78
MW-11	11.65	5.61	6.04

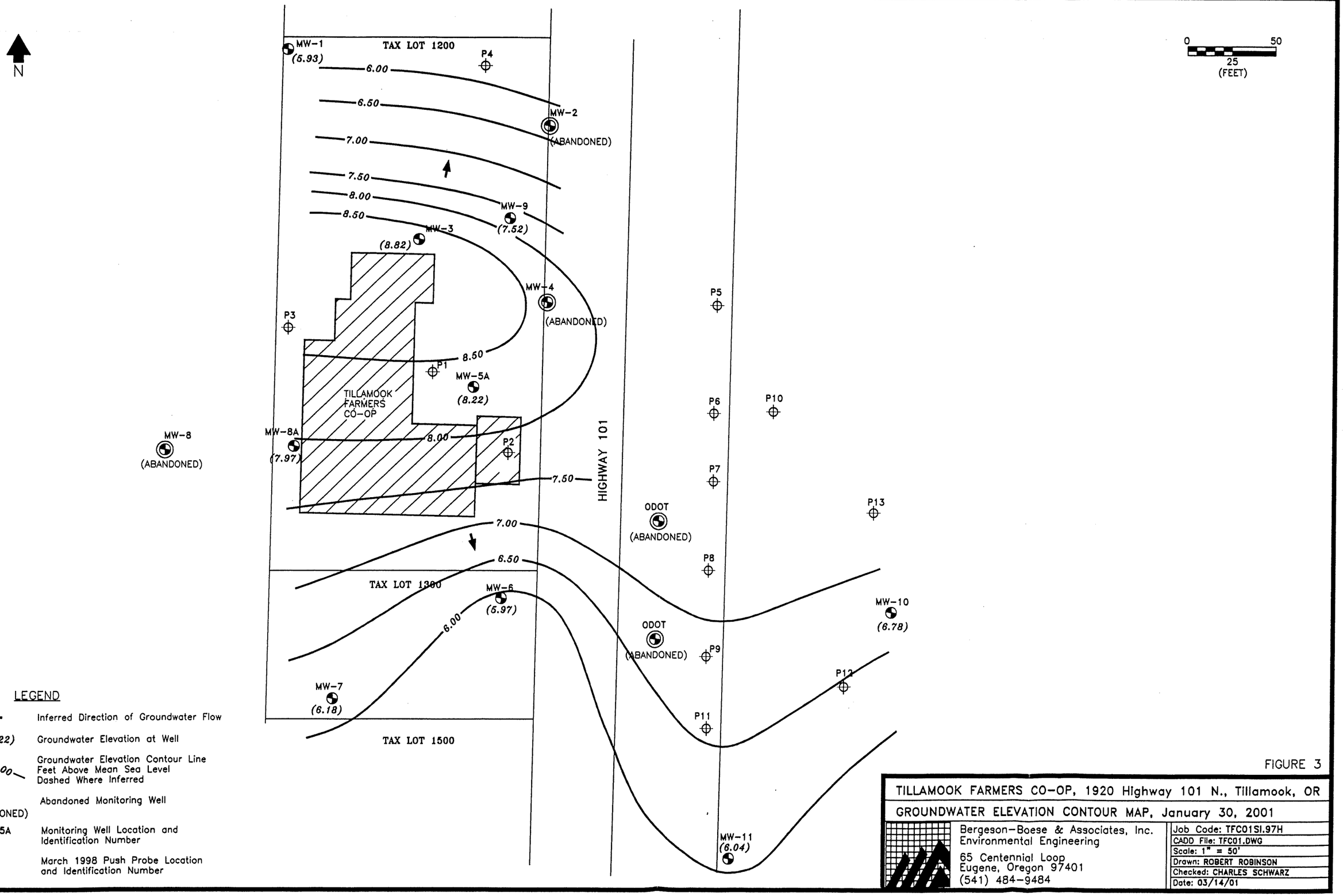

FIGURE 3

TILLAMOOK FARMERS CO-OP, 1920 Highway 101 N., Tillamook, OR

GROUNDWATER ELEVATION CONTOUR MAP, January 30, 2001

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4.2 Results of Groundwater Sample Analyses

The site monitoring wells were purged on January 30, 2001. With the exception of monitoring well MW-8A, all of the wells were purged using an electric submerisble pump. Monitoring well MW-8A, which is constructed of 3/4 inch diameter PVC, was not purged due to its slow recharge.[2] Free product was not observed in any of the monitoring wells.

Samples obtained for dissolved lead analysis were collected using a peristaltic pump and polyethylene tubing. Those samples were field filtered using a 0.45 micron filter. In addition to dissolved lead and total lead, the samples collected on January 30, 2001 were also analyzed for gasoline-range petroleum hydrocarbons and VOCs. By prior agreement with the DEQ, analyses for PAH compounds were not conducted in January 2001. The results of previous monitoring events had indicated that, with the exception of naphthalene, PAH compounds were not present at concentrations exceeding RBCs established for groundwater exposure pathways.

Groundwater samples were analyzed for both total and dissolved lead according to EPA Method 7421. Analyses for gasoline-range petroleum hydrocarbons were conducted using the NWTPH-Gx method. Analyses for VOCs were conducted according to EPA Method 5030/8260B. All of the groundwater samples were analyzed at Pacific Northwest Laboratories (PNL) in Eugene, Oregon. A copy of the laboratory report issued by PNL is provided in Appendix B. Partial summaries of the January 2001 groundwater analytical results are shown on Figure 4.

The results of the analyses for gasoline, dissolved lead, total lead and VOCs are presented below in Table 2. VOCs and gasoline-range petroleum hydrocarbons were not detected in monitoring wells MW-1, MW-7, MW-10, and MW-11. Gasoline was detected in monitoring wells MW-3, MW-5A, MW-6, MW-8A, and MW-9 at concentrations ranging from 1.5 to 110 ppm. Monitoring wells MW-5A and MW-6 contained the highest concentrations of gasoline, 110 and 75 parts per million (ppm), respectively.

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[2] In the future, monitoring well MW-8A will be purged using a peristaltic pump. The well will be purged dry prior to sampling.

N

0 50
25
(FEET)

MW-1 TAX LOT 1200
GASOLINE=(<0.25)
BENZENE=(<1)
MTBE=(<1)
NAPHTHALENE=(<5)

P4

MW-2
(ABANDONED)

GASOLINE=1.6
BENZENE=79
MTBE=2.5
NAPHTHALENE=22
TOTAL LEAD=<2

MW-3 GASOLINE=14
BENZENE=2,300
MTBE=260
NAPHTHALENE=140

MW-9

MW-4
(ABANDONED)

P3

P5

P1

MW-5A GASOLINE=110
BENZENE=18,000
MTBE=1,400
NAPHTHALENE=660
TOTAL LEAD=17

TILLAMOOK FARMERS CO-OP

MW-8A

P2

P6

P10

MW-8
(ABANDONED)

GASOLINE=1.5
BENZENE=460
MTBE=170
NAPHTHALENE=6.1
TOTAL LEAD=14

HIGHWAY 101

P7

ODOT
(ABANDONED)

P13

P8

TAX LOT 1300

MW-6
GASOLINE=75
BENZENE=110
MTBE=(<1)
NAPHTHALENE=670
TOTAL LEAD=45

MW-10
GASOLINE=(<0.25)
BENZENE=(<1)
MTBE=(<1)
NAPHTHALENE=(<5)

ODOT
(ABANDONED)

P9

P12

MW-7

P11

GASOLINE=(<0.25)
BENZENE=(<1)
MTBE=(1.3)
NAPHTHALENE=(<5)

TAX LOT 1500

MW-11
GASOLINE=(<0.25)
BENZENE=(<1)
MTBE=(<1)
NAPHTHALENE=(<5)

LEGEND

GASOLINE=110
BENZENE=18,000
MTBE=1,400
NAPHTHALENE=660
TOTAL LEAD=17

Groundwater Analytical Results as Indicated. Gasoline Concentrations in ppm (Parts Per Million), Benzene, MTBE, Naphthalene, and Total Lead Concentrations in ppb (Parts Per Billion)

(ABANDONED) Abandoned Monitoring Well

MW-5A Monitoring Well Location and Identification Number

P1 March 1998 Push Probe Location and Identification Number

FIGURE 4

TILLAMOOK FARMERS CO-OP, 1920 Highway 101 N., Tillamook, OR

GROUNDWATER ANALYTICAL RESULTS, January 30, 2001

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Checked:	CHARLES SCHWARZ
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Table 2. Groundwater Analytical Results-Gasoline, Dissolved Lead, and VOCs

Samples collected on January 30, 2001.
Gasoline concentrations are reported in mg/L (ppm).
VOCs, total lead, and dissolved lead concentrations are reported in μg/L (ppb).
(<5) = not detected at method reporting limit given in parentheses.

Parameter	Monitoring Well Samples									Lab Blank
	MW-1	MW-3	MW-5A	MW-6	MW-7	MW-8A	MW-9	MW-10	MW-11	
Gasoline	(<0.25)	1.6	110	75	(<0.25)	1.5	14	(<0.25)	(<0.25)	(<0.25)
Total Lead	NA	(<2)	17	45	NA	14	NA	NA	NA	(<2)
Dissolved Lead	NA	(<2)	5	(<2)	NA	6	NA	NA	NA	(<2)
Methyl tertiary butyl ether	(<1)	2.5	1,400	(<1)	1.3	170	260	(<1)	(<1)	(<1)
1,2-Dichloroethane	(<1)	(<1)	(<1)	(<1)	(<1)	(<1)	(<1)	(<1)	(<1)	(<1)
1,2-Dibromoethane	(<1)	(<1)	(<1)	(<1)	(<1)	(<1)	(<1)	(<1)	(<1)	(<1)
Benzene	(<1)	79	18,000	110	(<1)	460	2,300	(<1)	(<1)	(<1)
Toluene	(<1)	39	22,000	68	(<1)	110	1,400	(<1)	(<1)	(<1)
Ethylbenzene	(<1)	57	2,400	1,800	(<1)	19	560	(<1)	(<1)	(<1)
Xylenes	(<1)	310	17,000	6,700	(<1)	340	2,900	(<1)	(<1)	(<1)
Naphthalene	(<5)	22	660	670	(<5)	6.1	140	(<5)	(<5)	(<5)
iso-Propylbenzene	(<1)	5.7	83	170	(<1)	(<1)	34	(<1)	(<1)	(<1)
n-Propylbenzene	(<1)	13	190	390	(<1)	(<1)	78	(<1)	(<1)	(<1)
1,2,4-Trimethylbenzene	(<1)	180	2,400	3,000	(<1)	21	820	(<1)	(<1)	(<1)
1,3,5-Trimethylbenzene	(<1)	54	890	1,100	(<1)	12	190	(<1)	(<1)	(<1)

In January 2001, total lead concentrations in monitoring wells MW-3, MW-6, MW-5A, and MW-8A ranged from nondetect (ND) in monitoring well MW-3 to 45 parts per billion (ppb) in monitoring well MW-6. Dissolved lead concentrations in those water samples ranged from ND in monitoring well MW-3 to six (6) ppb in monitoring well MW-8A.

In January 2001, benzene concentrations in monitoring wells MW-3, MW-5A, MW-6, MW-8A, and MW-9 ranged from 79 ppb in MW-3 to 18,000 ppb in monitoring well MW-5A. MTBE concentrations in those monitoring wells ranged from 2.5 to 1,400 ppb. The highest concentration of MTBE was detected in monitoring well MW-5A.

5.0 EVALUATION OF ANALYTICAL RESULTS

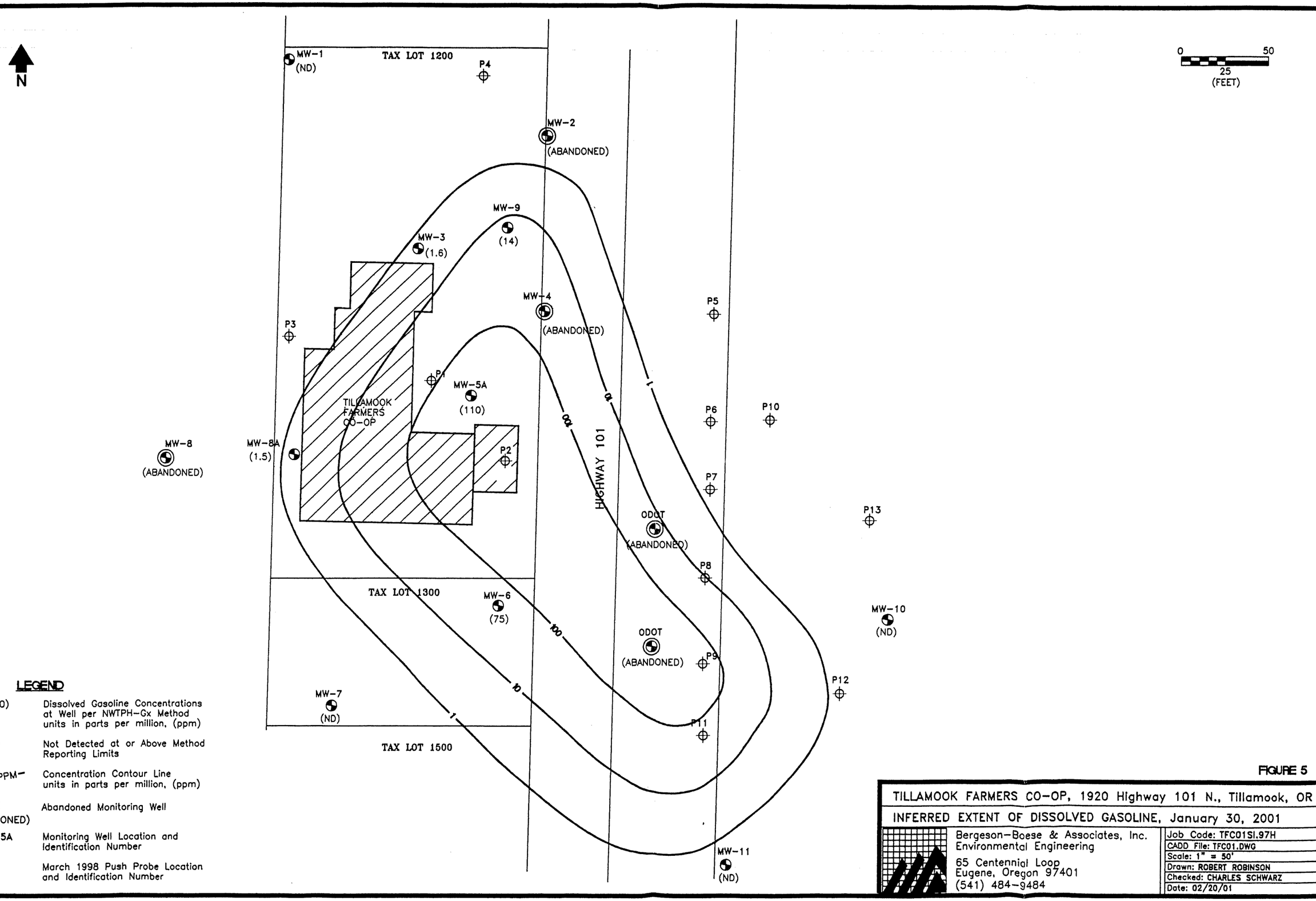
5.1 Contaminant Plume Evaluation

The gasoline analytical results for the groundwater samples collected on January 30, 2001 are plotted on Figure 5. The dissolved gasoline plume is inferred to extend to the southeast from monitoring well MW-5A. Analyses of samples collected from push probes in March 1998 are the basis for inferring that the plume extends across Highway 101 to the east. Although gasoline concentrations in monitoring wells MW-6, MW-8A, and MW-9 were higher in January 2001, the configuration of the gasoline groundwater contaminant plume did not change from that observed in June and October 2000.

The inferred extent of the benzene plume in January 2001 is shown in Figure 6. The data for benzene indicate a source area in the vicinity of monitoring well MW-5A, where benzene was detected at a concentration of 18,000 ppb. Groundwater samples collected from push probes P1 and P2 in March 1998 contained 15,000 and 29,000 ppb benzene, respectively.

The inferred extent of the MTBE plume is shown in Figure 7. The highest concentrations of MTBE have been detected in monitoring well MW-5A (1,300 ppb) and push probe P1 (1,400 ppb). The MTBE plume appears to have a northeast to southwest trend. The source of the MTBE release also appears to have been in the vicinity of monitoring well MW-5A.

Historical groundwater analytical results for monitoring wells MW-1, MW-3, MW-5, MW-5A, MW-6, MW-7, MW-8A, MW-9, MW-10, and MW-11 are summarized in table format in Appendix C.



LEGEND

(110)	Dissolved Gasoline Concentrations at Well per NWTPH–Gx Method units in parts per million, (ppm)
ND	Not Detected at or Above Method Reporting Limits
-10 PPM-	Concentration Contour Line units in parts per million, (ppm)
(ABANDONED)	Abandoned Monitoring Well
MW-5A	Monitoring Well Location and Identification Number
P1	March 1998 Push Probe Location and Identification Number

FIGURE 5

TILLAMOOK FARMERS CO-OP, 1920 Highway 101 N., Tillamook, OR

INFERRED EXTENT OF DISSOLVED GASOLINE, January 30, 2001

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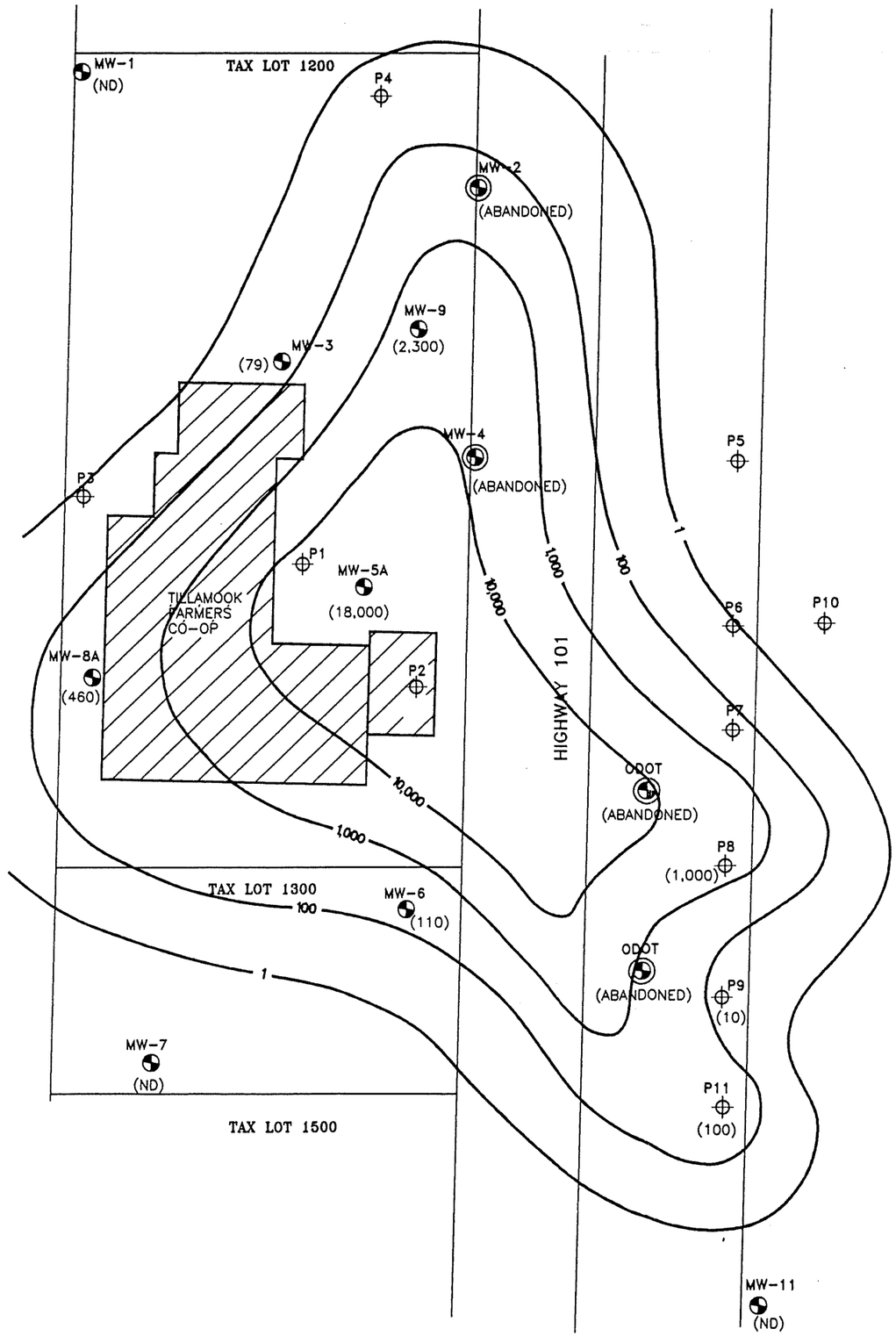
N

0 50
25
(FEET)



NOTE: RESULTS FOR PUSH PROBE BORINGS FROM MARCH 1998 INVESTIGATION. MONITORING WELL RESULTS ARE FROM JANUARY 2001.

LEGEND

(18,000)	Dissolved Benzene Concentrations at Well per EPA Method 5030/8260B units in parts per billion, (ppb)
ND	Not Detected at of Above Method Reporting Limits
–100 PPB–	Concentration Contour Line units in parts per billion, (ppb)
(ABANDONED)	Abandoned Monitoring Well
MW-5A	Monitoring Well Location and Identification Number
P1	March 1998 Push Probe Location and Identification Number

FIGURE 6

TILLAMOOK FARMERS CO-OP, 1920 Highway 101 N., Tillamook, OR

INFERRED EXTENT OF DISSOLVED BENZENE, January 30, 2001

Bergeson–Boese & Associates, Inc.
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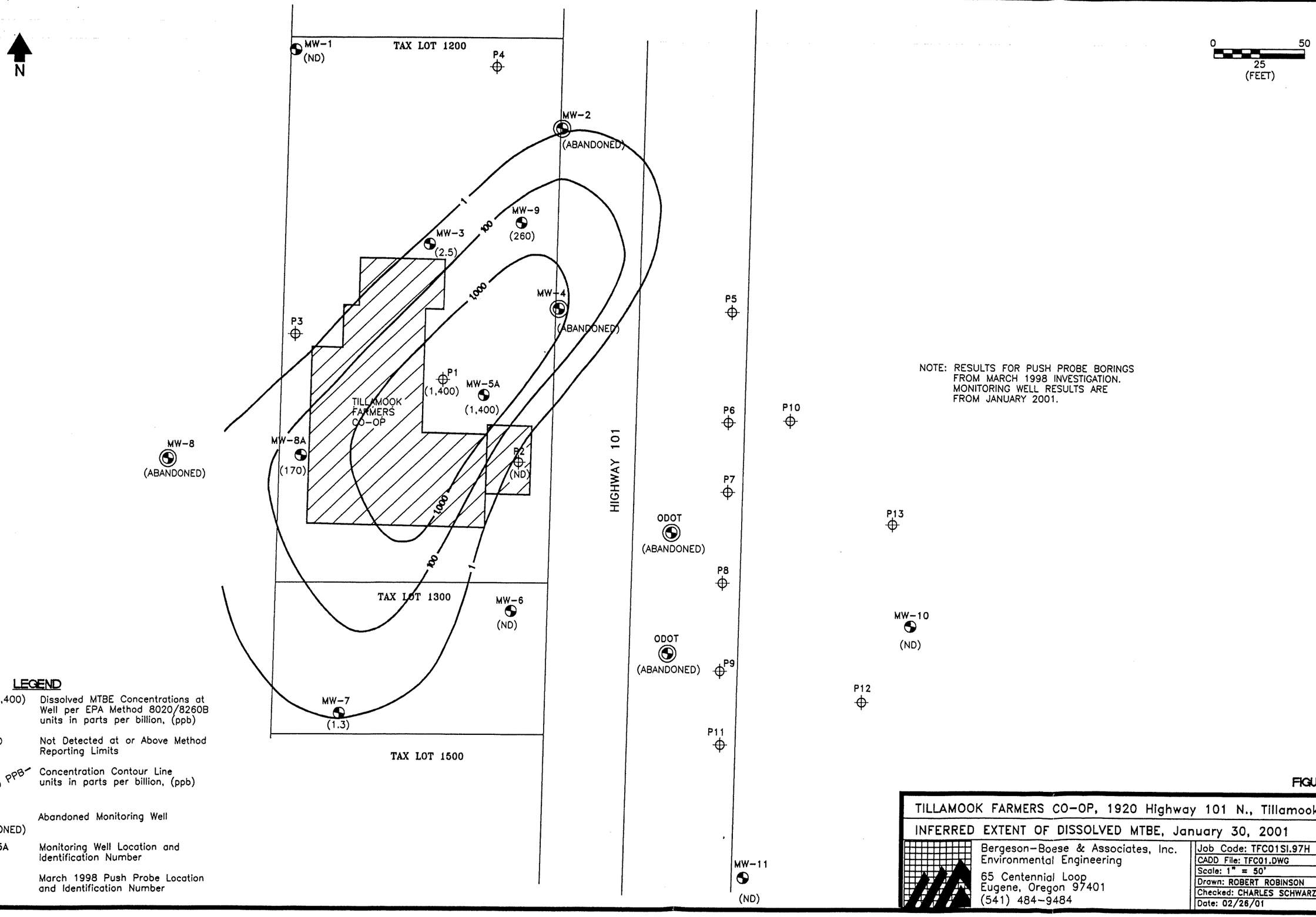

FIGURE 7

TILLAMOOK FARMERS CO-OP, 1920 Highway 101 N., Tillamook, OR

INFERRED EXTENT OF DISSOLVED MTBE, January 30, 2001

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5.2 Groundwater Contaminant Concentrations vs. RBCs

In Table 4, the analytical results for the January 30, 2001 groundwater sample collected from monitoring well MW-5A are compared with the occupational RBCs established for groundwater exposure pathways. If the groundwater ingestion and tapwater ingestion and inhalation exposure pathways are not considered applicable for this site then the contaminants-of-concern (COCs) would be reduced to benzene, naphthalene, and 1,3,5-trimethylbenzene. The concentration of benzene detected in monitoring well MW-5A exceeds occupational groundwater RBCs for volatilization to outdoor air, vapor intrusion into buildings, and groundwater in excavation. The concentrations of naphthalene and 1,3,5-trimethylbenzene in that well also exceed RBCs for the groundwater in excavation exposure pathway.

need the site beneficial use determination

6.0 SUMMARY AND RECOMMENDATIONS

A groundwater monitoring event was completed on January 30, 2001. The results of the groundwater sampling conducted at that time are summarized below:

1. Nine (9) monitoring wells were sampled as part of the January 2001 sampling event. Those samples were analyzed for gasoline-range petroleum hydrocarbons, total and dissolved lead, and VOCs.

2. In January 2001, depth to groundwater at the site ranged from 0.45 feet below land surface (BLS) in monitoring well MW-3 to 5.61 feet BLS in monitoring well MW-11. Depth to groundwater measurements collected at the time of sampling indicate that there is a groundwater mound in the vicinity of monitoring wells MW-3 and MW-5A and that groundwater flow is radially outward from that area.

3. Analyses of the January 2001 groundwater samples revealed gasoline at concentrations ranging from 1.5 ppm in monitoring well MW-8A to 110 ppm in monitoring well MW-5A. Gasoline was not detected in samples collected from off-site monitoring wells MW-1, MW-7, MW-10, and MW-11. The highest concentrations of benzene (18,000 ppb) and MTBE (1,400 ppb) were detected in samples collected from monitoring well MW-5A.

Table 3. Groundwater Risk-Based Concentrations

Occupational groundwater RBCs from DEQ September 1999 guidance document.
All concentrations in µg/L, parts per billion.
NA = not applicable.
(>S) = This groundwater RBC exceeds the limit of solubility. Concentrations in excess of this value indicate that free product might be present.
(=S) = Not a RBC. This contaminant cannot create an unacceptable risk by this pathway. Concentrations in excess of this value indicate that free product might be present.
Shading where concentration exceeds RBC.

Contaminants-of-Concern	January 2001 Groundwater Analytical Results for MW-5A µg/L	Groundwater Exposure Pathways				
		Ingestion	Volatilization to Outdoor Air	Vapor Intrusion Into Buildings	Tapwater Ingestion and Inhalation	Groundwater in Excavation
Total Lead	17	15	NA	NA	NA	NA
Dissolved Lead	5					
MTBE	1,400	20	51,000,000 (=S)	51,000,000 (=S)	20	240,000
1,2-Dichloroethane (EDC)	(<1)	1.4	4,200	1,700	0.32	280
1,2-Dibromoethane (EDB)	(<1)	0.0015	1,100	830	0.0014	8.6
Benzene	18,000	4.3	5,800	1,200	1.0	820
Toluene	22,000	8,900	530,000 (=S)	530,000 (=S)	1,000	30,000
Ethylbenzene	2,400	4,400	170,000 (=S)	170,000 (=S)	1,800	45,000
Xylenes	17,000	89,000	180,000 (=S)	180,000 (=S)	2,000	55,000
Naphthalene	660	890	31,000 (=S)	31,000 (=S)	8.7	240
iso-Propylbenzene	83	440	30,000 (=S)	30,000 (=S)	100	1,800
n-Propylbenzene	190	440	14,000 (=S)	14,000 (=S)	100	1,600
1,2,4-Trimethylbenzene	2,400	2,200 (>S)	260 (=S)	260 (=S)	23	260 (=S)
1,3,5-Trimethylbenzene	890	2,200	50,000 (=S)	18,000	23	630

4.) Elevated concentrations of gasoline and BTEX compounds observed in the groundwater sample collected from monitoring well MW-5A suggest the presence of free product in that area of the site, near the fuel island.

5.) The primary groundwater COC at the site appears to be benzene which is present at concentrations exceeding RBCs for the volatilization to outdoor air, vapor intrusion into buildings, and groundwater in excavation exposure pathways. Other COCs include naphthalene and 1,3,5-trimethylbenzene.

The next quarterly groundwater monitoring event has been tentatively scheduled for the month of April 2001.

7.0 LIMITATIONS

The professional services of Bergeson-Boese & Associates, Inc. have been rendered using the degree of care and skill ordinarily exercised under similar circumstances by reputable environmental consulting firms practicing in this or similar locations. No other warranty express or implied is made.

Groundwater samples were analyzed to identify and delineate surface and subsurface impact in areas most likely to have been impacted by releases and spills of petroleum products. The results of their analyses only indicate the presence or absence of petroleum hydrocarbons and hazardous constituents in those discrete sample locations. Analytical data from the laboratory samples should only be considered as indicators of site conditions and not a guarantee of the absence of petroleum hydrocarbons and hazardous constituents in areas not sampled.

The conclusions presented in this report are based only on the observations made during field investigation and data provided by others. The accuracy of these findings is based upon the accuracy of data and information provided by others. The findings of this assessment should not be considered as scientific certainties, but rather as professional opinion based upon selected and limited data.

If you have any questions concerning the information contained in this report, please do not hesitate to contact us.

Sincerely,
Bergeson-Boese & Associates, Inc.

Charles G. Schwarz, RG
Hydrogeologist

Randall J. Boese, RG
Senior Hydrogeologist

APPENDIX A

Field Data

Bergeson-Boese & Associates, Inc.
65 Centennial Loop • Eugene, Oregon 97401

GROUNDWATER SAMPLING FIELD DATA

PROJECT: TFC #151 - 974
DATE: 1/30/01
SAMPLER: RLB

- Water in CANAL - Full

3/4" = .023

D	X
When diameter of well (in inches) is:	The volume per linear foot (in gallons) is:
2	0.163 - .167
4	0.650
6	1.470

GENERALIZED EQUATION IS: $A = \pi r^2$; $V = \pi r^2 \cdot \frac{7.48 \text{ gal}}{\text{ft}^3}$ • height of water; V = X • h = gallons

MONITORING WELL		TIME		WELL DEPTH (WD) FROM TOP OF PVC (FEET)	DEPTH TO WATER (DTW) FROM TOP OF PVC (FEET)	H = TD - DTW (FEET)	PURGE VOLUME REQUIRED V = h·X·3	TEMP (°C)	COND. CORRECTED TO 25 °C	PH	REMARKS (i.e., total volume purged, clarity of water, recharge rate)
NO.	WELL DIAMETER (INCHES)	START	END								
1	2"	1140 A	1150 A	9.94	1.34 RISING	↑ 8.60	4.309	Pumped DRY		4.5 G.	Black/Clear/Slight
3	2"	1226 P	1245 P	7.75	.45	7.30	3.657	—	—	4.0 G.	Clear/ODOR
5A	2"	1255	120 P	8.87	.88	7.99	4.003	—	—	5 G	Black-gray/Clear/odor
6	2"	1015	1025	8.03	2.77	5.26	2.635	Pumped DRY		3. G.	Clear/odor/Sheen
7	2"	1042	1050	10.08	2.83	7.25	3.632	Pumped DRY		3. G.	Brown/Clear/Clear
8A	3/4"	940 A	950 A	10.80	2.79	8.01	.553	—	—	(No Purge)	Black-Clear-odor
9	2"	1204 P	1212	9.12	1.46	7.66	3.838	—	—	4.G.	LT. Brown/Clear/Slight
10	2"	1118	1123	9.81	4.05	5.76	2.885	—	—	5.G.	LT. Brown/Clear/Clear
11	2"	1102 A	1106 A	9.98	5.61	4.37	2.189	Pumped DRY		4.5 G.	LT. Brown/Clear/Clear

APPENDIX B

Laboratory Report and Chain of Custody Document

Pacific Northwest Laboratories

Environmental Analysis

65 Centennial Loop
Eugene, Oregon 97401

(541) 484-4493
Fax: (541) 484-4188

29791 SW Kinsman Road
Wilsonville, Oregon 97070

(503) 570-9436
Fax: (503) 570-0384

www.bergeson-boese.com

February 12, 2001

Tillamook Farmers Co-op
1920 Highway 101 North
Tillamook, OR 97141

RE: PNL Report Number: 2446
Client Project No.: TFC01SI.97H

Please find enclosed the report prepared for the laboratory analyses you requested.

The samples were received under a chain-of-custody. Soil samples analyzed using NWTPH methods are reported as dry weight. For all other methods results are reported as received.

Please contact us at the above address or phone number to obtain additional sample containers and coolers.

Thank you for selecting Pacific Northwest Laboratories for your analytical needs. We look forward to serving you in the future.

Sincerely,

Pacific Northwest Laboratories

Steven D. Castellano
Quality Assurance Manager

Enclosure

Pacific Northwest Laboratories
65 Centennial Loop
Eugene, Oregon 97401
(541) 484-4493 Fax: 484-4188

LABORATORY REPORT

PNL REPORT NUMBER: 2446

CLIENT: Tillamook Farmers Co-op
CLIENT PROJECT NUMBER: TFC01SI.97H
SITE LOCATION: 1920 Highway 101 North
Tillamook, Oregon 97141

ITEMS ANALYZED: 9 Water samples

DATE SAMPLES COLLECTED: January 30, 2001
DATE ANALYSIS COMPLETED: February 7, 2001
DATE SAMPLES DISCARDED: March 12, 2001

METHOD: NWTPH-Gx
Results and Method Reporting Limits (MRL) presented in mg/L (ppm)
ND = Compound not detected

SAMPLE I.D.	RESULT	MRL
TFC01-MW-1	ND	0.25
TFC01-MW-3	1.6	
TFC01-MW-5A	110	
TFC01-MW-6	75	
TFC01-MW-7	ND	0.25
TFC01-MW-8A	1.5	
TFC01-MW-9	14	
TFC01-MW-10	ND	0.25
TFC01-MW-11	ND	0.25
LAB BLANK	ND	0.25

Surrogate Recoveries
(4-Bromofluorobenzene)

SAMPLE ID	Percent	Acceptance Limits
TFC01-MW-1	103	50-150
TFC01-MW-3	103	
TFC01-MW-5A	103	
TFC01-MW-6	115	
TFC01-MW-7	111	
TFC01-MW-8A	102	
TFC01-MW-9	111	
TFC01-MW-10	109	
TFC01-MW-11	108	
LAB BLANK	103	

Pacific Northwest Laboratories
65 Centennial Loop
Eugene, Oregon 97401
(541) 484-4493 Fax: 484-4188

LABORATORY REPORT

PNL REPORT NUMBER: 2446

METHOD: Total Lead per EPA 7421
Results and Method Reporting Limits (MRL) presented in mg/L (ppm)
ND = Compound not detected

SAMPLE I.D.	RESULT	MRL
TFC01-MW-3	ND	0.002
TFC01-MW-5A	0.017	
TFC01-MW-6	0.045	
TFC01-MW-8A	0.014	
LAB BLANK	ND	0.002

METHOD: Dissolved Lead per EPA 7421
Results and Method Reporting Limits (MRL) presented in mg/L (ppm)
ND = Compound not detected

SAMPLE I.D.	RESULT	MRL
TFC01-MW-3	ND	0.002
TFC01-MW-5A	0.005	
TFC01-MW-6	ND	0.002
TFC01-MW-8A	0.006	
LAB BLANK	ND	0.002

Pacific Northwest Laboratories
65 Centennial Loop
Eugene, Oregon 97401
(541) 484-4493 Fax: 484-4188

LABORATORY REPORT

PNL REPORT NUMBER: 2446

METHOD: Volatile Organic Compounds per EPA Method 5030 / 8260B
Results and Method Reporting Limits (MRL) presented in ug/L (ppb)
ND = Compound not detected

COMPOUND	TFC01-MW-1 Result	MRL	TFC01-MW-3 Result	MRL	TFC01-MW-5A Result	MRL	TFC01-MW-6 Result	MRL
Methyl-tert-butylether (MTBE)	ND	1.0	2.5		1400		ND	1.0
1,2-Dichloroethane (EDC)	ND	1.0	ND	1.0	ND	25	ND	1.0
1,2-Dibromoethane (EDB)	ND	1.0	ND	1.0	ND	25	ND	1.0
Benzene	ND	1.0	79		18000		110	
Toluene	ND	1.0	39		22000		68	
Ethylbenzene	ND	1.0	57		2400		1800	
Xylenes (total)	ND	1.0	310		17000		6700	
Isopropylbenzene	ND	1.0	5.7		83		170	
n-Propylbenzene	ND	1.0	13		190		390	
1,3,5-Trimethylbenzene	ND	1.0	54		890		1100	
1,2,4-Trimethylbenzene	ND	1.0	180		2400		3000	
Naphthalene	ND	5.0	22		660		670	

COMPOUND	TFC01-MW-7 Result	MRL	TFC01-MW-8A Result	MRL	TFC01-MW-9 Result	MRL	TFC01-MW-10 Result	MRL
Methyl-tert-butylether (MTBE)	1.3		170		260		ND	1.0
1,2-Dichloroethane (EDC)	ND	1.0	ND	1.0	ND	1.0	ND	1.0
1,2-Dibromoethane (EDB)	ND	1.0	ND	1.0	ND	1.0	ND	1.0
Benzene	ND	1.0	460		2300		ND	1.0
Toluene	ND	1.0	110		1400		ND	1.0
Ethylbenzene	ND	1.0	19		560		ND	1.0
Xylenes (total)	ND	1.0	340		2900		ND	1.0
Isopropylbenzene	ND	1.0	ND	1.0	34		ND	1.0
n-Propylbenzene	ND	1.0	ND	1.0	78		ND	1.0
1,3,5-Trimethylbenzene	ND	1.0	12		190		ND	1.0
1,2,4-Trimethylbenzene	ND	1.0	21		820		ND	1.0
Naphthalene	ND	5.0	6.1		140		ND	5.0

(Continued on following page.)

Pacific Northwest Laboratories
65 Centennial Loop
Eugene, Oregon 97401
(541) 484-4493 Fax: 484-4188

LABORATORY REPORT

PNL REPORT NUMBER: 2446

METHOD: Volatile Organic Compounds per EPA 5030 / 8260B
Results and Method Reporting Limits (MRL) presented in ug/kg (ppb)
ND = Compound not detected

COMPOUND	TFC01-MW-11 Result	TFC01-MW-11 MRL	METHOD BLANK Result	METHOD BLANK MRL
Methyl-tert-butylether (MTBE)	ND	1.0	ND	1.0
1,2-Dichloroethane (EDC)	ND	1.0	ND	1.0
1,2-Dibromoethane (EDB)	ND	1.0	ND	1.0
Benzene	ND	1.0	ND	1.0
Toluene	ND	1.0	ND	1.0
Ethylbenzene	ND	1.0	ND	1.0
Xylenes (total)	ND	1.0	ND	1.0
Isopropylbenzene	ND	1.0	ND	1.0
n-Propylbenzene	ND	1.0	ND	1.0
1,3,5-Trimethylbenzene	ND	1.0	ND	1.0
1,2,4-Trimethylbenzene	ND	1.0	ND	1.0
Naphthalene	ND	5.0	ND	5.0

Surrogate Recoveries (percent)

	DBFM	TOL	BFB
METHOD BLANK	96	102	98
LCS	107	105	100
TFC01-MW-1	94	102	101
TFC01-MW-3	87	96	106
TFC01-MW-5A	110	101	104
TFC01-MW-6	91	100	102
TFC01-MW-7	100	101	97
TFC01-MW-8A	102	105	104
TFC01-MW-9	102	100	101
TFC01-MW-10	94	105	99
TFC01-MW-11	101	104	101

QC Limits

DBFM	= Dibromofluoromethane	76-114
TOL	= Toluene-d8	88-110
BFB	= 4-Bromofluorobenzene	86-115

Pacific Northwest Laboratories

65 Centennial Loop
Eugene, Oregon 97401
(541) 484-4493
Fax: (541) 484-4188

CHAIN OF CUSTODY RECORD

Client/Company: Bergeson-Boese
Project Manager: Charlie Schwarz
Project Code: TFCØ1ST.97H
Collected By: RLB

Site Location: Tillamook Farmers Co-op
Site Address: 1920 Hwy. 101 North
Billing Address: Tillamook, OR. 97141
P.O.No.:
Phone/Fax No.:

Lab Project Number: 2446

Samples Refrigerated (Yes) No
Samples in Proper Containers (Yes) No
RUSH Yes (No)

COMMENTS:

	SAMPLE I.D.	DATE	TIME	MATRIX: SOIL	MATRIX: WATER	MATRIX: OTHER	NUMBER OF CONTAINERS	NWTPH-HCID ODEQ/WDOE	NWTPH-Gasoline-x ODEQ/WDOE	NWTPH-Diesel-x ODEQ/WDOE	Volatile Organics EPA 624/8240/8260	BTEX/BTEX-N EPA 602/8020	MTBE/EDB/EDC EPA 8260	PAH GC/MS SIM ODEQ	PCBs 608/8080	Flashpoint EPA 1010	Semi-Volatile Organics EPA 625/8270	Lead 7421	TCLP Metals (3)/(8)/1311	pH	Diss. LEAD	TOTAL LEAD		BTEX + Additives (8260)	REMARKS
		1/30/01						ANALYSES TO BE PERFORMED																	
1	TFCØ1-MW-1		9:30 AM		✓		3		✓															✓	
2	TFCØ1-MW-3				✓		5		✓												✓	✓		✓	
3	TFCØ1-MW-5A				✓		5		✓												✓	✓		✓	
4	TFCØ1-MW-6				✓		5		✓												✓	✓		✓	
5	TFCØ1-MW-7				✓		3		✓															✓	
6	TFCØ1-MW-8A				✓		5		✓												✓	✓		✓	
7	TFCØ1-MW-9				✓		3		✓															✓	
8	TFCØ1-MW-10				✓		3		✓															✓	
9	TFCØ1-MW-11		1:30 pm		✓		3		✓															✓	
10																									
11																									
12																									
13																									
14																									

Dissolved Lead are already field filtered!

RELINQUISHED BY: Rick L. Boese	COMPANY BB&A	DATE / TIME 1/30/01 4:30 pm	RECEIVED BY:	COMPANY ENL	DATE / TIME 1/30/01 1630
RELINQUISHED BY:	COMPANY	DATE / TIME	RECEIVED BY:	COMPANY	DATE / TIME
RELINQUISHED BY:	COMPANY	DATE / TIME	RECEIVED BY:	COMPANY	DATE / TIME

APPENDIX C

Historical Groundwater Analytical Results

Tillamook Farmers Co-op

Datum: Mean Sea Level
Units = ug/L or ppb
= Not analyzed

Only detected compounds are listed.
-- = Not measured

GROUNDWATER DATA SHEETS

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-1	14-Oct-93	30-Dec-93	5-Apr-94	22-Jun-94	10-Oct-94	8-Jan-95	3-Apr-95	11-Jul-95	6-Oct-95
Groundwater Data									
Top PVC Elv.	7.27	7.27	7.27	7.27	7.27	7.27	7.27	7.27	7.27
DTW	--	--	--	--	--	--	--	--	--
WTE	--	--	--	--	--	--	--	--	--
NWTPH Methods	*Total Petroleum Hydrocarbons*								
Gasoline									
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE									
1,2-Dichloroethane									
1,2-Dibromoethane									
iso-Propylbenzene									
n-Propylbenzene									
1,3,5-Trimethylbenzene									
1,2,4-Trimethylbenzene									
Naphthalene									
Benzene	3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	4	<0.5	2.0	0.8	<0.5	1.0	2.0	<0.5	1.0
Ethylbenzene	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylenes	34	<1.5	2.0	3.0	<1.5	<1.5	2.0	<1.5	<1.5
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene									
Acenaphthene									
Fluorene									
Phenanthrene									
Anthracene									
Fluoranthene									
Pyrene									
EPA Method 7421	*Metals*								
Dissolved Lead									
Total Lead									

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-1	22-Dec-95	10-Oct-97	17-Apr-98	16-Sep-98	29-Sep-98	6-Jan-99	22-Jun-00	18-Oct-00	30-Jan-01
Groundwater Data									
Top PVC Elv.	7.27	7.27	7.27	7.27	7.27	7.27	7.27	7.27	7.27
DTW	--	0.38	1.98	5.40	--	1.98	2.66	1.53	1.34
WTE	--	6.89	5.29	1.87	--	5.29	4.61	5.74	5.93
NWTPH Methods	*Total Petroleum Hydrocarbons*								
TPH-G							<250	<250	<250
TPH-D									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE							<1	<1	<1
1,2-Dichloroethane							<1	<1	<1
1,2-Dibromoethane							<1	<1	<1
iso-Propylbenzene							<1	<1	<1
n-Propylbenzene							1.7	<1	<1
1,3,5-Trimethylbenzene							1.6	<1	<1
1,2,4-Trimethylbenzene							3.2	<1	<1
Naphthalene							<1	<5	<5
Benzene	<0.5			4.5		1.0	<0.5	<1	<1
Toluene	<0.5			7.4		3.7	<0.5	<1	<1
Ethylbenzene	<0.5			1.5		1.4	<0.5	<1	<1
Xylenes	<1.5			4.2		6.3	<0.5	<1	<1
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene							<1	<1	
Acenaphthene							<0.1	<0.1	
Fluorene							<0.1	<0.1	
Phenanthrene							<0.1	<0.1	
Anthracene							<0.1	<0.1	
Fluoranthene							<0.1	<0.1	
Pyrene							<0.1	<0.1	
EPA Method 7421	*Metals*								
Dissolved Lead							<2		
Total Lead									

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-3	14-Oct-93	30-Dec-93	5-Apr-94	22-Jun-94	10-Oct-94	8-Jan-95	3-Apr-95	11-Jul-95	6-Oct-95
Groundwater Data									
Top PVC Elv.	9.27	9.27	9.27	9.27	9.27	9.27	9.27	9.27	9.27
DTW	--	--	--	--	--	--	--	--	--
WTE	--	--	--	--	--	--	--	--	--
NWTPH Methods	*Total Petroleum Hydrocarbons*								
Gasoline									
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE									
1,2-Dichloroethane									
1,2-Dibromoethane									
iso-Propylbenzene									
n-Propylbenzene									
1,3,5-Trimethylbenzene									
1,2,4-Trimethylbenzene									
Naphthalene									
Benzene	2,800	1,500	2,600	3,000	1,100	81	660	500	260
Toluene	9,200	4,200	4,200	740	1,100	28	390	290	46
Ethylbenzene	920	710	710	930	270	18	250	37	<0.5
Xylenes	11,000	12,000	12,000	7,800	4,700	170	4,600	1,200	34
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene									
Acenaphthene									
Fluorene									
Phenanthrene									
Anthracene									
Fluoranthene									
Pyrene									
EPA Method 7421	*Metals*								
Dissolved Lead									
Total Lead									

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-3	22-Dec-95	10-Oct-97	17-Apr-98	16-Sep-98	29-Sep-98	6-Jan-99	22-Jun-00	18-Oct-00	30-Jan-01
Groundwater Data									
Top PVC Elv.	9.27	9.27	9.27	9.27	9.27	9.27	9.27	9.27	9.27
DTW	--	0.23	1.16	1.81	--	1.00	1.13	0.86	0.45
WTE	--	9.04	8.11	7.46	--	8.27	8.14	8.41	8.82
NWTPH Methods	*Total Petroleum Hydrocarbns*								
Gasoline							5,300	3,400	1,600
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE							8.0	8.8	2.5
1,2-Dichloroethane							<1.0	<1.0	<1.0
1,2-Dibromoethane							<1.0	<1.0	<1.0
iso-Propylbenzene							14.0	9.8	5.7
n-Propylbenzene							28	20	13
1,3,5-Trimethylbenzene							110	79	54
1,2,4-Trimethylbenzene							310	270	180
Naphthalene							100	54	22
Benzene	780			1,100		130	240	180	79
Toluene	130			1,200		120	220	69	39
Ethylbenzene	100			370		65	280	99	57
Xylenes	430			2,500		420	1,600	540	310
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene							32	13	
Acenaphthene							0.11	<0.1	
Fluorene							0.20	<0.1	
Phenanthrene							0.12	<0.1	
Anthracene							<0.1	<0.1	
Fluoranthene							<0.1	<0.1	
Pyrene							<0.1	<0.1	
EPA Method 7421	*Metals*								
Dissolved Lead							2	9	<2
Total Lead								3	<2

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-5	14-Oct-93	30-Dec-93	5-Apr-94	18-May-94	10-Oct-94	8-Jan-95	3-Apr-95	11-Jul-95	6-Oct-95
Groundwater data									
Top PVC Elv.	9.29	9.29	9.29	9.29	9.29	9.29	9.29	9.29	9.29
DTW	--	--	--	--	--	--	--	--	--
WTE	--	--	--	--	--	--	--	--	--
NWTPH Methods	*Total Petroleum Hydrocarbons*								
Gasoline									
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE									
1,2-Dichloroethane									
1,2-Dibromoethane									
iso-Propylbenzene									
n-Propylbenzene									
1,3,5-Trimethylbenzene									
1,2,4-Trimethylbenzene									
Naphthalene									
Benzene	15,000	28,000	22,000	14,000	11,000	570	13,000	11,000	2,900
Toluene	16,000	35,000	30,000	19,000	12,000	560	14,000	11,000	3,100
Ethylbenzene	1,100	2,000	5,800	1,500	1,200	110	1,600	990	380
Xylenes	13,000	21,000	30,000	24,000	12,000	360	17,000	12,000	2,800
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene									
Acenaphthene									
Fluorene									
Phenanthrene									
Anthracene									
Fluoranthene									
Pyrene									
EPA Method 7421	*Metals*								
Dissolved Lead									
Total Lead									

Tillamook Farmers Co-op	Date of Monitoring Event								
MONITORING WELL MW-5	22-Dec-95	10-Oct-97	17-Apr-98	16-Sep-98	29-Sep-98	6-Jan-99			
Groundwater data									
Top PVC Elv.	9.29	9.29	9.29	9.29	9.29	9.29			
DTW	--	0.46	1.25	1.86	--	0.96			
WTE	--	8.83	8.04	7.43	--	8.33			
NWTPH Methods	*Total Petroleum Hydrocarbons*								
Gasoline									
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE									
1,2-Dichloroethane							Well Decommissioned		
1,2-Dibromoethane							8-Jun-00		
iso-Propylbenzene									
n-Propylbenzene									
1,3,5-Trimethylbenzene									
1,2,4-Trimethylbenzene									
Naphthalene									
Benzene	23.0			7,500		3,700			
Toluene	89.0			8,300		5,500			
Ethylbenzene	<0.5			1,900		1,400			
Xylenes	1,900.0			11,000		7,000			
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene									
Acenaphthene									
Fluorene									
Phenanthrene									
Anthracene									
Fluoranthene									
Pyrene									
EPA Method 7421	*Metals*								
Dissolved Lead									
Total Lead									

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-5A	22-Jun-00	18-Oct-00	30-Jan-01						
Groundwater Data									
Top PVC Elv.	9.10	9.10	9.10						
DTW	0.94	0.88	0.88						
WTE	8.16	8.22	8.22						
NWTPH Methods	*Total Petroleum Hydrocarbons*								
Gasoline	110,000	110,000	110,000						
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE	1,300	1,300	1,400						
1,2-Dichloroethane	<1	<1	<1						
1,2-Dibromoethane	<1	<1	<1						
iso-Propylbenzene	130	82	83						
n-Propylbenzene	280	190	190						
1,3,5-Trimethylbenzene	1,100	950	890						
1,2,4-Trimethylbenzene	3,000	2,700	2,400						
Naphthalene	790	1,100	660						
Benzene	16,000	16,000	18,000						
Toluene	24,000	21,000	22,000						
Ethylbenzene	2,800	2,500	2,400						
Xylenes	23,000	18,000	17,000						
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene	310.0	320.00							
Acenaphthene	0.19	0.17							
Fluorene	0.20	0.14							
Phenanthrene	0.16	0.12							
Anthracene	<0.1	<0.1							
Fluoranthene	<0.1	<0.1							
Pyrene	<0.1	<0.1							
EPA Method 7421	*Metals*								
Dissolved Lead	5	5	5						
Total Lead		23	17						

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-6	14-Oct-93	30-Dec-93	5-Apr-94	22-Jun-94	10-Oct-94	8-Jan-95	3-Apr-95	11-Jul-95	6-Oct-95
Groundwater Data									
Top PVC Elv.	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74
DTW	--	--	--	--	--	--	--	--	--
WTE	--	--	--	--	--	--	--	--	--
NWTPH Methods	*Total Petroleum Hydrocarbons*								
Gasoline									
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE									
1,2-Dichloroethane									
1,2-Dibromoethane									
iso-Propylbenzene									
n-Propylbenzene									
1,3,5-Trimethylbenzene									
1,2,4-Trimethylbenzene									
Naphthalene									
Benzene	2,300	1,400	1,500	180	100	150	520	200	10
Toluene	1,400	820	340	180	140	4,000	680	2,350	380
Ethylbenzene	1,500	2,000	2,300	2,000	1,900	12,000	1,800	2,900	230
Xylenes	180	21,000	17,000	17,000	14,000	51,000	15,000	2,400	8,900
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene									
Acenaphthene									
Fluorene									
Phenanthrene									
Anthracene									
Fluoranthene									
Pyrene									
Dissolved Lead									
Total Lead									

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-6	22-Dec-95	10-Oct-97	17-Apr-98	16-Sep-98	29-Sep-98	6-Jan-99	22-Jun-00	18-Oct-00	30-Jan-01
Groundwater Data									
Top PVC Elv.	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74	8.74
DTW	--	0.92	1.88	--	--	2.26	2.05	1.93	2.77
WTE	--	7.82	6.86	--	--	6.48	6.69	6.81	5.97
NWTPH Methods	*Total Petroleum Hydrocarbons*								
Gasoline							28,000.0	33,000.0	75,000
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE							<1	<1	<1
1,2-Dichloroethane							<1	<1	<1
1,2-Dibromoethane							<1	<1	<1
iso-Propylbenzene							18	53	170
n-Propylbenzene							51	110	390
1,3,5-Trimethylbenzene							990	340	1,100
1,2,4-Trimethylbenzene							2,500	1,100	3,000
Naphthalene							570	310	670
Benzene	250				150	210	170	86	110
Toluene	450				780	65	90	41	68
Ethylbenzene	1,100				26	1,400	2,100	860	1,800
Xylenes	5,300				1,800	5,800	7,800	2,900	6,700
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene							190	420	
Acenaphthene							0.28	0.88	
Fluorene							0.33	1.20	
Phenanthrene							0.47	1.80	
Anthracene							<0.1	0.60	
Fluoranthene							<0.1	0.24	
Pyrene							<0.1	0.35	
Dissolved Lead							2	3	<2
Total Lead								9	45

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-7	14-Oct-93	30-Dec-93	5-Apr-94	22-Jun-94	10-Oct-94	8-Jan-95	3-Apr-95	11-Jul-95	6-Oct-95
Groundwater Data									
Top PVC Elv.	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01
DTW	--	--	--	--	--	--	--	--	--
WTE	--	--	--	--	--	--	--	--	--
NWTPH Methods	*Total Petroleum Hydrocarbons*								
Gasoline									
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE									
1,2-Dichloroethane									
1,2-Dibromoethane									
iso-Propylbenzene									
n-Propylbenzene									
1,3,5-Trimethylbenzene									
1,2,4-Trimethylbenzene									
Naphthalene									
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	2.0	<1.0	<0.5	<0.5	1.0	2.0	<0.5	<0.5	1.0
Ethylbenzene	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylenes	5.0	8.0	<1.5	<1.5	2.0	3.0	<1.5	<1.5	3.0
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene									
Acenaphthene									
Fluorene									
Phenanthrene									
Anthracene									
Fluoranthene									
Pyrene									
EPA Method 7421	*Metals*								
Dissolved Lead									
Total Lead									

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-7	22-Dec-95	10-Oct-97	17-Apr-98	16-Sep-98	29-Sep-98	6-Jan-99	22-Jun-00	18-Oct-00	30-Jan-01
Groundwater Data									
Top PVC Elv.	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01	9.01
DTW	--	0.66	3.56	4.25	--	2.79	3.62	3.38	2.83
WTE	--	8.35	5.45	4.76	--	6.22	5.39	5.63	6.18
NWTPH Methods	*Total Petroleum Hydrocarbons*								
Gasoline							<250	<250	<250
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE							13	<1	1.3
1,2-Dichloroethane							<1	<1	<1
1,2-Dibromoethane							<1	<1	<1
iso-Propylbenzene							<1	<1	<1
n-Propylbenzene							<1	<1	<1
1,3,5-Trimethylbenzene							<1	<1	<1
1,2,4-Trimethylbenzene							<1	<1	<1
Naphthalene							<1	<5	<5
Benzene	<0.5			<1.0		1.0	<1	<1	<1
Toluene	<0.5			1.7		4.1	<1	<1	<1
Ethylbenzene	<0.5			<1.0		6.3	<1	<1	<1
Xylenes	<1.5			2.0		29.0	<1	<1	<1
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene							<0.1	<0.1	
Acenaphthene							<0.1	<0.1	
Fluorene							<0.1	<0.1	
Phenanthrene							<0.1	<0.1	
Anthracene							<0.1	<0.1	
Fluoranthene							<0.1	<0.1	
Pyrene							<0.1	<0.1	
EPA Method 7421	*Metals*								
Dissolved Lead							<2	<2	
Total Lead									

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-8	14-Oct-93	30-Dec-93	5-Apr-94	22-Jun-94	10-Oct-94	8-Jan-95	3-Apr-95	11-Jul-95	6-Oct-95
Groundwater Data									
Top PVC Elv.	--	--	--	--	--	--	--	--	--
DTW	--	--	--	--	--	--	--	--	--
WTE	--	--	--	--	--	--	--	--	--
NWTPH Methods	*Total Petroleum Hydrocarbons*								
Gasoline									
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE									
1,2-Dichloroethane									
1,2-Dibromoethane									
iso-Propylbenzene									
n-Propylbenzene									
1,3,5-Trimethylbenzene									
1,2,4-Trimethylbenzene									
Naphthalene									
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.0
Ethylbenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylenes	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	2.0
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene									
Acenaphthene									
Fluorene									
Phenanthrene									
Anthracene									
Fluoranthene									
Pyrene									
Dissolved Lead									
Total Lead									

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-8A	22-Jun-00	18-Oct-00	30-Jan-01						
Groundwater Data									
Top PVC Elv.	10.76	10.76	10.76						
DTW	3.15	3.17	2.79						
WTE	7.61	7.59	7.97						
NWTPH Methods	*Total Petroleum Hydrocarbons*								
Gasoline	1,900	770	1,500						
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE	280	140	170						
1,2-Dichloroethane	<1	<1	<1						
1,2-Dibromoethane	<1	<1	<1						
iso-Propylbenzene	3.8	1.9	<1						
n-Propylbenzene	5.5	3.0	<1						
1,3,5-Trimethylbenzene	58	20	12						
1,2,4-Trimethylbenzene	110	48	21						
Naphthalene	17	11	6.1						
Benzene	240	84	460						
Toluene	16	1.3	110						
Ethylbenzene	20	10	19						
Xylenes	58	20	340						
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene	3.8	2.5							
Acenaphthene	<0.1	<0.1							
Fluorene	0.12	<0.1							
Phenanthrene	0.10	<0.1							
Anthracene	<0.1	<0.1							
Fluoranthene	<0.1	<0.1							
Pyrene	<0.1	<0.1							
EPA Method 7421	*Metals*								
Dissolved Lead	2	2	6						
Total Lead		120	14						

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-9	16-Sep-98	6-Jan-99	22-Jun-00	18-Oct-00	30-Jan-01				
Groundwater Data									
Top PVC Elv.	8.98	8.98	8.98	8.98	8.98				
DTW	1.95	1.47	1.95	1.40	1.46				
WTE	7.03	7.51	7.03	7.58	7.52				
NWTPH Methods	*Total Petroleum Hydrocarbons*								
Gasoline			5,700	9,600	14,000				
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE			260	270	260				
1,2-Dichloroethane			<1	<1	<1				
1,2-Dibromoethane			<1	<1	<1				
iso-Propylbenzene			18	20	34				
n-Propylbenzene			51	64	78				
1,3,5-Trimethylbenzene			160	240	190				
1,2,4-Trimethylbenzene			420	770	820				
Naphthalene			75	170	140				
Benzene	1,400	3,200	940	1,500	2,300				
Toluene	3,100	6,000	620	570	1,400				
Ethylbenzene	710	1,000	330	430	560				
Xylenes	4,000	5,300	2,000	2,500	2,900				
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene			43	53					
Acenaphthene			<0.1	<0.1					
Fluorene			<0.1	<0.1					
Phenanthrene			<0.1	<0.1					
Anthracene			<0.1	<0.1					
Fluoranthene			<0.1	<0.1					
Pyrene			<0.1	<0.1					
EPA Method 7421	*Metals*								
Dissolved Lead			<2						
Total Lead									

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-10	22-Jun-00	18-Oct-00	30-Jan-01						
Groundwater Data									
Top PVC Elv.	10.83	10.83	10.83						
DTW	4.36	5.01	4.05						
WTE	6.47	5.82	6.78						
NWTPH Methods	*Total Petroleum Hydrocarbons*								
Gasoline	<250	<250	<250						
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE	<1	<1	<1						
1,2-Dichloroethane	<1	<1	<1						
1,2-Dibromoethane	<1	<1	<1						
iso-Propylbenzene	<1	<1	<1						
n-Propylbenzene	<1	<1	<1						
1,3,5-Trimethylbenzene	<1	<1	<1						
1,2,4-Trimethylbenzene	<1	<1	<1						
Naphthalene	<1	<5	<5						
Benzene	<1	<1	<1						
Toluene	<1	<1	<1						
Ethylbenzene	<1	<1	<1						
Xylenes	<1	<1	<1						
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene	<1	<1							
Acenaphthene	<0.1	<0.1							
Fluorene	<0.1	<0.1							
Phenanthrene	<0.1	<0.1							
Anthracene	<0.1	<0.1							
Fluoranthene	<0.1	<0.1							
Pyrene	<0.1	<0.1							
EPA Method 7421	*Metals*								
Dissolved Lead	<2								
Total Lead									

Tillamook Farmers Co-op	*Date of Monitoring Event*								
MONITORING WELL MW-11	22-Jun-00	18-Oct-00	30-Jan-01						
Groundwater Data									
Top PVC Elv.	11.65	11.65	11.65						
DTW	5.70	6.19	5.61						
WTE	5.95	5.46	6.04						
NWTPH Methods	*Total Petroleum Hydrocarbons*								
Gasoline	<250	<250	<250						
Diesel									
EPA Method 5030/8260B	*Volatile Organic Compounds*								
MTBE	<1	<1	<1						
1,2-Dichloroethane	<1	<1	<1						
1,2-Dibromoethane	<1	<1	<1						
iso-Propylbenzene	<1	<1	<1						
n-Propylbenzene	<1	<1	<1						
1,3,5-Trimethylbenzene	<1	<1	<1						
1,2,4-Trimethylbenzene	<1	<1	<1						
Naphthalene	<1	<5	<5						
Benzene	<1	<1	<1						
Toluene	<1	<1	<1						
Ethylbenzene	<1	<1	<1						
Xylenes	<1	<1	<1						
EPA Method 8270 GC/MS/SIM	*Polynuclear Aromatic Hydrocarbons*								
Naphthalene	<1	<1							
Acenaphthene	<0.1	<0.1							
Fluorene	<0.1	<0.1							
Phenanthrene	<0.1	<0.1							
Anthracene	<0.1	<0.1							
Fluoranthene	<0.1	<0.1							
Pyrene	<0.1	<0.1							
EPA Method 7421	*Metals*								
Dissolved Lead	<2								
Total Lead									