10-16-98

SUMMARY OF ENVIRONMENTAL CONDITIONS
SITE 303 D-TUNNEL TANKS
MANCHESTER FISC

BACKGROUND

- Consists of eight 20,000- to 50,000-barrel concrete underground storage tanks (USTs) containing marine diesel fuel. The USTs are located on the D-tunnel line which extends from Tank 30 to Building 12 in the Industrial Area (Site 304). Tank 23 not included in Site 303?

- The USTs typically are covered with 4 to 6 feet of soil with the base of the tanks extending from 30 to 32 feet below ground surface.

- The USTs are surrounded by a backfill drain field extending approximately 6 to 8 feet outside the exterior tank wall. Drain tile systems located at the base of the outside tank walls drain fuel and water into oil/water separator collection systems.

- The oil/water collection system drains into Separator No. 8 (and others?) located along East Clam Bay Road.

HYDROGEOLOGIC CONDITIONS

- Fill material placed around the tanks consists of reworked till composed of sands, silts, clays, and gravels.

- Native soils surrounding the tank excavations typically consist of dense to very dense glacial till including very dense, clayey, gravelly Sand and hard, sandy, gravelly Clay.

- The depth to groundwater beneath Site 303 is expected to be at least 50 feet below ground surface. Localized occurrences of shallow perched groundwater also appear to be present, particularly in the area west of Tanks 28 and 29.

PREVIOUS ENVIRONMENTAL INVESTIGATIONS

- **Tank 30 Fuel Spill (GeoEngineers, 1990).** Investigated diesel fuel spill which occurred at Tank 30 in February of 1990. Approximately 38,000 to

40,000 gallons of diesel were spilled. Most of the petroleum was captured by the footing drain system and directed to oil/water separator No. 8. Fuel not contained by the drainage system flowed down the steep slope north of the tank. Some of the fuel emptied into the North Dike and was recovered. The remaining portion of the fuel infiltrated into the subsurface and discharged from seeps along the steep slope and beach areas located to the north and west of Tank 30. Collection sumps and sorbent pads were used to recover product seeping from the beach areas. Petroleum NAPL and/or sheens were also observed in monitoring wells and test pits installed along the beach area to the north of Tank 30 and in several test pits located to the west along Pine Road. Fifteen feet of product were observed in an observation well (OW-1) located along Pine Road. Because product in well OW-1 consisted of several fuel types, the source(s) of this occurrence is not known.

- **Underground Vapor Monitoring Installation Report (URS, 1995).** Installed up to 12 vapor monitoring wells around each Site 303 UST. Soil samples collected during drilling indicated that spills and/or leaks had occurred in the tanks. However, there were no indications that the product released from the tanks migrated outside the tank backfill areas.

- **Corliss Lane Marsh Site Assessment (Hart Crowser, 1998).** Investigated diesel fuel spill from Tank 24 which occurred in March of 1990. Approximately 10,000 gallons of marine diesel fuel were spilled. Although most of the fuel was recovered on the base, 100 to 200 gallons leaked onto a marsh area located on private property south of the fuel depot. Natural attenuation mechanisms decreased the petroleum concentrations over time to concentrations below MTCA risk-based cleanup levels. A "no further action" determination was obtained from Ecology in 1998.

- **SCAPS Site Characterization (Navy, 1997).** Installed a number of cone penetrometer borings adjacent to Tanks 24, 29, and 30. Soils were screened for the presence of petroleum hydrocarbons using laser induced fluorescence. Results of this screening in the Site 303 area were generally inconclusive.

RECOMMENDATIONS

- Perform site reconnaissance in Tank 30 area to verify that petroleum is no longer being released along slope or beaches.

- Monitor for the presence of free product in Tank 30 monitoring wells, sumps, and observation wells.

- If no product is present, could verify that remaining impacted soils are not significantly impacting groundwater quality by sampling seeps and wells for petroleum hydrocarbons.

- Assuming that petroleum is not being discharged to the marine environment or off-site properties at concentrations of concern, subsurface soil hydrocarbon contamination will likely only need to be addressed during construction activities or if changes in land use occur (e.g., base closure).

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Table 1 - Summary of Tank 22 Soil Petroleum Hydrocarbon Data

MW-No.	Sample Depth	Sample Number	Hydrocarbon Type	Concentration in ppm
MW-1-22	32-33.5	18146	NA	ND
MW-2-22	32-33.5	18147	NA	ND
MW-3-22	32-33.5	18148	NA	ND
MW-4-22	32-33.5	18149	NA	ND
MW-5-22	32-33.5	18150	NA	ND
MW-6-22	32-33.5	18151	NA	ND
MW-6-D-22	32-33.5	18152	NA	ND
MW-7-22	32-33.5	18153	NA	ND
MW-8-22	22-23.5	18154	Diesel	520
		18154	Motor Oil	190
MW-9-22	32-33.5	18155	NA	ND
MW-10-22	32-33.5	18156	NA	ND
MW-11-22	32-33.5	18157	NA	ND
MW-12-22	32-33.5	18158	NA	ND
MW-13-22	32-33.5	18159	NA	ND
MTCA Method C Industrial Direct Contact				>100,000
MTCA Method B Surface Water Protection				Unknown

Diesel-range C12-C24
Motor oil-range C24-C34
NA Not applicable.
ND Not detected.

Table 2 - Summary of Tank 24 Soil Petroleum Hydrocarbon Data

MW-No.	Sample Depth	Sample Number	Hydrocarbon Type	Concentration in ppm
MW-1-24	32-32.8	18160	NA	ND
MW-2-24	32-33.4	18161	NA	ND
MW-3-24	32-32.8	18162	NA	ND
MW-4-24	32-32.9	18163	NA	ND
MW-5-24	32-32.4	18164	NA	ND
MW-6-24	32-32.6	18165	NA	ND
MW-7-24	32-32.6	18166	NA	ND
MW-8-24	32-32.7	18167	Diesel	4000
MW-8-D-24	32-32.7	18168	Diesel	4100
MW-9-24	32-32.3	18169	Diesel	2100
MW-10-24	32-32.6	18170	Diesel	4300
		Lab Dup.		3390
MW-11-24	32-32.7	18171	Diesel	93
MW-12-24	32-32.7	18172	NA	ND
MW-13-24	32-33.3	18173	NA	ND
T24-02	20.5		NA	ND
T24-04	22		NA	ND
T24-05	8.5		NA	ND
MTCA Method C Industrial Direct Contact				>100,000
MTCA Method B Surface Water Protection				Unknown

Diesel-range C12-C24
NA Not applicable.
ND Not detected.

Table 3 - Summary of Tank 24 Corliss Lane Marsh Soil Quality Data

Sample ID	Sample Depth Interval in Feet below Groundsurface	TPH[1] in mg/kg		Volatile Aromatics[2] in mg/kg			
		Diesel	Oil	Benzene	Toluene	Ethylbenzen	Xylenes
SB-1 S-1	2.5 - 4	60	50 U	-	-	-	-
SB-1 S-5	12.5 - 14	20 U	50 U	-	-	-	-
SB-1 S-10	25 - 26.5	20 U	50 U	-	-	-	-
SB Dr Comp[3]	-	20 U	50 U	0.05	0.05	0.05	0.05 U
HA-1	0 - .25	630	50 U	-	-	-	-
HA-1	0.75 - 1	840	50 U	-	-	-	-
HA-1	1.5 - 1.75	2500	50 U	-	-	-	-
HA-2	0 - .25	120	50 U	-	-	-	-
HA-2	0.75 - 1	20 U	50 U	-	-	-	-
HA-2	1.5 - 1.75	34	160	-	-	-	-
HA-3	0 - .25	570	150	-	-	-	-
HA-3	0.75 - 1	300	1300	-	-	-	-
HA-3	1.5 - 1.75	20 U	50 U	-	-	-	-
HA-4	0 - .25	1200	210	-	-	-	-
HA-4	0.75 - 1	560	50 U	-	-	-	-
HA-4	1.5 - 1.75	20 U	50 U	-	-	-	-
HA-5	0 - .25	96	50 U	-	-	-	-
HA-5	0.75 - 1	20 U	50 U	-	-	-	-
HA-5	1.5 - 1.75	20 U	50 U	-	-	-	-
HA-6	0 - .25	20 U	50 U	-	-	-	-
HA-6	0.75 - 1	20 U	50 U	-	-	-	-
HA-6	1.5 - 1.75	26	50 U	-	-	-	-
HA-7	0 - 0.25	57	50 U	-	-	-	-
HA-7	0.75 - 1	44	50 U	-	-	-	-
HA-7	1.5 - 1.75	39	50 U	-	-	-	-
HA-8	0 - 0.25	20 U	50 U	-	-	-	-
HA-8	0.75 - 1	20 U	50 U	-	-	-	-
HA-8	1.5 - 1.75	78	50 U	-	-	-	-
HA-9	0 - 0.25	20 U	50 U	-	-	-	-
HA-9	0.75 - 1	20 U	50 U	-	-	-	-
HA-9	1.5 - 1.75	20 U	50 U	-	-	-	-
HA-10	0 - 0.25	20 U	50 U	-	-	-	-
HA-10	0.75 - 1	20 U	50 U	-	-	-	-
HA-10	1.5 - 1.75	20 U	50 U	-	-	-	-
HA-11	0 - 0.25	20 U	50 U	-	-	-	-
HA-11	0.75 - 1	20 U	50 U	-	-	-	-
HA-11	1.5 - 1.75	20 U	50 U	-	-	-	-
HA-12	0 - 0.25	20 U	50 U	-	-	-	-
HA-12	0.75 - 1	62	50 U	-	-	-	-
HA-12	1.5 - 1.75	2400	50 U	-	-	-	-
HA-13	0 - 0.25	290	50 U	-	-	-	-
HA-13	0.75 - 1	2100	50 U	-	-	-	-
CLM-S3 (HA-13 dup)	0.75 - 1	1900	50 U	-	-	-	-

Table 3 - Summary of Tank 24 Corliss Lane Marsh Soil Quality Data

Sample ID	Sample Depth Interval in Feet below Groundsurface	TPH[1] in mg/kg		Volatile Aromatics[2] in mg/kg			
		Diesel	Oil	Benzene	Toluene	Ethylbenzen	Xylenes
HA-13	1.5 - 1.75	20 U	50 U	-	-	-	-
HA-14	0 - 0.25	150	50 U	-	-	-	-
HA-14	0.75 - 1	20 U	50 U	-	-	-	-
HA-14	1.5 - 1.75	20 U	50 U	-	-	-	-
HA-15	0 - 0.25	1400	50 U	-	-	-	-
HA-15	0.75 - 1	20 U	50 U	-	-	-	-
HA-15	1.5 - 1.75	20 U	50 U	-	-	-	-
CLM S-1 (HA-15 dup)	1.5 - 1.75	20 U	50 U	-	-	-	-
HA-16	0 - 0.25	4200	50 U	-	-	-	-
HA-16	0.75 - 1	100	200	-	-	-	-
HA-16	1.5 - 1.75	20 U	50 U	-	-	-	-
HA-17	0 - 0.25	20 U	50 U	-	-	-	-
HA-17	0.75 - 1	340	1200	-	-	-	-
CLM S-2 (HA-17 dup)	0.75 - 1	270	1000	-	-	-	-
HA-17	1.5 - 1.75	20 U	50 U	-	-	-	-
MTCA Method C Industrial Direct Contact			>100,000	4,530	700,000	350,000	7,000,000
MTCA Method B Surface Water Protection			Unknown	4.3	4,850	691	NA

U - Not detected at indicated detection limit
NA - Not Available
- Not analyzed.
(1) TPH analysis by WTPH-D.
(2) Volatile organics analysis by EPA Method 8020.
(3) Composite sample of drill cuttings from boring SB-1 collected for waste designation purposes.

Table 4 - Summary of Tank 24 Corliss Lane Marsh EPH/VPH Testing Results

Constituent	Units	Sample Location and Number						
		1997-SB-1 /S-5	1997-SB-1 /S-10	1997-HA-1 /0-6	1997-HA-2 /0-6	1997-HA-3 /0-6	CLM/S-4[1]	1997-HA-4 /0-6
TPH Results[2]								
TPH as Diesel	mg/kg	nd	nd	630	120	570		1200
TPH as Oil	mg/kg	nd	nd	nd	nd	150		210
Non-Carcinogen - Human Health Hazard Index Compounds								
Total Aliphatics	mg/kg	nd	9.5	190	120	440	400	430
Total Aromatics	mg/kg	8.6	23	84	120	370	380	150
Benzene	mg/kg	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	mg/kg	nd	nd	nd	nd	nd	nd	nd
Toluene	mg/kg	nd	nd	nd	nd	nd	nd	nd
Xylenes	mg/kg	nd	nd	nd	nd	nd	nd	nd
Calculated Non-Carcinogen Hazard Index[3]	–	0.0	0.0	0.07	0.08	0.25	0.24	0.15
Carcinogen - Human Health Risk Compounds								
Benzene[4]	mg/kg	0.26	0.23	0.23	0.39	0.75	0.75	0.38
Total CPAHs[4]	mg/kg	0.06	0.05	0.05	0.08	0.17	0.17	0.08
Calculated Carcinogen Risk from Benzene[4,5]	–	7.54E-09	6.67E-09	6.67E-09	1.13E-08	2.18E-08	2.18E-08	1.10E-08
Calculated Carcinogen Risk from Total CPAHs[4,5]	–	4.12E-07	3.65E-07	3.61E-07	6.06E-07	1.24E-06	1.24E-06	5.95E-07
Total Carcinogenic Risk[4,5]	–	4.20E-07	3.72E-07	3.68E-07	6.17E-07	1.26E-06	1.26E-06	6.06E-07
Fate and Transport - Soil to Groundwater								
Calculated Well Concentration[6]	mg/L	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Notes:

(1) Duplicate of 1997-HA-3.

(2) TPH analyses on samples from HA-1, HA-2, HA-3, and HA-4 from 0 to 3-inch depth, EPH/VPH analyses on samples from 0 to 6-inch depth.

(3) See Sound Analytical EPH/VPH Summary Report, Appendix B, calculated value should be less than 1 for residential land use.

(4) Non-detect in all samples, reported at 1/2 the practical quantitation limit.

(5) See Sound Analytical EPH/VPH Summary Report, Appendix B, calculated value should be less than 1E-6 for residential land use.

(6) See Sound Analytical EPH/VPH Summary Report, Appendix B, calculated value should be less than 1 for drinking water quality protection.

Table 5 - Comparison of Tank 24 Corliss Lane Marsh Soil Sampling Results to Draft Freshwater Sediment Quality Values

Constituent	Concentration in mg/kg					
	1997-HA-1 /0-6	1997-HA-2 /0-6	1997-HA-3 /0-6	CLM/S-4[1]	1997-HA-4 /0-6	Draft Derived Freshwater Sediment Quality Values[2]
Volatile Aromatics						
Benzene	0.45 U	0.77 U	1.5 U	1.5 U	0.75 U	na
Ethylbenzene	0.45 U	0.77 U	1.5 U	1.5 U	0.75 U	na
Toluene	0.45 U	0.77 U	1.5 U	1.5 U	0.75 U	na
Xylenes	0.9 U	1.5 U	3.1 U	3.1 U	1.5 U	na
PAHs						
Naphthalene	0.03 U	0.051 U	0.1 U	0.1 U	0.05 U	37
Acenaphthylene	0.026 U	0.044 U	0.09 U	0.091 U	0.043 U	1.9
Acenaphthene	0.023 U	0.038 U	0.077 U	0.077 U	0.037 U	3.5
Fluorene	0.018 U	0.03 U	0.06 U	0.061 U	0.029 U	3.6
Phenanthrene	0.016 U	0.027 U	0.055 U	0.055 U	0.026 U	5.7
Anthracene	0.019 U	0.032 U	0.065 U	0.065 U	0.031 U	2.1
Total LPAH	0.07(3) U	0.11(3) U	0.22(3) U	0.22(3) U	0.11(3) U	27
Fluoranthene	0.015 U	0.024 U	0.049 U	0.05 U	0.024 U	11
Pyrene	0.014 U	0.023 U	0.047 U	0.048 U	0.023 U	9.6
Benzo(a)Anthracene	0.011 U	0.018 U	0.036 U	0.036 U	0.017 U	5
Chrysene	0.014 U	0.023 U	0.047 U	0.048 U	0.023 U	7.4
Total Benzofluoranthenes	0.019 U	0.032 U	0.065 U	0.065 U	0.031 U	11
Benzo(a)Pyrene	0.01 U	0.017 U	0.035 U	0.035 U	0.017 U	7
Indeno(1,2,3-Cd)Pyrene	0.018 U	0.03 U	0.06 U	0.061 U	0.029 U	0.73
Dibenz(a,h)Anthracene	0.014 U	0.024 U	0.049 U	0.049 U	0.024 U	0.23
Benzo(g,hi)Perylene	0.016 U	0.026 U	0.053 U	0.054 U	0.026 U	1.2
Total HPAH	0.07(3) U	0.11(3) U	0.22(3) U	0.22(3) U	0.11(3) U	36
Total PAH	0.13(3) U	0.22(3) U	0.44(3) U	0.45(3) U	0.22(3) U	60

Notes:

(1) Duplicate of 1997-HA-3.

(2) Dry weight basis, based on values presented in Ecology, 1997b.

(3) Calculated as the sum of 1/2 the detection limit of individual compounds.

Table 6 - Summary of Tank 24 Corliss Lane Marsh Water Quality Data

Analyte	Monitoring Well Sample	Surface Water Samples		Temporary Well Point Samples				
	MW-1	1997-SW1	1997-SW2	1997-GW1	1997-GW2	1997-GW3	1997-GW4	1997-GW5
Total Suspended Solids in mg/L	1980	54.7	2340	12300	18	160	154	10.7
Volatile Organics in ug/L								
Benzene	1.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	1 U	1 U	1 U	5.7	1 U	1 U	1 U	1 U
Xylenes	1 U	1 U	1 U	1.8	1 U	1 U	1 U	1 U
TPH in mg/L								
Diesel	0.76	0.25 U	0.27	13	0.25 U	0.25 U	0.25 U	0.43
Oil	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	1.19
PAHs in ug/L								
Naphthalene	6.02 J	0.31	0.15 U	-	-	-	-	
2-Methylnaphthalene	0.86	0.07	0.11	-	-	-	-	
Acenaphthylene	0.05 U	0.05 U	0.05 U	-	-	-	-	
Acenaphthene	0.05	0.05 U	0.16	-	-	-	-	
Fluorene	0.08	0.05 U	0.36	-	-	-	-	
Phenanthrene	0.05 U	0.05 U	2.27	-	-	-	-	
Anthracene	0.05 U	0.05 U	0.38	-	-	-	-	
Fluoranthene	0.05 U	0.05 U	1.66	-	-	-	-	
Pyrene	0.05 U	0.05 U	0.77	-	-	-	-	
Benzo(a)Anthracene	0.05 U	0.05 U	0.2	-	-	-	-	
Chrysene	0.05 U	0.05 U	0.27	-	-	-	-	
Benzo(b)Fluoranthene	0.05 U	0.05 U	0.13	-	-	-	-	
Benzo(k)Fluoranthene	0.05 U	0.05 U	0.06	-	-	-	-	
Benzo(a)Pyrene	0.05 U	0.05 U	0.11	-	-	-	-	
Indeno(1,2,3-c,d)Pyrene	0.05 U	0.05 U	0.05 U	-	-	-	-	
Dibenz(a,h)Anthracene	0.05 U	0.05 U	0.05 U	-	-	-	-	
Benzo(g,h,I)Perlyene	0.05 U	0.05 U	0.05 U	-	-	-	-	

Notes:

- Not analyzed.

J- Detected at estimated concentration.

U - Not detected at indicated detection limit

Table 7 - Summary of Tank 25 Soil Petroleum Hydrocarbon Data

MW-No.	Sample Depth	Sample Number	Hydrocarbon Type	Concentration in ppm
MW-1-25	32-33.5	18174	Diesel	4800
			Motor Oil	1200
MW-2-25	32-33.2	18175	Diesel	610
MW-3-25	32-33	18176	NA	ND
MW-4-25	22-23	18177	NA	ND
MW-5-25	32-33.1	18178	NA	ND
MW-6-25	34-34.6	18179	Diesel	3800
MW-7-25	34-35.5	18180	Diesel	350
MW-8-25	34-35.5	18181	NA	ND
MW-8-D-25	34-35.5	18182	NA	ND
MW-9-25	32-33.4	18183	Diesel	8600
MW-12-25	32-33.5	18186	Diesel	11000
MW-13-25	32-33	18187	NA	ND
MTCA Method C Industrial Direct Contact				>100,000
MTCA Method B Surface Water Protection				Unknown

Motor oil-range C24-C34
Diesel-range C12-C24
NA Not applicable.
ND Not detected.

Table 8 - Summary of Tank 26 Soil Petroleum Hydrocarbon Data

MW-No.	Sample Depth	Sample Number	Hydrocarbon Type	Concentration in ppm
MW-1-26	32-33.5	18188	NA	ND
MW-2-26	32-33.3	18189	NA	ND
MW-3-26	32-33.5	18190	NA	ND
MW-4-26	32-33.5	18191	NA	ND
MW-5-26	32-33.3	18192	NA	ND
MW-6-26	32-33.5	18193	NA	ND
MW-7-26	32-33.5	18194	Diesel	2600
MW-8-26	32-33.1	18195	Diesel	3000
MW-9-26	32-33	18196	Diesel	1100
MW-10-26	32-33	18197	NA	ND
MW-11-26	32-33.2	18198	NA	ND
MW-11-D-26	32-33.2	18199	NA	ND
MW-12-26	32-33.5	18200	NA	ND
MW-13-26	32-33.5	18201	NA	ND
MTCA Method C Industrial Direct Contact				>100,000
MTCA Method B Surface Water Protection				Unknown

Diesel-range C12-C24
NA Not applicable.
ND Not detected.

Table 9 - Summary of Tank 27 Soil Petroleum Hydrocarbon Data

MW-No.	Sample Depth	Sample Number	Hydrocarbon Type	Concentration in ppm
MW-1-27	32-33.5	18202	NA	ND
MW-2-27	32-33.5	18203	NA	ND
MW-2-D-27	32-33.5	18204	NA	ND
MW-3-27	32-33.4	18205	NA	ND
MW-4-27	32-33.4	18206	NA	ND
MW-5-27	32-33	18207	NA	ND
MW-6-27	32-33.5	18208	Diesel	940
MW-7-27	32-33.2	18209	NA	ND
MW-8-27	33-34.5	18210	NA	ND
MW-9-27	32-32.5	18211	Diesel	1100
MW-10-27	32-33.5	18212	NA	ND
MW-11-27	32-33	18213	Diesel	190
MW-12-27	32-32.9	18214	Diesel	410
MW-13-27	32-33.2	18215	NA	ND
MTCA Method C Industrial Direct Contact				>100,000
MTCA Method B Surface Water Protection				Unknown

Diesel-range C12-C24
NA Not applicable.
ND Not detected.

Table 10 - Summary of Tank 28 Soil Petroleum Hydrocarbon Data

MW-No.	Sample Depth	Sample Number	Hydrocarbon Type	Concentration in ppm
MW-1-28	32-33.5	18216	NA	ND
MW-2-28	32-33.5	18217	NA	ND
MW-3-28	32-32.7	18218	NA	ND
MW-4-28	32-33.5	18219	NA	ND
MW-4-D-28	32-33.5	18220	NA	ND
MW-5-28	32-33.3	18221	Diesel	1100
MW-6-28	32-33.2	18222	Diesel	3600
MW-7-28	32-33.5	18223	NA	ND
MW-8-28	33-33.4	18224	NA	ND
MW-9-28	32-33.1	18225	NA	ND
MW-10-28	32-33.4	18226	NA	ND
MW-11-28	32-33.5	18227	NA	ND
MW-12-28	32-33.1	18228	NA	ND
MW-13-28	32-33.5	18229	NA	ND
MTCA Method C Industrial Direct Contact				>100,000
MTCA Method B Surface Water Protection				Unknown

Diesel-range C12-C24
NA Not applicable.
ND Not detected.

Table 11 - Summary of Tank 29 Soil Petroleum Hydrocarbon Data

MW-No.	Sample Depth	Sample Number	Hydrocarbon Type	Concentration in ppm
MW-1-29	32-33	18230	Diesel	11000
MW-2-29	32-33	18231	Diesel	260
MW-3-29	30-31	18232	NA	ND
MW-4-29	32-33.7	18233	Diesel	4800
MW-5-29	32-32.3	18234	Diesel	580
MW-6-29	32-32.9	18235	Diesel	4800
MW-7-29	32-33.2	18236	Diesel	200
MW-7-D-29	32-33.2	18237	Diesel	110
MW-8-29	33-33.3	18238	NA	ND
MW-9-29	32-33.5	18239	Diesel	7300
MW-10-29	32-33.1	18240	NA	ND
MW-11-29	32-32.6	18241	NA	ND
MW-12-29	32-33.8	18242	NA	ND
MW-13-29	32-32.8	18243	NA	ND
MTCA Method C Industrial Direct Contact				>100,000
MTCA Method B Surface Water Protection				Unknown

Diesel-range C12-C24
NA Not applicable.
ND Not detected.

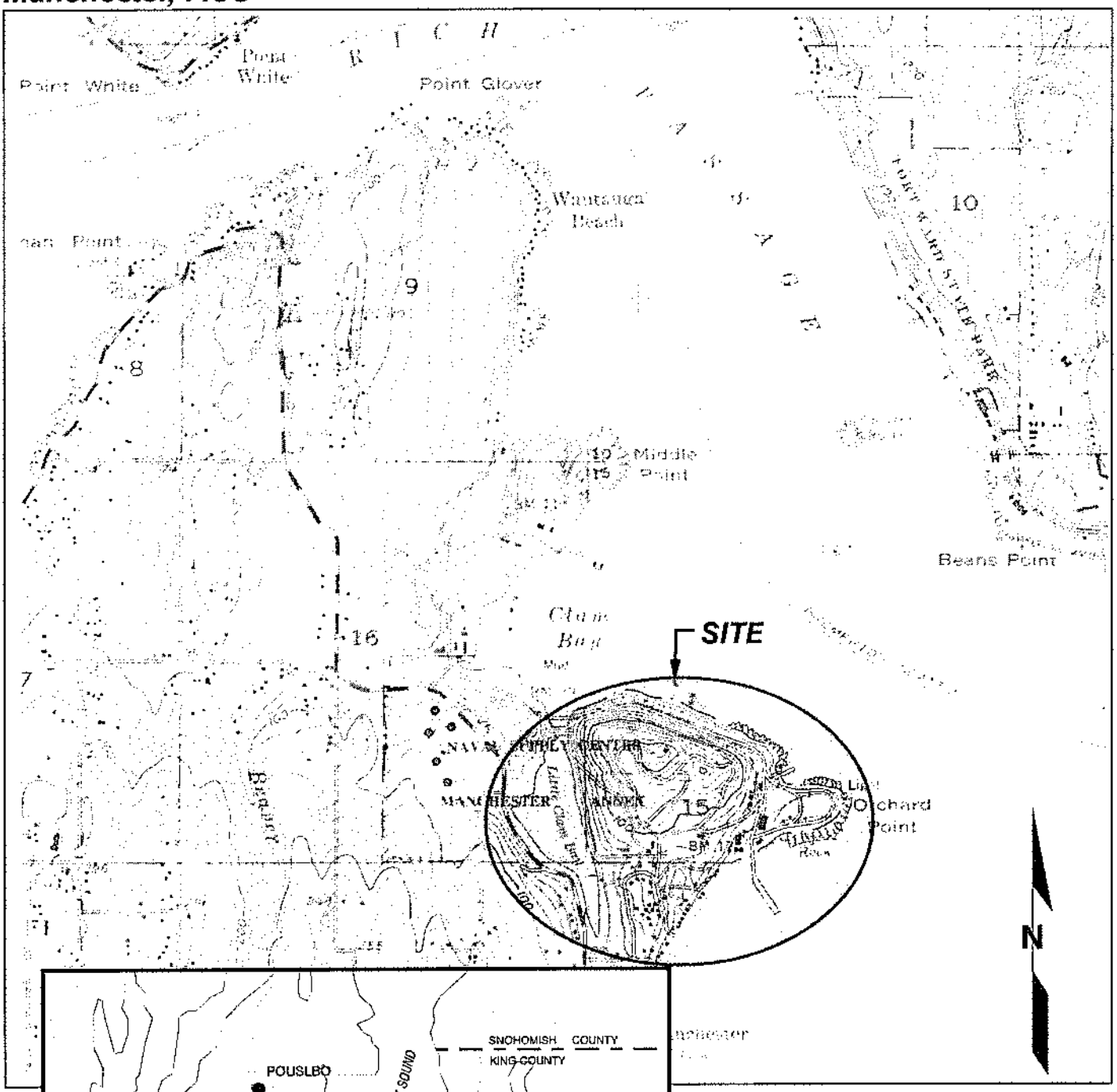
Table 12 - Summary of Tank 30 Soil Petroleum Hydrocarbon Data

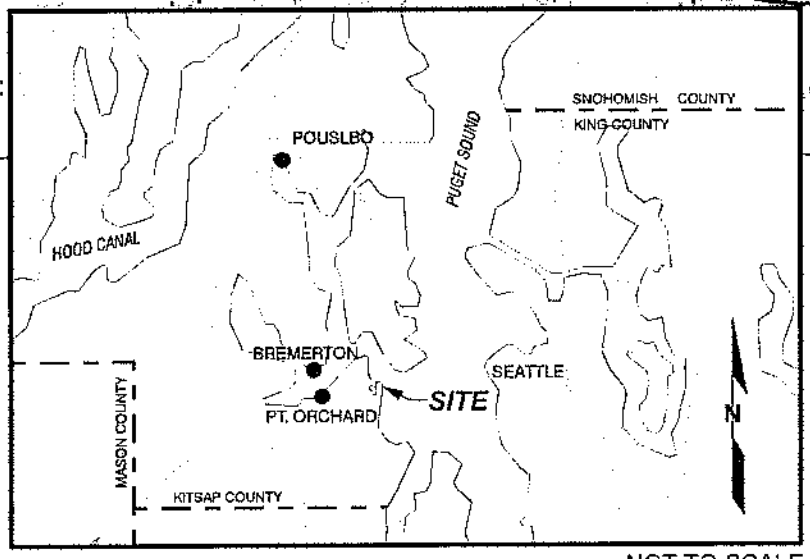
MW-No.	Sample Depth	Sample Number	Hydrocarbon Type	Concentration in ppm
MW-1-30	32-33.8	18244	NA	ND
MW-2-30	32-33.8	18245	NA	ND
MW-3-30	32-32.3	18246	Diesel	1900
MW-4-30	32-32.6	18247	Diesel	230
MW-5-30	32-32.8	18248	Diesel	1400
MW-6-30	32-32.5	18249	Diesel	980
MW-7-30	32-32.8	18250	Diesel	270
MW-8-30	32-32.4	18251	Diesel	140
MW-9-30	32.6-33	18252	Diesel	290
MW-10-30	32-33.1	18253	Diesel	640
MW-10-D-30	32-33.1	18254	Diesel	290
MW-11-30	32-32.3	18255	NA	ND
MW-13-30	37-37.3	18257	NA	ND
MW-12-30	No sample recovered			
MTCA Method C Industrial Direct Contact				>100,000
MTCA Method B Surface Water Protection				Unknown

Diesel-range C12-C24
NA Not applicable.
ND Not detected.

Vicinity Map

Manchester, FISC





Note: Base map prepared from USGS 7.5 minute quadrangle of Bremerton East, Washington, dated 1981.

0 2000 4000

Scale in Feet

NOT TO SCALE

Regional Map

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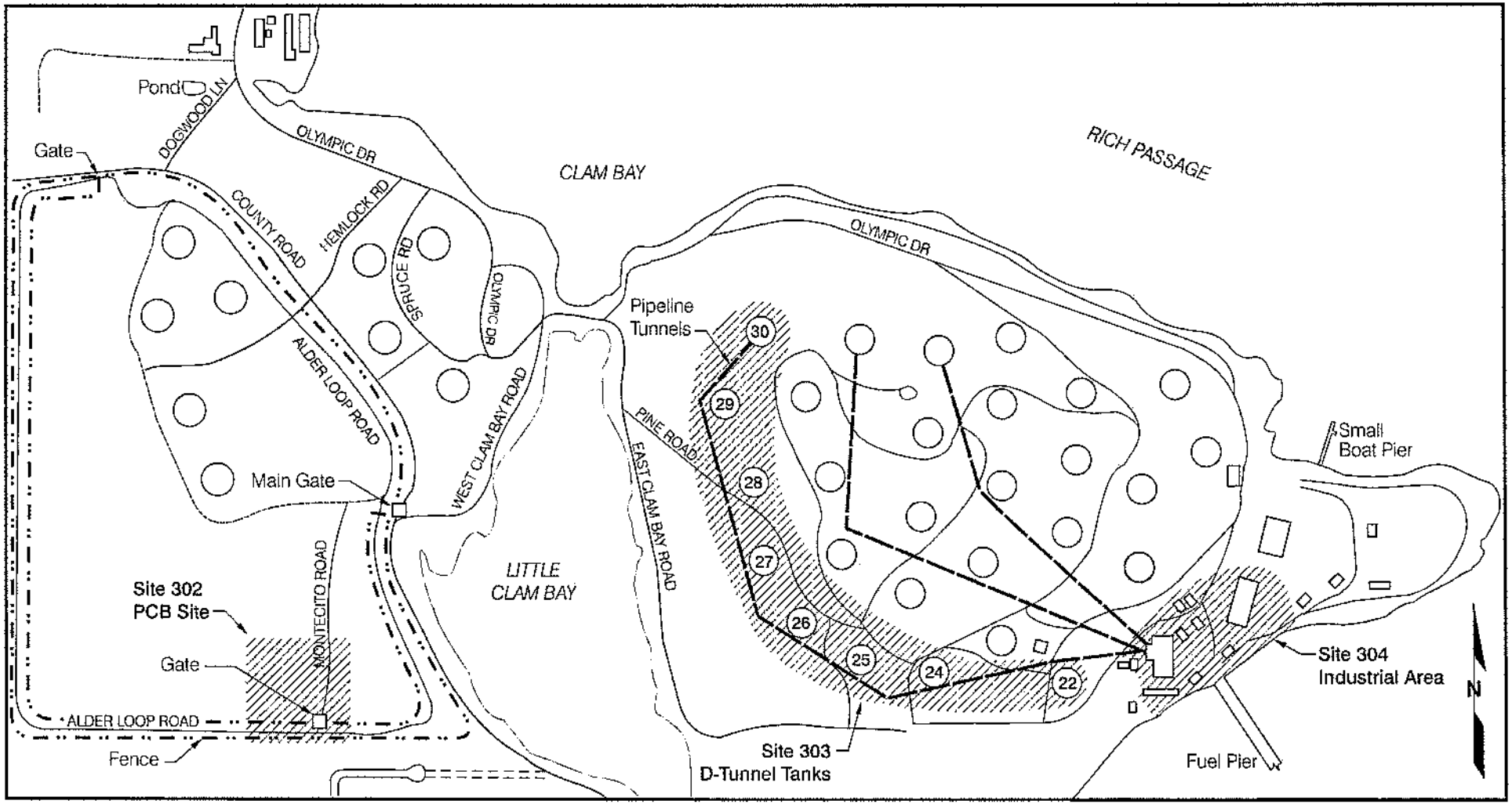
Figure 1

COREL\465439\MAP465439

Site Plan



Note. Map prepared from drawing provided by CLEAN entitled "FISC, Manchester, Site Map".

0 250 500

Scale in Feet

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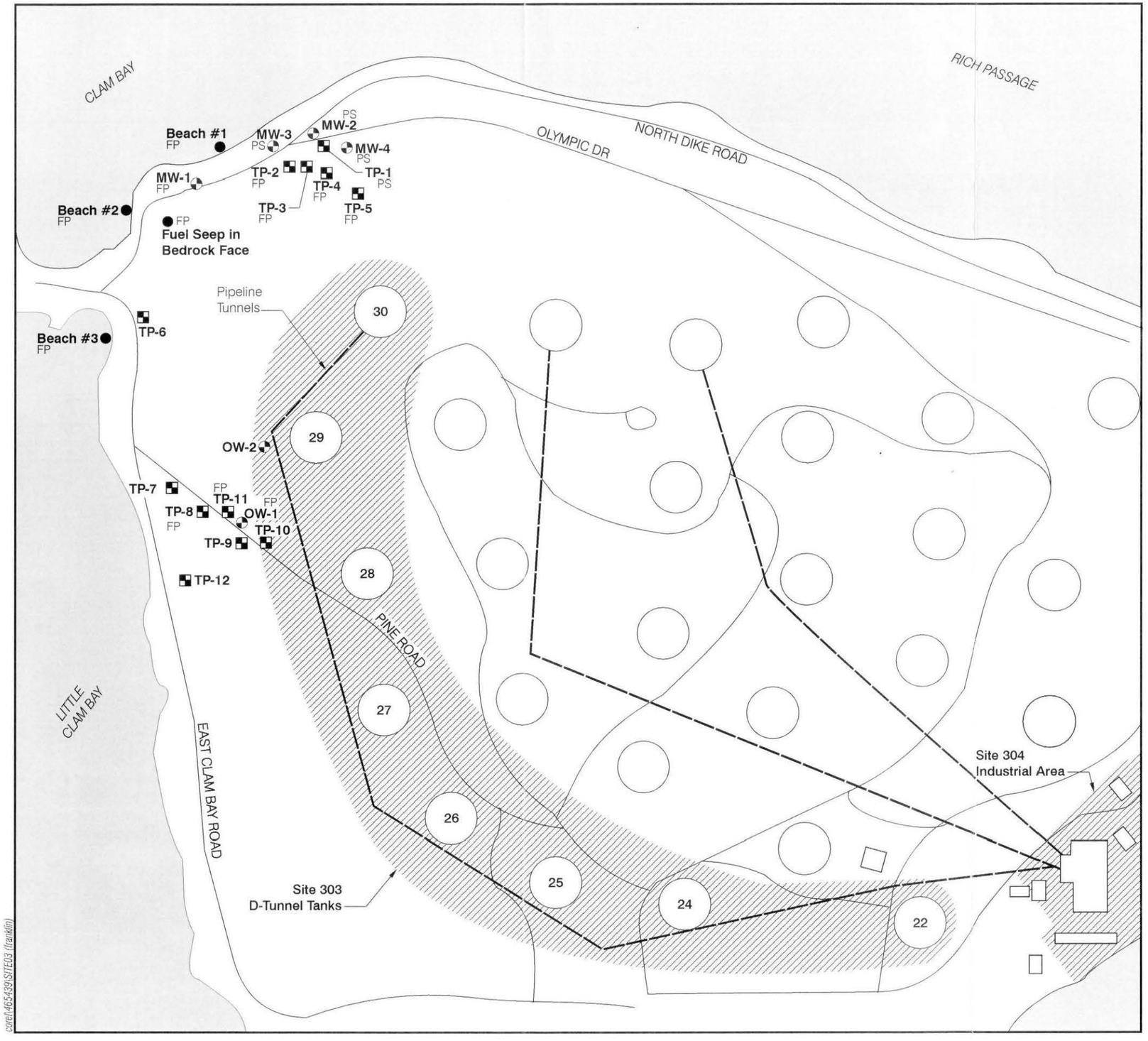
Figure 2

corel\4654391SITE465439

Site 303
Tank 30 Spill
Exploration
Location Map



corel\4564\39\SITE03 (franklin)

MW-1 Monitoring Well Location and Number

TP-101 Test Pit Location and Number

Beach #1 Petroleum Seep Location Observed in 1990

FS Free Phase Petroleum Product Observed in 1990

PS Petroleum Product Sheen Observed in 1990

N

0 100 200

Scale in Feet

Note: Map prepared from drawing provided by CLEAN entitled "FISC, Manchester, Site Map".

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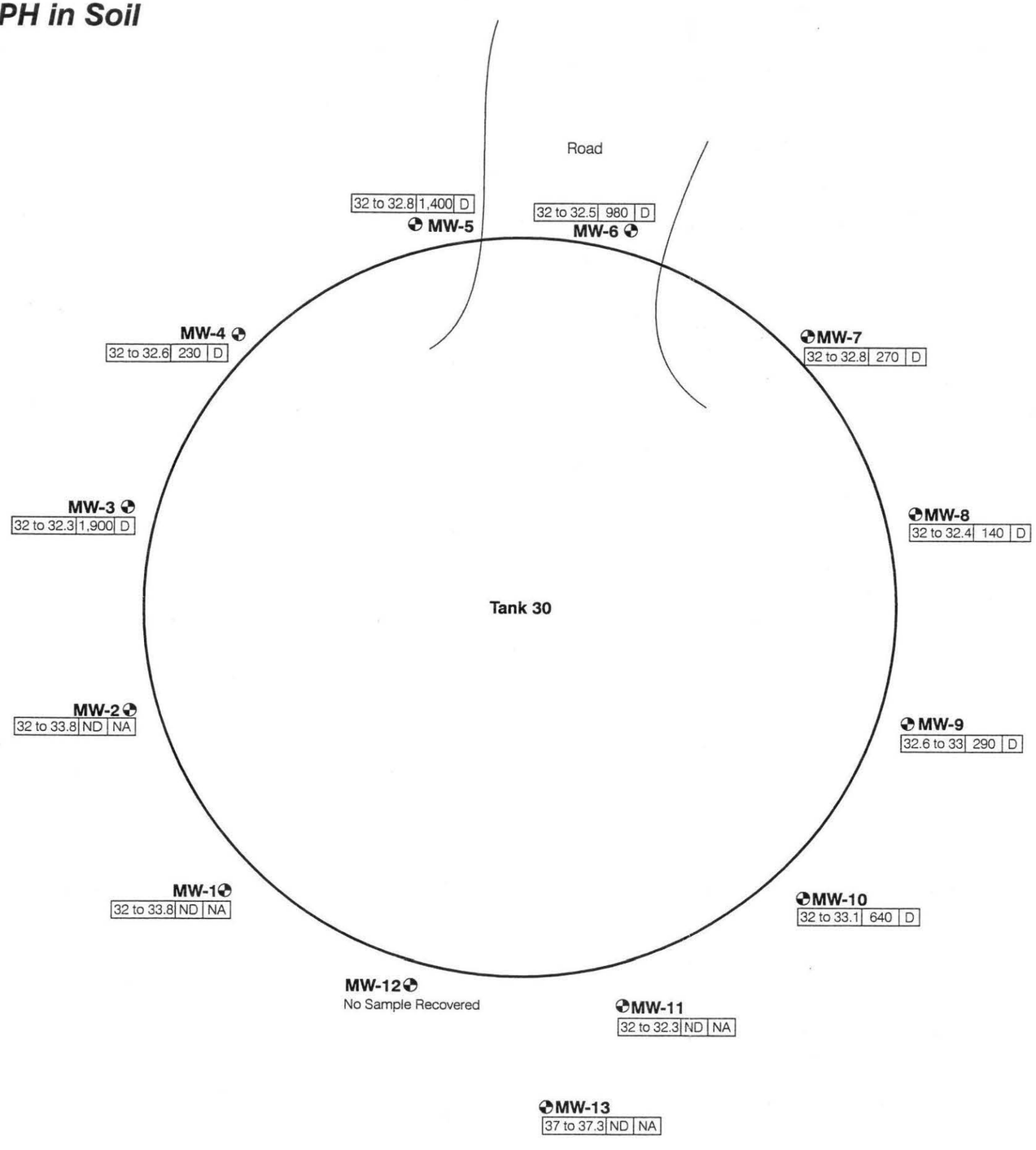
Figure 13

Distribution of TPH in Soil
Site 303, Tank 30



MW-1 Monitoring Well Location and Number

Depth in Feet
TPH Concentration in mg/kg (ppm)
32 to 32.3 | 1,900 | D — Product Type

D Diesel

NA Not Applicable

ND Not Detected

Note: Base map prepared from drawing provided by CLEAN entitled "Tank 30 As-builts".

N

0 20 40

Scale in Feet

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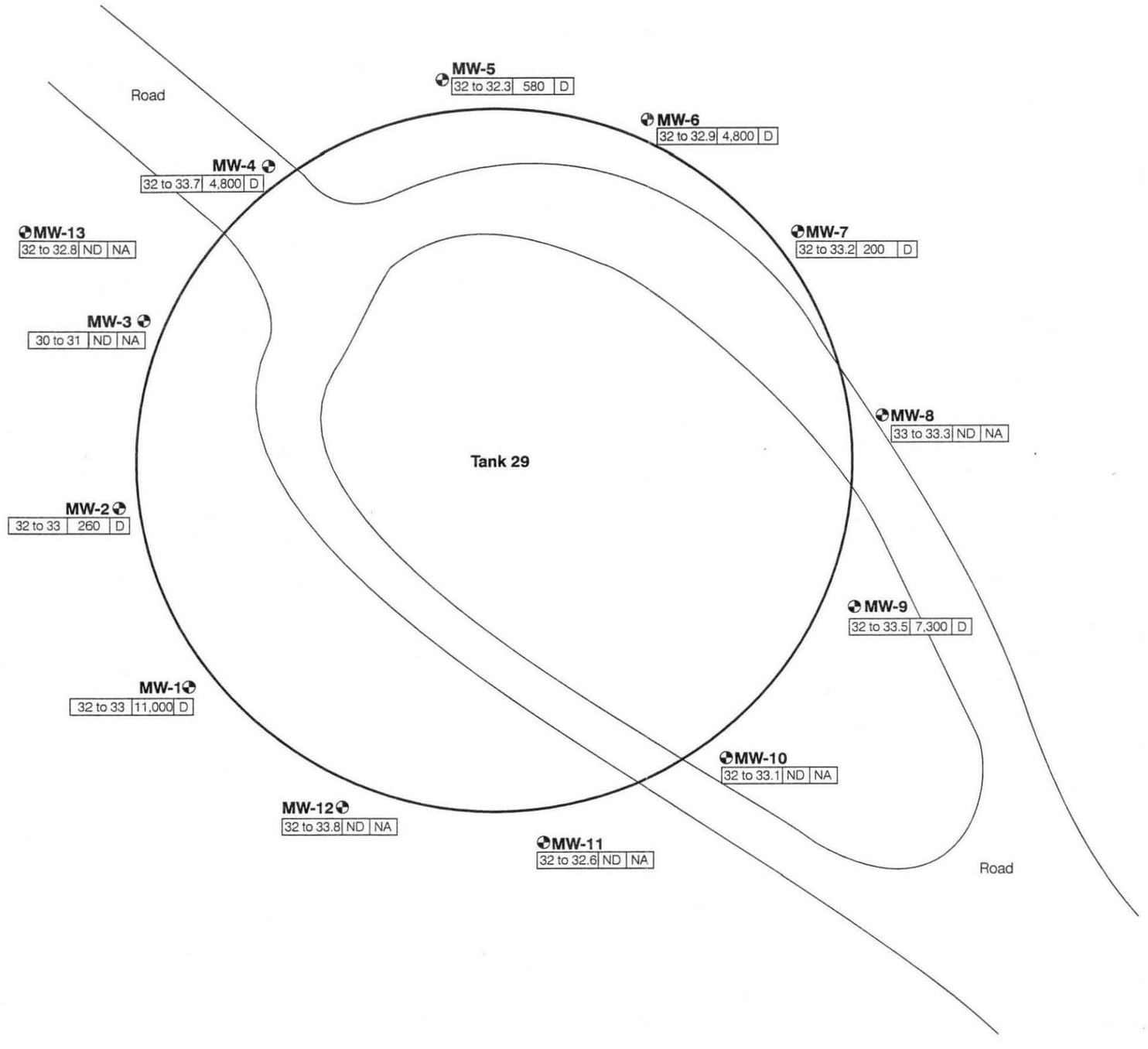
Figure 12

corel\465439\tank30

Distribution of TPH in Soil

Site 303, Tank 29



MW-1 Monitoring Well Location and Number

Depth in Feet | TPH Concentration in mg/kg (ppm) | Product Type

32 to 33 | 11,000 | D

D Diesel

NA Not Applicable

ND Not Detected

Note: Base map prepared from drawing provided by CLEAN entitled "Tank 29 As-builts".

N

0 20 40

Scale in Feet

core\\465439\tank29

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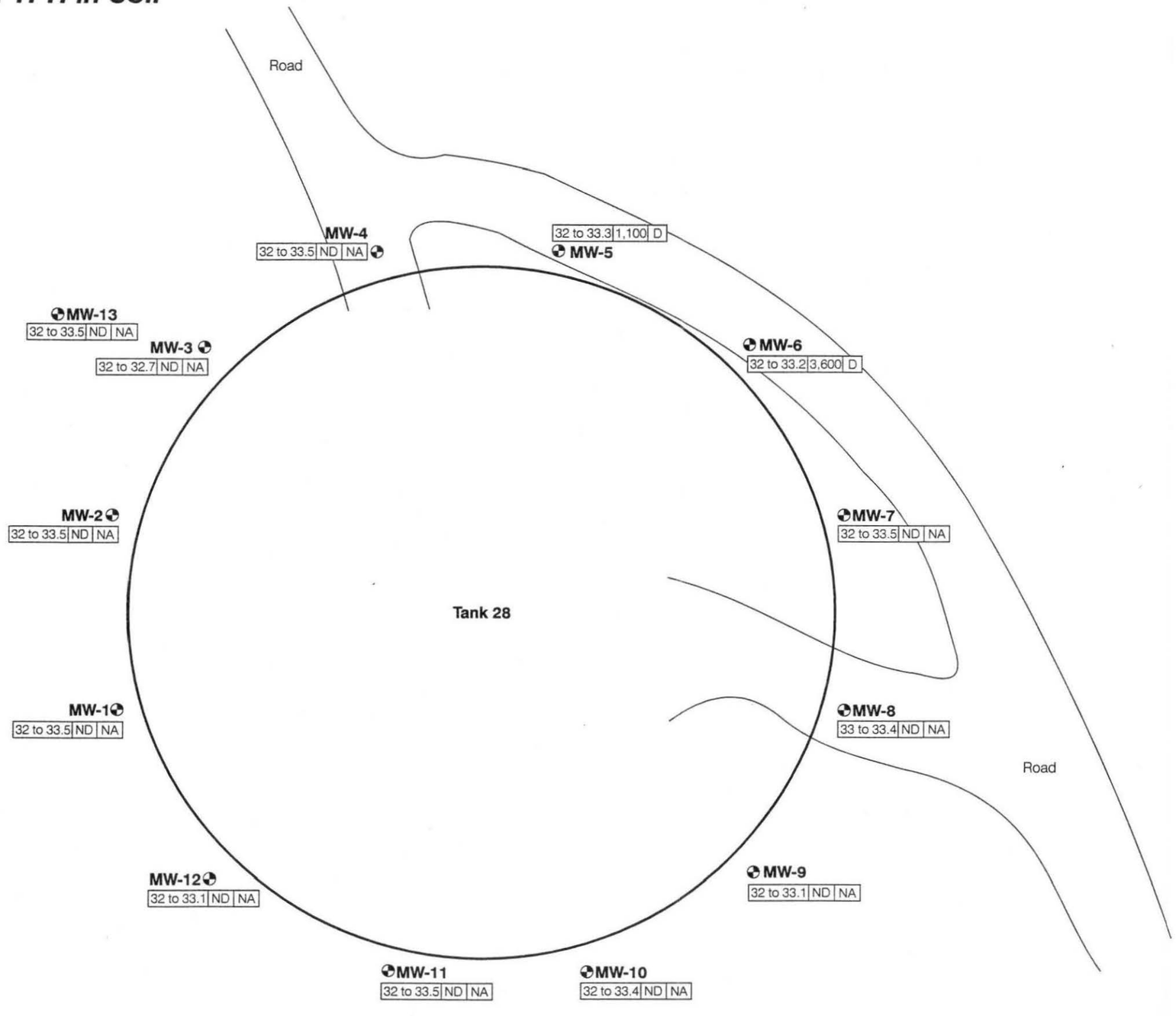
Figure 11

Distribution of TPH in Soil

Site 303, Tank 28



MW-1 Monitoring Well Location and Number

Depth in Feet

TPH Concentration in mg/kg (ppm)

32 to 33.3 | 1,100 | D — Product Type

D Diesel

NA Not Applicable

ND Not Detected

Note: Base map prepared from drawing provided by CLEAN entitled "Tank 28 As-builts".

N

0 20 40

Scale in Feet

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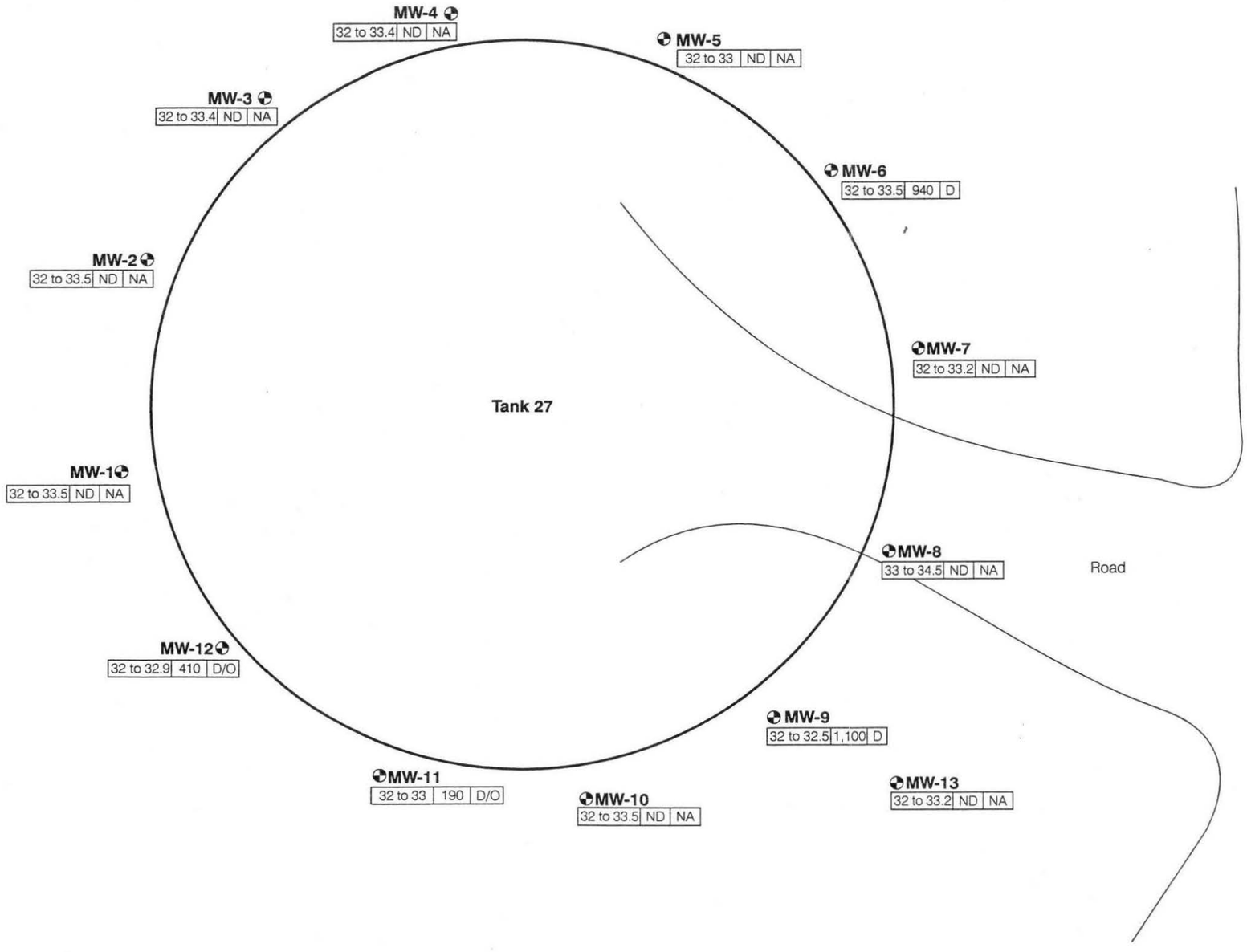
Figure 10

corel\465439\tank28

Distribution of TPH in Soil

Site 303, Tank 27



MW-1 Monitoring Well Location and Number

Depth in Feet
TPH Concentration in mg/kg (ppm)
32 to 33.5 | 940 | D — Product Type

- D Diesel
- O Oil
- NA Not Applicable
- ND Not Detected

Note: Base map prepared from drawing provided by CLEAN entitled "Tank 27 As-builts".

N

0 20 40

Scale in Feet

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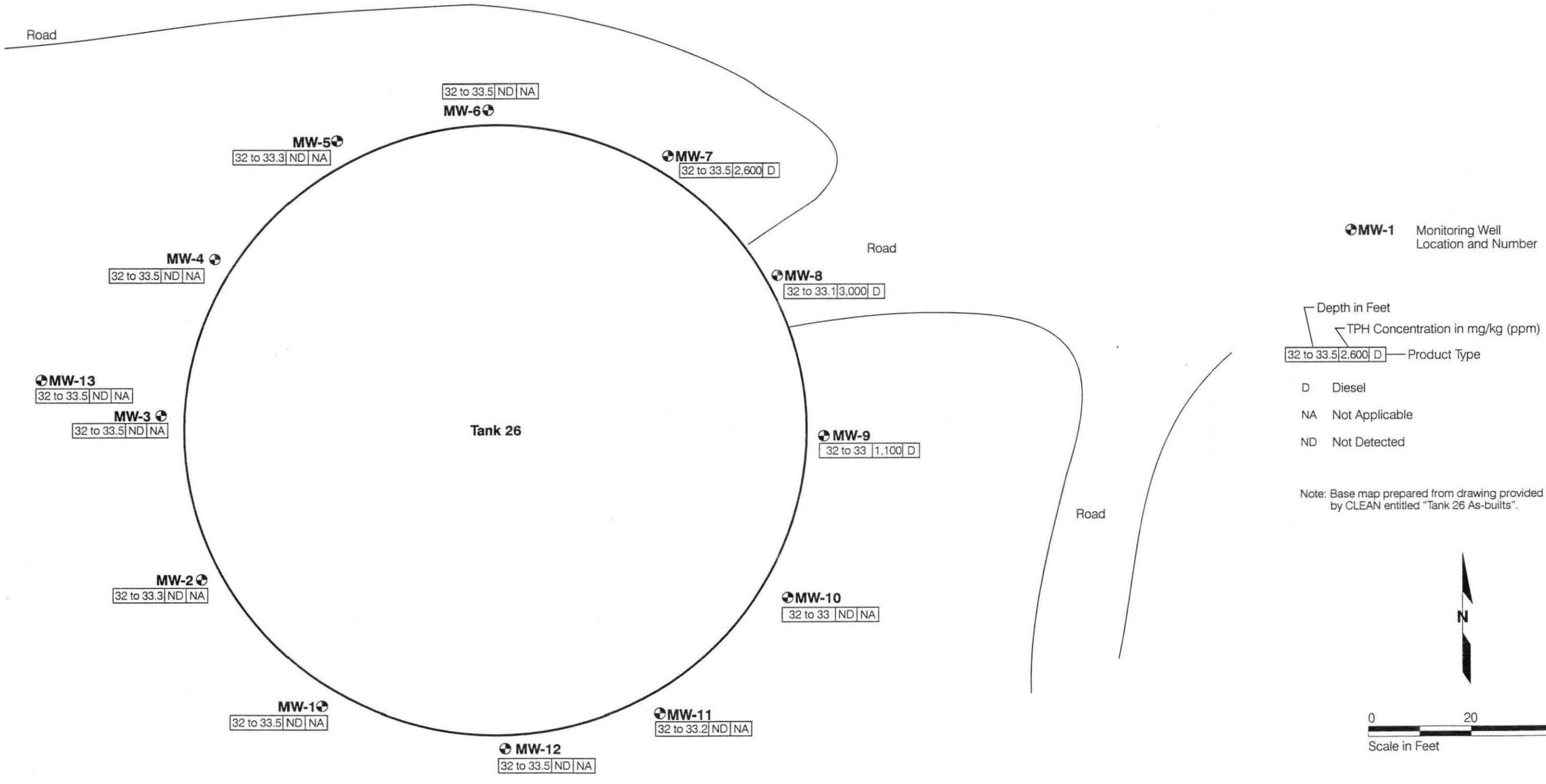
Figure 9

core\\465439\tank27

Distribution of TPH in Soil
Site 303, Tank 26



core\465439\tank26

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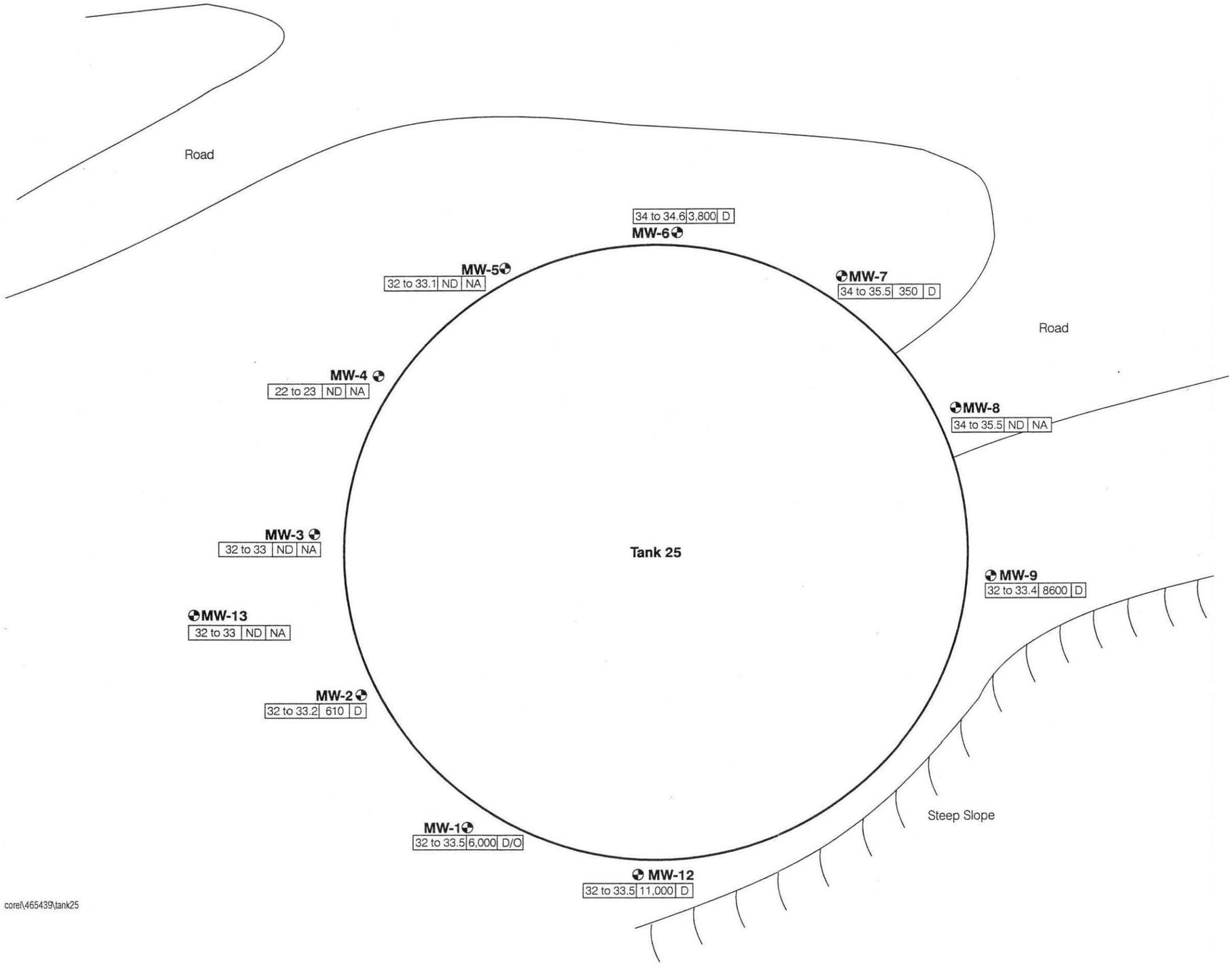
Figure 8

Distribution of TPH in Soil

Site 303, Tank 25



MW-1 Monitoring Well Location and Number

Depth in Feet
TPH Concentration in mg/kg (ppm)
32 to 33.5 | 6000 | D — Product Type

- D Diesel
- O Motor Oil
- NA Not Applicable
- ND Not Detected

Note: Base map prepared from drawing provided by CLEAN entitled "Tank 25 As-builts".

N

0 20 40

Scale in Feet

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Figure 7

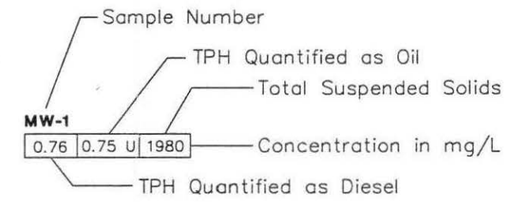
corel\465439\tank25

Distribution of TPH in Groundwater and Surface Water

Site 303, Tank 24 Corliss Marsh Area

Exploration/Sample Location and Number

● **SB-1**	Soil Boring
⊕ **MW-5**	Monitoring Well
⊕ **HA-11**	Hand–Auger
⊕ **SW-1**	Surface Water
□ **HA-1/GW-1**	Hand–Auger/Well Point



u Not Detected at Concentration Noted

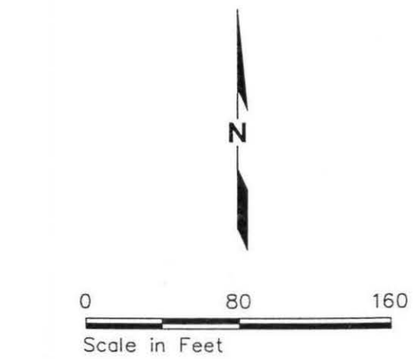


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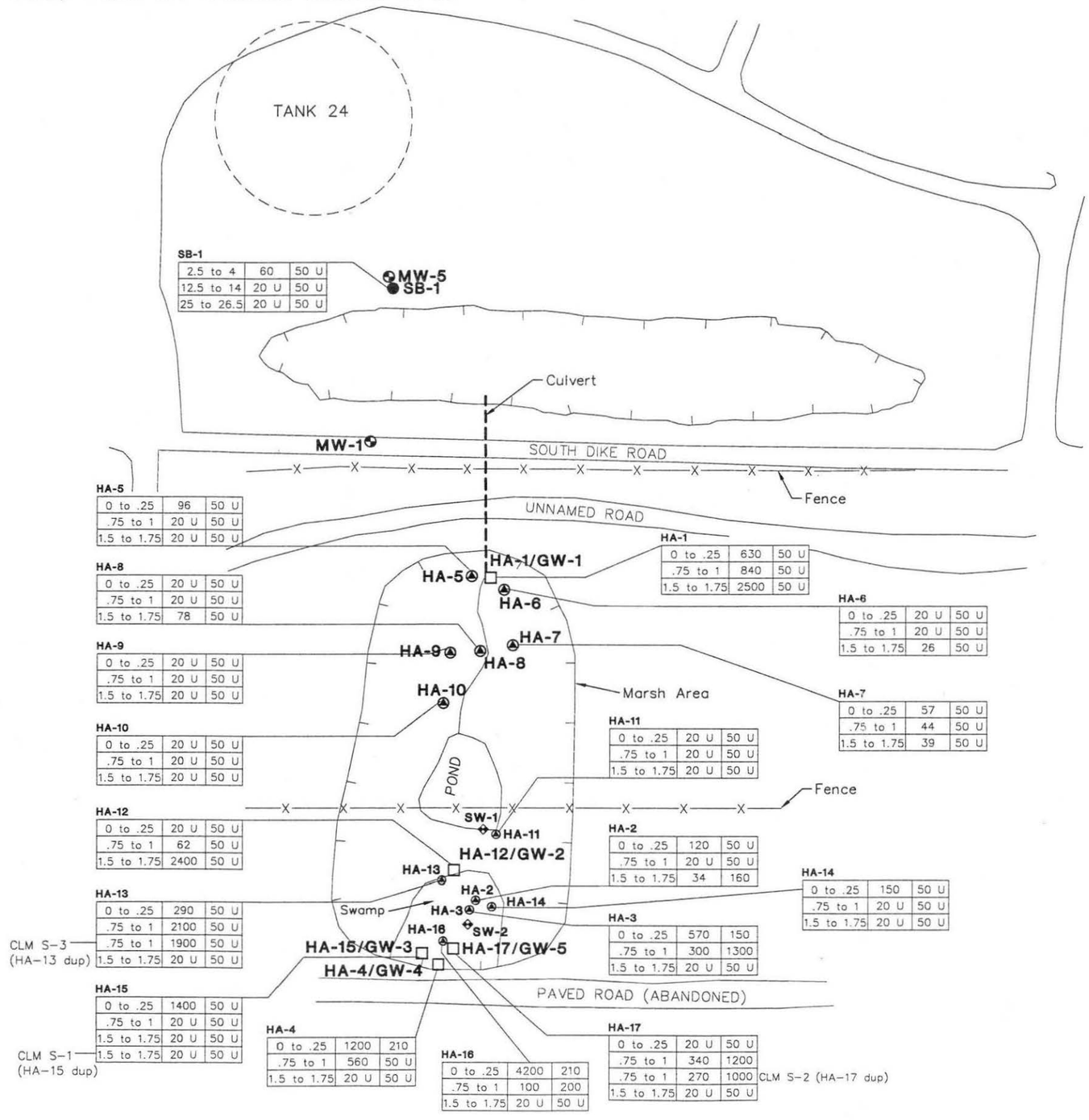
Figure 6

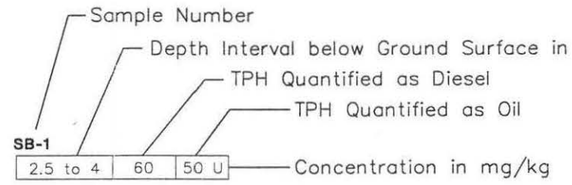
CVD 10/13/98 1=80 woodslk.pc2
46543908

Distribution of TPH in Soil

Site 303, Tank 24 Corliss Marsh Area



Exploration/Sample Location and Number	
● SB-1	Soil Boring
⊙ MW-5	Monitoring Well
⊛ HA-11	Hand-Auger
⊕ SW-1	Surface Water
□ HA-1/GW-1	Hand-Auger/Well Point



U Not Detected at Concentration Noted

0 80 160

Scale in Feet

CVD 10/13/98 1=80 woodslk pc2
46543907

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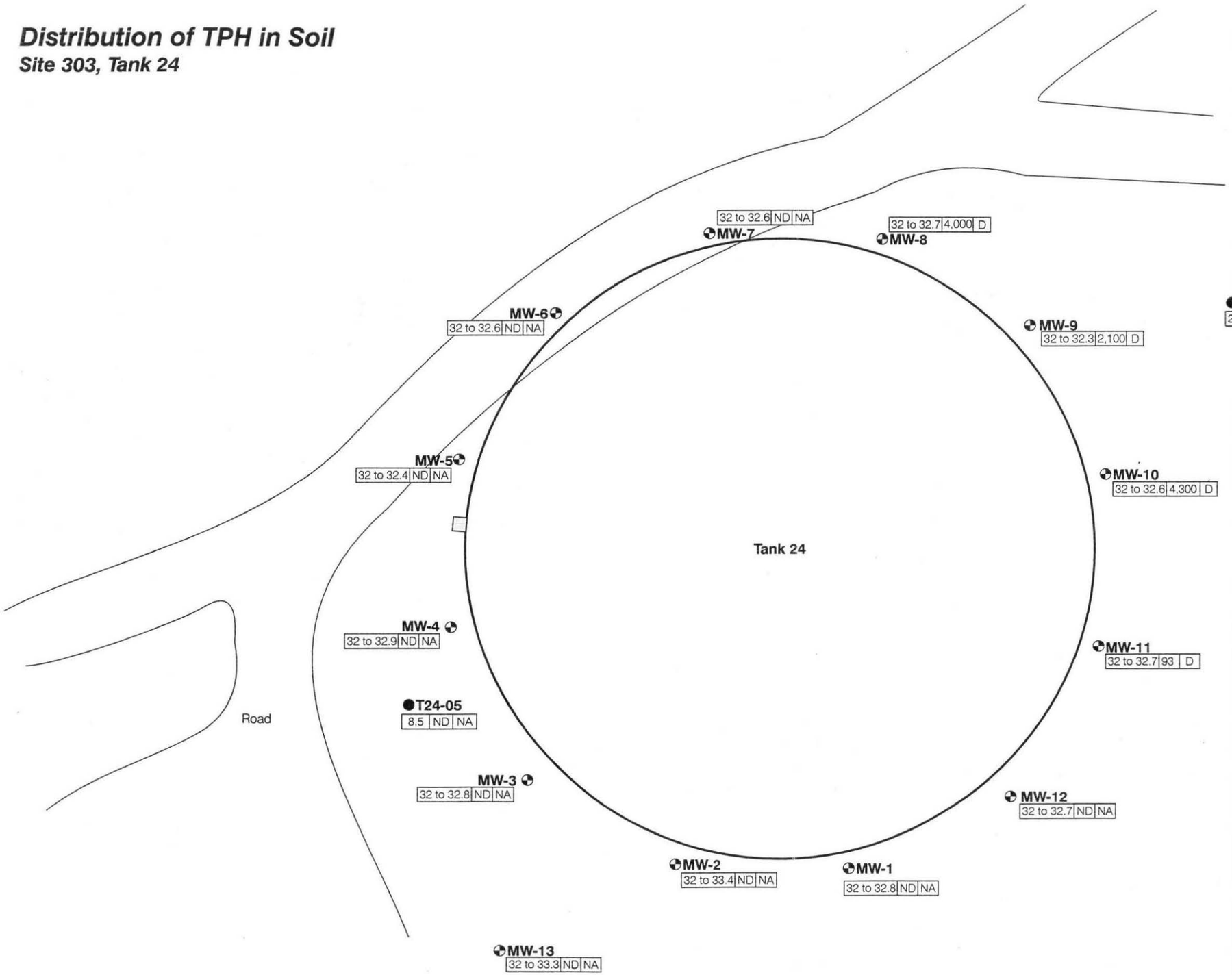
J-4654-39 10/98

Figure 5

Distribution of TPH in Soil
Site 303, Tank 24



MW-1 Monitoring Well Location and Number

T24-02 SCAPS Push Location and Number

Depth in Feet
TPH Concentration in mg/kg (ppm)
32 to 32.7 | 4000 | D — Product Type

D Diesel

NA Not Applicable

ND Not Detected

Note: Base map prepared from drawing provided by CLEAN entitled "Tank 24 As-builts".

N

0 20 40

Scale in Feet

core\\465439\tank24

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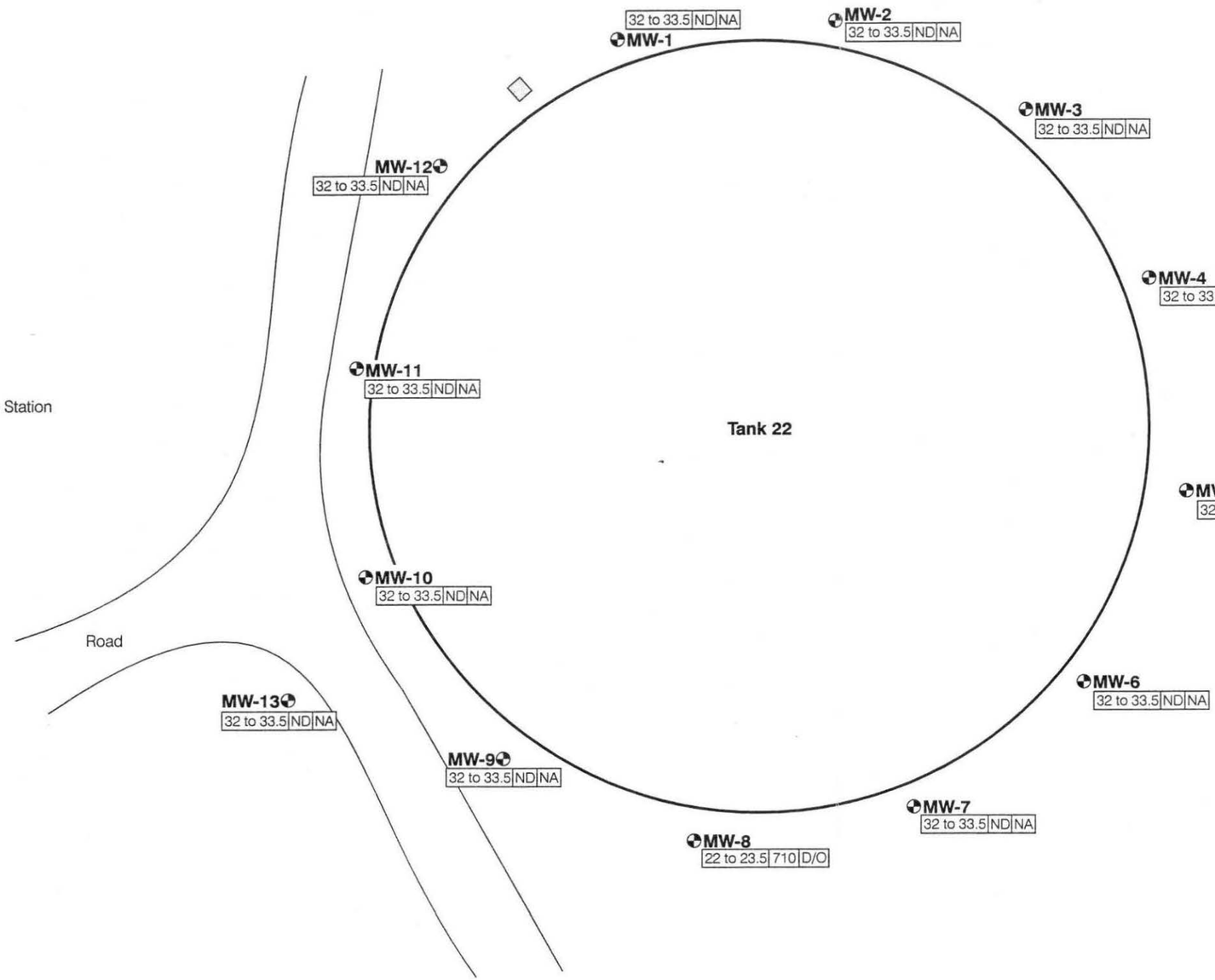
Figure 4

Distribution of TPH in Soil

Site 303, Tank 22



MW-1 Monitoring Well Location and Number

Depth in Feet

TPH Concentration in mg/kg (ppm)

22 to 23.5 | 710 | D/O — Product Type

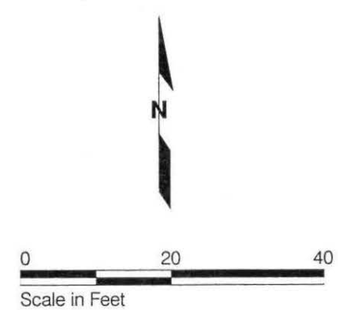
D Diesel

O Oil

NA Not Applicable

ND Not Detected

Note: Base map prepared from drawing provided by CLEAN entitled "Tank 22 As-builts".



core\465439\tank22

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Figure 3