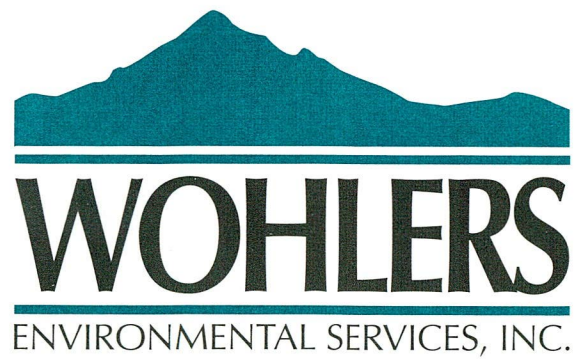
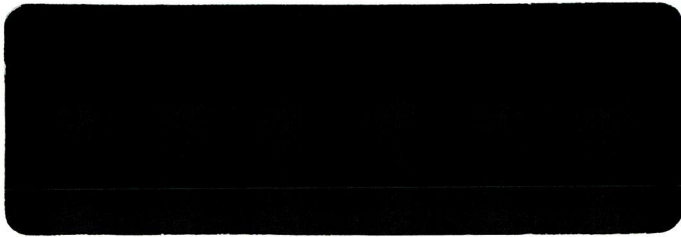




***FOURTH QUARTER '00 &
FIRST QUARTER '01 GROUND-
WATER MONITORING REPORT***

**Delco Petroleum Co. Service Station
17873 S.E. McLoughlin Boulevard
Milwaukie, Oregon**

Wohlers Environmental Project No. 01-0001
DEQ LUST File No. 03-93-0008

Prepared For:

Delco Petroleum Company, L.L.C.
14 Longleaf Drive
Hamilton Square, New Jersey 08690
Attn: Mr. Devinder Dhillon, President

Prepared By:

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18 May 2001





18 May 2001

Mr. Devinder Dhillon, President
Delco Petroleum Company, L.L.C.
14 Longleaf Drive
Hamilton Square, New Jersey 08690

RE: Transmittal of "Fourth Quarter '00 & First Quarter '01 Groundwater Monitoring Report"
Associated with the Delco Petroleum Company, L.L.C. Retail Motor Fuel Facility
Located at 17873 S.E. McLoughlin Boulevard in Milwaukie, Oregon
Wohlers Environmental Project No. 01-0001; DEQ LUST File No. 03-93-0008

Dear Mr. Dhillon:

On 10 and 11 January 2001 and 28 March 2001, Wohlers Environmental Services, Inc. ("Wohlers Environmental") personnel completed quarterly groundwater monitoring and sampling activities at the above-referenced Delco Petroleum Company, L.L.C. ("Delco") retail motor fuel facility located at 17873 S.E. McLoughlin Boulevard in Milwaukie, Oregon ('subject site'). The following letter report summarizes site history, current site status and results associated with recently-completed groundwater monitoring activities. In addition, the report includes information requested by the Oregon Department of Environmental Quality (DEQ) in correspondence dated 6 November 2000, including presentation of a Conceptual Site Model (CSM).

Based on approval by Mr. Robert Williams, UST Project Manager, Oregon DEQ, groundwater monitoring activities completed on 10 and 11 January 2001 will be considered the second consecutive quarterly groundwater monitoring event following the initial quarterly groundwater monitoring event completed in August 2000. The third consecutive quarterly groundwater monitoring event was completed on 28 March 2001.

1.0 INTRODUCTION

In January 2001, Delco representatives authorized Wohlers Environmental to complete groundwater monitoring activities and followup reporting for the above-referenced Delco retail motor fuel facility. This letter report includes a summary of previous site activities, groundwater elevation and contour map, laboratory results associated with groundwater samples collected from seven monitoring wells by Wohlers Environmental on 10 and 11 January 2001 and 28 March 2001, and conclusions regarding the findings associated with environmental assessment and cleanup activities completed at the subject site. Field methods and procedures are presented in Appendix A, "Field Procedures." Analytical results and Chain-of-Custody documentation are presented in Appendix B, "Analytical Results/Chain-of-Custody Documentation."

The subject site is an approximate 0.7-acre commercial property located at 17873 S.E. McLoughlin Boulevard in Milwaukie, Clackamas County, Oregon in Township 2 South, Range 2 East in Section 18, as shown on the U.S. Geological Survey (USGS) 7.5 minute topographic map for the Gladstone, Oregon Quadrangle (see Figure 1, "Site Vicinity Map").

Based on review of the topographic map, the subject site is located approximately 100 feet above mean sea level (amsl). Topography in the vicinity of the site is generally flat with a slight rise toward residential properties to the west. The Willamette River is located approximately 0.5 miles west of the subject site, and the Clackamas River discharges into the Willamette River approximately 1.5 miles south of the subject site.

According to the U.S. Department of Agriculture (USDA) *Soil Survey of Clackamas County, Oregon* (November 1985), the subject site is underlain by "Humaquepts, ponded" soils with zero to two percent slopes. These deep, poorly-drained soils are found on flood plains and old lake bottoms and are formed in lacustrine material over peat. These soils are subject to brief periods of flooding in winter. Based on information developed during previously-completed onsite investigations and cleanups, apparent native subsurface material beneath the subject site consists of clay and clayey silt to depths of up to 15 feet below surface grade (bsg), underlain by silty sand and cobbly gravel (see Geological Services' [GeoPro] April 2000 "Remedial Excavation Report" for additional information). Based on current and previously-completed field measurements, groundwater levels associated with onsite and offsite monitoring wells have ranged from between two feet and nine feet bsg.

Ed's Muffler and Brakes borders the subject site along its northern perimeter and Buster's Restaurant is located south of the subject site. Commercial properties are located east across S.E. McLoughlin Boulevard. Residential properties are located west of the subject site. A Delco office and a Jiffy Lube facility occupy a building located in the western-central portion of the subject site. Fuel dispenser islands are located in the eastern-central portion of the subject site. Underground Storage Tanks (USTs) and an out-of-service Soil Vapor Extraction (SVE) system are located along the northern perimeter of the subject site (see Figure 2, "Site Map").

2.0 PREVIOUS SITE ACTIVITIES

The following section contains information provided by GeoPro Geological Services ("GeoPro") and Delco representatives, and previously-completed reports, and summarizes prior site assessment and cleanup activities associated with historical petroleum releases at the Delco retail motor fuel facility located at 17873 S.E. McLoughlin Boulevard in Milwaukie, Oregon.

In April 1988, an approximate 81-gallon surface fuel spill was reported and subsequently cleaned up.

In January 1993, a release from a petroleum product line was discovered during installation of an onsite Stage II vapor recovery system. The product line reportedly ran eastward from the onsite UST cavity toward future monitoring well MW-2. Groundwater was not encountered

during retrofitting and repair of the product line system, and excavated soil from the associated trench was stockpiled west of the onsite Jiffy Lube facility. A composite soil sample from the excavated material was analyzed for Total Petroleum Hydrocarbon-Gasoline (THP-G) and Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) and lead constituents. TPH-G constituents were detected at 1,000 milligrams per kilogram (mg/kg) or parts per million (ppm). Benzene and lead were not detected. In February 1993, an "Initial Report Form for UST Cleanup Project" was prepared by Flying J, Inc. ("Flying J"), the then-owner of the subject site.

In May 1993, a Phase I environmental assessment was completed by Delta Environmental Consultants, Inc. ("Delta") at the Flying J/subject site gasoline station. Results of the assessment activities indicated the likelihood of a release of petroleum product at the site. Geo-Tech Explorations, Inc. ("Geo-Tech") subsequently completed a Phase II preliminary site characterization which included the completion of five soil borings (i.e., borings B-1 through B-5). Free product reportedly was observed in borings B-1 and B-5.

In June 1993, an additional six borings were drilled and completed as two-inch monitoring wells (i.e., wells MW-1 through MW-6) with groundwater encountered at approximately seven feet bsg. Silty sands reportedly were observed beneath the subject site with silty clay occurring at between approximately seven feet and 10 feet bsg. Soil samples collected from between approximately five feet and 6.5 feet bsg contained benzene concentrations ranging from non-detect in a soil sample collected from boring MW-6 to a maximum of 23,000 ppm in a soil sample collected from boring MW-2.

Tightness tests were conducted on four onsite Flying J UST systems in December 1993 and December 1994. Each UST system reportedly tested 'tight' (i.e., no apparent leak detected using U.S. Environmental Protection Agency (EPA)-mandated testing protocols).

In July 1994, soil samples were collected from the trench material stockpile or "spoil pile" located west of the Jiffy Lube facility and analyzed. TPH-Diesel extended (TPH-Dx) constituents (i.e., diesel and heavy oil) were detected at a maximum of 330 ppm.

In July 1994, approximately one inch of free product was observed in onsite well MW-3. Free product from well MW-3 was removed on a weekly basis from July through October 1994, and on a biweekly basis from November 1994 through January 1995. In September 1994, the onsite regular and unleaded gasoline fuel lines and premium gasoline UST system was tested and passed. During November and December 1994, five 1,500-gallon Jiffy Lube motor oil USTs were decommissioned by removal and taken offsite for disposal/recycling. Soil cleanup activities were not completed following UST decommissioning activities.

In January 1995, onsite wells MW-7, MW-8 and MW-9 were installed. In February 1995, well MW-3 was damaged during site characterization activities and subsequently was decommissioned. During groundwater sampling completed in June 1995, free product was observed in and removed from well MW-7 (i.e., located in the vicinity of former well MW-3). Free product was not reported in any onsite monitoring wells after September 1995.

Between September 1995 and August 1996, onsite monitoring well MW-10 was installed. In August 1996, offsite well MW-11 was installed in the reported downgradient groundwater flow direction north of the Jiffy Lube facility and west of Ed's Muffler and Brakes. Wells MW-12 and MW-13 were installed onsite in August/September 1996.

In January 1998, gasoline UST product lines and tanks were tightness tested and passed. The onsite 8000-gallon diesel UST and associated lines, however, failed the tightness test. During remedial activities in September 1999, apparent abandoned product lines were encountered between the onsite UST cavity and well MW-2.

In October 1999, four steel USTs were excavated and transported to Northwest Truck Parts Recycling by Pacific Northern Environmental, Inc. ("PNE"). The USTs included one 8,000-gallon diesel and three 12,000-gallon gasoline tanks. The tanks were formerly located in the northern-central portion of the subject site. Visible holes or ruptured areas were not observed. To prevent erosion under the adjacent Ed's Muffler and Brakes building, a temporary steel sheet pile retaining wall was installed approximately 52 inches from the southern edge of the building. The retaining wall was installed in October 1999 to an approximate depth of 30 feet bsg.

Following UST removal, the petroleum-impacted soil in the former UST cavity was over-excavated to an approximate depth of 12 feet bsg with over-excavation of petroleum-impacted soil in several onsite locations to approximately 15 feet bsg. Approximately 5,000 tons of petroleum-impacted soil were excavated and transported to TPS Technologies in Portland, Oregon for treatment/disposal. Groundwater that accumulated in the excavation was pumped into onsite holding tanks, aerated, and discharged under an Oregon DEQ National Pollutant Discharge Elimination System (NPDES) permit into an onsite storm drain. An estimated 200,000 gallons of accumulated groundwater were discharged into the onsite storm drain.

The former UST cavity was extended east, southeast and west based on soil sample analytical results. At the western extent of the excavation, an unreported accumulation of disposed materials (i.e., building materials, auto parts and trash) was uncovered, apparently dating from the early 1960s when a prior station had been demolished. Approximately 230 tons of soil and 10 truck tires were transported offsite for disposal from this unreported 'dump' area (see the above-referenced "Remedial Excavation Report" for further details regarding UST decommissioning and soil over-excavation activities).

A groundwater pump and treatment system operated at the subject site from late 1995 to September 1999 but reportedly has not operated since UST decommissioning and soil cleanup activities were completed in October 1999. In November 1999, onsite wells MW-14 and MW-15 were installed. In late 1999 and early 2000, new USTs and associated systems were installed at the subject site.

In August 2000, GeoPro completed Third Quarter 2000 groundwater monitoring. A description of these activities was included in the September 2000 "Quarterly Report: Groundwater Monitoring/August 2000" previously submitted by GeoPro to the Oregon DEQ.

3.0 REMAINING GASOLINE/BENZENE-IMPACTED SOIL

Based on analytical results and soil sample location data provided in the above-referenced "Remedial Excavation Report," Wohlers Environmental has calculated an estimated volume of the remaining gasoline-impacted and benzene-impacted soil 'pockets-in-place' associated with apparent historical petroleum releases at the subject site located at 17873 S.E. McLoughlin Boulevard in Milwaukie, Oregon.

The estimated areal extent of gasoline-impacted and benzene-impacted soil is represented by an irregular shape located west, north and east of the former 8,000-gallon diesel UST and former 12,000 gasoline USTs extending southeast beneath the former onsite dispenser islands. Calculation of the remaining pockets-in-place assumed that remaining gasoline-impacted and benzene-impacted soil beneath the subject site was located predominantly between 10.5 feet and 15 feet bsg. The total estimated volume of the remaining pocket-in-place gasoline-impacted soil is approximately 550 cubic yards. The total estimated volume of the remaining pocket-in-place benzene-impacted soil is approximately 360 cubic yards. The estimated extent of gasoline-impacted and benzene-impacted soil remaining at the subject site is illustrated in Appendix A, "Pocket-in-Place Estimated Extent Maps."

4.0 GROUNDWATER MONITORING ACTIVITIES

The following sections describe quarterly groundwater monitoring activities completed on 10 and 11 January 2001 and 28 March 2001.

4.1 Fourth Quarter 2000 Groundwater Monitoring: January 2001

On 10 & 11 January 2001, Wohlers Environmental representatives completed groundwater monitoring activities at the subject site. Depth to groundwater was measured in each of the 10 onsite and offsite wells (i.e., wells MW-1, MW-5, MW-6, and wells MW-9 through MW-15). Depth to water measurements and calculated groundwater elevations are presented in Table 1, "Groundwater Elevation Data."

Following measurement of depth to groundwater, seven wells (i.e., wells MW-1, MW-5, MW-9, MW-10, MW-11, MW-14 and MW-15) were purged using a submersible pump that was washed and thoroughly rinsed with fresh water before and between sampling each well. Removal of approximately three casing volumes of water, stabilization of groundwater physical parameters (i.e., temperature, conductivity and pH), and recovery of static water levels were achieved prior to groundwater sample collection.

Groundwater samples were collected from each of the seven wells using disposable bailers, placed in appropriate sampling containers, stored at approximately four degrees centigrade, and transported to an analytical laboratory under Chain-of-Custody protocols (see Appendix B for a full discussion of field procedures). Groundwater samples collected during the Fourth Quarter 2000 monitoring event were analyzed for TPH-Dx constituents. In addition, samples collected

from wells MW-1 and MW-5 were analyzed for Risk-Based Decision Making (RBDM) Volatile Organic Compound (VOC) constituents using U.S. EPA Method 8260B and dissolved lead using U.S. EPA Method 200. The sample collected from well MW-11 was analyzed for a full range of VOC constituents using U.S. EPA Method 8260B. Samples collected from wells MW-9, MW-10, MW-14 and MW-15 were analyzed for BTEX constituents using U.S. EPA Method 8020. A followup Polynuclear Aromatic Hydrocarbon (PAH) analysis was completed for sample MW-1 (see Appendix C, "Analytical Results/Chain-of-Custody Documentation").

4.2 First Quarter 2001 Groundwater Monitoring: March 2001

On 28 March 2001, Wohlers Environmental representatives completed groundwater monitoring activities at the subject site. Depth to groundwater was measured in each of the 10 onsite and offsite wells (i.e., wells MW-1, MW-5, MW-6, and wells MW-9 through MW-15). Depth to water measurements and calculated groundwater elevations are presented in Table 1.

Following measurement of depth to groundwater, seven wells (i.e., wells MW-1, MW-5, MW-9, MW-10, MW-11, MW-14 and MW-15) were purged using a submersible pump that was washed and thoroughly rinsed with fresh water before and between sampling each well. Removal of approximately three casing volumes of water, stabilization of groundwater physical parameters (i.e., temperature, conductivity and pH), and recovery of static water levels were achieved prior to groundwater sample collection.

Groundwater samples were collected from each of the seven wells using disposable bailers, placed in appropriate sampling containers, stored at approximately four degrees centigrade, and transported to an analytical laboratory under Chain-of-Custody protocols (see Appendix B). Groundwater samples collected during the First Quarter 2001 monitoring event were analyzed for TPH-Dx constituents. In addition, samples collected from wells MW-1 and MW-5 were analyzed for RBDM VOC constituents using U.S. EPA Method 8260B and dissolved lead using EPA Method 200.9. The sample collected from well MW-11 was analyzed for a full range of VOC constituents using U.S. EPA Method 8260B. Samples collected from wells MW-9, MW-10, MW-14 and MW-15 were analyzed for BTEX constituents using U.S. EPA Method 8020. A followup PAH analysis was completed for sample MW-1 (see Appendix C).

5.0 GROUNDWATER MONITORING RESULTS

The following sections describe results associated with quarterly groundwater monitoring activities completed on 10 and 11 January 2001 and 28 March 2001.

5.1 Fourth Quarter 2000 Groundwater Monitoring Results

Based on results associated with the January 2001 monitoring event, depth to shallow groundwater at onsite and offsite wells ranged from 5.66 feet to 8.00 feet below Top Of Casing (TOC). Groundwater elevations were calculated by subtracting measured depth to groundwater from the surveyed TOC elevations of each well. Groundwater elevation measurements associated with wells MW-14 and MW-15 appear anomalous due to their location within backfill material from a former excavation.

Based on groundwater elevation calculations, shallow groundwater at the subject site appeared relatively 'flat' with no clear groundwater flow direction indicated. Groundwater elevations are included in Figure 3, "Groundwater Elevation Map: Fourth Quarter 2000").

Groundwater analytical results associated with the completion of Fourth Quarter 2000 monitoring activities are illustrated on Figure 4, "Groundwater Sample Analytical Results Map: Fourth Quarter 2000" and presented in Table 2, "Groundwater Sample Analytical Results." Benzene was detected in groundwater samples collected from wells MW-1, MW-5, MW-9 and MW-15 during the First Quarter 2001 monitoring event at concentrations of 250 micrograms per liter (ug/l) or parts per billion (ppb), 86 ppb, 0.6 ppb and 9.3 ppb, respectively. BTEX constituents were not detected in the groundwater samples collected from wells MW-10, MW-11 and MW-14. Refer to Figure 4 and Table 2 for remaining BTEX constituent concentrations detected in the groundwater samples collected from the above-referenced monitoring wells during the Fourth Quarter 2000 monitoring event.

Minimal concentrations of TPH-Dx constituents were detected in groundwater samples collected from wells MW-1, MW-5, MW10 and MW-11. TPH-Dx constituents were not detected in samples collected from wells MW-9, MW-14 and MW-15. Methyl Tertiary Butyl Ether (MTBE) was detected in water samples collected from wells MW-1, MW-5 and MW-11 at 88 ppb, 54 ppb and 1.6 ppb, respectively. Naphthalene was detected in sample MW-1 at 11 ppb while cis-1,2-DiChloroEthene (cis-1,2-DCE) was detected at 1.8 ppb in the groundwater sample collected from well MW-11. Only the PAH constituent naphthalene was detected at 6.4 ppb in the groundwater sample collected from well MW-1. Laboratory analytical results and Chain-of-Custody documentation are included in Appendix C.

5.2 First Quarter 2001 Groundwater Monitoring Results

Based on results associated with the March 2001 monitoring event, depth to shallow groundwater at onsite and offsite wells ranged from 5.62 feet to 7.58 feet below TOC. Groundwater elevations were calculated by subtracting measured depth to groundwater from the surveyed TOC elevations of each well. Groundwater elevation measurements associated with wells MW-5, MW-14 and MW-15 appear anomalous due to their proximity to and/or location within backfill material from a former excavation.

Based on groundwater elevation calculations, shallow groundwater at the subject site appeared relatively 'flat' with no clear groundwater flow direction indicated. Groundwater elevations are included in Figure 5, "Groundwater Elevation Map: First Quarter 2001").

Groundwater analytical results associated with the completion of First Quarter 2001 monitoring activities are illustrated on Figure 6, "Groundwater Sample Analytical Results Map: First Quarter 2001" and presented in Table 2. Benzene was detected in groundwater samples collected from wells MW-1, MW-5 and MW-15 during the First Quarter 2001 monitoring event at concentrations of 280 ppb, 81 ppb and 18 ppb, respectively. BTEX constituents were not detected in the groundwater samples collected from wells MW-9, MW-10, MW-11 and MW-14. Refer to Figure 6 and Table 2 for remaining BTEX constituent concentrations detected in the groundwater samples collected from the above-referenced monitoring wells during the First Quarter 2001 monitoring event.

Minimal concentrations of TPH-Dx constituents were detected in groundwater samples collected from wells MW-1 and MW-11. TPH-Dx constituents were not detected in samples collected from wells MW-5, MW-9, MW-10, MW-14 and MW-15. MTBE was detected in water samples collected from wells MW-1, MW-5 and MW-11 at 86 ppb, 51 ppb and 1.7 ppb, respectively. Naphthalene was detected in sample MW-1 at 20 ppb while cis-1,2-DCE was detected at 1.1 ppb in the groundwater sample collected from well MW-11. Only the PAH constituent naphthalene was detected at 3.4 ppb in the groundwater sample collected from well MW-1. Laboratory analytical results and Chain-of-Custody documentation are included in Appendix C.

6.0 RISK-BASED DECISION MAKING (RBDM) LEVELS

In September 1999, the Oregon DEQ promulgated risk-based guidance protocols and cleanup targets for soil and groundwater impacted by leaking petroleum USTs (see "Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites" September 1999). The Oregon DEQ RBDM process includes evaluation of petroleum source, human and environmental receptors, and potential exposure pathways, and a 'tiered' approach to determination of Risk-Based Concentration (RBC) cleanup targets for soil and groundwater. One air exposure pathway, four soil exposure pathways and five groundwater exposure pathways are included in the September 1999 RBDM guidance document.

RBC target cleanup levels are based on conservative assumptions regarding exposure pathways and receptors, and are listed in the 'Table of Risk-Based Concentrations (RBCs)' contained in the September 1999 Oregon DEQ RBDM guidance document. The Table of RBCs includes conservative soil, groundwater and air RBCs for 25 chemicals, including 13 PAH constituents, BTEX, Ethylene DiBromide/Ethylene DiChloride (EDB/EDC), MTBE, lead, and four alkylated benzene compounds.

The Oregon DEQ "...does not routinely require that air be tested at UST cleanup sites due to the great temporal and spatial variability in concentrations which makes it difficult to collect representative samples."¹ Based on an absence of applicable site characteristics, air sampling was not performed at the subject site and the corresponding air 'inhalation' exposure pathway scenario was not evaluated.

Based on an assessment of site-specific criteria and circumstances, the subject site is located in a commercial-industrial land use area. Based on this evaluation, the following RBDM analysis focuses on commercial-industrial exposure pathways. The following is a list of potential pathways that conceivably may be associated with historical releases of petroleum product at the subject site. A site-specific Conceptual Site Model (CSM) illustrating potential pathways and receptors is illustrated on Figure 7, "Conceptual Site Model for Potential Receptors." Risk-Based Contaminants of Potential Concern (COPCs) for soil at the subject site associated with significant and/or feasible exposure pathways are listed in Table 3, "Contaminants of Potential Concern: Soil." Risk-Based COPCs for groundwater at the subject site associated with significant and/or feasible exposure pathways are listed in Table 4, "Contaminants of Potential Concern: Groundwater."

6.1 Soil Pathways

Surface Soil Ingestion, Dermal Contact and Inhalation (RBC_{ss}): Analytical results associated with previous site cleanup activities completed from October through December 1999 have indicated that petroleum COPCs either were not detected or were below generic RBC_{ss} exposure pathway target cleanup levels. In addition, petroleum-impacted soil was not encountered within approximately three feet of the surface at the subject site. Thus, "Surface Soil Ingestion, Dermal Contact and Inhalation" does not appear to represent a significant and feasible current or future exposure pathway at or adjacent to the subject site.

Volatilization to Outdoor Air (RBC_{so}): Analytical results associated with previous site cleanup activities completed from October through December 1999 have indicated that petroleum COPCs either were not detected or were below generic RBC_{so} exposure pathway target cleanup levels. In addition, asphalt, concrete and buildings cover or "cap" over 95 percent of the surface area of the subject site and adjacent sites, reducing release of volatile petroleum constituents from subsurface soil to outdoor air. Thus, "Volatilization to Outdoor Air" does not appear to represent a significant and feasible current or future exposure pathway at or adjacent to the site.

1 "Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites," September 29, 1999, page A-4.

Vapor Intrusion into Buildings (RBC_{si}): Analytical results associated with previous site cleanup activities from October through December 1999 have indicated that petroleum COPCs either were not detected or were below generic RBC_{si} exposure pathway target cleanup levels with the exception of benzene detected in several soil samples exceeding the RBC_{si} exposure pathway target cleanup level of 0.5 ppm established for commercial-industrial receptors. The nearest building, however, is located at least 10 lateral feet from the nearest observed location of remaining petroleum-impacted soil exceeding 0.5 ppm benzene. Thus, "Vapor Intrusion into Buildings" does not appear to represent a feasible current or future exposure pathway at or adjacent to the subject site.

Leaching to Groundwater (RBC_{sw}): Analytical results associated with previous site cleanup activities from October through December 1999 have indicated that petroleum COPCs either were not detected or were below generic RBC_{sw} exposure pathway target cleanup levels with the exception of benzene and MTBE detected in soil samples exceeding the RBC_{sw} exposure pathway target cleanup levels of 0.1 ppm and 0.16 ppm, respectively, established for commercial-industrial receptors.

Review of community and domestic well log files maintained by the Oregon Water Resources Department (OWRD) has indicated that only one domestic well is located within 0.25 miles of the subject site (see Appendix D, "Community/Domestic Well Survey" for additional information). This well has a casing depth of approximately 60 feet, is located approximately 0.2 miles southwest of the subject site and is separated from the subject site by a low ridge. In addition, information obtained from the City of Milwaukie has indicated that potable water for the subject site and nearby properties is supplied by the City of Milwaukie and likely will be for the foreseeable future. Also, asphalt, concrete and/or buildings cover or 'cap' the majority of the surface area and adjacent sites, limiting or eliminating surface water infiltration. Thus, "Leaching to Groundwater" does not appear to represent a feasible current or future exposure pathway at and in the vicinity of the subject site.

6.2 Groundwater Pathways

Groundwater Ingestion (RBC_{dw}): Analytical results associated with the last three groundwater monitoring events (i.e., August 2000, January 2001 and March 2001) have indicated that petroleum COPCs either were not detected or were below the generic RBC_{dw} exposure pathway target cleanup levels established for commercial-industrial receptors with the exception of benzene detected in groundwater samples collected from well MW-1, MW-5 and MW-15 during the August 2000, January 2001 and March 2001 monitoring activities, MTBE detected in groundwater samples collected from well MW-1 and MW-14 during the August 2000 monitoring activities, and MTBE detected in groundwater samples collected from well MW-1 and MW-5 during the January and March 2001 monitoring activities. Benzene and MTBE concentrations in these groundwater samples exceeded the RBC_{dw} exposure pathway target cleanup levels of 4.3 ppb and 20 ppb, respectively, established for commercial-industrial receptors.

Review of community and domestic well log files maintained by the OWRD has indicated that only one domestic well is located within 0.25 miles of the subject site. This well has a casing depth of approximately 60 feet, is located approximately 0.2 miles southwest of the subject site and is separated from the subject site by a low ridge. In addition, information obtained from the City of Milwaukie has indicated that potable water for the subject site and nearby properties is supplied by the City of Milwaukie and likely will be for the foreseeable future. Thus, the absence of community and domestic water wells at and in the vicinity of the subject site and the current and likely future availability of potable water from the City of Milwaukie indicate that "Groundwater Ingestion" does not appear to represent a feasible current or future exposure pathway at the subject site.

Volatilization to Outdoor Air (RBC_{wo}): Analytical results associated with the last three groundwater monitoring events have indicated that petroleum COPCs either were not detected or were below the generic RBC_{wo} exposure pathway target cleanup levels established for commercial-industrial receptors. In addition, asphalt, concrete or buildings cover or "cap" the majority of the surface area of the subject site and adjacent sites, reducing or eliminating release of volatile petroleum constituents from subsurface soil to outdoor air. Thus, "Volatilization to Outdoor Air" does not appear to represent a significant or feasible current or future exposure pathway at or adjacent to the subject site.

Vapor Intrusion into Buildings (RBC_{wi}): Analytical results associated with the last three groundwater monitoring events have indicated that petroleum COPCs either were not detected or were below the generic RBC_{wi} exposure pathway target cleanup levels established for commercial-industrial receptors. Thus, "Vapor Intrusion into Buildings" does not appear to represent a significant current or future exposure pathway at or adjacent to the subject site.

Groundwater in Excavation (RBC_{we}): Analytical results associated with the last three groundwater monitoring events have indicated that petroleum COPCs either were not detected or were below the generic RBC_{we} exposure pathway target cleanup levels established for commercial-industrial receptors. Thus, "Groundwater in Excavation" does not appear to represent a significant current or future exposure pathway at the subject site.

Ingestion and Inhalation from Tapwater (RBC_{tw}): As noted above, the absence of apparent exposure from community and/or domestic water wells at or in the vicinity of the subject site, the current and likely supply of potable water at and in the vicinity of the subject site by the City of Milwaukie, and the relatively limited extent of petroleum-impacted shallow groundwater, indicate that "Ingestion and Inhalation from Tapwater" does not appear to represent a feasible current or future exposure pathway.

7.0 U.S. EPA REGION IX PRELIMINARY REMEDIATION GOALS (WATER)

In 1996, U.S. EPA Region IX developed Preliminary Remediation Goals (PRGs) to assist in evaluation of risks associated with chemical-impacted soil, water and air. Several hundred chemicals are included in the EPA Region IX PRG guidance document, including petroleum and non-petroleum constituents. Chemical constituents detected in groundwater samples collected at the subject site during completion of the August 2000, January 2001 and March 2001 groundwater monitoring events were compared with "Tap Water" PRGs contained in the EPA Region IX guidance document (see Table 5, "Potentially Applicable Water Cleanup Levels/Targets"). As noted in Table 5, only vinyl chloride detected in groundwater sample MW-11 at 0.8 ppb exceeded its EPA Region IX PRG target cleanup level of 0.02 ppb. As noted in section 6.0 above, however, site and regional-specific conditions and characteristics indicate that shallow groundwater at and in the vicinity of the subject site is not a currently-used or feasible future source of potable water.

8.0 U.S. EPA REGION III RISK-BASED CONCENTRATIONS (WATER)

In 1998, U.S. EPA Region III developed RBCs to assist in evaluation of risks associated with chemical-impacted soil, water and air. Several hundred chemicals are included in the EPA Region III RBC guidance document, including petroleum and non-petroleum constituents. Chemical constituents detected in groundwater samples collected at the subject site during completion of the August 2000, January 2001 and March 2001 groundwater monitoring events were compared with "Tap Water" RBCs contained in the EPA Region III guidance document. As noted in Table 5 of this report, only vinyl chloride detected in groundwater sample MW-11 at 0.8 ppb exceeded its EPA Region III RBC target cleanup level of 0.019 ppb. As noted in section 6.0 above, however, site and regional-specific conditions and characteristics indicate that shallow groundwater at and in the vicinity of the subject site is not a currently-used or feasible future source of potable water.

9.0 DRINKING WATER MAXIMUM CONTAMINANT LEVELS (MCLs)

Under the authority of the Safe Drinking Water Act (SDWA), the U.S. EPA has developed primary and secondary drinking water standards and health advisories to assist in protection of human health associated with potable water provided by public and multi-hook-up private drinking water supplies. Included in the U.S. EPA "Drinking Water Standards and Health Advisories" table of referenced concentrations are several hundred chemical constituents. Two chemicals (i.e., cis-1,2-DCE and vinyl chloride) detected in groundwater samples collected at the subject site during completion of the August 2000, January 2001 and March 2001 groundwater monitoring events have corresponding Maximum Contaminant Level (MCL) standards contained in the above-referenced U.S. EPA table. As noted in Table 5, neither of these constituents was detected in groundwater samples in excess of their respective EPA MCL standards. In addition, and as noted in section 6.0 above, site and regional-specific conditions and characteristics indicate that shallow groundwater at and in the vicinity of the subject site is not a currently-used or feasible future source of potable water.

10.0 SUMMARY OF FINDINGS

The following is a summary of findings associated with completion of Fourth Quarter 2000 and First Quarter 2001 groundwater monitoring activities associated with the Delco retail motor fuel facility located at 17873 S.E. McLoughlin Boulevard in Milwaukie, Oregon.

- ◆ Groundwater elevation data associated with the completion of Fourth Quarter 2000 and First Quarter 2001 groundwater monitoring activities indicated that shallow groundwater elevation appeared relatively 'flat' with no clear groundwater flow direction indicated.
- ◆ Comparison to previously-compiled data indicates that the groundwater elevations at onsite and offsite wells are highly variable throughout the year.
- ◆ Analytical results associated with Fourth Quarter 2000 and First Quarter 2001 groundwater monitoring activities indicate that Total Petroleum Hydrocarbon-Diesel extended (TPH-Dx) constituents either were not detected or were detected at relatively low levels.
- ◆ Benzene was detected in groundwater samples collected from wells MW-1, MW-5, MW-9 and MW-15 during the Fourth Quarter 2000 and/or First Quarter 2001 monitoring event at concentrations ranging from 0.6 micrograms per liter (ug/l) or parts per billion (ppb) to a maximum of 280 ppb.
- ◆ Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) constituents were not detected in the groundwater samples collected from wells MW-10 and MW-14 during completion of Fourth Quarter 2000 groundwater monitoring activities.
- ◆ BTEX constituents were not detected in the groundwater samples collected from wells MW-9, MW-10 and MW-14 during completion of First Quarter 2001 groundwater monitoring activities.
- ◆ Methyl Tertiary Butyl Ether (MTBE) was detected in groundwater samples collected in Fourth Quarter 2000 from wells MW-1, MW-5 and MW-11 at 88 ppb, 54 ppb and 1.6 ppb, respectively. Naphthalene was detected in sample MW-1 at 11 ppb.
- ◆ MTBE was detected in groundwater samples collected in First Quarter 2001 from wells MW-1, MW-5 and MW-11 at 81 ppb, 51 ppb and 1.7 ppb, respectively. Naphthalene was detected in sample MW-1 at 20 ppb.
- ◆ Based on evaluation of Oregon Department of Environmental Quality (DEQ) Risk-Based Decision Making (RBDM) protocols, petroleum Contaminants of Potential Concern (COPCs) either were not detected in soil samples collected at the subject site from October through December 1999 or were detected below the generic commercial-industrial Risk-Based Concentration (RBC) target cleanup levels for the "Surface Soil Ingestion, Dermal Contact and Inhalation" and "Volatilization to Outdoor Air" exposure pathways.

- ◆ Petroleum COPCs either were not detected in soil samples collected at the subject site from October through December 1999 or were detected below the generic RBC target cleanup levels for the "Vapor Intrusion into Buildings" exposure pathway with the exception of benzene.
- ◆ The nearest building to benzene-impacted soil exceeding the Oregon DEQ RBDM "Vapor Intrusion into Buildings" target cleanup level is located greater than 10 feet laterally from impacted soil.
- ◆ Petroleum COPCs either were not detected in soil samples collected at the subject site from October through December 1999 or were detected below the generic commercial-industrial RBC target cleanup levels for the "Leaching to Groundwater" exposure pathway with the exception of benzene and MTBE.
- ◆ Based on review of well log files maintained by the Oregon Water Resources Department (OWRD), only one domestic well cased to approximately 60 feet below surface grade (bsg) is located approximately 0.2 miles southwest of the subject site. In addition, information obtained from the City of Milwaukie has indicated that potable water for the subject site and nearby properties is supplied by the City of Milwaukie and likely will be for the foreseeable future.
- ◆ Petroleum COPCs either were not detected in groundwater samples collected at the subject site during completion of the August 2000, January 2001 and March 2001 groundwater monitoring events or were detected below the generic commercial-industrial RBC target cleanup levels for the "Volatilization to Outdoor Air," "Vapor Intrusion into Buildings" and "Groundwater in Excavation" exposure pathways.
- ◆ Petroleum COPCs either were not detected in groundwater samples collected at the subject site during completion of the August 2000, January 2001 and March 2001 groundwater monitoring events or were detected below the generic commercial-industrial RBC target cleanup levels for the "Groundwater Ingestion" exposure pathway with the exception of benzene and MTBE.
- ◆ Petroleum COPCs either were not detected in groundwater samples collected at the subject site during completion of the August 2000, January 2001 and March 2001 groundwater monitoring events or were detected below the generic commercial-industrial RBC target cleanup levels for the "Ingestion and Inhalation from Tapwater" exposure pathway with the exception of benzene, naphthalene and MTBE.
- ◆ Vinyl chloride detected at 0.8 ppb in groundwater sample MW-11 collected at the subject site during the January and March 2001 groundwater monitoring events exceeded its U.S. Environmental Protection Agency (EPA) Region IX Preliminary Remediation Goal (PRG) target cleanup level of 0.02 ppb.

- ◆ Vinyl chloride detected at 0.8 ppb in groundwater sample MW-11 collected at the subject site during the January and March 2001 groundwater monitoring events exceeded its U.S. EPA Region III PRG target cleanup level of 0.019 ppb.
- ◆ Concentrations of cis-1,2-DiChloroEthene and vinyl chloride detected in groundwater samples collected at the subject site during completion of the August 2000, January 2001 and March 2001 groundwater monitoring events did not exceed their respective EPA Maximum Contaminant Level (MCL) standards.
- ◆ Based on review of well log files maintained by the OWRD, only one domestic well cased to approximately 60 feet bsg is located approximately 0.2 miles southwest of the subject site. In addition, information obtained from the City of Milwaukie has indicated that potable water for the subject site and nearby properties is supplied by the City of Milwaukie and likely will be for the foreseeable future.

11.0 CONCLUSIONS

The following conclusions are presented based on the findings associated with previous and current onsite and offsite investigation and cleanup activities associated with the Delco retail motor fuel facility located at 17873 S.E. McLoughlin Boulevard in Milwaukie, Oregon.

- ◆ Removal of the above-referenced four Underground Storage Tanks (USTs) and approximately 5000 cubic yards of petroleum-impacted soil at the subject site in 1999 appears to have eliminated the majority of the 'source' of petroleum impacts to subsurface soil and groundwater at the subject site associated with historical petroleum releases at the Delco retail motor fuel facility.
- ◆ Based on site and regional-specific conditions and circumstances, "Surface Soil Ingestion, Dermal Contact and Inhalation," "Volatilization to Outdoor Air," "Vapor Intrusion into Buildings" and "Leaching to Groundwater" associated with petroleum-impacted soils at the subject site do not appear to represent significant and/or feasible current or future exposure pathways.
- ◆ Based on site and regional-specific conditions and circumstances, "Groundwater Ingestion," "Volatilization to Outdoor Air," "Vapor Intrusion into Buildings," "Groundwater in Excavation" and "Ingestion and Inhalation from Tapwater" associated with petroleum-impacted shallow groundwater at the subject site do not appear to represent significant and/or feasible current or future exposure pathways.
- ◆ Based on an evaluation of Oregon DEQ RBDM protocols, petroleum-impacted soil and groundwater at the subject site associated with historical releases of petroleum from the Delco retail motor fuel facility do not appear to pose a significant and/or feasible current risk to human health and the environment.

12.0 RECOMMENDATIONS

Based on the findings and conclusions associated with previously-completed and current site assessment activities completed at the subject site located at 17873 S.E. McLoughlin Boulevard in Milwaukie, Oregon, Wohlers Environmental recommends the following.

- ◆ Complete a drivepoint assessment of potential impacts to shallow groundwater at the northeastern corner of the subject site and north of Ed's Muffler & Brakes.
- ◆ Complete four consecutive quarterly groundwater monitoring events at the subject site. Given completion of Third and Fourth Quarter 2000 and First Quarter 2001 events, only the Second Quarter 2001 event remains to be completed. Following completion of the recommended four quarterly groundwater monitoring events, re-evaluate ongoing groundwater monitoring activities with particular focus on frequency of monitoring, wells monitored, and constituent analyses.
- ◆ Assuming results associated with completion of activities described in the two above-referenced recommendations continue to indicate an absence of significant and/or feasible risk to human health and the environment associated with historical petroleum releases at the subject site, Wohlers Environmental anticipates requesting project file closure and issuance of a No Further Action (NFA) finding for the subject site by the Oregon DEQ upon completion of the recommended activities.

13.0 QUALIFICATIONS

Our professional services have been performed, our findings obtained, and our conclusions presented in accordance with customary principles and practices in the fields of environmental science and engineering. This statement is in lieu of other statements either expressed or implied. Wohlers Environmental is not responsible for the independent conclusions, opinions or recommendations made by others based on the records review, site observations, field exploration, or laboratory test data presented in this report.

Environmental assessments and evaluations are inherently limited in that conclusions are drawn and recommendations developed from information obtained from limited research and site evaluation. For these types of evaluations, it is often necessary to use information prepared by others and Wohlers Environmental cannot be responsible for the accuracy of such information.

Additionally, the passage of time may result in a change in the environmental characteristics at this and any other site and surrounding properties. This report does not warrant against future operations or conditions, nor does this report warrant against operations or conditions present of a type or at a location not investigated. This report is not a regulatory compliance audit and is not intended to satisfy the requirements of any local, state, or federal real estate transfer laws.

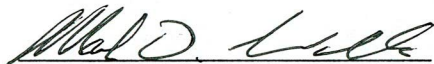
This report is intended for the sole use of **Delco Petroleum Company, Inc.** This report may not be used or relied upon by any other party without the written consent of Wohlers Environmental. The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document or the findings, conclusions, or recommendations is at the risk of said user.

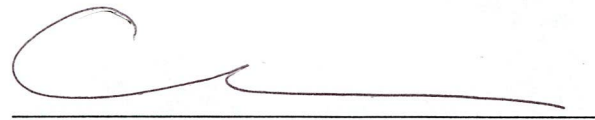
The conclusions presented in this report are, in part, based upon subsurface sampling performed at selected locations and depths. There may be conditions between borings or samples that differ significantly from those presented in this report and which cannot be predicted by this study.

Wohlers Environmental does not warrant the correctness, completeness, currentness, merchantability, or fitness of any information related to records review provided in this report. Such information is not the product of an independent review conducted by Wohlers Environmental, but is only available environmental information obtained by or provided to Wohlers Environmental.

Report Prepared By:

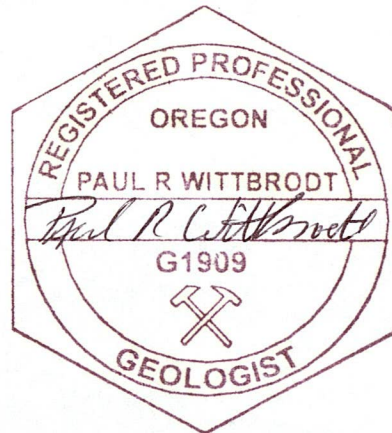
Report Reviewed By:


Mark D. Walla, Staff Scientist


Christopher C. Wohlers, Senior Consultant

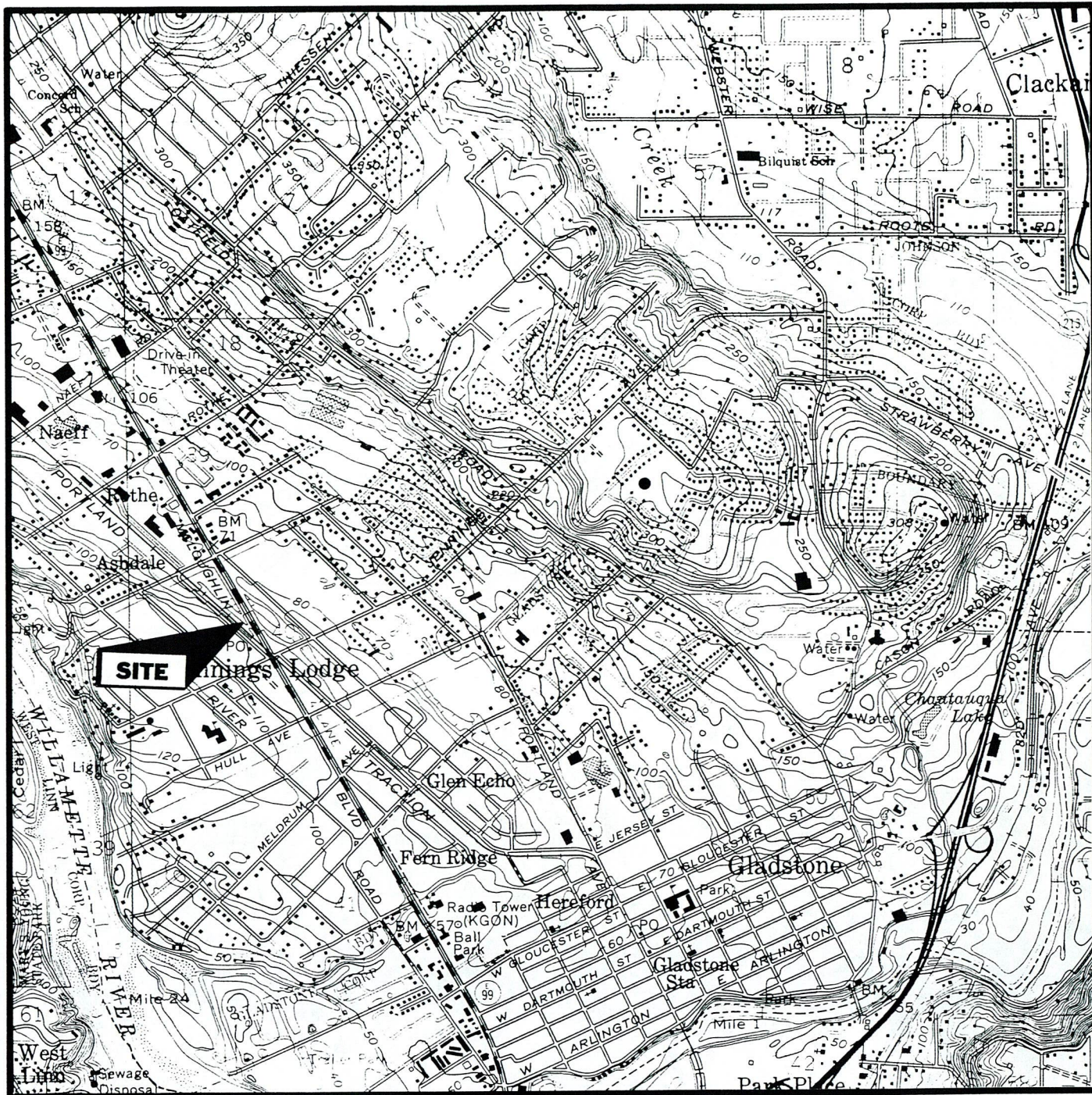
Report Reviewed By:


Paul R. Wittbrodt, Ph.D., R.G., Senior Geologist



Enclosures:	Figure 1	Site Vicinity Map
	Figure 2	Site Map
	Figure 3	Groundwater Elevation Map: Fourth Quarter 2000
	Figure 4	Groundwater Sample Analytical Results Map: Fourth Quarter 2000
	Figure 5	Groundwater Elevation Map: First Quarter 2001
	Figure 6	Groundwater Sample Analytical Results Map: First Quarter 2001
	Figure 7	Conceptual Site Model for Potential Receptors
	Table 1	Groundwater Elevation Data
	Table 2	Groundwater Sample Analytical Results
	Table 3	Contaminants of Potential Concern: Soil
	Table 4	Contaminants of Potential Concern: Groundwater
	Table 5	Potentially Applicable Water Cleanup Levels/Targets

Appendix A	Pocket-in-Place Estimated Extent Maps
Appendix B	Field Procedures
Appendix C	Analytical Results/Chain of Custody Documentation
Appendix D	Community/Domestic Well Survey



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1 MILE



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC SURVEY MAP OF
GLADSTONE, OREGON QUADRANGLE. 1961, PHOTOREVISED 1984.

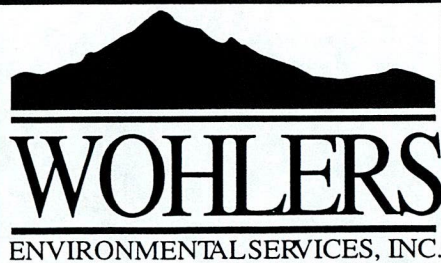
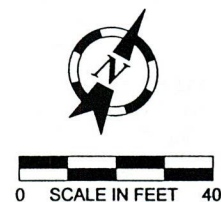
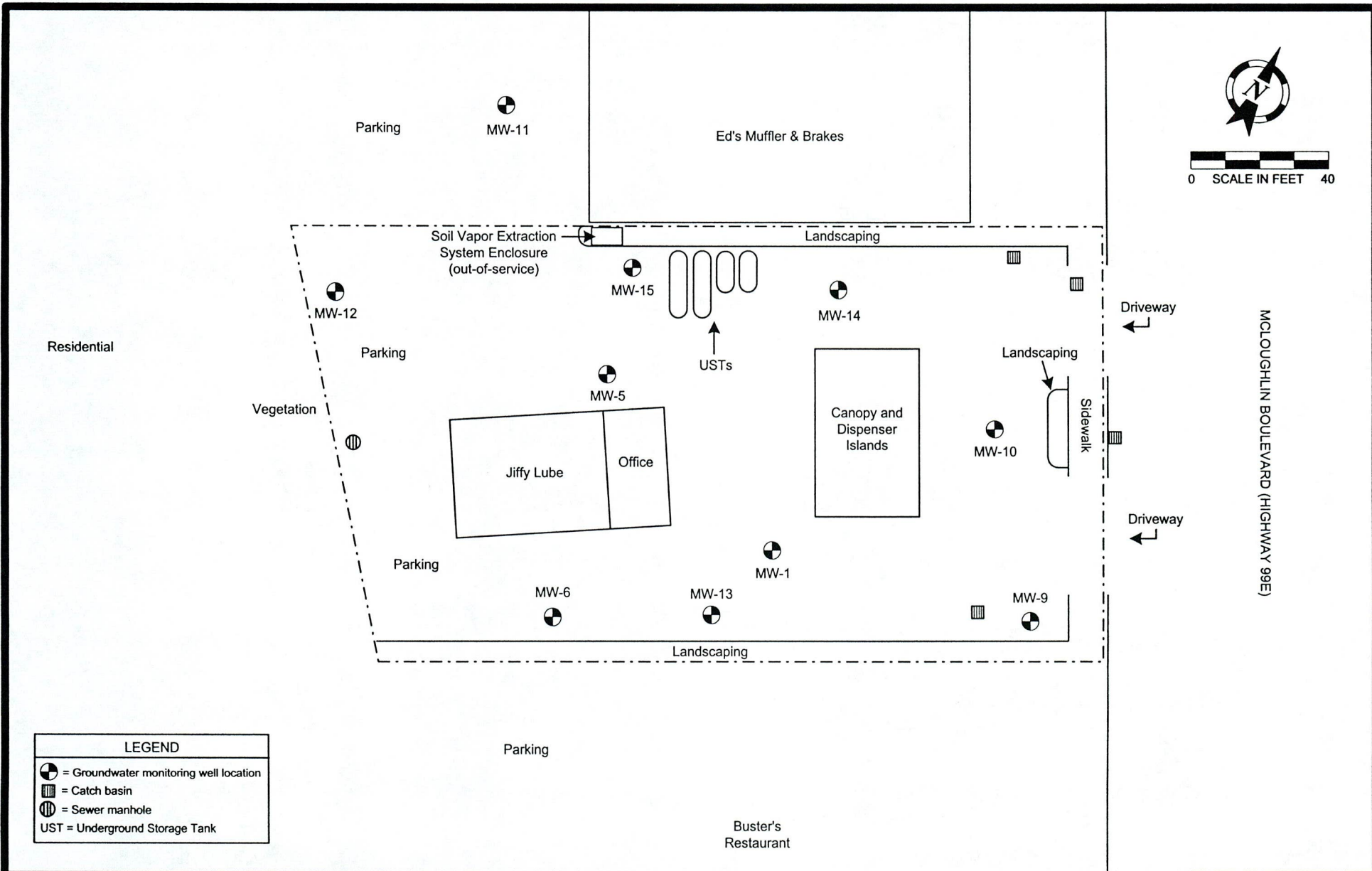


FIGURE 1

SITE VICINITY MAP

DELCO PETROLEUM RETAIL FUELING FACILITY
17873 S.E. MCLOUGHLIN BOULEVARD
MILWAUKIE, OREGON

PROJECT NO.:	01-0001
DATE:	01/12/01
SCALE:	1 : 24,000
FILE:	FG1010001
DRAWN BY:	MM



LEGEND	
	= Groundwater monitoring well location
	= Catch basin
	= Sewer manhole
UST = Underground Storage Tank	

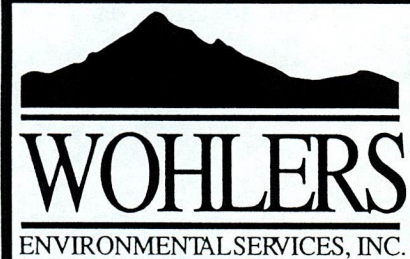


FIGURE 2
SITE MAP

DELCO PETROLEUM RETAIL FUELING FACILITY
17873 S.E. MCLOUGHLIN BOULEVARD
MILWAUKIE, OREGON

PROJECT NO.:	01-0001
DATE:	01/12/01
SCALE:	1" = 40'
FILE:	FG010001
DRAWN BY:	MM

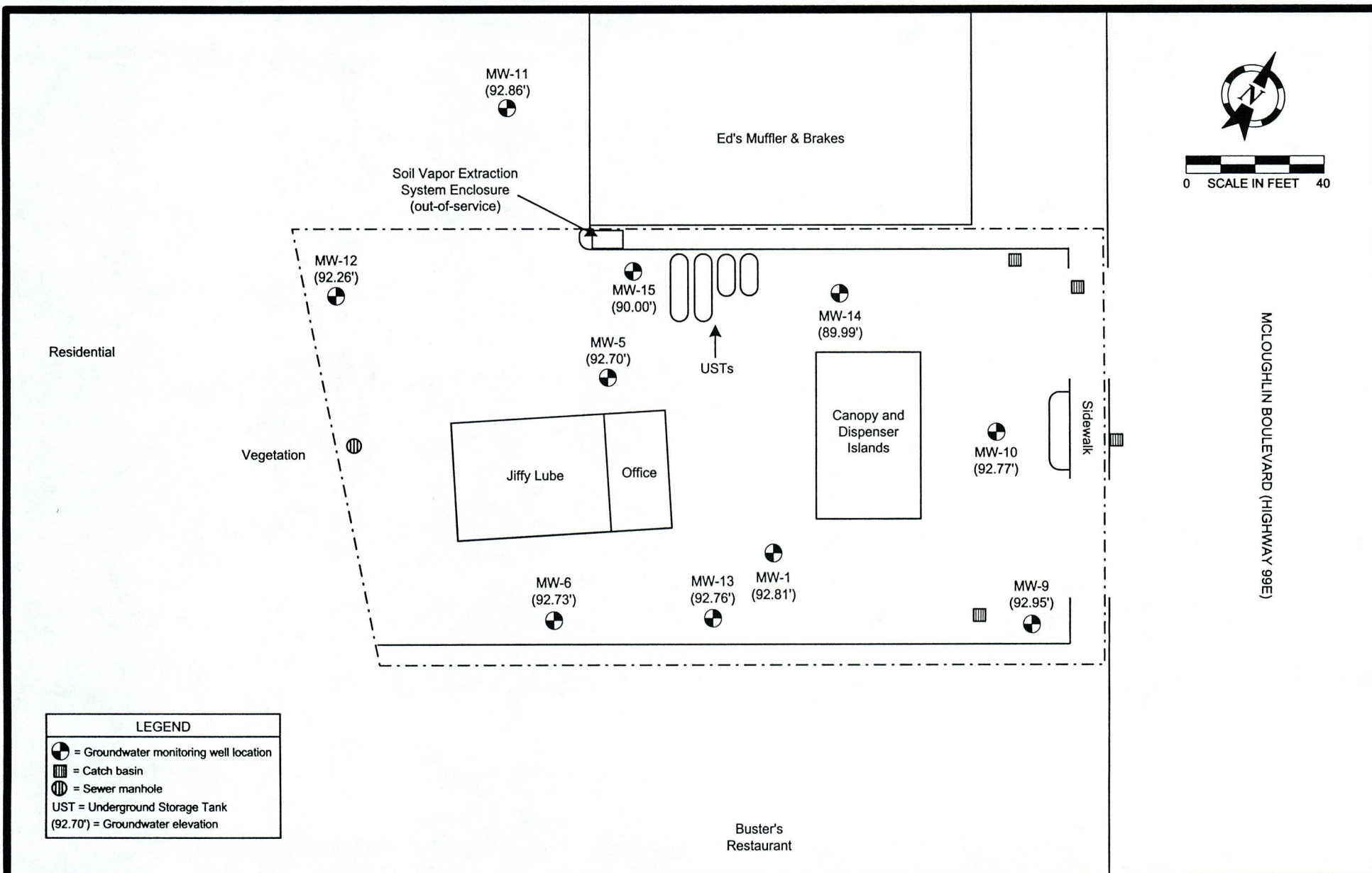
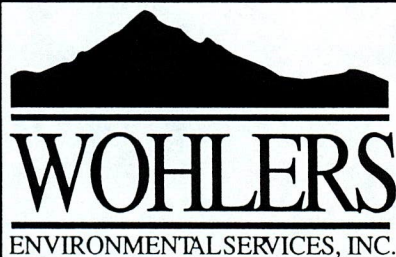


FIGURE 3

GROUNDWATER ELEVATION MAP: FOURTH QUARTER 2000

DELCO PETROLEUM RETAIL FUELING FACILITY
17873 S.E. MCLOUGHLIN BOULEVARD
MILWAUKIE, OREGON



PROJECT NO.: 01-0001

DATE: 02/05/01

SCALE: 1" = 40'

FILE: FG010001

DRAWN BY: BSM

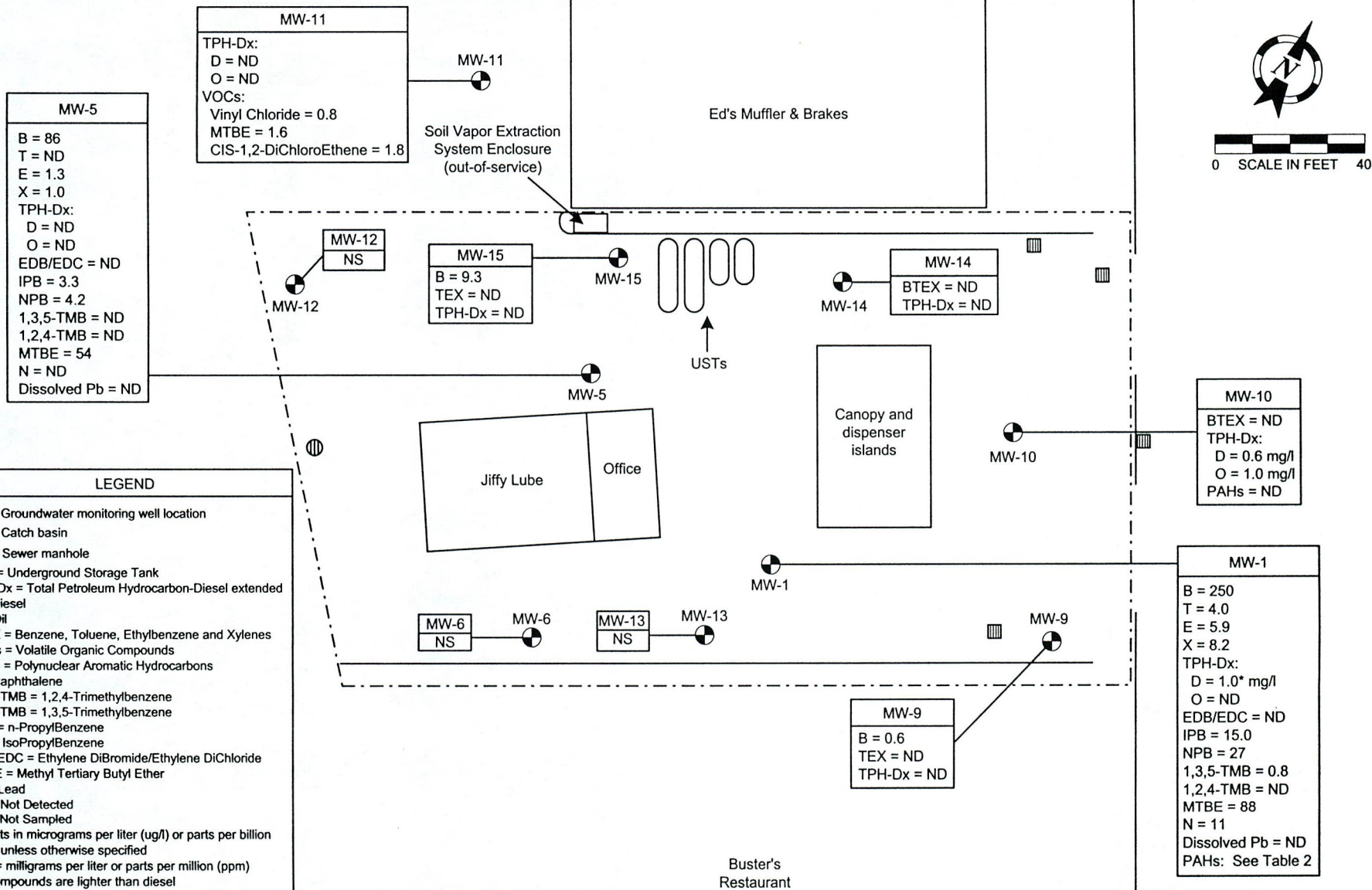


FIGURE 4

GROUNDWATER SAMPLE ANALYTICAL RESULTS: FOURTH QUARTER 2000

DELCO PETROLEUM RETAIL FUELING FACILITY
 17873 S.E. MCLOUGHLIN BOULEVARD
 MILWAUKIE, OREGON

PROJECT NO.: 01-0001

DATE: 01/23/01

SCALE: 1" = 40'

FILE: FG010001

DRAWN BY: KRB

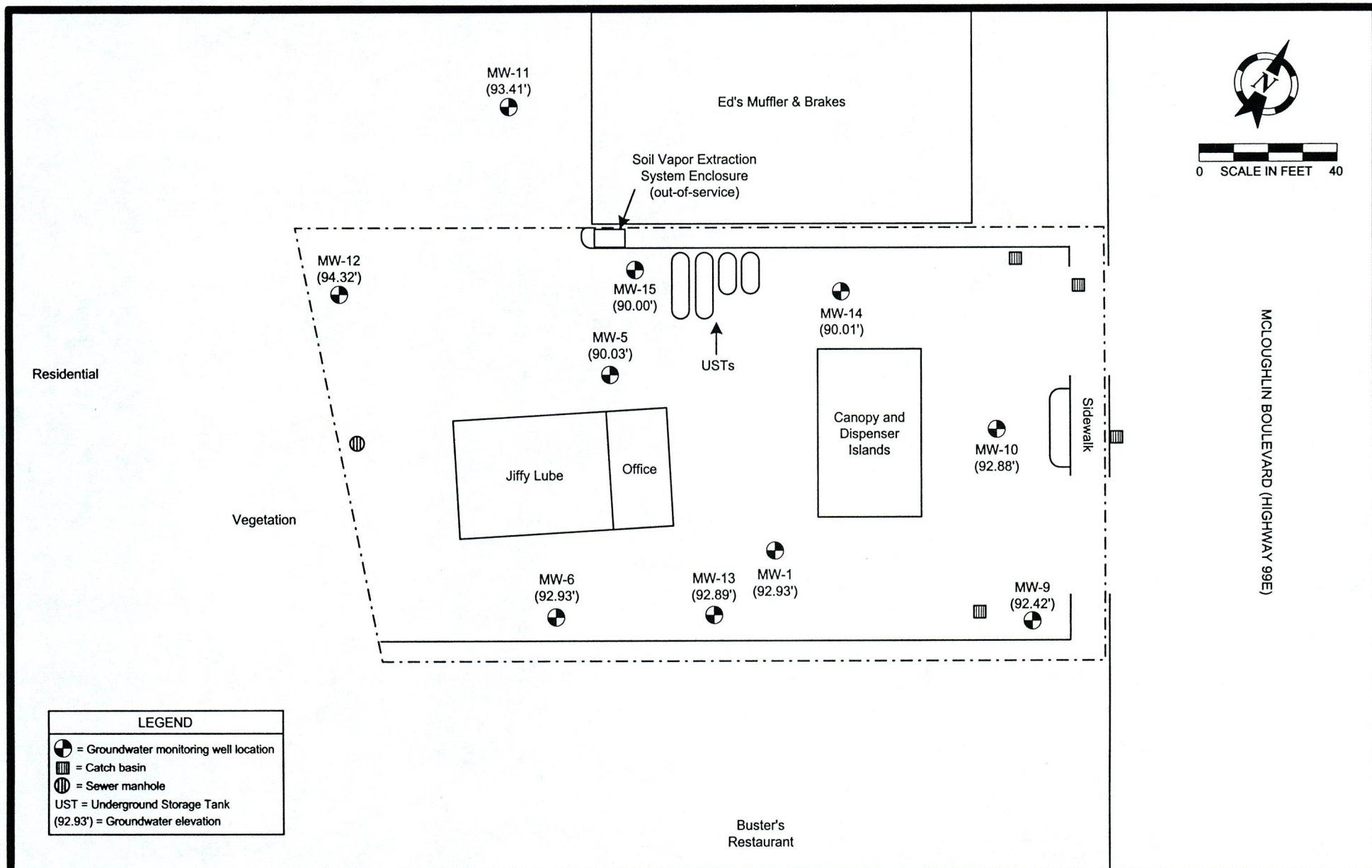


FIGURE 5

GROUNDWATER ELEVATION MAP: FIRST QUARTER 2001

DELCO PETROLEUM RETAIL FUELING FACILITY
17873 S.E. MCLOUGHLIN BOULEVARD
MILWAUKIE, OREGON

PROJECT NO.: 01-0001

DATE: 05/02/01

SCALE: 1" = 40'

FILE: FG010001

DRAWN BY: MDW

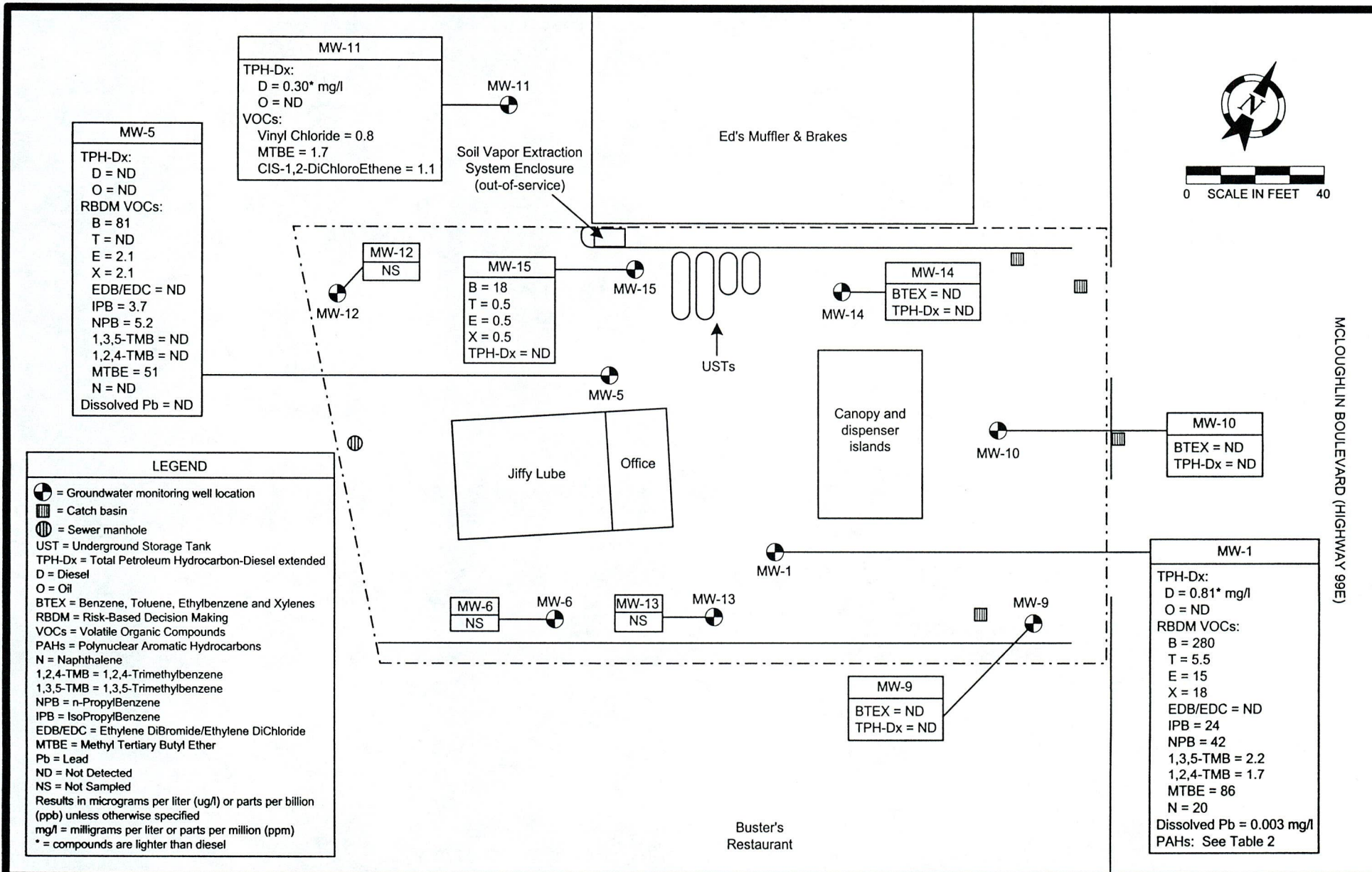
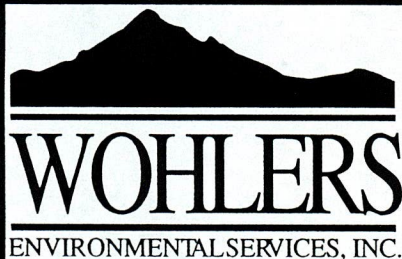


FIGURE 6

GROUNDWATER SAMPLE ANALYTICAL RESULTS: FIRST QUARTER 2001

DELCO PETROLEUM RETAIL FUELING FACILITY
 17873 S.E. MCLOUGHLIN BOULEVARD
 MILWAUKIE, OREGON



PROJECT NO.: 01-0001

DATE: 05/02/01

SCALE: 1" = 40'

FILE: FG010001

DRAWN BY: MDW

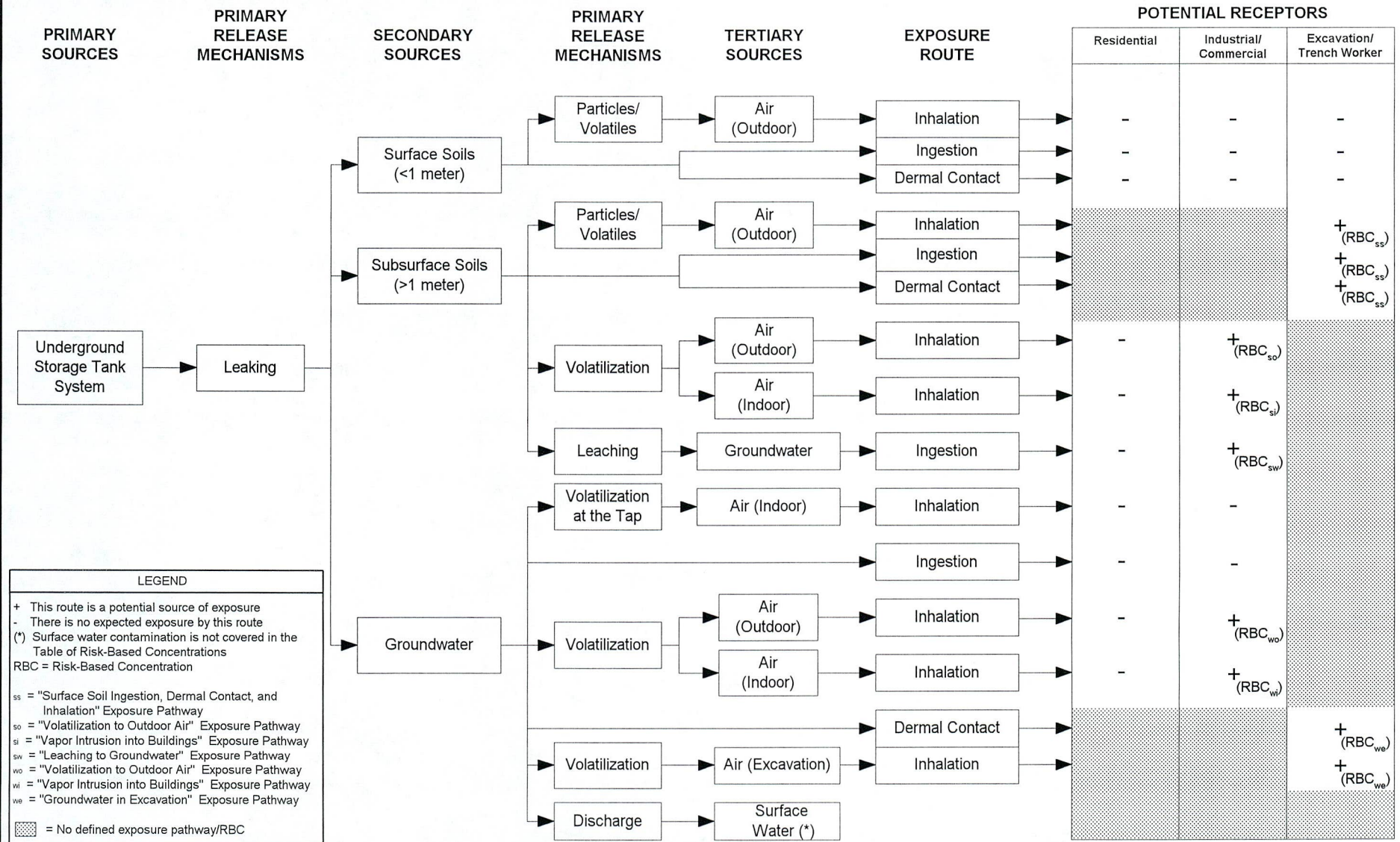


FIGURE 7

CONCEPTUAL SITE MODEL FOR POTENTIAL RECEPTORS

DELCO PETROLEUM RETAIL FUELING FACILITY
17873 S.E. MCLOUGHLIN BOULEVARD
MILWAUKIE, OREGON

PROJECT NO.:	01-0001
DATE:	03/15/01
SCALE:	not applicable
FILE:	FG7010001
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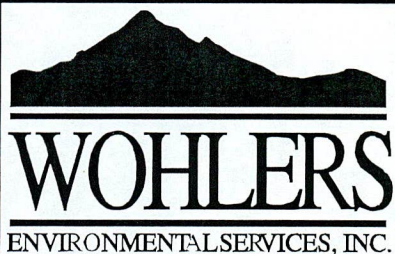


TABLE 1 (Page 1 of 4)

GROUNDWATER ELEVATION DATA

DELCO PETROLEUM RETAIL FUELING FACILITY

17873 S.E. MCLOUGHLIN BOULEVARD

MILWAUKIE, OREGON

WES Project No. 01-0001

Monitoring Well	Date Installed & Installer	Measured By	Date of Measurement	Screened interval (feet bsg)	TOC Elevation (feet amsl)	Depth to water from TOC (feet)	Groundwater Elevation (feet amsl)
MW-1	6/18/93 NWE	NWE	06/21/93	5-15	99.67	NR	94.65
		NWE	01/24/95		99.67	3.97	95.70
		NWE	06/20/95		99.67	4.67	95.00
		NWE	09/29/95		99.67	6.91	92.76
		NWE	02/15/96		99.67	3.00	96.67
		NWE	04/26/96		99.67	3.74	95.93
		NWE	10/29/96		99.67	5.82	93.85
		NWE	01/15/97		99.67	2.74	96.93
		NWE	01/27/98		99.67	4.51	95.16
		GGG	07/24/99		99.37	5.66	93.71
		GGG	08/27/00		99.37	6.16	93.21
		WES	01/10/01		99.37	6.56	92.81
		WES	03/28/01		99.37	6.44	92.93
MW-2 ¹	6/18/93 NWE	NWE	06/21/93	4-14	98.79	NR	94.59
		NWE	01/24/95		98.79	2.97	95.82
		NWE	06/20/95		98.79	3.77	95.02
		NWE	09/29/95		98.79	6.48	92.31
		NWE	02/15/96		98.79	1.87	96.92
		NWE	04/26/96		98.79	3.16	95.63
		NWE	10/29/96		98.79	5.00	93.79
		NWE	01/15/97		98.79	2.23	96.56
		NWE	01/27/98		98.79	3.75	95.04
		GGG	07/24/99		98.51	5.18	93.33
MW-3 ²	6/18/93 NWE	NWE	06/21/93	5-15	98.57	NR	94.57
		NWE	01/24/95		98.57	2.89	95.68
MW-4 ³	6/18/93 NWE	NWE	06/21/93	5-15	99.30	NR	94.54
		NWE	01/24/95		99.30	3.56	95.74
		NWE	06/20/95		99.30	4.28	95.02
		NWE	09/29/95		99.30	7.20	92.10
		NWE	02/15/96		99.30	2.57	96.73
		NWE	04/26/96		99.30	3.75	95.55
		NWE	10/29/96		99.30	5.55	93.75
		NWE	01/15/97		99.30	2.75	96.55
		NWE	01/27/98		99.30	4.26	95.04
		GGG	07/25/99		99.00	5.57	93.43
MW-5	6/18/93 NWE	NWE	06/21/93	5-15	100.66	NR	94.52
		NWE	01/24/95		100.66	4.94	95.72
		NWE	06/20/95		100.66	5.63	95.03
		NWE	09/29/95		100.66	8.22	92.44
		NWE	02/15/96		100.66	3.77	96.89
		NWE	04/26/96		100.66	5.00	95.66
		NWE	10/29/96		100.66	6.95	93.71
		NWE	01/15/97		100.66	4.02	96.64
		NWE	01/27/98		100.66	5.62	95.04
		GGG	07/25/99		100.41	5.99	94.42
		GGG	08/27/00		100.41	7.30	93.11
		WES	01/10/01		100.41	7.71	92.70
		WES	03/28/01		100.41	7.58	92.83

See final page for legend

TABLE 1 (Page 2 of 4)

GROUNDWATER ELEVATION DATA

DELCO PETROLEUM RETAIL FUELING FACILITY
 17873 S.E. MCLOUGHLIN BOULEVARD
 MILWAUKIE, OREGON
WES Project No. 01-0001

Monitoring Well	Date Installed & Installer	Measured By	Date of Measurement	Screened interval (feet bsg)	TOC Elevation (feet amsl)	Depth to water from TOC (feet)	Groundwater Elevation (feet amsl)
MW-6	6/18/93 NWE	NWE	06/21/93	5-14.5	100.29	NR	94.58
		NWE	01/24/95		100.29	4.75	95.54
		NWE	06/20/95		100.29	5.28	95.01
		NWE	09/29/95		100.29	7.38	92.99
		NWE	02/15/96		100.29	3.17	97.12
		NWE	04/26/96		100.29	4.27	96.02
		NWE	10/29/96		100.29	6.47	93.82
		NWE	01/15/97		100.29	3.33	96.96
		NWE	01/27/98		100.29	5.01	95.28
		GGS	07/24/99		100.01	6.25	93.76
		GGS	08/27/00		100.01	6.88	93.13
		WES	01/10/01		100.01	7.28	92.73
		WES	03/28/01		100.01	7.08	92.93
MW-7 ⁴	1/27/95/NWE	NWE	06/20/95	4-19	98.95	4.61	94.34
MW-8 ⁴	1/27/95/NWE	NWE	06/20/95	5-20	99.62	4.68	94.94
MW-9	1/27/95 NWE	NWE	06/20/95	5-15	99.71	4.88	94.83
		NWE	09/29/95		99.71	6.73	92.99
		NWE	02/15/96		99.71	3.39	96.32
		NWE	04/26/96		99.71	4.42	95.30
		NWE	10/29/96		99.71	5.66	94.06
		NWE	01/15/97		99.71	2.34	97.38
		NWE	01/27/98		99.71	4.91	94.81
		GGS	07/23/99		99.42	5.64	93.78
		GGS	08/27/00		99.42	6.23	93.19
		WES	01/11/01		99.42	6.47	92.95
		WES	03/28/01		99.42	6.00	93.42
MW-10	8/12/96 NWE	NWE	09/18/96	10-15	98.77	5.18	93.59
		NWE	10/29/96		98.77	4.94	93.83
		NWE	01/15/97		98.77	2.03	96.74
		NWE	01/27/98		98.77	3.61	95.16
		GGS	07/23/99		98.50	4.82	93.68
		GGS	08/27/00		98.50	4.78	93.72
		WES	01/11/01		98.50	5.73	92.77
		WES	03/28/01		98.50	5.62	92.88
MW-11	8/12/96 NWE	NWE	09/18/96	10-15	99.98	6.54	93.44
		NWE	10/29/96		99.98	6.37	63.61
		NWE	01/15/97		99.98	4.38	95.60
		NWE	01/27/98		99.98	5.66	94.32
		GGS	07/23/99		99.64	6.42	93.22
		GGS	08/27/00		99.64	6.11	93.53
		WES	01/11/01		99.64	6.78	92.86
		WES	03/28/01		99.64	6.23	93.41
MW-12	8/12/96 NWE	NWE	09/18/96	10-15	100.54	7.19	93.35
		NWE	10/29/96		100.54	6.68	93.86
		NWE	01/15/97		100.54	4.72	95.82
		NWE	01/27/98		100.54	4.96	95.58
		GGS	07/23/99		100.26	6.88	93.38
		GGS	08/27/00		100.26	6.62	93.64
		WES	01/10/01		100.26	8.00	92.26
		WES	03/28/01		100.26	5.94	94.32

TABLE 1 (Page 3 of 4)

GROUNDWATER ELEVATION DATA

DELCO PETROLEUM RETAIL FUELING FACILITY
 17873 S.E. MCLOUGHLIN BOULEVARD
 MILWAUKIE, OREGON
WES Project No. 01-0001

Monitoring Well	Date Installed & Installer	Measured By	Date of Measurement	Screened interval (feet bsg)	TOC Elevation (feet amsl)	Depth to water from TOC (feet)	Groundwater Elevation (feet amsl)
MW-13	8/12/96	NWE	09/18/96	10-15	100.11	5.19	94.92
		NWE	10/29/96		100.11	6.29	93.82
		NWE	01/15/97		100.11	3.13	96.98
		NWE	01/27/98		100.11	4.86	95.25
		GGs	07/23/99		99.85	6.00	93.85
		GGs	08/27/00		99.85	6.69	93.16
		WES	01/11/01		99.85	7.09	92.76
		WES	03/28/01		99.85	6.96	92.89
MW-14	11/17/99 GGs	GGs	08/27/00	4-9	95.65	5.29	90.36
		WES	01/10/01		95.65	5.66	89.99
		WES	03/28/01		95.65	5.64	90.01
MW-15	11/17/99 GGs	GGs	08/27/00	5.5-15.5	96.42	9.00	87.42
		WES	01/10/01		96.42	6.42	90.00
		WES	03/28/01		96.42	6.39	90.03

See final page for legend

TABLE 1 (Page 4 of 4)

GROUNDWATER ELEVATION DATA

DELCO PETROLEUM RETAIL FUELING FACILITY
17873 S.E. MCLOUGHLIN BOULEVARD
MILWAUKIE, OREGON
WES Project No. 01-0001

LEGEND

- ¹ Monitoring Well MW-2 was decommissioned in 1999.
- ² Monitoring Well MW-3 was decommissioned in 1995.
- ³ Monitoring Well MW-4 was decommissioned in 1999.
- ⁴ Monitoring Wells MW-7 and MW-8 were constructed as production wells for the onsite groundwater treatment system and depth to groundwater measurements were not collected on a quarterly basis from these two monitoring wells.

WES = Wohlers Environmental Services
PEMCO = Petroleum Equipment Maintenance Company
NWE = Northwest Envirocon
GGS = GeoPro Geologic Services
bsg = below surface grade

amsl = above mean sea level
TOC = Top of Casing
NR = Not Recorded
NA = Not Available

TABLE 2 (Page 1 of 10)

GROUNDWATER SAMPLE ANALYTICAL RESULTS

DELCO PETROLEUM RETAIL FUELING FACILITY
 17873 S.E. MCLOUGHLIN BOULEVARD
 MILWAUKIE, OREGON
WES Project No. 01-0001

Sample ID	Date Sampled	Sampled By	Benzene (ug/l)	Toluene (ug/l)	Ethyl-Benzene (ug/l)	Xylenes (ug/l)	TPH-Dx (mg/l)		TPH-Gx (mg/l)	MTBE (ug/l)	VOCs (ug/l)	PAHs (ug/l)	Dissolved Lead (mg/l)
							Diesel	Oil					
MW-1	06/22/93	NWE	910	1,300	470	2,090	--	--	--	--	--	--	--
	07/18/94	NWE	770	14	264	272	--	--	--	--	--	--	--
	10/28/94	NWE	729	16	269	145	--	--	--	--	--	--	--
	01/24/95	NWE	62	29	349	315	--	--	--	--	--	--	--
	06/20/95	NWE	619	10	66	377	--	--	--	--	--	--	--
	09/29/95	NWE	3,700	43	1,050	895	--	--	--	--	--	--	--
	02/15/96	NWE	727	8	92	261	--	--	--	--	--	--	--
	04/26/96	NWE	497	17	180	159	--	--	--	--	--	--	--
	10/29/96	NWE	231	5	18	15	--	--	--	--	--	--	--
	01/15/97	NWE	83	ND	9	13	--	--	--	--	--	--	--
	01/27/98	NWE	411	11	66	82	--	--	--	--	--	--	--
	07/24/99	GGs	340	4.29	9.60	ND	ND	ND	2,330	112	--	--	--
	08/27/00	GGs	207	8.26	ND	ND	ND	ND	1,820	72.4	IPB = 10.2 NPB = 16.7 N = 14.5	--	--
	01/10/01	WES	250	4.0	5.9	8.2	1.0 ¹	ND	--	88	IPB = 15 NPB = 27 1,3,5-TMB = 0.8 N = 11	N = 6.4	ND
	03/28/01	WES	280	5.5	15	18	0.81	ND	--	86	IPB = 24 NPB = 42 1,3,5-TMB = 2.2 1,2,4-TMB = 1.7 N = 20	N = 3.4	0.003

See final page for legend

TABLE 2 (Page 2 of 10)

GROUNDWATER SAMPLE ANALYTICAL RESULTS

DELCO PETROLEUM RETAIL FUELING FACILITY

17873 S.E. MCLOUGHLIN BOULEVARD

MILWAUKIE, OREGON

WES Project No. 01-0001

Sample ID	Date Sampled	Sampled By	Benzene (ug/l)	Toluene (ug/l)	Ethyl-Benzene (ug/l)	Xylenes (ug/l)	TPH-Dx (mg/l)		TPH-Gx (mg/l)	MTBE (ug/l)	VOCs (ug/l)	PAHs (ug/l)	Dissolved Lead (mg/l)
							Diesel	Oil					
MW-2 ²	06/22/93	NWE	140	13	20	75	--	--	--	--	--	--	--
	07/18/94	NWE	25	ND	ND	187	--	--	--	--	--	--	--
	10/28/94	NWE	53	ND	4	4	--	--	--	--	--	--	--
	01/24/95	NWE	108	ND	6	8	--	--	--	--	--	--	--
	06/20/95	NWE	240	ND	ND	4	--	--	--	--	--	--	--
	09/29/95	NWE	208	ND	ND	ND	--	--	--	--	--	--	--
	02/15/96	NWE	26	ND	ND	ND	--	--	--	--	--	--	--
	04/26/96	NWE	56	ND	ND	ND	--	--	--	--	--	--	--
	10/29/96	NWE	54	ND	ND	ND	--	--	--	--	--	--	--
	01/15/97	NWE	9	ND	ND	ND	--	--	--	--	--	--	--
	01/27/98	NWE	34	ND	ND	ND	--	--	--	--	--	--	--
	07/23/99	GGs	1.54	ND	ND	ND	ND	ND	ND	113	--	--	--
MW-3 ³	06/22/93	NWE	1,600	3,800	1,900	10,100	--	--	--	--	--	--	--
	07/18/94	NWE	226	141	58	286	--	--	--	--	--	--	--
	10/28/94	NWE	18,400	17,400	3,200	20,200	--	--	--	--	--	--	--
	01/24/95	NWE	19,900	21,200	6,170	31,500	--	--	--	--	--	--	--

See final page for legend

TABLE 2 (Page 3 of 10)

GROUNDWATER SAMPLE ANALYTICAL RESULTS

DELCO PETROLEUM RETAIL FUELING FACILITY

17873 S.E. MCLOUGHLIN BOULEVARD

MILWAUKIE, OREGON

WES Project No. 01-0001

Sample ID	Date Sampled	Sampled By	Benzene (ug/l)	Toluene (ug/l)	Ethyl-Benzene (ug/l)	Xylenes (ug/l)	TPH-Dx (mg/l)		TPH-Gx (mg/l)	MTBE (ug/l)	VOCs (ug/l)	PAHs (ug/l)	Dissolved Lead (mg/l)
							Diesel	Oil					
MW-4 ⁴	06/22/93	NWE	3,500	1,500	420	2,360	--	--	--	--	--	--	--
	07/18/94	NWE	7,460	134	2,730	8,120	--	--	--	--	--	--	--
	10/28/94	NWE	8,400	161	5,320	4,724	--	--	--	--	--	--	--
	01/24/95	NWE	14,900	4,200	1,630	7,500	--	--	--	--	--	--	--
	06/20/95	NWE	5,130	281	3,150	16,400	--	--	--	--	--	--	--
	09/29/95	NWE	12,900	70	2,090	733	--	--	--	--	--	--	--
	02/15/96	NWE	4,490	522	1,500	2,390	--	--	--	--	--	--	--
	04/26/96	NWE	4,330	257	1,160	3,320	--	--	--	--	--	--	--
	10/29/96	NWE	490	15	123	442	--	--	--	--	--	--	--
	01/15/97	NWE	4,540	149	739	2,210	--	--	--	--	--	--	--
	01/27/98	NWE	2,960	133	513	1,070	--	--	--	--	--	--	--
	07/25/99	GGs	2,910	ND	109	ND	2.57	0.627	10,300	ND	--	--	--

See final page for legend

TABLE 2 (Page 4 of 10)

GROUNDWATER SAMPLE ANALYTICAL RESULTS

DELCO PETROLEUM RETAIL FUELING FACILITY
 17873 S.E. MCLOUGHLIN BOULEVARD
 MILWAUKIE, OREGON
WES Project No. 01-0001

Sample ID	Date Sampled	Sampled By	Benzene (ug/l)	Toluene (ug/l)	Ethyl-Benzene (ug/l)	Xylenes (ug/l)	TPH-Dx (mg/l)		TPH-Gx (mg/l)	MTBE (ug/l)	VOCs (ug/l)	PAHs (ug/l)	Dissolved Lead (mg/l)
							Diesel	Oil					
MW-5	06/22/93	NWE	500	750	180	1,090	--	--	--	--	--	--	--
	07/18/94	NWE	237	24	ND	187	--	--	--	--	--	--	--
	10/28/94	NWE	141	ND	28	35	--	--	--	--	--	--	--
	01/24/95	NWE	726	10	36	125	--	--	--	--	--	--	--
	06/20/95	NWE	150	18	4	70	--	--	--	--	--	--	--
	09/29/95	NWE	386	3	75	63	--	--	--	--	--	--	--
	02/15/96	NWE	23	ND	ND	9	--	--	--	--	--	--	--
	04/26/96	NWE	310	ND	34	30	--	--	--	--	--	--	--
	10/29/96	NWE	350	2	23	49	--	--	--	--	--	--	--
	01/15/97	NWE	33	ND	2	5	--	--	--	--	--	--	--
	01/27/98	NWE	901	5	17	60	--	--	--	--	--	--	--
	07/25/99	GGs	35.7	ND	ND	ND	ND	ND	118	ND	--	--	--
	08/27/00	GGs	170	ND	ND	ND	ND	ND	667	ND	N = 30.2	--	--
	01/10/01	WES	86	ND	1.3	1.0	ND	ND	--	54	IPB = 3.3	--	ND
	03/28/01	WES	81	ND	2.1	2.1	ND	ND	--	51	NPB = 4.2 IPB = 3.7 NPB = 5.2	--	ND

See final page for legend

TABLE 2 (Page 5 of 10)

GROUNDWATER SAMPLE ANALYTICAL RESULTS

DELCO PETROLEUM RETAIL FUELING FACILITY
 17873 S.E. MCLOUGHLIN BOULEVARD
 MILWAUKIE, OREGON
WES Project No. 01-0001

Sample ID	Date Sampled	Sampled By	Benzene (ug/l)	Toluene (ug/l)	Ethyl-Benzene (ug/l)	Xylenes (ug/l)	TPH-Dx (mg/l)		TPH-Gx (mg/l)	MTBE (ug/l)	VOCs (ug/l)	PAHs (ug/l)	Dissolved Lead (mg/l)
							Diesel	Oil					
MW-6	06/22/93	NWE	14	7	7	26	--	--	--	--	--	--	--
	07/18/94	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	10/28/94	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	01/24/95	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	06/20/95	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	09/29/95	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	02/15/96	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	04/26/96	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	10/29/96	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	01/15/97	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	01/27/98	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	07/24/99	GGs	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
	08/27/00	GGs	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
	01/10/01	WES	--	--	--	--	--	--	--	--	--	--	--
	03/28/01	WES	--	--	--	--	--	--	--	--	--	--	--

See final page for legend

TABLE 2 (Page 6 of 10)

GROUNDWATER SAMPLE ANALYTICAL RESULTS

DELCO PETROLEUM RETAIL FUELING FACILITY
 17873 S.E. MCLOUGHLIN BOULEVARD
 MILWAUKIE, OREGON
WES Project No. 01-0001

Sample ID	Date Sampled	Sampled By	Benzene (ug/l)	Toluene (ug/l)	Ethyl-Benzene (ug/l)	Xylenes (ug/l)	TPH-Dx (mg/l)		TPH-Gx (mg/l)	MTBE (ug/l)	VOCs (ug/l)	PAHs (ug/l)	Dissolved Lead (mg/l)
							Diesel	Oil					
MW-7	06/20/95	NWE	4,230	6,410	11,700	16,700	--	--	--	--	--	--	--
	09/29/95	NWE	540	4	117	74	--	--	--	--	--	--	--
	02/15/96	NWE	117	26	13	629	--	--	--	--	--	--	--
	04/26/96	NWE	276	31	70	309	--	--	--	--	--	--	--
	10/29/96	NWE	298	5	16	55	--	--	--	--	--	--	--
	01/15/97	NWE	258	50	60	225	--	--	--	--	--	--	--
	01/27/98	NWE	309	121	315	1,560	--	--	--	--	--	--	--
MW-8	06/20/95	NWE	2,830	312	253	2,830	--	--	--	--	--	--	--
	09/29/95	NWE	1,164	70	211	290	--	--	--	--	--	--	--
	02/15/96	NWE	384	38	111	496	--	--	--	--	--	--	--
	04/26/96	NWE	163	ND	41	208	--	--	--	--	--	--	--
	10/29/96	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	01/15/97	NWE	944	153	130	1,690	--	--	--	--	--	--	--
	01/27/98	NWE	522	63	230	469	--	--	--	--	--	--	--

See final page for legend

TABLE 2 (Page 7 of 10)

GROUNDWATER SAMPLE ANALYTICAL RESULTS

DELCO PETROLEUM RETAIL FUELING FACILITY

17873 S.E. MCLOUGHLIN BOULEVARD

MILWAUKIE, OREGON

WES Project No. 01-0001

Sample ID	Date Sampled	Sampled By	Benzene (ug/l)	Toluene (ug/l)	Ethyl-Benzene (ug/l)	Xylenes (ug/l)	TPH-Dx (mg/l)		TPH-Gx (mg/l)	MTBE (ug/l)	VOCs (ug/l)	PAHs (ug/l)	Dissolved Lead (mg/l)
							Diesel	Oil					
MW-9	06/20/95	NWE	ND	ND	ND	2	--	--	--	--	--	--	--
	09/29/95	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	02/15/96	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	04/26/96	NWE	71	ND	12	9	--	--	--	--	--	--	--
	10/29/96	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	01/15/97	NWE	55	ND	10	15	--	--	--	--	--	--	--
	01/27/98	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	07/23/99	GGs	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
	08/27/00	GGs	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
	01/10/01	WES	0.6	ND	ND	ND	ND	ND	--	--	--	--	--
	03/28/01	WES	ND	ND	ND	ND	ND	ND	--	--	--	--	--
MW-10	09/18/96	NWE	ND	ND	ND	ND	--	--	ND	--	--	--	--
	10/29/96	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	01/15/97	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	01/27/98	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	07/23/99	GGs	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
	08/27/00	GGs	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
	01/10/01	WES	ND	ND	ND	ND	0.6	1.0	--	--	--	ND	--
	03/28/01	WES	ND	ND	ND	ND	ND	ND	--	--	--	--	--

See final page for legend

TABLE 2 (Page 8 of 10)

GROUNDWATER SAMPLE ANALYTICAL RESULTS

DELCO PETROLEUM RETAIL FUELING FACILITY

17873 S.E. MCLOUGHLIN BOULEVARD

MILWAUKIE, OREGON

WES Project No. 01-0001

Sample ID	Date Sampled	Sampled By	Benzene (ug/l)	Toluene (ug/l)	Ethyl-Benzene (ug/l)	Xylenes (ug/l)	TPH-Dx (mg/l)		TPH-Gx (mg/l)	MTBE (ug/l)	VOCs (ug/l)	PAHs (ug/l)	Dissolved Lead (mg/l)
							Diesel	Oil					
MW-11	09/18/96	NWE	ND	ND	ND	ND	--	--	ND	--	--	--	--
	10/29/96	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	01/15/97	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	01/27/98	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	07/24/99	GGs	ND	ND	ND	ND	0.542	ND	ND	ND	--	--	--
	08/27/00	GGs	ND	ND	ND	ND	0.610	ND	ND	ND	cis-1,2-DCE = 1.96	--	--
	01/10/01	WES	ND	ND	ND	ND	ND	ND	--	1.6	Vinyl Chloride = 0.8 cis-1,2-DCE = 1.8	--	--
	03/28/01	WES	ND	ND	ND	ND	0.30	ND	--	1.7	Vinyl Chloride = 0.8 cis-1,2-DCE = 1.1	--	--
MW-12	09/18/96	NWE	ND	ND	ND	ND	--	--	ND	--	--	--	--
	10/29/96	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	01/15/97	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	01/27/98	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	07/24/99	GGs	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
	08/27/00	GGs	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
	01/10/01	WES	--	--	--	--	--	--	--	--	--	--	--
	03/28/01	WES	--	--	--	--	--	--	--	--	--	--	--

See final page for legend

TABLE 2 (Page 9 of 10)

GROUNDWATER SAMPLE ANALYTICAL RESULTS

DELCO PETROLEUM RETAIL FUELING FACILITY
 17873 S.E. MCLOUGHLIN BOULEVARD
 MILWAUKIE, OREGON
WES Project No. 01-0001

Sample ID	Date Sampled	Sampled By	Benzene (ug/l)	Toluene (ug/l)	Ethyl-Benzene (ug/l)	Xylenes (ug/l)	TPH-Dx (mg/l)		TPH-Gx (mg/l)	MTBE (ug/l)	VOCs (ug/l)	PAHs (ug/l)	Dissolved Lead (mg/l)
							Diesel	Oil					
MW-13	09/18/96	NWE	ND	ND	ND	ND	--	--	ND	--	--	--	--
	10/29/96	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	01/15/97	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	01/27/98	NWE	ND	ND	ND	ND	--	--	--	--	--	--	--
	07/23/99	GGs	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
	08/27/00	GGs	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--
	01/10/01	WES	--	--	--	--	--	--	--	--	--	--	--
	03/28/01	WES	--	--	--	--	--	--	--	--	--	--	--
MW-14	08/27/00	GGs	ND	ND	ND	ND	ND	ND	ND	37.8	--	--	--
	01/10/01	WES	ND	ND	ND	ND	ND	ND	--	--	--	--	--
	03/28/01	WES	ND	ND	ND	ND	ND	ND	--	--	--	--	--
MW-15	08/27/00	GGs	24.6	2.13	10.6	10.3	ND	ND	410	7.66	N = 11.3	--	--
	01/10/01	WES	9.3	ND	ND	ND	ND	ND	--	--	--	--	--
	03/28/01	WES	18	0.5	0.5	0.5	ND	ND	--	--	--	--	--

See final page for legend

GROUNDWATER SAMPLE ANALYTICAL RESULTS

DELCO PETROLEUM RETAIL FUELING FACILITY
17873 S.E. MCLOUGHLIN BOULEVARD
MILWAUKIE, OREGON
WES Project No. 01-0001

LEGEND

- ¹ Compounds are lighter than diesel.
- ² Monitoring Well MW-2 was decommissioned in 1999.
- ³ Monitoring Well MW-3 was decommissioned in 1995.
- ⁴ Monitoring Well MW-4 was decommissioned in 1999.

WES = Wohlers Environmental Services, Inc.

ID = Identification

TPH = Total Petroleum Hydrocarbon

Dx = Diesel extended

Gx = Gasoline extended

MTBE = Methyl Tertiary Butyl Ether

VOCs = Volatile Organic Compounds

PAHs = Polynuclear Aromatic Hydrocarbons

ug/l = micrograms per liter or parts per billion (ppb)

mg/l = milligrams per liter or parts per million (ppm)

NWE = Northwest Envirocon, Inc.

GGs = GeoPro Geologic Services

IPB = IsoPropylBenzene

NPB = n-PropylBenzene

N = Naphthalene

1,3,5-TMB = 1,3,5-TriMethylBenzene

1,2,4-TMB = 1,2,4-TriMethylBenzene

cis-1,2-DCE = cis-1,2-DiChloroEthene

ND = Not Detected

-- = Not Analyzed

TABLE 3

CONTAMINANTS OF POTENTIAL CONCERN: SOIL*

DELCO PETROLEUM RETAIL FUELING FACILITY
17873 S.E. MCLOUGHLIN BOULEVARD
MILWAUKIE, OREGON
WES Project No. 01-0001

CONTAMINANT	MAXIMUM CONCENTRATION DETECTED (mg/kg)	DEPTH (feet bsg)	MOST STRINGENT FEASIBLE RBDM RBC ¹ (mg/kg)
Benzene	3.27	9.5	21 (RBC _{so})
Toluene	3.03	4	19 (RBC _{so}) ²
Ethylbenzene	1.70	4	47 (RBC _{so}) ²
Xylenes	7.13	4	33 (RBC _{so}) ²
Naphthalene	NA	--	330 (RBC _{so})
MTBE	3.97	4	140 (RBC _{so}) ²
Ethylene DiBromide	NA ³	--	0.78 (RBC _{so})
Ethylene DiChloride	NA ³	--	6.6 (RBC _{so})
Lead	NA ³	--	NL
Iso-PropylBenzene	NA ³	--	2,100 (RBC _{so}) ²
n-PropylBenzene	NA ³	--	2,100 (RBC _{so}) ²
1,2,4-TriMethylBenzene	NA ³	--	360 (RBC _{so}) ²
1,3,5-TriMethylBenzene	NA ³	--	360 (RBC _{so}) ²

* Commercial-Industrial Scenario

¹ Due to site and region-specific conditions and characteristics, "Surface Soil Ingestion, Dermal Contact, and Inhalation," "Vapor Intrusion into Buildings," and "Leaching to Groundwater" are not considered feasible exposure pathways.

² These values represent actual RBCs, recalculated using Oregon DEQ-approved models.

³ Confirmation soil samples were not analyzed for these constituents. Soil sample analytical results are available for these COPCs, however, for soil that has been over-excavated and COPC concentrations were either non-detect or below applicable soil exposure pathway target cleanup levels.

WES = Wohlers Environmental Services, Inc.

DEQ = Department of Environmental Quality

mg/kg = milligrams per kilogram or parts per million (ppm)

bsg = below surface grade

RBDM = Risk-Based Decision Making

RBC = Risk-Based Concentration

MTBE = Methyl Tertiary Butyl Ether

NA = Not Analyzed

-- = Not Applicable

NL = Not Listed

_{so} = Volatilization to Outdoor Air Pathway

TABLE 4

CONTAMINANTS OF POTENTIAL CONCERN: GROUNDWATER*

DELCO PETROLEUM RETAIL FUELING FACILITY

17873 S.E. MCLOUGHLIN BOULEVARD

MILWAUKIE, OREGON

WES Project No. 01-0001

CONTAMINANT	MAXIMUM CONCENTRATION DETECTED (ug/l)	MOST STRINGENT FEASIBLE RBDM RBC ¹ (ug/l)
Benzene	280	820 (RBC _{we})
Toluene	8.26	30,000 (RBC _{we})
Ethylbenzene	15	45,000 (RBC _{we})
Xylenes	18	55,000 (RBC _{we})
Acenaphthene	ND	12,000 (RBC _{we}) ²
Anthracene	ND	38,000 (RBC _{we}) ²
Benz(a)anthracene	ND	4.1 (RBC _{we})
Benzo(b)fluoranthene	ND	2.4 (RBC _{we}) ²
Benzo(k)fluoranthene	ND	26 (RBC _{we}) ²
Benzo(a)pyrene	ND	0.24 (RBC _{we})
Chrysene	ND	410 (RBC _{we}) ²
Dibenz(a,h)anthracene	ND	0.088 (RBC _{we})
Fluoranthene	ND	4,700 (RBC _{we}) ²
Fluorene	ND	6,900 (RBC _{we}) ²
Indeno(1,2,3-cd)pyrene	ND	1.3 (RBC _{we}) ²
Naphthalene	30.2	240 (RBC _{we})
Pyrene	ND	2,400 (RBC _{we}) ²
MTBE	88	240,000 (RBC _{we})
Ethylene DiBromide	ND	8.6 (RBC _{we})
Ethylene DiChloride	ND	280 (RBC _{we}) ²
Dissolved Lead	ND	NL
Iso-PropylBenzene	24	1,800 (RBC _{we})
n-PropylBenzene	42	1,600 (RBC _{we})
1,2,4-TriMethylBenzene	1.7	600 (RBC _{we}) ²
1,3,5-TriMethylBenzene	2.2	630 (RBC _{we}) ²

* Commercial-Industrial Scenario

WES = Wohlers Environmental Services, Inc.

ug/l = micrograms per liter or parts per billion (ppb)

RBDM = Risk-Based Decision Making

RBC = Risk-Based Concentration

we = Groundwater in Excavation Pathway

MTBE = Methyl Tertiary Butyl Ether

ND = Not Detected

DEQ = Department of Environmental Quality

¹ Due to site and region-specific conditions and characteristics, "Groundwater Ingestion," and "Ingestion and Inhalation from Tapwater" are not considered feasible exposure pathways.² These values represent actual RBCs, recalculated using Oregon DEQ-approved models.

TABLE 5

POTENTIALLY APPLICABLE WATER CLEANUP LEVELS/TARGETS

DELCO PETROLEUM RETAIL FUELING FACILITY
 17873 S.E. MCLOUGHLIN BOULEVARD
 MILWAUKIE, OREGON
WES Project No. 01-0001

Constituent	Sample ID	Sample Date	Maximum Identified Concentration (ug/l)	EPA Region IX PRG Tap Water (ug/l)	EPA Region III RBC Tap Water (ug/l)	EPA MCL (ug/l)
Cis-1,2-DiChloroEthene	MW-11	08/27/00	1.96	61 (nc)	61 (nc)	70
		01/10/01	1.8			
Vinyl Chloride	MW-11	01/10/01	0.8	0.02 (ca)	0.019 (ca)	2

WES = Wohlers Environmental services, Inc.

ID = Identification

EPA Region IX = U.S. Environmental Protection Agency, Region IX

EPA Region III = U.S. EPA, Region III

PRG = Preliminary Remediation Goal

MCL = U.S. EPA Maximum Contaminant Level for Drinking Water

nc = non-carcinogenic

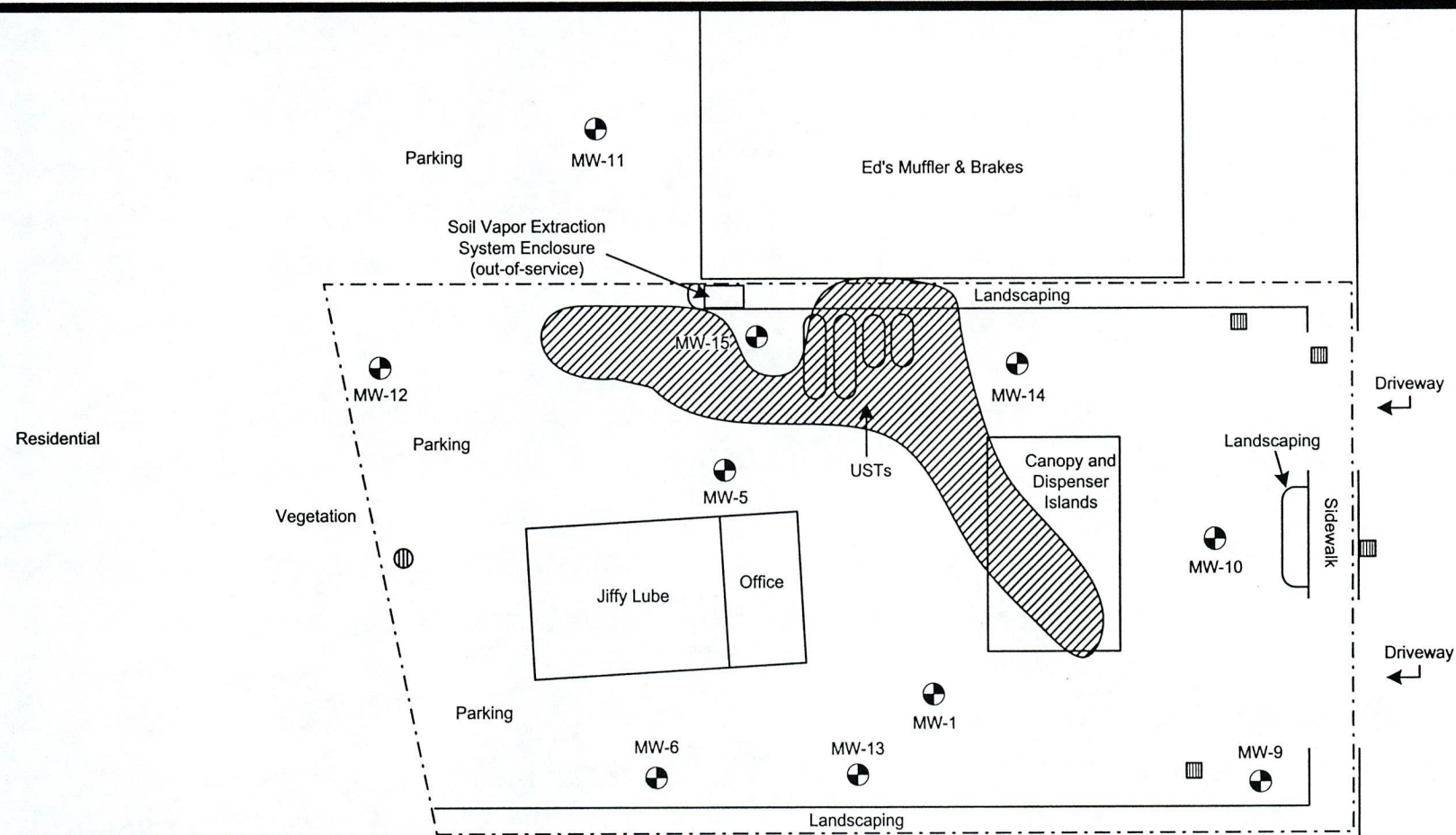
ca = carcinogenic

ug/l = micrograms per liter or parts per billion (ppb)

0.02 = Cleanup Standard/Target Level Exceeded

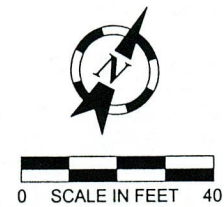
APPENDIX A

POCKET-IN-PLACE ESTIMATED EXTENT MAPS



LEGEND

- = Groundwater monitoring well location
- = Catch basin
- = Sewer manhole
- UST = Underground Storage Tank
- bsg = below surface grade
- mg/kg = milligrams per kilogram or parts per million (ppm)
- = Approximate boundary of gasoline remaining in soil at depths between 10.5 feet and 15 feet bsg (maximum concentration of 96.0 mg/kg).

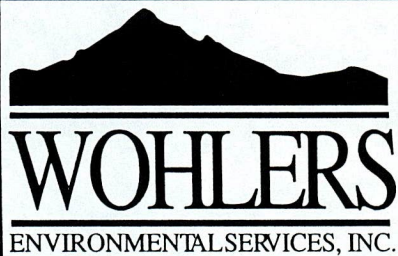


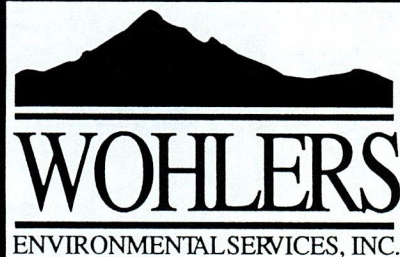
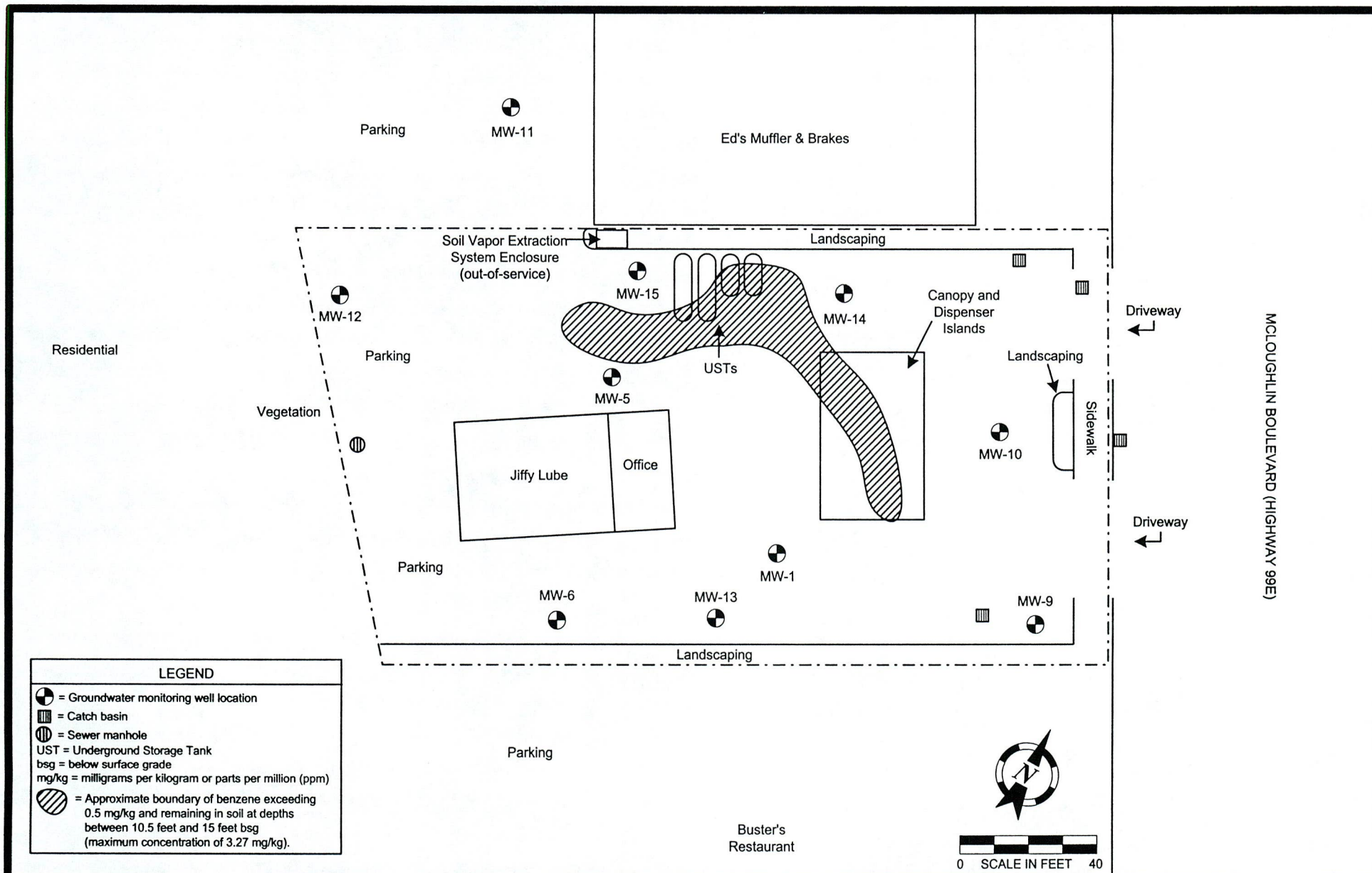
APPENDIX A-1

GASOLINE POCKET-IN-PLACE ESTIMATED EXTENT MAP

DELCO PETROLEUM RETAIL FUELING FACILITY
17873 S.E. MCLOUGHLIN BOULEVARD
MILWAUKIE, OREGON

PROJECT NO.:	01-0001
DATE:	01/12/01
SCALE:	1" = 40'
FILE:	App010001
DRAWN BY:	MDW





APPENDIX A-2

BENZENE POCKET-IN-PLACE ESTIMATED EXTENT MAP

DELCO PETROLEUM RETAIL FUELING FACILITY
17873 S.E. MCLOUGHLIN BOULEVARD
MILWAUKIE, OREGON

PROJECT NO.:	01-0001
DATE:	01/12/01
SCALE:	1" = 40'
FILE:	App010001
DRAWN BY:	MDW

APPENDIX B
FIELD PROCEDURES

FIELD PROCEDURES

I. Groundwater Level Measurements & Monitoring Well Survey

Groundwater levels are measured with a hand-held electronic water level indicator. The probe of the indicator is lowered into the well until groundwater is contacted. The depth from that level to a mark on the top of the well casing is recorded, along with the date, time and type of instrument. Groundwater levels are measured to the nearest 0.01 foot. This level is then referenced to a benchmark elevation (above mean sea level or amsl) located near the subject site followed by calculation of the elevation of the top of shallow groundwater table surface at each monitoring point. This information subsequently is used to calculate apparent groundwater gradient and flow direction beneath the site (i.e., preparation of groundwater contour map).

II. Groundwater Sampling & Analytical Protocols

Groundwater sample collection and analytical protocols are intended to provide consistent and accurate results. These protocols have been developed from the following applicable regulatory documents.

- ◆ Oregon Administrative Rules (OAR) for Underground Storage Tanks, Section 340-122-242
- ◆ Test Methods for Evaluating Solid Waste, U.S. EPA SW-846, 3rd Edition (November 1986)

Sampling equipment used to collect water samples will be thoroughly cleaned using an Alconox or similar cleansing solution prior and after use. Sampling equipment subsequently will be rinsed using tap water followed by a distilled water flush. Sealed and laboratory-cleaned/sterilized sample containers will be used to store the samples prior to laboratory analysis.

The water level, thickness of floating hydrocarbon materials (if present), and total depth of the monitoring wells are measured before a groundwater sample is collected. Measurements of groundwater levels are recorded to the nearest 0.01 foot.

Following the above-referenced measurements, and before collection of a groundwater sample(s), the monitoring well is purged of standing water in the well casing and sand filter pack using a positive displacement pump, polyethylene bailer, or a peristaltic vacuum pump. Water is purged from the well until a minimum volume of water equal to three casing volumes in contact with saturated materials is removed. Casing volume is calculated based on the height of the water column and the depth and radius of the well casing.

Temperature, pH and specific conductance of removed water periodically are measured during well purging (measurements are typically collected following purging of each well volume). Once a minimum of three well casing volumes has been purged, and physical parameters have stabilized, groundwater samples are collected with a disposable, polyethylene bailer. Sample containers are labeled immediately after the sample is collected and placed in a cooler at approximately four degrees centigrade for transport to an analytical laboratory under Chain-of-Custody protocols.

APPENDIX C

ANALYTICAL RESULTS/CHAIN OF CUSTODY DOCUMENTATION



Professional
Laboratory
Services

13035 S.W. Pacific Hwy.
Tigard, OR 97223

Tel 503 639 9311
Fax 503 684 1588

ANALYSIS REPORT

C
L Wohlers Environmental Services
I Attn. Chris Wohlers
E 6665 SW Hampton St., Suite 100
N Tigard, OR 97223
T

Date Sampled: 3/28/01
Date Received: 3/28/01
Date Analyzed: 4/1/01
Date Reported: 4/2/01
Job Number: **01087/17-23**
Page: 1 of 6

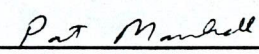
Project: Delco Petroleum
Project Number: 01-0001
Sample Type - Water

Lab Number	Client Identification	Analysis - BTEX (EPA Method 8020)				
		ug/L (ppb)				
		Benzene	Toluene	Ethylbenzene	Xylenes	Surrogate % Recovery
01087/19	MW-9	ND	ND	ND	ND	89
01087/20	MW-10	ND	ND	ND	ND	116
01087/22	MW-14	ND	ND	ND	ND	139
01087/23	MW-15	18	0.5	0.5	0.5	93
01087/23-dup	MW-15	18	0.6	0.5	0.7	141
QC Information:						
Lab Blank	3/18/01	ND	ND	ND	ND	88
01087/23-spike	MW-15	85	95	88	89	102
Detection Limit:		0.5	0.5	0.5	0.5	
ND = None Detected						


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WES01087-19btex


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ANALYSIS REPORT

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N Tigard, OR 97223
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Date Sampled: 3/28/01
Date Received: 3/28/01
Date Extracted: 4/3/01
Date Analyzed: 4/3/01
Date Reported: 4/4/01
Job Number: **01087/17-23**
Page: 2 of 6

Project: Delco Petroleum
Project Number: 01-0001
Sample Type - Water

Lab Number	Client Identification	Analysis - TPH-Dx mg/L (ppm)		
		Diesel C ₁₂ -C ₂₅	Heavy Oil > C ₂₅	Surrogate % Recovery
01087/17	MW-1	0.81*	ND	108
01087/18	MW-5	ND	ND	122
01087/19	MW-9	ND	ND	107
01087/20	MW-10	ND	ND	106
01087/21	MW-11	0.30*	ND	102
01087/22	MW-14	ND	ND	104
01087/23	MW-15	ND	ND	109
01087/23-dup	MW-15	ND	ND	118

QC Information:

Lab Blank	4/3/01	ND	ND	90
Blank Spike	% Recovery	102	86	129

Detection Limit: 0.25 0.5

ND = None Detected

*Chromatographic evidence suggests that compounds from the gasoline range are overlapping into the diesel range.

Pat Marshall
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ANALYSIS REPORT



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Date Sampled: 3/28/01
Date Received: 3/28/01
Date Analyzed: 4/8/01
Date Reported: 4/10/01
Job Number: 01087/17-23
Page: 3 of 6

Analysis - RBDM List (EPA Method 8260B)

Project: Delco Petroleum

Project Number: 01-0001

Sample Type - Water

Laboratory Sample # Client Identification	01087/17 MW-1	01087/18 MW-5	01096/50 Batch QC	Detection Limit	4/8/01 Blank
Compound	ug/L (ppb)	ug/L (ppb)	% Recovery	ug/L (ppb)	ug/L (ppb)
Benzene	280	81	97	0.5	ND
Toluene	5.5	ND	89	0.5	ND
Ethylbenzene	15	2.1	97	0.5	ND
Total Xylenes	18	2.1	97	0.5	ND
1,2-Dichloroethane (EDC)	ND	ND	95	0.5	ND
1,2-Dibromoethane (EDB)	ND	ND	87	0.5	ND
Isopropylbenzene	24	3.7	98	0.5	ND
n-Propylbenzene	42	5.2	97	0.5	ND
1,3,5-Trimethylbenzene	2.2	ND	100	0.5	ND
1,2,4-Trimethylbenzene	1.7	ND	101	0.5	ND
Methyl tert butyl ether (MTBE)	86	51	90	0.5	ND
Naphthalene	20	ND	88	5.0	ND

QC Information: Surrogate % Recovery

(1,2-Dichloroethane-d4)	104	100	91	106
(Toluene-d8)	94	94	95	96
(4-Bromofluorobenzene)	101	100	98	100

ND = None Detected

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Attn. Chris Wohlers
6665 SW Hampton St., Suite 100
Tigard, OR 97223

13035 S.W. Pacific Hwy.
Tigard, OR 97223

Date Sampled: 3/28/01

Date Received: 3/28/01

Date Analyzed: 4/3/01

Date Reported: 4/10/01

Tel 503 639 9311

Fax 503 684 1588

Job Number: 01087/17-23

Page: 4 of 6

Analysis - GC/MS Volatiles (EPA Method 8260B)

Project: Delco Petroleum

Project Number: 01-0001

Laboratory Sample Number

01087/21

01087/21

Detection

4/3/01

Client Identification

MW-11

duplicate

Limit

Blank

Compound	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Dichlorodifluoromethane	ND	ND	0.5	ND
Chloromethane	ND	ND	0.5	ND
Vinyl chloride	0.8	0.8	0.5	ND
Bromomethane	ND	ND	0.5	ND
Chloroethane	ND	ND	0.5	ND
Trichlorofluoromethane	ND	ND	0.5	ND
1,1-Dichloroethene	ND	ND	0.5	ND
Carbon disulfide	ND	ND	5.0	ND
Iodomethane	ND	ND	0.5	ND
Methylene chloride	ND	ND	2.0	ND
Acetone	ND	ND	10	ND
trans-1,2-Dichloroethene	ND	ND	0.5	ND
Methyl tert butyl ether (MTBE)	1.7	1.6	0.5	ND
1,1-Dichloroethane	ND	ND	0.5	ND
Vinyl acetate	ND	ND	5.0	ND
2,2-Dichloropropane	ND	ND	0.5	ND
cis-1,2-Dichloroethene	1.1	1.1	0.5	ND
Bromochloromethane	ND	ND	0.5	ND
Chloroform	ND	ND	0.5	ND
1,1,1-Trichloroethane	ND	ND	0.5	ND
Carbon tetrachloride	ND	ND	0.5	ND
2-Butanone (MEK)	ND	ND	10	ND
1,1-Dichloropropene	ND	ND	0.5	ND
Benzene	ND	ND	0.5	ND
1,2-Dichloroethane	ND	ND	0.5	ND
Trichloroethene	ND	ND	0.5	ND
1,2-Dichloropropane	ND	ND	0.5	ND
Dibromomethane	ND	ND	0.5	ND
Bromodichloromethane	ND	ND	0.5	ND
2-Chloroethyl vinyl ether	ND	ND	0.5	ND
cis-1,3-Dichloropropene	ND	ND	0.5	ND
Toluene	ND	ND	0.5	ND
2-Hexanone	ND	ND	10	ND
trans-1,3-Dichloropropene	ND	ND	0.5	ND
1,1,2-Trichloroethane	ND	ND	0.5	ND
Tetrachloroethene	ND	ND	0.5	ND
1,3-Dichloropropane	ND	ND	0.5	ND
Dibromochloromethane	ND	ND	0.5	ND
1,2-Dibromoethane	ND	ND	0.5	ND

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Tigard, OR 97223

Date Sampled: 3/28/01

Date Received: 3/28/01

Date Analyzed: 4/3/01

Date Reported: 4/10/01

Job Number: 01087/17-23

Page: 5 of 6

Tel 503 639 9311
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Wohlers Environmental Services

Attn. Chris Wohlers

6665 SW Hampton St., Suite 100

Tigard, OR 97223

Analysis - GC/MS Volatiles (EPA Method 8260B)

Project: Delco Petroleum

Project Number: 01-0001

Laboratory Sample Number

Client Identification

01087/21

01087/21

Detection

4/3/01

MW-11

duplicate

Limit

Blank

Compound

ug/L (ppb)

ug/L (ppb)

ug/L (ppb)

ug/L (ppb)

4-Methyl-2-pentanone (MIBK)

ND

ND

10

ND

Chlorobenzene

ND

ND

0.5

ND

1,1,1,2-Tetrachloroethane

ND

ND

0.5

ND

Ethylbenzene

ND

ND

0.5

ND

Total Xylenes

ND

ND

0.5

ND

Styrene

ND

ND

0.5

ND

Bromoform

ND

ND

0.5

ND

Isopropylbenzene

ND

ND

0.5

ND

Bromobenzene

ND

ND

0.5

ND

1,1,2,2-Tetrachloroethane

ND

ND

0.5

ND

1,2,3-Trichloropropane

ND

ND

0.5

ND

n-Propylbenzene

ND

ND

0.5

ND

2-Chlorotoluene

ND

ND

0.5

ND

4-Chlorotoluene

ND

ND

0.5

ND

1,3,5-Trimethylbenzene

ND

ND

0.5

ND

tert-Butylbenzene

ND

ND

0.5

ND

1,2,4-Trimethylbenzene

ND

ND

0.5

ND

sec-Butylbenzene

ND

ND

0.5

ND

1,3-Dichlorobenzene

ND

ND

0.5

ND

4-Isopropyltoluene

ND

ND

0.5

ND

1,4-Dichlorobenzene

ND

ND

0.5

ND

1,2-Dichlorobenzene

ND

ND

0.5

ND

n-Butylbenzene

ND

ND

0.5

ND

1,2-Dibromo-3-chloropropane

ND

ND

2.0

ND

1,2,4-Trichlorobenzene

ND

ND

2.0

ND

Hexachlorobutadiene

ND

ND

2.0

ND

Naphthalene

ND

ND

5.0

ND

1,2,3-Trichlorobenzene

ND

ND

2.0

ND

QC Information: Surrogate % Recovery

(1,2-Dichloroethane-d4)

100

103

100

(Toluene-d8)

93

92

92

(4-Bromofluorobenzene)

96

94

96

ND = None Detected

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ANALYSIS REPORT

L Wohlers Environmental Services
I Attn. Chris Wohlers
E 6665 SW Hampton St., Suite 100
N Tigard, OR 97223

Date Sampled: 3/28/01
Date Received: 3/28/01
Date Extracted: 4/10/01
Date Analyzed: 4/15/01
Date Reported: 4/17/01
Job Number: 01087/17-23
Page: 6 of 6

Analysis - Polynuclear Aromatics (EPA Method 8270C SIM)

Project: Delco Petroleum

Project Number: 01-0001

Sample Type - Water

Laboratory Sample Number 01087/17*

Client Identification MW-1

Detection
Limit

4/10/01
Blank

ug/L (ppb)

ug/L (ppb)

ug/L (ppb)

Naphthalene	3.4	0.1	ND
Acenaphthylene	<0.4	0.1	ND
Acenaphthene	<0.4	0.1	ND
Fluorene	<0.4	0.1	ND
Phenanthrene	<0.4	0.1	ND
Anthracene	<0.4	0.1	ND
Fluoranthene	<0.4	0.1	ND
Pyrene	<0.4	0.1	ND
Benzo(a)anthracene	<0.4	0.1	ND
Chrysene	<0.4	0.1	ND
Benzo(b)fluoranthene	<0.4	0.1	ND
Benzo(k)fluoranthene	<0.4	0.1	ND
Benzo(a)pyrene	<0.4	0.1	ND
Indeno(1,2,3-c,d)pyrene	<0.4	0.1	ND
Dibenzo(a,h)anthracene	<0.4	0.1	ND
Benzo(g,h,i)perylene	<0.4	0.1	ND

QC Information: Surrogate % Recovery

2-Fluorobiphenyl 111
p-Terphenyl-d14 MI

119
134

ND = None Detected

MI = Matrix Interference

*The raised detection limit is due to the sample matrix.

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QA Check

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Laboratory
Services

13035 S.W. Pacific Hwy.
Tigard, OR 97223

Tel 503 639 9311
Fax 503 684 1588

ANALYSIS REPORT

C
L Wohlers Environmental Services
I Attn. Chris Wohlers
E 6665 SW Hampton St., Suite 100
N Tigard, OR 97223
T

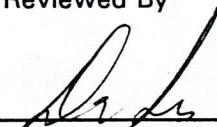
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Date Received: 3/28/01
Date Prepared: 3/29/01
Date Analyzed: 4/23/01
Date Reported: 4/26/01
Job Number: 01087/17-23
Page: 7

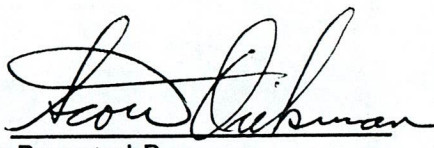
Project: Delco Petroleum
Project Number: 01-0001
Sample Type - Well Water

Dissolved Lead
Analysis - EPA Method 200.9
Results mg/L (ppm)

Lab Number	Client Identification	Results mg/L (ppm)
01087/17	MW-1	0.003
01087/18	MW-5	ND
Lab Blank	4/23/01	ND

ND = None Detected
Detection Limit = 0.001 mg/L (ppm)
Matrix Spike (% Recovery) = 100


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AMTEST
OREGON L.L.C.

9205 S.W. Nimbus Ave.
Beaverton, OR 97008

Tel 503 626 7424
Fax 503 643 1460

Project Manager: Chris Wohlers
Company Name: Wohlers Environmental Services, Inc.
Address: 6665 SW Hampton St., Suite 100
City, State, ZIP: Tigard OR 97223
Phone: 670-1344
FAX: 670-1701

P.O. # or Project #: 01-0001
Project Name: Delco Petroleum
Project Location: 17873 SE McLoughlin Blvd., Milwaukie
Sampling Date: 3/28/01

Lab Project Number

01087/17-23

Lab Location

R 4

RUSH? YES NO

Filter for possible Dissolved Pb
possible RACT & RBDm Followup

01087/17, 01087/18. filtered 03/29/01 LD

LAB USE ONLY

Additional Analyses: *Room Dissolved Pb mwt 15*

Requested By: Merik al WES

Date: 17 April 01

Relinquished By <i>M. O. L. O.</i>	Date/Time 3/28/01 4:40	Received By <i>[Signature]</i>	Date/Time 3-28-01. 4:38 P
Relinquished By	Date/Time	Received By	Date/Time
linquished By	Date/Time	Received By	Date/Time

ANALYSIS REPORT



Professional
Laboratory
Services

13035 S.W. Pacific Hwy.
Tigard, OR 97223

Tel 503 639 9311
Fax 503 684 1588

C
L Wohlers Environmental Services
I Attn. Chris Wohlers
E 6665 SW Hampton St., Suite 100
N Tigard, OR 97223
T

Date Sampled: 1/10/01
Date Received: 1/11/01
Date Analyzed: 1/15/01
Date Reported: 1/16/01
Job Number: 01011/28-32
Page: 1 of 7

Analysis - RBDM List (EPA Method 8260B)

Project: Delco Petroleum - Milwaukie

Project Number: 01-0001

Sample Type - Water

Laboratory Sample # Client Identification	01011/28 MW-1	01011/29 MW-5	Detection Limit	1/15/01 Blank
Compound	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Benzene	250	86	0.5	ND
Toluene	4.0	ND	0.5	ND
Ethylbenzene	5.9	1.3	0.5	ND
Total Xylenes	8.2	1.0	0.5	ND
1,2-Dichloroethane (EDC)	ND	ND	0.5	ND
1,2-Dibromoethane (EDB)	ND	ND	0.5	ND
Isopropylbenzene	15	3.3	0.5	ND
n-Propylbenzene	27	4.2	0.5	ND
1,3,5-Trimethylbenzene	0.8	ND	0.5	ND
1,2,4-Trimethylbenzene	ND	ND	0.5	ND
Methyl tert butyl ether (MTBE)	88	54	0.5	ND
Naphthalene	11	ND	5.0	ND

QC Information: Surrogate % Recovery

(1,2-Dichloroethane-d4)	98	90	100
(Toluene-d8)	94	95	96
(4-Bromofluorobenzene)	98	92	95

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Date Received: 1/11/01
Date Analyzed: 1/15/01
Date Reported: 1/16/01
Job Number: 01011/28-32
Page: 2 of 7

Analysis - GC/MS Volatiles (EPA Method 8260B)

Project: Delco Petroleum - Milwaukie

Project Number: 01-0001

Laboratory Sample Number	01011/30	01011/30	Detection	1/15/01
Client Identification	MW-11	duplicate	Limit	Blank
Compound	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Dichlorodifluoromethane	ND	ND	0.5	ND
Chloromethane	ND	ND	0.5	ND
Vinyl chloride	0.8	0.8	0.5	ND
Bromomethane	ND	ND	0.5	ND
Chloroethane	ND	ND	0.5	ND
Trichlorofluoromethane	ND	ND	0.5	ND
1,1-Dichloroethene	ND	ND	0.5	ND
Carbon disulfide	ND	ND	5.0	ND
Iodomethane	ND	ND	0.5	ND
Methylene chloride	ND	ND	2.0	ND
Acetone	ND	ND	10	ND
trans-1,2-Dichloroethene	ND	ND	0.5	ND
Methyl tert butyl ether (MTBE)	1.6	1.7	0.5	ND
1,1-Dichloroethane	ND	ND	0.5	ND
Vinyl acetate	ND	ND	5.0	ND
2,2-Dichloropropane	ND	ND	0.5	ND
cis-1,2-Dichloroethene	1.8	1.7	0.5	ND
Bromochloromethane	ND	ND	0.5	ND
Chloroform	ND	ND	0.5	ND
1,1,1-Trichloroethane	ND	ND	0.5	ND
Carbon tetrachloride	ND	ND	0.5	ND
2-Butanone (MEK)	ND	ND	10	ND
1,1-Dichloropropene	ND	ND	0.5	ND
Benzene	ND	ND	0.5	ND
1,2-Dichloroethane	ND	ND	0.5	ND
Trichloroethene	ND	ND	0.5	ND
1,2-Dichloropropane	ND	ND	0.5	ND
Dibromomethane	ND	ND	0.5	ND
Bromodichloromethane	ND	ND	0.5	ND
2-Chloroethyl vinyl ether	ND	ND	0.5	ND
cis-1,3-Dichloropropene	ND	ND	0.5	ND
Toluene	ND	ND	0.5	ND
2-Hexanone	ND	ND	10	ND
trans-1,3-Dichloropropene	ND	ND	0.5	ND
1,1,2-Trichloroethane	ND	ND	0.5	ND
Tetrachloroethene	ND	ND	0.5	ND
1,3-Dichloropropane	ND	ND	0.5	ND
Dibromochloromethane	ND	ND	0.5	ND
1,2-Dibromoethane	ND	ND	0.5	ND

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Wohlers Environmental Services
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Date Sampled: 1/10/01
Date Received: 1/11/01
Date Analyzed: 1/15/01
Date Reported: 1/16/01
Job Number: 01011/28-32
Page: 3 of 7

Analysis - GC/MS Volatiles (EPA Method 8260B)

Project: Delco Petroleum - Milwaukie

Project Number: 01-0001

Laboratory Sample Number	01011/30	01011/30	Detection	1/15/01
Client Identification	MW-11	duplicate	Limit	Blank
Compound	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
4-Methyl-2-pentanone (MIBK)	ND	ND	10	ND
Chlorobenzene	ND	ND	0.5	ND
1,1,1,2-Tetrachloroethane	ND	ND	0.5	ND
Ethylbenzene	ND	ND	0.5	ND
Total Xylenes	ND	ND	0.5	ND
Styrene	ND	ND	0.5	ND
Bromoform	ND	ND	0.5	ND
Isopropylbenzene	ND	ND	0.5	ND
Bromobenzene	ND	ND	0.5	ND
1,1,2,2-Tetrachloroethane	ND	ND	0.5	ND
1,2,3-Trichloropropane	ND	ND	0.5	ND
n-Propylbenzene	ND	ND	0.5	ND
2-Chlorotoluene	ND	ND	0.5	ND
4-Chlorotoluene	ND	ND	0.5	ND
1,3,5-Trimethylbenzene	ND	ND	0.5	ND
tert-Butylbenzene	ND	ND	0.5	ND
1,2,4-Trimethylbenzene	ND	ND	0.5	ND
sec-Butylbenzene	ND	ND	0.5	ND
1,3-Dichlorobenzene	ND	ND	0.5	ND
4-Isopropyltoluene	ND	ND	0.5	ND
1,4-Dichlorobenzene	ND	ND	0.5	ND
1,2-Dichlorobenzene	ND	ND	0.5	ND
n-Butylbenzene	ND	ND	0.5	ND
1,2-Dibromo-3-chloropropane	ND	ND	2.0	ND
1,2,4-Trichlorobenzene	ND	ND	2.0	ND
Hexachlorobutadiene	ND	ND	2.0	ND
Naphthalene	ND	ND	5.0	ND
1,2,3-Trichlorobenzene	ND	ND	2.0	ND

QC Information: Surrogate % Recovery

(1,2-Dichloroethane-d4)	102	104	100
(Toluene-d8)	97	94	96
(4-Bromofluorobenzene)	97	94	95

ND = None Detected

Reported By Pat Marshall
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ANALYSIS REPORT

C
L Wohlers Environmental Services
I Attn. Chris Wohlers
E 6665 SW Hampton St., Suite 100
N Tigard, OR 97223
T

Date Sampled: 1/10/01
Date Received: 1/11/01
Date Analyzed: 1/15/01
Date Reported: 1/16/01
Job Number: 01011/28-32
Page: 4 of 7

Project: Delco Petroleum - Milwaukie
Project Number: 01-0001
Sample Type - Water

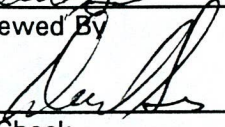
Lab Number	Client Identification	Analysis - BTEX (EPA Method 8020)				
		Benzene	Toluene	Ethylbenzene	Xylenes	Surrogate % Recovery
01011/31	MW-14	ND	ND	ND	ND	106
01011/32	MW-15	9.3	ND	ND	ND	108

QC Information:

Lab Blank	1/15/01	ND	ND	ND	ND	104
-----------	---------	----	----	----	----	-----

Detection Limit: 0.5 0.5 0.5 0.5
ND = None Detected


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ANALYSIS REPORT

Wohlers Environmental Services
Attn. Chris Wohlers
6665 SW Hampton St., Suite 100
Tigard, OR 97223

Date Sampled: 1/10/01
Date Received: 1/11/01
Date Extracted: 1/16/01
Date Analyzed: 1/18&22/01
Date Reported: 1/18/01
Job Number: **01011/28-32**
Page: 5 of 7

Project: Delco Petroleum - Milwaukie
Project Number: 01-0001
Sample Type - Water

Lab Number	Client Identification	Analysis - TPH-Dx mg/L (ppm)		
		Diesel	Heavy Oil	Surrogate % Recovery
01011/28	MW-1	1.0*	< 1.0**	108
01011/28-dup	MW-1	1.3*	< 1.0**	112
01011/29***	MW-5	ND	ND	98
01011/30***	MW-11	ND	ND	114
01011/31	MW-14	ND	ND	122
01011/32	MW-15	ND	ND	109

QC Information:

Lab Blank	1/16/01	ND	ND	111
Blank Spike	% Recovery	100	72	100

Detection Limit: 0.25 0.5

ND = None Detected

*Gasoline contamination present. Chromatogram does not match diesel standard.

**Raised detection limit is due to the sample matrix.

***Samples were put through a silica gel cleanup. Blank not put through cleanup.

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ANALYSIS REPORT

Date Sampled: 1/10/01
Date Received: 1/11/01
Date Extracted: 1/19/01
Date Analyzed: 1/21/01
Date Reported: 1/23/01
Job Number: 01011/28-32
Page: 6 of 7

Wohlers Environmental Services
Attn: Chris Wohlers
6665 SW Hampton St., Suite 100
Tigard, OR 97223

Analysis - Polynuclear Aromatics (EPA Method 8270C SIM)

Project: Delco Petroleum - Milwaukie

Project Number: 01-0001

Sample Type - Water

Laboratory Sample Number 01011/28
Client Identification MW-1

Detection Limit 1/19/01
Blank

ug/L (ppb)

ug/L (ppb)

ug/L (ppb)

Naphthalene	6.4	0.1	ND
Acenaphthylene	ND	0.1	ND
Acenaphthene	ND	0.1	ND
Fluorene	ND	0.1	ND
Phenanthrene	ND	0.1	ND
Anthracene	ND	0.1	ND
Fluoranthene	ND	0.1	ND
Pyrene	ND	0.1	ND
Benzo(a)anthracene	ND	0.1	ND
Chrysene	ND	0.1	ND
Benzo(b)fluoranthene	ND	0.1	ND
Benzo(k)fluoranthene	ND	0.1	ND
Benzo(a)pyrene	ND	0.1	ND
Indeno(1,2,3-c,d)pyrene	ND	0.1	ND
Dibenzo(a,h)anthracene	ND	0.1	ND
Benzo(g,h,i)perylene	ND	0.1	ND

QC Information: Surrogate % Recovery

2-Fluorobiphenyl 97
p-Terphenyl-d14 107

94
113

ND = None Detected

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ANALYSIS REPORT

C
L Wohlers Environmental Services
I Attn. Chris Wohlers
E 6665 SW Hampton St., Suite 100
N Tigard, OR 97223
T

Date Sampled: 1/10/01
Date Received: 1/11/01
Date Prepared: 1/15/01
Date Analyzed: 1/19/01
Date Reported: 1/19/01
Job Number: 01011/28-32
Page: 7 of 7

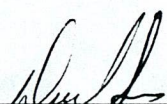
Project: Delco Petroleum - Milwaukie
Project Number: 01-0001
Sample Type - Water

Dissolved Lead
Analysis - EPA Method 200.9
Results mg/L (ppm)

Lab Number	Client Identification	Results mg/L (ppm)
01011/28	MW-1	ND
01011/29	MW-5	ND
Lab Blank	1/19/00	ND

ND = None Detected
Detection Limit = 0.001 mg/L (ppm)
Matrix Spike % Recovery = 92


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ANALYSIS REPORT

Wohlers Environmental Services
Attn. Chris Wohlers
6665 SW Hampton St., Suite 100
Tigard, OR 97223

Date Sampled: 1/11/01
Date Received: 1/11/01
Date Analyzed: 1/15/01
Date Reported: 1/16/01
Job Number: **01011/33-34**
Page: 1 of 3

Project: Delco Petroleum - Milwaukie
Project Number: 01-0001
Sample Type - Water

Analysis - BTEX (EPA Method 8020)

Lab Number	Client Identification	ug/L (ppb)				
		Benzene	Toluene	Ethylbenzene	Xylenes	Surrogate % Recovery
01011/33	MW-9	0.6	ND	ND	ND	107
01011/34	MW-10	ND	ND	ND	ND	103
01011/34dup	MW-10	ND	ND	ND	ND	104

QC Information:

Lab Blank	1/15/01	ND	ND	ND	ND	104
01011/34 Spike	MW-10	112	107	108	108	115

Detection Limit: 0.5 0.5 0.5 0.5

ND = None Detected

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ANALYSIS REPORT

Date Sampled: 1/11/01
Date Received: 1/11/01
Date Extracted: 1/16/01
Date Analyzed: 1/18/01
Date Reported: 1/18/01
Job Number: **01011/33-34**
Page: 2 of 3

Project: Delco Petroleum - Milwaukie
Project Number: 01-0001
Sample Type - Water

Lab Number	Client Identification	Analysis - TPH-Dx mg/L (ppm)		
		Diesel	Heavy Oil	Surrogate % Recovery
01011/33	MW-9	ND	ND	136
01011/34	MW-10	0.6	1.0	111

QC Information:

Lab Blank	1/16/01	ND	ND	115
Blank Spike	% Recovery	75	78	89

Detection Limit: 0.25 0.5

ND = None Detected

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Attn. Chris Wohlers
6665 SW Hampton St., Suite 100
N Tigard, OR 97223

Date Sampled: 1/11/01
Date Received: 1/11/01
Date Extracted: 1/19/01
Date Analyzed: 1/21/01
Date Reported: 1/22/01
Job Number: 01011/33-34
Page: 3 of 3

Analysis - Polynuclear Aromatics (EPA Method 8270C SIM)

Project: Delco Petroleum - Milwaukie

Project Number: 01-0001

Sample Type - Water

Laboratory Sample Number	01011/34	Detection	1/19/01
Client Identification	MW-10	Limit	Blank
	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Naphthalene	ND	0.1	ND
Acenaphthylene	ND	0.1	ND
Acenaphthene	ND	0.1	ND
Fluorene	ND	0.1	ND
Phenanthrene	ND	0.1	ND
Anthracene	ND	0.1	ND
Fluoranthene	ND	0.1	ND
Pyrene	ND	0.1	ND
Benzo(a)anthracene	ND	0.1	ND
Chrysene	ND	0.1	ND
Benzo(b)fluoranthene	ND	0.1	ND
Benzo(k)fluoranthene	ND	0.1	ND
Benzo(a)pyrene	ND	0.1	ND
Indeno(1,2,3-c,d)pyrene	ND	0.1	ND
Dibenzo(a,h)anthracene	ND	0.1	ND
Benzo(g,h,i)perylene	ND	0.1	ND

QC Information: Surrogate % Recovery

2-Fluorobiphenyl 107
p-Terphenyl-d14 127

94
113

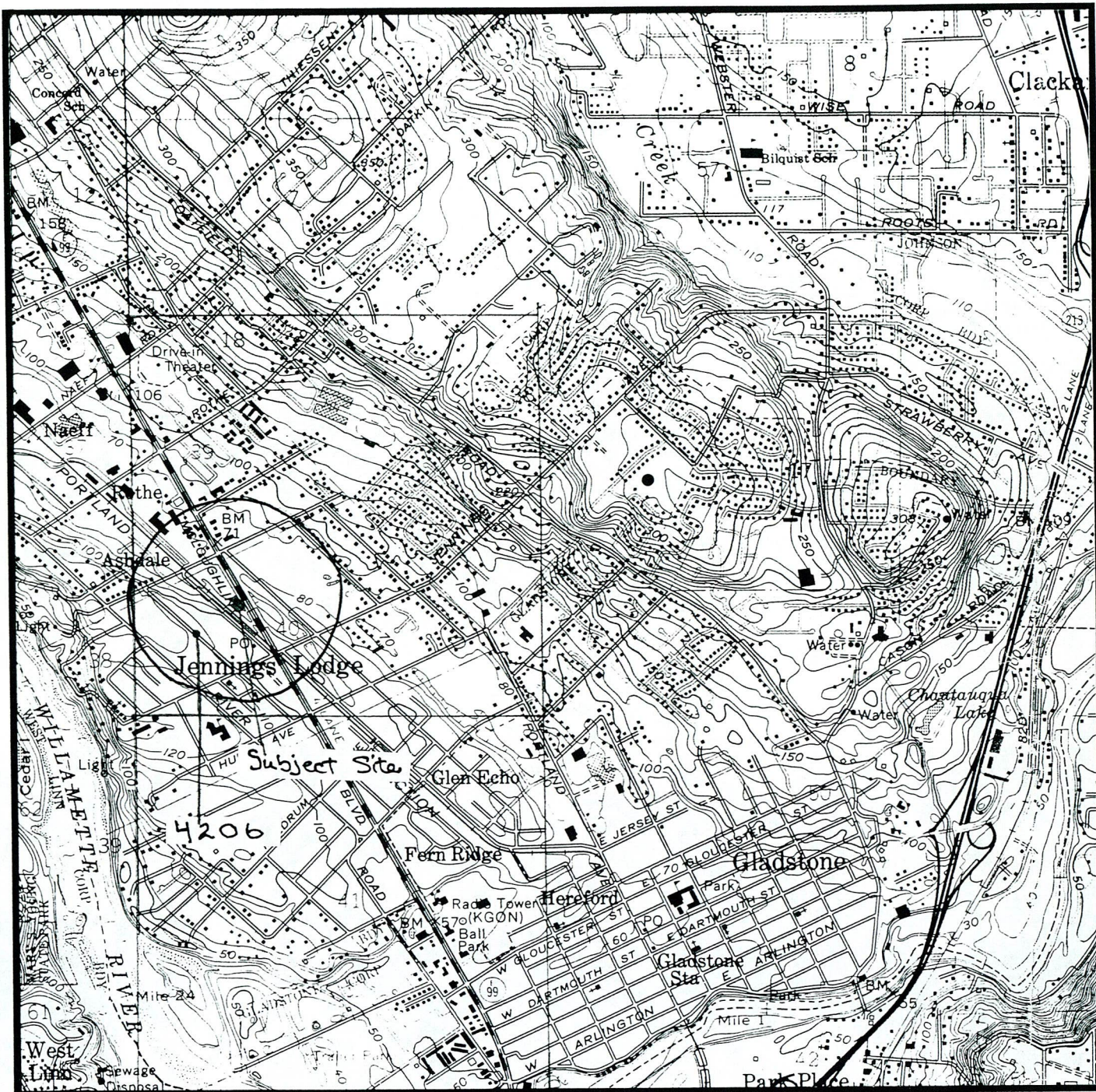
ND = None Detected

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Pat Marshall
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APPENDIX D

COMMUNITY/DOMESTIC WELL SURVEY



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC SURVEY MAP OF GLADSTONE, OREGON QUADRANGLE. 1961, PHOTOREVISED 1984.

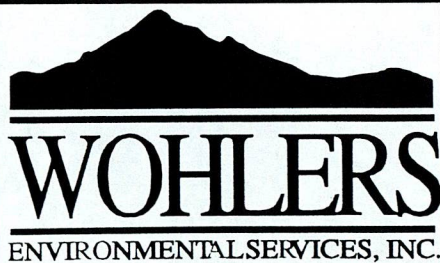


FIGURE D-1
**COMMUNITY/DOMESTIC
WELL SURVEY**

DELCO PETROLEUM RETAIL FUELING FACILITY
17873 S.E. MCLOUGHLIN BOULEVARD
MILWAUKIE, OREGON

PROJECT NO.:	01-0001
DATE:	01/12/01
SCALE:	1 : 24,000
FILE:	FG1010001
DRAWN BY:	MM

TABLE D-1

**DOMESTIC/COMMUNITY WELL SURVEY
IDENTIFIABLE WELLS WITHIN A 1/4 MILE RADIUS OF**

**DELCO PETROLEUM RETAIL FUELING FACILITY
17873 S.E. MCLOUGHLIN BOULEVARD
MILWAUKIE, OREGON
*WES Project No. 01-0001***

WELL ID NO.	NAME	WELL ADDRESS OR NEAREST ADDRESS/LOCATION	USGS MAP COORDINATES	DATE COMPL'D	DRILL DEPTH (feet bsg)	STATIC WATER (feet bsg)	FIRST WATER (feet bsg)	SCREENED INTERVAL (feet bsg)	CASING DEPTH (feet bsg)	TYPE OF WELL
4206	Joe Mellmer	18120 S.E. Blanton Street Milwaukie, Oregon	S18, T2S, R2E	05/13/63	60	35	Not listed	Not listed	1 - 60	Domestic

WES = Wohlers Environmental Services, Inc.

ID = Identification

USGS = United States Geological Survey

bsg = below surface grade

NOTICE TO WATER WELL CONTRACTOR

The original and first copy of this report are to be filed with the

STATE ENGINEER, SALEM 10, OREGON within 30 days from the date of well completion.

WATER WELL REPORT

STATE OF OREGON
(Please type or print)

04206

State Well No.

State Permit No.

2/2-18
1963 #9

(1) OWNER:

Name Joe Mellmer
Address 18720 SE Blanton
Milwaukie 22, Ore

(2) LOCATION OF WELL:

County Clatsop Driller's well number
1/4 1/4 Section 18 T. 25 R. 2E W.M.
Bearing and distance from section or subdivision corner

(3) TYPE OF WORK (check):

New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
Abandonment, describe material and procedure in Item 12.

(4) PROPOSED USE (check):

Domestic ☒ Industrial ☐ Municipal ☐ Rotary ☐ Driven ☐
Irrigation ☐ Test Well ☐ Other ☐ Cable ☒ Jetted ☐
Dug ☐ Bored ☐

(5) TYPE OF WELL:

(6) CASING INSTALLED:

Threaded ☐ Welded ☒
6" Diam. from 1 ft. to 60 ft. Gage 25
" Diam. from ft. to ft. Gage
" Diam. from ft. to ft. Gage

(7) PERFORATIONS:

Perforated? ☐ Yes ☒ No
Type of perforator used
Size of perforations in. by in.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.
perforations from ft. to ft.

(8) SCREENS:

Well screen installed ☐ Yes ☒ No
Manufacturer's Name
Model No.
Slot size Set from ft. to ft.
Diam. Slot size Set from ft. to ft.

(9) CONSTRUCTION:

Well seal—Material used in seal BENTONITE
Depth of seal 20 ft. Was a packer used?
Diameter of well bore to bottom of seal 9 in.
Were any loose strata cemented off? ☐ Yes ☒ No Depth
Was a drive shoe used? ☒ Yes ☐ No
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.
Did any strata contain unusable water? ☐ Yes ☒ No
Type of water? Depth of strata
Method of sealing strata off

(10) WATER LEVELS:

Static level 35 ft. below land surface Date 5/13/63

(11) WELL TESTS:

Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☒ No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " " "
" " " " "
Bailer test 30 gal./min. with 5 ft. drawdown after 1 hrs.
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? ☐ Yes ☒ No

(12) WELL LOG:

Diameter of well below casing 6
Depth drilled 60 ft. Depth of completed well 60 ft.
Formation: Describe by color, character, size of material and structure, and show thickness of aquifers and the kind and nature of the material in each stratum penetrated, with at least one entry for each change of formation.

MATERIAL	FROM	TO
TOP - Soil	0	2
CLAY - Red	2	18
Boulders -	18	28
GRAVEL - CORASE	28	48
GRAVEL - Red - CEMENT	48	50
SAND & GRAVEL - CORASE	50	59
GRAVEL - CORASE	59	60
WATER BEARING		

Work started 5/9 - 19 63 Completed 5/13 - 19 63
Date well drilling machine moved off of well 5/13/63 19 63

(13) PUMP:

Manufacturer's Name Fairbanks-Morse
Type: Q H.P. 1

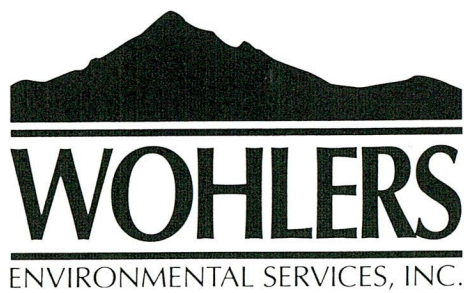
Water Well Contractor's Certification:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

NAME Skyles Drilling & Supply
(Person, firm or corporation) (Type or print)
Address 19215 SE McLaughlin Gladstone

Drilling Machine Operator's License No. 222

[Signed] Gene H. Skyles
(Water Well Contractor)



7440 SW Hunziker Street, Suite C
Tigard, Oregon 97223
(503) 670-1344 • Fax (503) 670-1701 • (800) 664-6808
e-mail: ccwohlers@aol.com