

**RISK ANALYSIS
OF
FORMER JIFFY LUBE
INTERNATIONAL STORE**

Prepared For

NORTHWEST ENVIROCON, INC.

Attn: Mr. Peter Trabusiner

1500 Adair Drive

Richland, Washington 99352

Prepared By

COLUMBIA ENERGY AND ENVIRONMENTAL SERVICES, INC.

1207 George Washington Way, Suite 22

Richland, Washington 99352

April 3, 1997

Columbia Energy & Environmental Services, Inc.

1207 George Washington Way, Suite 22
Richland, Washington 99352
(509) 946-7111 • Fax (509) 946-9365

April 3, 1997

Northwest Envirocon, Inc.
Attn: Mr. Peter Trabusiner
1500 Adair Drive
Richland, WA 99352

**RE: Risk Analysis for Milwaukie Fuel Stop/Delco facility (formerly Flying J) in
Milwaukie, Oregon**

Dear Mr. Trabusiner:

Columbia Energy and Environmental Services, Inc. (Columbia Energy) is pleased to submit the enclosed letter report prepared in accordance with generally accepted professional practices for the nature and conditions of the work completed in the same or similar localities, at the time the work was performed. It is intended for the exclusive use of Northwest Envirocon, Inc. for specific application to the referenced property. This report is not meant to represent a legal opinion. No other warranty, express or implied, is made.

It should be noted that Columbia Energy relied on verbal information provided by the individual indicated above. Columbia Energy can only relay this information and cannot be responsible for its accuracy or completeness.

Any questions regarding our work and this letter report, the presentation of the information, and the interpretation of the data are welcome and should be referenced to W. H. Riggsbee at (509) 946-7111.

Sincerely,



Dennis F. Brendel, Ph.D.
President

DFB/wr

Enclosed: Original and One (1) Copy

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**RISK ANALYSIS
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1.0 INTRODUCTION

Columbia Energy and Environmental Services, Inc. (Columbia Energy) was retained by Northwest Envirocon, Inc., to review the available environmental data for the Milwaukie Fuel Stop/Delco facility, formerly the Jiffy Lube International Store No. 1012 17869, Southeast McLoughlin Boulevard, Milwaukie, Oregon and to provide a risk analysis of the site. This report summarizes the results of the risk analysis performed on this site.

2.0 BACKGROUND

Delta Environmental of Bellevue, Washington conducted Phase I and Phase II assessments and characterizations at the former Jiffy Lube International Store No. 1012 17869 site during the summer of 1993. The results of these investigations are summarized in supporting documents prepared by Northwest Envirocon, Inc., Vancouver, Washington. These initial investigations indicated that concentrations of BTEX (benzene, toluene, ethylbenzene and xylene) and TPH (total petroleum hydrocarbons) found in the soil samples were at levels high enough to warrant additional drilling on the site.

In June 1993, Geotech Explorations and Delta Environmental drilled six additional monitoring wells (MW) on the site to evaluate potential environmental impacts to ground water identified as a result of the earlier sampling. The Delta Environmental Phase III report indicated that the soils from borings obtained from Nos. MW-1 through MW-5 contained concentrations of benzene and TPH which exceeded Oregon clean up levels. Monitoring well No. MW-6, however, showed concentrations of benzene and TPH below Oregon cleanup requirements.

A limited soils remediation was conducted in the immediate area around the waste oil storage tanks and reported by ACT Environmental in their UST Decommissioning Closure Report. The recovered soil was stockpiled for later removal and disposed of in accordance with the State of Oregon UST (underground storage tank) disposal requirements. Contaminated soil was sampled and characterized around the area of the tanks and service area.

Three additional monitoring wells, Nos. MW-7, MW-8, and MW-9, were added on January 27, 1995, as recommended by the Oregon Department of Environmental Quality. These wells were installed to provide upgradient control of the ground water at the site. Details of these wells are discussed in the summary prepared by Northwest Envirocon, Inc., dated June 22, 1995.

On February 20, 1995, monitoring well No. MW-3 was decommissioned and paved over.

Stockpiled soil from the waste oil storage tank investigation and remediation was removed and disposed of at the Roosevelt Regional Landfill in Roosevelt, Washington on March 22, 1995.

A ground water remediation system was installed on site and has been operating since September 6, 1995. Monitoring wells Nos. MW-7 and MW-8 have recovery pumps installed in them and serve as production wells for the remediation system. Operation and discharge is controlled under National Pollutant Discharge Elimination System (NPDES) Waste Discharge Permit No. 1500A.

On August 12, 1996, four new monitoring wells were installed. These wells were designated Nos. MW-10, MW-11, MW-12, and MW-13. Sample results from these wells at the time of installation indicated that no contamination was detected.

Ground water samples have been collected and analyzed on a quarterly basis since July 1994. In general the concentrations of the contaminants of concern have decreased during the sampling period from July 22, 1994 to October 30, 1996. The current quarterly monitoring report, the Ninth Quarterly Ground Water Monitoring Report, shows a slight increase in the level of contamination at the site.

3.0 CONCEPTUAL SITE MODEL

Based on the data presented in the summary reports compiled by Northwest Envirocon, Inc., the following is a conceptual model of the site.

3.1 Geology

The site is underlain by gravely silt, medium grey clay, dark grey clay to dark grey fine to medium sand. The depth of investigation across the site is approximately 16.5 ft. The following is a summary of the sediments which underlie the site:

- The upper 2.5 to 5 ft sediment grades from gravely silt to silty clay to a sandy silt.
- The medium grey clay, ranging from 5 to 13 ft, is continuous across the site.
- A lower sand unit, ranging from 13 to 16.5 ft, is continuous across the site.

3.2 Hydrogeology

The underlying aquifer appears to be locally unconfined to semiconfined with the depth to water averaging 3 to 6 ft across the site. In general, local ground water flow across the site is from the southeast toward the northwest. The regional ground water flow is toward the southwest.

4.0 EVALUATION OF RESULTS

The site is an active facility which has been remediated in the general area of the former waste oil tanks and upgraded for fuel dispensing and automotive services. The site has been repaved and the pavement serves as an impermeable cap over the site which controls runoff and limits infiltration into the underlying sediments. The most recent results of the sampling and analysis report (Ninth Quarterly Ground Water Monitoring Report) indicates that concentrations of benzene in ground water are relatively low, in the range of 0.00454 ppm. No free product has been observed during monthly ground water monitoring. The contaminate of concern consists primarily of dissolved benzene. Contamination is currently contained within the boundaries of the site and is being monitored by one downgradient well No. MW-11. The current ground water treatment system is effectively controlling the onsite contamination.

The following components of gasolines are the constituents of concern:

- BTEX (Benzene, Toluene, Ethylbenzene, and Toluene)

The available analytical data indicates that the primary constituent of concern in the ground water is benzene at reported levels of approximately 4,540 ppb.

- PAHs (Polynuclear Aromatic Hydrocarbons)

PAHs are not applicable because none were detected.

- MTBE (Methyl Tertiary Butyl Ether)

MTBE is not applicable because it was detected. (?)

- Lead

Although samples were limited to soil recovered from bedding material around the waste oil storage tanks, analytical results reported undetectable levels of lead.

5.0 AFFECTED MEDIA

5.1 Receptors

Ground water contamination underlying the site is contained within the property boundaries and controlled by the pumping drawdowns and radius of influence of the recovery wells. A limited ground water well search was conducted by Northwest Envirocon, Inc. There are no reported offsite downgradient ground water users. The current use of potable water in the area is provided by a public water supply maintained by the City of Milwaukie. The shallow aquifer is considered of limited capability to serve as a local source of water for residential or industrial use.

The following categories of receptors have been identified and are discussed below:

- Residential

The area in, and adjacent to, the site is designated commercial/residential; however, any residential area would only be impacted downgradient.

- Industrial

The impact on industry is limited because the local area is restricted to small commercial development.

- Construction

Since site property is bounded on two sides with roads and utility right-of-ways, the potential exists for impacting construction.

5.2 Pathways

The following discussions present potential pathways which might allow contamination to reach potential receptors.

- Inhalation

Inhalation by breathing the vapors of benzene is not considered a viable pathway since the concentrations are below levels of concern as dissolved constituents in ground water.

- Ingestion

Exposure by ingestion could occur by accidentally drinking contaminated ground water. However, ground water use in the local area is not considered a viable pathway.

- Dermal contact

Exposure by direct contact with ground water exposed in an open trench could occur, but with limited consequences due to the low concentrations of dissolved benzene in the ground water.

5.3 Pathways Analysis

5.3.1 Current Land Use - Industrial

- **Residents**

Ingestion of contaminated ground water is not considered a viable pathway. There are a limited number of potable ground water supplies in general but none identified downgradient of the site. Ground water flow is generally toward the west with discharge to the Willamette River. The local area is sewered and a public water supply provided by the City of Milwaukie.

- **Industrial Workers**

Inhalation of chemicals volatilized into buildings is not considered a credible pathway since the concentrations of dissolved benzene are below levels of concern. The likelihood of migration is limited due to the asphalt cap covering the site, the adjacent property, and the paved street adjacent to both properties.

- **Industrial Workers/Construction Workers**

Direct contact with chemicals in onsite soil is not considered a credible pathway since the contaminated soil adjacent to the former oil solvent tanks was removed and replaced with clean soil. Following replacement the site was repaved forming an impermeable cap over the site.

5.3.2 Future Land Use - Residential

Direct contact by residents with chemicals in onsite soil is not considered a credible pathway since the contaminated soil adjacent to the former oil solvent tanks was removed and replaced with clean soil. The site is currently zoned commercial/industrial and is not expected to revert back to zoned residential.

6.0 SUMMARY

Based on reviews of existing project reports and quarterly ground water monitoring reports, a Risk Based Corrective Action Analysis was performed on the current conditions onsite. The primary contaminate of concern is benzene. Monitored levels of benzene are below the target cleanup level identified in the RBCA Guidance Tier 1 Look-up Table for ground water. The identified receptors are limited to trench workers on site. The identified potential pathway is direct contact by trench workers with low potential for exposure due to low concentrations of benzene in the ground water. A small plume of contamination exists in the immediate area of the active tank storage area where benzene levels are currently at 4,540 ppb. The 4,540 ppb concentration of benzene exceeds acceptable standards for drinking water. However, the monitored levels of benzene are below the target cleanup level.