Health Consultation

Former Unocal 76 (Durrand Distributing)
Yakima, Yakima County, Washington

January 29, 2002

Prepared by

The Washington State Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

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Foreword

The Washington State Department of Health (DOH) has prepared this health consultation in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR). ATSDR is part of the U.S. Department of Health and Human Services and is the principal federal public health agency responsible for health issues related to hazardous waste. This health consultation was prepared in accordance with methodologies and guidelines developed by ATSDR.

The purpose of this health consultation is to identify and prevent harmful human health effects resulting from exposure to hazardous substances in the environment. The health consultation allows DOH to respond quickly to a request from concerned residents for health information on hazardous substances. It provides advice on specific public health issues. DOH evaluates sampling data collected from a hazardous waste site, determines whether exposures have occurred or could occur, reports any potential harmful effects, and recommends actions to protect public health.

For additional information or questions regarding DOH, ATSDR or the contents of this health consultation, please call the Health Advisor who prepared this document:

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Glossary

Agency for Toxic Substances and Disease Registry (ATSDR)	The principal federal public health agency involved with hazardous waste issues, responsible for preventing or reducing the harmful effects of exposure to hazardous substances on human health and quality of life. ATSDR is part of the U.S. Department of Health and Human Services.
Aquifer	An underground formation composed of materials such as sand, soil, or gravel that can store and/or supply groundwater to wells and springs.
BETX	Benzene, ethylbenzene, toluene, and xylenes
Carcinogen	Any substance that can cause or contribute to the production of cancer.
Comparison value	A concentration of a chemical in soil, air or water that, if exceeded, requires further evaluation as a contaminant of potential health concern. The terms comparison value and screening level are often used synonymously.
Contaminant	Any chemical that exists in the environment or living organisms that is not normally found there.
Dose	A dose is the amount of a substance that gets into the body through ingestion, skin absorption or inhalation. It is calculated per kilogram of body weight per day.
Exposure	Contact with a chemical by swallowing, by breathing, or by direct contact (such as through the skin or eyes). Exposure may be short term (acute) or long term (chronic).
Groundwater	Water found underground that fills pores between materials such as sand, soil, or gravel. In aquifers, groundwater often occurs in quantities where it can be used for drinking water, irrigation, and other purposes.
Hazardous substance	Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive.
Maximum Contaminant Level (MCL)	A drinking water regulation established by the federal Safe Drinking Water Act. It is the maximum permissible concentration of a contaminant in water that is delivered to the free flowing outlet of the ultimate user of a public water system. MCLs are enforceable standards.
Media	Soil, water, air, plants, animals, or any other part of the environment that can contain contaminants.
Model Toxics Control Act (MTCA)	The hazardous waste cleanup law for Washington State.

Monitoring wells	Special wells drilled at locations on or off a hazardous waste site so water can be sampled at selected depths and studied to determine the movement of groundwater and the amount, distribution, and type of contaminant.
Parts per billion (ppb)/Parts per million (ppm)	Units commonly used to express low concentrations of contaminants. For example, 1 ounce of trichloroethylene (TCE) in 1 million ounces of water is 1 ppm. 1 ounce of TCE in 1 billion ounces of water is 1 ppb. If one drop of TCE is mixed in a competition size swimming pool, the water will contain about 1 ppb of TCE.
Plume	An area of contaminants in a specific media such as groundwater.

Background and Statement of Issues

The Washington State Department of Health (DOH) has prepared this health consultation at the request of the Washington State Department of Ecology (Ecology), to evaluate the potential human health risks associated with residents living near a petroleum bulk supply terminal.

The facility was established in the 1950s, as *Unocal 76 Products Company*, until it became *Tosco Distributing Company* in March of 1997.[1] The plant is currently known as *Apple Valley Fuel Company, Inc.,* and is located in a mixed residential/commercial area of Yakima, Washington (Figure 1). The site is paved and fenced, and consists of an office, warehouse, an aboveground tank farm consisting of four 20,000 gallon and three 10,000 gallon storage tanks, and a pumping station with dispensers (Figure 2).

A site assessment, performed in October of 1997, found petroleum hydrocarbons in soil and groundwater.[2] Diesel fuel was detected in soil throughout the facility, ranging from 27.5 to 820 ppm. Soil sampling also found heavy oil between 26.7 and 3440 ppm and a maximum concentration of gasoline at 166 ppm.

The surface aquifer is 14 feet below ground surface and was contaminated with gasoline ranging from 183 to 39,500 ppb, diesel ranged from 748 to 388,000 ppb, benzene ranged from 321 to 3,360 ppb, ethyl benzene ranged from 75.5 to 717 ppb, toluene ranged from 20.8 to 6,210 ppb, and xylene ranged from 1.17 to 3,640 ppb, (Table 1).[1]

There has been no soil removal or cleanup of this site, however, two additional assessments were performed in March and April 1999, and showed no contamination in soil. During this assessment, free product (petroleum products) was found in three monitoring wells in March. This contamination was the result of a subsurface spill.[1] There was no free product found in monitoring wells in April 1999. The most recent groundwater sampling, performed in November of 2000, continues to show one or more BETX compounds and/or the sum of gasoline, diesel, and lube oil-range hydrocarbons exceeding MTCA Method A cleanup levels in samples from two monitoring wells (MW-3 and MW-5), located near the above ground tank farm (Figure 2).[3]

In 1991, Ecology identified nine drinking water wells as far out as one-half mile of the facility (Figure 1). There was no file information indicating the depth of the wells, however, they are all upgradient or cross gradient of any potential TPH plumes.[4] The only exception was one industrial well located one-half mile downgradient from the site. This well is screened within a deeper confined aquifer beneath the surface aquifer.[4] A more recent study indicates that shallow groundwater beneath the site flows south-southeast.[5] A site visit, performed by DOH on March 6, 2001, revealed no private domestic wells within a two block area of site. Discussions with Ecology and local health indicated that all domestic wells described in Figure 1 are believed to be closed since this area has been hooked up to city water. However, a survey of all houses and businesses out to a half-mile radius of the site has not been performed.

Table 1. Contaminants of concern detected in on-site groundwater monitoring wells at the Apple Valley Fuel site located in Yakima, WA (Sampling from March through September 2000)

Chemical	Maximum Concentration (ug/l)	Carcinogenic Comparison Value (ug/l)	Non Carcinogenic comparison value (ug l)
Gasoline	39,500	NA	300 (Child RMEG)*
Diesel	388,000	NA	300 (Child RMEG)*
Heavy Oil	814	NA	300 (Child RMEG)*
Benzene	3,360	1 (CREG)	5 (MCL)
Ethyl benzene	717	NA	700 (MCL and LTHA)
Toluene	6,210	NA	200 (Child EMEG)
Xylenes	3,640	NA	2,000 (Child EMEG)

* - based on pyrene as a surrogate
NA - Not available
EMEG - ATSDR's Environmental Media Evaluation Guide
ug/l - micrograms per liter
Child EMEG - ATSDR's Environmental Media Evaluation Guide for children
CREG - ATSDR's Cancer Risk Evaluation Guide
MCL - Federal Safe Drinking Water Maximum Contaminant Level

Discussion

Site environmental sampling data were screened using federal (ATSDR and EPA), and state (MTCA method B) health-based criteria (comparison values). Comparison values are media-specific concentrations used to select environmental contaminants for further evaluation. Contaminant concentrations below comparison values are unlikely to pose a health threat, and were not further evaluated in this health consultation. Contaminant concentrations exceeding comparison values (Table 1) do not necessarily pose a health threat, but were further evaluated as contaminants of concern to determine whether they are at levels which could result in adverse human health effects.

Groundwater levels in October are higher than in March due to irrigation in the summer and fall. The raising and lowering of groundwater causes a "smear zone," in which contamination is

saturated by groundwater during the high groundwater season. This contamination is then "smeared" in the soil as the aquifer drops in the winter. This phenomenon may explain why free product has not been found in monitoring wells during winter sampling of wells from which free product has already been removed.[1]

Groundwater travels either north/northeast or southeast depending on the depth. While some on-site groundwater monitoring wells contain TPH at levels above health comparison values, no off-site wells have been found to be contaminated. In addition, there is also no data to indicate that the deep water aquifer has been contaminated.

Based on existing information, ground water does not appear to be a pathway of concern, however, evidence that there are no drinking water wells within a half mile of the site and there is no off-site contamination,

Although there has been no documented evidence of offsite contamination, there also was no file information to show that off-site wells have been sampled, and there's been no survey of all houses and businesses out to a half-mile radius of the site has not been performed. and there are no operating drinking water wells within one-half mile of the facility.

Exposure Pathways and Children

ATSDR's Child Health Initiative recognizes that the unique vulnerabilities of infants and children deserve special emphasis with regard to exposures to environmental contaminants. Infants, young children, and the unborn may be at greater risk than adults from exposure to particular contaminants. Exposure during key periods of growth and development may lead to malformation of organs (teratogenesis), disruption of function, and even premature death. In certain instances, maternal exposure, via the placenta, could adversely effect the unborn child.

After birth, children may receive greater exposures to environmental contaminants than adults. Children are often more likely to be exposed to contaminants from playing outdoors, ingesting food that has come into contact with hazardous substances, or breathing soil and dust. Pound for pound body weight, children drink more water, eat more food, and breathe more air than adults. For example, in the United States, children in the first 6 months of life drink 7 times as much water per pound as the average adult. The implication for environmental health is that, by virtue of children's lower body weight, given the same exposures, they can receive significantly higher relative contaminant doses than adults.

Children are not exposed to the contaminants originating at the Apple Valley fuel site because contaminated groundwater has not impacted any drinking water wells in the area.

Conclusions

- Groundwater contamination originating from the Apple Valley Fuel site *represents an indeterminate public health hazard*. Current levels of total petroleum hydrocarbons (TPH) in

on-site groundwater exceed ATSDR comparison values. Although there does not appear to be any drinking water wells off-site, there's been no house to house (or business to business) well survey to confirm this assumption.

Recommendations/Public Health Action Plan

- Since groundwater beneath the site is contaminated with TPH, a house to house (or business to business) well survey should be performed to assure and there's been no but does not appear to be moving off site. A drinking water well survey of residential and commercial establishments does not appear to be necessary as there have been no complaints and the areas north/northeast and southeast are hooked up to city water.

  Copies of this health consultation will be provided to Ecology, Yakima Health Department, and Apple Valley Fuel Company, Inc.

Preparer of Report

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Site Assessment Section

References

1. Ecology Worksheet 1, Summary Score Sheet, Former Unocal 76, (aka, Durrand Distributing), February 2000.

2. Letter to M. Boone, Tosco Refining and Marketing Incorporated, from L. Rainey, Pacific Environmental Group, Inc., February 12, 1998.

3. Letter to M. Cramer, Tosco Refining Company, from B. Peterka, GeoEngineers, Inc., November 20, 2000.

4. Response letter to S. Burgdorff, from J. Fowler, Ecology, May 13, 1991.

5. Letter to M. Cramer, Tosco Refining Company, from B. Peterka, GeoEngineers, Inc., April 21, 2000.