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PRELIMINARY

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Health Assessment for

PASCO SANITARY LANDFILL

PASCO, FRANKLIN COUNTY, WASHINGTON

CERCLIS NO. 10WA0000000002

Draft

Agency for Toxic Substances and Disease Registry
U.S. Public Health Service

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SUMMARY

The Pasco Sanitary Landfill (PSL) is an active landfill located on 280 acres of land, 1.5 miles northeast of the city of Pasco, in Franklin County, Washington. Historically, the landfill accepted municipal and industrial wastes. The industrial wastes were reportedly deposited in surveyed locations at the landfill from 1972 to 1974. Contamination has been detected in on-site groundwater monitoring wells. In the information reviewed by the Agency for Toxic Substances and Disease Registry (ATSDR), no evidence of contamination appears in any public or private domestic wells or irrigation wells in use downgradient of the site. The PSL currently is not of public health concern. There is a possibility of future health concern because of the potential for migration of toxic substances through the groundwater to wells used as a potable water source.

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BACKGROUND

A. SITE DESCRIPTION AND HISTORY

The Pasco Sanitary Landfill (PSL) is an active landfill located on 280 acres of land near the crossroads of Kahlotus Road and State Route 12, 1.5 miles northeast of the city of Pasco, in Franklin County, Washington (Appendix A). The landfill is surrounded by a combination of irrigated agricultural fields and range land. Immediately south of the landfill there is a recycling facility, and 1,500 feet southwest is the Devries Dairy. There is an inhabited mobile home located on-site approximately 100 feet from the gate. The site is not restricted.

The PSL, originally the Basin Disposal Company, was operated as an open burning dump from 1956 to 1971 by owner John Dietrich. Municipal wastes were dumped on the surface and periodically burned. In 1971, PSL was converted to a sanitary landfill. The Research and Recovery Corporation leased a portion of PSL in 1972 and operated it as a regional hazardous waste disposal site. The site accepted hazardous wastes until 1981; the majority were accepted prior to 1975. More than 47,000 drums of various hazardous wastes were deposited in the leased portions of the landfill. Wastes known to be deposited include chlor-alkali sludges, paints, resins, herbicide manufacturing wastes, caustic chemicals, and empty pesticide containers. Prior to burial, liquid wastes were evaporated to dryness in lined and unlined lagoons.

B. SITE VISIT

A site visit was made by the Agency for Toxic Substances and Disease Registry (ATSDR) staff on March 13, 1989. The majority of the landfill is not fenced or restricted. The main gate located in the southwest corner of the property is monitored and there is reportedly no difficulty with trespassers.

The landfill is operated using the lift method. The weekly cover soil used at the site is native soil which has had septic wastes spread on it prior to excavation from the northern portion of the site. A gas monitoring system has been installed along the western boundary and at the top of the refuse pile. A variety of wildlife, including sea gulls and pheasants, was noted at the landfill. Reportedly, there are no deer or coyotes in the area. There were a few trees located along the road and some weeds in areas where active filling was not occurring. The remaining vegetation consists of crops in the nearby fields.

C. COMMUNITY HEALTH CONCERNS

No concerns were expressed by citizens to local, state, or federal agencies regarding the PSL. Residents should be kept informed regarding the activities occurring at the PSL to prevent concerns generated by incorrect and/or the absence of information.

DEMOGRAPHICS, LAND USE AND NATURAL RESOURCE USE

There is one mobile home trailer located on-site, which is inhabited by a man who does not work at PSL but provides nighttime surveillance for the landfill and recycling facility. The nearest population center is a trailer park located approximately 3,000 feet southwest of the site with approximately 36 lots in use. These lots are all supplied with drinking water by the municipal water supply, which utilizes the Columbia River as its source. The city of Pasco extends to the west, beyond the trailer park. There was evidence of children living at the trailer park. The actual population of children in the area is unknown.

The site itself is surrounded by agricultural land with 18 irrigation circles within 1-mile. The land slopes with a 1-3 percent grade towards the west-southwest. The junction of the Snake River and the Columbia River is approximately 2.5 miles south of the PSL.

There is one potable water well located on-site. There has been no evidence of contamination in this well. There are 12 domestic and commercial wells and 18 irrigation wells within 1-mile of the site.

Hunting was reportedly forbidden on-site, but was known to occur in fields adjacent to the landfill.

ENVIRONMENTAL CONTAMINATION AND OTHER HAZARDS

A. ON-SITE CONTAMINATION

No surface water sampling was performed on-site, because of lack of surface water. Surface soil sampling above the waste disposal areas was not done since the wastes were covered with three feet of uncontaminated soil, a polyvinyl chloride liner (PVC), and an additional two feet of soil. It seems unlikely that contamination would migrate towards the surface. The possibility exists that erosion may expose buried wastes. In addition, areas within the landfill boundaries not associated with the buried hazardous wastes may show some type of surface contamination.

Ambient air sampling on-site has revealed no release. Groundwater sampling from 12 monitoring wells installed on-site revealed the presence of several compounds at levels above the U.S. Environmental Protection Agency's Maximum Contaminant Levels (MCLs) (Table I).

TABLE I

CONTAMINANT	SAMPLE	CONCENTRATION (ppb)
1,1-Dichloroethane	Groundwater	ND - 213
1,1-Dichloroethylene	Groundwater	10 - 120
1,1,1-Trichloroethane	Groundwater	50 - 591
Trichloroethylene	Groundwater	52 - 684
Vinyl Chloride	Groundwater	ND - 8
Xylenes	Groundwater	ND - 600

ND - not detected
Data from July 1989
Pasco Sanitary Landfill, Pasco, WA

Subsurface soil samples taken during monitoring well construction revealed moderate concentrations of various organic and inorganic compounds not listed in Table I (for example, polynuclear aromatic hydrocarbons). The organic contamination was found almost exclusively in a shallow (10-30 feet) soil sample collected from the former municipal waste disposal and burn area. These compounds are not in the surface soil and have not been detected in the groundwater, so do not present a current concern.

B. OFF-SITE CONTAMINATION

Groundwater samples from a private well in the area indicated the presence of TCE and 1,1 dichloroethane below concentrations of public health concern. There appears to be a trend towards an increase in the concentrations of contaminants detected in these wells. However, the contamination found cannot be attributed to the PSL site, since the site contamination is contained to the waste disposal area, and several private wells between the site and the contaminated well did not contain traces of these chemicals.

C. QUALITY ASSURANCE QUALITY CONTROL

In preparing this Preliminary Health Assessment, the ATSDR relies on information provided in the referenced documents and assumes that adequate quality assurance and quality control measures were followed with regards to chain-of-custody, laboratory procedures, and data reporting. The

validity of the analysis and conclusions drawn for this Preliminary Health Assessment is determined by the availability and reliability of the referenced information.

D. PHYSICAL AND OTHER HAZARDS

The generation and migration of gas (methane and other gases commonly found at landfills) is a potential fire and explosion hazard. PSL has a gas monitoring system in place; no problems have been reported.

PATHWAYS ANALYSES

A. ENVIRONMENTAL PATHWAYS (FATE AND TRANSPORT)

Groundwater beneath the site occurs in two aquifers: 1) the Yakima Basalt, and 2) the overlying sedimentary materials. Depth to the water table aquifer is approximately 55 feet. Groundwater movement is generally southwest toward the Columbia River with a gradient of 3.7 feet per 1,000 feet.

Annual precipitation averages less than 7 inches. The relatively mild winters and hot summers provide an evaporation potential of 60 inches per year. This suggests a low potential for leaching and migration of contaminants from the burial sites into the groundwater.

There is no surface water on or near the site. Surface soil above the buried wastes would not be expected to contain contamination because of the three feet of uncontaminated soil and a PVC liner containing the wastes. However, erosion may expose buried wastes, and there may be areas not associated with the buried wastes which may contain surface soil contamination. Air quality measurements have revealed no release of volatile compounds. At this time, groundwater is the primary environmental pathway of concern for the transport of contaminants. Surface testing must be performed to eliminate soil as a pathway of concern.

If contaminants from PSL were to reach potable wells, the concentrations would be reduced from levels found in the groundwater on-site. If the contaminants reach irrigation wells, not only would the concentrations be reduced at the well head but the act of irrigating would allow the release of volatile compounds into the air providing greater reduction of concentrations. Due to the high volatility of VOCs and the low initial concentrations found in the groundwater, any plants irrigated by a contaminated well would not be expected to contain significant surface residues. Insufficient data does not allow for a determination of VOC bioaccumulation in plants.

B. HUMAN EXPOSURE PATHWAYS

Available data indicates the lack of air contamination, surface water does not exist, surface water runoff is expected to be rare, and surface soil associated with the buried hazardous wastes is uncontaminated. Therefore,

human exposure to these media would not be expected to pose a public health threat. Surface soil sampling from areas not associated with the buried wastes has not be completed, and it cannot be determined if contamination of public health concern exists.

If surface soil not associated with the buried wastes contains contamination the following human exposure pathways may exist:

- Direct ingestion
- Dermal absorption, ocular contact and/or reaction
- Inhalation of chemicals volatilized from soil
- Inhalation of reentrained dust
- Ingestion of inhaled contaminants removed from the lungs via the mucociliary tract

The exposure to contamination in the groundwater from PSL can potentially occur in the following ways:

- Direct ingestion of groundwater
- Inhalation of volatile compounds released during household use or irrigating
- Absorption through the skin while bathing or showering
- The consumption of plant life irrigated with contaminated water
- The consumption of animals which consume plant life irrigated with contaminated water

Currently, no wells show evidence of contamination attributable to the site. As mentioned above, several private wells have shown low levels of organic and inorganic compounds below federal drinking water standards. these compounds cannot be attributed to the site.

Exposure through ingestion of the plants directly or through the ingestion of animals consuming the plants is currently not occurring. Current sampling data indicates that contaminant concentrations would not be expected to reach levels of public health concern if groundwater contamination migrates to downgradient irrigation wells. The reasons are explained in the Environmental Pathways section above. The other exposure pathways will only be of concern if contaminants migrate from the landfill site to wells used for potable water.

PUBLIC HEALTH IMPLICATIONS

If migration of contaminants were to reach private wells in the area of the site, adverse health effects are possible. Some groundwater contaminant concentrations at the site presently exceed their EPA MCLs. Mechanisms such as soil absorption and degradation will decrease the concentrations of these compounds by the time they reach potable or irrigation wells. Thus, health effects of potential concern could include minor acute effects and chronic effects due to low-level long-term exposure. The amount of possible future exposure to contaminants from the site cannot be estimated.

Acute exposure to any of the compounds listed in Table I can produce central nervous system (CNS) depression (fatigue, confusion, incoordination, etc.). Several of the compounds can also produce respiratory, eye, or skin irritation. Violent or severe reactions such as vomiting, collapse, and kidney or liver damage occurs at concentrations much higher than found in the groundwater on-site, and are unlikely to occur. In the case of trichloroethylene (TCE), the drinking of ethanol can enhance any effects seen. In addition, concurrent occupational or other exposures may increase the possibility of health effects being seen in certain individuals.

Chronic effects from these compounds have been reported in occupational settings with inhalation of relatively high concentrations. Long-term ingestion of groundwater containing lower concentration levels can produce possible liver or kidney damage.

Vinyl chloride is designated a human carcinogen. There is evidence in both animal studies and human epidemiologic studies that vinyl chloride causes angiosarcoma, a rare liver cancer. Vinyl chloride is a biodegradation product of TCE, and it is possible that concentrations may increase with time. Those who smoke are exposed to an additional 5-27 nanograms of vinyl chloride per cigarette.

There is evidence based upon animal studies suggesting that TCE and 1,1-dichloroethylene (1,1-DCE) may be carcinogenic in humans. TCE has been shown to be mutagenic in the Ames test, and has produced tumors in

the liver of mice. 1,1-DCE is considered weakly mutagenic and has produced tumors in rats when exposed by inhalation, but not by ingestion. Direct evidence of carcinogenicity in man has not been demonstrated for either compound.

At this time, none of the health effects mentioned above can be expected from exposure to chemicals from the site since no exposures are currently known. It is possible that future exposure may occur.

CONCLUSIONS

Based upon information reviewed, the ATSDR has concluded that this site is of potential public health concern because of the potential future risk to human health resulting from possible future exposure to hazardous substances. As noted in the previous sections, there are currently no human exposures evident. However, there are indications that the possibility of exposure exists if contaminants appear in the on-site well or migrate off-site to private drinking water or irrigation wells.

At this time, contamination is restricted to the on-site groundwater. No contamination attributable to the site has appeared in any potable water well with potential for contamination by the site plume. The well on-site has no contamination evident.

Surface soil in areas not associated with the buried hazardous wastes has not been tested for the presence of contamination.

As in all sanitary landfills, the possibility of migration, a fire, or explosion from methane gas buildup exists.

RECOMMENDATIONS

1. Frequent sampling of the potable water well on-site should be done to monitor for the presence of contamination to prevent exposure to the individual living on-site.

2. Suitable monitoring of on-site and off-site monitoring and private wells should be done to track the advance of the contaminant plume. If contamination should appear in private wells at levels of human health concern, then appropriate steps should be taken to prevent exposures that could produce adverse health effects.

3. On-site surface soil sampling should be done in areas not covered with uncontaminated soil and a PVC liner.

4. Continue to maintain the gas monitoring system in place at the landfill. Institute appropriate preventive devices or procedures necessary to prevent a fire or explosion resulting from gas buildup.

In accordance with CERCLA as amended, the PSL site has been evaluated for appropriate follow-up with respect to health effects studies. Inasmuch as there is no extant documentation or indication in the information and data reviewed for this Preliminary Health Assessment that human exposure is currently occurring or has occurred in the past, this site is not being considered for follow-up health studies at this time. However, if data become available suggesting that human exposure to significant levels of hazardous substances is currently occurring or has occurred in the past, the ATSDR will reevaluate this site for any indicated follow-up.

PREPARERS OF REPORT

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REFERENCES

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2. Ecology and Environment, Inc., Final Report for Resource Recovery Corporation, Pasco, Washington, TDD R10-8410-14, Seattle, 1986.

3. Ecology and Environment, Inc., Preliminary Site Inspection Report of Resource Recovery Corporation, Pasco, Washington, TDD R10-8408-22, Seattle, 1985.

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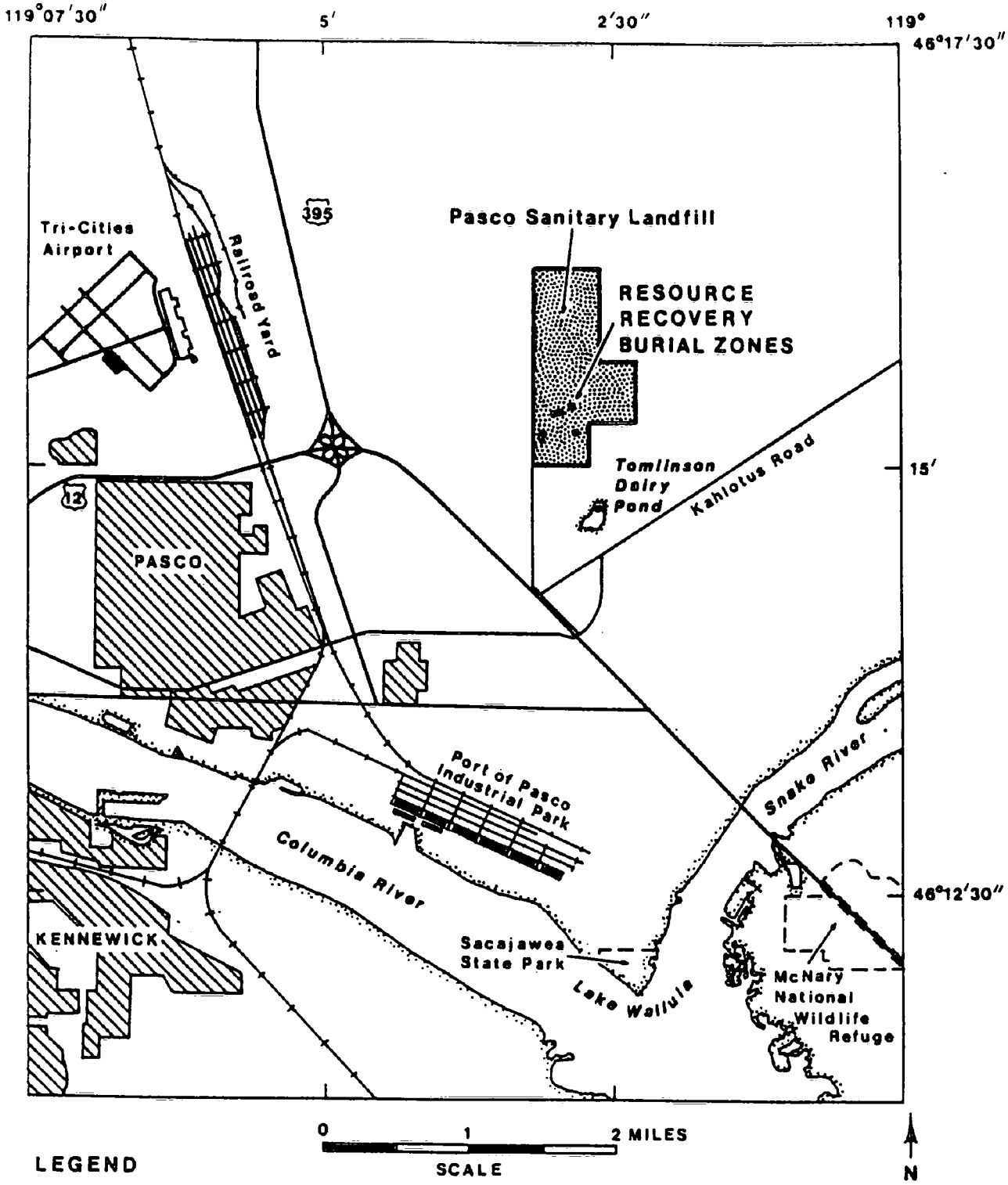
5. Harry G. Armstrong Aerospace Medical Research Laboratory, The Installation Restoration Program Toxicology Guide, Vol. 1, Arthur D. Little, Inc., Cambridge, 1985.

6. Technico and Enviro Services Co., Pasco Sanitary Landfill and the National Priorities List Update No. 7, Richland, WA, 1988.

APPENDIX A



LEGEND

Areas of commercial and residential development

U.S. Route

City of Pasco muncipal intake

ecology and environment, inc. SEATTLE, WA	
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Vicinity map, Resource Recovery study area, Pasco, Washington.