

PRELIMINARY HEALTH ASSESSMENT

PIPER AIRCRAFT CORPORATION/VERO BEACH WATER AND SEWER

INDIAN RIVER COUNTY

VERO BEACH, FLORIDA

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Prepared by:

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Florida Department of Health and Rehabilitative Services (HRS)

Prepared for:

Agency for Toxic Substances and Disease Registry (ATSDR)

Background

The Piper Aircraft Corporation/Vero Beach Water and Sewer Department National Priorities List (NPL) Site covers 8 acres in Vero Beach, Indian River County, Florida (see attached map). The facility began assembling and painting light aircraft in 1957. Chemicals utilized in these operations are stored on-site in underground storage tanks. In 1978, routine sampling and analysis of the city water supply revealed the presence of four volatile organic compounds (VOCs): trichloroethene, 1,1-dichloroethene, cis/trans-1,2-dichloroethene and vinyl chloride. An area search and tank testing revealed the trichloroethene source to be a leaking pipe fitting on a Piper Aircraft storage tank. No estimate is known for the amount of trichloroethene lost. Well #15 of the City of Vero Beach well field was subsequently shut down due to contamination with VOCs at levels of health concern.

In 1981, the Florida Department of Environmental Regulation (DER) took enforcement actions requiring Piper Aircraft to conduct a monitoring, testing, and treatment program at the site. Piper Aircraft Corporation repaired the faulty equipment and in April, 1981, began to pump out the contaminated ground water. To date, the pumping has removed approximately 2,050 gallons of solvents, including trichloroethene, cis/trans-1,2-dichloroethene, vinyl chloride, and 1,1-dichloroethene. The contaminated water is pumped through closed conduits one-half mile to the Main Canal. At the canal a pipe fitted with spigots sprays the contaminated water into the canal. Main Canal empties into Indian River.

The following documents were reviewed by the Florida HRS.

1. National Priorities List Site, Summary Sheet - July 16, 1985.
2. Quarterly Water Analysis Report #136, 135; Sediment Report #27; Oyster Analysis Report #27; Harbor Branch Foundation, Inc. - 1987.
3. RCRA (interim status/final) Standards Compliance Inspection - Undated.
4. Impact of trichloroethene contaminated well water discharge on the main relief canal and Indian River lagoon at Vero Beach, Florida, Harbor Branch Foundation, Inc. - June 30, 1980.
5. Ground Water Contamination Remedial Action Evaluation, University of Florida, Department of Environmental Engineering Sciences College of Engineering - May 1987.
6. ATSDR Site Summary, September 21, 1988.

Environmental Contamination and Physical Hazards

Small aircraft are currently manufactured at this site. No physical hazards are present except those which would normally be associated with this type of manufacturing. No holding ponds are present and no soil has been disturbed on this site.

The following tables summarize maximum contaminant concentration levels of ground water and surface water. Ground water data is derived from the on-site monitoring well and the contaminated city well off site which is developed into the Anastasia Formation. The Anastasia Formation comprises the surficial aquifer which is the major water supply aquifer for the area (maximum thickness approximately 150').

Water quality associated with the pump and treatment system is indicated by the surface water data. Not included were oyster and fish samples that showed very low levels of trichloroethene (from less than 1 to 10 ng/kg in both edible parts (oyster and fish) and livers (fish)).

GROUND WATER

<u>CONTAMINANTS (UG/L)</u> ¹	<u>ON SITE SHALLOW AQUIFER</u>	<u>OFF SITE VERO BEACH WELL #15</u>
Trichloroethene	301	TR
1,1-dichloroethene	21.4	11.2
Cis/trans-1,2-dichloroethene	2177	206
Vinyl Chloride	462	146

SURFACE WATER

<u>CONTAMINANTS (ug/L)</u> ¹	<u>ON SITE BEFORE MIXING</u> ²	<u>OFF SITE CANAL DISCHARGE</u> ³
1,1-dichloroethene	18.5	TR
1,1-dichloroethane	2.8	TR
Cis/trans-1,2-dichloroethene	366	25.2

1 ug/L: micrograms per liter

2 Contaminant levels in effluent before it mixes with the canal.

3 Contaminant levels in the canal after the effluent mixes with it.

TR Trace amount of contaminant, but below the level of concern for health.

Cis/trans-1,2-dichloroethene was also found midway between the discharge point and the salinity barrier in the canal and at the confluence between Main Canal and Indian River at levels of 11.9 ug/L and 2.04 ug/L respectively.

Potential Environmental and Exposure Pathways

Based on the available data, contaminant movement via ground water and surface water flow are the pathways of environmental exposure. Biota from surface water also contained low levels of trichloroethene.

Potential routes of human exposure include inhalation, dermal absorption, and ingestion via contaminated ground water; dermal absorption or accidental ingestion of contaminants from surface water; and ingestion of low levels of contaminants from biota in local contaminated surface water.

There are nearly 10,000 residents who obtain drinking water from municipal wells located within a mile of the subject site. However, potential health concerns due to the former location of the municipal well have been mitigated by relocating city wells and monitoring water quality at the new locations. Information assessing the presence of private potable wells (or irrigation wells) in the area that may potentially provide additional pathways of human exposure, was not available.

Air contamination due to the pumping and aeration of contaminated ground water (as a treatment process) has not been addressed. The EPA notified the city of Vero Beach that it would allow discharge of untreated ground water to surface water under a National Pollutant Discharge Elimination System (NDPES) permit if:

- 1) trichloroethene concentrations in the discharge were below 1.5 mg/l,
- 2) the city investigated alternate treatment techniques, and
- 3) the city implemented an extensive monitoring program.

Acceptable air levels were not set as a part of the permitting process and present-day concentrations have not been determined.

Demographics

The Piper Aircraft spill site is located in the northwestern portion of the City of Vero Beach on the southern edge of Vero Beach Airport in Indian River County, Florida. There are nearly 10,000 residents who obtain drinking water from public potable wells located within a mile of the site. The population of Vero Beach (1986 census) is 61,313.

Evaluation and Discussion

To adequately address potential health concerns that may be attributable to exposure to contaminated ground water in the vicinity of the Piper Aircraft site, additional information is needed. The contaminant plume has not been sufficiently defined and the number of private potable wells in the area is unknown.

Decreasing solvent levels in the monitoring wells indicate that the withdrawal/pumping system is probably effective, but the monitoring system may not contain enough wells to allow determination of the system's ability to control migration of the contaminants off-site. Air quality, in conjunction with the aeration process, has not been addressed.

Conclusions and Recommendations

Based on available information, this site is considered to be of potential public health concern because of the risk to human health caused by the possibility of exposure to hazardous substance via contaminated ground water, aerated ground water that is being discharged to the surface water and air contaminants released from the ground water aeration process.

Air monitoring should be carried out to adequately characterize air quality in the proximity of the spray aeration site. The areal extent of contaminated ground water should be established. In addition, the area should be surveyed for potentially affected down gradient private wells.