



Introduction

Extensive groundwater contamination resulting from industrial activities led to the listing of the Tucson International Airport Area as a Superfund Site in 1983. Early investigations revealed elevated levels of volatile organic compounds (VOCs) including the chlorinated solvents trichloroethylene (TCE) and perchloroethylene (PCE) in wells in the area. Several responsible parties were identified and cleanup activities were begun in the late 1980s using technology designed for removal of VOCs. In 2002, the compound 1,4-dioxane was discovered in wells in the Tucson Airport Remediation Project (TARP) area. Since then, 1,4-dioxane has been detected throughout the TARP area, in some cases exceeding the U.S. Environmental Protection Agency (USEPA) drinking water advisory level of 3 µg/L (U.S. Environmental Protection Agency, 2006).

Purpose and Scope

The purpose of this map is to present 1,4-dioxane temporal data from wells sampled from 2002 through 2009 in the TARP area, which shows trends in well concentrations. This map includes data from wells in the commercial and residential community in the TARP area and does not include data from wells in suspected or confirmed source areas such as Air Force Plant 44 and Tucson International Airport or from wells within treatment facilities. Data from agency reports including the U.S. Geological Survey, Pima County Department of Environmental Quality, Tucson International Airport, and Tucson Water are included on the map.

Methods

Data from all wells sampled and analyzed for 1,4-dioxane in the TARP area were compiled from available sources (Appendix A at <http://pubs.usgs.gov/sim/3113/>). These data were plotted on time-series charts, using a value of one-half the reporting limit for all samples reported as "non-detected". All charts utilize the same scale of data points for both the horizontal sample date and the vertical 1,4-dioxane concentration. This permits ease of comparison of concentration levels between wells. Basic well construction information of depth of well in feet below land surface and depth of well openings in feet below land surface, if available, is placed in the chart header with the well identifier. Well construction information and well location information were obtained from the U.S. Geological Survey and the Arizona Department of Water Resources databases. Horizontal dashed lines on the charts indicate the USEPA Region 9 Preliminary Remediation Goal of 6.1 ppb (U.S. Environmental Protection Agency, 2009) and the USEPA Drinking Water Advisory Level of 3 ppb (U.S. Environmental Protection Agency, 2006). Well locations are plotted on an aerial photo of the TARP area in a Geographic Information System (GIS) using colored symbols to differentiate between monitoring, supply, former supply, and private wells. Charts are placed as closely as possible to well locations on the map, and colored arrows link the chart to the well.

Wells were sampled using collection, handling, and analysis methods approved by each collecting organization (see data sources listed in explanation for information on sample collection and analysis methods). Former supply wells were sampled using disposable polyethylene bailers and were not purged prior to sample collection. While a significant mass of dissolved 1,4-dioxane is not likely to volatilize out of water under natural conditions, results from these bailed wells indicate only the concentration of 1,4-dioxane in the borehole water at the time of sampling and do not necessarily represent concentrations in the surrounding aquifer.

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EXPLANATION

Select well type to display only that well type.

- Monitoring well
- Private well
- Supply well
- Former supply well
- Display All

Depth of well, if known, in feet below land surface.

Well identifier

Well Depth

Opening unknown

Depth of well opening, if known, in feet below land surface.

Data source

USEPA Region 9 Preliminary Remediation Goal of 6.1 ppb

USEPA Drinking Water Advisory Level of 3 ppb

Sample collection date (20xx)

Data Source	
(See References Cited for complete source reference)	
Pima DEQ	Pima County Department of Environmental Quality (2007, 2009)
Tucson Intl Airport	Conestoga-Rovers & Associates (2007, 2009)
Tucson Water	Malcolm Pirnie, Inc. (2007, 2009)
USGS	Tillman (2009)

Base extracted from U.S. Geological Survey 1:7500-scale Digital Raster Graphic (DRG), 2004
 Universal Transverse Mercator projection, Zone 12
 Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD83)
 Vertical coordinate information is referenced to the North American Vertical Datum of 1988 (NAVD88)

SCALE 1:7500

1 0.125 0.25 0.5 0.75 1 KILOMETER

1 0.125 0.25 0.5 0.75 1 MILE

Map compiled by Fred D Tillman
 Digital cartography by Fred D Tillman
 Edited by J.L. Ziegler; cartography by D.A. Ryan
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Concentration of 1,4-Dioxane in Wells Sampled During 2002–2009 in the Vicinity of the Tucson International Airport Area Superfund Site, Arizona

By
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2010

When this map is printed on an electronic plotter directly from digital files, dimensional calibration may vary between X and Y directions on the same plotter, and paper may change size due to atmospheric conditions; therefore, scale and proportions may not be true on plots of this map.

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