

Table A1. Location of Sampled Wells in Relation to Productive Aquifers and Urban and Rural Areas

aquifer (Figure 1)	percentage of U.S. surface area, underlain by aquifer	Number of sampled wells associated with aquifer	percentage of total number of sampled wells	number of sampled wells in urban areas	number of sampled wells in rural areas
alluvial	7	465	16	88	377
sand and gravel	20	830	28	120	710
sandstone	8	153	5	37	116
carbonate	7	327	11	68	259
sandstone/carbonate	6	139	5	11	128
volcanic	3	396	13	15	381
crystalline	0.2	0	0	0	0
not a productive aquifer	48.8	638	22	67	571
Total	100.0	2948	100.0	406	2542

TABLE A2. Volatile Organic Compounds Detected by Land-Use Setting At a Reporting Level of 0.2 µg/L

[dw, drinking water; min., minimum; max., maximum; MCL, Maximum Contaminant Level; HA, Health-Advisory Level, lifetime 70-kg adult; RSD5, risk-specific dose associated with a risk of one additional person in one hundred thousand (1.0×10^{-5}) contracting cancer over a 70-year life; µg/L, micrograms per liter; >, greater than]

Wells in urban areas (≥ 386 persons/km²), total = 406 wells											
compound	primary use	detections/ wells with analysis	detected concentrations, (µg/L)			drinking-water criteria			taste/ odor threshold		
			min.	Median	max.	value (µg/L); [type of standard, MCL, HA, or RSD5 (4)]	percent exceeding all wells	dw wells	Threshold ¹ (µg/L) (reference)	percent exceeding all wells	dw wells
Compounds not detected											
bromobenzene	solvent	0/209	--	--	--	--	--	--	--	--	--
bromomethane	fumigant	0/335	--	--	--	10 (HAL)	0	0	--	--	--
2-chlorotoluene	solvent	0/209	--	--	--	100 (HAL)	0	0	6.9 (18)	0	0
4-chlorotoluene	solvent	0/209	--	--	--	100 (HAL)	0	0	24 (19)	0	0
1,3-dichlorobenzene	solvent	0/209	--	--	--	600 (HAL)	0	0	20 (20)	0	0
1,2-dibromoethane	fumigant	0/292	--	--	--	0.05 (MCL)	0	0	--	--	--
1,3-dichloropropane	organic synthesis	0/209	--	--	--	--	--	--	--	--	--
2,2-dichloropropane	organic synthesis	0/209	--	--	--	--	--	--	--	--	--
1,1-dichloropropene	organic synthesis	0/204	--	--	--	--	--	--	--	--	--
cis-1,3-dichloropropene	fumigant	0/349	--	--	--	2 (RSD5)	0	0	--	--	--
trans-1,3-dichloropropene	fumigant	0/347	--	--	--	2 (RSD5)	0	0	--	--	--
hexachlorobutadiene	organic synthesis	0/242	--	--	--	1 (HAL)	0	0	--	--	--
styrene	organic synthesis	0/341	--	--	--	100 (MCL)	0	0	11 (18)	0	0
1,1,1,2-tetrachloroethane	solvent	0/209	--	--	--	10 (RSD5)	0	0	--	--	--
1,1,1,2,2-tetrachloroethane	solvent	0/204	--	--	--	--	--	--	--	--	--
1,2,3-trichlorobenzene	organic synthesis	0/242	--	--	--	--	--	--	--	--	--
1,2,4-trichlorobenzene	solvent	0/242	--	--	--	70 (MCL)	0	0	5 (20)	0	0
1,1,2-trichloroethane	solvent	0/393	--	--	--	5 (MCL)	0	0	--	--	--
Detection frequency >0 to 1%											
tert-butylbenzene	hydrocarbon	1/209			1.1	--	--	--	--	--	--
dibromomethane	solvent	1/209			0.2	--	--	--	--	--	--
1,2-dichloropropane	solvent	3/359	0.2	0.2	1.3	5 (MCL)	0	0	1.4 (20)	0	0
p-isopropyltoluene	organic synthesis	2/209	3.4	3.65	3.9	--	--	--	--	--	--
1,2,3-trichloropropane	solvent	1/264			0.2	40 (HAL)	0	0	--	--	--
1,2-dibromo-3-chloropropane ²	fumigant	1/215			2.5	0.2 (MCL)	0.5	0	0.095 (21)	0.5	0
Detection frequency >1 to 5%											
benzene	hydrocarbon	14/398	0.2	1.0	290	5 (MCL)	1.0	0	--	--	--
bromochloromethane	organic synthesis	2/180	0.2	0.2	0.2	10 (HAL)	0	0	--	--	--
bromodichloromethane	organic synthesis	12/404	0.2	0.85	23	100 (MCL) ³	0	0	--	--	--
n-butylbenzene	hydrocarbon	4/242	1.1	1.55	6	--	--	--	--	--	--
sec-butylbenzene	hydrocarbon	4/209	1.3	1.65	11	--	--	--	--	--	--
chlorobenzene	solvent	4/361	0.2	0.3	1.0	100 (MCL)	0	0	50 (18)	0	0

Wells in urban areas (≥ 386 persons/km²), total = 406 wells

compound	primary use	detections/ wells with analysis	detected concentrations, ($\mu\text{g/L}$)			drinking-water criteria				taste/ odor threshold		
			min.	Median	max.	value ($\mu\text{g/L}$); [type of standard, MCL, HA, or RSD5 (4)]	percent exceeding		Threshold ¹ ($\mu\text{g/L}$) (reference)	percent exceeding		
							all wells	dw wells		all wells	dw wells	
chlorodibromomethane	organic synthesis	11/397	0.2	0.9	21	100 (MCL) ³	0	0	--	--	--	
chloroethane	solvent	7/340	0.2	1.2	40	--	--	--	--	--		
chloroethene	solvent	8/397	0.3	0.65	7.5	2 (MCL)	0.3	0	--	--	--	
chloromethane	refrigerant	2/189	0.2	0.4	0.6	3 (HAL)	0	0	--	--	--	
1,2-dichlorobenzene	solvent	5/359	0.2	0.2	120	600 (MCL)	0	0	10 (22)	0.3	0	
1,4-dichlorobenzene	fumigant	6/330	0.3	1	56	75 (MCL)	0	0	0.3 (23)	1.2	0	
dichlorodifluoromethane	refrigerant	10/352	0.2	0.45	38	1000 (HAL)	0	0	--	--	--	
1,2-dichloroethane	solvent	7/351	0.2	0.5	3	5 (MCL)	0	0	--	--	--	
1,1-dichloroethene	organic synthesis	12/397	0.2	0.9	11	7 (MCL)	0.5	0	--	--	--	
cis-1,2-dichloroethene	solvent	12/262	0.2	0.4	6.1	70 (MCL)	0	0	--	--	--	
trans-1,2-dichloroethene	solvent	18/383	0.2	0.75	28	100 (MCL)	0	0	4.3 (22)	0.5	0	
dichloromethane	solvent	8/336	0.2	0.45	1.5	5 (MCL)	0	0	--	--	--	
ethylbenzene	hydrocarbon	7/403	0.2	1.9	51	700 (MCL)	0	0	29 (18)	0.3	0	
isopropylbenzene	organic synthesis	5/242	0.3	5.5	8.4	--	--	--	--	--	--	
methylbenzene	hydrocarbon	13/397	0.2	0.9	350	1000 (MCL)	0	0	8 (22)	1.0	2.7	
naphthalene	hydrocarbon	7/242	0.3	3.9	43	20 (HAL)	0.4	0	2.5 (19)	1.7	0	
n-propylbenzene	solvent	5/241	0.6	4.5	35	--	--	--	--	--	--	
tetrachloromethane	solvent	6/405	0.3	0.8	19	5 (MCL)	0.3	0	--	--	--	
tribromomethane	solvent	11/397	0.2	0.9	4.2	100 (MCL) ³	0	0	--	--	--	
trichlorofluoromethane	refrigerant	12/387	0.2	1.05	24	2000 (HAL)	0	0	28 (21)	0	0	
1,1,2-trichloro-1,2,2-trifluoroethane	refrigerant	3/234	0.4	0.5	10	--	--	--	--	--	--	
1,2,4-trimethylbenzene	organic synthesis	4/241	1.4	29	69	--	--	--	--	--	--	
1,3,5-trimethylbenzene	hydrocarbon	4/209	0.3	8.55	11	--	--	--	--	--	--	
xylenes (mixed isomers)	hydrocarbon	8/370	0.2	1.55	42	10000 (MCL)	0	0	17 (9)	0.5	--	
Detection frequency > 5 to 10%												
1,1-dichloroethane	solvent	26/405	0.2	0.3	39	--	--	--	--	--	--	
1,1,1-trichloroethane	solvent	39/404	0.2	0.5	15	200 (MCL)	0	0	--	--	--	
Detection frequency > 10%												
methyl <i>tert</i> -butyl ether	oxygenate	38/225	0.2	0.6	23,000	--	--	--	20 (19)	1.3	0	
tetrachloroethene	solvent	67/403	0.2	1.1	260	5 (MCL)	3.5	0	--	--	--	
trichloroethene	solvent	47/405	0.2	0.9	80	5 (MCL)	1.2	2.5	--	--	--	
trichloromethane	solvent	107/405	0.2	0.6	400	100 (MCL) ³	0.3	0	--	--	--	

Wells in rural areas (< 386 persons/km²), total = 2542 wells

compound	primary use	detections/ wells with analysis	detected concentrations (µg/L)			Drinking- water criteria				taste/ odor threshold	
			min.	median	max.	Value (µg/L) [Type of standard; MCL, HAL, or RSD5 (4)]	percent exceeding		threshold (µg/L) ¹ (reference)	percent exceeding	
							all wells	dw wells		all wells	dw wells
Compounds not detected											
bromobenzene	solvent	0/1396	--	--	--	--	--	--	--	--	--
bromochloromethane	organic synthesis	0/1241	--	--	--	10 (HAL)	0	0	--	--	--
2-chlorotoluene	solvent	0/1396	--	--	--	100 (HAL)	0	0	6.9 (18)	0	0
4-chlorotoluene	solvent	0/1396	--	--	--	100 (HAL)	0	0	24 (19)	0	0
dibromomethane	solvent	0/1396	--	--	--	--	--	--	--	--	--
1,3-dichlorobenzene	solvent	0/1396	--	--	--	600 (HAL)	0	0	20 (20)	0	0
2,2-dichloropropane	organic synthesis	0/1396	--	--	--	--	--	--	--	--	--
1,1-dichloropropene	organic synthesis	0/1267	--	--	--	--	--	--	--	--	--
cis-1,3-dichloropropene	fumigant	0/2138	--	--	--	2 (RSD5)	0	0	--	--	--
trans-1,3-dichloropropene	fumigant	0/2039	--	--	--	2 (RSD5)	0	0	--	--	--
hexachlorobutadiene	solvent	0/1458	--	--	--	1 (HAL)	0	0	--	--	--
1,1,1,2-tetrachloroethane	solvent	0/1396	--	--	--	10 (RSD5)	0	0	--	--	--
1,1,2,2-tetrachloroethane	solvent	0/1267	--	--	--	--	--	--	--	--	--
1,2,3-trichlorobenzene	organic synthesis	0/1462	--	--	--	--	--	--	--	--	--
1,2,4-trichlorobenzene	solvent	0/1458	--	--	--	70 (MCL)	0	0	5 (20)	0	0
1,1,2-trichloroethane	solvent	0/2173	--	--	--	5 (MCL)	0	0	--	--	--
Detection frequency >0 to 1%											
Benzene	hydrocarbon	24/2504	0.2	0.7	73	5 (MCL)	0.1	0	--	--	--
Bromodichloromethane	organic synthesis	19/2476	0.2	0.5	5.2	100 (MCL) ³	0	0	--	--	--
Bromomethane	fumigant	1/1886			0.5	10 (HAL)	0	0	--	--	--
n-butylbenzene	hydrocarbon	2/1462	0.3	3.55	6.8	--	--	--	--	--	--
sec-butylbenzene	solvent	2/1396	0.2	2.3	4.4	--	--	--	--	--	--
tert-butylbenzene	hydrocarbon	1/1396			0.2	--	--	--	--	--	--
Chlorobenzene	solvent	6/2515	0.2	0.9	7.2	100 (MCL)	0	0	50 (18)	0	0
Chlorodibromomethane	organic synthesis	15/2415	0.2	0.4	11	100 (MCL) ³	0	0	--	--	--
Chloroethane	solvent	4/1967	0.3	0.3	2.3	--	--	--	--	--	--
Chloroethene	organic synthesis	5/2407	0.2	0.3	1.4	2 (MCL)	0	0	--	--	--
Chloromethane	refrigerant	4/993	0.2	0.35	21	3 (HAL)	0.1	0	--	--	--
1,2-dibromoethane	fumigant	5/1798	0.3	0.9	1.4	0.05 (MCL)	0.3	0	--	--	--
1,2-dibromo-3 chloropropane ²	fumigant	4/1277	1.3	1.45	2.1	0.2 (MCL)	0.3	16.7 ⁴	0.0965 (21)	0.3	16.7 ⁴
1,2-dichlorobenzene	solvent	4/2469	0.3	1.05	5.8	600 (MCL)	0	0	10 (22)	0	0
1,4-dichlorobenzene	fumigant	4/2434	0.8	1.3	6.7	75 (MCL)	0	0	0.3 (23)	0.2	0
Dichlorodifluoromethane	Refrigerant	20/2380	0.2	0.5	3.1	1000 (HAL)	0	0	--	--	--
1,1-dichloroethane	Solvent	18/2539	0.2	0.55	2.8	--	--	--	--	--	--
1,2-dichloroethane	Solvent	8/2449	0.2	0.3	2.9	5 (MCL)	0	0	--	--	--

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			min.	median	max.	Value (µg/L) [Type of standard; MCL, HAL, or RSD5 (4)]	percent exceeding		threshold (µg/L) ¹ (reference)	percent exceeding		
							all wells	dw wells		all wells	dw wells	
1,1-dichloroethene	Organic synthesis	7/2414	0.4	1.0	39	7 (MCL)	0.1	0.2	--	--	--	
cis-1,2-dichloroethene	Solvent	9/1966	0.2	0.4	4.4	70 (MCL)	0	0	--	--	--	
Trans-1,2-dichloroethene	Solvent	10/2281	0.2	0.25	8.8	100 (MCL)	0	0	4.3 (22)	0.04	0	
Dichloromethane	Solvent	20/2345	0.2	0.45	4	5 (MCL)	0	0	--	--	--	
1,2-dichloropropane	Solvent	23/2508	0.2	0.5	7.5	5 (MCL)	0.2	0.1	1.4 (20)	0.3	0.3	
1,3-dichloropropane	Organic synthesis	2/1396	0.2	0.3	0.4	--	--	--	--	--	--	
Ethylbenzene	Hydrocarbon	6/2539	0.2	2.8	270	700 (MCL)	0	0	29 (18)	0.04	0	
Isopropylbenzene	Organic synthesis	5/1463	0.2	0.5	27	--	--	--	--	--	--	
p-isopropyltoluene	Organic synthesis	4/1396	0.3	0.45	6.3	--	--	--	--	--	--	
Naphthalene	Hydrocarbon	3/1458	0.3	0.4	70	20 (HAL)	0.1	0	2.5 (22)	0.1	0	
n-propylbenzene	Solvent	3/1462	0.6	1.9	47	--	--	--	--	--	--	
Styrene	Organic synthesis	1/2372			0.3	100 (MCL)	0	0	11 (18)	0	0	
Tetrachloromethane	Solvent	8/2542	0.2	0.55	2.9	5 (MCL)	0	0	--	--	--	
Tribromomethane	Solvent	9/2415	0.2	0.4	8.2	100 (MCL) ¹	0	0	--	--	--	
1,1,2-trichloro-1,2,2- trifluoroethane	Refrigerant	2/1343	0.3	0.3	0.3	--	--	--	--	--	--	
Trichlorofluoromethane	Refrigerant	14/2283	0.2	0.3	1.2	2000 (HAL)	0	0	28 (21)	0	0	
1,2,3-trichloropropane	Solvent	10/1729	0.2	0.5	1.1	40 (HAL)	0	0	--	--	--	
1,2,4-trimethylbenzene	Organic synthesis	6/1440	0.3	5.35	260	--	--	--	--	--	--	
1,3,5-trimethylbenzene	Hydrocarbon	3/1396	2.9	4	18	--	--	--	--	--	--	
xylenes (mixed isomers)	Hydrocarbon	22/2394	0.2	0.65	300	10000 (MCL)	0	0	17 (9)	0.2	--	
Detection frequency >1 to 5%												
Methylbenzene	Hydrocarbon	50/2484	0.2	0.3	23	1000 (MCL)	0	0	8 (22)	0.2	0	
methyl tert-butyl ether	Oxygenate	45/1312	0.2	0.5	140	--	--	--	20 (19)	0.2	0	
Tetrachloroethene	Solvent	64/2526	0.2	0.8	250	5 (MCL)	0.5	0.4	--	--	--	
1,1,1-trichloroethane	Solvent	27/2540	0.2	0.5	120	200 (MCL)	0	0	--	--	--	
trichloroethene	Solvent	41/2542	0.2	0.6	63	5 (MCL)	0.2	0.4	--	--	--	
Detection frequency >5 to 10%												
trichloromethane	Solvent	130/2538	0.2	0.5	210	100 (MCL) ¹	0.04	0	--	--	--	

¹ - Only included if the taste or odor threshold was less than the drinking-water criteria, or if there were no drinking-water criteria.

² - Reporting level of 1.0 µg/L

³ -Total for trihalomethanes.

⁴ - Two out of 12 dw wells.