Southern Tier Regional Groundwater Baseline Initiative*

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Concentrations of Gas Well "Signature Chemicals" in 112 Private Drinking Water Wells in Central and Southern New York State. The numbers of wells tested in each county were: Otsego (58), Tompkins (12), Chenango (11), Delaware (10), Steuben (5), Tioga (4), Schuyler (3), Broome (3), Chemung (2), Yates (2), Schoharie (1), Seneca (1), Sullivan (1).

Gas Well Signature Chemical (units)	Wells tested (wells with detects)[a]	Median Value for all wells[b]	Minimum Value for all wells[b]	Maximum Value for all wells[b]	Federal MCL[c] (Wells over)	NY State Standard[d] (Wells Over)
Calcium (mg Ca/L)	111 (110)	32.8	1.9	156	None	None
Alkalinity (mg $CaCO_3$ /L)	112 (112)	141.5	8.13	450	None	None
Total Hardness (mg $CaCO_3$ /L)	111 (111)	108	8.8	635	None	None
Total Dissolved Solids (mg/L)	110 (104)	180	25	1090	None	500[e] (2)
Total Suspended Solids (mg/L)	111 (5)	Non-detect (<2)	Non-detect (<2)	91.6	None	None
Turbidity (NTU)	111 (111)	0.9	Non-detect (<0.01)	91.8	5 (13)	5 (13)
pH (pH units)	112 (112)	7.57	5.9	8.65	None	6.5-8.5[e] (12)
Chloride (mg/L)	111 (73)	3.52	Non-detect (<2)	281.5	None	250[e] (2)
Conductivity (uS/cm)	112 (112)	300.5	40.4	1682	None	None
Chemical Oxygen Demand (mg/L)	111 (29)	Non-detect (<10)	Non-detect (<10)	26.9	None	None
Gross Alpha Radioactivity (pCi/L)	111 (111)	0.62	-0.45	4.97	15 (0)	15 (0)
Gross Beta Radioactivity (pCi/L)	111 (111)	1.05	-0.59	40.83	50f (0)	50[f] (0)
Methane (mg/L)	112 (48)	0.005	Non-detect (<0.001)	14	None	10[g] (2)
Methylene Blue Active Substances (MBAS) (mg/L)	112 (11)	Non-detect (<0.04)	Non-detect (<0.04)	0.1	None	0.5e (0)
Barium (mg/L)	112 (112)	0.0643	0.0019	0.895	2 (0)	2 (0)
Iron (mg/L)	112 (105)	0.0915	Non-detect (<0.005)	11.3	None	0.3[e] (24)
Manganese (mg/L)	112 (94)	0.0475	Non-detect (<0.002)	1.52	None	0.3[e] (5)
Arsenic (mg/L)	112 (38)	Non-detect (<0.0005)	Non-detect (<0.0005)	0.0137	0.01 (1)	0.01 (1)
Strontium (mg/L)	98 (98)	0.217	0.0006	2.07	None	None

Volatile Organic Compounds (52 total) (mg/L)[h]	103 (7)	Non-detect (<0.0005)	Non-detect (<0.0005)	1.3	0.005-10, depending on VOC (1) (Toluene)	None

***The Southern Tier Regional Groundwater Initiative is a project of the nonprofit Community Science Institute (CSI) and CSI's certified water quality testing laboratory, NYSDOH-ELAP #11790. Private clients who contract with CSI's lab to perform baseline testing on their private drinking water wells have given permission to pool their results for presentation in anonymous formats on the CSI website. All samples were collected by CSI staff with chain of custody documentation. All analyses were performed by CSI's certified lab and by certified subcontract labs using methods approved by the New York State Department of Health-Environmental Laboratory Approval Program. This table and other results will be posted on the CSI website with the goal of providing information to the general public on groundwater quality in the Southern Tier of New York State.**

[a] Number of wells with concentrations above the laboratory's limit of quantitation (similar to detection)

[b] If the laboratory reported a non-detect, the value is less than the laboratory's limit of quantitation (similar to detection). If a well was sampled more than once, the value is taken to equal the average of all samples collected from that well. The quantitation limit is indicated by "<"; for example, a chloride value of <2 means that the measurement was less than a limit of quantitation of 2 mg/L.

[c] The MCL refers to the Maximum Contaminant Level, a health-based, enforceable standard under the federal Safe Drinking Water Act (SDWA). MCLs are based human health risk assessments and are listed on the EPA website at http://water.epa.gov/drink/contaminants/index.cfm#List. MCLs are distinct from National Secondary Drinking Water Standards (NSDWS), which are not health-based and not enforceable by EPA (see state standards, footnote d).

[d] State standards refer to levels of chemicals in drinking water that are enforced by New York State under the federal Safe Drinking Water Act (SDWA) and are listed at http://www.health.ny.gov/regulations/nycrr/title_10/part_5/subpart_5-1_tables.htm. An enforceable state standard must be equally or more stringent than a federal standard. A state is not required to base its enforceable standards on human health risk assessments, however, a state may refer to its standards as MCLs. In general, state MCLs are a mixture of federal health-based MCLs and federal non-health-based National Secondary Drinking Water Standards (NSDWS). For example, New York bases several enforceable standards on NSDWS, available at http://water.epa.gov/drink/contaminants/index.cfm#SecondaryList. NSDWS are not enforceable at the federal level because they are directed at cosmetic properties of drinking water such as taste and odor, not at risks to human health.

[e] Based on a National Secondary Drinking Water Standard (NSDWS) that is not health-based and is not enforceable by the federal government (see http://water.epa.gov/drink/contaminants/index.cfm#Secondary)

[f] Standard is based on an exposure limit of 4 mrem/year. This level of exposure corresponds to a concentration of 15 pCi/L to 50 pCi/L, depending on various factors. It is possible that the one well that exceeded 15 pCi/L may have resulted in an exposure greater than the federal MCL of 4 mrem/year.

[g] A guidance value, not a standard. The U.S. Department of the Interior recommends that wells containing greater than 10 mg/L of dissolved methane be vented to minimize the explosion hazard that could result from methane volatilizing (escaping) from water and building up inside a home. Methane is considered hazardous because it is explosive. It is considered non-toxic because there is no evidence that its presence in drinking water causes health problems.

[h] A total of 103 wells were tested for 52 volatile organic compounds (VOCs) for a total of 5,356 tests for VOCs using EPA Method 524.2. Seven (7) wells contained a total of 12 VOCs above the quantitation (similar to detection) limit. One (1) well contained toluene at 1.3mg/L, which exceeded the federal MCL of 1mg/L.