

Nitrate in Well Water: Results From 23 Years of Monitoring in Nova Scotia¹

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The NS Well Water Nitrate Monitoring Program is a long-term study that involves annual testing for nitrate at approximately 150 water wells in Kings County, Nova Scotia. The objectives of the program are to monitor nitrate levels in a group of randomly selected water wells to determine the number of wells that exceed the Canadian drinking water guideline for nitrate (i.e., 10 mg/L, as NO₃-N) and to identify any long-term trends in nitrate levels. The annual monitoring program was initiated in 2002 as a follow-up to previous water quality studies in 1989, 1999 and 2000. A total of 14 annual sampling events have been completed during the period between 1989 and 2012 (Table 1). The monitoring results for the entire period of record indicate that 15% to 25% of the wells exceeded the nitrate drinking water guideline on any given year since 1989. The results from 2012 showed that 20% of the wells exceeded the guideline. The results also showed that 10% of the wells had an upward trend in nitrate levels, 30% had a downward trend, and 60% had no trend in nitrate levels. No trend was observed in the annual median nitrate concentration of the entire dataset between 1989 and 2012.

Table 1: Summary of Nitrate Concentrations in Well Water (1989-2012)

Year	No. of Wells Sampled	Median Nitrate (mg/L, as NO ₃ -N)	Maximum Nitrate (mg/L, as NO ₃ -N)	No. of Wells Above Guideline (10 mg/L, as NO ₃ -N)	Percent of Wells Above Guideline
1989	135	3.6	46.1	27	20%
1999	142	4.2	43.0	34	24%
2000	137	3.4	46.9	27	20%
2002	139	4.1	33.1	28	20%
2003	138	4.7	42.5	25	18%
2004	134	5.1	46.7	34	25%
2005	130	2.2	39.3	19	15%
2006	133	3.0	38.5	29	22%
2007	132	2.9	34.9	28	21%
2008	135	2.6	25.5	26	19%
2009	135	3.7	33.3	29	21%
2010	129	3.0	29.4	28	22%
2011	120	4.0	38.8	28	23%
2012	126	3.2	30.9	25	20%

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