Nitrate Concentrations In Private Wells

Afton, Minnesota

November 2016

Natural Resources and Groundwater Committee

Introduction:

The city of Afton, located 15 miles east of downtown St. Paul, is mostly open and rural except for the old village along the St. Croix River. The residents have a high regard for their environment and want to maintain its rural character (Afton Comp Plan, 2010). Low-density development with private wells and single-family and/or cluster septic systems have provided Afton with sustainable neighborhoods with minimal impact on the environment. Zoning in the western half of the city is mostly agriculture, and the eastern half is mostly rural residential.

Afton residents were invited to participate in a water-sampling project in October 2016. Samples were for the analysis of nitrates, and 59 residents participated. Many residents have participated in nitrate samplings before, and have appreciated knowing the quality of their water.

The purpose of sampling was to (1) determine the current general distribution of nitrate concentrations and (2) determine baseline nitrate levels in the Village before hookups to the community septic system.

Methods and Approach:

The Washington County Department of Health and Environment sent participants a sample bottle, forms for recording pertinent sampling information, and sampling instructions. Participants brought their water samples to Afton City Hall the morning that the samples were collected. Volunteers at city hall delivered the samples to county health by 10:00 AM. Then a courier picked up the samples from county health and delivered them to a contract lab for timely nitrate analysis.

A Brief Discussion About Nitrates:

Nitrate is a naturally occurring compound that is found in air, soil, water, and plants. Nitrate is also added to the environment by way of fertilizers and human and animal wastes.

Too much nitrate in drinking water poses a risk to infants under six months of age. Primarily because of this risk, the federal drinking-water standard for nitrate is 10 mg/L (milligrams per liter) of nitrate-nitrogen. This limit is mandatory for all public water supplies and recommended for private wells.

If an infant is fed water or formula made with water that is high in nitrate, a condition called methemoglobinemia or "blue baby syndrome" can develop. Bacteria that are present in the stomachs of infants can convert nitrate to nitrite, a compound that can interfere with the ability of the infant's blood to carry oxygen. As an infant ages, its stomach acidity increases, reducing the numbers of nitrite-producing bacteria. After six months, the conversion of nitrate to nitrite in the stomach no longer occurs. Most adults can consume large amounts of nitrate with no ill effects. In fact, the average adult in the United States

consumes about 20-25 milligrams of nitrate-nitrogen every day in food.
http://www.health.state.mn.us/divs/eh/wells/waterquality/nitrate.html

In 2014, the Minnesota Department of Agriculture looked at nitrates in select townships and cities. Cottage Grove and Denmark Township were in this group. To add some perspective, 28 percent of the private wells tested in Cottage Grove had results above 10 mg/L, and Denmark Township had 14 percent above 10 mg/L .
http://www.mda.state.mn.us/protecting/cleanwaterfund/gwdwprotection/~/media/Files/chemicals/nfmp/washington2014sum.pdf

The latest testing in Afton, on the other hand, shows results above 10 mg/L for 3 percent of wells sampled.

Results and Discussion:

Historical data from the Minnesota Department of Health were obtained for the period 2005-14. These consist of 194 nitrate-nitrogen (NO3-N) sample results from private wells in Afton. These results can be compared to the sampling that was done in October 2016. Tables 1 and 2 show the historical and October 2016 data, respectively.

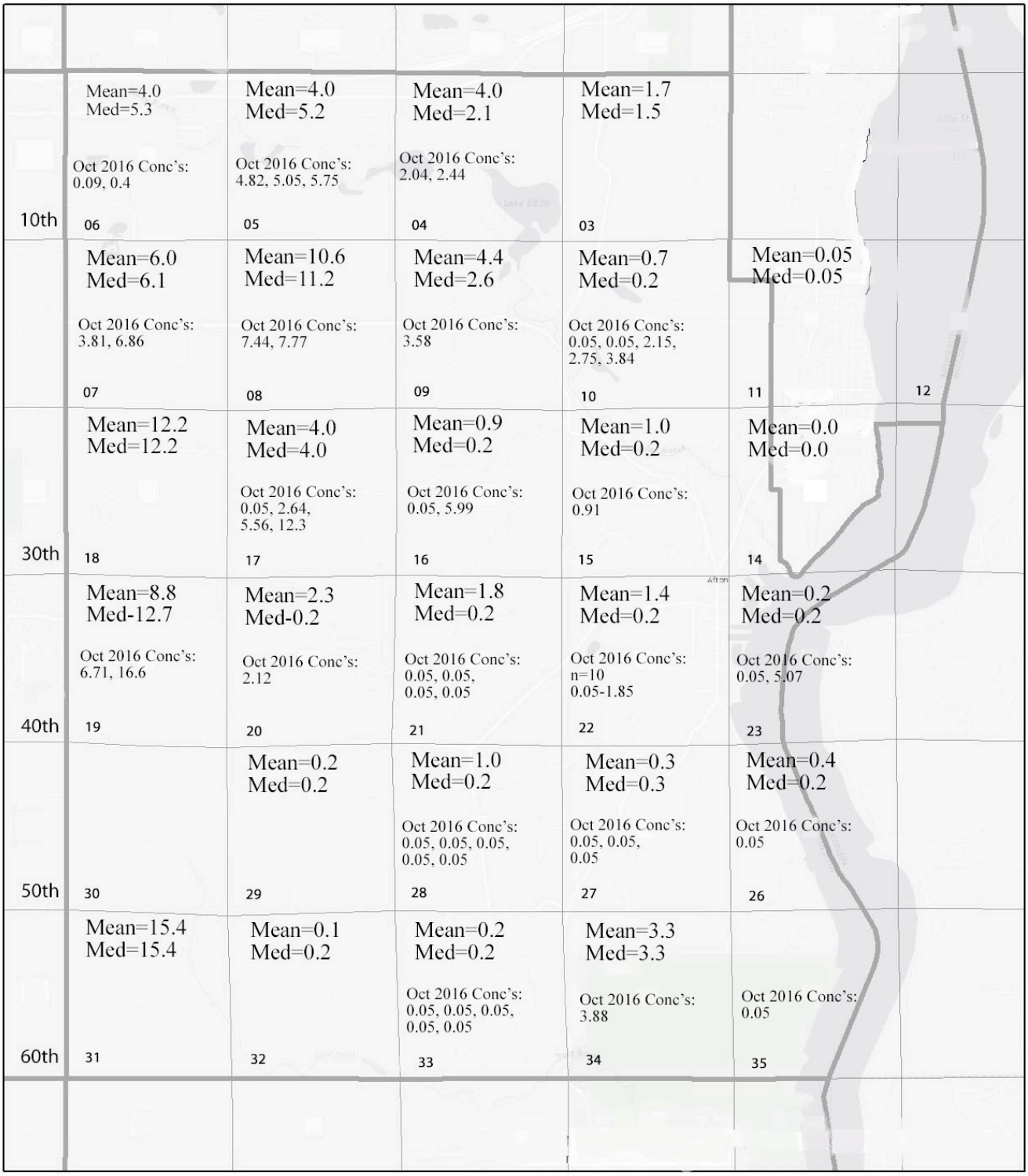
Five percent of the 194 samples collected from 2005-14 have values >10 mg/L; 80 percent of these occur in the ag area, mainly located in the western part of Afton. Two samples (3 percent) of the 59 collected in 2016 are above 10 mg/L. Both samples are from wells in the ag area – sections 17 and 19.

Figure 1 shows the mean and median values of the historical data and the individual values of the 59 NO3-N results collected in October 2016. Because sampling events have been dependent on voluntary participation, the random participation renders some statistical comparisons difficult. However, the data do show certain tendencies:

1. NO3-N concentrations are highest in the ag area. Row crops are generally predominant in sections 18, 19, 30, and 31 where concentrations tend to be highest. Because of the changing terrain, pasture land becomes more common east of the these sections along with decreasing NO3-N concentrations.

   Land use is an important factor affecting NO3-N concentrations in ground water. Highest concentrations generally occur under row crops and lowest concentrations under forest.
   http://www.health.state.mn.us/divs/eh/water/swp/nitrate/reports/2011method/washington.pdf

Figure 1.- Mean and median NO3-N concentrations in mg/L for samples collected from private wells in Afton for the period 2005-2014. Individual results are shown for samples collected in October 2016. Ten samples were collected in section 22, so the concentration range from lowest to highest is shown.



2. Sections 3-9 in the north part of the city show lower concentrations than those in the more intense farming area but higher than those in the eastern and southern part of the city. The north part is near commercial and industrial activity and Interstate 94. Part of the industrial activity is gravel mining. These activities suggest that there has been disturbance of the natural geology that may have created an efficient pathway for contaminants to enter the ground water. Further study is needed to better understand the hydrology in this area.

3. NO3-N concentrations in the eastern and much of the southern parts of Afton are low. Many analyses show concentrations near natural-occurring levels. In the Village, concentrations have remained relatively low as shown by the latest round of sampling. The eastern half of Afton is more hilly and forested. This type of terrain and land use is an important factor that helps account for the low concentrations.

4. In general, the NO3-N concentrations show the ground water in Afton to be good in that respect. The higher concentrations in the ag area are not unusual for that type of land use. If drinking water is over 10 mg/L in NO3-N and in the high range shown by the data, it is safe to drink with the following exceptions: Infants under six months of age and women who are pregnant might be advised by their doctor not to drink water of this type.

Conclusions:

Except for the ag area, NO3-N concentrations suggest that Afton's drinking water is very good to excellent. In the few wells that show concentrations above 10, that water should not be given to infants under six months of age. Also, pregnant women are advised caution before drinking that type of water.

Part of the purpose of testing for nitrates was to establish a baseline in the Village area before construction of the wastewater collection and treatment system. A preliminary plan is to follow up with a periodic sampling scheme in the Village after the system is operating. It appears that future sampling (for this purpose) may not need to be as high a priority as once thought.

Table 1.- NO3-N concentrations in mg/L for samples collected from private wells in Afton for the period 2005-2014

PHD#	NO3-(ml/l)	CollectedDate	StreetNo.	StreetName	City	Sect.	Aquifer	WellDepth	DrillDate
17811	1.58	10/14/2014	380	Croixview Dr	Afton	3			
16961	0	1/1/2007	177	Croixview DR S	Afton	3			
18486	1.08	10/14/2008	215	Croixview DR S	Afton	3			
16991	6.55	5/25/2010	426	Croixview DR S	Afton	3	Ironton - Galesville	190	4/19/1976
18659	1.16	6/15/2010	81	Stagecoach TR S	Afton	3			
17718	1.93	6/15/2010	105	Stagecoach TR S	Afton	3			
17724	1.76	6/15/2010	105	Stagecoach TR S	Afton	3			
17795	1.55	6/15/2010	105	Stagecoach TR S	Afton	3			
18260	1.22	5/13/2008	105	Stagecoach TR S	Afton	3			
18461	1.1	6/14/2011	105	Stagecoach TR S	Afton	3			
17567	2.23	6/5/2007	502	Stagecoach TR S	Afton	3			
17344	2.16	5/13/2008	502	Stagecoach TR S	Afton	3			
17721	1.88	6/5/2007	502	Stagecoach TR S	Afton	3			
18248	1.26	6/5/2007	502	Stagecoach TR S	Afton	3			
17991	1.5	4/19/2005	502	Stagecoach TR S	Afton	3			
18056	1.49	4/19/2005	502	Stagecoach TR S	Afton	3			
18121	1.42	5/13/2008	502	Stagecoach TR S	Afton	3			
18655	0.81	4/19/2005	502	Stagecoach TR S	Afton	3			
16466	0.2	5/13/2008	502	Stagecoach TR S	Afton	3			
17229	2.38	8/8/2007	671	Stagecoach TR S	Afton	3			
16662	10.2	7/2/2010	947	Indian TR S	Afton	4	Prairie Du Chein	140	4/14/1987
17573	2.23	6/14/2011	120	Stagecoach TR S	Afton	4			
17720	1.93	6/14/2011	120	Stagecoach TR S	Afton	4			
17767	1.65	6/14/2011	120	Stagecoach TR S	Afton	4			
18131	1.42	11/10/2010	13276	10th St S	Afton	5			
16958	0.2	7/2/2013	13529	Hudson RD S	Afton	5			
19162	5.28	6/29/2010	270	Indian TR S	Afton	5	Prairie Du Chein	125	8/25/1981
19127	5.32	5/8/2012	467	Indian TR S	Afton	5			
19215	5.24	5/24/2011	467	Indian TR S	Afton	5			
16176	5.1	5/25/2010	467	Indian TR S	Afton	5			
19107	5.38	5/25/2010	470	Indian TR S	Afton	5	Jordan	153	7/18/1978
15894	6	5/13/2008	776	Indian TR S	Afton	5			
17114	3.25	6/14/2007	777	Indian TR S	Afton	5			
17112	3.2	3/27/2007	777	Indian TR S	Afton	5			
17022	6.11	6/29/2010	12720	10th ST S	Afton	6	Prairie Du Chein	100	10/15/1986
18490	5.44	2/6/2007	12720	10th ST S	Afton	6	Prairie Du Chein	100	10/15/1986
19165	5.28	6/5/2012	12720	10th St S	Afton	6	Prairie Du Chein	100	10/15/1986
19113	5.33	8/5/2014	12720	10th Street S	Afton	6	Prairie Du Chein	100	10/15/1986
16921	6.82	1/14/2014	12738	4th St S	Afton	6			
16949	6.78	12/11/2012	12738	4th ST S	Afton	6			
16998	6.21	2/13/2007	12751	4th ST S	Afton	6			
16987	6.74	12/5/2006	12805	4th ST S	Afton	6			
18964	0.2	2/28/2006	12343	60th ST S	Afton	6			
16841	0.2	5/7/2013	12343	60th ST S	Afton	6			
16622	4.05	6/5/2012	12055	8th ST S	Afton	6			
18398	1.16	4/22/2008	12161	8th ST S	Afton	6			
18935	0.36	6/22/2010	12180	8th ST S	Afton	6	Jordan	235	11/30/1994
18674	1.3	3/28/2006	12433	8th ST S	Afton	6			
17033	6.06	3/20/2007	1745	Manning AVE S	Afton	7			
19190	5.27	7/5/2005	1745	Manning AVE S	Afton	7			
16862	6.82	5/13/2008	1456	Neal AVE S	Afton	7			
16417	11.2	3/22/2005	13854	15th ST S	Afton	8			
16371	11.3	5/13/2014	1850	Oakgreen ave	Afton	8	Prairie Du Chein	150	8/17/1985
16782	9.38	7/11/2007	1850	Oakgreen AVE S	Afton	8	Prairie Du Chein	150	8/17/1985
16352	12	2/4/2014	14252	15th ST N	Afton	9			
17087	3.18	5/23/2006	14229	15th ST S	Afton	9			
17640	2.08	2/4/2014	14229	15th St S	Afton	9			
16898	0.2	4/10/2014	14252	15th St S	Afton	9			
17742	0.2	5/25/2010	15444	11th ST S	Afton	10		163	6/24/1976
16661	3.9	5/12/2008	1553	Stagecoach TR S	Afton	10			
18678	1.17	2/10/2009	1553	Stagecoach TR S	Afton	10			
19249	0.2	8/10/2010	1553	Stagecoach TR S	Afton	10			
16456	0	8/8/2006	1553	Stagecoach TR S	Afton	10			
16999	0	8/8/2007	1553	Stagecoach TR S	Afton	10			
17736	0	8/8/2007	1553	Stagecoach TR S	Afton	10			

Table 1.- NO3-N concentrations in mg/L for samples collected from private wells in Afton for the period 2005-2014 (con't)

PHD#	NO3-(ml/l)	CollectedDate	StreetNo.	StreetName	City	Sect.	Aquifer	WellDepth	DrillDate
16902	0.2	8/7/2012	1380	Strawberry Hill RD	Afton	10			
18673	0.05	4/21/2015	16091	15th St S	Afton	11			
17234	0	9/18/2007	16120	Putnam BLVD S	Afton	14			
17527	2.29	3/31/2015	15330	Afton Hills Ct	Afton	15			
18060	1.45	8/16/2005	15276	Afton Hills CT S	Afton	15			
17769	0	7/12/2005	15318	Afton Hills CT S	Afton	15			
18933	0.05	4/28/2015	15416	Afton Hills Dr	Afton	15			
17267	0.2	7/14/2009	15078	Afton Hills DR S	Afton	15	Franconia	344	8/14/1984
17772	0.2	5/8/2012	15078	Afton Hills DR S	Afton	15	Franconia	344	8/14/1984
17392	0	4/24/2007	15078	Afton Hills DR S	Afton	15	Franconia	344	8/14/1984
17532	2.37	1/3/2012	15083	Afton Hills DR S	Afton	15			
17625	2.06	9/29/2015	15392	Afton Hills Dr S	Afton	15			
18675	0.05	8/2/2013	15511	Afton Hills DR S	Afton	15			
17140	2.89	2/6/2007	15785	Afton Hills DR S	Afton	15			
17723	0.05	5/12/2015	2005	Oakgreen Ave S	Afton	16			
17653	2	7/23/2013	2447	Trading Post TR S	Afton	16			
19000	0.45	7/16/2013	2447	Trading Post TR S	Afton	16			
17259	0	1/17/2006	14099	Valley Creek TR S	Afton	16			
16702	0	8/2/2005	14401	Valley Creek TR S	Afton	16			
17268	2.83	7/29/2010	14668	Valley Creek TR S	Afton	16	Franconia	120	12/16/1992
17126	3.66	8/28/2012	13035	Valley Creek TR S	Afton	17			
16446	4.44	6/7/2011	13726	Valley Creek TR S	Afton	17	Jordan	240	8/31/1985
16351	12.2	8/14/2007	12750	30th ST S	Afton	18			
16025	15.7	6/5/2012	12745	32nd ST S	Afton	19	Prairie Du Chein	145	10/6/1983
16166	13.4	6/8/2010	12745	32nd ST S	Afton	19	Prairie Du Chein	145	10/6/1983
18034	1.5	4/25/2006	12770	40th ST S	Afton	19	Jordan	440	12/9/1988
18654	0.97	3/29/2011	12770	40th ST S	Afton	19	Jordan	440	12/9/1988
16266	12.7	6/15/2010	3027	Manning AVE S	Afton	19			
17984	0.2	5/27/2014	5892	33rd St S	Afton	20			
16143	14.9	1/31/2006	13368	40th ST S	Afton	20			
17748	0.2	12/11/2007	13962	40th ST S	Afton	20			
17431	0.2	1/14/2008	13962	40th ST S	Afton	20			
15856	0.39	4/28/2015	3805	Neal Ave S	Afton	20			
18769	0	7/30/2007	3112	Nybeck AVE S	Afton	20			
16570	0.2	8/16/2005	3372	Nybeck AVE S	Afton	20			
16794	0.05	7/7/2015	14851	Afton Blvd Ct S	Afton	21			
16990	6.64	8/16/2005	14571	Afton BLVD S	Afton	21			
15855	0.2	8/8/2006	14641	Afton BLVD S	Afton	21			
18150	0.2	9/23/2014	14641	Afton Blvd S	Afton	21			
17717	6.04	3/26/2008	14725	Afton BLVD S	Afton	21			
16835	7.49	3/21/2006	14726	Afton BLVD S	Afton	21			
18768	0.2	6/14/2011	14825	Afton BLVD S	Afton	21	Franconia	125	11/18/1977
15853	0.2	9/8/2009	3355	Trading Post TR S	Afton	21			
17266	0.2	8/23/2011	3355	Trading Post TR S	Afton	21			
18266	0.2	7/30/2013	3355	Trading Post TR S	Afton	21			
17719	0	10/18/2005	3355	Trading Post TR S	Afton	21			
16542	0.2	4/9/2013	3486	Trading Post TR S	Afton	21			
18676	0.2	1/7/2014	15890	31st St	Afton	22			
18120	0.2	1/31/2012	15890	31st ST S	Afton	22			
18004	0.2	1/7/2014	15890	31st ST S	afton	22			
17262	0.05	8/25/2015	15890	31st St S	Afton	22			
17933	0.2	9/19/2006	15890	31st ST S	Afton	22			
17264	0.2	2/26/2008	15890	31st ST S	Afton	22			
16948	0.2	12/2/2009	15890	31st ST S	Afton	22			
16169	0	11/8/2005	15890	31st ST S	Afton	22			
18333	0	11/29/2005	15888	34th ST S	Afton	22			
17722	1.77	12/31/2013	15882	35th ST S	Afton	22			
18867	0.53	9/9/2014	15370	Afton Blvd	Afton	22			
17770	0	3/20/2007	15237	Afton BLVD S	Afton	22			
19088	0.2	1/3/2012	15398	Afton BLVD S	Afton	22			
17105	2.92	11/2/2015	15677	Afton Blvd S	Afton	22			
17624	2.07	12/11/2007	15751	Afton BLVD S	Afton	22			
17345	0.05	7/7/2015	15893	Afton Blvd S	Afton	22			
18112	0.2	5/25/2010	5	Coulee Ridge RD	Afton	22			
17101	0.2	6/7/2011	5	Coulee Ridge RD	Afton	22	Ironton - Galesville	216	10/17/1975

Table 1.- NO3-N concentrations in mg/L for samples collected from private wells in Afton for the period 2005-2014 (con't)

PHD#	NO3-(ml/l)	CollectedDate	StreetNo.	StreetName	City	Sect.	Aquifer	WellDepth	DrillDate
17743	0.2	6/29/2010	3975	Paradox End AVE S	Afton	22	Franconia	250	11/3/1994
19112	0.21	4/19/2005	3296	Pennington AVE S	Afton	22			
16692	3.86	6/20/2011	3322	Pennington AVE S	Afton	22			
16390	5.03	3/20/2012	3418	Pennington AVE S	Afton	22			
17983	1.54	6/20/2007	3418	Pennington AVE S	Afton	22			
17864	0.2	7/28/2009	3752	River RD S	Afton	22			
17017	6.2	9/18/2006	3329	Saint Croix TR S	Afton	22			
16532	5.7	8/25/2005	3329	Saint Croix TR S	Afton	22			
17965	0.05	5/4/2005	3419	Saint Croix TR S	Afton	22			
16021	0.05	5/5/2006	3419	Saint Croix TR S	Afton	22			
17768	0.05	6/30/2008	3419	Saint Croix TR S	Afton	22			
17766	1.62	1/10/2012	3579	Saint Croix TR S	Afton	22			
16462	11.1	11/4/2008	3601	Saint Croix TR S	Afton	22			
17204	0.02	5/25/2010	3742	Saint Croix TR S	Afton	22			
18507	1.04	6/29/2010	15857	Upper 34th ST S	Afton	22			
18470	0.2	1/3/2006	3936	River RD S	Afton	23			
17994	0.2	5/25/2010	4042	River RD S	Afton	26			
18809	0.7	6/6/2006	4142	River RD S	Afton	26			
16814	0	8/2/2005	4416	River RD S	Afton	26			
18825	0.59	8/19/2008	15621	42nd ST S	Afton	27			
16984	0.29	11/26/2007	15621	42nd ST S	Afton	27			
17384	0.2	10/16/2007	15621	42nd ST S	Afton	27			
18477	0.2	7/27/2010	4389	Pasture Ridge AVE S	Afton	27	Franconia	330	7/26/1999
19039	0.44	6/6/2006	4760	Pheasant CT S	Afton	27			
16768	0	11/8/2005	14605	41st ST S	Afton	28			
17333	0.2	3/7/2006	14323	42nd ST S	Afton	28	Franconia	160	9/28/1989
16925	0.2	5/25/2010	14323	42nd ST S	Afton	28	Franconia	160	9/28/1989
17725	0.2	12/16/2014	14323	42nd St S	Afton	28	Franconia	160	9/28/1989
17282	5.61	9/16/2008	14168	44th ST S	Afton	28			
17726	0.2	5/21/2008	4390	Partridge CIR S	Afton	28			
17993	0.2	10/4/2011	4390	Partridge CIR S	Afton	28			
18132	1.34	5/25/2010	1589	Trading Post TR S	Afton	28			
17091	0.28	7/31/2007	13575	40th ST S	Afton	29			
17773	0.2	9/19/2006	13446	50th ST S	Afton	29			
15819	0	6/5/2007	13446	50th ST S	Afton	29			
16038	15.4	5/28/2008	5333	Manning AVE S	Afton	31			
15766	0.2	2/1/2005	13115	50th ST S	Afton	32			
17741	0.2	12/2/2009	13115	50th ST S	Afton	32			
16989	0.2	1/31/2012	13115	50th ST S	Afton	32			
17186	0.2	1/7/2014	13115	50th St S	Afton	32			
18658	0	4/14/2006	13115	50th ST S	Afton	32			
16423	0	9/11/2007	13115	50th ST S	Afton	32			
17992	0.2	10/30/2007	13501	50th ST S	Afton	32			
18677	0	10/9/2007	13501	50th ST S	Afton	32			
16924	0.2	4/15/2008	14151	50th ST S	Afton	33			
16497	0.2	11/10/2009	14601	55th ST S	Afton	33			
18652	0.2	5/25/2010	14791	57th ST S	Afton	33	Franconia	141	7/22/1976
16454	4.4	5/11/2007	15061	Hudson RD S	Afton	33			
17735	0	8/14/2007	5380	Odell AVE S	Afton	33			
18989	0.2	2/2/2010	5650	Odell AVE S	Afton	33			
16572	0.2	6/20/2006	5124	Saint Croix TR S	Afton	33			
16182	0.2	8/25/2009	5124	Saint Croix TR S	Afton	33			
15854	0.2	9/17/2009	5124	Saint Croix TR S	Afton	33			
17995	0.2	7/13/2010	5124	Saint Croix TR S	Afton	33			
16923	0.2	9/27/2011	5124	Saint Croix TR S	Afton	33			
16795	0.2	8/21/2012	5124	Saint Croix TR S	Afton	33			
19278	0.2	8/21/2012	5124	Saint Croix TR S	Afton	33			
19308	0.2	8/13/2013	5124	Saint Croix TR S	Afton	33			
16838	0	7/12/2005	5124	Saint Croix TR S	Afton	33			
18860	0	6/20/2007	5124	Saint Croix TR S	Afton	33			
16256	0.05	8/4/2015	5124	St. Croix Trl S	Afton	33			
17758	0.23	8/12/2014	5124	St.Croix Trail S	Afton	33			
17222	0.2	11/19/2007	5912	Trading Post TR S	Afton	33			
17212	2.86	5/15/2007	5381	Saint Croix TR S	Afton	34			
16694	3.77	12/15/2015	5381	St Croix Trail South	Afton	34			

Table 2.- NO3-N concentrations in mg/L for samples collected from private wells in Afton in October 2016.

PHD #	NO3-(ml/l)	CollectedDate	StreetNo.	StreetName	City	Sect.	Aquifer	WellDepth	DrillDate
16725	2.04	10/25/16	14719	Hudson Rd S	Afton	4			
16743	2.44	10/25/16	14733	Hudson Rd S	Afton	4			
16820	5.05	10/25/16	467	Indian Trl S	Afton	5		100	0/0/1967
16700	4.82	10/25/16	470	Indian Trl S	Afton	5	Jordan	153	7/18/1978
16744	5.75	10/25/16	571	Neal Ave S	Afton	5		123	0/0/1958
16816	0.4	10/25/16	12180	8th St S	Afton	6	Jordan	235	11/30/1994
16707	0.09	10/25/16	12320	8th St S	Afton	6		347	11/0/1992
16783	6.86	10/25/16	1745	Manning Ave S	Afton	7		225	0/0/1958
16795	7.44	10/25/16	1313	Neal Ave S	Afton	8			0/0/1970
16740	7.77	10/25/16	1395	Neal Ave S	Afton	8			
16717	3.58	10/25/16	14124	15th St S	Afton	9		235	8/29/1994
16805	0.05	10/25/16	15444	11th St S	Afton	10		163	6/24/1976
16826	0.05	10/25/16	1480	Quant Ave S	Afton	10		180	6/1/1978
16733	3.84	10/25/16	1002	Stagecoach Trl S	Afton	10			
16825	2.15	10/25/16	1741	Stagecoach Trl S	Afton	10		105	1/12/1995
16739	2.75	10/25/16	1872	Stagecoach Trl S	Afton	10		63	
16787	0.91	10/25/16	15650	Afton Hills Dr S	Afton	15		250	0/0/1999
16790	5.99	10/25/16	14020	Valley Creek Trl	Afton	16			
16723	0.05	10/25/16	14125	Valley Creek Trl S	Afton	16			
16702	5.56	10/25/16	2951	Neal Ave S	Afton	17			0/0/1998
16714	2.64	10/25/16	2760	Nybeck Ave S	Afton	17		240	10/0/2008
16713	0.05	10/25/16	2950	Nybeck Ave S	Afton	17		260	0/0/2005
16681	12.3	10/25/16	13258	Valley Creek Trl S	Afton	17		175	
16766	16.6	10/25/16	12745	32nd St S	Afton	19	Prairie Du Chein	145	10/6/1983
16664	3.81	10/25/16	1980	Neal Ave S	Afton	19			0/0/2004
16790	6.71	10/25/16	3880	Neal Ave S	Afton	19			
16819	2.12	10/25/16	3233	Nybeck Ave S	Afton	20		189	
16745	0.05	10/25/16	14875	Afton Blvd Ct S	Afton	21		280	0/0/2002
16804	0.05	10/25/16	14933	Afton Blvd S	Afton	21		140	
16785	0.05	10/25/16	3180	Trading Post Trail S	Afton	21		250	7/23/1993
16795	0.05	10/25/16	3486	Trading Post Trl S	Afton	21		390	0/0/1995
16814	0.05	10/25/16	15892	33rd St S	Afton	22		70	
16796	0.05	10/25/16	15887	35th St S	Afton	22			
16708	0.05	10/25/16	15895	35th St S	Afton	22		100	0/0/1998
16671	0.05	10/25/16	15875	36th St S	Afton	22		85	0/0/1967
16741	1.53	10/25/16	15617	Afton Blvd S	Afton	22			
16672	0.05	10/25/16	15893	Afton Blvd S	Afton	22		140	7/24/2004
16806	0.05	10/25/16	5	Coulee Ridge Rd	Afton	22	Ironton - Galesville	216	10/17/1975
16791	0.05	10/25/16	3995	Pature Ridge Rd	Afton	22			0/0/1993
16650	1.85	10/25/16	3369	Pennington Ave S	Afton	22			
16720	0.87	10/25/16	15991	Upper 34th St S	Afton	22			
16720	5.07	10/25/16	3395	1st Croix Trl S	Afton	23			
16637	0.05	10/25/16	3904	River Road S	Afton	23			
16820	0.05	10/25/16	4270	River Rd S	Afton	26			
16813	0.05	10/25/16	15120	42nd St S	Afton	27		220	8/16/1993
16817	0.05	10/25/16	15269	42nd St S	Afton	27			
16706	0.05	10/25/16	4117	Penfield Ct S	Afton	27			0/0/1984
16688	0.05	10/25/16	14393	42nd St S	Afton	28		190	0/0/1992
16794	0.05	10/25/16	14020	44th St S	Afton	28		160	04/0/1992
16801	0.05	10/25/16	4243	Odell Ave S	Afton	28		165	6/0/1988
16715	0.05	10/25/16	4411	Oxbow Cir S	Afton	28		161	0/0/1978
16691	0.05	10/25/16	4626	Ozark Ave S	Afton	28		155	7/11/1973
16742	0.05	10/25/16	14791	57th St S	Afton	33	Franconia	141	7/22/1976
16669	0.05	10/25/16	5290	Odell Ave S	Afton	33			8/0/1990
16731	0.05	10/25/16	5650	Odell Ave S	Afton	33		150	0/0/1986
16823	0.05	10/25/16	5405	Osgood Ave S	Afton	33			0/0/1980
16670	0.05	10/25/16	5628	Trading Post Trl	Afton	33			
16821	3.88	10/25/16	15145	50th St S	Afton	34			
16807	0.05	10/25/16	16368	Swede Hill Dr S	Afton	35			