Big Creek Research and Extension Team

University of Arkansas System Division of Agriculture

Quarterly Report – January 1 to March 31, 2016

MONITORING THE SUSTAINABLE MANAGEMENT OF NUTRIENTS ON C&H FARM IN BIG CREEK WATERSHED

Mission of the University of Arkansas System Division of Agriculture

The mission of the **Division of Agriculture** is to advance the stewardship of natural resources and the environment, cultivate the improvement of agriculture and agribusiness, develop leadership skills and productive citizenship among youth and adults, enhance economic security and financial responsibility among the citizens of the state, ensure a safe, nutritious food supply, improve the quality of life in communities across Arkansas, and strengthen Arkansas families.

Dr. Mark J. Cochran
Vice President for Agriculture

Executive Summary

This is the first Quarterly Report of 2016 for the Big Creek Research and Extension Team that details progress made from January 1 through March 31, 2016.

1. We continue to collect weekly base flow and periodic storm flow water samples from Big Creek above and below the C&H Farm, along with water from a spring, ephemeral stream, surface runoff sites on Fields 1, 5a, and 12, two interceptor trenches below the slurry holding ponds, and reconfigured house well for chemical and bacterial analysis.

2. House well-water analyses from samples collected after the new sampling port and sampling protocol were in operation are summarized below.

	Dissolved P	Total P	Nitrate-N	Total N	E. coli	Total coliform	Conductivity
	---------- mg/L ----------				--- MPN/100L ---		µS/cm
9/30/2015	0.009	0.016	0.499	0.60	<1.0	2.0	446
10/8/2015	0.008	0.020	0.518	0.53	<1.0	<1.0	455
10/14/2015	0.012	0.020	0.490	0.63	<1.0	<1.0	461
10/22/2015	0.010	0.014	0.478	0.50	<1.0	2.0	453
10/28/2015	0.008	0.016	0.391	0.54	<1.0	<1.0	456
11/4/2015	0.010	0.016	0.468	0.54	<1.0	<1.0	455
11/12/2015	0.009	0.012	0.501	0.55	<1.0	<1.0	458
11/18/2015	0.009	0.014	0.464	0.59	<1.0	<1.0	458
12/2/2015	0.011	0.014	0.480	0.60	1.0	1.0	422
12/14/2015	0.011	0.010	0.545	0.57	<1.0	1.0	460
12/22/2015	0.010	0.016	0.534	0.59	<1.0	<1.0	458
1/5/2016	0.008	0.020	0.528	0.57	<1.0	1.0	439
1/25/2016	0.012	0.020	0.602	0.55	<1.0	<1.0	462
2/10/2016	0.007	0.014	0.542	0.56	<1.0	<1.0	468
2/24/2016	0.010	0.010	0.582	0.55	<1.0	<1.0	447

Big Creek Research Team

Andrew Sharpley, Ph.D., TEAM LEADER – Distinguished Professor - Soil science, water quality, soil phosphorus chemistry, agricultural management

Brian Breaker, M.Sc., Surface-Water Specialist, stream flow and constituent collection, analysis, and statistical evaluation of trends.

Kris Brye, Ph.D., Professor - Effects of land application of poultry litter on in-situ nutrient leaching, effects of land use and management practices on soil physical, chemical, and biological properties related to soil quality and sustainability

Rick Cartwright, Ph.D., Professor – Associate Director of Extension for Agriculture and Natural Resources

Mark Cochran, Ph.D., – Vice President, University of Arkansas System Division of Agriculture.

Mike Daniels, Ph.D., Professor – Extension water quality and nutrient management specialist

Ed Gbur, Ph.D., Professor and Director, Agricultural Statistics Laboratory - Experimental design, linear and generalized linear mixed models, regression, agricultural applications of statistics.

Brian Haggard, Ph.D., Professor - Ecological engineering, environmental soil and water sciences, water quality chemistry, water quality monitoring and modeling, algal nutrient limitation, pollutant transport in aquatic systems

Phil Hays, Ph.D. Ground Water Specialist, U.S. Geological Survey and Research Professor with Geosciences Dept., University of Arkansas, application of stable isotopes and other geochemical indicators in delineating movement and behavior of contaminants in ground-water systems

Tim Kresse, M.Sc., Water Quality Specialist, U.S. Geological Survey, natural geochemical evolution of groundwater and separating these processes from anthropogenic sources of contamination

Nathan McKinney, Ph.D., – Assistant Director, Agriculture Experiment Station

Morteza Mozaffari, Ph.D. – Director, Univ. of Arkansas Soil Testing and Research Laboratory, Marianna.

Mary Savin, Ph.D. - Structure and function of microbial communities in natural and managed ecosystems, microorganisms in nutrient cycling, contaminant degradation

Thad Scott, Ph.D., Associate Professor - Water quality, transport of contaminants to and within water bodies

Karl VanDevender, Ph.D. and P.E., Professor - Extension Engineer, Livestock and poultry manure and mortality management, nutrient management planning

Jun Zhu, PhD., Professor - Biological and agricultural engineering, agricultural sustainability, manure treatment technologies

Adam Willis, M.Sc., Newton County Extension Agent - Agriculture

Field Technicians - The Big Creek Research and Extension Team are ably supported by several excellent Program Technicians based in Little Rock and Fayetteville.

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Site 1. Edge-of-field monitoring on Field 1 permitted to receive slurry.

Site 2. Edge-of-field monitoring on Field 5a excluded from receiving slurry.

Site 3. Edge-of-field monitoring on Field 12 permitted to receive slurry.

Site 4. Ephemeral stream flow draining a subwatershed containing the production facilities.

Site 5. Spring below Field 1.

Site 6. Big Creek upstream of the C&H Farm operation.

Site 7. Big Creak downstream of the C&H Farm operation.

Site 8. Left Fork downstream of the C&H Farm operation.

Site 9. Manure holding pond north trench. The site was visited weekly and trench water sampled when flowing.

Site 10. Manure holding pond south trench.

Site 11. Well at animal facility.

Table 1. Location of sampling sites on the Big Creek Research and Extension Team project.

Site description	Latitude	Longitude	Elevation, ft
Field 1	35 55’ 06.42”	93 03’ 38.34”	984
Field 5a	35 56’03.01”	93 04’ 25.85”	778
Field 12	35 54’ 13.57”	93 04’ 04.76”	838
Ephemeral stream	35 55’ 25.89”	93 04’ 14.94”	824
Spring	35 54’ 57.06”	90 03’ 34.64”	977
Big Creek upstream of farm	35 53’ 32.28”	93 04’ 06.38”	857
Big Creek downstream of farm	35 56’ 18.98”	93 04’ 21.81”	769
Left Fork	35 5’”48.04”	93 04” 02.02”	760
Trench 1 (south)	35 55’ 19.24”	93 04’ 23.04”	896
Trench 2 (north)	35 55’ 21.39”	93 04’ 19.93”	883
House well	35 55’ 27.02”	93 04’ 22.71”	915

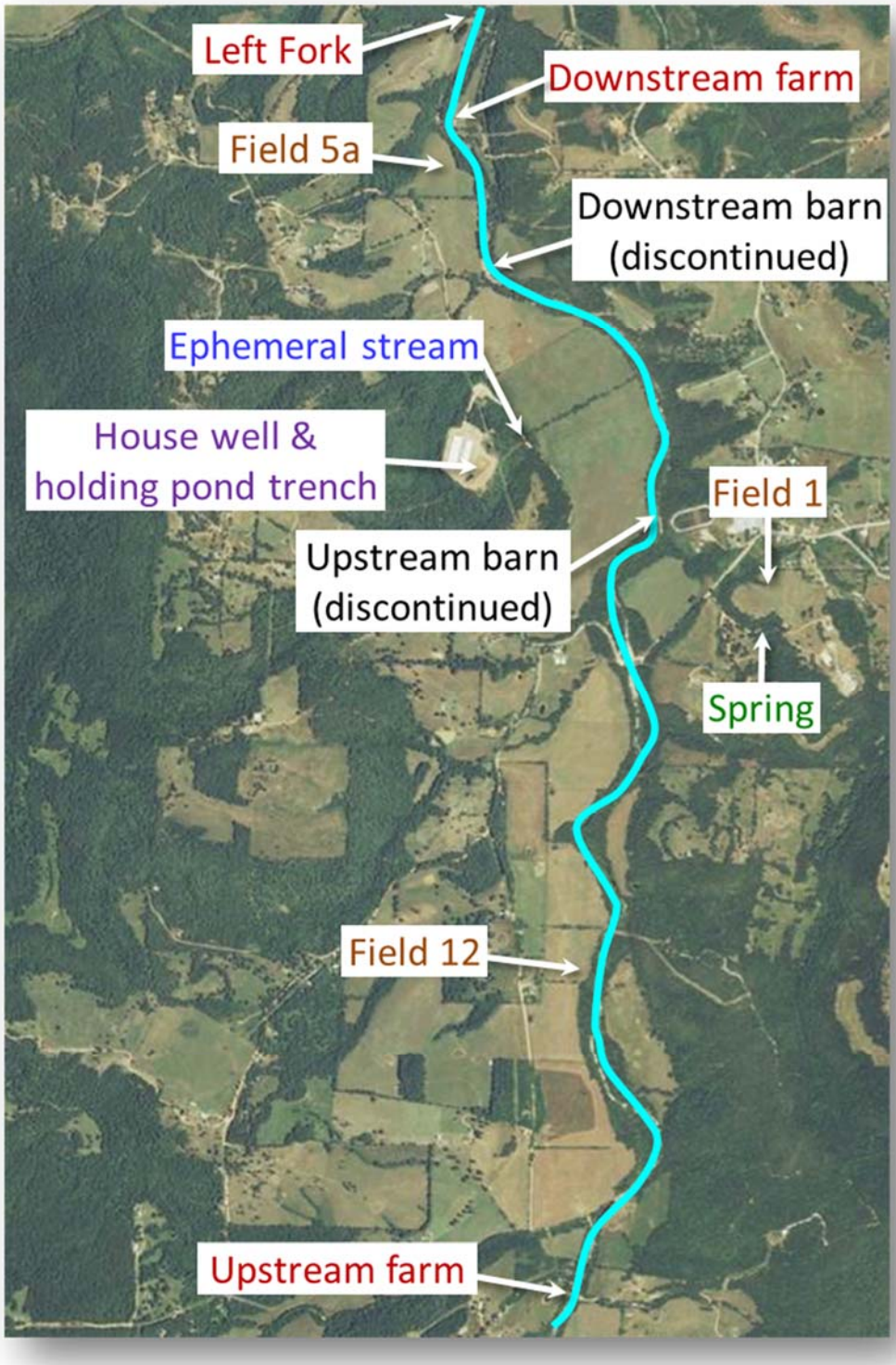

Figure 1. Location of sampling sites for the Big Creek Research and Extension Team project.

Sampling Protocols and Analyses

The following protocols were used to collect, prepare, and analyze all water samples:

1. One-liter acid-washed bottles were used to collect the stream samples for nutrient analyses.
2. Water was collected from just beneath the surface, where the stream was actively moving and well-mixed.
3. The bottle was rinsed with stream water before collecting the sample.
4. Sterilized specimen cups were used to collect samples for bacterial evaluation.
5. Time of collection was noted, and samples placed in a cooler on ice to preserve them until processed and were submitted to the Arkansas Water Resources Center Water Quality Lab on the day of collection for analyses.
6. Analyses included Alkalinity (APHA 2320-B), Ammonia (EPA 351.2), Chloride (EPA 300.0), Dissolved Phosphorus (EPA 365.2), E. coli (APHA 9223-B), Electrical Conductivity (EPA 120.1), Nitrate (EPA 300.0), pH (EPA 150.1), Total Coliforms (APHA 9223-B), Total Dissolved Solids (EPA 160.1), Total Nitrogen (APHA 4500-P J), Total Phosphorus (APHA 4500-P J), and Total Suspended Solids (EPA 160.2). APHA is American Public Health Association from the Wadeable Streams Assessment, Water Chemistry Laboratory Manual http://www.epa.gov/owow/monitoring/wsa/WRS_lab_manual.pdf
7. Prior to collection of a house well water sample, the well is purged and water temperature, pH, and electrical conductivity measured on-site every 30 seconds until all values stabilize (primarily water temperature). At that point a sample of water is collected in a 1-L acid-washed bottle. This method is taken from USGS and EPA well-water sampling protocols. See USGS methods for sampling at https://water.usgs.gov/owq/FieldManual/chapter4/pdf/Chap4_v2.pdf. Specific and detailed guidance on the collected of water quality data can be found in the USGS National Field Manual at file:///U:/Words/C&H%20Farm/Publications/Planning/USGS%20National%20Field%20Mannual_complete%202015.pdf

   The U.S. EPA also recommend that selected water quality parameters can be monitored during low-rate purging, with stabilization of these parameters indicating when the discharge water represents aquifer water or source well water. See: http://www.csus.edu/indiv/h/hornert/Geol_210_Summer_2012/Week%202%20readings/Puls%20and%20Barcelona%201996%20Low%20flow%20sampling.pdf and https://in-situ.com/wp-content/uploads/2015/01/Low-Flow-Groundwater-Sampling-Techniques-Improve-Sample-Quality-and-Reduce-Monitoring-Program-Costs-Case-Study.pdf
8. Minimum detection limits (MDLs) for each chemical and biological constituent are listed in Table 1. Some constituent concentrations were reported by the laboratory as less than the MDL but greater than zero. Those values are given in subsequent tables but have less confidence in their accuracy than concentrations above the MDL.
9. Chemical and biological analyses of samples collected from the beginning of 2015 to March 31, 2016 are given in Tables 2, 3, and 4.

Table 2. Minimum detection limits (MDLs) for each chemical and biological constituent.

Constituent	Minimum detection limit [1]
Alkalinity, mg/L as $CaCO_3$	2
Chloride, mg/L	0.093
Dissolved P, mg/L	0.002
Conductivity, uS/cm	1
Ammonia-N, mg/L	0.03
Dissolved organic carbon, mg/L	0.18
E. coli, MPN/100 mL	1
Nitrate-N, mg/L	0.004
pH	0.1
Total coliform, MPN/100 mL	1
Total dissolved solids, mg/L	15.22
Total N, mg/L	0.006
Total P, mg/L	0.012
Total suspended solids, mg/L	6.58

[1] MDL the Minimum Detection Limit of an analyte that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. Further information is available at http://water.usgs.gov/owq/OFR_99-193/detection.html

USGS Stations

Big Creek Continuous Flow

We are collaborating with USGS at Big Creek near Mt. Judea (USGS 705579; downstream of the C&H Farm operation) and at Left Fork Big Creek near Vendor (USGS 07055792), to collect base and storm water flows for N, P, and bacteria analysis. The USGS Big Creek site is instrumented with continuous flow gaging equipment and a nitrate sensor, which provides real-time flow, water temperature, nitrate-N, and precipitation data. These data are available on line at the USGS website below.

USGS 07055790 Big Creek near Mt. Judea, AR

http://nwis.waterdata.usgs.gov/ar/nwis/uv/?site_no=07055790&agency_cd=USGS

Big Creek Research and Extension Team Monitoring Data

Nutrients, Sediment, and Bacteria by Date of Sampling

Table 3. Water quality analyses at each sample site since 2015, with those collected since the last report noted. Coliform units are Most Probable Number (MPN) per 100 mL of water.

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
			---------- mg/L ----------							-- MPN/100 mL --	
1/8/2015	**1/8/2015**	**Base flow**									
11:05	15:05	Spring	0.010	0.014	<0.03 ¶	0.376	0.56	2.0	3.80	14.8	686.7
11:25	15:05	Upstream farm	0.009	0.022	<0.03	0.187	0.21	2.3	1.41	30.9	547.5
10:53	15:05	Downstream farm	0.011	0.024	<0.03	0.376	0.39	2.5	1.22	42.6	980.4
11:40	15:05	Ephemeral stream	0.008	0.022	<0.03	0.448	0.59	2.4	1.73	25.6	1203.3
12:00	15:05	Trench 1	0.005	0.022	<0.03	0.769	0.75	4.7	0.88	1.0	13130.0
1/14/2015	**1/14/2015**	**Base flow**									
11:30	15:20	Spring	0.010	0.028	<0.03	0.473	0.66	1.1	10.20	21.6	613.1
11:45	15:20	Upstream farm	0.012	0.032	<0.03	0.135	0.19	1.1	3.02	88.2	727.0
11:15	15:20	Downstream farm	0.011	0.020	<0.03	0.388	0.34	1.0	2.03	25.6	613.1
12:00	15:20	Ephemeral stream	0.007	0.028	<0.03	0.469	0.55	1.9	0.55	7.4	1413.6

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
1/21/2015	**1/21/2015**	**Base flow**									
11:15	15:28	Spring	0.009	0.020	<0.03	0.552	0.69	1.5	2.29	9.8	461.1
11:52	15:28	Upstream farm	0.008	0.018	<0.03	0.089	0.12	1.1	0.95	70.3	579.4
11:05	15:28	Downstream farm	0.010	0.026	0.06	0.197	0.30	1.1	1.60	37.4	613.1
11:25	15:28	Ephemeral stream	0.005	0.016	<0.03	0.370	0.46	1.0	2.34	155.3	2419.2
1/29/2015	**1/29/2015**	**Base flow**									
10:40	15:28	Spring	0.010	0.018	0.03	0.886	0.74	2.3	4.27	1.0	2850.0
11:45	15:28	Upstream farm	0.006	0.060	<0.03	0.065	0.21	47.8	1.71	727.0	1413.6
1:20	15:28	Downstream farm	0.009	0.020	0.04	0.168	0.27	1.3	1.50	19.9	1046.2
2/3/2015	**2/3/2015**	**Base flow**									
11:05	15:40	Spring	0.008	0.018	<0.03	0.691	0.77	3.8	7.64	1.0	461.1
11:40	15:40	Upstream farm	0.006	0.022	<0.03	0.051	0.28	1.1	2.69	4.1	1203.3
10:50	15:40	Downstream farm	0.009	0.018	<0.03	0.140	0.29	4.1	2.66	1.0	547.5
2/10/2015	**2/10/2015**	**Base flow**									
10:38	15:08	Spring	0.010	0.010	<0.03	0.544	0.64	1.9	0.76	2.0	686.7
11:05	15:08	Upstream farm	0.009	0.012	<0.03	0.056	0.09	0.7	1.04	1119.1	2419.2

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
10:25	15:08	Downstream farm	0.011	0.012	<0.03	0.143	0.23	1.0	1.15	7.4	1553.1
2/26/2015	**2/26/2015**	**Base flow**									
10:45	15:30	Spring	0.009	0.042	0.02	0.237	0.38	5.0	3.97	37.3	2419.2
11:36	15:30	Upstream farm	0.006	0.024	<0.03	0.100	0.13	0.6	1.20	47.9	686.7
10:34	15:30	Downstream farm	0.008	0.026	0.02	0.200	0.25	0.8	1.17	48.7	866.4
10:55	15:30	Ephemeral stream	0.006	0.022	<0.03	0.530	0.57	1.3	1.38	16.1	4790.0
11:15	15:30	Trench 1	0.004	0.028	0.01	0.712	0.76	46.0	0.60	1.0	41063.0
3/3/2015	**3/3/2015**	**Base flow**									
11:07	15:33	Spring	0.008	0.052	<0.03	0.124	0.35	13.5	4.90	N.S. §	N.S.
11:50	15:33	Upstream farm	0.006	0.026	0.02	0.048	0.11	2.3	1.50	N.S.	N.S.
10:55	15:33	Downstream farm	0.007	0.028	<0.03	0.138	0.23	1.3	1.50	N.S.	N.S.
11:18	15:33	Ephemeral stream	0.006	0.020	<0.03	0.477	0.52	2.0	1.84	N.S.	N.S.
11:30	15:33	Trench 1	0.003	0.024	<0.03	0.867	0.89	14.9	0.95	N.S.	N.S.
3/11/2015	**3/11/2015**	**Storm Flow**									
11:30	14:58	Spring	0.009	0.030	<0.03	0.242	2.37	5.5	14.79	19.5	111.9

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
12:30	14:58	Upstream farm	0.005	0.026	0.02	0.118	0.16	2.1	3.38	34.5	579.4
11:20	14:58	Downstream farm	0.007	0.030	0.02	0.209	0.27	1.8	1.44	66.3	770.1
11:45	14:58	Ephemeral stream	0.006	0.022	0.04	0.567	0.60	0.5	2.20	6.3	410.0
12:10	14:58	Trench 1	0.003	0.014	0.07	0.989	0.97	0.3	2.00	<1.0	2419.2
12:15	14:58	Trench 2	0.003	0.056	0.04	1.443	1.59	1.2	3.51	<1.0	2419.2
3/19/2015	**3/19/2015**	**Base flow**									
10:59	15:10	Spring	0.010	0.028	0.03	0.184	0.29	10.6	7.37	38.9	79.4
12:00	15:10	Upstream farm	0.007	0.024	0.04	0.111	0.20	1.7	2.53	42.6	866.4
11:13	15:10	Downstream farm	0.009	0.028	0.04	0.234	0.35	2.8	2.87	71.7	1119.9
11:08	15:10	Ephemeral stream	0.007	0.018	0.01	0.529	0.63	1.0	4.31	14.6	866.4
11:13	15:10	House well	0.009	0.020	0.02	0.467	0.55	1.2	4.93	1.0	31.3
11:30	15:10	Trench 1	0.003	0.012	0.01	0.849	0.93	<6.58	3.11	1.0	275.5
11:35	15:10	Trench 2	0.004	0.062	0.09	1.036	1.42	1.9	5.12	5.2	2419.2
3/25/2015	**3/25/2015**	**Base flow**									

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
11:45	15:20	Spring	0.006	0.014	0.02	0.197	0.39	1.6	1.45	23.1	275.5
13:30	15:20	Upstream farm	0.006	0.028	0.02	0.056	0.16	2.9	1.36	125.9	2419.2
11:30	15:20	Downstream farm	0.008	0.036	0.04	0.162	0.29	5.0	1.41	547.5	3410.0
12:00	15:20	Ephemeral stream	0.007	0.014	0.02	0.462	0.53	1.1	0.64	8.6	344.8
12:20	15:20	House well	0.007	0.016	<0.03	0.450	0.52	1.9	0.03	18.5	30.1
12:30	15:20	Trench 1	0.003	0.008	<0.03	0.838	0.88	0.2	0.59	<1.0	410.6
3/26/2015	**3/26/2015**	**Storm flow**									
13:10	15:25	Upstream farm	0.013	0.064	0.06	0.090	0.30	11.4	3.71	547.5	5200.0
13:35	15:25	Downstream farm	0.013	0.076	0.06	0.144	0.41	14.1	3.94	816.4	4960.0
12:55	15:25	Trench 1	0.004	0.026	0.02	0.904	1.00	15.4	0.69	<1.0	1553.1
12:50	15:25	Trench 2	0.004	0.126	0.13	0.873	1.44	22.2	4.63	105.4	6950.0
13:20	15:25	Field 1	0.143	0.346	0.41	0.216	2.68	65.5	15.65	N.S.	N.S.
12:30	15:25	Field 5a	0.813	1.330	0.39	0.225	2.59	72.3	15.95	N.S.	N.S.
4/2/2015	**4/2/2015**	**Base flow**									

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
11:50	15:25	Spring	0.008	0.042	0.04	0.173	0.35	3.5	10.47	248.1	1299.7
12:15	15:25	Upstream farm	0.007	0.040	0.02	0.045	0.14	3.1	3.61	166.9	2419.2
1:30	15:25	Downstream farm	0.007	0.042	0.02	0.139	0.22	2.5	2.71	121.1	1986.3
12:30	15:25	Ephemeral stream	0.006	0.032	0.02	0.467	0.46	1.8	4.41	5.2	547.5
12:48	15:25	House well	0.008	0.030	<0.03	0.477	0.50	0.7	6.05	39.3	9060.0
12:54	15:25	Trench 1	0.003	0.028	0.02	0.865	0.87	0.3	3.34	1.1	308.6
4/9/2015	**4/9/2015**	**Base flow**									
11:45	15:30	Spring	0.011	0.034	0.01	0.257	0.42	4.9	9.11	7380.0	9040.0
12:30	15:30	Upstream farm	0.011	0.042	0.04	0.066	0.18	13.1	2.13	86.0	2650.0
12:50	15:30	Downstream farm	0.010	0.048	0.03	0.157	0.25	19.7	1.82	47.2	1986.3
12:00	15:30	House well	0.011	0.026	<0.03	0.499	0.50	1.5	0.74	4.1	325.5
12:10	15:30	Trench 1	0.006	0.018	<0.03	0.790	0.83	0.8	2.99	<1.0	187.2
4/15/2015	**4/15/2015**	**Storm Flow**									
11:38	14:55	Spring	0.007	0.034	<0.03	0.210	0.39	7.7	4.70	275.5	2280.0

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
12:23	14:55	Upstream farm	0.007	0.040	0.03	0.090	0.16	3.5	3.24	648.8	4040.0
12:40	14:55	Downstream farm	0.009	0.048	0.03	0.166	0.26	4.4	2.67	344.8	2920.0
11:48	14:55	Ephemeral stream	0.005	0.026	0.03	0.472	0.56	0.8	1.26	305.0	2430.0
11:58	14:55	House well	0.008	0.022	0.02	0.475	0.60	1.2	3.72	9.6	80.9
12:10	14:55	Trench 1	0.003	0.020	<0.03	0.857	0.93	1.3	4.29	<1.0	3180.0
4/23/2015	**4/23/2015**	**Base Flow**									
12:23	15:30	Spring	0.008	0.034	<0.03	0.264	0.36	7.4	3.64	71.7	648.8
13:00	15:30	Upstream farm	0.007	0.032	0.03	0.083	0.18	4.0	5.11	104.6	2419.2
12:15	15:30	Downstream farm	0.007	0.032	0.03	0.162	0.25	2.6	2.51	65.7	2419.2
11:55	15:30	Ephemeral stream	0.008	0.026	0.03	0.520	0.56	2.0	1.78	12.0	3270.0
11:35	15:30	House well	0.008	0.082	<0.03	0.496	0.53	1.4	1.69	18.5	35.0
11:48	15:30	Trench 1	0.003	0.034	<0.03	0.877	0.97	1.2	1.18	3.1	2690.0
4/29/2015	**4/29/2015**	**Base flow**									
11:25	14:05	Spring	0.010	0.028	<0.03	0.419	0.59	9.0	4.28	25.6	1732.9

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
11:53	14:05	Upstream farm	0.010	0.020	0.03	0.082	0.13	2.7	1.58	58.3	1732.4
12:13	14:05	Downstream farm	0.012	0.018	0.03	0.189	0.82	2.1	1.64	58.6	1986.3
11:30	14:05	Ephemeral stream	0.012	0.018	0.02	0.569	0.61	3.5	1.98	14.3	4080.0
11:35	14:05	House well	0.010	0.006	<0.03	0.517	0.51	0.7	2.26	248.1	5040.0
5/7/2015	**5/7/2015**	**Base flow**									
11:10	14:10	Spring	0.011	0.036	0.02	0.499	0.58	9.9	44.04	135.4	980.4
11:43	14:10	Upstream farm	0.008	0.032	0.01	0.110	0.16	7.5	10.16	77.6	3280.0
12:05	14:10	Downstream farm	0.009	0.034	<0.03	0.267	0.36	4.5	7.70	27.8	2280.0
11:18	14:10	Ephemeral stream	0.013	0.066	0.02	0.628	0.71	3.2	16.41	71.7	7170.0
11:23	14:10	House well	0.008	0.022	0.01	0.512	0.49	<6.58	28.63	3.1	59.4
5/8/2015	**5/8/2015**	**Storm flow**									
13:25	15:32	Upstream farm	0.134	0.354	0.16	0.340	1.12	51.4	9.30	N.S.	N.S.
13:25	15:32	Downstream farm	0.195	0.544	0.27	0.292	1.20	113.2	7.47	N.S.	N.S.

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
11:43	15:32	Ephemeral stream	0.005	0.254	0.41	2.287	3.23	127.1	6.45	N.S.	N.S.
13:00	15:32	Field 1	0.525	0.714	0.16	0.475	2.19	16.9	13.28	N.S.	N.S.
12:38	15:32	Field 12	0.675	0.956	0.14	0.303	1.82	57.0	16.00	N.S.	N.S.
5/11/2015	**5/12/2015**	**Storm Flow**									
11:35	8:30	Spring	0.008	0.058	0.01	0.339	0.49	8.7	3.67	N.S.	N.S.
11:28	8:30	Upstream farm	0.004	0.074	0.04	0.004	0.24	4.5	4.31	N.S.	N.S.
12:47	8:30	Downstream farm	0.031	0.530	0.11	0.071	1.12	277.5	8.48	N.S.	N.S.
12:05	8:30	Ephemeral stream	0.008	0.146	0.15	0.941	1.80	22.0	8.09	N.S.	N.S.
12:15	8:30	House well	0.009	0.038	0.02	0.541	0.55	4.2	0.89	N.S.	N.S.
12:25	8:30	Trench 1	0.003	0.060	0.02	0.916	0.97	27.6	1.78	N.S.	N.S.
12:35	8:30	Trench 2	0.003	0.042	0.05	0.553	0.76	8.8	3.44	N.S.	N.S.
11:25	8:30	Field 1	0.251	0.386	0.09	0.055	0.86	44.4	6.31	N.S.	N.S.

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
11:40	8:30	Field 5a	0.248	0.968	0.26	0.127	1.50	320.1	8.58	N.S.	N.S.
1:05	8:30	Field 12	0.194	0.364	0.09	0.135	0.83	36.7	7.03	N.S.	N.S.
5/14/2015	**5/14/2015**	**Base flow**									
12:35	15:12	Spring	0.009	0.062	0.02	0.222	0.35	41.5	2.84	121.1	2419.2
12:28	15:12	Upstream farm	0.011	0.046	0.02	0.177	0.23	2.8	1.35	145.5	2470.0
12:47	15:12	Downstream farm	0.015	0.050	0.02	0.326	0.39	6.1	1.16	128.1	4370.0
12:57	15:12	Left Fork	0.015	0.038	0.02	0.321	0.38	3.3	1.36	83.3	2690.0
12:15	15:12	Ephemeral stream	0.010	0.022	0.01	0.527	0.50	1.7	0.73	41.3	1986.3
12:05	15:12	Trench 1	0.005	0.042	0.02	0.904	0.94	29.9	1.20	81.6	1732.9
5/18/2015	**5/18/2015**	**Storm Flow**									
10:45	14:43	Spring	0.005	0.084	0.05	0.209	0.56	114.2	2.79	98.7	1413.6
11:57	14:43	Upstream farm	0.007	0.034	0.02	0.110	0.15	5.2	1.29	137.6	2419.2

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
12:17	14:43	Downstream farm	0.009	0.040	0.03	0.201	0.25	6.1	1.47	185.0	6770.0
12:29	14:43	Left Fork	0.011	0.040	0.04	0.209	0.29	4.1	1.90	167.4	8300.0
11:14	14:43	Ephemeral stream	0.007	0.028	0.03	0.525	0.55	0.7	1.18	90.7	7630.0
11:20	14:43	House well	0.008	0.018	<0.03	0.529	0.53	0.9	0.90	5.2	13.4
12:55	14:43	Trench 1	0.002	0.020	<0.03	0.897	0.93	0.3	1.28	32.3	1732.9
10:58	14:43	Field 1	0.208	0.512	0.54	0.410	3.59	53.7	26.12	N.S.	N.S.
5/26/2015	**5/26/2015**	**Base flow**									
11:49	15:48	Spring	0.021	0.020	<0.03	0.205	0.29	1.2	2.66	N.S.	N.S.
13:20	15:48	Upstream farm	0.012	0.044	0.04	0.080	0.19	6.4	1.50	N.S.	N.S.
13:32	15:48	Downstream farm	0.045	0.200	0.11	0.096	0.56	94.7	4.57	N.S.	N.S.
13:45	15:48	Left Fork	0.014	0.048	0.04	0.139	0.29	6.1	2.41	N.S.	N.S.
13:11	15:48	Ephemeral stream	0.017	0.030	0.03	0.514	0.60	0.9	1.12	N.S.	N.S.
12:43	15:48	House well	0.013	0.020	<0.03	0.514	0.54	2.7	0.87	N.S.	N.S.

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
12:55	15:48	Trench 1	0.007	0.012	0.01	0.752	0.80	1.0	0.78	N.S.	N.S.
1:00	15:48	Trench 2	0.007	0.112	0.04	1.190	1.44	131.9	1.23	N.S.	N.S.
12:09	15:48	Field 1	0.245	0.432	0.20	0.174	1.66	37.8	11.28	N.S.	N.S.
6/1/2015	**6/1/2015**	**Storm Flow**									
13:15	15:20	Downstream farm	0.006	0.050	0.05	0.109	0.25	13.7	1.80	N.S.	N.S.
12:00	15:20	Ephemeral stream	0.002	0.056	0.01	0.851	1.05	18.3	2.46	N.S.	N.S.
6/4/2015	**6/4/2015**	**Base Flow**									
12:50	15:20	Spring	0.010	0.028	<0.03	0.239	0.3	6.2	9.54	44.3	1413.8
12:00	15:20	Upstream farm	0.008	0.026	0.03	0.083	0.11	2.3	2.93	38.6	>2419.2
13:05	15:20	Downstream farm	0.009	0.034	<0.03	0.184	0.23	1.7	2.64	24.7	2419.2
13:13	15:20	Left Fork	0.008	0.022	<0.03	0.145	0.19	2.1	3.15	38.9	2560.0
11:40	15:20	Ephemeral stream	0.010	0.024	0.02	0.572	0.58	0.8	5.35	21.6	3890.0
11:35	15:20	House well	0.012	0.022	0.02	0.561	0.52	1.3	6.07	<1.0	14.6
6/8/2015	**6/8/2015**	**Base flow**									
11:36	15:30	House well	0.008	0.018	0.27	0.475	0.82	0.7	6.67	<1.0	<1.0

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
10:45	15:30	Spring	0.011	0.046	0.03	0.322	0.53	12.7	11.18	20.1	1986.3
12:26	15:30	Upstream farm	0.010	0.030	0.06	0.058	0.24	4.5	3.63	866.4	2780.0
13:12	15:30	Downstream farm	0.009	0.022	0.05	0.185	0.27	0.9	2.66	57.4	4640.0
13:25	15:30	Left Fork	0.006	0.024	0.02	0.102	0.23	1.1	2.78	32.7	4550.0
11:51	15:30	Ephemeral stream	0.009	0.020	0.03	0.560	0.62	0.6	2.81	65.7	9870.0
6/17/2015	**6/17/2015**	**Base flow**									
12:08	15:40	Spring	0.009	0.046	0.07	0.224	0.47	9.4	8.92	517.2	24890.0
10:10	15:40	Upstream farm	0.009	0.036	0.03	0.050	0.16	3.5	2.83	435.2	13130.0
12:49	15:40	Downstream farm	0.007	0.034	0.03	0.106	0.23	2.3	2.92	344.8	20980.0
13:01	15:40	Left Fork	0.005	0.026	0.04	0.112	0.22	2.8	1.62	26.2	8550.0
11:50	15:40	Ephemeral stream	0.009	0.032	0.04	0.948	1.04	6.7	0.97	770.1	8840.0
11:47	15:40	House well	0.010	0.028	0.03	0.466	0.52	0.06	3.08	488.4	15390.0
6/22/2015	**6/22/15**	**Storm flow**									

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
12:30	15:55	Spring	0.009	0.032	0.03	0.218	0.26	5.3	3.01	61.3	1413.6
12:15	15:55	Upstream farm	0.010	0.030	0.01	0.042	0.05	2.9	0.99	78.0	4960.0
12:55	15:55	Downstream farm	0.009	0.032	0.04	0.136	0.16	2.9	1.15	36.8	5040.0
13:10	15:55	Left Fork	0.011	0.030	0.02	0.147	0.18	2.5	1.59	35.4	5910.0
10:50	15:55	Ephemeral stream	0.011	0.026	0.05	0.563	0.61	1.3	1.21	37.9	2419.2
10:45	15:55	House well	0.010	0.032	0.02	0.459	0.43	0.4	1.85	27.2	1732.9
10:30	15:55	Trench 1	0.005	0.048	0.07	0.653	0.76	47.3	1.86	21.1	1986.3
6/29/2015	**6/29/2015**	**Storm flow**									
10:47	15:32	Spring	0.013	0.018	0.03	0.235	0.30	1.7	5.26	93.3	2419.2
12:30	15:32	Upstream farm	0.010	0.028	0.14	0.055	0.13	2.7	2.49	117.8	4710
13:22	15:32	Downstream farm	0.068	0.748	0.17	0.147	1.88	571	6.57	135.4	7540
13:30	15:32	Left Fork	0.010	0.026	0.02	0.189	0.26	2.9	2.80	53.6	10170
12:20	15:32	Ephemeral stream	0.067	1.268	0.34	0.580	3.42	1366.8	11.04	69.7	4040
12:15	15:32	Trench 1	0.008	0.022	0.05	0.394	0.42	56.8	4.17	82.3	11450

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
10:48	15:32	Field 1	0.354	0.524	0.37	0.226	1.64	11	11.32	N.S.	N.S.
7/6/2015	**7/7/2015**	**Storm flow**									
19:45	14:58	Downstream farm	0.275	0.380	0.22	0.204	1.03	19.1	7.91	N.S.	N.S.
17:10	14:58	Ephemeral stream	0.063	0.658	0.37	0.717	2.75	567.3	8.52	N.S	N.S.
13:25	14:58	Field 1	0.387	0.444	0.23	0.345	1.30	4.9	8.32	N.S.	N.S.
16:45	14:58	Field 12	0.796	0.910	0.13	0.567	1.58	29.0	7.67	N.S.	N.S.
18:25	14:58	Field 5a	0.094	0.448	0.13	0.172	1.01	261.3	4.38		
7/9/2015	**7/9/2015**	**Base flow**									
13:37	15:15	Spring	0.011	0.048	0.09	0.144	0.41	4.3	6.47	77.1	3050.0
12:25	15:15	Upstream farm	0.013	0.048	0.02	0.087	0.18	6.8	2.75	201.4	10140.0
12:55	15:15	Downstream farm	0.014	0.050	0.03	0.117	0.24	8.8	2.32	275.5	10760.0
13:15	15:15	Left Fork	0.015	0.058	0.04	0.138	0.31	11.4	2.67	387.3	12670.0
12:12	15:15	Ephemeral stream	0.010	0.034	<0.03	0.569	0.71	4.9	2.56	78.9	5560.0
12:07	15:15	House well	0.011	0.024	0.01	0.423	0.48	2.0	1.69	9.8	4160.0
12:00	15:15	Trench 1	0.007	0.030	<0.03	0.520	0.62	7.1	2.52	63.7	12330.0

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
7/16/2015	**7/16/2015**	**Base flow**									
12:15	15:10	Upstream farm	0.010	0.024	0.02	0.065	0.15	0.5	1.91	41.3	52.0
12:54	15:10	Downstream farm	0.011	0.030	<0.03	0.195	0.33	0.5	1.35	11.8	6310.0
13:03	15:10	Left Fork	0.010	0.042	0.01	0.181	0.28	0.9	1.64	21.6	9330.0
12:33	15:10	Ephemeral stream	0.011	0.046	0.01	0.517	0.61	0.4	2.16	45.7	14830.0
12:28	15:10	House well	0.012	0.024	0.01	0.471	0.47	0.0	4.00	2.0	727.0
12:42	15:10	Spring	0.010	0.024	0.01	0.303	0.41	5.7	5.54	22.8	1413.6
7/23/2015	**7/23/2015**	**Storm flow**									
10:55	15:20	Spring	0.010	0.026	<0.03	0.436	0.60	2.7	1.12	61.3	1046.2
11:15	15:20	Upstream farm	0.009	0.026	0.02	0.096	0.18	1.3	0.97	93.3	7490.0
12:40	15:20	Downstream farm	0.011	0.028	0.02	0.198	0.31	0.8	1.06	16.8	4870.0
13:02	15:20	Left Fork	0.009	0.028	0.04	0.239	0.40	1.4	1.21	35.4	8360.0
12:00	15:20	Ephemeral stream	0.011	0.034	<0.03	0.511	0.68	11.3	0.33	201.4	24950.0
12:23	15:20	House well	0.015	0.030	<0.03	0.442	0.52	1.0	0.89	8.5	35.0
7/30/2015	**7/30/2015**	**Base flow**									

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
12:28	15:20	Spring	0.011	0.026	0.03	0.479	0.65	6.3	4.73	6.3	920.8
12:17	15:20	Upstream farm	0.014	0.024	<0.03	0.101	0.15	0.9	1.61	27.2	2880.0
12:50	15:20	Downstream farm	0.012	0.022	0.02	0.268	0.38	1.9	2.16	11.9	6500.0
13:00	15:20	Left Fork	0.008	0.020	0.04	0.221	0.37	2.3	2.60	30.3	8160.0
11:58	15:20	House well	0.013	0.014	0.02	0.466	0.51	0.3	0.90	1.0	7.4
8/6/2015	**8/6/2015**	**Storm flow**									
12:05	14:50	Spring	0.008	0.240	0.07	0.265	0.97	<6.58	7.10	23.1	48840.0
11:36	14:50	Upstream farm	0.009	0.028	<0.03	0.147	0.24	1.8	3.37	488.4	13540.0
12:22	14:50	Downstream farm	0.010	0.028	0.03	0.406	0.52	1.7	3.06	40.2	10390.0
12:37	14:50	Left Fork	0.007	0.026	0.04	0.310	0.47	1.2	3.16	217.8	8130.0
10:37	14:50	House well	0.010	0.018	0.04	0.482	0.52	0.5	3.33	920.8	21870.0
8/13/2015	**8/13/2015**	**Base flow**									
11:40	15:30	Spring	0.009	0.360	0.15	0.735	1.12	254.9	7.29	21.6	3360.0
12:06	15:30	Upstream farm	0.013	0.018	0.04	0.124	0.16	0.3	4.32	13.4	2460.0
13:01	15:30	Downstream farm	0.011	0.024	<0.03	0.384	0.50	4.0	3.74	24.0	3310.0
13:12	15:30	Left Fork	0.007	0.016	0.03	0.192	0.52	1.4	4.50	13.2	4810.0
11:53	15:30	House well	0.025	0.012	0.03	0.498	0.58	0.5	6.15	4.1	228.2

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
8/20/2015	**8/20/2015**	**Storm flow**									
11:32	14:05	Spring	0.009	0.276	0.07	0.337	0.89	223.6	17.88	148.3	3270.0
11:49	14:05	Downstream farm	0.015	0.022	0.03	0.491	0.53	2.2	5.94	39.3	66.3
12:04	14:05	Left Fork	0.009	0.028	0.04	0.306	0.42	2.3	5.12	48.8	3930.0
10:52	14:05	House well	0.012	0.018	<0.03	0.545	0.56	0.9	6.63	1.0	29.5
8/27/2015	**8/27/2015**	**Base flow**									
12:48	15:35	Spring	0.007	0.158	0.04	0.329	0.69	103.7	9.07	27.2	7540.0
12:37	15:35	Upstream farm	0.005	0.028	0.04	0.084	0.28	2.9	4.30	104.6	7710.0
1:20	15:35	Downstream farm	0.013	0.024	<0.03	0.450	0.54	2.5	4.43	137.4	5730.0
1:30	15:35	Left Fork	0.008	0.024	0.02	0.218	0.33	2.0	3.79	7.4	3010.0
12:20	15:35	House well	0.012	0.018	<0.03	0.599	0.61	1.6	3.66	1.0	61.3
9/2/2015	**9/2/2015**	**Base flow**									
12:06	14:45	Spring	0.007	0.620	0.10	0.304	1.27	2.47	402.7	155.3	15530.0
11:50	14:45	Upstream farm	0.007	0.042	0.07	0.047	0.39	3.37	5.5	46.4	9070.0
12:19	14:45	Downstream farm	0.010	0.020	0.01	0.449	0.55	3.2	4.80	20.3	6630.0
12:30	14:45	Left Fork	0.010	0.020	0.01	0.449	0.55	3.19	4.8	20.3	6630.0
11:30	14:45	House well	0.007	0.020	0.03	0.109	0.33	1.67	3.8	26.9	5290.0

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
9/10/2015	**9/10/2015**	**Base flow**									
12:45	15:15	Spring	0.004	0.026	0.02	0.197	0.39	6.50	3.5	980.4	38730.0
12:59	15:15	Downstream farm	0.008	0.028	0.02	0.464	0.58	3.96	2.9	66.3	5470.0
13:10	15:15	Left Fork	0.006	0.026	<0.03	0.198	0.34	4.09	2.5	21.6	7230.0
11:56	15:15	House well	0.010	0.018	<0.03	0.576	0.60	3.21	0.3	8.6	727.0
9/16/2015	**9/16/2015**	**Base flow**									
11:41	14:40	Spring	0.004	0.176	<0.03	0.260	0.70	5.84	111.2	130.9	8330.0
12:06	14:40	Upstream farm	0.004	0.024	<0.03	0.104	0.30	4.62	2.1	50.4	3590.0
12:24	14:40	Downstream farm	0.009	0.030	0.01	0.404	0.62	4.59	1.4	6.2	4800.0
12:36	14:40	Left Fork	0.006	0.032	<0.03	0.146	0.48	2.49	1.3	38.2	6333.0
11:52	14:40	House well	0.009	0.020	<0.03	0.559	0.60	2.58	0.2	1.0	148.3
9/24/2015	**9/24/2015**	**Base flow**									
11:40	14:30	Spring	0.006	0.024	<0.03	0.216	0.42	10.59	12.3	8.6	1119.9
11:30	14:30	Upstream farm	0.006	0.078	<0.03	0.200	0.41	5.92	14.8	17.1	4570.0
12:07	14:30	Downstream farm	0.009	0.018	<0.03	0.449	0.56	5.58	1.2	29.9	7540.0
12:18	14:30	Left Fork	0.007	0.016	0.01	0.098	0.20	3.08	0.6	31.3	3410.0
11:19	14:30	House well	0.009	0.012	<0.03	0.543	0.58	7.72	0.3	<1.0	24.6

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
9/30/2015	**9/30/2015**	**Base flow**									
12:00	15:15	Spring	0.005	0.630	0.11	0.178	1.15	15.88	450.3	137.6	36540.0
11:50	15:15	Downstream farm	0.008	0.022	0.01	0.472	0.66	5.43	4.5	31.7	5290.0
11:42	15:15	Left Fork	0.007	0.018	<0.03	0.082	0.20	4.98	1.2	18.3	5940.0
12:43	15:15	House well	0.009	0.016	<0.03	0.499	0.60	4.20	0.5	<1.0	2.0
10/8/2015	**10/8/2015**	**Base flow**									
11:32	14:05	Spring	0.003	0.018	0.02	0.176	0.27	4.5	2.43	<1.0	686.7
11:20	14:05	Downstream farm	0.005	0.020	0.02	0.517	0.60	1.5	1.62	21.3	12360.0
11:10	14:05	Left Fork	0.003	0.020	0.02	0.069	0.15	1.5	1.58	59.8	3640.0
12:15	14:05	House well	0.008	0.020	0.02	0.518	0.53	0.5	1.54	<1.0	<1
10/14/2015	**10/14/2015**	**Base flow**									
11:42	14:40	Spring	0.008	0.056	0.03	0.193	0.36	27.5	1.50	<1.0	248.1
11:28	14:40	Downstream farm	0.010	0.056	0.03	0.603	0.76	12.4	1.33	7.3	8164.0
11:17	14:40	Left Fork	0.009	0.022	0.01	0.078	0.16	2.2	1.28	9.8	1986.3
12:10	14:40	House well	0.012	0.020	<0.03	0.490	0.63	0.3	0.94	<1.0	<1
10/22/2015	**10/22/2015**	**Base flow**									
12:35	13:45	Spring	0.005	0.028	0.03	0.173	0.33	11.4	6.99	<1.0	307.6

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
12:15	13:45	Downstream farm	0.008	0.018	0.07	0.548	0.69	2.3	3.64	17.8	3140.0
12:05	13:45	Left Fork	0.008	0.018	<0.03	0.069	0.13	1.9	3.57	3.1	1732.9
13:10	13:45	House well	0.010	0.014	0.04	0.478	0.50	0.4	1.93	<1.0	2.0
10/28/2015	**10/28/2015**	**Base flow**									
12:10	14:25	Spring	0.005	0.112	0.05	0.247	0.55	66.2	4.89	179.3	3950.0
11:56	14:25	Downstream farm	0.009	0.032	0.03	0.544	0.78	1.7	3.91	35.0	6700.0
11:46	14:25	Left Fork	0.007	0.024	0.02	0.060	0.24	1.9	2.90	61.3	3410.0
12:55	14:25	House well	0.008	0.016	0.01	0.391	0.54	<6.58	2.40	<1.0	<1
11/4/2015	**11/4/2015**	**Base flow**									
12:14	14:50	Spring	0.007	0.026	0.07	0.139	0.33	0.7	5.44	8.4	920.8
12:03	14:50	Downstream farm	0.010	0.038	<0.03	0.607	0.76	1.7	3.79	23.1	2880.0
11:54	14:50	Left Fork	0.007	0.018	<0.03	0.072	0.18	0.7	3.98	77.6	>2419.2
12:41	14:50	House well	0.010	0.016	<0.03	0.468	0.54	<6.58	2.62	<1.0	<1
11/12/2015	**11/12/2015**	**Base flow**									
12:15	15:00	Spring	0.007	0.064	<0.03	0.187	0.43	33.6	5.46	72.7	>2419.2
12:26	15:00	Upstream farm	0.015	0.022	<0.03	0.127	0.22	0.9	2.51	117.8	2620.0
12:03	15:00	Downstream farm	0.013	0.044	<0.03	0.439	0.64	6.9	2.14	75.9	>2419.2

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
11:54	15:00	Left Fork	0.005	0.016	<0.03	0.215	0.34	1.1	2.50	25.6	3360.0
12:42	15:00	House well	0.009	0.012	<0.03	0.501	0.55	0.3	3.71	<1.0	<1
11/18/2015	**11/18/2015**	**Base flow**									
11:37	15:05	Spring	0.011	0.030	0.01	0.168	0.43	1.8	5.47	461.1	13130.0
11:50	15:05	Upstream farm	0.013	0.046	0.06	0.229	0.41	4.0	2.55	517.2	5810.0
11:25	15:05	Downstream farm	0.017	0.050	0.09	0.334	0.56	4.5	2.88	435.2	14550.0
11:15	15:05	Left Fork	0.020	0.062	0.08	0.432	0.73	7.4	3.72	686.7	23590.0
12:15	15:05	Ephemeral stream	0.012	0.040	0.07	1.262	1.57	2.7	3.23	325.5	10710.0
12:28	15:05	Trench 1	0.005	0.030	0.02	0.264	0.52	1.9	1.74	65.7	17930.0
12:50	15:05	House well	0.009	0.014	<0.03	0.464	0.59	0.4	0.48	<1.0	<1
12/2/2015	**12/2/2015**	**Base flow**									
12:15	15:35	Spring	0.011	0.014	<0.03	1.262	1.63	1.9	2.51	109.2	2419.2
13:22	15:35	Upstream farm	0.010	0.020	0.03	0.135	0.22	1.4	0.98	55.6	1986.3
11:57	15:35	Downstream farm	0.012	0.022	0.02	0.266	0.39	1.6	0.94	48.0	9600.0
11:40	15:35	Left Fork	0.014	0.024	0.01	0.302	0.43	1.6	1.36	66.9	1986.3
12:27	15:35	Ephemeral stream	0.011	0.024	<0.03	0.613	0.89	1.0	1.01	145.0	1986.3

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
12:48	15:35	Trench 1	0.006	0.008	<0.03	0.218	0.33	1.3	1.10	6.3	5810.0
13:38	15:35	House well	0.011	0.014	0.02	0.480	0.60	0.9	1.38	1.0	1.0
Sample analyses since the last quarterly report											
12/14/2015	**12/14/2015**	**Base flow**									
12:45	16:00	Spring	0.007	0.024	<0.03	0.744	0.94	0.5	3.86	No Data	3230.0
13:00	16:00	Upstream farm	0.009	0.030	<0.03	0.364	0.58	3.4	11.89	118.7	2810.0
12:30	16:00	Downstream farm	0.009	0.034	0.05	0.181	0.27	4.1	4.10	410.6	4080.0
12:20	16:00	Left Fork	0.012	0.048	0.07	0.235	0.38	11.2	3.24	325.5	4520.0
15:15	16:00	Ephemeral stream	0.014	0.056	0.06	0.298	0.50	10.8	3.92	410.6	6010.0
13:30	16:00	Trench 1	0.004	0.012	<0.03	0.299	0.36	1.1	3.44	8.4	10460.0
13:38	16:00	House well	0.011	0.010	<0.03	0.545	0.57	0.1	10.15	<1.0	1.0
12/22/2015	**12/22/2015**	**Base flow**									
11:35	14:45	Spring	0.008	0.018	<0.03	0.531	0.58	0.7	1.23	146.7	1203.3
12:38	14:45	Upstream	0.010	0.020	<0.03	0.092	0.14	0.4	0.94	50.4	648.8
11:02	14:45	Downstream	0.011	0.020	<0.03	0.245	0.32	1.0	1.12	31.8	980.4
10:48	14:45	Left Fork	0.013	0.020	<0.03	0.267	0.35	0.1	1.36	26.5	1299.7
11:46	14:45	Ephemeral	0.010	0.016	<0.03	1.452	1.68	0.7	2.41	52.9	1299.7

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
12:14	14:45	Trench 1	0.005	0.010	<0.03	0.157	0.20	0.3	0.89	1.0	435.2
12:25	14:45	House well	0.010	0.016	<0.03	0.534	0.59	0.3	1.40	<1.0	<1.0
1/5/2016	**1/25/2016**	**Base flow**									
11:52	15:29	Spring	0.007	0.024	<0.03	0.584	0.63	0.7	1.39	16.0	816.4
13:00	15:29	Upstream	0.008	0.026	<0.03	0.158	0.20	0.5	0.95	67.7	648.8
11:40	15:29	Downstream	0.011	0.026	<0.03	0.419	0.46	0.1	1.13	40.8	648.8
11:30	15:29	Left Fork	0.013	0.028	<0.03	0.427	0.48	0.7	1.51	34.1	686.7
12:02	15:29	Ephemeral	0.007	0.018	<0.03	0.883	1.00	1.2	2.15	32.7	686.7
12:13	15:29	Trench 1	0.003	0.016	<0.03	0.243	0.29	0.9	1.11	1.0	209.8
12:44	15:29	House well	0.008	0.020	<0.03	0.528	0.57	0.9	1.08	<1.0	1.0
1/25/2016	**1/25/2016**	**Base flow**									
11:16	15:25	Spring	0.010	0.022	<0.03	0.565	0.60	0.3	1.27	34.5	1732.9
12:10	15:25	Upstream	0.010	0.022	<0.03	0.068	0.09	1.1	1.52	16.9	290.9
11:00	15:25	Downstream	0.011	0.022	<0.03	0.213	0.24	0.7	1.29	8.6	365.4
10:48	15:25	Left Fork	0.010	0.024	<0.03	0.198	0.25	1.0	1.30	21.1	435.2
11:28	15:25	Ephemeral	0.011	0.030	<0.03	0.762	0.87	9.8	3.10	1.0	816.4
11:42	15:25	House well	0.012	0.020	<0.03	0.602	0.55	0.5	2.36	<1.0	<1
2/10/2016	**2/10/2016**	**Base flow**									

Time sample collected	Time received @ laboratory	Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic Carbon	E. coli	Total coliform
12:25	15:26	Spring	0.007	0.040	<0.03	0.634	0.80	17.7	2.70	1.0	325.5
11:15	15:26	Upstream	0.005	0.016	<0.03	0.048	0.11	0.5	1.11	14.5	178.5
11:04	15:26	Downstream	0.005	0.016	<0.03	0.198	0.24	0.9	0.99	4.1	218.7
11:29	15:26	Left Fork	0.003	0.012	<0.03	0.175	0.24	0.8	1.15	7.4	209.8
12:03	15:26	House well	0.007	0.014	<0.03	0.542	0.56	0.1	0.63	<1.0	<1.0
2/24/2016	**2/24/2016**	**Base flow**									
11:05	14:45	Spring	0.010	0.052	<0.03	1.102	1.46	2.8		209.8	3930.0
12:16	14:45	Upstream	0.014	0.052	<0.03	0.099	0.28	6.1		1203.3	7330.0
10:52	14:45	Downstream	0.015	0.058	<0.03	0.142	0.37	8.3		1986.3	6500.0
10:38	14:45	Left Fork	0.015	0.088	<0.03	0.249	0.63	15.6		2780.0	14390.0
11:15	14:45	Ephemeral	0.010	0.056	<0.03	0.195	0.40	12.8		387.3	4870.0
11:36	14:45	Trench 1	0.005	0.014	<0.03	0.345	0.39	2.1		<1.0	9070.0
11:53	14:45	House well	0.010	0.010	<0.03	0.582	0.55	1.3		<1.0	<1.0

¶ Values proceeded by '<' were reported by the analytical laboratory as zero and the minimum detection limit is given.
§ N.S. is No Sample.

Nutrients, Sediment, and Bacteria by Date Spring, Upstream, and Downstream Sites

Table 4. Water quality analyses in Big Creek upstream and downstream of the C&H Farm boundary of permitted land application since January 2015, with those collected since the last report noted.

Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
	---------- mg/L ----------							--- MPN/100 mL ---	
1/8/2015									
Upstream	0.009	0.022	<0.03	0.187	0.21	2.3	1.41	30.9	547.5
Downstream	0.011	0.024	<0.03	0.376	0.39	2.5	1.22	42.6	980.4
1/14/2015									
Upstream	0.012	0.032	<0.03	0.135	0.19	1.1	3.02	88.2	727.0
Downstream	0.011	0.020	<0.03	0.388	0.34	1.0	2.03	25.6	613.1
1/21/2015									
Upstream	0.008	0.018	<0.03	0.089	0.12	1.1	0.95	70.3	579.4
Downstream	0.010	0.026	0.06	0.197	0.30	1.1	1.60	37.4	613.1
1/29/2015									
Upstream	0.006	0.060	<0.03	0.065	0.21	47.8	1.71	727.0	1413.6
Downstream	0.009	0.020	0.04	0.168	0.27	1.3	1.50	19.9	1046.2

Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
2/3/2015									
Upstream	0.006	0.022	<0.03	0.051	0.28	1.1	2.69	4.1	1203.3
Downstream	0.009	0.018	<0.03	0.140	0.29	4.1	2.66	1.0	547.5
2/10/2015									
Upstream	0.009	0.012	<0.03	0.056	0.09	0.7	1.04	1119.1	2419.2
Downstream	0.011	0.012	<0.03	0.143	0.23	1.0	1.15	7.4	1553.1
2/26/2015									
Upstream	0.006	0.024	<0.03	0.100	0.13	0.6	1.20	47.9	686.7
Downstream	0.008	0.026	0.02	0.200	0.25	0.8	1.17	48.7	866.4
3/3/2015									
Upstream	0.006	0.026	0.02	0.048	0.11	N.D.	1.50	N.S.	N.S.
Downstream	0.007	0.028	<0.03	0.138	0.23	N.D.	1.50	N.S.	N.S.
3/11/2015									
Upstream	0.005	0.026	0.02	0.118	0.16	2.1	3.38	34.5	579.4
Downstream	0.007	0.030	0.02	0.209	0.27	1.8	1.44	66.3	770.1
3/19/2015									

Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
Upstream	0.007	0.024	0.04	0.111	0.20	1.7	2.53	42.6	866.4
Downstream	0.009	0.028	0.04	0.234	0.35	2.8	2.87	71.7	1119.9
3/25/2015									
Upstream	0.006	0.028	0.02	0.056	0.16	2.9	1.36	125.9	2419.2
Downstream	0.008	0.036	0.04	0.162	0.29	5.0	1.41	547.5	3410.0
3/26/2015									
Upstream	0.013	0.076	0.06	0.144	0.41	14.1	3.94	816.4	4960.0
Downstream	0.004	0.026	0.02	0.904	1.00	15.4	0.69	<1.0	1553.1
4/2/2015									
Upstream	0.007	0.040	0.02	0.045	0.14	3.1	3.61	166.9	2419.2
Downstream	0.007	0.042	0.02	0.139	0.22	2.5	2.71	121.1	1986.3
4/9/2015									
Upstream	0.011	0.042	0.04	0.066	0.18	13.1	2.13	86.0	2650.0
Downstream	0.010	0.048	0.03	0.157	0.25	19.7	1.82	47.2	1986.3
4/15/2015									
Upstream	0.007	0.040	0.03	0.090	0.16	3.5	3.24	648.8	4040.0

Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
Downstream	0.009	0.048	0.03	0.166	0.26	4.4	2.67	344.8	2920.0
4/23/2015									
Upstream	0.007	0.032	0.03	0.083	0.18	4.0	5.11	104.6	2419.2
Downstream	0.007	0.032	0.03	0.162	0.25	2.6	2.51	65.7	2419.2
4/29/2015									
Upstream	0.010	0.020	0.03	0.082	0.13	2.7	1.58	58.3	1732.4
Downstream	0.012	0.018	0.03	0.189	0.82	2.1	1.64	58.6	1986.3
5/7/2015									
Upstream	0.008	0.032	0.01	0.110	0.16	7.5	10.16	77.6	3280.0
Downstream	0.009	0.034	<0.03	0.267	0.36	4.5	7.70	27.8	2280.0
5/8/2015									
Upstream	0.195	0.544	0.27	0.292	1.20	113.2	7.47	N.S.	N.S.
Downstream	0.005	0.254	0.41	2.287	3.23	127.1	6.45	N.S.	N.S.
5/11/2015									
Upstream	0.004	0.074	0.04	0.004	0.24	4.5	4.31	N.S.	N.S.
Downstream	0.031	0.530	0.11	0.071	1.12	277.5	8.48	N.S.	N.S.

Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
5/14/2015									
Upstream	0.011	0.046	0.02	0.177	0.23	2.8	1.35	145.5	2470.0
Downstream	0.015	0.050	0.02	0.326	0.39	6.1	1.16	128.1	4370.0
5/18/2015									
Upstream	0.007	0.034	0.02	0.110	0.15	5.2	1.29	137.6	2419.2
Downstream	0.009	0.040	0.03	0.201	0.25	6.1	1.47	185.0	6770.0
5/26/2015									
Upstream	0.012	0.044	0.04	0.080	0.19	6.4	1.50	N.S.	N.S.
Downstream	0.045	0.200	0.11	0.096	0.56	94.7	4.57	N.S.	N.S.
6/1/2015									
Downstream	0.006	0.050	0.05	0.109	0.25	13.7	1.80	N.S.	N.S.
6/4/2015									
Upstream	0.008	0.026	0.03	0.083	0.11	2.3	2.93	38.6	>2419.2
Downstream	0.009	0.034	<0.03	0.184	0.23	1.7	2.64	24.7	2419.2
6/8/2015									
Upstream	0.010	0.030	0.06	0.058	0.24	4.5	3.63	866.4	2780.0

Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
Downstream	0.009	0.022	0.05	0.185	0.27	0.9	2.66	57.4	4640.0
6/17/2015									
Upstream farm	0.009	0.036	0.03	0.050	0.16	3.5	2.83	435.2	13130.0
Downstream	0.007	0.034	0.03	0.106	0.23	2.3	2.92	344.8	20980.0
6/22/2015									
Upstream	0.010	0.030	0.01	0.042	0.05	2.9	0.99	78.0	4960.0
Downstream	0.009	0.032	0.04	0.136	0.16	2.9	1.15	36.8	5040.0
6/29/2015									
Upstream	0.010	0.028	0.14	0.055	0.13	2.7	2.49	117.8	4710
Downstream	0.068	0.748	0.17	0.147	1.88	571	6.57	N.S.	N.S.
7/6/2015									
Downstream	0.275	0.380	0.22	0.204	1.03	19.1	7.91	N.S.	N.S.
7/9/2015									
Upstream	0.013	0.048	0.02	0.087	0.18	6.8	2.75	201.4	10140.0
Downstream	0.014	0.050	0.03	0.117	0.24	8.8	2.32	275.5	10760.0
7/16/2015									

Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
Downstream	0.011	0.030	<0.03	0.195	0.33	0.5	1.35	11.8	6310.0
7/23/2015									
Upstream	0.009	0.026	0.02	0.096	0.18	1.3	0.97	93.3	7490.0
Downstream	0.011	0.028	0.02	0.198	0.31	0.8	1.06	16.8	4870.0
7/30/2015									
Upstream	0.014	0.024	<0.03	0.101	0.15	0.9	1.61	27.2	2880.0
Downstream	0.012	0.022	0.02	0.268	0.38	1.9	2.16	11.9	6500.0
8/6/2015									
Upstream	0.009	0.028	<0.03	0.147	0.24	1.8	3.37	488.4	13540.0
Downstream	0.010	0.028	0.03	0.406	0.52	1.7	3.06	40.2	10390.0
8/13/2015									
Upstream	0.013	0.018	0.04	0.124	0.16	0.3	4.32	13.4	2460.0
Downstream	0.011	0.024	<0.03	0.384	0.50	4.0	3.74	24.0	3310.0
8/20/2015									
Downstream	0.015	0.022	0.03	0.491	0.53	2.2	5.94	39.3	66.3
8/27/2015									

Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
Upstream	0.005	0.028	0.04	0.084	0.28	2.9	4.30	104.6	7710.0
Downstream	0.013	0.024	<0.03	0.450	0.54	2.5	4.43	137.4	5730.0
9/2/2015									
Upstream	0.007	0.042	0.07	0.047	0.39	3.37	5.5	46.4	9070.0
Downstream	0.010	0.020	0.01	0.449	0.55	3.2	4.80	20.3	6630.0
9/10/2015									
Downstream	0.008	0.028	0.02	0.464	0.58	3.96	2.9	66.3	5470.0
9/16/2015									
Upstream	0.004	0.024	<0.03	0.104	0.30	4.62	2.1	50.4	3590.0
Downstream	0.009	0.030	0.01	0.404	0.62	4.59	1.4	6.2	4800.0
9/24/2015									
Upstream	0.006	0.078	<0.03	0.200	0.41	5.92	14.8	17.1	4570.0
Downstream	0.009	0.018	<0.03	0.449	0.56	5.58	1.2	29.9	7540.0
9/30/2015									
Downstream	0.008	0.022	0.01	0.472	0.66	5.43	4.5	31.7	5290.0
10/8/2015									

Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
Downstream	0.005	0.020	0.02	0.517	0.60	1.5	1.62	21.3	12360.0
10/14/2015									
Downstream	0.005	0.020	0.02	0.517	0.60	1.5	1.62	21.3	12360.0
10/14/2015									
Downstream	0.010	0.056	0.03	0.603	0.76	12.4	1.33	7.3	8164.0
10/22/2015									
Downstream	0.008	0.018	0.07	0.548	0.69	2.3	3.64	17.8	3140.0
10/28/2015									
Downstream	0.009	0.032	0.03	0.544	0.78	1.7	3.91	35.0	6700.0
11/4/2015									
Downstream	0.010	0.038	<0.03	0.607	0.76	1.7	3.79	23.1	2880.0
11/12/2015									
Upstream	0.015	0.022	<0.03	0.127	0.22	0.9	2.51	117.8	2620.0
Downstream	0.013	0.044	<0.03	0.439	0.64	6.9	2.14	75.9	>2419.2
11/18/2015									
Upstream	0.013	0.046	0.06	0.229	0.41	4.0	2.55	517.2	5810.0

Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
Downstream	0.017	0.050	0.09	0.334	0.56	4.5	2.88	435.2	14550.0
12/2/2015									
Upstream	0.010	0.020	0.03	0.135	0.22	1.4	0.98	55.6	1986.3
Downstream	0.012	0.022	0.02	0.266	0.39	1.6	0.94	48.0	9600.0
Sample analyses since the last quarterly report									
12/14/2015									
Upstream	0.009	0.034	0.05	0.181	0.27	4.1	4.10	410.6	4080.0
Downstream	0.012	0.048	0.07	0.235	0.38	11.2	3.24	325.5	4520.0
12/22/2015									
Upstream	0.010	0.020	<0.03	0.092	0.14	0.4	0.94	50.4	648.8
Downstream	0.011	0.020	<0.03	0.245	0.32	1.0	1.12	31.8	980.4
1/5/2016									
Upstream	0.008	0.026	<0.03	0.158	0.20	0.5	0.95	67.7	648.8
Downstream	0.011	0.026	<0.03	0.419	0.46	0.1	1.13	40.8	648.8
1/25/2016									
Upstream	0.010	0.022	<0.03	0.068	0.09	1.1	1.52	16.9	290.9

Sample location	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
Downstream	0.011	0.022	<0.03	0.213	0.24	0.7	1.29	8.6	365.4
2/10/2016									
Upstream	0.005	0.016	<0.03	0.048	0.11	0.5	1.11	14.5	178.5
Downstream	0.005	0.016	<0.03	0.198	0.24	0.9	0.99	4.1	218.7
2/24/2016									
Upstream	0.014	0.052	<0.03	0.099	0.28	6.1		1203.3	7330.0
Downstream	0.015	0.058	<0.03	0.142	0.37	8.3		1986.3	6500.0

¶ Values proceeded by '<' were reported by the analytical laboratory as zero and the Minimum detection limit is given.

§ N.S. is No Sample.

† N.D. is No Data.

Nutrients, Sediment, and Bacteria by Site for Ephemeral Stream, House Well, Trenches, Left Fork and Field Runoff

Table 5. Water quality analyses at the ephemeral stream draining the subwatershed containing the production houses and manure holding ponds, and surface runoff from Fields 1, 5a, and 12 since January, 2015, with those collected since the last report noted.

Date sample collected	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
	mg/L							MPN/100 mL	
Ephemeral stream									
1/8/2015	0.008	0.022	<0.03 ¶	0.448	0.59	2.4	1.73	25.6	1203.3
1/15/2015	0.007	0.028	<0.03	0.469	0.55	1.9	0.55	7.4	1413.6
1/21/2015	0.005	0.016	<0.03	0.370	0.46	1.0	2.34	155.3	2419.2
2/26/2015	0.006	0.022	<0.03	0.530	0.57	1.3	1.38	16.1	4790.0
3/3/2015	0.006	0.020	<0.03	0.477	0.52	ND	1.84	N.S. §	N.S.
3/11//2015	0.006	0.022	0.04	0.567	0.60	0.5	2.20	6.3	410.0
3/19/2015	0.007	0.018	0.01	0.529	0.63	1.0	4.31	14.6	866.4
3/25/2015	0.007	0.014	0.02	0.462	0.53	1.1	0.64	8.6	344.8
4/2/2015	0.006	0.032	0.02	0.467	0.46	1.8	4.41	5.2	547.5
4/15/2015	0.005	0.026	0.03	0.472	0.56	0.8	1.26	305.0	2430.0
4/23/2015	0.008	0.026	0.03	0.520	0.56	2.0	1.78	12.0	3270.0

Date sample collected	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
4/29/2015	0.012	0.018	0.02	0.569	0.61	3.5	1.98	14.3	4080.0
5/7/2015	0.013	0.066	0.02	0.628	0.71	3.2	16.41	71.7	7170.0
5/8/2015	0.005	0.254	0.41	2.287	3.23	127.1	6.45	5200.0	241920
5/11/2015	0.008	0.146	0.15	0.941	1.80	22.0	8.09	N.S.	N.S.
5/14/2015	0.010	0.022	0.01	0.527	0.50	1.7	0.73	41.3	1986.3
5/18/2015	0.007	0.028	0.03	0.525	0.55	0.7	1.18	90.7	7630.0
5/26/2015	0.017	0.030	0.03	0.514	0.60	0.9	1.12	N.S.	N.S.
6/1/2015	0.002	0.056	0.01	0.851	1.05	18.3	2.46	N.S.	N.S.
6/4/2015	0.010	0.024	0.02	0.572	0.58	0.8	5.35	21.6	3890.0
6/8/2015	0.009	0.020	0.03	0.560	0.62	0.6	2.81	65.7	9870.0
6/17/2015	0.009	0.032	0.04	0.948	1.04	6.7	0.97	770.1	8840.0
6/22/2015	0.011	0.026	0.05	0.563	0.61	1.3	1.21	37.9	2419.2
6/29/2015	0.067	1.268	0.34	0.580	3.42	1366.8	11.04	N.S.	N.S.
7/6/2015	0.063	0.658	0.37	0.717	2.75	567.3	8.52	N.S	N.S.
7/9/2015	0.010	0.034	<0.03	0.569	0.71	4.9	2.56	78.9	5560.0
7/16/2015	0.011	0.046	0.01	0.517	0.61	0.4	2.16	45.7	14830.0
7/23/2015	0.011	0.034	<0.03	0.511	0.68	11.3	0.33	201.4	24950.0

Date sample collected	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
11/18/2015	0.012	0.040	0.07	1.262	1.57	2.7	3.23	325.5	10710
12/2/2015	0.011	0.024	<0.03	0.613	0.89	1.0	1.01	145.0	1986.3
Sample analyses since the last quarterly report									
12/14/2015	0.009	0.030	<0.03	0.364	0.58	3.4	11.89	118.7	2810.0
12/22/2015	0.010	0.016	<0.03	1.452	1.68	0.7	2.41	52.9	1299.7
1/5/2016	0.007	0.018	<0.03	0.883	1.00	1.2	2.15	32.7	686.7
1/25/2016	0.011	0.030	<0.03	0.762	0.87	9.8	3.10	1.0	816.4
2/24/2016	0.010	0.056	<0.03	0.195	0.40	12.8		387.3	4870.0
Interceptor Trench 1 (South)									
1/8/2015	0.005	0.022	<0.03	0.769	0.75	4.7	0.88	1.0	13130.0
1/14/2015	0.007	0.028	<0.03	0.469	0.55	1.9	0.55	7.4	1413.6
2/26/2015	0.004	0.028	0.01	0.712	0.76	46.0	0.60	1.0	41063.0
3/3/2015	0.003	0.024	<0.03	0.867	0.89	N.D. †	0.95	N.S.	N.S.
3/11/2015	0.003	0.014	0.07	0.989	0.97	0.3	2.00	<1.0	2419.2
3/19/2015	0.003	0.012	0.01	0.849	0.93	<6.58	3.11	1.0	275.5

Date sample collected	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
3/25/2015	0.003	0.008	<0.03	0.838	0.88	0.2	0.59	<1.0	410.6
3/26/2015	0.004	0.026	0.02	0.904	1.00	15.4	0.69	<1.0	1553.1
4/2/2015	0.003	0.028	0.02	0.865	0.87	0.3	3.34	1.1	308.6
4/9/2015	0.006	0.018	<0.03	0.790	0.83	0.8	2.99	<1.0	187.2
4/15/2015	0.003	0.020	<0.03	0.857	0.93	1.3	4.29	<1.0	3180.0
4/23/2015	0.003	0.034	<0.03	0.877	0.97	1.2	1.18	3.1	2690.0
5/11/2015	0.003	0.060	0.02	0.916	0.97	27.6	1.78	N.S.	N.S.
5/14/2015	0.005	0.042	0.02	0.904	0.94	29.9	1.20	81.6	1732.9
5/18/2015	0.002	0.020	<0.03	0.897	0.93	0.3	1.28	32.3	1732.9
5/26/2015	0.007	0.012	0.01	0.752	0.80	1.0	0.78	N.S.	N.S.
6/22/2015	0.005	0.048	0.07	0.653	0.76	47.3	1.86	21.1	1986.3
6/29/2015	0.008	0.022	0.05	0.394	0.42	56.8	4.17	82.3	11450
7/9/2015	0.007	0.030	<0.03	0.520	0.62	7.1	2.52	63.7	12330.0
11/18/2015	0.005	0.030	0.02	0.264	0.52	1.9	1.74	65.7	17930.0
12/2/2015	0.006	0.008	<0.03	0.218	0.33	1.3	1.10	6.3	5810.0

Date sample collected	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
Sample analyses since the last quarterly report									
12/14/2015	0.004	0.012	<0.03	0.299	0.36	1.1	3.44	8.4	10460.0
12/22/2015	0.005	0.010	<0.03	0.157	0.20	0.3	0.89	1.0	435.2
1/5/2016	0.003	0.016	<0.03	0.243	0.29	0.9	1.11	1.0	209.8
2/24/2016	0.005	0.014	<0.03	0.345	0.39	2.1		<1.0	9070.0
Interceptor Trench 2 (North)									
3/11/2015	0.003	0.056	0.04	1.443	1.59	1.2	3.51	<1.0	2419.2
3/19/2015	0.004	0.062	0.09	1.036	1.42	1.9	5.12	5.2	2419.2
3/26/2015	0.004	0.126	0.13	0.873	1.44	22.2	4.63	105.4	6950.0
5/11/2015	0.003	0.042	0.05	0.553	0.76	8.8	3.44	N.S.	N.S.
5/14/2015	0.005	0.042	0.02	0.904	0.94	29.9	1.20	81.6	1732.9
5/18/2015	0.002	0.020	<0.03	0.897	0.93	0.3	1.28	32.3	1732.9
5/26/2015	0.007	0.112	0.04	1.190	1.44	131.9	1.23	N.S.	N.S.
Left Fork									
5/14/2015	0.015	0.038	0.02	0.321	0.38	3.3	1.36	83.3	2690.0

Date sample collected	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
5/18/2015	0.011	0.040	0.04	0.209	0.29	4.1	1.90	167.4	8300.0
5/26/2015	0.014	0.048	0.04	0.139	0.29	6.1	2.41	N.S.	N.S.
6/4/2015	0.008	0.022	<0.03	0.145	0.19	2.1	3.15	38.9	2560.0
6/8/2015	0.006	0.024	0.02	0.102	0.23	1.1	2.78	32.7	4550.0
6/17/2015	0.005	0.026	0.04	0.112	0.22	2.8	1.62	26.2	8550.0
6/22/2015	0.011	0.030	0.02	0.147	0.18	2.5	1.59	35.4	5910.0
6/29/2015	0.010	0.026	0.02	0.189	0.26	2.9	2.80	53.6	10170
7/9/2015	0.015	0.058	0.04	0.138	0.31	11.4	2.67	387.3	12670.0
7/16/2015	0.010	0.042	0.01	0.181	0.28	0.9	1.64	21.6	9330.0
7/23/2015	0.009	0.028	0.04	0.239	0.40	1.4	1.21	35.4	8360.0
7/30/2015	0.008	0.020	0.04	0.221	0.37	2.3	2.60	30.3	8160.0
8/6/2015	0.007	0.026	0.04	0.310	0.47	1.2	3.16	217.8	8130.0
8/13/2015	0.007	0.016	0.03	0.192	0.52	1.4	4.50	13.2	4810.0
8/20/2015	0.009	0.028	0.04	0.306	0.42	2.3	5.12	48.8	3930.0
8/27/2015	0.008	0.024	0.02	0.218	0.33	2.0	3.79	7.4	3010.0

Date sample collected	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
9/2/2015	0.007	0.020	0.03	0.109	0.33	1.67	3.8	26.9	5290.0
9/10/2015	0.006	0.026	<0.03	0.198	0.34	4.09	2.5	21.6	7230.0
9/16/2015	0.006	0.032	<0.03	0.146	0.48	2.49	1.3	38.2	6333.0
9/24/2015	0.007	0.016	0.01	0.098	0.20	3.08	0.6	31.3	3410.0
9/30/2015	0.007	0.018	<0.03	0.082	0.20	4.98	1.2	18.3	5940.0
10/8/2015	0.003	0.020	0.02	0.069	0.15	1.5	1.58	59.8	3640.0
10/14/2015	0.009	0.022	0.01	0.078	0.16	2.2	1.28	9.8	1986.3
10/22/2015	0.008	0.018	<0.03	0.069	0.13	1.9	3.57	3.1	1732.9
10/28/2015	0.007	0.024	0.02	0.060	0.24	1.9	2.90	61.3	3410.0
11/4/2015	0.007	0.018	<0.03	0.072	0.18	0.7	3.98	77.6	>2419.2
11/12/2015	0.005	0.016	<0.03	0.215	0.34	1.1	2.50	25.6	3360.0
11/18/2015	0.020	0.062	0.08	0.432	0.73	7.4	3.72	686.7	23590.0
12/2/2015	0.014	0.024	0.01	0.302	0.43	1.6	1.36	66.9	1986.3
Sample analyses since the last quarterly report									
2/14/2015	0.014	0.056	0.06	0.298	0.50	10.8	3.92	410.6	6010.0

Date sample collected	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
12/22/2015	0.013	0.020	<0.03	0.267	0.35	0.1	1.36	26.5	1299.7
1/5/2016	0.013	0.028	<0.03	0.427	0.48	0.7	1.51	34.1	686.7
1/25/2016	0.010	0.024	<0.03	0.198	0.25	1.0	1.30	21.1	435.2
2/10/2016	0.003	0.012	<0.03	0.175	0.24	0.8	1.15	7.4	209.8
2/24/2016	0.015	0.088	<0.03	0.249	0.63	15.6		2780.0	14390.0
Field 1									
3/26/2015	0.143	0.346	0.41	0.216	2.68	65.5	15.65	N.S.	N.S.
5/8/2015	0.525	0.714	0.16	0.475	2.19	16.9	13.28	N.S.	N.S.
5/11/2015	0.251	0.386	0.09	0.055	0.86	44.4	6.31	N.S.	N.S.
5/18/2015	0.208	0.512	0.54	0.410	3.59	53.7	26.12	N.S.	N.S.
5/26/2015	0.245	0.432	0.20	0.174	1.66	37.8	11.28	N.S.	N.S.
6/29/2015	0.354	0.524	0.37	0.226	1.64	11	11.32	N.S.	N.S.
7/6/2015	0.387	0.444	0.23	0.345	1.30	4.9	8.32	N.S.	N.S.
Field 5a									
3/26/2015	0.813	1.330	0.39	0.225	2.59	72.3	15.95	N.S.	N.S.

Date sample collected	Dissolved P	Total P	Ammonia-N	Nitrate-N	Total N	Total suspended solids	Dissolved Organic C	E. coli	Total coliform
5/8/2015	0.248	0.968	0.26	0.127	1.50	320.1	8.58	N.S.	N.S.
7/6/2015	0.796	0.910	0.13	0.567	1.58	29.0	7.67	N.S.	N.S.
Field 12									
5/8/2015	0.675	0.956	0.14	0.303	1.82	57.0	16.00	N.S.	N.S.
5/11/2015	0.194	0.364	0.09	0.135	0.83	36.7	7.03	N.S.	N.S.
7/6/2015	0.094	0.448	0.13	0.172	1.01	261.3	4.38	N.S.	N.S.

¶ Values proceeded by '<' were reported by the analytical laboratory as zero and the minimum detection limit is given.

§ N.S. is No Sample. E. coli and total coliform were not measured on surface runoff samples collected by ISCO samplers when sample holding time exceeded the required 8-hour threshold.

† N.D. is No Data

Temporal Trends in Phosphorus, Nitrogen and Bacteria in Big Creek Above and Below the C&H Farm

The concentration of P, N and bacteria forms in Big Creek above and below the C&H Farm are presented in subsequent figures to show the season / temporal trends in measured concentrations (Figures 2, 3, 4, 5, 6, and 7).

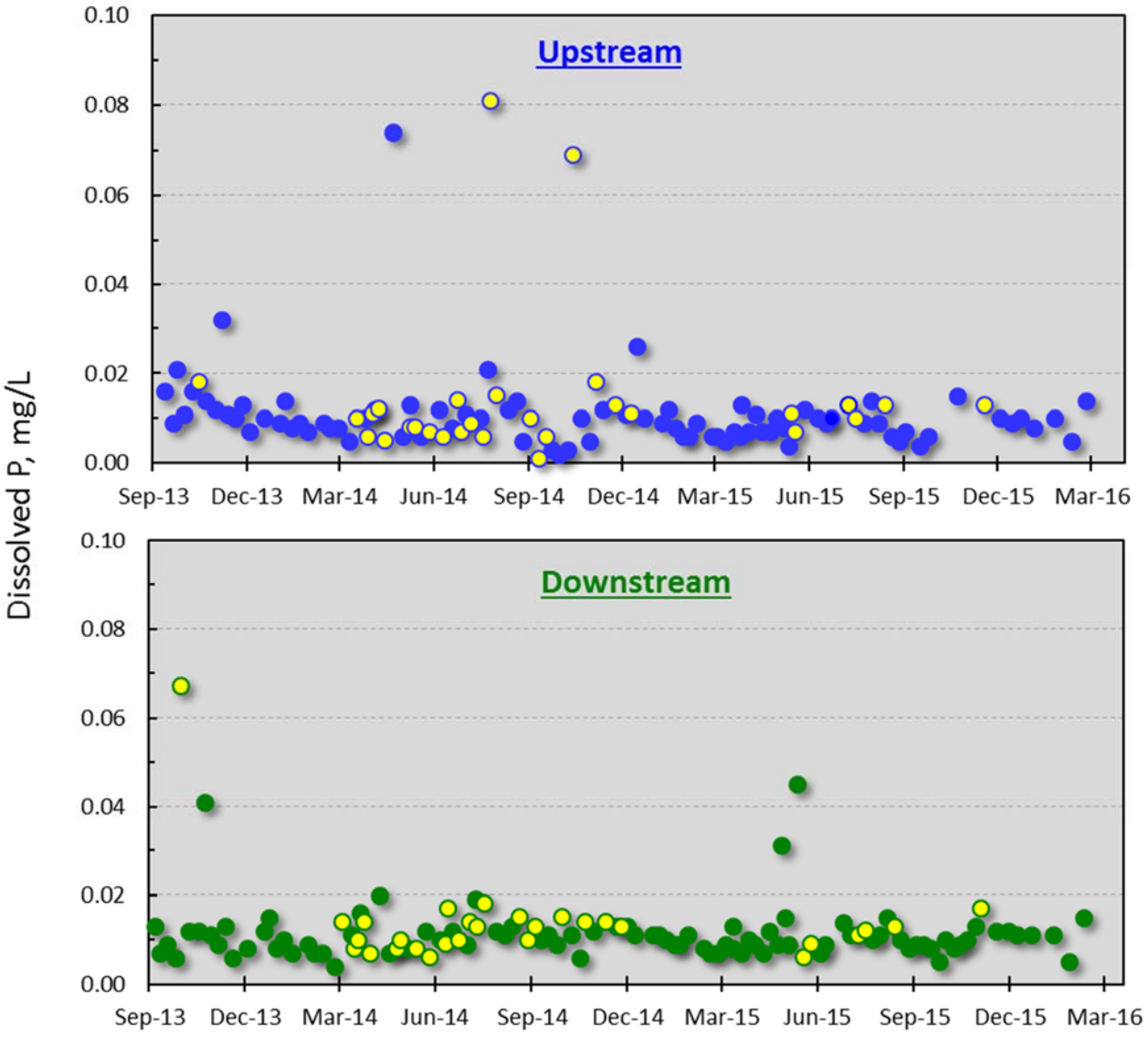

Figure 2. Dissolved P concentration at the Big Creek monitoring site up- and downstream of the C&H Farm, Newton County, AR.

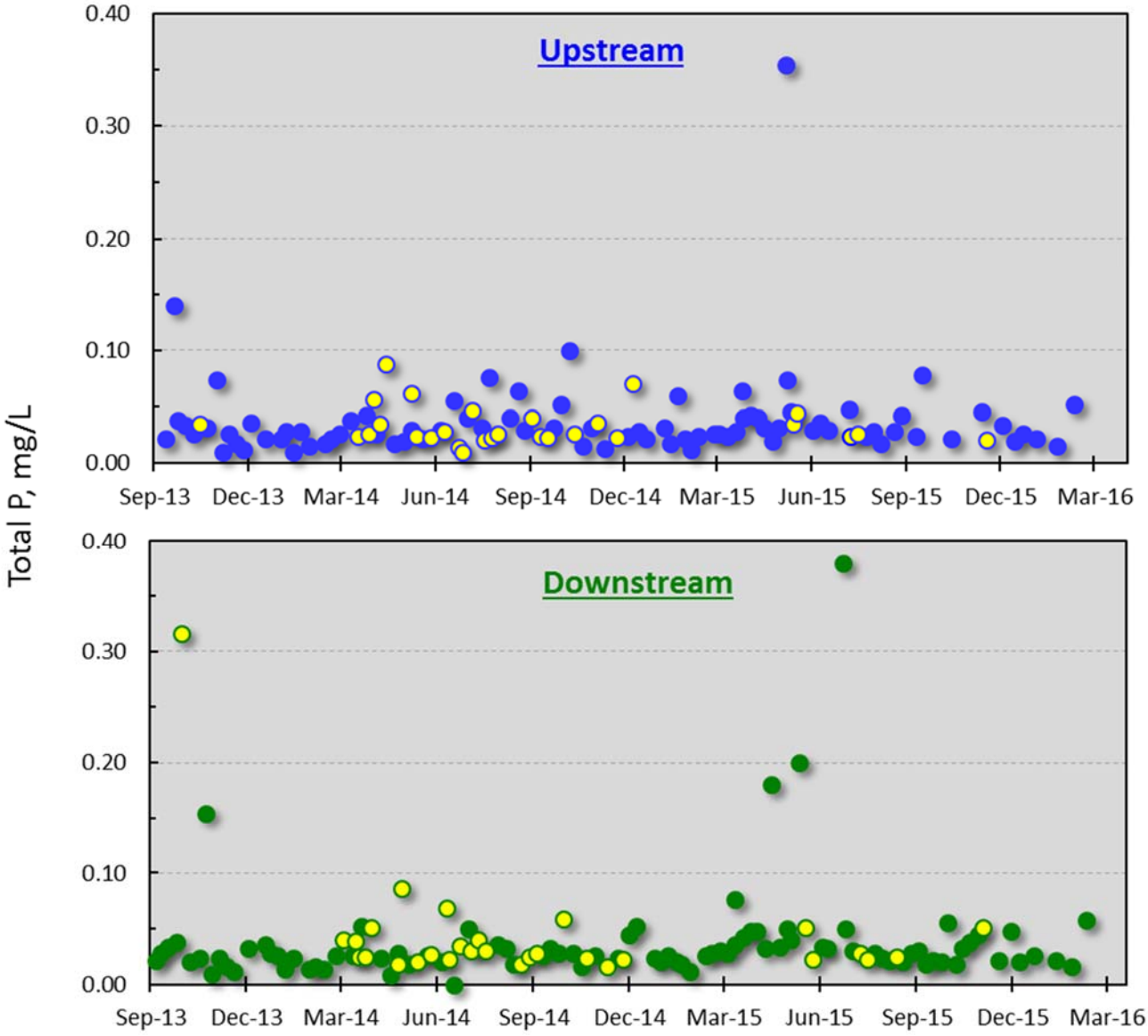

Figure 3. Total P concentration at the Big Creek monitoring site up- and downstream of the C&H Farm, Newton County, AR.

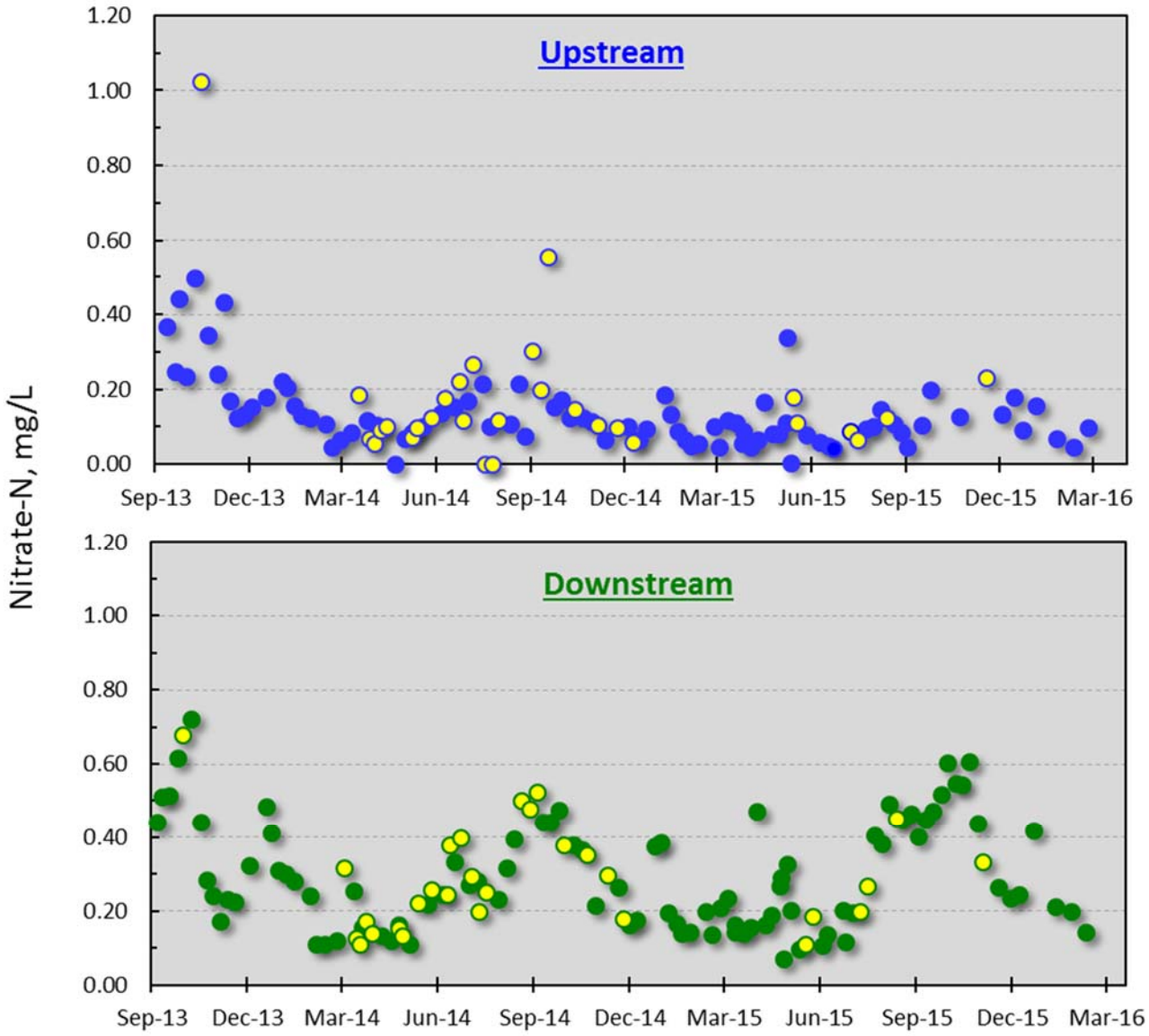

Figure 4. Nitrate-N concentration at the Big Creek monitoring site up- and downstream of the C&H Farm, Newton County, AR.

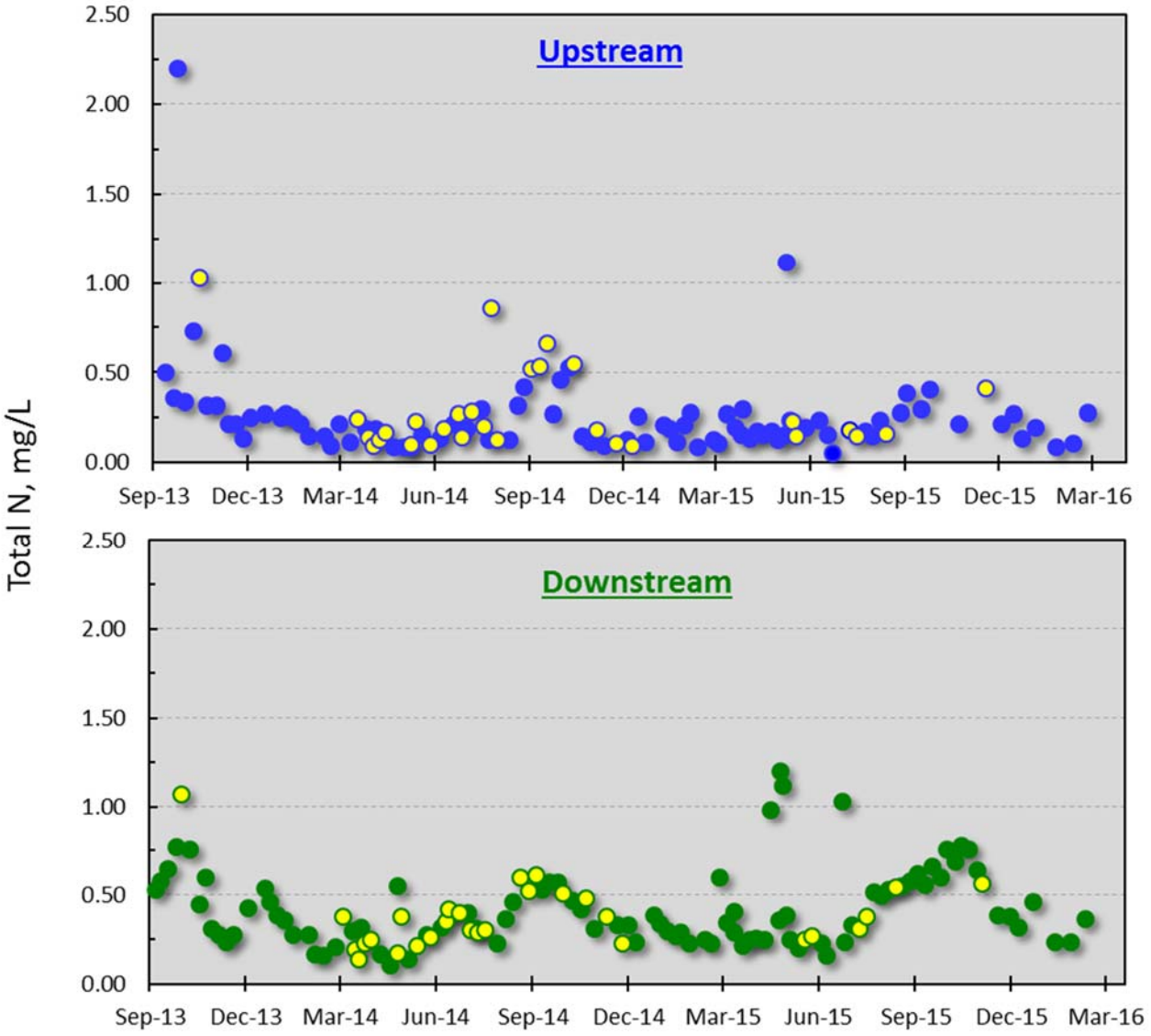

Figure 5. Total N concentration at the Big Creek monitoring site up- and downstream of the C&H Farm, Newton County, AR.

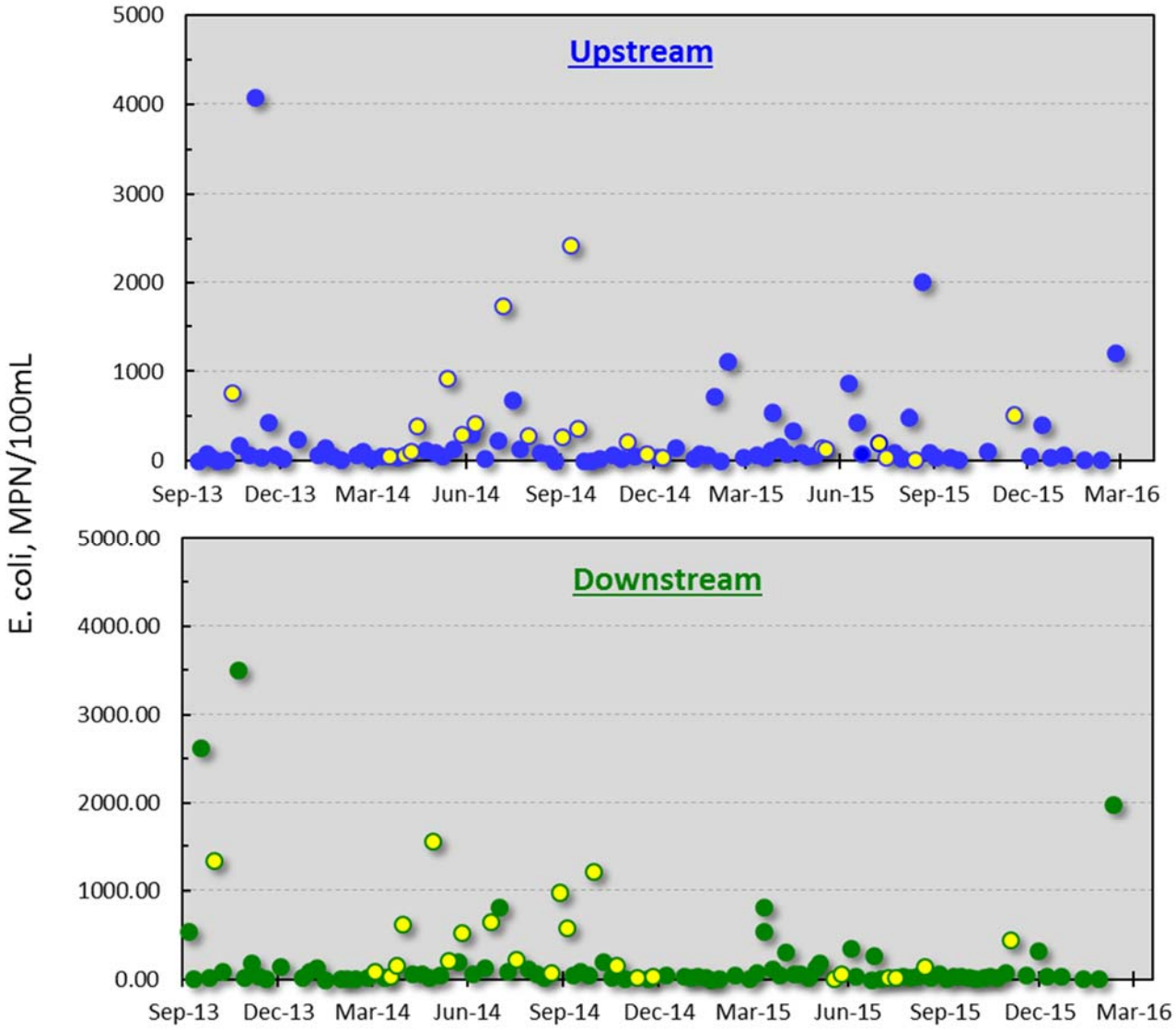

Figure 6. E. coli numbers at the Big Creek monitoring site up- and downstream of the C&H Farm, Newton County, AR.

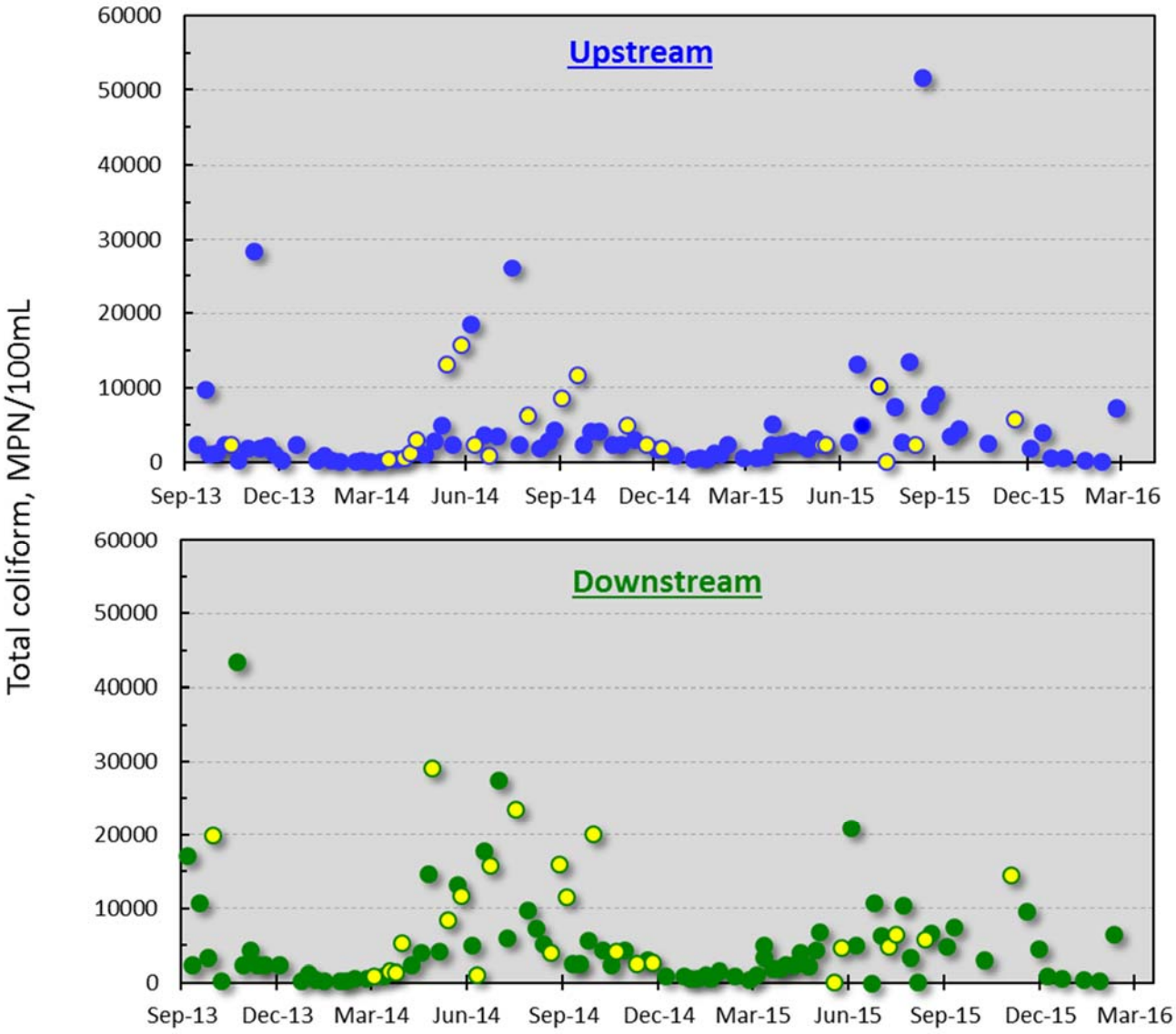

Figure 7. Total coliform numbers at the Big Creek monitoring site up- and downstream of the C&H Farm, Newton County, AR.

Differences in dissolved P, total P, nitrate-N, total P, E. coli, and total coliform concentrations between upstream and downstream sites from the beginning of monitoring (September 2013) to the present time are given in Figures 8, 9, 10, 11, 12, and 13.

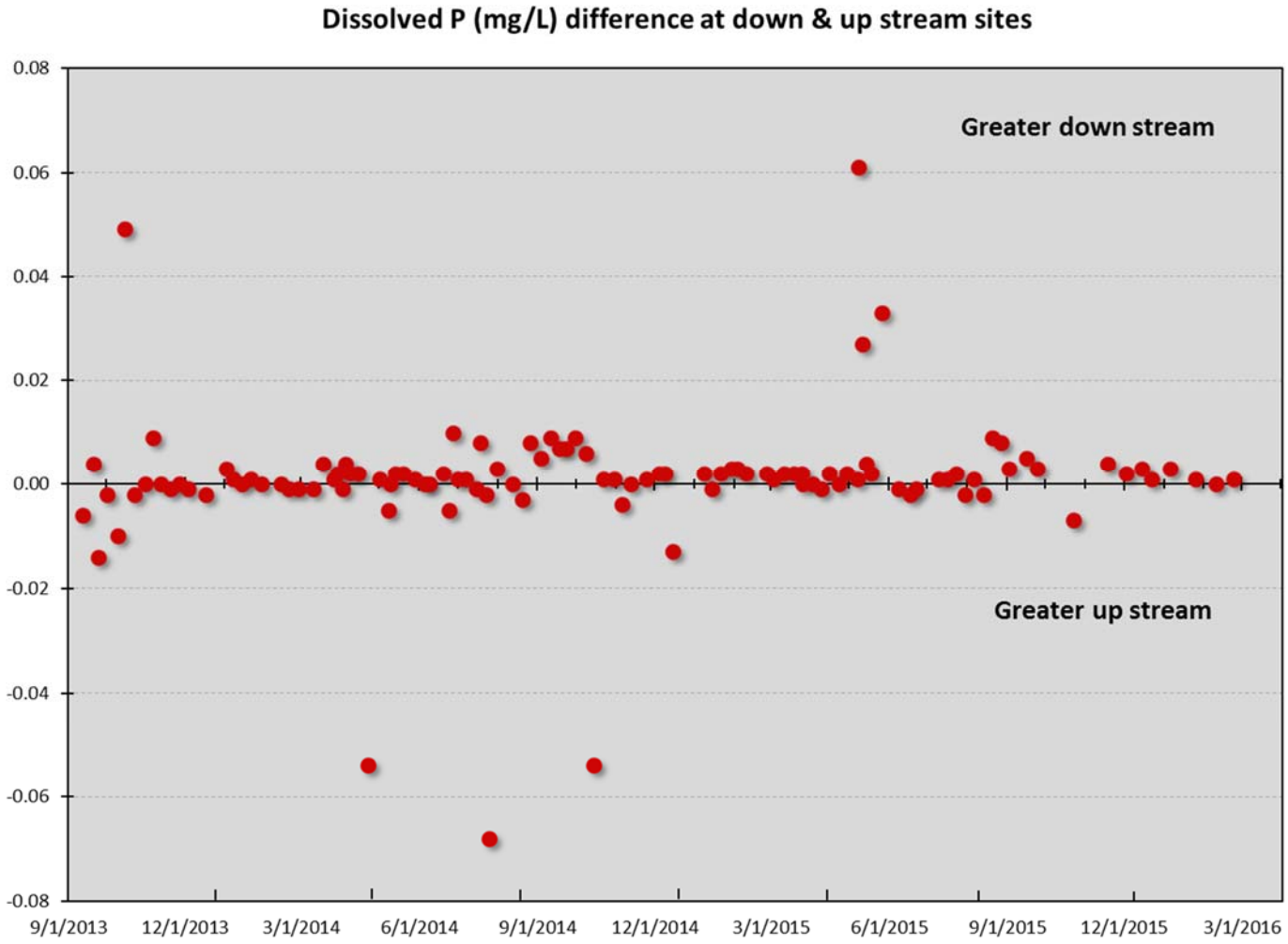

Figure 8. Difference in dissolved P concentrations in Big Creek up- and downstream of the C&H Farm, Newton County, AR.

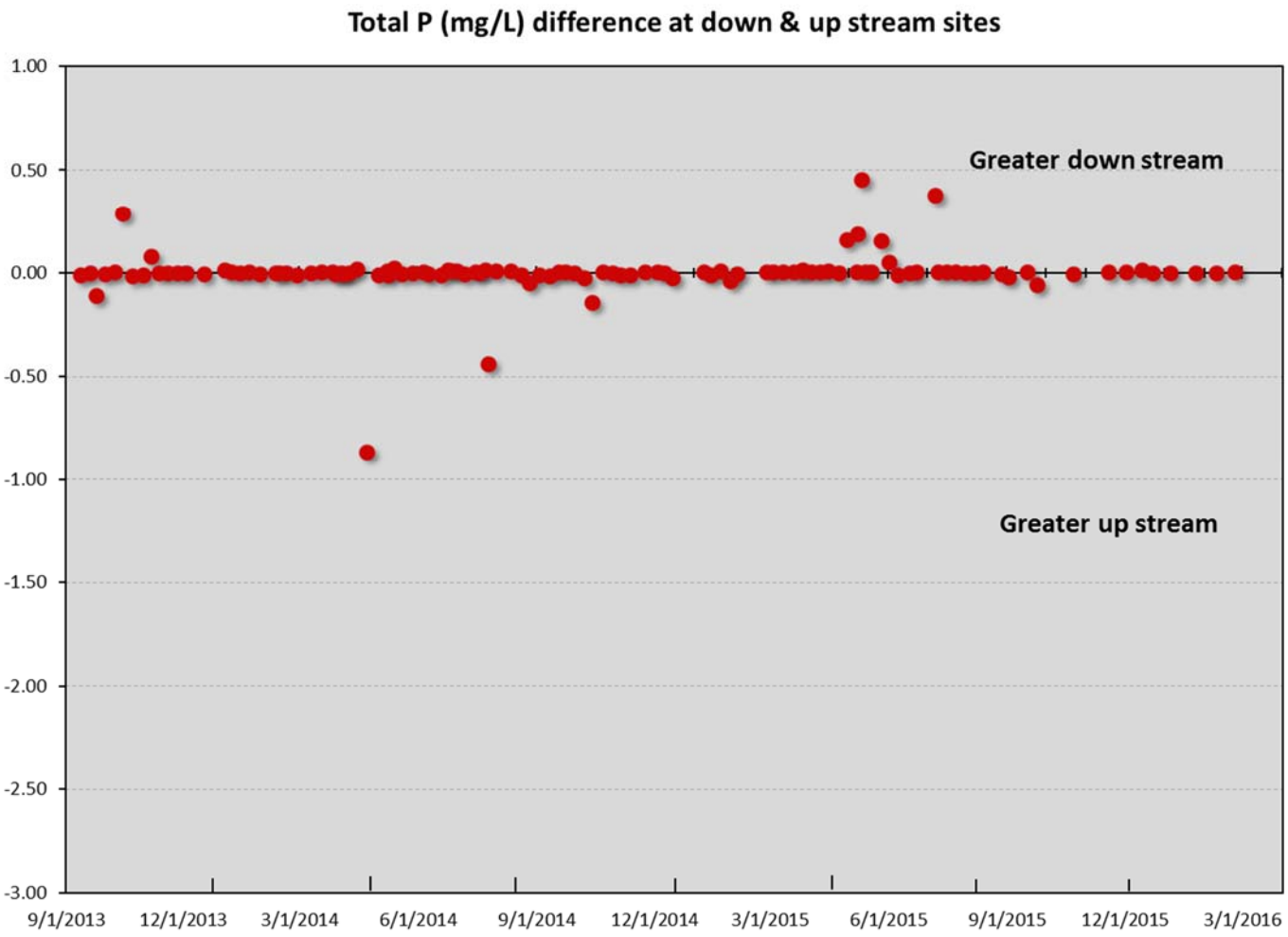

Figure 9. Difference in total P concentrations in Big Creek up- and downstream of the C&H Farm, Newton County, AR.

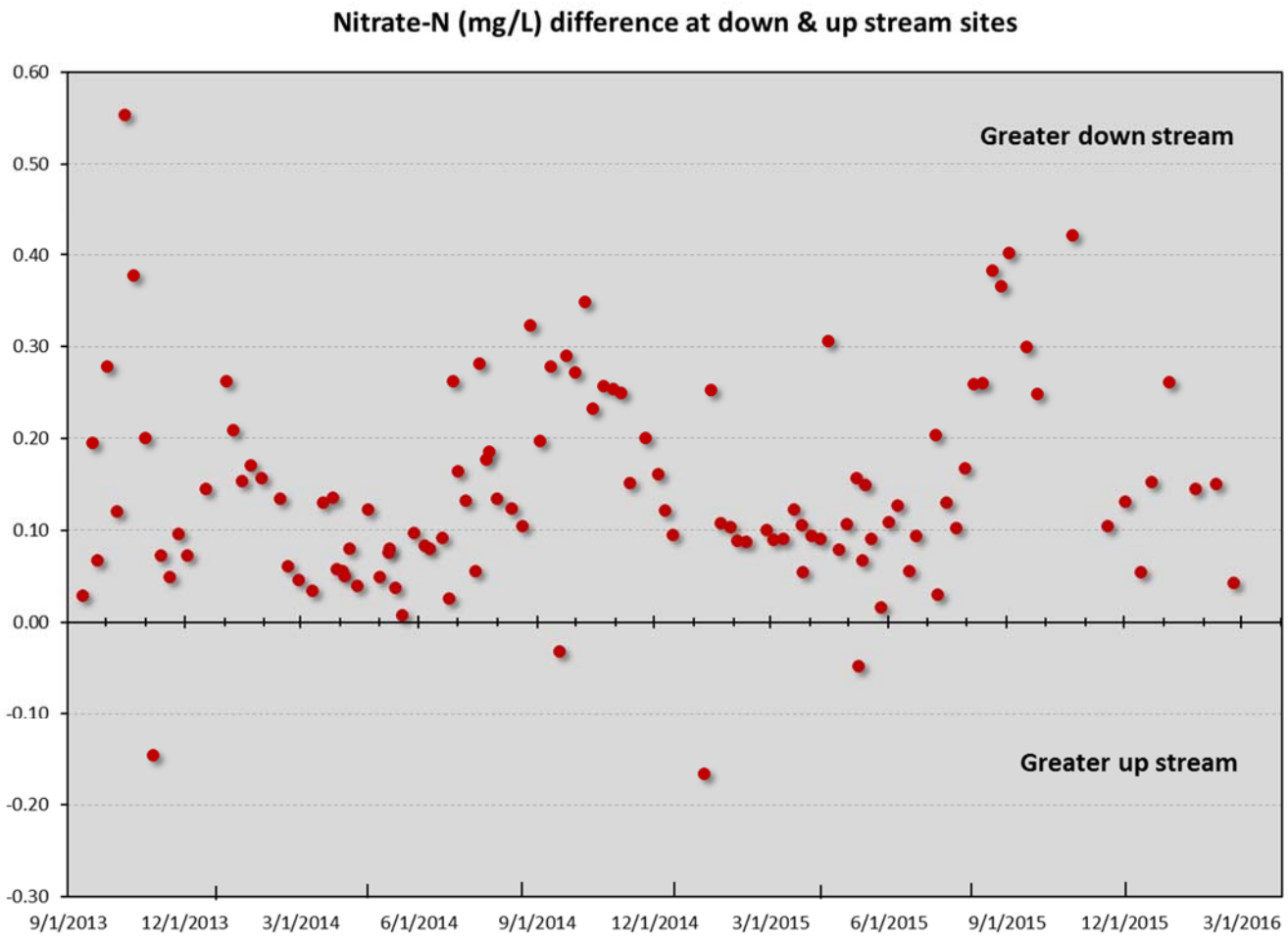

Figure 10. Difference in nitrate-N concentrations in Big Creek up- and downstream of the C&H Farm, Newton County, AR.

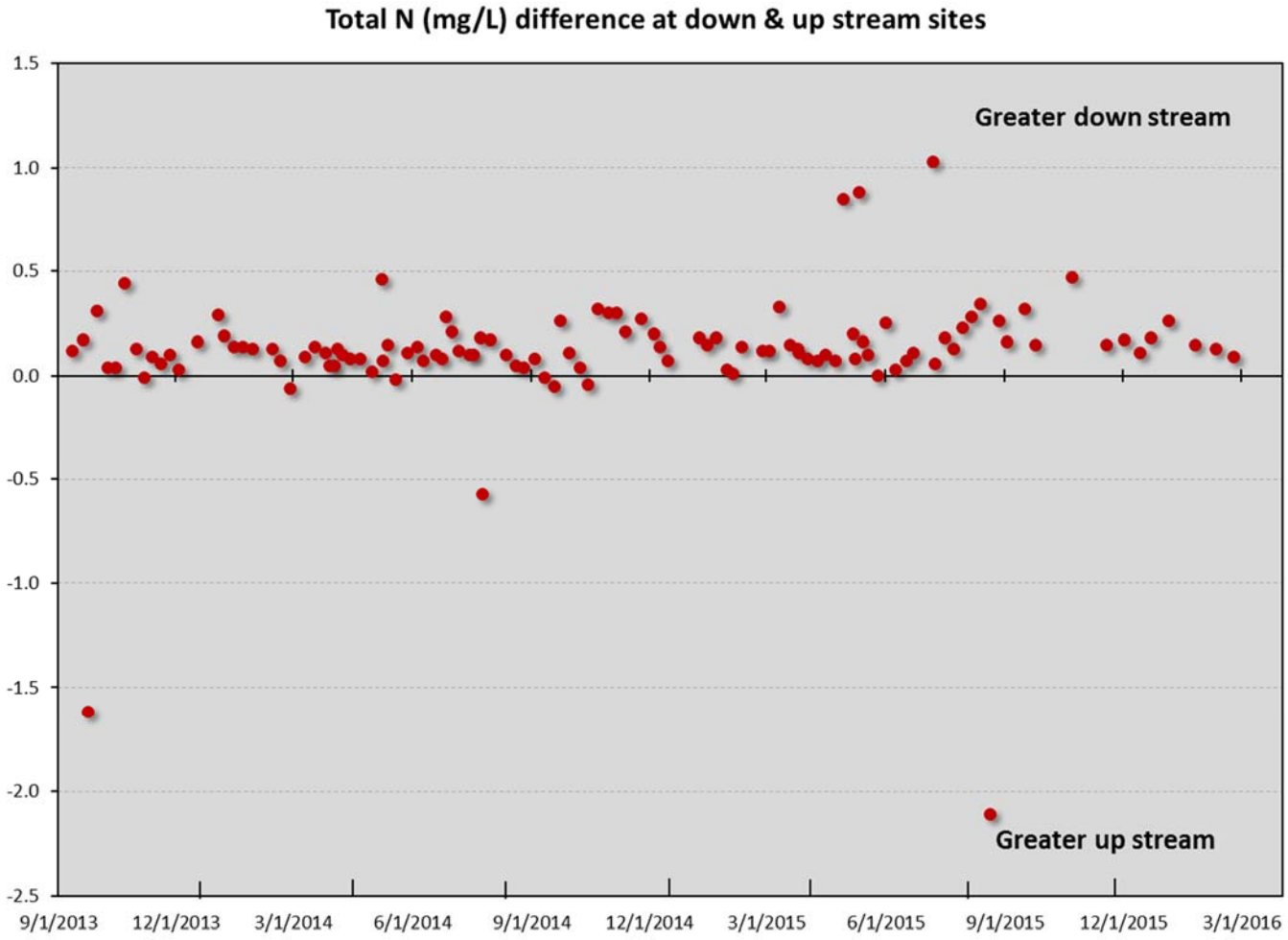

Figure 11. Difference in total N concentrations in Big Creek up- and downstream of the C&H Farm, Newton County, AR.

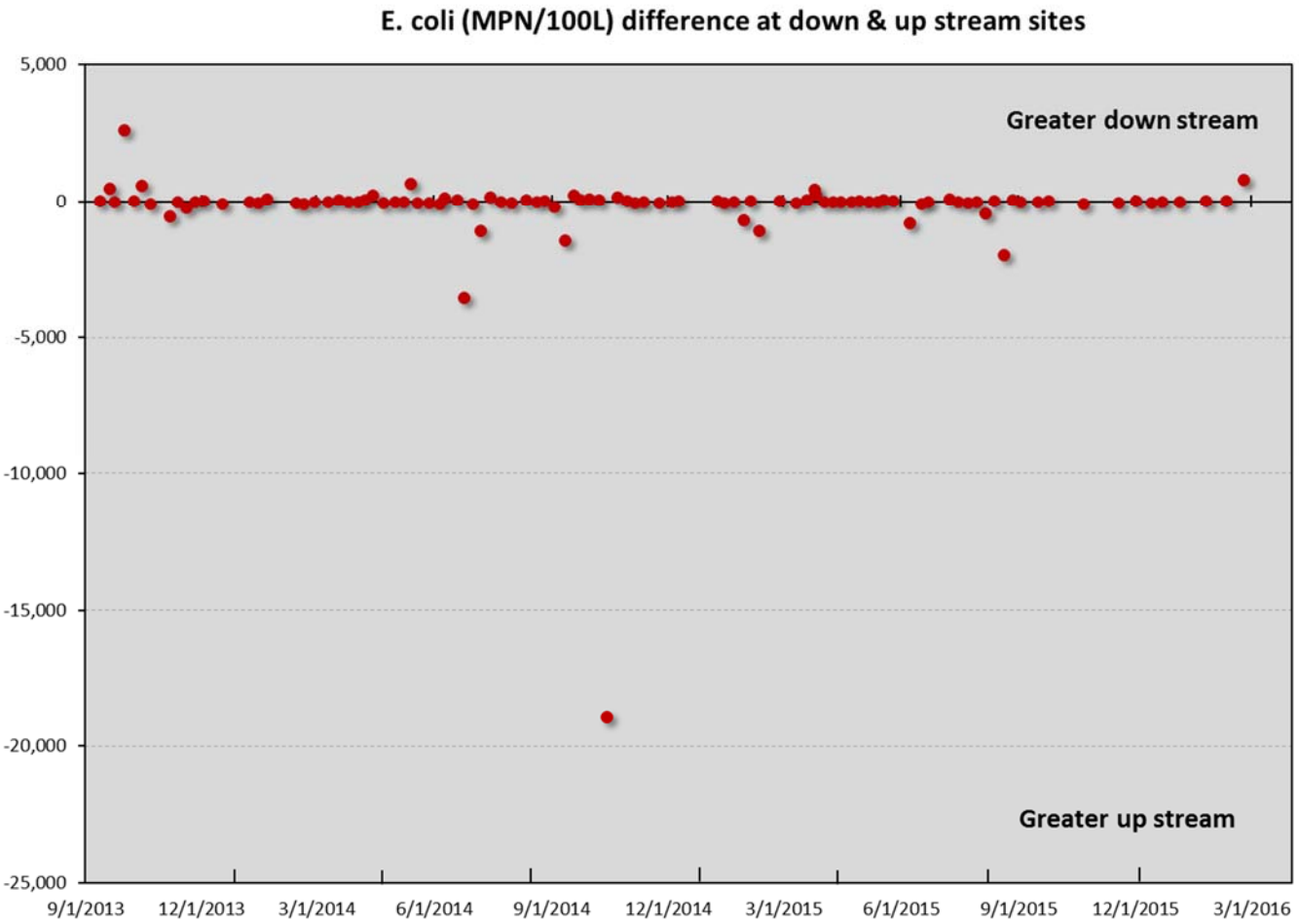

Figure 12. Difference in E. coli concentrations in Big Creek up- and downstream of the C&H Farm, Newton County, AR.

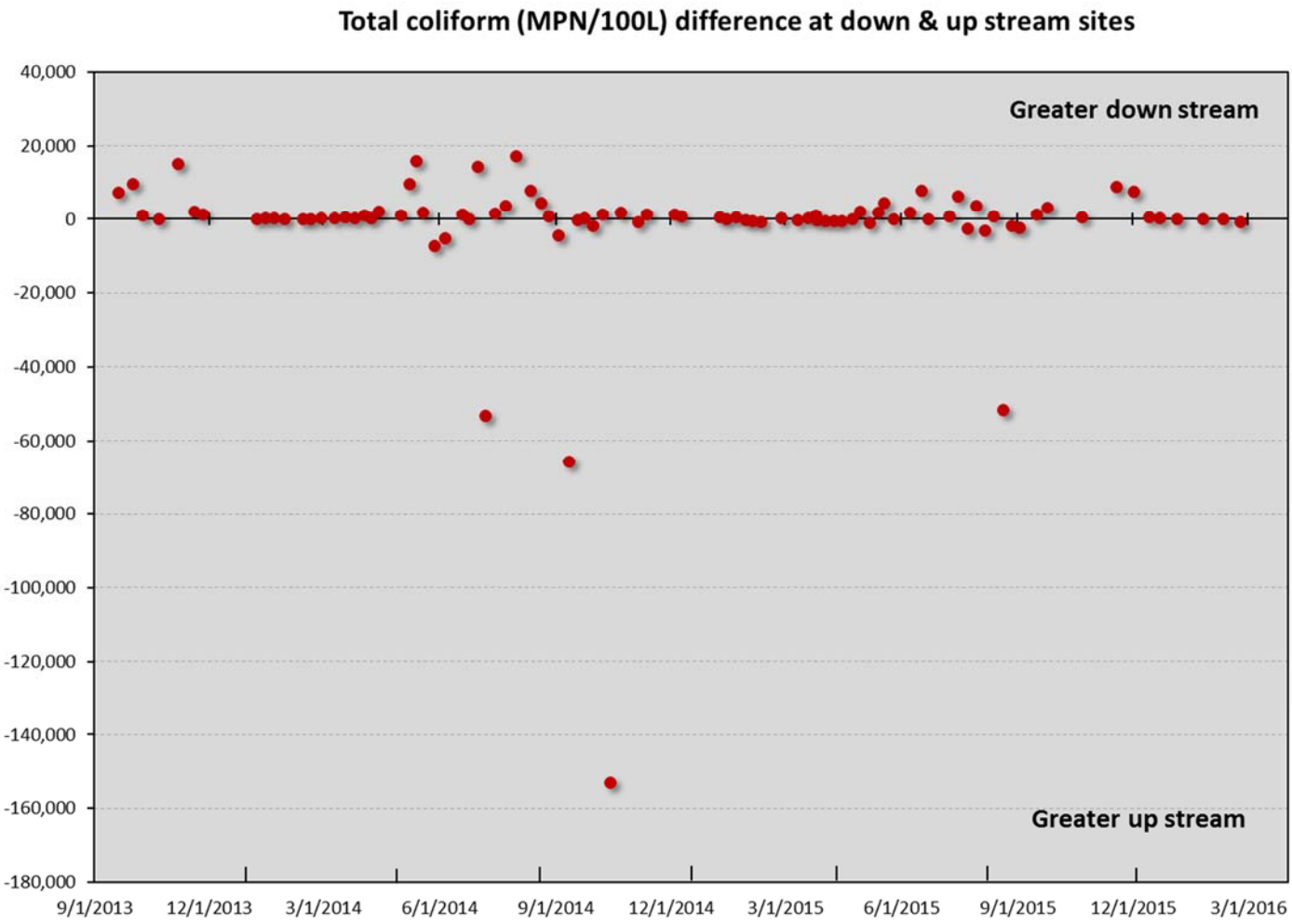

Figure 13. Difference in total coliform concentrations in Big Creek up- and downstream of the C&H Farm, Newton County, AR.

Water pH, Alkalinity, Chloride, Electrical Conductivity, and Total Dissolved Solids for Several Big Creek Sites

At the beginning of 2015, the pH, alkalinity, chloride concentration, electrical conductivity and total dissolved solids were determined on water samples collected at the upstream and downstream sites, spring, house well, and trenches, to build a data base that will enable to eventually source track the major water source pathways at these sites. These values are given below in Table 5.

Table 6. The pH, Chloride concentration, electrical conducting, and total solids concentration of water samples collected at upstream, downstream, spring, house well and trench sites, initiated at the beginning of 2015, with those collected since the last report noted.

Date	pH	Alkalinity	Chloride	Electrical conductivity	Total dissolved solids
		------- mg/L ------		µS/cm	mg/L
Upstream					
1/8/2015	7.3	36	1.80	90	71.6
1/14/2015			2.09	105	49.1
1/21/2015	7.6	48	1.85	121	71.1
1/29/2015			2.09	140	71.3
2/3/2015	7.7	54	2.40	129	71.1
2/10/2015			2.51	132	67.6
2/26/2015	7.6	40	1.98	107	56.4
3/3/2015			2.08	112	58.9
3/11/2015	7.8	30	1.88	85	269.3
3/19/2015			1.55	98	58.0
3/25/2015	8.0	42	1.77	110	67.6
3/26/2015			1.33	115	64.4
4/2/2015	8.0	42	1.57	110	76.0
4/9/2015			1.73	116	74.9
4/15/2015	7.7	36	1.38	91	63.8
4/23/2015			1.65	95	60.4
4/29/2015	8.1	50	1.56	85	54.3

Date	pH	Alkalinity	Chloride	Electrical conductivity	Total dissolved solids
5/7/2015			1.40	123	70.7
5/8/2015			1.80	157	88.4
5/11/2015	7.5	24	1.63	131	110.0
5/14/2015			1.55	143	79.3
5/18/2015			1.20	107	56.2
5/26/2015	7.7	28	1.10	90	58.4
6/4/2015			1.08	78	55.3
6/8/2015	8.2	60	2.03	149	111.3
6/17/2015			1.51	128	70.2
6/22/2015	8.2	40	1.36	114	64.9
6/29/2015			1.74	55	49.8
7/9/2015	7.7	32	1.53	90	64.7
7/16/2015			1.33	161	78.9
7/23/2015	7.9	78	1.63	180	50.2
7/30/2015			1.75	224	113.3
8/6/2015	7.7	100	1.84	218	75.3
8/13/2015			1.91	210	121.6
8/20/2015	7.3	108	2.15	219	120.0
8/27/2015			2.11	240	131.3
9/2/2015	7.1	122	2.50	262	129.3
9/16/2015	7.6	132	3.05	272	151.3
9/24/2015			2.74	271	149.3
11/12/2015	8.0	104	2.13	228	115.0
11/18/2015			1.36	84	55.6
12/2/2015			1.52	83	100.0
Sample analyses since the last quarterly report					

Date	pH	Alkalinity	Chloride	Electrical conductivity	Total dissolved solids
12/14/2015	7.5	26	1.21	63	50.0
12/22/2015	8.3	56	1.78	107	50.0
1/5/2016	7.5	40	1.34	102	62.5
1/25/2016	8.2	46	1.50	115	65.0
2/10/2016	8.6	54	1.69	141	60.0
2/24/2016	7.2	66	1.20	102	97.5
Downstream					
1/8/2015	7.6	64	2.02	144	89.3
1/14/2015			2.76	166	79.8
1/21/2015	7.6	84	2.44	191	91.1
1/29/2015			2.51	205	109.1
2/3/2015	7.7	88	2.82	196	103.3
2/10/2015			3.01	204	105.5
2/26/2015	7.8	66	2.27	162	88.0
3/3/2015			2.39	170	80.0
3/11/2015	7.8	52	2.02	128	77.3
3/19/2015			1.75	148	84.9
3/25/2015	7.8	64	2.07	158	88.7
3/26/2015			1.46	83	78.7
4/2/2015	8.1	68	1.95	163	103.0
4/9/2015			2.08	168	100.4
4/15/2015	7.8	56	1.54	130	82.0
4/23/2015			1.81	142	81.0
4/29/2015	8.0	80	2.15	150	97.3
5/7/2015			1.84	185	101.1
5/8/2015			2.50	225	125.8

Date	pH	Alkalinity	Chloride	Electrical conductivity	Total dissolved solids
5/11/2015	7.5	36	1.73	149	130.9
5/14/2015			1.06	103	80.2
5/18/2015			1.55	150	58.7
5/26/2015	7.7	46	1.25	137	89.1
6/1/2015			1.20	125	93.3
6/8/2015	8.0	94	1.44	163	86.9
6/17/2015			2.14	216	141.3
6/22/2015	7.9	76	1.76	204	106.5
7/7/2015			1.55	177	79.3
7/9/2015	7.7	50	1.63	116	77.6
7/16/2015			1.50	124	72.2
7/23/2015	7.8	108	1.84	223	111.8
7/30/2015			2.18	248	122.0
8/6/2015	7.6	154	2.31	286	142.9
8/13/2015			2.78	283	159.1
8/20/2015	7.2	142	2.83	287	156.0
8/27/2015			3.01	300	153.3
9/2/2015	7.5	146	3.13	322	159.6
9/10/2015			3.47	309	172.7
9/16/2015	7.4	152	3.87	310	169.3
9/24/201			3.46	308	168.3
9/30/2015	7.6	148	3.98	322	174.5
10/8/2015			3.42	344	179.8
10/14/2015	7.8	16	3.72	362	181.0
10/22/2015			3.45	362	168.8
10/28/2015	7.8	164	3.40	351	168.3
11/4/2015			4.05	358	181.0

Date	pH	Alkalinity	Chloride	Electrical conductivity	Total dissolved solids
11/12/2015	7.9	128	2.80	281	152.0
11/18/2015			1.55	120	77.8
12/2/2015			1.86	127	68.9
Sample analyses since the last quarterly report					
12/14/2015	7.7	38	1.26	93	70.0
12/22/2015	7.7	70	1.99	157	82.5
1/5/2016	7.5	60	2.17	158	92.5
1/25/2016	8.0	80	2.00	191	95.0
2/10/2016	8.0	94	2.36	214	102.5
2/22/2016	7.5	80	1.48	156	110.0
Spring					
1/8/2015			2.27	534	321.1
1/14/2015			2.79	517	310.0
1/21/2015			2.27	553	324.0
2/3/2015			2.20	562	321.8
2/10/2015			2.44	581	314.2
2/26/2015			1.74	491	266.4
3/3/2015			1.57	430	234.9
3/11/2015			1.63	495	54.7
3/19/2015			1.54	474	220.0
3/25/2015			2.08	544	277.6
4/2/2015			1.78	515	289.8
4/9/2015			2.03	509	305.8
4/15/2015			1.76	480	276.9
4/23/2015			1.93	512	297.3
4/29/2015			2.55	564	294.9

Date	pH	Alkalinity	Chloride	Electrical conductivity	Total dissolved solids
5/4/2015			1.57	554	251.8
5/7/2015			2.29	623	318.9
5/11/2015			1.11	408	202.0
5/14/2015			1.35	507	259.6
5/18/2015			1.17	508	265.8
5/26/2015			1.08	516	250.4
6/8/2015			1.95	615	341.8
6/17/2015			1.65	532	276.0
6/22/2015			1.79	601	301.1
7/9/2015			1.43	542	266.9
7/16/2015			2.02	629	309.3
7/23/2015			2.17	656	312.0
7/30/2015			2.26	648	334.9
8/6/2015			0.92	606	330.7
8/13/2015			2.71	522	328.0
8/20/2015			2.09	554	330.9
8/27/2015			2.01	575	318.2
9/2/2015			2.08	581	311.1
9/10/2015			1.99	485	254.8
9/16/2015			0.00	557	294.9
9/24/2015			1.95	574	311.5
9/30/2015			2.00	573	321.3
10/8/2015			1.92	581	333.8
10/14/2015			1.94	610	313.0
10/22/2015			1.86	581	273.8
10/28/201			1.81	537	292.3
11/4/2015			2.11	572	299.0

Date	pH	Alkalinity	Chloride	Electrical conductivity	Total dissolved solids
11/12/2015			2.20	565	294.5
11/18/2015			1.80	395	215.6
12/2/2015			4.14	487	302.2
Trench 1					
1/8/2015			2.01	154	103.6
1/14/2015			2.81	166	81.8
2/26/2015			2.08	171	78.4
3/3/2015			2.11	177	86.7
3/11/2015			1.95	193	114.0
3/19/2015			1.70	209	109.3
3/25/2015			2.13	238	105.1
3/26/2015			1.64	209	120.2
4/2/2015			1.94	261	151.3
4/9/2015			1.99	260	154.0
4/15/2015			1.80	260	146.7
4/23/2015			2.06	231	132.7
5/11/2015			2.09	262	126.5
5/14/2015			1.86	299	156.5
5/18/2015			1.57	346	173.1
5/26/2015			1.65	297	146.0
6/22/2015			1.99	341	169.8
6/29/2015			2.63	342	167.8
7/9/2015			2.08	171	78.4
11/18/2015			1.15	152	86.7
12/2/2015			1.47	162	108.9
Sample analyses since the last quarterly report					

Date	pH	Alkalinity	Chloride	Electrical conductivity	Total dissolved solids
12/14/2015			1.59	157	92.5
12/22/2015			1.70	180	95.0
1/5/2016			1.61	161	82.5
2/24/2016			1.16	162	102.5
Trench 2					
3/11/2015			1.77	159	140.8
3/19/2015			1.04	168	104.9
3/26/2015			0.78	135	160.9
5/11/2015			0.41	165	88.5
5/26/2015			0.93	284	141.3
Sample analyses since the last quarterly report					
12/14/2016			1.00	148	110.0
2/24/2016			0.99	144	122.5

Well Water Analyses

The sample collection point for the house well adjacent to the animal house facilities and slurry holding ponds was reconfigured to exclude any potential sources of sample contamination. It was determined that the risk of contamination was a result of factors such as well-head pump and in-house maintenance, In addition to installing a new well-water sampling site, USGS water quality sampling guidelines were used, which involved collection of a well sample when in-situ field measurement of well water temperature, pH, and electrical conductivity had stabilized. Well water analyses from samples collected after the new sampling port and sampling protocol were in operation are given in Table 6.

Table 7. Water quality analyses for samples collected from the well adjacent to the animal houses and slurry holding ponds following installation of new sampling port at the beginning of October, 2015.

	Dissolved P	Total P	Ammonia -N	Nitrate-N	Total N	Total suspended solids	Dissolved organic C	E. coli	Total coliform	Chloride	Conduct -ivity	Total dissolved Solids
	mg/L							MPN/100 mL		mg/L	µS/cm	mg/L
9/30/2015	0.009	0.016	<0.03	0.499	0.60	4.2	0.5	<1.0	2.0	7.307	446	236.3
10/8/2015	0.008	0.020	0.02	0.518	0.53	0.5	1.54	<1.0	<1	5.782	455	250.3
10/14/2015	0.012	0.020	<0.03	0.490	0.63	0.3	0.94	<1.0	<1	5.235	461	230.0
10/22/2015	0.010	0.014	0.04	0.478	0.50	0.4	1.93	<1.0	2.0	5.845	453	241.0
10/28/2015	0.008	0.016	0.01	0.391	0.54	<6.58	2.40	<1.0	<1	4.837	456	234.0
11/4/2015	0.010	0.016	<0.03	0.468	0.54	<6.58	2.62	<1.0	<1	5.159	455	239.3
11/12/2015	0.009	0.012	<0.03	0.501	0.55	0.3	3.71	<1.0	<1	5.590	458	237.0
11/18/2015	0.009	0.014	<0.03	0.464	0.59	0.4	0.48	<1.0	<1	4.657	458	231.1
12/2/2015	0.011	0.014	0.02	0.480	0.60	0.9	1.38	1.0	1.0	5.557	422	253.3
12/14/2015	0.011	0.010	<0.03	0.545	0.57	0.1	10.15	<1.0	1.0	4.545	460	245.0
12/22/2015	0.010	0.016	<0.03	0.534	0.59	0.3	1.40	<1.0	<1.0	5.455	458	242.5
1/5/2016	0.008	0.020	<0.03	0.528	0.57	0.9	1.08	<1.0	1.0	4.855	439	215.0
1/25/2016	0.012	0.020	<0.03	0.602	0.55	0.5	2.36	<1.0	<1.0	5.300	462	242.5
2/10/2016	0.007	0.014	<0.03	0.542	0.56	0.1	0.63	<1.0	<1.0	5.273	468	215.0
2/24/2016	0.010	0.010	<0.03	0.582	0.55	1.3	2.63	<1.0	<1.0	5.237	447	242.5