

APPENDIX 2.1 -- AECOM Toms Creek Annual Water Quality Report

November 20, 2017

Mr. Kevin D. Moore
Specialty Granules LLC
13424 Pennsylvania Avenue, Suite 303
Hagerstown, MD 21742

**Re: Report of Toms Creek Baseline Surface Water Quality Monitoring Program – Year 6 –
September 2017
AECOM Project #60553363**

Dear Mr. Moore:

This letter report provides a summary of the Toms Creek annual surface water quality monitoring that was conducted on September 25, 2017. This sampling event represents the fifth annual round of monitoring following the initial year of quarterly monitoring. This monitoring program was undertaken by Specialty Granules LLC (SGI) as a condition of the land exchange agreement with Pennsylvania Department of Conservation and Natural Resources (PADCNR) and Adams County. The purpose of the monitoring program is to monitor surface water quality at key locations along Toms Creek to evaluate water quality trends in Toms Creek from the upstream reaches and tributaries downstream to where it enters Carrol Valley.

This report includes a description of the monitoring program, sample collection and analysis methodologies, and a summary of the sample results.

Introduction

AECOM was contracted by SGI to complete a water quality monitoring program in the upper mainstem of Toms Creek, and unnamed tributaries to Toms Creek within the upper watershed near its Charmian Facility. The Toms Creek monitoring network consists of nine (9) sampling locations (identified as TC-1 through TC-9) established on Toms Creek and unnamed tributaries to Toms Creek, upstream and downstream of the SGI Charmian facility (**Figure 1**). With the exception of TC-1, the drainage basin for the sampling locations consists mainly of forested uplands. Each sampling point was sampled quarterly beginning with the October, 2011 event through August, 2012. The monitoring network was to be sampled for five (5) additional years, with 2017 being the last planned year of monitoring. 2016 was planned to be the baseline year for operations at the site. However, the permit for the area has not been approved. As such, SGI intends to continue monitoring on an annual basis until the permit is approved. A quarterly sampling frequency to establish the operational baseline will be completed during the first year of operations at the site. Currently, this is estimated to be 2020/2021. At the same time the samples are collected for chemical analyses, stream flow conditions are also measured and recorded.

The water quality constituents analyzed as part of this monitoring program consist of field measured and laboratory water quality parameters. Field measured water quality parameters include dissolved oxygen (DO), pH, specific conductance, turbidity, and temperature. Laboratory analyzed water quality parameters include pH, total suspended solids (TSS), total dissolved solids (TDS), total alkalinity, total acidity, ammonia-nitrogen, nitrogen (as NO₂ and

NO₃), phosphate (as total phosphorus), sulfate, total metals (aluminum, iron, and manganese), dissolved metals (aluminum, arsenic, cadmium, copper, iron, lead, manganese, nickel, and zinc), and bacteriological parameters (total coliform, fecal coliform, and e. coli).

Sampling & Analysis Methodology

Sampling points on the mainstem of Toms Creek were selected at locations directly downstream of named and unnamed tributaries to Toms Creek to understand the water quality of Toms Creek and potential influences to water quality that may be attributed to contributions from different tributaries. As shown on **Figure 1**, a total of eight (8) sampling points (TC-1, TC-2, TC-3, TC-4, TC-5, TC-6, TC-7 and TC-9, from downstream to upstream) are located on the mainstem of Toms Creek within the upper watershed, with the sampling points after TC-9 located just downstream of where a tributary joins the mainstem. Sampling point TC-8 is located on an unnamed tributary that contributes flow from the uppermost reaches of the watershed to Toms Creek.

The samples were collected following Pennsylvania Department of Environmental Protection (PADEP) surface water quality sampling protocols (e.g., instructions for Module 1 – Stormwater, Form 3850-pm-BCW0008d). Samples were collected in mid-stream directly into laboratory-supplied bottle ware, taking care not to overfill the bottles and lose preservative. Dissolved metal samples were field filtered prior to placing them in the preserved bottles using 0.45 micron disposable filters, which were replaced after each sample. Sample bottles were labeled with unique sample identifiers sample time, sample date, and requested analyses and packed in coolers with ice for storage and shipping. The sample containers were then delivered to ALS Environmental in Middletown, Pennsylvania, a PADEP-certified lab (PA 22-293). A Chain of Custody form was completed to document handling of each sample.

Samples were analyzed by the laboratory for pH, TSS, TDS, total alkalinity, total acidity, ammonia-nitrogen, nitrogen (as NO₂ and NO₃), phosphate (as total phosphorus), sulfate, total metals (aluminum, iron, and manganese), dissolved metals (aluminum, arsenic, cadmium, copper, iron, lead, manganese, nickel, and zinc), and bacteriological parameters (total coliform, fecal coliform, and e. coli) according to appropriate United States Environmental Protection Agency (USEPA) standard laboratory methodology in accordance to those contained in 40 CFR Part 136, “Guidelines for Establishing Test Procedures for the Analysis of Pollutants”.

Dissolved Oxygen (DO), pH, specific conductance, turbidity, and temperature were measured in the field using a Horiba U-22 water quality meter calibrated according to manufacturer specifications, in addition, the meter was calibrated in the field prior to use. The probes of the meter were rinsed with distilled water after the measurement of each sample and prior to use at the subsequent sample point.

Stream flow was measured using a Marsh-McBirney Flo-mate Model 2000 flow meter to record velocity at equal intervals across the stream bed. Two (2) methods for stream flow were used, based on the depth of water column. Both methods obtain the mean stream flow at a section across the streambed. The $\bar{U}_{max}$ method (for stream depths less than 6.5 inches) takes the flow rate reading and multiplies that number by 0.9 to obtain the mean flow for that interval. The second method (0.2, 0.4 and 0.8 depth method) obtains the mean velocities within an interval by

averaging flows at three (3) different depths within the water column where the stream depth is sufficient to obtain multiple measurements.

Summary of Results

Stream flow measurements are summarized in **Table 1**. **Table 2** provides the results of field and laboratory water quality analyses for the September 2017 sampling event. Historical data from previous events are summarized in **Table 3**, along with the 2017 results.

At the time of the sampling on September 25, 2017, stream flow in Toms Creek was well below average for this time of year. In the two weeks prior to this sampling event, a combined total of 0.14-inches of precipitation had been received in the area. The flows measured in 2017 are the lowest recorded since monitoring began in 2011, with the exception of at TC-1. Stream flow measurements recorded on September 25, 2017 ranged from 0.06 cubic feet per second (cfs) or 27 gallons per minute (gpm) at location TC-8 to 1.8 cfs (800 gpm) at the most downstream location, TC-1.

Field parameter measurements are included on **Tables 2 and 3**. The field pH readings were generally similar to the laboratory results, although upstream field readings tended to be higher than the lab results, while downstream locations TC-1 and TC-2 had lower field readings compared to the lab results. The field pH readings ranged from 7.80 at TC-1 to 8.76 at TC-7 and laboratory pH readings ranged from 8.40 at TC-1 to 7.39 at TC-9. The DO readings were all above 9.0 mg/l and near saturation, which is typical of a clean headwater stream. Specific conductivity values were all low and ranged from 15 umhos/cm at TC-2 to 33 umhos/cm at TC-7. Turbidity levels were higher than in previous years, ranging from 30.0 NTUs at TC-9 to 75.9 NTUs at TC-8.

A review of the laboratory results indicates a number of chemical constituents were reported as not detected (denoted by a less than “<” symbol), indicating that the actual concentration of that constituent is less than the laboratory method detection limit (MDL). The constituents not detected in any of the samples during the September 2017 monitoring event included total acidity, ammonia nitrogen, phosphorus, and several dissolved metals (aluminum, arsenic, cadmium, copper, lead, nickel, and zinc).

Dissolved iron was only reported at TC-6 (0.11 mg/L). Dissolved manganese was reported at TC-6 (0.0062 mg/L), TC-7 (0.0015 mg/L), TC-8 (0.010 mg/L). Low concentrations within naturally occurring ranges of other inorganic constituents (total aluminum, total iron, and total manganese) were also detected at the following locations: total aluminum was detected in TC-7; total iron was detected at TC-5 through TC-9; and total manganese was detected at TC-5 through TC-9.

Sulfate was reported in all surface water samples except TC-9 at concentrations ranging from 2.7 mg/L in TC-8 to 4.0 mg/L in TC-1. Nitrogen as NO₂ and NO₃ was only detected at TC-1, 3, 4 and 5 and occurred at low concentrations ranging from 0.22 mg/L at TC-3 to 0.30 mg/L at TC-1.

Bacteriological components were detected in all samples: E. coli values range from 20 Colony Forming Units (cfu)/100 ml at TC-1 to 154 cfu at TC-6; fecal coliform values range from 16

cfu/100 ml at TC-1 to 570 cfu/100 ml at TC-6; and TC-1, TC-6 and TC-8 had total coliform values greater than 2,419.6 cfu/100 ml).

Discussion - Conclusions

The stream flow was very low at the time of this year's monitoring event in late September. The levels of TDS and alkalinity increase slightly in downstream sampling locations compared to those further upstream. Concentrations of plant nutrients - nitrogen and phosphorus - were below detection or at low levels throughout the stream reach. Metals also were generally below detection limits or at very low concentrations, with low levels total iron and manganese reported in TC-5 and upstream sampling locations, but virtually no dissolved metals were present (dissolved iron was reported at TC-6 at a level of 0.11 ug/l – the reporting limit is 0.06 mg/l).

The field pH readings decreased from upstream to downstream stations, however, the laboratory results showed an increasing trend. Field pH readings are generally considered more reliable than laboratory readings, as the holding time for pH samples is “analyze immediately”. Field turbidity readings were anomalously high at all locations compared to previous years at low flow.

Bacterial counts in the 2017 results tended to be lower in downstream sampling stations and show an inverse correlation with flow (tended to be higher at low flows), however, total coliform counts “too numerous to count” were reported at both TC-8 and TC-1 and fecal coliforms were detected at every sampling station.

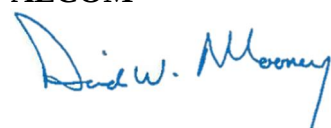
Other parameters appear to be stable over time and over the stream length monitored, with fluctuations between sampling events that may be related to the low stream flow in September of 2017 and timing of recharge events in previous years that affect the baseflow chemical characteristics.

The sample results, to date, illustrate generally good water quality, although all reaches of the stream are impacted by coliform bacteria, including high levels of fecal coliform bacteria in the creek upstream of mining operations. Analyzed quality parameters exhibit expected temporal variability typical of a functioning, natural stream setting. The results also illustrate some variations in water quality within naturally occurring and expected ranges between different sampling locations and dates for some parameters that typically vary with flow or season in the natural environment.

Please contact me if you have any questions regarding this summary report.

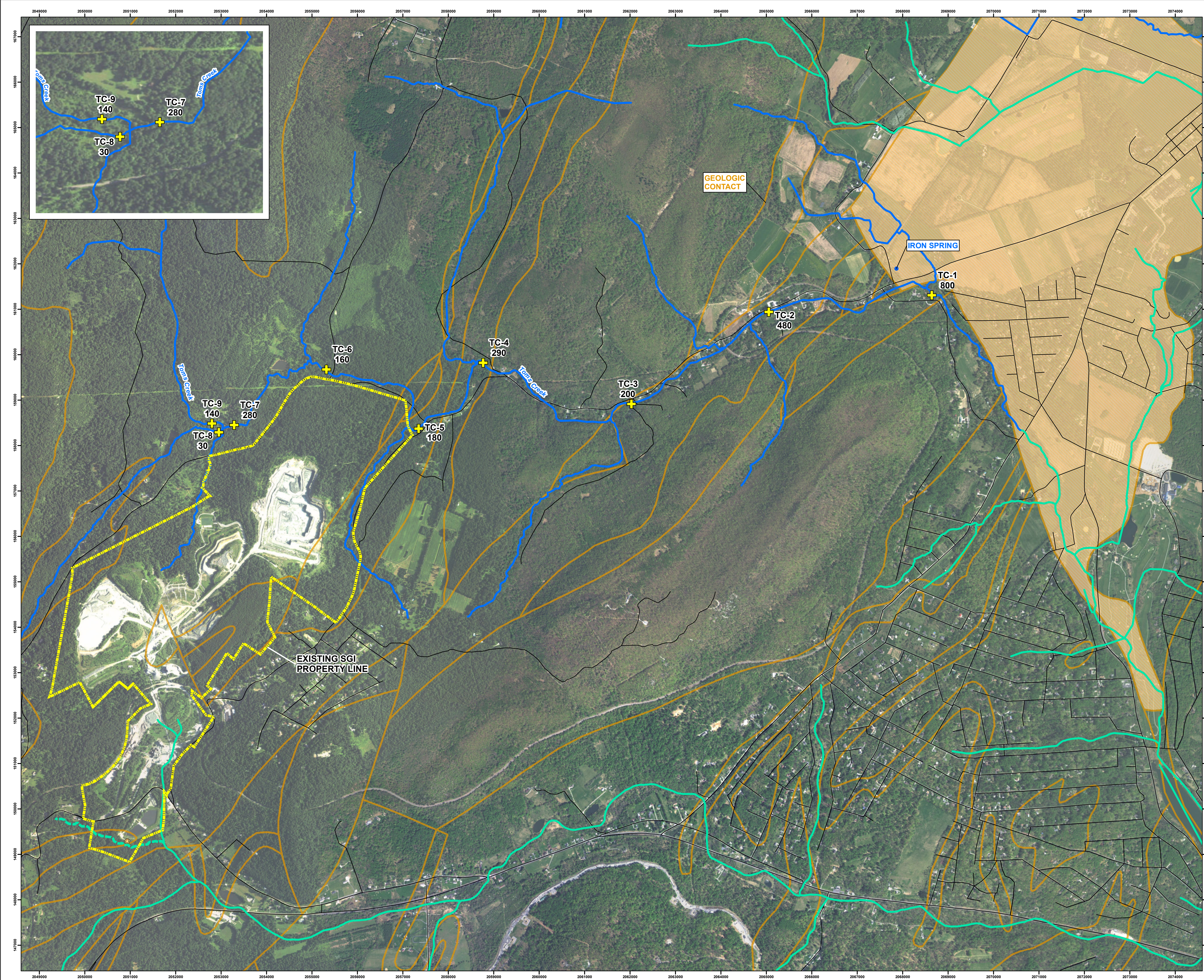
Sincerely,

AECOM



David W. Mooney
Project Manager

Figures



Legend

- Stream Samples**
- TC-1 800 + Toms Creek Sample Location
Flow in Gallons per Minute
- Streams CH93 Designated Use**
- CWF (Cold Water Fishes)
 - HQ-CWF (High Quality-Cold Water Fishes)
 - WWF (Warm Water Fishes)
 - Spring

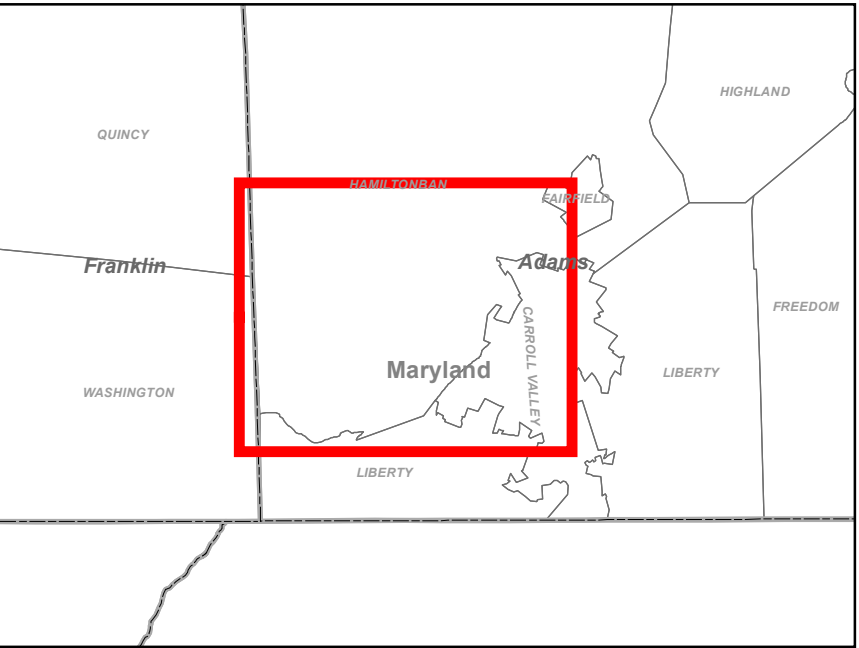
Boundary Lines

- Existing SGI Property Line

Geology

- Clastic/Metabasalt & Metarhyolite
- Geologic Contact
- Gettysburg Limestone Conglomerate

NOTES:
FLOW MEASUREMENTS ARE RECORDED AS GALLONS PER MINUTE.



Key Map
Not to Scale

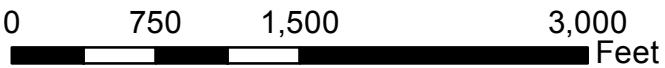


NAD_1983_StatePlane_Pennsylvania_South_FIPS_3702_Feet
Projection: Lambert_Conformal_Conic
False_Easting: 1968500.000000
False_Northing: 0.000000
Central_Meridian: -77.750000
Standard_Parallel_1: 39.933333
Standard_Parallel_2: 40.966667
Latitude_Of_Origin: 39.333333
Linear Unit: Foot_US

GCS_North_American_1983
Datum: D_North_American_1983

REFERENCE:

AECOM CUSTOM DATA
PADCNR GEOLOGIC MAP OF PENNSYLVANIA
PADEP CHAPTER 93 DESIGNATED STREAM USE
PAMAP AERIAL
PAMAP PROGRAM ROADS



AECOM

FIGURE 1
TOMS CREEK MONITORING
PROGRAM SAMPLE LOCATIONS
SEPTEMBER 25, 2017

SPECIALTY GRANULES LLC
BLUE RIDGE SUMMIT, PA
ADAMS COUNTY, PENNSYLVANIA

Prepared By:	BAS	Checked By:	DWM
Job:	60553363	Date:	10/5/2017

Tables

TABLE 1
September 2017 Toms Creek Stream Sampling Network
Summary of Streamflow Measurements

Sample Station	Date Measured	Flow (cfs)	Flow (gpm)
TC-1	9/25/2017	1.8	800
TC-2	9/25/2017	1.1	480
TC-3	9/25/2017	0.5	200
TC-4	9/25/2017	0.6	290
TC-5	9/25/2017	0.4	180
TC-6	9/25/2017	0.4	160
TC-7	9/25/2017	0.6	280
TC-8	9/25/2017	0.1	30
TC-9	9/25/2017	0.3	140

Notes:

cfs - Cubic Feet per Second.

gpm - Gallons per Minute.

Flow calculated using Hach HF950 flow meter at 1' intervals across stream bed

September 2017 Toms Creek Stream Sampling Network

Table 2

Summary of Field and Laboratory Water Quality Results

Sample ID	TC-1	TC-2	TC-3	TC-4	TC-5	TC-6	TC-7	TC-8	TC-9
Sample Date	9/25/2017	9/25/2017	9/25/2017	9/25/2017	9/25/2017	9/25/2017	9/25/2017	9/25/2017	9/25/2017
FIELD READINGS									
pH - Field (std. units)	7.80	7.85	7.90	7.91	7.94	8.24	8.76	8.50	8.53
Specific Conductance - Field (umhos/cm)	16.20	15.00	16.40	19.00	18.10	16.80	32.60	17.70	9.90
Total Dissolved Solids (mg/L)	110	100	100	120	110	110	170	110	60
Temperature - Field (°C)	21.64	20.20	20.25	21.74	20.38	20.27	21.81	21.24	20.69
Dissolved Oxygen - Field (mg/L)	9.65	9.81	10.18	9.81	9.82	10.22	9.52	9.58	9.56
Turbidity - Field (n.t.u.)	30.2	58.3	69.7	57.8	50.0	64.6	75.9	44.3	30.0
LABORATORY RESULTS									
pH - Laboratory (at 25°C)	8.40	8.01	7.86	7.85	7.81	7.73	7.64	7.57	7.39
Total Suspended Solids (mg/L)	<5	<5	<5	<5	<5	<5	<5	<5	<5
Total Dissolved Solids (mg/L)	78	75	76	85	80	72	60	64	55
Total Alkalinity (Total as CaCO ₃)(mg/L)	45	38	35	41	40	35	26	26	17
Total Acidity (mg/L)	<5	<5	<5	<5	<5	<5	<5	<5	<5
Aluminum - Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Arsenic - Dissolved (mg/L)	<0.008	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080	<0.0080
Cadmium - Dissolved (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Copper - Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.011	<0.010	<0.010	<0.010	<0.010
Iron - Dissolved (mg/L)	<0.060	<0.060	<0.060	<0.060	<0.060	0.11	<0.060	<0.060	<0.060
Lead - Dissolved (mg/L)	<0.0060	0.0076	0.0067	0.0066	0.0069	<0.0060	<0.0060	0.0081	<0.0060
Manganese - Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0062	0.0015	0.010	<0.0050
Nickel - Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.022	<0.020	<0.020	<0.020	<0.020
Zinc - Dissolved (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Aluminum - Total (mg/L)	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	0.14	<0.11	<0.11
Iron - Total (mg/L)	<0.067	<0.067	<0.067	<0.067	0.13	0.11	0.39	0.31	0.11
Manganese - Total (mg/L)	<0.0056	<0.0056	<0.0056	<0.0056	0.012	0.008	0.047	0.035	0.010
Ammonia-Nitrogen (mg/L)	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100	<0.100
Total Phosphorous (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sulfate (mg/L)	4.0	3.6	3.6	3.9	3.5	3.1	3.5	2.7	<2.0
Nitrogen as NO ₂ and NO ₃ (mg/L)	0.30	<0.20	0.22	0.26	0.26	<0.20	<0.20	<0.20	<0.20
E. coli (CFU/100 ml)	20	31	55	30	47	154	152	111	77
Fecal Coliforms (CFU/100 ml)	16	34	57	35	58	570	34	105	67
Total Coliform (CFU/100 ml)	>2419.6	1,200	1,300	1990	1730	>2,419.6	1730	>2,419.6	1200

NOTES:

1. TC-1 - Tom's Creek sample location 1.
2. "< Value" - Not Detected.
3. Alkalinity reported milligrams per liter (mg/L) CaCO₃.
4. Analytical parameter concentrations reported in mg/L.
5. CFU/100 ml - colony-forming units per 100 milliliters of sample.
6. pH concentrations reported in Standard Units.
7. Specific conductance values reported in micromhos/centimeter at 25° Celsius.

Toms Creek Stream Sampling Network
Table 3
Summary of Historical Field and Lab Water Quality Results

Sample ID	TC-1									TC-2								
Sample Date	10/17/2011	1/23/2012	5/2/2012	8/2/2012	9/12/2013	8/25/2014	8/19/2015	8/17/2016	9/25/2017	10/17/2011	1/23/2012	5/2/2012	8/2/2012	9/12/2013	8/25/2014	8/19/2015	8/17/2016	9/25/2017
Flow (gpm)	3622	14274	10783	2036	1476	3200	3482	3200	800	2397	12938	7635	1954	3147	2905	3855	850	478
pH - Field (std. units)	5.3	8.14	6.78	7.56	6.78	5.67	7.13	6.94	7.80	4.89	7.30	7.31	7.66	7.19	6.03	7.14	7.52	7.85
pH - Lab (std. units)	NA	6.8	7.2	7.4	7.3	7.56	7.65	7.73	8.4	NA	6.8	7.2	7.5	7.2	7.5	8.9	7.75	8.01
Specific Conductance - Field (umhos/cm)	116	63	85	116	107	126	93	89	16	109	56	80	110	85	107	79	81	15
Temperature - Field (°C)	13.0	2.26	12.89	20.73	19.96	15.71	19.80	21.40	21.64	12.8	2.12	12.66	20.39	19.32	15.61	19.85	21.43	20.20
Dissolved Oxygen - Field (mg/L)	10.6	12.02	8.84	8.90	6.48	7.54	8.04	8.62	9.65	10.6	12.73	9.18	9.76	8.95	7.39	8.40	8.45	9.81
Turbidity - Field (n.t.u.)	0.8	18.5	3.0	3.3	5.5	0.5	0.0	2.7	30.2	3.6	11.9	3.5	3.0	9.5	0.7	0.0	1.2	58.3
Total Suspended Solids (mg/L)	<4.0	<4.0	5.0	<4.0	6.0	<5.0	6.0	5.0	<5	<4.0	<4.0	6.0	5.0	4.0	<5.0	<5	<5	<5
Total Dissolved Solids (mg/L)	30	52.0	67.0	56.0	33.0	84.0	71	81	78	26	<10.0	62.0	56.0	43.0	104.0	70	78	75
Total Alkalinity (Total as CaCO3)(mg/L)	26.0	20.0	12.0	26.0	34.0	33.0	34	35	45	30.0	18.0	14.0	30.0	28.0	29.0	31	26	38
Total Acidity (mg/L)	<10.0	<10.0	<10.0	<10.0	<10.0	<5.0	<5	<5	<5	<10.0	<10.0	<10.0	<10.0	<10.0	<5.0	<5	<5	<5
Aluminum - Dissolved (mg/L)	NA	<0.050	<0.050	<0.050	<0.050	<0.03	<0.1	<0.10	<0.10	NA	<0.050	<0.050	<0.050	<0.050	<0.03	<0.1	<0.10	<0.10
Arsenic - Dissolved(mg/L)	NA	<0.005	<0.005	<0.005	<0.005	0.0037	<0.008	<0.008	<0.008	NA	<0.005	<0.005	<0.005	<0.005	<0.003	<0.008	<0.0080	<0.0080
Cadmium - Dissolved (mg/L)	NA	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.0020	<0.0020	NA	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.0020	<0.0020
Copper - Dissolved (mg/L)	NA	<0.005	<0.005	<0.005	<0.005	<0.003	<0.01	<0.010	<0.010	NA	<0.005	<0.005	<0.005	<0.005	<0.003	<0.01	<0.010	<0.010
Iron - Dissolved (mg/L)	<0.070	<0.070	<0.070	<0.070	<0.070	0.024	<0.06	<0.060	<0.060	<0.070	<0.070	<0.070	0.0873	<0.070	0.026	<0.06	<0.060	<0.060
Lead - Dissolved (mg/L)	NA	<0.005	<0.005	<0.005	<0.005	<0.002	<0.006	<0.0060	<0.0060	NA	<0.005	<0.005	<0.005	<0.005	<0.002	<0.006	<0.0060	0.0076
Manganese - Dissolved (mg/L)	<0.005	<0.005	0.0171	0.0055	<0.005	0.0024	<0.005	0.0058	<0.005	<0.005	<0.005	0.0178	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.0050
Nickel - Dissolved (mg/L)	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020
Zinc - Dissolved (mg/L)	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020
Aluminum - Total (mg/L)	<0.050	<0.050	0.0643	0.105	0.0729	<0.03	<0.11	<0.11	<0.11	<0.050	<0.050	0.0949	0.219	0.0865	0.0410	<0.11	<0.11	<0.11
Arsenic - Total (mg/L)	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium - Total (mg/L)	<0.003	NA	NA	NA	NA	NA	NA	NA	NA	<0.003	NA	NA	NA	NA	NA	NA	NA	NA
Copper - Total (mg/L)	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA	NA	NA
Iron - Total (mg/L)	0.0895	<0.070	0.103	0.144	<0.070	0.045	<0.067	<0.067	<0.067	0.0749	<0.070	0.101	0.300	0.0825	0.063	<0.067	<0.067	<0.067
Manganese - Total (mg/L)	<0.005	<0.005	<0.005	0.0075	0.0053	0.0023	0.0087	0.0092	<0.0056	<0.005	<0.005	0.0069	0.0119	0.0058	0.0029	<0.0056	0.0058	<0.0056
Nickel - Total (mg/L)	<0.010	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	NA	NA	NA	NA	NA	NA	NA	NA
Zinc - Total (mg/L)	<0.010	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen Ammonia (mg/L)	<0.10	<0.10	<0.10	0.13	<0.10	0.088	<0.1	<0.100	<0.100	<0.10	<0.10	<0.10	0.13	0.23	0.06	<0.1	<0.100	<0.100
Phosphorous (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030	0.063	0.16	<0.10	<0.10	<0.030	<0.030	<0.030	<0.030	<0.030	<0.040	0.170	<0.10	<0.10
Sulfate (mg/L)	10.2	11.4	<10.0	12.4	10	5.4	4.3	3.8	4	10.0	<0.10	<10.0	<10.0	<10.0	5.2	4.1	3.6	4.0
Nitrogen as NO ₂ and NO ₃ (mg/L)	0.33	0.56	0.34	0.35	0.28	0.28	0.54	0.38	0.3	0.25	0.50	0.31	0.33	0.22	0.38	0.38	0.32	0.30
E. coli (CFU/100 ml)	38	5.0	55	440	65	109	47	238	20	14	4.0	30	690	48	248	52	81	20
Fecal Coliform (CFU/100 ml)	NA	10.0	52	200	140	59	56	270	16	NA	2.0	18	600	250	280	56	104	16
Total Coliform (CFU/100 ml)	>200	270	1000	>2400	>2,400	>2,419	1,990	2,420	>2419.6	>200	390	730	>2400	>2,400	>2,419	1,550	>2419.6	>2419.6

NOTES:

1. TC-1 - Tom's Creek sample location
1. See **Figure 1**
2. "< Value" - Not Detected.
3. Alkalinity reported in milligrams per liter (mg/L) CaCO₃.
4. Analytical parameter concentrations reported in mg/L.
5. CFU/100 ml - colony-forming units per 100 milliliters of sample.
6. gpm - gallons per minute.
7. pH concentrations reported in Standard Units.
8. Specific conductance values reported in microhos/centimeter at 25o
9. NA = Not analyzed

Toms Creek Stream Sampling Network
Table 3
Summary of Historical Field and Lab Water Quality Results

Sample ID	TC-3									TC-4								
Sample Date	10/17/2011	1/23/2012	5/2/2012	8/2/2012	9/12/2013	8/25/2014	8/19/2015	8/17/2016	9/25/2017	10/17/2011	1/23/2012	5/2/2012	8/2/2012	9/12/2013	8/25/2014	8/19/2015	8/17/2016	9/25/2017
Flow (gpm)	1957	9854	6306	2479	2743	2720	3989	1400	201	1939	8373	5562	1111	1933	2287	3962	840	287
pH - Field (std. units)	5.75	7.21	7.44	7.65	7.45	6.38	7.25	7.60	7.90	6.24	7.27	7.51	7.67	7.57	6.70	7.20	7.75	7.91
pH - Lab (std. units)	NA	6.9	7.3	7.4	7.3	7.55	8.02	7.77	7.86	NA	6.9	7.3	7.5	7.5	7.6	7.84	7.82	7.85
Specific Conductance - Field (umhos/cm)	120	63	85	122	88	123	95	75	16	116	63	81	128	105	124	99	93	19
Temperature - Field (°C)	12.6	1.69	12.84	20.14	18.88	15.48	20.14	20.99	20.25	12.5	1.92	12.81	20.52	19.71	15.59	19.98	21.79	21.74
Dissolved Oxygen - Field (mg/L)	10.82	12.63	8.29	10.02	7.47	6.18	8.11	8.84	10.18	10.67	13.80	8.96	8.54	7.56	6.64	7.61	7.89	9.81
Turbidity - Field (n.t.u.)	5.1	8.3	1.7	3.1	5.4	0.0	0.0	1.9	69.7	2.9	7.5	3.4	3.6	4.1	0.0	37.7	1.4	57.8
Total Suspended Solids (mg/L)	<4.0	<4.0	<4.0	4.0	4.0	<5.0	<5	<5	<5	<4.0	<4.0	7.0	6.0	4.0	<5.0	<5	<5	<5
Total Dissolved Solids (mg/L)	28.0	31.0	73.0	<10.0	42.0	90.0	80	76	78	37.0	25.0	63.0	62.0	51.0	87.0	65	83	85
Total Alkalinity (Total as CaCO3)(mg/L)	30.0	18.0	20.0	32.0	28.0	32.0	34	31	35	28.0	20.0	<10.0	38.0	36.0	34.0	33	34	41
Total Acidity (mg/L)	<10.0	<10.0	<10.0	<10.0	<10.0	<5.0	<5	<5	<5	<10.0	<10.0	<10.0	<10.0	<10.0	<5.0	<5	<5	<5
Aluminum - Dissolved (mg/L)	NA	<0.050	<0.050	<0.050	<0.050	<0.03	<0.1	<0.10	<0.10	NA	<0.050	<0.050	<0.050	<0.050	<0.03	<0.1	<0.10	<0.10
Arsenic - Dissolved(mg/L)	NA	<0.005	<0.005	<0.005	<0.005	0.0033	<0.008	<0.0080	<0.0080	NA	<0.005	<0.005	<0.005	<0.005	<0.003	<0.008	<0.0080	<0.0080
Cadmium - Dissolved (mg/L)	NA	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.0020	<0.0020	NA	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.0020	<0.0020
Copper - Dissolved (mg/L)	NA	<0.005	<0.005	<0.005	<0.005	<0.003	<0.01	<0.010	<0.010	NA	<0.005	<0.005	<0.005	<0.005	<0.003	<0.01	<0.010	<0.010
Iron - Dissolved (mg/L)	<0.070	<0.070	<0.070	<0.070	<0.070	0.031	<0.06	<0.060	<0.060	<0.070	<0.070	<0.070	<0.070	<0.070	0.047	<0.06	<0.060	<0.060
Lead - Dissolved (mg/L)	NA	<0.005	<0.005	<0.005	<0.005	<0.002	<0.006	<0.0060	0.0067	NA	<0.005	<0.005	<0.005	<0.005	<0.002	<0.006	<0.0060	0.0066
Manganese - Dissolved (mg/L)	<0.005	<0.005	0.0178	<0.005	<0.005	0.0019	<0.005	<0.0050	<0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	0.0025	<0.005	0.0053	<0.0050
Nickel - Dissolved (mg/L)	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020
Zinc - Dissolved (mg/L)	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020
Aluminum - Total (mg/L)	<0.050	<0.050	0.0767	0.173	0.062	0.039	<0.11	<0.11	<0.11	<0.050	<0.050	0.113	0.193	0.075	0.19	<0.11	<0.11	<0.11
Arsenic - Total (mg/L)	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium - Total (mg/L)	<0.003	NA	NA	NA	NA	NA	NA	NA	NA	<0.003	NA	NA	NA	NA	NA	NA	NA	NA
Copper - Total (mg/L)	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA	NA	NA
Iron - Total (mg/L)	0.0721	<0.070	0.106	0.204	0.0741	0.066	<0.067	0.086	<0.067	0.0968	<0.070	0.137	0.224	0.104	0.32	<0.067	0.096	<0.067
Manganese - Total (mg/L)	<0.005	<0.005	0.0051	0.0101	0.0058	0.0028	<0.0056	0.0080	<0.0056	<0.005	<0.005	0.0078	0.0102	0.0082	0.021	<0.0056	0.0096	<0.0056
Nickel - Total (mg/L)	<0.010	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	NA	NA	NA	NA	NA	NA	NA	NA
Zinc - Total (mg/L)	<0.010	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen Ammonia (mg/L)	<0.10	<0.10	<0.10	0.12	<0.10	0.072	0.46	<0.100	<0.100	<0.10	<0.10	<0.10	<0.10	<0.10	0.093	<0.1	<0.100	<0.100
Phosphorous (mg/L)	<0.030	<0.030	<0.030	<0.030	0.031	<0.040	0.17	<0.10	<0.10	<0.030	<0.030	<0.030	<0.030	<0.030	<0.040	0.17	<0.10	<0.10
Sulfate (mg/L)	10.5	<10.0	<10.0	<10.0	<10.0	6.2	4.6	3.5	3.6	10.6	<10.0	<10.0	<10.0	<10.0	6.4	5.1	3.6	3.9
Nitrogen as NO ₂ and NO ₃ (mg/L)	0.25	0.56	0.33	0.39	0.24	0.46	0.46	0.30	0.22	0.25	0.58	0.33	0.38	0.34	0.52	0.52	0.32	0.26
E. coli (CFU/100 ml)	11	6.0	7.0	130	35	51	58	73	55	16	5.0	6.0	120	93	55	52	59	30
Fecal Coliform (CFU/100 ml)	NA	5.0	8.0	140	200	33	54	240	57	NA	6.0	6.0	110	1300	52	33	260	35
Total Coliform (CFU/100 ml)	>200	240	730	>2400	>2,400	>2,419	>2419	>2,419.6	1,300	>200	410	820	>2400	>2,400	>2,419	>2,419.6	>2,419.6	1990

NOTES:

1. TC-1 - Tom's Creek sample location
1. See **Figure 1**
2. "< Value" - Not Detected.
3. Alkalinity reported in milligrams per liter (mg/L) CaCO₃.
4. Analytical parameter concentrations reported in mg/L
5. CFU/100 ml - colony-forming units per 100 milliliters of sample.
6. gpm - gallons per minute.
7. pH concentrations reported in Standard Units.
8. Specific conductance values reported in microhos/centimeter at 25o
9. NA = Not analyzed

Toms Creek Stream Sampling Network
Table 3
Summary of Historical Field and Lab Water Quality Results

Sample ID	TC-5									TC-6								
Sample Date	10/17/2011	1/23/2012	5/2/2012	8/2/2012	9/12/2013	8/25/2014	8/19/2015	8/17/2016	9/25/2017	10/17/2011	1/23/2012	5/2/2012	8/2/2012	9/12/2013	8/25/2014	8/19/2015	8/17/2016	9/25/2017
Flow (gpm)	2029	5720	4176	1006	1566	2193	2912	730	175	1450	5213	3258	694	1018	1986	1974	740	163
pH - Field (std. units)	6.31	7.09	7.64	7.64	7.60	6.92	7.02	7.79	7.94	6.39	6.86	7.54	7.58	7.53	6.94	6.45	7.63	8.24
pH - Lab (std. units)	NA	7.0	7.3	7.1	7.4	7.55	7.77	7.80	7.81	NA	6.9	6.5	7.2	7.3	7.47	7.61	7.72	7.73
Specific Conductance - Field (umhos/cm)	115	62	79	113	99	122	90	88	18	93	48	66	104	86	96	111	71	17
Temperature - Field (°C)	12.5	1.97	12.81	19.91	19.54	15.19	19.74	21.38	20.38	12.4	2.27	12.80	19.99	19.19	15.64	19.15	21.39	20.27
Dissolved Oxygen - Field (mg/L)	10.77	13.84	8.51	9.74	8.71	5.58	8.25	8.69	9.82	11.02	13.35	9.18	9.65	5.63	6.67	7.95	8	10.22
Turbidity - Field (n.t.u.)	5.3	7.4	4.0	5.5	5.8	0.9	89.7	2.1	50.0	3.2	8.0	4.9	3.4	5.6	1.2	5.6	1.7	64.6
Total Suspended Solids (mg/L)	<4.0	<4.0	4.0	5.0	4.0	6.0	<5	5.0	<5	<4.0	<4.0	5.0	4.0	4.0	<5.0	<5	<5	<5
Total Dissolved Solids (mg/L)	33.0	37.0	64.0	87.0	48.0	91.0	78	79	80	27.0	17.0	58.0	60.0	36.0	75.0	39	71	72
Total Alkalinity (Total as CaCO3)(mg/L)	20.0	18.0	18.0	30.0	32.0	32.0	31	32	40	20.0	18.0	18.0	22.0	34.0	28.0	27	27	35
Total Acidity (mg/L)	<10.0	<10.0	<10.0	<10.0	<10.0	<5.0	<5	<5	<5	<10.0	<10.0	<10.0	<10.0	<10.0	<5.0	<5	<5	<5
Aluminum - Dissolved (mg/L)	NA	<0.050	<0.050	<0.050	<0.050	<0.03	<0.1	<0.10	<0.10	NA	<0.050	<0.050	<0.050	<0.050	<0.03	<0.1	<0.10	<0.10
Arsenic - Dissolved(mg/L)	NA	<0.005	<0.005	<0.005	<0.005	<0.003	<0.008	<0.0080	<0.0080	NA	<0.005	<0.005	<0.005	<0.005	<0.003	<0.008	<0.0080	<0.0080
Cadmium - Dissolved (mg/L)	NA	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.0020	<0.0020	NA	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.0020	<0.0020
Copper - Dissolved (mg/L)	NA	<0.005	<0.005	<0.005	<0.005	<0.003	<0.01	<0.010	<0.010	NA	<0.005	<0.005	<0.005	<0.005	<0.003	<0.01	<0.010	<0.010
Iron - Dissolved (mg/L)	<0.070	<0.070	<0.070	0.167	<0.070	0.052	<0.06	<0.060	<0.060	<0.070	<0.070	<0.070	0.114	0.112	0.1	0.070	0.100	0.110
Lead - Dissolved (mg/L)	NA	<0.005	<0.005	<0.005	<0.005	<0.002	<0.006	<0.0060	0.0069	NA	<0.005	<0.005	<0.005	<0.005	<0.002	<0.006	<0.0060	<0.0060
Manganese - Dissolved (mg/L)	<0.005	<0.005	<0.005	<0.005	0.0063	0.0022	<0.005	<0.0050	<0.0050	<0.005	<0.005	0.0073	0.0098	0.0101	0.008	0.0055	0.0077	0.0062
Nickel - Dissolved (mg/L)	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020
Zinc - Dissolved (mg/L)	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020
Aluminum - Total (mg/L)	0.0532	<0.050	0.103	0.196	0.094	0.0520	<0.11	<0.11	<0.11	0.0659	0.0508	0.131	0.743	0.070	0.0970	<0.11	<0.11	<0.11
Arsenic - Total (mg/L)	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium - Total (mg/L)	<0.003	NA	NA	NA	NA	NA	NA	NA	NA	<0.003	NA	NA	NA	NA	NA	NA	NA	NA
Copper - Total (mg/L)	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA	NA	NA
Iron - Total (mg/L)	0.0985	<0.070	0.142	0.260	0.139	0.097	0.085	0.15	0.13	0.129	<0.070	0.170	0.913	0.172	0.2	0.12	0.18	0.11
Manganese - Total (mg/L)	0.0051	<0.005	0.0093	0.0109	0.0107	0.0041	0.0088	0.011	0.012	0.0087	<0.005	0.0162	0.0547	0.0127	0.013	0.0073	0.013	0.008
Nickel - Total (mg/L)	<0.010	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	NA	NA	NA	NA	NA	NA	NA	NA
Zinc - Total (mg/L)	<0.010	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen Ammonia (mg/L)	<0.10	<0.10	0.13	<0.10	<0.10	0.085	<0.10	<0.100	<0.100	<0.10	<0.10	0.17	<0.10	<0.10	0.088	<0.10	<0.100	<0.100
Phosphorous (mg/L)	<0.030	<0.030	<0.030	<0.030	<0.030	<0.040	0.190	<0.10	<0.10	<0.030	<0.030	<0.030	<0.030	<0.030	<0.040	0.017	<0.10	<0.10
Sulfate (mg/L)	10.3	<10.0	<10.0	<10.0	<10.0	5.8	4.3	3.5	3.5	<10.0	<10.0	<10.0	<10.0	<10.0	5.6	4.0	3.3	3.1
Nitrogen as NO ₂ and NO ₃ (mg/L)	0.26	0.56	0.32	0.39	0.34	0.52	0.52	0.34	0.26	0.18	0.44	0.25	0.30	0.29	0.4	0.36	0.26	<0.20
E. coli (CFU/100 ml)	48	2.0	11	120	580	162	49	61	47	45	12	14	130	410	365	411	345	154
Fecal Coliform (CFU/100 ml)	NA	4.0	10	140	1000	70	52	57	58	NA	7	14	<2.0	2300	260	240	510	570
Total Coliform (CFU/100 ml)	>200	250	1100	>2400	>2,400	>2,419	>2,419.6	>2,419.6	1730	>200	580	2400	>2400	>2,400	>2,419	>2,419.6	>2,419.6	>2,419.6

NOTES:

1. TC-1 - Tom's Creek sample location
1. See **Figure 1**
2. "< Value" - Not Detected.
3. Alkalinity reported in milligrams per liter (mg/L) CaCO₃.
4. Analytical parameter concentrations reported in mg/L.
5. CFU/100 ml - colony-forming units per 100 milliliters of sample.
6. gpm - gallons per minute.
7. pH concentrations reported in Standard Units.
8. Specific conductance values reported in microhos/centimeter at 25o
9. NA = Not analyzed

Toms Creek Stream Sampling Network
Table 3
Summary of Historical Field and Lab Water Quality Results

Sample ID	TC-7									TC-8								
Sample Date	10/17/2011	1/23/2012	5/2/2012	8/2/2012	9/12/2013	8/25/2014	8/19/2015	8/17/2016	9/26/2017	10/17/2011	1/23/2012	5/2/2012	8/2/2012	9/12/2013	8/25/2014	8/19/2015	8/17/2016	9/26/2017
Flow (gpm)	1539	4440	2786	685	892	1897	1499	520	284	251	820	111	101	432	153	267	60	27
pH - Field (std. units)	6.50	7.21	7.45	7.47	7.51	6.95	6.43	7.56	8.76	6.52	6.85	8.03	8.00	7.50	7.30	7.00	8.14	8.50
pH - Lab (std. units)	NA	6.9	7.2	7.1	7.2	7.42	7.56	7.66	7.64	NA	6.8	7.7	7.0	7.2	7.91	7.95	8.18	7.57
Specific Conductance - Field (umhos/cm)	84	46	57	95	63	86	62	62	33	104	55	201	88	78	282	254	304	18
Temperature - Field (°C)	12.4	2.39	12.63	20.35	19.66	16.08	19.21	21.47	21.81	12.7	2.35	13.20	20.04	20.81	15.95	19.85	22.11	21.24
Dissolved Oxygen - Field (mg/L)	10.8	13.39	9.68	11.49	7.69	6.62	8.09	9.52	9.52	10.64	12.46	8.87	11.92	5	5.31	7.96	6.53	9.58
Turbidity - Field (n.t.u.)	10.8	11.2	6.2	24.0	10.2	1.9	3.0	3.5	75.9	3.7	8.8	8.4	5.0	9.5	3.7	3.2	8.5	44.3
Total Suspended Solids (mg/L)	<4.0	<4.0	6.0	64.0	6.0	<5.0	<5	6.0	<5	4.0	<4.0	14.0	5.0	5.0	7.0	81.0	18.0	<5
Total Dissolved Solids (mg/L)	19.0	16.0	31.0	51.0	<10.0	38.0	51	64	60	17.0	17.0	122	45.0	<10.0	167.0	159	204	64
Total Alkalinity (Total as CaCO3)(mg/L)	20.0	12.0	<10.0	26.0	22.0	24.0	21	22	26	22.0	12.0	62.0	22.0	24.0	76.0	84	92	26
Total Acidity (mg/L)	<10.0	<10.0	<10.0	<10.0	<10.0	<5.0	<5	<5	<5	<10.0	<10.0	<10.0	<10.0	<10.0	<5.0	<5	<5	<5
Aluminum - Dissolved (mg/L)	NA	<0.050	<0.050	<0.050	<0.050	0.034	<0.1	<0.10	<0.10	NA	<0.050	<0.050	0.167	<0.050	<0.03	<0.1	<0.10	<0.10
Arsenic - Dissolved(mg/L)	NA	<0.005	<0.005	<0.005	<0.005	<0.003	<0.008	<0.0080	<0.0080	NA	<0.005	<0.005	<0.005	<0.005	<0.003	<0.008	<0.0080	<0.0080
Cadmium - Dissolved (mg/L)	NA	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.0020	<0.0020	NA	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.0020	<0.0020
Copper - Dissolved (mg/L)	NA	<0.005	<0.005	<0.005	<0.005	0.0036	<0.01	<0.010	<0.010	NA	<0.005	<0.005	<0.005	<0.005	0.0039	<0.01	<0.010	<0.010
Iron - Dissolved (mg/L)	0.0735	<0.070	<0.070	0.155	0.0972	0.084	0.068	0.085	<0.060	0.0862	<0.070	<0.070	0.181	0.14	0.024	<0.06	<0.060	<0.060
Lead - Dissolved (mg/L)	NA	<0.005	<0.005	<0.005	<0.002	<0.006	<0.006	<0.0060	<0.0060	NA	<0.005	<0.005	<0.005	<0.005	<0.002	<0.006	<0.0060	0.0081
Manganese - Dissolved (mg/L)	<0.005	<0.005	0.0056	0.0102	0.0128	0.0073	0.0064	0.0085	0.0015	0.0083	<0.005	<0.005	0.0186	0.0195	0.0045	<0.005	0.0063	0.01
Nickel - Dissolved (mg/L)	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020
Zinc - Dissolved (mg/L)	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020
Aluminum - Total (mg/L)	0.0677	0.0519	0.131	2.430	0.217	0.220	0.34	<0.11	0.14	0.0716	<0.050	0.670	0.231	0.254	0.110	0.55	0.22	<0.11
Arsenic - Total (mg/L)	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium - Total (mg/L)	<0.003	NA	NA	NA	NA	NA	NA	NA	NA	<0.003	NA	NA	NA	NA	NA	NA	NA	NA
Copper - Total (mg/L)	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NA	NA	NA	NA	NA	NA	NA	NA
Iron - Total (mg/L)	0.138	<0.070	0.169	3.170	0.304	0.36	0.73	0.20	0.39	0.186	0.0864	0.964	0.459	0.576	0.16	0.94	0.32	0.31
Manganese - Total (mg/L)	0.0086	<0.005	0.0145	0.199	0.0254	0.026	0.079	0.019	0.047	0.0144	0.0063	0.0358	0.0331	0.0459	0.0066	0.061	0.024	0.035
Nickel - Total (mg/L)	<0.010	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	NA	NA	NA	NA	NA	NA	NA	NA
Zinc - Total (mg/L)	<0.010	NA	NA	NA	NA	NA	NA	NA	NA	<0.010	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen Ammonia (mg/L)	<0.10	<0.10	0.13	0.35	<0.10	0.076	<0.1	<0.100	<0.100	<0.10	<0.10	0.22	0.29	<0.10	0.051	<0.1	<0.100	<0.100
Phosphorous (mg/L)	<0.030	<0.030	<0.030	<0.030	0.25	<0.040	0.17	<0.10	<0.10	<0.030	<0.030	<0.030	<0.030	0.03	<0.040	0.110	<0.10	<0.10
Sulfate (mg/L)	<10.0	<10.0	<10.0	<10.0	<10.0	5.4	4.0	3.5	3.5	10.2	10.0	20.1	<10.0	<10.0	23.3	3.8	27.1	2.7
Nitrogen as NO ₂ and NO ₃ (mg/L)	0.18	0.49	0.27	0.28	0.21	0.4	1.20	0.24	<0.20	0.13	0.42	1.8	0.19	0.17	1.7	0.34	0.98	<0.20
E. coli (CFU/100 ml)	29	3.0	10	130	290	>2,419	137	248	152	27	4.0	14	200	460	236	613	517	111
Fecal Coliform (CFU/100 ml)	NA	3.0	6.0	120	1900	2300	59	380	34	NA	1.0	4.0	160	280	101	330	580	105
Total Coliform (CFU/100 ml)	>200	580	2000	>2400	>2,400	>2,419	>2,419.6	>2,419.6	1730	>200	610	>2400	>2400	>2,400	>2,419	>2,419.6	>2,419.6	>2,419.6

NOTES:

- TC-1 - Tom's Creek sample location
- See **Figure 1**
- "< Value" - Not Detected.
- Alkalinity reported in milligrams per liter (mg/L) CaCO₃.
- Analytical parameter concentrations reported in mg/L.
- CFU/100 ml - colony-forming units per 100 milliliters of sample.
- gpm - gallons per minute.
- pH concentrations reported in Standard Units.
- Specific conductance values reported in microhos/centimeter at 25o
- NA = Not analyzed

Toms Creek Stream Sampling Network
Table 3
Summary of Historical Field and Lab Water Quality Results

Sample ID	TC-9								
Sample Date	10/17/2011	1/23/2012	5/2/2012	8/2/2012	9/12/2013	8/25/2014	8/19/2015	8/17/2016	9/26/2017
Flow (gpm)	610	2039	2331	363	592	1532	1130	80	137.27
pH - Field (std. units)	6.58	6.74	7.66	7.89	7.53	7.46	6.84	7.84	8.53
pH - Lab (std. units)	NA	6.8	7.2	6.8	7.1	7.2	7.27	7.69	7.39
Specific Conductance - Field (umhos/cm)	44	27	74	48	78	42	44	68	9.9
Temperature - Field (°C)	12.5	2.63	12.85	19.61	20.81	15.87	19.08	22.06	20.69
Dissolved Oxygen - Field (mg/L)	11.01	13.18	8.45	11.19	5	7.05	8.15	7.26	9.56
Turbidity - Field (n.t.u.)	4.8	7.6	6.4	5.5	9.5	2.5	21.5	2.5	30
Total Suspended Solids (mg/L)	<4.0	4.0	12.0	12.0	9.0	6.0	8.0	7.0	<5
Total Dissolved Solids (mg/L)	<10.0	<10.0	55.0	37.0	<10.0	20	48	65	55
Total Alkalinity (Total as CaCO3)(mg/L)	10.0	12.0	<10.0	12.0	28.0	12.0	12	24	11
Total Acidity (mg/L)	<10.0	<10.0	<10.0	<10.0	<10.0	<5.0	<5	<5	<5
Aluminum - Dissolved (mg/L)	NA	<0.050	<0.050	<0.050	<0.050	0.07	<0.1	<0.10	<0.10
Arsenic - Dissolved(mg/L)	NA	<0.005	<0.005	<0.005	<0.005	0.0032	<0.008	<0.0080	<0.0080
Cadmium - Dissolved (mg/L)	NA	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.0020	<0.0020
Copper - Dissolved (mg/L)	NA	<0.005	<0.005	<0.005	<0.005	<0.003	<0.01	<0.010	<0.010
Iron - Dissolved (mg/L)	0.150	<0.070	<0.070	0.0954	0.0754	0.098	<0.06	0.12	<0.060
Lead - Dissolved (mg/L)	NA	<0.005	<0.005	<0.005	<0.005	<0.002	<0.006	<0.0060	<0.0060
Manganese - Dissolved (mg/L)	0.0259	<0.005	0.0075	0.0067	0.0076	0.0042	0.005	0.019	<0.0050
Nickel - Dissolved (mg/L)	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020
Zinc - Dissolved (mg/L)	NA	<0.010	<0.010	<0.010	<0.010	<0.007	<0.02	<0.020	<0.020
Aluminum - Total (mg/L)	0.150	0.0624	0.176	0.302	0.276	0.14	<0.11	<0.11	<0.11
Arsenic - Total (mg/L)	<0.005	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium - Total (mg/L)	<0.003	NA	NA	NA	NA	NA	NA	NA	NA
Copper - Total (mg/L)	<0.005	NA	NA	NA	NA	NA	NA	NA	NA
Iron - Total (mg/L)	0.136	<0.070	0.285	0.359	0.291	0.19	0.15	0.28	0.11
Manganese - Total (mg/L)	0.0082	<0.005	0.019	0.0237	0.0204	0.013	0.013	0.032	0.01
Nickel - Total (mg/L)	<0.010	NA	NA	NA	NA	NA	NA	NA	NA
Zinc - Total (mg/L)	<0.010	NA	NA	NA	NA	NA	NA	NA	NA
Nitrogen Ammonia (mg/L)	<0.10	<0.10	<0.10	0.11	<0.10	0.075	<0.1	<0.100	<0.100
Phosphorous (mg/L)	<0.030	<0.030	<0.030	<0.030	0.061	<0.040	0.1	<0.10	<0.10
Sulfate (mg/L)	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	3.8	2.8	<2.0
Nitrogen as NO ₂ and NO ₃ (mg/L)	<0.010	0.28	0.24	0.16	0.24	0.24	0.34	0.24	<0.20
E. coli (CFU/100 ml)	18	2.0	14	110	340	110	85	517	77
Fecal Coliform (CFU/100 ml)	NA	1.0	16	56	320	58	54	530	67
Total Coliform (CFU/100 ml)	>200	770	2400	>2400	>2,400	>2,419	>2,419.6	>2,419.6	1200

NOTES:

1. TC-1 - Tom's Creek sample location
1. See **Figure 1**
2. "< Value" - Not Detected.
3. Alkalinity reported in milligrams per liter (mg/L) CaCO₃.
4. Analytical parameter concentrations reported in mg/L.
5. CFU/100 ml - colony-forming units per 100 milliliters of sample.
6. gpm - gallons per minute.
7. pH concentrations reported in Standard Units.
8. Specific conductance values reported in microhos/centimeter at 25o
9. NA = Not analyzed

Attachment
Laboratory Reports & Chain of Custody Form

October 23, 2017

Mr. Randy Crispino
AECOM - Mechanicsburg
100 Sterling Parkway
Suite 205
Mechanicsburg, PA 17050

Certificate of Analysis

Project Name: **2016-SGI SURFACE WATER
TESTING**

Workorder: **2264255**

Purchase Order:

Workorder ID: **Toms Creek Annual Sampling**

Dear Mr. Crispino:

Enclosed are the analytical results for samples received by the laboratory on Monday, September 25, 2017.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

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ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903



Mrs. Vanessa N Badman
Project Coordinator

*This page is included as part of the Analytical Report and
must be retained as a permanent record thereof.*

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SAMPLE SUMMARY

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2264255001	TC-1	Water	9/25/2017 14:45	9/25/2017 16:20	Collected by Client
2264255002	TC-2	Water	9/25/2017 14:20	9/25/2017 16:20	Collected by Client
2264255003	TC-3	Water	9/25/2017 13:55	9/25/2017 16:20	Collected by Client
2264255004	TC-4	Water	9/25/2017 13:20	9/25/2017 16:20	Collected by Client
2264255005	TC-5	Water	9/25/2017 12:50	9/25/2017 16:20	Collected by Client
2264255006	TC-6	Water	9/25/2017 12:15	9/25/2017 16:20	Collected by Client
2264255007	TC-7	Water	9/25/2017 10:40	9/25/2017 16:20	Collected by Client
2264255008	TC-8	Water	9/25/2017 11:10	9/25/2017 16:20	Collected by Client
2264255009	TC-9	Water	9/25/2017 11:25	9/25/2017 16:20	Collected by Client

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SAMPLE SUMMARY

Workorder: 2264255 Toms Creek Annual Sampling

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255001**

Date Collected: 9/25/2017 14:45

Matrix: Water

Sample ID: **TC-1**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY										
Acidity, Total	ND	2	mg/L	5	S2310B-97			9/29/17 13:33	C_D	A
Alkalinity, Total	45	3	mg/L	5	S2320B-97			9/28/17 04:01	MSA	A
Ammonia-N	ND		mg/L	0.100	D6919-09			10/19/17 22:34	CMM	E
Nitrate/Nitrite-N	0.30		mg/L	0.20	EPA 300.0			9/26/17 06:48	CHW	A
pH	8.40	1	pH_Units		S4500HB-11			9/28/17 04:01	MSA	A
Phosphorus, Total	ND		mg/L	0.10	EPA 365.1	10/9/17 19:40	AK	10/13/17 11:43	AK	E
Sulfate	4.0		mg/L	2.0	EPA 300.0			9/26/17 06:48	CHW	A
Total Dissolved Solids	78		mg/L	5	S2540C-11			10/2/17 12:14	BMK	A
Total Suspended Solids	ND		mg/L	5	S2540D-11			9/27/17 14:33	AB	A
METALS										
Aluminum, Total	ND		mg/L	0.11	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:13	SRT	D1
Aluminum, Dissolved	ND		mg/L	0.10	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:47	SRT	C
Arsenic, Total	ND		mg/L	0.0090	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:13	SRT	D1
Arsenic, Dissolved	ND		mg/L	0.0080	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:47	SRT	C
Cadmium, Total	ND		mg/L	0.0022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:13	SRT	D1
Cadmium, Dissolved	ND		mg/L	0.0020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:47	SRT	C
Copper, Total	ND		mg/L	0.011	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:13	SRT	D1
Copper, Dissolved	ND		mg/L	0.010	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:47	SRT	C
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:13	SRT	D1
Iron, Dissolved	ND		mg/L	0.060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:47	SRT	C
Lead, Dissolved	ND		mg/L	0.0060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:47	SRT	C
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	10/4/17 05:30	LXC	10/9/17 10:41	SRT	D1
Manganese, Dissolved	ND		mg/L	0.0050	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:47	SRT	C
Nickel, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:13	SRT	D1
Nickel, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:47	SRT	C
Zinc, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:13	SRT	D1
Zinc, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:47	SRT	C
MICROBIOLOGY										
E. Coli	20		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F
Fecal Coliform	16	4	col/100mL	1	S9222D-97	9/25/17 22:12	AMC	9/26/17 20:20	AMC	G
Total Coliform	>2419.6		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F

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State Certifications: DE ID 11 , MA PA0102 , MD 128 , VA 460157 , WV 343

ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255001**

Date Collected: 9/25/2017 14:45

Matrix: Water

Sample ID: **TC-1**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
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Mrs. Vanessa N Badman

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255002**

Date Collected: 9/25/2017 14:20

Matrix: Water

Sample ID: **TC-2**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY										
Acidity, Total	ND	2	mg/L	5	S2310B-97			9/29/17 13:33	C_D	A
Alkalinity, Total	38	3	mg/L	5	S2320B-97			9/28/17 04:12	MSA	A
Ammonia-N	ND		mg/L	0.100	D6919-09			10/19/17 22:54	CMM	E
Nitrate/Nitrite-N	ND		mg/L	0.20	EPA 300.0			9/26/17 07:01	CHW	A
pH	8.01	1	pH_Units		S4500HB-11			9/28/17 04:12	MSA	A
Phosphorus, Total	ND		mg/L	0.10	EPA 365.1	10/9/17 19:40	AK	10/13/17 11:43	AK	E
Sulfate	3.6		mg/L	2.0	EPA 300.0			9/26/17 07:01	CHW	A
Total Dissolved Solids	75		mg/L	5	S2540C-11			10/2/17 12:14	BMK	A
Total Suspended Solids	ND		mg/L	5	S2540D-11			9/27/17 14:33	AB	A
METALS										
Aluminum, Total	ND		mg/L	0.11	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:23	SRT	D1
Aluminum, Dissolved	ND		mg/L	0.10	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:51	SRT	C
Arsenic, Total	ND		mg/L	0.0090	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:23	SRT	D1
Arsenic, Dissolved	ND		mg/L	0.0080	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:51	SRT	C
Cadmium, Total	ND		mg/L	0.0022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:23	SRT	D1
Cadmium, Dissolved	ND		mg/L	0.0020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:51	SRT	C
Copper, Total	ND		mg/L	0.011	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:23	SRT	D1
Copper, Dissolved	ND		mg/L	0.010	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:51	SRT	C
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:23	SRT	D1
Iron, Dissolved	ND		mg/L	0.060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:51	SRT	C
Lead, Dissolved	0.0076		mg/L	0.0060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:30	SRT	C
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:23	SRT	D1
Manganese, Dissolved	ND		mg/L	0.0050	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:51	SRT	C
Nickel, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:23	SRT	D1
Nickel, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:51	SRT	C
Zinc, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:23	SRT	D1
Zinc, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:51	SRT	C
MICROBIOLOGY										
E. Coli	31		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F
Fecal Coliform	34		col/100mL	1	S9222D-97	9/25/17 22:12	AMC	9/26/17 20:20	AMC	G
Total Coliform	1200		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255002**

Date Collected: 9/25/2017 14:20

Matrix: Water

Sample ID: **TC-2**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
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Mrs. Vanessa N Badman

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255003**

Date Collected: 9/25/2017 13:55

Matrix: Water

Sample ID: **TC-3**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY										
Acidity, Total	ND	2	mg/L	5	S2310B-97			9/29/17 13:33	C_D	A
Alkalinity, Total	35	3	mg/L	5	S2320B-97			9/28/17 04:23	MSA	A
Ammonia-N	ND		mg/L	0.100	D6919-09			10/19/17 23:14	CMM	E
Nitrate/Nitrite-N	0.22		mg/L	0.20	EPA 300.0			9/26/17 07:14	CHW	A
pH	7.86	1	pH_Units		S4500HB-11			9/28/17 04:23	MSA	A
Phosphorus, Total	ND		mg/L	0.10	EPA 365.1	10/9/17 19:40	AK	10/13/17 11:43	AK	E
Sulfate	3.6		mg/L	2.0	EPA 300.0			9/26/17 07:14	CHW	A
Total Dissolved Solids	76		mg/L	5	S2540C-11			10/2/17 12:14	BMK	A
Total Suspended Solids	ND		mg/L	5	S2540D-11			9/27/17 14:33	AB	A
METALS										
Aluminum, Total	ND		mg/L	0.11	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:41	SRT	D1
Aluminum, Dissolved	ND		mg/L	0.10	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:54	SRT	C
Arsenic, Total	ND		mg/L	0.0090	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:41	SRT	D1
Arsenic, Dissolved	ND		mg/L	0.0080	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:54	SRT	C
Cadmium, Total	ND		mg/L	0.0022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:41	SRT	D1
Cadmium, Dissolved	ND		mg/L	0.0020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:54	SRT	C
Copper, Total	ND		mg/L	0.011	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:41	SRT	D1
Copper, Dissolved	ND		mg/L	0.010	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:54	SRT	C
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:41	SRT	D1
Iron, Dissolved	ND		mg/L	0.060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:54	SRT	C
Lead, Dissolved	0.0067		mg/L	0.0060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:54	SRT	C
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:41	SRT	D1
Manganese, Dissolved	ND		mg/L	0.0050	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:54	SRT	C
Nickel, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:41	SRT	D1
Nickel, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:54	SRT	C
Zinc, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:41	SRT	D1
Zinc, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:54	SRT	C
MICROBIOLOGY										
E. Coli	55		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F
Fecal Coliform	57	4	col/100mL	1	S9222D-97	9/25/17 22:12	AMC	9/26/17 20:20	AMC	G
Total Coliform	1300		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255003**

Date Collected: 9/25/2017 13:55

Matrix: Water

Sample ID: **TC-3**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
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Mrs. Vanessa N Badman

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255004**

Date Collected: 9/25/2017 13:20

Matrix: Water

Sample ID: **TC-4**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY										
Acidity, Total	ND	2	mg/L	5	S2310B-97			9/29/17 13:33	C_D	A
Alkalinity, Total	41	3	mg/L	5	S2320B-97			9/28/17 04:33	MSA	A
Ammonia-N	ND		mg/L	0.100	D6919-09			10/19/17 23:33	CMM	E
Nitrate/Nitrite-N	0.26		mg/L	0.20	EPA 300.0			9/26/17 07:27	CHW	A
pH	7.85	1	pH_Units		S4500HB-11			9/28/17 04:33	MSA	A
Phosphorus, Total	ND		mg/L	0.10	EPA 365.1	10/9/17 19:40	AK	10/13/17 11:43	AK	E
Sulfate	3.9		mg/L	2.0	EPA 300.0			9/26/17 07:27	CHW	A
Total Dissolved Solids	85		mg/L	5	S2540C-11			10/2/17 12:14	BMK	A
Total Suspended Solids	ND		mg/L	5	S2540D-11			9/27/17 14:33	AB	A
METALS										
Aluminum, Total	ND		mg/L	0.11	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:44	SRT	D1
Aluminum, Dissolved	ND		mg/L	0.10	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:58	SRT	C
Arsenic, Total	ND		mg/L	0.0090	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:44	SRT	D1
Arsenic, Dissolved	ND		mg/L	0.0080	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:58	SRT	C
Cadmium, Total	ND		mg/L	0.0022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:44	SRT	D1
Cadmium, Dissolved	ND		mg/L	0.0020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:58	SRT	C
Copper, Total	ND		mg/L	0.011	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:44	SRT	D1
Copper, Dissolved	ND		mg/L	0.010	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:58	SRT	C
Iron, Total	ND		mg/L	0.067	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:44	SRT	D1
Iron, Dissolved	ND		mg/L	0.060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:58	SRT	C
Lead, Dissolved	0.0066		mg/L	0.0060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:34	SRT	C
Manganese, Total	ND		mg/L	0.0056	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:44	SRT	D1
Manganese, Dissolved	ND		mg/L	0.0050	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:58	SRT	C
Nickel, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:44	SRT	D1
Nickel, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:58	SRT	C
Zinc, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:44	SRT	D1
Zinc, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 10:58	SRT	C
MICROBIOLOGY										
E. Coli	30		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F
Fecal Coliform	35	4	col/100mL	1	S9222D-97	9/25/17 22:12	AMC	9/26/17 20:20	AMC	G
Total Coliform	1990		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255004**

Date Collected: 9/25/2017 13:20

Matrix: Water

Sample ID: **TC-4**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
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Mrs. Vanessa N Badman

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255005**

Date Collected: 9/25/2017 12:50

Matrix: Water

Sample ID: **TC-5**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY										
Acidity, Total	ND	2	mg/L	5	S2310B-97			9/29/17 13:33	C_D	A
Alkalinity, Total	40	3	mg/L	5	S2320B-97			9/28/17 04:44	MSA	A
Ammonia-N	ND		mg/L	0.100	D6919-09			10/19/17 23:53	CMM	E
Nitrate/Nitrite-N	0.26		mg/L	0.20	EPA 300.0			9/26/17 07:40	CHW	A
pH	7.81	1	pH_Units		S4500HB-11			9/28/17 04:44	MSA	A
Phosphorus, Total	ND		mg/L	0.10	EPA 365.1	10/9/17 19:40	AK	10/13/17 11:43	AK	E
Sulfate	3.5		mg/L	2.0	EPA 300.0			9/26/17 07:40	CHW	A
Total Dissolved Solids	80		mg/L	5	S2540C-11			10/2/17 12:14	BMK	A
Total Suspended Solids	ND		mg/L	5	S2540D-11			9/27/17 14:33	AB	A
METALS										
Aluminum, Total	ND		mg/L	0.11	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:48	SRT	D1
Aluminum, Dissolved	ND		mg/L	0.10	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:01	SRT	C
Arsenic, Total	ND		mg/L	0.0090	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:48	SRT	D1
Arsenic, Dissolved	ND		mg/L	0.0080	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:01	SRT	C
Cadmium, Total	ND		mg/L	0.0022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:48	SRT	D1
Cadmium, Dissolved	ND		mg/L	0.0020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:01	SRT	C
Copper, Total	ND		mg/L	0.011	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:48	SRT	D1
Copper, Dissolved	ND		mg/L	0.010	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:01	SRT	C
Iron, Total	0.13		mg/L	0.067	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:48	SRT	D1
Iron, Dissolved	ND		mg/L	0.060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:01	SRT	C
Lead, Dissolved	0.0069		mg/L	0.0060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:01	SRT	C
Manganese, Total	0.012		mg/L	0.0056	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:48	SRT	D1
Manganese, Dissolved	ND		mg/L	0.0050	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:01	SRT	C
Nickel, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:48	SRT	D1
Nickel, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:01	SRT	C
Zinc, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:48	SRT	D1
Zinc, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:01	SRT	C
MICROBIOLOGY										
E. Coli	47		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F
Fecal Coliform	58	4	col/100mL	1	S9222D-97	9/25/17 22:12	AMC	9/26/17 20:20	AMC	G
Total Coliform	1730		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255005**

Date Collected: 9/25/2017 12:50

Matrix: Water

Sample ID: **TC-5**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
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Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255006**

Date Collected: 9/25/2017 12:15

Matrix: Water

Sample ID: **TC-6**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY										
Acidity, Total	ND	2	mg/L	5	S2310B-97			9/29/17 13:33	C_D	A
Alkalinity, Total	35	3	mg/L	5	S2320B-97			9/28/17 04:54	MSA	A
Ammonia-N	ND		mg/L	0.100	D6919-09			10/20/17 00:53	CMM	E
Nitrate/Nitrite-N	ND		mg/L	0.20	EPA 300.0			9/26/17 07:53	CHW	A
pH	7.73	1	pH_Units		S4500HB-11			9/28/17 04:54	MSA	A
Phosphorus, Total	ND		mg/L	0.10	EPA 365.1	10/9/17 19:40	AK	10/13/17 11:43	AK	E
Sulfate	3.1		mg/L	2.0	EPA 300.0			9/26/17 07:53	CHW	A
Total Dissolved Solids	72		mg/L	5	S2540C-11			10/2/17 12:14	BMK	A
Total Suspended Solids	ND		mg/L	5	S2540D-11			9/27/17 14:33	AB	A
METALS										
Aluminum, Total	ND		mg/L	0.11	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:52	SRT	D1
Aluminum, Dissolved	ND		mg/L	0.10	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:05	SRT	C
Arsenic, Total	ND		mg/L	0.0090	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:52	SRT	D1
Arsenic, Dissolved	ND		mg/L	0.0080	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:05	SRT	C
Cadmium, Total	ND		mg/L	0.0022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:52	SRT	D1
Cadmium, Dissolved	ND		mg/L	0.0020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:05	SRT	C
Copper, Total	ND		mg/L	0.011	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:52	SRT	D1
Copper, Dissolved	ND		mg/L	0.010	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:05	SRT	C
Iron, Total	0.11		mg/L	0.067	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:52	SRT	D1
Iron, Dissolved	ND		mg/L	0.060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:05	SRT	C
Lead, Dissolved	ND		mg/L	0.0060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:05	SRT	C
Manganese, Total	0.0080		mg/L	0.0056	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:52	SRT	D1
Manganese, Dissolved	0.0062		mg/L	0.0050	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:05	SRT	C
Nickel, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:52	SRT	D1
Nickel, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:05	SRT	C
Zinc, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:52	SRT	D1
Zinc, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:05	SRT	C
MICROBIOLOGY										
E. Coli	154		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F
Fecal Coliform	570	4	col/100mL	1	S9222D-97	9/25/17 22:12	AMC	9/26/17 20:20	AMC	G
Total Coliform	>2419.6		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255006**

Date Collected: 9/25/2017 12:15

Matrix: Water

Sample ID: **TC-6**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
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Mrs. Vanessa N Badman

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255007**

Date Collected: 9/25/2017 10:40

Matrix: Water

Sample ID: **TC-7**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY										
Acidity, Total	ND	2	mg/L	5	S2310B-97			9/29/17 13:33	C_D	A
Alkalinity, Total	26	3	mg/L	5	S2320B-97			9/28/17 05:04	MSA	A
Ammonia-N	ND		mg/L	0.100	D6919-09			10/20/17 01:13	CMM	E
Nitrate/Nitrite-N	ND		mg/L	0.20	EPA 300.0			9/26/17 08:06	CHW	A
pH	7.64	1	pH_Units		S4500HB-11			9/28/17 05:04	MSA	A
Phosphorus, Total	ND		mg/L	0.10	EPA 365.1	10/9/17 19:40	AK	10/13/17 11:43	AK	E
Sulfate	3.5		mg/L	2.0	EPA 300.0			9/26/17 08:06	CHW	A
Total Dissolved Solids	60		mg/L	5	S2540C-11			10/2/17 12:14	BMK	A
Total Suspended Solids	ND		mg/L	5	S2540D-11			9/27/17 14:33	AB	A
METALS										
Aluminum, Total	0.14		mg/L	0.11	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:55	SRT	D1
Aluminum, Dissolved	ND		mg/L	0.10	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:09	SRT	C
Arsenic, Total	ND		mg/L	0.0090	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:55	SRT	D1
Arsenic, Dissolved	ND		mg/L	0.0080	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:09	SRT	C
Cadmium, Total	ND		mg/L	0.0022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:55	SRT	D1
Cadmium, Dissolved	ND		mg/L	0.0020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:09	SRT	C
Copper, Total	ND		mg/L	0.011	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:55	SRT	D1
Copper, Dissolved	ND		mg/L	0.010	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:09	SRT	C
Iron, Total	0.39		mg/L	0.067	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:55	SRT	D1
Iron, Dissolved	ND		mg/L	0.060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:09	SRT	C
Lead, Dissolved	ND		mg/L	0.0060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:09	SRT	C
Manganese, Total	0.047		mg/L	0.0056	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:55	SRT	D1
Manganese, Dissolved	0.015		mg/L	0.0050	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:09	SRT	C
Nickel, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:55	SRT	D1
Nickel, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:09	SRT	C
Zinc, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:55	SRT	D1
Zinc, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:09	SRT	C
MICROBIOLOGY										
E. Coli	152		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F
Fecal Coliform	34	4	col/100mL	1	S9222D-97	9/25/17 22:12	AMC	9/26/17 20:20	AMC	G
Total Coliform	1730		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255007**

Date Collected: 9/25/2017 10:40

Matrix: Water

Sample ID: **TC-7**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
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Vanessa N. Badman

Mrs. Vanessa N Badman

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255008**

Date Collected: 9/25/2017 11:10

Matrix: Water

Sample ID: **TC-8**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY										
Acidity, Total	ND	2	mg/L	5	S2310B-97			9/29/17 13:33	C_D	A
Alkalinity, Total	26	3	mg/L	5	S2320B-97			9/28/17 05:15	MSA	A
Ammonia-N	ND		mg/L	0.100	D6919-09			10/20/17 01:33	CMM	E
Nitrate/Nitrite-N	ND		mg/L	0.20	EPA 300.0			9/26/17 08:19	CHW	A
pH	7.57	1	pH_Units		S4500HB-11			9/28/17 05:15	MSA	A
Phosphorus, Total	ND		mg/L	0.10	EPA 365.1	10/9/17 19:40	AK	10/13/17 11:43	AK	E
Sulfate	2.7		mg/L	2.0	EPA 300.0			9/26/17 08:19	CHW	A
Total Dissolved Solids	64		mg/L	5	S2540C-11			10/2/17 12:14	BMK	A
Total Suspended Solids	ND		mg/L	5	S2540D-11			9/27/17 14:33	AB	A
METALS										
Aluminum, Total	ND		mg/L	0.11	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:59	SRT	D1
Aluminum, Dissolved	ND		mg/L	0.10	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:12	SRT	C
Arsenic, Total	ND		mg/L	0.0090	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:59	SRT	D1
Arsenic, Dissolved	ND		mg/L	0.0080	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:12	SRT	C
Cadmium, Total	ND		mg/L	0.0022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:59	SRT	D1
Cadmium, Dissolved	ND		mg/L	0.0020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:12	SRT	C
Copper, Total	ND		mg/L	0.011	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:59	SRT	D1
Copper, Dissolved	ND		mg/L	0.010	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:12	SRT	C
Iron, Total	0.31		mg/L	0.067	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:59	SRT	D1
Iron, Dissolved	ND		mg/L	0.060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:12	SRT	C
Lead, Dissolved	0.0081		mg/L	0.0060	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:12	SRT	C
Manganese, Total	0.035		mg/L	0.0056	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:59	SRT	D1
Manganese, Dissolved	0.010		mg/L	0.0050	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:12	SRT	C
Nickel, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:59	SRT	D1
Nickel, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:12	SRT	C
Zinc, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 16:59	SRT	D1
Zinc, Dissolved	ND		mg/L	0.020	SW846 6010C	9/28/17 14:22	SRT	10/2/17 11:12	SRT	C
MICROBIOLOGY										
E. Coli	111		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F
Fecal Coliform	105	4,5	col/100mL	1	S9222D-97	9/25/17 22:30	AMC	9/26/17 20:30	AMC	G
Total Coliform	>2419.6		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255008**

Date Collected: 9/25/2017 11:10

Matrix: Water

Sample ID: **TC-8**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
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Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255009**

Date Collected: 9/25/2017 11:25

Matrix: Water

Sample ID: **TC-9**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
WET CHEMISTRY										
Acidity, Total	ND	2	mg/L	5	S2310B-97			9/29/17 13:33	C_D	A
Alkalinity, Total	17	3	mg/L	5	S2320B-97			9/28/17 06:07	MSA	A
Ammonia-N	ND		mg/L	0.100	D6919-09			10/20/17 01:52	CMM	E
Nitrate/Nitrite-N	ND		mg/L	0.20	EPA 300.0			9/26/17 09:36	CHW	A
pH	7.39	1	pH_Units		S4500HB-11			9/28/17 06:07	MSA	A
Phosphorus, Total	ND		mg/L	0.10	EPA 365.1	10/9/17 19:40	AK	10/13/17 11:43	AK	E
Sulfate	ND		mg/L	2.0	EPA 300.0			9/26/17 09:36	CHW	A
Total Dissolved Solids	55		mg/L	5	S2540C-11			10/2/17 12:14	BMK	A
Total Suspended Solids	ND		mg/L	5	S2540D-11			9/27/17 14:33	AB	A
METALS										
Aluminum, Total	ND		mg/L	0.11	SW846 6010C	10/4/17 05:30	LXC	10/5/17 17:02	SRT	D1
Aluminum, Dissolved	ND		mg/L	0.10	SW846 6010C	10/4/17 08:42	SRT	10/5/17 12:19	SRT	C
Arsenic, Total	ND		mg/L	0.0090	SW846 6010C	10/4/17 05:30	LXC	10/5/17 17:02	SRT	D1
Arsenic, Dissolved	ND		mg/L	0.0080	SW846 6010C	10/4/17 08:42	SRT	10/5/17 12:19	SRT	C
Cadmium, Total	ND		mg/L	0.0022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 17:02	SRT	D1
Cadmium, Dissolved	ND		mg/L	0.0020	SW846 6010C	10/4/17 08:42	SRT	10/5/17 12:19	SRT	C
Copper, Total	ND		mg/L	0.011	SW846 6010C	10/4/17 05:30	LXC	10/5/17 17:02	SRT	D1
Copper, Dissolved	ND		mg/L	0.010	SW846 6010C	10/4/17 08:42	SRT	10/5/17 12:19	SRT	C
Iron, Total	0.11		mg/L	0.067	SW846 6010C	10/4/17 05:30	LXC	10/5/17 17:02	SRT	D1
Iron, Dissolved	ND		mg/L	0.060	SW846 6010C	10/4/17 08:42	SRT	10/5/17 12:19	SRT	C
Lead, Dissolved	ND		mg/L	0.0060	SW846 6010C	10/4/17 08:42	SRT	10/5/17 13:53	SRT	C
Manganese, Total	0.010		mg/L	0.0056	SW846 6010C	10/4/17 05:30	LXC	10/5/17 17:02	SRT	D1
Manganese, Dissolved	ND		mg/L	0.0050	SW846 6010C	10/4/17 08:42	SRT	10/5/17 12:19	SRT	C
Nickel, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 17:02	SRT	D1
Nickel, Dissolved	ND		mg/L	0.020	SW846 6010C	10/4/17 08:42	SRT	10/5/17 12:19	SRT	C
Zinc, Total	ND		mg/L	0.022	SW846 6010C	10/4/17 05:30	LXC	10/5/17 17:02	SRT	D1
Zinc, Dissolved	ND		mg/L	0.020	SW846 6010C	10/4/17 08:42	SRT	10/5/17 12:19	SRT	C
MICROBIOLOGY										
E. Coli	77		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F
Fecal Coliform	67	4	col/100mL	1	S9222D-97	9/25/17 22:30	AMC	9/26/17 20:30	AMC	G
Total Coliform	1200		col/100mL	1	S9223B-04	9/25/17 23:05	AMC	9/26/17 23:05	AMC	F

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

Lab ID: **2264255009**

Date Collected: 9/25/2017 11:25

Matrix: Water

Sample ID: **TC-9**

Date Received: 9/25/2017 16:20

Parameters	Results	Flag	Units	RDL	Method	Prepared	By	Analyzed	By	Cntr
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Mrs. Vanessa N Badman

Project Coordinator

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
2264255001	1	TC-1	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2264255001	2	TC-1	S2310B-97	Acidity, Total
The Total Acidity is titrated to a pH of 8.3 and reported as mg CaCO3/L.				
2264255001	3	TC-1	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2264255001	4	TC-1	S9222D-97	Fecal Coliform
This is an estimated result. based on non-ideal colony counts. Per PADEP guidelines, results that do not fall between 20-60 colonies on a single plate are to be reported as an estimated value.				
2264255002	1	TC-2	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2264255002	2	TC-2	S2310B-97	Acidity, Total
The Total Acidity is titrated to a pH of 8.3 and reported as mg CaCO3/L.				
2264255002	3	TC-2	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2264255003	1	TC-3	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2264255003	2	TC-3	S2310B-97	Acidity, Total
The Total Acidity is titrated to a pH of 8.3 and reported as mg CaCO3/L.				
2264255003	3	TC-3	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2264255003	4	TC-3	S9222D-97	Fecal Coliform
2264255004	1	TC-4	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2264255004	2	TC-4	S2310B-97	Acidity, Total
The Total Acidity is titrated to a pH of 8.3 and reported as mg CaCO3/L.				
2264255004	3	TC-4	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
2264255004	4	TC-4	S9222D-97	Fecal Coliform
2264255005	1	TC-5	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2264255005	2	TC-5	S2310B-97	Acidity, Total
The Total Acidity is titrated to a pH of 8.3 and reported as mg CaCO3/L.				

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ANALYTICAL RESULTS

Workorder: 2264255 Toms Creek Annual Sampling

2264255005	3	TC-5	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2264255005	4	TC-5	S9222D-97	Fecal Coliform
2264255006	1	TC-6	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2264255006	2	TC-6	S2310B-97	Acidity, Total
The Total Acidity is titrated to a pH of 8.3 and reported as mg CaCO ₃ /L.				
2264255006	3	TC-6	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2264255006	4	TC-6	S9222D-97	Fecal Coliform
2264255007	1	TC-7	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2264255007	2	TC-7	S2310B-97	Acidity, Total
The Total Acidity is titrated to a pH of 8.3 and reported as mg CaCO ₃ /L.				
2264255007	3	TC-7	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2264255007	4	TC-7	S9222D-97	Fecal Coliform
2264255008	1	TC-8	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2264255008	2	TC-8	S2310B-97	Acidity, Total
The Total Acidity is titrated to a pH of 8.3 and reported as mg CaCO ₃ /L.				
2264255008	3	TC-8	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2264255008	4	TC-8	S9222D-97	Fecal Coliform
This is an estimated result. based on non-ideal colony counts. Per PADEP guidelines, results that do not fall between 20-60 colonies on a single plate are to be reported as an estimated value.				
2264255008	5	TC-8	S9222D-97	Fecal Coliform
2264255009	1	TC-9	S4500HB-11	pH
The pH analysis is an "analyze immediately" analysis. Parameters identified as "analyze immediately" require analysis within 15 minutes of collection, and are therefore analyzed outside of the method holding time when analyzed in the laboratory.				
2264255009	2	TC-9	S2310B-97	Acidity, Total
The Total Acidity is titrated to a pH of 8.3 and reported as mg CaCO ₃ /L.				
2264255009	3	TC-9	S2320B-97	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO ₃ /L.				
2264255009	4	TC-9	S9222D-97	Fecal Coliform

ALS Environmental Laboratory Locations Across North America

Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
Vancouver Waterloo · Winnipeg · Yellowknife **United States:** Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York **Mexico:** Monterrey

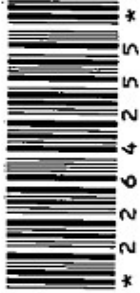


34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT /
SAMPLER. INSTRUCTIONS ON THE BACK

Page of
Courier:
Tracking #:



Co. Name: **AECOM**

Contact (Report to): **Randy Crisp**

Address: **100 Sterling Parkway**

**Suite 205
Mechanicsburg, PA 17050**

Phone: **717-635-7926**

Bill to (if different than Report to): **AECOM**

PO#:

Project Name#: **Town Creek Annual Sampling** ALS Quote #:

TAT: ☒ Normal-Standard TAT is 10-12 business days.
☐ Rush-Subject to ALS approval and surcharges.

Email? ☒ Y **randy.crisp@aecom.com**

Fax? ☐ Y No:

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Millitary Time
1 TC-1		9/25/17	1445
2 TC-2			1420
3 TC-3			1355
4 TC-4			1320
5 TC-5			1250
6 TC-6			1215
7 TC-7			1040
8 TC-8			1110

SAMPLED BY (Please Print): **TB/NJ**

Project Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
AECOM	9/25/17	1626	Jas B	9/25/17	1626

Container Type	Container Size	Preservative	ANALYSES/METHOD REQUESTED
			Total Alkalinity, do not Acidify
			Sulfides
			Ammonia - Nitrogen
			Nitrate-N
			Total NH4-N
			Dissolved NH4-N
			Phosphate
			Orthophosphate
			Total Coliform, fecal coliform

Matrix	Enter Number of Containers Per Analysis
G or C	2

ALS FIELD SERVICES

Container in good condition? ☒ Y ☐ N

COC labels complete/accurate? ☒ Y ☐ N

Received on ice? ☒ Y ☐ N

(if present) Seals intact? ☒ Y ☐ N

Custody seals Present? ☒ Y ☐ N

Correct sample volume? ☒ Y ☐ N

Correct preservation? ☒ Y ☐ N

Headspace/Volatiles? ☒ Y ☐ N

Circle appropriate Y or N.

ALS Field Services: ☐ Pickup ☐ Labor ☐ Composite Sampling ☐ Rental Equipment ☐ Other:

SWA Forms? ☐ MD ☐ NJ ☐ NY ☒ PA

Standard ☒ CLP-like ☐ NJ-Reduced ☐ NJ-Full ☐ Other

EDS ☐ If yes, format type: ☐ Other

Enter EWSID No. **0000000000**

Matrix: A=Air; BW=Drinking Water; GW=Groundwater; O=Oil; OL=Other Liquid; SL=Sludge; SW=Soil; WP=Wipe; WW=Wastewater

Container Type: AG=Amber Glass; CG=Clear Glass; PL=Plastic. Container Size: 200ml, 500ml, 1L, 5oz, etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

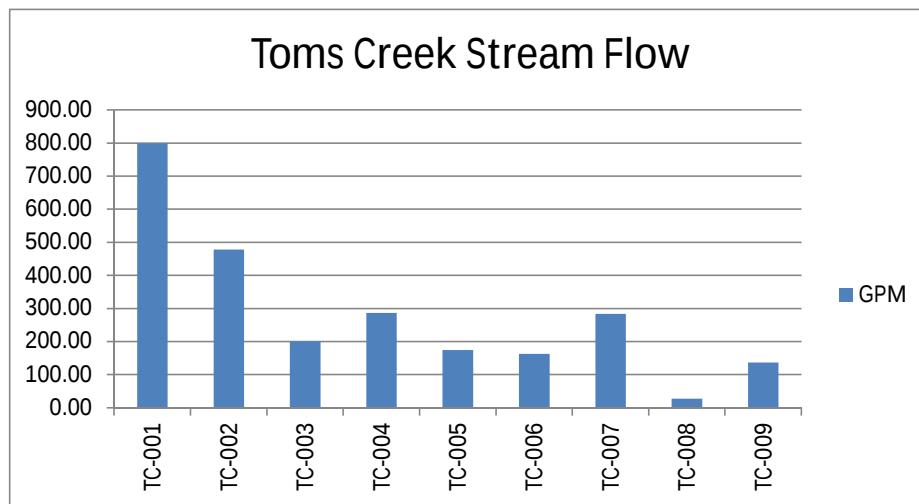
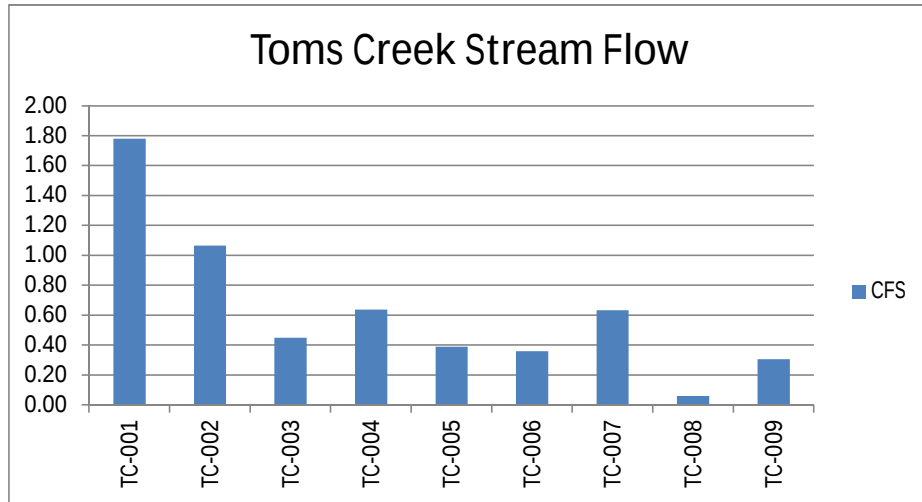
Rev 01-2013

Attachment Field Data

SGI Annual Toms Creek Monitoring
2017

Site Name	Location		Flow	
	Lat	Long	Cubic Feet per second (CFS)	Gallon per Minute (GPM)
TC-001	39.775492°	-77.393543°	1.78	799.58
TC-002	39.774604°	-77.406771°	1.07	478.10
TC-003	39.769134°	-77.417354°	0.45	201.16
TC-004	39.771621°	-77.429166°	0.64	286.58
TC-005	39.767905°	-77.433560°	0.39	174.65
TC-006	39.770962°	-77.440973°	0.36	162.90
TC-007	39.767768°	-77.448790°	0.63	283.91
TC-008	39.767485°	-77.449725°	0.06	27.34
TC-009	39.768043°	-77.450029°	0.31	137.27

SGI Annual Toms Creek Monitoring
2017



CFS = cubic feet per second

GPM = gallons per minute

SGI Toms Creek Annual Monitoring
2017

Site	Location		pH	Specific Conductivity μS/m	Total Dissolved Solids (g/L)	Dissolved Oxygen (mg/L)	Temperature (C°)	Turbidity (NTU)
	Lat	Long						
TC - 001	39.775492°	-77.393543°	7.80	16.20	0.11	9.65	21.64	30.20
TC - 002	39.774604°	-77.406771°	7.85	15.00	0.10	9.81	20.20	58.30
TC - 003	39.769134°	-77.417354°	7.90	16.40	0.10	10.18	20.25	69.70
TC - 004	39.771621°	-77.429166°	7.91	19.00	0.12	9.81	21.74	57.80
TC - 005	39.767905°	-77.433560°	7.94	18.10	0.11	9.82	20.38	50.00
TC - 006	39.770962°	-77.440973°	8.24	16.80	0.11	10.22	20.27	64.60
TC - 007	39.767768°	-77.448790°	8.76	32.60	0.17	9.52	21.81	75.90
TC - 008	39.767485°	-77.449725°	8.50	17.70	0.11	9.58	21.24	44.30
TC - 009	39.768043°	-77.450029°	8.53	9.90	0.06	9.56	20.69	30.00