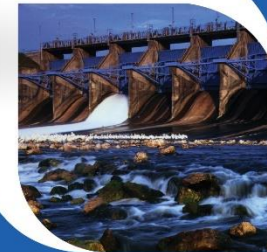


Water Quality Monitoring Results

Angela Kilpatrick

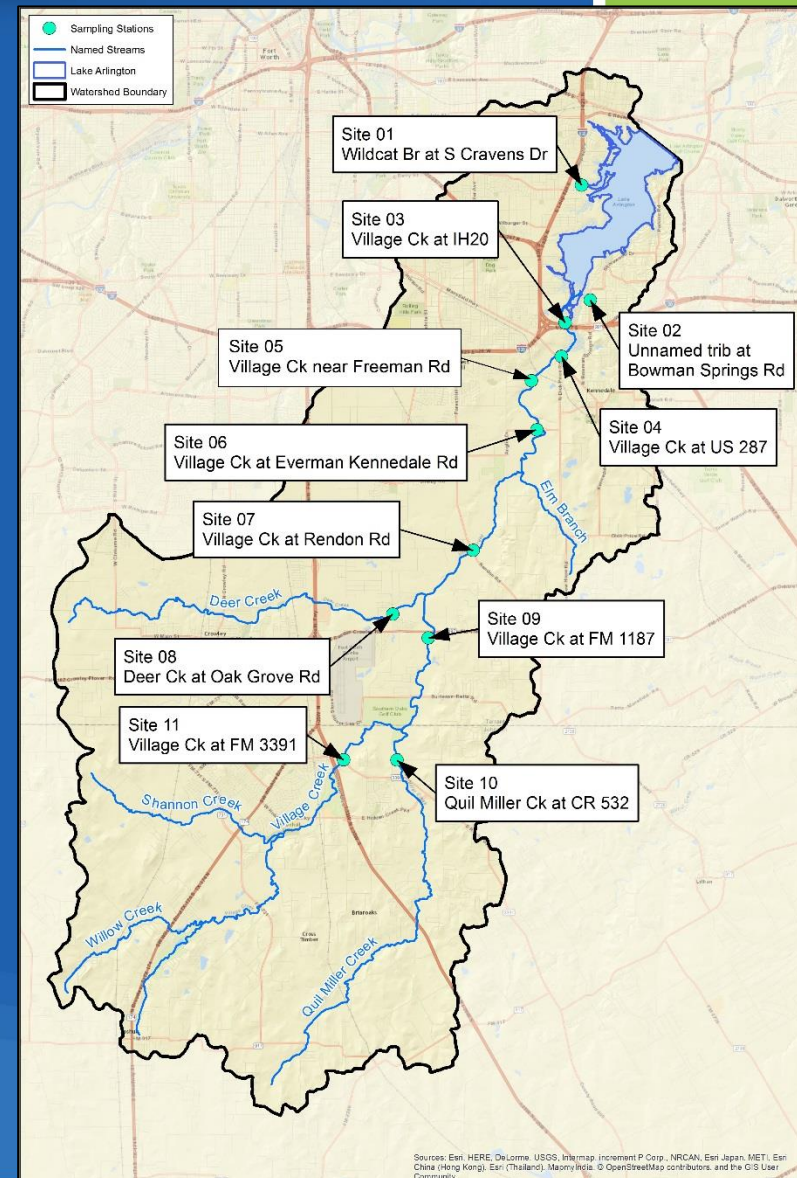
Trinity River Authority

May 18, 2017



Monitoring Plan and Lab Analysis

- Samples collected by PES staff are dropped off at CRWS lab for analysis of:
 - *E. coli*
 - Nitrate, Nitrite, Total Kjeldahl Nitrogen
 - Total Phosphorus, Orthophosphate
 - Chlorophyll a
 - TDS, TSS, VSS
- QC-approved data for June to November 2016 submitted to TCEQ
- **Preliminary** data presented for December 2016 to April 2017



Evaluation Criteria

Analytical results were compared to TCEQ's water quality standards and screening levels to determine if values exceeded criteria

Site-specific Water Quality Criteria for the Village Creek-Lake Arlington Watershed (TCEQ)

Parameter	Segment ID	
	0828	0828A
Cl-1 (mg/L)	100	100
SO4-2 (mg/L)	100	-
TDS (mg/L)	300	300
DO (mg/L) grab minimum	3.0	2.0
DO (mg/L) 24 hour average	5.0	3.0
DO (mg/L) 24 hour minimum	3.0	2.0
pH range	6.5-9.0	6.5-9.0
E. coli #/100ml	126	126
Temperature (°F; °C)	95; 35	95; 35

Texas Nutrient Screening Levels and EPA Nutrient Reference Criteria

Parameter		TCEQ Screening Levels		EPA Reference Criteria				Other Sources
		Lake/Reservoir	Stream	Lake/Reservoir		Stream		
TKN	(mg/L)	-	-	0.38 ^a	0.41 ^b	0.3 ^a	0.4 ^b	0.02 ^c
NO ₂	(mg/L)	-	-	-	-	-	-	
NO ₃	(mg/L)	0.37	1.95	-	-	-	-	
NO ₂ +NO ₃	(mg/L)	-	-	0.017 ^a	0.01 ^b	0.125 ^a	0.078 ^b	
TP	(mg/L)	0.20	0.69	0.02 ^a	0.019 ^b	0.037 ^a	0.038 ^b	
OP	(mg/L)	0.05	0.37	-	-	-	-	
Chl-a ^d	(µg/L)	26.7	14.1	5.18 ^a	2.875 ^b	0.93 ^a	1.238 ^b	

^a Reference conditions for aggregate Ecoregion IX waterbodies, upper 25th percentile of data from all seasons, 1990-1999.

^b Reference conditions for level III Ecoregion 29 waterbodies, upper 25th percentile of data from all seasons.

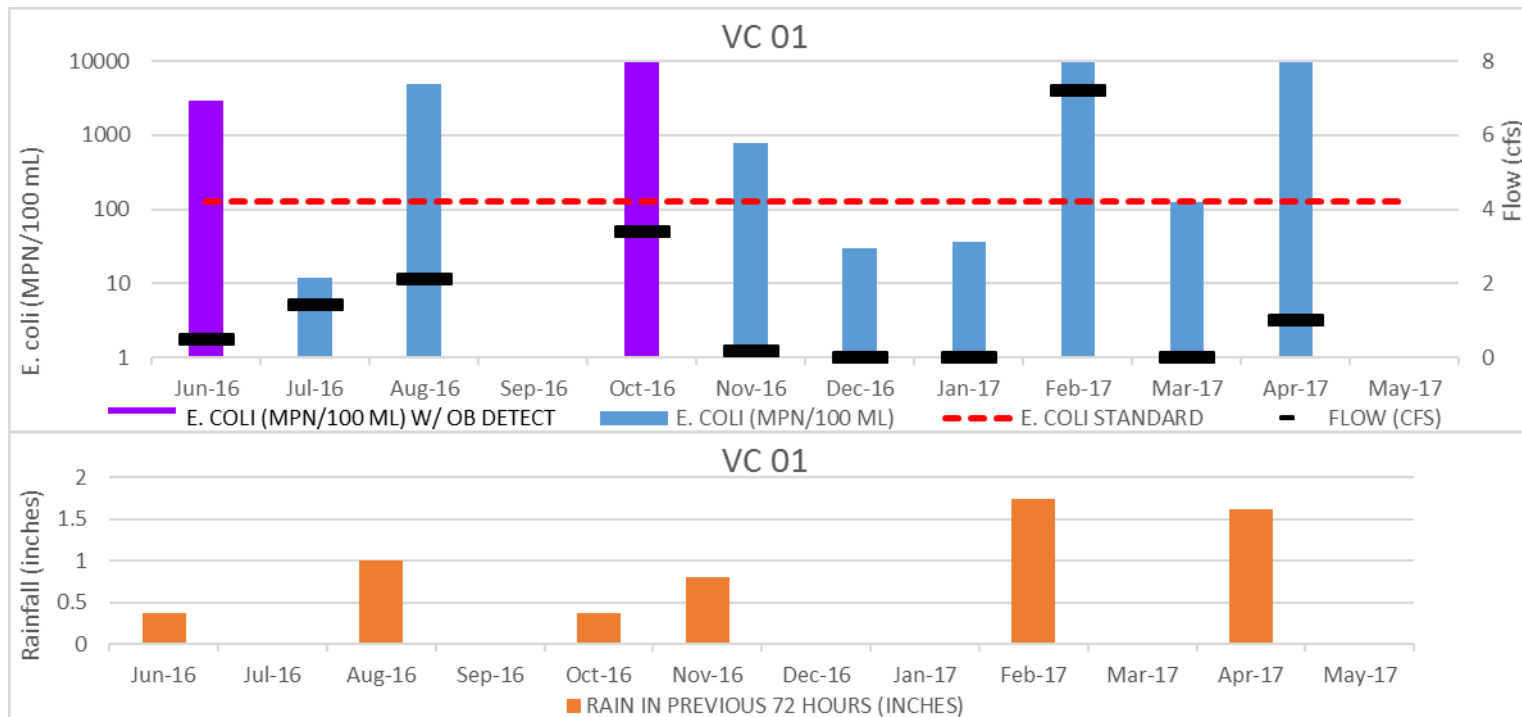
^c For nitrite, concentrations above 0.02 mg/L (ppm) usually indicate polluted waters (Mesner, N., J. Geiger. 2010. Understanding Your Watershed: Nitrogen. Utah State University, Water Quality Extension.

^d Chlorophyll a, as measured by Spectrophotometric method with acid correction.

Site 1 – Wildcat Branch at Cravens



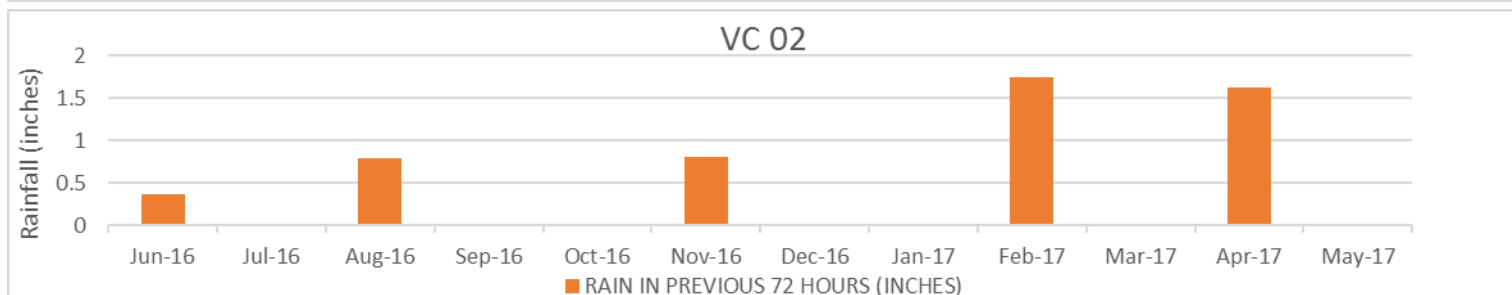
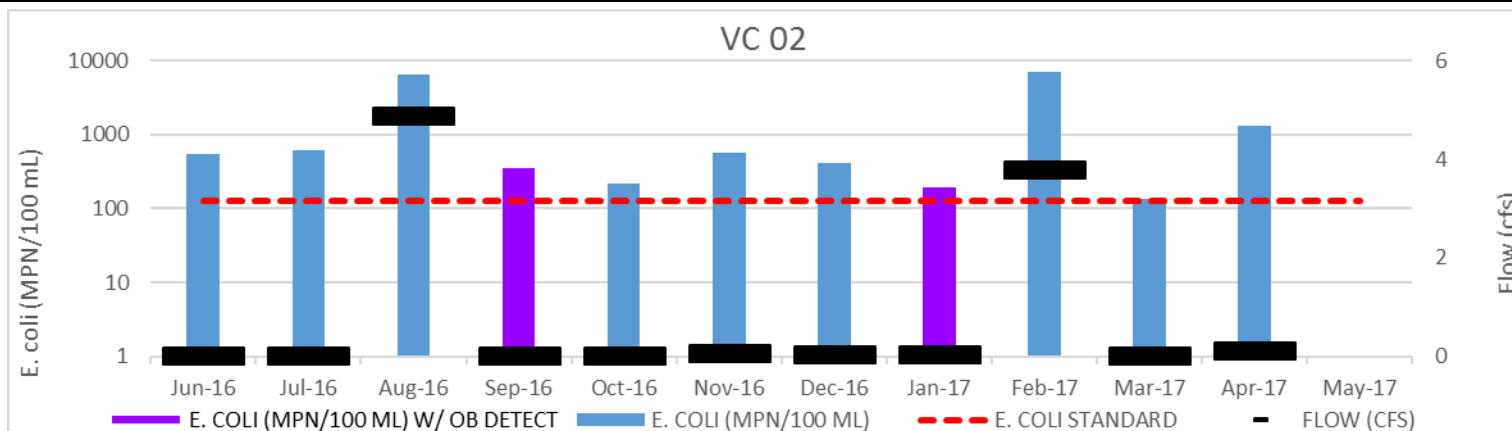
DATE	CHLOROPHYLL-A (UG/L)	E. COLI (MPN/100 ML)	NITRATE (MG/L)	NITRITE (MG/L)	TKN (MG/L)	OP (MG/L)	TP (MG/L)	TDS (MG/L)	TSS (MG/L)	VSS (MG/L)	OBs DETECTED (1=YES, 0=NO)	24 HR RAIN (INCHES)	72 HR RAIN (INCHES)	FLOW (CFS)
6/29/2016	17	2909	0.25	<0.05	1.08	0.04	0.14	164	10	<3	1	0.375	0.375	0.476
7/19/2016	17	12	<0.05	<0.05	0.65	<0.02	0.04	244	7	3	0	0	0	1.413
8/15/2016	4	>4839	0.33	<0.05	0.82	0.03	0.09	187	12	<8	0	0.63	1	2.125
10/20/2016	<3	>9678	0.41	<0.05	1.35	0.08	0.22	144	58	10	1	0.375	0.375	3.41
11/9/2016	3	771	0.12	< 0.05	0.55	0.03	0.06	194	3	< 2	0	0.055	0.805	0.16
12/14/2016	< 3	30	< 0.05	< 0.05	0.37	< 0.02	0.05	367	4	< 2	0	0	0	0.01
1/10/2017	< 3	37	< 0.05	< 0.05	0.6	0.04	0.09	339	6	< 3	0	0	0	0
2/14/2017	< 3	9678	0.57	< 0.05	0.85	0.25	0.34	130	26	< 4		1.75	1.75	7.2
3/28/2017	31	125	< 0.05	< 0.05	1.17	< 0.02	0.09	238	8	4		0	0	0
4/3/2017	5	9678	0.19	< 0.05	0.8	0.05	0.19	123	38	< 6		1.25	1.625	1.012



Site 2 – Unnamed trib at Bowman Springs Rd



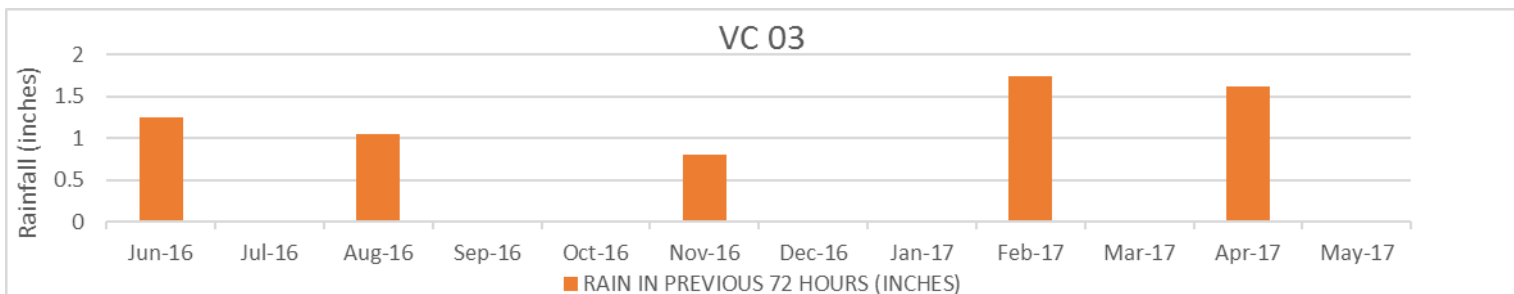
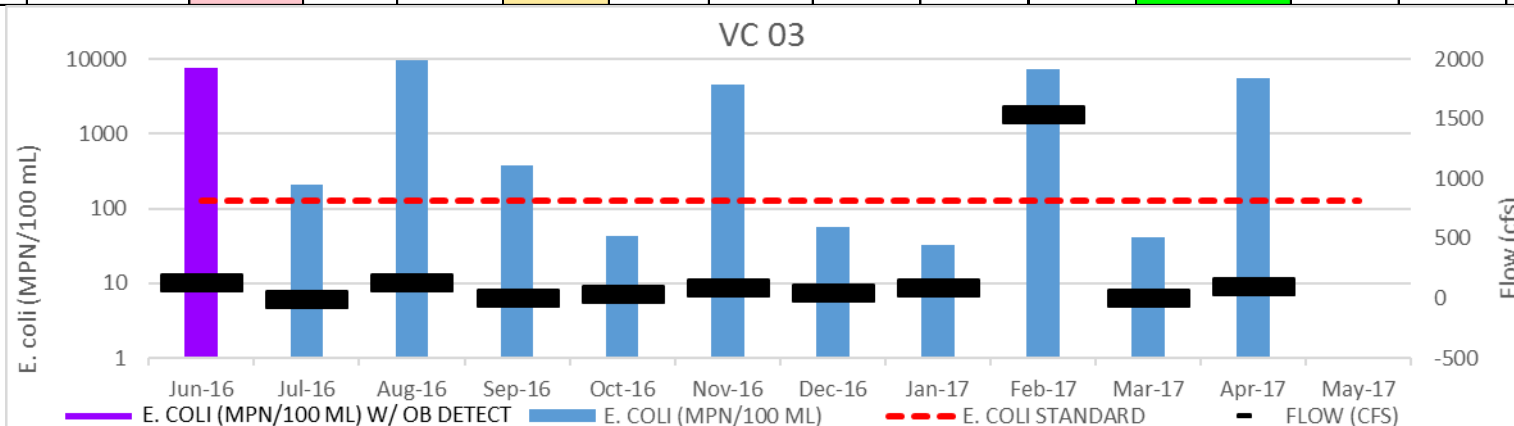
DATE	CHLOROPHYLL-A (UG/L)	E. COLI (MPN/100 ML)	NITRATE (MG/L)	NITRITE (MG/L)	TKN (MG/L)	OP (MG/L)	TP (MG/L)	TDS (MG/L)	TSS (MG/L)	VSS (MG/L)	OBS DETECTED (1=YES, 0=NO)	24 HR RAIN (INCHES)	72 HR RAIN (INCHES)	FLOW (CFS)
6/28/2016	11	534	0.2	<0.05	0.38	<0.02	0.02	1304	<2	<2	0	0.375	0.375	0.03
7/20/2016	<3	612	<0.05	<0.05	0.36	<0.02	0.02	1573	4	<2	0	0	0	0.017
8/17/2016	3	6510	0.4	<0.05	0.68	<0.02	0.06	240	19	<15	0	0	0.8	4.87
9/13/2016	<3	344	0.06	<0.05	0.22	<0.02	0.02	815	<3	<3	1	0	0	0.01
10/11/2016	6	213	<0.05	<0.05	0.26	<0.02	0.03	1093	8	<2	0	0	0	0.02
11/9/2016	<3	556	0.18	<0.05	0.47	<0.02	0.04	535	3	<2	0	0.055	0.805	0.07
12/13/2016	<3	413	0.09	<0.05	0.47	<0.02	0.03	1142	<2	<2	0	0	0	0.05
1/10/2017	<3	192	0.1	<0.05	<0.2	<0.02	0.02	1219	3	<2	1	0	0	0.05
2/14/2017	<3	6932	0.78	<0.05	1.03	0.27	0.37	207	24	4		1.75	1.75	3.79
3/28/2017	12	137	<0.05	<0.05	0.81	<0.02	0.04	1095	5	2		0	0	0.03
4/3/2017	7	1302	0.21	<0.05	0.65	<0.02	0.08	509	6	<2		1.25	1.625	0.13



Site 3 – Village Creek at IH-20



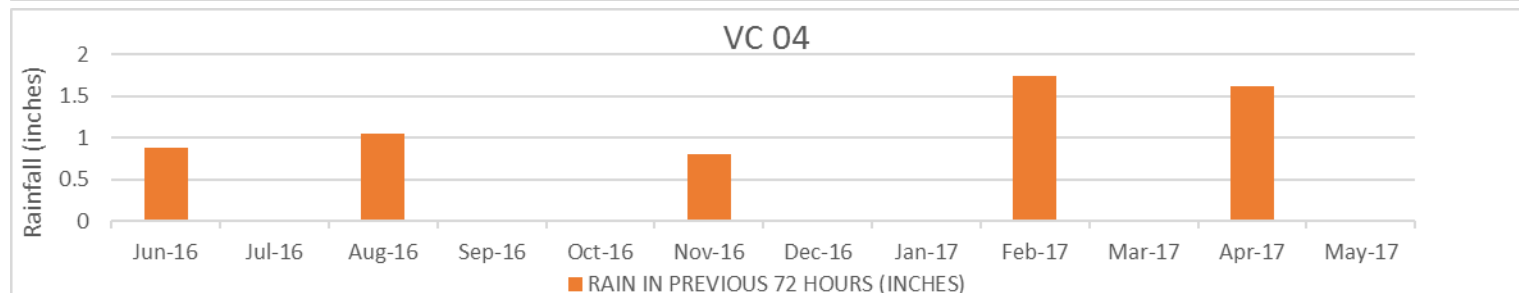
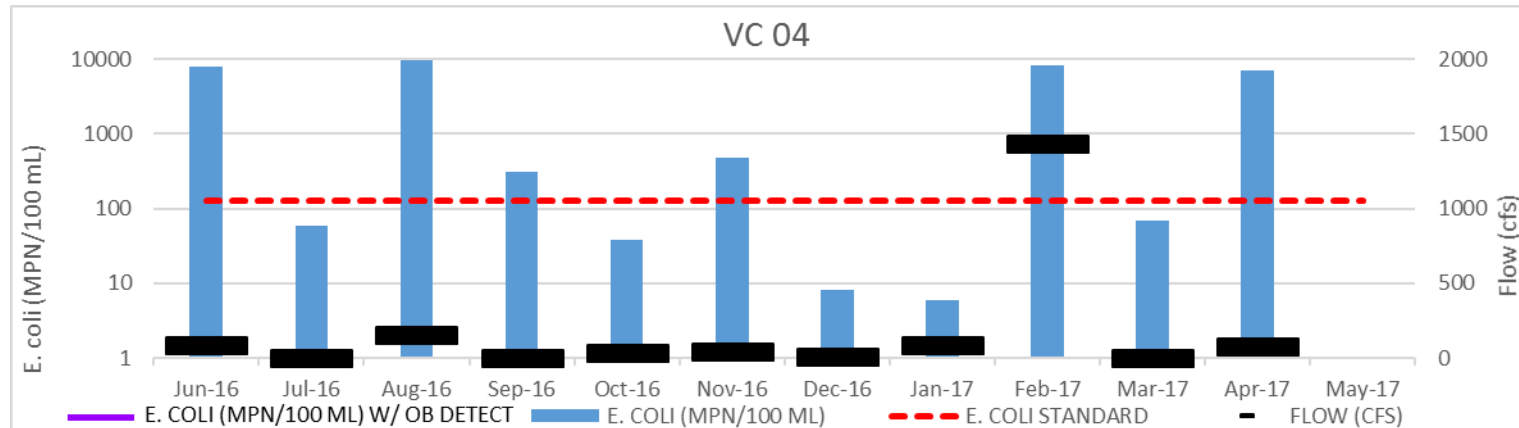
DATE	CHLOROPHYLL-A (UG/L)	E. COLI (MPN/100 ML)	NITRATE (MG/L)	NITRITE (MG/L)	TKN (MG/L)	OP (MG/L)	TP (MG/L)	TDS (MG/L)	TSS (MG/L)	VSS (MG/L)	OBs DETECTED (1=YES, 0=NO)	24 HR RAIN (INCHES)	72 HR RAIN (INCHES)	FLOW (CFS)
6/29/2016	9	7701	0.62	<0.05	0.96	0.11	0.35	233	116	<14	1	0.375	1.25	133.222
7/20/2016	12	212	0.14	<0.05	0.59	<0.02	0.05	238	20	3	0	0	0	-2.757
8/15/2016	6	>9678	0.23	<0.05	0.9	0.02	0.28	192	128	12	0	0.88	1.05	131.714
9/13/2016	8	384	0.63	<0.05	0.27	0.02	0.06	154	26	<3	0	0	0	0.378
10/11/2016	5	43	0.71	<0.05	0.56	0.03	0.06	171	13	2	0	0	0	34.09
11/9/2016	6	4611	0.25	<0.05	0.38	0.03	0.08	156	21	<6	0	0.055	0.805	86
12/14/2016	4	56	0.29	<0.05	0.46	<0.02	0.04	164	8	<2	0	0	0	46.829
1/10/2017	9	32	0.33	<0.05	0.22	<0.02	0.04	173	8	<2	0	0	0	91
2/14/2017	22	7270	0.71	<0.05	1.39	0.14	0.54	203	426	35		1.75	1.75	1545
3/28/2017	18	42	<0.05	<0.05	0.69	<0.02	0.05	335	14	<3		0	0	0
4/3/2017	<3	5654	0.8	<0.05	0.92	0.1	0.24	272	68	9		1.25	1.625	101.072



Site 4 – Village Creek at US-287 BUS



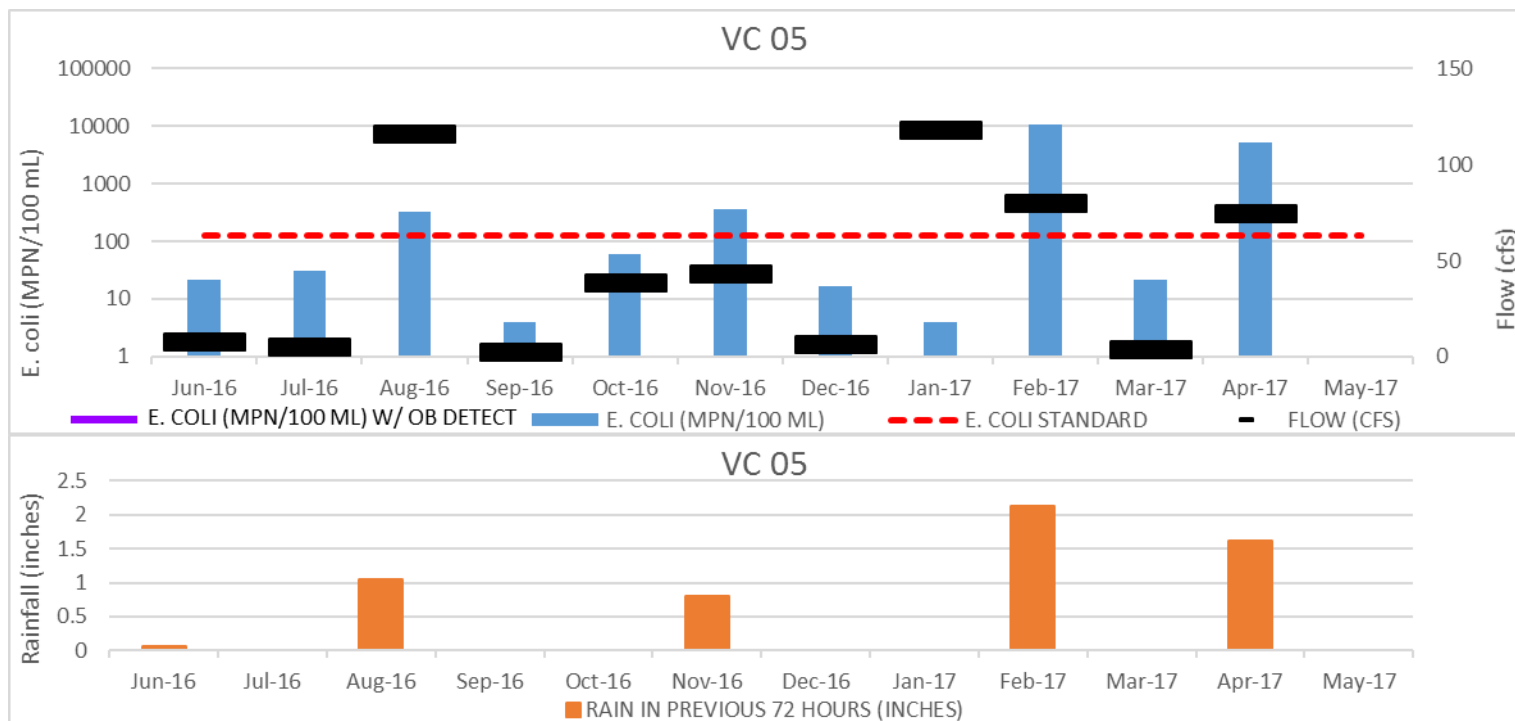
DATE	CHLOROPHYLL-A (UG/L)	E. COLI (MPN/100 ML)	NITRATE (MG/L)	NITRITE (MG/L)	TKN (MG/L)	OP (MG/L)	TP (MG/L)	TDS (MG/L)	TSS (MG/L)	VSS (MG/L)	Obs DETECTED (1=YES, 0=NO)	24 HR RAIN (INCHES)	72 HR RAIN (INCHES)	FLOW (CFS)
6/28/2016	11	7945	0.37	<0.05	0.61	<0.02	0.12	304	54	<6	0	0.875	0.875	82.731
7/20/2016	5	59	0.2	<0.05	0.42	<0.02	0.04	167	9	<2	0	0	0	3.281
8/15/2016	8	>9678	0.28	<0.05	0.88	0.04	0.33	179	152	<16	0	0.88	1.05	154.395
9/13/2016	4	314	0.56	<0.05	0.45	0.03	0.04	157	12	<3	0	0	0	3.31
10/11/2016	6	38	0.72	<0.05	0.53	0.03	0.05	161	8	<2	0	0	0	34.88
11/9/2016	7	488	0.25	< 0.05	0.45	0.03	0.07	145	12	< 4	0	0.055	0.805	46
12/13/2016	4	8	0.31	< 0.05	0.51	0.02	0.04	151	3	< 2	0	0	0	7.889
1/10/2017	9	6	0.33	< 0.05	< 0.2	< 0.02	0.04	168	8	< 2	0	0	0	87
2/14/2017	14	8164	0.73	< 0.05	1.26	0.13	0.65	220	470	40		1.75	1.75	1432
3/28/2017	8	70	< 0.05	< 0.05	0.46	< 0.02	0.04	418	15	< 2		0	0	0.04
4/3/2017	12	6932	1.06	< 0.05	0.95	0.13	0.26	273	64	< 7		1.25	1.625	79.827



Site 5 – Village Creek near Freeman Dr



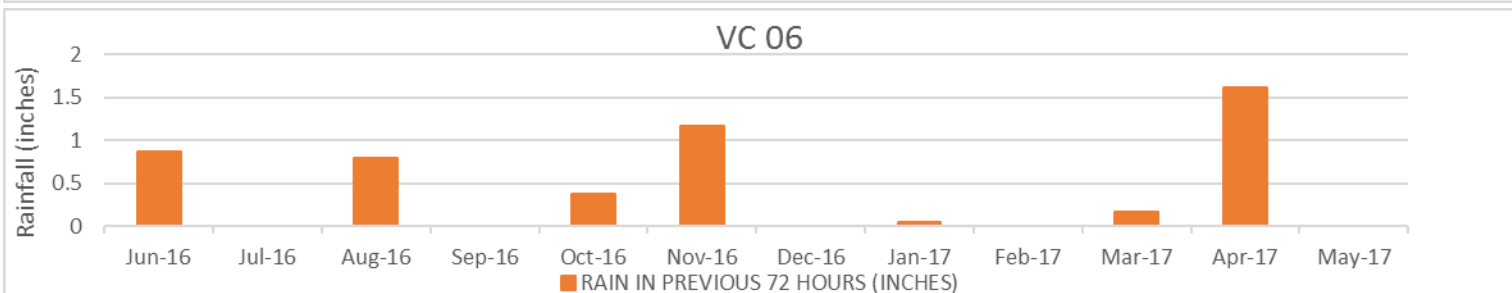
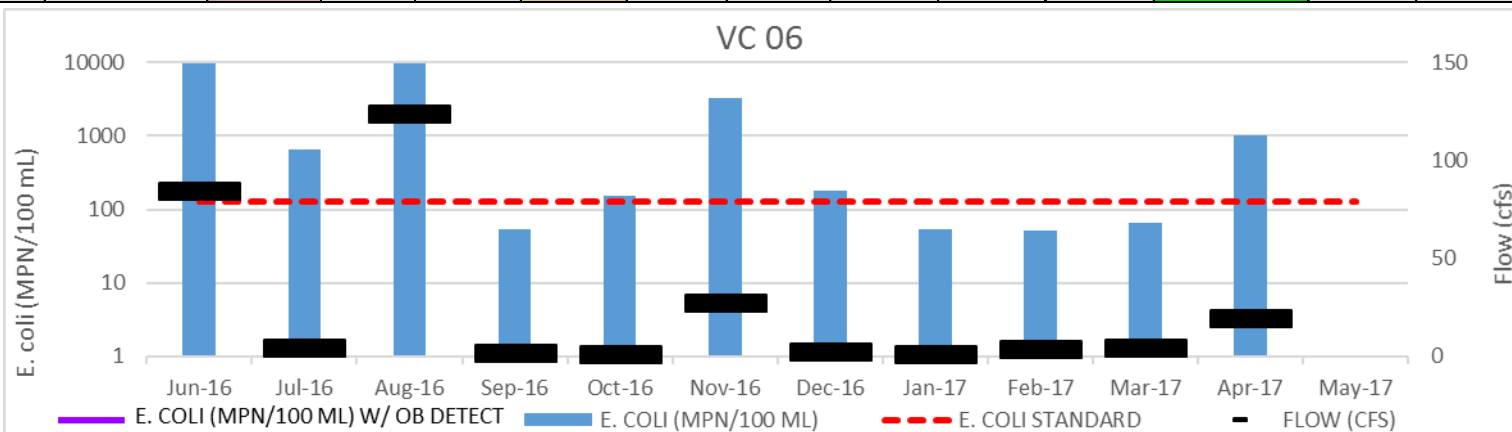
DATE	CHLOROPHYLL-A (UG/L)	E. COLI (MPN/100 ML)	NITRATE (MG/L)	NITRITE (MG/L)	TKN (MG/L)	OP (MG/L)	TP (MG/L)	TDS (MG/L)	TSS (MG/L)	VSS (MG/L)	OBs DETECTED (1=YES, 0=NO)	24 HR RAIN (INCHES)	72 HR RAIN (INCHES)	FLOW (CFS)
7/12/2016	6	21	0.17	<0.05	0.47	0.02	0.04	152	8	<2	0	0	0.055	8.1811
7/20/2016	<3	30	0.23	<0.05	0.42	<0.02	0.03	191	5	<2	0	0	0	5.046
8/17/2016	9	323	0.33	<0.05	0.45	<0.02	0.05	146	21	<9	0	0	1.05	115.7915
9/13/2016	<3	4	0.67	<0.05	0.48	0.03	0.04	172	4	<2	0	0	0	2.65
10/11/2016	8	61	0.74	<0.05	0.44	0.03	0.06	159	14	3	0	0	0	38.95
11/9/2016	6	369	0.26	< 0.05	0.51	0.03	0.07	132	15	< 4	0	0.055	0.805	43.11
12/13/2016	< 3	17	0.32	< 0.05	0.44	0.02	0.04	149	2	< 2	0	0	0	6.54
1/10/2017	11	4	0.35	< 0.05	< 0.2	< 0.02	0.04	162	8	< 2	0	0	0	118.41
2/15/2017	7	10462	0.93	< 0.1	0.99	0.16	0.29	271	59	< 7		0.375	2.125	80.2
3/28/2017	< 3	22	< 0.05	< 0.05	0.44	< 0.02	0.03	408	8	< 2		0	0	4.13
4/3/2017	8	5199	0.93	< 0.05	0.77	0.12	0.24	278	72	9		1.25	1.625	74.52



Site 6 – Village Creek at Everman-Kennedale Rd



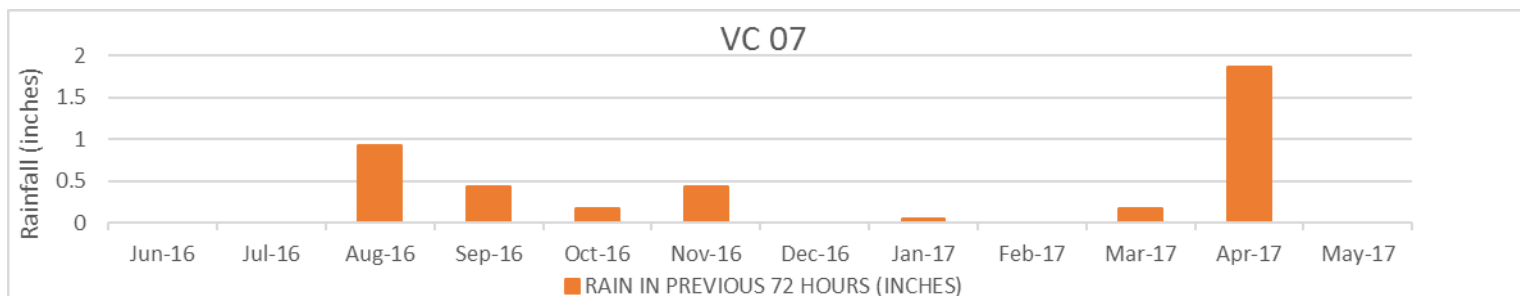
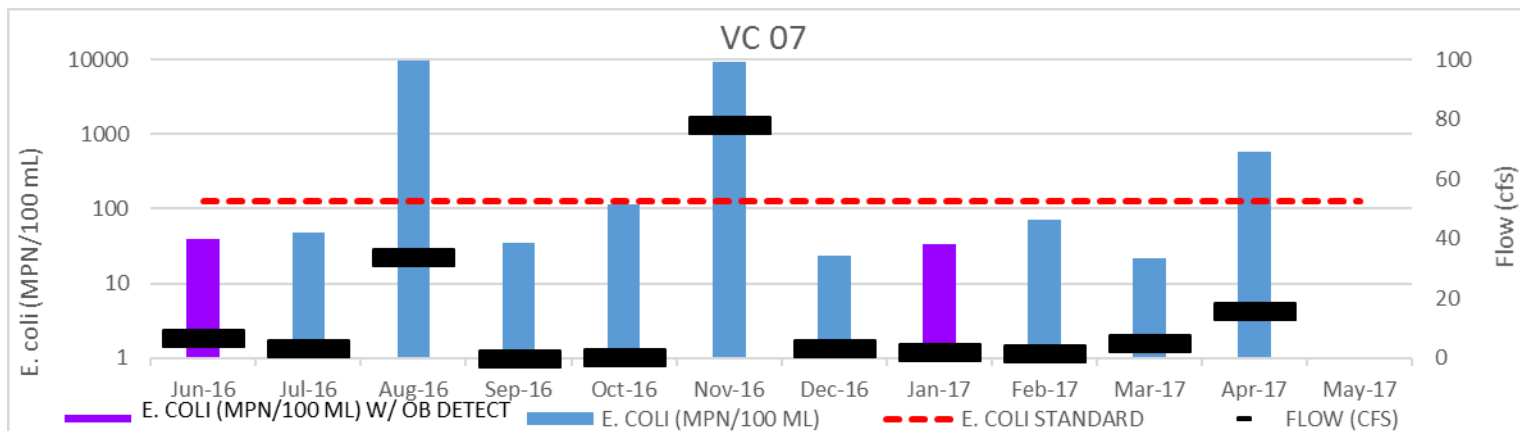
DATE	CHLOROPHYLL-A (UG/L)	E. COLI (MPN/100 ML)	NITRATE (MG/L)	NITRITE (MG/L)	TKN (MG/L)	OP (MG/L)	TP (MG/L)	TDS (MG/L)	TSS (MG/L)	VSS (MG/L)	OBS DETECTED (1=YES, 0=NO)	24 HR RAIN (INCHES)	72 HR RAIN (INCHES)	FLOW (CFS)
6/28/2016	7	>9678	0.44	<0.05	0.72	<0.02	0.17	276	87	<11	0	0.875	0.875	84.47
7/20/2016	3	643	<0.05	<0.05	0.21	<0.02	<0.02	481	5	<2	0	0	0	4.19
8/15/2016	8	>9678	0.35	<0.05	0.88	0.06	0.4	190	196	<20	0	0.63	0.8	123.674
9/13/2016	4	53	<0.05	<0.05	<0.2	<0.02	0.03	355	14	<2	0	0	0	1.6
10/10/2016	3	154	0.26	<0.05	0.44	0.04	0.09	216	22	<4	0	0	0.375	0.99
11/9/2016	3	3255	0.36	<0.05	0.53	0.06	0.14	211	42	<7	0	0.175	1.175	27.14
12/13/2016	<3	177	<0.05	<0.05	0.32	<0.02	0.04	312	5	<2	0	0	0	2.8
1/9/2017	<3	54	0.84	<0.05	<0.2	0.07	0.09	341	6	<2	0	0	0.055	0.98
2/13/2017	4	52	0.67	<0.05	0.48	<0.02	0.03	416	11	<2		0	0	4.1
3/27/2017	4	65	<0.05	<0.05	0.46	<0.02	0.04	467	15	<2		0	0.175	4.52
4/4/2017	<3	1031	0.63	<0.05	0.71	0.07	0.16	285	35	5		0	1.625	19.38



Site 7 – Village Creek at Rendon Rd



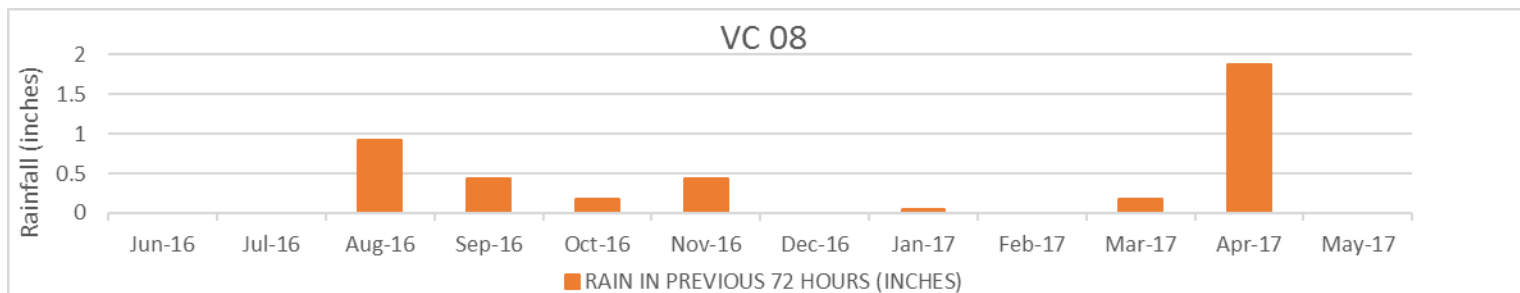
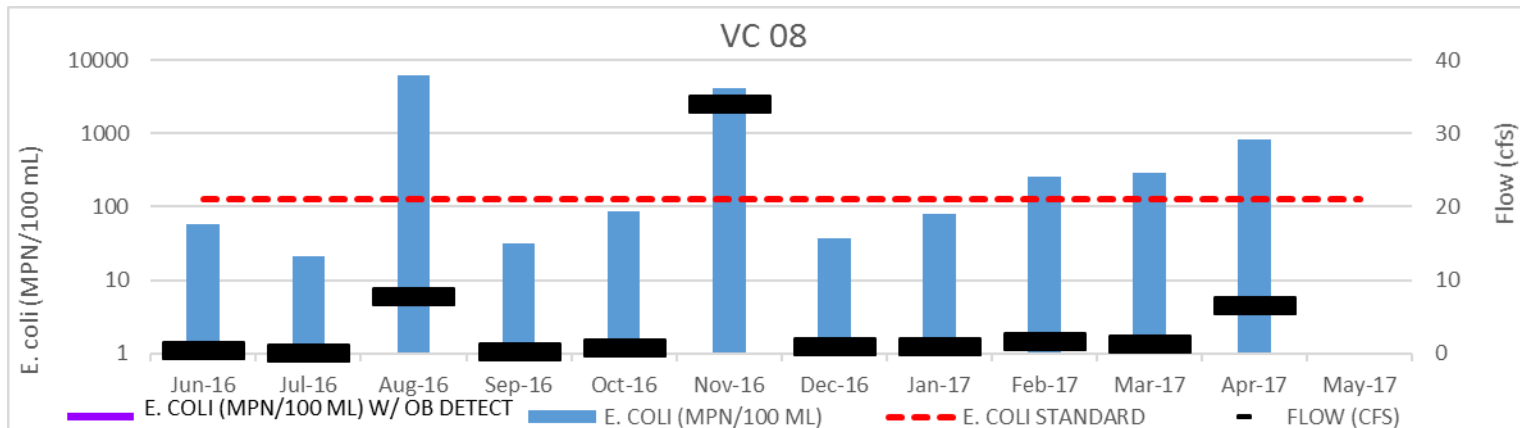
DATE	CHLOROPHYLL-A (UG/L)	E. COLI (MPN/100 ML)	NITRATE (MG/L)	NITRITE (MG/L)	TKN (MG/L)	OP (MG/L)	TP (MG/L)	TDS (MG/L)	TSS (MG/L)	VSS (MG/L)	Obs DETECTED (1=YES, 0=NO)	24 HR RAIN (INCHES)	72 HR RAIN (INCHES)	FLOW (CFS)
6/27/2016	<3	39	0.14	<0.05	0.45	<0.02	0.02	509	5	<2	1	0	0	7
7/20/2016	4	48	<0.05	<0.05	0.37	<0.02	<0.02	461	4	<2	0	0	0	3.2
8/15/2016	4	>9678	0.33	<0.05	0.81	0.07	0.25	202	58	<19	0	0.88	0.93	34
9/12/2016	<3	35	<0.05	<0.05	0.29	<0.02	0.03	304	5	<2	0	0	0.43	0.08
10/10/2016	<3	113	0.08	<0.05	0.38	0.03	0.05	223	3	<2	0	0	0.175	0.17
11/8/2016	4	9208	0.42	<0.05	0.59	0.08	0.16	209	34	<9	0	0.375	0.43	78
12/12/2016	<3	24	<0.05	<0.05	0.36	<0.02	0.03	318	2	<2	0	0	0	3.2
1/9/2017	<3	34	0.19	<0.05	<0.2	0.08	0.11	328	<2	<2	1	0	0.055	2.1
2/13/2017	<3	70	0.78	<0.05	0.53	<0.02	0.03	408	<2	<2		0	0	1.5
3/27/2017	<3	22	<0.05	<0.05	0.43	<0.02	0.03	430	2	<2		0	0.175	5.3
4/4/2017	<3	573	0.64	<0.05	0.62	0.09	0.14	299	12	<2		0	1.875	16



Site 8 – Deer Creek at Oak Grove Rd



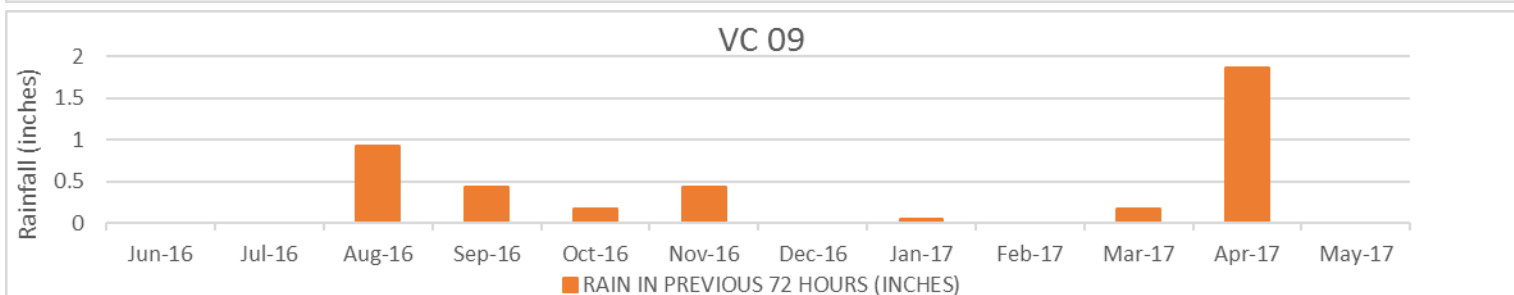
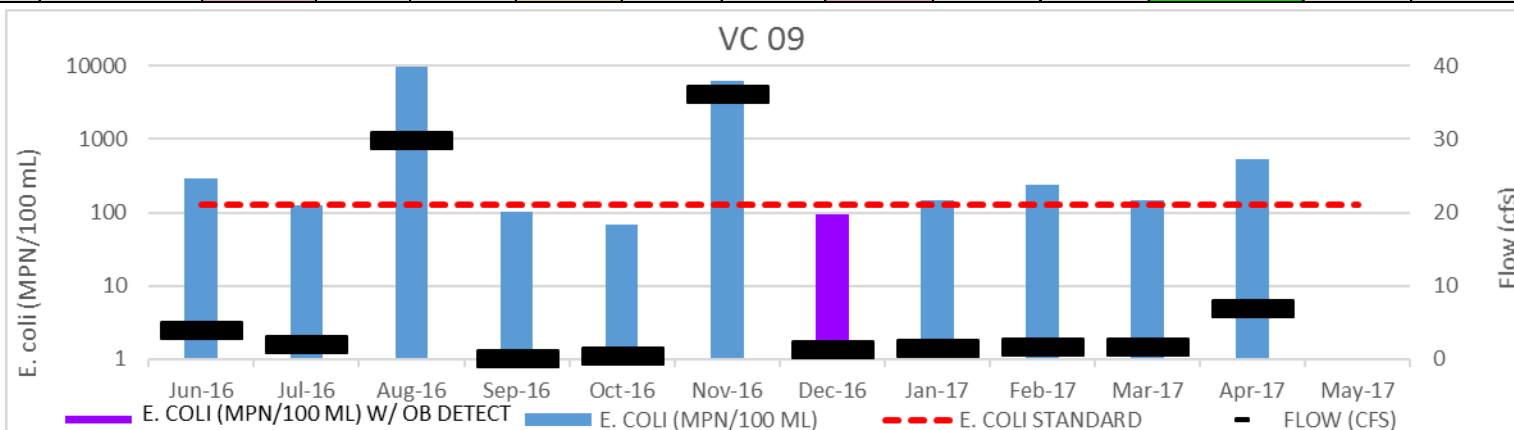
DATE	CHLOROPHYLL-A (UG/L)	E. COLI (MPN/100 ML)	NITRATE (MG/L)	NITRITE (MG/L)	TKN (MG/L)	OP (MG/L)	TP (MG/L)	TDS (MG/L)	TSS (MG/L)	VSS (MG/L)	OBs DETECTED (1=YES, 0=NO)	24 HR RAIN (INCHES)	72 HR RAIN (INCHES)	FLOW (CFS)
6/27/2016	4	58	0.54	<0.05	0.49	<0.02	<0.02	350	4	<2	0	0	0	0.5
7/19/2016	4	21	0.15	<0.05	0.45	<0.02	<0.02	309	5	<2	0	0	0	0.214
8/15/2016	8	6212	0.39	<0.05	0.71	0.04	0.26	212	137	<14	0	0.88	0.93	7.92
9/12/2016	4	32	<0.05	<0.05	0.31	<0.02	0.03	268	7	<2	0	0	0.43	0.32
10/10/2016	5	86	0.1	<0.05	0.42	<0.02	0.04	253	10	2	0	0	0.175	0.8
11/8/2016	< 3	4106	0.35	< 0.05	0.59	0.03	0.09	216	38	< 8	0	0.375	0.43	34.05
12/12/2016	< 3	37	0.3	< 0.05	0.24	< 0.02	< 0.02	300	2	< 2	0	0	0	1.02
1/9/2017	< 3	80	0.25	< 0.05	< 0.2	< 0.02	0.02	286	< 2	< 2	0	0	0.055	0.95
2/13/2017	< 3	255	0.15	< 0.05	0.49	< 0.02	0.03	324	4	< 2		0	0	1.71
3/27/2017	< 3	288	0.08	< 0.05	0.44	< 0.02	0.02	345	5	< 2		0	0.175	1.45
4/4/2017	3	820	0.69	< 0.05	0.56	0.03	0.08	297	21	< 2		0	1.875	6.69



Site 9 – Village Creek at FM 1187



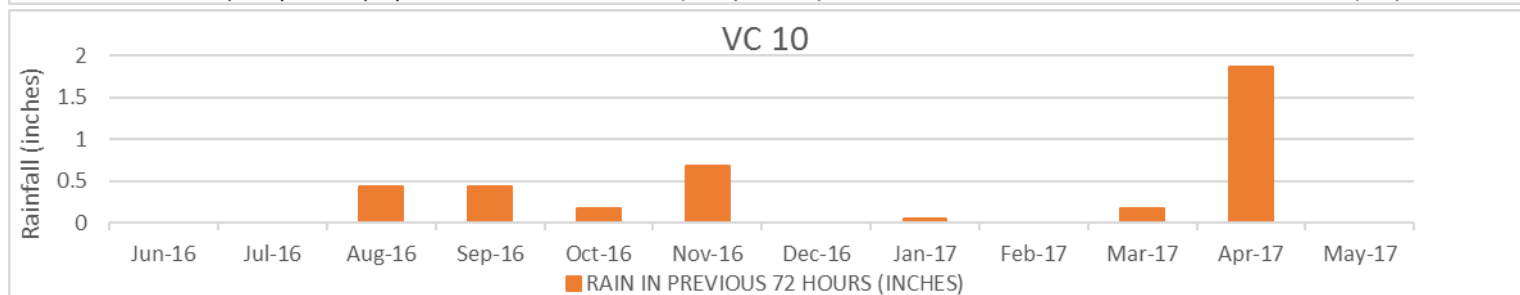
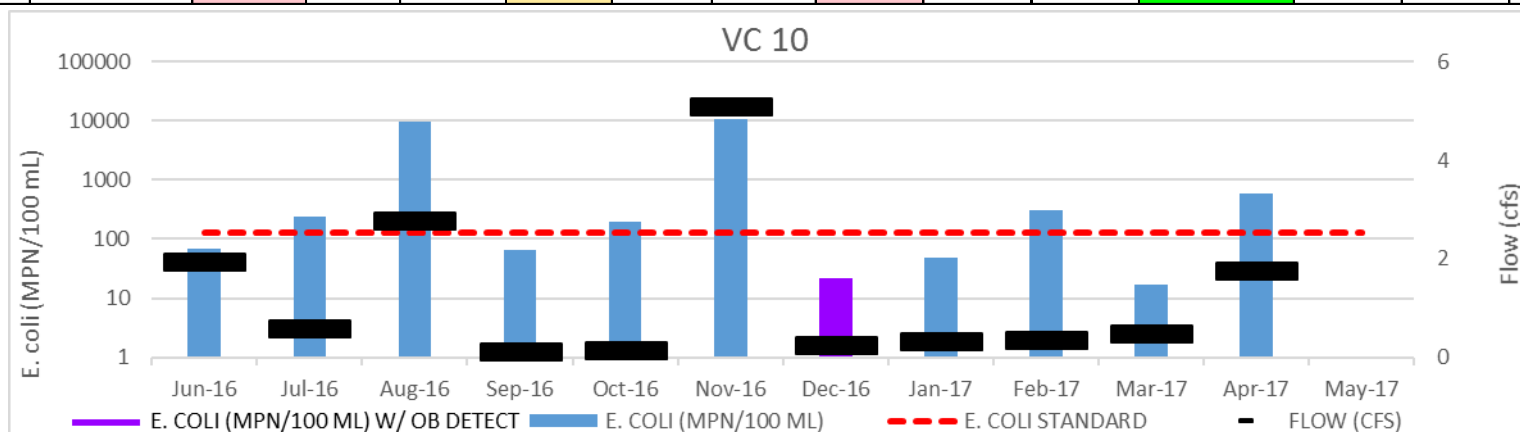
DATE	CHLOROPHYLL-A (UG/L)	E. COLI (MPN/100 ML)	NITRATE (MG/L)	NITRITE (MG/L)	TKN (MG/L)	OP (MG/L)	TP (MG/L)	TDS (MG/L)	TSS (MG/L)	VSS (MG/L)	OBS DETECTED (1=YES, 0=NO)	24 HR RAIN (INCHES)	72 HR RAIN (INCHES)	FLOW (CFS)
6/27/2016	5	289	0.31	<0.05	0.42	<0.02	0.03	558	8	<2	0	0	0	4.033
7/19/2016	<3	127	0.4	<0.05	0.5	<0.02	0.02	501	4	<2	0	0	0	2.09
8/15/2016	8	>9678	0.37	<0.05	0.83	0.08	0.28	204	54	<17	0	0.88	0.93	29.93
9/12/2016	4	102	1.17	<0.05	0.29	0.03	0.07	402	16	<3	0	0	0.43	0.2
10/10/2016	<3	67	0.96	<0.05	0.36	0.1	0.13	246	2	<2	0	0	0.175	0.59
11/8/2016	4	6131	0.45	< 0.05	0.54	0.12	0.19	180	24	< 7	0	0.375	0.43	36.11
12/12/2016	< 3	96	0.41	< 0.05	0.31	0.12	0.15	408	2	< 2	1	0	0	1.38
1/9/2017	< 3	144	0.26	< 0.05	0.24	0.16	0.18	412	< 2	< 2	0	0	0.055	1.5
2/13/2017	11	234	2.02	0.08	0.81	0.04	0.09	514	7	< 2		0	0	1.76
3/27/2017	15	148	0.19	< 0.05	0.61	0.07	0.14	535	47	10		0	0.175	1.77
4/4/2017	< 3	537	0.78	< 0.05	0.61	0.18	0.25	312	16	< 2		0	1.875	6.98



Site 10 – Quil Miller Creek at CR 532



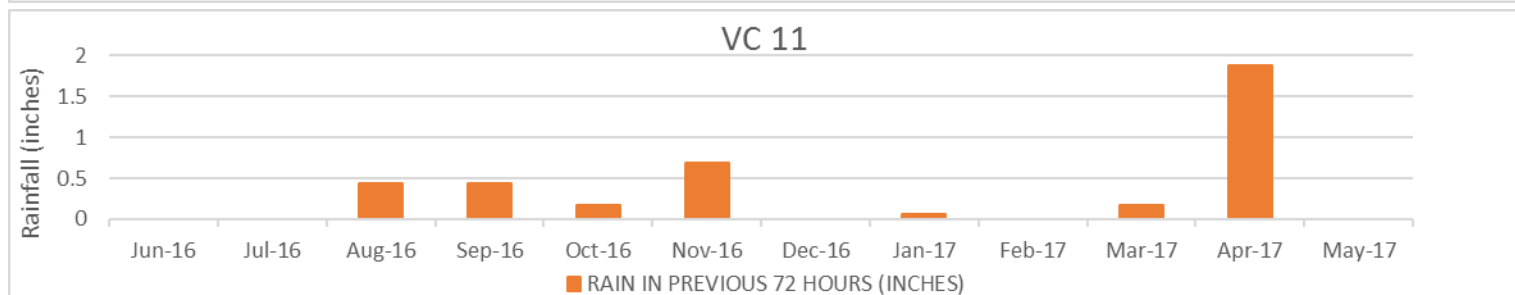
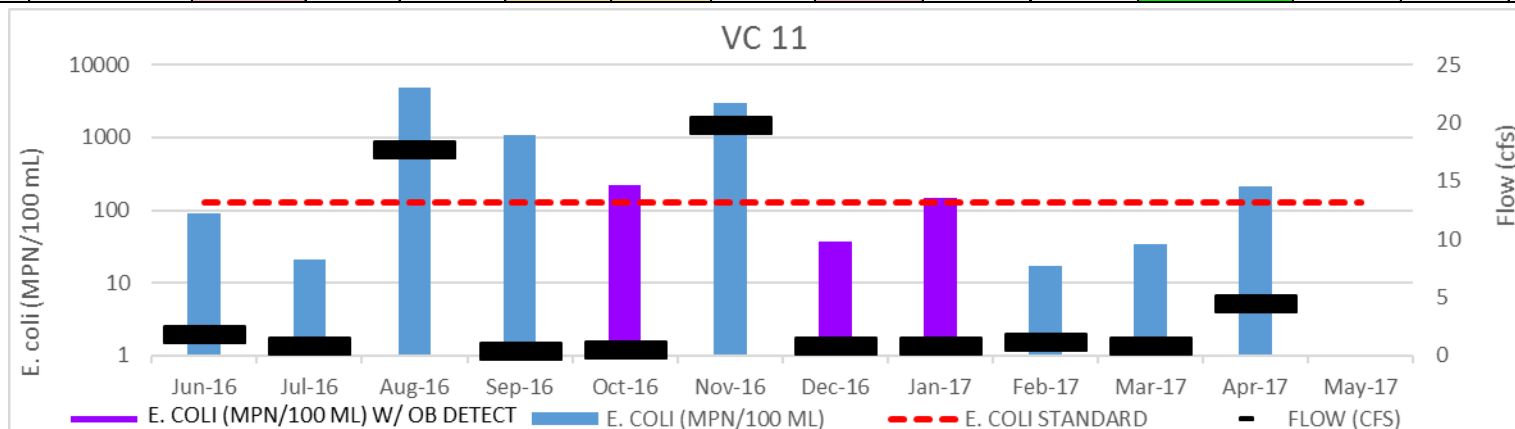
DATE	CHLOROPHYLL-A (UG/L)	E. COLI (MPN/100 ML)	NITRATE (MG/L)	NITRITE (MG/L)	TKN (MG/L)	OP (MG/L)	TP (MG/L)	TDS (MG/L)	TSS (MG/L)	VSS (MG/L)	OBs DETECTED (1=YES, 0=NO)	24 HR RAIN (INCHES)	72 HR RAIN (INCHES)	FLOW (CFS)
6/27/2016	<3	68	0.29	<0.05	0.39	0.07	0.05	676	3	<2	0	0	0	1.932
7/19/2016	<3	245	0.12	<0.05	0.26	0.04	0.05	613	4	<2	0	0	0	0.598
8/15/2016	<3	>9678	0.43	<0.05	0.99	0.17	0.38	234	54	<14	0	0.38	0.43	2.77
9/12/2016	<3	64	<0.05	<0.05	0.21	0.05	0.06	528	32	<3	0	0	0.43	0.13
10/10/2016	<3	200	<0.05	<0.05	0.22	0.05	0.06	410	7	<2	0	0	0.175	0.16
11/8/2016	<3	10462	0.39	<0.05	0.79	0.19	0.31	237	35	<9	0	0.625	0.68	5.1
12/12/2016	<3	22	<0.05	<0.05	<0.2	0.04	0.06	556	2	<2	1	0	0	0.25
1/9/2017	<3	49	<0.05	<0.05	<0.2	0.03	0.04	672	<2	<2	0	0	0.055	0.33
2/13/2017	6	311	<0.05	<0.05	0.41	0.02	0.04	604	3	<2		0	0	0.36
3/27/2017	<3	17	<0.05	<0.05	0.26	0.02	0.04	662	13	4		0	0.175	0.49
4/4/2017	5	602	0.29	<0.05	0.58	0.1	0.2	384	26	<3		0	1.875	1.75



Site 11 – Village Creek at FM 3391



DATE	CHLOROPHYLL-A (UG/L)	E. COLI (MPN/100 ML)	NITRATE (MG/L)	NITRITE (MG/L)	TKN (MG/L)	OP (MG/L)	TP (MG/L)	TDS (MG/L)	TSS (MG/L)	VSS (MG/L)	OBs DETECTED (1=YES, 0=NO)	24 HR RAIN (INCHES)	72 HR RAIN (INCHES)	FLOW (CFS)
6/27/2016	<3	92	2.45	0.07	0.67	0.1	0.14	553	8	<2	0	0	0	1.814
7/19/2016	<3	21	<0.05	<0.05	0.41	0.18	0.2	515	8	<2	0	0	0	0.881
8/15/2016	6	>4839	0.34	<0.05	0.72	0.13	0.22	158	40	<8	0	0.38	0.43	17.78
9/12/2016	<3	1095	<0.05	<0.05	0.48	0.23	0.25	370	7	<3	0	0	0.43	0.39
10/10/2016	<3	220	2.14	0.06	0.58	0.52	0.56	303	8	<2	1	0	0.175	0.59
11/8/2016	4	2987	1.03	< 0.05	0.63	0.28	0.34	232	28	< 6	0	0.625	0.68	19.84
12/12/2016	< 3	37	4.65	< 0.05	0.89	1.16	1.24	453	< 2	< 2	1	0	0	0.85
1/9/2017	< 3	146	4.52	< 0.05	0.48	1.75	1.8	455	< 2	< 2	1	0	0.055	0.91
2/13/2017	12	17	4.87	0.16	0.84	0.99	0.97	527	3	< 2		0	0	1.2
3/27/2017	4	34	2.93	< 0.1	0.66	0.88	0.89	529	3	< 2		0	0.175	0.9
4/4/2017	6	216	1.2	< 0.05	0.51	0.37	0.38	353	8	< 2		0	1.875	4.55

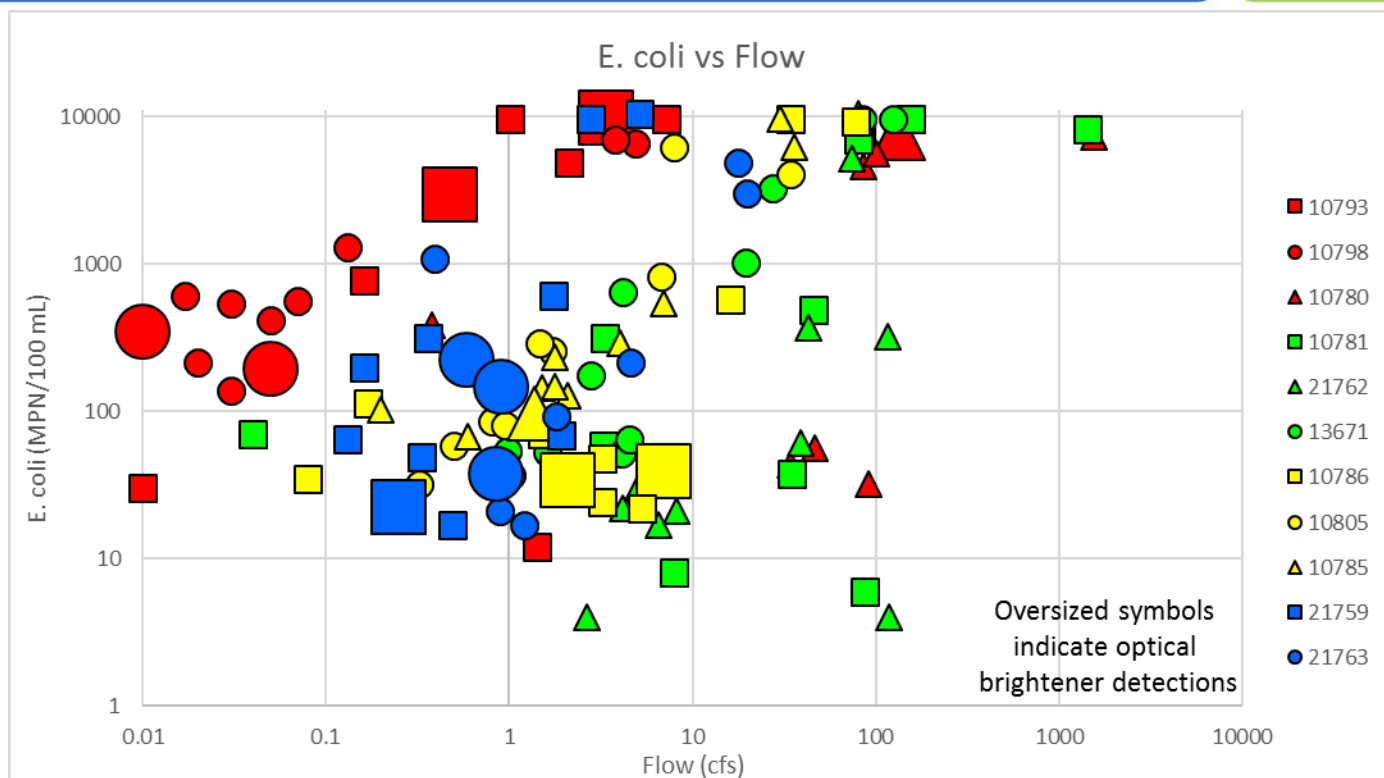


Optical Brighteners



Results for data
collected:
Jun 2016 – April 2017

(*E. coli* and Flow plotted
on log scale)



Potential Sources with positive OB hits

- High *E. coli*, low flow: malfunctioning septic systems or wastewater infrastructure, greywater
- High *E. coli*, high flow: large wastewater pipeline break, sanitary sewer overflow
- Low *E. coli*, varying flows: various chemicals, pesticides, dyes, car washes

OB testing is not intended to provide definite results, but instead provide us with another means of identifying possible sources.

Correlation Analysis



Results for data collected at all sites:
Jun 2016 – April 2017

	Secchi	Turbidity	Days Since Precip	24 hr rain	72 hr rain	Flow	NO2	TKN	TSS	VSS
Days Since Precip	0.5132									
24 hr rain	-0.6459	0.5358								
72 hr rain	-0.6220									
Flow		0.7655		0.5116						
TKN	-0.5677			0.6408	0.5401					
OP							0.8831			
TP							0.8276			
TSS	-0.5207	0.8069		0.6525		0.9077		0.5684		
VSS		0.8184		0.6385		0.9013		0.6024		
E. coli	-0.7549		-0.5021	0.7753	0.5866			0.6637	0.5540	0.5420

* Each of the coefficients in the table below has a p-value of 0.0000000044 or less; the correlations between each set of parameters is actual and significant.

**Arbitrary cutoff of +/- 0.5 was defined to indicate those correlations which may be significant.

Significant correlations

- TSS, VSS ► Rainfall
- TKN ► TSS, VSS, Recent rainfall
- *E. coli* ► Recent rainfall, TKN, TSS, VSS

Based on this dataset, the correlation coefficients above seem to indicate that constituents such as *E. coli*, nutrients, and solids are being introduced to the watershed primarily through non-point source runoff, and is most likely a non-point source issue.

Moving Forward

- Will submit additional data in Spring 2017
- Continue to analyze water quality samples at TRA-CRWS through May 2017
- TRA will run statistical and load duration curve analysis using CRWS data
- Data will be used to guide development of the Village Creek-Lake Arlington WPP



Questions?

<http://www.trinityra.org/lakearlingtonvillagecreek>

Aaron Hoff
Trinity River Authority
hoffa@trinityra.org
817.493.5581

