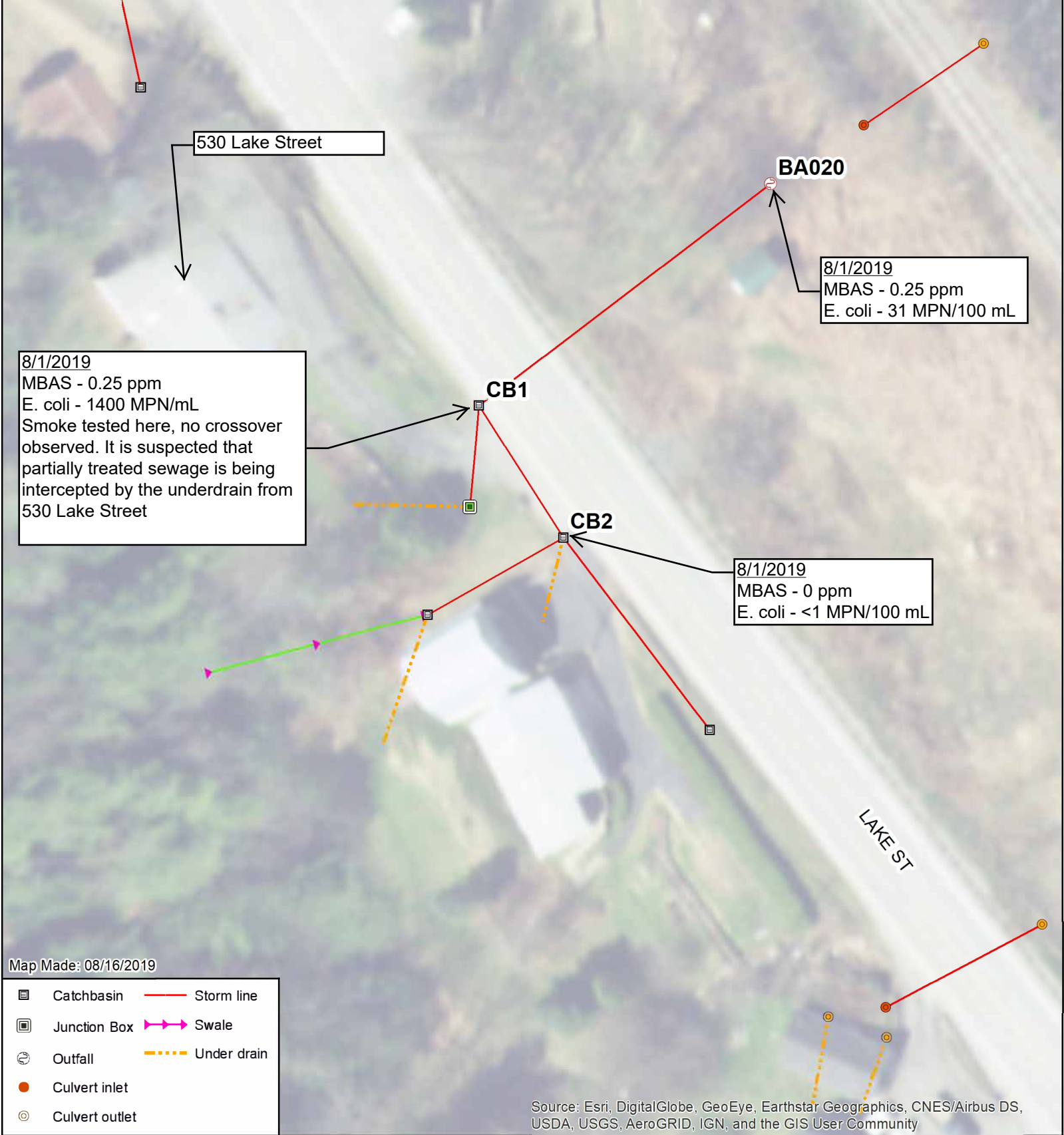



## Appendix 3 - Advanced Investigation Maps





Map 1 - Outfall BA 020

Advanced Investigation

Barton, VT

0

25

50 ft

N

Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
BA020	8/1/2019	-	yes	7.55	379	-	0.25	-	-	31	-
BA020_CB1	8/1/2019	-	yes	7.18	467	-	0.25	-	-	1400	-
BA020_CB2	8/1/2019	-	yes	7.91	256	-	0	-	-	<1	-

Dye tested from gas station bathroom, no crossover observed.






VT ROUTE 16

BERK\_3

Septic system is located here. The close proximity to the outfall could be a potential source of *E. coli* and phosphorus via septic leachate.

CB41 & CB 39:  
Ammonia - above detection limit  
MBAS - 2 ppm  
Smoke Tested here, no crossover observed.

Map Made: 10/23/2019

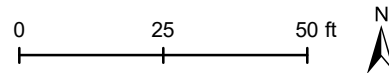
-  Catchbasin
-  Storm line
-  Outfall
-  Swale
-  Under drain

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



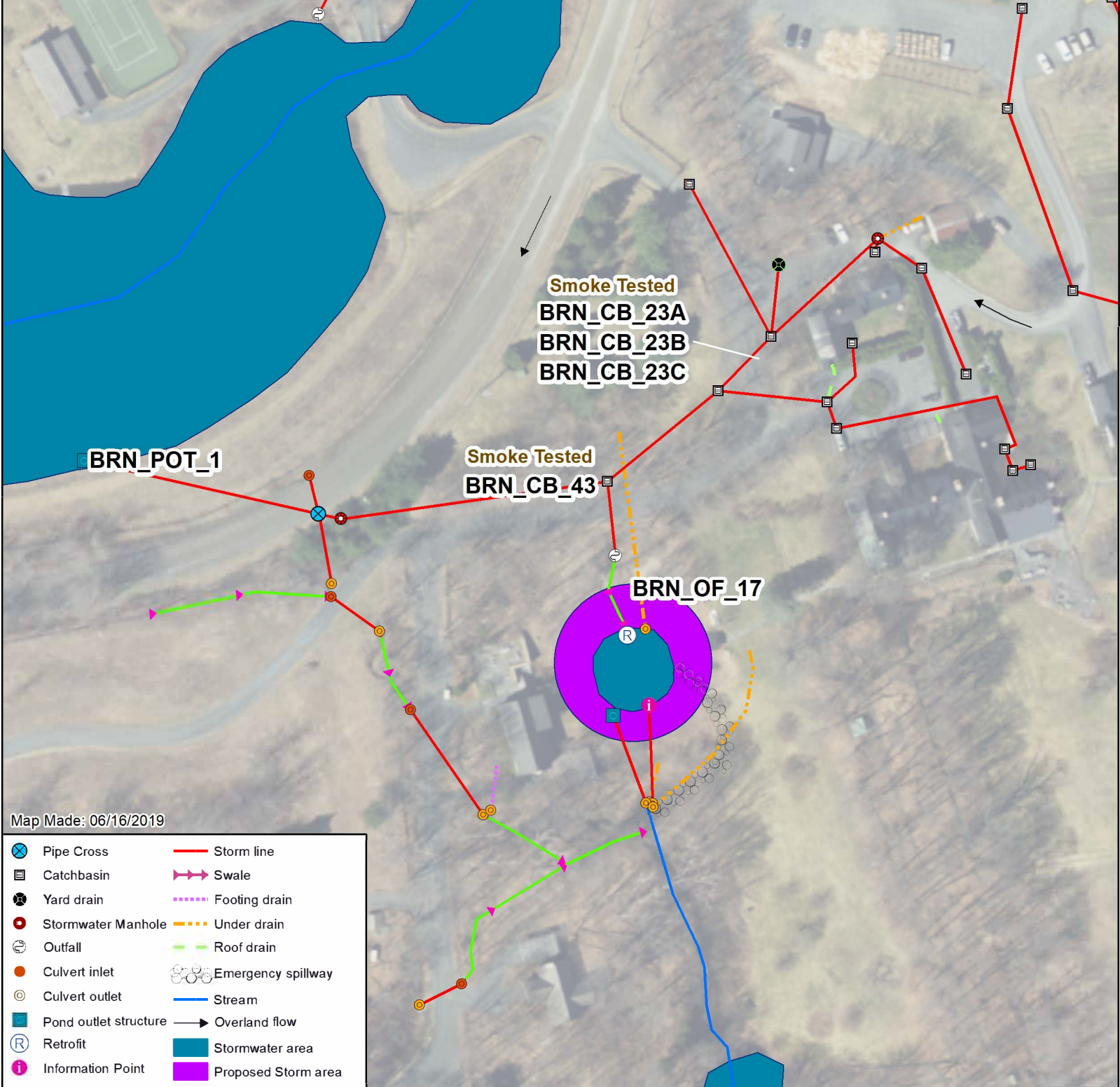
## Map 2 - Outfall BERK 3

### Advanced Investigation Berkshire, VT



Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
OF_BERK_3	8/27/2018		yes							2400	0.19
OF_BERK_3	2019-06-24	Outlet either covered with rockfall or collapsed. Sample take from pool in ditch that has sediment suspended from flow. This could elevate ammonia and phosphorus levels.	yes	8.35	562	0	0.25	yes	yes	1600	1
OF_BERK_3_CB_41	8/21/2019	Ammonia was overrange, lots of dead bugs in the catchbasin. Perforation holes are on the non-septic side of the catchbasin. Smoke tested from the catchbasin, no crossover observed. Flushed green dye down the gas station toilet, purple dye in the bathroom sink, and orange dye in the utility sink; no dye was observed in any storm infrastructure.	no	8.1	179	5	2	N/A	N/A	N/A	N/A
OF_BERK_3_CB_39	8/21/2019	Same as CB_41	no	7.5	199	5	2	N/A	N/A	N/A	N/A



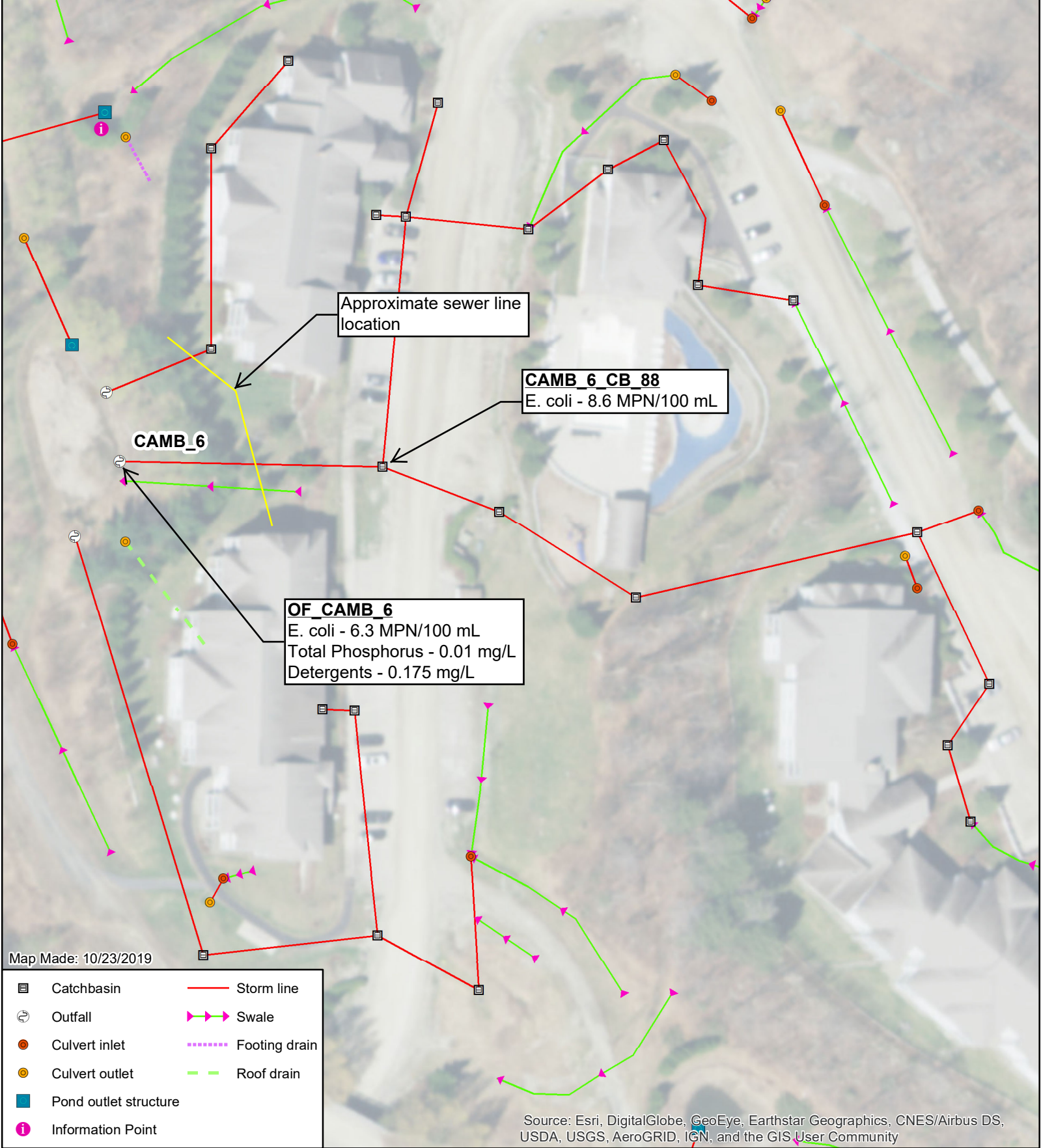


Map Made: 06/16/2019

- Pipe Cross
- Catchbasin
- Yard drain
- Stormwater Manhole
- Outfall
- Culvert inlet
- Culvert outlet
- Pond outlet structure
- Retrofit
- Information Point
- Storm line
- Swale
- Footing drain
- Under drain
- Roof drain
- Emergency spillway
- Overland flow
- Stormwater area
- Proposed Storm area

Map 3 - Outfall BRN 17											
Advanced Investigation											
Barnard, VT											
Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
BRN_OF_17	04/25/16	No physical indicators present	Yes	8.06	445	0.05	trace				
BRN_OF_17	08/24/17	No physical indicators present	Yes	7.81	720	0.63	0.25				
BRN_OF_17	04/17/19	No physical indicators present	Yes	8.2	267	0.35	0			1	<.05
BRN_CB_23A	04/17/19	No physical indicators present	Yes	7.86	1217	0	0.25			<1.0	
BRN_CB_23B	04/17/19	No physical indicators present	Yes	8.32	693	0.05	0.25			<1.0	
BRN_CB_23C	04/17/19	No physical indicators present	Yes	8.02	729	0.25	0.25			<1.0	
BRN_POT_1	04/17/19	No physical indicators present	Yes	8.68	120	0.29	0			<1.0	
BRN_CB_43	04/17/19	No physical indicators present	Yes	8.32	265	0.15	0			<1.0	

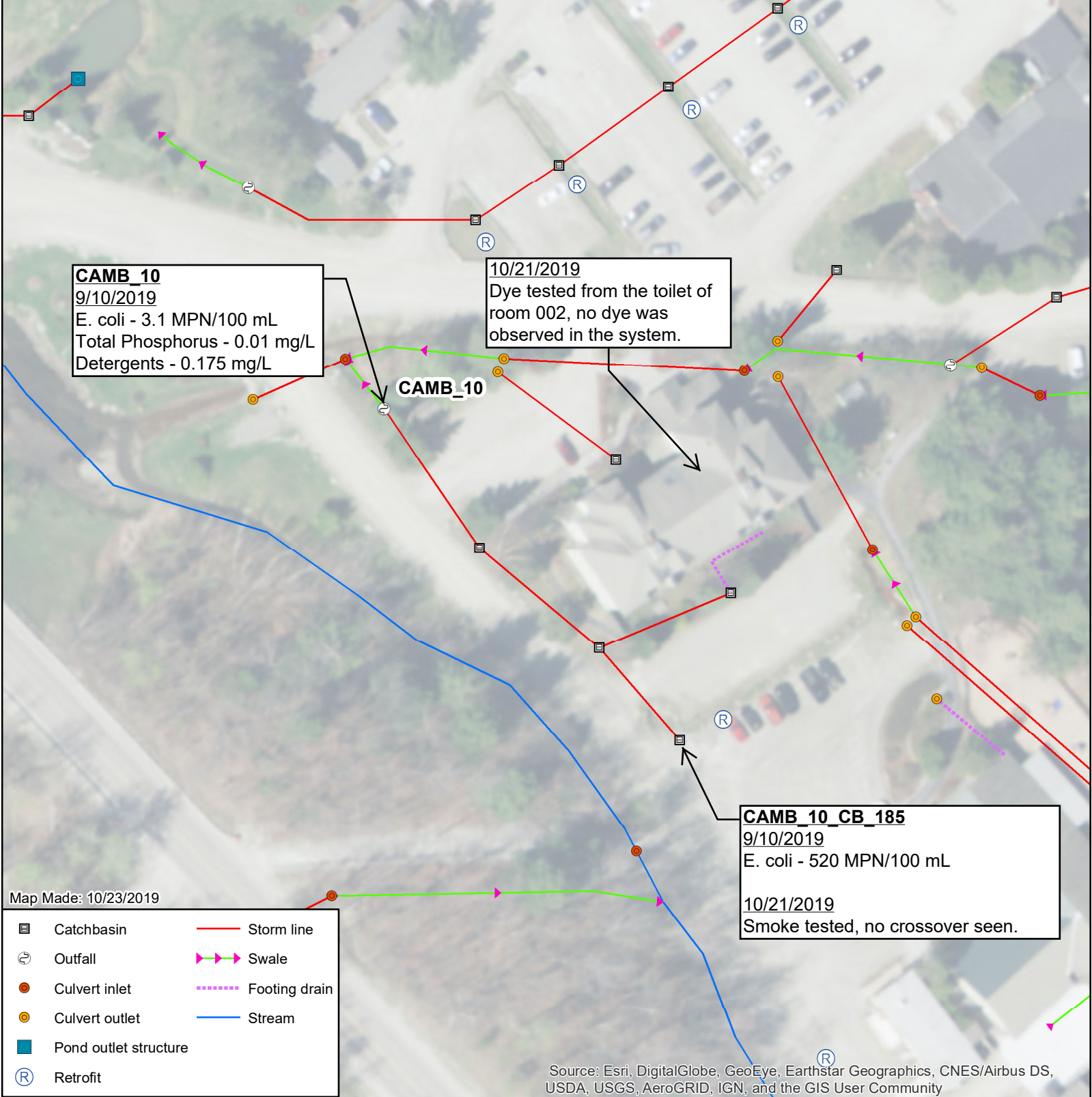




Map 4 - Outfall CMB 6 Advanced Investigation Cambridge, VT											
Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
OF_CAMB_6	2018-07-31		yes	7.98	2316	0.02					0.45
OF_CAMB_6	9/10/2019		yes	7.42	473	0	0.175			6.3	0.01
OF_CAMB_6_CB_88	9/10/2019		yes							8.6	

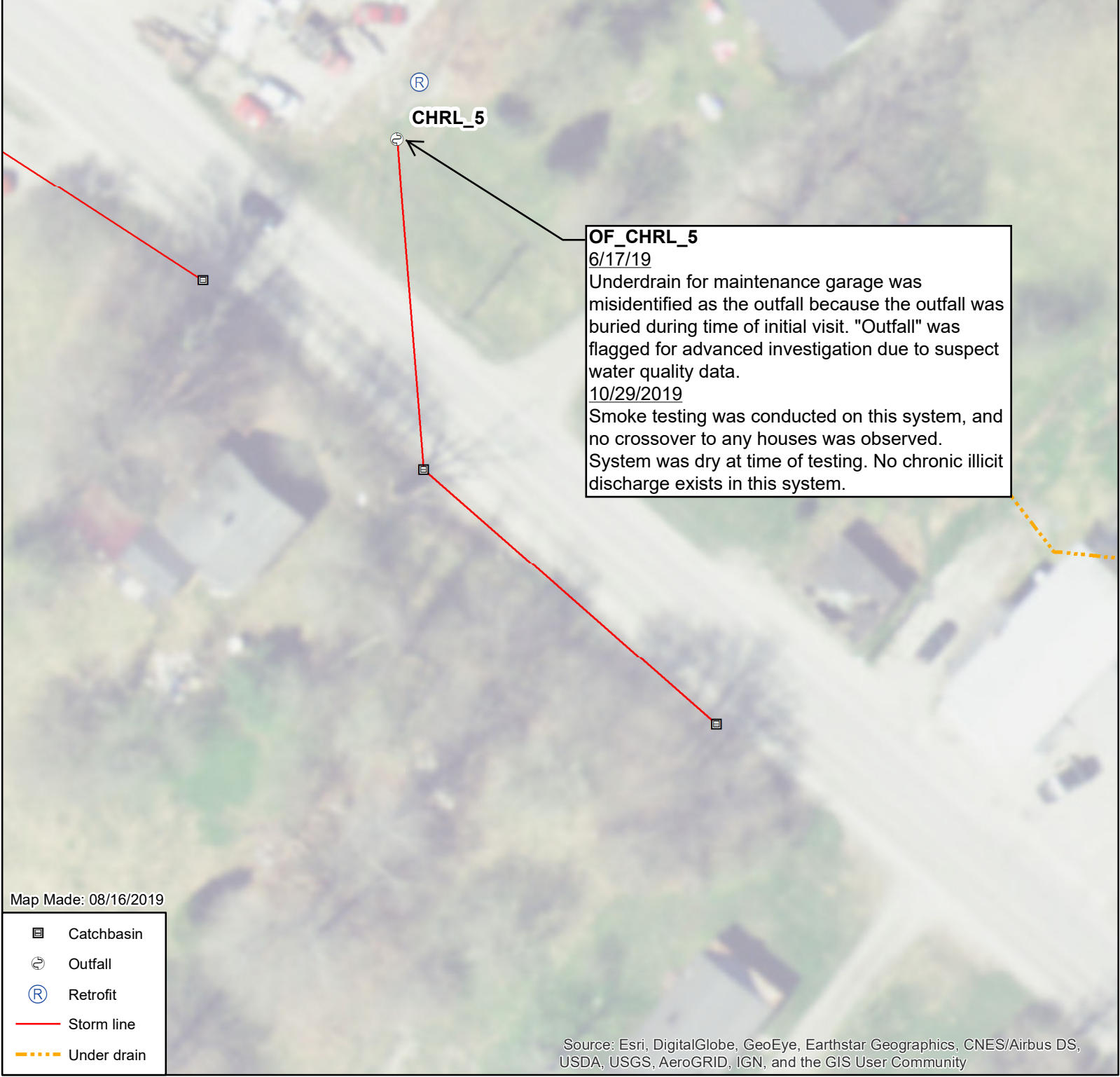






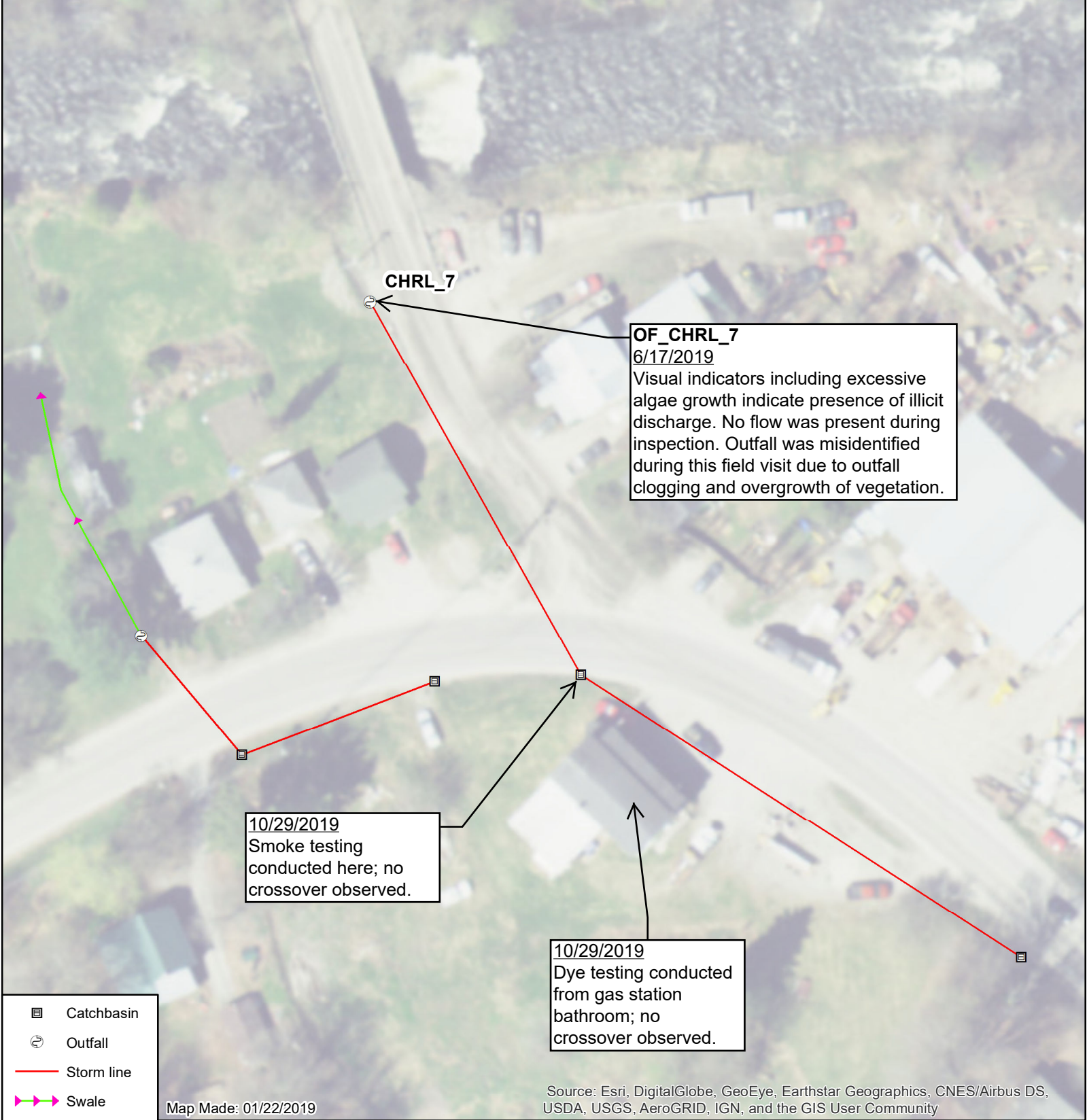



Map 6 - Outfall CMB 10 Advanced Investigation Cambridge, VT											
Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
OF_CAMB_10	2018-07-30		yes	7.3	2080	0.31	0.25			10	0.03
OF_CAMB_10	9/10/2019		yes	7.31	805	0.61	0.175			3.1	0.01
OF_CAMB_10_CB_185	9/10/2019		no							520	
OF_CAMB_10_CB_185	10/21/2019	Smoke testing performed at CMB 10 CB 185, which only receives surface runoff. No sewer infrastructure visible from testing location, so building sewer gas vents were observed and no smoke seen. Smoke testing was inconclusive. Dye testing was then performed. Dye flushed down first floor toilet. None observed at stormwater outlet. Near main base area intersection.	no	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A





<div><div><div><div><div>Map 7 - Outfall CHRL 5</div><div>Advanced Investigation</div><div>Charleston, VT</div></div></div><div><div>02550 ft</div><div></div></div></div></div>										
Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
OF_CHRL_5	6/17/2019	Pool of orange algae filled water at pipe outfall. It seems like pollutant source is from garage/rubbish removal business adjacent to outfall.	yes	7.03	1024	3.46	0.175	Yes	4.1	0.44
OF_CHRL_5	10/29/2019	Smoke testing performed, no crossover observed. Outfall misidentified from last visit, because it was buried during last visit. Previously identified outfall is an underdrain for maintenance garage.	no	-	-	-	-	-	-	-






Map 8 - Outfall CHRL 7

Advanced Investigation

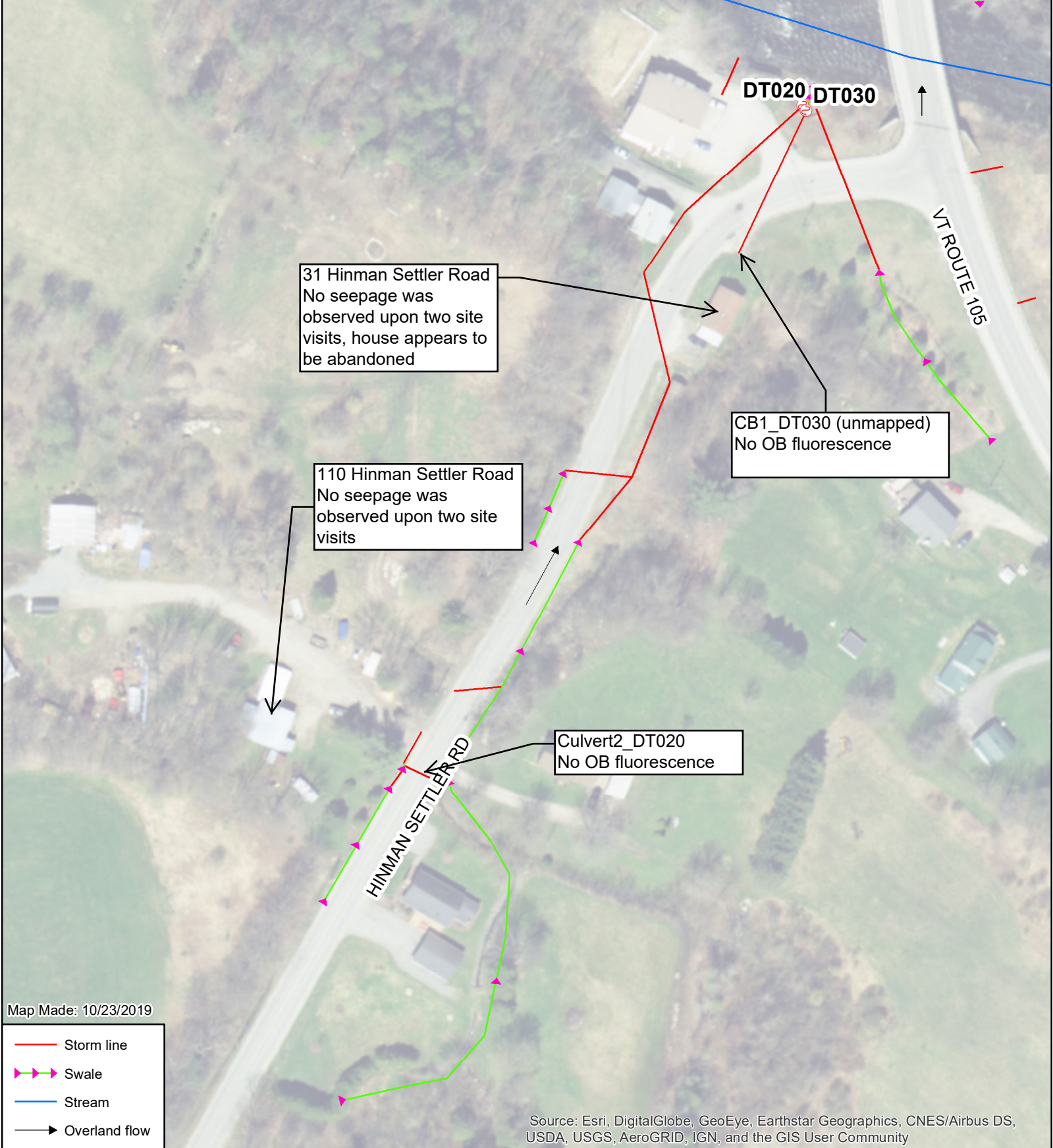
Charleston, VT

02550 ft

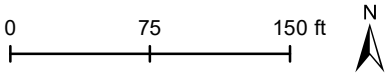


Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
OF_CHRL_7	6/17/2019	Lots of orange algal growth	no	-	-	-	-	-	-	-
OF_CHRL_7	10/29/2019	Outfall misidentified during last visit due to clogging and overgrowth of vegetation. Smoke testing performed from the immediate upsystem catchbasin, no crossover observed.	no	-	-	-	-	-	-	-



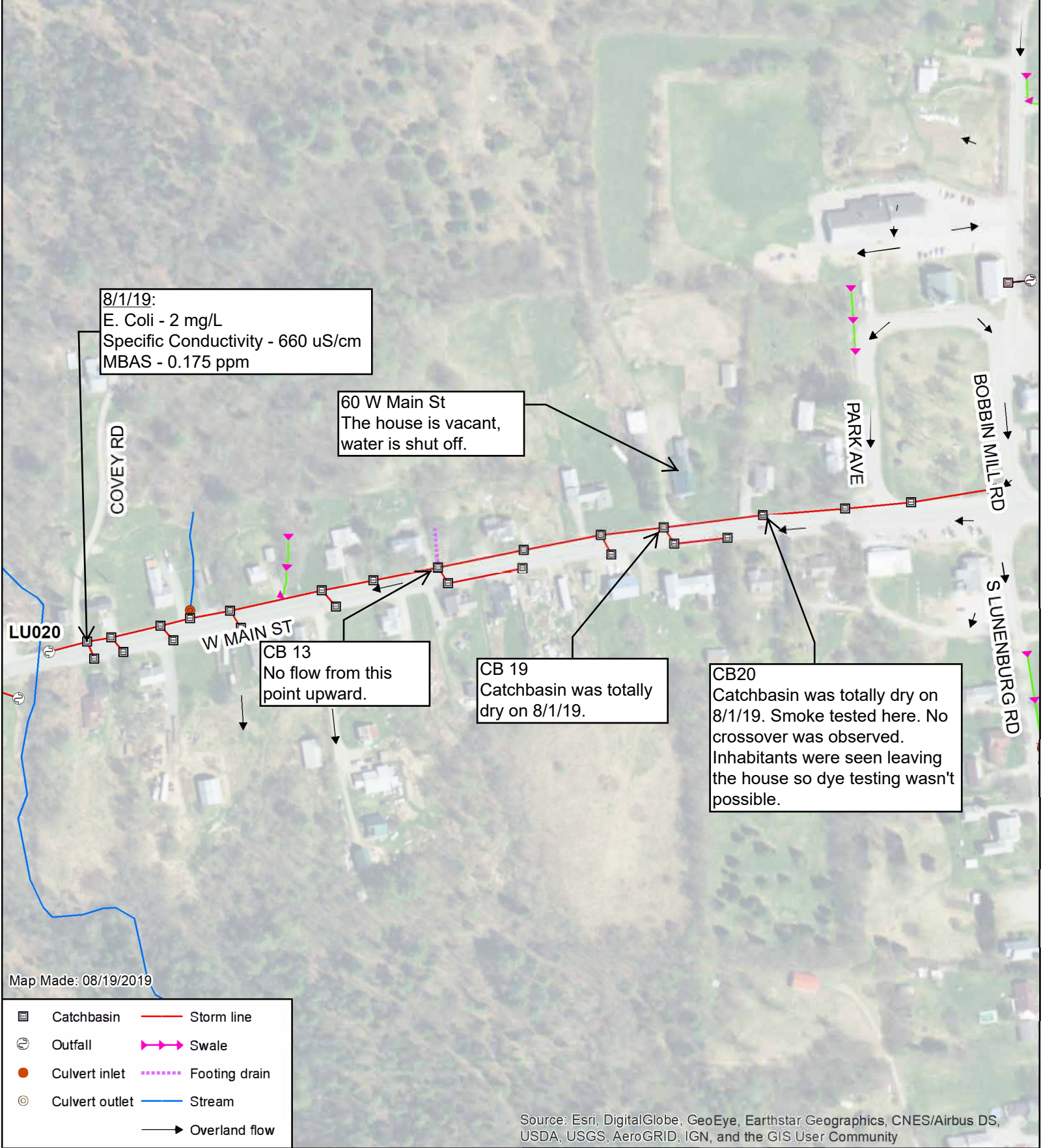


**Map 9 - Outfalls DT 020 & DT 030**  
Advanced Investigation  
Derby, VT

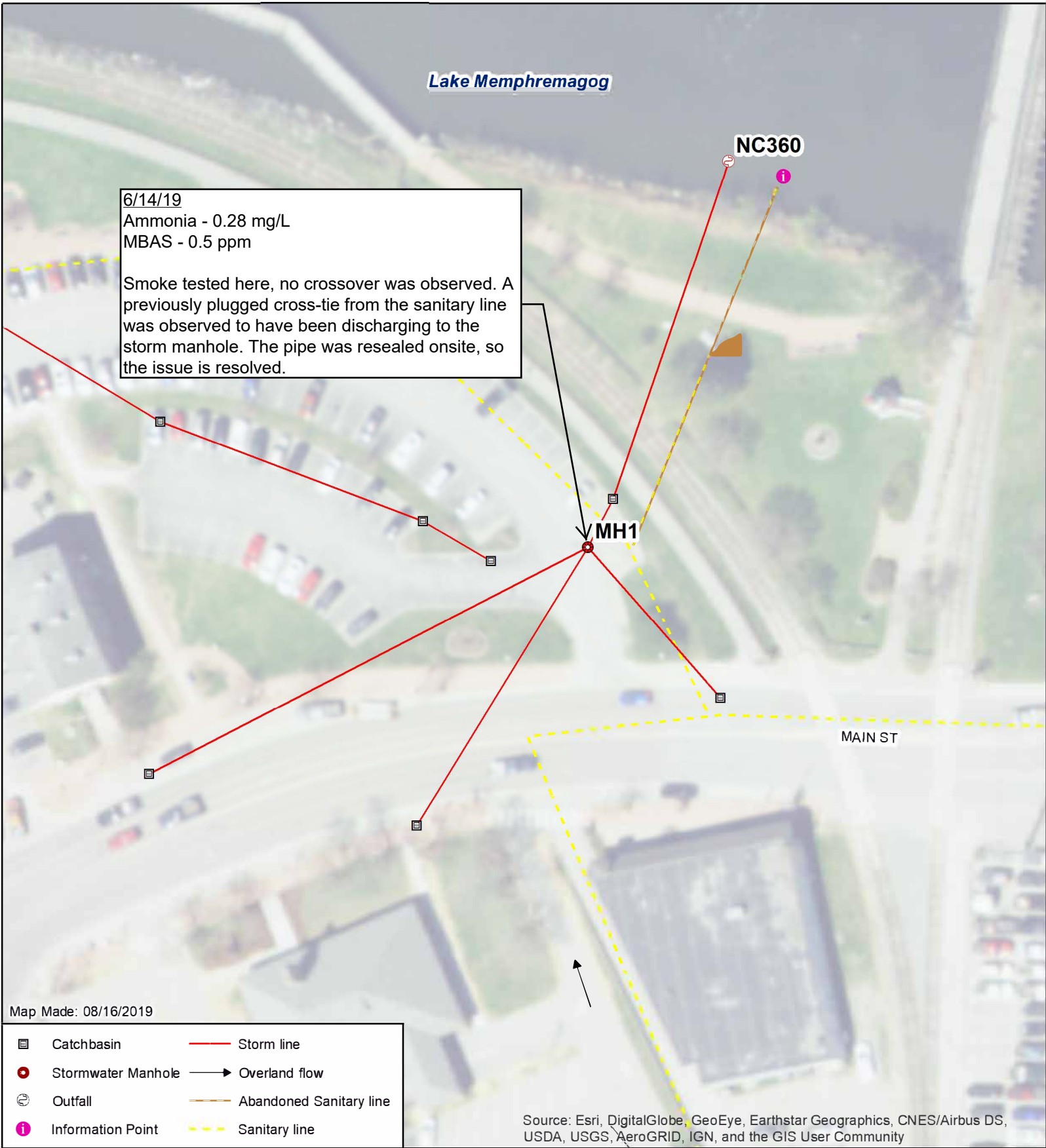



Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
DT020	8/1/2019	No OB fluorescence	yes	7.69	835					52	
DT030	8/1/2019	No OB fluorescence	no								



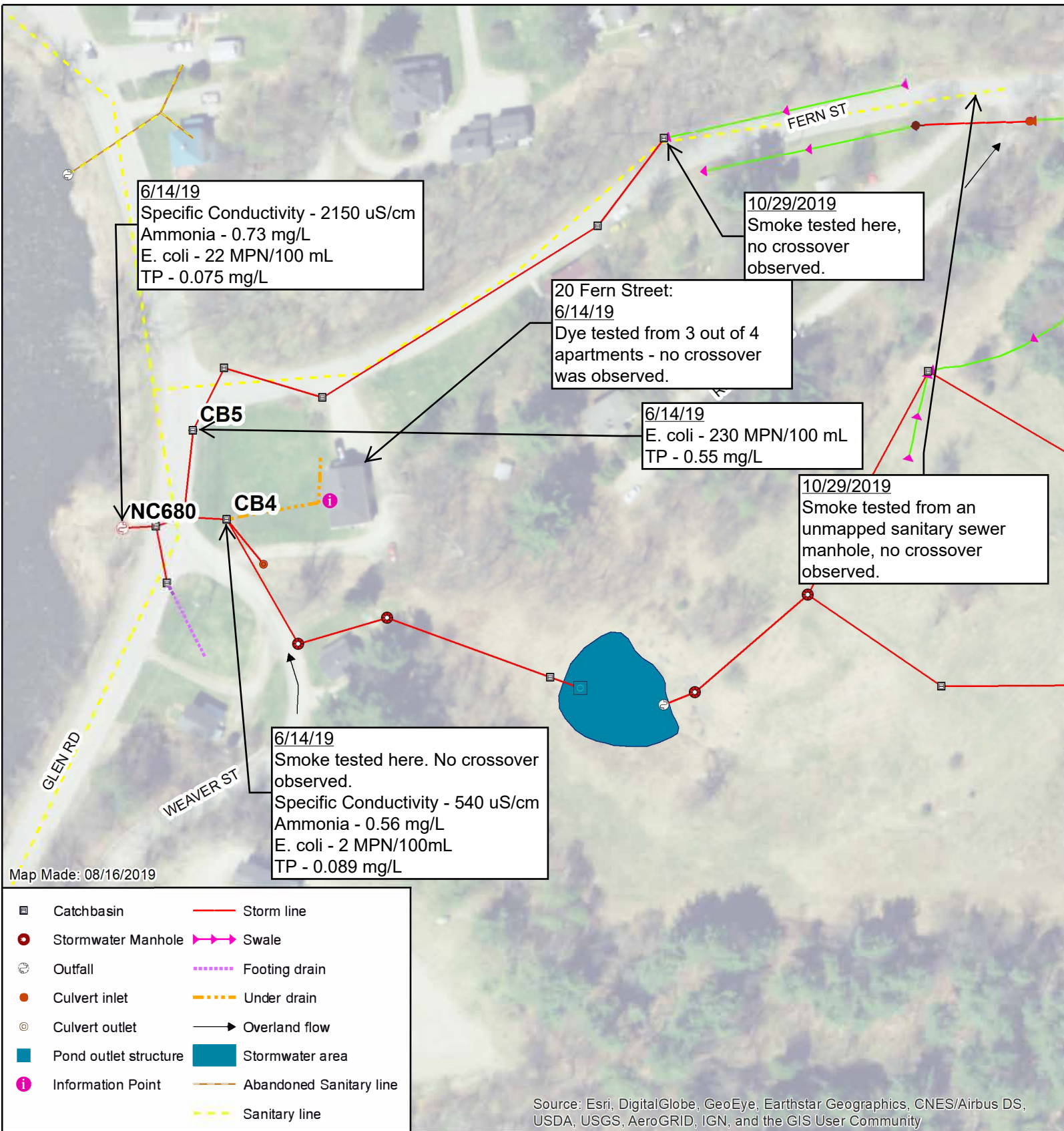




Map 10 - Outfall LU 020											
Advanced Investigation											
Lunenburg, VT											
0 100 200 ft											
N											
Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
LU020	08/01/19	Small amount of flow in catchbasin.	yes	7.87	660	-	0.175	-	-	2	-



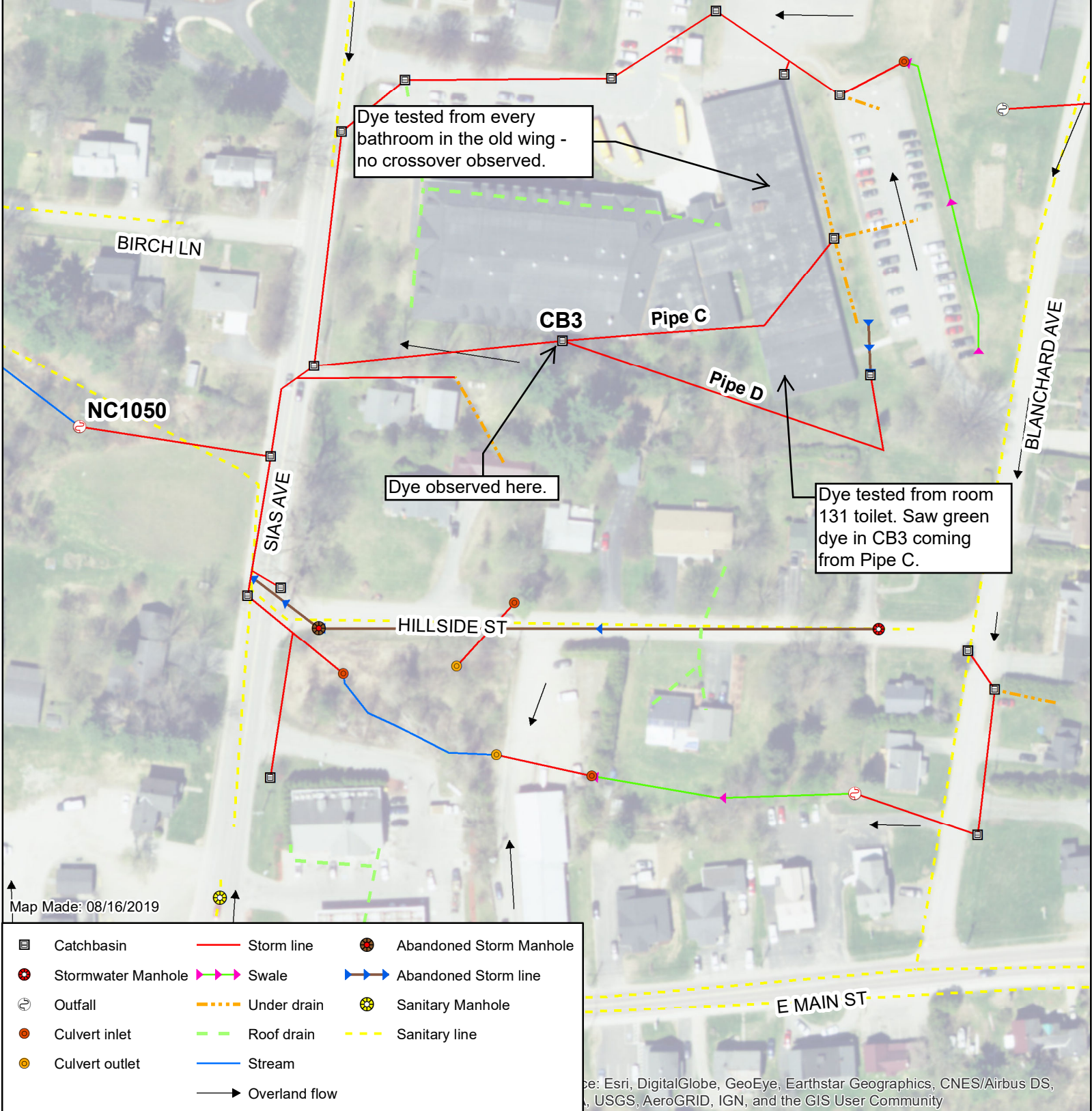
<div>  <div> <b>Map 11 - Outfall NC360 - MH1</b>            Advanced Investigation            Newport City, VT         </div> <div> <div>050100</div> <div>ft</div> <div>N</div> </div> </div>											
Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
NC360_MH1	06/14/19	There was a leak in a cement pipe connected to sewer, but it was plugged on site.	yes	-	3999	0.28	0.5	yes	yes	5.3	0.096





<div>  <div> <b>Map 12 - Outfall NC680</b>            Advanced Investigation            Newport City, VT         </div> <div>           0 50 100 ft            </div> </div>											
Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
NC 680	06/14/19	Oily residue on top of pool of water that the outfall discharges to.	yes	-	2150	0.73	0.5	no	no	22	0.075
NC 680 - CB4	06/14/19	Water in the catchbasin sump is orange and turbid.	yes	-	540	0.56	0.25	yes	yes	2	0.089
NC680 - CB5	06/14/19	Canine alert not definitive	yes	-	-	-	-	yes	no	230	0.55

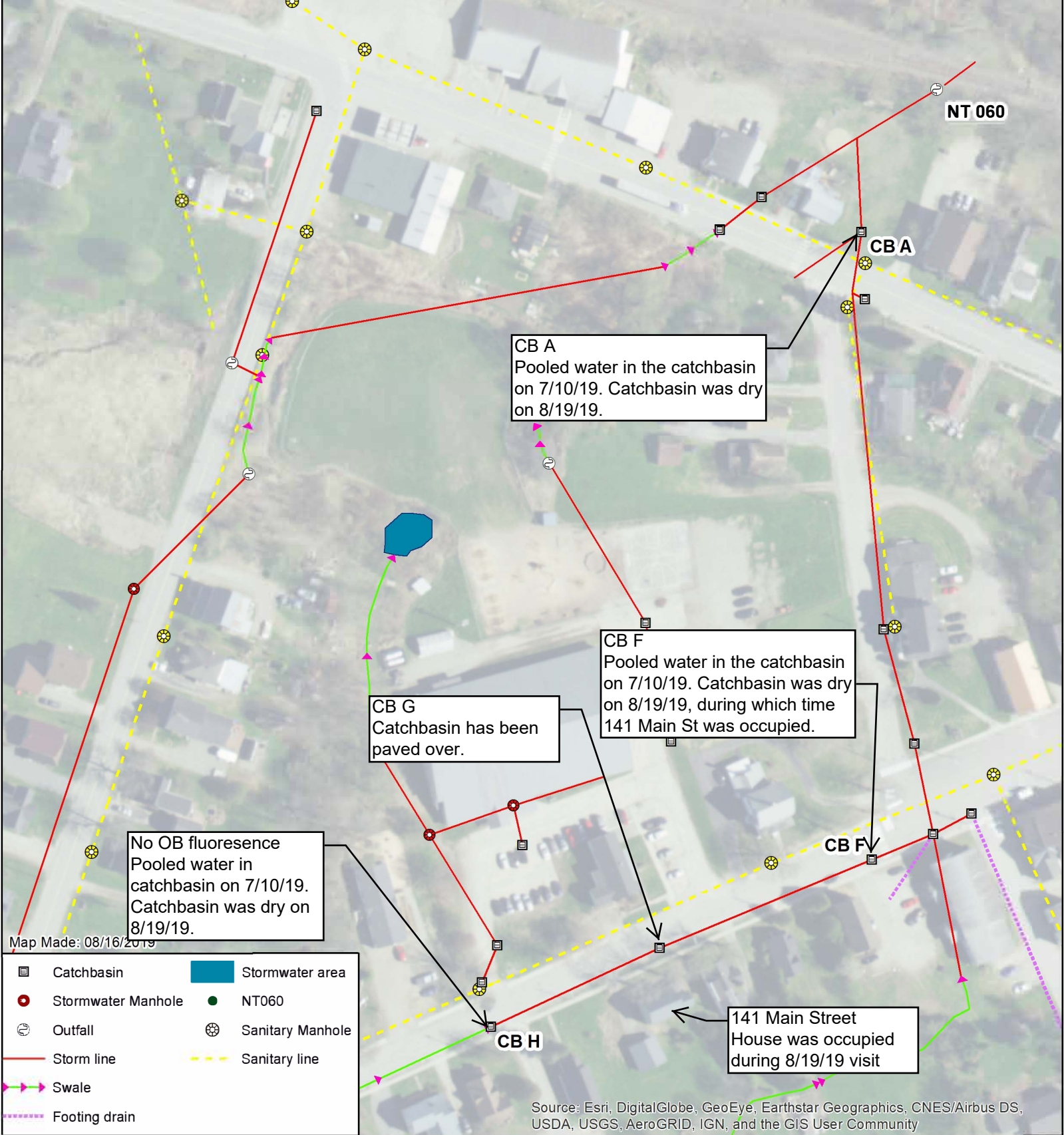




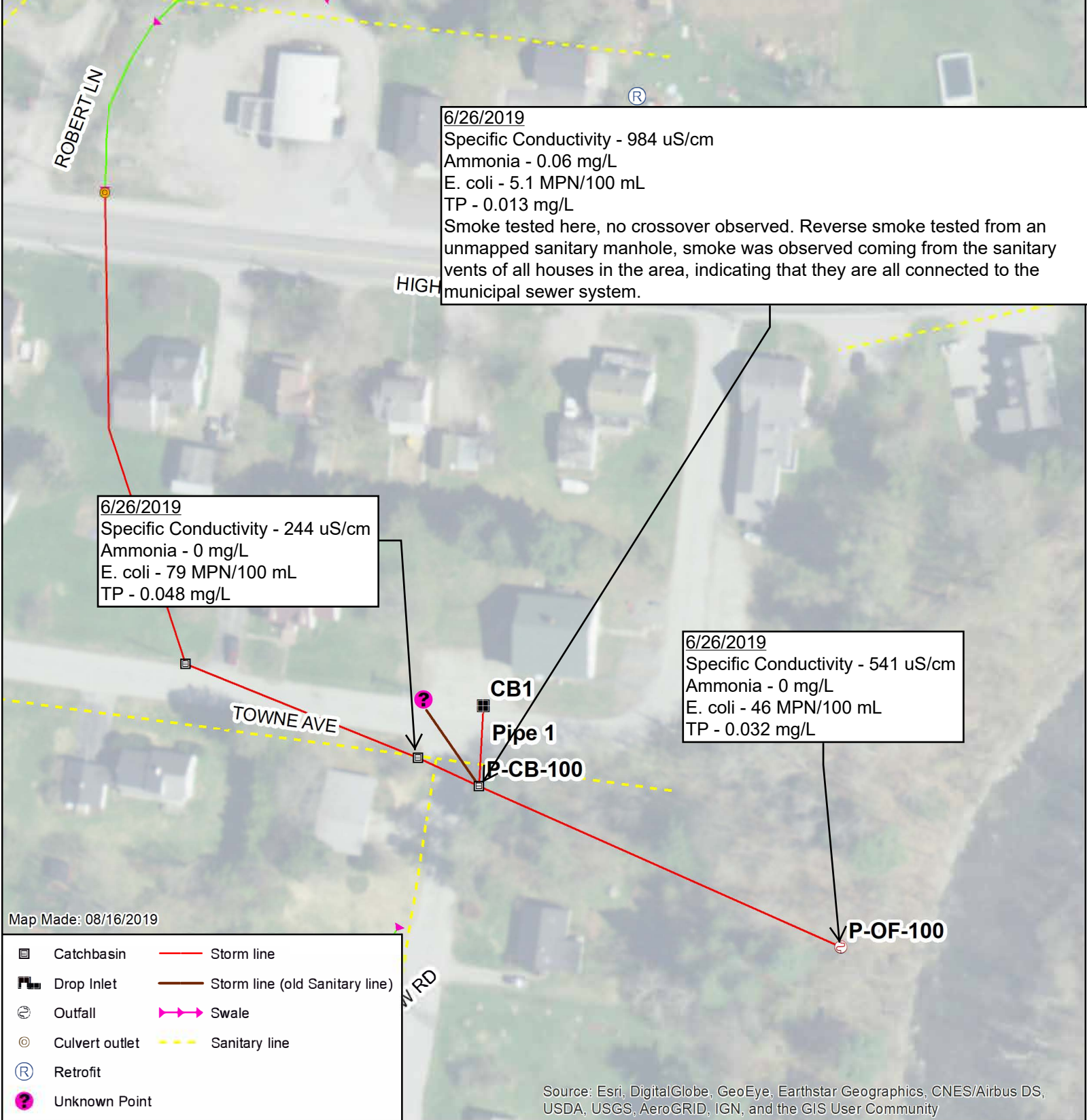
**Map 13 - Outfall NC 1050**  
Advanced Investigation  
Newport City, VT

Infrastructure ID	Date	Notes	Flow	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
NC1050_CB3_pipe C	2019-06-14	Sewage and TP observed flowing in pipe.	yes	1702	1.9	0.5	yes	N/A	2400	0.46
NC1050_CB3_pipe C	8/23/2019	Dye tested from school bathrooms. Used a camera to inspect pipe. Flushed fluorescent green dye down room 131 toilet and observed dye in pipe C. Dye tested from every other bathroom in the old wing of the school, no other connections were found.	yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NC 1050_CB3_pipe D	2019-06-14		yes	1307	0.23	0.25	no	no	0	0.014



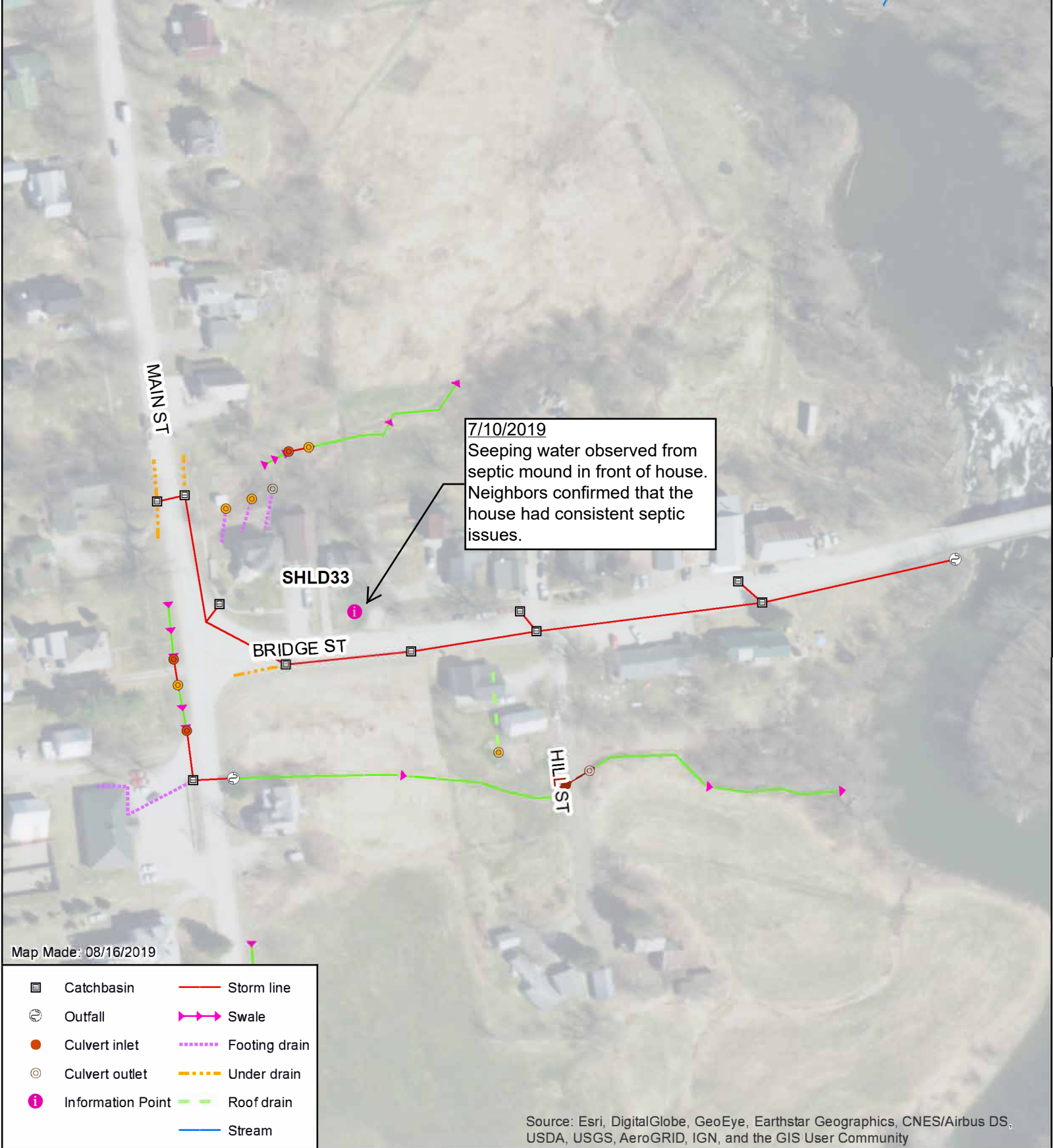


<div>WATERSHED CONSULTING</div> <div>Map 14 - Outfall NT 060</div> <div>Advanced Investigation</div> <div>North Troy, VT</div> <div>075150 ft</div> <div>N</div>											
Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
CBA-NT060	07/10/19	-	no	-	-	-	-	-	-	-	-
CB-F-NT060	07/10/19	-	no	-	-	-	-	-	-	-	0.089
CB-H-NT060	07/10/19	Catch basin is dry.	no	-	-	-	-	-	-	-	0.55



<div><div><div><div><div></div><div>WATERSHED</div><div>CONSULTING</div></div></div><div><div>Map 15 - Outfall P 100</div><div>Advanced Investigation</div><div>Plainfield, VT</div></div><div><div>050100</div><div>ft</div><div>N</div></div></div></div>											
Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
P_OF_100	2019-06-26	Canine alert not definitive.	yes	7.32	541	0	0.175	yes	no	46	0.032
P_CB_100 pipe_1	2019-06-26	-	yes	7.14	983	0.06	0.175	yes	yes	5.1	0.013
P_OF_100_C B_2	2019-06-26	Suds on top of water in catchbasin sump.	yes	7.66	244	0	0.175	yes	yes	79	0.048





<div>WATERSHED CONSULTING</div> <div>Map 16 - SHLD 33 Advanced Investigation Sheldon, VT</div> <div>075150 ftN</div>											
Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
SHLD-33-Bridge	07/10/19	Water is seeping from mound in front of house. Neighbors have confirmed leaking septic.	yes	7.88	810	-	0.5	yes	yes	21	0.18

7/10/2019

Sampled from a purplish blue pool of water at the edge of the lawn of 90 Church St. Water quality data clearly indicate a failed septic system.

SHLD90

CHURCH ST

Map Made: 08/16/2019

- Culvert inlet    — Storm line
- ⊙ Culvert outlet    — Swale
- Stream

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



### Map 17 - SHLD 90

Advanced Investigation  
Sheldon, VT

0 50 100 ft

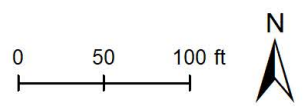


Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
SHLD-90-Church	2019-07-10	Purplish blue color to water, looks like detergent. Muck accumulation at culvert inlet.	yes	6.65	750	-	3	yes	yes	2400	2.9

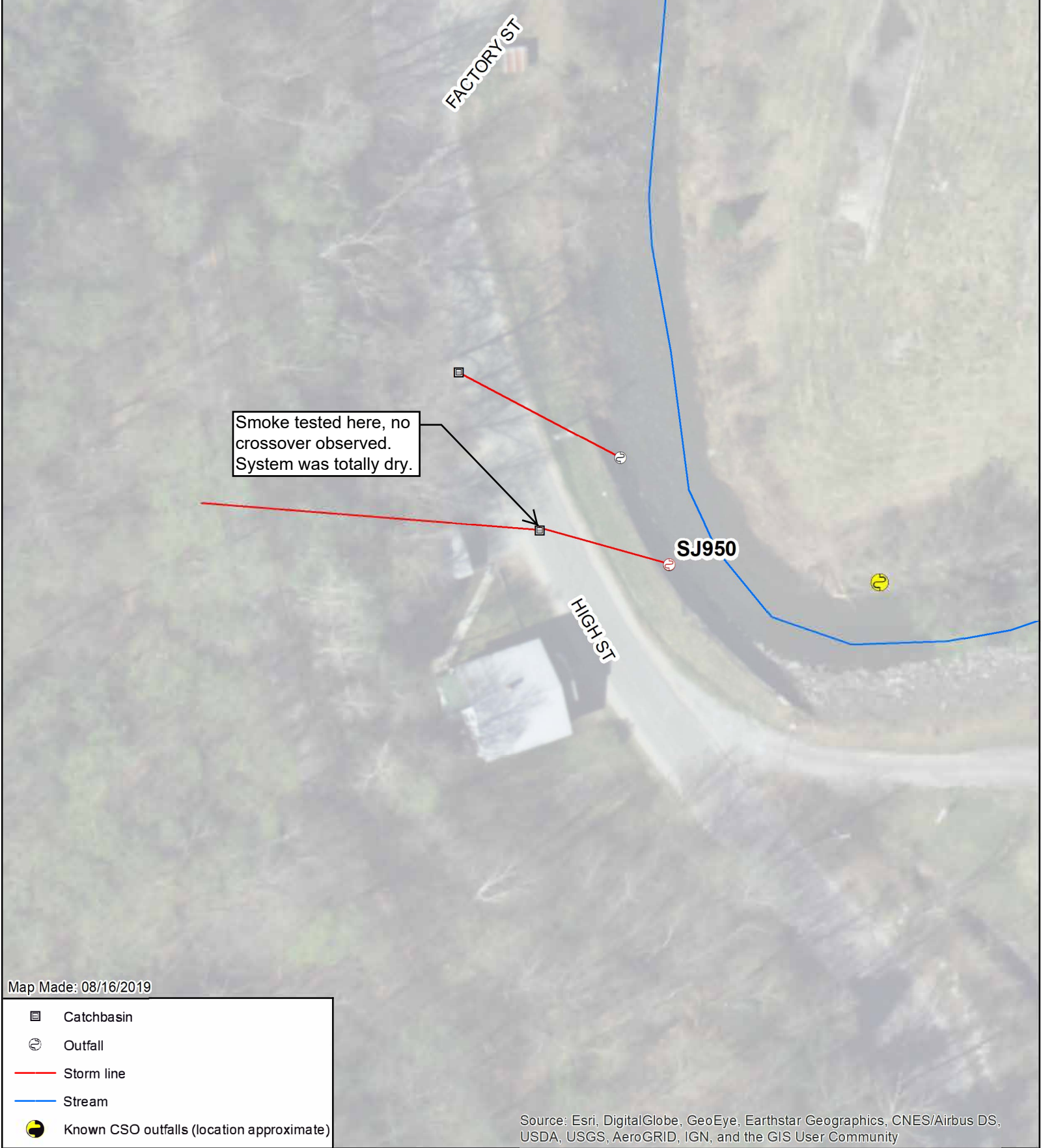





**Outfall SJ 440**  
Advanced Investigation  
St. Johnsbury, VT




Infrastructure ID	Date	Flow?	Physical Indicators Present?	pH	Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	E. Coli (MPN/100 mL)
SJ440	6/26/2019	no	no	NA	NA	NA	NA	NA
SJ440 - SSMH-1	6/26/2019	no	Damage to manhole structure. Clearly can and does overflow.	NA	NA	NA	NA	NA
SJ440-CB-1	8/5/2020	no	no	NA	NA	0.17	0.25-0.5	>2400




Map Made: 08/16/2019




Catchbasin




Outfall



Storm line




Stream



Known CSO outfalls (location approximate)

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community




Map 19 - Outfall SJ 950

Advanced Investigation

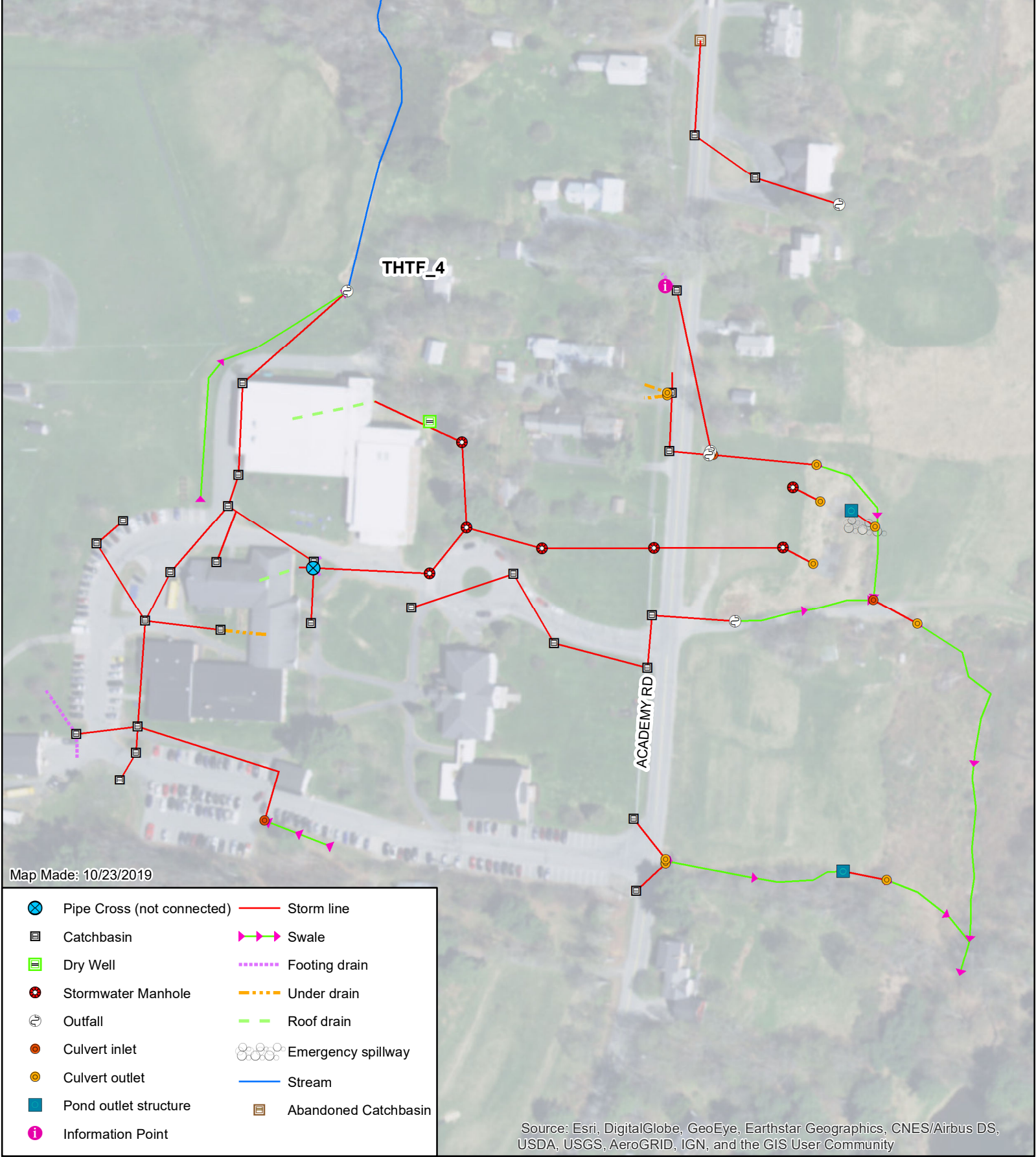
St. Johnsbury, VT

02550 ft



Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
SJ950	06/26/19	System is totally dry.	no	-	-	-	-	-	-	-	-






Map Made: 10/23/2019

	Pipe Cross (not connected)		Storm line
	Catchbasin		Swale
	Dry Well		Footing drain
	Stormwater Manhole		Under drain
	Outfall		Roof drain
	Culvert inlet		Emergency spillway
	Culvert outlet		Stream
	Pond outlet structure		Abandoned Catchbasin
	Information Point		

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



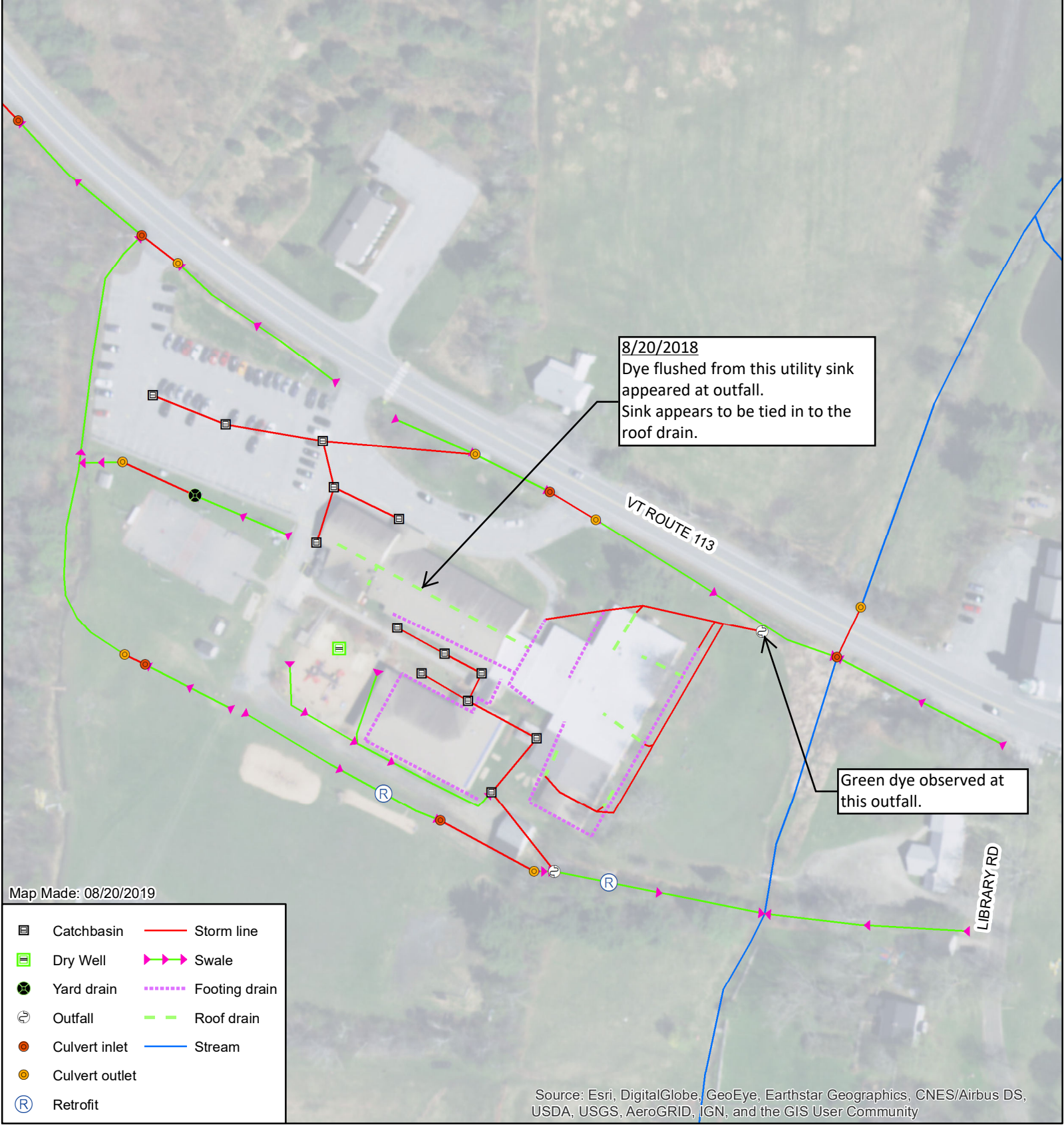
### Map 20 - Outfall THTF 4

Advanced Investigation  
Thetford, VT

075150 ft

N

Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
OF_THTF_4	2018-08-06		yes	8.11	2485	0.13					
OF_THTF_4	9/5/2019		yes	7.71	3625	0.24	0.5			6.3	0.02



<div><div><div><div><div></div><div>WATERSHED</div><div>CONSULTING</div></div></div><div><div>Map 21 - Outfall THTF 7</div><div>Advanced Investigation</div><div>Thetford, VT</div></div><div><div>050100 ft</div><div>N</div></div></div></div>											
Infrastructure ID	Date	Notes	Flow	pH	Specific Conductivity (uS/cm)	Ammonia (mg/L)	Detergents (ppm)	Canine Alert 1?	Canine Alert 2?	E. Coli (MPN/100 mL)	Total Phosphorus (mg/L)
OF_THTF_7	2018-08-06	Suds present.	yes	7.97	1167	3.61	0.75	-	-	39	0.31
OF_THTF_7	2018-08-20	Blueish color clearly visible in the outfall; MBAS much greater than 3.	yes	8.55	513	-	3	-	-	-	-