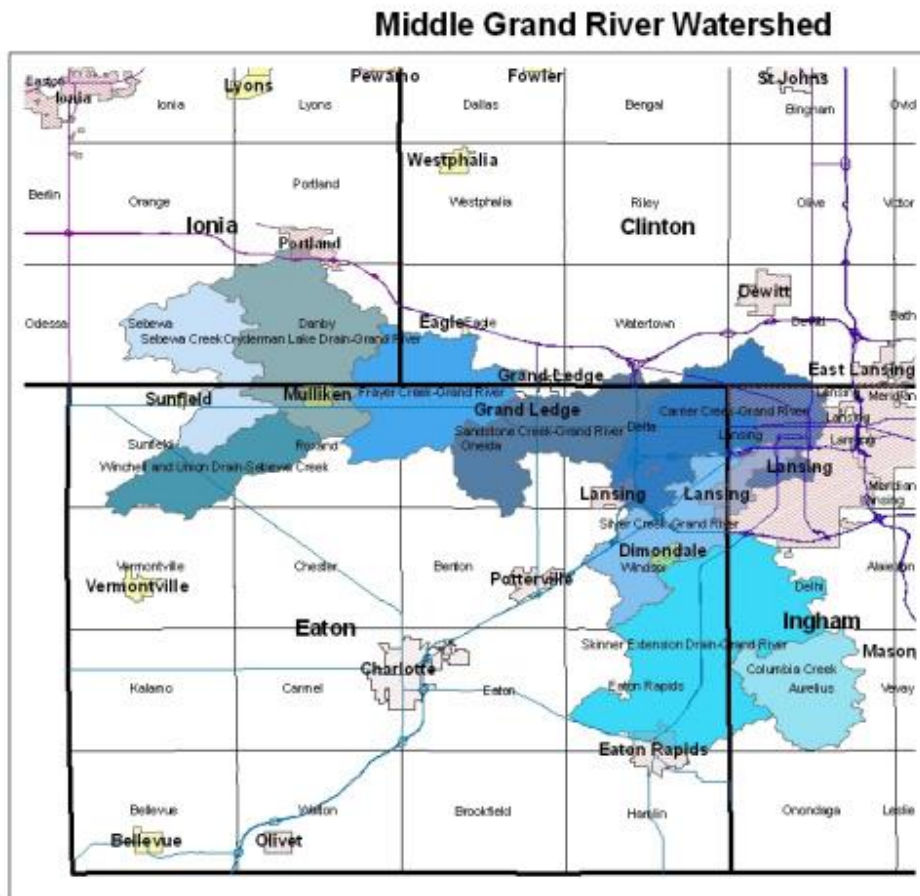


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# Canine Source Tracking Project

## Middle Grand River Watershed 2014

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## Background

In 2012 the Eaton County Conservation District (ECCD) hired Environmental Canine Services LLC (ECS) to conduct preliminary canine source tracking investigations on 10 water samples collected by ECCD from pre-determined locations in the Middle Grand Watershed.

Following the ECS “bucket sample” protocol and the Michigan Department of Environmental Quality’s Quality Assurance Project Plan (QAPP) all water samples collected were brought to a neutral scent area (Lions Community Park in Dimondale). Scott Reynolds of ECS supervised the setup of the samples to reduce scent cross contamination and conducted the canine source tracking with K9 Sable.

At the completion of the preliminary investigations K9 Sable alerted to the presence of human fecal contamination in two samples.

One positive alert was from a sample collected from Silver Creek at the Windsor Road crossing. The second positive alert was from a sample collected from the Columbia Creek on S. Eifert Road between Thurlby and Curtice Road.



## Follow up

In June of 2014 ECCD secured the services of ECS to conduct canine source tracking in the Silver and Columbia Creek sub-watersheds based on the two positive 2012 bucket sample results. The scope of work included walking creeks, drains, and tributaries to locate potential sources of human fecal contamination.

The follow up investigation faced an initial challenges on two fronts; the first being the two years that lapsed between the preliminary investigations in 2012 and the June 2014 investigations. Additionally, significant rainfall increased raised drain levels, flows, and turbidity in both the Silver and Columbia Creeks and its tributaries. Increased water flows and levels may have covered pipes and seeps otherwise accessible during normal dry weather conditions, as well as washed away any visual evidence of sanitary debris and odors associated with septic by-pass pipes.

### Silver Creek

Reynolds and K9 Sable, accompanied by Rachael Loucks with ECCD, walked the Silver Creek from Bridge Street north to Windsor Street. No positive alerts were given by K9 Sable at any location in the stream reach. No other evidence of human fecal sources were observe.

-  A bucket sample collected from the Silver Creek at the Bridge Street crossing and an adjacent outfall received a negative response from K9 Sable. No other evidence of human fecal sources were observed.
-  Two buckets were collected at the creek crossing on Vermontville Highway and Pares Road. One was taken from the main creek channel, the other was collected from an outfall flowing from the east. Both received a negative response. The section from Vermontville Highway north to

Bridge Street between Canal Road and Pares Road is largely agricultural and wooded and not likely to be a source of human fecal contamination.



The upper tributary of Silver Creek at Rossman Road between Spruce and Gunnell Road had multiple catch basins and inputs with flow. All potential inputs were checked by K9 Sable and received a negative response. No other evidence of human fecal sources were observed.

The creek crossing culvert at Canal Road between Rossman Road and Vermontville Highway was investigated by K9 Sable and received a positive alert for the presence of human sewage. An upstream investigation to the east found a branch in the creek and a dense wetland area. See *Recommendations* for further information.

### Columbia Creek

Reynolds and K9 Sable, accompanied by Ms. Loucks, walked Columbia Creek from S. Eifert Road between Bunker Road and Curtice Road to Bunker Road. Two pipes were found partially submerged in the drain. Due to the flow and level of the water field personnel were unable to determine if the pipes were flowing. Although no positive alerts were received from K9 Sable this area needs additional follow up. See *Recommendations* for further information.

Large algal mats, sometimes spanning across the width of the drain, were observed in a number of areas from Bunker Road to approximately 200 yards north. At times the depth of the water and sediment on the bottom and limited sight distance due to heavy vegetation may have prevented field personnel from locating all potential sources discharging to the Columbia Creek.

Additionally the tributary from S. Eifert Rr. northwest to the main creek was walked. K9 Sable did not give any positive alerts and no other signs of human fecal sources were observed.




A bucket was collected at the Bunker Road crossing of the tributary drain between S. Eifert and Aurelius Rd. and S. Eifert Rd. between Bunker Rd. and Thurlby Rd. Neither bucket elicited a positive response from K9 Sable.

The creek south of Bunker Road to Toles Rd. is largely agricultural fields. One residence on Bunker Road west of S. Eifert Rd. was observed to have a tributary draining directly to the Columbia Creek. This tributary was accessed using the Columbia Creek easement near the radio towers. K9 Sable gave a positive alert at the tributary upstream of the Columbia Creek. See *Recommendations* for additional location information.

K9 Sable gave a positive alert to the presence of human fecal contamination at the road crossing on S. Eifert Road approximately ¼ mile south of Toles Road. Further investigation of the tributary from the south did not elicit a positive response. An investigation of the tributary drain running east and all pipes located did not receive a positive response from K9 Sable. (south of dairy farm SE corner of Toles and S. Eifert) It is noted that the origin of the tributary is unknown and appears to be underground on the dairy property.

The tributary drain originating at the end of Green Gables Dr. draining west to S. Eifert Rd. was determined not to be a potential source for human fecal contamination based on proximity to Green Gables housing and the age of the homes. The surrounding area is agricultural fields.

K9 Sable alerted to the presence of human fecal contamination in the enclosed storm drain at the southwest corner of Barnes Rd. and S. Eifert Rd. an upstream investigation produced additional alerts at the following locations:

-  42.52141, -84.54217: Manhole in grass west side on S. Eifert Rd. north of 2100
-  42.52039, -84.54215: Storm drain goes under ground at driveway edge
-  42.51826, -84.54220: Drain crosses over from west to east side of road. Multiple pipes from west side, unknown origin

## *Recommendations*

### Silver Creek

The tributary drain that crosses under Canal Road south of Vermontville Highway received a positive response from K9 Sable on two occasions. The drain appears to have its head water south of Vermontville Highway just east of Smith Rd. Field personnel observed a new septic system being installed at 9650 Vermontville Hwy. and could see surface waters directly behind the residence. A review of Google Earth shows a potential connection to the tributary drain flowing west to the Silver Creek (See Map 1).

It is recommended that ECCD contact the Barry-Eaton Health Department to see if a previous inspection found a by-pass or seepage to the surface waters south of the residence. It is also recommended that ECCD confirm this tributary is under the Eaton Co. Drain Commissioner's jurisdiction. If not, permission should be obtained from adjacent property owners for further investigation of the reach from Canal Rd. northeast to Vermontville Hwy.

Further investigations of the drains, creeks, and ditches should be conducted during "leaf off" conditions (spring/fall) to maximize observations and access.

### Columbia Creek

A follow up investigation of the submerged pipes found in Columbia Creek west of S. Eifert Road should be conducted to confirm there are no human fecal sources (See Map 2).

ECS recommends that the ECCD work with the Ingham County Health Department to inspect the property west of the tributary drain to Columbia Creek (directly east of Columbia Creek, south of Bunker Road) for human fecal sources (See Map 2).

Further investigation of the drain south of the dairy farm at Toles and S. Eifert Roads is needed. It is recommended that ECCD work with the Ingham County Drain Office to obtain information regarding the origin of the drain and further upstream investigation. If it is not within the drain office's jurisdiction then the current property owner should be contacted with the assistance of the Ingham Co. Health Department (See Map 3).

Due to the number of positive alerts in the enclosed drain south of W. Barnes Rd and S. Eifert Rd. to the east crossover it is recommended that the ECCD first determine if the drain is flowing during dry weather conditions. ECCD should continue water quality monitoring at the locations noted by red icons on Map 4 once the conditions are determined (i.e. Wet weather sampling or dry weather sampling) until

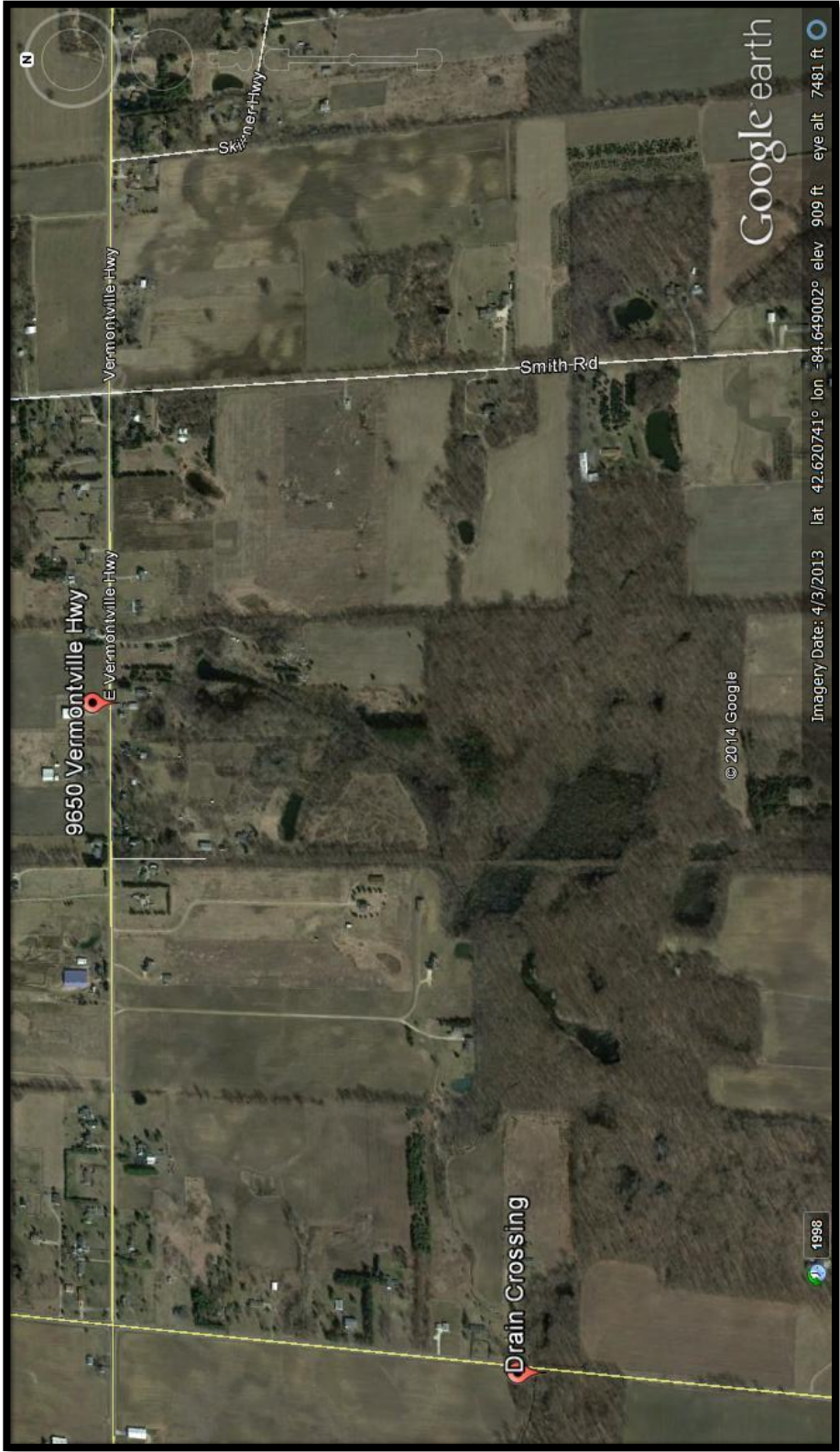
all potential sources are located and removed. Further investigation should be conducted to locate the upstream end of the drain. Drain maps should be available from the drain office. Further investigations of the drains, creeks, and ditches should be conducted during “leaf off” conditions (spring/fall) to maximize observations and access.

## *Final Recommendations*

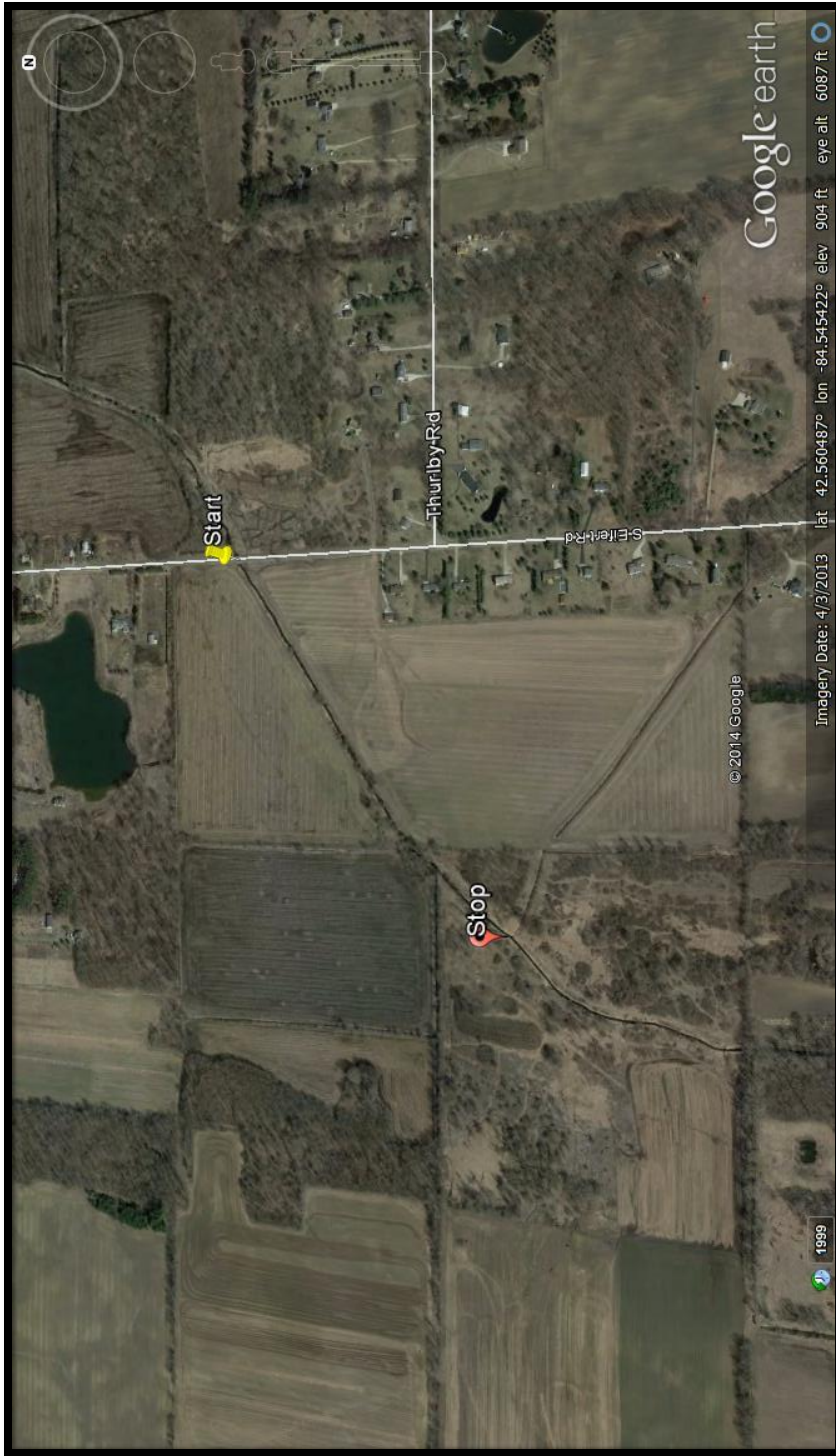
In 2007 the US EPA determined that 26.1 million homes in the United States were served by on-site septic systems, an increase of 1.54 million since 1985. Fifty percent (13.1 million) of those were located in rural areas. (EPA# 832-F-08-057 Oct. 2008) The USDA-ERS estimates that Michigan has 1.8 million people residing in rural areas.

In 2007 the Barry-Eaton County Health Department began an aggressive program to locate and repair failing septic system. By 2013 they discovered nearly 1,000 failed systems and 300 residences without a system at all. (*Thousands of Failed Septic Tanks Threaten Michigan’s Waters*. Bridge Magazine May 2013). According to the DEQ more than 4,500 failed septic tanks were reported to Michigan Health Departments in 2011 (132 in Barry-Eaton and 65 in Ingham). The DEQ also noted that Point of Sale inspections find a 20%-25% failure rate.

Based on our observations and experience with locating illicit discharges in rural areas, it is our opinion that the Middle Grand River Watershed would benefit from a long term water quality monitoring program. The program should include methods for differentiating between human and animal sources so that resources can appropriately target potential sources. Detecting, locating and removing sources of human fecal contamination should be a priority in the watershed. A secondary goal should be working with agriculture producers to properly manage their nutrient run-off with programs such as The Michigan Agriculture Environmental Assurance Program (MAEAP).



Map 1. 9650 Septic System

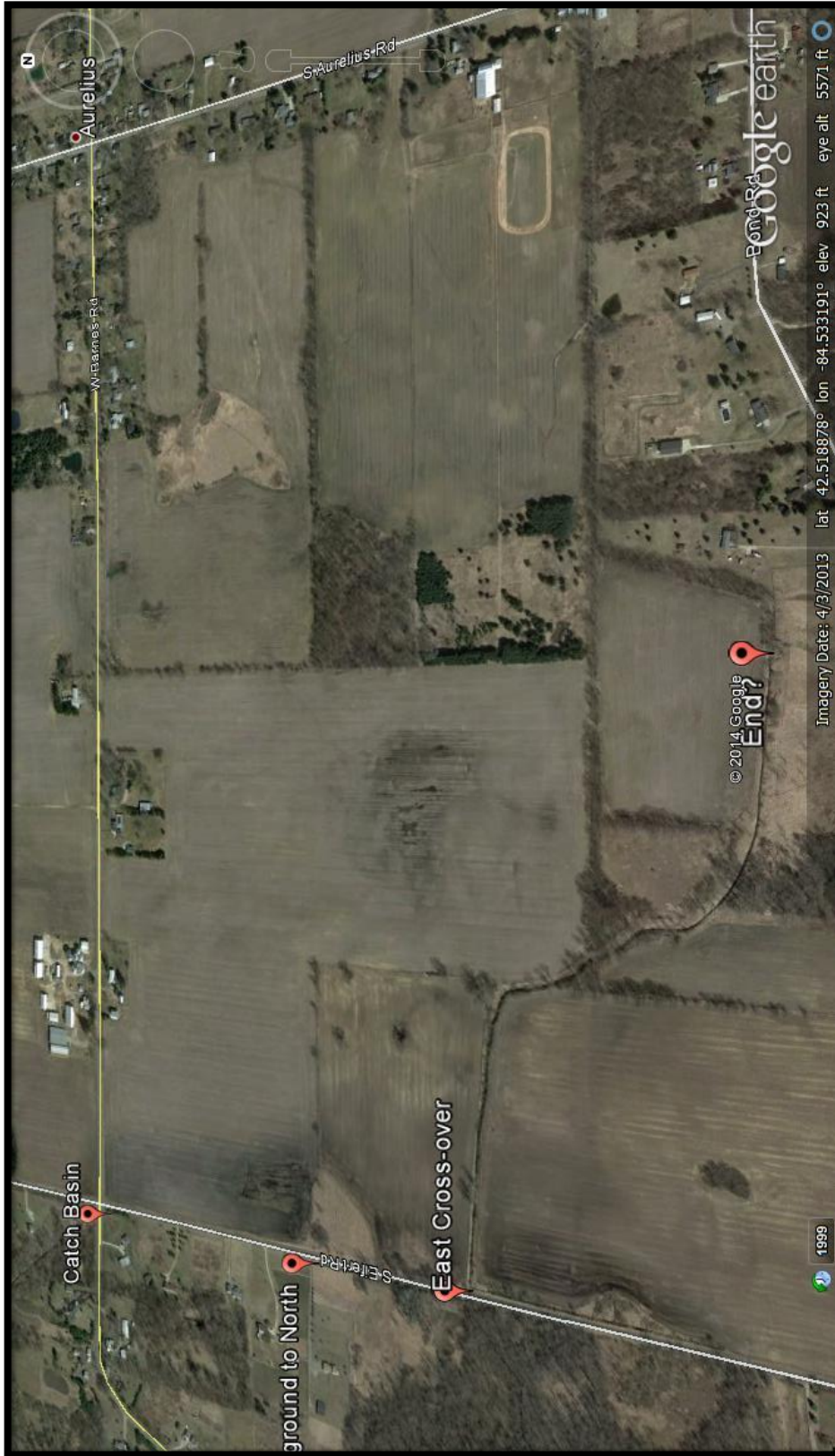


Map 2. Submerged Pipes



Map 3. Dairy Farm





Map 4. Oak Drain