



Illicit Discharge Detection & Elimination Program

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Report Prepared by the



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Introduction

In general terms, an illicit discharge is any discharge into the municipally owned stormwater drainage system that is not composed entirely of stormwater. Exceptions to this include water relating to fire fighting activities and discharges from facilities already covered under a National Pollution Discharge Elimination System (NPDES) permit. Illicit discharges are a cause for concern because, unlike wastewater which flows to a wastewater treatment plant, stormwater generally flows to waterways without receiving any treatment. Illicit discharges can contain pollutants such as pathogens, sediment, oil/grease, nutrients (e.g. phosphorous and nitrogen), surfactants (e.g. soap and detergents), and various other toxins.

The City of South Burlington (CSB) Vermont has been running an active Illicit Discharge Detection and Elimination (IDDE) program since the creation of the South Burlington Stormwater Utility. Over the course of the last five-year Municipal Separate Storm Sewer System (MS4) permit cycle, the program has been very effective and has resulted in the discovery and elimination of numerous illicit discharges. The following report describes the IDDE program in South Burlington and discusses the various illicit discharges that have been identified and eliminated during the last MS4 permit cycle.

IDDE Program Description

In order to be effective, any good IDDE program will consist of multiple parts. The CSB's IDDE program consists of four different components:

- Ordinance defining and prohibiting illicit discharges
- Stormwater infrastructure mapping
- Outfall inspections
- Stormwater sampling

Each individual component of the CSB's IDDE program is discussed in greater detail below.

Ordinance

In March 2005 the CSB updated its "Ordinance Regulating the Use of Public and Private Sanitary Sewerage and Stormwater Systems" to include sections prohibiting illicit discharges. These requirements can be found in Article V of the ordinance and are included in Appendix A of this report. The stormwater superintendent is given the authority to inspect and enforce these provisions in Article VII. Penalty for non-compliance can include fines, suspension of services, and termination of access to the stormwater system.

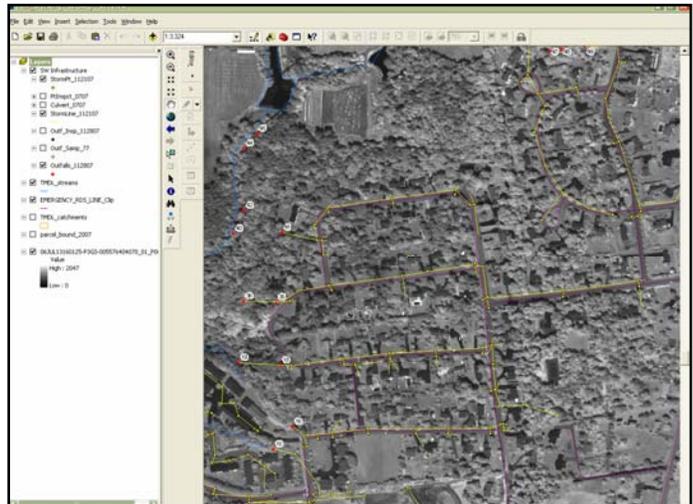
The CSB's stormwater ordinance includes a list of discharges that are allowed to enter the public stormwater system. In addition to stormwater, water from fire fighting activities, discharges already covered under a NPDES permit, landscape irrigation, uncontaminated pumped ground water, foundation or footing drains, air conditioning condensation, and other low risk discharges of water that do not contain pollutants are allowed to discharge into the City's stormwater

drainage system. A complete list of allowable discharges can be found in section 5a of Article V.

Stormwater Infrastructure Mapping

The Stormwater Utility is continuously updating a GIS database that contains information on stormwater infrastructure throughout the CSB. The database contains both dimensional information (i.e. size, volume, length, etc...) and inspection data for the following stormwater infrastructure:

- Storm drains
- Stormwater piping
- Stormwater outfalls
- Stormwater treatment practices (e.g. stormwater treatment ponds, bio-retentions cells, hydrodynamic swirl separators, etc...)



Screen shot of South Burlington's Stormwater GIS Database

The data is collected using a GPS receiver equipped with ArcPad software or with paper forms. This information is then either downloaded or manually entered into the existing GIS database. Information on stormwater outfalls is collected using procedures found in EPA guidance documents. Copies of the GIS database are available upon request.

Outfall Inspections

Stormwater Utility staff regularly inspects the stormwater outfalls in the CSB. These inspections are conducted in accordance with procedures outlined in the EPA's *Illicit Discharge Detection and Elimination Guidance Manual* (October 2004). An Outfall Reconnaissance Inventory (ORI) datasheet is completed for each outfall and this information is now kept in a GIS database. With current staff levels, the stormwater Utility will now be able to inspect every outfall in the City at least twice during the five-year MS4 permit cycle. Outfall inspection data is included in Appendix B.



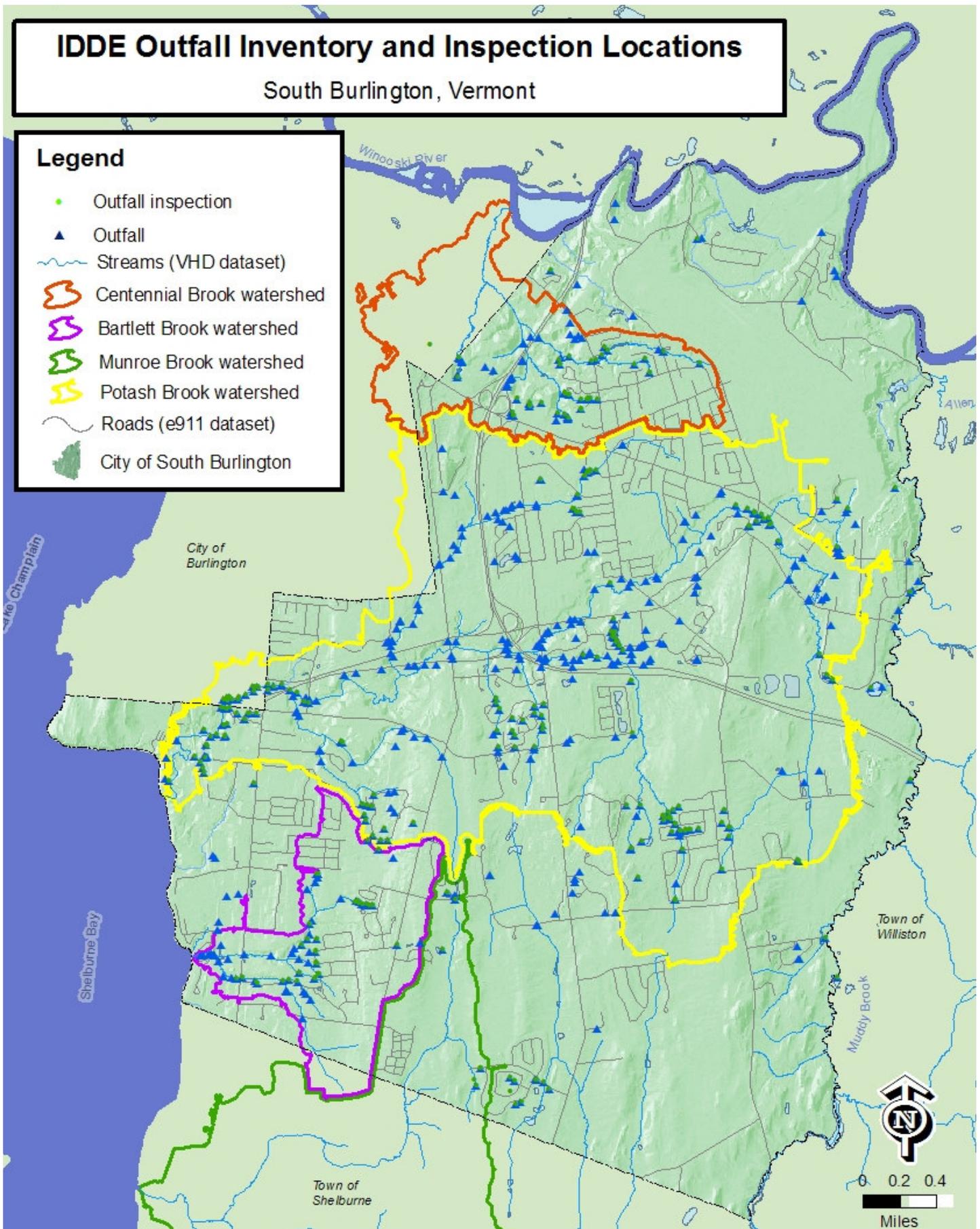
Stormwater outfalls located near the Williston Road / Dorset Street intersection in South Burlington

IDDE Outfall Inventory and Inspection Locations

South Burlington, Vermont

Legend

- Outfall inspection
- ▲ Outfall
- ~ Streams (VHD dataset)
- Centennial Brook watershed
- Bartlett Brook watershed
- Munroe Brook watershed
- Potash Brook watershed
- ~ Roads (e911 dataset)
- City of South Burlington



Stormwater Sampling

If it is thought that an outfall could potentially have an illicit discharge flowing to it samples are taken in an attempt to find the source. Sometimes the source is obvious and sampling is not necessary, however, much of the time it is necessary to follow up on a suspected illicit discharge by taking water samples. Sample bottles and test strips are brought along during all outfall inspections. The test strips give a first glance at nutrient levels in the water and can help narrow down the source of a potentially illicit discharge while in the field. If necessary, samples are collected and brought to the lab for additional analysis.

In addition, Stormwater Utility staff has placed numerous Optical Brightener (OB) pads in an attempt to locate discharges that might otherwise go unnoticed. OB Pads are placed in wire cages, tied in place, and left for approximately seven days. The OB pads are then collected and brought back to the lab for testing. Positive results are followed up on with additional sampling and field investigation.

All sampling data is now stored in the CSB's electronic GIS database. Sampling results are included in Appendix C.

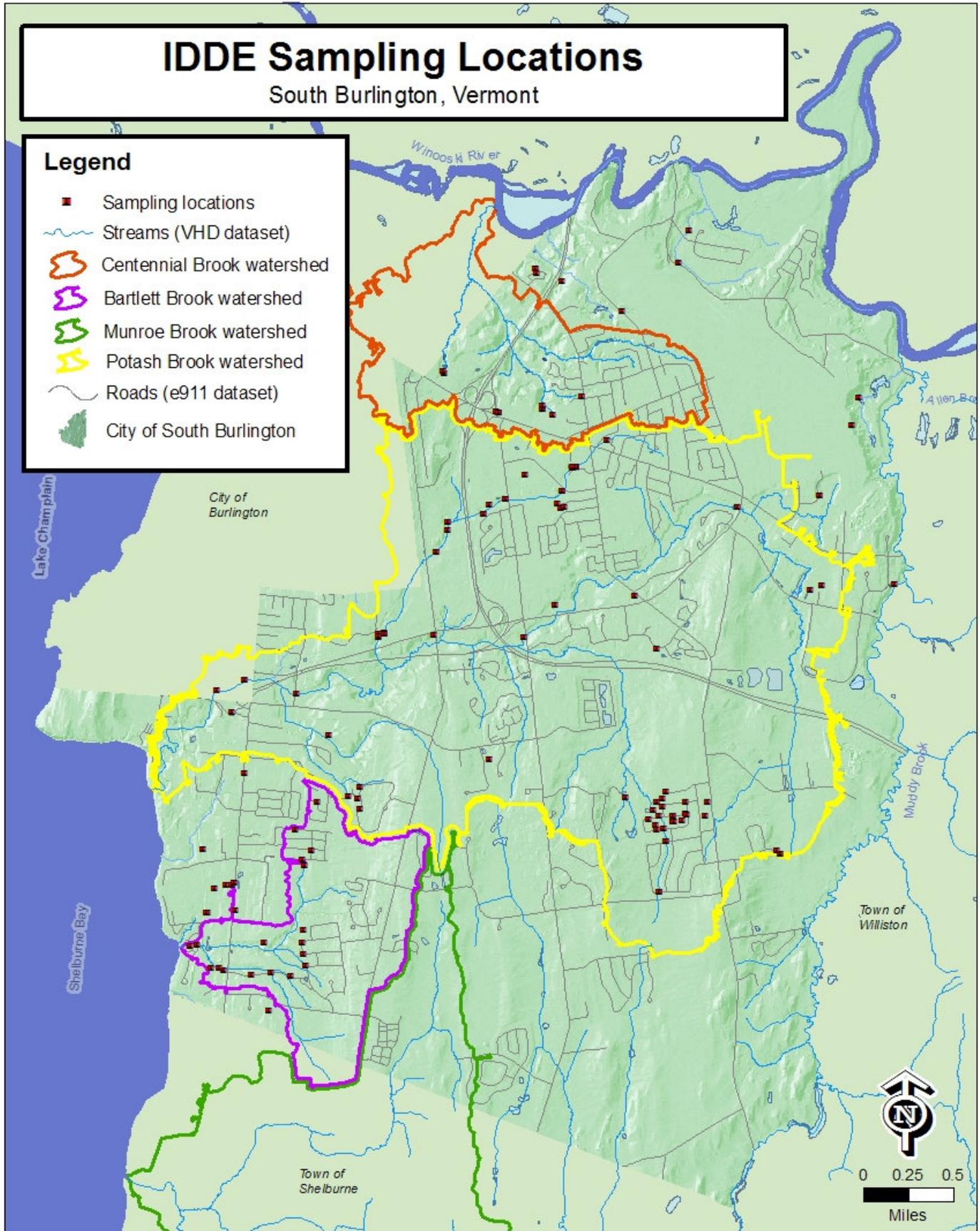


IDDE Sampling Locations

South Burlington, Vermont

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Illicit Discharges in South Burlington

The following section summarizes all illicit discharges identified during the last five-year MS4 permit cycle. The circumstances surrounding the discovery of the illicit discharge are discussed, as well as the steps taken to eliminate the discharge. Photographs are included where possible.

UVM Miller Farm

During the course of a regular stream walk and outfall inspection Stormwater Utility (SWU) staff collected samples of the water in Potash Brook near the UVM Miller Research Farm. The samples showed elevated levels of E. Coli. SWU staff contacted the University of Vermont and it was determined that discharge water from the farm's treatment wetland was causing the problem. When the treatment wetland was constructed it was built with the option to discharge directly to the stream, or to the municipal wastewater treatment plant. In order to eliminate the discharge, the wetland's discharge pipe was modified and now effluent from the wetland goes to the wastewater treatment plant.



Modified constructed wetland outfall pipe. Water now flows from the wetland outlet pipe and drops to the bottom of this manhole structure where it flows into the municipal sewer

Mill Pond Lane Sanitary Sewer

While repairing storm drains on Mill Pond Lane, City Highway Department staff smelled a foul odor coming from one of the storm drains. SWU staff followed up on the incident and discovered that the sanitary wastewater line from one of the homes had been incorrectly connected to the stormwater line instead of the wastewater line. Wastewater from this home had been flowing through the stormwater piping system and directly to Potash Brook for approximately 12 years. CSB immediately called in a contractor to repair the connections. After the repair was made, the SWU conducted follow-up monitoring. The results of this monitoring have not indicated that any additional cross connections exist in the neighborhood.



Sanitary sewer line flowing into the stormwater drainage pipe on Mill Pond Lane

Discharge of Vehicle Washwater in the Ethan Allen Industrial Park

When driving through the Ethan Allen Industrial Park, SWU staff observed obvious signs of vehicle washing. Vehicles were being cleaned on the paved parking lot and the wash water was flowing down the driveway, into the street, and directly into the stormwater system. The stormwater superintendent followed up with the business's owner. The business owner was provided with information about the pollutants contained in vehicle washwater and a letter describing possible penalties if the practice was continued. No additional infractions have been observed.



Vehicle washwater flowing over impervious surfaces and into the City's storm drainage network

UVM Field Paint Dumped into Storm Drain

While driving down Spear Street, SWU staff noticed bright orange water in a swale along the side of the road. Following the trail of orange water, SWU discovered where field paint had been dumped into a storm drain near UVM's Gutterson Field House. Discussion with maintenance staff at UVM indicated that excess paint used to line athletic field had been dumped into a storm drain. SWU notified the appropriate individuals at UVM and corrective actions were taken. In addition, UVM followed up with training for maintenance staff to ensure that a discharge of this type will not happen again.



Orange field paint dumped down a storm drain ended up in a road side swale

Grand Union Meat Department

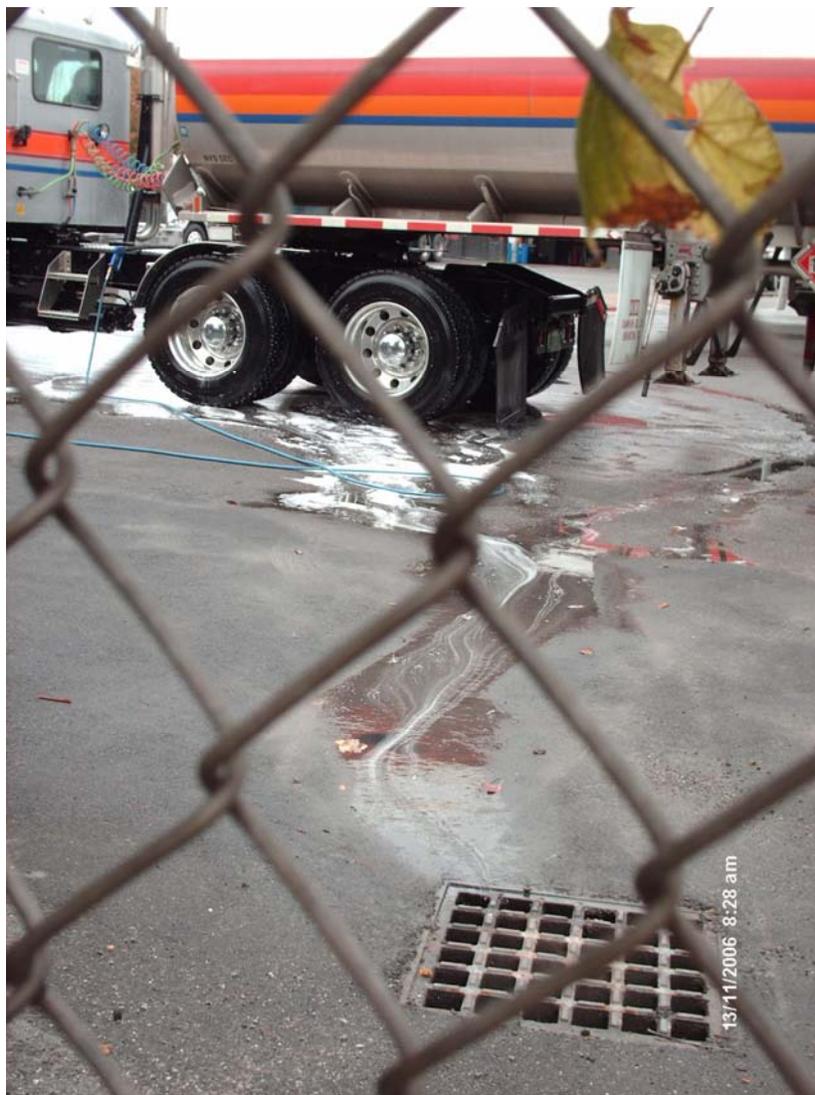
Sampling conducted by SWU staff continually showed elevated E. Coli levels in a stream behind the Grand Union building located at the intersection of Williston and Hinesburg Road. Grand Union allowed SWU staff to conduct dye testing on floor drains in the building and it was determined that one of the floor drains located in the meat department was getting piped directly to the stream. In order to eliminate this discharge, the floor drain was plugged. Subsequent testing has shown a decrease in E. Coli levels in this area.



Floor drain discharging directly to the stream

COCo Vehicle Washing

Historic reports of soapy and dirty water in a portion of Potash Brook near Brookwood Drive led SWU staff to investigate upstream inputs to the drainage system. In addition, City staff received calls from residents complaining that a nearby trucking company was washing vehicles and allowing the washwater to flow into a storm drain located on site. In cooperation with the trucking company, SWU staff dye tested the storm drain and determined that the vehicle washwater was in fact entering the stormwater drainage system that eventually discharged into Potash Brook. The trucking company agreed to make major site changes to prevent this discharge from occurring. Washwater is now collected in a storm drain, directed through an oil water separator, and sent to the wastewater treatment plant. A small berm prevents additional runoff from the parking area from entering the storm drain.



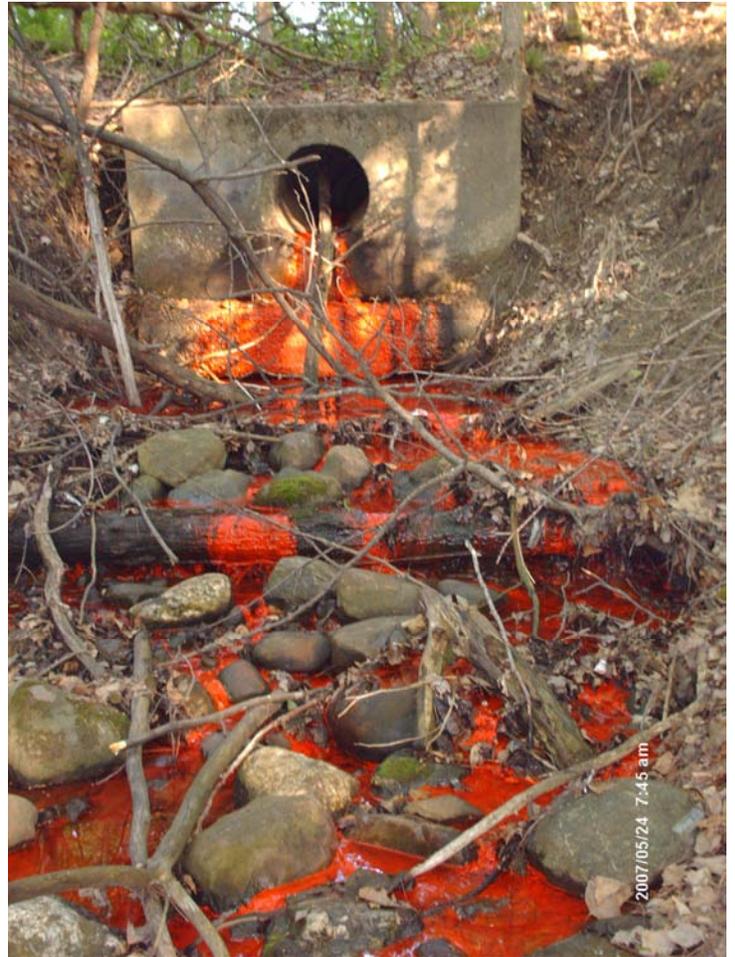
Vehicle washwater entering a storm drain

SBHS Field Paint Dumped into Storm Drain

SWU staff received a call from the construction inspector on the Kennedy Drive reconstruction project describing a red discharge flowing into the wetland adjacent to the construction site. SWU traced the red discharge to a storm drain located near the maintenance entrance at the South Burlington High School. Discussions with school representatives determined that school maintenance staff had dumped old field paint down the storm drain. At the time of the spill, measures were taken to reduce the amount of red paint reaching the wetland. After the incident, the school district conducted additional training for maintenance personnel. In addition, SWU staff placed metal “No Dumping” labels on all the storm drains located at the public schools.



Storm drain where old field paint was dumped. This storm drain leads to a nearby wetland.



Storm drain outfall pipe. Field paint dumped down the storm drain flowed down this drainage swale and into the wetland

UVM Blue Paint in the Stormwater Pond

While inspecting stormwater infrastructure, SWU staff noticed a blue discharge entering the UVM stormwater treatment pond near the Sheraton hotel. SWU staff contacted representatives at UVM and attempted to find the source of the blue discoloration. A definitive source for the discharge was never discovered.



Blue discharge into UVM stormwater pond

D.G. Robertsons Cement Truck Cleaning

During a stream walk associated with regularly planned outfall inspections, SWU staff observed a trail of concrete leading from the top of a slope down towards Potash Brook. The facility at the top of the slope manufactured concrete vaults for funerals. The concrete supplier would arrive in a ready mix truck a few times a week and pour concrete into molds at the facility. The contractor would then back his truck up to the edge of the parking lot and wash the cement out of the back of the truck. This prevented hardened concrete from falling off the truck as he drove back to the plant. Stormwater staff explained the problem with this practice to the business owner and contacted the concrete company to advise them to discontinue this practice. No additional incidents have been observed.



Workers had been cleaning off a cement truck and allowing the material to flow down the bank towards Potash Brook

Valley Ridge Cracked Force Main

A resident called the Department of Public Works in South Burlington to complain about water bubbling up in his lawn. The cause of this water could not immediately be identified. The bubbling would occur intermittently and not necessarily when the nearby wastewater pump station was in operation. In addition, numerous foundation drains were tied into the nearby storm drain and were also suspected to be the cause of this discharge. Because it was an older neighborhood, maps of the buried infrastructure were unreliable. After speaking with nearby residents, dye testing the pump station and dye testing toilets of the nearby homes, City staff decided to excavate in order to determine what was causing the discharge. It was discovered that the 2" force main from the nearby pump station ran through this yard and had cracked. When the pump turned on, it caused the water to bubble to the surface. A piece of fabric was on the pipe near the crack and this could possibly have plugged the hole at times. This would explain why the bubbling did not correlate to when the pump station turned on. The force main was repaired and the area was backfilled, seeded, and mulched. No additional discharges have been observed.



A cracked 2" sanitary sewer force main was causing wastewater to bubble to the ground surface and flow into a nearby storm drain.

Paint Dumped Down a Storm Drain in the Country Club Neighborhood

A resident called the Department of Public Works to report that a neighbor had been dumping paint down a storm drain. SWU staff followed up on this claim, but found no clear evidence of this illegal dumping in the storm drain, or at the outfall. SWU staff placed metal “No Dumping” signs on all storm drains in the neighborhood. No additional complaints have been received.



“No Dumping” tag placed on storm drain. The tag indicates that the storm drain leads directly to the stream and waste materials should not be dumped into it.

Atlantic Detroit

The South Burlington City office received a call from a former employee at the Atlantic Detroit facility located at Berard Drive complaining that the wastewater leach field had been tampered with. No evidence of this could be observed, however, while on site City staff observed a trail of oil leaving the garage and leading towards the Winooski River. Discussions with staff at Atlantic Detroit revealed that someone had washed a truck engine outside and allowed the washwater to flow off the site. SWU staff provided the garage workers with information about the proper way to clean engines, how to handle waste oil, and other garage best management practices (BMPs). A letter detailing the incident was sent to the facility recommending training and other BMPS.



Maintenance garage staff washed an engine outside and allowed the washwater to flow off the site.

Appendix A – South Burlington Sewer and Stormwater Ordinance

Appendix B – Outfall Inspection Data

Appendix C – Sampling Data