

# Stormwater Sleuths Solve the Mystery of the Putrid Pipe

## Pullman's hunt for the elusive, illicit discharge



Downtown Pullman, WA  
Photo credit: Jerry Prout

### Introduction

The illicit stormwater discharge often lurks out of sight under a city's buildings and streets. The challenge for cities, regulated under the state's Municipal Stormwater Permit, is to locate and eliminate this pollution source. An investigative team in the city of Pullman found several illicit pipes and solved a recurring problem.

### Problem

In every city across the nation, mistakes happen during construction. After all, when you are connecting pipes underground they all pretty much look the same. But it is important to make sure the drains from sinks and toilets lead to the sanitary sewer and not the stormwater sewer. A misconnection could mean raw sewage going

directly to a stream without treatment. One of the requirements of the state's Municipal Stormwater Permit is for cities to develop a program called an Illicit Discharge Detection and Elimination (IDDE) program to find and resolve these problems. An *illicit discharge* is any discharge to a stormwater system that is not composed entirely of stormwater.

The South Fork Palouse River, which flows through the city of Pullman, has been impaired by excess fecal coliform bacteria for years. These bacteria are indicators that sewage or manure could be entering the stream. Within the city, it was suspected that one of the sources could be cross-connections between sanitary and stormwater sewer lines. A 2006-2007 water quality study of the South Fork Palouse River demonstrated that significant bacteria loads often came from the stormwater pipes, so a water quality improvement implementation plan required the city to investigate some of the worst culprits. At the same time, Pullman was kicking up their IDDE program required by their Municipal Stormwater Permit.

### Project goals

As required by their stormwater permit, Pullman was implementing their IDDE program in earnest by August 2011. Pullman's program already included a requirement that all new construction undergo dye testing to ensure all pipes are hooked up to the correct collection system. As a result of the new permit, stormwater staff also regularly conducts inventories and inspections of catch basins, outfalls, and manholes that sometimes reveal evidence of an illicit discharge. During road and infrastructure maintenance and construction projects, the underbelly of the city often comes to light, giving another opportunity to find potential pollution sources that have lain hidden for decades.



Dye testing to determine illicit connection of a sanitary sewer to a stormwater outfall  
Photo credit: Pullman Stormwater Services

### Milestones and outcomes

In 2011, city crews working on an infrastructure replacement project in Pullman's downtown business district noticed "suspicious material" and reported it to the city's Stormwater





*Web of pipes under the historic building where the illicit connection was found  
Photo credit: Pullman Stormwater Services*

Services Division. The obviously illicit connection was traced back to a historic office building. Some of the infrastructure under this building consisted of cast iron pipes dating back to the early 1900s. Further investigation revealed multiple illicit pipes. A true team effort of private contractors and public staff was required to fully unravel the mystery.

Stormwater personnel worked with the building's owner, its six tenants, and a local plumbing contractor to figure out where all the pipes came from and flowed. From this, they could determine which pipes may be carrying untreated sewage and gray water (sink, shower, and floor drains) to the storm system and eventually to the South Fork Palouse River. After tracing the path of the pipes through the bowels of the building's basement and several dye testing events, the team discovered there were eight sanitary lines flowing to one main line that

went directly to a storm sewer. Once the mystery of each pipe's path was solved, the plumber went to work rerouting the piping so everything now flows to the correct system.

## Project highlights

The water quality criterion for fecal coliform bacteria in the South Fork Palouse River is a concentration of 100 colony forming units (CFU) per 100 milliliters of water or less. During the 2006-2007 water quality study, the Department of Ecology sampled a storm drain which had several fecal coliform results in the 10s of thousands of CFU per 100mL of water. These results were reported to the city personnel who conducted an investigation. However, because of the intermittent nature of these spikes and the delay between sample time and lab results, the city was unable to find a source. The illicit pipe located during the investigation just happened to be connected to this storm drain. Time will tell how much impact this will have on the overall bacteria levels in the South Fork Palouse River, but one thing is known for sure: progress is being made! And Pullman's Stormwater Services Program continues to focus their IDDE Program on stormwater outfalls found to have high bacteria loads during the water quality study.

## Partners

City of Pullman Stormwater Services  
Local Private Plumbing Contractor

Building Owner  
Tenants

## Funding

Investigation funded by the city of Pullman. Repair costs funded by the building owner.

## For more information

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