

# Working Together to Prevent Treatment Upsets

## Finding the “un-solution” to black water



*Black water at the city of Moses Lake's Dunes Facility's Headworks*

### Introduction

Have you ever thought about the water used in industrial processes? Or how it becomes different types of wastewater? Have you ever considered the by-products that result from putting nice designs on boxes or the consequences of that process? Well, the Department of Ecology (Ecology), the city of Moses Lake, and International Paper have!

### The problem

A plant that makes paper boxes using ink to print images on them can produce unsightly wastewater. This type of wastewater has the potential to cause an upset at a wastewater treatment plant receiving the water. The wastewater is black with suspended ink particulates, which do not settle out of solution. As this black, inky water passes through the treatment plant, it can clog machinery and coat the ultra-violet (UV) lights that provide final disinfection. An upset could result in the discharge of polluted water. Several attempts to address this black water in Moses Lake proved it was very unique and difficult to treat.

### The project

For years the International Paper Box Plant (IP) operated in Moses Lake and discharged to the city of Moses Lake's Dunes Facility without issue. However, in 2006 when the Dunes Facility was upgraded to improve treatment and capacity, the operators kept finding black water showing up at the facility's headworks. The city of Moses Lake and Ecology partnered on a cursory investigation to search for possible sources of the black water. This investigation pointed to the International Paper Box Plant as the most likely source. Ecology and the city contacted IP to start discussions about how to resolve this problem.



*A water sample from International Paper before installing a new treatment system*



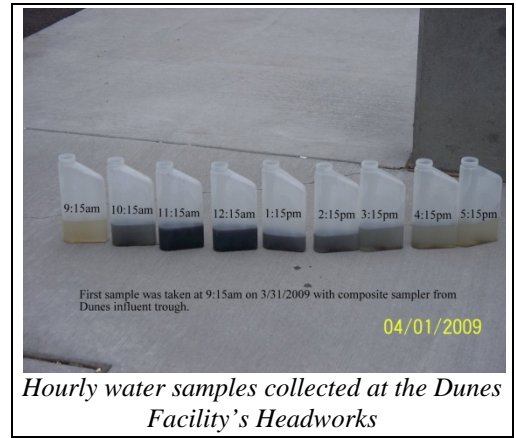
*International Paper Box Plant's new Beckart Treatment System*

In 2008, the Eastern Region's Water Quality Program arranged with Ecology's Manchester Environmental Laboratory to analyze samples, collected at the Dunes Facility, to better isolate the source of the black water. The city and IP collected samples from the Dunes Facility, IP, and several other potential sources and shipped them to the laboratory. A scanning electron microscope examination found the black color resulted from 1 to 0.4 um (micrometer) suspended carbon particles most likely to be black paint or ink pigment.

Because of the study, IP assessed the feasibility of several methods that could be used to fix the problem. The wastewater settling tank was re-designed to allow the particles to settle out before the wastewater was discharged to the Dunes Facility.

Unfortunately, even after the settling tank redesign, the unsightly water was still arriving at the Dunes Facility. So, in 2009, the city did a color water study at the Dunes Treatment plant. A portable sampler collected wastewater samples at the headworks each hour for approximately four months. They discovered that the facility was receiving the black water about 24 hours after IP discharged its settling tank. Ecology again contacted IP and expressed concerns about their wastewater and the impact it was having on the treatment plant and potentially on the environment.

In 2010, IP tried several different treatments, including filtration and improved settling. However, the particulates in the wastewater are very fine and stay in solution rather than settling out. IP looked at other treatments used at similar plants, and in 2011 they found the system they thought would work. It was a Beckart Wastewater Treatment System. This system is known for getting the “black” and other pollutants out of water and this system was now available from a former IP Plant. In the winter of 2012, this Beckart Treatment System was installed.



*Hourly water samples collected at the Dunes Facility's Headworks*



*International Paper's wastewater after treatment with the new system*

### Project outcomes

With the installation of this new system, IP's wastewater went from black to almost clear. The treatment process is able to remove the black particles from solution and now no more black water is arriving at the city of Moses Lake's Dunes Wastewater Treatment Plant.

With patience and working together, Ecology, the city of Moses Lake, and IP found a solution to the yucky black water and prevented future upsets at the city's plant. Additionally, with IP's new treatment system, in the future they may be able to recycle the effluent wastewater to put it to other uses instead of sending to the Dunes Facility.

### Partners

- Richard Ealing & Jessi Schorzman of International Paper
- Tim Varney, Tony Pfluger, and Jim Whitmore of the city of Moses Lake
- Scott Mallery and Mike Hepp of Ecology's Eastern Region Water Quality Program
- Dickey Huntamer of Ecology's Manchester Environmental Laboratory

### For more information

Scott Mallery, Pretreatment Engineer  
Spokane, Washington  
509-329-3473  
[scott.mallery@ecy.wa.gov](mailto:scott.mallery@ecy.wa.gov)



*Dunes Facility's Headworks after installation of IP's new treatment system.*

*Note: Untreated municipal wastewater should look brown as in this picture.*

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