

## Advanced stormwater treatment technologies protect Russian river from coal dust pollution

### Project profile

#### Objective

Russia's river Tuloma was suffering from pollution from coal dust and sediment carried in stormwater runoff originating from local coal mines. As coal dust is difficult to remove due to its low density, however, an unconventional treatment approach was required.

#### Solution

Hydro International assessed environmental conditions and requirements and proposed a chemically dosed Downstream Defender<sup>®</sup> hydrodynamic separator with an Up-Flo<sup>®</sup> Filter stormwater filter to achieve >95% capture of coal dust pollution in stormwater runoff.

### Situation

Bordering Finland in Russia's far northwest, the Murmansk region is home to a number of rivers that feed the Barents Sea basin, including the Pechenga, Ura, Kola and Tuloma.

The western part of the Murmansk region has a highly developed infrastructure and a number of industrial zones that power the regional economy. The main industries are mining and chemical processing, which have intensively processed local fields of rock minerals and ores.

Murmansk's heavy industrial output has been adversely affecting local rivers for some time, with chemical processing, ferrous and non-ferrous metallurgy and rare materials processing discharging contaminants into local waters that damage natural ecosystems.

#### Problem

The river Tuloma was suffering from pollution from coal dust and sediment, which was carried by stormwater runoff originating from local coal mines.

Rainfall would generate surface water that picked up coal dust from storage yards, and in the absence of any form of pollution capture, that dust simply washed from the coal

### Product profile

Downstream Defender<sup>®</sup> is an advanced hydrodynamic vortex separator that provides impressive and reliable removals of sediments, oil and floatables from stormwater runoff across a range of flows.

Up-Flo<sup>®</sup> Filter is an advanced stormwater treatment solution that combines sedimentation and screening with custom filtration to deliver exceptional surface water pollution removal. Up-Flo<sup>®</sup> Filter is verified to remove 80% suspended solids but demonstrates removal rates of up to 98%.

mining facility and into the environment.

As an important spawning ground for Atlantic salmon, the water quality of the Tuloma river needed to improve.

Coal dust is very challenging to remove from stormwater due to its low density, however, and it is difficult to treat coal particles in water using traditional settlement methods.

An unconventional treatment approach was required.



Murmansk's rivers are adversely affected by pollution carried in stormwater runoff from industrial facilities (Image © Maarten Dirkse)

## Solution

Local distribution company Ecoline identified the problem and brought in experts from Hydro International to develop an effective solution.

First the Hydro International team conducted site sampling and lab analysis in order to understand the composition of the water and its pollutant load.

Using the results of that analysis, they determined that, due to the nature of the pollution, chemically enhanced settling combined with advanced filtration would be required.

The team then installed a **Downstream Defender**® hydrodynamic separator and an **Up-Flo**® Filter stormwater filter on site, and applied site-specific polymer and flocculant dosing to increase the settling velocity of the coal dust.

## Outcome

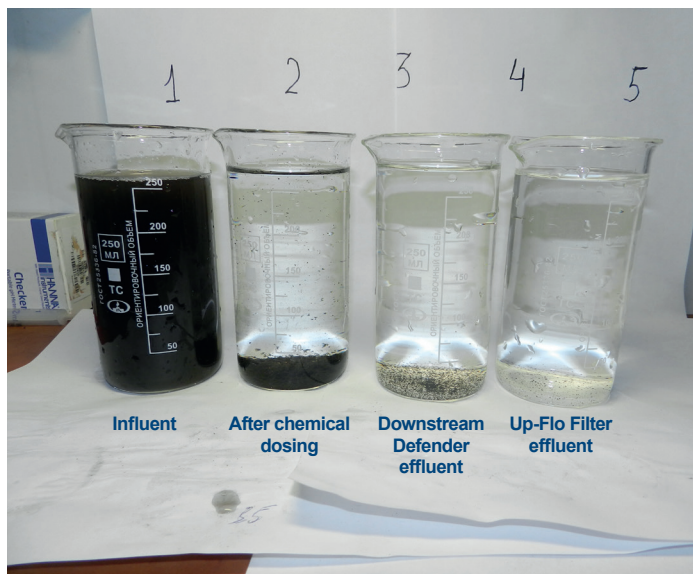
The pilot trial performed very successfully—under operational conditions the chemically dosed Downstream Defender® and Up-Flo® Filter system captured >95% of coal dust present in the influent—and the treatment concept was approved for full-scale deployment.

“The success of this project came down to working closely with the client to understand local environmental conditions and the client’s requirements for chemical handling and storage.

Getting our experts on board early in the process ensured a positive outcome, as our team has both the laboratory facilities and the expertise to understand local needs and tailor a solution to meet them.

We’re delighted at how well our systems removed coal dust from surface water runoff, and we’re confident that this approach could equally be applied to many other industrial discharges, such as at ore refinement facilities and metal works.”

– Clive Evans  
Managing Director, Africa, Middle East & Asia



**“What is the most important thing that clients should consider when approaching a project like this?”**

Seek expert input from as early a stage in the project as possible, and work with companies that have experience in stormwater treatment and a track record of real-world testing.

In particular, when considering chemical dosing, it is of paramount importance that an expert assessment of local conditions is carried out in order to ensure optimal chemical selection.

This must also be balanced against client health and safety requirements, as well as the ability to select an appropriate local chemical supplier.

## Learn more

To learn more about how Hydro International can help you to manage water more effectively, visit [hydro-int.com](https://hydro-int.com), search **Downstream Defender** or **Up-Flo Filter** online or contact us:

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