

## TECHNICAL SUMMARY – REMEDIATION OF HIGH PRIORITY HOTSPOTS IN WESTERN BALKANS

STEWART WILLIAMS - CHIEF TECHNICAL ADVISOR - 22 April 2008 – WESTERN BALKANS REGIONAL PROGRAMME – UNDP MONTENEGRO

COUNTRY : SERBIA

SITE: Kula & Vrbas Municipalities Vojvodina Province: Industry waste water

### ENVIRONMENTAL/HUMAN HEALTH PROBLEM

Historic and ongoing industrial, sewerage and commercial food production discharges have **contributed to the clogging and gross pollution of the “grand canal”**. Nutrient levels and microbiological contamination of the waters are at dangerous levels to human health and have resulted in an absence of oxygen in the river and creation of a dead zone. Odour from the canal also represents a major impact on the community and the river sludge is also heavily contaminated with metals in certain locations. 12 industries continue to discharge untreated waste waters to the canal.

### INTERVENTION & WORKS

The planned intervention is to construct a main water collector connecting the 12 industries and the local sewerage to this and sending all the waters to a centrally located water treatment plant for treatment in accordance with best practice. The other action planned is to monitor before and after each of the 12 discharge points at an upstream and downstream location. This will provide the current baseline for each industry's discharge point and permit a characterization of their current wastewater discharges.

### BASELINE AND EXISTING INFORMATION

There is considerable baseline data available from the various studies that have been for this site. The studies cover characterization of the river sludge and waters in relation to the inorganic and nutrient content as well as the microbiological contamination and compares this with current European human health standards. There has been a number of well conducted treatability studies done which identify options for reuse, treatment and disposal of the different sludge types present in the river. The current river physico-chemical, microbiological and chemical loads exceed all human health and environmental thresholds.

### SITE VISIT - 24 March 2008

The site visit revealed a grossly polluted canal in close proximity of residential dwellings on its bank filled with industrial sludge for many kilometers with extensive vegetation growth on either bank. Apparent depth of water flowing in the canal over the sludge is approx 30 cm. A strong odour from the river was detected and there was an oily film on the water surface from a nearby industry discharge point (edible oil production). Planning for construction of the collector is well under way and we were shown the proximity of the collector to the industries to be connecting along the route to the centralized wastewater collection. The site visit revealed that many of the industries already have their own wastewater treatment plants but due to low levels of regulation they have found it cheaper not to treat their waste waters and to instead discharge their raw effluents directly to the river. There is a campaign both increasing the regulatory compliance and in educating industry that will be progressed in tandem with the physical works to ensure this practice does not continue. Compliance monitoring of the industry discharge points will also be conducted once the collector and centralized treatment plant is online. There is a plan to further characterize the river sludge in greater detail that has currently been undertaken to better refine the treatment, reuse and disposal options as part of the works.

In the site visit it was also discussed that a program for the 12 industries be conducted which would engage them in conducting cleaner production training and potentially run them through an IPPC process to help move them towards better industrial and environmental practices.

## RECOMMENDATIONS

This is a solid and well planned project with a high level of expertise and good involvement of the municipality and state authorities. It is recommended that a series of waste water monitoring for each of the industry discharge points be undertaken overtime and in a manner that the effluent characteristics are accurately recorded both to log the current river inputs and to use as a future reference that these discharges cease once the collector is completed and options for treatment via the centralized wastewater treatment plant are on line. The monitoring should also include upstream and down stream monitoring outside of the industry discharge points.

It is also recommended that further engagement with industry be undertaken to cease the discharge of raw effluent and to utilize their current waste water systems and to become involved in a program of cleaner production processes that will have economic and environmental benefits including reduction in the uses and recovery of resources, decreased water and energy uses and the potential recovery of substantial quantities of biomass and reduction of green house gases. The program of a **simulated IPPC program is also supported and will help bring forward the industry's ability to reduce** the effect on environmental and human health in accordance with best practice requirements.