

## Khartoum North WTP Rehabilitation & Upgrade

### Bahri, Khartoum North, Sudan

The Khartoum North Water Treatment Plant (Bahri WTP) located on Blue river Nile once was constructed in 3 phases. Plant A with a design capacity of 12.000 m<sup>3</sup>/day was constructed in 1957, followed in 1968 by plant B (72.000 m<sup>3</sup>/day). Last but not least plant C (108.000 m<sup>3</sup>/day) was added since 1988.

The aim of the project now was to refurbish all the water treatment facilities and to increase the capacity of the plant to 300.000 m<sup>3</sup>/d. The general concept was based on centralizing the intake of the plant by construction of a new Mixing and Distribution Chamber in order to get more flexibility for

operation and maintenance. To increase the intake flow existing pumps were at first complete overhauled and later replaced by new pumps with higher flow. To minimize the energy consumption, new gravity lines were implemented. This was accomplished through

installation of new pipe lines from and to the new Main Mixing Chamber. All clariflocculators underwent rehabilitation and complete overhaul followed by installation of lamella settlers, which resulted in increase of settling area and reduction of the required retention time. As a positive effect, the loads on the upgraded or new constructed sand filters were significantly reduced. For the distribution of the additional gained capacity a new low lift station was constructed, serving Bahri and Haj Yousif. To ease and better control of the operation new process / flow control equipment were installed and automatic back wash for sand filters was implemented.

After rehabilitation and upgrade, the plant provides at least 300.000 m<sup>3</sup>/day of the cleanest potable water available in Sudan. The project started in 2010 and was accomplished by the end of 2012.



### Potable Water from River Nile

**Turbidity up to 30.000 NTU**

**300.000 m<sup>3</sup>/day**



### PROJECT DATA

- Complete Plant Rehabilitation & Upgrade from 190.000 to 300.000 m<sup>3</sup>/day
- Upgrade & Centralize of intake
- Implementation of gravity lines
- Installation of lamella settlers
- Upgrade of 36 sand filters
- Construction of new low-lift station





Repair of 8 clarifiers:

**before**



**during**



**after**



Overhaul of 11 intake pumps and 13 low-lift pumps



Installation of 8 new river intake pumps & pipelines



Installation of 6 low-lift pumps including headers



Installation of lamella settlers in 8 clarifiers



Repair or new construction & automation of 36 sand filters



Construction of new main mixing & distribution chamber

