



## Headworks Bio Brings MBBR/IFAS Upgrade to Dubai Investment Park in United Arab Emirates

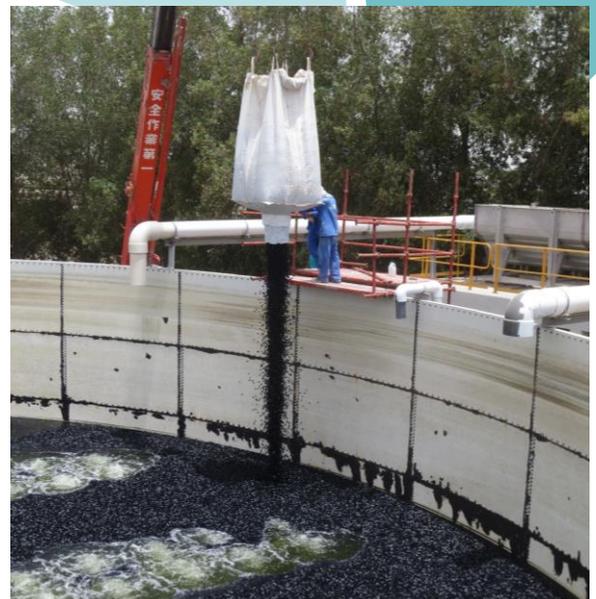
### Background

Dubai Investments Park is a unique, self-contained mixed use industrial, commercial and residential complex operated by Dubai Investments Park Development Company LLC. Spread across an area of 3200 hectares, it is a city within a city offering world-class infrastructure and outstanding facilities and services.

A key feature of the park is the industrial zone, which generates wastewater from different industries: food and beverage, furniture, plastic, power & utilities, printing press, and building material which all require treatment. Due to the growth in industries resulting in an increase in wastewater, the existing treatment plant required expansion. The existing wastewater plant, a conventional activated sludge plant designed to handle 5,000 m<sup>3</sup>/d, was in need of expansion to 10,000 m<sup>3</sup>/d. The goal was to not only double capacity in a small footprint, but also to produce effluent suitable for reuse and irrigation applications.

Headworks Bio Inc. was awarded the contract to design an Integrated Fixed File Activated Sludge ("IFAS") process to double the capacity of existing plant to 10,000 m<sup>3</sup>/d within the existing footprint without additional reactors.

Customer: Dubai Investment Park  
Industry: Mixed Industries  
Location: Dubai, United Arab Emirates



### Process

One of the key challenges at the plant was to provide a solution to retrofit the existing aeration tanks without increasing the plant footprint. As the plant could not be shut down for long periods, an easy to implement/retrofit solution was preferred. The additional challenge of treating mixed industrial wastewater with high incoming COD and BOD of up to 3,000 mg/l and varying temperatures meant MBBR/IFAS was a perfect fit for this application.

The IFAS variation of the Moving Bed Biofilm Reactor (MBBR) process gets its name from the integration of biofilm carrier technology within a conventional activated sludge process. This hybrid process enables activated sludge systems to achieve dramatic gains in volumetric levels. The result is an extremely compact system that produces excellent effluent quality, suitable for reuse applications.

The self-regulating nature of the MBBR/IFAS process was very appealing to Dubai Investment Park as it allowed the process to handle variations in influent loads by varying biofilm growth with minimal operational intervention. A cost effective, easy to implement and a low OPEX, meant that the MBBR/IFAS solution was the ideal choice for increasing the plant's capacity.

### Results

The MBBR/IFAS upgrade of the existing treatment plant treats approximately 10,000 m<sup>3</sup>/day and BOD reduction of < 10mg/l and nitrification NH<sub>3</sub>-N of < 1mg/l outlet respectively, thus producing effluent suitable for reuse and irrigation applications. The two treatment reactors have a total footprint of 700 m<sup>2</sup>, a remarkable achievement for a plant with such high treatment capacity.

Along with the process design, Headworks BIO has supplied the core components of the system, including the media, aeration grids, and media retention screens. Headworks BIO has employed one of their proprietary medias for this project, in this case Active Cell 450 offering 402 m<sup>2</sup>/m<sup>3</sup> of protected surface area. The ActiveCell process provides an extensive protected surface area for autotrophic bacteria that supports a self-regulated and effective biological treatment process without the build-up of end products and minerals which normally inhibits the process in suspended growth systems.

