



**AQUA-AEROBIC SYSTEMS, INC.**  
A Metawater Company

# SUCCESS STORIES

## PLANT NAME AND LOCATION

**SHEPARD ENERGY CENTRE – CALGARY, ALBERTA CANADA**

## DESIGN DAILY FLOW / PEAK FLOW

**4.0 MGD (18,184 m<sup>3</sup>/day) / 7.7 MGD (35,005 m<sup>3</sup>/day)**

## AQUA-AEROBIC SOLUTION

**3 AquaDisk® Filters (8-disk) utilizing OptiFiber PES-14® pile cloth media**

## **AquaDisk® FILTERS REDUCE TSS AND NTU FOR POWER PLANT PROCESS WATER**

Shepard Energy Centre (owned by Enmax and Capital Power Corporation) is located in Calgary, Alberta, Canada. It began operating in March 2015 and is capable of generating over 800 megawatts of electricity to Alberta residents using natural gas. The facility utilizes (2) combustion turbines featuring a combined-cycle technology to generate electricity, and in addition, processes waste heat through a steam turbine to produce even more electricity. This electricity generation process makes Shepard approximately 30% more efficient than traditional coal-fired plants, and reduces overall fuel costs. Not only is Shepard's plant more efficient, but better for the environment by emitting less than half of the CO<sub>2</sub> emissions per megawatt hour compared to a coal generated facility. Sulphur dioxide and nitrogen dioxide emissions are also reduced.

The facility uses up to 7.7 million gallons per day (MGD) of reclaimed wastewater from the City of Calgary's Bonnybrook Wastewater Treatment Plant. This is the first application of reclaimed water for power production in Alberta. The majority of this water is used for cooling tower water and boiler feed water.

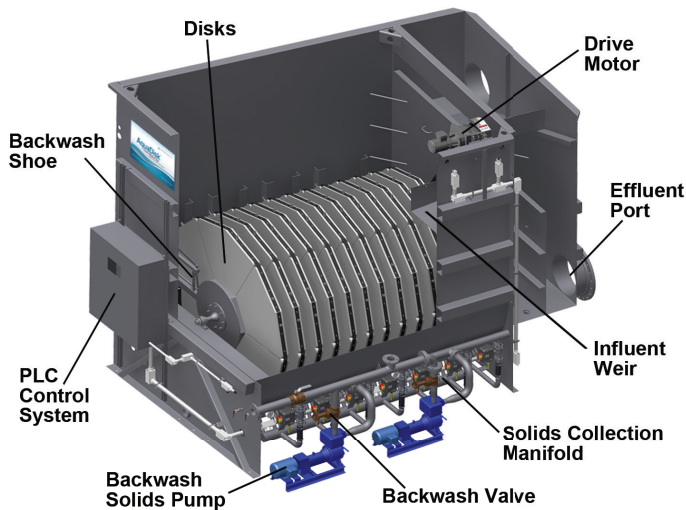
Enmax and Capital Power chose to install (3) 8-disk AquaDisk® cloth media filter units to help in this process. Effluent from the Bonnybrook Wastewater Treatment Plant is pumped through a 9 mile long pipe to the Shepard Energy Centre. Water then passes through the (3) AquaDisk cloth media filters before being sent to the cooling tower. Filtration is key in preventing solids accumulation in the cooling tower.



Overview of the (3) 8-disk AquaDisk® filter units located adjacent to Shepard Energy Centre's cooling towers.

## AquaDisk® FILTER PROCESS

Water from the Bonnybrook Wastewater Treatment Plant enters the filters and flows by gravity through the cloth media of the stationary hollow disks. The filtrate exits through the hollow shaft which supports the individual disks and flows to the effluent channel. As solids accumulate on the surface of the media, the water level surrounding the disks rises. Once a predetermined level is reached, the disks rotate and the media surface is automatically vacuum backwashed clean. Heavier solids settle to the bottom of the tank and are then removed using a solids manifold. Both backwash and solids wastewater are sent to back to the wastewater treatment plant.



## DESIGN CHARACTERISTICS

The AquaDisk filters remove total suspended solids (TSS) and reduce turbidity (NTU) to protect the heat exchangers from clogging. This in turn, reduces energy consumption, or in severe cases, prevents plant shutdown.

Shepard Energy Centre is now Alberta's largest gas-fueled electricity generation facility.

## BENCH SCALE TESTING

Bench-scale testing was implemented in the design process to demonstrate filter performance.

|        | INFLUENT   |                 | EFFLUENT   |                 |
|--------|------------|-----------------|------------|-----------------|
|        | TSS (mg/l) | Turbidity (NTU) | TSS (mg/l) | Turbidity (NTU) |
| Run 1  | 8          | 2.6             | 5          | 2.0             |
| Run 2  | 5          | 2.4             | 2          | 1.7             |
| Spiked | 50         | ---             | 3          | 2.1             |

## AquaDisk® FILTER ADVANTAGES

- Utilizes engineered OptiFiber® cloth filtration media
- Produces consistent, reuse-quality effluent
- Backwash system fluidizes fibers for efficient release of stored solids
- Tolerates extreme variations in load
- Vertically oriented disks reduce required footprint
- Lightweight, removable disk segments for ease of maintenance
- Low backwash volume results in water savings and energy reduction
- Available in painted steel, stainless steel or concrete tanks
- Eliminates sand media and underdrains
- Low effluent TSS and NTU for industrial cooling used in power plants, petroleum refineries, food processing, and other industrial facilities



Overview of the Shepard Energy Centre.  
(Photo: Burns & McDonnell © 2015 www.dataconservation.com)