

# LIVESTOCK WASTE WATER TREATMENT



Livestock farming plays an essential role in economic development for many countries.

In the Asian region, livestock provides a significant stimulus to agriculture development through manure, fuel, as well as fertilizers. Livestock farming presents many undisputable opportunities but then again challenges that farmers need to face. One of the challenges that we would like to focus on is the harmful impact of the discharge of the livestock wastewater into ecological system.

Livestock wastewater contains a high amount of color, COD, BOD, nitrogen and suspended solids, among others. Important to take into consideration that during routine daily operation of a farm, a significant amount of wastewater is produced, this water is a primary source of pollution of ground and surface water when discharged untreated into the environment.

## THE BOK PIG FARM

The Bok pig farm that is located outside Cheongyang, outside the city in South Korea, faced with wastewater discharge challenge has recently invested in a modern and technologically advanced treatment plant, that is easy to operate is maintenance free and it allows having a chemical-free process.

Bok pig farm is home to up to 5000 pigs, which reach the barn as some 30 kg pigs. The farm has a policy of zero antibiotics or pharmaceuticals as the additive to the animal diet which only consists of natural ingredients, with primary being corn, the pigs are being monitored daily to ensure good health and growth.

## FOUR GUIDING PRINCIPLES OF BOK PIG FARM OPERATION

- > Controlled indoor environment
- > Natural feed – no antibiotics used
- > Healthy growth
- > Gentle to the environment

## PRIMOZONE SOLUTION

- > One Primozone GM18 ozone generator, 1080g O3/h
- > PSA System
- > Closed loop chiller
- > PAOR Recirculation system

After a period of approximately three months and reaching the weight of about 100 kg, the pigs are market ready to leave the farm. During this period, the pigs produce a large volume of wastewater. The total amount ca 20m<sup>3</sup> per day with a COD value of approximately 400mg/l.

The authorized threshold for discharge of wastewater provided by The Ministry of Environment of South Korea is set to 50mg/l. The objective of Bok pig farm, however, is to reduce the threshold to 30mg/l before they feel comfortable to discharge it.



#### BOK'S FIVE STEP WASTEWATER TREATMENT PROCESS



Project Manager, Mr T Park from PAOR next to the ozone system and in front of the re-circulation tank

#### STEPS OF THE PROCESS

The first two steps of the process are typical for the treatment of wastewater, yet what is slightly unusual is the adoption of the membrane filtration to avoid chemicals.

The reverse osmosis is added to remove nitrogen from the water.

Primozone partner PAOR had been responsible for the design of the ozone step, PAOR had been successfully implementing this solution on several livestock applications in South Korea already. The ozone step consists of a re-circulating tank, where the precise dosage of high concentration ozone is applied. The high concentration of ozone enables the ozone to dissolve efficiently in the water; thus, get the COD level to below 30 mg/l.

#### CUSTOMER TESTIMONY

“Livestock application means harsh environment for the equipment. We are pleased with the Primozone ozone generator, as we could experience the benefits of this technology immediately. Since Primozone unit cools both reactor and the power supplier inside the cabinet, there is no need for ventilation in the electrical cabinets, which had been a cause of failure of traditional ozone generators in our experience. The compact size also makes it easy to place the generator in the room, and since there is almost no need for maintenance, we do not need to reserve extra space to be able to exchange or clean parts.”

Mr T Park, Project Manager for the Bok project.