

National Beef Leather - St. Joseph's, MO

Hydro MicroScreen™ Provides a Cost Effective Solution to an Expensive Sludge Problem

Industrial Wastewater Case Study Project Profile

Objective

National Beef Leather (NBL) was looking to upgrade its primary wastewater treatment system, specifically to **reduce Ammonia and TSS loading rates** to its aerated lagoon and **reduce sludge disposal costs**

Solution

Following a successful pilot test of the Hydro MicroScreen at the St. Joseph's facility three MS-80's were installed, significantly improving their plant's overall operation by reducing maintenance, sludge handling / treatment / disposal costs, energy consumption, and footprint required for primary treatment.

NBL is a division of National Beef Packing Company, the fourth largest beef processing company in the United States. Their tanning facility in St. Joseph's is the **largest wet blue tannery in the world**, providing processed hides to finished leather goods manufacturers worldwide. To prepare the hides for tanning salt, flesh, hair and grease are removed in a series of steps by **soaking hides in baths of salt, lime and sodium sulfide**. To tan the hides they are soaked in a **chromium** bath giving them a blue color. Given NBL's scale of operations and the liquid nature of the wet blue tanning process - NBL had a lot of wastewater and pollutants to deal with.

Plant effluent is highly variable depending on which 'cycle' of the tanning process is in operation. The existing primary treatment system consisted of two 35' (10.7 m) diameter primary clarifiers. Following the primary clarifiers flow is treated in an activated sludge process then discharged to the City of St. Joseph, MO. Primary sludge is dewatered with a belt filter press.

The primary solids were a particularly troubling and expensive problem as the driest that NBL could dewater their sludge to was 18% total solids, meaning that **72% of the volume they had to haul and dispose of was water**. Further, National Beef wasn't dealing with your typical sludge. In addition to fats and hair, the sludge contains significant amounts of chromium and other chemicals. Only one facility in the United States has the capabilities to deal with this waste. That facility is located half way across the country in California.

The Hydro MicroScreen is able to reduce TSS, COD, and VSS in their wastewater which is expected to reduce their oxygen requirements for COD oxidation by 11-12% and ammonia was reduced by 33%. An even bigger savings was realized in sludge handling, hauling and disposal costs. The Hydro MicroScreen has **reduced chemical used for sludge processing by \$2000 per month** by discharging solids with as much as 40% total solids **without the use of chemical, cutting transport and disposal**

Benefits

- Improved primary treatment
- Reduce TSS, COD & ammonia loadings to the lagoons
- Reduce overall aeration requirements
- Reduce primary sludge disposal costs
- No need for additional processing of primary solids
- Easy retrofit
- Reduced capital and O&M costs for the facility

costs literally in half. The Hydro MicroScreen removes and processes a whopping 26 tons per day of material on average.

"The Hydro MicroScreen literally saves us several million each year in hauling costs compared to hauling contaminated materials."

National Beef Leathers Engineering Department



Compressed & dewatered tannery solids can be landfilled rather than discharged to biological processes or the sewer.

Piloting Leads to Permanent Installation

One (1) MS-28 Hydro MicroScreen system pilot unit was tested at the St. Joseph's facility and confirmed the outstanding performance of the Hydro MicroScreen system in NBL's demanding application. After the pilot system's success NBL installed three MS-80 Hydro MicroScreen systems and that have been improving their operations and reducing their costs ever since.

"The installed Hydro MicroScreens reduced ammonia by 33%, chemical use by \$2000 / month and about 50-60% of the secondary sludge load off of the primary clarifiers."

National Beef Leathers Engineering Department

Installed MS-80 Hydro MicroScreen Plant Benefits

Avg TSS % Reduction	Avg COD % Reduction	Avg VSS % Reduction	Avg % TS
53%	38%	50%	30%
* 02 Reduction is the amount of oxygen required for COD oxidation			

Hydro MicroScreen Advantages

Not all MicroScreens are the same. The Hydro MicroScreen has been designed with the end user in mind. A few of the many differentiators of the Hydro MicroScreen include:

- Adjustable pneumatic shroud seal eliminates bypass
- Fully draining effluent chamber eliminates sediment build-up and simplifies service and maintenance
- Screen isolation plate keeps conveyor, bearings and sprockets out of effluent resulting in cleaner filtrate, no solids carryover and improved bearing life. The belt stays cleaner and lasts longer
- Much larger diameter auger easily handles significantly larger solids volumes



Tannery Screenings



Installed System Operating at National Beef