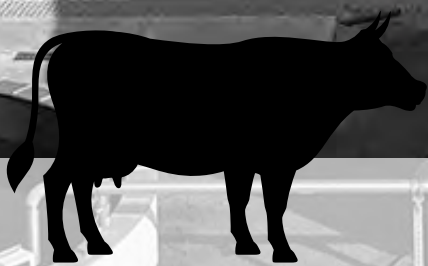




# WASTEWATER TREATMENT FOR THE MEAT INDUSTRY

ELIMINATE SURCHARGES | REDUCE OPERATING COSTS  
REUSE WATER | RECOVER VALUABLE RESOURCES



Water, a critical resource

Where does meat processing wastewater come from?

Smart Plant Philosophy

Your challenges and the Nijhuis solution

SOLID SOLUTIONS IN A FLUID WORLD

# WATER, A CRITICAL RESOURCE



## Eliminate Surcharges | Reduce Operational Costs | Reuse Water | Recover Valuable Resources

Nijhuis Industries is the specialist that will reduce or eliminate **your wastewater discharge surcharges**, reduce costs you encounter for incoming potable water, and organic wastes disposal all while being **compliant with local regulations**.

To realize the above, Nijhuis provides for opportunities to **Reduce** your water usage and operating costs, **Reuse** the water where possible, and we will **Recover** valuable resources from the water like heat, fats for bio fuel, biogas or electricity to **Reduce the environmental footprint**.



## How to realize?



**Step 1:** A site survey.



**Step 2:** A report with recommendations for a solution.



**Step 3:** Design and build the appropriate treatment plant solution while considering total cost of ownership (TCO)



**Step 4:** Operational services for the lifecycle of the plant.

The recommendations and information contained in this document will provide the industry with on **how to save on wastewater disposal costs**, and how to implement innovative solutions. Nijhuis Industries innovative, adaptive and solid water solutions for the meat industry have been installed all around the globe, from the US to Chile, from Europe to South Africa and to Asia-Pacific, all while helping to create a **sustainable** and **resilient** future.



**CEO Menno M. Holterman, on behalf of the Nijhuis Industries team**

# TYPICAL WATER FACTS



Where does meat processing wastewater come from?



A Pork processor uses 60-120 Gallon / (0.2-0.4 m³) per head.



For beef/pork a rule of thumb is 0.5-1 Gallon (2-4 litre) per pound of meat.



A broiler processor uses 3.5-10 Gallon (0.01-0.04 m³) per head. For poultry a rule of thumb is 0.3 Gallon / 1 litre per pound of meat.

“A typical beef processing plant uses 150-450 gallon (0.5-2 m³) per head ”

## Water streams:

- Live animals (receiving area) water from Pens / Truck washing
- Slaughtering
- Cut up
- Further processing / packaging (seasoning, cooking, frying)
- CIP / cleaning shift

## Type of water:

- Manure/Litter, bedding material, sand
- Blood, hair/feathers, meat
- Meat, fat, bone fragments
- Fat, cooking oils, tarch meat
- Cleaning agents + combination of above wastes

## Solid waste streams:

- Meat / organic wastes
- Fat wastes from primary treatment

## Type of solids:

- Typically 30% dry solids | **potential energy resource!**
- Typically > 20% dry solids | **potential energy resource!**

## Meat market trends affecting water management, processes and footprint

Stricter environmental regulations / water treatment facility reaches end-of-life



Sufficient amount of **fresh water** for the facility to fulfill e.g. production expansion



Efficient pre-rinse to reduce water consumption



Higher water consumption due to production expansion



Different types of meat requires **adaptable cleaning processes**, which results into fluctuations in wastewater pollution



# SMART PLANT PHILOSOPHY



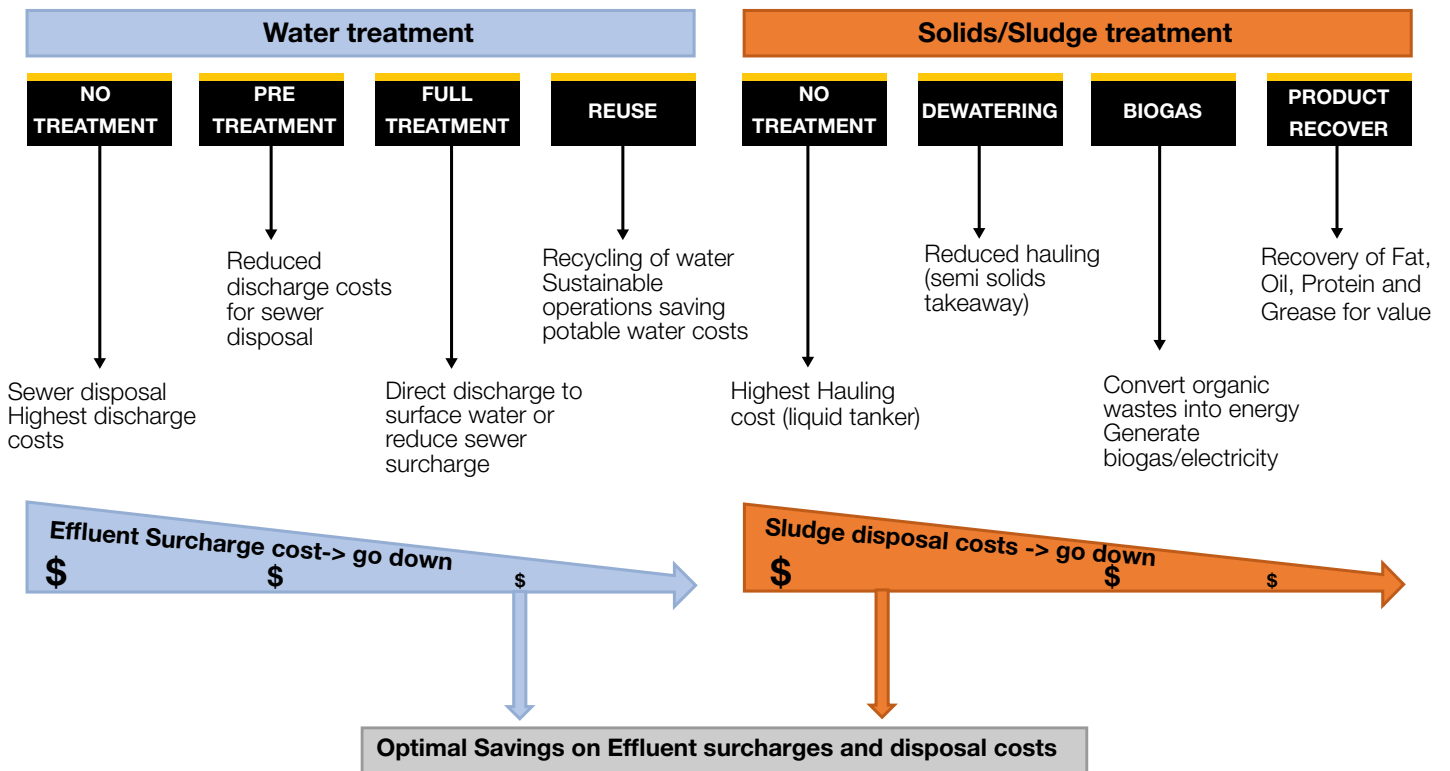
**Eliminate Surcharges | Reduce Operational Costs  
Reuse Water | Recover Valuable Resources**

In order to bring down current surcharge cost, investments need to be done in technologies. Typical savings we see are in the range of 50-90% on discharge cost. We saved to some meat processing companies hundreds of thousands of dollars in environmental surcharges. The DAF (dissolved air flotation) technology is a first step to reduce TSS, Fat, Oil and Grease surcharges, a system commonly referred to as “pre-treatment”.

If you are going for “Full” treatment in order to remove organics (BOD, Nitrogen), biological treatment is required. Now the effluent can be discharged to surface water or are used as possible irrigation water and can eliminating surcharge costs.

## A best fit for your application














Nijhuis offers a variety of meat processing wastewater solutions allowing you to realize a customized solution best fit for your application. In the diagram you can see the effect of water treatment stages on your current surcharge costs and also the effect of further managing the solids/sludges.



# YOUR CHALLENGES AND THE LATEST INNOVATIVE SOLUTIONS













## Reduce challenges

Challenge	Solution	Benefit	Reference example
<p>Reduce effluent surcharge - step 1</p> 	Screens / Dissolved Air Flotation (i-DAF)	\$ >50-90% discharge savings, effluent compliance for primary treatment of FOG, TSS and COD removal	
<p>Reduce effluent surcharge - step 2</p> 	Aerobic (BIOCTOR) and Anaerobic Treatment (AECOMIX™)	\$, produce direct discharge quality effluent low in BOD and nutrients	
<p>Reduce potable water consumption</p> 	i-CONSULT	\$, Less intake/ discharge cost	
<p>Reduce chemical consumption</p> 	Intelligent dosing (i-DOSE)	Up to 30% chemical dosing reduction, Automatic process control	
<p>Reduce land application/ Landfill</p> 	Screw Press (NSP)	Remove free and bound water from sludges, reduces hauling/disposal costs	 <span style="background-color: yellow; border-radius: 50%; padding: 2px 5px; font-size: 0.8em;">&gt;20% dry solids</span>
<p>Control Nitrogen and Phosphorus</p> 	Ammonia Recovery (AECO-NAR)	More than 80% ammonia recovery into Green Mineral Nutrients	
<p>Wastewater emergency / Temporary solution / Outsource plant operation</p>	Rental Solutions and Online Monitoring	Effluent compliance, less man power	

# YOUR CHALLENGES AND THE LATEST INNOVATIVE SOLUTIONS



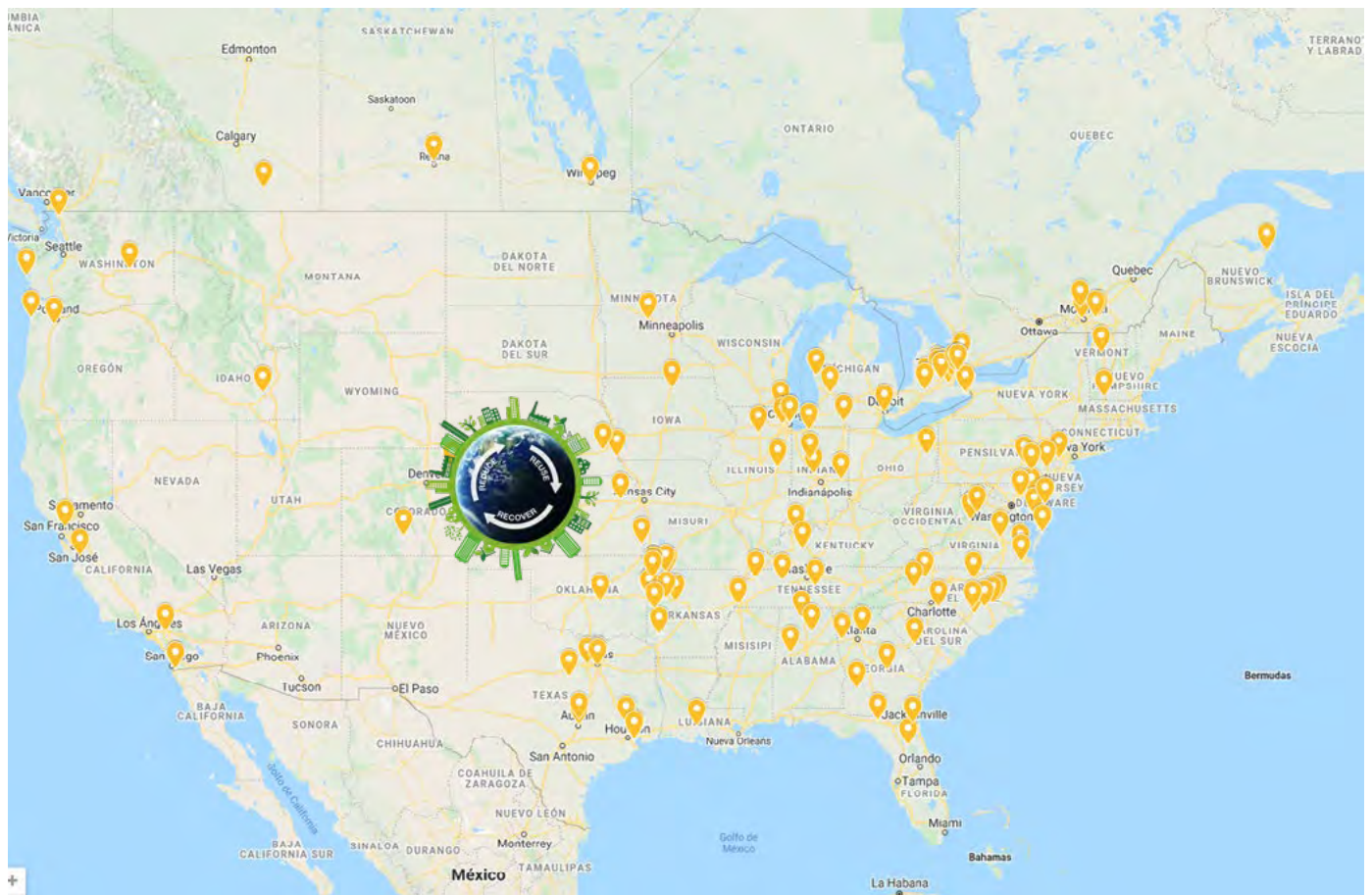
## Reuse and Recover challenges

Challenge	Solution	Benefit	Reference example
Turn WWTP effluent into irrigation water or drinking water quality for in-house purposes 	Sand Filter (i-CSF), Carbon Filter (CarboPure), Membrane Systems (NMS), Disinfection (NUV/NOS)	\$, Less intake costs, reduce water footprint, reduce environmental footprint	 1.05 mgd / 4000 m <sup>3</sup> reuse per day
Prevent bacterial growth and legionella in cooling towers and other heat/cold water services 	Ozone (NOS), Bio Organic Catalyst (BOC), Electrodeposition, chemical-treatment	\$, Less blow-down, Prevent legionella, Environmental compliance	
Fat/Oils Recovery + sludge / chemical reduction 	Fat recovery (AECO-FAT)	\$, Recover free fats, oils and grease for revenue Generate biofuel, reduce environmental footprint, reduce sludge and chemical consumption	 50% less chemicals 50% less sludge
Recover biogas out of waste streams 	Anaerobic digestion (AECOMIX™)	\$, Generate gas /electricity, reduce environmental footprint	
Ground water / well water treatment for facility purposes 	Tertiary i-DAF, Sand Filter (i-CSF), Carbon Filter (CarboPure), Membrane Systems (NMS), Disinfection (NUV/NOS)	\$, Less intake costs, reduce water footprint, reduce environmental footprint	

# CONTACT US FOR A SITE SURVEY



“ **More than 200 meat clients** have implemented Nijhuis **wastewater** treatment, resource recovery and sludge management **solutions** ”



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