PILOT PROJECT REQUEST:

An Alternative to Current Dairy Waste Treatment

Despite their efforts, Dairy Farmers continue to be criticized as a leading contributor to poor water quality.

PROPOSED PILOT PROJECT: ADVANCED DISTILLATION SYSTEM FOR DAIRY WASTE

We request $3M to design, fabricate, and implement an Advanced Distillation Pilot Project at a Puget Sound dairy that uses Vapor Recompression Distillation (VRD) technology to turn liquid manure into clean water, nitrogen-rich fertilizer, and pathogen-free solids. Once in production, we expect subsequent per unit cost at $500k to $750k – a significant savings for most farmers when compared to current manure management technologies in use today. This project will also quantify other benefits, to include:

- **MONEY SAVED** by farmers due to recycled water use, reduced transportation & pumping costs,
- **EFFICIENCIES ACHIEVED** for growers due to the use of a concentrated, N-rich fertilizer,
- **REVENUE GENERATED** by growers due to the use of a pathogen-free, organic fertilizer,
- **POSITIVE IMPACT** to salmon & shellfish habitats due to improved water quality,
- **REDUCED WASTE VOLUME** for farmers to handle—waste is processed into consolidated outputs.

PUGET SOUND CONSERVATION PARTNERS, NATIVE TRIBES, & DAIRY FARMERS are working together with JANICKI BIOENERGY to harness and pilot VRD technology to turn liquid manure into:

1. *Clean, pathogen-free* **WATER**, *which can be recycled for on-farm purposes (animal drinking water, flush water, or irrigation).*
2. *Concentrated, pathogen-free* **NITROGEN-RICH FERTILIZER** *for use on-site or as an exportable, trans-portable product.*
3. *Pathogen-free, dry* **SOLIDS**, *which can be used as bedding, a nutrient-rich soil amendment, or a fuel source for energy production.*

WASHINGTON DAIRY INDUSTRY

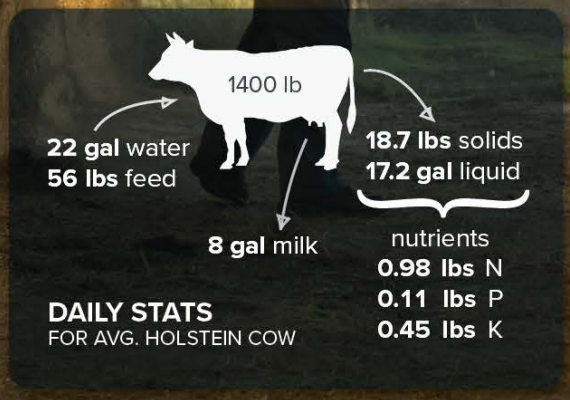
Twenty-Seven Washington Counties Providing Jobs & Supporting Communities

2ND Largest Agricultural Commodity in WA

4TH In U.S. Cow's Milk Production

10TH In Total U.S. Milk Production

$5.2B In Annual Economic Impact



"A sustainable regional bread basket is critical to Puget Sound's economy, health and environment. We have an opportunity for a science-based and cost-effective way of dealing with manure waste—helping farmers create new revenue, recover valuable resources, eliminate pathogens, and improve water quality for at-risk salmon and shellfish."

—Jessie Israel
Director, Puget Sound Conservation
The Nature Conservancy

PHOTO CREDIT: ©Bridget Besaw

	STORAGE LAGOONS	ANAEROBIC DIGESTION	VRD TECHNOLOGY
KILLS PATHOGENS	✗	✓ 90%	✓ 100%
PRODUCES CLEAN WATER	✗	✗	✓
ELIMINATES RISK OF NUTRIENT & BACTERIA LEACHING OR RUN-OFF	✗	✗	✓
SEPARATES NITROGEN INTO A CONCENTRATED FERTILIZER	✗	✗	✓
PRECISION APPLICATION: Allows for precise, site-specific, variable rate application of Nitrogen to fields.	✗	✗	✓
ENERGY RECOVERY POTENTIAL (Electricity, Heat)	✗	✓	✓
REVENUE GENERATION & COST-SAVINGS POTENTIAL	✗	✓	✓
UNSUSCEPTIBLE TO BIOLOGICAL UPSET CONDITIONS	✗	✗	✓
HIGHER AIR QUALITY & LOWER ODOR	✗	✓	✓

FLOW OF PROPOSED VAPOR RECOMPRESSION DISTILLATION PROCESS:

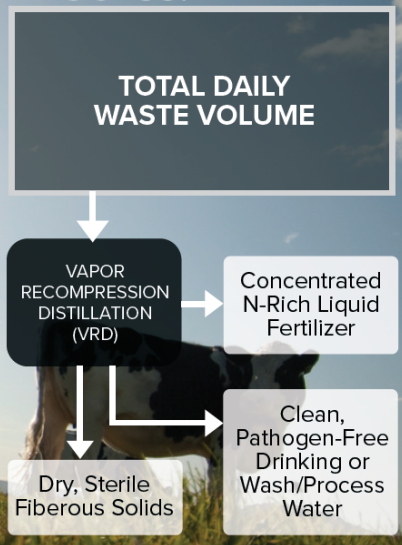


PHOTO CREDIT: ©Bridget Besaw

IN SEARCH OF A BETTER WAY

THE PROBLEM: Puget Sound dairies generate large amounts of manure and must make costly investments in traditional handling solutions. Even with these costly investments, dairies are criticized as a leading contributor to surface and ground water contamination.

TWO IMPERFECT OPTIONS:

1. STORAGE LAGOONS: Manure is collected, combined with wash and process water and pumped to storage lagoons until safely applied to fields as a fertilizer when the crops need the nutrients. Usually, little to no treatment happens prior to lagoon storage, and its contents remain contaminated by high levels of fecal coliform bacteria. Rain further dilutes the manure, adding as much as 2 to 5 times the volume of water to these lagoons. If improperly managed, manure stored in these lagoons can contaminate both surface and ground water with nutrients and pathogens.

2. ANAEROBIC DIGESTION: Used on a small number of dairies, anaerobic digesters are effective at producing biogas, but do not completely eliminate fecal coliform bacteria nor provide nutrient recovery. They also require significant capital investment. Farmers generate limited income by combining other organic waste materials with the manure, which can significantly increase the amount of nitrogen and phosphorus produced when compared to manure alone. These added nutrients often force farmers to acquire more land and lower application rates in order to balance these additional nutrients with crop production—adding considerable time, effort and expense to the farmers' bottom line.

SUPPORTING PARTNERS

FOR MORE INFORMATION:

CONTACT:
JAY GORDON
Washington State Dairy Federation
jay@wastatedairy.com
360-482-3485 office
360-951-8419 cell

VISIT:
allianceforpugetsound.org

Alliance for Puget Sound Natural Resources

Stillaguamish Tribe of Indians

The Nature Conservancy

Washington State Conservation Commission

American Farmland Trust

JANICKI BIOENERGY

NORTHWEST DAIRY ASSOCIATION
PROUD OWNERS OF DARIGOLD SINCE 1918

Washington State Dairy Federation