



TECHNOLOGY PROVIDER TECHNOLOGY INFORMATION REQUEST

Technology/Service: Vaughan Company Inc. - Chopper Pumps

Information by: Carl Edem

Date: March 22, 2019

COMPANY INFORMATION

Company: Vaughan Company, Inc.

Phone: (360) 249-4042

Web Site: <http://www.chopperpumps.com/>

Address: 364 Monte-Elma Road

City: Montesano

State: Washington

Zip Code: 98563

TECHNICAL CONTACT

Name: Carl Edem

Phone: (360) 249-4042

Email: carl@chopperpumps.com

Address: 364 Monte-Elma Road

City: Montesano

State: Washington

Zip Code: 98563

DEMONSTRATION SITE CONTACT

Site Name: TBD

Contact: Carl Edem

Title: Ag Specialist

Phone: (360) 249-4042

Email: carl@chopperpumps.com

Address: 364 Monte-Elma Road

City: Montesano

State: Washington

Zip Code: 98563

INITIAL TECHNOLOGY OVERVIEW

This information is to guide in the development of a more specific and detailed Technology Information Request. Please answer the following questions for each Technology or Service Provided.

What is the name of the technology or service you provide?

The Vaughan Chopper Pump is a centrifugal pump with the unique ability of chopping all incoming solids prior to pumping. This not only protects the pump from clogging, but also provides added benefit to downstream components, processes, and the environment.

Describe how this technology is used in a larger Nutrient Management System. Please be as detailed as possible.

Jim Vaughan invented the first chopper pump back in 1960, after working on local dairymen's pumps in his repair shop and realizing the need to "chop" the solids to avoid clogging while pumping. Since then, Vaughan chopper pumps have been successfully applied on dairies where high reliability and low maintenance are required. Applications for Vaughan chopper pumps on dairies included: pumping manure from barn flush pit to lagoon storage or solid-liquid separators and anaerobic digesters, etc.

How many systems do you have installed on dairy farms or other livestock operations?

SYSTEMS

NUMBER OF SITES

SIZE OF INSTALLATIONS

Dairy

More than 425 different dairies since 2000

75 to 20,000+ cows

Pork	More than 5	Unknown
Poultry	More than 7	Digester operations

What's the smallest and largest farm using your system?

75 to 20,000+ cows

Does this technology have a 12-month record of reliable performance on at least three dairy farms?

Yes, on multiple dairies

Do you have a preferred region or area for the location of projects?

Worldwide

Input and output of your unit/system – do you have a mass balance analysis?

If a mass balance is available, please include below or attach as a separate document.

The Vaughan Chopper Pump is a centrifugal pump with the unique ability of chopping all incoming manure and organic substrates prior to pumping the output to the next manure handling step (e.g., lagoon storage, digester, etc.)

Input material description and characteristics:

For example: raw manure, digestate, screened digestate, suitable non-farm feedstocks, other.

Scraped manure, digestate, screened digestate, biowaste, food waste including fats, oils and grease

Does the technology treat the full manure stream for a farm or a fraction of the stream?

Treats the full manure stream

Do you consider this a mature system or ongoing farm development?

A mature technology with thousands of agricultural/dairy installations worldwide

Any weather constraints? Yes ☐ No ☒ *If so, please describe.*

Any bedding constraints? Yes ☐ No ☒ *If so, please describe.*

Sand needs to be separated before being pumped.

Output material description and characteristics:

Please include the % of the total stream for each material, i.e. 10% fiber and 90% screened liquid by weight.

The Vaughan chopper pump is a centrifugal pump with the unique ability of chopping all incoming solids prior to pumping. No change in moisture content of the pumped material.

Do the Outputs of the process have a resale market identified? Yes ☐ No ☒

If so, under what brand name or who is the contract with?

Is this process scalable and to what extent (top and bottom limits)? Yes ☒ No ☐ *If so, please describe.*

The chopper pump system is scalable to any project requirements

Do you have a known scaling factor? Yes ☐ No ☒ *If so, please describe.*

Does this technology require any air input? Yes ☐ No ☒

What is the preferred air connection? For example: psi, fitting size, air quality.
If not distributed by the system, please list each connected device.

Does this technology require any water input? Yes ☐ No ☒ If so, please describe.

What is the preferred water connection? For example: psi, fitting size, water quality, gpm.
If not distributed by the system, please list each connected device.

Does this technology require any electrical input? Yes ☒ No ☐ If so, please describe.

What is the preferred electrical connection? For example: phase #, voltage, full load amps.
If not distributed by the system, please list each connected device.

Three-phase, 240, 480 and 575 volt

Does this technology require any mechanical input? Yes ☐ No ☒ If so, please describe.

What is the preferred mechanical connection? For example: horsepower, connection, rpms.
If not distributed by the system, please list each connected device.

Does this system require any special plumbing? Yes ☐ No ☒ If so, please describe what is required.

Does this system require any special foundations or pads? Yes ☐ No ☒ If so, please describe.

Do you consider this technology part of a larger system that you provide? Yes ☐ No ☒ If so, please describe.

Does your system require any other components that you do not provide or are not included in your proposal? Yes ☐ No ☒
If so, please describe.

How is the system delivered to the site? For example: skid mounted, assembled on site, constructed on site.

Skid mounted, delivered to site.

Is this system portable or configured in such a way that it could be easily transported for use in several locations?
Yes ☒ No ☐ If so, please describe.

Vaughan offers portable chopper pumps for agricultural applications

Has your technology been accepted by the NRCS and is it included into a practice standard? Yes ☒ No ☐
If so, please describe if necessary.

Are there any unusable or hazardous byproducts of this process? Yes ☐ No ☒
If so, please describe the product and recommended means of disposal.

What spare parts and redundant components are included with the system?

Vaughan maintains a multi-million dollar parts inventory of all production and wear parts for expedited delivery of both pumps and parts, including many custom orders.

How is the system controlled and what are the components and capabilities of the control system?

Simple systems are controlled with float switches and motor starters. More complicated systems use sensors, PLC controller mounted integrated control panel. All controls are supplied by the dealer or local Electric shop.

What is the usable life of the system?

Twenty years

What is the salvage value at the end of the usable life?

Minimal

What is the educational and technical level of competence for the operation of the system?

Trained labor should be able to operate the system, including routine maintenance

What level of maintenance is required for the system?

Please indicate if rebuilds or major components must be replaced and what the frequency is for these components.

Component parts require maintenance and replacement per maintenance schedule. Daily inspections and periodic response to system upsets are required

Are consumables used in the process? Yes ☐ No ☒

Please provide the nature and purchase relationship for these consumables. For example: proprietary, special contract, generally available.

Which of these NRCS codes would your technology be classified under? Check all that apply. Add if necessary.

CODE	NRCS DESCRIPTION	CHECK ALL THAT APPLY
472	Access Control	<input type="checkbox"/>
560	Access Road	<input type="checkbox"/>
309	Agrichemical Handling	<input type="checkbox"/>
371	Air Filtration and Scrubbing	<input type="checkbox"/>
591	Amendments for the Treatment of Agricultural Waste	<input type="checkbox"/>
366	Anaerobic Digester	<input type="checkbox"/>
672	Building Envelope Improvement	<input type="checkbox"/>
372	Combustion System Improvement	<input type="checkbox"/>
317	Composting Facility	<input type="checkbox"/>
554	Drainage Water Management	<input type="checkbox"/>
375	Dust Control from Animal Activity on Open Lot Surfaces	<input type="checkbox"/>
373	Dust Control on Unpaved Roads and Surfaces	<input type="checkbox"/>
374	Farmstead Energy Improvement	<input type="checkbox"/>
512	Forage and Biomass Planting	<input type="checkbox"/>
561	Heavy Use Area Protection	<input type="checkbox"/>

516	Livestock Pipeline	<input type="checkbox"/>
590	Nutrient Management	<input type="checkbox"/>
521A	Pond Sealing or Lining, Flexible Membrane	<input type="checkbox"/>
533	Pumping Plant	<input type="checkbox"/>
588	Roof Runoff Structure	<input type="checkbox"/>
367	Roofs and Covers	<input type="checkbox"/>
318	Short-Term Storage of Animal Waste and By-Products	<input type="checkbox"/>
570	Stormwater Runoff Control	<input type="checkbox"/>
606	Subsurface Drain	<input type="checkbox"/>
635	Vegetated Treatment Area	<input type="checkbox"/>
601	Vegetative Barrier	<input type="checkbox"/>
360	Waste Facility Closure	<input type="checkbox"/>
632	Waste Separation Facility	<input checked="" type="checkbox"/>
313	Waste Storage Facility	<input type="checkbox"/>
634	Waste Transfer	<input type="checkbox"/>
629	Waste Treatment	<input checked="" type="checkbox"/>
359	Waste Treatment Lagoon	<input type="checkbox"/>
		<input type="checkbox"/>
		<input type="checkbox"/>
		<input type="checkbox"/>

Can you provide an estimate of the capital required for the installation of this technology?*Please include all components and designate if provided by you or others.*

Typical small farm pump is a V4K x 8 ft. long with a 10 HP @ 1800 RPM motor and a budget price is about \$9,500; typical pump on a medium sized dairy is a V6U x 10 ft. long with a 20 HP @ 1170 RPM motor and is about \$16,000; typical pump for a large sized dairy is a V8N x 14 ft. long with a 40 HP @ 1170 RPM and is about \$30,000. Final price with installation is dealer specific. Pump size range from 3 to 16 inches. Typical dairy size is 4 to 10 inch.

Can you provide an estimate of the operational costs required for this technology?*Please include all costs and designate if provided by you or others.*

Operation expense for parts in nominal for the first year or so. Wear is associated to grit in the system, speed of pump, efficiency point the pump operates at and run time per day.

Is there financing available for this system? Yes ☒ No ☐ *If so, what are the conditions for this financing?*

Equipment financing options are available through most Vaughan authorized equipment dealers

Is the system available for lease? Yes ☐ No ☒ *If so, please describe.*

What sort of warrantee or guarantee do you provide with this technology?*Do you provide any performance guarantees or strictly defects in parts and materials?*

All Vaughan chopper pumps are guaranteed in writing for performance and continuous operation without clogging, provided the pump is properly maintained. Vaughan standard warranty is 1 year on workmanship and materials.

Explain how this system is unique or transformative and how does it improve upon or go beyond other technologies that are currently available.

With 32 patents and over 20,000 units successfully installed worldwide, Vaughan chopper pumps are now utilized by all industries worldwide to handle the most difficult solids pumping applications. In the dairy industry, Vaughan chopper pumps are primarily used for manure pits and lagoons and are also available with recirculation nozzles for mixing.

Would you be willing to provide a location for a site visit by Newtrient? Yes ☒ No ☐ *If so, please provide location.*

TECHNOLOGY REFERENCES

Please provide customers with whom we can discuss this technology and its performance.

Include a company name, location, contact name and contact information.

Reference 1

Company Name:	Pikeside Ag Machinery
Company Location:	Gainesville, NY
Contact Name:	Ken Van Slyke
Contact Information:	kvanslyke.pikeside@gmail.com

Reference 2

Company Name:	Dairy Specialists
Company Location:	Evans, CO
Contact Name:	Scott Brown
Contact Information:	sbrown@dairyspecialists.com 970-330-1870

Reference 3

Company Name:	Braun Inc
Company Location:	St. Nazianz, WI
Contact Name:	Eric Eisner
Contact Information:	eeisner@braunelectricinc.com 920-773-2143

Reference 4

Company Name:	Ernst Irrigation
Company Location:	St. Paul, OR
Contact Name:	Mike Dolan
Contact Information:	miked@ernstirrigation.com 503-633-1111

Are there any other facts about this technology that you feel should be included in this document?

Dealer references upon request.