TECHNOLOGY PROVIDER

TECHNOLOGY INFORMATION REQUEST

Technology/Service:			
Information by:		**Date:**	

COMPANY INFORMATION

Company Name:	Vermont Organics Reclamation		
Phone:	802-528-8512	**Web Site:**	www.vermontorganics.com
Address:	PO Box 1128, 452 South Main St., 911 Wilder	**State:**	Vermont
City:	St. Albans	**Zip Code:**	05478

TECHNICAL CONTACT

Name:	Tim Camisa
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City:	St. Albans
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DEMONSTRATION SITE CONTACT

Site Name:	
Contact:	
Title:	
Phone:	
Email:	
Address:	
City:	
State:	
Zip Code:	

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?

Mobile Manure Management System (MMMS)

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

VOR's MMMS uses a large dewatering system which removes 20% of manure volume and 20% of P and N while reducing greenhouse gas emissions. The residual liquid fraction is returned to the manure pit for land application. Farmers are paid for the solids and VOR brings them to our facility for use in soil products.
This system requires little or no infrastructure at the farm. The standard MMMS configuration operates at over 1000 gpm. Stationary systems using the same technology can be installed at larger farms.

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

	Number of Sites	Size of Installations
Dairy	3	400-1000 Cows
Pork		
Poultry		

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

We would like to implement this system across the United States in dairy regions that are home to at least 3000 cows.

Location of farm(s)?

Franklin County, VT

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

400 cows is the smallest and 1000 is the largest. They are all permanent installations.

Input and output of your unit/system – do you have a mass balance analysis?
If a mass balance is available, please attach or include as a separate document.

Inputs and outputs vary widely depending on the size of the herd, style of dairy, and type of manure management. http://www.manuremanagement.cornell.edu/Pages/General_Docs/Papers/SLS_performance_eval_Gooch_etal_2005.pdf

Input material description/characteristics:
For example: raw manure, digestate, screened digestate, suitable non-farm feedstocks, other.

The system works on all common forms of manure whose water content exceeds approximately 80%. Minimum herd size is approximately 40 cows.

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

MMMS treats the full manure stream.

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

MMMS is a highly mature system with proven performance.

Any weather constraints? (●) **Yes** ( ) **No** *Please describe.*

The only possible limitation is extreme cold (cold enough to freeze manure and clog manure handling piping and equipment)

Any bedding constraints? (●) **Yes** ( ) **No** *Please describe.*

None, however price for manure solids will be adjusted as needed to offset additional wear on equipment for sand or other problematic bedding materials

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

There are two outputs from the system – dewatered solids (35% solids by weight) and the separated liquid (95%+ water by weight) which is returned to the manure pit.

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?

Yes. Solids will be incorporated into soil products marketed under the brand Vermont Organics Reclamation. In addition to local distribution VOR products are marketed and shipped through a national retail chain.

Is this process scalable and to what extent (top and bottom limits)? *Please describe.*

The system is infinitely scalable on the large side with a practical limit of a herd of approximately 40 cows on the small end.

Do you have a known scaling factor? *Please describe.*

Larger farms and farms that are closer together will be less expensive to service with MMMS, but the scaling factor will depend on many variables.

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 not apply

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 not apply

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.

Mobile units will be powered by 480V 3 phase generator. Stationary installations will require 240V minimum.

Does this technology require any mechanical input? ◯ **Yes** ◉ **No** *If so, please describe.*

No (all pumping and movement of solids for the mobile system are provided for. Stationary systems will include required mechanical systems).

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

Does not apply

Does this technology require any special plumbing? ◯ Yes ◉ No *Please describe what is required.*

In cold regions a reception pit configured as needed may be required.

Does this system require and special foundations or pads? ◉ Yes ◯ No *If so, please describe.*

Parking access for a heavy truck with direct access to the manure pit and liquids holding pit.

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

No, it is a complete stand alone system.

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.*

The MMMS system is complete and stand alone, and stationary systems will be designed to be complete.

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

The MMMS operates from a truck and trailer. Stationary systems will be built on site.

Is this system portable or configured in such a way that it could be easily transported for use in several locations?
◉ Yes ◯ No *Please describe.*

The MMMS system is fully mobile and can serve as many as 30 sites, depending on factors such as size of the herd and distances between farms.

Has your technology been accepted by the NRCS and is it included into a practice standard? ◉ Yes ◯ No
Describe if necessary.

Yes. Screw presses and stationary screens are common practice on dairy farms and qualify for cost sharing.

Are the 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?

The mobile system is fully maintained by the provider. Equipment used at fixed installations is all industry standard

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

The pumps, conveyors and screw press are operated from a single panel mounted on the trailer by experienced technicians.

What is the usable life of the system?

Any given vehicle will have a useful life of approximately ten years, but is itself a replaceable component of the system. Pits and piping on the farm will have useful lives of approximately twenty years. Screw presses for stationary systems will last approximately twenty years

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

The mobile components will have limited value as spare parts and scrap. The on-farm components will have limited or no residual value with the exception of screw presses at stationary installations.

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

There are no specific educational or technical competencies required for regular operations. Training consists of a brief apprenticeship. General competency with operations of heavy vehicles and moderately complex mechanical systems will be required as well as licensure for operation of vehicles. Fixed systems will be maintained by qualified technicians/mechanics.

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.

Mobile systems will be maintained by the service provider. Regular maintenance will be driven by standard daily and weekly system checks. Maintenance of permanent installations will be driven by similar checks. Broadly speaking, fluid levels should be monitored daily and tolerances should be monitored weekly.

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.

No. Grease and replacement parts will be required from time to time.

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

CODE	NRCS DESCRIPTION	APPLIES
472	Access Control	
560	Access Road	
309	Agrichemical Handling	
371	Air Filtration and Scrubbing	
591	Amendments for the Treatment of Agricultural Waste	
366	Anaerobic Digester	
672	Building Envelope Improvement	
372	Combustion System Improvement	
317	Composting Facility	
554	Drainage Water Management	
375	Dust Control from Animal Activity on Open Lot Surfaces	
373	Dust Control on Unpaved Roads and Surfaces	
374	Farmstead Energy Improvement	
512	Forage and Biomass Planting	
561	Heavy Use Area Protection	
516	Livestock Pipeline	
590	Nutrient Management	✓
521A	Pond Sealing or Lining, Flexible Membrane	
533	Pumping Plant	✓
558	Roof Runoff Structure	
367	Roofs and Covers	
318	Short-Term Storage of Animal Waste and By-Products	✓
570	Stormwater Runoff Control	
606	Subsurface Drain	
635	Vegetated Treatment Area	
601	Vegetative Barrier	
360	Waste Facility Closure	
632	Waste Separation Facility	✓
313	Waste Storage Facility	✓
634	Waste Transfer	✓
629	Waste Treatment	✓
359	Waste Treatment Lagoon	✓

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.

A standard mobile system (up to 30 farms) will have a capital cost of $440,000 (covered by the grant).

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.

Operating costs are deducted from the price paid to the farmer for manure. Operations should be cash positive at every stage for all farmers.

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

MMMS systems require no payment by farmers. Stationary systems can be leased from many providers

Is the system available for lease? ◯ **Yes** ◉ **No** *Please describe.*

VOR does not provide leasing services

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?

Does not apply to mobile system. Stationary systems will have warrantees from providers.

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

This appeal of this system is its simplicity and low cost when compared to alternative mechanized greenhouse gas abatement systems for manure. Farmers using the mobile service will have no capital outlay and get paid to participate. One set of equipment can serve as many as 30 farms, depending on variables such as herd size and distances between farms.

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:	
Company Location:	
Contact Name:	
Contact Information:	

Reference 2

Company Name:	
Company Location:	
Contact Name:	
Contact Information:	

Reference 3

Company Name:	
Company Location:	
Contact Name:	
Contact Information:	

Reference 4

Company Name:	
Company Location:	
Contact Name:	
Contact Information:	

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

The technology is extremely common and well understood. The packaging of technology, financing, and services are uniquely advantageous to farmers.