TECHNOLOGY PROVIDER
TECHNOLOGY INFORMATION REQUEST

Technology/Service:	Manure Lagoon Aeration		
Information by:	Mark Rennie	**Date:**	5/10/18

COMPANY INFORMATION

Company:	Khubeka Construction		
Phone:	+27 (0)44 874 1584	**Web Site:**	https://www.khubeka.co.za/
Address:	20 Ring Road, George Industria	**City:**	George
State:	Western Cape	**Zip Code:**	6536

TECHNICAL CONTACT

Name:	Mark Rennie
Phone:	+27 (0)44 874 1584
Email:	mark@khubeka.co.za
Address:	20 Ring Road, George Industria
City:	George
State:	Western Cape
Zip Code:	6536

DEMONSTRATION SITE

Site Name:	Langebaan wastewater treatment works, Saldanha Bay Municipality
Contact:	Mark Rennie
Title:	Mr.
Phone:	+27 (0)44 874 1584
Email:	mar@khubeka.co.za
Address:	Langebaan Waste Water Treatment Works: 33 degrees '54.31' S - 018 degree 03'50.05" E.
City:	Saldanha Bay
State:	Western Cape
Zip Code:	7357

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?

Bio-Aire™

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

Our unit enhances biological activity and aerates wastewater lagoons to reduce and eliminate GHG emissions, sludge and toxic chemicals. This produces clean clear effluent to discharge safely into our freshwater sources.

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

SYSTEMS	NUMBER OF SITES	SIZE OF INSTALLATIONS
Dairy	0	0
Pork	0	
Poultry	0	
Municipal	1	

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

Our system is scalable and can work with a small to large dairy farming operation

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

No

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

No

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.

A Mass Balance for the client can be done on a case by case basis

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

Input material is lagoon wastewater.

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

Fraction

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

Mature System

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

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

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.

100% Effluent within acceptable discharge limits

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?

Effluent can be used for irrigation purposes

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

The units are modular, we can scale to any size dairy farm

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

Our system will be designed on a case by case basis

Does this technology require any air input? **Yes** ☑ **No** ☐

Yes we supply a Ring Blower to supply air to our system

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

We supply the system to power our unit, no input from the client is required

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.

3 phase power supply, 10 amps, 230 volts (our system can be converted to suit the American standard power supply)

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.*

We require a small flat hard surface raised above ground for our units (preferably concrete)

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.*

Delivered and Assembled 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** ☐ *If so, please describe.*

Our system has been designed to be portable

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?

Filters for the Blower units

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

The system will be controlled by a small electrical panel, with a basic on/off, and breaker

What is the usable life of the system?

The system should be able to perform for 10 years with proper maintenance

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

None

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

The system has been designed to be used by basic labor, no highly trained staff are required, or specialized tools

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.

Components that require maintenance are:

1. Filter – Every 6months check and replaced if required
2. Aeration Harness – must be checked annually for blockages and leaks

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 consumables are used

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

CODE	NRCS DESCRIPTION (assuming the grinder is part of a manure digester system)	CHECK ALL THAT APPLY
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	☐
588	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.

Our current Estimate for a 800 cattle dairy farm with solids separation = $90,000 – 120, 000 depending on locality

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.

Our Current estimates for 800 cattle dairy farm with solids separation = $15,000 - $25,000 annually depending on involvement and cost of power

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

Financing and grant options can be discussed on a project by project basis

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

The system is not available for lease. However, third party build, own, operate business models can be considered

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?

We offer a 12month Warranty on the unit, with the blower for any defect due to mechanical failure, but not due to wear and tear, or user error

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

Our system, is cost effective and more efficient vs. other systems in its class, our system has been designed so that existing systems require no or very small changes to their current waste water pond system, saving the farmer money on upfront capital outlay for a treatment system

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

Langebaan WWTW

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:	George Municipality
Company Location:	George
Contact Name:	Jurie Jumat
Contact Information:	+27(0)82 633 7394

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?

We have done a successful Pilot of our system at the Gwaing WWTW, in George where we rehabilitated the existing WWTW polishing ponds.

We are also currently running trials with one of our units at a dairy farm in South Africa, that has 800 head of cattle, we have managed to reduce the COD demand of the effluent b 75% with only one of our units