Organic NPK Solutions Inc.

Box 226
Kipling, Saskatchewan
Canada
S0G 2S0

JUN 3

National Organic Program
Rm 2945-So., Ag Stop 0268
P.O. Box 96456
Washington, D.C.
U.S.A. 20090-6456
Attn: Keith Jones
Program Manager

Dear Mr. Jones:

Please except the attached documentation as our application to include **Ammonium** to the National List. We have previously sent a copy of this document through the mail, which you may or may not have already received. The organic industry as well as the environment will both gain from having this substance approved; since it is derived from organic sources (hog manure).

Although there are no distillation machines available in North America, the data has been gained from the Funki Manura machines that are currently operating in Europe. The development of this modern technology using a distillation process is new, however, the methodology has been around for approximately 2000 years. The distillation technique ensures the **Ammonium** remains organic.

The Hollovelt Report included in this petition was done by a private lab in the Netherlands. The N fraction is the product we wish to have on the list. The NPK fraction is not included in this petition

We have included a video that explains the Funki Manura process; it takes approximately 5 minutes to review. While we our new to this petition process, we want to confirm to you we are readily available to answer or research any questions you may have.

Sincerely,

Brian Tennant and Stasia Perkins

E-mail address: organicnpk@sasktel.net
Phone: (306) 736-2920
Fax: (306) 736-8392

Please accept this application of petition seeking evaluation of the nonsynthetic substance allowed for use in organic crop production.

Substance's common name: Ammonium

Manufacturer's name, address and phone number:

Organic NPK Solutions Inc.
Box 226
Kipling, Saskatchewan
Canada S0G 2S0

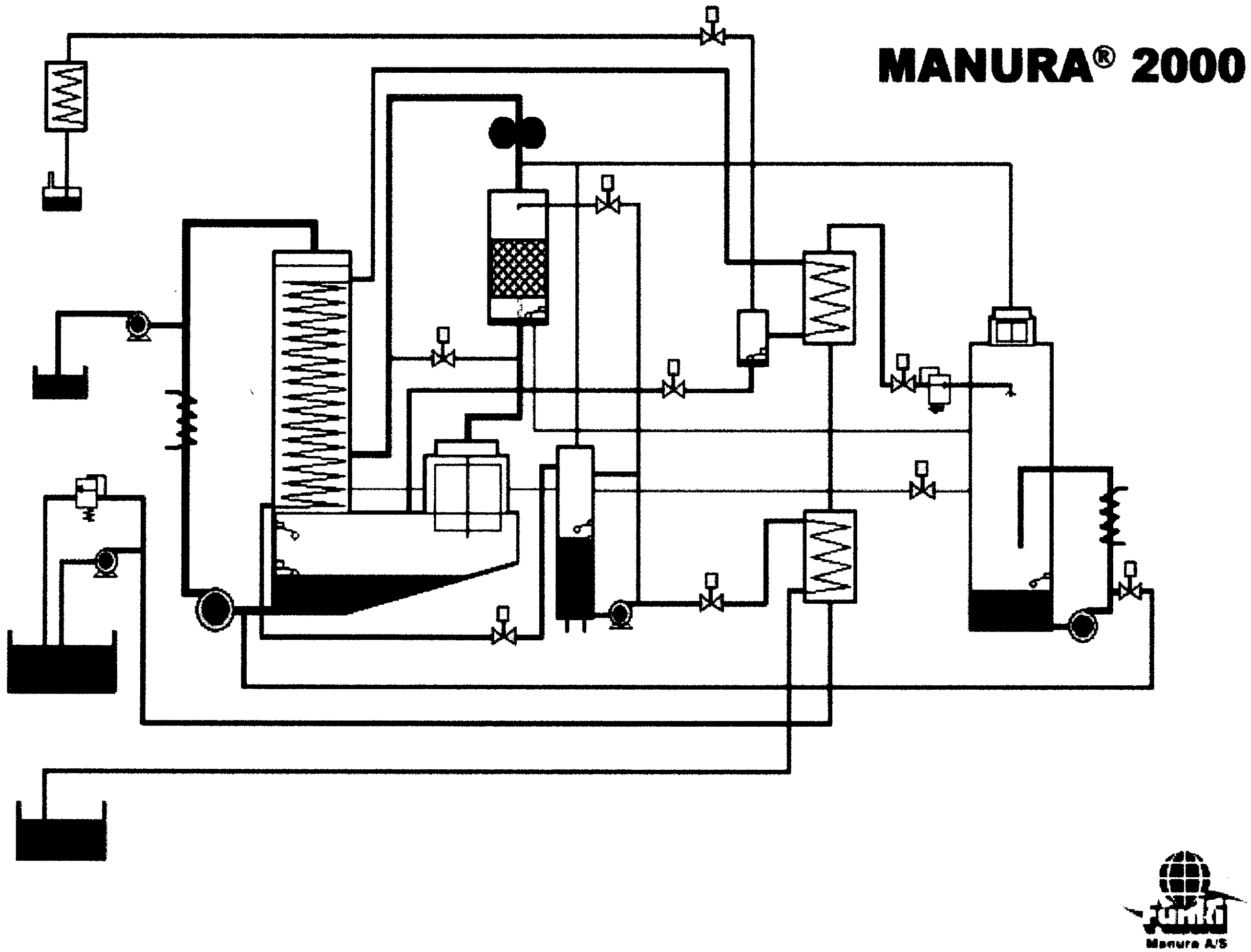
Phone no.:(306) 736-2920
Fax no: (306) 736-8392
e-mail address: organicnpk@sasktel.net

Intended use of the Ammonium: Organic Liquid Fertilizer

Use of Product and Method of Application:
Ammonium contributes to a healthy nitrogen cycle that is environmentally safe and efficient. When ammonium is used with best management practices, it contributes to long term soil health. The liquid organic fertilizer is to be banded or incorporated into the soil. Ammonium is a non-toxic form of liquid fertilization.

It is anticipated that ammonium will be used by farmers, who grow field crops ie: grain (cereal, oil seed and specialty crops), vegetable, fruit and nut growers.

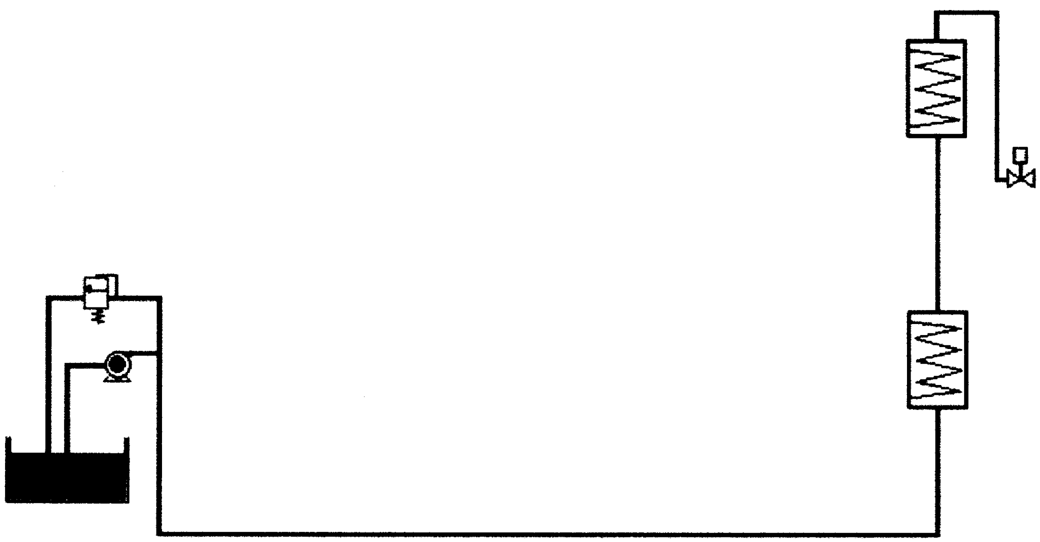
Flow Charts



NPK- concentrate

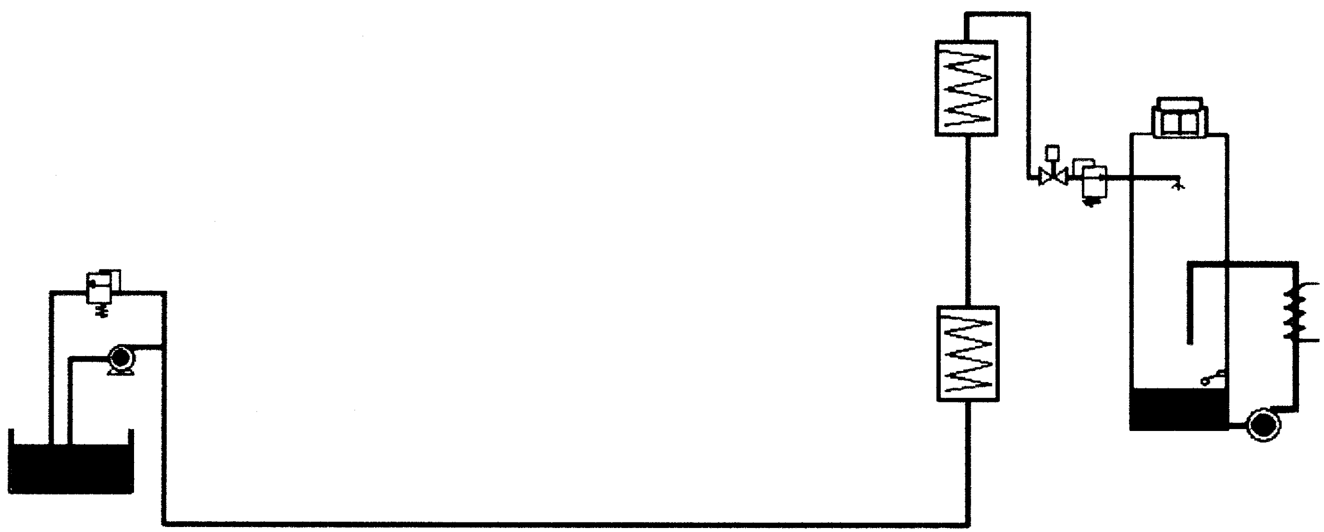
NPK- concentrate

- **Pre-heating**



NPK- concentrate

- Pre-heating
- Degassing

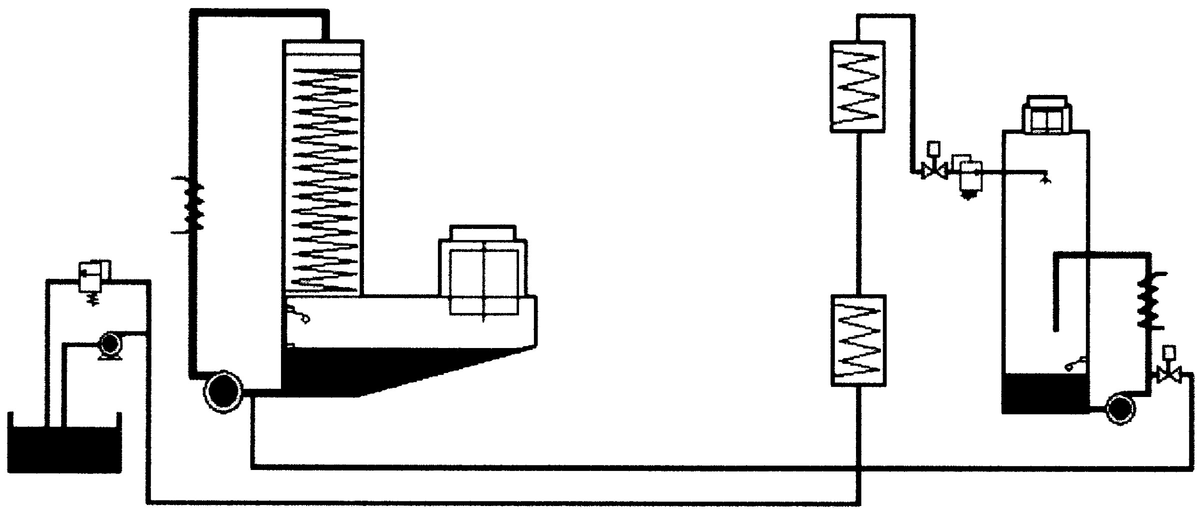


Manura A/S

30/05/2002

NPK- concentrate

- Pre-heating
- Degassing
- Dehydration

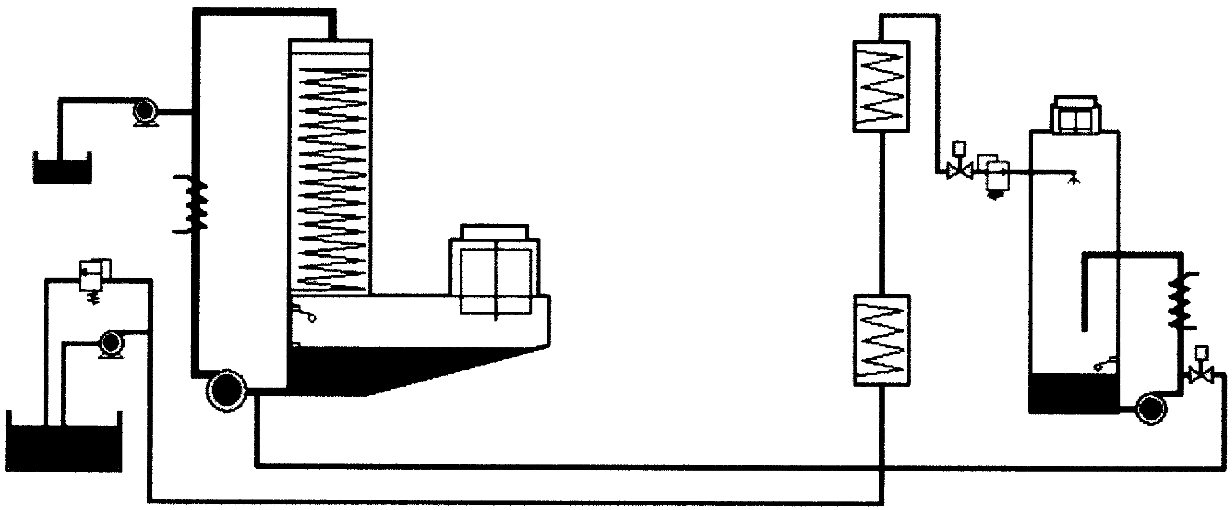


Manure A/S

NPK- concentrate

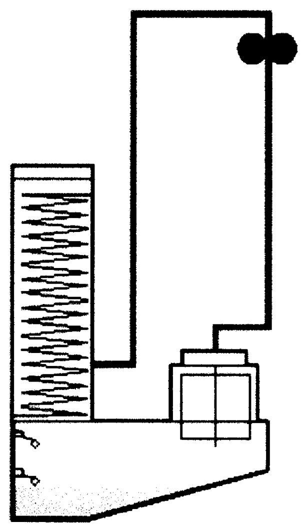
- **Pre-heating**
- **Degassing**
- **Dehydration**

→ NPK-concentrate



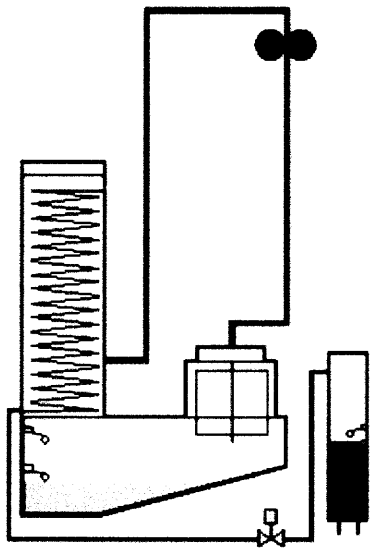
Water

Water



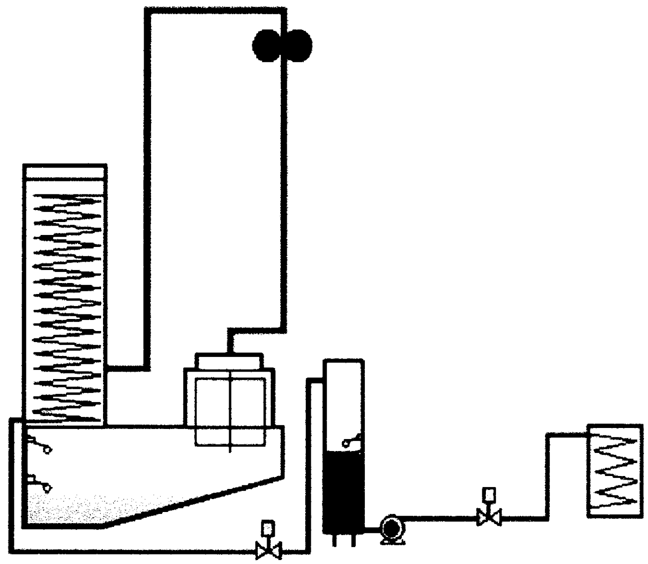
- **Evaporation and recompression**

Water



- Evaporation and recompression
- Condensation

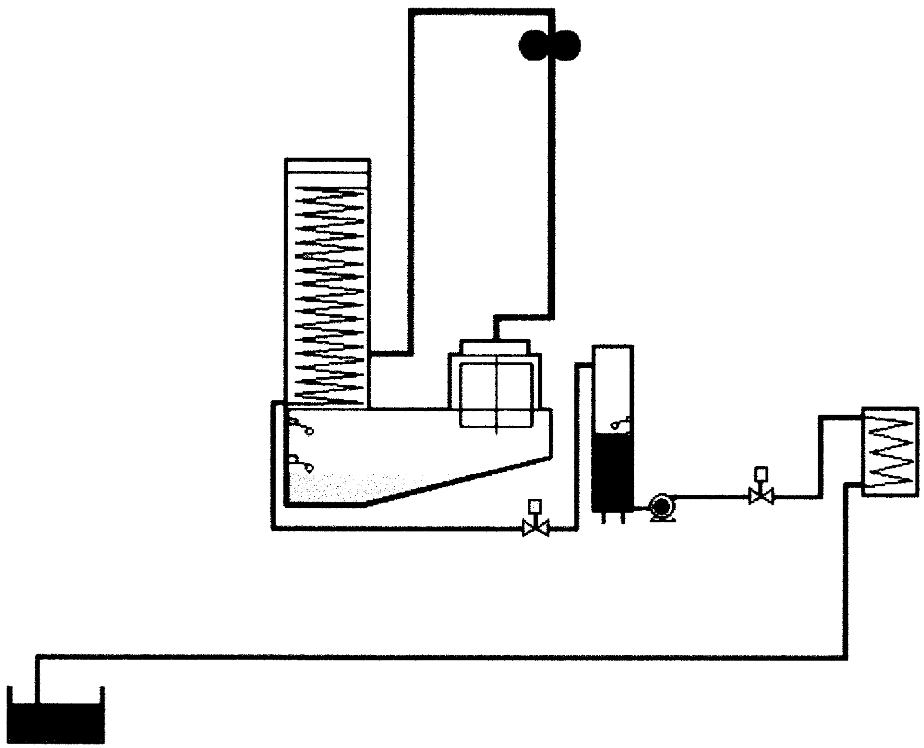
Water



- Evaporation and recompression
- Condensation
- Heat recovery

Manure A/S

Water



- Evaporation and recompression
- Condensation
- Heat recovery

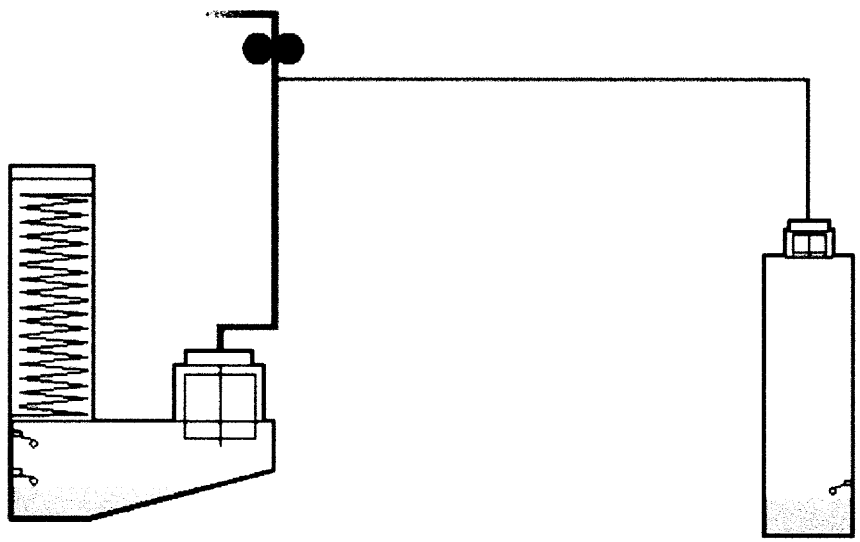
→ Water

N- concentrate

Manura A/S

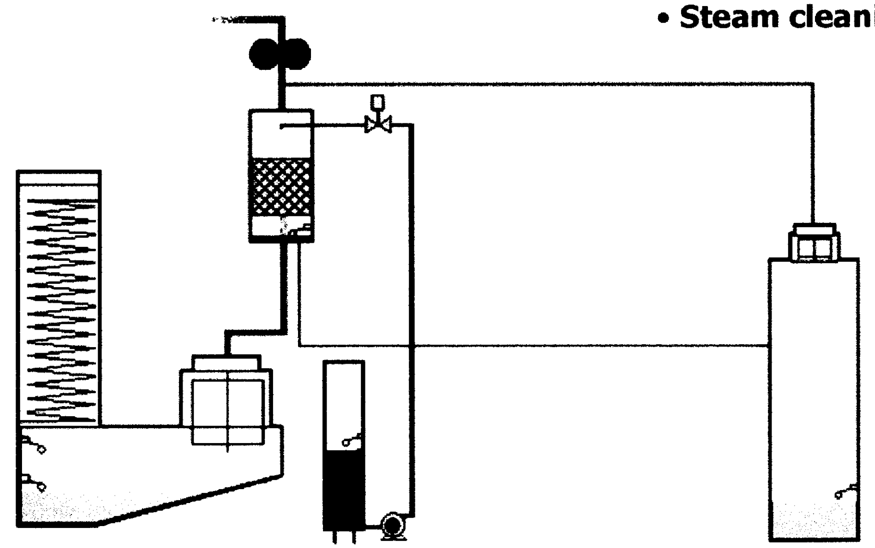
N- concentrate

- CO_2-degassing

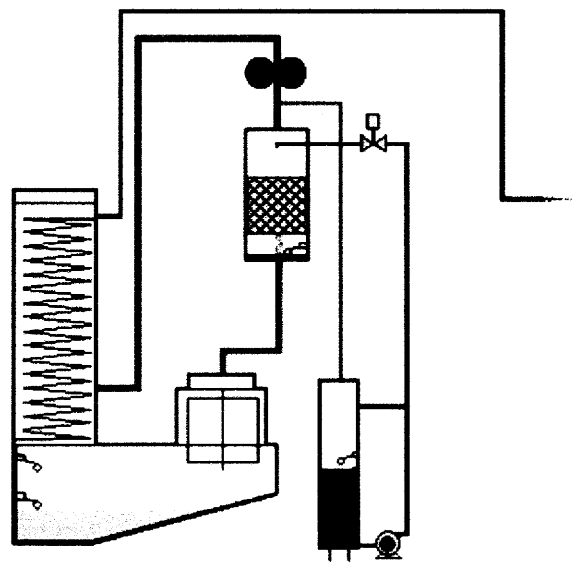


N- concentrate

- CO_2-degassing
- Steam cleaning

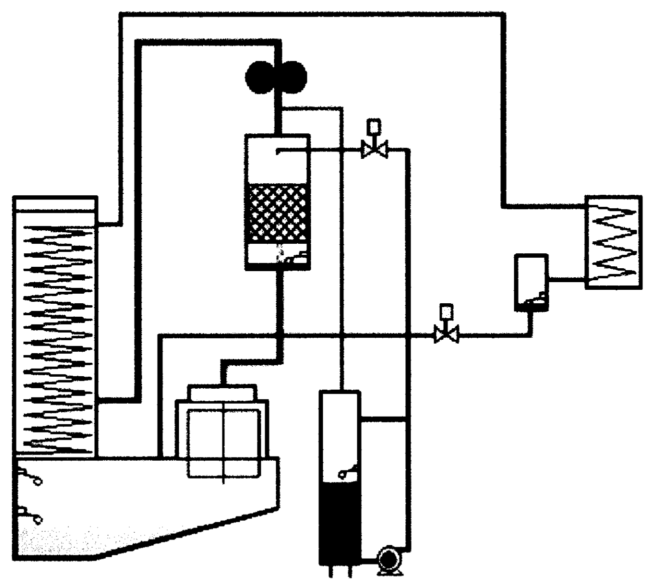


N- concentrate



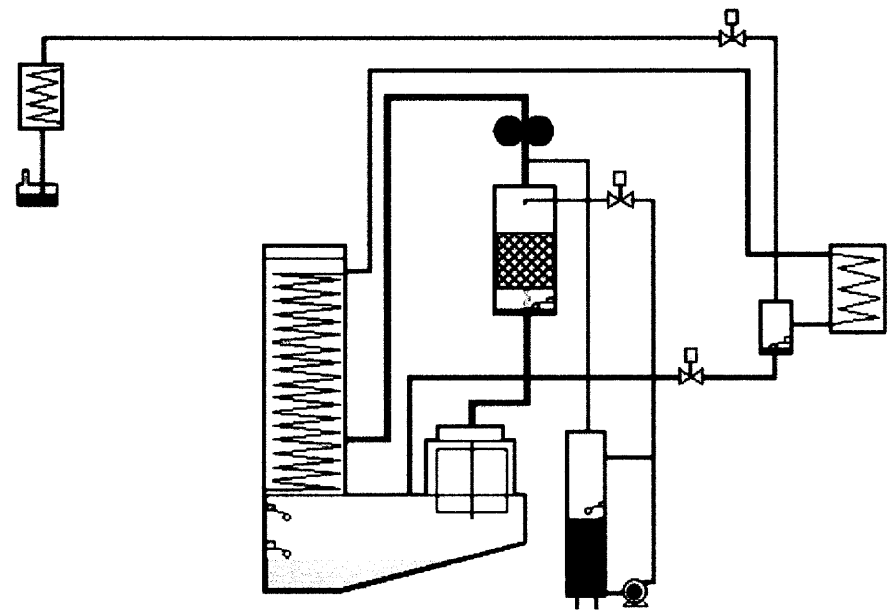
- CO_2-degassing
- Steam cleaning
- NH_3 blow off

N- concentrate



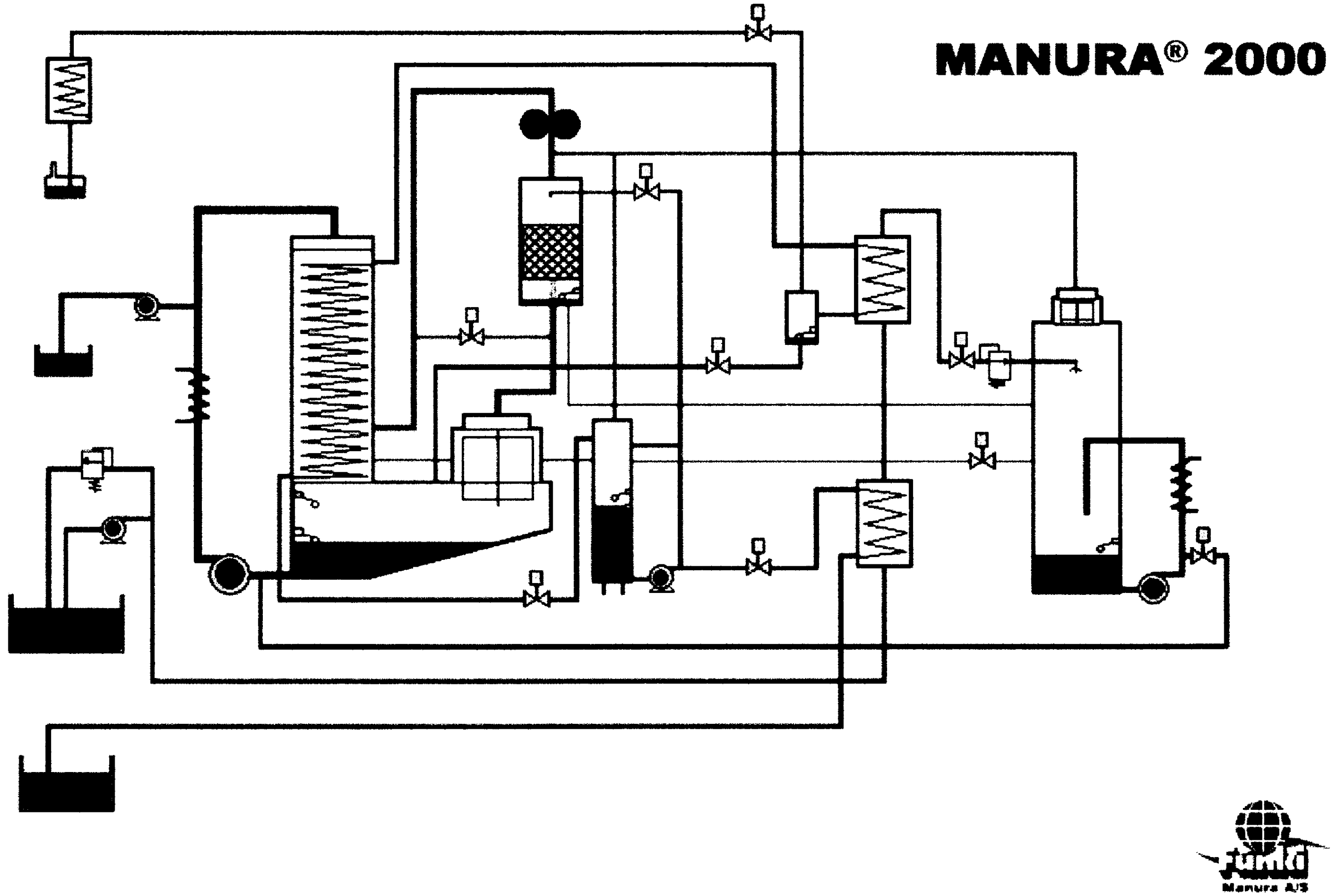
- CO_2-degassing
- Steam cleaning
- NH_3 blow off and discharging of NH_3 remains

N-concentrate



- CO_2-degassing
- Steam cleaning
- NH_3 blow off and discharging of NH_3 remains
- Condensation

→ N-concentrate


MANURA® 2000
Manura A/S

Processing Procedures:

Slurry Separation – how's it done?

With **MANURA® 2000**, Funki Manura A/S offers you a solution to the farmer's problem of liquid manure. The design is a combination of well-tried technology within unitary operations and specially developed components assembled into a plant for the complete treatment of liquid manure. It is thus a system in which all parts of the manure are used and the volume reduced to a minimum.

The separation process falls basically into three stages. In the first stage a decanter centrifuge performs a mechanical pre-separation with the fibre part (humus) being separated from the liquid phase. In the second stage the liquid phase is concentrated by evaporation, and in the third stage the distilled water thereby produced is cleaned.

Evaporation and cleaning are carried out in a closed system. There is therefore no odour nuisance or environmental impact from ammonia evaporation. As the mechanical pre-separation can also be carried out in a closed system, odour nuisance from liquid manure handling can be entirely eliminated. The evaporation process is based on a number of operations in which a large fraction of the heat energy is recycled, thus minimizing the system's total energy consumption.

Assuming 1000 kg of raw liquid manure with a dry substance content of 5.0%, the system permits the following separation results, see fig. 1.

As can be seen the volume reduction is approx. 75%. 747 kg of the original 1000 kg of raw liquid manure is separated out as clean water
The separated and distilled water no longer needs to be spread on the fields as manure, but can be reused for irrigation or stall cleaning, or simply be discharged.

The nutrient contents of the raw manure are separated into three fractions, known as humus, NPK concentrate and N concentrate, comprising 15%, 13% and 2% respectively of the raw liquid manure.

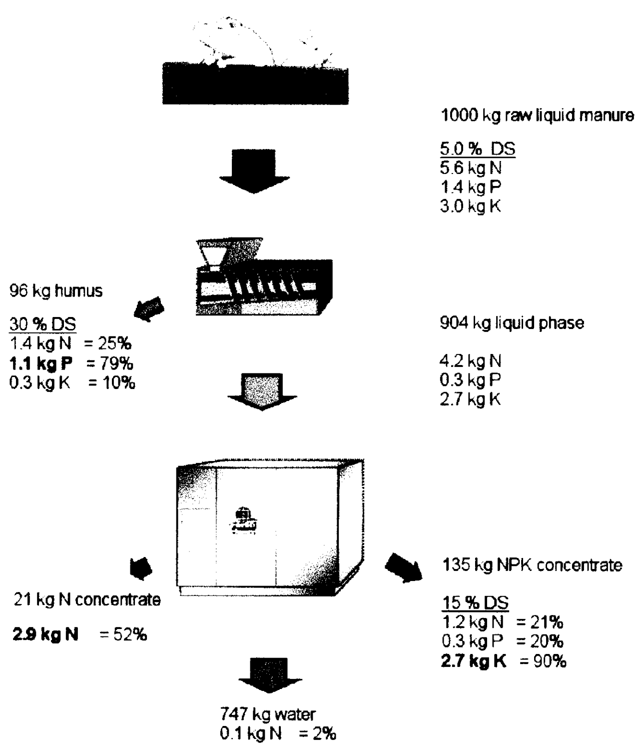


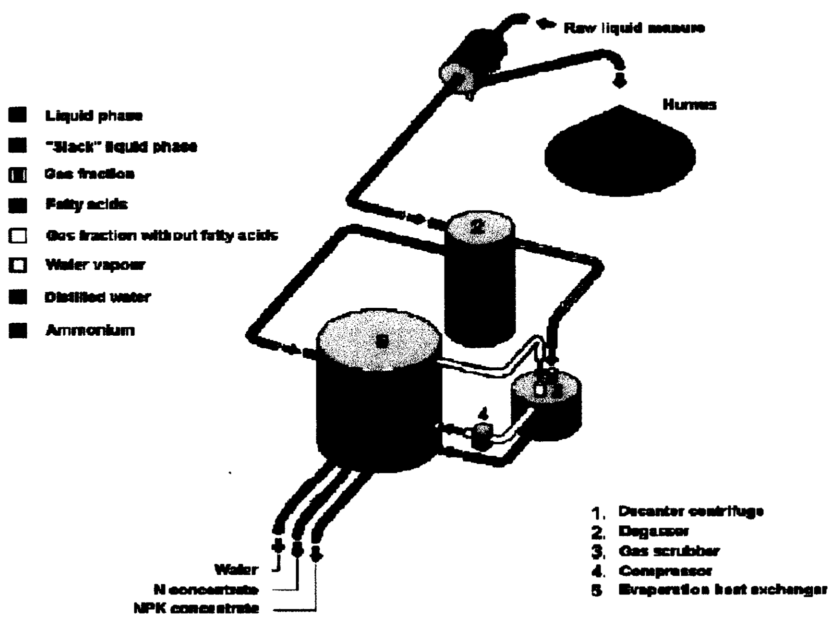
*Figure 1. **MANURA® 2000** mass flow diagram*

Thus, a further advantage of the separation process is that the nutrients are also separated. 79% of the phosphorus (P) content of the raw manure is removed in the humus fraction. 90% of the potassium (K) content is removed in the NPK concentrate and 52% of the nitrogen (N) content is removed in the N concentrate. Separation enables the farmer to dose the nutrients precisely in later use, which together with a high utilization rate approximately 85% ensures optimum use of liquid manure nutrients as compared to traditional raw slurry spreading at approx. 50% to 60% utilization. The fractions are also useful raw materials for organic fertilizer blenders and distributors

The N concentrate, NPK concentrate and water are also heat-treated at 100°C and are therefore free of pathogens and bacteria. They can thus be handled without risk of infection and would not restrict application to land used for a crop or incorporation into the soil during all stages of plant production.

<u>Plant and Process Description</u>

European Union is allowing this product to be moved between countries due to it's patheogen free status



As mentioned, the basic process has three stages:
1. Mechanical pre-separation
2. Evaporation
3. Cleaning of distillate

Figure 2. MANURA® 2000 process and flow diagram.

Mechanical Pre-Separation

The raw liquid manure is led directly from the livestock area via a holding tank with stirrer to a decanter centrifuge. In the decanter centrifuge the manure is subjected to a centrifugal force 3000-4000 times greater than the force of gravity. Here the manure's content of organic and inorganic particles are dewatered to a dry substance content of 25-35%. The liquid manure is thereby separated into a fibre fraction, called humus, and a liquid phase fraction. This separation as mentioned previously results in less mass to be transported. The humus matter could possibly be used in land reclamation projects or further processing could result in a composted material. Not part of this application.

It is essential for the subsequent evaporation that the mechanical pre-separation functions optimally. Poor separation will inevitably lead to a higher content of suspended matter in the liquid phase. If the suspended matter forms too high a proportion of the total dry substance content of the liquid phase, this may have undesirable consequences for the subsequent heat exchange process. This separation method reduces the cleaning of equipment. HNO3 Acid cleans the and heat exchanger of the Manura 2000 approximately once a month or when needed. The heat exchanger is isolated from the system by valving . (CIP) Cleaning in place (*please refer to flowchart on page 8*) – computer controlled process pumps HNO3 through the appropriate surfaces to be cleaned. The products of cleaning and acids used in the process are removed from the system and put into a separate storage tank prior to restart procedure.

As liquid manure varies greatly from outlet to outlet as regards to the dry substance content, composition and particle size distribution, an extensive testing program is carried out for each customer. The aim of this is to adapt the pre-separation process to the precise nature of the liquid manure occurring on the farm.

From the decanter centrifuge the liquid phase is led to the **MANURA® 2000** evaporation unit.

Evaporation

The system's evaporation unit consists of three stages:

1. Degasser
2. Gas scrubber
3. Evaporation heat exchanger

Degasser

After initial heating to 100°C, the liquid phase is degassed. The boiling liquid phase is blown into a container causing it to "flash off", splitting into a liquid fraction and a gas fraction. The majority of the liquid phase's content of carbon dioxide, ammonia and fatty acids simply separates out from the liquid phase, leaving a "slack" liquid phase, which has lost its scumming properties.

The "slack" liquid phase collects at the base of the degasser and is led into the heart of the system, the evaporation heat exchanger, where the actual concentration occurs.

While the "slack" liquid phase is being taken care of, the gas fraction is led from the degasser to the next stage, the gas scrubber.

Gas Scrubber

The gas fraction from the degasser is conveyed together with water vapour from the "slack" liquid phase in the evaporation heat exchanger through the evaporation unit's patented gas scrubber unit.

As the water will later be condensed from this mixture of carbon dioxide, ammonia, fatty acid and water vapour, it is necessary to remove the gas mixture's content of fatty acids. Otherwise the fatty acids would retain ammonia in the distillate and make it hard to reduce the ammonia content in the distillate to 100-200 mg/L The gas mixture is therefore led through an absorber, in which the fatty acids are washed out. The fatty acids then return to the evaporation heat exchanger and end up in the NPK concentrate.

The remainder of the gas mixture, which after its passage through the absorber mainly consists of water vapour plus carbon dioxide and ammonia, is led to the compressor.

The gas mixture, largely consisting of water vapour, has a temperature of 100°C prior to compression. In the compressor it is subjected to a pressure of approx. 0.2 bar, causing its temperature to rise to 105-106°C.

The superheated gas mixture is then led to the condensation side of the evaporation heat exchanger.

Foaming Control

During the evaporation process the raw manure will become very foamy and take up a large area in the evaporation tank. Any foam taken over the top would inhibit the process as the compressor is designed for pumping gas.

Two methods used to reduce the foam are a patented mechanical separation and a foam controlling agent. . To meet the organic requirements for OMRI certification we will use an organic soy oil from Ojai Organics International. Please refer to Appendix A (Certifcate of Compliance and schedule)

Evaporation Heat Exchanger

The evaporation heat exchanger is designed as a "downflow" heat exchanger with a total volume of approx. 9 m^3. The boiling side has 8 m^3, the condensation side has 1 m^3, and the heat exchanger has heating surfaces of 240 m^2.

The "slack" liquid phase is led from the degasser to the boiling side of the heat exchanger. On the boiling side, it is recirculated over the heating surfaces at a sufficiently high flow to avoid burning . The 100°C hot liquid phase here takes on additional heat from the condensation side. Let us briefly review the heat exchange process on the condensation side.

After its passage through the compressor, the gas mixture consisting of carbon dioxide, ammonia and water vapour at a temperature of 105-106°C is led to the condensation side. At the condensation side the gas mixture rises. As the gas mixture gives off its heat to the "slack" liquid phase on the boiling side, its temperature will fall, and when it reaches 100°C, the water vapour in the gas mixture will condense on the heating surfaces and slowly drip down to a collector at the base (hence the name downflow heat exchanger). The condensed distillate then passes to the distillate cleaning unit.

The remainder of the gas mixture, consisting of carbon dioxide and ammonia, does not condense at 100°C, and can be blown up to the top of the condensation side. As this mixture of carbon dioxide and ammonia cools, N concentrate is formed, in which the nitrogen is dissolved in water as ammonium hydrogen carbonate.

Returning to the boiling side of the evaporation heat exchanger, it can be seen that the heat which during the condensation of the water vapour passed to the boiling side is now used to supply further heat to the already boiling liquid phase, causing even more water vapour to boil off from the liquid phase.

The water vapour liberated from the liquid phase is evacuated on the boiling side and led to the gas cleaning stage together with the gas mixture from the degasser. This completes the circuit – the water vapour is again ready to be compressed together with the carbon dioxide and ammonia from the degasser.

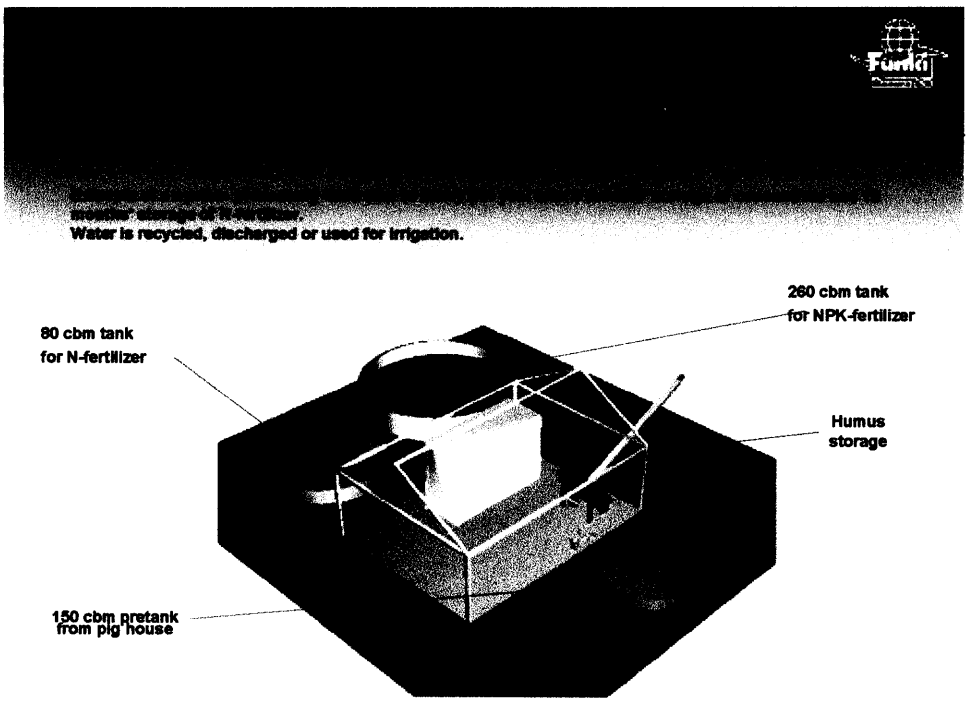
The concentrated liquid phase is continuously tapped from the heat exchanger as NPK concentrate, and new liquid phase is introduced from the degasser.

Distillate Cleaning (further cleaning of the water fraction)

- Stage 6 will not be used in North America. It was added to the Funki Manura process in Europe to meet regulatory requirements for a lower nitrogen content in the water. This last process also uses Sulphuric Acid for further removal of N in the clean water fraction. To avoid the use of sulphuric acid and costs associated with this it has been decided not to add this process on to plants in North America.

Operating results have in every respect equaled or exceeded expectations and the system has, as the first and only example of its kind, been given EU approval after completion of a measurement programme and sampling tests instigated by the Dutch Ministry of Agriculture.

Figure 3



Previous Review:
As per our phone call to the National Organic Program office, it was stated that Ammonium was not on the list as a petitioned substance. Also our searches on the internet proved to be nil.

Regulatory Registrations:
To date we have not found any regulatory registrations regarding ammonium originating from the organic source, hog manure.

Chemical Abstract Service (CAS):
(CAS-no.1066-33-7)

Physical Properties and Chemical Mode of Action

Appearance:	Colourless to yellow liquid
Odour:	Strong ammonia
Solubility:	Soluble in water
pH:	9.3 - 10.3

Under warm and moist soil conditions, the ammonium converts to a nitrate, by naturally occurring soil organisms. The negatively charged clay, organic matter, and particles (anions) attract the positively charged atoms, molecules and compounds (cations) from the liquid in the soil onto exchange sites thus exchanging chemical and biological reactions and allowing soil to provide nutrients and food to the plant

MSDS:

1. Identification of the substance/preparation and of the company/undertaking

Product name: N-Fraction 12-15 %

Company/Undertaking identification: FUNKI MANURA A/S
Ellegaardvej 17
DK-6400 Soenderborg
Denmark
Telephone: +45 7442 1145
Telefax: +45 7442 0045

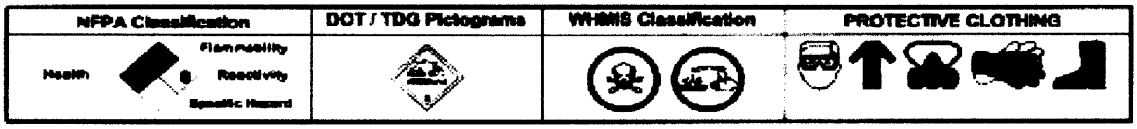
2. Composition/information on ingredients

Principle hazardous components: Ammonium Hydrogen Carbonate (CAS-no.1066-33-7).
Total N: 12 -15 weight %

N-Fraction is derived from pig manure.

3. Hazards identification

Harmful



Harmful if swallowed.

See section 8 for Personal protective equipment.

4. First aid measure

Generally: Never give anything by mouth to an unconscious person. Get medical attention immediately.

Inhalation: Remove to fresh air. Give oxygen if breathing is difficult. If breathing has stopped give artificial respiration. Keep person warm and get medical attention.

Skin contact: Remove contaminated clothing. Wash thoroughly with plenty of water. Launder contaminated clothing before re-use. Get medical attention if irritation persist

Eye contact: Immediately flush eyes with plenty of water lifting upper and lower lids occasionally. Get medical attention if irritation persist.

Ingestion: Give plenty of water to drink, if patient is conscious. DO NOT INDUCE VOMITING. Immediately call a physician.

5. Fire-Fighting measures

Extinguishing media: Product is not combustible. Use appropriate media for surrounding fire.

Decomposition products: Ammonia volatilises from the solution. Flammable limits of ammonia gas in air (by volume) are: Lower 16 %, Upper 25 %.

Special fire-fighting procedures: Aqua ammonia will not burn. Fire-fighting precautions are based on escaping ammonia gases. Wear full protective clothing and self-contained breathing apparatus. Apply water spray to knock down and absorb ammonia vapours. Keep all personnel upwind of fire. Control runoff waters.

Fire and explosion hazards: At elevated temperatures, such as in a fire condition, the material will release toxic gaseous ammonia and nitrogen oxides. Closed containers may burst due to expansion.

6. Accidental release measures

Small spill: Absorb liquid into paper, vermiculite, floor absorbent or other absorbent material.
Large spill: Stop spills at the source, dike area of the spill to prevent spreading, pump liquid to salvage tank. Remaining liquid may be taken up in sand, clay, earth, floor absorbent material and shovelled into containers.
Do not contaminate water supplies or public sewers. Contact the local environmental authorities in case of contamination.

7. Handling and Storage

Handling: Wear protective clothing (see section 8). Avoid breathing vapour where ammonia vapours exist. Open containers with caution.
Storage: Store in a tightly closed and well-ventilated area. Keep away from oxidisers and acids.

8. Exposure controls/personal protection

Engineering measure: Provide for eye wash station.
Occupational exposure limits: OSHA standard for ammonia is 35 ppm
Personal protection:
Respiratory protection: Not normally required. Where ammonia vapours exist in concentration above the standard, respiratory protection should be provided. A full-face mask with ammonia cartridge can be used in vapours up to 500 ppm. Above this limit and in unknown concentrations, use a full-face self-contained breathing apparatus.
Eye protection: Chemical goggles or shielded safety glasses.
Skin protection: Wear protective clothing: rubber apron, long-sleeved shirts and pants, rubber boots with socks. Wear rubber or chemical resistant gloves (rubber, neoprene, PVC or equivalent).
Work practices: Wash hands after working with the product.

9. Physical and chemical properties

Appearance: Colourless to yellow liquid
Odour: Strong ammonia
Solubility: Soluble in water
pH: 9.3 - 10.3

10. Stability and reactivity

Chemical incompatibilities: Avoid contact with strong oxidising agents, acids, free radical initiators such as peroxides, metallic halides or soaps.
Conditions to avoid: Excessive heat and contact with strong acids and oxidisers.
Hazardous decomp. products: Ammonia and carbon dioxide.

11. Toxicological information

Inhalation: May cause irritation to the respiratory tract.
Eye: Eye contact may cause irritation.
Skin: Skin contact may cause slight irritation.
Ingestion: Harmful if swallowed. Causes gastrointestinal discomfort.

12. Ecological information

There is no data available on the product. Do not emit to water causes or public sewage.

13. Disposal considerations

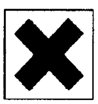
Material should be disposed in accordance with National and Local regulations.

14. Transport information

No dangerous goods.

15. Regulatory information

According to EEC Directive 67/548/EEC the product is labelled as follows:



Harmful

R-phrases:	22-	Harmful if swallowed.
S-phrases:	2-	Keep out of the reach of children.
	13-	Keep away from food, drink and animal feedingstuffs.
	46-	If swallowed, seek medical advice immediately and show this container or label.

16. Other information

This Safety Data Sheet is issued according to the directions given in the EU Directive on Safety Data Sheets. The directions are given assuming the product is used for its normal purpose. It is however always the responsibility of the user to comply with National legislation's. The information in this Safety Data Sheet should be understood as a description for safe handling of the product and is no guarantee for the properties of the product.

RESULTS SLURRY SEPARATION

BY

HOLLVOET B.V.

IN COOPERATION WITH

ROBA LABORATORY

FALL 2001

Mestverwerking Hollvoet BV

ROBA LABORATORIUM

Funki Manura A/S

INTRODUCTION

This report contains the results from the MANURA® 2000 system that is operated by HOLLVOET B.V. in REUSEL HOLLAND
The results were collected during a period of four consecutive weeks by J. Lavrijsen from HOLLVOET B.V.
During these four weeks the MANURA ® 2000 was operated at a capacity of 90%
The samples taken in this period were analysed by ROBA laboratory in DEURNE HOLLAND.
Calculations made in this report are based on the results of these four weeks.

Jan Lavrijsen
Hollvoet B.V

RAW SLURRY SEPARATION

MECHANICAL PRE-SEPARATION

	HOURS	[redacted]	DECANTER FLOW	DECANTER TORQUE	REJECT M³	[redacted]
START						
WEEK 1	163,40		2,60	51,25	381	
WEEK 2	168,78		2,60	49,14	384	
WEEK 3	168,53		2,60	53,14	405	
WEEK 4	167,67		2,60	49,71	400	
TOTAL	668,38		2,60	50,81	1571,15	
IN PERCENTS					90,40%	

SEPARATION OF REJECT WITH THE MANURA® 2000

	HOURS	REJECT debit	REJECT period	REJECT /hour	DISTILLATE debit	DISTILLATE period	DISTILLATE /hour	NPK concentrate debit	NPK concentrate period	NPK concentrate /hour	N concentrate debit	N concentrate period	N concentrate /hour
START		2911,32			2053,25			407,66					
WEEK 1	177,07	3238,38	327,06	1,85	2322,99	269,74	1,52	457,8	50,14	0,283	3,654		
WEEK 2	159,52	3447,86	196,16	1,23	2493,76	159,77	1,00	489,11	30,18	0,189	9,402	5,736	0,036
WEEK 3	168,55	3720,68	272,82	1,62	2714,83	221,07	1,31	531,02	41,91	0,249	18,426	9,02	0,054
WEEK 4	167,67	4028,47	307,79	1,84	2966,73	251,90	1,50	577,96	46,94	0,280	26,782	8,36	0,050
TOTAL	672,80		1103,83	1,64		902,48	1,34		169,17	0,251		23,12	0,047
IN PERCENTS			90,40%			73,91%			13,85%			2,64%	

Hollvoet BV

RESULTS SAMPLES DECANTER

[redacted]

PERIOD	DS	AS	N	NH3-N	P	K	pH	Ec	CZV	Nitrate	Nitrite	Cu	Zn	Cd	SO4
	%	%	g/Kg	g/Kg	g/Kg	g/Kg	-								
WEEK 1	4,82	2,13	5,04	3,88	2,53	6,10	8,18								
WEEK 2	4,98	2,09	5,29	3,83	2,58	6,09	8,27								
WEEK 3	5,37	2,22	5,42	3,99	2,66	6,28	8,16								
WEEK 4	4,70	2,10	5,08	3,80	2,22	6,05	8,19								
AVERAGE	**4,97**	**2,14**	**5,21**	**3,88**	**2,50**	**6,13**	**8,20**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

[redacted]

PERIOD	DS	AS	N	NH3-N	P	K	pH	Ec	CZV	Nitrate	Nitrite	Cu	Zn	Cd	SO4
	%	%	g/Kg	g/Kg	g/Kg	g/Kg	-					g/Kg	g/Kg	ug/l	
WEEK 1	37,20	14,90	9,82	5,43	28,00	5,13	6,47					0,15	0,45	1,00	
WEEK 2	33,95	13,34	8,39	3,37	26,64	5,22	6,03					0,00	0,47	0,70	
WEEK 3	35,90	13,70	9,56	3,50	26,50	6,28	5,85					0,40	0,40	0,60	
WEEK 4	35,40	13,50	9,02	3,38	26,40	5,27	5,85					0,00	0,49	0,80	
AVERAGE	**35,61**	**13,86**	**9,20**	**3,92**	**26,89**	**5,48**	**6,05**	**X**	**X**	**X**	**X**	**0,14**	**0,45**	**0,78**	**X**

REJECT DECANTER

PERIOD	DS	AS	N	NH3-N	P	K	pH	Ec	CZV	Nitrate	Nitrite	Cu	Zn	Cd	SO4
	%	%	g/Kg	g/Kg	g/Kg	g/Kg	-								
WEEK 1	2,62	1,31	4,53	3,61	0,59	6,34	8,32								
WEEK 2	2,85	1,35	4,67	3,66	0,55	6,11	8,34								
WEEK 3	3,03	1,40	4,91	3,69	0,65	6,40	8,20								
WEEK 4	2,80	1,40	4,61	3,50	0,52	5,87	8,21								
AVERAGE	**2,83**	**1,37**	**4,68**	**3,62**	**0,58**	**6,18**	**8,27**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

ROBA LABORATORIUM

RESULTS SAMPLES MANURA

REJECT MANURA

PERIOD	DS	AS	N	NH3-N	P	K	pH	Ec	CZV	Nitrate	Nitrite	Cu	Zn	Cd	SO4
	%	%	g/Kg	g/Kg	g/Kg	g/Kg	-	mS	mg o2/l	g/Kg	g/Kg	g/Kg	g/Kg	ug/l	
WEEK 1	2,51	1,29	4,31	3,42	0,51	6,03	8,40								
WEEK 2	2,56	1,24	4,46	3,23	0,48	5,58	8,55								
WEEK 3	2,70	1,31	4,97	3,61	0,55	5,99	8,25								
WEEK 4	2,60	1,30	4,88	3,60	0,51	5,85	8,21								
AVERAGE	**2,59**	**1,29**	**4,66**	**3,47**	**0,51**	**5,86**	**8,35**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

DISTILLATE MANURA

PERIOD	DS	AS	N	NH3-N	P	K	pH	Ec	CZV	Nitrate	Nitrite	Cu	Zn	Cd	SO4
	%	%	g/Kg	g/Kg	g/Kg	g/Kg	-	mS	mg o2/l	g/Kg	g/Kg	g/Kg	g/Kg	ug/l	
WEEK 1	0,02	0,01	0,24	<1	<0,07	0,00	9,25		86,00						
WEEK 2	0,03	0,01	0,27	<1	<0,07	0,00	9,37		77,00						
WEEK 3	0,05	0,00	0,59	<1	0,04	0,14	9,44		113,00						
WEEK 4	0,00	0,00	0,27	<1	<0,07	0,16	9,16		62,00						
AVERAGE	**0,03**	**0,01**	**0,34**	**<1**	**0,04**	**0,08**	**9,31**	**X**	**84,50**	**X**	**X**	**X**	**X**	**X**	**X**

NPK concentrate MANURA

PERIOD	DS	AS	N	NH3-N	P	K	pH	Ec	CZV	Nitrate	Nitrite	Cu	Zn	Cd	SO4
	%	%	g/Kg	g/Kg	g/Kg	g/Kg	-	mS	mg o2/l	g/Kg	g/Kg	g/Kg	g/Kg	ug/l	
WEEK 1	10,00	5,12	3,53	<1	1,94	25,60	9,77	74,70				1,80	0,13	<1	
WEEK 2	9,63	4,91	3,79	<1	1,96	21,85	10,00	55,50				0,00	0,14	0,90	
WEEK 3	10,30	5,04	3,84	<1	1,91	22,80	9,68	65,13				0,13	0,10	1,40	
WEEK 4	11,30	5,70	4,42	<1	2,23	27,40	9,74	76,60				0,37	0,16	<1	
AVERAGE	**10,31**	**5,19**	**3,90**	**<1**	**2,01**	**24,41**	**9,80**	**67,98**	**X**	**X**	**X**	**0,58**	**0,13**	**<1.09**	**X**

ROBA LABORATORIUM

RESULTS SAMPLES MANURA

N concentrate MANURA

PERIOD	DS	AS	N	NH3-N	P	K	pH	Ec	CZV	Nitrate	Nitrite	Cu	Zn	Cd	SO4
	%	%	g/Kg	g/Kg	g/Kg	g/Kg	-	mS	mg o2/l	g/Kg	g/Kg	g/Kg	g/Kg	ug/l	
WEEK 1	7,40	0,64	130,60	119,70	<0.07	0,02	9,91	1,70							
WEEK 2	0,72	0,02	123,60	113,80	<0.07	0,00	10,10	541,00							
WEEK 3	3,95	0,02	138,60	115,50	<0.07	0,10	9,87	545,00							
WEEK 4	6,50	0,00	126,60	121,00	<0.07	0,00	9,79	561,00							
AVERAGE	**4,64**	**0,17**	**129,85**	**117,50**	**<0.07**	**0,03**	**9,92**	**412,18**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

NPK concentrate MANURA

PERIOD	ENTEROBACTERIACEAE c.f.u./gram	SALMONELLA 25 gram	AEROBE BACTERIA c.f.u./gram
WEEK 1	<10	NOT FOUND	1500
WEEK 2	<10	NOT FOUND	5500
WEEK 3	<10	NOT FOUND	40
WEEK 4			
AVERAGE	<10	NOT FOUND	2347

N concentrate MANURA

PERIOD	ENTEROBACTERIACEAE c.f.u./gram	SALMONELLA 25 gram	AEROBE BACTERIA c.f.u./gram
WEEK 1	<10	NOT FOUND	<100
WEEK 2	<10	NOT FOUND	<100
WEEK 3	<10	NOT FOUND	10
WEEK 4			
AVERAGE	<10	NOT FOUND	<100

ROBA LABORATORIUM

POWER CONSUMPTION MANURA 2000® SYSTEM PRO M³ RAWSLURRY

POWER CONSUMPTION DECANTER

	HOUR	KWh meter	FACTOR meter	KWh total	KWh period	KWh extern	KWh decanter	KWh /hour
START		2167,7	20,0	43354,8				
WEEK 1	163,4	2320,5	20,0	46409,2	3054,4	1511,8	1542,6	9,44
WEEK 2	168,8	2473,7	20,0	49474,6	3065,4	1561,6	1503,8	8,91
WEEK 3	168,90	2632,86	20,00	52657,20	3182,60	1562,3	1620,3	9,59
WEEK 4	167,23	2788,66	20,00	55773,20	3116,00	1546,9	1569,1	9,38
TOTAL	668,38				12418,40	6182,55	6235,85	9,33

POWER CONSUMPTION MANURA 2000®

	HOUR	KWh meter	FAKTOR meter	KWh total	KWh period	KWh /hour
START		963,10	150*	144465,00		
WEEK 1	177,07	1209,09	**	161261,50	16796,50	94,86
WEEK 2	159,63	1431,42	50	172378,00	11116,50	69,64
WEEK 3	168,90	1711,31	50	186372,50	13994,50	82,86
WEEK 4	167,23	2015,03	50	201558,50	15186,00	90,81
TOTAL	672,83				57093,50	84,86

* KWh meter was not correctly connected   ** connections KWh meter changed

DECANTER

TOTAL KWh	6235,85 KWh
TOTAL M³ PRE-SEPARATED RAW SLURRY	1738 M³ /
KWh/M³ RAW SLURRY	3,59 KWh/M³

MANURA

TOTAL KWh	57093,50 KWh
TOTAL M³ SEPARATED REJECT	1103,83 M³ /
KWh/M³ REJECT	51,72 KWh/M³
1M³ REJECT = 1 / 0,904 M³ RAW SLURRY =	1,11 /
KWh/M³ RAW SLURRY	46,76 KWh/M³

ENERGY COSTS PRO SEPARATED M³ RAW SLURRY

DECANTER	KWh/M³ RAW SLURRY	3,59 KWh
MANURA	KWh/M³ RAW SLURRY	46,76 KWh +
TOTAL	KWh/M³ RAW SLURRY	50,35 KWh
COSTS KWh		£0,058 x
TOTAL COSTS PRO M³ RAW SLURRY =		**£2,92**

Mestverwerking Hollvoet BV

Funki Manura A/S

PERFORMANCE MANURA 2000

SEPARATED REJECT FACTOR	1103,83 M³ 1,11 x	SEPARATED REJECT FACTOR	1103,83 M³ 1,11 x
TOTAL SEPARATED RAW SLURRY TOTAL HOURS	1221,05 M³ 672,8 /	TOTAL SEPARATED RAW SLURRY PRODUCTION HOURS IN THIS PERIOD	1221,05 M³ 593,27 /
RAW SLURRY PRO HOUR TOTAL HOURS PRO YEAR	1,81 M³/HOUR 8760 x	RAW SLURRY PRO HOUR TOTAL HOURS PRO YEAR	2,06 M³/HOUR 8000 x
TOTAL SEPARATED RAW SLURRY ON A ONE YEAR BASIS	15898,34 M³	TOTAL SEPARATED RAW SLURRY ON A ONE YEAR BASE	16465,36 M³
WITH 100% CAPACITY	**17665 M³**	**WITH 100% CAPACITY**	**18295 M³**

* CALCULATIONS ARE BASED ON RESULTS FROM THIS REPORT. THIS MEANS RAW SLURRY WITH A TOTAL DRY MATTER OF 5% AND THE MANURA® 2000 RUNNING ON A CAPACITY OF 90%

Organic NPK Solutions Inc.
NOP Petition

[illegible]			Funki Manura A/S
Funki Manura Slurry Separation			
Sample Calculation in Euro, Holland			
Dry matter			
Raw slurry	5,0%		
Reject	2,5%		
Humus	25,8%		
NPK	15,0%		
CAPACITY			
Running hours per year	8000		
Capacity, evaporator	**Distribution**	**kg/h**	**ton/year**
Distillate	72,3%	1600	12800
N-concentrate	2.1%	45,6	365
NPK	14,9%	329,1	2633
Total		1974,7	15798
Capacity, pre-separation			
Humus	10,8%	237,9	1903
Capacity in all		**2212,6**	**17701**
Investment and running costs			
		Cost/year	**Cost/ton**
Depreciation and interest			
Total investment	€ 601.259		
- investment in storage tanks	€ -		
- Subsidies	€ -		
Net investment	€ 601.259		
Interest rate	5%		
Depreciation period, years	10		
Yearly total		€ 77.866	€ 4,40
Running costs			
Electricity, per kWh	€ 0,058		
Electricity, kilowatt-tax (135 kW installed)		€ 6.805	€ 0,38
Anti-foam chemicals, per liter	€ 5,38		
Acids, per liter	€ 0,33		
Consumption	**Consumption/ton**		
Evaporator, kWh (distillate basis)	64,00	€ 47 514	€ 2,68
Pre-separation, kWh	4,50	€ 4 620	€ 0,26
Peripherals, kWh kWh 3,0	1,36	€ 1 392	€ 0,08
Acid for CIP, liter	0,20	€ 1 043	€ 0,06
Acid for stripper, liter	1,50	€ 7 820	€ 0,44
Anti-foam chemicals, liter	0,05	€ 4 250	€ 0,24
Consumption and taxes in all		€ 73.443	€ 4,15
- Subsidies		€ -	€ -
Running costs in total (922.855 kWh/year)		€ 73.443	€ 4,15
Service & maintenance		€ 15 882	€ 0,90
Separation in all		**€ 167.191**	**€ 9,45**

Funki Manura A/S

Petition Justification Statement:

While some other traditional sources of Organic N are derived from a depleting source or resources that have been over harvested, this product is recyclable. Through the heat treating process of distillation, which is accepted as an organic process, ammonium is a readily available form of liquid nitrogen, originating from hog manure. The practice of distillation removes any contamination of crops, soil, or water by removing pathogenic organisms from raw manure. Ammonium will supply a growing organic industry and its need for nutrients while at the same time helping the environment by transferring nitrogen from areas where it's excess may cause environmental concerns. This is a truly holistic approach to protect our environment and all who live in it.

Encyclopedia Britannica 20th addition

Sal Ammoniac (ammonium chloride) was an article of commerce in antiquity, and is mentioned by Pliny. It was first derived from organic material containing nitrogen by heating either camel's dung or a mixture of salt and urine. During the Middle Ages ammonia was obtained in aqueous solution by distilling the horns and hoofs of oxen; thus, its alchemical designation "spirits of harts horn" (Cited from Encylopedia Britannica 1970)

Pliny lived in 50 AD