

# Environmental Management Plan Biotech Farms Wastewater Biogas Facility

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## I. BRIEF PROJECT INFORMATION

Proponent : **BIOTECH FARMS INC.**  
Business Address : KCC Mall of Marbel, Koronadal City, South Cotabato  
President / CEO : Wilfredo I. Chiang  
Project : Methane Recovery and Combustion from the Biogas Digester  
Project Location : Barangay San Vicente, Banga, South Cotabato  
Project Type : Livestock Project  
PSIC : A 02 – Farming of Animals (project is a component)

### Contact Persons on the Environmental Assessment Report

#### Biotech Farms

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Contact No. :

#### LANDBANK

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## I.1 THE PIGGERY FARM

The livestock of Biotech Farms, Inc. is a farrow to finish piggery farm with an existing sow level of 1,831 heads. The estimated hog population is 18,310 heads if one (1) sow produces ten (10) piglets. Based on the farms' Environmental Compliance Certificate issued by the Department of Environment and Natural Resources on 2001, Biotech is allowed to operate up to 4,000 sow level, which will have an estimated total hog population of 40,000 heads. The Standing Pig Population (SPP) is as follows:

Pig Type	SPP, heads	Weight, kg
Sows	2,000	200
Wean	3,667	5
Finish	3,667	20
Nursery	9,534	90

There are twenty one (21) buildings of the piggery farm used for gestating sows, lactating sows, boars, feeder pigs and nursery pigs. The floors of each pigpen are slatted and perforated which allows the wastes to be flushed to the canal underneath.

The farm occupies an area of 281,931 square meters located at Brgy. San Vicente, Banga, South Cotabato.

Photos of the piggery farm:



The pigpen buildings



Set-up of a pigpen

## I.2 FARM LOCATION

The piggery farm of Biotech Farms is located at Brgy. San Vicente, Municipality of Banga in the Province of South Cotabato. The area of the farm is 281,931 square meters covered by Transfer Certificate of Title Nos. T-90235, T-90234, T-8576, T-29920, Homestead Patent No. V-4681 and Lot No. 1702 Pls-214-D-9.

Below are maps of the project site.





### I.3 ENVIRONMENTAL CONSIDERATIONS IN THE AREA

#### Sensitive area

The creek near the piggery farm is the only potential receptor that may be affected by the operation of the project, through wastewater discharge. This flowing creek is located less than a kilometer from the project site, with approximate width of 2 meters.

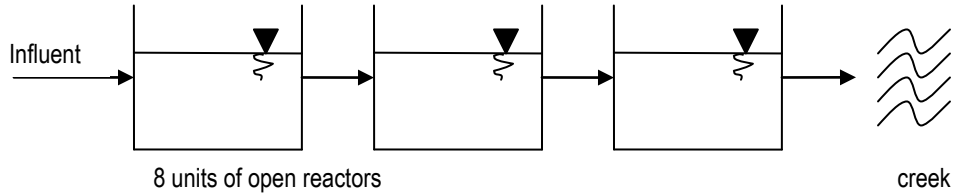
#### Human Settlement

There are no informal settlers in the project site. Thus, families are not affected nor will there be any relocation or resettlement.

### I.4 EXISTING WASTEWATER SET-UP

Manure in the holding tank located below the piggens piggens is washed with water and discharged into to eight (8) cement reactors. Overflow from the reactors flows into an anaerobic lagoon. The anaerobic lagoon stores the wastewater for an indefinite period.. It was constructed in 1996 with a capacity of around 105,000 cu.m.

Flow Diagram:



Design Parameters:

Reactors	Quantity / Unit	Dimension (m)			Capacity (cu.m.)
		Length	Width	Depth	
open reactors	8	8	7	4	224

### I.5 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

An Environmental Compliance Certificate (ECC) was secured from the Environmental Management Bureau (EMB) Region XII on October 23, 2001 for a 4,000 sow level in an area of 281,931 square meters land.

Biotech Farms likewise secured a Discharge Permit (DP) from EMB Region XII in compliance with Republic Act No. 9275 or known as the Philippine Clean Water Act. The latest DP was issued on May 23, 2005 which allows Biotech Farms to discharge a wastewater volume not to exceed 30.0 cu.m per day.

The farm currently has a 250 KVA diesel engine, a 75 KVA diesel engine and a 500 KVA diesel engine, each provided with muffler and silencer. The operation of these equipment is supported with a valid Permit to Operate (PTO) issued by EMB Region XII on May 23, 2005 in compliance with Republic Act No. 8749 or also known as the Philippine Clean Air Act of 1999. Once a gas engine that will utilize the methane is installed, Biotech Farms will secure the PTO of the same.

Permit	Reference No.	Date Secured	Validity	Conditions
ECC	12 01 10 19-190-116	October 23, 2001	No expiration	1. Sow level – 4,000 heads 2. Land area – 281,931 sq.m.
DP	05-WDP-C-1263-004	May 23, 2005	March 14, 2010	1. Volume discharge– 30.0 cu.m. per day 2. BOD based load – 3.6 kg/day
PTO	05-POA-C-1263-010	May 23, 2005	March 14, 2010	1. Regular submission of emission sampling test report

## II. METHANE RECOVERY

### II.1 PROJECT ACTIVITY

The main components of the methane recovery project are as follows:

- a. Prefiltration using perforated screen
- b. Equalization Tank
- c. Micro-sieve Solid/Liquid Separator
- d. Gravity Press Sludge Drying Bed
- e. Biogas Digester
- f. Clarifier
- g. Aquatic Reed and Water Hyacinth Wetlands
- h. Biological Disinfection Lagoon
- i. Generator set

Design Parameters:

Component	Quantity	Capacity / Specifications	Remarks
Prefiltration using perforated screen			
Equalization Tank			
Micro-sieve Solid/Liquid Separator			
Gravity Press Sludge Drying Bed			
Biogas Digester		volume of 6,000 m <sup>3</sup> hydraulic retention time of thirty (30) days	
Clarifier			
Aquatic Reed and Water Hyacinth Wetlands			
Biological Disinfection Lagoon			
Generator set			

An average flow of 200 cubic meters per day of pig wastes is conveyed from the farm through the main canal system where it flows by gravity to the pre-filters using perforated stainless sheets to initially remove the straws, sacks and other debris, which tend to disrupt the pumping workability.

The pig wastes then flows by gravity to the equalization tank with a capacity of 200 cubic meters. The equalization tank buffers the day-to-day fluctuations in wastewater flow rates and allows the daily wastewater volume of 200 cubic meters to be loaded uniformly into the digester. Sludge recovery to the equalization tank is also provided by mere turning of an isolation valve.



From the equalization tank, the wastewater is pumped to the stainless micro-sieve solid/liquid separators to attain the maximum recovery of the pig hairs and the cellulosic component of the pig wastes which would otherwise accumulate inside the digester, forming scum cover on the water surface and interfering in the separation of the biogas and reducing the actual hydraulic retention time of the digester, thereby reducing the biogas production.

A sludge recycle is provided in the digester to improve its treatment efficiency by recycling the mesophilic bacteria and by hydraulic mixing of the digester's contents.

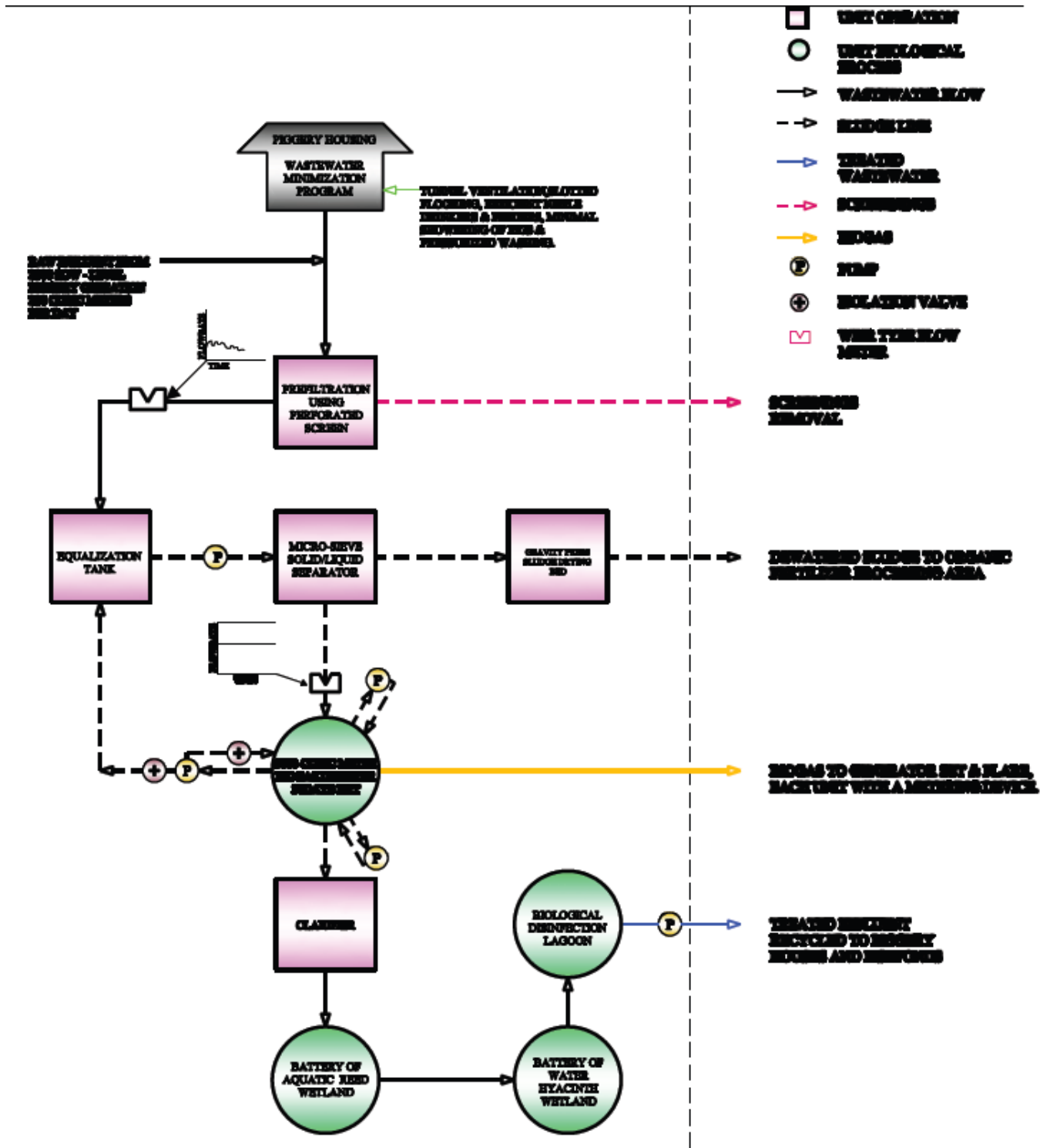
The recovered solids are conveyed to a sludge processing area while the liquid portion is conveyed by gravity to the anaerobic biogas digesters with a volume of 6,000 m<sup>3</sup> or a hydraulic retention time of thirty (30) days.

The overflow from the digester is conveyed by gravity to the clarifier to remove the settleable solids before conveying it to the wetland system.

The action of the aquatic reed/water hyacinth system reduces the residual total suspended solid (TSS) and the residual biochemical oxygen demand(BOD)/chemical oxygen demand(COD) and aerates the wastewater to a quality that is within the norms for effluent standards set by the DENR.

The treated wastewater is conveyed to a disinfection lagoon, which will eventually be recycled to the pig houses for flushing. A zero-wastewater discharge is the ultimate objective of this WTF.

Diagram of the Methane Recovery Project



## II.2 WASTEWATER AND GAS GENERATION

### II.2.1 Wastewater

The wastewater of Biotech Farms, Inc. is estimated at 0.01 cu.m. or 3 gallons per pig per day. With a total hog population of 20,000 heads, the wastewater generated is estimated at 200 cu.m per day.

The biogas digester has a diameter of approximately 36 meters and allowable water level of up to 6 meters. It will be concrete walled, circular type of digester, which will be lined and covered with HDPE to prevent leakage of wastewater into soil and to capture the methane gas generated in the digester.

The rest of the process equipment such as the clarifiers, equalization tanks and solid/liquid separator will be constructed using concrete and will be waterproofed to prevent leakage of wastewater to the soil.

### II.2.2 Biogas

Based on the pig waste properties, biogas production for the anaerobic digesters are as follows:

Parameters	Digester 1
Estimated methane production (ft <sup>3</sup> /day)	55,000
Power Output (kW)	160
Energy Output (kWh/day)	3,927
Methane Reduction (MT/yr)	318
CO2 Reduction (MT/yr)	6,674

### **III. PROJECT COST**

#### **III.1 PROJECT COST**

The cost of the facility is approximately PhP 40 million.

## **IV. ENVIRONMENTAL MANAGEMENT PLAN**

### **IV.1 CONSTRUCTION PHASE**

#### **IV.1.1 Solid Wastes Generation**

##### Impact Identification

The set-up and installation of the anaerobic digester and other process tanks of the wastewater treatment facility shall generate various construction spoils from small pieces of scrap wastes to bulk sizes that include scrap plastics, scrap metal sheets bars, scrap wood, fractured hollow blocks, etc..

Solid wastes improperly managed can be easily dumped on the ground. Waste is a nuisance to Biotech Farms, Inc.

The regular hygiene of the construction workers / laborers shall generate human wastes. Besides foul odor, the wastes carry harmful bacteria. The wastes may contaminate the working area and the ground soil.

##### Prevention / Mitigation

A solid wastes storage area shall be provided by the contractor. Recyclable wastes shall be recovered and used or sold to junk buyers. Residual wastes shall be disposed to the municipality's garbage collector once a week.

The existing toilet facility of the piggery farm shall be used by the contractor's workers / laborers. The facility separates the women and the men. The septic tank is adequate to receive the wastes of the contractors. However, if the need arises, a temporary toilet facility may be used such as a "portalet".

##### Monitoring

The storage area of the solid wastes shall be regularly inspected by the project engineer once a week to ensure that the wastes are properly managed and stored. The project engineer will ensure that the wastes shall not accumulate in the area. For the toilet facility, regular desludging shall be conducted once clogging is observed.

#### **IV.1.2 Noise Generation**

##### Impact Identification

Construction works and the use of heavy equipment will generate noise. Noise is a nuisance to the employees and workers of the farm. It can impair the hearing senses of a person if he/she is overexposed to the noise above the allowable level.

#### Prevention / Mitigation

Workers assigned in noisy areas of the construction activity shall wear earplugs. The workers shall be rotated once in a while to avoid continuous exposure. Heavy equipment shall not be operated continuously for long hours.

#### Monitoring

The project engineer shall inspect the area daily and measures the noise levels using a Sound Meter Level.

### **IV.1.3 Traffic Congestion**

#### Impact Identification

The heavy equipment and transportation vehicles shall slowdown the traffic flow in major and barangay routes

#### Prevention / Mitigation

Traffic enforcers shall be assigned at intersections and at the entrance road leading to the project site. Appropriate traffic signages shall be placed. Heavy equipment shall only be parked within the project site and not on public roads.

#### Monitoring

The project engineer shall daily observe the traffic flow in the area. He shall provide recommendations to Biotech Farms if traffic congestion occurs.

## **IV.2 OPERATION PHASE**

### **IV.2.1 Wastewater Generation**

#### Impact Identification

Liquid waste that shall be discharge from the pigpens shall be directed and treated in the Wastewater Treatment Facility (WTF) of Biotech Farms. If there are leaks, the wastewater may not fully enter the WTF and will contaminate the ground soil and percolate to the ground water.

The effluent may still be pollutive after treatment. Thus, discharge may still contaminate the soil and ground water.

### Prevention / Mitigation

The tanks will be constructed out of concrete material and will be ensured that leakage of the wastewater is prevented through installation of impermeable liners or application of waterproofing material.

Maintenance of the facilities shall be conducted whenever necessary. All leaks shall be sealed.

The effluent from the last lagoon of the eight (8) open lagoons shall be closed to prevent discharge to the creek. The treated effluent in the last lagoon shall be used in the farm such as for cleaning and washing.

### Monitoring

The Pollution Control Officer (PCO) shall inspect monthly the WTF and the drainage system for any leaks. Wastewater sampling shall be conducted at the last lagoon at least once a year.

Parameters to be monitored compared with the Surface Waters Class D Effluent Standards of DENR Administrative Order No. 1990-35, as stipulated under Republic Act No. 9275 or known as the Philippine Clean Water Act of 2004, are as follows:

<b>Parameter</b>	<b>Unit</b>	<b>Standard</b>
BOD	mg/L	120
COD	mg/L	200
TSS	mg/L	1,500
pH	-	6.0-9.0
Color	PCU	-

Result of monitoring shall be reported by the PCO to the farm manager with recommendations for improvement of the effluent, if necessary.

Groundwater quality, particularly on the coliforms and nitrates content, will also be monitored on semi-annual basis. The proponent will identify and establish at least two (2) monitoring wells, i.e., upstream and downstream groundwater flow.

## **IV.2.2 Air Pollution from Burning the Biogas**

### Impact Identification

The combustion of the biogas using the 375 KW gas engine will release carbon monoxide.

### Prevention / Mitigation

The gas engine shall have an air pollution control device to minimize the generation of carbon monoxide. The gas engine shall also be provided with a muffler and smoke stack

to reduce carbon concentrations. To prevent the biogas from damaging the engine, an absorbent material shall be used to remove hydrogen sulfide prior to combustion.

The equipments shall be regularly maintained by the O&M crew to generate efficient electricity.

#### Monitoring

Particulate matter and carbon monoxide shall be analyzed at least annually from the gas engines to determine the level of the pollutants. The concentration shall be within the Emission Standards set by the DENR under Republic Act No. 8749 or known as the Philippine Clean Air Act of 1999, as follows:

Parameter	Unit	Concentration
Particulates	mg/Ncm	200
Carbon Monoxide	mg/Ncm	500

The PCO shall report the air sampling results with recommendations, if appropriate, to the farm manager.

### **IV.2.3 Sludge Generation**

#### Impact Identification

Sludge collected in the solid separator tank shall be piled. Piled sludge may result to anaerobic conditions and generate methane. Wet sludge dumped anywhere may contaminate the ground soil and its leachate may percolate to the ground water.

#### Prevention / Mitigation

The sludge collected from the solid separator tank shall be deposited in a sludge drying bed. The sludge shall not be more than 20cm high to prevent methane generation. Sludge shall be used as fertilizer in vegetation areas.

#### Monitoring

The PCO shall monthly inspect the amount of sludge in the sludge drying bed to ensure that the sludge is not accumulating. He shall ensure that the piled sludge is not more than 20 cm high.

### **IV.2.4 Odor Generation**

#### Impact Identification

Pig wastes consisting of manure and urine generate an odorous smell. Urine gives off ammonia which has a distinct odor that can irritate the skin, eyes, throat and lungs. It



can also cause coughing and burns<sup>1</sup>. Wet pig manure also generates foul odor. Foul odor is a nuisance to the laborers and the employees of Biotech Farms.

Biogas is mainly composed of methane, carbon dioxide, carbon monoxide, hydrogen, nitrogen and hydrogen sulfide. The intentional production of biogas from the anaerobic digester will also increase the potential of release of the gas to the atmosphere. Hydrogen sulfide is an odorous gas (similar to the smell of rotten eggs) that shall be a nuisance to the workers and employees of Biotech Farms.

#### Prevention / Mitigation

The WTF and the drainage system shall be well maintained especially for possible leaks. The O&M crew shall ensure that the liquid waste will continuously flow in the WTF up to the last lagoon for proper treatment.

#### Monitoring

The PCO shall inspect the WTF and the methane recovery project for leaks. A methane monitoring system shall be installed in the facility to continuously monitor the levels of methane.

### **IV.2.5 Noise Generation**

#### Impact Identification

The source of noise is the gas engine when it is being operated.

#### Prevention / Mitigation

The gas engine shall be placed in an insulated room away from the farm's office and pigpens to avoid disturbance during operation. Shock absorbers shall be installed to minimize the noise. Engine operators shall wear earplugs during engine operation.

#### Monitoring

During the operation of the gas engines, the PCO shall determine if the noise generated is at a tolerable level using a Sound Level Meter.

### **IV.2.6 Health and Safety**

#### Hazard Identification

Trapped biogas in the anaerobic digester, including those collected in the pipes, have the potential to escape to the atmosphere and pollute the air quality if there are leaks. In addition, methane, hydrogen and carbon monoxide (which are among the components

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<sup>1</sup>DOH, *Health Advisory on Ammonia*, March 30, 2006

of the biogas) are combustible. There is a potential that the biogas will catch fire and/or explode if exposed to heat.

#### Prevention / Mitigation

The PCO shall ensure that the HDPE cover and the gas collection pipes are not damaged. Leaks shall immediately be sealed.

Equipments that are sources of heat shall be kept at a safe distance away from the methane recovery project especially from the anaerobic digester.

Workers operating the gas engines and flaring equipment shall wear personal protective.

#### Monitoring

The PCO shall monthly inspect the HDPE cover and the collection pipes for leaks. He shall observe also the operator of the gas engine if safety protocols are observed.

**V. MATRIX OF THE ENVIRONMENTAL MANAGEMENT PLAN**

Project Phase / Env't Aspect	Env't Component Likely to be Affected	Potential Impact	Implementation Arrangements					Monitoring Plan					
			Prevention / Mitigation	Schedule	Responsible Entity	Cost	Reporting to	Monitoring Method	Parameters to be Monitored	Schedule	Responsible Entity	Cost	Reporting to
<b>Construction Phase</b>													
Solid Wastes Generation	<ul style="list-style-type: none"> <li>• Biotech Farms</li> </ul>	<ul style="list-style-type: none"> <li>• Solid wastes shall pose nuisance to Biotech Farms</li> </ul>	<ul style="list-style-type: none"> <li>• Solid wastes shall be regularly disposed to the Municipality's garbage collector.</li> </ul>	<ul style="list-style-type: none"> <li>• Once a week.</li> </ul>	Workers	P5,000 .00 for the trash bins.	Project engineer	Visual inspection	Solid wastes in the storage area.	Once a week	Project engineer		Pollution Control Officer (PCO)
			<ul style="list-style-type: none"> <li>• Existing toilet facility of Biotech Farms shall be utilized.</li> </ul>	<ul style="list-style-type: none"> <li>• Toilet facility of Biotech Farms is existing</li> </ul>	Biotech Farms		Project engineer	Visual inspection	Solid wastes in the storage area.	Once a week	Project engineer		Pollution Control Officer (PCO)

Closed anaerobic lagoon	<ul style="list-style-type: none"> <li>Air quality</li> <li>Health and safety</li> </ul>	<ul style="list-style-type: none"> <li>Increase the risk to pollute the air quality.</li> <li>Biogas may catch fire that may lead to explosion.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure the HDPE cover is not damaged.</li> <li>Heat sources shall be kept away from the Project.</li> </ul>	Before installation of the HDPE cover	Project engineer	P 735,000.00 for the HDPE cover	PCO	Observation	Leaks in the HDPE cover	Two weeks after placement of the cover	Project engineer		Farm manager
Open flare	<ul style="list-style-type: none"> <li>Health and safety</li> </ul>	Hazard to employees	Enclose the flaring equipment.	Operation phase	PCO		Farm manager	Visual observation	Flaring area	Within the month after installation	Farm manager		Biotech Farms
<b>Operation Phase</b>													
Wastewater Generation	<ul style="list-style-type: none"> <li>Leaks from the WTF.</li> <li>Ground soil</li> <li>Ground water</li> </ul>	Liquid wastes will contaminate the ground soil and percolate to the ground water.	<ul style="list-style-type: none"> <li>Maintenance of the WTF. The final pond shall be closed to disallow discharge of the treated effluent anywhere.</li> </ul>	<ul style="list-style-type: none"> <li>Daily flushing of wastes to the WTF.</li> <li>Monthly maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Labors</li> <li>Operation and Maintenance (O&amp;M) crew</li> </ul>	<p>P40 Million for the construction of the biogas facility</p> <p>P3,500.00 for maintenance cost.</p>	The laborers and O&M crew shall report to the PCO	<ul style="list-style-type: none"> <li>Visual inspection of the pig wastes.</li> <li>Effluent wastewater sampling</li> <li>Ground water sampling and monitoring</li> </ul>	<ul style="list-style-type: none"> <li>Wastes in the pignpens</li> <li>BOD, TSS, pH and color</li> <li>Coliform and nitrates</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> <li>Yearly</li> <li>Semi-annual</li> </ul>	PCO	P60,000.00 per year for wastewater and groundwater sampling and testing	Farm manager
Health and Safety													

<ul style="list-style-type: none"> <li>Biogas trapped in the anaerobic digester and collection gas pipes</li> </ul>	<ul style="list-style-type: none"> <li>Air quality</li> <li>Health and safety</li> </ul>	<ul style="list-style-type: none"> <li>Leaks will release the biogas and pollute the air quality.</li> <li>Biogas will catch fire that may lead to explosion when exposed to heat.</li> </ul>	<p>Regular maintenance of the HDPE cover and the collection gas pipes.</p> <p>Heat sources shall be kept at a safe distance away from the biogas facility</p> <p>Personal protective equipment shall be used by the engine operators</p>	Weekly	Operation & Maintenance (O&M) crew	P3,500.00 for maintenance cost.	PCO	Methane monitoring system	Methane	Monthly	PCO		Farm manager
<p>Emission of Air Pollutants</p> <ul style="list-style-type: none"> <li>Combustion of the 375KW gas engine</li> </ul>	Air quality	Incomplete combustion of biogas will release carbon monoxide.	<ul style="list-style-type: none"> <li>Installation of a muffler, smoke stack and other air pollution control device/s</li> <li>Maintenance of the gas engines</li> </ul>	<ul style="list-style-type: none"> <li>Was considered during the installation of the gas engines.</li> <li>Quarterly maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Farm manager</li> <li>O&amp;M crew</li> </ul>	P3,500.00 for maintenance cost.	O&M shall report to the PCO	Point source air emission test	PM and CO	Yearly	PCO	P30,000.00 / emission test	Farm manager
<ul style="list-style-type: none"> <li>Flaring</li> </ul>	Air quality	Incomplete	<ul style="list-style-type: none"> <li>Systemat</li> </ul>	During	Gas engine	P3,500	PCO	Visual	Status of the	Quarterly	PCO		Farm

when gas engines are not in use		combustion of biogas will release carbon monoxide.	<ul style="list-style-type: none"> <li>ic flaring operation</li> <li>Maintenance of the flaring equipment.</li> </ul>	non-operation of the gas engines	operator	.00 for maintenance cost.		inspection	flaring equipment				manager
<p>Solid Wastes Generation</p> <ul style="list-style-type: none"> <li>Operation WTF</li> </ul>	<ul style="list-style-type: none"> <li>Ground soil</li> <li>Ground water</li> </ul>	Sludge will be generated that will produce leachate and contaminate the ground soil and percolate to the ground water	Sludge shall be placed in the sludge drying bed. Piled sludge shall not be more than 20cm high.	Yearly or as the need arises.	Biotech Farms	P400,000.00 for the sludge drying bed		Visual inspection	Sludge	Weekly	PCO		Farm manager
<p>Odor Generation</p> <ul style="list-style-type: none"> <li>Pig wastes</li> <li>Wastewater</li> </ul>	<ul style="list-style-type: none"> <li>Biotech Farms</li> </ul>	Foul odor from the pig wastes will be a nuisance	<ul style="list-style-type: none"> <li>Good housekeeping practices will be observed</li> <li>Ensure continuous flow of the wastewater in the treatment system</li> </ul>	Operation	Laborers		PCO	Sense of smell	Amount of pig wastes	Weekly	PCO		Farm manager



## **VI. INSTITUTIONAL ARRANGEMENT ON MONITORING AND VALIDATION**

### **VI.1 CAPACITY BUILDING ON IEC**

LBP will establish partnerships with donors and universities to provide technical support/training and outreach to assist the piggery owners establishing their monitoring and reporting system for the EMP and the anaerobic digester focusing on environmental performance/compliance on the EMP, proper quality controls; troubleshooting on monitoring issues; and in undertaking calibration of the biodigester system.

### **VI.2 MONITORING OF ENVIRONMENTAL PERFORMANCE**

To ensure the sustainability of the project, the long-term and accountable implementation of the environmental safeguards will be one of the obligations under the Emission Reduction Purchase Agreement (ERPA), and hence, will be monitored by LBP and will form part of the annual Emission Reduction (ER) monitoring report. For guidance, WB will supervise the safeguards implementation.

An Environmental Monitoring Report (EMR), which shall include the review of the proponent's Self Monitoring Report, shall be prepared on a semi-annual frequency, i.e. January and July of each year, to be submitted to the EMB regional office concerned and a copy of the submitted EMR must be provided to the PMO for reference and review purposes.

The primary purpose of compliance monitoring is to ensure the implementation of sound and standard environmental procedures as defined during the project preparation. Specifically, it aims to:

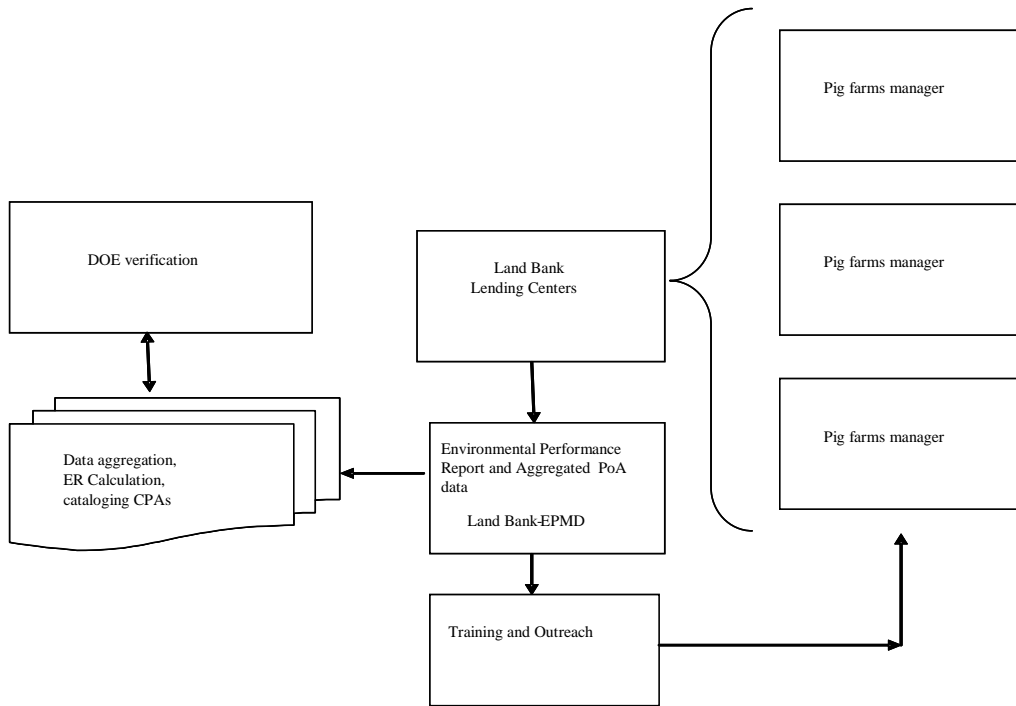
- Monitor project compliance with the conditions set in the ECC;
- Monitor compliance with the EMP(s) and applicable laws, rules and regulations; and
- Provide a basis for timely decision-making and effective planning and management of environmental measures through the monitoring of actual project impacts vis-à-vis the predicted impacts in the EIS / IEE.

#### **VI.2.1 INSTITUTIONAL SET-UP OF THE MONITORING SYSTEM**

The operation and management of the PoA will be led by LBP in their role as technical and financial intermediary and the group in charge of organizing and ensuring compliance with the rules under the PoA. Thus, LBP has established an Environment and Social Safeguard Framework to make sure that all projects under the PoA (e.g. Biotech Farms, etc.) will follow an agreed standard framework to address the project's environmental aspects/impacts.



The diagram below illustrates how the monitoring plan will be implemented:



LBP, being an ISO 14001 certified institution, will establish a Project Management Office (PMO) under the LBP's Environmental Program and Management Department (EPMD) to primarily implement the safeguards activities. For this purpose, the Environmental Program Management Unit (EPMU) will serve as the project's PMO. Part of this activities will be to exercise environmental due diligence by keeping records of project EA reports, feedbacks / technical information (which may include but not limited to environmental performance history, issuance of related environmental permits, notice of violations, dumpsite closure plan, etc.), and ECCs / CNCs. Environmental safeguards documents may undergo substantive review by the PMO environmental engineer or the LBP-EPMD, particularly if pressing environmentally critical issues exist.

The conduct of review by PMO / LBP-EPMD, particularly of the Environmental Review and Assessment Unit (ERAU), is part of its oversight function and task enumerated in the LBP CPI 2009-002 to verify that projects are in compliance to environmental standards and regulations. ERAU is currently manned by four (4) regular personnel of LBP, whose primary function is to implement the LBP CPI 2009-002. As the LBP CPI 2009-002 primarily requires environmental assessment of the projects covered by the Philippine EIS system and collaterals which are part of the project or used as project site only, the environmental assessment will be extended and conducted to CDM projects (which are usually not covered by the Philippine EIS system) for this purpose. This type of review performed by either the PMO or WB is entirely independent and does not conflict with the nature of evaluation the DENR performs.

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## VII. ACCOUNTABILITY STATEMENT

This is to certify that all the information in this Environmental Assessment Report for the Methane Recovery and Combustion Project of Biotech Farms, Inc. are accurate and complete to the best of our knowledge, and that an objective and thorough assessment of the Project was undertaken in accordance with the dictates of professional and reasonable judgment.

All the commitments contained herein including the Environmental Management Plan shall be strictly complied. In case of any deviation, the same shall be of interest in environmental protection and sustainable development. Biotech Farms, Inc. shall be held responsible for any liabilities and/or penalties arising from the Methane Recovery and Combustion Project.

In witness whereof, we hereby set our hands this \_\_\_\_\_ day of \_\_\_\_\_ at \_\_\_\_\_.

\_\_\_\_\_  
Pollution Control Officer

\_\_\_\_\_  
Farm Manager

\_\_\_\_\_  
President

SUBSCRIBED AND SWORN TO before me this \_\_\_\_\_ day of \_\_\_\_\_, affiant exhibiting his / her \_\_\_\_\_  
No. issued at \_\_\_\_\_ on \_\_\_\_\_.

Doc. No. \_\_\_\_\_  
Page No. \_\_\_\_\_  
Book No. \_\_\_\_\_  
Series of \_\_\_\_\_