

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

RDF FLORIDABLANCA FARM

Methane Recovery and Power Generation Project

Ref. No. 5979-0014

CPA-12 Methane Recovery and Combustion with Renewable Energy Generation from Anaerobic Animal Manure Management Systems under the Land Bank of the Philippines' Carbon Finance Support Facility

June 2019

LIST OF ACRONYMS

| | |
|--------|---|
| BOD | Biological Oxygen Demand |
| CDM | Clean Development Mechanism |
| CER | Certified Emission Reduction |
| CFSF | Carbon Finance Support Facility |
| CMR | Compliance Monitoring Report |
| CPA | Component Project Activity |
| DECORP | Dagupan Electric Corporation |
| DENR | Department of Environment and Natural Resources |
| DNA | Designated National Authority |
| DP | Discharge Permit |
| ECC | Environmental Compliance Certificate |
| EMB | Environmental Management Bureau |
| EPMD | Environmental Program and Management Department |
| ESMP | Environmental and Social Management Plan |
| ESSF | Environmental and Social Safeguards Framework |
| LBP | Land Bank of the Philippines |
| MOA | Memorandum of Agreement |
| MRF | Methane Recovery Facility |
| MSDS | Materials Safety Data Sheet |
| PCO | Pollution Control Officer |
| P.D. | Presidential Decree |
| PoA | Program of Activity |
| PPE | Personal Protective Equipment |
| PTO | Permit to Operate |
| R.A. | Republic Act |
| SMR | Self-Monitoring Report |
| SPA | Subproject Agreement |
| TSD | Treatment, Storage, Disposal |
| TSS | Total Suspended Solids |
| WTF | Water Treatment Facility |

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PURPOSE OF THE DOCUMENT

This Environmental and Social Management Plan (ESMP) is prepared as part of the requirements of the Safeguards Framework for Clean Development Mechanism (CDM) projects implemented under the Carbon Finance Support Facility (CFSF) of the Land Bank of the Philippines (LBP). The Environmental and Social Safeguards Framework (ESSF) was developed to ensure the establishment of protection, compliance, and mitigation measures for relevant environmental and social aspects of projects under the CDM program which covers the Methane Recovery and Power Generation Projects in pig farms.

Scope

Since the Project is a key component of RDF Floridablanca Farm's wastewater treatment facility (WWTF) – which handles the primary waste the piggery produces (manure) – this ESMP will cover the operations of the entire pig farm described herein. It will, however, highlight the management of impacts attributable to or associated with the Project.

1 PROJECT SUMMARY

The Methane Recovery and Power Generation Project of RDF Floridablanca Farm owned by RDF Feed, Livestock and Foods, Incorporated is an initiative developed under LANDBANK's CFSF. Its goal is to capture greenhouse gases, particularly methane from piggery wastewaters that would otherwise dissipate into the atmosphere, and convert them into electrical energy.

1.1 Proponent Profile

Proponent: RDF Feed, Livestock and Foods, Incorporated
Business Address: Nepo Commercial Complex, Angeles City, Pampanga
CEO: Robert H. Lo, DVM

Farm Name: RDF Floridablanca Farm
Project Site: Floridablanca, Pampanga, Philippines
Farm Coordinates: 14°54'32.29"N, 120°26'17.12"E

Project Type: Livestock Project
Philippine Standard
Industrial Classification: 0145 - Hog Farming

Contact Persons

RDF Floridablanca Farm

Safety Officer: Richard Paguio
Telephone No.: 09233302882
Pollution Control Officer: Dr. Ronald Dizon
Telephone No.: (63) 998 988 9507

LANDBANK

Lending Programs
Management Group: Emellie V. Tamayo
Designation: Head / First Vice President
Telephone No.: (632) 405-7309
Fax No.: (632) 528-8542

Environmental Program

Management Department: Prudencio E. Calado III
Designation: Head / Assistant Vice President
Telephone No.: (632) 405-7339
Fax No.: (632) 528-8484

1.3 Existing Environmental Conditions

1.3.1 Project Site

The Project has been built inside the premises of RDF Floridablanca Farm Inc. (14°54'32.29"N, 120°26'17.12"E), a 19.05 ha property in Brgy. Gutad, Floridablanca, Pampanga. Pampanga is in the island of Luzon, northern Philippines (see Map 1).



Map 1. Philippine map showing the location of the Province of Pampanga (Image from *Wikipedia*^a)



Map 2. Municipality of Floridablanca, Pampanga (highlighted in red) showing the location of the project site (Image generated using *Google Maps*^b)

1.3.2 Land Classification and Use

The Project's location is classified as agro-industrial [Zoning / Locational Clearance]. In its vicinity are croplands and quite a number of houses and churches (see Map 3).



Map 3. Satellite image of RDF Floridablanca Farm (14°54'32.29"N, 120°26'17.12"E) and its vicinity (Image generated using Google Earth)



Image 1. Satellite image of RDF Floridablanca Farm showing areas (low: yellow; moderate: orange; high: red) at risk to flooding (Image generated using NOAA website^b)

1.3.3 Climate

Floridablanca, Pampanga has a tropical climate. Most months of the year are marked by significant rainfall. The short dry season has little impact. The Köppen-Geiger climate classification is Am. The temperature here averages 27.3 °C. The average annual rainfall is 2428 mm. (climate-data.org) ¹

1.3.4 Topography and Soil

The Farm sits on a relatively flat land surrounded with hills sloping around the farm except for the road going to the farm which is also flat. the soil series in Floridablanca are composed of Angeles Coarse soil, Angeles soil Undifferentiated, and LA PAZ Silt Loara.

1.3.5 Water Resources

The closest surface water to the property is the Gutad creek 1.2 km away from the farm. The water is used for irrigation and farm related activities.

1.3.6 Natural Hazards

The area where the Farm is situated is not frequented by typhoons (low typhoon incidence).

Almost half the property's ground, from its southern perimeter northward, is at risk from low to medium (0.5 m) flooding.

1.3.7 People and Communities

There are a few, sporadically situated houses within the 500 m radius of the Farm.

1.4 Project Description

The Project covers the installation and operation of an anaerobic digester system and its ancillary facilities including post-treatment wastewater lagoons and a biogas-fueled electricity generation system. The biodigester and the power generation unit are collectively referred to herein as methane recovery facility (MRF).

1.4.1 Components and Design

RDF Floridablanca Farm's wastewater treatment process features three phases:

- *Pre-Treatment*, which involves mechanical removal of indigestible materials from and the breaking down of relatively large digestible particles in wastewaters prior to entering the reactors;
- *Anaerobic digestion*, or the disintegration of biodegradable materials in the wastewaters through biological processes facilitated by microbes which thrive in the conditions promoted by the reactor; and
- *Post-Treatment* of biogas, effluent, and sludge resulting from anaerobic digestion.

In general, the WWTF is mainly composed of a collecting tank, a covered concrete lagoon (hybrid channel), and a series of earthen clarifying lagoons (see Image). The interior of the biodigester is similar to a scaled up sand trap. A biogas generator set basically consists the MRF.

Overall, the anaerobic digester have been intended to accommodate wastes generated by the farm's maximum pig population (30,000 heads) and capture enough biogas to run the project's facilities with a net energy requirement of zero. The design and layout of the WWTF are in the construction plans in Appendix A. Properties and specifications of the WWTF-MRF, including capacities, outputs, and efficiencies, will be detailed in the succeeding version of this ESMP (see Section 4).

Table 1 presents the general aspects and technical features of each of these systems.

Table 1. Specifications of RDF Floridablanca Farm's Wastewater Treatment Facility-Methane Recovery Facility

| Phase | | Process | Component | No. of Units | Description / Equipment |
|---------------------|----------|------------------------------------|---------------------------|---|--|
| Pre-treatment | | settling | pre-storage settling tank | 1 | concrete 6 x 6 x 8 m (height) --- equipped with submersible pump |
| Anaerobic treatment | | anaerobic digestion / fermentation | reactor | 1 | earthen lagoon, lined and covered with 1 mm HDPE 3,930 m ³ |
| Post-treatment | Biogas | combustion | scrubber system | 1 | - |
| | | | generator set | 1 | 150kva |
| | Effluent | clarification (settling, aeration) | open lagoon | 3 | earthen lagoon lined with 1mm HDPE - 30 x 45 x 3m - 30 x 45 x 3m - 30 x 45 x 3m |
| | | | | | earthen ditch lined with 1mm HDPE - 30 x 45 x 3m |
| Sludge | drying | drying bed | 1 | earthen ditch lined with 1mm HDPE - 30 x 45 x 3m | |

1.4.2 Operation

The waste produced from the pig houses of the farm is treated in an enclosed anaerobic wastewater treatment facility consisting of a collection tank, a biogas digester and post treatment lagoons. The digester is covered by high-strength plastic material (HDPE) to collect the biogas and prevent atmospheric gases from leaking into the tank.

Inside the biodigester, wastewaters are continuously stirred by incoming and outgoing wastewaters, thus preventing sedimentation. This consequently results in minimal formation of sludge inside the chamber. Through hydraulic pressure created by influent, partially treated wastewaters exit the biodigester into the adjacent settling lagoon where they are stored indefinitely or until drawn to be used in the farm.

Biogas trapped in the biodigester is directed to gas collecting tank. When needed, gas from this tank is drawn to a gas conditioning equipment using a blower, and then to one of the generator sets that converts it to electrical energy used in the farm.

The biodigester has been designed to efficiently degrade organic solids in wastewaters. Hence, provision for sludge extraction and management will be established when the need arises.

Figure 2 illustrates the current processes involved and the project components employed in the wastewater treatment and power generation process in RDF Floridablanca Farm.

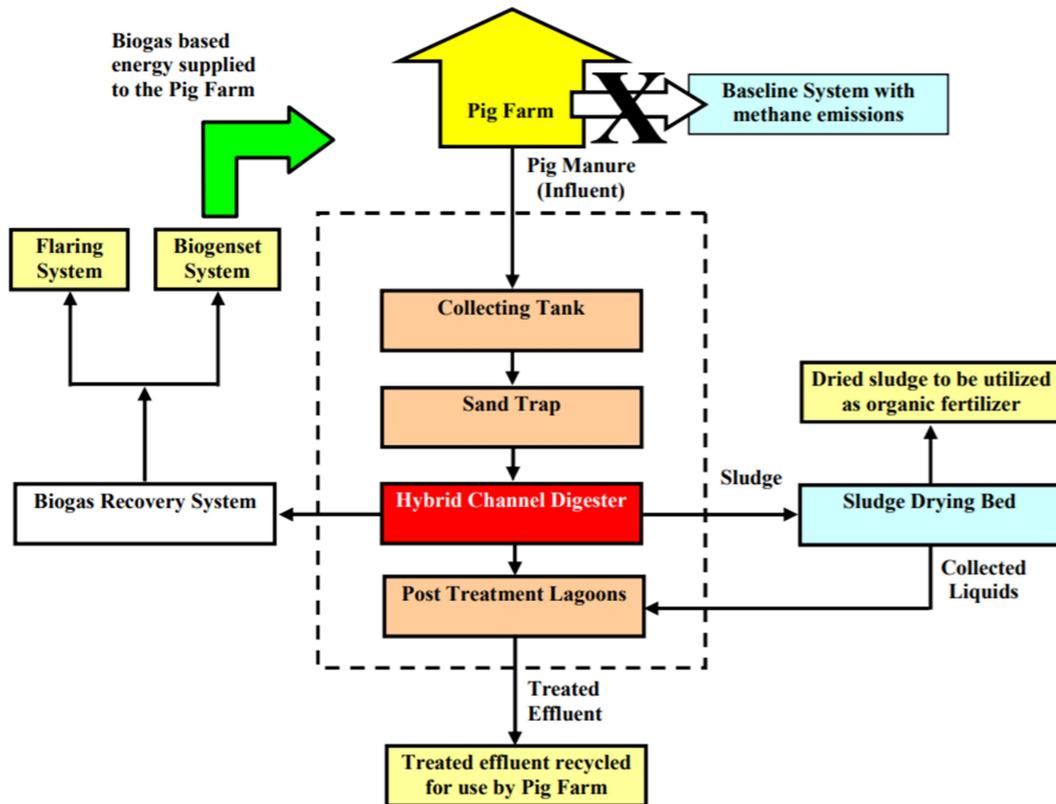


Figure 2. Wastewater treatment process of RDF Floridablanca Farm

2 ENVIRONMENTAL MANAGEMENT

2.1 Impact Assessment

2.1.1 Positive

RDF Floridablanca Farm provides employment opportunities to residents of the Municipality of Floridablanca and in the province of Pampanga and even to people from nearby provinces. It also generates significant revenue for the local government.

The project in particular improved the pig farm's method of handling manure and liquid waste. Compared to open lagoons, the biodigester has significantly amended the farm's wastewater treatment process, resulting in better effluent quality. Foul odors from effluents have also been greatly abated, improving the environment for both workers and livestock, as well as for neighboring communities.

Moreover, using biogas-generated electricity also reduces the farm's reliance on the grid (and on power from conventional fuels), translating to savings for the piggery business.

By providing a mechanism to capture methane and using it as a source of energy, the project has lowered Floridablanca Farm's overall carbon footprint. With inputs coming from about 17,400 hogs (current average), through the project, the farm is estimated to be capable of reducing greenhouse gas emissions equivalent to 7,575 tCO₂e annually.

Finally, having been registered as a component project activity (CPA) in the CDM Program, RDF Floridablanca Farm has an opportunity to earn monetary incentives by selling carbon credits to World Bank. It may also opt to trade its carbon credits in the wider carbon market.

Economy

Using biogas-generated electricity lessens the Farm's reliance on the grid, translating to savings for the piggery business. Sludge on site eliminates the need to purchase fertilizer for the Farm's vegetation. Selling it as soil amendment presents an opportunity to generate additional income. Further savings is also gained from reusing treated effluent.

Moreover, having been registered as a component project activity (CPA) in the CDM Program, RDF Floridablanca Farm has an opportunity to earn monetary incentives by selling carbon credits to World Bank. It may also opt to trade its carbon credits in the wider carbon market after the Program.

Lastly, RDF Floridablanca Farm provides employment opportunities to residents of Brgy. Gutad and generates revenue for the local government.

2.1.2 Negative

Certain aspects of the pig farms' and the project's operations inevitably result in potential harm to the environment, including generation wastewaters; hazardous and non-hazardous wastes; air pollutants; foul odors, noise, dust and other nuisance; and depletion of natural resources. These pose inherent risks to environmental quality and natural ecosystems and to health and safety of workers, communities, and livestock.

A. Wastewater Generation

Wastewaters saturated with dissolved manure and feed materials are primarily generated from raising around 807 pigs through intensive farming methods.

B. Solid Wastes Generation

Pig manure, sludge from treatment of wastewaters, and carcasses (non-infectious) make up the bulk of solid wastes generated in the Farm.

C. *Hazardous Wastes Generation*

Generation of potentially hazardous wastes mainly result from veterinary activities and use of various chemicals for cleaning and for maintenance of machineries. Biological materials from diseased pigs also pose significant risks to the health of workers and livestock.

D. *Generation of Air Pollutants*

Emissions from diesel- and biogas- fueled generator sets which supplement the grid for the Farm's power requirements are the main sources of air pollutants in the Farm.

E. *Risks to Environmental Quality*

- ▭ Pollution. The inadvertent release to the environment (through breaches and leaks) of the wastes listed above, especially of nutrient-rich materials, may cause serious damage to the quality of affected soil and aquatic resources.
- ▭ Global warming. Large amount of biogas, mostly composed of potent greenhouse gases, are produced during the anaerobic decomposition pig manure and other organic compounds. If allowed to escape to the atmosphere, these gases will contribute to the furthering of the deteriorating effects of global warming. Moreover, the use of power from the grid consumes non-renewable fuels which generate greenhouse gases when processed for electricity production.
- ▭ Resource depletion. Intensive farming demands for significant volume of freshwater. Neglectful sourcing and use of water in the Farm could deplete water resources.
- ▭ Site risks. The project site is a typhoon prone area. Strong winds may damage WWTF and MRF causing release of pollutants. Long periods of heavy rainfall could overtop wastewater lagoons and wash off sludge piles.

F. *Health and Safety (Methane Recovery Facility)*

Biogas is a mixture of gases produced during anaerobic digestion. It is mainly composed of methane and carbon dioxide, but other gases (nitrogen, hydrogen, hydrogen sulphide, ammonia, etc.) may also be present at lower concentrations.

- ▭ Fire and Explosion. The MRF presents a major fire and explosion hazard in the farm owing to the high concentrations of biogas (primarily consists of methane which is highly flammable and combustible) that it is designed to capture and process. Risk of explosion is elevated in areas where biogas is compressed in containers for storage.
- ▭ Asphyxiation and Poisoning. Methane and carbon dioxide are asphyxiants, substances that cause suffocation by displacing oxygen in the ambient air. Furthermore, carbon dioxide and hydrogen sulfide are considered poisonous when inhaled at high concentrations. In the farm, risks of asphyxiation and gas poisoning are high in the areas associated with the MRF and in confined spaces and poorly ventilated areas where fugitive biogas may collect.
- ▭ Infection and Infestation. Handling and processing of manure, wastewaters, and sludge exposes workers to various pathogens and parasites.

G. *Health and Safety (General Operations)*

- ▭ Odor, Noise, Dust

2.2 **Due Diligence**

RDF Floridablanca Farm commits to undertake due diligence in its dealings and operations through compliance with relevant regulatory safeguards and implementation of the environmental management and monitoring plan in Table 2 and of other relevant provisions herein.

2.2.1 **Compliance to Regulatory Instruments (Legal Framework)**

The Farm operates in the context of laws prescribing the regulatory safeguards in the following tables. Table 2 lists relevant national legal instruments concerned with environmental protection,

whereas Table 3 lists permits issued by local government agencies that mainly address health and safety aspects of the Farm and the Project.

Table 2. Environmental documents and statutory requirements regulating the operation of RDF Floridablanca Farm

| DOCUMENT | PARTICULARS / STATUS | |
|--|----------------------|--|
| Environmental Compliance Certificate (ECC) | Reference No. | R03-1105-0274 (amended) |
| | Issuing Agency | EMB Region 3 |
| | Date of Issuance | November 19, 2012 |
| | Valid Until | - no expiration - |
| | Conditions | <ul style="list-style-type: none"> • area of operation: 190500 m² • maximum population: 15,000 heads • submission of SMR and CMR • register as Hazardous Waste Generator • creation of EMF |
| Discharge Permit (DP) | Reference No. | DP-15K-03PA-1670-R |
| | Issuing Agency | EMB Region 3 |
| | Date of Issuance | July 21, 2016 |
| | Valid Until | July 30, 2019 |
| | Conditions | <ul style="list-style-type: none"> • effluent wastewater flow rate: 180 m³/day • receiving body of water: Moriones Creek • submission of SMR and CMR |
| Permit to Operate (PTO) Air Pollution Source Control Installations | Reference No. | POA-17G-03PA-1670 |
| | Issuing Agency | EMB Region 3 |
| | Date of Issuance | July 19, 2018 |
| | Valid Until | July 30, 2019 |
| | Conditions | For the following equipment: <ul style="list-style-type: none"> ▪ (1 unit) 150 KVA "DENYO" generator setsubmission of SMR |
| Water Permit | Reference No. | Application Process |
| | Issuing Agency | National Water Resources Board |
| | Date of Issuance | - |
| | Valid Until | - no expiration - |
| | Conditions | (P.D. 1067 Water Code) |
| Hazardous Waste Generator ID | Registration No. | Application Process |
| | Approving Agency | EMB Region 3 |
| | Date of Approval | |
| | Valid Until | - no expiration - |
| | Conditions | |
| PCO (Pollution Control Officer) Accreditation Certificate | Accreditation No. | COA No. - 17F-03PA-0318 |
| | Issuing Agency | EMB Region 3 |
| | Date of Issuance | February 3, 2014 |
| | Valid Until | June 28, 2020 |

CMR Compliance Monitoring Report
 EMB Environmental Management Bureau
 P.D. Presidential Decree

Table 3. Permits ensuring the safety of RDF Floridablanca III Farm's facilities and operation

| DOCUMENT | PARTICULARS | |
|-----------------|------------------|--|
| Business Permit | Permit No. | Available |
| | Issuing Agency | Office of the Mayor - Municipality of Floridablanca |
| | Date of Issuance | January 2019 |
| | Valid Until | December 31, 2019 |
| | Prerequisites | compliance with the requirements of the following: <ul style="list-style-type: none"> • Building Permit |

| | | |
|------------------|------------------|--|
| | | <ul style="list-style-type: none"> • Occupancy Permit • Locational / Zoning Clearance • Fire Safety Inspection Certificate • Health and Sanitary Certificate |
| Zoning Clearance | Registration No. | Available |
| | Approving Agency | City Planning and Development Office |
| | Date of Approval | |
| Fire Clearance | Reference No. | Available |
| | Issuing Agency | Bureau of Fire Protection Regional Office 3 |
| | Date of Issuance | |
| | Valid Until | |
| | Prerequisites | compliance with R.A. 9514 (Revised Fire Code) |
| Sanitary Permit | Permit No. | Available |
| | Issuing Agency | City Health Office – Municipality of Floridablanca |
| | Date of Issuance | |
| | Valid Until | |
| | Prerequisites | <ul style="list-style-type: none"> ▪ compliance with P.D. 522 ('Sanitation Requirements'), P.D. 856 (Code on Sanitation), and pertinent local ordinances |

Environment and Natural Resources Office
 Presidential Decree
 Republic Act

2.2.2 Environmental Management Plan

Table 4 summarizes the measures intended to address the environmental impacts and risks identified in Section 2.1.2. Adequate training will be given to concerned employees to ensure that the content of this environmental management plan will be properly carried out.

Table 4. Environmental Management and Monitoring Plan of RDF Floridablanca III Farm

| IMPACT | SOURCE / ACTIVITY | MANAGEMENT | | MONITORING METHOD | FREQUENCY | PARAMETER / INDICATOR | RESPONSIBLE ENTITY | REPORTING TO | Cost, Php |
|---|--|--|---|---|-----------------------------|--|--------------------|--------------------------|-----------|
| A. Wastewater | | | | | | | | | |
| a.1 generation of wastewater | pig raising | water conservation strategies | | quantify wastewater produced | monthly | volume of wastewater produced | Safety officer | PCO > reported in SMR | |
| | | regular inspection and maintenance of water delivery system | | | | | | | |
| | | wastewater treated in WWTF | | | | | | | |
| | | treated effluent used as liquid fertilizer | | | | | | | |
| a.2 generation of domestic wastewater, gray water | general farm and domestic activities | water conservation strategies | - | check siphoning and hauling records | every 5 years | volume of sewage hauled | Safety officer | | |
| | | regular inspection and maintenance of water delivery system | | | | | | | |
| | | siphoning and hauling of sewage to a wastewater treatment facility | | | | | | | |
| B. Solid Waste | | | | | | | | | |
| b.1 generation of manure, sludge | pig raising, feed wastage, WTF | minimize feed wastage | , | quantify (dried) sludge produced | every harvesting / disposal | amount of sludge produced | Safety officer | PCO | |
| | | regular inspection and maintenance of feed delivery system | | | | | | | |
| | | manure treated in WWTF | | | | | | | |
| b.2 generation of (non-infectious) carcasses, blood | injuries, adverse environmental conditions, etc. | observe sound pig raising practices and biosecurity measures | - | weigh disposed materials | daily / every hauling | weight of materials disposed | Safety officer | PCO | |
| | | regular inspection and maintenance of equipment that regulates pig environment | | | | | | | |
| | | disposal through burial | | | | | | | |
| b.3 generation of general solid wastes | general farm and domestic activities | on-site segregation | | quantify / weigh solid wastes disposed of (recyclables and residuals) | weekly / every disposal | quantity of and details on wastes generated, stored, and disposed of | Safety officer | PCO | |

| | | | | | | | | | |
|---|--|--|---|---|--|-----------------|-----|-------------------|--|
| | | | | | | | | > reported in SMR | |
| | | adequate collection bins, storage area | | | | | | | |
| | | reduce, reuse, recycle / selling of recyclables | | | | | | | |
| | | composting of biodegradable wastes | | | | | | | |
| | | disposal through barangay collection | | | | | | | |
| C. Hazardous Materials | | | | | | | | | |
| c.1 generation of hazardous, toxic materials | facility and equipment operation and maintenance, pest control | monitor resource usage to avoid expiration of chemicals, etc. | quantify each type of hazardous waste produced / stored and disposed of (check hazardous waste manifests) | quarterly | quantity of each hazardous waste type stored and disposed | Safety officer | PCO | > reported in SMR | |
| | | will dispose through accredited TSD | | | | | | | |
| c.2 generation of infectious, pathological materials, carcasses | veterinary activities, outbreaks | disposal through burial | | | | | | | |
| D. Air pollution | | | | | | | | | |
| d.1 generation of biogas | WTF, anaerobic digestion | combustion using biogas-fueled engine | - quantify power produced | daily | kWh produced | Safety officer | PCO | | |
| d.2 generation of air pollutants | vehicles, stand-by generator sets (fossil fuel combustion) | operate equipment, machineries according to manufacturer's instruction | review inspection and maintenance record | monthly | number and details of machinery issues noted | Safety officer | PCO | | |
| | | regular inspection and maintenance of equipment | | | | | | | |
| E. Risk of Environmental Degradation | | | | | | | | | |
| e.1 (risk of) surface water and groundwater quality degradation, disruption of soil properties, contamination | e.1.1 wastewater collection, transport, treatment, disposal | prevention of leakage, overtopping, spillage, | effluent sampling and testing by an EMB-accredited laboratory | annually - more frequently during rainy season | effluent quality indicators: BOD, TSS, ammonia, phosphate (must meet standards for Class C^ effluent) | farm technician | PCO | > reported in SMR | |
| | | regular inspection and maintenance of WTF and equipment | | | | | | | |

| | | | | | | | | |
|--|---|--|--|--|---|-----------------|-----|--|
| | | | | | | | | |
| | | provided adequate drainage for rainwater | | | | | | |
| | | maintain vegetation (serves as filter strips) around lagoons | | | | | | |
| | | operates WWTF- MRF according to designer /contractor's instruction | | | | | | |
| | | ensures effluents meet EMB standards | | | | | | |
| | e.1.2pathological wastes, carcass disposal, leachate | regular inspection of disposal site | review inspection and maintenance record | monthly - more frequent during rainy season | number and details of leak / breach incidents | Safety officer | PCO | |
| | e.1.3handling, transport, storage, disposal of hazardous and infectious materials | use of suitable containers with labels | review inspection and maintenance record | monthly | number and details of leak / breach incidents | Safety officer | PCO | |
| | | secured collection and storage area | | | | | | |
| | | will make MSDS available on-site for ready reference | | | | | | |
| | | uses of materials according to registered use / manufacturer's instruction | | | | | | |
| | | will develop and observe safety protocols safety | | | | | | |
| | | will install signage, warnings | | | | | | |
| | | will provide a spill kit on site | | | | | | |
| | | will prepare a contingency response plan | | | | | | |
| | | will provide adequate staff training on handling of hazardous materials | | | | | | |
| e.2 (risk of) pollution from fugitive biogas | biogas collection, storage, combustion | constructed gas collection system with impermeable and durable materials | review inspection and maintenance record | monthly - more frequent during typhoon season | number and details of leak / breach incidents | farm technician | PCO | |
| | | operates WTF + MRF according to supplier/contractor's instruction | | | | | | |
| | | regular inspection and maintenance of MRF | | | | | | |
| F, Health, Safety and Other Concerns | | | | | | | | |

| | | | | | | | | |
|--|--|--|------------------------------|--|--|----------------|-----|--|
| f.1 odor - nuisance, discomfort, health issues | f.1.1 pig houses, manure | regular cleaning, disinfection of pig houses | review complaints register | every two weeks - more frequent during typhoon (windy) season | number and details of odor complaints | Safety officer | PCO | |
| | | employs tunnel ventilated buildings | | | | | | |
| | | maintains vegetation that serves as natural buffer | | | | | | |
| | | provision and use of appropriate PPE | | | | | | |
| | f.1.2 WTF, effluent, MRF | biogas trapped and combusted through MRF | | | | | | |
| | | will ensures adequate retention time of wastewaters in the biodigester | | | | | | |
| | | constructed gas collection system with impermeable and durable materials | | | | | | |
| | | regular inspection and maintenance of WWTF -MRF | | | | | | |
| | | prevent leakage, overtopping, spillage, (see e.1.1) | | | | | | |
| | | maintains vegetation that serve as natural buffer | | | | | | |
| | | provision and use of appropriate PPE | | | | | | |
| | f.1.3decomposing materials (placental materials and carcasses) | disposal through burial | | | | | | |
| | | prevent leakage of leachate (see e.1.2) | | | | | | |
| | | provision and use of appropriate PPE | | | | | | |
| f.2 noise - nuisance, discomfort | f.2.1 pigs | maintains vegetation that serve as natural buffers | - review complaints register | monthly | number and details of noise complaints | Safety officer | PCO | |
| | | provision and use of appropriate PPE | | | | | | |
| | f.2.2 vehicles, machineries | operates equipment, machineries according to manufacturer's instruction | | | | | | |
| | | limit operation of loud equipment during day time (as much as it is practical) | | | | | | |
| | | regular inspection and maintenance of equipment and machineries | | | | | | |
| | | provision and use of appropriate PPE | | | | | | |

| | | | | | | | | |
|--|--|---|--|--|---|----------------|-----|--|
| f.3 dust - nuisance, discomfort, health issues | f.2.1 pig houses, feed handling | cautious handling of dust-generating materials | - review complaints register | monthly - more frequent during typhoon (windy) season | number and details of dust complaints | Safety officer | PCO | |
| | | use of appropriate containers, covers, barriers | | | | | | |
| | | employs mechanical / tunnel ventilation system in pig buildings | | | | | | |
| | | limit dust-generating activities during day time, low wind movement (as much as it is practical) | | | | | | |
| | | provision and use of appropriate PPE | | | | | | |
| | f.2.2 composting areas, dried compost handling | use of appropriate containers, covers, barriers | | | | | | |
| | | cautious handling of dust-generating materials | | | | | | |
| | | limit dust-generating activities during day time and low wind movement (as much as it is practical) | | | | | | |
| | | provision and use of appropriate PPE | | | | | | |
| f.4 pest and vermin proliferation / infestation - nuisance, health issues | decomposing materials and sources of odors | odor control measures (see f.1) | - review inspection records and complaints register | monthly - more frequent during rainy season | number and details of incidents, complaints | Safety officer | PCO | |
| | | pest, vermin control measures | | | | | | |
| | | regular inspection of farm facilities, surroundings | | | | | | |
| f.5 health hazards, (risk of) contracting infectious diseases, sustaining injuries, livestock outbreak | handling, transport, storage of hazardous and infectious materials, movement of carrier pests and vermin, handling of ill pigs | will provide adequate training on handling of hazardous, infectious materials | - review incident reports, inspection records and complaints register, results of employees' regular health checks | monthly | number and details of illness, injury incidents, complaints | PCO | - | |
| | | provision and use of appropriate equipment for handling and storage of hazardous, infectious materials, including PPE | | | | | | |
| | | enforces, practices biosecurity measures, health and safety protocols | | | | | | |
| | | measures for safe handling of hazardous and infectious materials (see e.1.2&e.1.3) | | | | | | |
| | | pest and vermin control measures (see f.4) | | | | | | |

| | | | | | | | | |
|--|---|---|---|---------|---|------------|--------------------------|--|
| | | regular inspection of farm facilities, surroundings | | | | | | |
| | | provides regular health checkups for employees | | | | | | |
| | | will report and record disease, injury incidents | | | | | | |
| f.6 explosion, fire hazard | biogas collection, storage, combustion | constructed WTF + MRF with impermeable and durable materials | - review inspection and maintenance records, incident reports | monthly | number and details of explosion, fire incidents | PCO | - | |
| | | operates WTF-MRF according to supplier/contractor's instruction | | | | | | |
| | | regular monitoring of pressure within the MRF system | | | | | | |
| | | regular inspection and maintenance of MRF | | | | | | |
| | | will prohibit ignition sources (smoking) near the MRF | | | | | | |
| | | will install signage and warnings | | | | | | |
| | | considering installing a flare | | | | | | |
| | | will report and record explosion, fire incidents | | | | | | |
| f.7 drowning hazard | open ponds, lagoons, tanks | will install signage and warnings | - review incident reports | monthly | number and details of drowning incidents | PCO | - | |
| | | will report and record drowning incidents | | | | | | |
| f.8 freshwater depletion | farm activities | water conservation strategies (see a.1) | - quantify volume of freshwater consumption | monthly | volume of freshwater consumed | bookkeeper | PCO > reported in SMR | |
| | | uses effluent as soil amendment | | | | | | |
| f.9 consumption of non-renewable resource (fossil fuels for power) | pig raising and general farm activities | energy conservation strategies | quantify power consumed | monthly | kWh consumed | bookkeeper | PCO > reported in SMR | |
| | | using power generated using biogas through MRF | | | | | | |

BOD Biological Oxygen Demand
 EMB Environmental Management Bureau
 MSDS Materials Safety Data Sheet
 PCO Pollution Control Officer
 PPE Personal Protective Equipment
 SMR Self-Monitoring Report
 TSD Treatment, Storage, Disposal
 TSS Total Suspended Solids

2.2.3 Contingency Response

Below is overview of RDF Floridablanca Farm's current preparation and action plan in response to the following:

- a. Fire
 - Fire extinguishers are in strategic locations around the farm. Pig sheds have taps from which water for putting out fires can be sourced.
- b. Earthquake
 - The open grounds within the farm may serve as evacuation area for when an earthquake occurs.
- c. Outbreak
 - The farm's veterinarian or animal production specialist (provided by the integrator) is immediately notified to assess the situation and give instructions for the workers to carry out.
- d. Power outage
 - A standby diesel-fueled generator is able to supply the farm's electricity needs, in addition to the biogas genset.
- e. Health emergencies
 - A first aid kit is available at the site for minor health issues. Farm personnel have access to vehicles which can be used for transporting cases that may need more advanced medical care.

Most emergency services can be accessed in the Municipality of Dinalupihan proper after about a 25 to 30-min drive from the farm.

In the interim, RDF Floridablanca Farm hereby commits to develop a more comprehensive contingency preparedness and response plan that will address incidents of fire; natural hazards (earthquake); outbreak; health emergencies; and environmental emergencies (leaks and spills of wastewaters and hazardous wastes, WWTF-MRF system breakdowns). This plan will be appended in the succeeding version of this ESMP.

2.2.4 Occupational Health and Safety

In addition to the health and safety measures presented in Table 3, RDF Floridablanca Farm will develop a more comprehensive health and safety risk management plan which will deal with general occupational health and safety issues associated with work in the pig farms. Health complaints and accidents will be recorded in a register and will serve as indicators of the plans effectiveness, together with results of workers' annual health check-ups. This plan will be appended in the succeeding version of this ESMP.

2.3 Monitoring, Reporting and Auditing

The proponent will perform the monitoring plan in Table 3 and conduct regular inspection of its facilities not only for internal purposes but also to satisfy the requirements of the EMB for periodic self-monitoring reports (SMR). In addition, assessments will also be initiated during or immediately after incidents that may have compromised the integrity of the farm's facilities, especially of WWTF-MRF, and caused the release of pollutants in the environment. A registry of such incidents and other environmental emergencies and accidents will be maintained in the farm and its details reported in the SMR.

The SMR will contain the results of audits on the Farm's environmental performance in terms of resource utilization, waste management, regulatory compliance, and fulfillment of environmental commitments among others. Copies of this document will be tendered to EMB quarterly, as well as to LBP-EPMD (Environmental Program and Management Department) for reference and review purposes.

The PCO, Dr. Ronald Dizon, has been tasked to ensure that the farm is compliant with pertinent environmental regulations, including those listed in Table 3, and is performing its environmental commitments, including the implementation of this ESMP.

During the implementation of the CDM Program, LBP-EPMD will conduct monitoring activities in the farm at least twice a year to help the Proponent execute, identify gaps in, and improve and update this management plan.

3 SOCIAL DUE DILIGENCE

RDF Floridablanca Farm aims to operate in a manner that is not only environmentally sustainable but socially acceptable as well. Below are some of the Proponent's efforts towards achieving this goal.

3.1 Consultation and Participation

Stakeholders of the Project were identified and invited by the Proponent, together with LBP-EPMD, through letters and notices to the consultative meeting held on July 28, 2016 at RDF Head Office, Purok 6, Brgy. Lara, San Fernando, Pampanga. The meeting was attended by at least 22 individuals from various institutions, including local officials and residents of communities near the project site.

All relevant information, especially those that pertain to the Project's environmental and social impacts, was communicated to the stakeholders during the consultations. The issues and queries they raised were all satisfactorily addressed by the Proponent and other presenters. Details of the points discussed in the meeting are in the minutes in Appendix B, as well as some photos documenting the event.

3.2 Grievance Redress Mechanism

The Safety officer, Mr. Richard Paguio, is hereby designated as the main contact person for grievances, feedbacks, and queries related to the project. She is to ensure that the details of complaints and the actions made to address the same will be recorded completely and truthfully in a register. Such information shall be part of the regular monitoring report for the Project and will be made available to relevant stakeholders.

The proponent will make every effort to settle any concern at the project level. Should its attempts be unsuccessful, issues will be raised to the following third party institutions for arbitration and possible resolution:

Office of the Barangay Chairman

Complaints shall be entertained in the barangay where the farms are situated. The barangay office concerned will facilitate the negotiation process and LBP-EPMD will ensure that the complainant is properly represented.

Municipal Office

Should no agreement be reached at the barangay level, the matter will be elevated to a municipal government office. Depending on the nature of the complaint, grievances may be addressed to the Municipal Health Office, Agriculturist Office, Environment and Natural Resources Office, or other relevant municipal agencies.

LBP

LBP through EPMD will take part on the resolution process only after the aggravated party has gone through the previous levels and finds the decisions rendered there unacceptable. EPMD will coordinate with the proponent to ensure that issues regarding the latter's project are resolved to the best interest of the complainant.

To further ensure the proponent's accountability, contact details of the farms' management and LBP-EPMD shall be provided to stakeholders during consultations and through postings at public notice boards in Barangay Moriones's community hall and at RDF Floridablanca Farm's main gate. For this project, the following individuals will serve as grievance administrators:

Prudencio E. Calado III
Head/Assistant Vice President, LBP-EPMD
Telephone No.: (632) 405-7339
Fax No.: (632) 528-8484

Mr. Richard Paguio
Safety Officer: RDF Floridablanca
Telephone No.: 09233302882

3.3 **Information Disclosure**

This ESMP and other relevant information regarding the project will be published in LANDBANKS's website where it can be readily accessed by the public. Printed copies of this document will be submitted to EMB Region 3 and will also be available in Barangay Gutad office, in LANDBANK's library (1598 M.H. Del Pilar cor Dr. J. Quintos St., Malate, Manila, Philippines), and in the World Banks InfoShop.

3.4 **Equal Opportunity**

RDF Floridablanca Farm is an equal opportunity employer, not regarding gender, age, disability, and ethnicity in evaluating and hiring potential employees. Presently, RDF Floridablanca Farm workforce is consisted of 18 males and 4 females. Most of the male workers take on manual, physically demanding work such as animal handling and facility maintenance.

3.5 **Resettlement**

The project is located inside the premises of RDF Floridablanca Farm, a private property. No individual was displaced for nor were there any indigenous peoples affected by the establishment of the farm and the project.

3.6 **Others**

Employees of RDF Floridablanca Farm receive standard basic salary at the minimum, 13th month pay, and other regular statutory benefits, in addition to free food and lodging at the farm.

4 ESMP REVIEW AND UPDATING

This ESMP shall be reviewed annually and will be updated subject to the results of the semiannual monitoring activities conducted by RDF Floridablanca Farm and LBP-EPMD. Reviews may be done more frequently or earlier than schedule, especially after events resulting in significant adverse effect to the environment.

In the first updated version of this ESMP, which will be published in the last quarter of this year (2019), the following information and documents will be provided:

- properties, specifications, and performance parameters of the WWT-MRFs;
- WWTF-MRF Operations Manual;
- cost of implementing the Environmental Management and Monitoring Plan;
- Contingency Preparedness and Response Plan; and
- Health and Safety Risk Management Plan
- Biosecurity protocol

5 INSTITUTIONAL ARRANGEMENTS

5.1 The Proponent

The proponent, RDF Feed, Livestock and Foods, Inc., will be responsible in all the aspects of the project, including the implementation of this ESMP. It will shoulder all costs associated with the construction and operation of the project, internal monitoring activities, and meeting various statutory requirements. Specifically, it shall / it shall cause the accomplishment of the following:

- exercise environmental and social due diligence in implementing the Project
- incorporate sound practices in environmental, health, and safety management
- comply with relevant national and local laws and satisfy regulatory obligations
- perform diligent environmental and system monitoring
- prepare and submit on schedule accurate monitoring reports to EMB and LBP
- cooperate with the LBP and other regulatory agencies by providing assistance and correct and relevant information regarding the Project and its environmental performance for reference, review, and monitoring purposes
- promote transparency by maintaining open lines of communication with project stakeholders and giving them access to relevant information
- initiate resolution of conflicts that may arise as a result of the Project's operation

The Proponent, in close coordination with LBP, shall implement the Project based on LBP's ESSF and on the agreed activities and timelines stipulated in the memorandum of agreement (MOA) and subproject agreement (SPA) between the said entities.

5.2 LANDBANK

LBP shall serve as the financial and technical intermediary for the CDM Program of Activity (PoA) under which the Project of RDF Floridablanca Farm is being implemented. It shall provide the Proponent carbon and investment finance assistance for the installation of an anaerobic wastewater treatment facility equipped with a biodigester and methane-fueled power generator. Moreover, it shall act as the entity in charge of project validation and verification activities, and of collation of relevant information and monitoring data for the undertakings mentioned. Specifically, LANDBANK, through EPMD, shall:

- make available financing facilities to the Proponent, subject to existing lending policies of LBP
- coordinate and facilitate communications and transactions between the Proponent and World Bank or other Carbon Buyers, Designated Operational Entity, and when necessary, with other project partners
- administer the agreements (MOA, SPA) forged between LBP and the Proponent
- provide technical support and relevant trainings to farm owners and personnel in partnership with other institutions
- ensure compliance of the Project and its proponent with the rules governing PoAs and with its commitments in the MOA and SPA
- ensure compliance of the Project and its proponent with relevant standards and regulations and environmental commitments by conducting onsite monitoring and evaluation and desk reviews
- provide assistance to the Proponent in complying with statutory requirements for the Project
- ensure the Project's sustainability by monitoring the long-term implementation of the safeguards specified in this ESMP and its environmental performance in general
- gather, collate, and review pertinent information and documents (including safeguard instruments, reports, and permits and clearances) concerning the Project
- participate in conflict resolution initiated by the Proponent
- prepare and submit monitoring reports to World Bank regularly
- satisfy its obligations under the Emissions Reduction Purchase Agreement between LBP and World Bank

LBP shall assist the Proponent in its implementation of the Project based on LBP's Safeguards Framework and on the agreed activities and timelines stipulated in the MOA and SPA.

5.3 Department of Environment and Natural Resources

The Department of Environment and Natural Resources (DENR) is the primary government institution mandated to manage and protect the Philippines' environment and natural resources. It is also the Designated National Authority (DNA) of the CDM Program in the Philippines. As DNA, its main role is to review and endorse PoAs to the United Nations Framework Convention on Climate Change.

5.3.1 Environmental Management Bureau

Through the EMB, DENR sanctions and regulates the activities of the Project by means of various legal instruments. EMB also leads (whether or not as part of a Multi-partite Monitoring Team) the periodic monitoring of the Project's compliance and impacts, including the fulfillment of the commitments stated in this ESMP. Prior to construction, EMB was the agency tasked to review and evaluate the environmental soundness of the Project and authorize its establishment through the issuance of an Environmental Compliance Certificate.

5.4 World Bank

The World Bank is the main Carbon Buyer of the Project, but will also serve as an advisor to LPB in carrying out the latter's responsibilities as the coordinating and managing entity for CDM projects. The Bank will conduct regular monitoring, audits, and appraisals on the Project's safeguards performance against its established policies, as well as provide technical guidance to LBP and to the Proponent.

6 SUB-PROJECT ACCOUNTABILITY

In line with Section 3.02 on *Sub-Project Development and Operation by the Sub-Project Entity*, Item (q) of the Sub-Project Purchase Agreement (SPA) signed by the Farm Management, the Sub-Project Entity (Farm Management) agrees and undertakes to:

- (q) implement and operate the Sub-Project in compliance with the World bank Operational Policies, including without limitation and as applicable, the Environmental Management Plan, Resettlement Plan, Indigenous Peoples Plan, and any other requirement resulting from the application of the World Bank Operational Policies.

Having signed the SPA, the Farm Management is accountable to comply with the commitments stated in this document.

REFERENCES

- 1 en.climate-data.org
- 2 vm.observatory.ph
- 3 dbmp.philrice.gov.ph/soils
- 4 noah.up.edu.ph (ESRI Base Map)

Maps and Images Sources

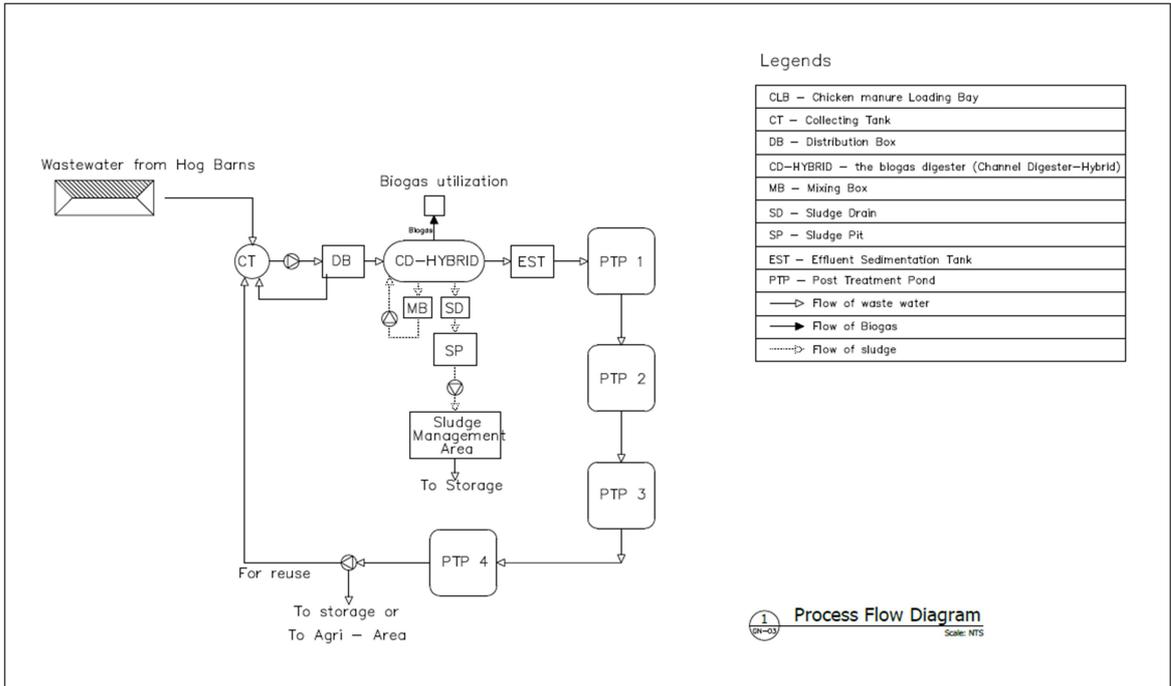
- a https://en.wikipedia.org/wiki/File:Ph_locator_map_pangasinan.png
- b <https://www.google.com/maps>
- c Google Earth Pro
- d <http://noah.up.edu.ph/#/section/geoserver/flood25>

APPENDICES

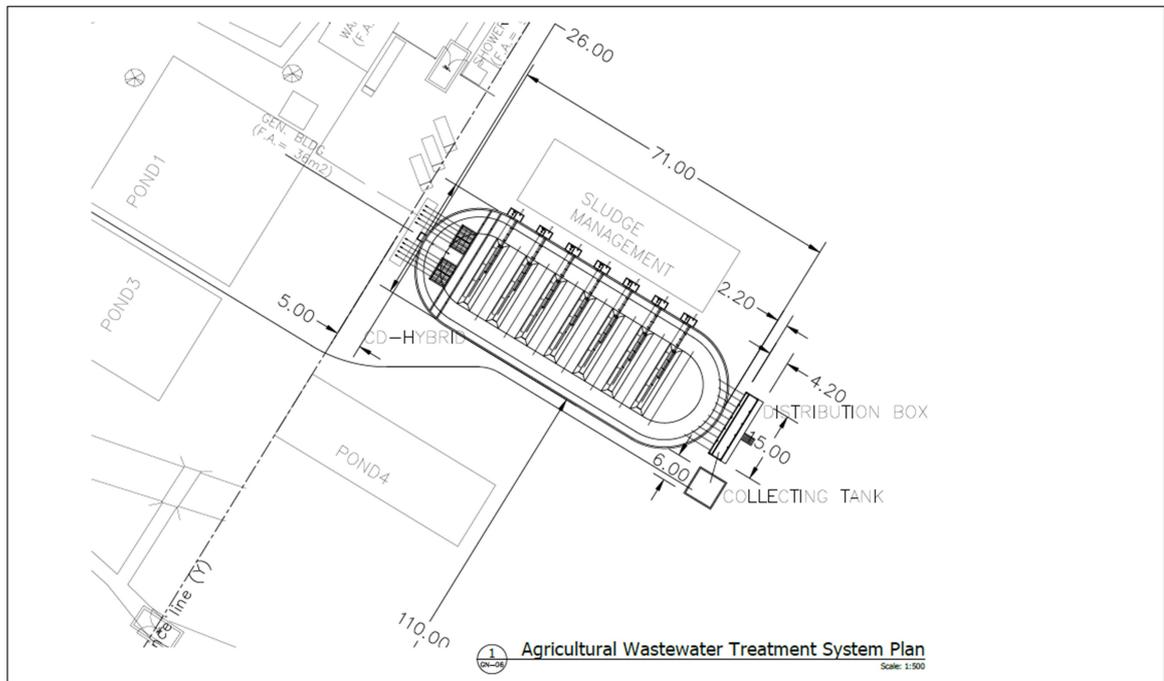
- A Project Design, Plan and Specifications
- B Health and Safety Risks Management Plan of CPA 53 Pig Farm
- C Public Consultation Records
 - Notices
 - Attendance
 - Minutes
- D. Site Evacuation Plan

APPENDIX A

Project Design, Plan and Specifications



| | | | | |
|---|--|---|---|--|
| Technology Principal: Energy Research and Development Institute- Nakhonjing, Chiang Mai University, Thailand Business Principal: Tetra Products and Consulting Corporation Aphise Tower, Pattanaeem, Bangkok, Thailand Local Implementer: Alterna Verde Corporation L252, Rockwood Homes, Brgy Sagath, City of San Fernando Pampanga <small>No part of this document may be reproduced in any form without written permission. Violation is punishable by law.</small> | Project Leaders: Engr. Nuttakorn Towlek & Engr. Jaykie Homer P. Hernandez TH Civil/Structural Engineer: Wongthep Tangskul TH Environmental Engineer: Nuttakorn Towlek JAYKIE HOMER P. HERNANDEZ Professional Agricultural Engineer PRC Reg. No.: 6618 PTR No.: 2485044 Valid Until: March 2018 Place Issued: Taguig City | TH Electrical Engineer: Kris Likit-Anurak TH Mechanical Engineer: Sarawoot Amornara --- Sanitary Engineer/Master Plumber PRC Reg. No.: PTR No.: Valid Until: Place Issued: | Scaled As Shown Sheet Contents: Process Flow Diagram Revision No. Date Details | RGF FEEDS, LIVESTOCK & FOODS INC. Owner Project Title : Proposed Agricultural Wastewater Treatment System Location : Guad, Florida Blanca, Pampanga Checked by: Wendell Umali, DVM Approved by: Obelito Liberato, DVM Date: Total Pages: GN-03 |
| | No. Date Details | | | |



| | | | | |
|---|--|---|--|--|
| Technology Principal: Energy Research and Development Institute- Nakhonjing, Chiang Mai University, Thailand Business Principal: Tetra Products and Consulting Corporation Aphise Tower, Pattanaeem, Bangkok, Thailand Local Implementer: Alterna Verde Corporation L252, Rockwood Homes, Brgy Sagath, City of San Fernando Pampanga <small>No part of this document may be reproduced in any form without written permission. Violation is punishable by law.</small> | Project Leaders: Engr. Nuttakorn Towlek & Engr. Jaykie Homer P. Hernandez TH Civil/Structural Engineer: Wongthep Tangskul TH Environmental Engineer: Nuttakorn Towlek JAYKIE HOMER P. HERNANDEZ Professional Agricultural Engineer PRC Reg. No.: 6618 PTR No.: 2485044 Valid Until: March 2018 Place Issued: Taguig City | TH Electrical Engineer: Kris Likit-Anurak TH Mechanical Engineer: Sarawoot Amornara --- Sanitary Engineer/Master Plumber PRC Reg. No.: PTR No.: Valid Until: Place Issued: | Scaled As Shown Sheet Contents: Agricultural Wastewater Treatment System Plan Revision No. Date Details | RGF FEEDS, LIVESTOCK & FOODS INC. Owner Project Title : Proposed Agricultural Wastewater Treatment System Location : Guad, Florida Blanca, Pampanga Checked by: Wendell Umali, DVM Approved by: Obelito Liberato, DVM Date: Total Pages: GN-06 |
| | No. Date Details | | | |

APPENDIX B

Health and Safety Risks Management Plan of CPA 53 Pig Farm

| Hazard | Possible Harm | Source / Cause | Prevention / Minimization* | Person/s Responsible |
|--|---|---|---|--|
| physical | | | | |
| noise | discomfort, hearing damage | pig squeals | <ul style="list-style-type: none"> wear appropriate PPE (ear protection) | Farm Personnel |
| | | running machineries and vehicles | <ul style="list-style-type: none"> install noise-control devices when applicable regular equipment inspection and maintenance equipment housed in enclosed structure, if applicable schedule shifting duties install signage and warnings wear appropriate PPE (ear protection) | Safety officer Farm Personnel |
| vibration | discomfort, ergonomic and nerve injuries, fatigue | running machineries | <ul style="list-style-type: none"> ensure all loose equipment are securely placed perform regular equipment inspection and maintenance install signage and warnings | Safety officer Farm Personnel |
| electricity | shock, electrocution, burns | faulty machineries and power lines | <ul style="list-style-type: none"> get services of a licensed electrician consult equipment manual perform regular equipment inspection and maintenance | Safety officer Farm Personnel |
| | | improper use (or servicing) of electrical equipment | <ul style="list-style-type: none"> restrict access to equipment install signage and warnings train staff (consult equipment manual) wear appropriate PPE | |
| heat | burns | running machineries (hot surfaces, vapors, liquids) | <ul style="list-style-type: none"> use insulation where possible install machine guards install signage and warnings wear appropriate PPE (such as long sleeved shirts) | Safety officer Farm Personnel |
| | discomfort, heat exhaustion, heat stroke | working in enclosed spaces with limited ventilation | <ul style="list-style-type: none"> adequate hydration and rest breaks | Safety officer |
| dust | irritation, respiratory distress / diseases | feeds, ambient dust | <ul style="list-style-type: none"> calm work pacing to avoid exciting the pigs thorough cleaning of indoor spaces PPEs (mask) | Farm Personnel |
| poor lighting | eye strain, can't see hazards | unlit / inadequately lit areas | <ul style="list-style-type: none"> install light sources carry portable light sources work during daytime whenever possible | Safety officer Farm Personnel |
| chemical | | | | |
| harmful gases, dust, vapors (inhalation) | discomfort (odor), asphyxiation, poisoning, respiratory distress / diseases | degrading organic wastes | <ul style="list-style-type: none"> observe measures for odor control install signage and warning labels train staff (on handling hazardous substances and wastes and working in confined spaces; review MSDS / product information sheets) | TSMD Safety officer Farm Personnel |
| | | hazardous substances (cleaning and pest control) | | |

| | | | | |
|--|--|---|--|---|
| | | chemicals, veterinary medicines, fuels, hazardous wastes, etc.) | <ul style="list-style-type: none"> wear appropriate PPE (mask) ensure first aid kits are readily available | |
| | | fuel burning (machineries, vehicles) | <ul style="list-style-type: none"> perform regular equipment inspection and maintenance | Safety officer |
| | | fugitive gases | <ul style="list-style-type: none"> perform regular inspection and maintenance of biogas system | Safety officer |
| hazardous substances (contact, ingestion) | irritation, burns, poisoning, skin problems | hazardous substances (cleaning and pest control chemicals, veterinary medicines, fuels, hazardous wastes, etc.) | <ul style="list-style-type: none"> use proper labeling, containers, and storage restrict access to chemical and hazardous waste storage train staff (handling hazardous substances and wastes; review MSDS / product information sheets) only competent staff should administer veterinary medicines ensure first aid kits are readily available PPEs (gloves, eye glasses) | TSMD Safety officer |
| biological | | | | |
| pathogens / infectious agents, toxins and other products | various infectious diseases, parasites, irritation | pathological materials / tissues | <ul style="list-style-type: none"> observe proper disposal of animal and veterinary wastes implement quarantine measures good housekeeping practices (disinfection) practice hygienic practices (especially hand hygiene) perform workers' regular health examination train staff (on animal handling, proper waste handling and disposal) wear appropriate PPE (gloves, mask, goggles) | TSMD Veterinarians Safety officer |
| | | sick animals | | |
| | | animal excretions and fluids | | |
| | | manure (wastewaters) | | |
| | | sludge | | |
| | | veterinary wastes (especially sharps) | | |
| | | potential disease carriers (objects, people, dust) | | |
| | | insects, pests, vermin | <ul style="list-style-type: none"> proper disposal of odorous wastes good housekeeping practices implement pest control measures | Farm Personnel |
| ergonomic | | | | |
| ergonomic stress | ergonomic injuries | repetitive actions, forceful exertions, sustained awkward posture | <ul style="list-style-type: none"> use aid of appropriate equipment for lifting/moving heavy objects use of proper lifting techniques implement buddy system at work ensure job rotation / adequate rest (in between tasks) | Safety officer Farm Personnel |
| | | improper use of equipment | <ul style="list-style-type: none"> train staff (consult manuals) | Safety officer Farm Personnel |
| | | use of faulty equipment | <ul style="list-style-type: none"> repair or replace equipment | Safety officer |
| other accidents and contingencies | | | | |
| slips, trips, falls | injuries, wounds, contusions | spills (slips) | <ul style="list-style-type: none"> maintenance of walkways daily safety briefings and regular trainings barricading of work areas wearing of appropriate PPE | Safety officer Farm Personnel |
| | | various objects, debris (trips) | | |
| | | heights, slips (falls) | | |
| entanglement | injuries, wounds, strangulation | machineries | <ul style="list-style-type: none"> install machine guards tie back long hair | Farm Personnel |

| | | | | |
|------------------|------------------------------|--|--|----------------------------------|
| | | | <ul style="list-style-type: none"> • wear long sleeve shirts • avoid wearing loose-fitting clothes and personal accessories • regular equipment inspection and maintenance | |
| blows, punctures | injuries, wounds, contusions | pig handling | <ul style="list-style-type: none"> • use animal restraints • ensure enough space to maneuver • train staff (animal handling techniques) • wear appropriate PPE (boots, gloves, etc.) | Safety officer Farm Personnel |
| sharps | sharps injuries, wounds | veterinary activities, waste handling | <ul style="list-style-type: none"> • ensure only trained personnel conduct veterinary activities • wear appropriate PPE (gloves, goggles) | Safety officer Farm Personnel |
| fires | burns | faulty electrical systems, explosions, fugitive gases, accidental ignition | <ul style="list-style-type: none"> • comply with requirements and regulations of fire authorities • provide adequate and proper (multipurpose) fire protection equipment • designate smoking areas away from digester, gas tanks, and electrical equipment and storage of combustible materials (compost, sludge, chemicals) • regular clearing of vegetation near farm structures • install signage and warnings • train staff (on contingency plan and proper equipment use) • perform regular inspection and maintenance of electrical systems and equipment | TSMD Lead Man |
| blast | blast injuries | excessive pressure in biodigester, fugitive gases, contained gases in confined spaces, fires | <ul style="list-style-type: none"> • keep sources of heat, including machineries, at a safe distance from biogas facility • prohibit smoking and use of cellphones around biogas system and gas storage facilities • perform regular inspection and maintenance of MRF • install signage and warnings | Safety officer Farm Personnel |

* Shaded rows / items applicable for Anaerobic Digestion System

APPENDIX C

Attendance

RDF FEED, LIVESTOCK & FOODS, INC.
FLORIDA FATTENER FARM
 July 28, 2016

| BIOGAS PROJECT | | POSITION | AGENCY | CONTACT # | SIGNATURE |
|----------------------|------------------------|--------------------|-------------|-------------|-----------|
| Rosali H. Hall | Sanitary Inspector | FLU - Florida | 09134570365 | [Signature] | |
| Juanito A. Roba | A.B.L. Area | Garage Captain | 09726819707 | [Signature] | |
| LUIS S MEDINA VIZ | ARCHITECT | PROJ. MANAGER | 09196510886 | [Signature] | |
| Jaime Abella | Project Manager | PROJ. Manager | 09076988065 | [Signature] | |
| Rosario C. ANOZA | Accounting Officer | LBP | 09193767919 | [Signature] | |
| RIZALDE P. VARGAS | Program Officer | LBP | 09154480188 | [Signature] | |
| REGINALDO R. TUMANG | CSO | NGO | 09774028580 | [Signature] | |
| Raula Mira | RFP Production Planner | RFP | 09066838771 | [Signature] | |
| ERIC Dula | Accounts Director | LBP | 0963651842 | [Signature] | |
| Rosalinda E. Garcia | FEED | FEED | 09981700217 | [Signature] | |
| Blanca D. Alcala | FEED 3 | FEED | | [Signature] | |
| ETNA T. Dimahiwag | CEBOS | CEBOS | 09193949936 | [Signature] | |
| Armelyn G. Claudio | (N) | EMD | | [Signature] | |
| Janet Ramirez | FEA-1 | EMD | | [Signature] | |
| Amor C. Dina | Plant Head | USA - OPR / OPRD | 903-0997 | [Signature] | |
| Jim E. Cava | Admin - OPR | USA - OPR / OPRD | | [Signature] | |
| Christopher S. Dumas | Admin - OPR | USA - OPR / OPRD | | [Signature] | |
| RICHARDO FIGUEROA | OPERATION | FEED | 0920300258 | [Signature] | |
| Annie Rose L. Marlar | SWH Plant Person / ENR | LCM - F/Manager | 09166589388 | [Signature] | |
| ROSEMARY G. FERRER | AIC / MGR | DA / OPR / OPRD | | [Signature] | |
| MORNELIO G. NALAY | Admin. Officer | DA / Cell, Florida | 09997278086 | [Signature] | |
| Hazel Ombra | Program Assistant | LBP | 09207167298 | [Signature] | |
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Minutes

MINUTES OF STAKEHOLDERS CONSULTATION MEETING

| | |
|--|---|
| Name of Project | : RDF Florida Fattener Farm |
| Project Proponent | : RDF Livestock & Food, Inc. |
| Location of Project | : Barangay Gutad, Floridablanca, Pampanga |
| Date of Stakeholder's Consultation Meeting | : July 28, 2016 |

The following were invited to attend the consultation thru a Letter of Invitation and Notice of Public Consultation:

| No. | Name | Office / Group | Address |
|-----|-----------------------------|---------------------------------|-------------------------|
| 1 | Dr. Felipe Jaime H. Cuyugan | Municipal Health Office | Floridablanca, Pampanga |
| 2 | Hon. Leandro A. Dabu | Barangay Bodega | Floridablanca, Pampanga |
| 3 | Lormelyn E. Claudio | DENR-EMB | San Fernando, Pampanga |
| 4 | Restituto Alfonso G. Paguio | Municipal Agricultural Office | Floridablanca, Pampanga |
| 5 | Gino Vismaya | Municipal Environmental Officer | Floridablanca, Pampanga |
| 6 | Reynaldo R. Tumang | Municipality of Floridablanca | Floridablanca, Pampanga |

The following attended the actual consultation meeting:

| No. | Name | Office / Group | Address |
|-----|----------------------------|-------------------------------|-------------------------|
| 1 | Rosalu M. Malit | RHU-I Floridablanca | Floridablanca, Pampanga |
| 2 | Leandro A. Dabu | Barangay Bodega | Floridablanca, Pampanga |
| 3 | Luis Manansala Jr. | Barangay Bodega | Floridablanca, Pampanga |
| 4 | Jaime Abella | Barangay Bodega | Floridablanca, Pampanga |
| 5 | Rosario C. Andaya | Land Bank Pampanga LC | Floridablanca, Pampanga |
| 6 | Rizaldo P. Vargas | Land Bank EPMD | Malate, Manila |
| 7 | Reynaldo R. Tumang | NGO | Floridablanca, Pampanga |
| 8 | Ronaldo Dizon | RDF Livestock and Foods, Inc. | Floridablanca, Pampanga |
| 9 | Eric Duloy | Land Bank Pampanga LC | Floridablanca, Pampanga |
| 10 | Reynaldo E. Garcia | DENR-EMB R3 | San Fernando, Pampanga |
| 11 | Dennis O. Celestial | DENR-EMB R3 | San Fernando, Pampanga |
| 12 | Elisa T. Dimaliwat | DENR-EMB R3 | San Fernando, Pampanga |
| 13 | Lormelyn E. Claudio | DENR-EMB R3 | San Fernando, Pampanga |
| 14 | Jamie Lozano | DENR-EMB R3 | San Fernando, Pampanga |
| 15 | Anelo C. David | CENRO | Floridablanca, Pampanga |
| 16 | Jim B. Cuson | CENRO | Floridablanca, Pampanga |
| 17 | Christopher S. Dumas | CENRO | Floridablanca, Pampanga |
| 18 | Ruichard Paguio | RDF Livestock and Foods, Inc. | Floridablanca, Pampanga |
| 19 | Annie Rose Mañalac | CENRO | Floridablanca, Pampanga |
| 20 | Restituto Alfonso G. Paliw | Municipal Agricultural Office | Floridablanca, Pampanga |
| 21 | Cornelio G. Magat | Municipal Agricultural Office | Floridablanca, Pampanga |
| 22 | Hazel Cuba | Land Bank EPMD | Malate, Manila |

The program started at 2:00 pm, in Purok 6, Brgy. Lara, San Fernando, Pampanga with a prayer led by Richard Paguio. Mr. Ronaldo Dizon welcomed the participants from various agencies/organizations. Then, a video about the history of RDF Livestock and Foods, Inc and the quality of their products was presented. Mr. Rizaldo P. Vargas explained and presented about Climate Change and Clean Development Mechanism (CDM) and Carbon Finance Support Facility (CFSF). To ensure topics are fully understood by the stakeholders, Tagalog language was used as medium of communication. It was then followed by the presentation of the RDF Livestock and Foods, Inc. Biogas Design by Dr. Nery Santiago of Alterna Verde.

The following are the summary of the issues raised during the question and answer (Q&A) portion of the meeting:

| Name of Person | Question/Comment raised | Answer/Reply | Person who Answered |
|--|--|---|-----------------------------------|
| Elisa Dimaliwat of DENR-EMB-R3 | She asked if a farm needs to loan to be included in the program. | The pig farms will have to seek financial assistance in the form of a loan as part of the additionality criteria. | Mr. Rizaldo Vargas, LBP-EPMD |
| Elisa Dimaliwat of DENR-EMB-R3 | The main concern of a pig farm is the odor which becomes a nuisance to the area. | The RDF Livestock and Food, Inc. will implement a Zero Emission-Zero Discharge Production System. This will solve the odor produced in the farm since it will be anaerobically treated in the digester. Further, clarifying and polishing ponds will be put up purposely to make sure effluent from the digester can be used for cleaning and other purpose like fish pond. | Dr. Nery Santiago, Alterna Verde |
| Restituto Alfonso Paliw of Municipal Agricultural Office | He asked if the design will not leak and if the polishing ponds after the biogas digestion will still emit methane. | The biogas system will be monolithic concrete structures and will be made waterproof. The polishing ponds will have very minimal emissions, since the solid wastes have already been digested. | Dr. Nery Santiago, Alterna Verde |
| Anel David of CENRO | She asked the status of the biogas project. | The construction for the farm will start next year. RDF is still on the process of purchasing adjacent lots so they can have the space for the biogas design. | Dr. Nery Santiago, Alterna Verde |
| Elisa Dimaliwat of DENR-EMB-R3 | She asked the active participation and coordination of the RDF Florida Farm with the Barangay for any concern more so relating to the environment. | RDF will provide their contact to the DENR and MAO so they can coordinate directly with RDF Farms | RDF Livestock & Foods, Inc staff. |

After series of Qs & As, the meeting was adjourned at 5PM through words of thanks to the participants by RDF Livestock & Foods, Inc. representative, Dr. Ronaldo Dizon.

Attachments:

1. Attendance Sheet
2. Printed copies of the presentation by RDF Florida Fattener

APPENDIX D

Site Evacuation Plan



RDF Floridablanca Farm Point Persons:

Safety officer: Richard Paguio - 09233302882
Biodigester and GenSet Supplier:
Alterna Verde Corporation (AVC)
(045) 455 4022

Local Emergency Contact Details:

Municipality of Dinalupihan Police Station: 636 - 1751
Municipality of Dinalupihan Fire Station: 481 - 5739
Dinalupihan District Hospital: (047) 481 1724