BIOX

Your Sustainable Partner for Renewable Energy

UNFCCC Secretariat
Martin-Luther King Strasse 8
D-53153 Bonn
Germany

29th Nov 2007

Attn: CDM Executive Board

Dear Members of the CDM Executive Board,

Re: Response to Request for Review for "Tradewinds Methane Extraction and Power Generation Project" (Ref. no. 1285)

Referring to the request for review from CDM EB members dated 11th, 14th and 16th November 2007 for ***Tradewinds Methane Extraction and Power Generation Project*** to our request for registration of the Project, we wish to provide the following response to the issues raised by the requests for review.

We trust with this complementary information, it will be useful to clarify the requests raised by the Executive Board members. Should you require further clarification, please do not hesitate to contact us.

Thank you.

Yours faithfully,

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Requests:

1. Clarification is required on how the DOE has validated the methodological requirement of scoring barriers for potential baseline options.

The Request No. 1 will be prepared by DOE (DNV).

2. Documentary evidences must be provided to substantiate that possible baseline options other than continuation of current practice have prohibitive barriers.

Legal Barriers:

The legal barrier is an absolute barrier in the sense that illegal options can not be the baseline.

a. The discharge limit under Environmental Quality (Prescribed Premises) (Crude Palm Oil) Regulation 1977 (Attachment 2) for water course way is 100 mg/L and Land application of 5,000 mg/L (Attachment 3, Pg 20-66, B.G. Yeoh, 2004). For state Sarawak, the requirement of Dept of Environment Sarawak for water course way discharge is at BOD 20 mg/L with the exemption letter made by state Department of Environment Sarawak (Attachment 14 – Exemption Letter).
b. For this reason, the Tradewinds Binu POM has no problem in obtaining yearly Mill Operating License (June 2007) from the Dept. of Environment (Attachment 1) which issued based on the performance of the quality of final discharge effluent.

Technical Barriers:

a. Due to the high organic load of POME, the existing practice for the treatment of the wastewater with open lagoons is the most common option (Attachment 3, Pg 20-64, B.G. Yeoh, 2004). It is demonstrated that more than 85% of palm oil mills are utilizing open based anaerobic lagoons and it is the prevailing practice for oil palm industry to treat the POME (Attachment 3, Pg 20-63, 20).
b. The concept of capturing biogas from anaerobic ponds for energy is not readily acceptable in the palm oil industry (Attachment 4, Eco-Ideal-PTM report, 2004). Capturing methane for energy purposes has uncertainties related to the performance of the biogas digester, corrosive behavior of the biogas and the general lack of technical expertise in handling such technologies. These uncertainties are recognized as a technical barrier for the concept of capturing biogas for energy production.

Financial Barriers:

a. Aerobic systems to treat POME needs 24 hours power supply from the mill. However, the palm oil mill only runs 4,900 hour annually (Attachment 5, Mill running hour). During the off operation period of the mill, the electricity supply depends solely on diesel generators. With the power rating of 7.5kWh, 415V, 50Hz for surface aerator, the power consumption from the diesel generators will be very high (Attachment 5, Power Rating Surface Aerators).

b. The concept of capturing biogas from anaerobic ponds to generate energy is financially not attractive enough in the palm oil industry (Attachment 4, Eco-Ideal-PTM report, 2004). Without CDM incentive, the IRR of the project is indefinable as the financial return will be in negative infinity territory. However, with a CDM incentive of Euro 10 per CER, the IRR improve to 33% (Refer Attachment 6 – IRR calculation & Attachment 7a - 7e – Project, O&M Cost).
c. Open based lagoons system is the most used treatment system due to their low capital and operating costs since most mills are situated in the plantations, and this situation has more or less been maintained through the years (Attachment 3, Pg 20-64, B.G. Yeoh, 2004).

Social Barriers:

a. By introducing biogas capture and electricity generation project into current open based anaerobic lagoons system, bad odour from biogas will be greatly reduce. As most of the palm oil mills are situated in the plantation far away from city and town, the practice of open based anaerobic lagoons system are accepted within the local community which comprise mostly from mill workers as well as plantation workers. No further social barriers are foreseen for any of the envisaged baselines.

Business Culture & Others Barriers:

a. The palm oil industry generally perceives that the installation of waste treatment systems is principally intended to satisfy statutory effluent discharge requirements. The concept of capturing biogas to generate power is not well received within the palm oil industry, thus forming a barrier for the introduction of this concept.

Conclusion:

1. Continuation of current practices (BAU)

The present system of open ponds is the most common wastewater treatment system for palm oil mills in Malaysia with 85% palm oil mills use open ponds (Attachment 3, Pg 20-63, 20-64, B.G. Yeoh, 2004).

2. Direct release of wastewater to a nearby water body

Direct release of wastewater into the nearby water bodies is not permitted and illegal. Therefore, it is an absolute barrier meaning that this option will not be evaluated further in the PDD.

3. Aerobic treatment facility

An aerobic treatment system is not common treating high organic loaded wastewater especially raw POME (technical barrier). The use of an aerobic system will also be associated with high operating cost and high power consumption (financial barrier).

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4. Proposed anaerobic treatment facility not taken as a CDM project activity
There is very limited experience in Malaysia with biogas system for POME (Attachment 4 – Eco-Ideal, 2004). Previous experiences with biogas have caused corrosion in gas engines and the performance of biogas production has discouraged the palm oil industry to invest into such system. The investment cost for anaerobic systems is significant and the (eventual) savings from the energy displacement are not sufficient to make the investment attractive.

3. Further clarification is required as to how the prior consideration of the CDM was validated by the DOE as required by the guidelines for completing Sec. B.5 of the CDM-PDD.

Comment from BioX:
We refer to section B.5. of the PDD. The Tradewinds project was the first CDM-project for BioX Carbon Malaysia. This project should be seen as a full-scale pilot providing the required information and experience for further development of the CDM-business and serving as a show model for other potential project partners. Therefore the project activity already started on the 27th of October 2006 and the project came into operation around May 2007, prior to receiving official approval from the EB. The project was financed by a loan of the BioX Group B.V., the mother company of BioX Carbon Malaysia, under the condition that the project would generate CER's (Attachment 9 – historical emailing, loan confirmation letter).
The envisaged planning for Validation and Registration was also extended which led to the fact that the plant was operational before being able to produce CER's.

It has to be emphasized that the sole intention of the arrangement was to establish a CDM-project. This is also mentioned in the Business Collaboration Agreement between BioX Carbon Malaysia Sdn Bhd and Tradewinds Plantation Management Sdn Bhd that was signed on 16th May 2006 (kindly refer Attachment 8 – Business Collaboration Agreement, especially recitals and section 5) to develop CDM projects at six (6) of their palm oil mills (Attachment 9 – historical emailing, loan confirmation letter).

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4. The PP/DOE must provide further justification how following requirement of the approved methodology AM0022 has been met considering that project activity is covering up an existing open lagoon for collecting biogas: "The project activity foresees the introduction of a new anaerobic treatment facility into an existing lagoon-based treatment system for industrial organic waste water treatment. The output of partially treated water of the new anaerobic treatment facility will be fed into the existing lagoon system."

Comment from BioX:
The anaerobic reactor that has been installed is a so called "in ground reactor" and is constructed as a pond with a cover and the equipment necessary to capture the biogas. Effluent from the anaerobic reactor will flow into the existing lagoons system as described in the Written Approval* (Attachment 10 – Written Approval Application to Dept of Environment, Sarawak).

Because of the fact that the anaerobic bioreactor is considered as a new activity the project partners had to apply for a new approval. A written approval for this new activity has been received (Attachment 11 – Written Approval issued by Dept of Environment, Sarawak).

Refer Figure 1 and 2 for Layout Diagram of wastewater treatment facilities before and after implementation of CDM project activity.

*Note: * Work permit to start work at the existing wastewater treatment facility*

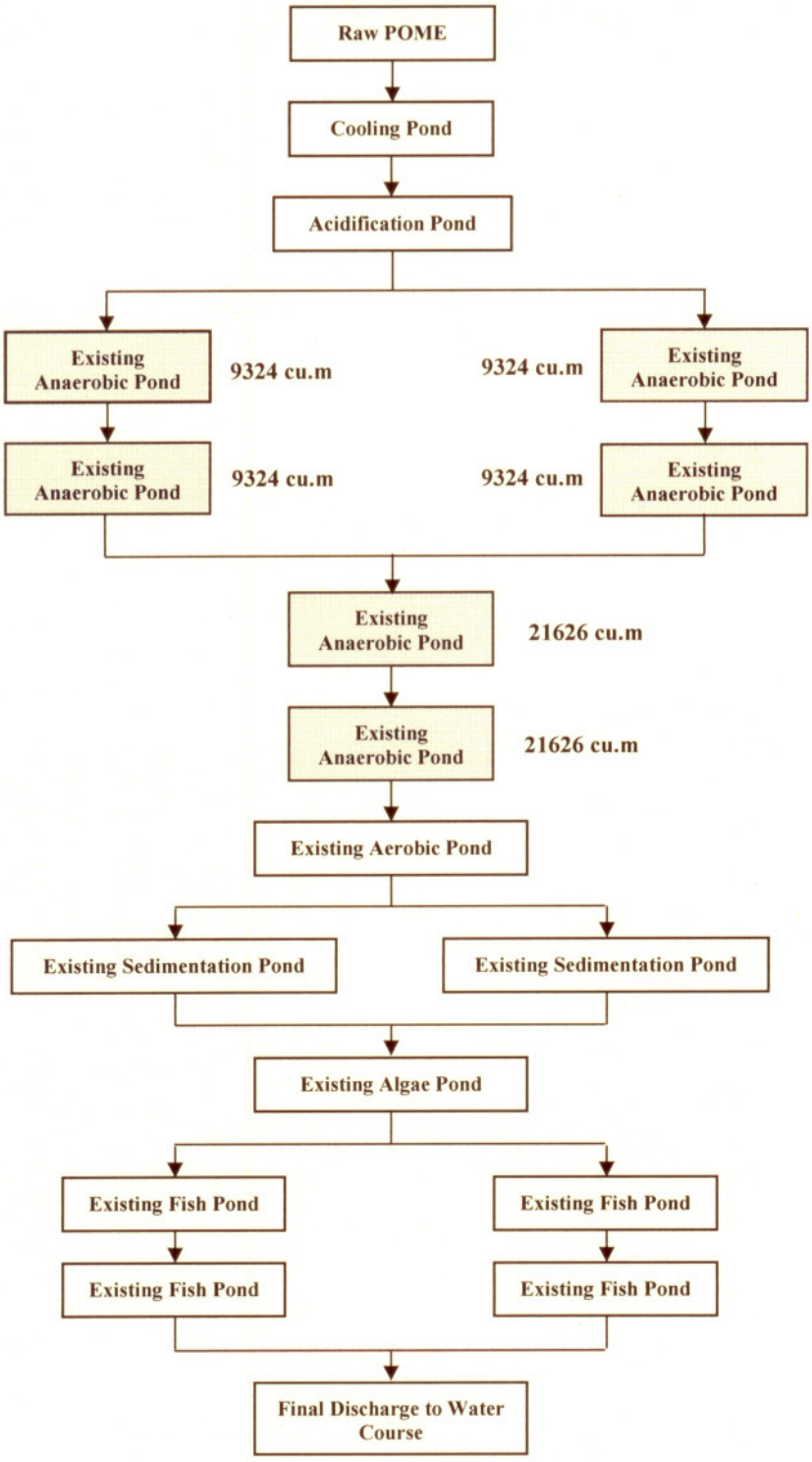

Figure 1: Layout Diagram of Wastewater Treatment Facilities before Implementation of CDM Project

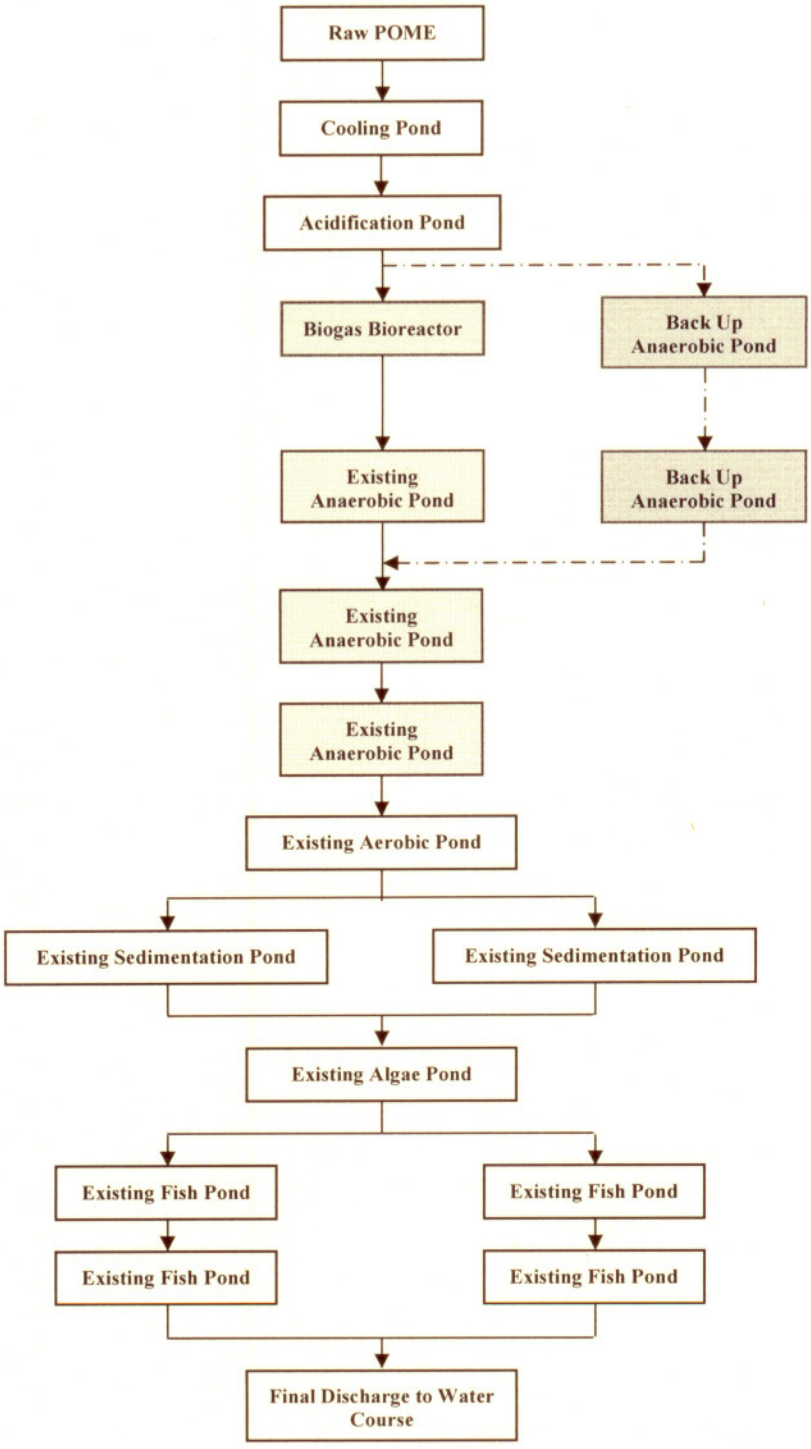

Figure 2: Layout Diagram of Wastewater Treatment Facilities after Implementation of CDM Project

5. Justification is required as to why the R_{lagoon} was not determined through a series of biochemical tests prior to project implementation as the methodology requires.

Comment from BioX:
The project developer based the R_{lagoon} on a series of biochemical tests performed by Yacob *et al.*, 2006 (Attachment 12 – Pg 194, Yacob *et al.*, 2006). The works carried out by Yacob *et al.*, 2006 is a very comprehensive study covering 52 weeks (277 days) of COD sampling at an open based lagoons wastewater treatment facility of a palm oil mill. The measurements have been taken from the inlet of 1st anaerobic pond and outlet of final anaerobic pond and are reliable and comprehensive and independent of any fluctuations in the palm oil process such as high or low crop season throughout the year.

It is the opinion of the project developer that the figures for the overall removal rate of the baseline (R_{lagoon}) from the study that has been described in the report are more reliable than a series of measurements that have been taken within a specific period in time as described in the methodology. Based on the journal published by Yacob *et al.*, 2006 approximately 97.8% of COD removal is achieved by the anaerobic treatment system before being channeled to Facultative Ponds. As described in the PDD the project developer choose for a conservative Value for R_{lagoon} of 95%.

This value has also been verified through a series of biochemical in-house measurements to determine the BOD efficiency over the first four (4) anaerobic lagoons (Attach 13 – In-house BOD lab tests results). The BOD removal efficiency over the first four anaerobic lagoons is 95% on average. Based on the publication by PTM (Malaysia Energy Center, also responsible for reviewing the PDD in Malaysia) the correlation between COD and BOD removal efficiency for the anaerobic water treatment facility in the palm oil industry is equal to 92% (Attachment 15 – PTM, Pg 9). With this correlation, the overall COD removal efficiency for the first four lagoons (46.4% of the anaerobic treatment capacity in the Binu POM) is equal to 87.4%. This supports the statement that a COD removal efficiency of 95% will be reached for 100% of the anaerobic treatment capacity (6 anaerobic lagoons).

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