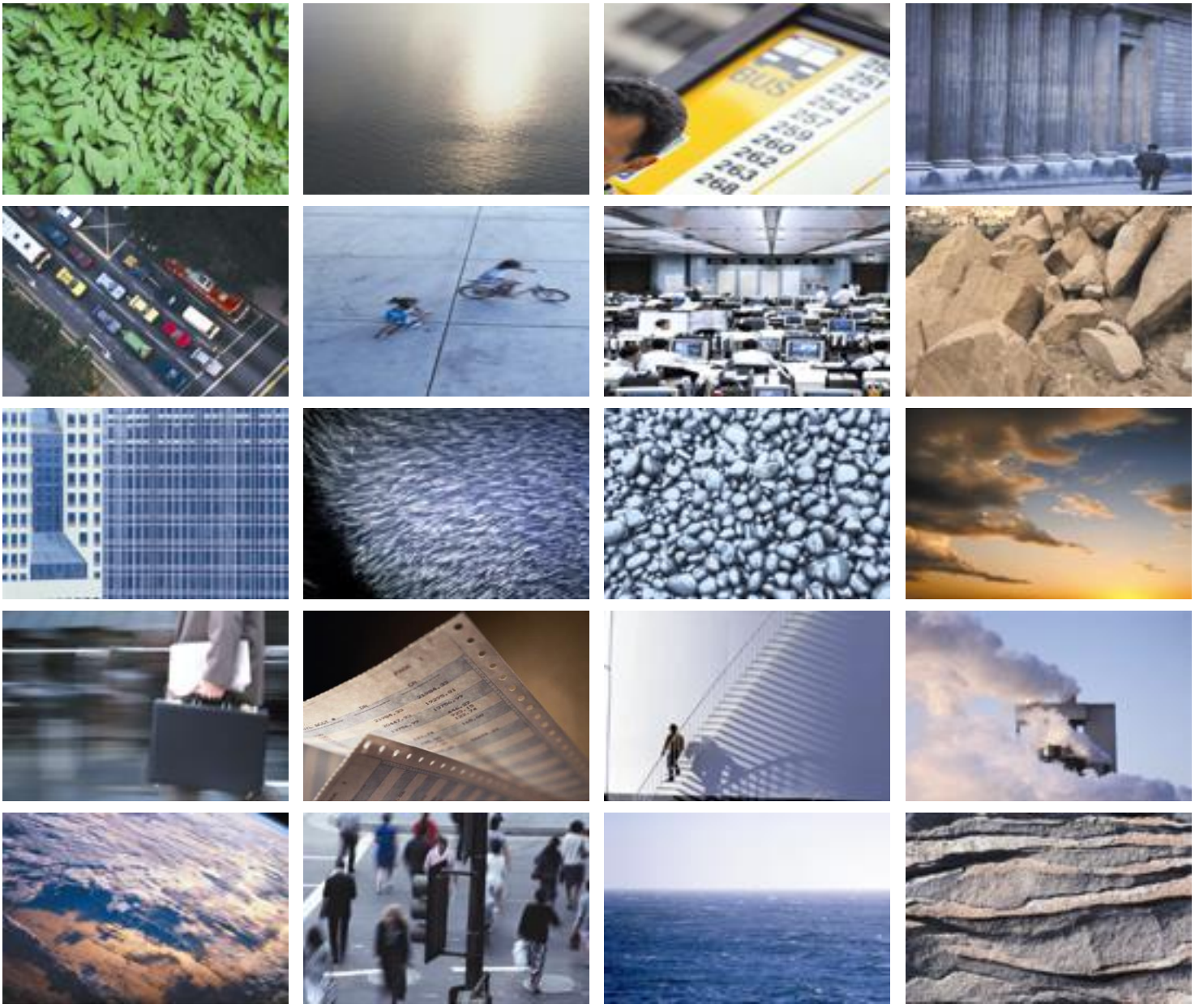

Biodiversity Offset Strategy

Long Son Petrochemical Project

Vung Tau Province, Vietnam

June 2017

ERM

Delivering sustainable solutions in a more competitive world

FINAL REPORT

Long Son Petrochemicals Co. Ltd.

Biodiversity Offset Strategy for Long Son Petrochemical Project
Vung Tau Province, Vietnam

June 2017

For and on behalf of ERM-Siam Co Ltd	
Approved by:	Kamonthip Ma Oon
Signed:	
Position:	IAP Partner
Date:	27 June 2017

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Glossary of Terms

Additionality	Additionality means ensuring that biodiversity management measures undertaken as part of an offset strategy do not take the place of actions that are already funded.
Biodiversity Offsets	Biodiversity offsets are measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development and persisting after appropriate avoidance, minimization and restoration measures have been taken.
Biodiversity Values	Biodiversity values means the values attached to particular biodiversity attributes by relevant local, national and international stakeholders.
Critical Habitats	Critical habitats are areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes.
Habitat	Habitat is defined as a terrestrial, freshwater, or marine geographical unit or airway that supports assemblages of living organisms and their interactions with the non-living environment.
Like-for-like	The principle of "like-for-like or better" indicates that biodiversity offsets must be designed to conserve the same biodiversity values that are being impacted by the project (an "in-kind" offset).
Mitigation Hierarchy	Mitigation Hierarchy is defined as the application of measures to firstly avoid impacts on biodiversity and ecosystem services. When avoidance of impacts is not possible, measures to minimize impacts and restore biodiversity and ecosystem services should be implemented. As a last resort, biodiversity offsets may be considered but only after appropriate avoidance, minimization, and restoration measures have been applied.
Natural Habitats	Natural habitats are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition.
Net Gain	Net gains are additional conservation outcomes that can be achieved for the biodiversity values for which the critical habitat was designated.
No-Net-Loss	No net loss is defined as the point at which project-related impacts on biodiversity are balanced by measures taken to avoid and minimize the project's impacts, to undertake on-site restoration and finally to offset significant residual impacts, if any, on an appropriate geographic scale (e.g., local, landscape-level, national, regional).

1 INTRODUCTION

1.1 BACKGROUND

Environmental Resources Management Siam Co. Ltd (ERM) has been contracted by Long Son Petrochemicals Co. Ltd. (LSP) to prepare a Biodiversity Offset Strategy (Strategy) for the Long Son Petrochemical Project (LSP Project).

The Strategy complements the findings of the Environmental and Social Impact Assessment (ESIA) undertaken by ERM for the Project (LSP ESIA) (ERM 2014). Specifically, ***Chapter 17*** of the LSP ESIA assesses the impacts on biodiversity values and applies the mitigation hierarchy according to the provisions of the *International Finance Corporation Performance Standard 6 Biodiversity Conservation and Sustainable Management of Living Natural Resources* (IFC PS 6) (IFC 2012).

The Strategy outlines the approach to offset the residual terrestrial biodiversity values impacted by the Project. It outlines the proposed governance, financial and administrative arrangements to manage biodiversity values necessary to achieve a no-net-loss of those values as required by IFC PS 6.

In addition, the Strategy considers the requirements to offset impacts on Protection Forest as required under the Vietnam Government Regulations (In particular, Circular 24/2013/TT-BNNPTNT).

The Strategy is limited to offsetting the impacts on terrestrial biodiversity values. It is considered that impacts to the marine and aquatic environment will be able to be mitigated and that no residual impacts on marine and aquatic biodiversity values will remain.

1.2 PROJECT OUTLINE

The Project is located within Hamlet 2 and Rach Gia Hamlet, Long Son Commune, Ba Ria – Vung Tau Province, Vietnam. It is to be spread over an area of 464ha on a site presently comprised of swamps, mangrove forest, salt fields, rice fields, hills and residential dwellings. The site is bordered by rural land and villages to the north and east, Ganh Rai Bay to the south and the Rang and Ong Ben Rivers to the east.

The Project will be comprised of the following primary components:

- Petrochemical Plant, consisting of an Olefins Plant, High Density Polyethylene (HDPE) Plant, Linear Low Density Polyethylene (LLDPE) Plant, Polypropylene (PP) Plant, Vinyl Chloride Monomer (VCM) Plant, Central Utility (CTU) Plant, Air Separation Plant (ASP) and Tank Farm. There are also a range of supporting facilities and buildings, including complex administration building, canteen, laboratory, emergency centre, and a first aid centre; and

- Seaport, consisting of a jetty, breakwater, access channel and turning basin.

The LSP Project is intended to operate for 50 years from the certification of the Investment Certificate (which is expected to occur in 2015). Extension of the lease for an additional 20 years is possible and subject to approval by the Government of Vietnam.

The existing biodiversity values of the Project site includes mangrove patches along the coastline and coastal mud flats, with the remainder of the site being comprised of aquaculture mangrove ponds, water channels, wooded hillsides, village plantations, rice fields and salt fields.

The development of the Project will have a direct impact on terrestrial and coastal habitat, primarily due to the direct removal of vegetation during the land development phase.

In applying the mitigation hierarchy, a range of mitigation measures have been developed to reduce this impact level, including a pre clearance and clearance process to limit the amounts of vegetation being cleared to that within the Project footprint.

However, residual impacts on biodiversity values remain. The Project has committed to ensuring a no-net-loss of biodiversity values and to offset the unavoidable loss of Natural Habitats as required under IFC PS 6. A biodiversity offset is therefore required to achieve this commitment.

1.3 SCOPE OF THE STRATEGY

The Strategy includes assessments of the requirements for biodiversity offsets for the LSP project according to:

- International Finance Corporation Performance Standard 6 *Biodiversity Conservation and Sustainable Management of Living Natural Resources* (IFC PS6); and
- Vietnam Government Regulations (In particular, Circular 24/2013/TT-BNNPTNT).

1.4 APPROACH

ERM has used the following frameworks as outlined by the Business and Biodiversity Offset Program (BBOP) resource documents:

- Biodiversity Offset Design Handbook (BBOP 2012a); and
- Resource Paper: No Net Loss and Loss-Gain Calculations in Biodiversity Offsets (BBOP 2012b).

ERM has applied the methodology as described by BBOP in designing the biodiversity offset for the LSP project.

1.5 CONSULTATION

In developing this Strategy, ERM and LSP undertook consultation with relevant Vietnam government agencies and NGOs. Consultation occurred with:

- Can Gio Mangrove Protection Forest Management Board (HCMC);
- Vietnamese Academy of Forest Science - Southern Branch (HCMC);
- Department of Agriculture and Rural Development (HCMC);
- Centre for Biodiversity and Development (CBD) (HCMC);
- World Wide Fund for Nature (Hanoi Office);
- Wildlife Conservation Society Vietnam (Hanoi Office); and
- IUCN Vietnam (Hanoi).

2 RESIDUAL BIODIVERSITY VALUES

IFC PS6 requires that residual impacts on biodiversity values are offset for Natural Habitats to achieve a no-net-loss of biodiversity values. Where Critical Habitats are identified, a net-gain in biodiversity values is required to be demonstrated. No Critical Habitats have been identified within the project footprint or the vicinity of the LSP Project.

Following the application of the mitigation step of the mitigation hierarchy, residual impacts on biodiversity values by the project have been identified. Further detail of on the application of the mitigation hierarchy and the mitigation measures identified to reduce impacts is outlined in ***Chapter 17*** of the LSP ESIA.

2.1 SUMMARY OF RESIDUAL IMPACTS ON BIODIVERSITY VALUES

As identified in ***Chapter 17*** of the LSP ESIA, the following residual impacts on biodiversity values have been identified.

2.1.1 Habitats

Mangrove Patches

Approximately 2.33 ha of natural mangrove patches of high mangrove forest quality will be impacted by the development. This area is classified as natural habitat under IFC PS6 and therefore requires to be offset to achieve a no-net-loss of biodiversity values.

No residual impacts were identified in relation to other terrestrial habitats or marine and aquatic habitats.

2.1.2 Species

No residual impacts on species were identified within the LSP ESIA.

However, monitoring of biodiversity values will be undertaken as part of a Biodiversity Action Plan (BAP) for the Project. As such, any ongoing impacts identified within the management framework for the BAP may trigger biodiversity offsets if ongoing residual impacts on species are identified.

3 BIODIVERSITY OFFSET RULES AND METRICS

Offset rules and metrics are used to outline the approach to govern how offset are undertaken and to define the offset calculation methods used to establish the offsets required.

IFC PS 6 specifically requires the following biodiversity offset design steps:

- Ensuring that the development project meets all applicable laws, regulations and policies pertaining to biodiversity offsets;
- Establishing an effective process for Affected Communities to participate in designing and implementing the biodiversity offset;
- Describing the project's scope and predicted impacts on biodiversity, applying and documenting the steps in the mitigation hierarchy and using defensible metrics that properly account for biodiversity to calculate residual impacts;
- Identifying suitable opportunities (potential offset sites, activities and mechanisms) for achieving "like-for-like or better" biodiversity gains to balance the losses due to the development;
- Quantifying the required biodiversity gains to achieve a no net loss or net gain outcome of biodiversity values and selecting the preferred locations and activities to provide these gains; and
- Setting the specific offset activities and locations in a biodiversity offset management plan to guide implementation.

Additionally, IFC PS 6 outlines requirements for the implementation of a biodiversity offset, including:

- Clarifying the roles and responsibilities of all stakeholders;
- Setting up the legal arrangements to secure the biodiversity offset site(s);
- Developing a comprehensive biodiversity offset management plan;
- Establishing appropriate financial mechanisms to ensure that all necessary gains are delivered; and
- Setting up a system for monitoring, evaluation and adaptive management for the implementation of the conservation outcomes required for the offset.

ERM has used the approach as outlined by the Business and Biodiversity Offset Program (BBOP) (BBOP 2012a; BBOP 2012b) to refine the application of IFC PS 6.

3.1 OFFSET RULES

For the purposes of this offsetting analysis, the following biodiversity offset rules have been developed (BBOP 2012a):

1. Offsets should be "like for like" where possible (trading is only allowed within the same habitat type);

2. Environmental contributions for specific programs can be used to substitute for the direct management of biodiversity;
3. Incremental loss and fragmentation of biodiversity values should be avoided;
4. Management of offset sites can be used to improve biodiversity values however this should not take the place of actions that are already funded (additionality);
5. Areas with existing or potential land uses that are likely to be in conflict with biodiversity offsets will be avoided (aquaculture, mining, forestry leases, hydro power projects);
6. Location of offsets in the landscape that facilitate connectivity with adjacent habitats will be of preference;
7. Large offset sites that are connected to existing protected areas will be of preference;
8. Sites that are similarly used by comparable ethnic groups sharing similar cultural values will be of preference;
9. Fairness and equity should be applied with affected stakeholders; and
10. Offsets chosen should be permanent and ongoing.

An analysis of how the recommended offset package complies against these rules is outlined in ***Section 8***.

3.2 BIODIVERSITY OFFSET METRIC

A biodiversity offset metric has been developed to determine the offsets required to offset residual impacts on biodiversity for the LSP Project. ERM has used the Habitat Hectare model (BBOP 2012a) to calculate the offset "quantum" required to compensate for the residual values lost.

This model captures the *type* (habitat and species), *amount* and *condition* of the habitat biodiversity values present on the impacted site and candidate offset sites. The basis of the analysis is calculating the change in condition (*loss*) at the impact site compared to the *gain* in condition at candidate offsets sites over time from management.

Offset metrics have been designed for the terrestrial biodiversity values using data on:

- Classification of habitat classes in the impact area (*Type*);
- Area of habitat classes from spatial analysis (*Amount*); and
- Land class condition assessment from field data (*Condition*).

Given that a candidate offset site has not been identified to offset the impacts of the Project, the range of Habitat Hectare values that would be required for an offset site has been determined. Two scenarios have been used to calculate the range of habitat hectares required based on area and condition values scores:

1. First scenario calculates the area required if the offset site is in high condition; and

2. Second scenario considers the offset site to be in low condition for the habitat types assessed.

This analysis will provide the range of habitat hectare values and hence the maximum and minimum area required to achieve the offset for each habitat type.

3.3 BIODIVERSITY OFFSET CALCULATIONS AND RESULTS

3.3.1 Impact Site Habitat Hectare Calculations

Habitat Baseline Condition Scores

The residual impact Habitat Hectare calculations are used to quantify the residual value of the impacted habitats. Areas of habitat types within the Project Area have been determined based on Habitat condition scores. These scores are used to set a baseline condition of the impact site against a habitat condition benchmark (set at a value of 1). The Habitat Hectare model relies on scores to define 'vegetation quality' being the degree to which the current vegetation differs from a 'benchmark' representing characteristics of a mature and apparently long-undisturbed stand of the same vegetation community. Essentially, this method attempts to assess how 'natural' a site is by comparing it to the same vegetation type in the absence of major ecosystem changes that have occurred (Parkes et al 2003).

Table 3.1 outlines the habitat class condition scores applied. These scores have been derived based on the definitions contained in IFC PS6 for "natural" and "modified" habitats and the definition of "degradation" of habitats (IFC, 2012). The scores applied have been derived to reflect the relative difference (and hence ability to restore) the habitat.

Table 3.1 Habitat condition scores (A)

Condition	Definition	Value
Benchmark	Being habitats in a mature condition with only native origin vegetation, a diversity of species of a mature or senescent state; and no sign of human disturbance (such as the presence of waste, vegetation removal).	1
Natural	High condition is defined as habitat largely of native origin, and/or where human activity has not essentially modified the primary ecological functions and species composition. Some disturbance is likely present such as vegetation removal, waste and minor introduction of invasive species.	0.75
Modified	Moderate condition habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition	0.5
Degraded	Degraded condition is defined as significant conversion or degradation of the habitat such as the elimination or severe diminution of the integrity of a habitat caused by a major and/or long-term change in land or water use; or (ii) a modification that substantially minimizes the habitat's ability to maintain viable populations of its native species	0.25

Habitat Hectare Calculation Formula (Impact Site)

The following formula has been used to calculate the Habitat Hectares of the residual values of the impacted habitats:

Area of Habitat Type (A) x Habitat Type Condition (B) = Habitat Hectares

Results of Habitat Hectare Calculations for the Impact Site

The results of the calculations are outlined in ***Table 3.2***.

Table 3.2 Calculation of impact area habitat hectares

Habitat Type	Habitat Type Condition	Condition Score(A)	Habitat Type Area* (B)	Habitat Hectares Impact Area
Mangrove	Natural	0.75	2.33	**1.75**

**Areas of residual impacts on natural habitat (See section 2.1)*

The number of Habitat Hectares that require to be offset to achieve a no-net-loss of biodiversity values is 1.75 Habitat Hectares for mangrove patches.

3.3.2 Candidate Offset Site Habitat Hectare Calculations

The management of candidate offset sites enables biodiversity value "gains" and hence enables impacts to be offset (that is, compensate for losses). This is calculated based on the expected outcomes from positive interventions from management actions at the offset site to improve biodiversity values.

The gains in condition value are relative to the existing condition of the offset site. Sites with an existing high condition are likely to have an incrementally smaller improvement in biodiversity condition values through management over time. Sites with a lower baseline condition have a greater capacity to improve from conservation management over time.

Offset Gain Period

The time period chosen for management of the offset areas has been 50 years. This period has been chosen as this equates to the agreed lease arrangement time for the operation of the Project by the Government of Vietnam.

Information provided by the International Union for the Conservation of Nature (IUCN) and the Can Gio Mangrove Protection Forest Management Board (CGMPFMB) indicate that mangrove forest growth mature from a seedling to a height of around 14 to 18m in height in 30 years in Vietnam (subject to favourable environmental and site conditions). Further work by Marchand (Marchand M, 2008) indicates that mangrove forests can reach a "mature" condition within 50 years through natural regeneration and selective planting in coastal areas of Vietnam (also subject to favourable environmental and site conditions). A conservative approach has been taken to determine the gain period, with a 50% reduction in estimated maturation stage being applied to the calculations below, assuming that 52.5% of the value of Benchmark vegetation from Degraded vegetation can be achieved after 50 years.

Offset Gain Scores

Offset gain scores are derived based on the relative gain in condition available from the Habitat Condition Baseline Scores over the offset gain period (based on a 30-50 year timeframe to reach a mature state).

Offset gain scores have been derived based on the relative gain in condition available from the Habitat Condition Scores over the offset gain period (refer to discussion on Ecological Gain Period above). The offset gain scores outlined have been derived based on the relative time frames to achieve ecological restoration and the available Offset Gain Period. In the case of Natural state vegetation, a multiplier of 0.1125 (11.25%) increase in value is estimated to be achieved in 25 years; and 0.15 (15%) increase by 50 years. After 50 years of management, the condition of Natural vegetation would therefore be 90% of the condition of benchmark vegetation (0.75+ 0.15). It is also assumed that offset management over time will have diminishing results; hence the multiplier reduces over time. These gain scores are outlined in ***Table 3.3***.

ERM has considered the potential rate for failure of plantings; impacts from natural effects (such as coastal erosion) and lost biodiversity value during the time period of management to define these values.

The estimates of gain may vary in practice and require monitoring to determine if the estimation are accurate. Where significant variations occur in estimated value increases, additional management or increases in offset areas managed will need to be applied.

Table 3.3 Offset gain score (C1)

Existing Site Condition	Base Condition Value	Gain 25 years	Gain 50 years
Natural	0.75	0.1125	0.15
Modified	0.5	0.15	0.2
Degraded	0.25	0.2	0.275

Habitat Hectare Calculation Formula (Offset site)

The formulas used to calculate the offset gains available from candidate offset areas are outlined below:

1. Calculation of Baseline Habitat Hectares:

   Candidate Offset Habitat Condition Score (A1) x Area of Habitat Type (B1) = Candidate Offset Habitat Hectares (W)

2. Calculation of Habitat Hectare Gains:

   Candidate Offset Habitat Condition Score (A1) + Candidate Offset Habitat Condition Score (Gain) (C1)] x Area of Habitat Type (B1) = Candidate Offset Habitat Hectares Gain (X)

3. Calculation of Offset Habitat Hectares:

Candidate Offset Habitat Hectares Gain (X) - Candidate Offset Baseline Habitat Hectares (W) = Candidate Offset Habitat Hectares (Y)

Results of Habitat Hectare Calculations Required for Offset Sites

Two scenarios have been determined to provide the range of areas required to offset the impacts on Habitats. The offset goal is to achieve the same number of Habitat Hectares impacted at the offset site.

As shown in ***Table 3.2***, the number of Habitat Hectares that are required to be offset to achieve a no-net-loss of biodiversity values is: 1.75 Habitat Hectares for mangroves.

The results of the analysis to identify the range of areas required to achieve the offset goal are outlined in ***Table 3.4*** below.

Table 3.4 Candidate Offset site Habitat Hectares

Habitat Type	Habitat Type Condition	Condition Score(A1)	Offset Gain Score (C1)	Habitat Type Area (B1)	Habitat Hectare Offset Area (W)	Habitat Hectare Gain Value (X)	Habitat Hectare Candidate Offset Value (Y)
Mangroves	Natural	0.75	0.15	11.65	8.74	10.49	1.75
	Modified	0.5	0.2	8.75	4.38	6.13	1.75
	Degraded	0.25	0.275	6.35	3.33	3.33	1.75

** These areas are calculated using the habitat hectare formulae as outlined above.*

From this analysis, the required range of areas of mangroves for difference condition classes to achieve a no-net-loss of biodiversity values for the habitat would be:

- 11.65ha of Natural condition mangroves; or
- 8.75ha of Modified condition mangroves; or
- 6.35ha of Degraded condition mangroves.

An assessment will be required to be undertaken of the proposed candidate offset site to determine the condition and hence available area to achieve a no-net-loss of biodiversity values. The chosen offset site is likely to contain a range of condition types and this will affect the final size of the offset site chosen. As required by the offset rules, it is intended that the site also be connected with other areas of natural habitat, areas of conservation interest or protected areas. These requirements will be contained within the Biodiversity Offset Plan prepared for the chosen offset site.

According to Decree 23/2006/ND-CP and Circular 24/2013/TT-BNNPTNT, the Vietnam Government requires offsets for impacts on all kinds of Forest (i.e. special use forest, protection forest, production forest) as classified under the Forest Protection and Development Law (2004). These regulations require a development project that changes forest land use of any type to other purpose to implement forest offset. The area to be offset is at least equal to the area of the forest lost. It should be noted that these "offsets" are solely for the purpose of offsetting the loss of productive timber and not for the protection of biodiversity.

According to the *2013-2015 Protective Forest Protection and Development Plan of the Department of Agriculture and Rural Development*, BR-VT Province (approved in late 2013), the mangrove (mangrove patches and aquaculture mangrove ponds) within the Project site is considered to be Protection Forest. The planned protected forest area maps show that the existing mangrove areas on site are planned to be protected and expanded under this plan. However, there would appear to be a fundamental difference between this plan and the plans for the area to be developed for industrial purposes.

The Department of Agriculture and Rural Development of Ba Ria- Vung Tau Province (DARD) and the Protection Forest Management Board (directly under DARD) during consultation meetings on 4 September 2014 and 5 October 2014, respectively, regulatory forest offset may be applicable for LSP. This will be officially confirmed and guided in writing by DARD. A direction was issued in early in 2014 (Direction 02/CT-TTg) by the Prime Minister reinforcing these offset requirements. According to this Direction, LSP would be required to complete their offset within 2015, if it is determined to be required.

The various requirements of the offset are outlined within the Circular 24/2013/TT-BNNPTNT. A forest offset plan shall be developed for DARD's appraisal and Provincial PC's approval. In instances where there is no wetland available for mangrove reforestation, offset through other forest types can be acceptable. In case there is no land available for offset within the Province, a payment to the National Forest Protection and Development Fund must be made in accordance with Decree 05/2008/ND-CP.

LSP has made effort in seeking official confirmation and clarification from DARD on the offset requirements under the regulations. However, there has been no response from DARD so far regarding LSP's forest offset obligation excepting a letter No.697/BQL dated 26 December 2014 to confirm the area of protection mangrove forest within the project boundary.

On 10 August 2015, a meeting was held between LSP and Department of Natural Resources and Environment (DoNRE) on clarification of legal requirements on land use purpose change and land use right certificating for LSP Project. According to the minutes of meeting, DoNRE confirmed the permitting process for forest land use

change is not applicable for LSP Project in accordance to Item 1 of Provision 58 of the Land Law 2013[1] given LSP investment was accepted by the Prime Minister in 2008[2]. LSP is of the view that the Project is not considered a Project that changes forest land use based on outcomes of the meeting with DoNRE and is not required to offset forest cleared as part of the project.

[1] Item 1 of Provision 58 of the Land Law 2013: if a project investment is accepted by the Prime Minister, acceptance for change of forest and agriculture land use from relevant authorities (i.e. Prime Minister or Provincial Council) is not required.

[2] Letter No. 1004/Ttg-KTN dated 1 July 2008 of the Prime Minister

5 STAKEHOLDER CONSULTATION

As required by the provisions of IFC PS 6, stakeholder engagement is a key component to design a biodiversity offset strategy. This is particularly important to clarify the roles and responsibilities of all stakeholders; understand the jurisdictional legal arrangements to secure the biodiversity offset site; understanding the options to establish appropriate financial mechanisms; and engaging with government and NGOs with experience in setting up systems for monitoring, evaluation and adaptive management.

ERM and LSP undertook targeted stakeholder engagement in Hanoi and Ho Chi Minh City (HCMC), Vietnam from 13 to 15 October 2014. Consultation occurred with:

- World Wide Fund for Nature (Hanoi Office);
- Can Gio Mangrove Protection Forest Management Board (HCMC);
- Vietnamese Academy of Forest Science - Southern branch (HCMC);
- Department of Agriculture and Rural Development (HCMC);
- Centre for Biodiversity and Development (CBD) (HCMC);
- Wildlife Conservation Society Vietnam (Hanoi Office); and
- IUCN Vietnam (Hanoi).

The purpose of this consultation was to discuss the:

- Potential location for offsets for mangroves for the LSP Project;
- Financial arrangements that could be used by LSP to fund conservation projects;
- Roles and responsibilities of government and NGOs in administering and managing biodiversity offset/conservation projects, especially within protected areas;
- Legal frameworks available to secure land for the purposes of biodiversity offsets; and
- Expectations for governing biodiversity offset projects and managing performance.

Full notes from the discussion of the stakeholder engagement are contained at ***Annex A***.

Key points from the results of the stakeholder consultation are contained in ***Table 5.1***.

Table 5.1 Key Points from the Results of the Stakeholder Consultation

Topic	Results Summary
Financial	• No trust funds have currently been set up for conservation management in Vietnam. Financial arrangements would therefore need to be set up separately by the company to manage any funds set aside for offsets. • Current projects in Can Gio Biosphere Reserve are set over 4 years (1 year for planting and 3 years of maintenance) as required by regulations. Price of undertaking offset per hectare for standard mangrove rehabilitation is 100 – 170M VND/ha (planting in first year); ongoing maintenance cost in the 2nd, 3rd and 4th year is 20%, 10% and 10% of the initial investment, respectively. Abandoned salt farm rehabilitation costs around 200-270M VNDD/ha (for planting in the 1st year) + the same ongoing maintenance costs.
Governance	• Some conflict exists currently between NGOs and the Government in Vietnam. Government is reluctant to let NGOs solely manage funds for conservation projects. Government wants to manage the funds themselves. • Development of a sound management structure that involves the government is important. • Government stakeholders that would require consultation include the Management Board of Can Gao; Department of Agriculture and Rural Development and National Park (NP) management boards. • Working with the government requires careful management of funds and expenditure. • General permission from the People's Committee of Ho Chi Minh City (HCMC) would be required to do a project in the biosphere reserve.
Legal	• Legal contracts can be set up between the donor (LSP) and NGOs to administer offsets. NGOs would sign a Memorandum of Understanding (MoU) with the government to set out clear objectives for the project.
Offset Experience	• Conservation projects with mangroves exist in Ben Tre and Ca Mau Provinces. Mangrove restoration work has been undertaken in Tram Chim NP and Mui Ca Mau NP. • Tram Chim NP and at Lang Sen NP have had freshwater forest conservation projects undertaken. • Can Gio mangrove conservation restoration projects have been used for offset projects. • Historic mangrove replanting projects in Can Gio has resulted in a monoculture with little species diversity.
Timeframes	• It is estimated that it would take 3 months to develop and submit the selected offset project; 3-5 months to negotiate with the government. This equates to between 10 to 12 months timeline.
Community Engagement	• Protection forest limits the ability for local community involvement. Limits use of natural resource use by the community. • Forest enterprises also offer opportunities to promote conservation. However, these areas are of mixed use and are still subject to cultivation and forestry. This would create conflicts between the conservation initiatives and the existing uses.
Offset Site preferences	• Rehabilitation of abandoned salt farms within the Can Gio biosphere reserve could be considered as an offset option Restoration would be more difficult on these areas but easier for investors to gain support from local authorities. • RAMSAR classification of a potential offset site is a good starting point to identify a suitable offset site. This international recognition and protected area status provides a sound legal basis for conservation.

Topic	Results Summary
	• Defoliants in the American war in Can Gio may pose a challenge to establishing restoration projects. Problems with site contamination have shown to be impacting on restoration projects. • Alternative sites to Can Gio should be considered in the Mekong Delta. These could include areas on the sea side of the Delta. • A survey of existing forest in the province is currently being conducted by the Protection Forest Management Board and expected to be completed by 20/10/14. From the survey, it is likely that 125ha of suitable mangrove forest will be identified within the province.
Threats to achieving management outcomes	• Difficulties faced and threats (long term and short term) include coastal erosion and failure of plantings. Agent Orange contamination is considered not a problem any longer (Can Gio MPFMB). • Around 10 hectares of forest impacted by storms every year. Success depends on the experience and expertise of technical consultant in selecting the right land for the right species. • Can Gio MPFMB is confident to provide such consultancy service within the biosphere as they know and understand the conditions of the biosphere very well. • Current threats that would need to be managed in this area include the illegal cutting of mangroves and coastal management.

6 OPTIONS FOR BIODIVERSITY OFFSETS

ERM has identified a range of options to deliver the required biodiversity offsets for the LSP Project. The following options have been identified based on stakeholder consultation, discussions with relevant experts and research undertaken by ERM. These options relate to the delivery of offsets as required by IFC PS6.

Offsets required by the Vietnam Government have been considered separately are described in ***Section 4*** of this report.

Option 1: Mangrove conservation in Can Gio Biosphere Reserve in conjunction with the Can Gio Mangrove Protection Forest Management Board (CGMPFMB).

Option 2: Project with the IUCN in the Mekong Delta on mangrove restoration.

Option 3: Management of mangrove vegetation on site.

The options outlined have been analysed using a "Strengths, Weaknesses, Opportunities and Threats" (SWOT) analysis in ***Table 6.2***. This assessment has enabled a preferred option to be recommended.

6.1 COSTS OF MANAGING BIODIVERSITY OFFSETS

The cost of managing biodiversity offsets will vary based on the baseline condition and size of the candidate offset site. The cost of managing these areas over the set time period (50 years) will vary dependant on the:

- Benchmark existing condition of the site (and hence the relative management effort required); and
- Area of the candidate offset site.

ERM has been provided with some indicative costs for managing *degraded* mangrove forest in Vietnam by the Can Gio Mangrove Protection Forest Management Board (CGMPFMB) and the IUCN (***See Annex B***).

An assessment of the estimated relative costs of managing biodiversity values of the candidate offset sites has been calculated. This analysis has used the cost information provided to calculate the relative costs of management for the areas of habitat type to achieve a no-net-loss of biodiversity values (***See Table 3.4***). A summary of this analysis is shown in ***Table 6.5*** below.

Full calculations of the likely cost to manage biodiversity offsets are contained in ***Annex B***.

Table 6.1 Estimated Costs to Manage Required Offset Areas

	Area	Cost/Ha (1)*	Cost/Ha (2)*	Total Cost (1)	Total Cost (2)
Mangroves in Natural Condition**	11.65	$2,556	$5,381	$22,314	$46,978
Mangroves in Modified Condition***	8.75	$7,668	$16,143	$33,510	$70,547
Mangroves in Degraded Condition	6.35	$12,780	$26,906	$37,318	$78,565

*** *Based on a requirement to manage the offset site for 50 years.*

**** *Assumes management costs for restoring natural condition mangroves are 20% of the costs to manage degraded condition mangroves per annum.*

***** *Assumes management costs for restoring modified condition mangroves are 60% of the costs to manage degraded condition mangroves per annum.*

(1) *Based on costs provided by the IUCN in November 2014.*

(2) *Based on costs provided by the CGMPFMB in October 2014.*

All values are quoted in USD at a rate of 22300VND : $1USD (July 2016)

The analysis shows that the range of costs associated with managing the candidate offset site(s) over 50 years would be between $46,978 and $78,565 USD for mangroves based on the condition and size of offsets required to achieve a no-net-loss of biodiversity values (calculated based on current values using data provided by the IUCN and CGMPFMB).

The estimations outlined are based on 2014 current values and do not take into account inflation. The estimations should only be used to guide the relative costs between the two options and may not reflect the true cost of undertaking offset management for the final site(s) chosen.

It is recommended that LSP budgets for 2015 and onwards should reflect the cost estimates identified in this report and be amended when actual costs are confirmed within the Biodiversity Offset Plan.

6.2 *OPTION 1: CAN GIO BIOSPHERE RESERVE OFFSET IN CONJUNCTION WITH THE CAN GIO MANGROVE PROTECTION FOREST MANAGEMENT BOARD*

The analysis of the option for management of portions of the Can Gio Biosphere Reserve has been developed following consultation with the CGMPFMB. ***Table 6.2*** outlines the components of *Option 1*.

Table 6.2 Outline of Option 1: Can Gio Biosphere Reserve Offset in Conjunction with the Can Gio Mangrove Protection Forest Management Board

Location:	Can Gio Biosphere Reserve
Site Description:	The Can Gio biosphere reserve is located in the coastal district of Vietnam South East of Ho Chi Minh City. It covers 75,740 hectares and is dominated by mangroves, including both salt water and brackish water species. The mangroves in Can Gio have a high biodiversity value with more than 200 species of fauna and 52 species of flora. Can Gio is a recognised biosphere reserve by UNESCO.
Partner:	Can Gio Mangrove Protection Forest Management Board (CGMPFMB).
Tenure:	Can Gio Biosphere reserve is classified under Vietnamese Regulations as Protection Forest. The forest is protected under these laws.
Project Description:	The project would be to contribute to the management of an equivalent area of mangroves to achieve an offset of biodiversity values. Management would be entrusted with the CGMPFMB within an area of the Reserve that is not currently managed for conservation. The CGMPFMB have indicated that there are opportunities to rehabilitate areas of land previously used as salt farms and aquaculture farms within the boundary of the reserve. A comprehensive management plan would be prepared by CGMPFMB to guide the management measures required to rehabilitate the required areas of mangroves. These areas would be identified and intensively managed to restore mangrove within the reserve boundary. There would be opportunities to involve the local community in the rehabilitation. CGMPFMB would fully implement, monitor and evaluate the project. The management time period for the project would be 50 years.
Governance:	The CGMPFMB has a management structure in place and expertise in managing areas of mangroves within the Reserve. Monitoring and evaluation would be required to determine outcomes to meet the offset requirements of LSP. The CGMPFMB has accepted monetary contributions from donors previously to undertake specific projects. Legal arrangements would need to be negotiated with CGMPFMB.
Financial:	The CGMPFMB has estimated that the cost of per hectare of undertaking mangrove rehabilitation for degraded forests is between 100M – 170M VND/ha (planting in first year); ongoing maintenance cost in the 2nd year, the 3rd and 4th year is 20%, 10% and 10% of the initial investment, respectively. See ***Annex B*** for cost calculations.
Legal:	The CGMPFMB currently has been set up under the provisions of the Forest Protection and Development Law (1991). The site is also afforded international status under the UNESCO listing as a Biosphere Reserve of international importance. The site is overseen by the Can Gio People's Committee with the primary purpose for biodiversity conservation. The site therefore has strong legal mechanisms that ensure that its biodiversity values are maintained.
Monitoring and Evaluation:	A monitoring and evaluation framework will be established based on ecological, governance and financial objectives and targets. This framework will be established to efficiently track progress of indicators such as: the implementation of management measures; the success/failure of implementation; adaptive management; and financial performance.
Additionality:	The Can Gio Biosphere reserve currently receives money from Government and the private sector to manage the reserve. Offsets would need to contribute to biodiversity gains that would not normally funded through existing means. Given the existing financial arrangements received by CGMPFMB, additionality may

Location:	Can Gio Biosphere Reserve
	constrain this option.
Approvals Required:	Approvals will be required by the Ho Chi Minh City District People's Committee to establish the offset area within Can Gio Biosphere Reserve. This would include the approval of the management plan, management structure, financing and administrative arrangements. The CGMPFMB will also need to endorse and approach the offset strategy.

6.3 OPTION 2: PROJECT WITH THE INTERNATIONAL UNION FOR THE CONSERVATION OF NATURE (IUCN) IN THE MEKONG DELTA ON MANGROVE AND MUDFLAT RESTORATION

The following offset option has been developed in conjunction with discussions with the IUCN. ***Table 6.3*** outlines the components *Option 2*.

Table 6.3 Outline of Option 2: Project with the International Union for the Conservation of Nature (IUCN) in the Mekong Delta on Mangrove and Mudflat Restoration

Location:	Ben Tre Province, Lower Mekong Delta
Site Description:	Ben Tre Province plans to increase forest land area to 7,833 ha over twelve communes in the three coastal districts of Ben Tre-Binh Dai, Ba Tri, and Thanh Phu. The current forested land area is 3,946 ha: 1,651 ha of protective forests; 1,888 ha of special-use forest; 407 ha of production forest. Areas not forested are: 3,803 ha of protective forest; 2,584 ha of special-use forest; and 1,446 ha of production forest. The area of mangrove forests consists of good to degraded condition forests currently used for conservation, forestry and multiple human use purposes.
Partner:	IUCN and the Mangroves for the Future (MFF) partnership.
Tenure:	Land suitable for offsets containing mangroves within the Province is a mix of Protection Forest, Production Forest and land used for commercial activities such as shrimp farming and fish farming. The final offset site would need to consist of tenure that is consistent with conservation and protected from incompatible uses (such as timber harvesting). The Project Partner has advised that an assessment undertaken by DARD indicates that over 200 hectares of degraded condition mangrove forest is available within protection forests that could be used for the purposes of a biodiversity offset.
Project Description:	The Project would contribute to a community based conservation initiative in Protection forest within Ben Tre Province in conjunction with the MFF Partnership. The project would look to involve local people in mangrove and mudflat restoration by focussing on improving their skills as well as capacity building and awareness of mangrove conservation. A management plan would be prepared showing key management and performance related initiatives to enable the project to be implemented. The project would be solely run by the IUCN in conjunction with DARD. Project would occur over 50 years.
Governance:	IUCN has a management structure in place and experience within the Mekong Delta restoring Mangrove ecosystems. IUCN has close working relationships with local government bodies and the community. Monitoring and evaluation requirements would need to be developed to determine outcomes as required by LSP in the Biodiversity Offset Management Plan. This would include Legal agreements with the Project Partner and the community.
Financial:	Cost estimated and provided by DARD is 40M VND per hectare for site preparation (year 1) and 15M VND for 3 years management for managing degraded mangroves. See ***Annex B*** for cost calculations.
Legal:	The legal status of land available within the Mekong Delta that would protect a biodiversity offset lie within the Forest Protection and Development Law (1991).

Location:	Ben Tre Province, Lower Mekong Delta
	Provisions enable classifications to restrict access and manage land-use. Classifications as Protection Forest[3] or Special Use[4] forests would enable sufficient legal status to enable long term conservation.
Monitoring and Evaluation:	A monitoring and evaluation framework will be established based on ecological, governance and financial objectives and targets. This framework will be established to efficiently track progress of indicators such as: the implementation of management measures; the success/failure of implementation; adaptive management; and financial performance.
Additionality:	Ben Tre Province and the IUCN currently receive money from other sources and donors for mangrove conservation. A discrete project would need to be established that demonstrates that conservation gains in addition to those already likely for the area. Projects for offsets would need to be carefully established so as to contribute to biodiversity gains that would not normally funded through existing means.
Approvals Required:	Approvals will be required by the Ben Tre Province People's Committee. Approvals and endorsement will also be required by DARD.

6.4 OPTION 3: MANAGEMENT OF REMNANT MANGROVE STANDS WITHIN THE LSP PROJECT SITE ON LONG SON ISLAND

The following offset option has been developed in conjunction with discussions with LSP. ***Table 6.3*** outlines the components *Option 3*.

Table 6.4 Outline of Option 3: Management of remnant mangrove stands within the LSP project site on Long Son Island

Location:	Management of remnant mangrove stands within LSP Project Site
Site Description:	The LSP Project site contains an area of approximately 25 ha of remnant mangrove and salt marsh communities. This area is currently in degraded state and would benefit from long term management to restore the ecological values of the mangrove area.
Partner:	LSP would undertake the management of the offset site with technical input from the IUCN's Mangroves for the Future (MFF) program.
Tenure:	The site is currently subject to a long-term concession agreement. The tenure is Production Forest. LSP is currently responsible for the sites management during the period of the concession agreement.
Project Description:	The project would be to contribute to the management of an equivalent area of mangroves to achieve an offset of biodiversity values. Management would be undertaken by LSP with guidance by the IUCN Mangroves for the Future program within the site boundary of the LSP Project. The comprehensive management plan will be prepared by ERM for LSP to guide the management measures required to rehabilitate the required areas of mangroves. These areas would be identified and intensively managed to restore mangroves. There would be opportunities to involve the local community in the rehabilitation. LSP would fully implement, monitor and evaluate the project. The management time period for the project would be 50 years.
Governance:	LSP would work closely with the IUCN to implement the Biodiversity Offset

[3] *Protection Forests - These forest areas are used predominantly for protecting water resources, land, to prevent erosion and desertification in key areas, to restrict natural calamities, and to regulate climate.*

[4] *Special-use Forests – These forest areas are used mainly for conservation and are designated as such to protect nature, national forest ecosystems, and biodiversity. The title is also for protecting areas of historical or cultural significance. Designations include: national parks, conservation zones, scientific research and experiment areas.*

Location:	Management of remnant mangrove stands within LSP Project Site
	Management Plan. The Plan will contain relevant accountability, monitoring and management measures.
Financial:	The cost of management would be approximately $230,000 over 50 years. This figure may vary dependent on costings for undertaking management of the site.
Legal:	The mangroves will be managed and protected within the LSP project boundary. Classification of the forest as protection forest or special uses forest would enable long term protection.
Monitoring and Evaluation:	A monitoring and evaluation framework will be established based on ecological, governance and financial objectives and targets. This framework will be established to efficiently track progress of indicators such as: the implementation of management measures; the success/failure of implementation; adaptive management; and financial performance. This will be included as part of the Biodiversity Offset Plan.
Additionality:	No current money or subsequent management occurs within the boundary of the proposed offset area. Additionality is unlikely to be an issue for this site.
Approvals Required:	DARD may be required to issue an approval if the site is to be used as a local offset area according to Decree 23/2006/ND-CP and Circular 24/2013/TT-BNNPTNT.

Table 6.5 Strengths, Weaknesses, Opportunities and Threats Assessment of Offset Options

	Factors relevant to LSP		Relevant external factors	
Offset Option	**Strengths** *Characteristics that give the option an advantage over others*	**Weaknesses** *Characteristics that place the option at a disadvantage relative to others*	**Opportunities** *Elements that are advantageous for the option*	**Threats** *Elements that could constrain the option*
Option 1 **Can Gio Biosphere Reserve**	• Site has sufficient size to accommodate the required offset size for LSP. • Site contains mangrove forest that matches the habitat requirements for the offset. • Site is currently administered and managed by a suitably experienced government agency. • Legal protection for the site is already in place through both local regulatory recognition and UNESCO listing. • Site is close to the LSP site, enabling good public relations exercises to be run.	• Additionality is likely to be an issue as the site is currently managed for conservation purposes through both government and private sector funding arrangements.	• Site has existing governance and legal frameworks in place sufficient to manage to achieve conservation outcomes. • Sufficient technical expertise is available to oversee the project implementation. • CGMPFMB have knowledge and experience in managing the Biosphere Reserve. • Site has national and global significance for management.	• Approval mechanisms will be required through the HCMC People's Committee for the establishment of the project. This may lead to delays. • Additionality would be seen as an issue that would need careful consideration by financiers in order to comply with IFC PS6 • Cost is likely to be an issue for the management of the site in the short term. • Managing costs and outcomes over a 50 year management period will require careful supervision.
Option 2 **Ben Tre area within the Mekong Delta**	• Candidate site has sufficient flexibility to accommodate the required offset size for LSP. • Candidate site contains mangrove forest that matches the habitat requirements for the offset. • Site is currently administered and managed by a suitably experienced NGO. • A discrete management site can be established that would be additional to existing conservation programs so concerns over additionality are unlikely to apply. • Site management costs are likely to be cheaper than *Option 1*.	• Candidate site is a considerable distance from the impact site (being in the Mekong Delta). • Candidate site will require discussion and agreement with local DARD officials and the community enable management to commence. • Candidate site may not currently have legal status as a conservation reserve, however legal mechanisms are available under Vietnamese law to establish legal protection for the area chosen (such as either choosing areas currently classified as Protection Forest or reclassifying forest as Protection Forest under the Forest Protection and Development Law (1991).	• NGO has sufficient experience with working on conservation projects in the Mekong Delta. • Sufficient technical expertise is available to oversee project implementation. • Involvement of the community in conservation management is likely to be beneficial for conservation by managing threats. • Site has national and global significance for management.	• Approval mechanisms will be required through the Ben Tre Province People's Committee for the establishment of the project. This may lead to delays. • Developing the project with NGOs and community stakeholders will require careful definition and management to achieve outcomes over 50 years.

Option 3: Management of remnant mangrove stands within the LSP project site on Long Son Island	• Site has sufficient size to accommodate the required offset size for LSP. • Site contains mangrove forest that matches the habitat requirements for the offset. • Site is currently under a long-term concession agreement arrangement with LSP. • Site is close to the LSP site, enabling good public relations exercises to be run.	• Additionality is not likely to be an issue as the site is not currently managed for conservation purposes.	• Site is currently managed by LSP. • Sufficient technical expertise is available to oversee the project implementation from the IUCN.	• Managing costs and outcomes over a 50 year management period will require careful supervision.

7 RECOMMENDED BIODIVERSITY OFFSET PACKAGE

7.1 RECOMMENDED BIODIVERSITY OFFSET PACKAGE

7.1.1 Analysis

From the analysis undertaken, it is recommended that *Option 3* be chosen as the preferred offset management Strategy.

For Option 1, ERM is of the view that it will be difficult to justify that offset management in Can Gio Biosphere Reserve as a result of the LSP offset project would be additional to management that would normally occur given the support and funding of the Vietnam Government within the Reserve.

For Option 2, ERM is of the view that this option is not as feasible as managing mangroves on site. The uncertainty of the legal status of land available for offsets also means that the mangroves may not be managed for the long-term.

7.1.2 Next Steps

ERM has identified the following next steps to implement the Offset Strategy:

1. Seek approval from relevant lenders on the proposed Biodiversity Offset Strategy;
2. Prepare a Biodiversity Offset Plan for the chosen offset site(s), including determining costs for offset management over the offset management period (50 years); and legal, governance and administrative frameworks for the offset site;
3. Set aside sufficient budgets within an appropriate mechanism to fund offset site management (based on the estimated costs, however this may be subject to change based on the calculations on costs to be prepared within the Biodiversity Offset Plan); and
4. Implement and oversee the offset package.

7.2 ANALYSIS OF OFFSET PACKAGE AGAINST BIODIVERSITY OFFSET RULES

Table 7.1 outlines the analysis of the recommended option against the offset rules.

Table 7.1 Analysis of recommended option against offset rules

Offset Rule	Analysis of Option 3
1. Offsets should be "like for like" where possible (trading is only allowed within the same habitat type);	The recommended offset site is immediately adjacent to the project site and contains the same biodiversity values (mangrove and mudflat communities)
2. Environmental contributions for specific programs can be used to substitute for the direct management of biodiversity;	No environmental contributions have been identified for this offset project.
3. Incremental loss and fragmentation of biodiversity values should be avoided;	The offset sites chosen will be contiguous in nature and contribute to the conservation of biodiversity within the Long Son Island area.
4. Management of offset sites can be used to improve biodiversity values however this should not take the place of actions that are already funded (additionality);	No current management funding exists to manage the site
5. Areas with existing or potential land uses that are likely to be in conflict with biodiversity offsets will be avoided;	The offset site is adjacent to the Can Gio Biosphere Reserve. Areas of existing fish and shrimp farming will be avoided.
6. Location of offsets in the landscape that facilitate connectivity with adjacent habitats will be of preference;	The offset site is adjacent to the Can Gio Biosphere Reserve.
7. Large offset sites that are connected to existing protected areas will be of preference;	The offset requirement is relatively small. The chosen offset site is immediately adjacent to the Can Gio Biosphere Reserve.
8. Sites that are similarly used by comparable ethnic groups sharing similar cultural values will be of preference;	The impact site and candidate offsets sites are currently used by local Vietnamese villagers and fishermen.
9. Fairness and equity should be applied with affected stakeholders; and	Stakeholder consultation will form part of the establishment of the offset site to ensure adequate community engagement. Existing uses, such as the sustainable collection of forest products will be carefully managed within the offset area.
10. Offsets chosen should be permanent and ongoing.	Proposal to reclassify the offset site as a Protection Forest or Special use forest is possible.

7.3 MANAGING UNCERTAINTY AND RISK

There are inherent risks to analysing and designing biodiversity offsets due to the uncertainty in terms of matching what is lost and the risk of failure to secure and manage an appropriate offset (BBOP 2012a). ***Table 7.2*** outlines the likely uncertainties and risks associated with the offset analysis, approaches used to limit these risks and mechanisms used to manage the risk.

Table 7.2 Risks associated with the offset analysis

Risk	Management Approach	Mechanism
Biodiversity losses are not all accounted for in designing and implementing the offset	• No-net-loss rules and the offset metric have been designed to achieve like for like offsets. • Consideration has been made of the components of biodiversity impacted and offset (habitats). • Candidate offsets have been considered based on their contribution to conservation criteria and the biodiversity values they contain. • Monitoring and evaluation is included in the offset package to determine responses to management measures.	Offset rules Management framework to be prepared
Impacts to biodiversity components cannot be offset	• Assessment of impacts has not identified any critical habitat that will be impacted by the project. • Biodiversity baseline data has been collected to determine the conservation significance of the species and habitats present. • Careful selection of offset sites will be undertaken to match the impacts on a like-for-like basis.	Offset metric Management framework to be prepared
Dissimilar biodiversity between impact and offset sites	• The type and condition of habitats has formed the basis of the offset analysis to limit risks of offsetting dissimilar biodiversity values.	Offset metric
Uncertainty in offset performance	• There is inherent risk in the performance and responses to management of the ecosystems for candidate offset sites. • Gains in condition from management have been conservatively set based on long management time frames (up to 50 years). • Recommendations on ongoing monitoring and evaluation have been included to determine the effectiveness of management measures. • Continual improvement mechanisms are to be included in management planning to account for the uncertainty of offset condition improvement performance.	Management framework to be prepared
Uncertainty in the ecological system	• Recommendations on monitoring and evaluation have been included to determine the effectiveness of management measures. This is in response to uncertainty in the ecological system on the impact and offset sites. • Continual improvement mechanisms are to be included in management planning.	Management framework to be prepared Offset metric

Risk	Management Approach	Mechanism
Uncertainty in offset implementation success	• Gains in condition from management have been conservatively set based on long management time frames (up to 50 years). • Recommendations on monitoring and evaluation will be included to determine the effectiveness of management measures. • Continual improvement mechanisms are to be included in management planning.	Offset Metric Management framework to be prepared
Time delays in offset delivery	• It is recommended that active management of offset sites start as soon as possible following project commencement.	Management framework to be prepared

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Annex A

Results from Stakeholder Consultation

Annex A – Results from Stakeholder Consultation

World Wide Fund for Nature (WFF) Vietnam

Mr Huynh Tien Dung – Conservation Program Manager

Mr Dung made the following comments regarding the potential for an offset to be established for the LSP Project:

- Mr Huynh commented that Can Gio biosphere reserve is currently a well-protected in the forest. Potential for conservation within the protected areas of the Mekong delta should also be considered.
- WWF have worked on 3 projects in the Mekong Delta and it is considered a good place for the offset. WWF has worked with the government in Ben Tre and Ca Mau Provinces, including existing projects on mangrove conservation. The work has been undertaken in Tram Chim National Park (NP) and Mui Ca Mau NP.
- Projects undertaken by WWF to date include working on fisheries and aquaculture, including training and capacity building with the local government for adaptation.
- Mr Dung said that RAMSAR classification of a site is a good place to start. This international recognition and protected area status provides a sound legal basis for conservation
- The development of a sound management structure that involves the government is important. However, careful management of expectations around funding needs to be considered. Suggestions made about managing the funds privately.
- Mr Dung recommended developing the project based on conservation needs. The Province can set up a Provincial focal point. Consultation is required with the provincial government. A project management plan should be set up with the Province. A work plan should be prepared, possibly with a pilot site first. Involvement of the community in the conservation restoration in encouraged.
- Some conflict exists currently between NGOs and the Government. Government is reluctant to let NGOs solely manage funds for conservation projects. Government wants to manage the funds themselves.
- Monitoring and Evaluation system run by WWF in place. Milestones set at 3 months. Adaptive management system is also used.
- WWF has an office in HCMC and also in Can Tho city. Team coordinator used to coordinate projects.
- Protection forest limits the ability for local community involvement. Limits use of natural resource use by the community.
- Mr Dung noted that legal contracts can be set up between the donor and WWF. WWF signs a MoU with the government to set out clear objectives for the project. Work with the province to sign the MoU for the project, including requirements for the government to set the terms of the project.

- In terms of timeline, it is estimated that it will take 3 months to develop and submit the project; 3-5 months to negotiate with the government. This equates to between 10 to 12 months all up timeline to develop the strategy.
- WWF have technical specialists who can provide support. Can work with other offices. 6-7 years working on mangrove conservation.
- Consultation with MoNRE; Department of Fisheries and the Provincial government is the most important.

Wildlife Conservation Society Vietnam (WCS)

Mr Kevin Marks - Program Manager

The following points were raised by Mr Marks when discussing the potential for offset projects for the LSP Project:

- WCS currently don't undertake projects for offset projects in Vietnam. The focus of WCS now is working with the government on wildlife trade in Vietnam.
- Advice was given on the requirements for setting up a project based on Mr Marks experience with working with WWF in the Mekong Delta. He suggested that a special team be set up to organize, design and implement the project.
- Mr Marks has completed work in the Tram Chim NP and at Lang Sen NP in freshwater forest conservation. Can Gio mangrove conservation restoration projects.
- Defoliants in the American war in Can Gio may pose a challenge to establishing restoration projects there. Problems with site contamination have shown to be impacting on restoration projects.
- Historic mangrove replanting projects in Can Gio has resulted in a monoculture with little species diversity.
- Alternative sites to Can Gio should be considered in the Mekong Delta. These could include areas on the sea side of the Delta. Current threats that would need to be managed in this area include the illegal cutting of mangroves and coastal management.
- Forest enterprises also offer opportunities to promote conservation. However, these areas are of mixed use and are still subject to cultivation and forestry. This would create conflicts between the conservation initiatives and the existing uses.
- Mr Marks suggested that two Vietnamese scientists that he has previously worked with could provide technical governance for the project. They include Mr Nguyen Huu Thien and Le Phat Quoi who have worked on projects in the Mekong Delta on mangrove consultation.
- Mr Marks warned about some of the pitfalls of working with the government. He suggested that working with the government requires careful management of funds and expenditure. He suggested that the

company keep hold of the funds and provide management payments based on successful performance.

- Government stakeholders that would require consultation include the Management Board of Can Gao; Department of Agriculture and Rural Development and NP management boards. He also suggested that working with the Provincial peoples committee would be required.
- Mr Marks noted that no trust funds been set up for conservation in Vietnam. Financial arrangements would therefore need to be set up separately by the company to manage any funds set aside for offsets.
- Government Investment board approval is required for projects over $1M. Mr Marks suggested breaking the project up into varying phases to avoid needing to get central government approval.
- Mr Marks said from his experience the IUCN would be the best NGO to work with in setting up an offset project. He suggested getting in touch with Mr Jake Brunner at IUCN to discuss their work in the Mekong Delta and wetlands. Mr Marks said that there were some management issues with WWF that hinder their performance in managing projects. Mr Marks had worked with WWF previously and had left.

Forest Science Institute of South Vietnam (FSIS)

Mr Phung Van Khen - Head of FSIS

Mr Tran Thanh Cao - Vice Director FSIS

The following notes were taken in response to questions with Mr Khen and Mr Cao:

- FSIS has been involved in offset projects both under Vietnam regulations and for private restoration work. The projects that FSIS have been involved with have been for protection forests lost due to development. The projects were for compensation for forest resource loss of protection forests. Protection forests are replaced by planting new protection forest and that will be permanently protected. Under Vietnam regulations, the offset is strictly required to be implemented within the same province.
- According to Circular 24/2013/TT-BNNPTNT, there are two offset options allowed by Vietnamese regulations, including:
  - Option 1: Offset implementation by private developers based on the approved offset plans; and
  - Option 2: Payment to national/ provincial forest protection funds.

  FSIS has been contracted by private developers to assist them to comply with the Vietnam regulations for offsets. This has involved conducting of baseline survey, drafting of the offset plans for local authorities' appraisal (provincial Department of Agriculture and Rural Development -DARD) and approval (provincial PC) and implementation upon approval.
- However, FSIS noted that most of offset plans developed by them were for option 2 which are preferred to the option 1 by private developers due to much more simple procedure. When developing the offset plans under

Vietnam regulations, it may be taken up to 1 year for option 1 but only 2 -3 months for option 2 to get approval from local authorities. In the 1st option, finding the land for the offset is the most difficult part of the process. The process is run by the government and it must be decided by the Provincial authorities. Therefore, LSP should closely collaborate with a local authority.

- It should be expected the lands allocated for offset by local authorities are those in harsh condition for afforestation which may result in higher cost of implementation or are not suitable for planting the same species that are lost so may not provide sufficient outcomes that would satisfy international lenders (i.e. a loss of pine forest in Ninh Thuan Province was then compensated by coastal vegetation).
- Commonly, private developers contract with technical consultants like FSIS to develop and implement the approved offset plans. In some cases, the local forest management boards engage in this process instead. Supervision of the outcomes will be the responsibility of the Provincial People's Committee (PC). The government has no experience in implementation to date of the new offset regulations.
- The developer would be responsible for managing the offset however. Investor would manage the funds and project and then provide advice. It would take up to 5 years to develop and implement the plan according to FSIS (including 1 year for the plan development, 1 year for planting and 3 years for raising the trees).
- Evaluation would be undertaken by an independent consultant. Annual budget provided by the company. International project would require oversight by a consultant, not by DARD.
- Offset management plan is developed based on regulatory forestry guidelines and includes: baseline; species selection; planting schedule; methods of planting; timeframes for managing plantings after establishment; cost estimation. The unit price and number of workforces used for cost estimation are also legally prescribed by the government.
- Commonly, local people are used to implement offset or reforestation plans. Allowed to do fishing and management of the mangroves.

Offsets cannot be set in in special use forests which include National Parks and other protected areas; only within the protection forest areas. Mudflat management would be viable in the Soc Trang Province in Mekong Delta. Lot of land in the area that is suitable for mangroves and it is protection forest. There was a World Bank reforestation project conducted within this area 10 years ago.

- Experience of FSIS in special use forests (national parks/reserves) has only been in relation to research projects. If LSP wants to implement the offset (following IFC) within special use forests, it should be modified in the form of a privately funded research project of which reforestation/ rehabilitation is a part of it. Forest offset establishment would not be supported. If investor is a foreign organization, collaboration with a local organization is

required in order to get permission from the provincial PC for any forest research projects.

Can Gio Mangrove Protection Forest Management Board (MPFMB)

Mr Huynh Duc Hoan – Deputy Director

Mr Cao Huy Binh - Chief of Management Resources Development

- Discussed the options to undertake an offset within the Can Gio Biosphere Reserve. Discussed the option to do two offsets – one to satisfy the local regulations and another to satisfy the international requirements.
- LSP should check with BR-VT DARD if offset following national regulations are allowed to be implemented outside the province. According to their understanding, this practice is not allowed. However, in case there is no land left for offset In BR-VT province, LSP can send an official letter to request Ministry of Agriculture and Rural Development (MARD) to implement the offset in Can Gio. Based on the letter, MARD may consider requesting the People's Committee (PC) of Ho Chi Minh City (HCMC) to allocate land within Can Gio biosphere.
- In case regulatory offset is not allowed to be implemented outside BR-VT province. LSP should follow the 2nd option (payment to the forest fund) to satisfy national requirement and do an independent reforestation/ rehabilitation project in Can Gio biosphere.
- General permission from the People's Committee of Ho Chi Minh City (HCMC) would be required to do a project in the biosphere reserve. Therefore, LSP should send official request letter to HCMC PC and based on responding letter from HCMC PC to work out the detailed project with Can Gio MPFMB. Project could be for rehabilitation of mangrove from degraded forest in the biosphere reserve or improvement of the quality of existing poor quality forest using rehabilitation techniques.
- Biosphere reserve has been restored since 1978 following the Vietnam War. Volunteers have been involved. Student association (called Nam Du association) in Japan has undertaken rehabilitation for 40 hectares and they come every year on study tour to take care the area.
- One project for natural gas pipeline that acquired forest within HCMC has used the Can Gio biosphere for an offset site previously for around 8 hectares. This project involved the management board, who did all components of the project. Supervision process over 4 years. For project evaluation, the Board invited the project owners and local authorities (i.e. DARD, district PC, etc.) to do an inspection on a regular basis. Scientific technical advice follows the regulatory forestry guidelines of MARD.
- Can Gio MPFMB will sign a contract with the gas pipeline company to implement the offset. A one off payment was provided to them. Can allow per schedule payment. The contract cost was estimated based on Vietnamese regulations.

- JICA funded residential households to rehabilitate the forest in 1990s. Around 50 hectares was rehabilitated. The area was then bought by local authority. They could do a private offset and encourage private conservation initiatives. Contact the peoples committee first. Contact the management board.
- Many local and international NGOs have conducted projects in the biosphere. They do other types of projects (awareness raising, capacity building, etc). Forest restoration is mainly done by the government.
- Rehabilitation of abandoned salt farms within the biosphere could be an option. Restoration would be more difficult on these areas but easier for investors to gain support from local authorities.
- Projects are set over 4 years (1 year for planting and 3 years of maintenance) as required by regulations. Price of undertaking offset per hectare of doing standard mangrove rehabilitation is 100 – 170M VND/ha (planting in first year); ongoing maintenance cost in the 2nd year, the 3rd and 4th year is 20%, 10% and 10% of the initial investment, respectively. Abandoned salt farm rehabilitation costs around 200-270M VNDD/ha (for planting in the 1st year) plus the same ongoing maintenance costs.
- Difficulties faced and threats (long term and short term) included coastal erosion and failure of plantings. Agent Orange contamination is considered not a problem any longer by Can Gio MPFMB (However this wasn't justified by any scientific evidence). Only around 10 hectares of forest impacted by storms every year. Success depends on the experience and expertise of technical consultant in selecting the right land for the right species. Can Gio MPFMB is confident to provide such consultancy service within the biosphere as they know and understand the conditions of the biosphere very well.
- Projects are evaluated and monitored based on death rates of trees. Replanting is required if greater than 15% death rates.
- Mixed species of mangroves now used to achieve a greater biodiversity outcome.
- Government allocates 156,000VND/ha/yr for forest protection activities. Management board signs a contract with 15 local organizations (youth/military/farming) and many poor households allocate an area of forest to protect. The allocation is paid to these groups/ households to stop illegal activities.
- Every year they have a management plan prepared and submitted to the upper authorities (DARD) for approval. 100 people involved within the management board. 6 sub zones and managed by 6 divisions. Responsible to do supervision within the biosphere reserve.
- Check website for management structure for the biosphere reserve.

The Protection Forest Management Board – BR-VT DARD

Mr Pham Van Thu – Director of Protection Forest Management Board

Mr Van Hoat Phuc – Vice Head of Agriculture Management Division of DARD

- 125 ha of protection forest within the project boundary is required to be offset under the Vietnam regulations. Impacts are primarily with mangrove forest. Can be replaced with other types of forest, depending on the forest plan. Option of doing the payment into the forest fund is possible.
- LSP should send a letter to DARD to officially request DARD: (1) to clarify the exact area of protection forest that require offset to be done; and (2) to direct the Protection Forest Management Board to conduct a survey , select and inform LSP on potential locations for offset. Locations suitable for mangrove reforestation/ rehabilitation will be considered for LSP by DARD in order to support the project to be in line with IFC requirement.
- A survey of existing forest in the province is currently being conducted by the Protection Forest Management Board and expected to be completed by 20/10/14. From the survey, the PFMB indicated that it is likely that 125ha of suitable mangrove forest will be identified within the province (but not confirmed).
- It was commended that forest rehabilitation can be undertaken to achieve an offset but this must be within the province. IFC offset could be at the same site if appropriate area can be found. Note that this offset would need to meet the offset rules under IFC PS6. This may be difficult to achieve as the requirements are different.
- LSP can freely decide on the involvement of international scrutiny of the offset if both the Vietnamese and IFC offsets occurred on the same parcel of land. DARD would appraise and provincial PC will approve the offset plan according to regulations. This means that LSP can set the legal, governance and financial terms of the plan.

Annex B

Estimated Costs for Mangrove Rehabilitation

Annex B Estimated Costs for Mangrove Rehabilitation

B1 Analysis of Estimated Management Actions Costs for Offset Size/Condition Scenarios

	Area	Cost/Ha (1)*	Cost/Ha (2)*	Total Cost (1)	Total Cost (2)
Mangroves in Natural Condition**	11.65	$2,556	$5,381	$22,314	$46,978
Mangroves in Modified Condition***	8.75	$7,668	$16,143	$33,510	$70,547
Mangroves in Degraded Condition	6.35	$12,780	$26,906	$37,318	$78,565

* *Based on a requirement to manage the offset site for 50 years*

** *Assumes management costs for restoring natural condition mangroves are 20% of the costs to manage degraded condition mangroves per annum. This estimate is based on the assumption that the level of management will be proportionately less that managing degraded habitat.*

*** *Assumes management costs for restoring modified condition mangroves are 60% of the costs to manage degraded condition mangroves per annum. This estimate is based on the assumption that the level of management will be proportionately less that managing degraded habitat.*

(1) *Based on costs provided by the IUCN in November 2014*

(2) *Based on costs provided by the CGMPFMB in October 2014*

B2 Can Gio Biosphere Reserve Estimated Costs for Offsets (Degraded Forest)

	Base Cost/ha++	Year1	Year2	Year3	Years 4 to 50	Total VND/ha	Total USD/ha+	Total for offset area
Mangrove*	VND100,000,000	VND100,000,000	VND20,000,000	VND10,000,000	VND470,000,000	VND600,000,000	$26,906	$234,888
Total VND		VND100,000,000	VND20,000,000	VND10,000,000	VND470,000,000	VND600,000,000		
Total USD/yr/ha+		$4,484	$897	$448	$21,076	$26,906	$26,906	
Total Offset Area		$39,148	$7,830	$3,915	$183,996			$234,888

* *Based on a requirement to manage a degraded offset site of 11.65 hectares of mangroves for 50 years*

\+ *USD conversion used is 22,300VND = $1USD (July 2016)*

++ *Based on costs provided by the CGMPFMB in October 2014*

	$234,888
Average Total Cost Per Annum	$4,698

B3 Mekong Delta Estimated Costs for Offsets (Degraded Forest)

	Base Cost/ha++	Year1	Year2	Year3	Years 4 to 50	Total VND/ha	Total USD/ha+	Total for offset area
Mangrove*	VND40,000,000	VND40,000,000	VND5,000,000	VND5,000,000	VND235,000,000	VND 285,000,000	$12,780	$111,572
Total VND		VND 40,000,000	VND 5,000,000	VND5,000,000	VND 235,000,000	VND 285,000,000		
Total USD/yr/ha+		$1,794	$224	$224	$10,538	$12,780	$12,780	
Total Offset Area		$15,659	$1,957	$1,957	$91,998			$111,572
* *Based on a requirement to manage a degraded offset site of 11.65 hectares of mangroves for 50 years* ** *USD conversion used is 22,300VND = $1USD (July 2016)* ++ *Based on costs provided by the IUCN in November 2014*							**Total Cost for 50 years** **Average Total Cost Per Annum**	$110,713 $2,214

B4 Management of Mangrove Patches on site

	Base Cost/ha++	Year1	Year2	Year3	Years 4 to 50	Total VND/ha	Total USD/ha+	Total for offset area
Mangrove*	VND40,000,000	VND40,000,000	VND5,000,000	VND5,000,000	VND235,000,000	VND 285,000,000	$12,780	$111,572
Total VND		VND 40,000,000	VND 5,000,000	VND5,000,000	VND 235,000,000	VND 285,000,000		
Total USD/yr/ha+		$1,794	$224	$224	$10,538	$12,780	$12,780	
Total Offset Area		$15,659	$1,957	$1,957	$91,998			$111,572
* *Based on a requirement to manage a degraded offset site of 11.65 hectares of mangroves for 50 years* + *USD conversion used is 22,300VND = $1USD (July 2016)* ++ *Based on costs provided by the CGMPFMB in October 2014*							**Total Cost for 50 years** **Average Total Cost Per Annum**	$111,572 $ 2,231

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