



**Verified Carbon
Standard**

NON-PERMANENCE RISK REPORT



Document Prepared by Forest Carbon

Project Title	<i>Sumatra Merang Peatland Project</i>
Version	<i>1.1</i>
Date of Issue	<i>05-June-2021</i>
Project ID	<i>1899</i>
Monitoring Period	<i>01-January-2020 to 31-December-2020</i>
Prepared By	<i>Forest Carbon Pte Ltd</i>
Contact	<i>Management Team Headquarter: Wisma GKBI, Floor 37, Room 08A, Jl. Jendral Sudirman, Nr. 28, DKI Jakarta, Indonesia (10210) +62 21 5740817 j.chatellier@forestcarbon.com</i>

CONTENTS

1	INTERNAL RISK	3
2	EXTERNAL RISKS.....	6
3	NATURAL RISKS	8
4	OVERALL NON-PERMANENCE RISK RATING AND BUFFER DETERMINATION..	11
4.1	Overall Risk Rating	11
4.2	Calculation of Total VCUs	12

1 INTERNAL RISK

Project Management		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	Score is zero. The project will only plant native trees that are adapted to peatland ecosystems.	0
b)	Score is zero. The project works to reduce the threat of possible encroachment by local people. Further, the majority of the project's carbon stocks are in the peat soils. Therefore, encroachment on 50% of the project's carbon stocks would require massive industrial conversion of over 11,000 hectares of the project area that would create an extensive network of canals with heavy machinery. Only an industrial commercial entity would be able to achieve this. However commercial entities would have no legal right to do so and would be stopped by government authorities. Since the project has started there has been no encroachment in the project area.	0
c)	Score is zero. The project's management team includes staff with significant experience in all areas necessary to manage project activities. Resumes of staff are provided to validators upon request.	0
d)	Score is zero. The management team is headquartered in Wisma GKBI, Floor 37, Room 08A, Jl. Jendral Sudirman, Nr. 28, DKI Jakarta, Indonesia (10210); with all offices within one day travel from the project area.	0
e)	The project employs staff that have successfully developed and managed AFOLU projects, and are fully versed in the carbon accounting, methodologies and requirements of the VCS. Forest Carbon has acted as technical consultants on the Rimba Raya project and Kao Seima project, two projects that have been validated under the VCS.	-2
f)	The project has adopted an adaptive management approach to implement the project. The project has adopted an adaptive management plan that relies on a principle in making decisions and adjustments in response to new information and outputs of the monitoring system as the result of past management actions to improve future planning and management. The project so far has implemented this system in a variety of ways: - Short term: Weekly reports from project staffs are monitored closely - Medium term: Quarterly meetings and Board meetings to evaluate progress and propose new policies changes when needed	-2

	- Ad hoc basis: evaluate work done by third party vendor. During this monitoring period, the project planned for canal blocking construction and asked for a consultant to review and provide suggestion on improvement. The canal blocks were constructed according to the inputs and quality assessment from the field.	
Total Project Management (PM) [as applicable, (a + b + c + d + e + f)]		-4
Total may be less than zero.		

Financial Viability		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	N/A	0
b)	N/A	0
c)	N/A	0
d)	Score is zero as the project cash flow breakeven point is less than 4 years from the current risk assessment. Documentation demonstrating this is available to the auditor.	0
e)	N/A	0
f)	N/A	0
g)	N/A	0
h)	SMPP has secured more than 80% of funding needed to cover the total cash out before the project reaches breakeven. Documentation demonstrating this are available to the auditor.	0
i)	As stated above, the project's financial resources are available and have been secured and set aside. Documentation demonstrating this is available to the auditor.	-2
Total Financial Viability (FV) [as applicable, ((a, b, c or d) + (e, f, g or h) + i)]		0
Total may not be less than zero.		

Opportunity Cost

Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	N/A	0
b)	N/A	0
c)	N/A	0
d)	The project conducted an NPV analysis for its operations covering the 47-year crediting period and compared this to an NPV analysis of the establishment of an Industrial paper pulp plantation. The project was deemed to have a higher NPV.	0
e)	N/A	0
f)	N/A	0
g)	N/A	0
h)	N/A	0
i)	N/A	0
Total Opportunity Cost (OC) [as applicable, (a, b, c, d, e or f) + (g + h or i)] Total may be less than 0.		0

Project Longevity		
a)	The project holds a concession license for the entire project area. This is valid for 25 years and is renewable. Project longevity is determined as 47 years since concession issuance was in 2013 and the project start date is 2016 with a 25 additional period granted after renewal $(24 - (47/5) = 14.6)$.	15
b)	N/A	0
Total Project Longevity (PL) May not be less than zero		15

Internal Risk	
Total Internal Risk (PM + FV + OC + PL)	11

Total may not be less than zero.

2 EXTERNAL RISKS

Land Tenure and Resource Access/Impacts		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	N/A	0
b)	The land ownership and resource access/use rights are held by different entities as the land is owned by the government with the project having right of use.	2
c)	No disputes exist over the project area. There are two farmers that cover 12 ha of land inside the project's license area. This area has been excluded from the official project area. The project has engaged with these farmers and the farmers have signed an agreement letter that acknowledges their farms, and they agree not to expand their farms.	0
d)	No disputes exist over access or use rights.	0
e)	The project site is roughly 30km away from the sea and hence there are no expected impacts by the sea level. In terms of upstream impacts, the project's protected peat dome has its highest elevation inside the project area and hence there are no expected upstream impacts.	0
f)	N/A	0
g)	N/A	0
Total Land Tenure (LT) [as applicable, ((a or b) + c + d + e + f + g)]		2
Total may not be less than zero.		

Community Engagement		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating

a)	N/A	0
b)	There are 18 households who derive at least a portion of their livelihoods from the project area and live within 20km from the project boundary. More than 20% of this group have been consulted through one on one meetings and group discussions.	0
c)	Mitigation: The project generates net positive impacts on the social and economic wellbeing of the local communities who derive livelihoods from the project area.	-5
Total Community Engagement (CE) [where applicable, (a + b + c)]		-5
Total may be less than zero.		

Political Risk		
Risk Factor	Risk Factor and/or Mitigation Description	Risk Rating
a)	N/A	0
b)	N/A	0
c)	Indonesia's average governance score over the most recent five years (2015 to 2019) is equal to -0.19. See attached spreadsheet showing applicable scores (World Bank Governance Indicators Indonesia 2015 - 2019.xlsx)	2
d)	N/A	0
e)	N/A	0
f)	Indonesia is implementing REDD+ Readiness activities.	-2
Total Political (PC) [as applicable ((a, b, c, d or e) + f)]		0
Total may not be less than zero.		

External Risk	
Total External Risk (LT + CE + PC)	0
Total may not be less than zero.	

3 NATURAL RISKS

Natural Risk (Fire)	
Significance	It is not common to have natural fires in peatland forest areas where water table levels remain high. ¹⁻³ However anthropogenic fires are common in degraded peatland areas, especially in El Niño years ⁴ , decreasing the depth of the peat layer, and thus affecting the belowground carbon stock, as well as any aboveground carbon stock in vegetation present in the burnt areas. Fires have occurred more frequently than every 10 years in the project area. It should be noted that these fires occurred in years before active hydrology management and forest patrols were implemented to raise the water table and reduce fire risk.
Likelihood	Natural fires do not occur on undisturbed peatlands due to naturally high-water table levels. Natural fires only occur through lightning strike and in the tropics, lightning is consistently accompanied by heavy rain. Therefore, the likelihood of a natural fire starting in the project area is minimal. As mentioned earlier, anthropogenic causes of fire such as discarded cigarettes, flying embers from cooking fires, or fires used for cleaning agricultural fields are real sources of fire risk in the project zone. These anthropogenic risks for fire are assessed under “external risks”. This project is also implementing significant fire mitigation activities such as hydrology management, forest patrols, and early warning fire detection systems.
Score (LS)	2
Mitigation	0.5

Natural Risk (Pest and Disease Outbreak)	
Significance	A pest or disease outbreak would only impact above ground carbon stock and not the peat layer. Since the project’s carbon stocks are primarily stored in the peat soils, which is the major carbon pool, this risk would not have a significant impact on the project’s overall carbon stocks. However, a pest or disease outbreak could have a significant impact on above ground carbon stocks if it were to occur.
Likelihood	The likelihood of non-permanence from pests and diseases is low, as there has never been any report of a disease or pest outbreak event in

	any peatland forest area in Indonesia. ¹ No evidence of pests and disease threatening below-ground peat ecosystems has been found. For the emissions reductions that will be generated from sequestration into above-ground biomass through reforestation, the likelihood of an outbreak is also low due to high reforestation-tree species diversity. Large parts of the project area will be reforested with seeds and seedlings of native tree species taken from the only remaining patch of dense forest (232 ha) in the project area. After several pioneer species have established themselves, other canopy and emergent tree species will further increase tree diversity in the reforested areas. Using a diverse array of reforestation species has been shown to reduce the risk of non-permanence from pests (e.g., herbivorous small mammals and insects) and fungal diseases. ²
Score (LS)	0
Mitigation	0.5

Natural Risk (Extreme Weather)	
Significance	The water table in a peat swamp oscillates between naturally flooded in the rainy season and slightly below the soil surface in the dry season.⁶ In disturbed peatland areas, the water table level can drop significantly⁷ which can greatly increase the risk of fire of anthropogenic fires. The drops in the water table during long droughts does not lead to tree mortality but ferns and non-tree vegetation can die. However, ferns and non-tree vegetation comprises a small carbon pool and is therefore not significant. Flooding is not considered a significant risk since peatland vegetation are naturally adapted to waterlogged conditions. Further, high rain conditions will reduce fire risks and peat oxidization which will improve the carbon storage of the project. Floods could impact non-tree vegetation, but this is a minimal carbon pool and is considered not significant.
Likelihood	Droughts and floods may occur less than every ten years.

¹ Wiryono, 'Aspek Ekologis Hutan Tanaman Indonesia' in N Mindawait and others (eds), *Prosiding Seminar Hasil Penelitian Bali Penelitian Kehutanan Palembang* (2013).

² M Pautasso, O Holdenrieder and J Stenlid, 'Susceptibility to Fungal Pathogens of Forests Differing in Tree Diversity', *Forest diversity and function* (Springer 2005); Hervé Jactel and others, 'Tree Diversity Drives Forest Stand Resistance to Natural Disturbances' (2017) 3 Current Forestry Reports 223; Hervé Jactel and Eckehard G Brockerhoff, 'Tree Diversity Reduces Herbivory by Forest Insects' (2007) 10 Ecology Letters 835.

Score (LS)	0
Mitigation	1

Natural Risk (Geological Events)	
Significance	There is not a significant risk from geological events on the project area's carbon stocks.
Likelihood	The island of Sumatra is known to experience numerous geologic, volcanic, and tsunami events; however, these are strongly associated with the western coast of the island where the Great Sumatran Fault and the Sumatra Subduction Interface are located. ³ The eastern side of the island, where project is located, is drastically less geologically active. ⁴ Nevertheless, within the past 100 years 24 earthquakes with a magnitude of 4.5 or higher have been recorded within 200km of the project area. ⁵ Due to the absence of a fault and subduction zone on the eastern side of the island, tsunamis are also low risk, especially when compared with risk on the western side of the island. ⁶ The closest recently active volcano to the project area is Kaba volcano (last erupted in 1833), at a distance of over 200 km. ⁷ To be conservative, the likelihood of an event occurring "less than every 10 years" was selected for this risk due to seismic activity being present in the same province as the project.
Score (LS)	2
Mitigation	1

³ Mark D Petersen and others, 'Probabilistic Seismic Hazard Analysis for Sumatra, Indonesia and across the Southern Malaysian Peninsula' (2004) 390 Tectonophysics 141.

⁴ Petersen and others (n 1).

⁵ Petersen and others (n 1); Wikipedia, 'Map of Earthquakes in Indonesia 1900-2019' (2019) <https://en.wikipedia.org/wiki/List_of_earthquakes_in_Indonesia#/media/File:Map_of_earthquakes_in_Indonesia_1900-2019.svg> accessed 1 October 2019.

⁶ https://en.wikipedia.org/wiki/Geology_of_Indonesia

⁷ NOAA, 'NOAA Significant Volcanic Eruptions Database (Sumatra: 1750-2019)' (2019) <https://www.ngdc.noaa.gov/nndc/struts/results?ge_23=1750&le_23=2019&type_15=Like&query_15=&op_30=eq&v_30=&type_16=Like&query_16=Sumatra&op_29=eq&v_29=Indonesia&type_31=EXACT&query_31=06&le_17=&ge_18=&le_18=&ge_17=&op_20=eq&v_20=&ge_7=&le_7=&bt_24=&st_24=&ge_25=&le_25=&bt_26=&st_26=&ge_27=&le_27=&type_13=Like&query_13=&type_12=Exact&query_12=&type_11=Exact&query_11=&display_look=50&t=102557&s=50> accessed 1 October 2019.

Natural Risk (Other risk)	
Significance	There are no other natural risks
Likelihood	There are no historic records of other risks in the project area except those already stated above.
Score (LS)	0
Mitigation	1

Score for each natural risk applicable to the project (Determined by (LS × M))	
Fire (F)	1
Pest and Disease Outbreaks (PD)	0
Extreme Weather (W)	0
Geological Risk (G)	2
Other natural risk (ON)	0
Total Natural Risk (as applicable, F + PD + W + G + ON)	3

4 OVERALL NON-PERMANENCE RISK RATING AND BUFFER DETERMINATION

4.1 Overall Risk Rating

Risk Category	Rating
Internal Risk	11
External Risk	0.0
Natural Risk	3.0
Overall Risk Rating (a + b + c)	14

4.2 Calculation of Total VCUs

The combined non-permanence risk buffer for the project was determined as 14%. Per VCS methodology VM0007, the annual buffer withholding for all activities was determined as a percentage of the total carbon stock benefits which excludes emissions due to leakage (see table below). As the project does not account for emissions from fossil fuel combustion, direct N₂O emissions and emissions from biomass burning were also omitted from calculations.

Year	WRC NET GHG emission reductions (t CO ₂ -e)	ARR NET GHG emission reductions (t CO ₂ -e)	Non-Permanence risk buffer (14%)
2020	1,051,401	(25,430)	143,635