

JI Monitoring Report
Version No. 01 07th January 2013

Bikin Tiger Carbon Project
Permanent protection of otherwise logged Bikin Forest, in Primorye Russia

Figure 1: River bank on Bikin River



Photo by S. Melnikov

Prepared for
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Monitoring Period: 3rd June 2009 to 31st October 2012

UNFCCC JI Reference Number: 0311

Table 1: Contact Information		
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SECTION A. Description of the Project Activity

A.1. Purpose and General Description of the Project Activity

Project Title. The JI project has the title “Bikin Tiger Carbon Project - Permanent protection of otherwise logged Bikin Forest, in Primorye Russia”, hereafter referred to as the ‘project’.

Purpose of the Project Activity. The Tribal Commune Tiger (TCT), an economic interest group formed by the local tribe of the Russian ethnic group of Udege people, has leased the Bikin Nut Harvesting Zone (NHZ) and riparian zone of Bikin river (subsequently referred to as “concession area” whereas the project area is a part of the concession area) concession from the Forest Department of Primorsky krai¹. This allows TCT to protect its area of living from any logging activities and thereby ensures the integrity of forest- and carbon stocks in the project area.

The project setup foresees:

- The protection of the project area from any logging operations as well as the conservation of the existing forest carbon stocks.
- The assessment of the development of forest carbon stocks under a) the baseline scenario (i.e. logging) and b) the protection of the project area from logging.
- The calculation of the difference of carbon stocks of baseline and project scenarios.
- The generation of Emission Reduction Units (ERUs) considering above difference of carbon stocks, project emissions and leakage.
- The ERUs shall be sold in the international emission trading market allowing the TCT in the midterm to pay the annual concession fees to the Forest Department of Primorsky krai and to pay for all necessary conservation measures related to the management plan of the concession.

Description of Installed Technology. By declaring the forest as conservation forest, the extraction of timber with accompanying trees and soil damages and the release of carbon emission will be avoided for the time of the project period. There is no further specific technology applied.

Relevant Dates for the Project Activity. Three dates are considered as relevant for the project activity and its implementation: First, the actual lease of the forest concession by TCT, second the implementation of the anti-poaching brigade and third and finally the establishment of a forest fire monitoring- and fighting approach. The three dates are discussed below in detail:

- The Tribal Commune Tiger leases the project area and thereby protects the land from logging. At the 3rd June 2009, the Tribal Commune Tiger signed a contract for leasing the Bikin concession from the Primorsky Forest Department with the objective to protect the area against logging (Contract of Forest Lease No. 4/34). The concession contract explicitly grants the Tribal Commune Tiger the right to develop an emission reduction project. The concession lease period is 49 years. This shall protect the project area from logging until 2058 and shall conserve the forest stands and avoid the decrease of respective wood volumes - and related - the decrease of forest carbon stocks.
- TCT engaged anti-poaching brigade. This brigade has the purpose to protect the project area against illegal logging and against poaching. Anti poaching activities started to work at the 3rd of March 2009 (main function was anti-poaching). It assumed the activity to control also against illegal logging at the 5th of May 2009.
- On behalf of TCT, WWF Amur Branch engaged the Forest Fire Fighting Service (FFFS) of the Forest Department of the Primorsky krai.
 - The initial contract between WWF Amur Branch and FFFS was undersigned at the 7th May 2009 (date of signature) covering the period of 7th May 2009 until the 15th December 2009.
 - This was renewed twice, at the 14th December 2009 (date of signature) covering the period of 15th December 2009 to 15th December 2010.

¹ Also referred to as Primorye.

- Second renewal was undersigned at the 13th December 2010 and covers the period of 13th December to 15th December 2012.

Total Emission Reductions of the Monitoring Period. The table below presents the emission reductions achieved during the monitoring period, based on the parameters monitored, as described in Section D.

Table 2: Net Anthropogenic Removals by Sinks over the Monitoring Period	
Year	Determination of Annual Enhancements of Net Anthropogenic Removals by Sinks (in t CO ₂ e)
2009	44,587
2010	140,224
2011	186,921
2012	155,641
Total Estimated Enhancements of Net Anthropogenic Removals by Sinks over the Monitoring Period (in tCO ₂ e)	
	527,373

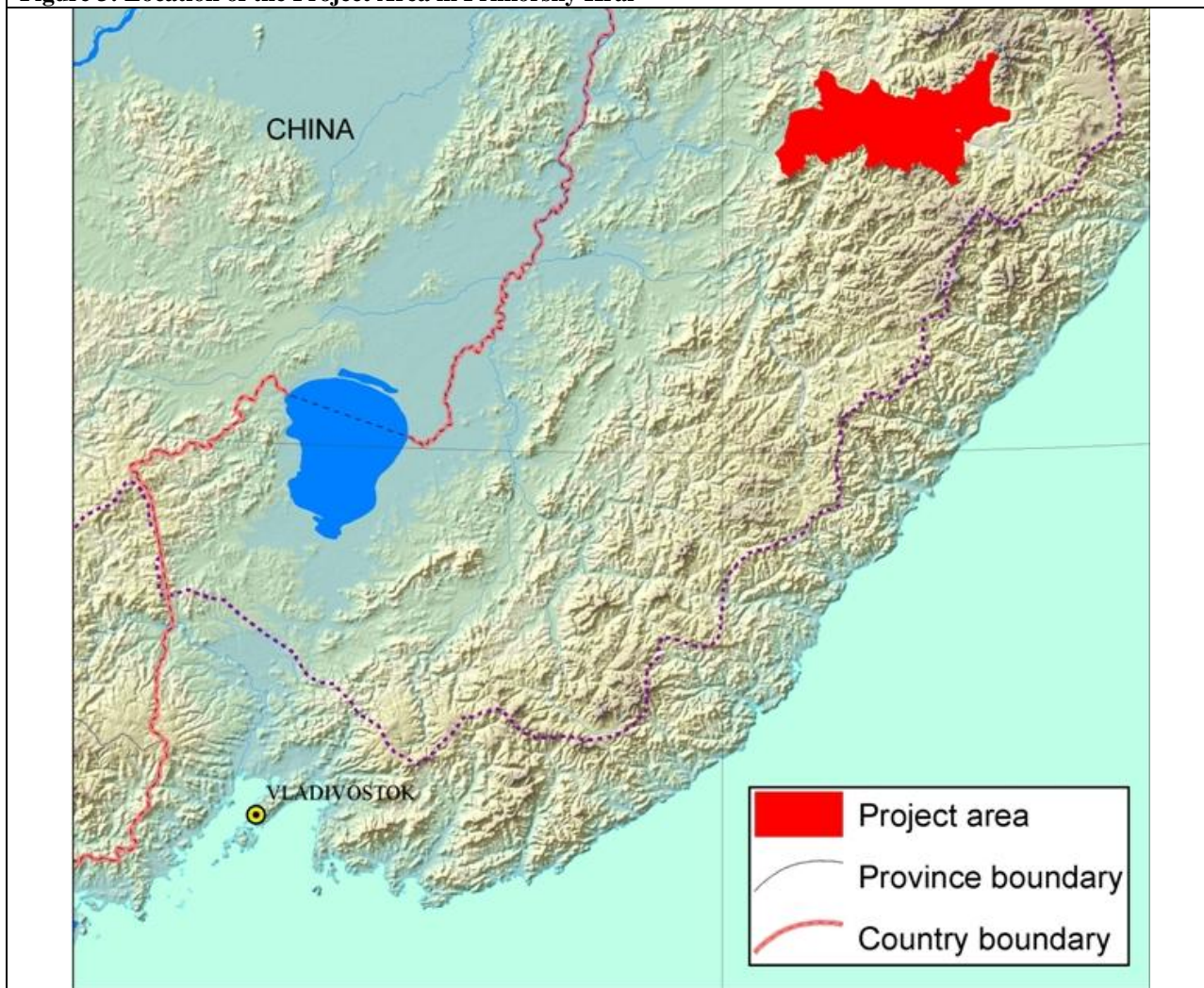
A.2. Location of the Project Activity

The project is located in Primorsky Krai. Primorsky Krai is located in the Southern Far East of Russia bordering China and North Korea. The exact location of Primorsky Krai is shown in below figure (area marked red).



The project is located north to the settlement of Vostok and east to the village of Krasny Yar.

Figure 3: Location of the Project Area in Primorsky Krai



A.3. Parties and Project Participants

The project is implemented by the following parties and participants:

Table 3: Details on the Project Participants and Host Countries		
Name of Party involved (*)	Legal entity / project participant (as applicable)	Party* involved wishes to be considered as project participant(Yes/No)
Russian Federation*	Tribal Commune Tiger	No
France	CF Partners (UK) LLP	No

* (host) indicates a host Party

A.4. Title, Reference and Version of the Baseline and Monitoring Methodology Applied to the Project Activity

A.4.1. Baseline methodology:

The registered project qualifies as ‘Large Scale’ under sectoral scope 14: ‘Land-use, land-use change and forestry’ in accordance with 13th JISC Meeting, Annex 2, §1.

The baseline for the proposed JI project activity was defined in accordance with the JISC Guidance on criteria for baseline setting and monitoring (Version 02). It classifies as a ‘JI specific approach’.

Reference is made to the baseline & monitoring methodology “Estimating GHG Emission Reductions from Planned Degradation (Improved Forest Management)²” developed under the Verified Carbon Standard (VCS). The methodology is available under the below link:

- www.v-c-s.org/methodologies/VM0011

Prior to being registered by the VCS, any VCS methodology must undergo a two phased validation process. The first and second VCS methodology assessment report may under the following link:

- www.v-c-s.org/sites/v-c-s.org/files/VM0011%20Second%20Assessment%20Report.pdf
- www.v-c-s.org/sites/v-c-s.org/files/VM0011%20First%20Assessment%20Report.pdf

Please note, the VCS methodology allows for considering ‘positive leakage’. These emissions are directly attributable to the project activity, occur outside of the project boundary and increase the volume of emission reductions. JISC’s Guidance of Criteria for Baseline Setting and Monitoring (JISC18, Version 02) explicitly constrain leakage for Land Use, Land Use Change and Forestry (LULUCF) to ‘negative leakage’³. The proposed project determines the volume of these types of emissions but does not include these in the calculation of emission reductions. This was done to ensure consistency with JI rules and procedures and is considered to be conservative.

Complementing above methodology, the following tools and guidelines were applied:

- Tool for testing significance of GHG emissions in A/R CDM project activities, Version 1, CDMEB 31,
- Tool for the demonstration and assessment of additionality in A/R CDM project activities, Version 2, CDM EB35, Annex 17.
- Tool for testing the significance of GHG emissions in A/R CDM project activities, Version 1, CDM EB 31,
- VCS Agriculture, Forestry and Other Land Use (AFOLU) Requirements⁴, Version 3.2,
- Guidance of Criteria for Baseline Setting and Monitoring, JISC18, Version 02;

A.4.2. Monitoring methodology:

The monitoring plan of the JI project is based on the monitoring methodology stipulated in the VCS methodology chosen (VM011). As such, this approach is considered as JI specific approach. The monitoring methodology is in accordance with paragraph 9 (a) of the ‘Guidance on criteria for baseline setting and monitoring and its description follows §30 of the ‘Guidance on criteria for baseline setting and monitoring’.

A.5. Technical Description of the Project

² Downloaded at 27th October 2011 from www.v-c-s.org/methodologies/VM0011

³ JISC18, §17 stipulates: “Leakage is the net change of anthropogenic emissions by sources and/or removals by sinks of GHGs which occurs outside the project boundary, and that can be measured and is directly attributable to the JI project. In the case of JI LULUCF projects, only the increased anthropogenic emissions by sources and/or reduced.”

⁴ Downloaded at the 13th February 2012 from www.v-c-s.org/program-documents/afolu-requirements-v30#overlay-context=program-documents

By declaring the forest as conservation forest, the extraction of timber with accompanying trees and soil damages and the release of carbon emission will be avoided for the time of the project period. There is no further specific technology applied. Not Applicable.

A.6. Crediting Period of the Project Activity and related Information

The below section briefly describes the start date, operational lifetime and crediting period of the JI project proposed for verification.

Start Date. The starting date of the project is 03/06/2009.

Operational Lifetime. The expected operational lifetime of the project is 49 years and 0 months which is the timeframe of the concession lease.

Crediting Period. According to the Russian JI Procedures, the crediting period comprises only the first commitment period of the Kyoto Protocol. This is 3 years and 7 months.

A.7. Name of Responsible Persons and Entities

The monitoring report was completed at the 07/12/2012.

Mr. Martin Burian, GFA ENVEST, martin.burian@gfa-envest.com

Mr. Evgeny Chuvasov, WWF Russia, Amur Branch, chuu69@gmail.com

Project participants are Tribal Commune Tiger and CF Partners (UK) LLP. GFA ENVEST and WWF Russia, Amur Branch are not project participants.

SECTION B. Implementation of the Project Activity

B.1. Description of the Implemented Registered Project Activity

Starting Date. The JI project started at the 3rd June 2009 by signing the lease contract between TCT and the Forest Department of Primorski krai (Contract of Forest Lease No. 4/34) with the objective to protect the area against logging. This agreement gives TCT the right to develop an emission reduction project. The concession lease period is 49 years. This shall protect the project area from logging until 2058 and shall conserve the forest stands and avoid the decrease of respective wood volumes - and related - the decrease of forest carbon stocks.

Complementing the signature of the lease contract, TCT established an anti poaching brigade to patrol the borders of and the project area itself. This shall protect the project area against any illegal logging and poaching as well as other forms of illegal nature use. The anti poaching brigade was established in March 2009 and its mandate was expanded to protect against illegal logging in May 2009.

In order to support TCT in the conservation of the project area, WWF Amur Branch engaged the Forest Fire Fighting Service of the Forest Department of Primorsky krai. The agreement between FFFS and WWF Amur Branch was undersigned at the 7th May 2009.

Phased implementation is not applicable to the project activity.

Operation of the JI Project. The project was implemented in accordance with the JI PDD. Minor forest fires occurred in 2012 (no forest fires occurred in 2009-2011). The total burnt area amounts to 6.5ha and the burnt volume amounts to 99m³.

Illegal logging occurred at minor scale: 220.24m³ (2009), 96.34 m³ (2010) and 106.83 m³ (2012). No illegal logging occurred in 2011. Overall it is concluded that the project was successfully protected and conserved.

The overall design of the conservation program foresees that TCT conducts logging operations to meet the demand of the local population. In the course of PDD development, the envisaged logging sites were removed from the JI project area on the basis of the NTFP Management Plan. This plan stipulates which compartments and sub-compartments are foreseen for logging.

In the course of actual logging operations of TCT in 2009, 2010 and 2011 logging sites that were foreseen by the Forest Management Plan were not logged. Instead other sites were logged, which were not initially foreseen for logging and which were partially in the project area.

The JI project design does not foresee the legal logging in the JI project area. In order to ensure consistency with the JI project design and the actual project implementation, these logged areas were excluded. A detailed description of the respective changes was included in Annex 1.

B.2. Post Registration Changes

As outlined above, the legal logging plots amounting to 498.6ha were removed from the project area (approx 0.1% of the total JI project are). Consequently, the baseline AAC was adopted in a conservative manner which leads to a very minor reduction of the baseline emissions. This is outlined in detail in Annex.

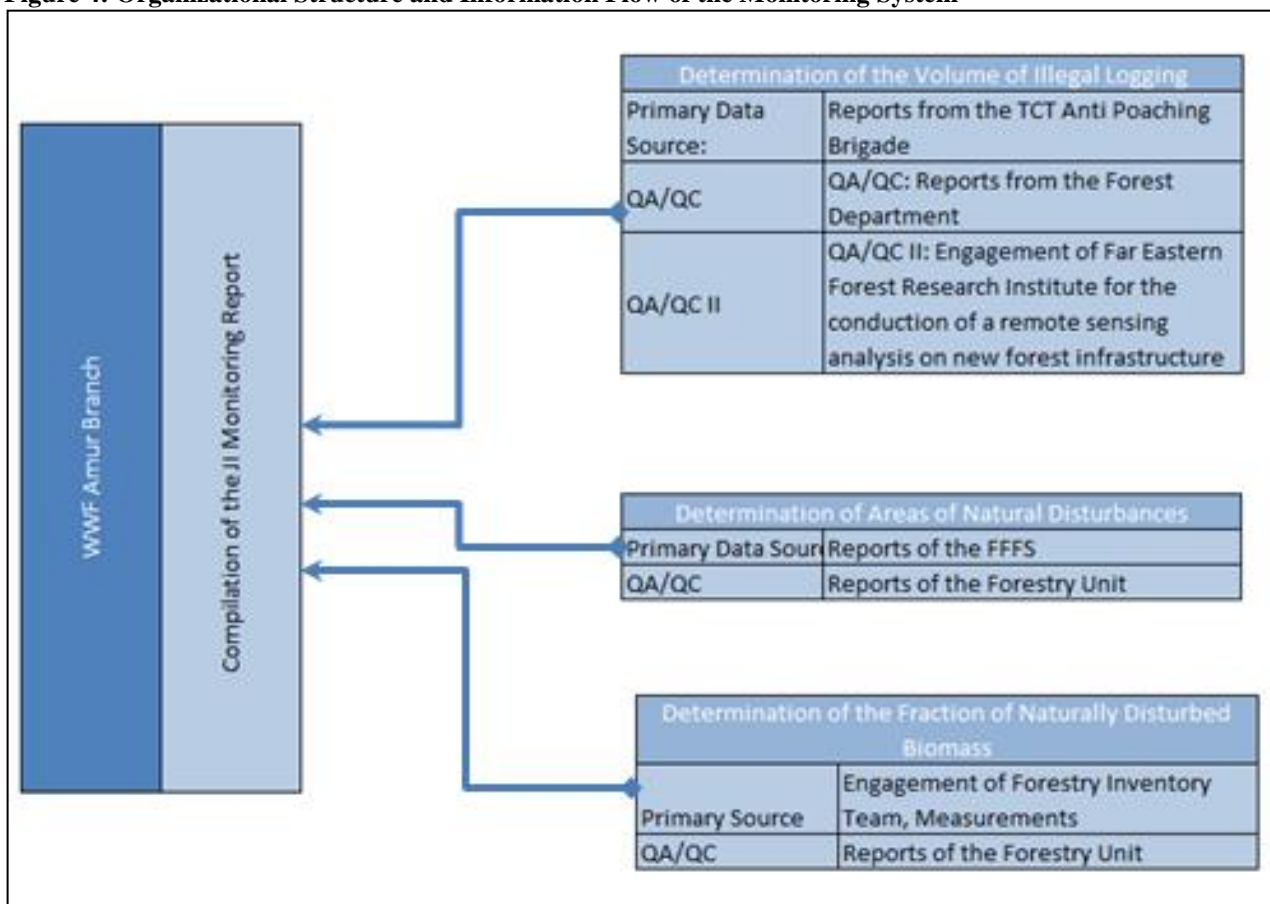
The project participant considers above change as a change in the spatial extent. As the project is still located in the same region, this does not qualify as a change in project location. Moreover this approach does not change the emission sources, baseline scenario nor the JI specific approach (specified in the PDD) as required by §7 of the JI Guidelines.

A detailed description of post registration changes is provided in Annex 1.

SECTION C. Description of the Monitoring System

The monitoring system is implemented by WWF Amur Branch on behalf of the TCT. In this regard, WWF Amur Branch is in charge for the generation of monitoring report as well as the focal point of the aggregation of the monitoring data. The organizational structure and the information flow is presented in below illustration.

Figure 4: Organizational Structure and Information Flow of the Monitoring System



The below section outlines the monitoring system following the structure of the monitoring parameters as defined in the JI PDD:

Determination of the Volume of Illegal Logging. TCT engages an anti poaching brigade which patrols the project boundary and within the project area. If the anti-poaching brigade detects any illegal logging, a report is written and provided to WWF. These reports were aggregated to one general report on illegal logging, used for this monitoring report.

QA/QC: WWF Amur Branch requested official data on illegal logging from the Lesnichestvo and/or Police.

QAQC II: As a second QA/QC procedure, WWF Amur Branch has hired the Far Eastern Forest Research Institute (called ‘Dallesproject’) to conduct a remote sensing analysis for the project area. This evaluation determined whether any new forest infrastructure was developed during the monitoring period.

Determination of Areas of Natural Disturbances. WWF Amur Branch engaged the Forest Fire Fighting Service of the Primorsky krai (FFFS) to implement the forest fire monitoring system and

to conduct fire fighting in case of incidents. In the course of this arrangement, FFFS reports any detected forest fires to WWF Amur Branch.

QA/QC: WWF requests official data on forest fires from the Lesnichestvo for the project area. This data allows for crosschecking the data provided by FFFS.

Determination of the Fraction of Naturally Disturbed Biomass. If FFFS and/or the Lesnichestvo report any forest fires, WWF Amur Branch would engage a forest inventory team to determine the decrease of biomass.

Alternatively, the project participant may opt to set the fraction of naturally disturbed biomass at 100%, e.g. if the burnt forest sites are located in remote and inaccessible areas.

SECTION D. Data and Parameters

D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

Data / Parameter:	$BCEF_j$
Data unit:	t.d.m
Description:	Area of natural disturbance ND, in stratum j in year t
Source of data used:	Calculated based on Tier 2 data, Value was determined in the excel mode, sheet 'ER Model', cell E189 of the JI Project Documentation
Value(s) :	Value Applied: 0.62
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project case
Additional comment:	

Data / Parameter:	CF_{AGB}
Data unit:	tC
Description:	Carbon fraction in the aboveground biomass of trees for the tropical forest
Source of data used:	Calculated based on Tier 2 data. Value was determined in the excel model of the JI Project Documentation, sheet 'ER Model', cell E101
Value(s) :	Various values applied: pls refer to Table 16 of the JI PDD
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline- and project case.
Additional comment:	

Data / Parameter:	$\bar{V}_{gstock,j,t}$
Data unit:	cbm/ha
Description:	Average growing stock per hectare for stratum j,
Source of data used:	Determined by the project's inventory for all 13,514 sub-compartments of the project area. Data source is the inventory for the project area conducted in 2010 by the State Forest Inventory Unit.
Value(s) :	Value applied: 226.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline- and project case.
Additional comment:	

Data / Parameter:	$\bar{G}_{regrowth,ND,j,t}$
Data unit:	t.d.m./ha/yr
Description:	Average regrowth per hectare per year of the aboveground biomass after logging in year t
Source of data used:	Published re-growth model for Russia Far East
Value(s) :	Value applied: 226. Value was determined in the excel mode, sheet 'ER Model', cell E188.
Indicate what the data are used for (Baseline/ Project/ Leakage emission)	Baseline case.

calculations)	
Additional comment:	

Data / Parameter:	R_{CH4}
Data unit:	Dimensionless
Description:	Emission ratio for CH ₄
Source of data used:	IPCC default
Value(s) :	Value applied: 0.012
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project case
Additional comment:	

Data / Parameter:	R_{N2O}
Data unit:	Dimensionless
Description:	Emission ratio for N ₂ O
Source of data used:	IPCC default
Value(s) :	Value applied: 0.007
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project case
Additional comment:	

Data / Parameter:	$R_{N/C}$
Data unit:	Dimensionless
Description:	Ratio of nitrogen to carbon
Source of data used:	IPCC default
Value(s) :	Value applied: 0.001
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project case
Additional comment:	

Data / Parameter:	GWP_{CH4}
Data unit:	Dimensionless
Description:	Global warming potential of CH ₄
Source of data used:	IPCC default
Value(s) :	Value applied: 21
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project case
Additional comment:	

Data / Parameter:	GWP_{N2O}
Data unit:	tCO ₂ e/tN ₂ O
Description:	Global warming potential of N ₂ O
Source of data used:	IPCC default
Value(s) :	Value applied: 276

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project Case
Additional comment:	

Data / Parameter:	$A_{project,t=0}$
Data unit:	ha
Description:	Project Area at time, t=0
Source of data used:	Concession contract, NTFP Mgmt plan and Inventory (the latter for subtraction of specific sub-compartments), provided as GIS data
Value(s) :	Value applied: 450,374, pls refer to Table 7 of the JI PDD
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project- and baseline case
Additional comment:	

Data / Parameter:	$A_{project,j,t=0}$
Data unit:	ha
Description:	Project Area within each stratum, j, at time, t=0
Source of data used:	Forest inventory specifying the volume of 13,514 sub-compartments
Value(s) :	Value applied: 450,374, pls refer to Table 7 of the JI PDD
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project- and baseline case
Additional comment:	

Data / Parameter:	$DBH_{n,i,s,j,t=0}$
Data unit:	cm
Description:	Diameter at breast height t=0 year
Source of data used:	Forest inventory
Value(s) :	Various values applied. Please refer to Bikin Forest Inventory (2010) which provides values for each of the sub-compartments.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline- and project case
Additional comment:	

Data / Parameter:	$H_{n,i,s,t=0}$
Data unit:	m
Description:	Height of trees, t=0 year
Source of data used:	Forest inventory
Value(s) :	Various values applied. The average tree height over all sub-compartments amounts to 23.8m. Please refer to Bikin Forest Inventory (2010) which provides values for each of the 13,514 sub-compartments.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline- and project case

Additional comment:	
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Data / Parameter:	$A_{NHA_{annual,t}}$
Data unit:	ha
Description:	Annual net harvest area for the Project Area in year, t
Source of data used:	Baseline Mgmt Plan
Value(s) :	Values applied: 3,323 and 8,762, please refer to Table 6 in the JI PDD.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline case
Additional comment:	

Data / Parameter:	BEF
Data unit:	dimensionless
Description:	Biomass expansion factor for converting volume of extracted roundwood to total aboveground biomass
Source of data used:	FAO, Forest Resource Assessment for Russia
Value(s) :	Value applied: 1.40 pls refer to Table 16 of the JI PDD
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project case
Additional comment:	

Data / Parameter:	CF_{wood}
Data unit:	tC/t.d.m
Description:	Carbon fraction of wood
Source of data used:	FAO, Forest Resource Assessment for Russia
Value(s) :	Value applied: 0.50 pls refer to Table 16 of the JI PDD
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline case
Additional comment:	

Data / Parameter:	D
Data unit:	t.d.m./cdm
Description:	Wood density for the forest with corresponding climate region and ecological zone.
Source of data used:	FAO, Forest Resource Assessment for Russia
Value(s) :	0.4476
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline- and project case
Additional comment:	

Data / Parameter:	D_i
Data unit:	t.d.m./cdm
Description:	Species-specific density of wood
Source of data used:	FAO, Forest Resource Assessment for Russia

Value(s) :	Various values applied ranging from 0.35 to 0.51, please refer to table 16 of the JI PDD.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline- and project case
Additional comment:	

Data / Parameter:	k_{decay}
Data unit:	yr^{-1}
Description:	Rate of decay of the deadwood pool
Source of data used:	Yatskov et al., 2003
Value(s) :	Value applied: 0.06, pls refer to Table 18 of the JI PDD
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline case
Additional comment:	

Data / Parameter:	f_{RSD}
Data unit:	dimensionless
Description:	Factor for residual stand damage
Source of data used:	Kovalev et al., 2011
Value(s) :	Value applied: 0.40
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline- and project case
Additional comment:	

Data / Parameter:	$f_{branch\ trim}$
Data unit:	dimensionless
Description:	Branch-trimming factor
Source of data used:	FAO, Forest Resource Assessment for Russia
Value(s) :	Value applied: 0.41
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline case
Additional comment:	

Data / Parameter:	$f_{lumber\ recovery}$
Data unit:	dimensionless
Description:	Lumber recovery factor
Source of data used:	Primorskstat, 2010
Value(s) :	Value applied 0.45, pls refer to Table 23 of the JI PDD
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline case
Additional comment:	

Data / Parameter:	k_{lHWP}
Data unit:	yr^{-1}
Description:	Rate of oxidation for long-term harvested wood products
Source of data used:	IPCC Default
Value(s) :	Value applied: 0.023
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline case
Additional comment:	

Data / Parameter:	k_{sHWP}
Data unit:	yr^{-1}
Description:	Rate of oxidation for short-term harvested wood products
Source of data used:	IPCC Default
Value(s) :	Value applied: 1.00
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline case
Additional comment:	

Data / Parameter:	$G_{regrowth,t}$
Data unit:	t.d.m./ha/yr
Description:	Average regrowth per hectare per year of the aboveground biomass after logging in year, t
Source of data used:	Calculated based on Dorofeeva, 1974, FAO FRA and Forest Inventory
Value(s) :	Value applied: 0.46, pls refer to Table 26 of the JI PDD.
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline case
Additional comment:	

Data / Parameter:	EF_{fuel}
Data unit:	tCO ₂ e/kL
Description:	Fuel emission factor
Source of data used:	IPCC defaults
Value(s) :	Value applied: 0.29519, pls refer to Table 28 of the JI PDD
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project- and baseline case
Additional comment:	

Data / Parameter:	$FC_{harvest}$
Data unit:	kL/m ³
Description:	Fuel consumption of equipment employed for felling and snigging per m ³ of merchantable log harvested
Source of data used:	Klvac and Skoupy, 2009
Value(s) :	Value applied: 0.12
Indicate what the data are	Baseline case

used for (Baseline/ Project/ Leakage emission calculations)	
Additional comment:	

Data / Parameter:	<i>FC_{hauling}</i>
Data unit:	kL/m ³
Description:	Fuel consumption of equipment for hauling one m ³ of merchantable log
Source of data used:	Provided by Primorski Gok, a logging company in the region
Value(s) :	Value applied: 1.3
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline case
Additional comment:	

D.2. Data and Parameters Monitored

This section documents how the data for ‘Area of Natural Disturbance’ ($A_{ND,j,t}$), ‘Fraction of Forest Naturally Damaged’ ($f_{ND,j,t}$) and ‘Volume of Wood Sold as Determined by Field Surveys’ ($V_{illegal-harvest,t}$) are determined.

Area of Natural Disturbance. TCT and WWF Amur Branch engaged the ‘Forest Fire Fighting Service (FFFS)’ of Primorye to steadily control for forest fires in the project areas. This was implemented by means of frequent evaluation of remote sensing data and by control flights.

- For the period from 3rd June 2009 to end of 2011, the FFFS confirms that no forest fires were detected (Reference Nr. 14).
- For the period from 1st January 2012 until 31st October 2012, the FFFS reports on three forest fires with a total area of 6.5ha and burnt timber volume of 99m³.

For Quality Assurance and Quality Control, TCT and WWF Amur Branch requested the official statement on forest fires from the forestry units.

- On behalf of the forestry units, the Forest Department confirms that no forest fires were detected in the project area for the period from 3rd June 2009 to end of 2011(Reference Nr. 3).
- On behalf of the forestry units, the Forest Department mentions three forest fires in the timer period of 1st January 2012 to 31st October 2012 with a total burnt area of 6.5ha and 99m³ of burnt volume.

The above data is presented in below table.

Category	Year	Lesnichestvo	Comp.	Sub-Comp.	Size	Volume	Data Source
FFFS Data - Primary Data Source	2009	No forest fires	N.A.	N.A.	N.A.	N.A.	Report from FFFS 2009-2011 (Reference Nr. 14)
	2010	No forest fires	N.A.	N.A.	N.A.	N.A.	Report from FFFS 2009-2011 (Reference Nr. 14)
	2011	No forest fires	N.A.	N.A.	N.A.	N.A.	Report from FFFS 2009-2011 (Reference Nr. 14)
	2012	Krasnoyarskoe	158	33 & 34	2.0	39.00	Report from FFFS 2012 (Reference Nr. 15)
	2012	Krasnoyarskoe	143	21	2.5	-	Report from FFFS 2012 (Reference Nr. 15)

	2012	Krasnoyarsk	272	7	2.0	60.00	Report from FFFS 2012 (Reference Nr. 15)
Forest Department Data - QAQC Data Source	2009	No forest fires	N.A.	N.A.	N.A.	N.A.	Information from Forest Department 2009 -2011 (Reference Nr. 3)
	2010	No forest fires	N.A.	N.A.	N.A.	N.A.	Information from Forest Department 2009 -2011 (Reference Nr. 3)
	2011	No forest fires	N.A.	N.A.	N.A.	N.A.	Information from Forest Department 2009 -2011 (Reference Nr. 3)
	2012	Krasnoyarsk	158	33 & 34	2.0	39.00	Information from Forest Department 2012 (Reference Nr. 10 & 11)
	2012	Krasnoyarsk	143	21	2.5	-	Information from Forest Department 2012 (Reference Nr. 10 & 11)
	2012	Krasnoyarsk	272	7	2.0	60.00	Information from Forest Department 2012 (Reference Nr. 10 & 11)
Total	2009	Project Area	N.A.	N.A.		0	Calculated
	2010	Project Area	N.A.	N.A.		0	Calculated
	2011	Project Area	N.A.	N.A.		N.A.	Calculated
	2012	Project Area	158, 143, 272	N.A.	6.5	99	Calculated

Fraction of Forest Naturally Damaged. In a next step, the extent of forest damages is determined. The data collected above presents information on the volume burnt (i.e. in m³/ha). As the areas are small and in remote areas, TCT decides not to measure f_{ND} but to set this value to 100%, which is considered as conservative.

Following above approach, in a next step, the total burnt volume was determined

Table 5: Determination of Volume Burnt based on f_{ND} of 100%						
Year	Lesnichestvo	Comp.	Sub-Comp.	Size of Burnt Area (in ha)	Volume per Sub-C (cbm/ha)	Total Burnt Volume (in cmb/Sub-C)
2012	Krasnoyarsk	158	34	2.0	160	360
2012	Krasnoyarsk	158	33		200	
2012	Krasnoyarsk	143	21	2.5	250	625
2012	Krasnoyarsk	272	7	2.0	310	620
Determination of Average Burnt Volume based on $f_{ND} = 100\%$						246.9

Volume of Wood Sold as Determined by Field Surveys. Following the SOPs, the reports from the TCT anti poaching brigade were evaluated. Two summary reports were used, the TCT Anti Poaching Brigade Annual Report 2009 -2011 (Reference Nr 1) and the TCT Anti Poaching Brigade Annual Report 2012 (Reference Nr 2).

For Quality Assurance and Quality Control, official data on illegal logging from the Forest Department of Primorye was collected. This is provided in two statements: Information from Forest Department 2009 - 2011 (Reference Nr 3) and Information from Forest Department 2011 (Reference Nr 10, 11). Additionally

the statements from the forest police and the Forest Department’s calculation of damage (References Nrs. 4-9) were provided.

A conservative approach was applied for the determination of the annual volume of illegal logging:

- For the year 2009, TCT does not report on illegal logging, whereas the Forest Department reports on a total of 220.24 m³. The latter was used for the annual total.
- For 2010 TCT reports on 96.34m³, whereas the Forest Department does not report illegal logging. The first was used for the determination of the annual total.
- For 2011, no illegal logging was detected, not by TCT nor by the Forest Department.
- For 2012, TCT and the Forest Department report on illegal logging, whereas the figures determined by TCT are slightly higher. The higher value was used for the determination of the annual total.

The data and related sources as well as the determination of the annual total are presented in below table.

As second Quality Assurance and Quality Control-measure, WWF Amur branch conducted two remote sensing evaluations. These analyses shall determine whether new roads were constructed to prepare the ground for new illegal logging sites.

- The first study covers the period 2009 to 2011 and was conducted by ‘Dallesproject’, the far eastern branch of the state forest inventory service (Reference Nr. 12).
- The second study covers January to October 2012 and was conducted by WWF Amur Branch (Reference Nr. 13).

Both studies used images with a minimum resolution of 10m, a cloud ratio below 20% and a minimum accuracy of 85%. Both studies prove that no new infrastructure was developed.

Category	Year	Lesnichestvo	Compartment	Sub-Comp.	Volume	Data Source
TCT Data - Primary Data Source	2009	N.A.	N.A.	N.A.	0	TCT Anti Poaching Brigade Annual Report 2009 -2011 (Reference Nr 1)
	2010	Krasnoyarskoe	157	11	96.34	TCT Anti Poaching Brigade Annual Report 2009 -2011 (Reference Nr 1)
	2011	N.A.	N.A.	N.A.	0	TCT Anti Poaching Brigade Annual Report 2009 -2011 (Reference Nr 1)
	2012	Krasnoyarskoe	132	5 & 6	106.83	TCT Anti Poaching Brigade Annual Report 2012 (Reference Nr 2)
Forest Department Data - QAQC Data Source	2009	Sobolinskoe	112		11.54	Information from Forest Department 2009 -2011 (Reference Nr 3, 4, 5)
	2009	Krasnoyarskoe	131		23.58	Information from Forest Department 2009 -2011 (Reference Nr 3, 6, 7)
	2009	Krasnoyarskoe	132		185.12	Information from Forest Department 2009 -2011 (Reference Nr 3, 8, 9)
	2010	N.A.	N.A.	N.A.	0	Information from Forest Department 2009 -2011 (Reference Nr 3)
	2011	N.A.	N.A.	N.A.	0	Information from Forest Department 2009 -2011

						(Reference Nr 3)
	2012	Krasnoyarskoe	132	5 & 6	61.95	Information from Forest Department 2011 (Reference Nr 10, 11)
Total	2009	Project Area	112, 131, 132	N.A.	220.24	Calculated
	2010	Project Area	157	11	96.34	TCT Anti Poaching Brigade Annual Report 2009 -2011 (Reference Nr 1)
	2011	Project Area	N.A.	N.A.	N.A.	Calculated
	2012	Project Area	132	5 & 6	106.83	TCT Anti Poaching Brigade Annual Report 2012 (Reference Nr 2)

Data / Parameter:	$A_{ND,j,t}$
Data unit:	ha
Description:	Area of natural disturbance ND, in stratum j in year t
Measured /Calculated /Default:	Measured
Source of data:	High resolution remote sensing analysis combined with fire fighting control flights by the Forest Department
Value(s) of monitored parameter:	0 ha (2009), 0 ha (2010), 0 ha (2011) and 6.5ha (2012)
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Value applied for ex-ante estimate: 17.7 provided in Table 37 of the JI PDD.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N.A.
Measuring/ Reading/ Recording frequency:	Several times per year
Calculation method (if applicable):	N.A.
QA/QC procedures applied:	The report from the forest fire fighting service was crosschecked with data from the forestry units. Both sources indicate no forest fires in 2009-2011. For 2012, the data (compartment, sub-compartment, spatial extent of areas burnt) is identical in both data sources.

Data / Parameter:	$f_{ND,j,t}$
Data unit:	dimensionless
Description:	Fraction of the forest naturally damaged in stratum j, in year t
Measured /Calculated /Default:	Measured
Source of data:	Collected by a forest inventory team sent to the disturbed areas identified under (1) above
Value(s) of monitored parameter:	0.00 (2009), 0.00 (2010), 0.00 (2011) and 100% (2012).
Indicate what the data are	Value applied for ex-ante estimate:0.15 provided in Table 37 of the JI

used for (Baseline/ Project/ Leakage emission calculations)	PDD.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N.A.
Measuring/ Reading/ Recording frequency:	Each time, if disturbed areas are detected under (1) above
Calculation method (if applicable):	N.A.
QA/QC procedures applied:	Maximum value applied, not applicable.

Data / Parameter:	<i>V_{illegal-harvest,t}</i>
Data unit:	Cbm
Description:	Volume of wood sold as determined from field surveys in year t
Measured /Calculated /Default:	Measured
Source of data:	Collected by a forest inventory team sent to the illegally logged areas if logged areas are identified under (1) above or are identified by WWF's border patrol tours.
Value(s) of monitored parameter:	220.24 (2009), 96.34(2010), 0 (2011) and 106.83 (2012).
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Value applied for ex-ante estimate: 70cbm/yr.
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	N.A.
Measuring/ Reading/ Recording frequency:	Several times per year
Calculation method (if applicable):	N.A.
QA/QC procedures applied:	<p>Following QA/QCs were applied:</p> <ul style="list-style-type: none"> ▪ The analysis was based on measurements of all (i.e. 100%) tree stumps. No need for extrapolation and statistical approaches (e.g. confidence intervals) are needed. ▪ The reports from the anti-poaching brigade were compared with reports from the Police and the Forestry Unit. If data is inconsistent, the higher data (i.e. volume) shall be applied. ▪ WWF ordered a remote sensing analysis in order to cross-check for new infrastructure developments, indicating illegal logging sites. <ul style="list-style-type: none"> ▪ The remote sensing analysis was conducted in compliance with the requirements as defined in the JI PDD (i.e. minimum resolution of 10m, cloud cover of below 20%, use of images for one forest area map which were taken within a time frame of 5 months, accuracy level of 85% or higher).

	<ul style="list-style-type: none">▪ This evaluation showed that no new forest infrastructure was developed in the course of this monitoring period.▪ As additional QAQC for the logging conducted by TCT, the PP compares the logging volume as stipulated in the agreement between the State Forest Logging Company with the volumes stipulated in the post felling reports, as developed by the divisional forestry.
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SECTION E. Calculations of Emission Reductions or GHG Removals by Sinks

E.1. Calculation of Baseline Emissions or Baseline Net GHG Removals by Sinks

The baseline was fixed ex-ante. As the AAC for the project territory is still valid, the baseline emission calculation is identical with the JI PDD. The formula used for the quantification of the baseline emission as well as the actual values of the baseline emissions, sources and sinks are presented in the below table.

Table 7: Quantification of Baseline Emissions

$$C'_{degradation,t} = \left[(C_{DWdecay,t} + C_{ltHWPoxidation,t} + C_{stHWPoxidation,t} + C_{regrowth,t}) \times \frac{44}{12} \right] \quad C'_{baseline,t} = C'_{degradation,t} + C'_{emissions,t}$$

Year t	$C_{DWdecay,t}$	$C_{ltHWPoxidation,t}$	$C_{stHWPoxidation,t}$	$C_{regrowth,t}$	$C'_{degradation,t}$	$C'_{emissions,t}$	$C'_{baseline,t}$
1	1,351	5,271	20,383	1,337	94,114	1,829	95,943
2	5,061	28,209	33,316	4,864	226,310	5,128	231,438
3	8,562	28,709	33,316	8,391	228,053	5,128	233,181
4	11,866	29,199	33,316	11,918	229,031	5,128	234,159

Please note, the above table quantifies the emission reductions for full years (i.e. 365 days). As the project did start in June 2009, e.g. year 1 does not match the value of 2009 etc. Please refer to Sections A.1 and E.5 for values adapted to the calendar year.

E.2. Calculation of Project Emissions or Actual Net GHG Removals by Sinks

The formula used to quantify the project emissions is presented below. In addition, the below table presents the results of the quantification of the emission reductions based on the monitored input parameter.

Table 8: Quantification of Project Emissions

$$C'_{actual,t} = \left[(C_{nat-distrurb,t} + C_{illegal-harvest,t}) \times \frac{44}{12} \right]$$

Year t	$C_{nat-distrurb,t}$	$C_{illegal-harvest,t}$	$C'_{actual,t}$	Leakage
1	-	97	355	18,823
2	-	42	155	45,262
3	-	-	-	45,611
4	550	47	2,188	45,806

Please note, the above table quantifies the emission reductions for full years (i.e. 365 days). As the project did start in June 2009, e.g. year 1 does not match the value of 2009 etc. Please refer to Sections A.1 and E.5 for values adapted to the calendar year.

E.3. Calculation of Leakage

This section presents the quantification of leakage. In the JI PDD a default leakage factor of 20% was established. This value is applicable to the net anthropogenic removals by sinks (i.e. $C'_{degradation,t}$). As the baseline is fixed ex-ante and as the AAC did not change during the monitoring report, the leakage emissions equal those determined in the ex-ante estimate provided in JI PDD.

Year t	Leakage
1	18,823
2	45,262
3	45,611
4	45,806

Please note, the above table quantifies the emission reductions for full years (i.e. 365 days). As the project did start in June 2009, e.g. year 1 does not match the value of 2009 etc. Please refer to Sections A.1 and E.5 for values adapted to the calendar year.

E.4. Summary of Calculation of Emission Reductions or Net Anthropogenic GHG Removals by Sinks

Based on the findings of sections E.1 to E.3, the below emission reductions are determined.

$Emission\ Reductions_t = C'_{degradation,t} + C'_{emissions,t} - C'_{actual,t} - Leakage_t$					
Year t	$C'_{degradation,t}$	$C'_{emissions,t}$	$C'_{actual,t}$	Leakage	Emission Reductions
1	94,114	1,829	355	18,823	76,766
2	226,310	5,128	155	45,262	186,021
3	228,053	5,128	-	45,611	187,570
4	229,031	5,128	2,188	45,806	186,165

Please note, the above table quantifies the emission reductions for full years (i.e. 365 days). As the project did start in June 2009, e.g. year 1 does not match the value of 2009 etc. Please refer to Sections A.1 and E.5 for values adapted to the calendar year.

E.5. Comparison of Actual Emission Reductions or Net Anthropogenic GHG Removals by Sinks with Estimates in the Registered JI PDD

The below table provides the comparison of the Ex-ante estimate of emission reductions with the actual emission reductions, based on the monitoring parameters, as determined in Section D.2.

Item	Values applied in ex-ante calculation of the registered PDD	Actual values reached during the monitoring period
2009 Emission reductions (tCO ₂ e)	44,577	44,587
2010 Emission reductions (tCO ₂ e)	140,455	140,224
2011 Emission reductions (tCO ₂ e)	187,246	186,921
2012 Emission reductions (tCO ₂ e) (Up to 31 st October 2012)	156,768	155,641

E.6. Remarks on Difference from Estimated value in the Registered JI PDD

The actual volume of emission reductions did not increase, it decreased by 1,673 ERUs. The Parameters for A_{ND} , f_{ND} , and $V_{illegal-harvest}$ were slightly overestimated in the course of JI PDD development. The table below compares the input parameters used for the ex-ante estimation of emission reduction volumes with the actual volume as determined in the course of the monitoring.

Still the removal of some sites from the JI project area leads to a minor decrease of the baseline emissions. This over-compensates the good performance of the JI project, so that the actual emission reductions are slightly below the ex-ante estimate.

Table 12: Comparison of Input Parameters		
Parameter	Ex-Ante Estimate	Monitoring Result
$V_{illegal-harvest,t}$	70 cbm/yr	220.24 (2009), 96.34(2010), 0 (2011) and 106.83 (2012).
$f_{ND,j,t}$	0.15	0% (2009) 0% (2010) 0% (2011) and 100% (2012)
$A_{ND,j,t}$	17.7ha/yr	0ha (2009), 0ha, 2010, 0ha (2011) and 6.5ha/yr

Annex 1

CHANGES DURING PROJECT IMPLEMENTATION

TCT Logging Operations. The overall design of the conservation program always foresaw that TCT conducts logging operations to meet the fire and timber demand of the local population. It is important to note that this focuses on the local demand and is not applied in an industrial scale. This local demand is determined by the Non-Timber Forest Product (NTFP) Management Plan for the concession area. According to the Russian forest regulation, this is implemented in the following way:

- TCT, as the NTFP lease holder, signs an agreement with the State Forest Logging Company for each specific logging site.
- The State Forest Logging Company subsequently issues logging permit to TCT.
- Having acquired the permit, TCT then logs the forest site and sells the logs and/or boards to the local market/Krasny Yar and surrounding villages.

The objective of this activity is to supply the local communities with fire wood and timber for construction purposes.

Non-Compliance with NTFP Mgmt Plan. The actual logging operations in 2009, 2010 and 2011 were not implemented on the logging sites foreseen for logging (which were excluded from the JI project area). This was due to the following reasons:

- The forest inventory was conducted in 2009 and 2010 by the State Forestry Inventory Service.
- On the basis of the new inventory data, The NTFP Management Plan was developed in 2010, approved by Forest Department at the 19th July 2010.
- The actual Sub-Compartments subject to logging are determined by the Forest Department.
- As in 2009 and 2010, no new forest inventory data and no NTFP Management Plan was available, the Forest Department selected the Sub-Compartments on the basis of the old inventory data.
- Late 2010 the new forest inventory data and the NTFP Management Plan was submitted to the Forest Unit to support the further selection of Sub-Compartments for logging.
- Due to a long transition period to the new forest data, the Forest Department determined the Sub-Compartments subject to logging also in 2011 on the basis of old inventory data (1993).
- The old inventory has a different delineation and number of the Sub-Compartments. Hence the actual logging operations were not in line with the existing NTFP Management Plan and occurred in the JI project area.

For 2012, the logging operations followed the new inventory data, and the logging took place in the sites envisaged for cutting. The cutting volumes amount to a total of 2.6 cbm over six sub-compartments. All sub-compartments subject to legal logging are listed in below table.

As a consequence, TCT's logging operations were conducted to some extent in the initial JI project area. As the JI project approach and the applied methodology do not allow for legal logging in the project area, these areas (i.e. the whole sub-compartments, not only the logging sites) were removed from the JI project area.

Table 13: Sub-Compartments Removed From the Project Area						
	Year	Lesnichestvo	Compartment	Sub-C.	Log. Vol.	Data Source
Erroneously Logged	2009	Krasnoyarskoe	121	18	4,500	Contract TCT - State Forest Comp.
	2010	Krasnoyarskoe	122	1	2,729	Contract TCT - State Forest Comp.
	2010	Krasnoyarskoe	123	19	3,147	Contract TCT - State Forest Comp.
	2010	Krasnoyarskoe	131	1	4,797	Contract TCT - State Forest Comp.
	2010	Krasnoyarskoe	154	6	1,557	Contract TCT - State Forest Comp.
	2011	Krasnoyarskoe	131	18	2,072	Contract TCT - State Forest Comp.
	2011	Krasnoyarskoe	154	12	2,159	Contract TCT - State Forest Comp.
Erroneously Logged	2009	Krasnoyarskoe	121	18	4,500	Post Felling Report
	2010	Krasnoyarskoe	122	1	2,729	Post Felling Report
	2010	Krasnoyarskoe	123	19	3,147	Post Felling Report
	2010	Krasnoyarskoe	131	1	4,797	Post Felling Report
	2010	Krasnoyarskoe	154	6	1,557	Post Felling Report
	2010	Krasnoyarskoe	154	10	490	Post Felling Report
	2011	Krasnoyarskoe	131	18	2,072	Post Felling Report
	2011	Krasnoyarskoe	154	9	685	Post Felling Report
	2011	Krasnoyarskoe	154	12	2,159	Post Felling Report
Logged for Access	2012	Krasnoyarskoe	124	27	0.80	Contract TCT - State Forest Comp.
	2012	Krasnoyarskoe	129	18		
	2012	Krasnoyarskoe	129	17	0.30	Contract TCT - State Forest Comp.
	2012	Krasnoyarskoe	129	34		

Table 14: Reduction in JI Project Area	
Project Area as per Registered PDD (in ha)	450,374.0
Revised Project Area (in ha)	449,875.4
Areas Removed (in ha)	498.6

The removal of above sub-compartments leads to a reduction of the JI project area. This reduction is determined in the left table and amounts to 498.6ha. The reduced project area amounts to 499.875ha.

In order to account for above change, the baseline logging area and volumes have to be adopted accordingly.

- The legal logging area, as specified in the JI PDD, Table 5, was increased by 498.6ha and now amounts to 5,752 ha over ten years and 575 ha per year.
- Table for of the JI PDD determines a baseline logging area of 9,287ha for the total concession. Dividing the 575ha/yr by the concession baseline logging area results in a discount factor of 6.19% (previously 5.66% based on 525ha/yr).
- The discount factor of 6.19% was subsequently applied to conservatively reduce the baseline logging area and volumes.

Table 15: Legal Logging Parameters	
Area	Area
in ha	in ha/yr
5,752	575
Discount Factor	0.06

The results are presented in below table. These reduced figures were subsequently used to determine the baseline emissions.

Table 16: Baseline Logging Area and Volumes for the Project Area					
Validity		Days	Volume	Area	Merchantable Volume
From	To	D	in m ³ /yr	in ha/yr	in m ³ /ha
03.06.2009	25.01.2010	236	133,505	3,304	40.41
26.01.2010	31.12.2012	339	374,288	8,712	42.96