Gold Standard for the Global Goals

TEMPLATE

KEY PROJECT INFORMATION & PROJECT DESIGN DOCUMENT (PDD)

PUBLICATION DATE **14.10.2020**

VERSION **v. 1.2**

RELATED SUPPORT

- **TEMPLATE GUIDE Key Project Information & Project Design Document v.1.2**

This document contains the following Sections

This template has been revised to aid a consistent interpretation and to better support project developers submitting documentation for certification. Please read the accompanying guide to understand how to complete this template accurately.
TEMPLATE GUIDE Key Project Information & Project Design Document v.1.2

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KEY PROJECT INFORMATION

GS ID of Project	GS11654
Title of Project	Arctic Afforestation in East Iceland
Time of First Submission Date	28/6/2022
Date of Design Certification	
Version number of the PDD	I
Completion date of version	22/3/2023
Project Developer	Yggdrasill Carbon ehf.
Project Representative	Ingibjorg Jonsdottir / ingibjorg@yggcarbon.com
Project Participants and any communities involved	
Host Country (ies)	Iceland
Activity Requirements applied	☐ Community Services Activities ☐ Renewable Energy Activities ☒ Land Use and Forestry Activities/Risks & Capacities ☐ N/A
Scale of the project activity	☒ Micro scale ☐ Small Scale ☐ Large Scale
Other Requirements applied	
Methodology (ies) applied and version number	
Product Requirements applied	☒ GHG Emissions Reduction & Sequestration ☐ Renewable Energy Label ☐ N/A
Project Cycle:	

	☒ Regular ☐ Retroactive

Land-use & Forest Key Project Information[1]

(delete below table if N/A)

Scope:	☒ Forestry ☐ Agriculture
Silvicultural system:	☒ Conservation (no use of timber) ☐ Selective Harvesting ☐ Rotation Forestry
Project Area (ha):	92.8
Eligible Area (ha):	65.6
10% Set Aside Conservation area (ha):	N/A since it is a micro scale project
Evidence that Project Area Boundary is clearly distinguishable in the field:	The project boundary is defined by a stream on the north side, fencing poles on the upper side, fencing poles on the south side, and a ditch on the east side.
Planting Area	65.6
How many Modelling Units (MUs) are included in the eligible area:	4
Summary of New Areas added (copy and insert as needed):	
Size (ha):	
Date Added	

[1] Please refer to 0 for detailed information on LUF projects

Table 1 – Estimated Sustainable Development Contributions

Sustainable Development Goals Targeted	SDG Impact (defined in B.6.)	Estimated Annual Average	Units or Products
13 Climate Action (mandatory)	Sequestration of CO2	541	tCO2e
8 Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all	Promote employment opportunities	8200	USD
15 Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	Increased area under tree canopy cover	1.2	Ha

SECTION A. DESCRIPTION OF PROJECT

A.1 Purpose and general description of project

Since human settlement in Iceland almost 1150 years ago, land degradation has been a major environmental issue. Natural forces like volcanic eruptions, thus vulnerable soil, and the harsh arctic winter combined with unsustainable land use, wood cutting, and livestock grazing have been the primary driving forces of that development. Birch covered about 25% of Iceland's land area at settlement, but now the natural birch forest reaches only 1.5% and cultivated forests with the main species to be pine, spruce, cottonwood, and larch, add 0.4 % more to the tree cover. As a result of the massive land degradation, it is estimated that an equivalent of up to 1.8 billion tons of CO2 has been lost from soil and vegetation since settlement[1].

[1] https://land.is/heim/english/revegetation_landcare_iceland/

This project is an afforestation project implemented in the eastern part of Iceland. It is managed by Yggdrasill Carbon (YGG), a company working to promote nature-positive solutions against climate change. The project will contribute to the Sustainable Development Goals (SDGs) via certified SDG impacts of each Gold Standard carbon credit. It will capture CO2 from the atmosphere and store it in the forest (SDG 13), increase forest cover in Iceland and prevent soil erosion (SDG 15), and add value to the local communities in East Iceland with new jobs opportunities, increased knowledge, and economic growth (SDG 8).

The project region is East Iceland, where boundaries are defined by East Iceland´s four municipalities, Mulathing, Fjardabyggd, Vopnafjordur, and Fljotsdalur. The exact location of the project activity is in Skriðdalur on the property of Myrar (65°03'31'N – 14°37'28'W), a 93-ha plot in the municipality of Mulathing. The plot is located 170 – 300 meters above sea level and faces towards the southeast on the lower slopes of Hallormsstaðaháls. It has an eligible planting area of 65.6 hectares with 133,507 seedlings, and the species are spruce, pine, and cottonwood. The GHG sequestration and emission sources of the project boundary are mostly CO_2 and a limited emission of N_2O due to fertilizer at the start of the project.

The Icelandic Forest Service (IFS) has created an afforestation plan for the project area built on their baseline vegetation mapping, and specialists in earth observation and aerial operations, finished the mapping for the certification process. Local contractors conducted land preparation in early July 2022, and the planting started at the end of July and was finished in late August 2022. The plan is to follow IFS's afforestation plan for the next 50 years, which is the contract duration between the landowner and YGG. Archeological mapping of the area has already taken place in cooperation with The Cultural Heritage Agency of Iceland. See Attachment I - Archaeological mapping in supporting documents.

The area was for years subject to extensive grazing, but today only slight grazing remains in the area.

A.1.1. Eligibility of the project under Gold Standard

The General Eligibility Requirements of the Land-use & Forests Activity Requirements are met as the project is an Afforestation & Reforestation (A/R) Project, and the

eligible area did not meet the definition of forest 10 years before the project start date and at the project start date.

For the non-forest assessment, a written statement from the Environmental Manager of the Municipality of Mulathing, of no forest in the project area 10 years ago and none at project start date, is uploaded in the supporting documents (*Attachment II – Non- Forest statement*).

The project is not registered with any other voluntary or compliance scheme and it is completely independent of all other Gold Standard or other similar voluntary or compliance standard programs.

The host country will not trade the emission deduction created by the project since this is an afforestation project on private land financed by the project owner.

The project does and will not overlap with that of another Gold Standard or other voluntary or compliance standard program of similar nature.

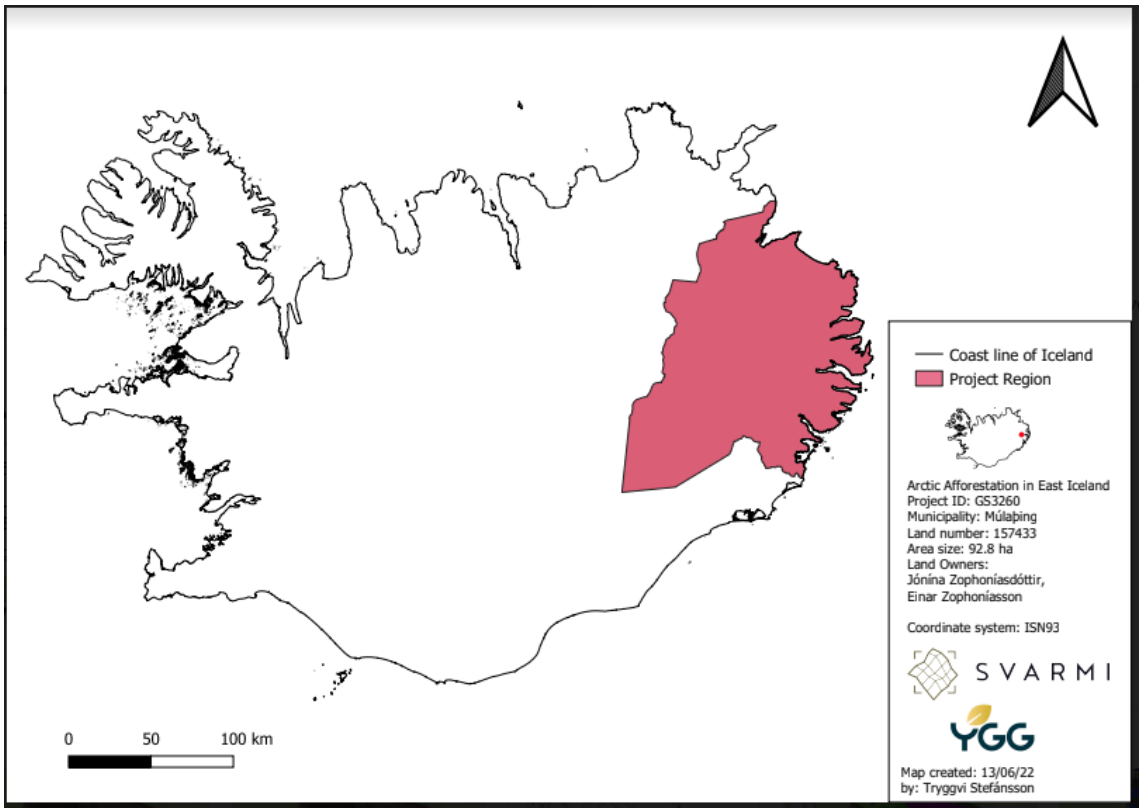
The project follows the Icelandic legal, environmental, ecological, and social regulations.

A.1.2. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

The project is operated on private land. A legal 50-year contract has been made between landowners and YGG regarding ownership of products generated by the project and legal rights to alter the use of resources required to service the project.

A.2 Location of project

The location of the project activity is in the municipality of Mulathing in East Iceland (Project region). Address: Myrar, 700 Egilsstaðir, Iceland.



A.3 Technologies and/or measures

Mapping:

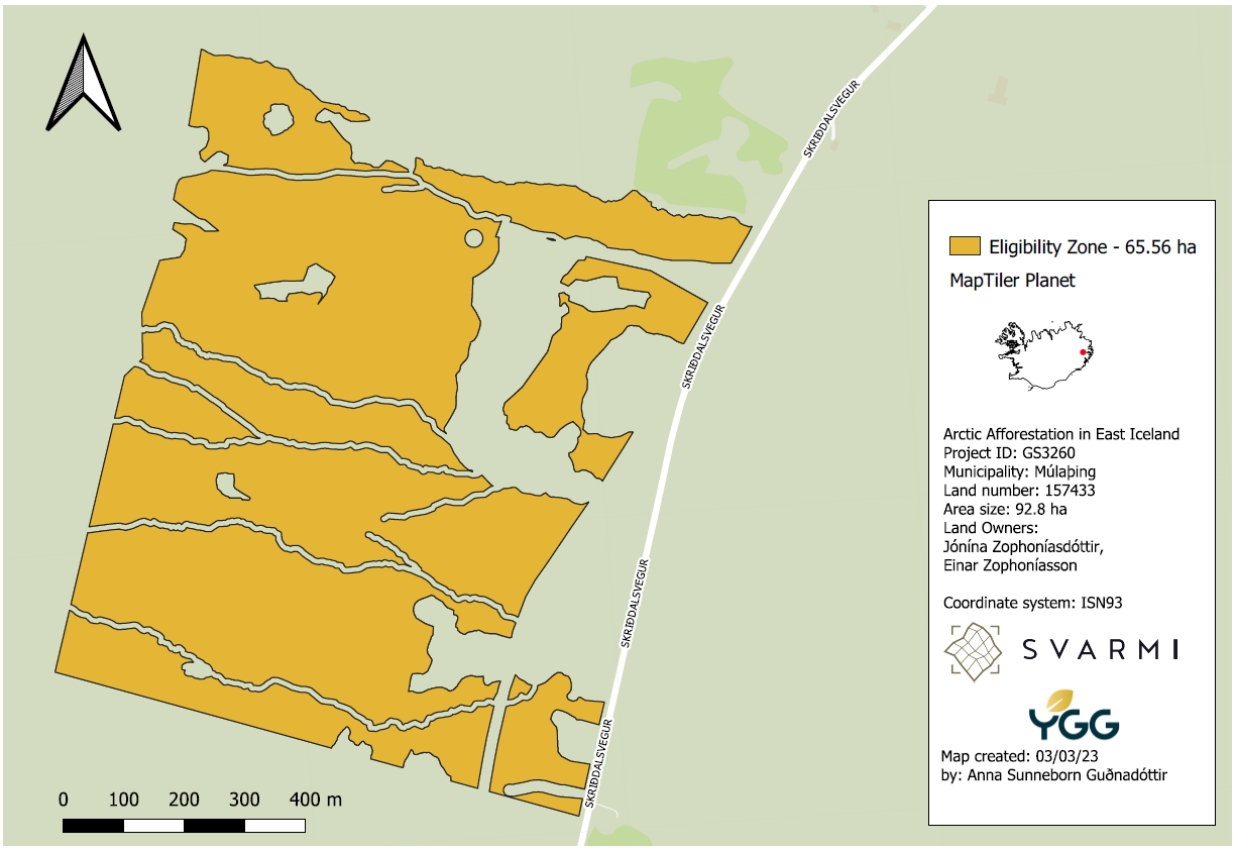
Baseline vegetation mapping on site was conducted by specialists from the Icelandic Forest Service (IFS) on the 20 – 22nd of June 2021. The mapping was implemented with the mapping key for primary data collection in the preparation of cultivation plans in forestry[2]. The specialists used a printed map of the area and a printed attribute table and visually assessed the proportion of the plant species. Then they divided the vegetation of the area into vegetation classes based on the species found (twelve classes) and measured the ha-size of each of the classes. All classes were then grouped into four vegetation districts: Grassland, Dry Moorland (also named Heathland), Wetland, and Barren land.

[2]https://www.skogur.is/static/files/rit-mogilsar/Rit-Mogilsar-33-2015.pdf

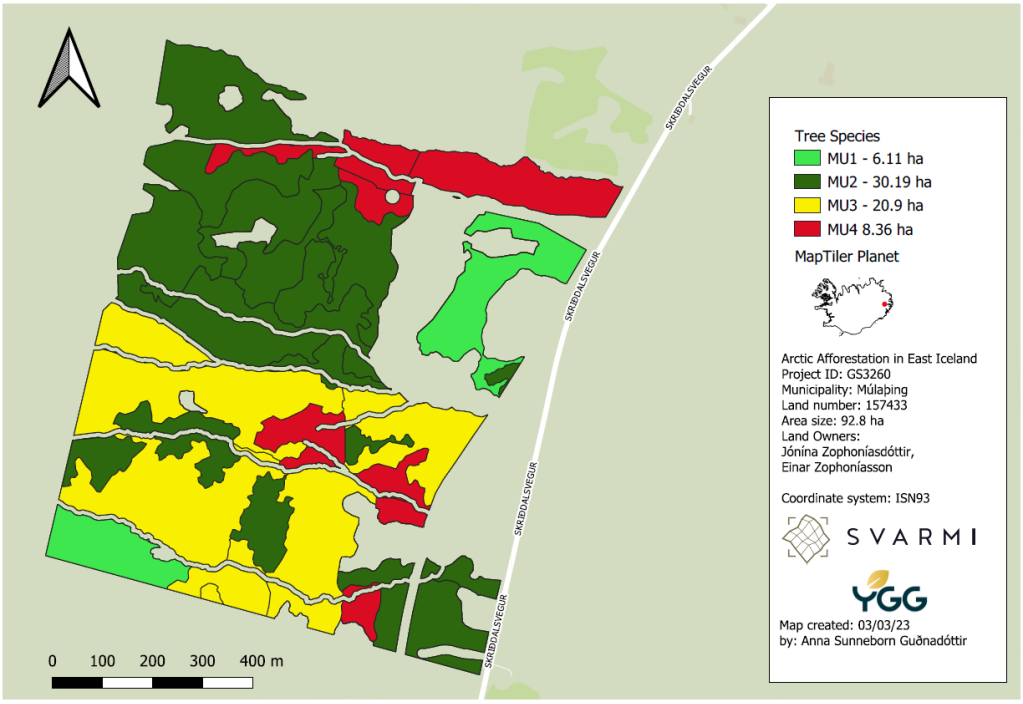
Table 1. Vegetation mapping in project area

	Vegetation District	Vegetation class	Size (ha)
	Wetland		**15.8**
TE		Elftingarhálfdeigja	
UE		Equisetum bog	
TGr		Grasses-carex semibog	
UR		Dwarf shrub bog	
UM		Carex nigra bog	
	Grassland		**8.8**
HG		Grassland	
HT		Fertile grassland	
HS		Dwarf shrub and grasses	
	Dry moorland / heathland		**55.72**
B		Dwarf shrub heath	
BB		Vaccinium heath	
C		Betula nana heath	
	Barren land		**0.3**
O		Unvegetated land	
	Total		**80.62**

Then all wetland vegetation districts were excluded, along with all streams, the old trail, and the archaeological sites, so the eligible area was measured as 65.6 ha.



Based on the vegetation mapping, three tree species were selected by the IFS´s specialists: *Cottonwood* for the grassland and the abandoned field (MU4), *Pine* in the driest heath areas, the barren land, and degraded areas (MU2), *spruce* in the more fertile heath areas (MU3) and 50/50 mix of pine and spruce in the more mixed areas (MU1).



Photographing the area with drones was done by Svarmi, a specialist in earth observation and aerial operations. Their observation was used to create all the maps for the standard, built on the original maps from the IFS. See *Attachment III - Maps* in supporting documents.

Cultural heritage:

Before any forestry implementation, a construction permit from the municipality is necessary. Part of that permit is an expert stakeholder opinion from the Cultural Heritage Agency of Iceland; after that, archaeological research is conducted on the site, if needed, based on that opinion. Archaeological research by a local archeologist Rannveig Þórhallsdóttir was implemented in April and May 2022 in Myrar. No sanctioned remains with a 100 m protection radius were found within the project area. Three archaeological remains with a 15 m protection radius were found within the project area and an old trail where a part might be older than 100 years. The PD sent a letter to the Cultural Heritage Agency where she explained they would:

1. Not plant in the old trail, even though it is likely not 100 years old.
2. Keep a 15-meter buffer zone around the two smaller ruins.
3. Keep a 50–60-meter buffer zone around the more considerable ruins, as the archeologist suggested.

The Cultural Heritage Agency accepted this suggestion. During project implementation, they also requested that the ruins be marked on-site so they would not be endangered by accident. *See Attachment I – Archaeological mapping and expert stakeholder opinion.*

Carbon stock calculation of baseline:

National research measures were used to estimate the baseline carbon stock calculation for Barren land, Grassland and Moorland/Heathland.

AGB - Grassland **–** 127.5 g/m^2
Magnússon et al. (1999). Long-term measurements and monitoring in horse paddocks. Ministerial meeting 1999, 22 (1), 276-286.
https://timarit.is/page/6853703?iabr=on#page/n283/mode/2up
The Icelandic Institute of Natural History recommended the data source.

AGB - Moorland (Dwarf birch) **–** 127.5 g/m^2
Magnússon et al. (1999). Long-term measurements and monitoring in horse paddocks. Ministerial meeting 1999, 22 (1), 276-286.
https://timarit.is/page/6853703?iabr=on#page/n283/mode/2up
Same data source used as for the Grassland.

AGB – Moorland (Heath) **–** 127.5 g/m^2
Magnússon et al. (1999). Long-term measurements and monitoring in horse paddocks. Ministerial meeting 1999, 22 (1), 276-286.
https://timarit.is/page/6853703?iabr=on#page/n283/mode/2up
Same data source used as for the Grassland.

ABG – Barren land **-** 60 gr/m2
Magnússon et al. (1999). Long-term measurements and monitoring in horse paddocks. Ministerial meeting 1999, 22 (1), 276-286.
https://timarit.is/page/6853703?iabr=on#page/n283/mode/2up

Same data source used as for the Grassland.
See B.6.2.

[1]https://www.skogur.is/static/files/rit-mogilsar/Rit-Mogilsar-33-2015.pdf

The IFS's Carbon calculator estimated the carbon fixation scenario of the future forest. – https://reiknivel.skogur.is/mat/. See also B.6.3 and attachment IV – Data from Carbon calculator in supporting documents. The Forest carbon calculator is a handy program that the IFS has developed to predict carbon sequestration in afforestation in Iceland. The forecasts are based on data from thousands of forest assessments throughout the country, which describe tree growth under different conditions. The calculator uses site quality classes for the main tree species in forestry in Iceland, on which the prediction of carbon sequestration is based, taking into account the mean sequestration and emissions on different site types.

Using the calculator involves first selecting the afforestation site on a web-based map. The calculator then creates a forecast of carbon sequestration in the area over the next fifty years for the tree species that can be cultivated there. The forecast is presented in a graph showing how sequestration gradually increases with tree growth, reaches its peak, and then declines as tree growth slows.

The choice of tree species in the calculation depends on various factors such as parts of the country, site quality and elevation. The user assesses which site quality classes are represented in the proposed forestry area, how sheltered the location is and whether fertilizer will be used. All this affects the choice of species and the predicted carbon sequestration.

There are a few factors we need to exclude when using the IFS's Carbon calculator. The calculator automatically adds a value of 1.34 tons ha/year for soil, based on national measures. We will not be measuring SOC so 87.9 tons are excluded for the calculator´s total sequestration per year. Also, the calculator automatically adds sequestration of litter, 0.517 per ha/year. Since we will not be measuring litter sequestration, we will exclude that from the calculator´s results. Since the first year is the deduction of baseline, we also have to lower the sequestration of 84.5.

Site preperation

Part of the implementation was to build a fence to keep reindeer and sheep away from the seedlings. The fence is outside the project boundaries though.

Area preparation includes soil disturbance for each plant to create a habitat and shelter for better survival. Area preparation includes creating mounds for each seedling with a tractor and particular soil preparation machine.

Photo source: www.skogur.is

Photo: Planting in abandoned grassland field

Planting:

Seedlings in Myrar:

Size (ha)	Cottonwood	Pine	Spruce	Total
65,6	**15.624**	**64.923**	**52.960**	**133.507**

Seedlings: spruce, pine, and cottonwood are hand-planted with a planting tube (Pottiputki) in July and August 2022. According to the planting contractor, the equipment used is three years of age. Approx; 2.5-3.0 meters are between each seedling, so the outcome per hectare is approx. 2000-2500 seedlings, but it also depends on the density of the mounds that can be irregular in the irregular landscape.

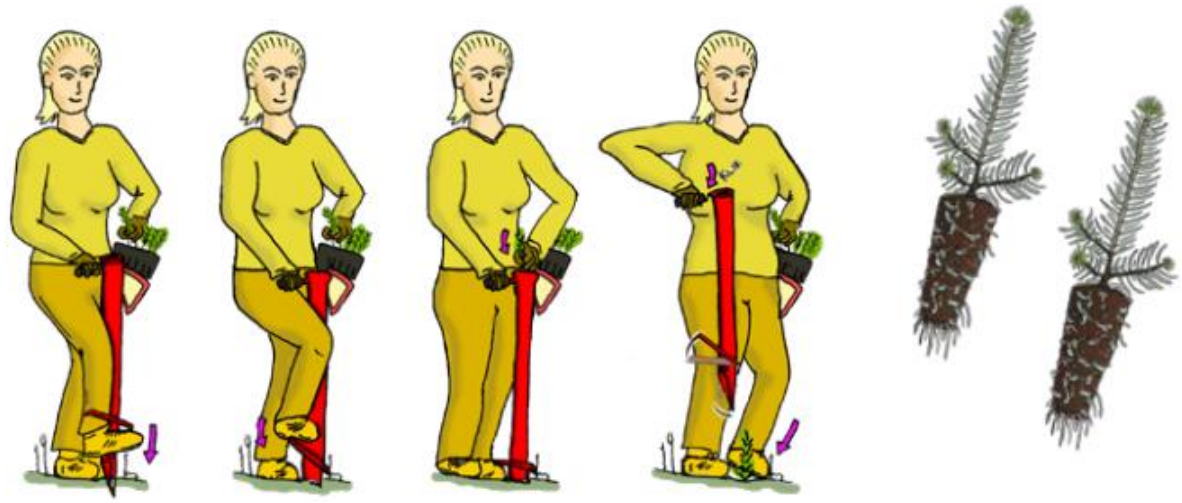


Photo source: www.skogur.is

The seedlings will be manually fertilized in May 2023 with nitrogen fertilizer, 10 grams per plant. Fertilization will be only in the first year for a better survival rate.

In three to four years, the IFS will assess the survival of trees and advise on additional planting to keep the number of plants approximately 2000 per hectare.

Monitoring and measures:

Nine factors will be monitored and measured during the 50-year project lifetime.

1. Carbon sequestration of the trees – every five years
2. Tree health – every five years
3. Forest cover – every five years
4. Distribution of pine into the non-eligible areas – every five years
5. Economic flow into the local community – every five years
6. Fences - annually
7. Invasive species (Lupine) – annually
8. Stakeholder communication – annually
9. Male and female involvement in the project – annually

The monitoring plan and methods are described thoroughly in chapter B.7.

A.4 Scale of the project

The project is considered microscale. Annex B of REQUIREMENTS FOR LUF SMALLHOLDER & MICROSCALE PROJECTS: Section 1.1.5 states 'Microscale projects

are defined as projects with a project area of maximum 500ha’. The Project Area for this project is 93 ha. The project owner plans to add more areas in the next few years and reach a maximum of 500 ha for more financial feasibility. The next property included will be Egilssel in Fell in Mulathing, with an estimated project area of 300 ha.

A.5 Funding sources of project

The project receives private funding from the owners of Yggdrasill Carbon ehf, the project owner and angel investors. For future project activity, income from sold carbon credits will be a necessary part of the funding source.

SECTION B. APPLICATION OF APPROVED GOLD STANDARD METHODOLOGY (IES) AND/OR DEMONSTRATION OF SDG CONTRIBUTIONS

B.1. Reference of approved methodology (ies)

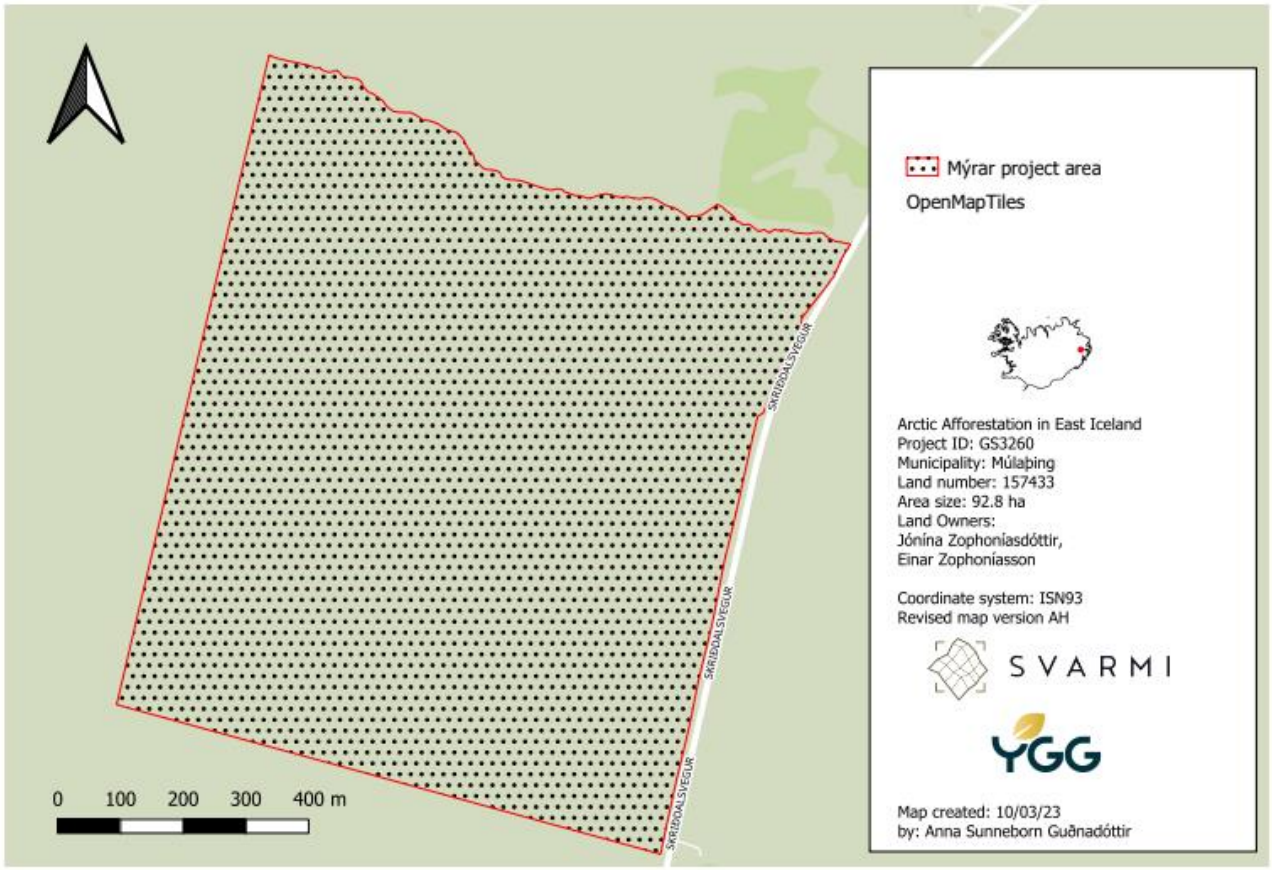
Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology, Version 1 – Published in July 2017. This is the latest version of the methodology.

B.2. Applicability of methodology (ies)

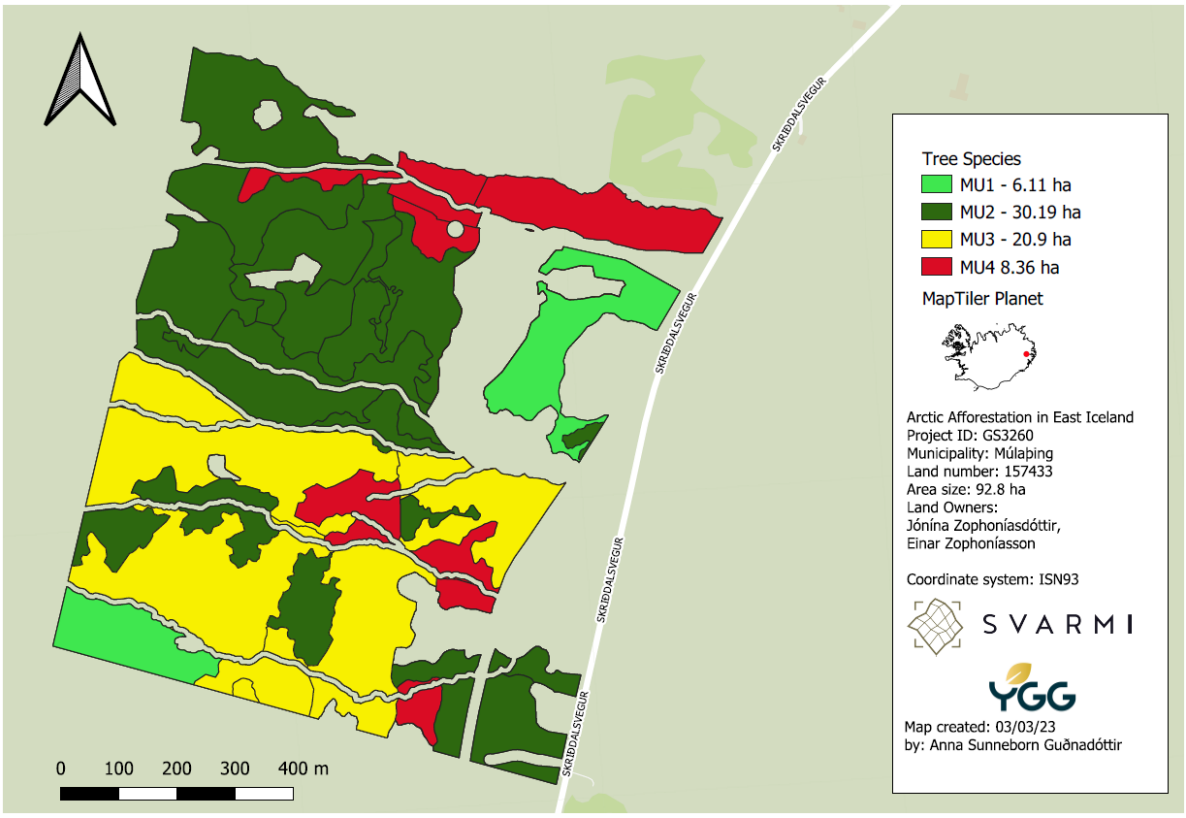
1. The project does apply Gold Standard for the Global Goals Principles & Requirements.
2. The project does apply the Gold Standard Emissions Reduction and Sequestration Product Requirements
3. The project does apply the Gold Standard LUF Activity Requirements.
4. The project does apply the Gold Standard Requirements for LUF Microscale Projects
5. The project does apply the Gold Standard Safeguarding Requirements
6. The project developer undertakes the stated processes for design certification, performance certification, and future new area certification.
7. The project land did not meet the definition of 'forest' at the start of planting nor ten years before.
8. The project applies the stated silvicultural systems: conservation forest.
9. The project area is not on wetland but there are wet patches that are excluded from planting and are to be utilized for biodiversity conservation.
10. No draining or irrigation will be implemented.
11. The baseline is defined for the project area as mainly dry Moorland / Heathland with limited sheep grazing. The baseline scenario does not include any activities that would show an increase in baseline biomass.

B.3. Project boundary

The physical project boundary will be defined with a stream on the north side, fencing poles on the south and west side and ditch on the east side.



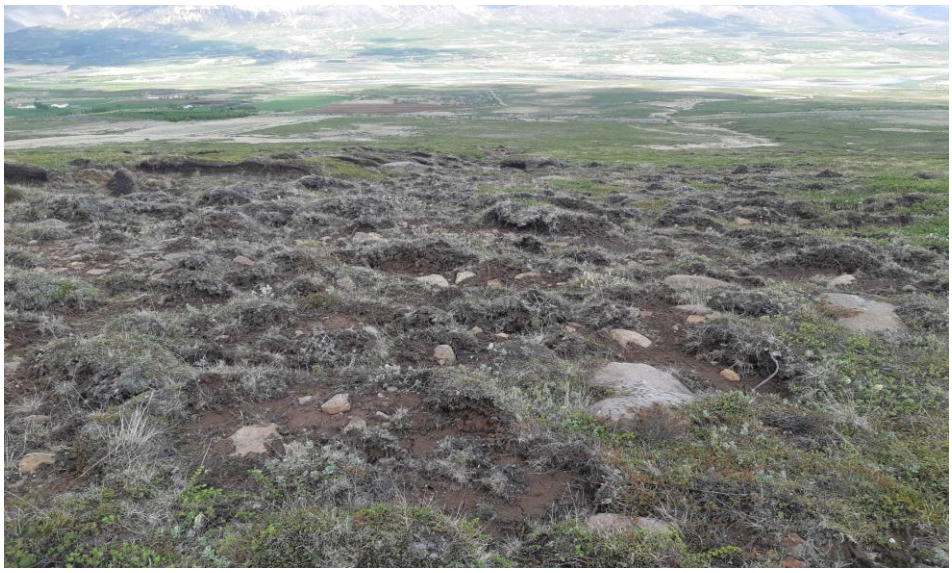
Modelling units



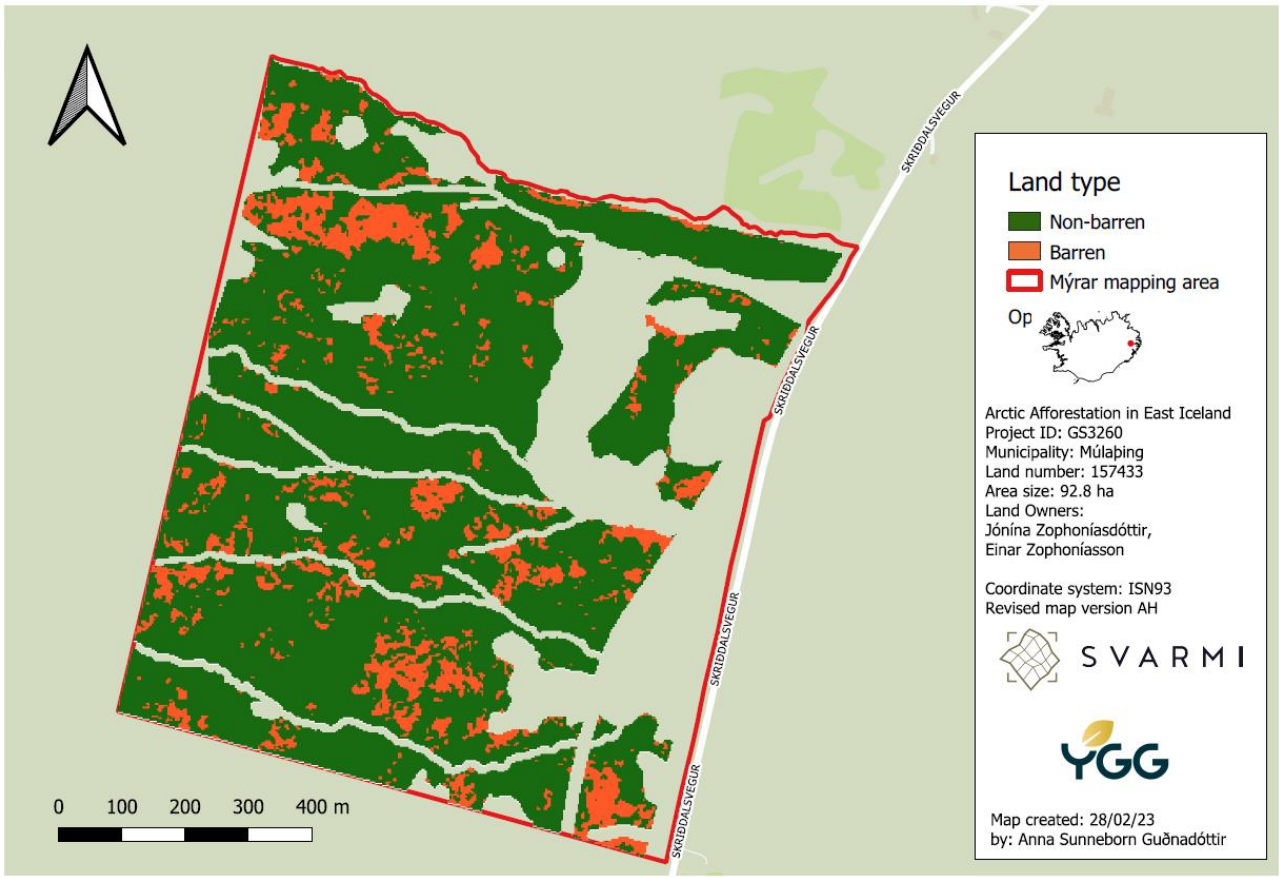
Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Moorland Grassland Barren land	CO_2	**Yes**	The carbon content of the moorland/heathland, grassland and barren land is included in the baseline calculation.
		CH_4	**No**	No land use in the area, no other GHG emissions
		N_2O	**No**	Although there is a potential for N_2O emissions from urine deposited by livestock, it was conservatively excluded from baseline calculations since grazing is very limited in the area today.
		…		
	Source 2	CO_2		
		CH_4		
		N_2O		
		…		
	…	…		
		…		
		…		
Project scenario	Tree biomass	CO_2	**Yes**	Carbon fixed in woody biomass is calculated for accreditation
		CH_4	**No**	Tree-planting has a negligible direct effect on this GHG
		N_2O	**No**	Tree-planting has a negligible direct effect on this GHG
		…		
	Soil	CO_2	**No**	
		CH_4	**No**	N/A
		N_2O	**No**	N/A
		…		
	N_2O fertilizer	CO_2	**No**	Fertilizer application has a negligible direct effect on this GHG
		CH_4	**No**	Fertilizer application has a negligible direct effect on this GHG
		N_2O	**Yes**	The release of this GHG from fertilizer applications is material and deducted from VER accreditation by the project

B.4. Establishment and description of baseline scenario

The project area is characterized by heather and dwarf birch with eroded, less vegetated areas in between, wetland, and grassland. The area was for years subject to extensive grazing, but today only slight grazing remains in the area. One abandoned field (4 ha) is on site. There were four ruins located in the area but there has been no agricultural land use on this plot (except for the field) for at least 120 years.



The weather in the area is characterized by mild summers and harsh winters. It is open to the northern winds and has eroded areas in between.



Even though grazing has been limited over the last few years, the vegetation cover is fragile and open to erosion.

It is difficult to say how future climate change will affect the baseline scenario. The Scientific Committee on Climate Change, led by the Icelandic Met Office, has been monitoring the impacts of climate change in Iceland since 2007, and their third report was published in 2018[3]. They expect warmer winters and reduced amplitude of the seasonal cycle. However, even though the warming in Iceland has generally been favorable for plant productivity, this might result in a freeze-thaw process in the soil during the wintertime, which could encourage erosion. Warming has also led to increased frequency and intensity of climate and weather extremes worldwide and has contributed to land degradation in many regions[4].

There are two possible baseline scenarios identified. One is the continuation of the pre-project land use, which is limited grazing and erosion. The other one is the PES Scheme, forestry funded by the Icelandic state if the landowners expand their contract into this property plot. The first scenario will likely add to the land

degradation, and the second is both expensive and time-consuming for the landowners. Many landowners within the PES Scheme wait their turn.

[3] https://en.vedur.is/climatology/iceland/climate-report
[4] https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report_smaller.pdf

B.5. Demonstration of additionality

Use this table for Automatic Additionality Only – delete if N/A

Specify the methodology, activity requirement or product requirement that establishes deemed additionality for the proposed project (including the version number and the specific paragraph, if applicable).	Additionality was established using the A/R CDM 'Combined tool to identify the baseline scenario, and demonstrate additionality as per GS4GG LAND USE & FORESTS ACTIVITY REQUIREMENTS Version 1.2.1, Paragraph 3.1.16(a)
Describe how the proposed project meets the criteria for deemed additionality.	Additionality was established by (1) using **alternative land use scenarios** and (2) **barrier analysis** to establish that the *pre-project scenario* is the baseline scenario and (4) **common practice analysis** to be sure that the project activity is not the common practice for similar land in the region.

B.5.1 Prior Consideration

N/A

B.5.2 Ongoing Financial Need

Financial incentives of carbon credits are necessary to develop successful outcome of this Gold Standard forestry project. The Icelandic state has been supporting farmers since the 1990s in the PES scheme (Payment for ecosystem services) but the budget for the scheme is low each year. Because there are no timber revenues from the project (conservation for 50 years), the project relies on carbon credits for the financing of the project throughout the project period. Therefore, these afforestation activities would not happen without carbon credits.

B.6. Sustainable Development Goals (SDG) outcomes

Relevant Target/Indicator for each of the three SDGs

Sustainable Development Goals Targeted	Most relevant SDG Target	SDG Impact Indicator (Proposed or SDG Indicator)
13 Climate Action (mandatory)	13.2 Integrate climate change measures into policies, strategies, and planning	Reduction in GHGs emissions
15. Life on land	15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	Increased area (ha) under tree canopy cover (which might not be large enough to be considered forest as per DNA or host country definition of the forest)
8. Decent work and economic growth	8.9 By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products	Increasing employment opportunities. $ value paid towards local companies.

B.6.1 Explanation of methodological choices/approaches for estimating the SDG Impact

SDG13 – Climate Action

Project-specific target: Mitigate adverse climate effects through the sequestration of atmospheric carbon in afforested areas.

Methods:

- On-site vegetation mapping in the project area by the IFS.
- Aerial mapping with drones by a specialist in earth observation and aerial operations
- Determine the carbon stock of the current vegetation in the project area based on vegetation classes in the area, national research measures and the default root to shoot ratio parameter 4,0, from the Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology.
    - **Above-ground biomass was estimated as follows:**
        - **Grassland** (8.4 ha of the eligible planting area): assumed to be 127.5 g/m^2, based on national published measurements from Iceland (Magnússon et al., 1999). Source recommendation from the Icelandic Institute of Natural History.

        - **Dry Moorland / Heathland** - Dwarf birch and Heath (57.2 ha of the eligible planting area): assumed to be 127.5 g/m^2, based on published measurements from Iceland (Magnússon et al., 1999).
        - **Barren land** (0.3 ha of the eligible planting area): assumed to be 60 g/m^2, based on national published measurements from Iceland (Magnússon et al., 1999).
    - **Below-ground biomass was estimated as follows:**
        - **Grassland** (8.4 ha of the eligible planting area): assumed to be 510 g/m^2, based on the default parameter from the Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology.
        - **Moorland & Heathland** - Dwarf birch and Heath (57.2 ha of the eligible planting area): assumed to be 510 g/m^2, based on the default parameter from the Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology.
        - **Barren land** (0.3 ha of the eligible planting area): assumed to be 240 g/m^2, based on the default parameter from the Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology.
    - **Total AGB and BGB (tons):**
        - **Grassland:** 1.275 t/ha + 5.1 t/ha x 8.4 ha = **53.55 tons**
        - **Moorland & Heathland:** 1.275 t/ha + 5.1 t/ha x 57.2 ha = **364,65 tons**
        - **Barren land:** 0.6 t/ha + 2.4 t/ha x 0.3 ha = **0.9 tons**
        - Total biomass of the 65.6 ha project area: 419.1 tons
    - **Total CO_2e for the non-tree carbon pool was then estimated as follows: (Total biomass=419.1)*0.4*3.67 = 615.2 t CO_2e.**
- Fencing to keep sheep and reindeer out of the project area.
- Area preparation / soil disturbing for better shelter and higher survival rate.
- Plant seedlings: pine, spruce, and cottonwood which are three of the most common tree species in Icelandic forestry.
- Fertilizer distribution for better survival rate. Only one time in the first year.
- Stratify the planted area and select a subset of plots for management and enumeration purposes.
- Manage the forest to maintain or increase its health and growth rate, including weeding and thinning as necessary.
- Control invasive plants and animal species.
- Conduct an audit of carbon fixation every five years by on-ground measurement of tree biomass (Attachment V – Biomass Calculation - IFS). For each measured tree:
    - **Spruce:** Above-ground biomass (AGB, kg) is calculated directly from diameter at 1) stem base the first 10 years, 2) 0,5 meters the next 10 years, and 3) 1.3 meters the remaining 30 years.
        - **AGB 1:** 9.03972E-05 & 0.636759124 kg (Snorrason, unpublished equation)
        - **AGB 2:** 0.170320499 & 8.732186101 kg (Bjarnadóttir et. al. 2007)
        - **AGB 3:** 1.301677989 & 137.2889609 kg (Snorrason & Einarsson 2006)

    - **Spruce:** Below-ground biomass (BGB, kg) is calculated according to root to shoot ratio at 1) stem base the first 10 years, 2) 0.5metres the next 10 years, and 3) 1.3 metres the remaining 30 years.
        - **BGB 1:** 6.90093E-05 & 0.228956804 kg. (Snorrason unpublished equation)
        - **BGB 2:** 0.045252363 & 2.369721098 kg. (Bjarnadóttir et. al. 2007)
        - **BGB 3:** 0.325419497 & 34.32224023 kg. (Snorrason et. al. 2002)

- **Pine:** Above-ground biomass (AGB, kg) is calculated directly from diameter at 1) stem base the first 10 years, 2) 0.5 metres the next 10 years, and 3) 1.3 meters the remaining 30 years.
  - **AGB 1:** 9.03972E-05 & 0.636759124 kg. (Snorrason unpublished equation)
  - **AGB 2:** 0.170320499 & 8.732186101 kg. (Bjarnadóttir et. al. 2007)
  - **AGB 3:** 2.90114448 & 153.6526679 kg. (Snorrason unpublished equation)

- **Pine:** Below-ground biomass (BGB, kg) is calculated according to root to shoot ratio at 1) stem base the first 10 years, 2) 0,5metres the next 10 years, and 3) 1.3 meters the remaining 30 years.
  - **BGB 1:** 6.90093E-05 & 0.228956804 kg. (Snorrason unpublished equation)
  - **BGB 2:** 0.045252363 & 2.369721098 kg (Bjarnadóttir et. al. 2007)
  - **BGB 3:** 0.72528612 & 38.41316699 kg. (Snorrason unpublished equation)

- **Cottonwood:** Above-ground biomass (AGB, kg) is calculated directly from diameter at 1) stem base the first 10 years, 2) 0,5 metres the next 10 years, and 3) 1,3 meters the remaining 30 years.
  - **AGB 1:** 9.03972E-05 & 0.636759124 kg. (Snorrason unpublished equation)
  - **AGB 2:** 0.432253991 & 0.93491407 kg (Jónsson, 2007)
  - **AGB 3:** 1.829755002 & 98.74872666 kg. (Snorrason & Einarsson 2006)

- **Cottonwood:** Below-ground biomass (BGB, kg) is calculated according to root to shoot ratio at 1) stem base the first 10 years, 2) 0,5metres the next 10 years, and 3) 1,3 meters the remaining 30 years.
  - **BGB 1:** 6.90093E-05 & 0.228956804 kg. (Snorrason unpublished equation)
  - **BGB 2:** 0.108063498 & 0.233728517 kg. (Snorrason et. al. 2002)
  - **BGB 3:** 0.660063103 & 1.656492031 kg. (Snorrason et. al. 2002)

- For each measured plot (100 m2)
  - Total biomass per plot calculated (AGB+BGB = Plot TB)
  - Plot CO_2e = 0.5x3.67x(plot TB)
- For each Modelling Unit:
  - Per-ha CO_2 equivalents sequestered = (plot TB) x 10^4/Plot area (in square meters)

- With each new measurement, the forest growth model is updated to project growth and carbon fixation rates into the future.
- Certify the integrity of the above steps against the Gold Standard certification scheme and issue VERs.

SDG15 – Life on Land

Project-Specific Target: Increase area under tree canopy cover.

Methods/steps used:

1. Plant seedlings to 65.6 ha of land, 2000 seedlings per ha.
2. Quantify the success through aerial photos of the area every five years.
3. With each new measurement, we update the tree canopy cover map.
4. Certify the integrity of the above steps against the Gold Standard certification scheme.

SDG8 - Decent work and economic growth

Project Specific Target: Promote new job opportunities for residents in the region (East Iceland) and add value to the local community.

Methods/steps used:

1. Aim to hire residents of East Iceland and trade with local contractors and companies throughout the project period.
1. Quantify the success through total annual expenses to employees and contractors in the region and local companies.
2. Certify the integrity of the above steps against the Gold Standard certification scheme.

Copy the table for each piece of data and parameter; use headings to group parameter tables by SDG

B.6.2 Data and parameters fixed ex ante

SDG13

Data/parameter	CO_2/C(mass)
Unit	tCO_2/tC
Description	Conversion factor
Source of data	Molecular carbon dioxide relative to that of each carbon atom
Value(s) applied	3.67
Choice of data or Measurement methods and procedures	Gold Standard default factor: 44/12 = 3.67
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	tC/tdm – non tree biomass
Unit	tC/tdm (total carbon of total dead mass)
Description	Carbon content of non-tree biomass
Source of data	Default factor in Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology
Value(s) applied	0.4 tC/tdm
Choice of data or Measurement methods and procedures	N/A

Purpose of data	Calculation of baseline
Additional comment	

Data/parameter	AGB - Grassland
Unit	Grams per square meter
Description	Above-ground biomass of grassland
Source of data	Magnússon et al. (1999). Long-term measurements and monitoring in horse paddocks. Ministerial meeting 1999, 22 (1), 276-286. https://timarit.is/page/6853703?iabr=on#page/n283/mode/2up
Value(s) applied	127.5 g/m^2
Choice of data or Measurement methods and procedures	Data source recommendation from the Icelandic Institute of Natural History.
Purpose of data	Calculation of baseline
Additional comment	

Data/parameter	BGB - Grassland
Unit	Grams per square meter
Description	Below-ground biomass of Grassland
Source of data	Recommended parameter in the Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology
Value(s) applied	AGB-Grassland x 4 = 127.5 x 4 = **510** g/m^2
Choice of data or Measurement methods and procedures	Gold Standard
Purpose of data	Calculation of baseline
Additional comment	

Data/parameter	Baseline carbon per hectare - Grassland

Unit	t CO2e per hectare
Description	Non-tree baseline carbon represented by grassland
Source of data	Function of above values
Value(s) applied	9.36 t CO_2e/ha
Choice of data or Measurement methods and procedures	1 [**AGB(Grassland)+BGB(Grassland)**] * convert(m^2-ha) * convert(g-t) * **tC/tdm(Grassland)** * **mass(CO2e/C)** 2 = (127.5+510)*10^4/10^6*0.4*3.67 = 9.36 t CO_2e/ha.
Purpose of data	Calculation of baseline
Additional comment	

Data/parameter	AGB - Moorland (dwarf birch)
Unit	Grams per square meter
Description	Above-ground biomass of moorland / dwarf birch
Source of data	Magnússon et al. (1999). Long-term measurements and monitoring in horse paddocks. Ministerial meeting 1999, 22 (1), 276-286. https://timarit.is/page/6853703?iabr=on#page/n283/mode/2up
Value(s) applied	127.5 g/m^2
Choice of data or Measurement methods and procedures	Same data source used as for the Grassland.
Purpose of data	Calculation of project scenario
Additional comment	East Iceland Nature Research Centre is working on more fitting data.

Data/parameter	BGB - Moorland / Dwarf Birch
Unit	Grams per square meter
Description	Below-ground biomass of moorland / dwarf birch
Source of data	Recommended parameter in the Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology

Value(s) applied	AGB x 4 = 127.5 x 4 = 510 gr/m2
Choice of data or Measurement methods and procedures	Gold Standard
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	Baseline carbon - Moorland / Dwarf Birch
Unit	t CO2e per hectare
Description	Non-tree baseline carbon represented by Moorland / Dwarf birch
Source of data	Function of above values
Value(s) applied	9.36 t CO_2e/ha
Choice of data or Measurement methods and procedures	3 [**AGB(Moorland)**+**BGB(Moorland)**] * convert(m^2-ha) * convert(g-t) * **tC/tdm (Moorland)** * **mass(CO2e/C)** 4 = (127.5+510)*10^4/10^6*0.4*3.67 = 9.36 t CO_2e/ha.
Purpose of data	Calculation of baseline
Additional comment	

Data/parameter	AGB - Moorland - Heath
Unit	Grams per square meter
Description	Above-ground biomass of Moorland - Heath
Source of data	Magnússon et al. (1999). Long-term measurements and monitoring in horse paddocks. Ministerial meeting 1999, 22 (1), 276-286. https://timarit.is/page/6853703?iabr=on#page/n283/mode/2up
Value(s) applied	127.5 gr/m2
Choice of data or Measurement methods and procedures	Same data source used as for the Grassland.
Purpose of data	Calculation of project scenario

Additional comment	East Iceland Nature Research Centre is working on more fitting data.

Data/parameter	BGB - Moorland - Heath
Unit	Grams per square meter
Description	Below-ground biomass of moorland
Source of data	Recommended parameter in the Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology
Value(s) applied	AGB x 4 = 127.5 x 4 = 510 gr/m2
Choice of data or Measurement methods and procedures	Gold Standard
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	Baseline carbon - Heath
Unit	t CO2e per hectare
Description	Non-tree baseline carbon represented by Moorland - Heath
Source of data	Function of above values
Value(s) applied	9.36 t CO_2e/ha
Choice of data or Measurement methods and procedures	5 [**AGB(Moorland - Heath)**+**BGB(Moorland - Heath)**] * convert(m^2-ha) * convert(g-t) * **tC/tdm(Moorland - Heath)** * **mass(CO2e/C)** 6 = (127.5+510)*10^4/10^6*0.4*3.67 = 9.36 t CO_2e/ha.
Purpose of data	Calculation of baseline
Additional comment	

Data/parameter	ABG – Barren land
Unit	Grams per square meter
Description	Above-ground biomass of Barren land

Source of data	Magnússon et al. (1999). Long-term measurements and monitoring in horse paddocks. Ministerial meeting 1999, 22 (1), 276-286. https://timarit.is/page/6853703?iabr=on#page/n283/mode/2up
Value(s) applied	60 gr/m2
Choice of data or Measurement methods and procedures	Same data source used as for the Grassland.
Purpose of data	Calculation of baseline
Additional comment	East Iceland Nature Research Centre is working on more fitting data.

Data/parameter	BGB – Barren land
Unit	Grams per square meter
Description	Below-ground biomass of barren land
Source of data	Recommended parameter in the Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology
Value(s) applied	60 X 4 = 240 gr/m2
Choice of data or Measurement methods and procedures	Gold Standard
Purpose of data	Calculation of baseline
Additional comment	

Data/parameter	Baseline carbon – Barren land
Unit	tCO2e per hectare
Description	Non-tree baseline carbon represented by Barren land
Source of data	Function of above values
Value(s) applied	0.05 t CO_2e/ha

Choice of data or Measurement methods and procedures	7 [**AGB(Barren land - Heath)+BGB(Barren land - Heath)**] * convert(m^2-ha) * convert(g-t) * **tC/tdm(Moorland - Heath)** * **mass(CO2e/C)** 8 = (60+240)*10^4/10^6*0.4*3.67 = 0.05 t CO_2e/ha.
Purpose of data	Calculation of baseline
Additional comment	

Data/parameter	tC/tdm – tree biomass
Unit	tC/tdm (total carbon of total dead mass)
Description	Carbon content of tree biomass
Source of data	Default factor in Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology
Value(s) applied	0.5 tC/tdm
Choice of data or Measurement methods and procedures	N/A

Data/parameter	AGB - Spruce
Unit	Kg
Description	The coefficients are used to find above-ground biomass in kg from two various diameters (mm) at stem base.
Source of data	Snorrason unpublished equation
Value(s) applied	Diameter 6 mm: 9.03972E-05 kg. Diameter 60 mm: 0.636759124 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	AGB - Spruce

Unit	Kg
Description	The coefficients are used to find above-ground biomass in kg from two various diameters (mm) at 0,5 m height
Source of data	Bjarnadóttir et. al. 2007 Single tree biomass and volume functions for young Siberian larch trees (Larix sibirica) in eastern Iceland B. Bjarnadottir, A. C. Inghammar, M.-M. Brinker and B. D. Sigurdsson Icelandic Agricultural Sciences 2007 Vol. 20 Pages 125-135 http://www.landbunadur.is/landbunadur/wgsamvef.nsf/key2/index.html
Value(s) applied	Diameter 12 mm: 0.170320499 kg. Diameter 92 mm: 8.732186101 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	AGB - Spruce
Unit	Kg
Description	The coefficients are used to find above-ground biomass in kg from two various diameters (mm) at 1,3 metre height
Source of data	Snorrason & Einarsson 2006 Single-tree biomass and stem volume functions for eleven tree species used in Icelandic forestry A. Snorrason and S. F. Einarsson Icelandic Agricultural Sciences 2006 Vol. 19 Pages 15-24
Value(s) applied	Diameter 27 mm: 1.301677989 kg. Diameter 250 mm: 137.2889609 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.

Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	BGB - Spruce
Unit	Kg
Description	The coefficients are used to find below-ground biomass in kg from two various diameters (mm) at stem base.
Source of data	Snorrason unpublished equation
Value(s) applied	Diameter 6 mm: 6.90093E-05 kg. Diameter 60 mm: 0.228956804 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	BGB - Spruce
Unit	Kg
Description	The coefficients are used to find below-ground biomass in kg from two various diameters (mm) at 0,5 metres
Source of data	Bjarnadóttir et. al. 2007 Single tree biomass and volume functions for young Siberian larch trees (Larix sibirica) in eastern Iceland B. Bjarnadottir, A. C. Inghammar, M.-M. Brinker and B. D. Sigurdsson Icelandic Agricultural Sciences 2007 Vol. 20 Pages 125-135 http://www.landbunadur.is/landbunadur/wgsamvef.nsf/key2/index.html
Value(s) applied	Diameter 12 mm: 0.045252363 kg. Diameter 92 mm: 2.369721098 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.

Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	BGB - Spruce
Unit	Kg
Description	The coefficients are used to find below-ground biomass in kg from two various diameters (mm) at 1.3 metres
Source of data	Snorrason et. al. 2002 Constant root/shoot ratio = 0.25 Carbon sequestration in forest plantations in Iceland A. Snorrason, B. D. Sigurdsson, G. Guðbergsson, K. Svavarsdóttir and Þ. H. Jónsson Icelandic Agricultural Sciences 2002 Vol. 15 Pages 81-93
Value(s) applied	Diameter 27 mm: 0.325419497 kg. Diameter 250 mm: 34.32224023 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	AGB - Pine
Unit	Kg
Description	The coefficients are used to find above-ground biomass in kg from two various diameters (mm) at stem base.
Source of data	Snorrason unpublished equation
Value(s) applied	Diameter 6 mm: 9.03972E-05 kg. Diameter 60 mm: 0.636759124 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	AGB - Pine
Unit	Kg
Description	The coefficients are used to find above-ground biomass in kg from two various diameters (mm) at 0,5 metres
Source of data	Bjarnadóttir et. al. 2007 Single tree biomass and volume functions for young Siberian larch trees (Larix sibirica) in eastern Iceland B. Bjarnadottir, A. C. Inghammar, M.-M. Brinker and B. D. Sigurdsson Icelandic Agricultural Sciences 2007 Vol. 20 Pages 125-135 http://www.landbunadur.is/landbunadur/wgsamvef.nsf/key2/index.html
Value(s) applied	Diameter 12 mm: 0.170320499 kg. Diameter 92 mm: 8.732186101 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	AGB - Pine
Unit	Kg
Description	The coefficients are used to find above-ground biomass in kg from two various diameters (mm) at 1,3 metres
Source of data	Snorrason unpublished equation
Value(s) applied	Diameter 42 mm: 2.90114448 kg. Diameter 250 mm: 153.6526679 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	BGB - Pine
Unit	Kg

Description	The coefficients are used to find below-ground biomass in kg from two various diameters (mm) at stem base
Source of data	Snorrason unpublished equation
Value(s) applied	Diameter 6 mm: 6.90093E-05 kg. Diameter 60 mm: 0.228956804 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	BGB - Pine
Unit	Kg
Description	The coefficients are used to find below-ground biomass in kg from two various diameters (mm) at stem base
Source of data	Bjarnadóttir et. al. 2007 Single tree biomass and volume functions for young Siberian larch trees (Larix sibirica) in eastern Iceland B. Bjarnadottir, A. C. Inghammar, M.-M. Brinker and B. D. Sigurdsson Icelandic Agricultural Sciences 2007 Vol. 20 Pages 125-135 http://www.landbunadur.is/landbunadur/wgsamvef.nsf/key2/index.html
Value(s) applied	Diameter 12 mm: 0.045252363 kg. Diameter 92 mm: 2.369721098 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	BGB - Pine
Unit	Kg
Description	The coefficients are used to find below-ground biomass in kg from two various diameters (mm) at stem base

Source of data	Snorrason unpublished equation
Value(s) applied	Diameter 42 mm: 0.72528612 kg. Diameter 250 mm: 38.41316699 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	AGB - Cottonwood
Unit	Kg
Description	The coefficients are used to find above-ground biomass in kg from two various diameters (mm) at stem base
Source of data	Snorrason unpublished equation
Value(s) applied	Diameter 6 mm: 9.03972E-05 kg. Diameter 60 mm: 0.636759124 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	AGB - Cottonwood
Unit	Kg
Description	The coefficients are used to find above-ground biomass in kg from two various diameters (mm) at 0,5 metres
Source of data	Jón Ágúst Jónsson 2007 Áhrif skógræktaraðgerða á viðarvöxt og flæði kolefnis í asparskógi Háskóli Íslands Master 2007
Value(s) applied	Diameter 21 mm: 0.432253991 kg. Diameter 30 mm: 0.93491407 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.

Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	AGB - Cottonwood
Unit	Kg
Description	The coefficients are used to find above-ground biomass in kg from two various diameters (mm) at 1,3 metres
Source of data	Jón Ágúst Jónsson 2007 Áhrif skógræktaraðgerða á viðarvöxt og flæði kolefnis í asparskógi Háskóli Íslands Master 2007
Value(s) applied	Diameter 30 mm: 2.640252413 kg. Diameter 45 mm: 6.625968125 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	AGB - Cottonwood
Unit	Kg
Description	The coefficients are used to find above-ground biomass in kg from two various diameters (mm) at 1,3 metres
Source of data	Snorrason & Einarsson 2006 Single-tree biomass and stem volume functions for eleven tree species used in Icelandic forestry Icelandic Agricultural Sciences 2006 Vol. 19 Pages 15-24
Value(s) applied	Diameter 46 mm: 1.829755002 kg. Diameter 250 mm: 98.74872666 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	BGB - Cottonwood
Unit	Kg
Description	The coefficients are used to find below-ground biomass in kg from two various diameters (mm) at stem base
Source of data	Snorrason unpublished equation
Value(s) applied	Diameter 6 mm: 6.90093E-05 kg. Diameter 60 mm: 0.228956804 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	BGB - Cottonwood
Unit	Kg
Description	The coefficients are used to find below-ground biomass in kg from two various diameters (mm) at 0,5 metres
Source of data	Snorrason et. al. 2002 Constant root/shoot ratio = 0.25 Carbon sequestration in forest plantations in Iceland A. Snorrason, B. D. Sigurdsson, G. Guðbergsson, K. Svavarsdóttir and Þ. H. Jónsson Icelandic Agricultural Sciences 2002 Vol. 15 Pages 81-93
Value(s) applied	Diameter 21 mm: 0.108063498 kg. Diameter 30 mm: 0.233728517 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	BGB - Cottonwood
Unit	Kg

Description	The coefficients are used to find below-ground biomass in kg from two various diameters (mm) at 1,3 metres
Source of data	Snorrason et. al. 2002 Constant root/shoot ratio = 0.25 Carbon sequestration in forest plantations in Iceland A. Snorrason, B. D. Sigurdsson, G. Guðbergsson, K. Svavarsdóttir and Þ. H. Jónsson Icelandic Agricultural Sciences 2002 Vol. 15 Pages 81-93
Value(s) applied	Diameter 30 mm: 0.660063103 kg. Diameter 45 mm: 1.656492031 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	BGB - Cottonwood
Unit	Kg
Description	The coefficients are used to find below-ground biomass in kg from two various diameters (mm) at 1,3 metres
Source of data	Snorrason et. al. 2002 Constant root/shoot ratio = 0.25 Carbon sequestration in forest plantations in Iceland A. Snorrason, B. D. Sigurdsson, G. Guðbergsson, K. Svavarsdóttir and Þ. H. Jónsson Icelandic Agricultural Sciences 2002 Vol. 15 Pages 81-93
Value(s) applied	Diameter 46 mm: 0.457438751 kg. Diameter 250 mm: 24.68718167 kg.
Choice of data or Measurement methods and procedures	Recommended data by Arnór Snorrason, carbon sequestration specialist at the Icelandic Forest Service.
Purpose of data	Calculation of project scenario
Additional comment	

Data/parameter	N fertilizer deduction

Unit	tCO_2e/kgN
Description	Fertilization with nitrogen causes the release of N_2O, a greenhouse gas with approximately 300 times the global warming potential of CO_2. This parameter provides a coefficient to the tons of N fertilizer applied to calculate the relevant CO_2 deduction.
Source of data	Gold Standard Afforestation/Reforestation (A/R) GHG Emissions Reduction & Sequestration Methodology
Value(s) applied	0.005 tCO_2 per kg of nitrogen (N) fertilizer applied
Choice of data or Measurement methods and procedures	N/A
Purpose of data	Calculation of project scenario
Additional comment	

B.6.3 Ex ante estimation of SDG Impact

SDG 13:

To measure the estimated project benefit from forest CO2e fixation, YGG uses the Forest Carbon Calculator https://reiknivel.skogur.is/mat/ .The Forest Carbon Calculator (FCC) is an application that helps to estimate roughly the potential carbon sequestration of new forests, considering their location in Iceland, growth, land type, shelter (based on location) and tree species. You can choose between three land types and five tree species, all of which have in common that they are the main tree species in forestry and have many decades of cultivation history in Iceland.

For this project the GPS coordinates in the IFS calculator is 65,0570, -14,639.

The biomass pool in the FCC is built on hundreds of empirical measurements of the main tree species used in Icelandic forestry spread around the country. Most of the measurements were sampled from 1999 to 2001 and were documented in five publications:

https://www.skogur.is/static/files/rit-mogilsar/Rit_Mogilsar_Nr7_Juni2001.pdf
https://www.skogur.is/static/files/rit-mogilsar/Rit_Mogilsar_Nr5_Mai2001.pdf
https://www.skogur.is/static/files/rit-mogilsar/Rit_Mogilsar_Nr6_Mai2001.pdf

https://www.skogur.is/static/files/rit-mogilsar/Rit_Mogilsar_Nr13_Mai2002.pdf https://www.skogur.is/static/files/rit-mogilsar/Rit_Mogilsar_Nr14_Juni2002.pdf. These papers were written in Icelandic but with an English summary and caption of pictures and tables. These data together with data from another measurement of the five most common tree species in Icelandic forestry were used to create yield curves that describe the development of the C-stock of the trees in the forest with age. For Black cottonwood, Lodgepole pine, and Sitka spruce yield curves were built on similar curves from Britain (Hamilton & Christie 1971: Forest Management Tables (Metric)).

Some information about the FCC methodology in English on how these curves are made and how they works can be found in a new report on the estimation of the Icelandic Forest Reference Level (https://www.skogur.is/static/files/utgafa/nfap_iceland_october_2020.pdf) in accordance with Regulation (EU) No 2018/841 (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2018.156.01.0001.01.ENG).

Use of the curves and the emission/removal factors have been reviewed and approved by the international expert review team both in the UNFCCC process and the EU-GHG-LULUCF process of the Paris agreement.

As said in chapter A.3. *Technologies and measures* earlier, there are a few factors we need to exclude when using the IFS's Carbon calculator. The calculator automatically adds a value of 1.34 tons ha/year for soil, based on national measures. We will not be measuring SOC so 87.9 tons are excluded for the calculator´s total sequestration per year. Also, the calculator automatically adds sequestration of litter, 0.517 per ha/year. Since we will not be measuring litter sequestration, we will exclude that from the calculator´s results.

Results:

SDG 13:

- Uncertainty analysis will follow 'approach 3' of the Annex A (LUF Requirements). The uncertainty associated with carbon fixation estimates in forest and soil is estimated from default measures and measures outside the project region. **Therefor the uncertainty deduction is 100%.**

- According to the IFS calculator, the forest capture is expected to be 28,042 tCO2e. Included is litter and soil sequestration and sequestration in the first year.
    - The litter deduction is -1694 tCO2e
    - The soil capture deduction is - 4392 tCO2e
    - The first year deduction is – 84.5
    - 28042 – 1694 – 4392 – 84.5 = 21871 tCO2e
    - 21871 * 0.5 = 10936 tCO2
- The baseline deduction is -612 x 1.5 = 918 tCO2e
- The fertilizer deduction is -8 tCO2e
- **CO2 sequestration of the project: 10936 – 918 – 8 = 10,010 tCO2e**

SDG 15: The project will **increase tree cover in the area by 60 ha.**

SDG 8: The project **will add 410,000 USD to the local community** through employment and related cost.

B.6.4 Summary of ex ante estimates of each SDG Impact

SDG 13 – Estimated tree capture – Information from the IFS calculator (before excluding litter and soil sequestration).

Year	Baseline estimate	Project estimate	Net benefit
Year 1	918	0	-918
Year 2		84,5	84,5
Year 3		84,5	84,5
Year 4		84,5	84,5
Year 5		80,6	80,6
Year 6		194,08	194,08
Year 7		201,79	201,79
Year 8		213,18	213,18
Year 9		223,16	223,16
Year 10		236,82	236,82
Year 11		250	250
Year 12		265,3	265,3

Year 13		282,79	282,79
Year 14		301,84	301,84
Year 15		322,61	322,61
Year 16		345,57	345,57
Year 17		371,89	371,89
Year 18		398,72	398,72
Year 19		430,27	430,27
Year 20		464,05	464,05
Year 21		499,47	499,47
Year 22		538,48	538,48
Year 23		578,16	578,16
Year 24		621,76	621,76
Year 25		668,72	668,72
Year 26		712,99	712,99
Year 27		760,59	760,59
Year 28		805,34	805,34
Year 29		848,75	848,75
Year 30		887,52	887,52
Year 31		920,15	920,15
Year 32		944,21	944,21
Year 33		959,52	959,52
Year 34		965,22	965,22
Year 35		960,55	960,55
Year 36		947,74	947,74
Year 37		928,62	928,62
Year 38		903,03	903,03
Year 39		875,89	875,89
Year 40		845,83	845,83
Year 41		814,28	814,28
Year 42		784,33	784,33
Year 43		756,73	756,73
Year 44		728,93	728,93

Year 45		703,08	703,08
Year 46		677,54	677,54
Year 47		654,75	654,75
Year 48		630,95	630,95
Year 49		609,07	609,07
Year 50		589,19	589,19
Total	**918**	**27.958**	**27.040**
Total number of crediting years: 50			
Annual average over the crediting period			**541**

SDG 15

Year	Baseline estimate	Project estimate	Net benefit
Year 1	0	66	66
Year 2	0	0	0
Year 3	0	0	0
Year 4	0	0	0
Year 5	0	0	0
Year 6	0	0	0
Year 7	0	0	0
Year 8	0	0	0
Year 9	0	0	0
Year 10	0	60	60
Year 11	0	0	0
Year 12	0	0	0
Year 13	0	0	0
Year 14	0	0	0
Year 15	0	0	0
Year 16	0	0	0
Year 17	0	0	0

Year 18	0	0	0
Year 19	0	0	0
Year 20	0	59	59
Year 21	0	0	0
Year 22	0	0	0
Year 23	0	0	0
Year 24	0	0	0
Year 25	0	0	0
Year 26	0	0	0
Year 27	0	0	0
Year 28	0	0	0
Year 29	0	0	0
Year 30	0	60	60
Year 31	0	0	0
Year 32	0	0	0
Year 33	0	0	0
Year 34	0	0	0
Year 35	0	0	0
Year 36	0	0	0
Year 37	0	0	0
Year 38	0	0	0
Year 39	0	0	0
Year 40	0	0	0
Year 41	0	0	0
Year 42	0	0	0
Year 43	0	0	0
Year 44	0	0	0
Year 45	0	0	0
Year 46	0	0	0
Year 47	0	0	0
Year 48	0	0	0
Year 49	0	0	0

Year 50	0	0	0
Total ha		**60**	**60**
Total number of crediting years: 50			
Annual average over the crediting period		**1,2 ha**	**1,2 ha**

SDG 8

Year	Baseline estimate	Project estimate	Net benefit
Year 1	0	4000	4000
Year 2	0	4000	4000
Year 3	0	25000	25000
Year 4	0	4000	4000
Year 5	0	4000	4000
Year 6	0	4000	4000
Year 7	0	4000	4000
Year 8	0	25000	25000
Year 9	0	4000	4000
Year 10	0	4000	4000
Year 11	0	4000	4000
Year 12	0	4000	4000
Year 13	0	25000	25000
Year 14	0	4000	4000
Year 15	0	4000	4000
Year 16	0	4000	4000
Year 17	0	4000	4000
Year 18	0	25000	25000
Year 19	0	4000	4000
Year 20	0	4000	4000
Year 21	0	4000	4000
Year 22	0	4000	4000
Year 23	0	25000	25000

Year 24	0	4000	4000
Year 25	0	4000	4000
Year 26	0	4000	4000
Year 27	0	4000	4000
Year 28	0	25000	25000
Year 29	0	4000	4000
Year 30	0	4000	4000
Year 31	0	4000	4000
Year 32	0	4000	4000
Year 33	0	25000	25000
Year 34	0	4000	4000
Year 35	0	4000	4000
Year 36	0	4000	4000
Year 37	0	4000	4000
Year 38	0	25000	25000
Year 39	0	4000	4000
Year 40	0	4000	4000
Year 41	0	4000	4000
Year 42	0	4000	4000
Year 43	0	25000	25000
Year 44	0	4000	4000
Year 45	0	4000	4000
Year 46	0	4000	4000
Year 47	0	4000	4000
Year 48	0	25000	25000
Year 49	0	4000	4000
Year 50	0	4000	4000
Total USD		**410,000**	**410,000**
Total number of crediting years: 50			
Annual average over the crediting period		**8,200**	**8,200**

B.7. Monitoring plan

B.7.1 Data and parameters to be monitored

(Copy the table for each piece of data and parameter; use headings to group parameter tables by SDG)

Data / Parameter	Gender participation
Unit	N/A
Description	Each year, male and female involvement in the project is documented and addressed in the annual report.
Source of data	N/A
Value(s) applied	N/A
Measurement methods and procedures	Documentation
Monitoring frequency	Annually
QA/QC procedures	

Data / Parameter	Stakeholder comments
Unit	N/A
Description	All stakeholder comments will be documented and addressed in the annual report
Source of data	N/A
Value(s) applied	N/A
Measurement methods and procedures	Documentation
Monitoring frequency	Annually
QA/QC procedures	

SDG 13

Data / Parameter	Growth curve parameters
Unit	Tons/C/ha
Description	Comprehensive measurements of tree biomass
Source of data	Methods used by the Icelandic Forest Service
Value(s) applied	The parameter does not have any fixed-value dependencies
Measurement methods and procedures	On-site assessment on plots
Monitoring frequency	Every five years
QA/QC procedures	
Purpose of data	Calculation of project scenario
Additional comment	Specialists from the Icelandic Forest Service will do the measuring.

SDG 15

Data / Parameter	Tree health
Unit	Class 1-4
Description	The vitality of each tree will be visually assessed in four classes: 1. Very healthy, 2. Moderately healthy, 3. Rather weak, and 4. Very weak. Conducted in the same sampling plots as the CO2 fixation plots. Class 1 describes seedlings growing under good and normal conditions. Classes 2 and 3 describe seedlings growing under stressful and harmful conditions, but Class 4 signifies seedlings potentially dying in coming years.
Source of data	Stratification used by the Icelandic Forest Service. https://www.skogur.is/static/files/rit-mogilsar/rit-mogilsar-41_2021.pdf
Value(s) applied	The parameter does not have any fixed-value

	dependencies
Measurement methods and procedures	On-site assessment on plots
Monitoring frequency	Every 5 years
QA/QC procedures	
Purpose of data	Monitor the heath of trees for early mitigation measures or responses if needed
Additional comment	Specialists from the Icelandic Forest Service will do the assessment.

Data / Parameter	Area under canopy forest cover
Unit	ha
Description	Area under tree canopy cover
Source of data	From specialists in earth observation and aerial operations
Value(s) applied	The parameter does not have any fixed-value dependencies
Measurement methods and procedures	Aerial photography by drones
Monitoring frequency	Every five years
QA/QC procedures	
Purpose of data	Calculation of project scenario
Additional comment	Specialist in earth observation and aerial operations

Data / Parameter	Natural distribution of pine in non-eligible areas
Unit	Number of self-distributed seedlings
Description	Monitor the distribution outside the project boundary and within the non-eligible area of the project area.
Source of data	

Value(s) applied	The parameter does not have any fixed-value dependencies
Measurement methods and procedures	On site assessment
Monitoring frequency	At least every five years
QA/QC procedures	
Purpose of data	Stakeholder concerns of possible invasiveness of pine.
Additional comment	Specialists in earth observation and aerial operations

Data / Parameter	Natural distribution of invasive species (Lupine)
Unit	M2 of area with Lupine
Description	Lupine is one of two invasive plant species in Iceland and is found on the property of Myrar. We will monitor Lupine within the planting area and conduct weeding as necessary but there is no Lupine in the area now.
Source of data	
Value(s) applied	The parameter does not have any fixed-value dependencies
Measurement methods and procedures	On site assessment
Monitoring frequency	At least every five years
QA/QC procedures	
Purpose of data	Tree and vegetation health in project area
Additional comment	Specialists in earth observation and aerial operations

Data / Parameter	Monitoring of fence
Unit	N/A
Description	Part of the project area has fencing to keep sheep, reindeer, and goats away.
Source of data	

Value(s) applied	The parameter does not have any fixed-value dependencies
Measurement methods and procedures	On site assessment
Monitoring frequency	Annually
QA/QC procedures	
Purpose of data	Tree and vegetation health in project area
Additional comment	Landowner

SDG 8

Data / Parameter	Economic value generated locally via employment and other resources.
Unit	USD
Description	Economic value generated locally via employment and other resources.
Source of data	
Value(s) applied	The parameter does not have any fixed-value dependencies
Measurement methods and procedures	The project should report $ paid towards local employment and paid expenses to local companies. Local employment are all contractors, subcontractors or employees living in East Iceland. Local companies are companies in East Iceland.
Monitoring frequency	Annually
QA/QC procedures	
Purpose of data	Calculation of project scenario
Additional comment	

(SDG 13, 15 and 8)

B.7.2 Sampling plan

CO2 sequestration of trees

- Thirty plots are located without bias in positions, representative of the respective modelling unit. The number of plots should be such that there is at least 90% confidence level. Specialists from the ISF will advise.
- Field measurements on plots will be managed with hardware and software from FieldMap (see https://www.fieldmap.cz/). Each plot is a circle with a fixed size of 100 m2. To find and set out the middle of the plot, a handheld GPS-device will be used, and when the device shows 0 m distance to the middle, the plot center is set out and marked with a red colored iron rod.
- The diameter and height are measured on all plot trees.
- Every five years before each verification.

Tree canopy cover

- Aerial photos with drones are taken to estimate the tree canopy cover.
- Every five years before each verification.

Tree health

- The vitality of each tree within the plot will be visually assessed in four classes.
- Every five years before each verification
- Weeding and thinning will be conducted as necessary to enhance tree health.

Invasive plants

- Lupine is one of two invasive plant species in Iceland. We will monitor Lupine in the planting area and conduct weeding as necessary, but there is no Lupine in the area now.
- Every five years before each verification.

Pine monitoring

- Distribution of Pine will be monitored outside the project boundaries and within the non-eligible area. Pine is not invasive in Iceland, but it is stratified as possible invasive in the NOBANIS database.
- Every five years before each verification.

Fencing

- Fencing will be monitored to keep sheep, goats, and reindeer out of the planting area.
- Annual monitoring

For monitoring of local value delivered by the project

- Annual expenses to local companies are recorded.
- Annual expenses for local employees are recorded.
- Local is defined as our project region, East Iceland
- Annual monitoring

Gender participation

- Gender participation in each task throughout the project period
- Available in annual report.

Stakeholder comments

- All stakeholder comments are documented.
- Available in annual report.

B.7.3 Other elements of monitoring plan

Uncertainty analysis will follow 'approach 3' of the Annex A (LUF Requirements), whereby the uncertainty associated with carbon fixation estimates is measured from default measures and an appropriate deduction will be applied.

SECTION C. DURATION AND CREDITING PERIOD

C.1. Duration of project

C.1.1 Start date of project

26/07/2022 (first day of planting)

C.1.2 Expected operational lifetime of project

50 years

C.2. Crediting period of project

C.2.1 Start date of crediting period

26/07/2022

C.2.2 Total length of crediting period

50 years

SECTION D. SUMMARY OF SAFEGUARDING PRINCIPLES AND GENDER SENSITIVE ASSESSMENT

D.1 Safeguarding Principles that will be monitored

A completed Safeguarding Principles Assessment is in Appendix 1, ongoing monitoring is summarised below.

Principles	Mitigation Measures added to the Monitoring Plan
Principle 2	Each year, male and female involvement in the project is documented and addressed in the annual report.

Principle 4.1.	Natural distribution of pine, spruce, and cottonwood are monitored in the archaeological plots.
Principle 9.2	Health of trees is monitored every five years
Principle 9.4	Any known pollution will be documented in the annual report

D.2. Assessment that project complies with GS4GG Gender Sensitive requirements

Question 1 - Explain how the project reflects the key issues and requirements of Gender Sensitive design and implementation as outlined in the Gender Policy?	The GS gender policy has gender-sensitive requirements that the project needs to reflect. The assessment of gender equality and women´s rights in the project were conducted. See APPENDIX 1. The assessment addressed no inequalities, but there is a clear division of "men´s work" and "women´s work" where workers in the field are only men, and the expert stakeholders are primarily women. Also, when considering social and other barriers that may prevent participation in consultations, the most likely risk is the higher control by men over information and resources relative to women. YGG will monitor gender participation in each task throughout the project period and in the stakeholder process. Also, there will be more emphasis on a one-on-one online or on-site meeting than large stakeholder meetings. Women are encouraged as men to participate equitably and meaningfully in project design and implementation. Even though all the workers on-site, this first year, are men, most of the expert stakeholders are women, and they have already impacted the design and implementation. This project is also implemented on private land. It will not increase gender inequity but benefit both men and women through positive climate action and boost the local economy. In the first invitation to stakeholders, 30 days before the meeting, there were 19 males and 18 females invited. Later there were five female stakeholders added to the group and one male. Current stakeholders are, therefore, 53% female and 46% male. Invitation methods were phone calls, emails, advertisements in a local newspaper (chosen to reach the elderly especially), and advertisements published on Facebook, one specifically for the Women´s Association in East Iceland. Men and women have equal opportunities and access to share and receive information through the grievances book at the municipality office, emails, phone calls, or visits to the office. YGG will document all comments to ensure all views and priorities are incorporated into design and practice.

	Each year, male and female involvement in the project is documented and addressed in the annual report.
Question 2 - Explain how the project aligns with existing country policies, strategies and best practices	The Icelandic legislation on gender equality is Act on Equal Status and Equal Rights Irrespective of Gender, No. 150/2020. The Act's objective is to prevent discrimination based on gender and maintain gender equality and equal opportunities for the genders in all spheres of society. The Directorate of Equality is a particular institution under the administration of the Prime Minister that supervises the implementation of the Act. It provides advice, public education, and information concerning gender equality. ACT on Equal Status and Equal Rights Irrespective of Gender: https://www.government.is/library/04-Legislation/Act%20on%20Equal%20Status%20and%20Equal%20Rights%20Irrespective%20of%20Gender.pdf According to the World Economic Forum and the Global Gender Gap Report 2021, Iceland is the world's best country for gender equality, topping the index for the 12th year. The score is high in all four indexes' gauges: Economic Participation and Opportunity, Educational Attainment, Health and Survival, and Political Empowerment. Iceland is also a country where women have been found in the head of state positions more frequently than the norm, or 23,5 years out of 50 years. The country is also at the top of the index regarding women in managerial positions (41,9%). Despite good results, only 86% of the gap has been closed when it comes to wages for similar jobs. In 2018, Iceland became the first country to enforce equal pay for men and women, requiring companies employing more than 25 workers to prove they pay employees in the same roles equally, regardless of their gender, sexuality, or ethnicity. The obligatory equal pay certification enforces the current legislation prohibiting discriminatory practices based on gender and requiring that women and men be paid equal wages and enjoy equal terms of employment for the same jobs or jobs of equal value. The three contractors YGG has hired for fencing, land preparing, and planting are all male. One of our primary goals is to add value to the local community, but there are no contractor businesses in this field in East Iceland run by women. To mitigate, most of the stakeholder experts and advisors are women. There is no discrimination based on gender when hiring; it is more

	subject to availability in the local area. Pay rates are based solely on the candidate's experience and the value offered to the team. Work tasks assigned are based solely on availability and expertise.
Question 3 - Is an Expert required for the Gender Safeguarding Principles & Requirements?	No
Question 4 - Is an Expert required to assist with Gender issues at the Stakeholder Consultation?	No

SECTION E. SUMMARY OF LOCAL STAKEHOLDER CONSULTATION

The below is a summary of the 2 step GS4GG Consultation for monitoring purposes. Please refer to the separate Stakeholder Consultation Report for a complete report on the initial consultation and stakeholder feedback round.

E.1 Summary of stakeholder mitigation measures

1. Species in the area have high conservation value, especially the Dwarf Willow vegetation. We will exclude plots within the project area as a mitigation measure.

2. While healthy moorland/heathland has good biodiversity, this project area is characterized with erosion (see erosion map) and few bird species (according to landowners). In absence of this project, the erosion will most likely continue and decrease biodiversity and grazing will continue in the area. There are wetland patches that will add to the biodiversity, and we will in addition exclude plots from planting, for biodiversity conservation. The East Iceland Nature Research Centre did a desk review on the area from their aerial data. This area has little vegetation diversity compared to other areas in Myrar property.

3. Pine is defined as possibly invasive by the NOBANIS database. We will monitor pine specifically and take mitigation measures if we see Pine is spreading and harming biodiversity outside the area or in the non-eligible areas.

E.2 Final continuous input / grievance mechanism

Method	Include all details of Chosen Method (s) so that they may be understood and, where relevant, used by readers.
Continuous Input /	A notebook titled 'Continuous Input and Grievance

Grievance Expression Process Book (mandatory)	Expression Process Book is kept at the municipality office in Egilsstaðir in East Iceland.
GS Contact (mandatory)	help@goldstandard.org
YGG contact	Ingibjörg Jónsdóttir ingibjorg@yggcarbon.com
Address and phone number	Fagradalsbraut 11, Egilsstaðir / 555-0944

APPENDIX 1 - SAFEGUARDING PRINCIPLES ASSESSMENT

Complete the Assessment below and copy all Mitigation Measures for each Principle into SECTION D above. Please refer to the instructions in the Guide to Completing this Form.

Assessment Questions/ Requirements	Justification of Relevance (Yes/potentially/no)	How Project will achieve Requirements through design, management or risk mitigation.	Mitigation Measures added to the Monitoring Plan (if required)
Principle 1. Human Rights			
1. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights	No	The Project Developer (PD) and the Project will respect internationally proclaimed human rights. They will not participate in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights.	Not required
2. The Project shall not discriminate with regards to participation and inclusion	No	The Project will not discriminate regarding participation and inclusion. Contractors have signed a code of ethics regarding this matter.	Not required

Principle 2. Gender Equality			
1. The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women 2. Projects shall apply the principles of non-discrimination, equal treatment, and equal pay for equal work 3. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks 4. (where required) Summary of opinions and recommendations of an Expert Stakeholder(s)	No Yes Yes	1. The project is conducted on private land that does not interfere with women's access to resources or safety. The project does not affect gender equality. 2.The project´s representatives, developers, and contractors, like all employers, are obligated to follow the *Act on Equal Status and Equal Rights Irrespective of Gender.* 3.The project's PDD refers to relevant national gender strategy 4. N/A	Each year, male and female involvement in the project is documented and addressed in the annual report.
Principle 3. Community Health, Safety and Working Conditions			
1. The Project shall avoid community exposure to increased health risks and shall not adversely	Yes	Workers are adequately trained in the safe handling of equipment and operation of dangerous machinery, if any.	Not required

affect the health of the workers and the community		Project activities do not represent a material impact on the health of surrounding communities.	
Principle 4.1 Sites of Cultural and Historical Heritage			
Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture?	Yes	Specific cultural sites have been identified and are excluded from the eligible area. Summary of the archaeological report is among documents.	Natural distribution of pine, spruce, and cottonwood are monitored in the archaeological plots every five years.
>>			
Principle 4.2 Forced Eviction and Displacement			
Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)?	No		Not required
>>			
Principle 4.3 Land Tenure and Other Rights			
a. Does the Project require any change, or have any uncertainties related to land tenure arrangements and/or access rights, usage rights or land ownership? b. For Projects involving land use tenure, are there any	No	Land and carbon credit ownership are defined by a 50-year legal contract between the Project owner and the landowner.	Not required

uncertainties with regards to land tenure, access rights, usage rights or land ownership?	No		
>>			
Principle 4.4 - Indigenous people			
Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples?	No		Not required
>>			
Principle 5. Corruption			
1. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects	No		Not required
Principle 6.1 Labour Rights			
1. The Project Developer shall ensure that all employment is in compliance with national labour occupational health and safety laws	Yes	1. All employment follows national labor laws. Contracts have been made with all employees and PD has also assisted employees with contracts for sub-contractors.	Not required

and with the principles and standards embodied in the ILO fundamental conventions 2. Workers shall be able to establish and join labour organisations 3. Working agreements with all individual workers shall be documented and implemented and include: a) Working hours (must not exceed 48 hours per week on a regular basis), AND b) Duties and tasks, AND c) Remuneration (must include provision for payment of overtime), AND d) Modalities on health insurance, AND e) Modalities on termination of the contract with provision for voluntary resignation by employee, AND	No Yes	2. Everyone could choose if they would join labor organization or not. 3. All workers sign working agreements that stipulate conditions that are locally appropriate for agricultural workers: a) Working hours do not regularly exceed 48 hours per week. b) Duties and tasks are agreed upon and documented. c) Remuneration and benefits are established in contracts. d) Health insurance is stipulated through the contractor. e) Voluntary resignation or termination is according to collective agreements. f) Annual leave is according to collective agreements. 4. Workers are 16 years or older 5. Contractor provides all employees and workers with	Not required Not required Not required

f) Provision for annual leave of not less than 10 days per year, not including sick and casual leave. 4. No child labour is allowed (Exceptions for children working on their families' property requires an Expert Stakeholder opinion) 5. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures		adequate training and supervision to safely perform their tasks if needed. Safe and appropriate equipment is provided for all tasks. Emergency preparedness and response measures are in place.	Not required
Principle 6.2 Negative Economic Consequences			
1. Does the project cause negative economic consequences during and after project implementation?	No	No negative economic impacts are predicted. Employment opportunities increase, which will produce flow-on effects on the whole local economy.	Not required
>>			
Principle 7.1 Emissions			

Will the Project increase greenhouse gas emissions over the Baseline Scenario?	No		Not required
>>			
Principle 7.2 Energy Supply			
Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users?	No	If there is any energy use, the power supply is connected to the regional grid.	Not required
>>			
Principle 8.1 Impact on Natural Water Patterns/Flows			
Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity?	No		Not required
>>			
Principle 8.2 Erosion and/or Water Body Instability			
a. Could the Project directly or indirectly cause additional	No	The area is situated on slopes, with visible water and wind	Not required

erosion and/or water body instability or disrupt the natural pattern of erosion? b. Is the Project's area of influence susceptible to excessive erosion and/or water body instability?	Yes	erosion plots in the vegetation and soil. Project will decrease erosion and water body instability.	Not required
>>			
Principle 9.1 Landscape Modification and Soil			
Does the Project involve the use of land and soil for production of crops or other products?	Yes	This is a plot on a sloping hillside, where land and soil will be used to grow forests. Forest will increase soil carbon content, lower risk of landslide, stop erosion in the area, create a shelter in an area that is very open for the harsh Arctic winds. There is a landscape modification with the forest, but the most visible boundaries are not straight lines to create natural appearances.	Not required.
>>			
Principle 9.2 Vulnerability to Natural Disaster			
Will the Project be susceptible to or lead to increased vulnerability to wind,	Yes	The project (seedlings and trees) is susceptible to winds and snow. However, the	Health of trees is monitored in spring 2023, again in two to three years and then every

earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions? >>		species used are highly adapted and resilient. Climate change will, though, have unknown effects and could affect survival &/or vegetation growth both in a positive and negative way.	five years.
Principle 9.3 Genetic Resources			
Could the Project be negatively impacted by or involve genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development, or take place in facilities or farms that include GMOs in their processes and production)? >>	No	No GMO's.	Not required.
Principle 9.4 Release of pollutants			
Could the Project potentially result in the release of pollutants to the environment? >>	Potentially	Oil spills are the most likely event during implementation and monitoring. All contractors receive environmental policy, emergency preparedness and response measures documents regarding this matter.	Any known pollution will be documented in the annual report.

Principle 9.5 Hazardous and Non-hazardous Waste			
Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials? >>	No.	No herbicides are used. Future pests or diseases will be treated with natural solutions as recommended by the Icelandic Forest Service.	Not required
Principle 9.6 Pesticides & Fertilisers			
Will the Project involve the application of pesticides and/or fertilisers? >>	Yes	No pesticides are used. Trees are fertilized only once in the first year with a blend used for these seedlings and soil, with recommendation from the IFS. Pesticides policy and Standard Operating Procedure have been developed and will be adhered to. Local sport team will distribute fertilizers and will have training beforehand.	Not required.
Principle 9.7 Harvesting of Forests			
Will the Project involve the harvesting of forests? >>	No	There is no harvest planned. Only thinning 1-2x during the project period to keep the forest healthy.	None required
Principle 9.8 Food			
Does the Project modify the	No	No crops or cropland are	None required

quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives?		affected by the project.	
>>			
Principle 9.9 Animal husbandry			
Will the Project involve animal husbandry?	No	No animal husbandry is undertaken by the project.	None required
>>			
Principle 9.10 High Conservation Value Areas and Critical Habitats			
Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified?	Yes	Part of the project area has typical moorland/heathland vegetation like Dwarf Willow bushes and Heath which have high conservation value. The whole Myrar property of 1200 ha has 600 ha of moorland/heathland vegetation where Dwarf Willow bushes and Heath are widespread. If we exclude the high conservation value vegetation completely, we cannot go ahead with the project. Wetland plots within the area are excluded for	None required
>>			

		biodiversity purposes. Icelandic moorland/heathland is also a critical habitat for two bird species, golden plover, and whimbrel. We will only plant in approx. 10% of Myrar´s moorland/heathland.	
Principle 9.11 Endangered Species			
a. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)? b. Does the Project potentially impact other areas where endangered species may be present through transboundary affects?	No No		Not required
>>			

APPENDIX 2- CONTACT INFORMATION OF PROJECT PARTICIPANTS

Organization name	Yggdrasill Carbon ehf.
Registration number with relevant authority	Kt. 480620-2080
Street/P.O. Box	Fagradalsbraut 11
Building	
City	Egilsstadir
State/Region	East Iceland
Postcode	700
Country	Iceland
Telephone	+354 8608852
E-mail	ingibjorg@yggcarbon.com
Website	www.yggcarbon.com
Contact person	Ingibjorg Jonsdottir
Title	Project manager
Salutation	
Last name	Jonsdottir
Middle name	
First name	Ingibjorg
Department	
Mobile	
Direct tel.	
Personal e-mail	

APPENDIX 3- LUF ADDITIONAL INFORMATION

Risk of change to the Project Area during Project Certification Period:	There is a very low risk of change to the Project Area. It is private property, and the project area is not suitable for any other agricultural activity. YGG has leased the area for 50 years with a signed contract.
Risk of change to the Project activities during Project Certification Period:	There is a very low risk of change to the Project activities. YGG has leased the area for 50 years with a signed contract.
Land-use history and current status of Project Area:	The planting area is a Dry moorland / heathland, with less vegetated areas in-between. It was heavily grazed for the last 100 years by sheep, but last 15 – 20 years, there has been only limited grazing of sheep, goats, and reindeers. Part of the area is already fenced. It is not suitable for any other agricultural activity.
Socio-Economic history:	Inside the planting area is an abandoned field. It has not been used for several years. Inside the area are also three ruins and one old trail.
Forest management applied (past and future)	This area has never been forested. This summer, we planted 133.507 seedlings, approx. 2000 seedlings per hectare and will distribute fertilizer in May 2023. This is a conservation project, so future forest management involves weeding and thinning as necessary to maintain tree health for the next 50 years.
Forest characteristics (including main tree species planted)	We will plant three types of seedlings: spruce, pine, and cottonwood. These species have been used in Icelandic forestry for decades with good success regarding climate and weather extremes. There will be a mix of these species in the

	area to lower the risk of pests, snow, wind damage and degradation of biodiversity.
Main social impacts (risks and benefits)	Social benefits of the project are the increased employment opportunities, increased income for the local community, opportunities for training and skills development in a new industry in East Iceland. The main social risk is if trees disperse their seeds over the four cultural heritage sites identified in the project area and the ruins are damaged by forest. It is mitigated by monitoring the ruins annually, and the 15 - 50 meters protected buffer zone around three of them and no planting in the old trail.
Main environmental impacts (risks and benefits)	Environmental benefits of the project: 1) It will sequester atmospheric carbon in trees and soil and play a role in the mitigation of climate change. 2) It will stop land degradation. 3) It will increase tree canopy cover as a part of the sustainable goals, but forest covers only 2% of Iceland. 4) Shelter for bird species in the area from the mink and arctic fox. 5) Increased biodiversity in eroded areas. YGG has identified potential environmental risks associated with the project and undertaken the appropriate mitigating actions: 1) The risk of pollution from fertilizers

	is mitigated by their minimal use and then only at the tree establishment phase 2) The risk of damage to remnant native vegetation is mitigated by excluding part of it from eligible area. 3) All sources of waste are identified, and measures are in place for waste collection and spill management.
Financial structure	The project East Iceland I is owned by the company Yggdrasill Carbon (YGG). All project activities are funded by YGG, both with private funding and income from sold carbon credits.
Infrastructure (roads/houses etc):	There is one old trail in the area. No buildings.
Water bodies:	Streams and wetlands are located on map and are not part of the eligible area.
Sites with special significance for indigenous people and local communities - resulting from the Stakeholder Consultation:	N/A
Where indigenous people and local communities are situated:	N/A
Where indigenous people and local communities have legal rights, customary rights or sites with special cultural, ecological, economic, religious or spiritual significance:	N/A

APPENDIX 4-SUMMARY OF APPROVED DESIGN CHANGES

Please refer to Design Change Requirements for more information on procedures governing Design Changes

Revision History

Version	Date	Remarks
1.2	14 October 2020	Hyperlinked section summary to enable quick access to key sections Improved clarity on Key Project Information Inclusion criteria table added Gender sensitive requirements added Prior consideration (1 yr rule) and Ongoing Financial Need added Safeguard Principles Assessment as annex and a new section to include applicable safeguards for clarity Improved Clarity on SDG contribution/SDG Impact term used throughout Clarity on Stakeholder Consultation information required Provision of an accompanying Guide to help the user understand detailed rules and requirements
1.1	24 August 2017	Updated to include section A.8 on 'gender sensitive' requirements
1.0	10 July 2017	Initial adoption