Mathison Station – Greenhouse Gas Abatement Plan

Prepared on behalf of Pancho Beef

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Abstract

Mathison Station has applied to clear approximately 4500 hectares of land for the purpose of growing improved pasture, hay and silage. Clearing is expected to occur over a 10 year period with total emissions (as calculated by the Department of Environment, Parks and Water Security) of 125,000 tonnes above the threshold for a large emitter. Avoided emissions from improved fire management, reduced fire occurrence and soil carbon sequestration under improved perennial pastures are expected to result in net annual sequestration of almost 8,000 tCO_2^{-2} per year once development is completed. The full 125,000 tonnes of emissions over threshold are expected to be offset within 22 years of clearing commencing.

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1 Project Description

Mathison Station is a perpetual pastural lease located south-west of Katherine on the Victoria Highway. The property is approximately 652 square kilometres (65,200 hectares) and the operators have applied to clear approximately 4500 hectares of land for the purpose of growing improved pasture, hay and silage. The area chosen reflects the best available soils and landtypes for this type of development within the Mathison Station pastoral lease. The design of the areas has been carefully done to avoid areas of slope which may be susceptible to erosion and potential critical habitat for endangered or threatened species. The design was also based on ensuring that the development can be undertaken efficiently and provide for optimal weed, pest and fire management for the long term. The size of the planned development was chosen based on the scale required to justify the required investment in equipment, infrastructure and labour. During development, the project will employ a minimum of 2 to 3 full-time equivalents and once complete, will employ 2 people full time with additional seasonal staff required (likely 3-4 FTE's during peak periods).

The development will be staged over 10 years with approximately 450 hectares cleared each year (final area to be dependent on seasonal conditions). Each cleared plot will be under production about 2 years after it is cleared. This staged plan is in line with best practice as it ensures that land is only cleared under optimal soil moisture conditions to avoid erosion (and compaction) and allow ground cover to be re-established quickly post soil disturbance.

Since 2011 the operators of Mathison Station have been engaged in a number of research projects to develop and implement land management practices which improve the productivity and sustainability of cattle production in the NT. Projects include use of remote data collection to better understand weather, cattle grazing patterns, pasture availability and land condition to enable better grazing management. The operators are also committed to best practice weed, biosecurity and fire management across their property. They have demonstrated their commitment, as members of industry best practice and research advisory groups, to regularly evaluate, test and adopt new technology and management practices where appropriate to their land and business.

2 Net scope 1 emissions

The Department of Environment, Parks and Water Security (DEPWS) calculated that total estimated emissions from the project over 10 years will be approximately 625,000 tonnes which is 125,000 tonnes over the NT Government's reporting threshold. As a result, and given application and interpretation of the regulations by DEPWS, this small family business in an isolated location has been placed in the same category as a large corporate emitter. This calculation was made based on output from the FullCam model (2021) produced by CSIRO at the Territory scale. Other GHG emissions calculation methods have not been applied, and no locally sourced data from this region of the NT is known to have informed these FullCam calculations. The error factor for this 10 year modelled estimation is also unknown, thus cumulative impact on the true expected emissions needs to be considered in the context of the assumptions applied in the FullCAM model.

Total annual emissions from the Northern Territory are approximately 11MtCO_2^{-e} (Clean Energy Regulator 2022), or approximately 110MtCO_2^{-e} over 10 years. If the FullCAM estimations are accurate, total emissions from the Mathison project are approximately 0.57% of NT emissions for the same

period. If accounting for only the emissions deemed over the threshold for a large emitter, Mathison project emissions are 0.11% of NT emissions

3 Net scope 2 emissions

The project will not have any scope 2 emissions – any emissions created from consumption of energy sources will be as a direct result of activities on site.

4 Net scope 3 emissions

Scope 3 emissions will be extremely small in relative terms and will only relate to things such emissions from trucks delivery equipment and infrastructure to the site. Once on site equipment will remain on site for the entire project and infrastructure will be installed as permanent installations.

5 Obligations under NGER

This development does not meet the thresholds for mandatory reporting of emissions under the National Greenhouse and Energy Reporting Act.

6 Long term missions target

It is expected that over the long term this project, which will improve ground cover and perennial pasture productivity, significantly improve soil health and deliver various environmental co-benefits and result in net sequestration of over 8,100 tCO_2^{-e} per year and by 2044 will have cumulatively sequestered over 125,000 tCO_2^{-e}. Estimates of the change in emissions and sequestration are provided in section 7 with updated estimates to be provided as the development progresses.

7 Interim targets

Based on the staged plan as outlined in the land clearing application it is not expected that that the threshold for a 'Large emitter' could be reached until year 7 of development (depending on the actual amount of clearing which occurs each year due to varying seasonal conditions). During that period there will be avoided emissions through the exclusion of fire and soil carbon sequestration as land is converted to perennial productive permanent pastures and ultimately grasslands. An estimate of emissions and sequestration over the project life are provided in section 7.

8 Strategies to avoid, mitigate and offset emissions

There are currently no approved methodologies for offsetting emissions from land clearing in the NT. However, there is evidence to suggest that the emissions from planned deforestation are less than that which occurs from unplanned wildfires (Bristow 2016) and that there could be an increase in soil carbon under pastures compared to savanna woodlands (Livesley 2021). This project will provide emissions mitigation in the form of reduced, late season, hot fires, and increased sequestration from improved pasture productivity.

The project proponents have been in discussions with the Northern Territory Cattlemen's Association (NTCA) who are undertaking a project with support from the DEPWS, to quantify the emissions mitigation and sequestration which will occur through these activities to develop an appropriate and practical means of pastoralists demonstrating their contribution to emissions targets whilst

supporting sustainable economic development and meeting development conditions of their pastoral lease.

This project needs to run concurrently with the land clearing process so that actual demonstration of mitigation as well as practical implementation issues can be identified and solved. It is expected that this project site will provide an important opportunity for collating data and providing extension of learnings to support other pastoralists maintain and manage development sustainably.

As learnings occur during development and the mitigation project, they will be incorporated into the next stage of development for this project and this plan updated accordinly.

Regular reporting to the Department and to industry through existing well-established extension networks (including the NTCA and NT DITT Rangelands and Livestock teams) will occur throughout development and the subsequent mitigation project.

The requirements for public reporting of emissions are yet to be determined by the NT Government. Once requirements are established this plan will be updated.

Reduced emissions and sequestration of carbon will occur in two ways:

1. Reduced hot, late season, wildfires
2. Increased soil carbon sequestration

8.1 Fire

Satellite data from the North Australian Fire Information service (Charles Darwin University, 2022) indicates that the area to be cleared was burnt between 2 and 5 times in the period 2000 to 2009 (see Figure 1). The majority of the large eastern clearing area (Block E) was burnt 4 to 5 times in that period. During that period the area of land now known as Mathison Station was part of a larger pastoral lease and was essentially unmanaged. Mathison Station (NT Portion 7061) was sub-divided from the larger area in 2011 and the current owners took over that same year. Since then, management of the area to reduce the risk of fire and in particular late season fires has meant that fire frequency has reduced and most of the area to be cleared has only burnt twice in the period 2012-2021 (see Figure 2).

Using the Savanna Burning Abatement Tool (SavBAT) baseline fire emissions were estimated using the baseline period 2006-2020. Some fire activity was recorded in 8 years during this period over 50% of the area burnt in 6 of those years. Mean emissions during the baseline period were 317.97 $C0_2^{-2}$ per year.

Once cleared and developed, the cleared area will no longer need to be burnt on a regular basis to reduce the risk of uncontrolled burns. A standard firebreak will be maintained around the boundary of the development which should be sufficient to prevent the incursion of uncontrolled fires outside the project area. In the event that an uncontrolled fire does cross the firebreak it will be much easier to control in the cleared area than currently is possible in the areas of woody vegetation, as response machinery, such as a grader will be able to quickly access the fire front and cut an effective firebreak at any point at short notice. Currently, while the area is still under remnant native vegetation with large trees and low scrub it is not possible to quickly position and access machinery to clear a firebreak and thus a larger areasof vegetation burn before the fires can be controlled at the next established fire break.

The chance of a fire starting from lightening within the clearing area will also be greatly reduced once developed due to the absence of large trees which attract lightening.

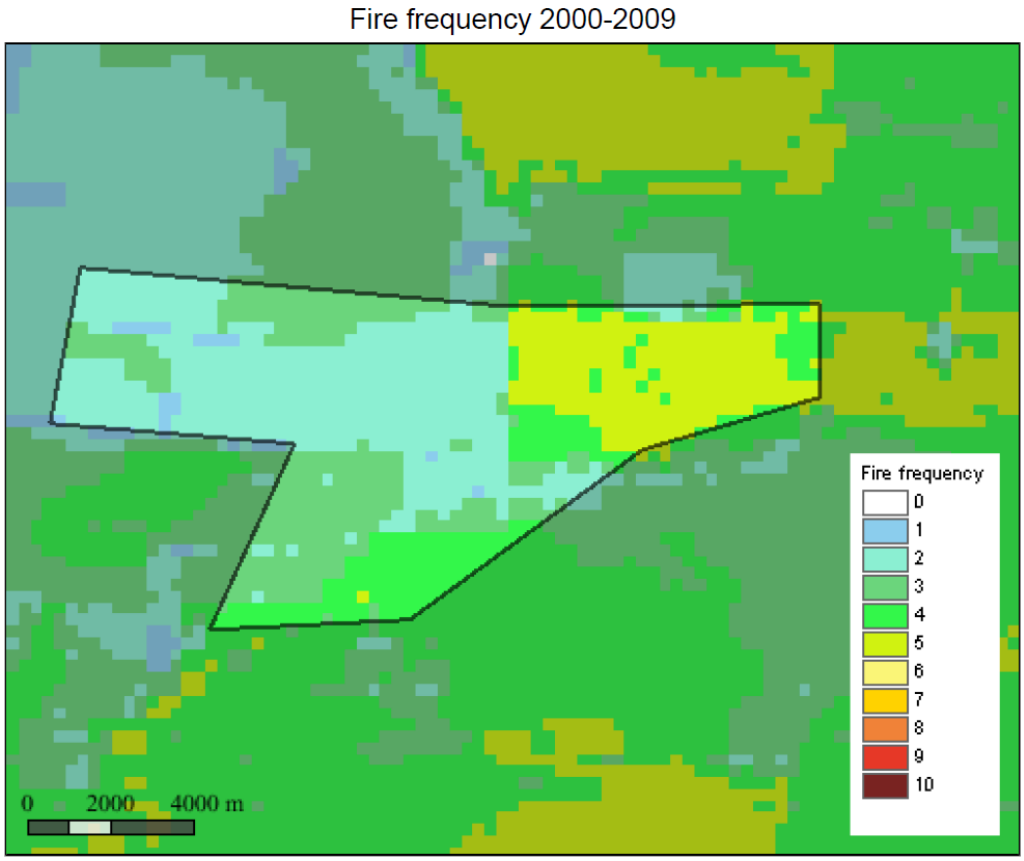

Figure 1 Fire frequency 2000-2009 (NAFI 2022)

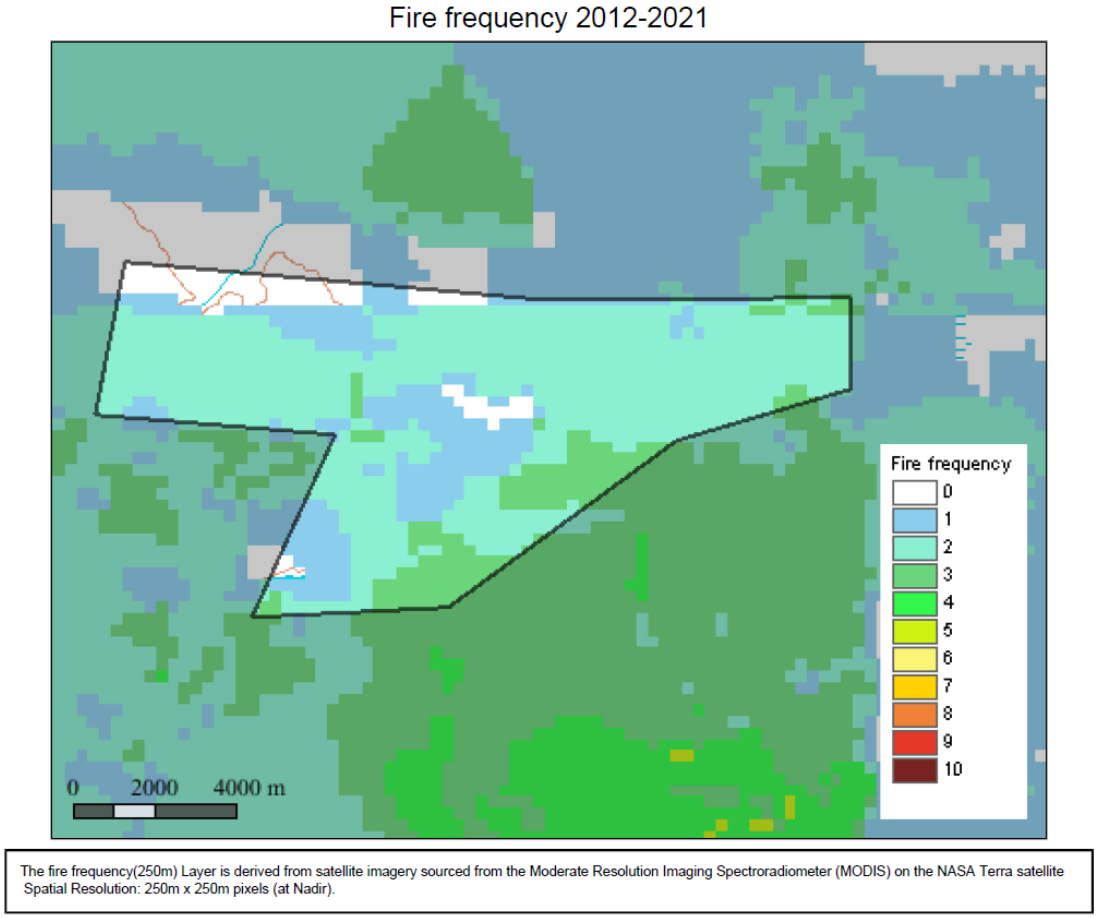

Figure 2 Fire Frequency 2012-21 (NAFI 2022)

8.2 Soil carbon sequestration

Soil carbon levels across Northern Australia are highly variable and dependent on the rainfall zone and depth to which measurements are taken. Recent research in the Douglas-Daly and Katherine regions suggests that converting savanna woodlands to rotational cropping or pasture could result in net soil carbon sequestration of 0.47tonnes of carbon per hectare per year (Livesley 2021). Applying this indicative research, this would equate to approximately 2,123t C or 7,791 $tC0_2^{-2}$ per year over the project area once fully developed.

8.3 Net Emissions

Using the avoided emissions and sequestration estimates provided above in section 8.1 and 8.2 net emissions were estimated. The project is expected to mitigate the 125,000 $tC0_2^{-2}$ within 22 years of project commencement.

Table 1 Estimated emissions and sequestration

Year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2044
Hectares cleared	450	450	450	450	451	457	456	466	450	437	-
Cumulative hectares cleared	450	900	1,350	1,800	2,251	2,708	3,164	3,630	4,080	4,517	4,517
Total hectares under production			450	900	1,350	1,800	2,251	2,708	3,164	3,630	4,517
Estimated emissions	62,265	62,265	62,265	62,265	62,403	63,233	63,095	64,479	62,265	60,466	-
Cumulative emissions	62,265	124,530	186,794	249,059	311,462	374,696	437,791	502,269	564,534	625,000	625,000
Cumulative emissions - above threshold	-	-	-	-	-	-	-	2,269	64,534	125,000	125,000
Sequestration - tonnes C	-	-	212	423	635	846	1,058	1,273	1,487	1,706	2,123
Sequestration - tCO2 equivalent	-	-	776	1,552	2,329	3,105	3,883	4,671	5,458	6,261	7,791
Mean baseline emissions (avoided emissions)	318	318	318	318	318	318	318	318	318	318	318
Cumulative sequestration	318	636	1,730	3,600	6,247	9,670	13,871	18,860	24,635	31,214	127,773

References

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Livesley, S.J., Bristow, M., Grover, S.P., Beringer, J., Arndt, S.K. and Hutley, L.B., 2021. Soil carbon density can increase when Australian savanna is converted to pasture, but may not change under intense cropping systems. *Agriculture, Ecosystems & Environment*, *319*, p.107527.

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