

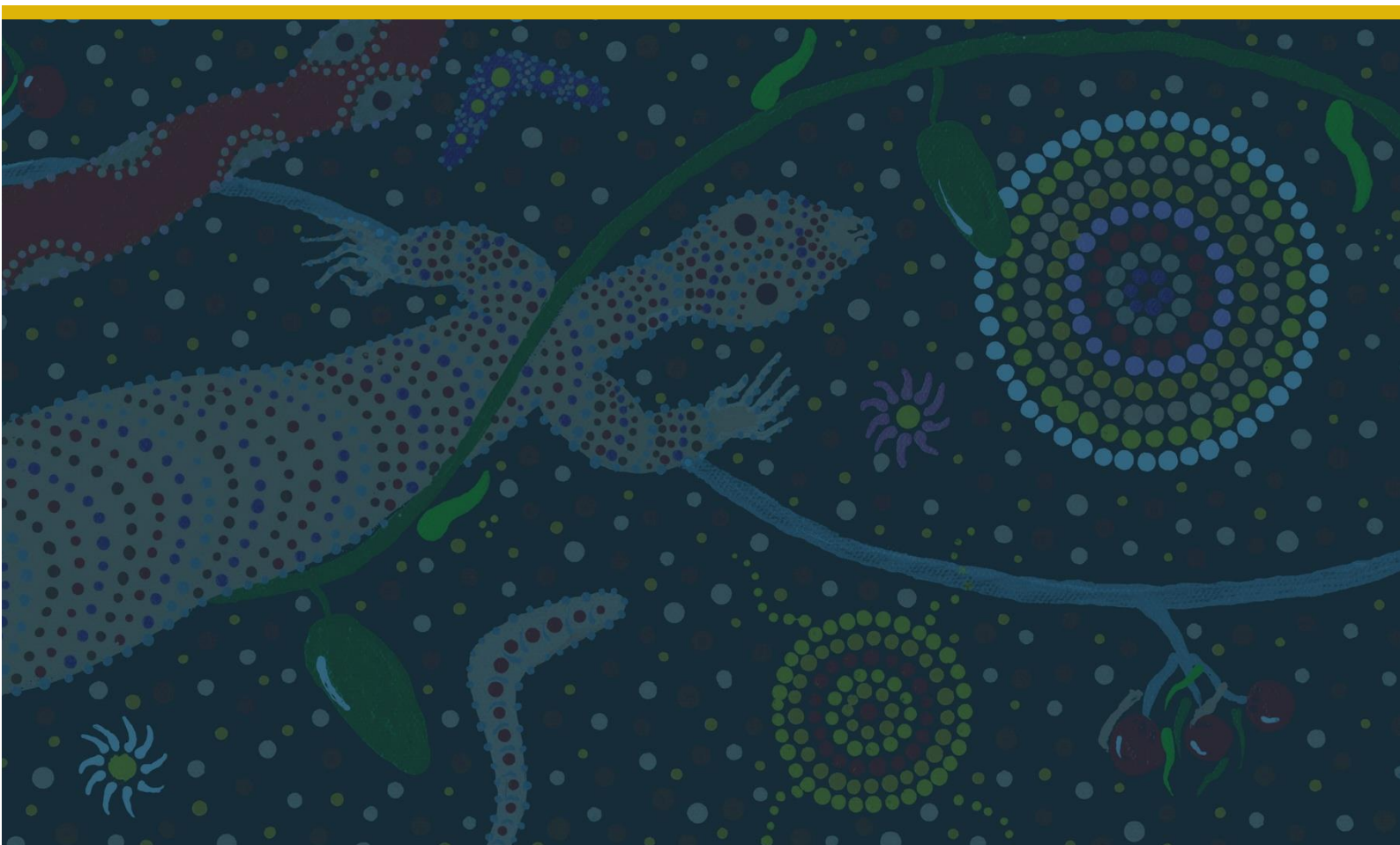
GREENHOUSE GAS MANAGEMENT PLAN

KALGOORLIE CONSOLIDATED GOLD MINES

FIMISTON GOLD MINE OPERATIONS EXTENSION (STAGE 3)

FIMISTON SOUTH PROJECT

REVISED PROPOSAL



GREENHOUSE GAS MANAGEMENT PLAN

Document Reviews

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21 March 2024	Rev A	Updated to new EPA format	Draft
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1. EXECUTIVE SUMMARY

Proposal name	Fimiston Gold Mine Operations Extension (Stage 3) and Mine Closure Planning: Revised Proposal - Fimiston South Project (FS Project)
Proponent name	Kalgoorlie Consolidated Gold Mines Pty Ltd fully owned by Northern Star Limited.
Proposal description and scope	<p>The Fimiston Operation is located adjacent to the City of Kalgoorlie-Boulder approximately 600 kilometres (km) east of Perth, Western Australia. On average, the operation produces ~500,000 ounces of gold each year and has a current operating mine life up until 2027 with ore processing expected to continue until 2034.</p> <p>The revised proposal is to implement a cutback to the existing Fimiston Open Pit at the southernmost extent, utilising similar mining methods as to those currently employed in the open pit. The cutback will allow for both the widening and deepening of the open pit and extend the operational mine life to approximately 2034 through the implementation of the FS Project.</p> <p>The FS Project will require additional areas for infrastructure, including waste rock dumps (WRD) and tailings storage facilities (TSF). Additional supporting infrastructure will include pipelines, electrical corridors, and roads. Proposed works under the FS Project, although similar in nature to current site activities, may result in additional emissions being reported under the National Greenhouse and Energy Reporting Act 2007 (NGER Act) for the KCGM Fimiston Operations. Once approved, the potential for impact would be limited to the execution phase only.</p>
Purpose of the GHG MP	<p>To meet the requirements of the EPA's How to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans Instructions (April 2023) for a Greenhouse Gas Management Plan (GHGMP) to be prepared as requested via a November 2023 Request for Information (RFI).</p> <p>Ministerial Statement 782 (MS782) Attachment 7 states that greenhouse gas (GHG) emissions will not exceed approximately 440,800 tonnes of carbon dioxide equivalent per annum from Scope 1 and Scope 2 emissions.</p> <p>The FS Project will contribute to report GHG emissions under the Fimiston Operation (NGER entity as required by the NGERs in the reoccurring annual NGER report and online lodgement. The emissions for the FS Project are reported to NGERs in combination with those for the Mt Charlotte Underground project which is not part of the FS Project. This GHGMP focuses on the emissions for the FS Project only.</p> <p>This GHG MP outline the current GHG emissions of the FS project and explore three possible scenarios for future GHG emissions estimates for the MS 782 mine disturbance envelope.</p>
Emission estimates	<p>The expected life of FS proposal emissions:</p> <ul style="list-style-type: none"> • Scope 1 Base Case: 2,587,170 tonnes CO₂-e • Scope 2 Base Case: 2,112,000 tonnes CO₂-e (with renewables is 197,210 tonnes CO₂e-) • Scope 3 Base Case: 935,000 tonnes CO₂-e

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Trajectory of emissions reductions	<p>Northern Star is pursuing the planned strategic pathway shown below to reduce Scope 1 and Scope 2 Emissions by 35% by 2030 and net zero by 2050. Across the whole organisation, this would achieve a reduction in GHG emissions from a baseline (1 July 2020) of 930,000 t CO₂-e down to approximately 590,000 t CO₂-e (Figure 4) using 2024 as the baseline year with a planned reduction trajectory of 4.9% per annum to reach net zero by 2050.</p> <p>Reductions in emissions for the KCGM Fimiston Operations will be achieved through the implementation of two renewable energy projects where the Scope 2 emissions can be offset by approximately 260,000 t CO₂-e.</p>
Other statutory decision-making processes which require reduction in GHG emissions	<ul style="list-style-type: none"> • National Greenhouse and Energy Reporting Scheme (National Greenhouse and Energy Reporting Act 2007 (Cth)). • Emissions Safeguard Mechanism (National Greenhouse and Energy Reporting Act 2007 (Cth)).
Key components in the GHG EMP	<ul style="list-style-type: none"> • Best practice measures adopted to avoid, reduce, and offset scope 1 emissions. • Reasonable and practicable measures adopted to avoid, reduce, and offset scope 2 emissions. • Estimate of scope 3 emissions. • Outline of other statutory decision-making processes. • Statement and description of five yearly reduction targets. • Management strategies.
GHG EMP reviews and reporting	<p>This GHG EMP will formally be reviewed at a minimum of five years or in accordance with changes in legislation or at other significant triggers/milestones. A range of State and Commonwealth public reporting associated with GHG performance will be maintained.</p>
Proposed construction date	<p>The mine is an ongoing operation, with the new cutback, WRD and TSFs pending environmental approval under the EP Act. Construction will commence upon approval.</p>
GHG EMP required pre-construction?	<p>No</p>
Proposed project end of life/decommissioning date	<p>2034</p>

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2. CONTEXT SCOPE AND PURPOSE

2.1. Proposal name

Fimiston Gold Mine Operations Extension (Stage 3) and Mine Closure Planning: Revised Proposal - Fimiston South Project

2.2. Proponent name

Kalgoorlie Consolidated Gold Mines Pty Ltd (KCGM)

2.3. Proposal description and scope

The Fimiston Operation is located adjacent to the City of Kalgoorlie-Boulder approximately 600 kilometres (km) east of Perth, Western Australia. On average, the operation produces ~500,000 ounces of gold each year and has a current operating mine life up until 2027 with ore processing expected to continue until 2034.

The revised proposal for the FS Project is to implement a cutback to the existing Fimiston Open Pit at the southernmost extent, utilising similar mining methods as to those currently employed in the open pit. The cutback will allow for both the widening and deepening of the open pit and extend the operational mine life to approximately 2034 through the implementation of the FS Project.

The FS Project will require additional areas for infrastructure, including waste rock dumps (WRD) and tailings storage facilities (TSF). Additional supporting infrastructure will include pipelines, electrical corridors, and roads. Proposed works under the FS Project, although similar in nature to current site activities, may result in additional emissions being reported under the *National Greenhouse and Energy Reporting Act 2007* (NGER Act) for the KCGM Fimiston Operations. Once approved, the potential for impact would be limited to the execution phase only.

Alternatives investigated for the FS Project were related to optimal locations for the new TSF and WRD that minimised impacts of flora and vegetation, fauna and the local community. WRD locations were selected as close as possible to mining areas to minimise haulage turnaround time and fuel use. This in turn will contribute to reduced Scope 1 emissions for the project.

The source of GHG emissions associated with the FS project include:

Scope 1 Emissions

- Direct combustion of diesel fuel, primarily used for mining (i.e., haul trucks, excavators, drill rigs, graders, loaders, dozers and in explosives).
- Direct consumption of oils and greases.
- Emissions associated with vegetation clearing associated with loss in capacity to sequester carbon; and
- Emissions associated with responsible disposal of waste or implementing recycling activities.

Scope 2 Emissions

- Consumption of purchased electricity, used for processing ore and powering fixed or mobile buildings (e.g., crushing and grinding or offices and ablution blocks).

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Scope 3 Emissions

- Associated with purchased goods and services (i.e., construction materials);
- Associated with capital goods (i.e., mining equipment);
- Associated with upstream transport and distribution of purchased goods or services
- Employee commuting to and from site; and
- Business travel.

2.4. Purpose of the Greenhouse Gas Management Plan

This GHGMP has been prepared in accordance with the Environment Protection Authority (EPA) Environmental Factor Guideline: Greenhouse Gas Emissions (EPA, 2023). The structure and content of this GHGMP are based on the Greenhouse Gas Environmental Management Plan Template (EPA,2023) to ensure transparency and consistency. The factor objective for Greenhouse Gas Emissions is:

- To minimise the risk of environmental harm associated with climate change by reducing greenhouse gas emissions as far as practicable.

There is a fundamental link between GHG emissions, their effect on the climate and consequential effect on the natural environment and society. Examples of common global issues are loss of life and livelihoods through the impacts of severe weather, loss of flora and fauna species through fire, flooding, and shifting biome boundaries, ocean acidification resulting in coral reef collapses and reduced biodiversity.

GHG emissions from a proposal will be considered by the EPA when they are reasonably likely to exceed:

- 100,000 tonnes of CO₂-e of scope 1 emissions in any year; or
- 100,000 tonnes of CO₂-e of scope 2 emissions in any year.

The FS Project does exceed this trigger value and as such has been reporting under the Commonwealth Government's Safeguard Mechanism since 2009.

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3. GHG EMP COMPONENTS

3.1. Emission estimates

Since 2009, KCGM has been required to identify report on Scope 1 and 2 emissions annually for the Fimiston Operations under the NGER Act 2007. This annual reporting cycle has resulted in a detailed understanding of the sources and quantities of both Scope 1 and Scope 2 emissions associated with the KCGM Fimiston Operations.

- Scope 1 emissions are the emissions released to the atmosphere as a direct result of an activity, or series of activities at a facility level.
- Scope 2 emissions are the emissions released to the atmosphere from the indirect consumption of an energy commodity (e.g., from the use of electricity produced by another facility).

Estimates of GHG emissions from the Project were originally prepared by KPMG (2021) and were then updated with real data from current Safeguard Mechanism reports. The original data was in the Proposal Content Document and has since been largely verified by the actual data as reported to NGERs. The source of emissions associated with the FS project include Scope 1, Scope 2 and Scope 3 GHG emissions.

Land Clearance Emissions

Northern Star utilised the Department of Climate Change, Energy, the Environment and Water Full Carbon Accounting Model (FullCAM) to estimate additional t CO₂-e entering the atmosphere through loss of sequestration due to clearing (DCCEEW, 2020). Using the FullCAM tool, based on latitude of -30.46 south and Longitude 121.30 east, carbon mass of trees per hectare and forest debris per hectare (ha) were valued at 21.61 and 11.15 t carbon/ha respectively. Using these values and the total hectares (2,246 Ha) to be cleared for the project, it is estimated that for the life of the project an additional 269,663 t CO₂-e will enter the atmosphere.

LOM Scope 1 and Scope 2

KCGM's Scope 2 emissions result from the emissions intensity of its sources of supply of electricity. An energy balance has been performed to estimate the volumes of electricity (kWh's) coming from each source of supply to meet KCGM's demand for electricity. KCGM's source of supply will be a mix of renewable energy with zero emissions, grid supply, which comes from the SWIS where Scope 2 emissions will depend on the emissions intensity of the SWIS in each reporting period, and firming supply (to meet any shortfalls in energy supply from the two forementioned sources of supply) and from Parkeston Power Station. The emissions intensity factor of Parkeston Power Station has been estimated based on historical performance when operating on gas.

Following the introduction of the NGER Act 2007, KCGM has been collating information to support the annual Scope 1 and Scope 2 emissions calculations and report development since 2009. This reporting includes the KCGM operations and the Underground operations.

KCGM sources its main quantity of electricity from the South Western Interconnected System (SWIS), with minor electricity being obtained from local generation plants in Kalgoorlie. This source is classified as "off grid" supply in NGERs because it is not connected to the SWIS.

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Three potential scenarios are presented below that outline the base case, base case with renewables and increased throughput with renewables scenarios.

Scenario 1 – Base Case Scenario assumes that renewable energy sources will not be available in the next 11 years.

Scenario 2 – includes applying renewable energy projects to reduce Scope 2 base case emissions as described in Section 3.3 and 3.4. Table 3 and Figure 2 illustrate the positive change to Scope 2 emissions by utilising this reduction measure.

Scenario 3 – includes increased mill throughput due to optimised plant infrastructure which increases Scope 2 emissions and applies renewable energy projects to reduce emissions (Table 4).

Scenario 1

The annual emissions for Scope 1 and Scope 2 have been estimated over the life of mine until 2034 (11 years). Table 1 shows the current understanding of the emissions inventory based on 2023 data reported under the NGER Act and forms the base case scenario.

Table 1 Inventory of Scope 1 and Scope 2 GHG Emissions for Base case scenario 1 (taken from NGERs reports)

Emissions source	Where used	Annual Quantity 2023	Annual t CO ₂ -e	% of Total
Scope 1				
Diesel	Mining Operations: haul trucks, excavators, explosives, drill rigs, and ancillary earthmoving equipment	82,332 kL	225,330	97
LPG	Processing: carbon regeneration kilns and gold room furnace	1,625 kL	2,530	2
Oils and greases	Mining Operations: haul trucks, excavators, drill rigs and ancillary earthmoving equipment	1,68.7 kL	854	< 1
Gasoline	Other: transport energy use	16.7 kL	38	< 1
Sulphur Hexafluoride (SF ₆)	Other: electrical insulators, transformers, circuit breakers, and high voltage switchgear	2791.7 kL	25	< 1
Scope 1 Total			228,777	54%
Scope 2				
Electricity	Processing: crushing and grinding	372,411,000 kWh	192,997	46%

Scenario 2

Northern Star Resources is developing a large-scale renewable energy project to achieve an overall reduction in KCGM's Scope 1 & 2 emissions by the end of FY2028 (30 June 2028). The project will incorporate a 100MW Solar PV Facility and a 200MW Wind Farm located on Northern Star Resources held mining tenure in proximity to the KCGM operations. Target commercial operation dates are 1 January 2026 for the Solar PV Facility and 1 July 2027 for the Wind Farm. When completed approximately 80% of KCGM's electricity supply is expected to be supplied by renewable energy.

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Renewables are expected to come on stream during 2026/2027 and Table 2 shows the total tonnes of CO₂-e estimated to be generated through Scope 1 and Scope 2 emissions over the LOM for Scenario 2. For the period between 2024 and 2038, diesel consumption was derived from the Life-of-Mine (LOM) forecast, which is used for long term mine planning. This forecast includes expected annual quantities of ore mined, ore processed, and gold produced.

*Table 2 Scenario 2 - Total of Scope 1 and Scope 2 Emissions Estimate over Project Life (including renewables)
Taken from average of data for 2015-2018 and used in the original proposal content document)*

Greenhouse Gases t CO ₂ -e	2024-2026 (Annual average)	2027-2034 (Annual average)	Total Project 2024-2034	% of Total
Scope 1	237,277	234,417	235,197	92
Scope 2	177,325	-39,380	19,721	8
TOTAL OF SCOPE 1 EMISSIONS	414,602	195,037	254,918	100

Table 3 Scenario 2 - Assessment of Scope 1 and Scope 2 Emissions – Average annual and Total Project to 2034 with renewables

Emissions source	Average annual quantity (t CO ₂ -e) ¹	Total for the Project (t CO ₂ -e)
Stationery Energy Purposes (diesel)	230,083	2,530,916
LPG	4,079	44,869
Transport Energy (diesel and gasoline)	691	7,601
Oils and Greases	312	3,432
Other (SF6)	32	352
TOTAL OF SCOPE 1 EMISSIONS	235,197	2,587,170
Electricity (Scope 2) offset by renewables	19,721	197,210
TOTAL OF SCOPE 1 AND 2 EMISSIONS	254,918	2,784,380

¹ Annual emissions have been averaged for the operational phase of the project (2021 to 2034). Emissions quantities decline sharply after 2034 due to reduced mining activity as the project approaches end-of-life).

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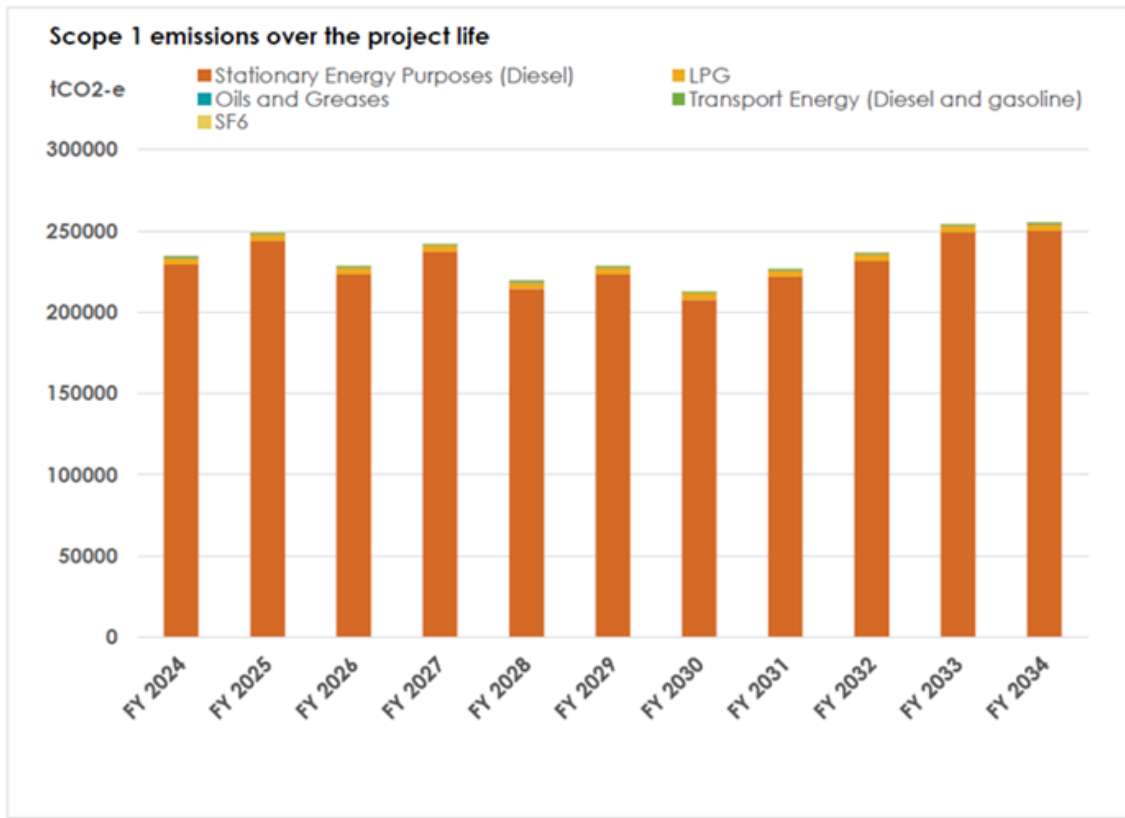


Figure 1 Scenario 1 and 2 - Scope 1 Emissions over the project life

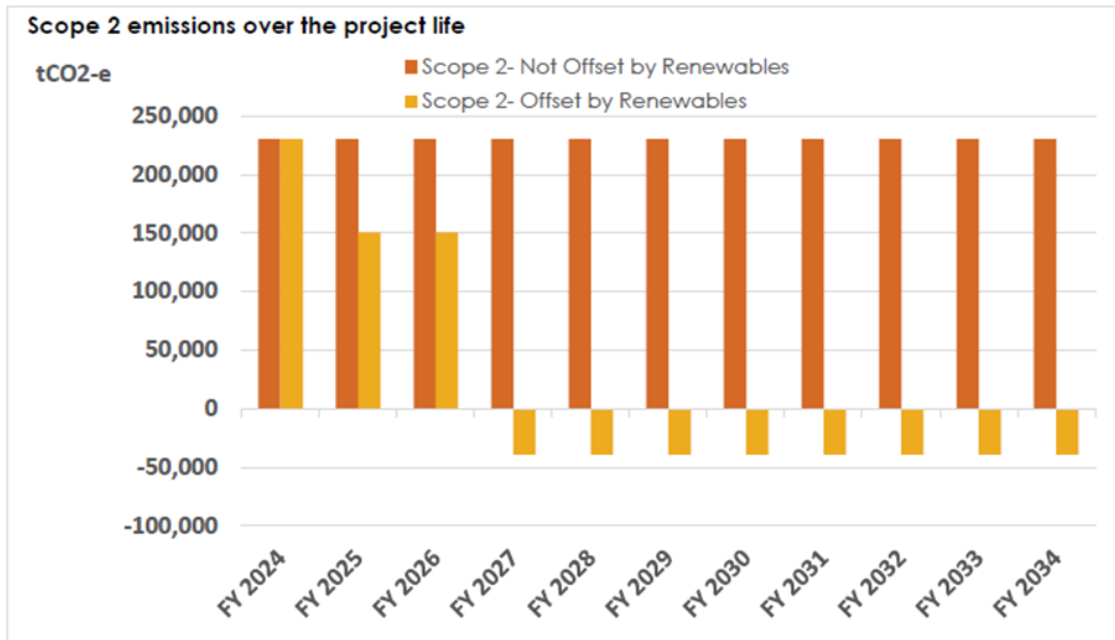


Figure 2 Scope 2 Emissions over the project life with renewables

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Scenario 3

Scenario 3 includes increased mill throughput due to optimised plant infrastructure which increases Scope 2 emissions and then applies renewable energy projects to reduce emissions.

The theoretical calculation of KCGM's potential emissions if the renewable energy project did not go ahead was compared with outcomes against the forecast position including the renewables project. The graph below tracks KCGM's forecast emissions to show these impacts. This shows a potential increase in emissions occurring in FY2027 when throughput is planned to increase. This is offset by renewables that are planned to come online over FY2026-28. There are minor movements in emissions over the forecast period which result from small variations in KCGM's energy demand year on year.

Table 4 Scenario 3 - Assessment of Scope 1 and Scope 2 Emissions – Average annual and Total Project to 2034 with renewables

Greenhouse Gases t CO ₂ -e	2024-2026 (Annual average)	2027-2034 (Annual average)	Total Project 2024-2034	% of Total
Scope 1	221,809	244,956	238,643	71%
Scope 2	173,725	345,243	298,465	
Scope 2 with renewables	162,762	69,843	95,184	29%
TOTAL OF SCOPE 1 EMISSIONS	384,571	314,799	333,827	100%

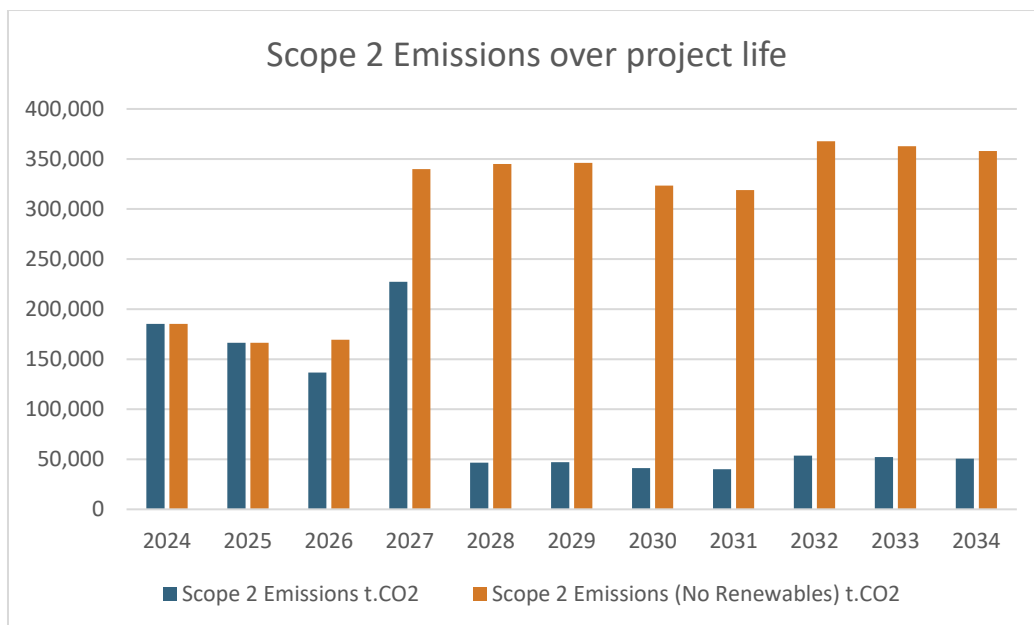


Figure 3 Scope 2 Emissions over the project life with mill optimisation and renewables

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Land Use Change

Northern Star utilised the Department of Climate Change, Energy, the Environment and Water Full Carbon Accounting Model (FullCAM) to estimate additional t CO₂-e entering the atmosphere through loss of sequestration due to clearing (DCCEE, 2020). Using the FullCAM tool, based on latitude of -30.46 south and Longitude 121.30 east, carbon mass of trees per hectare and forest debris per hectare were valued at 21.61 and 11.15 t carbon/ha respectively. Using these values and the total hectares (2,246 ha) to be cleared for the FS Project, it is estimated that for the life of the FS Project an additional 269,663 t CO₂-e will enter the atmosphere due to land clearing.

Scope 3

In addition, to Scope 1 and 2 emissions, there are Scope 3 emissions attributable to the Fimiston Operations overall emission profile. These and are considered indirect emissions; that is, they occur outside of KCGM's operational control, generally accepted to include or be as a result/s of manufacturing and transportation of raw materials utilised at the Fimiston Operations by KCGM to undertake the principle prescribed activity (mining and processing). For the implementation of the FS Project, Scope 3 emissions will most likely originate from the transportation of additional diesel fuels/oils and any additional machinery to and from the site.

Northern Star has continued to evolve measurement and analysis of Scope 3 emissions in line with the GHG Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard and supported by Greenbase's environmental accounting team. In financial year 9 FY) 23 review of the supply chain was completed and there was an increase in the number and type of suppliers surveyed. All suppliers to Northern Star during FY23 were assessed for materiality by spend and supplier categories. Supplier activities that were already being captured under the existing Scope 1 and 2 processes were excluded from the Scope 3 assessment to avoid duplication.

Of the fifteen Scope 3 categories listed in the GHG Protocol's Corporate Value Chain (Scope 3) Accounting and Reporting Standard, the following were considered applicable to Northern Star Resources and included in our FY23 assessment:

- Purchased goods and services;
- Capital goods;
- Fuel and energy related activities;
- Upstream transportation and distribution; and
- Waste generated in operations (new inclusion in FY23).

Scope 3 emissions not included within this assessment are:

- Business travel;
- Employee commuting;
- Processing of sold products;
- Downstream transportation and distribution; and
- Business travel.

A profile of Scope 3 emissions over the lifecycle of the Fimiston Operations is outlined in Table 5 and shown in Figure 4.

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Table 5 Assessment of Scope 3 Emissions – Average Annual and Total FS Project

Scope 3 Category	Average annual quantity (t CO ₂ -e) ²	Total for the Project from 2022-2034 (t CO ₂ -e)
Category 1 - Purchased goods and services	55,157	717,042
Category 3 - Fuel and energy related activities	15,803	205,441
Category 4 - Upstream transport and distribution	1,024	13,312
TOTAL OF SCOPE 3 EMISSIONS	71,984	935,794

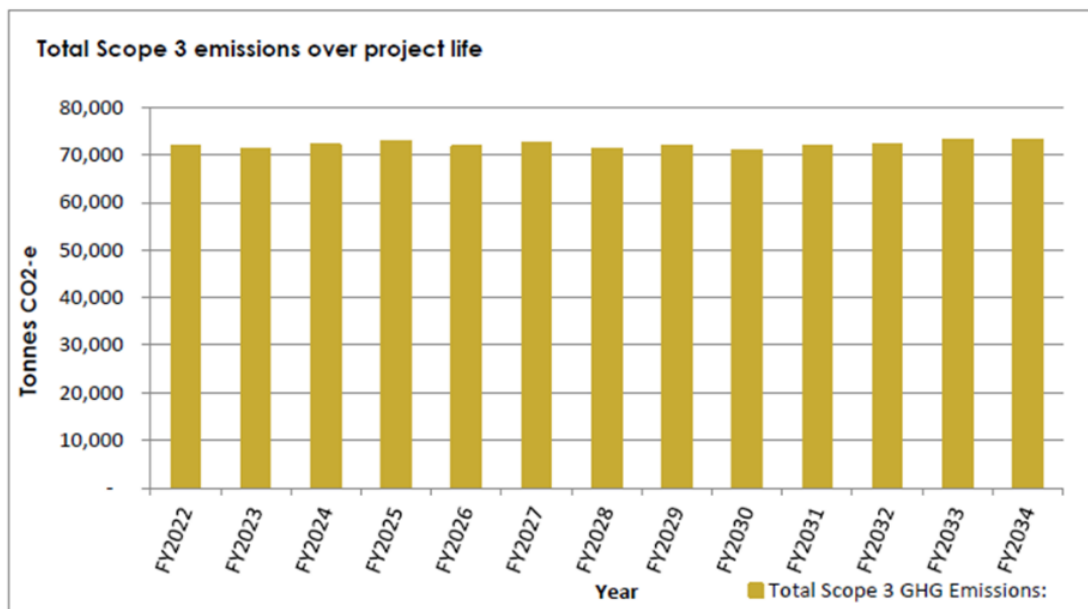


Figure 4 Total Scope 3 emissions over project life

GHG Emitted

Carbon dioxide is the primary source for GHG emissions. For minor sources of Scope 1 emissions (oils and greases, gasoline and leakage of sulphur hexafluoride), the forecast was based on analysis of historical data, which indicated that use in FY 2019 was representative of typical annual use of these materials. The 2019 figure was repeated as an annual figure for the life of the project, with appropriate adjustment for the final years when consumption would be expected to decrease. These minor sources accounted for less than 1% of forecast annual Scope 1 emissions.

² Annual emissions have been averaged for the operational phase of the project (2021 to 2034). Emissions quantities decline sharply after 2034 due to reduced mining activity as the project approaches end-of-life)

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Carbon dioxide has a Global Warming Potential of 1 under the Intergovernmental Panel on Climate Change.

The KCGM Operations Scope 1 & 2 GHG emissions in 2021 were 403,186 t CO₂-e. This increased due to increased production in 2022 to 453,539 t CO₂-e. In 2023 due to efficiencies on site this was reduced to 440,689 t CO₂-e.

Justification

The Safeguard Mechanism Rule commenced on 1 July 2016, imposing maximum emission limits for facilities with more than 100,000 t CO₂-e Scope 1 emissions per annum (emissions baseline), this applies to KCGM Fimiston Operation with a baseline being set at 242,659 t CO₂-e in 20122.

In addition, the Safeguard Mechanism Rule was amended (March 2019) reported that emission baselines were to expire on 1 July 2020, with facilities operating under the Safeguard Mechanism required to transition to calculated emissions baselines during 2018-2019 and 2019-2020 reporting years. However, in response to the global COVID-19 pandemic emerging, this deadline was extended to May 2020.

Changes were made to the Safeguard Mechanism that become effective from 1 July 2023. The key changes relevant to Northern Star include the requirement for facilities to reduce their Scope 1 Emissions by 4.9% each financial year until 2030, with an objective to reduce net emissions by approximately 30% by the end of this period. Northern Star is already making steps towards this as a result of its disclosed target reducing Scope 1 and 2 Emissions by 35% (from a 1 July 2020 baseline of 931 kt CO₂-e) by 2030.

Key Assumptions and Uncertainties

The key assumptions and uncertainties within this document are based on findings from annual GHG emission reports completed to date by the KCGM Fimiston Operations. These assumptions include:

- Fimiston Operations NGER reports to date have provided sufficient information on the quantity of emissions and details regarding sources of emitting activities;
- Alterations in the delivery of unplanned work activities due to unanticipated changes such as resourcing requirements or external supply constraints; and
- Likelihood of occurrence of unforeseen events to occur, which may then cause flow on impacts and disruptions back to mining operations (i.e., pit wall collapse, pandemic, economic conditions).

3.2. Trajectory of emissions reductions

Northern Star is pursuing the planned strategic pathway shown below for all projects in their portfolio to reduce Scope 1 and Scope 2 Emissions by 35% by 2030 and net zero by 2050. This would achieve a reduction in greenhouse gas emissions from the baseline (1 July 2020) of 930,000 t CO₂-e down to approximately 590,000 t CO₂-e (Figure 4) using 2024 as the baseline year with a planned reduction trajectory of 4.9% per annum to reach net zero by 2050. This is central to all business and strategic planning, with increased efficiencies and Emissions Reduction incorporated into decision-making integral to all current Operations, future projects, and business development.

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Reductions in emissions for only the KCGM Fimiston Operations will be achieved through the implementation of two renewable energy projects (KCGM grid 79,819 + 190,092) where the Scope 2 emissions can be offset by approximately 270,000 t CO₂-e.

As generated and purchased electricity accounts for 46% of Northern Star's GHG emissions (FY23 Baseline), this is a key focus area for reducing Scope 1 and Scope 2 emissions.

On 22 June 2023 Northern Star announced the Board approval of the KCGM mill expansion which is proposed to increase the capacity of the Fimiston Processing Plant from 13 Mtpa to 27 Mtpa. Part of this expansion will also involve an upgrade to the existing 33kV network and the intention is to provide for infrastructure upgrades to introduce renewable energy.

Measures to reduce Northern Star's reliance on fossil fuels used for electricity generation include increasing control over use of renewables, including wind and solar. Energy storage options form part of this solution from both a maximisation of the renewable input and system integration aspect.

This knowledge (and the long mine life at KCGM Operations in particular) enables Northern Star to focus on large-scale multi-decade renewable projects to replace reliance on carbon intensive energy sources, using known, existing technology to target the 2030 Emissions Reduction.

Figure 2 also showcases the reduction of Scope 2 emissions with renewable offsets. Through the implementation of renewable projects, the Scope 2 emissions can be offset by approximately 260,000 t CO₂-e. The reduction of approximately 260,000 t CO₂-e of Scope 2 emissions is outlined in Figure 4 when Scope 1 and Scope 2 emissions are combined over the FS Project life.

Total expected emissions over the life of the FS Project can be seen in Section 3.1 and Figure 5 with emissions ceasing in 2034 at the end of mine life.

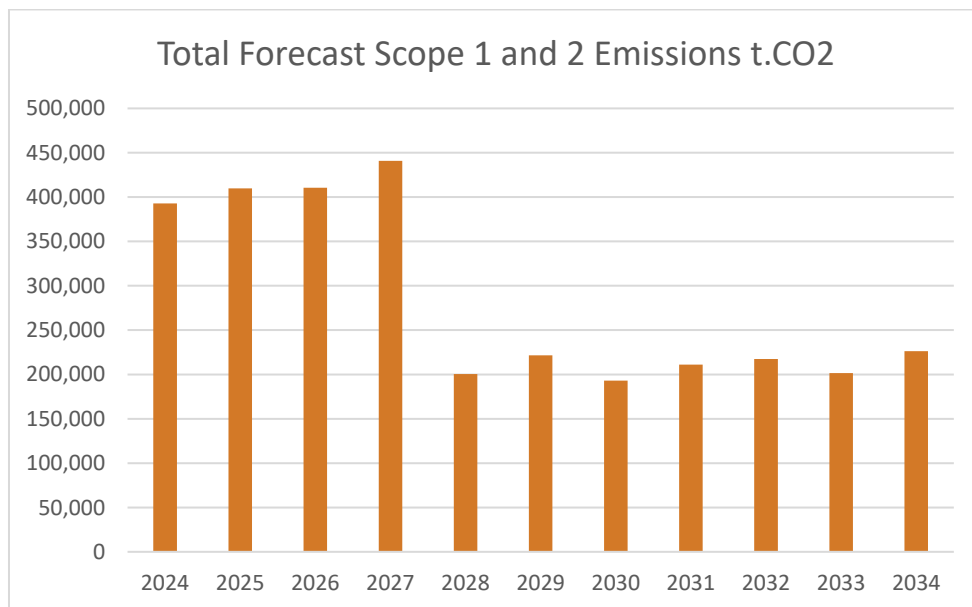


Figure 5 Total Scope 1 and Scope 2 emissions over the project life

Table 6 Scope 1 and 2 Interim Yearly Targets

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Years	Emissions Target (t CO ₂ -e) ³
1-5	1,920,000
5-11	1,780,000
11 onwards	0

3.3. Benchmarking

FS Project emissions were benchmarked against other large gold mining operations in Australia, New Zealand, and Papua New Guinea. Mines producing gold as a secondary product in a concentrate - as well as those that produced metallic gold – were included in the assessment. Information was obtained primarily from public reports (e.g., Annual reports). Gold production was also reported in order to give an idea of the scale of the operation (Figure 6).

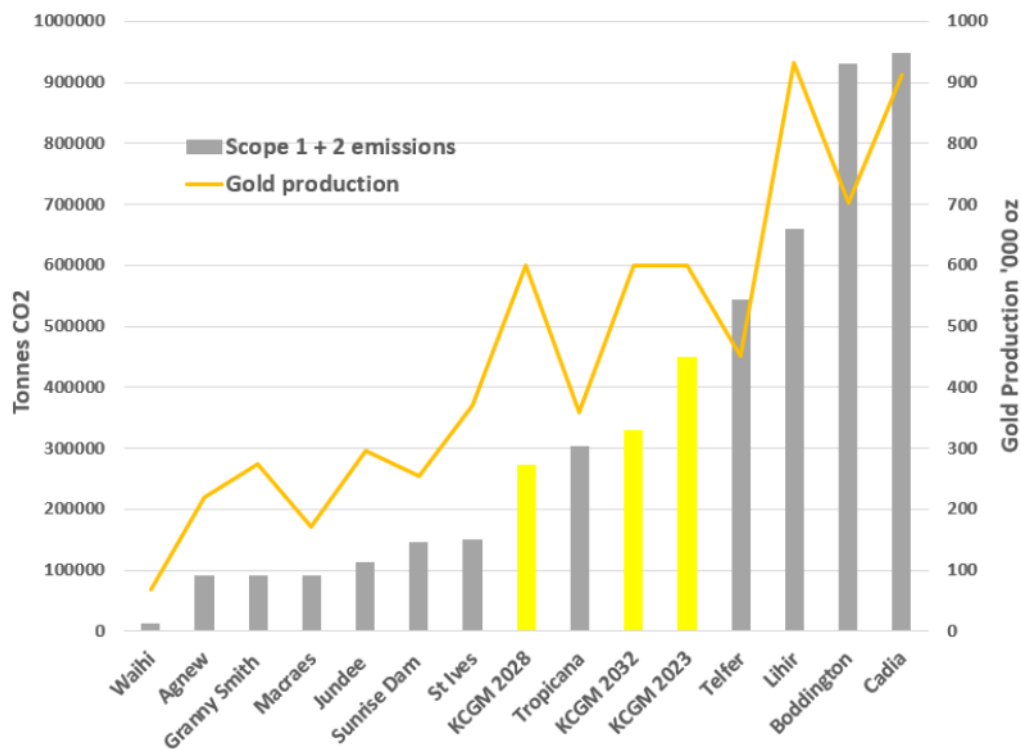


Figure 6 Results of benchmarking

Figure 6 shows a reasonable correlation between total emissions and gold production. Emissions from the FS Project are in line with the size of the project, including for the pit expansion stage of

³ Annual emissions have been averaged for the operational phase of the project (2021 to 2034). Emissions quantities decline sharply after 2034 due to reduced mining activity as the project approaches end-of-life)

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the project (2023) when the quantity of waste rock being removed is high relative to ore production, compared with post-expansion years (2028 and 2032).

Net zero by 2050 targets are applicable to KCGM and will require concerted effort by KCGM over time to reach this emissions target.

3.4. Scope 1 - Mitigation measures

Continuous improvement to reduce emissions over the implementation life of the FS Project (project execution), through the consideration of measures which show actual ability to improve overall performance delivery (lowering emissions).

Mitigation hierarchy measures being implemented by the proposal include:

- Avoidance of emissions by upgrading the fleet of 40 mechanical drive haul trucks from the 793C to the 793F model. This has been modelled and expected to result in a noticeable direct increase in fuel efficiency, and reduction of associated emissions per tonne. The updated BSFC (Brake Specific Fuel Consumption fuel map) for the proposed new fleet indicates a reduction in fuel burn by 1-4% when compared with the existing vehicles (i.e. an average 2% savings). The engine fluid and filter change intervals for the new engines has doubled when compared to the existing 793F fleet. This results in reduced waste of oils and consumables.
- Similar reduction of emissions by replacing six underground vehicles with Tier 1 diesel engines with more efficient Tier 4 engines; resulting in a noticeable decrease of associated emissions per tonne in some underground areas.
- KCGM have recently replaced 47 aging diesel mobile lighting plants with lighting plants which operate as LED lighting plants to safely and practically implement both continuous improvement within the workplace and opportunities for emission reduction/s. The common issue with earlier equipment models is the cost of maintenance and availability of spare parts is becoming increasingly more difficult and expensive to procure. This flows onto impacts to the mining schedule (production losses through equipment downtime), impacts to maintenance schedules (due to supplier constraints and long lead estimated time of delivery). The new generation of LED lighting plants offer a fuel saving of over 80% compared to the current models used on site. This is expected to reduce diesel consumption in the lighting plants from the current 10-11 litres/hr to 1.1 litres/hr, resulting in savings of \$1.2M per year.

Additional best practice reduction measure commitments include:

- Reducing emissions by upgrading the plant over time as newer and more efficient equipment becomes available.
- Ensuring operators and managers implement machinery optimisation during all surface and underground activities; that is the operation within the specified manufactures specifications to safely maximise a sustainable output. This would include:
- Monitoring diesel usage each shift or swing.
- Monitoring total costs per tonne against internal KCGM operational reporting requirements.
- Ensuring quality time is spent investing in trainees on new equipment, to develop sound and sustainable operational techniques.
- Looking for and encouraging efficiency discussions.

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- Investigating any new developments or improvements to diesel particulate matter filters (DPM) or other alternative technologies to encourage further reduce overall reliance on straight combustion engines.
- KCGM to continue monitoring day to day activities and identify potential studies to support site or corporate decarbonisation strategies; may include feasibility studies with scopes in excess of a single operation (national or global scope).

Northern Star is investigating carbon farming to offset reduce greenhouse gas emissions if required.

3.5. Scope 2 - Mitigation measures

Northern Star is also investigating the potential for reducing emissions by:

- Contracting green power from a wind farm development/s in the Eastern Goldfields Region that would supply electricity directly to KCGM behind the meter (BTM).
- Power Purchase Agreements (PPAs) with grid power suppliers for GHG emissions reduction.
- Fimiston Processing Plant revitalisation project has considered design efficiency opportunities to minimise power usage, replacing older equipment with more efficient new equipment and improving the efficiency of the processing stream.

KCGM consumes significant quantities of electricity from the South Western Interconnected System (SWIS) and Northern Star intends to contract green power from a wind farm developer/s through the Wholesale Electricity Market (WEM) to reduce its Scope 2 emissions.

Graphs showing the change in emissions are in Section 3.2.

3.6. Scope 3 - Mitigation measures

Continuing to support local businesses to deliver services and to employ locally to assist delivery of social governance objectives and practically reduce Scope 3 emissions associated with:

- Special transports;
- Additional staff relocation (from interstate or internationally);
- Reduce or control fly in-fly out as sole fix to resourcing;
- Ensure corporate visits to site are value adding;
- Continue to embrace online meetings and conversations (reduction of travel for a meeting);
- Sourcing: Work with suppliers to source low carbon capital goods from manufacturers. Consider factors such as material sourcing, manufacturing techniques, and transportation methods;
- Transportation Optimization: Optimize transportation logistics for capital goods to reduce emissions associated with their delivery. Consolidate shipments, choose low-emission transport modes, and utilize efficient routing strategies;
- Maintenance and Upkeep: Implement regular maintenance schedules and proper upkeep of capital goods to ensure optimal performance and longevity, reducing the need for premature replacements and associated emissions from manufacturing new equipment; and
- Reuse and Recycling: Implement policies to promote the reuse and recycling of capital goods components and materials. Extend the lifespan of equipment through refurbishment or repurposing, and ensure proper disposal practices to minimize environmental impact.

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3.7. Statutory GHG Reporting and Reduction Requirements

The following federal legislative requirements have been considered in preparation of this GHGMP, and are implemented by KCGM:

- National Greenhouse and Energy Reporting Act 2007 (NGER Act)
- National Greenhouse and Energy Reporting Regulations 2008
- National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 (Safeguard Mechanism Rule).

Clean Energy Regulator – NGER Reporting and the Safeguard Mechanism

The National Greenhouse and Energy Reporting (NGER) scheme, established by the (NGER Act), is a single national framework for reporting and disseminating company information about GHG emissions, energy production, energy consumption and other information specified under NGER legislation.

The Safeguard Mechanism Rule commenced on 1 July 2016, imposing maximum emission limits for facilities with more than 100,000 t CO₂-e Scope 1 emissions per annum (emissions baseline), this applies to KCGM Fimiston Operation with a baseline being set at 238,934 t CO₂-e in 2016.

Since 2009, KCGM has been required to identify and report on Scope 1 and 2 emissions annually for the NGERs Fimiston Operations under the NGER Act 2007. This annual reporting cycle has resulted in a detailed understanding of the sources and quantities of both Scope 1 and Scope 2 emissions associated with the KCGM Fimiston Operations.

A reform to the Safeguard Mechanism passed parliament on 30 March 2023 to help Australia reach its net zero target by 2050 and align with recent commitments to a 43% reduction below 2005 emission levels by 2030. The reform achieves this by removing “headroom” from the current baselines and then to tighten these baselines by 4.9% per year until 2030 with further reductions until 2050.

3.8. Future Statutory Measures

Australian Sustainability Reporting Standard (ASRS)

The Australian Government have released an Exposure Draft 1 for sustainability reporting where Northern Star are likely to fall into the first group requiring reporting in FY2024.

As part of the disclosure standard, the scenario planning requires alignment to 1.5 degree scenario.

3.9. Consistency with other (non-statutory) GHG reduction instruments

KCGM submitted a Transitional Calculated Baseline Application for the Fimiston facility after October 2021 (this submission included the proposed FS Project).

The application utilises a prescribed Schedule 2 production variable (ROM Metal Ore) and a site-specific emissions intensity of 0.018141962 t CO₂-e /tonne ROM metal ore that is based on forecast production and emissions data in FY22/23.

The Transitional Calculated Baseline Application has been implemented since FYe2021 (FY2021) and will extend to FY2023 GHG emission report submission.

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As mentioned above, KCGM's forecast emissions are calculated by applying appropriate emissions intensity factors (consistent with NGER reporting requirements) to KCGM's estimated energy demand forecast for both fuels (Scope 1 emissions) and electricity supply from each source (renewables, grid and Parkeston Power Station).

Renewables are a zero emissions source. KCGM has used a forecast of the SWIS emissions intensity factor as published by [reference]. The emissions intensity factor for Parkeston Power Station assumes an emissions factor of 0.58 t.CO₂/MWh, which assumes an average heat rate for the station of 11.2 GJ/MWh.

Taskforce on Climate Related Financial Disclosures

Northern Star is committed to understanding how both the physical impacts of climate change and the transition to low carbon operations might affect our business. We have provided details in our Sustainability Reports on our identified climate-related risks and opportunities and detailed our scenario analysis work and our approach to operational resilience in light of potential climate change impacts.

We understand the importance of continuing our alignment with the Taskforce on Climate-Related Financial Disclosures (TCFD) recommendations, and the need for Northern Star to progress its commitment to a low-carbon economy in advancing our Emissions Reduction projects.

Paris Agreement

Northern Star remains committed to the Paris Agreement and the journey towards a net-zero carbon future by limiting global warming to well below 2°C, preferably 1.5°C above pre-industrial levels by 2050.

Northern Star acknowledges the invitation made to the private sector by the United Nations at the Framework Convention on Climate Change when adopting the Paris Agreement, to scale up efforts and support actions to reduce emissions and/or to build resilience and decrease vulnerability to the adverse effects of climate change.

3.10. Offsets

Northern Star's intent is to strive towards zero emissions and improve efficiencies wherever practicable, however it is possible that there will remain a requirement to utilise offsets to achieve Net Zero operational emissions by 2050.

Reductions in emissions for the KCGM Fimiston Operations will be achieved through the implementation of two renewable energy projects where the Scope 2 emissions can be reduced by approximately 260,000 t CO₂-e. The renewable projects include behind the meter purchase of green energy and the implementation of a 200MW wind farm and 100MW solar farm to provide energy to the mine.

Offsets will be considered a last resort in the event Northern Star is not able to meet the targets outlined in this GHG EMP. Should offsets be required, Northern Star's preferred approach will be to generate the offsets such as carbon sequestration projects from within local communities and with stakeholder involvement, to benefit our stakeholders. To this end Northern Star has earmarked three pastoral leases in the Goldfields with potential for such projects.

Studies to confirm the eligibility of these pastoral leases for Human Induced Regeneration (HIR) Carbon Projects have been completed with two of the pastoral leases identified as being

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immediately suitable for registering as Emissions Reduction Fund projects with the Australian Government.

The third pastoral lease will be eligible for registration pending the proposed amendments to WA's Land Administration Act 1997.

Northern Star is progressing the requirements for registering (human induced renewables) HIR projects to meet the Company's future offset needs if required.

3.11. Projects operating beyond 2050

There is currently no intention of FS Project operating beyond 2050. Scope 1, Scope 2 and Scope 3 emissions are predicted to reduce after 2034 as open pit mining operations taper off. Overall reduction in emissions for MS 782 Fimiston are depicted in

Figure 7.

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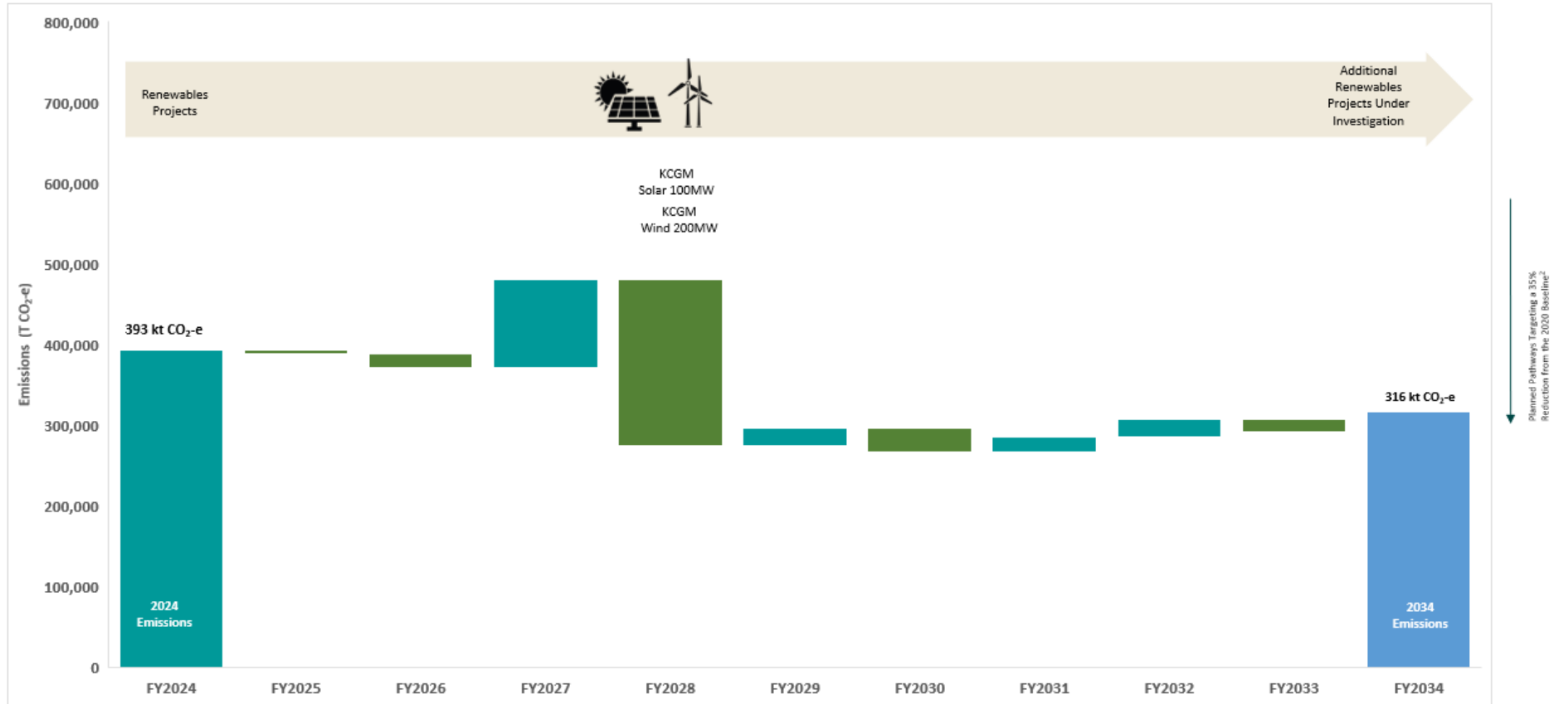


Figure 7 Fimiston Operational Area Emissions Reduction Pathway to 2034

*Teal=production increases, Olive=reduction due to renewables or other measures, Blue=emissions at end of project

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4. ADAPTIVE MANAGEMENT, CONTINUOUS IMPROVEMENT, AND REVIEW OF THE GHG EMP

KCGM recognises the dynamic nature of current monitoring and reporting requirements and supports adaptive management through adoption of this GHGMP and its implementation. Adaptive management introduces some flexibility to adapt to changes or to implement improved methods of delivery to improve performance and ensure targets for emissions can be met over time. An adaptive management approach will be adopted for the life of the Project. The concept of adaptive management aligns with the systematic approach of a robust environmental management system where the results from actions are monitored, reviewed and the plan is adapted to support continuous improvement.

Adaptive management involves (Table 6):

- Setting clear objectives and targets;
- Monitoring and evaluation against mitigation controls (including triggers and thresholds);
- Implementing mitigation measures or revising measures;
- Regular auditing and review of results;
- Review of emerging technologies and innovations in the mining and processing sector; and
- Systematically adapting to meet environmental objectives.

This may include significant changes to the FS Project design or delivery schedule, as a trigger to review and assess any impacts proposed within this management plan. Assumptions and uncertainties contained within this GHGMP will then be re-evaluated against collected data on a recurrent basis with a focus on continual improvement and the establishment of early response triggers and thresholds.

Any review or additions made to this GHGMP may trigger a requirement for the GHGMP to be re-submitted to EPA for formal review and comment, or if following a written request is received.

Examples of adaptive management throughout operations include:

- The introduction of different / alternative monitoring initiatives to better understand emission emanating from the implementation of works;
- The outcome of additional studies which significantly change the understanding of FS Project emissions, if undertaken; and
- The identification or modification of amended trigger or threshold criteria if more comprehensive policy and/or guidance documentation is publicly released.

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<p>EPA Factor: Greenhouse Gas Emissions</p> <p>EPA Objective: To reduce net greenhouse gas emissions to minimise the risk of environmental harm associated with climate change.</p> <p>Outcome: The operation of the proposal shall (i) comply with the requirement to report Scope 1 emissions under the NGER Act; and (ii) to operate below the emissions intensity set by the Commonwealth under the NGER (Safeguard Mechanism) Rule for the facility.</p> <p>Key environmental values: Climate change</p> <p>Key impacts and risks: Compliance with Regulations. Cost of having to "make-good" on excess emissions</p>				
PERFORMANCE INDICATORS	RESPONSE ACTIONS	MONITORING	TIMING/FREQUENCY	REPORTING
Trigger criteria 1: Average diesel usage over a 3-month period (quarter) is more than 5% above the estimated usage based on the business plan.	Investigate cause for variance.	Diesel usage will be monitored using the monthly diesel delivery invoices.	Diesel usage will be monitored quarterly.	The Annual Compliance Report will provide information on diesel usage and any significant variations to the business plan.
Trigger criteria 2: Estimation of Scope 1 emissions for the facility are higher than the Baseline set under the Safeguard Mechanism Rule based on the business plan.	Investigate cause for variance. Identify and implement opportunities to reduce greenhouse gas emissions to mitigate an exceedance.	Scope 1 emissions will be estimated based on forecast diesel usage from the open pit mine plan.	Scope 1 emissions will be monitored quarterly. Note that diesel usage for open pit mining accounts for approximately 94% of scope 1 emissions at the Fimiston facility.	In the event of an exceedance of the trigger criteria, the exceedance will be reported in the annual Compliance Assessment Report.
Threshold criteria 1: The Scope 1 emissions reported for the Fimiston facility are higher than the Baseline set under the Safeguard Mechanism Rule.	Investigate cause for exceedance. Identify and implement opportunities to reduce greenhouse gas emissions "Make good" on the excess emissions by procuring a quantity ACCUs equal to the excess emissions.	Scope 1 emissions will be calculated in accordance with the NGER Determination (refer to Appendix 1 for details).	Scope 1 emissions are calculated annually.	Scope 1 emissions are reported annually (by 31 October) to the CER under section 19 of the NGER Act.

Table 7 Trigger and Response actions

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5. REPORTING

Northern Star is committed to transparency and a range of public reporting associated with its GHG performance, specifically:

- The site Annual Compliance Report will provide information on diesel usage and any significant variations to the business plan.
- Scope 1 emissions reported annually (by 31 October) to the Clean Energy Regulator (CER) under Section 19 of the NGER Act 1997.
- Scope 2 emissions reported annually (by 31 October) to the CER under Section 19 of the NGER Act 1997.
- As a growth area within the industry, once Scope 3 management is better defined, it is envisaged that these emissions may be included into the Annual Compliance Report as per Scope 1 & 2 emissions.

The Greenhouse Gas Management Plan will be made available on Northern Star's website.

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6. STAKEHOLDER CONSULTATION

The relevant stakeholders for this GHGMP are:

- Clean Energy Regulator (CER): Reporting under Section 19 of the NGER Act, and for the Safeguard Mechanism Rule;
- Department of Industry, Science, Energy and Resources (DISER): Development of prescribed production variables and associated default emissions intensity values within Schedule 2 of the Safeguard Mechanism Rule;
- Environmental Protection Authority (EPA): Assessment of the revised proposal under Part IV of the *Environmental Protection Act 1986* (EP Act) and development of this GHGMP. All comments received during the assessment period from the EPA, other decision-making authorities and the public that relate to this GHGMP will be considered and where required, changes actioned; and
- Community: When approved, the revised plan will be made publicly available.

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7. CHANGES TO THE GHG EMP

Section 7			
Complexity of changes	Minor Revisions <input type="checkbox"/>	Moderate revisions <input checked="" type="checkbox"/>	Major revisions <input type="checkbox"/>
Date revision submitted to EPA: 23/02/2024			
Is the change proposed to be implemented under condition C3-3? If so, the proponent must provide a copy to the CEO at least 20 days before commencing implementation			Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Proponent's operational requirement timeframe for approval of revision	<One Month <input checked="" type="checkbox"/> <Six Months <input type="checkbox"/> >Six Months <input type="checkbox"/> None <input type="checkbox"/>		
Reason for Timeframe			

Item no.	GHG EMP section no.	GHG EMP page no.	Summary of change (separate track changes document to be provided)	Reason for change	New or increased adverse impacts to the environment? Risk to the achievement of limits, outcomes or objectives?
1.	Whole document	Whole document	New Document. Greenhouse Gas Management Plan (GHGMP) developed to meet the requirements of the EPA.	This GHGMP was specifically developed to support assessment of the Fimiston South Project by the EPA under Part IV of the EP Act.	Yes, proposal to extend mine life
2.	N/A	N/A	Sub development of project specific GHGMP to ensure continuation of GHG reporting under NGER Act 1997.	Segregation of additional works, outside of normal site activities captured within parent document.	N/A
3.	Whole document	Whole document	Document updated to align further with the 2023 EPA Guidelines. Estimated emissions presented as tonnes per annum (tpa) of carbon dioxide equivalent (CO ₂ -e) throughout the document. Justification of the emissions baseline proposed and alternative approaches that were considered have been provided. Trajectory of emission reductions and mitigation measures should be aligned with sections 3.2 and 3.3 of the GHG EMP template.	Updated guidelines from the EPA issued April 2023.	No.

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Item no.	GHG EMP section no.	GHG EMP page no.	Summary of change (separate track changes document to be provided)	Reason for change	New or increased adverse impacts to the environment? Risk to the achievement of limits, outcomes or objectives?
			<p>Benchmarking assessment and comparisons against other projects added to allow for a comparison of forecasted emissions.</p> <p>Baseline and trajectory presented in graph(s) and table format as tonnes of CO₂-e and with time periods aligning.</p>		

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8. GLOSSARY

CER	Clean Energy Regulator
CH ₄	Methane
CO ₂ -e	Carbon dioxide equivalent
EMP	Environmental Management Plan
EPA	Environmental Protection Authority (Western Australian)
EP Act	<i>Environmental Protection Act 1986</i> (Western Australian)
FullCAM	Full Carbon Accounting Model
FS	Fimiston South
FS Project	Fimiston South Project
GHG	Greenhouse Gas
GHGMP	Greenhouse Gas Management Plan (this document)
HIR	Human Induced Regeneration
KCGM	Kalgoorlie Consolidated Gold Mines Pty Ltd
kL	Kilolitre (1,000 litres)
km	Kilometre
kV	Kilovolts
LOM	Life of Mine
LPG	Liquefied petroleum gas
MP	Management Plan
MS	Ministerial Statement
Mtpa	Million tonnes per annum
NGER Act	<i>National Greenhouse and Energy Reporting Act 2008</i>
NGER Determination	National Greenhouse and Energy (Measurement) Determination 2009
N ₂ O	Nitrous Oxide
PPA	Power Purchase Agreements
ROM	Run-of-Mine
SF ₆	Sulphur Hexafluoride
Safeguard Mechanism Rule	<i>National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015</i>
SWIS	South Western Interconnected System
TCFD	Taskforce on Climate-Related Financial Disclosures
TSF	Tailings Storage Facility
t CO ₂ -e	Tonnes of carbon dioxide equivalent
WEM	Wholesale Electricity Market
WRD	Waste Rock Dump

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10. APPENDICES

10.1. Appendix 1: Measurement Criteria of GHG Emissions

Monitoring and management of GHG emissions is primarily based on invoiced quantities of fuels, electricity, and materials, and is consistent with the NGER Determination.

Emissions quantities are calculated by applying the relevant conversion method from the NGER Determination. KCGM uses the default method (Method 1) in all cases.

The table below outlines the techniques used for emissions measurement at KCGM, and the relevant measurement criteria and methodology in the NGER Determination.

EMISSIONS SOURCE	MEASUREMENT CRITERIA	EMISSIONS METHODOLOGY	MEASUREMENT CRITERIA
Diesel	Invoices	Method 1	A ³
LPG	Invoices	Method 1	A
Gasoline	Invoices	Method 1	A
Oils and greases	Invoices	Method 1	A
Electricity	Invoices	NA	NA

Scope 3 emissions for fuel and energy related activities were calculated using actual and forecasted fuel usage and electricity consumption data. Actual data was sourced from the Fimiston NGER FY22 report. Emissions for purchased goods and services, and upstream transport and distribution were calculated using actual supplier spend data from FY22. Relevant Scope 3 emission factors were used to convert total spend to Scope 3 GHG emissions. Emission factors were sourced from *US EPA Supply Chain Emission Factors guidance documents*.

10.2. Scope 1 Emissions Calculations

Scope 1 emissions calculations were based on the NGER emissions factor of 0.002709720.

10.3. Scope 2 Emissions Calculations

Scope 2 emissions were calculated based on total tonnes milled using a conversion factor of tonnes to KWh of 28.24 and a conversion factor of KWh to CO₂e of 0.000655714 based on historical data from 2013 – 2019.

³ Minor quantities of diesel are measured according to criteria BBB

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