

APPENDIX G Scope 3 Greenhouse Gas Assessment Report



TELFER LIFE OF MINE EXTENSION AND HAVIERON STAGE 2

SCOPE 3 GREENHOUSE GAS ASSESSMENT TECHNICAL REPORT

Prepared July 2023

Version 1.0

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Rounding of Amounts

All CO₂-e and energy amounts included in this document have been rounded to the nearest Kilo Tonne and GJ respectively, except when rounding would result in a zero.

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Summary

Newcrest Mining Limited (Newcrest) is the proponent for the Telfer Life of Mine Extension and Havieron Stage 2 (Telfer LOM Extension and Havieron) project.

A Greenhouse Gas (GHG) Technical Report had previously been prepared in July 2022 and submitted to the Australian Environmental Protection Agency (EPA). Within the report, Scope 1 and 2 GHG emissions were considered, but Scope 3 was not assessed.

This technical report focuses on Scope 3 emissions and forms an appendix to the original submission.

1 Scope 3 GHG Emissions

Scope 3 GHG emissions are all *indirect* emissions that are of a consequence of an organisation’s activities but are not from sources owned or controlled by the organisation, e.g. the emissions associated with the extraction, refinement, and delivery of diesel to site.

The GHG Protocol (2011) divides scope 3 GHG emissions into two groups, depending on the financial transactions of the company:

- Upstream indirect GHG emissions related to purchased or acquired goods and services,
- Downstream indirect GHG emissions related to sold goods and services.

Scope 3 GHG emissions are further split into 15 categories to provide a systematic framework for companies to quantify, manage and reduce emissions across their corporate value chain. To avoid double counting emissions, the categories are designed to be mutually exclusive. Table 2 outlines all scope 3 categories, their relevancy to the project and indicates those included in the GHG assessment. A full list and description of the scope 3 categories as well as definitions of relevancy are outlined in Appendix A.

Table 2 Scope 3 GHG Emissions Categories (Greenhouse Gas Protocol, 2011)

Category	Relevancy	Included/Excluded in Assessment
1. Purchased goods and services	Material; should be calculated.	Included
2. Capital goods	Material; should be calculated.	Included
3. Fuel- and energy-related activities (Not included in scope 1 or scope 2)	Material; should be calculated.	Included
4. Upstream transportation and distribution	Material; should be calculated.	Included ¹
5. Waste generated in operations	Immaterial; waste generated totals are not significant enough to be material.	Excluded
6. Business travel	Immaterial; emissions resulting from business travel would predominantly be attributed to corporate facilities.	Excluded

¹ Emission factors used in Category 1, 2 and 3 include emissions from transportation and distribution, so have been reported together.

7. Employee commuting	Immaterial; but calculated for completeness as data was available.	Included
8. Upstream leased assets	Immaterial; no upstream leased assets identified.	Excluded
9. Downstream transportation and distribution	Material; should be calculated.	Included
10. Processing of sold products	Material; should be calculated.	Included
11. Use of sold products	Immaterial; copper and gold do not have material carbon emissions after processing.	Excluded
12. End-of-life treatment of sold products	Immaterial; copper and gold do not have material carbon emissions after processing.	Excluded
13. Downstream leased assets	Immaterial; no downstream leased assets identified.	Excluded
14. Franchises	Immaterial; no franchises identified.	Excluded
15. Investments	Immaterial; no investments relating to this facility identified.	Excluded

1.1 Scope 3 Emissions Methodology

To calculate scope 3 GHG emissions, the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard (2011) has been consulted and the GHG Protocol Technical Guidance for Calculating Scope 3 Emissions (2013) referenced where required.

The two main methods of quantifying scope 3 GHG emissions are direct measurement and calculation. Direct measurement involves monitoring, mass balance or stoichiometry to quantify emissions, while calculation uses an emission factor and activity data to calculate emissions. Due to the difficulty in direct measurement generally the calculation method is used, as such the general formula for calculating emissions is outlined below:

$$GHG\ Emissions = Activity\ Data \times Emission\ Factor$$

A variety of emission factor sources were used, including but not limited to:

- Supplier-specific factors as provided by Newcrest,
- National Greenhouse Accounts Factors (2022),
- NGER (Measurement) Determination factors,
- UK DEFRA factors 2023,

- US EPA spend factors 2018.

1.2 Scope 3 Calculations and Results

Six categories of scope 3 GHG emissions were determined to be material for the Newcrest, these being Category 1 (purchased goods and services), Category 2 (capital goods), Category 3 (fuel and energy related activities), Category 4 (upstream transportation and distribution), Category 9 (downstream transportation and distribution) and Category 10 (processing of sold products). Category 7 (employee commuting) was considered immaterial, but calculations were conducted as data was available.

Data used in the calculations were sourced from Newcrest directly. A discussion on the data and emission factors used is provided in below sections.

The scope 3 results shown in Table 3 show that of the six categories, Category 11 Processing of Sold Product was the highest contributor making up 50% of the scope 3 GHG emissions.

Table 3 Estimated Scope 3 Emissions over LOM

Category	LOM Scope 3 Emissions (ktCO ₂ -e)	Scope 3 Emissions per year (ktCO ₂ -e/year)
Purchased Goods and Services (including upstream transportation and distribution)	237.0	17.0
Capital Goods	311.2	22.2
Fuel and Energy Related Activities (including upstream transportation and distribution)	433.6	31.0
Employee Commuting	4.7	0.4
Downstream transportation and distribution)	300.1	21.4
Processing of Sold Products	1,303.6	93.1
Total	2,590.3	185.0

1.2.1 Category 1 Purchased Goods and Services

The major emission sources for gold and copper mining and processing operations are:

- Lime
- Grinding media
- Cement

- Ammonium nitrate
- Sodium cyanide

Usages of each of the above products were forecasted for the LOM based on the usages in FY2022. By correlating the usage quantities in FY2022 against the amount of ore processed in the same period, an approximate ratio of product used per tonne of ore processed was developed and extended to future years based on the anticipated ore processing numbers provided by Newcrest.

Emission factors for each of the 5 products were provided by Newcrest. These emission factors were sourced directly from suppliers.

Other purchased goods and services were considered immaterial and thus not considered.

1.2.2 Category 2 Capital Goods

Capital expenditure data was obtained from the pre-feasibility study (PFS) for Havieron Stage 2 conducted by Newcrest. Within the PFS, capital expenditure is estimated as USD \$397 million for LOM.

No information was provided for when the capital was to be used throughout the project, so it was estimated that 50% of expenditure would fall within the first year of Havieron mining operations, 20% in the second year, 10% in the third year and the balance being apportioned throughout LOM based on estimated ore processing quantities.

A spend factor was obtained from the US EPA to estimate emissions from capital expenditure. The factor obtained specifically relates to the “copper, gold and silver concentrates” industry in 2018, and was adjusted for inflation to 2022.

1.2.3 Category 3 Fuel and Energy Related Activities

The fuels considered are the same fuels that were considered during the Scope 1 GHG estimate. These are:

- Diesel
- PNG
- Acetylene
- LPG
- Lubricating Oils
- Non-lubricating Oils
- Greases

Quantities were estimated using the same assumptions as the Scope 1 exercise. Emission factors were obtained from the Australian National Greenhouse Accounts Factors 2022.

Of the list of fuels, only diesel and PNG were material, forming 45% and 51% of total Category 3 emissions respectively.

1.2.4 Category 4 Upstream Transportation and Distribution

Upstream transportation and distribution emissions were considered as part of this exercise, but not reported under this heading. This is because emission factors used in Categories 1, 2 and 3 already factored in emissions arising from transportation and distribution activities.

1.2.5 Category 7 Employee Commuting

It was estimated that Havieron would be staffed by approximately 300 people steady state across the life of operations. It was further assumed that employees would be on a FIFO roster and would be based in Perth.

The approximate straight-line distance from Perth to Telfer/Havieron is 1,300 km. A single employee was assumed to take around 35 one-way trips per year (loosely based on a 3-week rotation).

The emission factor for air travel distances less than 3,700 km was obtained from the DEFRA UK, and is presented in units of kg CO₂-e per passenger per km. It was assumed all passengers would travel on economy class.

1.2.6 Category 9 Downstream Transportation and Distribution

Downstream transportation and distribution was broadly considered in 2 areas:

- Gold downstream transportation, and
- Copper downstream transportation.

Gold downstream transportation was found to be insignificant based on production estimates. Gold was assumed to be transported to Perth Mint for refining. Annual production values were around 260 kilo oz, which is around 8 tonnes.

Copper was assumed to be transported to Port Hedland for marine shipping to international destinations. Emissions from truck transport to port were estimated based on distance, capacity of truck and approximate fuel burn rate for trucks of such capacities. Furthermore, quantities of diesel combusted during shipping operations were estimated based on data from Newcrest for the FY2022 period, based on diesel combusted per tonne of product shipped. Finally, emissions were estimated based on the emission factor for diesel combustion for transport purposes from the NGER Determination.

1.2.7 Category 11 Processing of Sold Product

Similar to Category 9, gold and copper were considered separately.

All gold was assumed to be refined at the Perth Mint, who provided a specific refining emissions intensity.

Copper product is refined by several different refineries. Newcrest provided emission factors sourced directly from the main refineries they supply, and an average factor was derived from the specific emissions factors provided by 4 refineries.

Appendix A Scope 3 Emission Categories and Relevancy

Category	Description
1. Purchased goods and services	All emissions from the production of products and services purchased or acquired by the reporting company in the reporting period. <i>Example: The emissions associated with the extraction, production and transportation (between suppliers) of copper that is purchased by the reporting company to create bronze.</i>
2. Capital goods	All upstream emissions from the production of capital goods purchased by the company in the reporting period. <i>Example: Emissions associated with the production of excavators used by the reporting company.</i>
3. Fuel- and energy-related activities (Not included in scope 1 or scope 2)	All emissions related to the production (extraction, processing, transport etc.) of fuel and energy purchased by the reporting company, that are not included in the company's scope 1 and scope 2 emissions. <i>Example: The emissions from extracting crude oil, processing it to form diesel and transporting it to a site run by the reporting company.</i>
4. Upstream transportation and distribution	All emissions resulting from the transportation and distribution of purchased products, between a company's tier 1 suppliers and its own operations, in vehicles not owned by the reporting company, as well as any third-party transportation and distribution services purchased by the reporting company between a company's own facilities. <i>Example: Emissions from transportation of purchased copper between the supplier and the reporting company's bronze manufacturing facility.</i>
5. Waste generated in operations	All emissions from third-party treatment and disposal of waste that is generated by the company in the reporting period. <i>Example: Waste sent from the reporting company's site facilities for recycling, disposal at landfills, incineration, composting, etc.</i>
6. Business travel	All emissions from the transportation of employees for business-related activities in vehicles owned or operated by third-parties. <i>Example: Flights to business conferences and meeting suppliers.</i>
7. Employee commuting	All emissions from the transportation of employees between their homes and worksites. <i>Examples: FIFO and DIDO to site.</i>
8. Upstream leased assets	All emissions from the operation of leased assets that are not included in the company's scope 1 and 2 emissions inventory. <i>Example: Emissions from leased cars, offices and buildings.</i>
9. Downstream transportation and distribution	All emissions from third-party transport and distribution of the company's sold products in the reporting period. <i>Example: Emissions from third-party marine transportation of iron ore sold by the reporting company to be processed by another company.</i>
10. Processing of sold products	All emissions from processing of sold intermediate products by third-parties, subsequent to the sale of the product by the reporting company. <i>Example: Emissions from processing of iron ore sold by the reporting company to create steel.</i>

11. Use of sold products	All emissions from the use of goods and services sold by the reporting company in the reporting period. <i>Example: Emissions from the combustion of diesel, produced by the reporting company, as fuel for cars.</i>
12. End-of-life treatment of sold products	All emissions from the waste disposal or treatment of products sold by the company in the reporting period, at the end of their life. <i>Example: Emissions from recycling of metal cans sold by the reporting company.</i>
13. Downstream leased assets	All emissions from the operation of assets owned by the company and leased to third-parties in the reporting period, if they are not included in the company's scope 1 and scope 2 emissions. <i>Example: Emissions from electricity used in offices/buildings leased by the reporting company to other operations.</i>
14. Franchises	All emissions from the operation of franchises, by franchisees, not included in the franchisor's scope 1 and scope 2 emissions. <i>Example: Emissions from operations associated with a company's trademark.</i>
15. Investments	All emissions associated with operating the reporting company's investments in the reporting period. <i>Example: Emissions associated with a mine a company has a financial investment in but not operational control.</i>

Criteria	Description
Size	They contribute significantly to the company's total anticipated scope 3 emissions.
Influence	There are potential emissions reductions that could be undertaken or influenced by the company.
Risk	They contribute to the company's risk exposure (e.g., climate change related risks such as financial, regulatory, supply chain, product and customer, litigation, and reputational risks).
Stakeholders	They are deemed critical by key stakeholders (e.g., customers, suppliers, investors, or civil society).
Outsourcing	They are outsourced activities previously performed in-house or activities outsourced by the reporting company that are typically performed in-house by other companies in the reporting company's sector.
Sector guidance	They have been identified as significant by sector-specific guidance.
Other	They meet any additional criteria for determining relevance developed by the company or industry sector.

Source: GHG Protocol (2011)

Appendix B Scope 3 Calculations

Please refer to the NCM Telfer LOM Assessment 2022 – Scope 3 tab.

Appendix C References

Department of Environment, Food and Rural Affairs UK. (2023). Greenhouse gas reporting: conversion factors 2023. Available at: <https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting>

GHG Protocol (2011). *Corporate Value Chain (Scope 3) Accounting and Reporting Standard*. WRI/WBCSD. Available at: <https://ghgprotocol.org/standards/scope-3-standard>

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