ENVIRONMENTAL AND SAFETY DATA REPORT
2018

FIRST QUANTUM
MINERALS LTD.

CEO'S STATEMENT

As a growing mining company, First Quantum Minerals recognizes its long term obligation to extract resources responsibly. This responsibility extends from the communities immediately adjacent to and around our operations to our resource consumption and its impacts on the broader global environment. We aim to meet this obligation through the integration of sound environmental, health and safety management practices into all aspects of our business. Furthermore, First Quantum Minerals is committed to continuous improvement through its environmental, health and safety management systems which are subject to regular external review.

We recognize the impact of our mining activities on the landscape around our operations and on the wider environment. We acknowledge that while continual improvement and meaningful efficiencies have been achieved in recent years across our industry, a number of environmental, health and safety challenges still exist. As with all aspects of our business we continue to challenge and strengthen areas of weakness and explore opportunities to further improve our environmental, health and safety performance.

To illustrate our commitment and transparency on these matters, we have prepared our first environmental, health and safety data report. The report provides a summary of our environmental and safety performance against a number of globally recognized environmental and safety standards. We feel that the selected standards best reflect our environmental and safety performance.

I hope you will find the information presented herein both informative and useful, and I look forward to reporting on our environmental, health and safety performance and new initiatives in future years.

Philip K. R. Pascall
Chairman of the Board and Chief Executive Officer

"First Quantum Minerals is committed to continuous improvement through its environmental, health and safety management systems which are subject to regular external review."

FOREWORD

This report presents the environmental and safety performance of First Quantum Minerals Limited for 2017. While the data was collected by employees and has not been externally verified we do believe that it is highly representative of our overall performance. We intend to further strengthen our data collection activities.

Wherever possible, metrics have been presented at both a site and group level. We believe that this level of detail will provide greater context to our overall performance and longer term trends. When analyzing trends, it should be noted that some external factors can play a fairly significant role in year to year performance. While we continually strive to reduce the impact of these factors, some remain out of our control. Where data conforms to the requirements of the Global Reporting Initiative (GRI), the relevant code has been referenced. Notes provide further context and clarity to some of the data presented.

DATA COLLECTION AND STANDARDS

Greenhouse Gas and Water Data, have been collected in accordance with the Greenhouse Gas Protocol (WRI, WBCSD) and the Water Accounting Framework (Minerals Council of Australia, 2014) respectively. Where data conforms to the requirements of the Global Reporting Initiative (GRI), the relevant code has been indicated in the text. A summary of the GRI indicators listed in this report are as follows:

- **EN3:** Energy consumption within the organization
- **EN5:** Energy intensity
- **EN8:** Total water withdrawal by source
- **EN10:** Percentage and total volume of water recycled and reused
- **EN15:** Direct Greenhouse Gas (GHG) emissions (Scope 1)
- **EN16:** Energy indirect Greenhouse Gas (GHG) emissions (Scope 2)
- **EN18:** Greenhouse Gas (GHG) emissions intensity
- **EN21:** NO_x, SO_x, and other significant air emissions
- **EN23:** Total weight of waste by type and disposal method
- **LA6:** Type of injury and rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by region and by gender

ABBREVIATIONS AND ACRONYMS

- **KT (kilo tonnes)** - a thousand (10^3) tonnes
- **MT (megatonnes) -** a million (10^6) tonnes
- **ML (megalitres) -** a million (10^6) litres
- **GJ (gigajoule) -** a billion (10^9) joules
- **TJ (terajoule) -** a million million (1012) joules
- **Ha -** hectare
- **CU-eq (copper equivalent)** - a measure to normalize the production of several mined commodities into a single 'copper-equivalent' figure. Commodities are scaled by the number of 'equivalent' units of copper they represent in value. A relative price for each commodity based on its value relative to copper (price of commodity / price of copper) is used. Relative commodity prices are pegged to either a single point in time or averaged over a period
- **CO_2-eq (carbon dioxide equivalent)** - a measure to normalize the impact of different greenhouse gases in terms of the amount of CO_2 that would create the same amount of warming.

ENVIRONMENTAL STRATEGY

The Company aims to prevent pollution, and protect and conserve the environment during exploration activities, project development and mining operations, and to return areas affected by our activities to their original land use or acceptable alternative, post closure.

At First Quantum Minerals, environmental management is a corporate priority. Policies, programs and practices are in place to guide and advise operations on environmental management. Each operation is responsible for developing and implementing its own environmental management system and environmental programs in accordance with Company policies and all applicable laws providing for the protection of the environment, our employees and contractors, local communities and the public at large. Sites are subject to regular external and internal audits to assess environmental performance and ensure continual improvement. Where legislation is inadequate, the Company to the extent reasonable, adopts relevant international standards.

Board oversight of environmental matters is provided through a Committee of independent directors. The Group Environmental Manager works with the operations and reports to the Committee and CEO on all environmental matters.

We acknowledge climate change and the challenges it presents to our business. Our operations continue to look for opportunities to use energy more efficiently and reduce their carbon emissions.

To achieve our environmental objectives, the Company provides the necessary resources, personnel and the requisite training so that all our employees and contractors are aware of and able to fulfil their environmental responsibilities.

Lastly, but very importantly, we consult and communicate with our local communities and relevant stakeholders regularly and throughout the life of the project to keep them informed of our activities and how we are managing key risks.

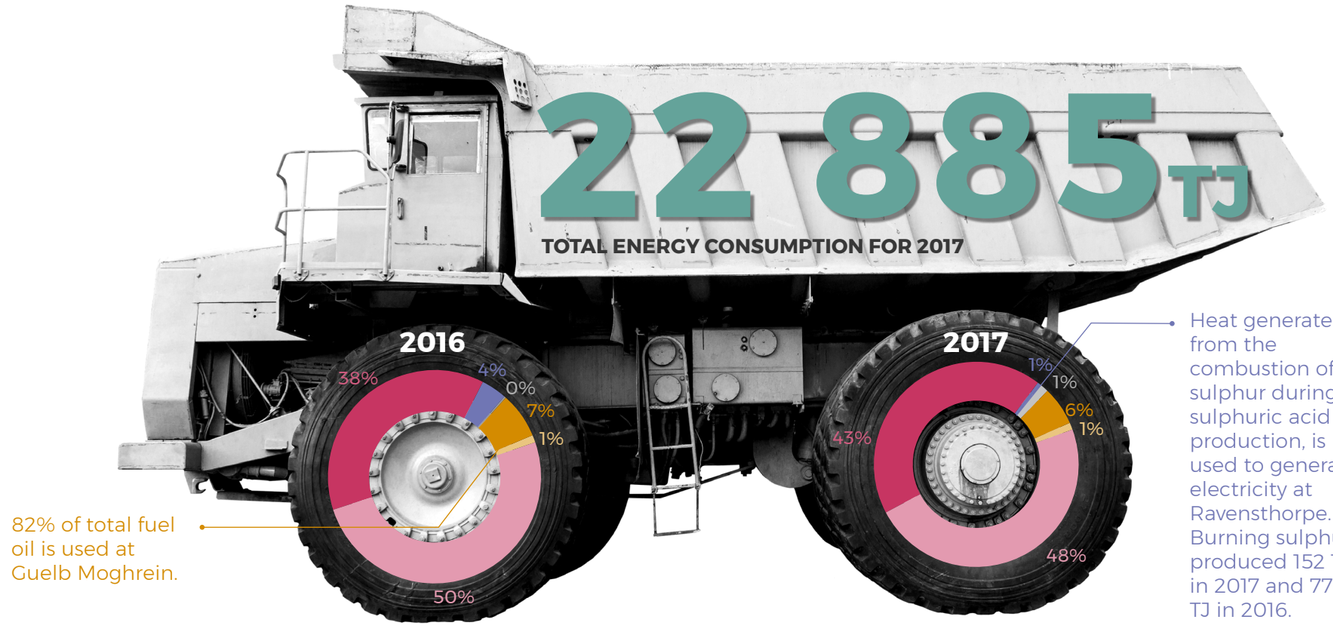
ENERGY CONSUMPTION

2016 – 2017

Mining and metal production is energy intensive. In 2017, our energy inputs accounted for approximately 20% of the total group operating costs. Energy for crushing, milling, smelting and processing equipment is typically powered by electricity from a national grid. However, where grid electricity is not available, energy sources such as heavy fuel oil and sulphur are used to generate power. Diesel is used in the mobile mining fleets and equipment.

Annual energy consumption increased by almost 12% in 2017, while total production (tonnes Cu-eq) increased by 1% over the same period resulting in an overall energy intensity increase of 10%.

EN3 GROUP ENERGY CONSUMPTION (TJ)



12%

INCREASE OF TOTAL ENERGY **CONSUMPTION** IN 2017

1%

INCREASE OF TOTAL MINE **PRODUCTION** (TONNES CU-EQ) IN 2017

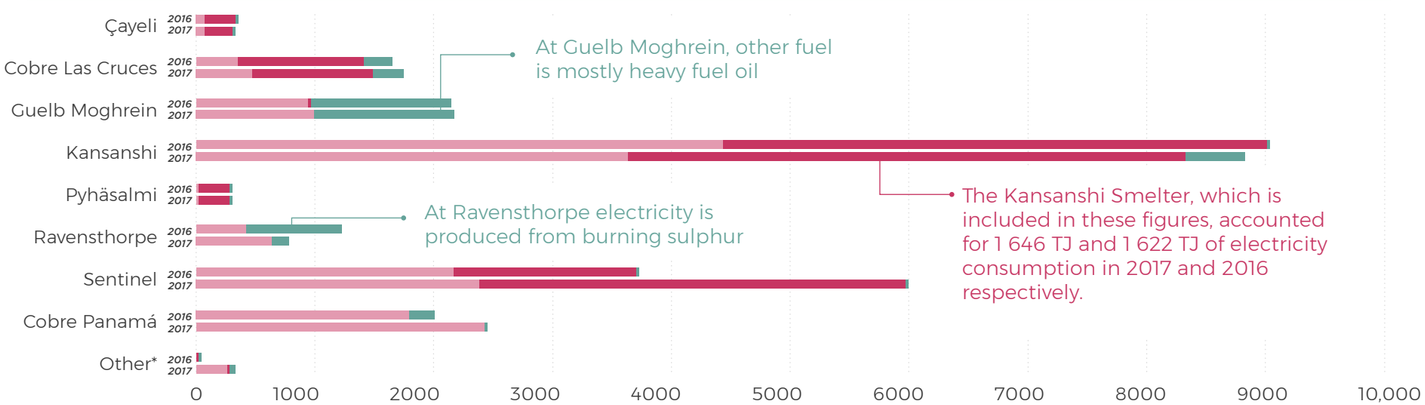
37%

OF ALL **PRIMARY ENERGY** CONSUMED WAS FROM **RENEWABLE ENERGY SOURCES**

KEY Diesel · Sulphur · Electricity · Heavy Fuel Oil · Natural gas · Other**

***Other includes fuels such as petrol and aviation fuel.*

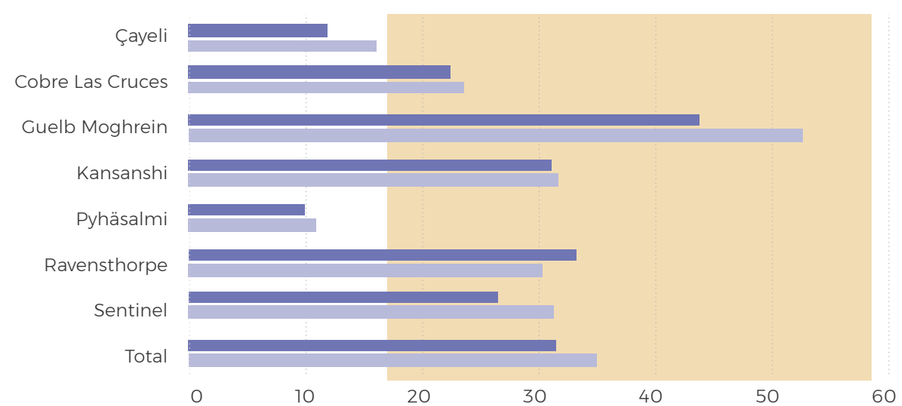
ANNUAL ENERGY CONSUMPTION PER SITE (TJ)



KEY Electricity · Diesel · Other fuel types

**Other includes exploration, projects, closed properties and support offices. The Cobre Panamá project has been included here as it makes a significant contribution to overall energy consumption.*

EN5 ENERGY INTENSITY (GJ/TONNE CU-EQ)



KEY 2016 · 2017 · Competitor range*

**Source: Digging Deep: Which Miners Are Facing up to the Low-Carbon Challenge, 2017, CDP: Tarek Soliman, Luke Fletcher and Tom Crocker.*

PURCHASED ELECTRICITY CONSUMPTION

Purchased electricity accounts for 43% of total energy consumption across all our operations. At First Quantum Minerals, we purchase electricity from various utility providers in the areas in which we operate. Each site, depending on its geographical location, purchases electricity generated from different sources. For example, in 2017, Zambia generated 94% of its electricity from hydro-electricity, whereas Spain has a broader mix consisting of 34% coal, 32% gas and 25% hydro-electricity. Since the Zambian operations account for 84% (in 2017) of our electricity consumption, the resulting energy profile has a high hydro-electricity component.

All purchased electricity indicated here is derived from utility grid-based electricity only. The energy we generate ourselves from primary fuel consumption is included in Section 2: Energy Consumption.

NOTES

Electricity compositions are based on IEA World Energy Balances (2016) for all countries in which First Quantum Minerals operates. It was conservatively assumed that electricity generation of all other activities (exploration, projects, and offices) have a 50:50 split between coal and gas. Not all of the data was from the IEA. Where is was available, different country data was used.

PURCHASED GROUP ELECTRICITY CONSUMPTION (TJ)

83.5% Hydro-electricity

0.7% Biofuels and waste

0.5% Solar and geothermal

3.3% Nuclear

4% Oil

2.2% Wind

2.7% Coal

3.1% Gas

9 835 TJ

TOTAL **ELECTRICITY CONSUMPTION** FOR 2017

87%

OF ELECTRICITY CONSUMPTION IS **FROM RENEWABLES**

84%

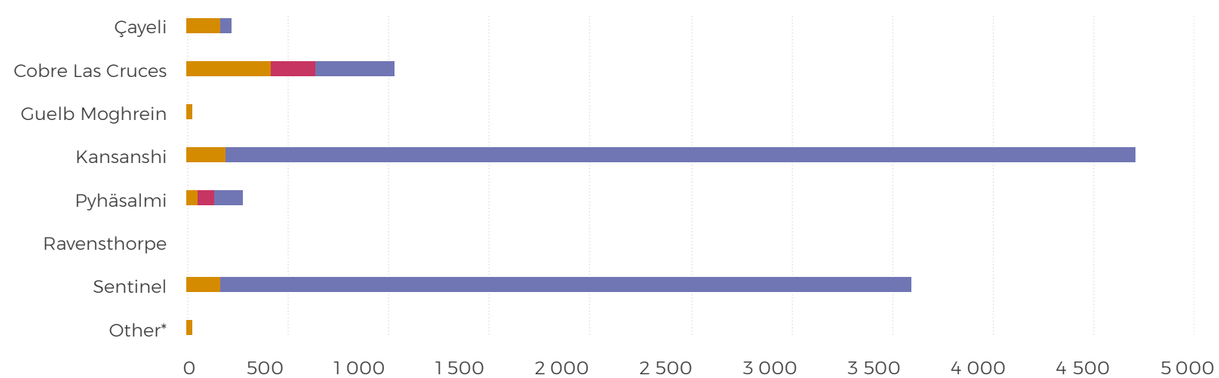
OF THE GROUPS PURCHASED ELECTRICITY CONSUMPTION IS **HYDRO-ELECTRICITY**

↑ 28%

INCREASE IN **ELECTRICITY CONSUMPTION** FROM 2016 – 2017

(largely as a result of the 135% increase of electricty consumption at Sentinel)

PURCHASED ELECTRICITY CONSUMPTION PER SITE (TJ)



KEY Renewable** Non-renewable Nuclear

**Other includes exploration, projects, closed properties and support offices.*
***Renewables include hydro-electricity, biofuels and wood, solar, geothermal and wind.*

KANSANSHI SMELTER

Smelting activities at Kansanshi require a significant amount of energy, resulting in increased greenhouse gas (GHG) emissions. However, when the annual smelter related GHG emissions at Kansanshi are compared to the GHG emissions when similar quantities of concentrate are smelted elsewhere in Zambia or China, it is clear that the Kansanshi Smelter offers significant overall GHG reduction benefits. Firstly, with the smelter in Zambia, there is no need to transport copper concentrate to other smelters around the world. Transportation of concentrate makes a significant contribution to GHG emissions. Secondly, power off the Zambian grid is dominated by hydro-electricity, resulting in substantial GHG emissions savings compared to grids powered by fossil fuels. Thirdly, instead of importing sulphur and using more energy to convert it to sulphuric acid for use in the leach circuit, Kansanshi uses the sulphuric acid from the smelter's emissions, thus saving more GHG emissions. The net GHG savings are estimated to be close to half a million tonnes of CO_2 equivalent per annum.

48%

OF THE **GROUP'S ELECTRICITY** IS CONSUMED AT **KANSANSHI**

35%

OF KANSANSHI'S ELECTRICITY IS CONSUMED AT THE **SMELTER**

37%

OF THE GROUP'S ELECTRICITY IS **CONSUMED AT SENTINEL**

EMISSIONS

2015 - 2017

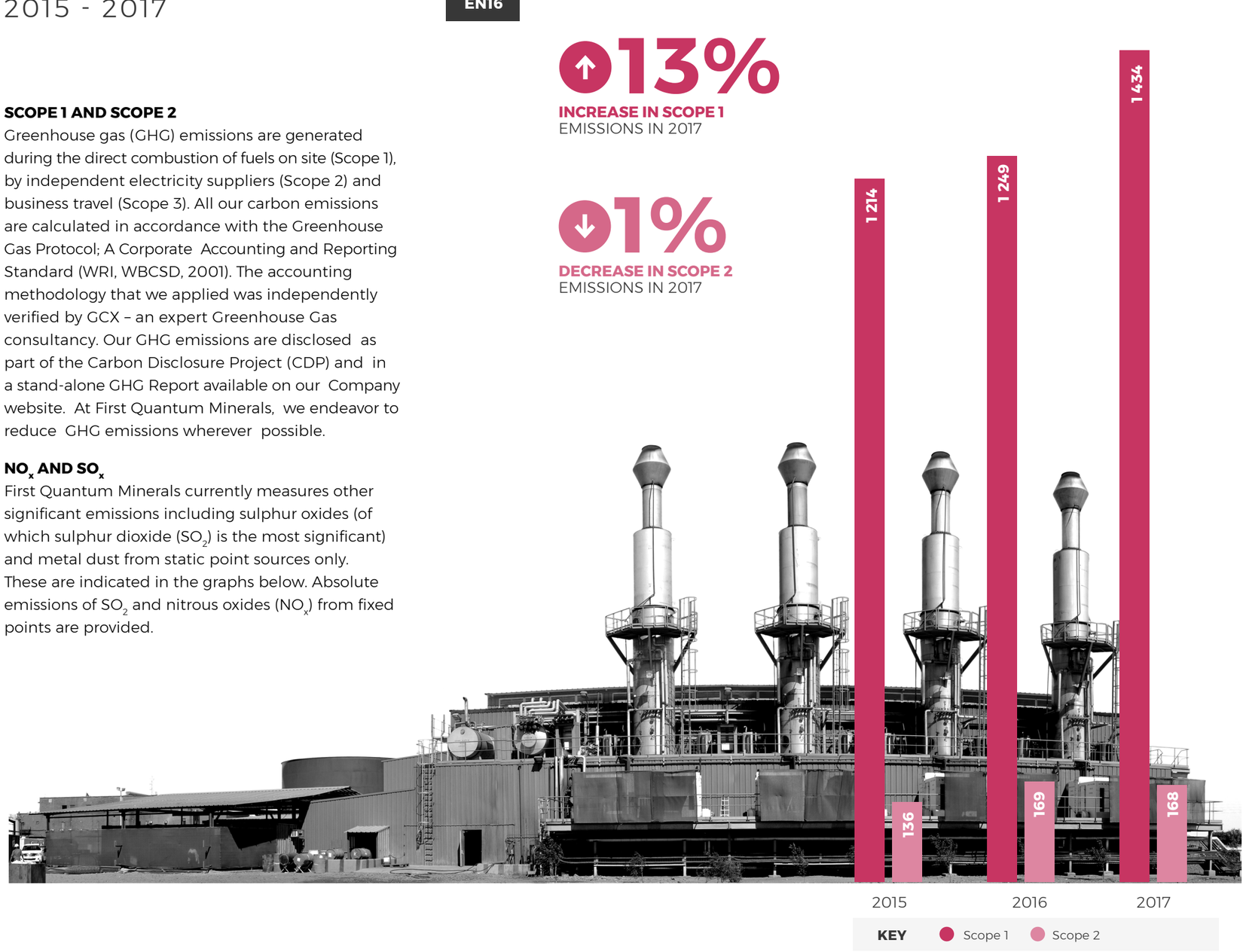
SCOPE 1 AND SCOPE 2

Greenhouse gas (GHG) emissions are generated during the direct combustion of fuels on site (Scope 1), by independent electricity suppliers (Scope 2) and business travel (Scope 3). All our carbon emissions are calculated in accordance with the Greenhouse Gas Protocol; A Corporate Accounting and Reporting Standard (WRI, WBCSD, 2001). The accounting methodology that we applied was independently verified by GCX – an expert Greenhouse Gas consultancy. Our GHG emissions are disclosed as part of the Carbon Disclosure Project (CDP) and in a stand-alone GHG Report available on our Company website. At First Quantum Minerals, we endeavor to reduce GHG emissions wherever possible.

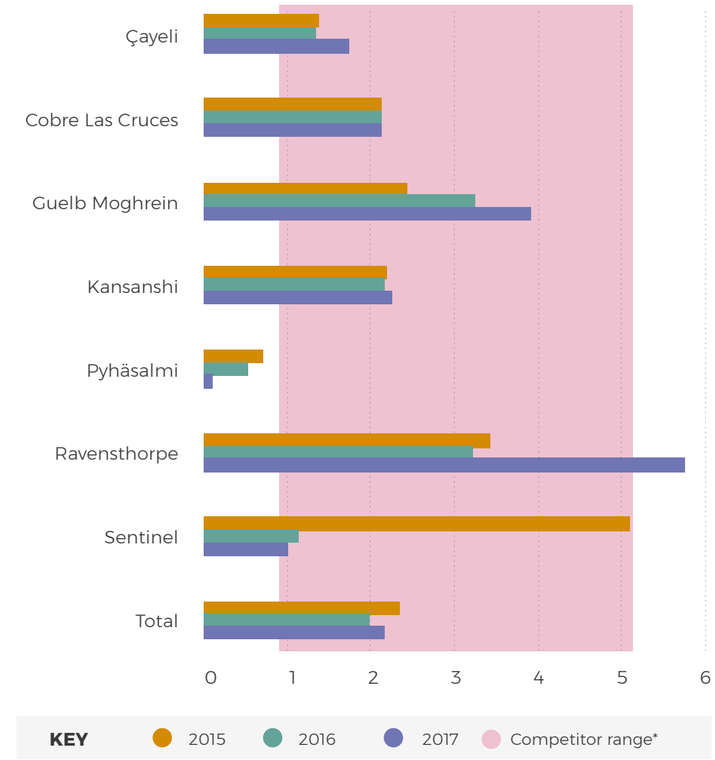
NO_x AND SO_x

First Quantum Minerals currently measures other significant emissions including sulphur oxides (of which sulphur dioxide (SO_2) is the most significant) and metal dust from static point sources only. These are indicated in the graphs below. Absolute emissions of SO_2 and nitrous oxides (NO_x) from fixed points are provided.

EN15 **EN16** **ANNUAL GHG EMISSIONS (KILOTONNES CO_2E)**



EN18 **CU EQ INTENSITY (TONNE CO_2E/TONNE CU EQ)**

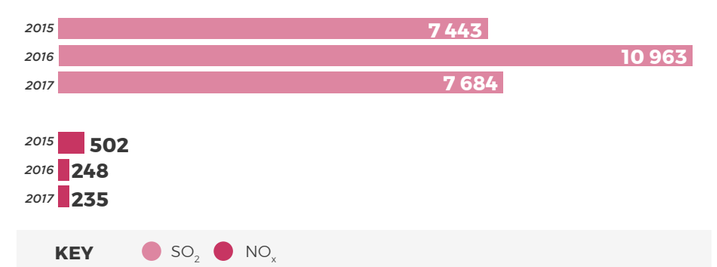


**Source: Digging Deep: Which Miners Are Facing up to the Low-Carbon Challenge, 2017, CDP: Tarek Soliman, Luke Fletcher and Tom Crocker.*

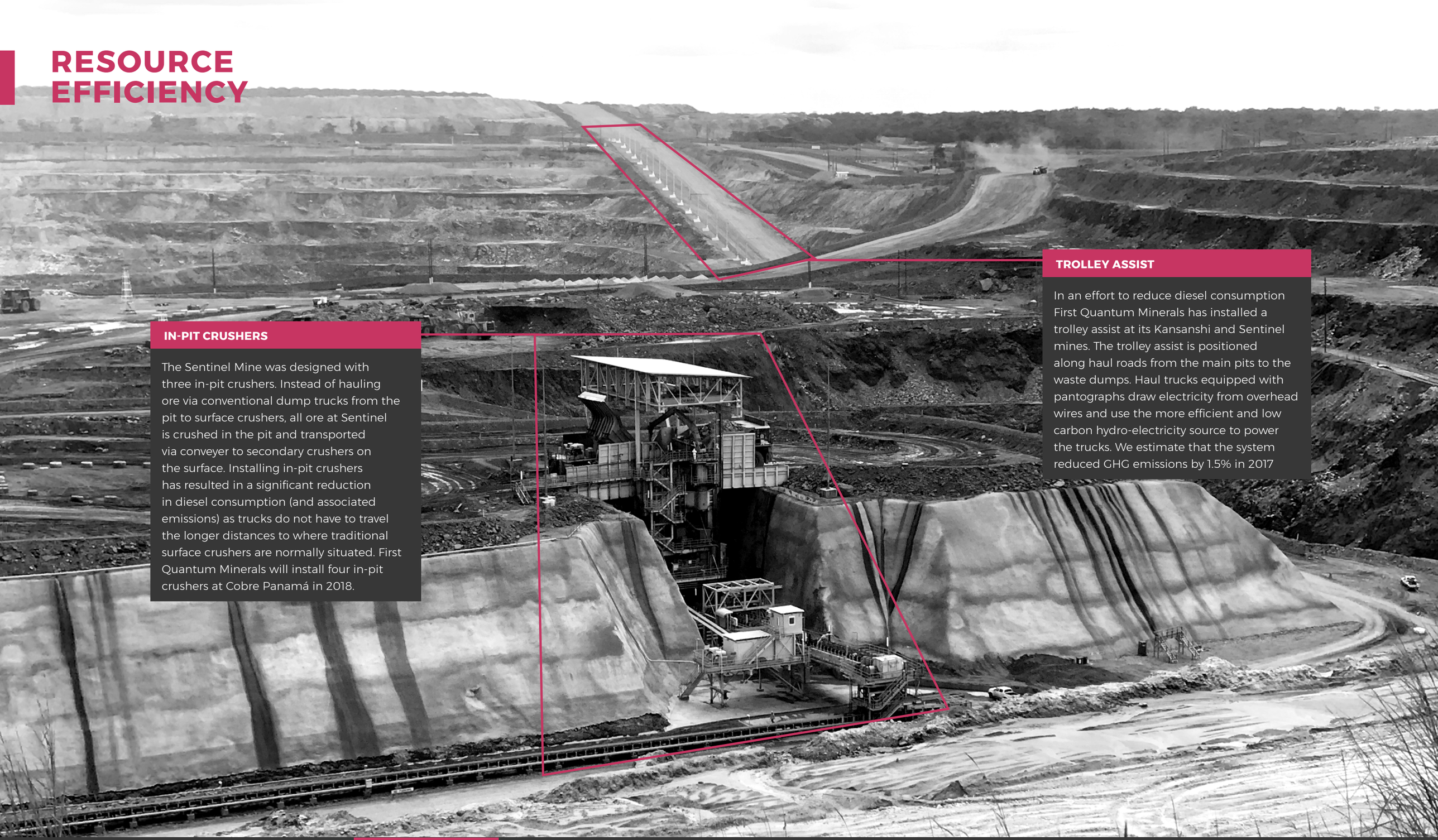
NOTES

Emissions generated from smelting activities at Kansanshi were not included in the Cu-EQ intensity calculations.

EN21 **SO_2 AND NO_x EMISSIONS (TONNES)**



RESOURCE EFFICIENCY



IN-PIT CRUSHERS

The Sentinel Mine was designed with three in-pit crushers. Instead of hauling ore via conventional dump trucks from the pit to surface crushers, all ore at Sentinel is crushed in the pit and transported via conveyer to secondary crushers on the surface. Installing in-pit crushers has resulted in a significant reduction in diesel consumption (and associated emissions) as trucks do not have to travel the longer distances to where traditional surface crushers are normally situated. First Quantum Minerals will install four in-pit crushers at Cobre Panamá in 2018.

TROLLEY ASSIST

In an effort to reduce diesel consumption First Quantum Minerals has installed a trolley assist at its Kansanshi and Sentinel mines. The trolley assist is positioned along haul roads from the main pits to the waste dumps. Haul trucks equipped with pantographs draw electricity from overhead wires and use the more efficient and low carbon hydro-electricity source to power the trucks. We estimate that the system reduced GHG emissions by 1.5% in 2017

GHG EMISSIONS PER SITE (KILOTONNES)

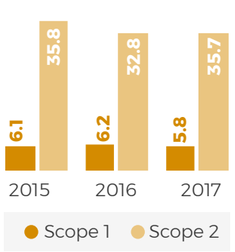
EN15

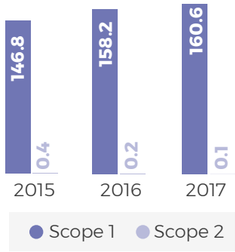
EN16

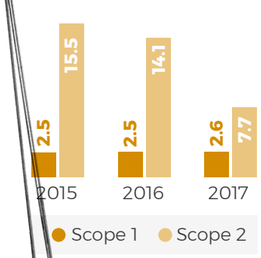
The percentage contribution of each site to group GHG emissions is provided below. While not necessarily to scale, GHG emissions from different sites over three years are also provided to show trends.

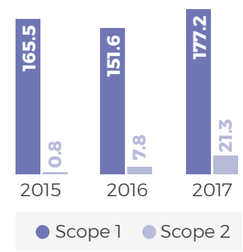
NOTES

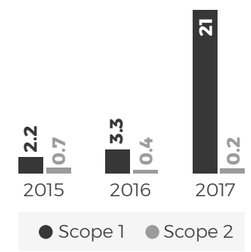
Other includes: exploration, projects, closed properties and support offices.
The GHG accounting methodology was independently verified by GCX.











3% Çayeli

10% Guelb Moghrein

1% Pyhäsalmi

13% Sentinel

1% Other

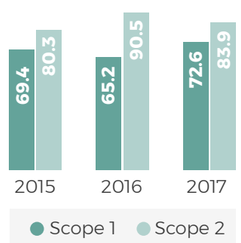
2017 PERCENTAGE BREAKDOWN PER SITE

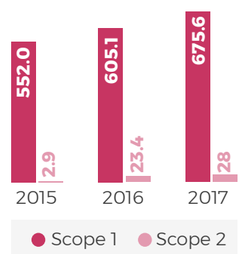
10% Cobre Las Cruces

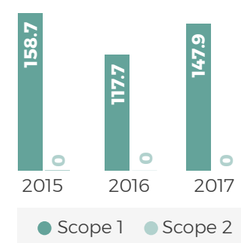
43% Kansanshi

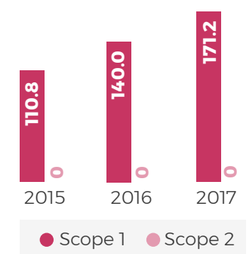
9% Ravensthorpe

11% Cobre Panamá







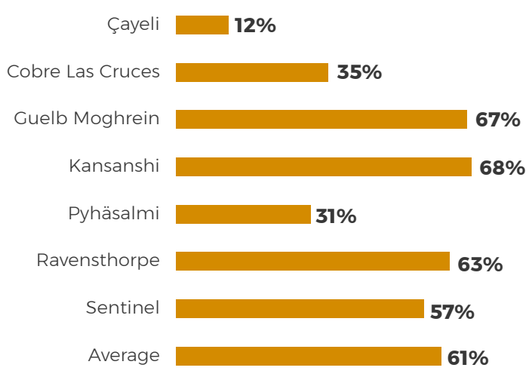


WATER

2017

We understand the importance of water as a precious global resource. Water is critical for all of the Company's operations and is not only used in processing ore and managing dust emissions, but also for our drinking and wastewater services. However, water consumption should be seen in the context of specific site demands, the local climate and the availability of water resources. Guelb Moghrein in Mauritania is located in an extremely water scarce environment, while Kansanshi, Sentinel and Cobre Panamá are in high rainfall areas. Ravensthorpe utilizes sea water for its processing and is therefore less dependent on local fresh water. The stories and achievements of each of these are well documented in the Company's sustainability reports. First Quantum Minerals measures all water inputs and outputs in accordance with the Water Accounting Framework (WAF) for the Minerals Industry (2014). All definitions and categories have been aligned to the requirements and specifications of the WAF.

EN10 WATER REUSE



EN8 WATER INPUT AND OUTPUT (MEGALITRES)

ESTIMATED WATER INPUT*

134 000

TOTAL **WATER INPUT**

**While every effort has been made to collect data that is accurate, it is impossible to account for every liter of water withdrawn or discharged at our operations. The total numbers are therefore estimated based on the best efforts of our operations. The numbers within the graphic are as per the data collected at our operating sites.*

ESTIMATED WATER OUTPUT*

134 000

TOTAL **WATER OUTPUT**

SURFACE WATER 89 631
- Precipitation & Runoff 53 299
- Rivers and Streams 32 432
- External Surface Water 3 900

GROUNDWATER 38 366
- Aquifer Interception 25 936
- Bore Fields (Saline) 8 625
- Ore Entrainment 3 805

SEA WATER 5 712

3RD PARTY WATER 638
- Contract/Municipal 161
- Waste Water 477

SURFACE WATER 48 961
- Discharge 48 961

GROUNDWATER 16 086
- Seepage 15 731
- Reinjection 356

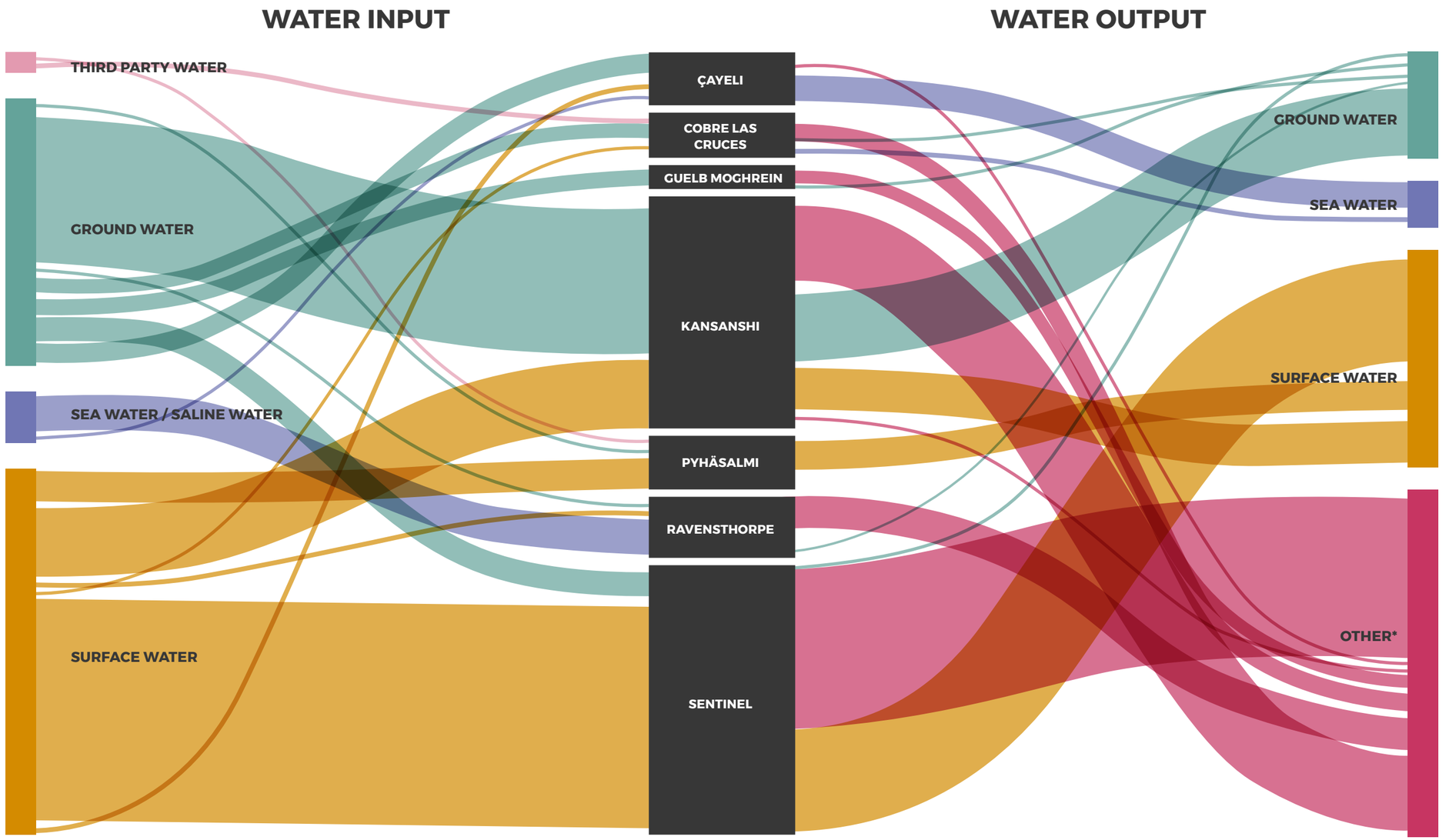
OTHER 64 100
- Evaporation 34 984
- Tailings Entrainment 29 115

SEA WATER 5 434
- Discharge to Estuary 891
- Discharge to Sea/Ocean 4 543

SUPPLY TO 3RD PARTY 6

WATER INPUTS AND OUTPUTS PER MINE

2017



*Other outputs are predominately evaporation (over 90%) and tailings entrainment.

SEA WATER

AT **RAVENSTHORPE** ALMOST ALL WATER INPUT IS FROM **SEA WATER**

SALINE WATER

APPROXIMATELY **55% OF WATER INPUTS** AT **GUELB MOGHREIN** IS SALINE GROUNDWATER.

NOTE: *Water inputs and outputs are only presented from our operational mines. Data from our Closed Properties in North America accounts for a significant volume of water from precipitation and run-off, most of which is discharged as surface water and evaporation. The data shown here is therefore only a subset of the data shown on the previous page.*

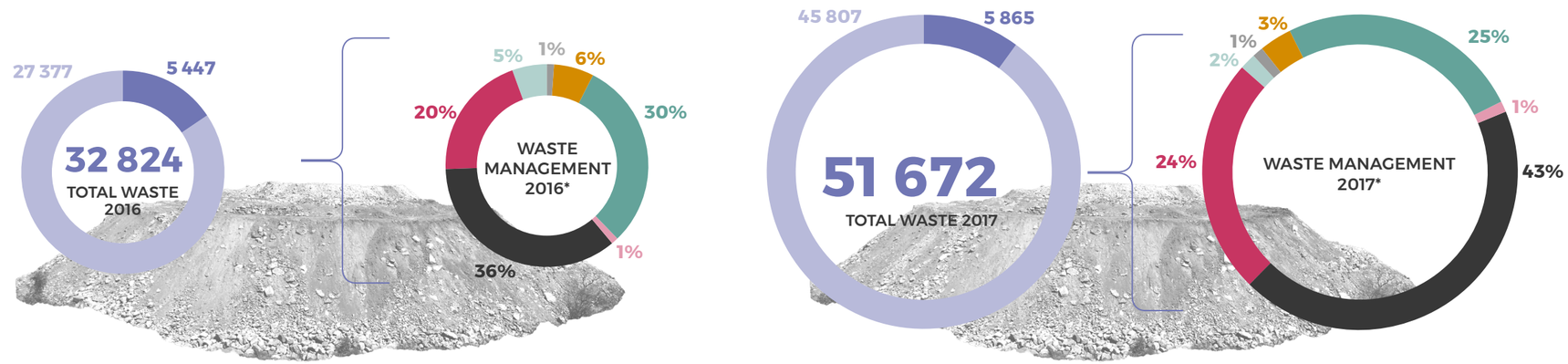
WASTE

2015 - 2017

First Quantum Minerals generates a number of waste streams at its operations:

- Hazardous wastes typically include used lubricants and process related chemicals, while non-hazardous wastes include organic matter, wood and plastics
- Waste streams from mining activities include overburden, waste rock, tailings, slag and waste treatment solids. Waste rock is stored in waste rock dumps adjacent to pits. Processing operations generate tailings which are deposited in tailings storage facilities. Smelting activities generate slag which is stored in dedicated slag dumps. Waste treatment solids are generated during the treatment of water.
- Recycled waste streams include waste oil and scrap metals

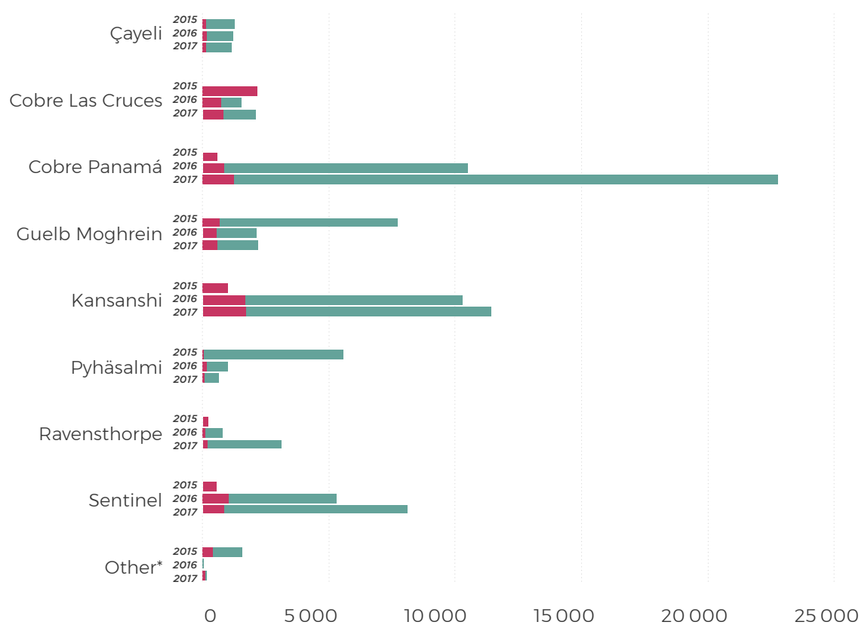
EN23 MANAGEMENT OF HAZARDOUS AND NON-HAZARDOUS WASTE (TONNES)



KEY Hazardous · Non-hazardous · Composting · Reused · Recycled · Incineration with energy recovery · Landfill off site · Landfill on site · On site storage · Bioremediation

**Includes waste managemengt of hazardous and non hazardous waste.*

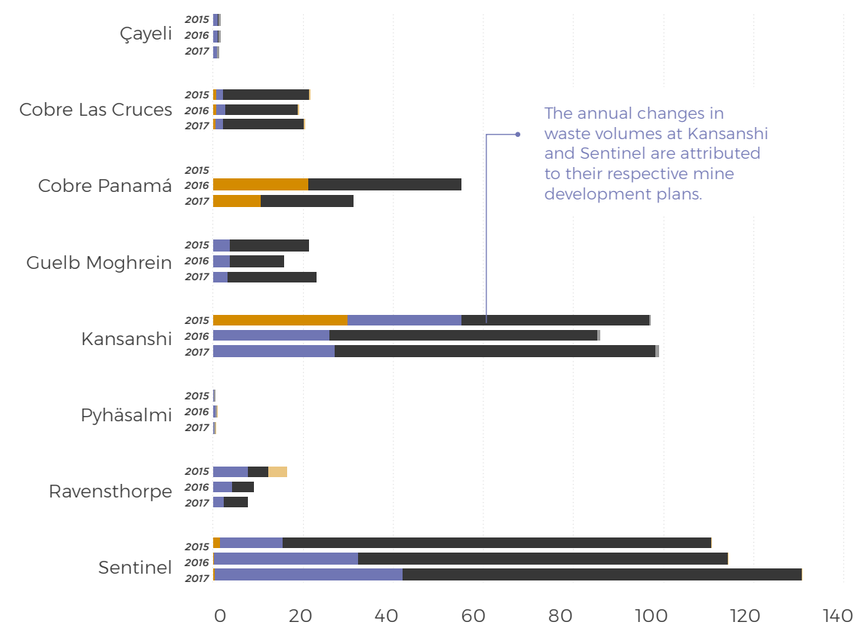
HAZARDOUS AND NON HAZARDOUS WASTE PER SITE (TONNES)



KEY Hazardous · Non hazardous

**Other includes exploration, projects, closed properties and support offices.*

MINING WASTE PER SITE (MEGATONNES)



KEY Tailings generated · Waste rock moved · Overburden moved · Waste treatment solid · Pastefill & slag

SAFETY

2015 - 2017

We view each fatality and serious injury at our operating sites as a tragedy. We are determined to achieve our goal of sending each and every employee home to his or her family, safe and sound, at the end of each and every shift. We believe that the only way to achieve this is to empower those same employees to identify, quantify and reduce the safety risks in their own work.

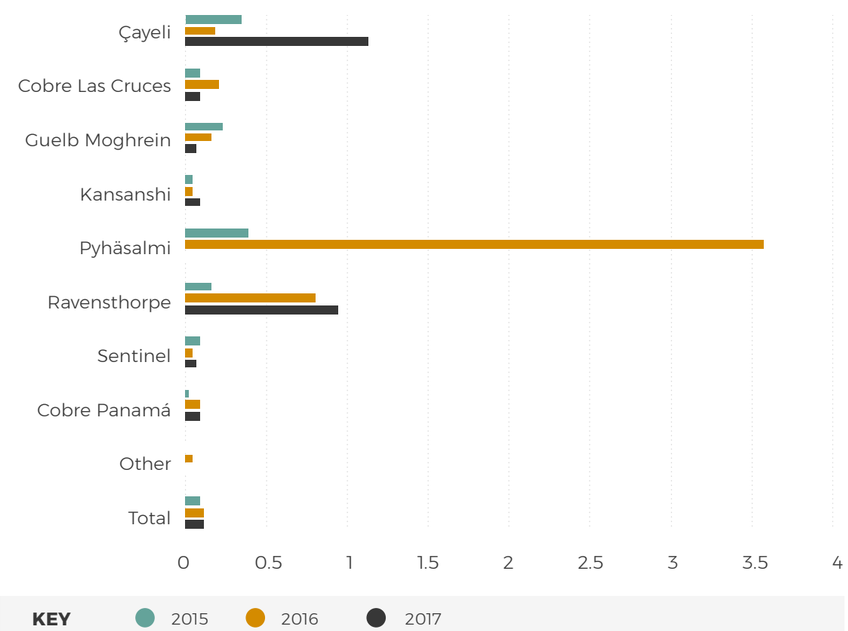
In an effort to empower employees, we launched the THINK campaign. The THINK campaign is a part of our OHSAS 18001 based Health and Safety Management System (HSMS) and has taken lessons from the aviation and oil and gas industries. It is a four-tiered approach to owning safety and keeping a safe workplace. It goes from the subcontractors all the way through to the CEO and ensures that everyone is open for dialogue – to share a near miss or tell a safety story to highlight an issue.

DEFINITIONS

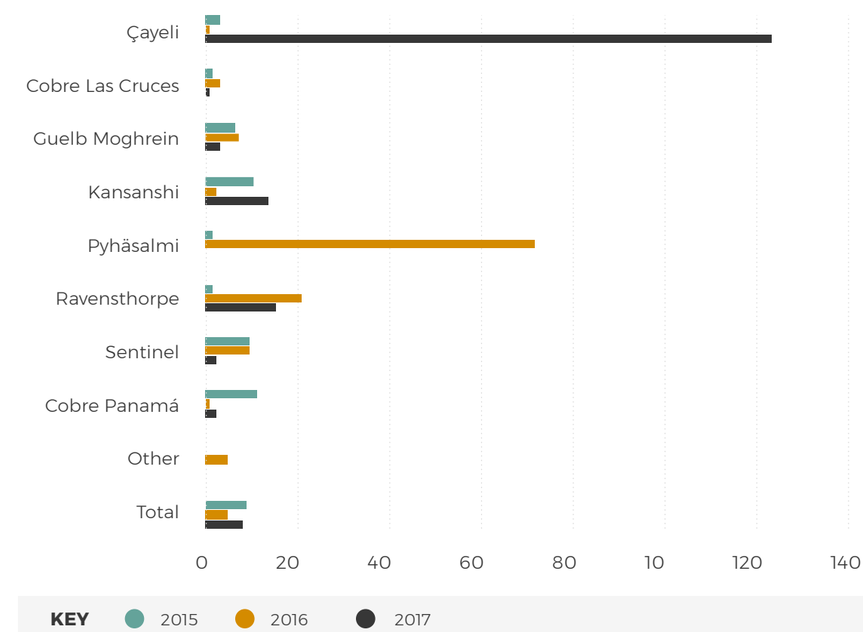
- ***Lost Time Injury Frequency Rate (LTIFR)*** *= lost time Injuries x 200,000 / hours worked*
- ***Severity Rate*** *= lost days x 200,000 / hours worked*

NUMBER OF FATAL INCIDENTS

LA6 LOST TIME INJURY FREQUENCY RATE



LA6 SEVERITY RATE



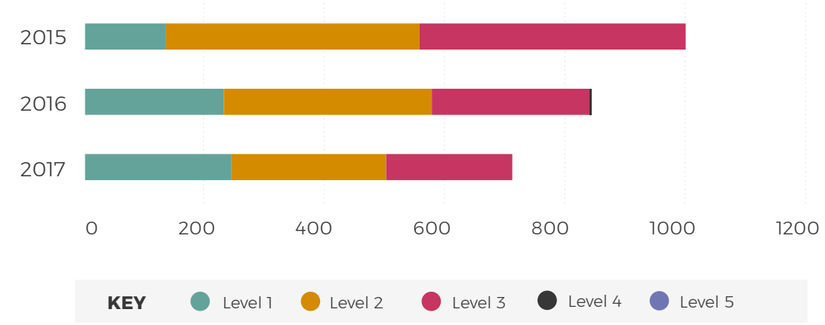
ENVIRONMENTAL INCIDENTS

2015 - 2017

We acknowledge that an effective Environmental Management System (EMS) is key to sound environmental practice and reducing environmental risk and liability. The Company's operations are implementing EMSs based on the ISO14001:2015 standard, and while the EMSs are subject to regular external environmental audit, we have not sought formal certification.

First Quantum Minerals believe that too much reliance on systems and procedures can result in increased environmental risk. We aim to develop site EMSs that are practicable to implement and manage. As part of the risk reduction strategy, the Company has implemented an internal five-level environmental incident classification system. All operations are required to record and report their site incidents in accordance with the classification every month. Since introducing EMSs, we have seen a steady and continuous reduction in the number of incidents and improvement of overall environmental compliance across the group.

NUMBER OF ENVIRONMENTAL INCIDENTS



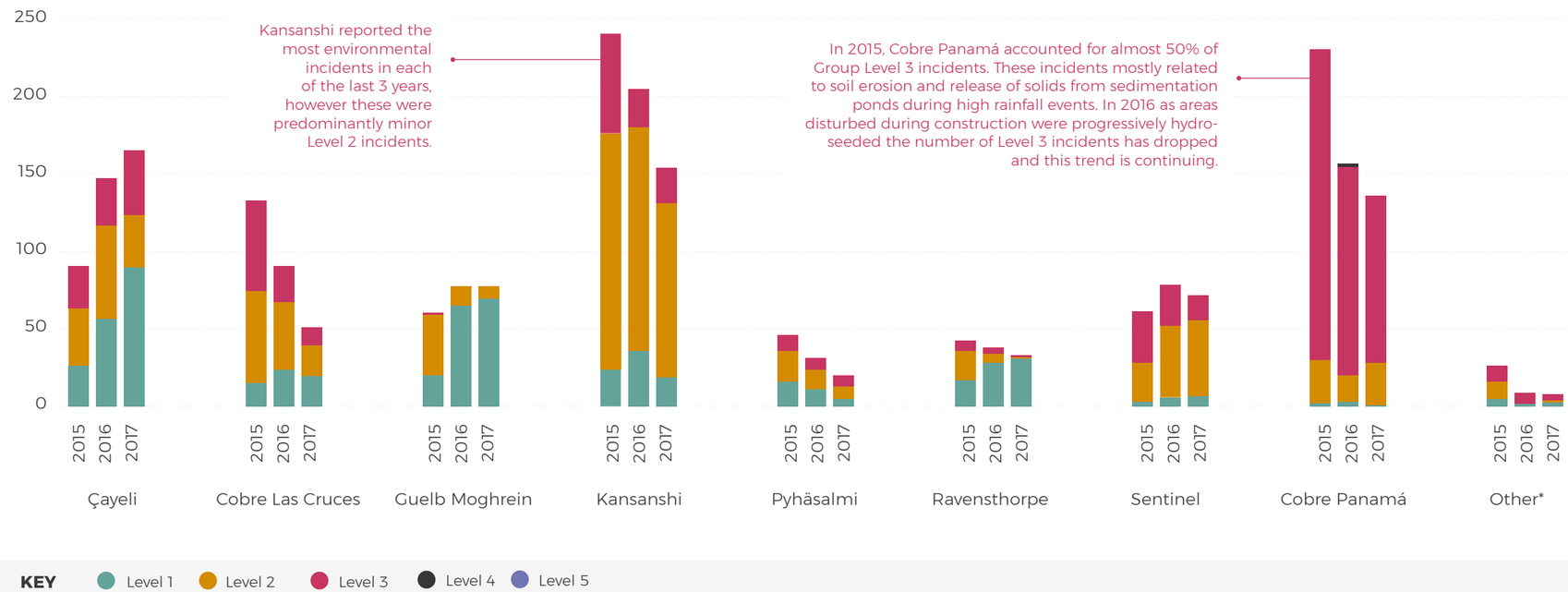
712

TOTAL **INCIDENTS** IN 2017

15%

DECREASE FROM 2016

TOTAL NUMBER AND SEVERITY OF ENVIRONMENTAL INCIDENTS PER SITE



**Other includes exploration, projects, closed properties and support offices.*

BIODIVERSITY

BIODIVERSTIY

Bio-diversity protection is very important to us and no more so than at the Cobre Panamá project situated on the Mesoamerican Biological Corridor some 120 kilometers west of Panama City. About 5 900 ha of land will be impacted directly by the project. A bio-diversity Action Plan is being implemented in line with IFC Performance Standards 6 to protect and conserve the sensitive bio-diversity of the project area. Throughout the project permitting and construction phase, we have been working closely with Kew Royal Botanical Gardens, Missouri Botanical Gardens, the Smithsonian Tropical Research Institute, Sea Turtle Conservancy, the Peregrine Fund and other specialists on all aspects of bio-diversity protection with the aim of achieving a net positive impact on bio-diversity over the life of mine. Collaboration with these organizations will continue into operations. Ecological restoration includes a 7 375 ha reforestry program outside the mine area and a planned 3 100 ha restoration of the mine and port sites. The reforestation program began in 2011 with 700 ha and a total of 2 400 ha has been reforested to-date.

PROTECTED AREAS PLAN

Cobre Panamá have committed to landscape-scale support in the Mesoamerican Biological Corridor. Funding will target specific management initiatives in three protected areas currently threatened by habitat loss. The three protected areas are Santa Fe National Park (72 636 ha), Omar Torrijos National Park (25 275 ha) and a protected area yet to be established in the District of Donoso (150 000 ha).

REFORESTATION

Cobre Panamá have committed to three separate reforestation projects in and around the Cobre Panamá Project. While the three projects have slightly different completion horizons, they share a common objective of habitat restoration. Firstly, the Agroforestry Program focuses on providing benefits to neighboring communities, while at the same time improving ecological conditions by increasing native tree cover. To date 2 400 ha have been reforested. Secondly, the Ecological Restoration Program focuses on reforestation inside protected areas and other locations that can be permanently protected with the goal of restoring native forests with structural and compositional diversity. Thirdly, the Mining Rehabilitation Program will initially stabilize land disturbed by mining activities and then aim to develop a self-sustaining forest cover across the mining footprint. It is currently estimated that approximately 3 100 ha will need to be rehabilitated.

SPECIES OF CONCERN (SOC)

Species-level management addresses the management needs of individual species for which the protected areas plan and reforestation plan may not be sufficient. Each SoC has a Species Action Plan that describes a portfolio of actions that are sufficient to ensure a net positive impact on its viability.

TOTAL LAND DISTURBANCE AND MINING CONCESSION AREAS FOR ALL OPERATING SITES

Site	Çayeli	Cobre Las Cruces	Guelb Moghrein	Kansanshi	Pyhäsalmi	Ravensthorpe	Trident	Total
Disturbed end 2017 (ha)	16	1 037	441	5 012	219	2 166	5 086	13 978
Mining concession end 2017 (ha)	9 074	1 037	1 689	24 980	412	14 407	95 000	146 599

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