Goldfields.com

Technical Report – National Instrument 43-101

Salares Norte Gold and Silver Mine

Chile, South America

Effective Date: 31 December 2021

Prepared by Gold Fields Limited

Qualified Person	Company	Date of Signing
Dr Julian Verbeek, FAusIMM	Gold Fields	30 June 2022
Richard Butcher, FAusIMM (CP)	Gold Fields	30 June 2022

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1 Summary

This Technical Report was prepared for Gold Fields Limited (Gold Fields, the Company or the Issuer) in accordance with the requirements of National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101) of the Canadian Securities Administrators, in relation to the Salares Norte gold and silver project (Salares Norte, the project or the property), a production stage property currently under construction located in the Atacama Region of northern Chile.

This Technical Report has been prepared for purposes of applicable Canadian securities laws (i) to support the scientific and technical information concerning the project which will be contained or in the management information circular of Yamana Gold Inc. (Yamana) for the special meeting of Yamana's shareholders to be held to approve the proposed acquisition by Gold Fields of all the issued and outstanding shares of Yamana pursuant to a plan of arrangement under the Canada Business Corporations Act (the Arrangement), and (ii) in connection with Gold Fields becoming a "reporting issuer" upon completion of that Arrangement for purposes of applicable securities laws in each of the provinces and territories of Canada.

The effective date of this Technical Report is 31 December 2021. This Technical Report does not purport to reflect new information regarding the project arising after such date.

Unless otherwise specified, all units of currency are in United States Dollars (US$). All measurements are metric with the exception of troy ounces (oz).

1.1 Property description and ownership

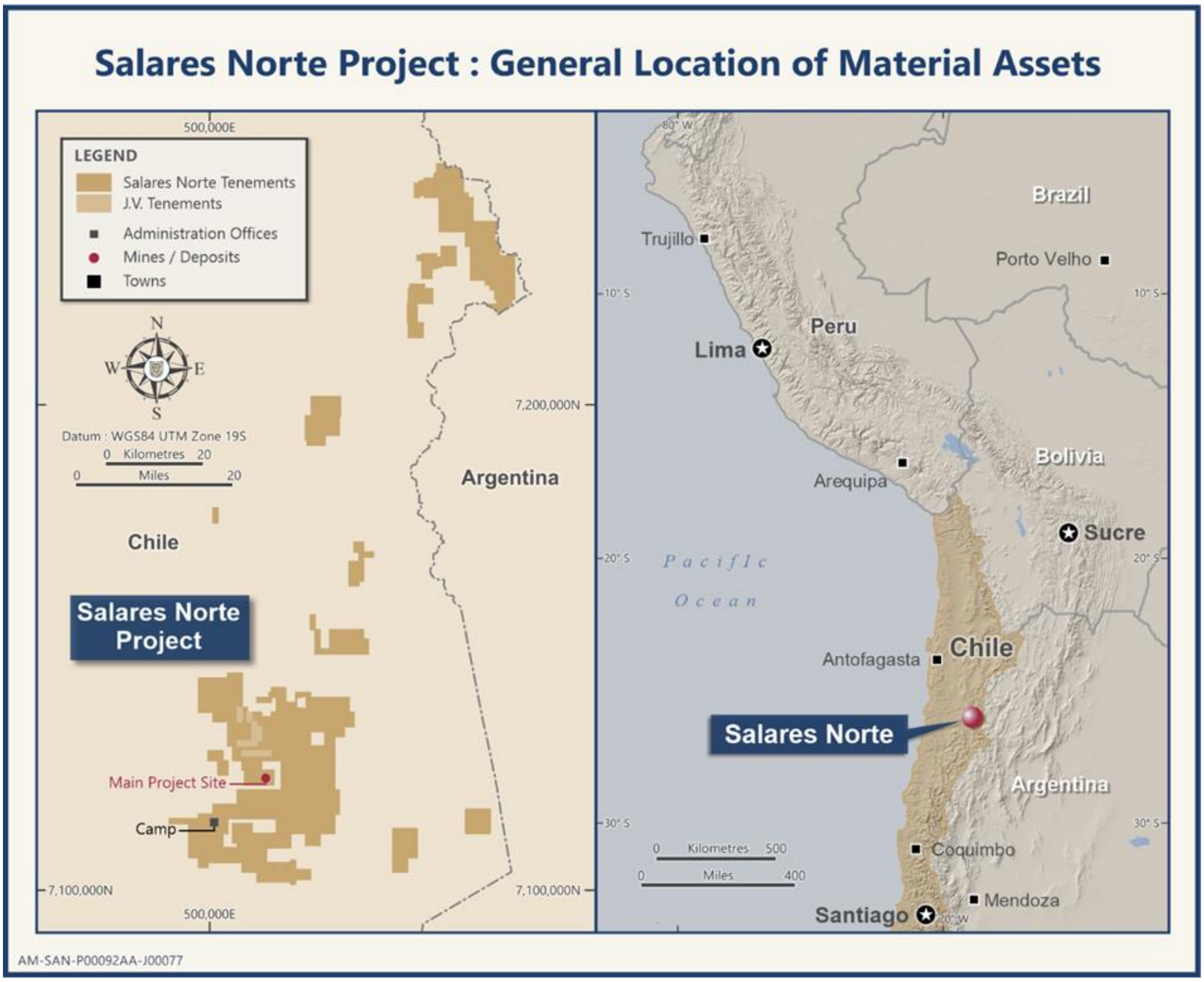
Salares Norte is in the Atacama Region of northern Chile, 266 km north-east of the regional city Copiapó, 75 km north-east of the El Salvador porphyry copper mine and 45 km west of the international border with Argentina (Figure 1.1). Elevations in the property range from 4,200 m to 4,900 m above sea level.

The property is operated by Minera Gold Fields Salares Norte SpA (MGFSN), a wholly owned subsidiary of Gold Fields. MGFSN holds mining concessions covering 1,800 ha (hectares), with an additional 90,700 ha of additional exploration (69,700 ha) and mining (21,000 ha) concessions and option agreements covering 4,700 ha in proximity to Salares Norte.

The major components of Salares Norte are:

- The Brecha Principal (BP) gold-silver deposit and the adjacent Agua Amarga (AA) gold-silver deposit from which Mineral Resources and Mineral Reserves have been declared.
- A feasibility study (FS) on the development of an open pit mine with combined counter-current decantation (CCD), Merrill-Crowe and carbon-in-pulp (CIP) processing facilities with name plate 2 Mt per annum throughput.
- Approved Environmental Impact Assessment (EIA) and sectorial permits.
- Fully completed detailed engineering.
- Approved water rights.
- Water extraction system at the wells.
- Offices, camp facilities, temporary fuel stations and a satellite/ microwave-based communications system.

Figure 1.1: Location of Salares Norte



Source: Salares Norte CPR, 2021

The following infrastructure was under construction as at 31 December 2021:

- Heavy mining equipment workshop, plant workshop and warehouse, administration building with dining area, laboratory, processing facility (Merrill-Crowe and CIP), water distribution system including water wells and water supply pipeline between the wells and the process plant area, long-term evolution (LTE) communications network, and fuel and power stations.

1.2 Geology and mineralisation

The BP and AA deposits at Salares Norte are epithermal, high-sulphidation, gold-silver mineralised systems at the southern end of South America's Central Volcanic Zone and near the northern end of the Maricunga metallogenic belt.

The immediate area surrounding Salares Norte is dominated by volcanic and pyroclastic rocks ranging in age from Late Oligocene–Early Miocene to Quaternary. Most of the gold-silver mineralisation is hosted by intensely silicified and alunite-quartz altered rocks, predominantly in polymictic breccia interpreted to have formed by phreatomagmatic explosions, where both magmatic gases and steam from groundwater are expelled, with an overprinting of phreatic/hydrothermal breccia. Gold is the most economically important metal with silver having secondary importance but is still significant. No other metals are present in potential economic concentrations.

1.3 Exploration, development and future operations

Gold Fields discovered the Salares Norte deposits in 2011 through a systematic greenfields exploration program. Up to June 2018, 620 drillholes for 169,982 m had been drilled at the property.

Key features of the FS completed in March 2019 were:

- Mineral Reserves of 3.5 Moz gold and 39 Moz silver.
- 11-year life of mine excluding Inferred Mineral Resource.
- First gold production expected in 2023.
- Annual ore throughput of 2 Mt per annum.
- Average annual production of 414 koz gold and 2,601 koz silver for the first seven years, and average annual production of 79 koz gold and 2,041 koz silver for the following four years.
- All-in sustaining costs (AISC) over the life of mine of US$560/gold-equivalent oz.

The BP and AA deposits will be mined by a contractor using conventional open pit mining methods. Mining occurs in six phases over nine years, including two years of pre-stripping starting in BP and finishing in AA. Waste is placed in either the south or north waste storage facility (WSF). All ore is hauled to either the run of mine (RoM) pad or one of the graded stockpiles south of the pits. The process flowsheet includes crushing, grinding and cyanide leaching with Merrill-Crowe recovery from pregnant solution after CCD, followed by a scavenger CIP circuit.

The tailings from the CIP circuit are subjected to cyanide detoxification and filtered with the use of vertical plate filters. Filtered tailings is transported by truck to the dry stack tailings storage facility (TSF) above the south WSF, spread and allowed to dry to specific moisture content before compaction. TSF construction will be performed by the mining contractor.

Following approval of the EIA on 18 December 2019 and completion of the funding strategy, the final notice to proceed (FNTP) with the mine development was approved by the Board of Gold Fields in February 2020. All sectorial permits required for the development of the mine have been secured in preparation for first gold in 2023. Open pit development and construction of the processing facility have commenced and are on schedule and within budget. The open pit development is ramping up and 22.8 Mt of overburden was removed during 2021. Construction of the 2 Mt per annum processing facility and associated infrastructure has advanced and is currently 55 % complete and pre-strip of the mine is 44 % complete as at 31 December 2021.

Minor drilling along the north extension of the AA deposit has been completed and step-out drilling is testing for potential extensions, focusing on the southwest extension of the AA deposit. However, exploration focus for the property has moved away from Mineral Resource and Mineral Reserve definition to the evaluation of targets outside of the resource footprint. District scale exploration drilling during 2021 totalled 21,603 m of diamond drilling (DD) in 71 holes. This meterage was primarily drilled at the Horizonte project (13,808 m), Fernando Sur (JV with Pan Pacific Copper) (3,403 m), Aster 3 (249 m), Filo Valle (2,942 m) and Pedernales, (3,447 m). None of this exploration drilling to date has delivered results considered material to the Salares Norte property. However, results in some areas were encouraging and warrant further work. Studies are ongoing to determine whether Mineral Resources and Mineral Reserves can be defined in certain areas and further target generation and exploration drill testing is planned in 2022.

With first gold production scheduled in 2023 there are no meaningful operating statistics to report.

1.4 Mineral Resource estimates

The Salares Norte Mineral Resources exclusive of Mineral Reserves as at 31 December 2021 are summarised in Table 1.1. The Mineral Resources are 100 % attributable to Gold Fields. The Mineral Resources are exclusive of Mineral Reserves and the point of reference for the tonnages and grades is in situ. Open pit Mineral Resources are confined to $1,500 per ounce pit shells that are defined by the price, costs and relevant Modifying Factors used for the estimates. The pit shells are used to constrain the mineralisation to that which is potentially economically and practically extractable under assumed economic conditions. The Mineral Resources are quoted at an appropriate in situ cut-off grade. The pit shells take into account selective mining units and also include estimates of any material below cut-off grade (dilution) that needs to be mined to extract the complete pay portion of the Mineral Resource.

Table 1.1: Salares Norte - summary of gold and silver exclusive Mineral Resources as at 31 December 2021 based on a gold price of $1,500/oz and silver price of $20/oz

	Mineral Resources (exclusive of Mineral Reserves)					NSR cut-off ($/t NSR)	Metallurgical recovery (%)	
	Tonnes (kt)	Grade (g/t)	Gold (koz)	Grade (g/t)	Silver (koz)			
		Au		Ag			Au	Ag
Open Pit Mineral Resources								
OP Measured Mineral Resources								
OP Indicated Mineral Resources	8,009	2.1	537	28	7,130	47.48	92.7	67.6
OP Measured + Indicated Mineral Resources	8,009	2.1	537	28	7,130	47.48	92.7	67.6
OP Inferred Mineral Resources	2,650	1.7	142	11	928	47.48	92.7	67.6

Notes:
a) Mineral Resources are exclusive of Mineral Reserves. Rounding of figures may result in minor computational discrepancies.
b) Quoted at an appropriate in situ cut-off grade and are confined revenue factor 1 pits. The cut-off grade varies by deposit, depending on the respective costs, depletion schedule and ore type. Mining dilution and expected mining recovery are included in the generation of the shell used to constrain the resource but not in the Mineral Resource statement since that is on an in-situ basis. The average cut-off grade net smelter return (NSR) values applied to the Mineral Resources are $47.48 per tonne processed.
c) Metallurgical recovery factors have not been applied to the Mineral Resource estimates. The approximate metallurgical recovery factor is gold 92.7 % and silver 67.6 %. The metallurgical recovery is the ratio, expressed as a percentage, of the mass of the specific mineral product recovered from ore treated at the process plant to its total specific mineral content before treatment. Salares Norte mining operations vary according to the mix of the source material (e.g., oxide, transitional, fresh and ore type blend).
d) The metal prices used for the 2021 Mineral Resources are based on a gold price of $1,500 per ounce and a silver price of $20 per ounce. The gold price used for Mineral Resources approximates 15 % higher than the selected Mineral Reserve price. The gold price used for Mineral Resources is discussed in Item 19.
e) Mineral Resources consider estimates of all costs, the impact of Modifying Factors, processing recovery and Environmental, Social and Governance (ESG) criteria to demonstrate reasonable prospects for economic extraction.
f) The Mineral Resources are estimated at a point in time and can be affected by changes in the gold price, US Dollar currency exchange rates, permitting, legislation, costs and operating parameters
g) Salares Norte is 100 % attributable to Gold Fields and is entitled to mine all declared material located within the property's mineral leases and all necessary statutory mining authorisations and permits are in place or have reasonable expectation of being granted.

Source: Salares Norte CPR, 2021

1.5 Mineral Reserve estimates

The Salares Norte Mineral Reserves as at 31 December 2021 are summarised in Table 1.2. The Mineral Reserves are 100 % attributable to Gold Fields. The point of reference for the Mineral Reserves is ore delivered to the processing facility.

The Salares Norte Mineral Reserves are the economically mineable part of the Indicated Mineral Resources based on the current understanding of the project and the FS completed in 2019, and are based on a Mineral Reserve gold price of $1,300/oz and a silver price of $17.50/oz. The Salares Norte life of mine Mineral Reserve has a FS level of accuracy and therefore reflects an overall estimated accuracy that improves on the pre-feasibility study (PFS) estimate accuracy of ±25 % with a contingency lower than or equal to 15 %.

Table 1.2: Salares Norte - summary of gold and silver Mineral Reserves as at 31 December 2021 based on a gold price of $1,300/oz and a silver price of $17.50/oz

	Tonnes (kt)	Grade (g/t)	Gold (koz)	Grade (g/t)	Silver (koz)	Cut-off grades ($/t NSR)	Metallurgical recovery (%)	
		Au		Ag			Au	Ag
Open Pit Mineral Reserves								
OP Proven Mineral Reserves	0	0	0	0	0	0	0	0
OP Probable Mineral Reserves	20,763	5.2	3,467	58.4	38,990	47.69	92.7	67.6
Total Salares Norte Mineral Reserves 2021	20,763	5.2	3,467	58	38,990	47.69	92.7	67.6
Total Salares Norte Mineral Reserves 2020	21,079	5.1	3,476	57.9	39,263			
Year on year difference (%)	-1.5%	1.3%	-0.3%	0.8%	-0.7%			

Notes:

a) Rounding of figures may result in minor computational discrepancies.

b) Quoted as mill delivered metric tonnes and run of mine grades, inclusive of all mining dilutions and metal losses except plant recovery. Metallurgical recovery factors have not been applied to the reserve figures. The approximate metallurgical recovery factor is 92.7 % for gold and 67.6 % for silver. The metallurgical recovery is the ratio, expressed as a percentage, of the mass of the specific mineral product recovered from ore treated at the process plant to its total specific mineral content before treatment. The recoveries for Salares Norte will vary according to the mix of the source material (e.g., head grade, oxide, fresh and deposit) and method of treatment.

c) The metal prices used for the 2021 life of mine Mineral Reserves are based on a gold price of $1,300 per ounce and a silver price of $17.50/oz. Open pit Mineral Reserves at Salares Norte are based on optimised pits using appropriate mine design and extraction schedules. The gold and silver prices used for Mineral Reserves is discussed in Item 19.

d) Dilution relates to planned and unplanned waste and/or low-grade material being mined and delivered to the process plant. The grade estimation process utilises a mining dilution of 13 % which is equivalent to 1.8 m of over-excavation of the ore/waste contact.

e) The mining recovery factor relates to the proportion or percentage of ore mined from the defined orebody at the metal prices used for the declaration of Mineral Reserves. This percentage will vary from mining area to mining area and reflects planned and scheduled Mineral Reserves against actual tonnes, grade and metal mined, with all Modifying Factors and mining constraints applied. A mining recovery factor of 100 % is applied since the diluting material is expected to contain metal and the lack of operational empirical information.

f) The cut-off grade varies by open pit, head grade, respective costs, depletion schedule, and ore type. The overall average cut-off grade value applied in the planning process is a net smelter return of $47.69/t processed NSR.

g) An ounces-based mine call factor (metal called for, over metal accounted for) of 100 % has been applied at Salares Norte. The Mineral Reserves are estimated at a point in time and can be affected by changes in the gold price, US Dollar currency exchange rates, permitting, legislation, costs and operating parameters.

h) Salares Norte is 100 % attributable to Gold Fields and is entitled to mine all declared material located within the property's mineral leases and all necessary statutory mining authorisations and permits are in place or have reasonable expectation of being granted.

Source: Salares Norte CPR, 2021

1.6 Capital and operating cost estimates

Major budgeted capital cost items for the 31 December 2021 Mineral Reserve life of mine plan include initial capital for pre-stripping of the mine, construction of the process plant, associated infrastructure and facilities, and sustaining capital for the life of the operation. The forecast capital costs are summarised in Table 1.3. Several non-material updates to the FS estimates are described in Item 218.1.

Table 1.3: Capital costs ($ million)

		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Capital expenditure	$ million	327.0	173.1	91.4	80.6	90.7	96.9	94.0	41.6	3.3	3.2	3.1	0.5

Notes: a) The detailed capital cost schedule is presented in Item 21.
b) This capital summary estimate is for the Mineral Reserve life of mine schedule.
c) No exploration capital included, as the Mineral Resource is 97 % Indicated and remaining conversion is expected to be achieved through grade control drilling which is included in operating costs.

Source: Salares Norte CPR, 2021

The current estimate to complete the project, after completion of detailed engineering, a 55 % advance in construction and 44 % advance in pre-strip, remains at $860.7 million, of which $467 million has been expended to date.

Budgeted operating costs for the 31 December 2021 Mineral Reserve life of mine plan are summarised in Table 1.4. The operating costs include updates from the mining and power supply as described in Item 18.5.

Table 1.4: Operating costs ($ million)

		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Operating cost	$ million		87.8	113.8	134.2	116.1	108.7	113.7	131.6	101.9	98.6	92.3	74.5

Notes: a) The detailed operating cost schedule is presented in Item 21.
b) This operating cost summary estimate is for the Mineral Reserve life of mine schedule.
c) Other costs include gold-in-process movements.

Source: Salares Norte CPR, 2021

The mine closure cost for the project is estimated $78.3 million. This includes a provision for physical remediation activities of the mine, storage facilities and infrastructure. It also includes a provision for personnel demobilisation and severance costs at the time of closure and for post-closure monitoring and maintenance.

1.7 Permitting

MGFSN holds exploitation concessions covering the Salares Norte mine development. Land access rights are in place through corresponding easements granted by the Government. Water rights needed for the operation were granted by the relevant water authorities and are environmentally approved. There are no known land ownership conflicts or claims with local or indigenous peoples.

The EIA was approved by Chilean authorities in December 2019 and details all potential environmental and social impacts for the construction, operation and closure of the mine, together with the corresponding mitigation actions and voluntary commitments to address them.

All sectorial permits for the project are approved, including permits for mining exploitation, processing, waste storage, tailings storage, water course modification and mine closure. With these approvals in place, the permitting effort until commencement of operations are mainly focused on obtaining specific construction permits, including sanitary permits, building permits, and final reception of the facilities.

A critically endangered species, the short-tailed chinchilla, is present on the property and the EIA highlighted the alteration and loss of habitat of the chinchilla, which is a endangered species in Chile. To mitigate such impact, a plan was developed and approved by the EIA authorities. The plan involves establishing a compensation and conservation area outside the mining area, declaring no-go zones, and relocating a small fraction of the chinchilla population that lives in future mining zones to a new location. The relocation program commenced in 2020. Two areas (out of nine) needed for the life of mine development have been released. Four chinchillas were relocated as part of this activity; however, two chinchillas passed during the process, resulting in the temporary suspension of the relocation program at the end of 2020 and the initiation of a sanctioning process by the relevant authorities against Salares Norte in November 2021. In response, MGFSN submitted a compliance plan to the authorities for approval during December 2021. The compliance plan, which incorporates significant learnings from the initial relocation campaign, remains under review by the authorities at the time of this report. MGFSN will continue to work with the authorities to improve and resume the relocation program.

The temporary suspension of the chinchilla relocation program does not put at risk the commissioning date of the project, nor the plant feed schedule for the initial five years of operation; however, the development of AA as an open pit is dependent on the successful relocation of chinchillas.

1.8 Conclusions and recommendations

The Salares Norte Mineral Reserves are estimated at 3.5 Moz gold and 39 Moz silver and currently support an 11 year life of mine plan to 2033 with a net present value (NPV) at a 5.9 % discount rate of $1,279 million at the Mineral Reserve gold price of $1,300/oz and silver price of $17.50/oz.

The operational performance during 2022 exceeded the FS plan with 22.8 Mt of overburden moved against the target of 17.8 Mt. Detailed engineering is 100 % complete and construction of the plant and associated infrastructure is 55 % complete. The project is forecast to be commissioned with first gold production scheduled in 2023.

The current estimate to complete the project remains at $860.7 million and is expected to be delivered within the accuracy limits of the FS. Development capital spent on the project to date is $472 million and remaining expenditure to complete the pre-strip and construction is estimated at $388.7 million.

The project has implemented several mitigating strategies to deal with the effects of the COVID-19 pandemic and to maintain the commissioning date for the project; however, if conditions worsen it could result in schedule delays and increased cost.

Gold Fields’ commitment to materiality, transparency and competency in its Mineral Resources and Mineral Reserves disclosure to regulators and in the public domain is of paramount importance to the Qualified Person and the Issuer’s Executive Committee and Board of Directors continue to endorse the company’s internal and external review and audit assurance protocols. This Technical Report should be read in totality to gain a full understanding of Salares Norte’s Mineral Resource and Mineral Reserve estimation and reporting process, including data integrity, estimation methodologies, Modifying Factors, mining and processing capacity and capability, confidence in the estimates, economic analysis, risk and uncertainty and overall projected property value.

However, to ensure consolidated coverage of the company’s primary internal controls in generating the estimates and the LoM plan a key point summary is provided in Item 24 for reference.

2 Introduction

2.1 Terms of reference and purpose of this Technical Report

The purpose of this Technical Report is to support the disclosure of Mineral Resources and Mineral Reserves for the Salares Norte gold and silver Project (Salares Norte or the property), a production stage property currently under construction located in Chile (Figure 1.1), and the report has been prepared in accordance with National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101).

This Technical Report was prepared for Gold Fields Limited (Gold Fields, the Company or the Issuer) in accordance with the requirements of National Instrument 43-101 Standards of Disclosure for Mineral Projects (NI 43-101) of the Canadian Securities Administrators, in relation to the Salares Norte gold and silver project (Salares Norte, the project or the property), a production stage property currently under construction located in Chile (Figure 1.1).

This Technical Report has been prepared for purposes of applicable Canadian securities laws in connection with the proposed acquisition by Gold Fields of all the issued and outstanding shares of Yamana Gold Inc. (Yamana), a company incorporated under the *Canada Business Corporations Act* (the CBCA) whose shares are listed on the Toronto Stock Exchange, the New York Stock Exchange and the London Stock Exchange, pursuant to a plan of arrangement under the CBCA (the Arrangement). The management information circular of Yamana (the Yamana Circular) for the special meeting of Yamana's shareholders to be held to approve the Arrangement will contain certain information regarding the project, including estimates of Mineral Reserves and Mineral Resources for the project effective as of December 31, 2021. In addition, upon completion of the Arrangement, Gold Fields will become a "reporting issuer" for purposes of applicable securities laws in each of the provinces and territories of Canada. Accordingly, this Technical Report has been prepared (i) to support the scientific and technical information concerning the project which will be contained in the Yamana Circular, and (ii) in connection with Gold Fields becoming a reporting issuer in such jurisdictions of Canada. It is understood that this Technical Report will be filed on the System for Electronic Document Analysis and Retrieval (SEDAR) maintained by the Canadian Securities Administrators.

The effective date of this Technical Report is 31 December 2021. This Technical Report does not purport to reflect new information regarding the project arising after such date.

In addition to this disclosure being in line with NI 43-101, the Mineral Resources and Mineral Reserves stated in this Technical Report have also been reported in accordance with the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC Code 2016). SAMREC is aligned to the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) Reporting Template November 2019.

2.2 Qualified Persons and details of inspection

The Qualified Persons responsible for the preparation of this Technical Report are listed in Table 2.1. All the Qualified Persons are eligible members in good standing of a recognised professional organisation (RPO) within the mining industry and have at least five years of relevant experience in the type of mineralisation and type of deposit under consideration and in the specific type of activity that the Qualified Person is undertaking on behalf of the Company at the time this Technical Report was prepared.

Qualified Person has the same meaning as Qualified Persons and vice versa within this report.

2.2.1 Certificates

Dr Julian Verbeek, FAusIMM

CERTIFICATE OF QUALIFIED PERSON

This Certificate of the Qualified Person has been prepared to meet the requirements of National Instrument 43-101 Standards of Disclosure for Minerals Projects Part 8.

a. Name, Address, Occupation

Dr Julian Verbeek FAusIMM, Geologist

Registered Office, Johannesburg: Gold Fields Limited, 150 Helen Road, Sandown, Sandton 2196.

Postnet Suite 252, Private Bag X30500, Houghton 2041

b. Title and Effective Date of Technical Report

Technical Report – National Instrument 43-101 Salares Norte Gold and Silver Mine - 2021

Effective Date: 31 December 2021

c. Qualifications

PhD Geology, University of Natal 1991.

FAusIMM

I am a geologist with 35 years relevant experience in Mineral Resource estimation in multiple commodities including gold, copper and silver in deposit styles of placer, lode gold, porphyry and epithermal. I am currently in full time employment with Gold Fields, in which I have had overseeing involvement in geology and resource estimation at the operating mines and development projects for the Issuer.

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43-101 for the sections of the technical report that I take responsibility for.

d. Site Inspection

Has not attended site but has attended virtual reviews.

e. Responsibilities

I am responsible for Items 1-28 of this Technical Report.

f. Independence

I am a full time employee of Gold Fields Limited and hence not independent in accordance with the application of Section 1.5 of National Instrument 43-101.

g. Prior Involvement

I have been employed by Gold Fields since September 2021. I have not visited the Salares Norte site but have participated in virtual reviews.

h. Compliance with NI 43-101

I have read National Instrument 43-101 and Form 43-101F1 and the Technical Report has been prepared in compliance with the same.

i. Disclosure

As of the effective date of the Technical Report, to the best of my knowledge, information, and belief, the parts of the Technical Report that I am responsible for, contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

"Signed and sealed by Julian Verbeek"

"Julian Verbeek" Date: June 30, 2022

Dr. Julian Verbeek

Richard Butcher, CEng, Msc (Eng), FAusIMM (CP), MIMMM, MSAIMM

CERTIFICATE OF QUALIFIED PERSON

This Certificate of Qualified Person has been prepared to meet the requirements of National Instrument 43-101 Standards of Disclosure for Minerals Projects Part 8.

a. Name, Address, Occupation

Richard Butcher, CEng, FAusIMM (CP), MIMMM, MSAIMM

Registered Office, Johannesburg: Gold Fields Limited, 150 Helen Road, Sandown, Sandton 2196.

Postnet Suite 252, Private Bag X30500, Houghton 2041

b. Title and Effective Date of Technical Report

Technical Report – National Instrument 43-101 Salares Norte Gold and Silver Mine - 2021

Effective Date: 31 December 2021

c. Qualifications

Msc (mining engineering)

CEng, FAusIMM (CP), MIMMM, MSAIMM

I am a mining engineer with 41 years relevant experience in Mineral Reserve estimation, assessment, evaluation and economic extraction in gold, copper and silver. I have worked in Resources and Reserves at Barrick, MMG, **SRK, IGL** and Gold Fields for the last **25** years. I also worked at SRK and other Consultancies in estimating Resources and Reserves. I have held various corporate positions and I am currently the Chief Technical Officer for Gold Fields, in which I have had overseeing involvement in mining engineering and technical services matters at various operating mines and development projects for the Issuer.

As a result of my experience and qualifications, I am a Qualified Person as defined in National Instrument 43-101 for the sections of the technical report that I take responsibility for.

d. Site Inspection

Has attended site on the 23rd January 2020.

e. Responsibilities

I am responsible for Items 1-5, 13 & 15-28 of this Technical Report.

f. Independence

I am not independent of Gold Fields Limited in accordance with the application of Section 1.5 of National Instrument 43-101.

g. Prior Involvement

During my 6-year tenure at Gold Fields I have been responsible for providing leading levels of technical standards, technical assurance, technical excellence, operational leadership, project delivery and asset optimisation, to the Issuer. I have had oversight of planning and execution of technical programs for Gold Fields to ensure that all Group technical disciplines are optimised, standardised and leveraged in a manner that delivered benefit across Gold Fields assets, operations and projects. I have had communications with and attended meetings with discipline heads at site and the corporate level.

h. Compliance with NI 43-101

I have read National Instrument 43-101 and Form 43-101F1 and the Technical Report has been prepared in compliance with the same.

i. Disclosure

As of the effective date of the Technical Report, to the best of my knowledge, information, and belief, the parts of the Technical Report that I am responsible for, contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

"Signed and sealed by Richard Butcher"

"Richard Butcher" Date: June 30, 2022

Richard Butcher

Table 2.1: List of Qualified Persons

Incumbent	Employer	Position	Affiliation in good standing	Relevant experience (years)	Details of inspection	Responsibility for which Items
Dr Julian Verbeek	Gold Fields	VP Geology and Mineral Resources	FAusIMM - 207994	35	Has not attended site but has attended virtual reviews	This document has been prepared under the supervision of and reviewed by Julian Verbeek. Items 1-28
Richard Butcher	Gold Fields	Chief Technical Officer GFL Group Technical Services	FAusIMM CP - 211182	41	Has attended site	Overview and review of document. Items 1-5, 13 & 15-28

Notes: The Qualified Persons where not all able to attend site in 2021 for Mineral Reserve and Mineral Resource reviews, however, the Mineral Reserve and Mineral Resource were reviewed according to the Item 24 description. Some Qualified Persons have attended site historically. The Qualified Persons opinion is that licenses and tenements are in good standing to enable execution of the life of mine plan and can be renewed or extended as required.

The Qualified Persons were not all able to attend site during 2021 for the Mineral Reserve and Mineral Resource reviews, however, the Mineral Reserve and Mineral Resource were reviewed according to the Item 24 descriptions. Members of the Qualified Persons team have attended site historically.

2.3 Report version update

This is the maiden Technical Report filed by Gold Fields on the Salares Norte property in Chile.

3 Reliance on other experts

The Qualified Person(s) has not identified any information provided by the Issuer for Salares Norte that requires noting under Item 27.

4 Property description and location

4.1 Area

MGFSN holds 22,800 ha of exploitation concessions (mining rights), with definitive title granted, including 1,800 ha covering the project area. MGFSN also holds 69,700 ha of additional exploration concessions and an option agreement with Pan Pacific Copper Exploration Chile Ltda. covering 2,200 hectares (300 ha of mining concessions and 1,900 ha of exploration concessions) to the northwest of Salares Norte and another with 2,500 ha (900 ha of mining concessions and 1,600 ha of exploration concessions) with Chilean private owners 40 km southeast of Salares Norte.

As at 31 December 2021, Gold Fields controlled, or has applied for, 97,200 ha of mineral rights concessions within the Salares Norte district.

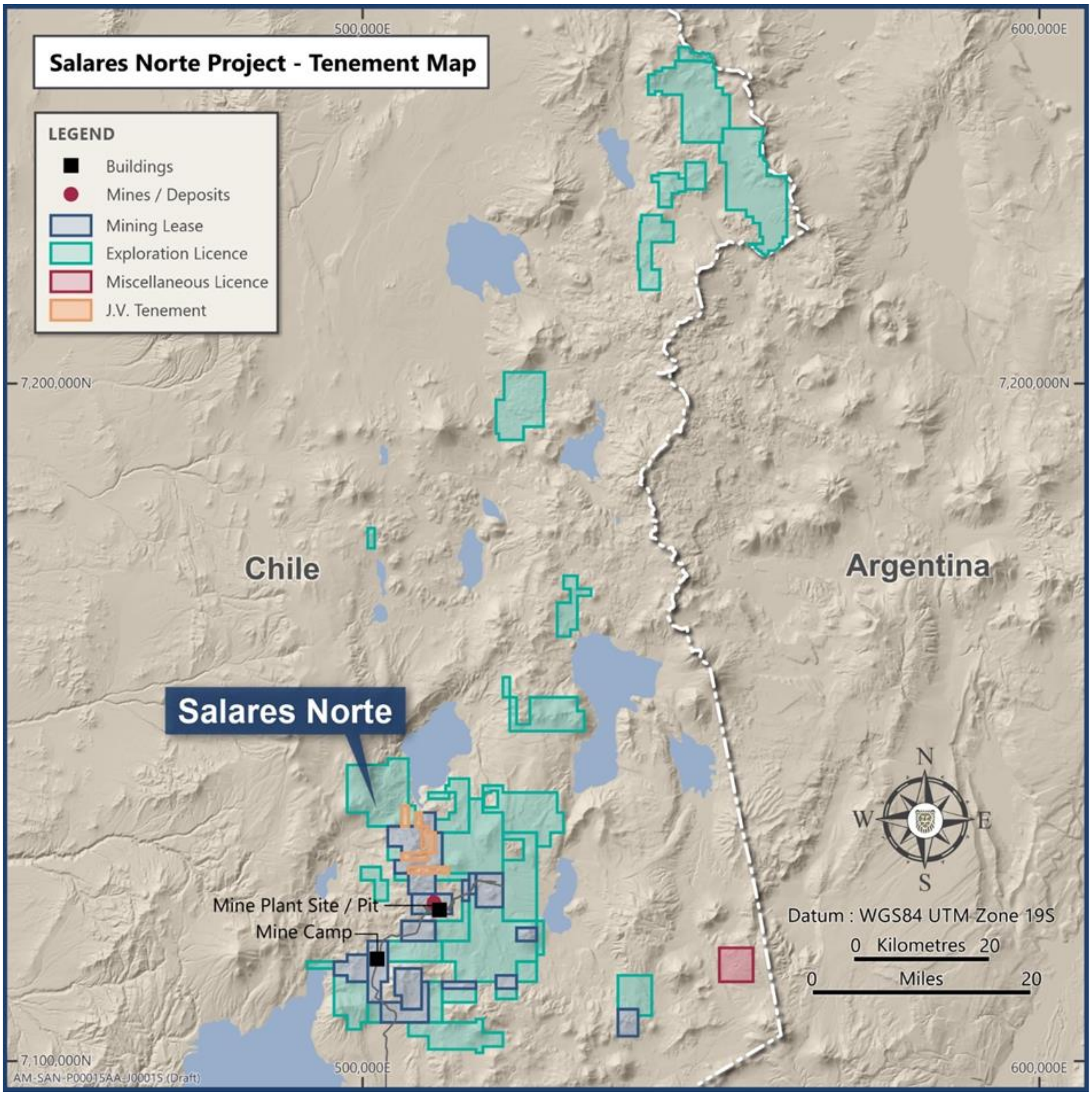
4.2 Location

Salares Norte is located in the Atacama Region (Region III) of Chile at UTM coordinate system (datum WGS 1984 zone 19S) 510,48 mE and 7,123,125 mN (Figure 1.1). The property is 266 km from the regional city Copiapó, 75 km northeast of the El Salvador porphyry copper mine, and 45 km west of the international border with Argentina.

4.3 Type of mineral tenure

The property comprises a block of mining and exploration concessions, exploration licenses and mining lease, within an area of interest circa 20 km from Salares Norte. The district Salares Norte concessions are shown in Figure 4.1 and are listed in Table 4.1. The mineral titles cover all of the declared Mineral Reserves and MGFSN has legal entitlement to the minerals being reported upon with no known impediments.

Figure 4.1: Salares Norte mineral tenement map



Source: Salares Norte CPR, 2021

Table 4.1: List of Salares Norte mineral tenements

Group	Name of concession	Number	Concession type	Status	Grant date	Expiry date	Area (ha)	Owner	Comments
Salares Norte Mine	SALARES NORTE 25 1 AL 30	03102-4256-K	Mining Concession	Constituted	Oct-13	Not expires	300	MGFSN	2 % NSR royalty
	SALARES NORTE 27 1 AL 30	03102-4068-0	Mining Concession	Constituted	Oct-13	Not expires	300	MGFSN	
	SALARES NORTE 28 1 AL 30	03102-4257-8	Mining Concession	Constituted	Oct-13	Not expires	300	MGFSN	
	RIO BAKER 1 1 AL 30	03102-4371-K	Mining Concession	Constituted	Jul-13	Not expires	300	MGFSN	
	RIO BAKER 2 1 AL 30	03102-4372-8	Mining Concession	Constituted	Jul-13	Not expires	300	MGFSN	
	RIO BAKER 3 1 AL 30	03102-4373-6	Mining Concession	Constituted	Jul-13	Not expires	300	MGFSN	
Horizonte Project	HELADA 1, 1 AL 30	03102-3753-1	Mining Concession	Constituted	Nov-12	Not expires	300	MGFSN	2.5 % NSR royalty
	HELADA 2, 1 AL 30	03102-3754-K	Mining Concession	Constituted	Nov-12	Not expires	300	MGFSN	
	PIRCAS 1 1 AL 30	03102-3856-2	Mining Concession	Constituted	Nov-12	Not expires	300	MGFSN	
	PIRCAS 5 1 AL 30	03102-3857-0	Mining Concession	Constituted	Nov-12	Not expires	300	MGFSN	
	PIRCAS 6 1 AL 30	03102-3858-9	Mining Concession	Constituted	Nov-12	Not expires	300	MGFSN	
	PIRCAS 7 1 AL 30	03102-3859-7	Mining Concession	Constituted	Nov-12	Not expires	300	MGFSN	
	HELADA 1, 1 AL 30	03102-3854-6	Mining Concession	Constituted	Nov-12	Not expires	300	MGFSN	
	HELADA 2, 1 AL 10	03102-3855-4	Mining Concession	Constituted	Nov-12	Not expires	100	MGFSN	
Anaranjada	ANARANJADA 1 1 AL 60	03102-6030-4	Mining Concession	Constituted	Jan-19	Not expires	300	MGFSN	100 % GF
	ANARANJADA 2 1 AL 60	03102-6031-2	Mining Concession	Constituted	Jan-19	Not expires	300	MGFSN	
	ANARANJADA 3 1 AL 60	03102-6032-0	Mining Concession	Constituted	Jan-19	Not expires	300	MGFSN	
	ANARANJADA 4 1 AL 60	03102-6033-9	Mining Concession	Constituted	Jan-19	Not expires	300	MGFSN	
	ANARANJADA 5 1 AL 60	03102-6034-7	Mining Concession	Constituted	Jan-19	Not expires	300	MGFSN	
	ANARANJADA 6 1 AL 60	03102-6035-5	Mining Concession	Constituted	Jan-19	Not expires	300	MGFSN	
	ANARANJADA 7 1 AL 60	03102-6036-3	Mining Concession	Constituted	Jan-19	Not expires	300	MGFSN	
Chinchilla A	CHINCHILLA 28A 1 AL 40	03102-5997-7	Mining Concession	Constituted	Jul-18	Not expires	200	MGFSN	100 % GF
	CHINCHILLA 29A 1 AL 60	03102-5998-5	Mining Concession	Constituted	Jul-18	Not expires	300	MGFSN	
	CHINCHILLA 40A 1 AL 60	03102-5999-3	Mining Concession	Constituted	Jul-18	Not expires	300	MGFSN	
	CHINCHILLA 46A 1 AL 40	03102-6000-2	Mining Concession	Constituted	Jul-18	Not expires	200	MGFSN	
	CHINCHILLA 47A 1 AL 40	03102-6001-0	Mining Concession	Constituted	Jul-18	Not expires	200	MGFSN	
	CHINCHILLA 48A 1 AL 20	03102-6002-9	Mining Concession	Constituted	Jul-18	Not expires	100	MGFSN	
	CHINCHILLA 49A 1 AL 20	03102-6003-7	Mining Concession	Constituted	Jul-18	Not expires	100	MGFSN	
	CHINCHILLA 50A 1 AL 20	03102-6004-5	Mining Concession	Constituted	Jul-18	Not expires	100	MGFSN	
	CHINCHILLA 51A 1 AL 40	03102-6005-3	Mining Concession	Constituted	Jul-18	Not expires	200	MGFSN	
	CHINCHILLA 52A 1 AL 40	03102-6006-1	Mining Concession	Constituted	Jul-18	Not expires	200	MGFSN	
	CHINCHILLA 112A 1 AL 60	03102-6007-K	Mining Concession	Constituted	Jul-18	Not expires	300	MGFSN	
	CHINCHILLA 113A 1 AL 40	03102-6008-8	Mining Concession	Constituted	Jul-18	Not expires	200	MGFSN	
Piedra	PIEDRA 1 1 AL 30	03102-3860-0	Mining Concession	Constituted	May-12	Not expires	300	MGFSN	2 % NSR royalty
	PIEDRA 2 1 AL 30	03102-3861-9	Mining Concession	Constituted	May-12	Not expires	300	MGFSN	
	PIEDRA 3 1 AL 30	03102-3862-7	Mining Concession	Constituted	May-12	Not expires	300	MGFSN	
	PIEDRA 4 1 AL 30	03102-3863-5	Mining Concession	Constituted	May-12	Not expires	300	MGFSN	
Chinchilla	CHINCHILLA 81 1 AL 40	03102-5431-2	Mining Concession	Constituted	Nov-16	Not expires	200	MGFSN	100 % GF
	CHINCHILLA 82 1 AL 40	031025432-0	Mining Concession	Constituted	Nov-16	Not expires	200	MGFSN	
	CHINCHILLA 83 1 AL 40	03102-5433-9	Mining Concession	Constituted	Nov-16	Not expires	200	MGFSN	
	CHINCHILLA 106 1 AL 20	03102-5436-3	Mining Concession	Constituted	Nov-16	Not expires	100	MGFSN	
	CHINCHILLA 107 1 AL 20	03102-5437-1	Mining Concession	Constituted	Nov-16	Not expires	100	MGFSN	
	CHINCHILLA 108 1 AL 20	03102-5438-K	Mining Concession	Constituted	Nov-16	Not expires	100	MGFSN	
	CHINCHILLA 114 1 AL 20	03102-5440-1	Mining Concession	Constituted	Nov-16	Not expires	100	MGFSN	
	CHINCHILLA 115 1 AL 40	03102-5441-K	Mining Concession	Constituted	Nov-16	Not expires	200	MGFSN	
Paciencia	PACIENCIA 1 1 AL 60	03102-4648-4	Mining Concession	Constituted	Jul-14	Not expires	300	MGFSN	100 % GF
	PACIENCIA 2 1 AL 60	03102-4649-2	Mining Concession	Constituted	Jul-14	Not expires	300	MGFSN	
	PACIENCIA 3 1 AL 60	03102-4650-6	Mining Concession	Constituted	Jul-14	Not expires	300	MGFSN	
	PACIENCIA 12 1 AL 60	03102-4659-K	Mining Concession	Constituted	Jul-14	Not expires	300	MGFSN	
	PACIENCIA 13 1 AL 60	03102-4660-3	Mining Concession	Constituted	Jul-14	Not expires	300	MGFSN	
	PACIENCIA 14 1 AL 60	03102-4661-1	Mining Concession	Constituted	Jul-14	Not expires	300	MGFSN	
	PACIENCIA 23 1 AL 60	03102-4670-0	Mining Concession	Constituted	Jul-14	Not expires	300	MGFSN	
	PACIENCIA 24 1 AL 60	03102-4671-9	Mining Concession	Constituted	Jul-14	Not expires	300	MGFSN	
	PACIENCIA 31 1 AL 60	03102-4678-6	Mining Concession	Constituted	Jul-14	Not expires	300	MGFSN	
	PACIENCIA 36 1 AL 60	03102-4683-2	Mining Concession	Constituted	Jul-14	Not expires	300	MGFSN	
	PACIENCIA 37 1 AL 60	03102-4684-0	Mining Concession	Constituted	Jul-14	Not expires	300	MGFSN	
	PACIENCIA 38 1 AL 60	03102-4685-9	Mining Concession	Constituted	Jul-14	Not expires	300	MGFSN	
	PACIENCIA 39 1 AL 40	03102-4686-7	Mining Concession	Constituted	Jul-14	Not expires	200	MGFSN	
	PACIENCIA 40 1 AL 40	03102-4687-5	Mining Concession	Constituted	Jul-14	Not expires	200	MGFSN	
	PACIENCIA 41 1 AL 40	03102-4688-3	Mining Concession	Constituted	Jul-14	Not expires	200	MGFSN	
	PACIENCIA 42 1 AL 60	03102-4689-1	Mining Concession	Constituted	Jul-14	Not expires	300	MGFSN	
Aster 2	ASTER 2 A 1 AL 30	03102-3741-8	Mining Concession	Constituted	Dec-12	Not expires	300	MGFSN	2 % NSR royalty
	ASTER 2 B 1 AL 30	03102-3742-6	Mining Concession	Constituted	Dec-12	Not expires	300	MGFSN	
	ASTER 2 C 1 AL 30	03102-3743-4	Mining Concession	Constituted	Dec-12	Not expires	300	MGFSN	

Group	Name of concession	Number	Concession type	Status	Grant date	Expiry date	Area (ha)	Owner	Comments
	ASTER 2 D 1 AL 30	03102-3744-2	Mining Concession	Constituted	Dec-12	Not expires	300	MGFSN	
	ASTER 2 E 1 AL 30	03102-3745-0	Mining Concession	Constituted	Dec-12	Not expires	300	MGFSN	
	ASTER 2 F 1 AL 30	03102-3746-9	Mining Concession	Constituted	Dec-12	Not expires	300	MGFSN	
Aster 3	ASTER 3 A 1 AL 30	03102-3747-7	Mining Concession	Constituted	Dec-12	Not expires	300	MGFSN	2 % NSR royalty
	ASTER 3 B 1 AL 30	03102-3748-5	Mining Concession	Constituted	Dec-12	Not expires	300	MGFSN	
	ASTER 3 C 1 AL 30	03102-3749-3	Mining Concession	Constituted	Dec-12	Not expires	300	MGFSN	
	ASTER 3 D 1 AL 30	03102-3750-7	Mining Concession	Constituted	Dec-12	Not expires	300	MGFSN	
Helada	HELADA I 1 AL 30	03102-4281-0	Mining Concession	Constituted	Oct-14	Not expires	300	MGFSN	2 % NSR royalty
	HELADA II 1 AL 30	03102-4282-9	Mining Concession	Constituted	Oct-14	Not expires	300	MGFSN	
	HELADA III 1 AL 30	03102-4283-7	Mining Concession	Constituted	Oct-14	Not expires	300	MGFSN	
	HELADA IV 1 AL 30	03102-4284-5	Mining Concession	Constituted	Oct-14	Not expires	300	MGFSN	
	HELADA V 1 AL 30	03102-4285-3	Mining Concession	Constituted	Oct-14	Not expires	300	MGFSN	
	HELADA VI 1 AL 30	03102-4286-1	Mining Concession	Constituted	Oct-14	Not expires	300	MGFSN	
	HELADA VII 1 AL 20	03102-4287-K	Mining Concession	Constituted	Oct-14	Not expires	200	MGFSN	
Pedernales	PEDERNALES D 1 AL 30	03102-4326-4	Mining Concession	Constituted	Jul-13	Not expires	300	MGFSN	2 % NSR royalty
	PEDERNALES E 1 AL 30	03102-4327-2	Mining Concession	Constituted	Jul-13	Not expires	300	MGFSN	
	PEDERNALES I 1 AL 40	03102-3430-3	Mining Concession	Constituted	Jul-13	Not expires	400	MGFSN	
	TERRIER VI 1 AL 30	03102-1434-5	Mining Concession	Constituted	Jul-13	Not expires	300	MGFSN	
	TERRIER VII 1 AL 30	03102-1435-3	Mining Concession	Constituted	Jul-13	Not expires	300	MGFSN	
Saturno	SATURNO 13, 1 AL 40	03102-6336-2	Mining Concession	In process	-	Not expires	200	MGFSN	100 % GF
Urano	URANO 25, 1 AL 60	03102-6335-4	Mining Concession	In process	-	Not expires	300	MGFSN	100 % GF
	URANO 26, 1 AL 60	03102-6337-0	Mining Concession	In process	-	Not expires	300	MGFSN	
Antares	ANTARES 1	03102-Q225-K	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	100 % GF
	ANTARES 2	03102-Q226-8	Exploration Concession	Constituted	Dec-20	2 years	100	MGFSN	
	ANTARES 3	03102-Q227-6	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	ANTARES 4	03102-Q228-4	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	ANTARES 5	03102-Q229-2	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	ANTARES 6	03102-Q230-6	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	ANTARES 7	03102-Q231-4	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	ANTARES 8	03102-Q232-2	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	ANTARES 9	03102-Q233-0	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	ANTARES 10	03102-Q234-9	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	ANTARES 11	03102-Q235-7	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	ANTARES 12	03102-Q236-5	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	ANTARES 13	03102-Q237-3	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	ANTARES 14	03102-Q238-1	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	ANTARES 15	03102-Q239-K	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	ANTARES 16	03102-Q168-7	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	ANTARES 17	03102-Q169-5	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
Ceniza	CENIZA UNO	03102-Q141-5	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	100 % GF
	CENIZA DOS	03102-Q142-3	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	CENIZA TRES	03102-Q143-1	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	CENIZA CUATRO	03102-Q144-K	Exploration Concession	Constituted	Dec-20	2 years	100	MGFSN	
	CENIZA CINCO	03102-Q145-8	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	CENIZA SEIS	03102-Q146-6	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	CENIZA SIETE	03102-Q147-4	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	CENIZA OCHO	03102-Q148-2	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	CENIZA NUEVE	03102-Q149-0	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	CENIZA DIEZ	03102-Q150-4	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	CENIZA ONCE	03102-Q151-2	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	CENIZA DOCE	03102-Q152-0	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	CENIZA TRECE	03102-Q153-9	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	CENIZA CATORCE	03102-Q154-7	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	CENIZA QUINCE	03102-Q155-5	Exploration Concession	Constituted	Dec-20	2 years	100	MGFSN	
Colorado	COLORADO UNO	03102-Q157-1	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	100 % GF
	COLORADO DOS	03102-Q158-K	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	COLORADO TRES	03102-Q159-8	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	COLORADO CUATRO	03102-Q160-1	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	COLORADO CINCO	03102-Q161-K	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	COLORADO SEIS	03102-Q162-8	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	COLORADO SIETE	03102-Q163-6	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	COLORADO OCHO	03102-Q164-4	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	COLORADO NUEVE	03102-Q165-2	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	COLORADO DIEZ	03102-Q166-0	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	COLORADO ONCE	03102-Q167-9	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
Jupiter	JÚPITER 1	03102-Q205-5	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	100 % GF
	JÚPITER 2	03102-Q206-3	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	

Group	Name of concession	Number	Concession type	Status	Grant date	Expiry date	Area (ha)	Owner	Comments
	JÚPITER 3	03102-Q207-1	Exploration Concession	Constituted	Jan-21	2 years	100	MGFSN	
	JÚPITER 4	03102-Q208-K	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 5	03102-Q209-8	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 6	03102-Q210-1	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 7	03102-Q211-K	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 8	03102-Q212-8	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 9	03102-Q213-6	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 10	03102-Q214-4	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 11	03102-Q215-2	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 12	03102-Q216-0	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 13	03102-Q217-9	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 14	03102-Q218-7	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 15	03102-Q219-5	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 16	03102-Q220-9	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 17	03102-Q221-7	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 18	03102-Q222-5	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 19	03102-Q223-3	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 20	03102-Q224-1	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 21	03102-Q261-6	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	JÚPITER 22	03102-Q262-4	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
	JÚPITER 23	03102-Q263-2	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
Marte	MARTE 1	03102-Q180-6	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	100 % GF
	MARTE 2	03102-Q181-4	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 3	03102-Q182-2	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 4	03102-Q183-0	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 5	03102-Q184-9	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 6	03102-Q185-7	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 7	03102-Q186-5	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 8	03102-Q187-3	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 9	03102-Q188-1	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 10	03102-Q189-K	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 11	03102-Q190-3	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 12	03102-Q191-1	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 13	03102-Q192-K	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 14	03102-Q193-8	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 15	03102-Q194-6	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 16	03102-Q195-4	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 17	03102-Q196-2	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 18	03102-Q197-0	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 19	03102-Q198-9	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 20	03102-Q199-7	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 21	03102-Q200-4	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 22	03102-Q201-2	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 23	03102-Q202-0	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 24	03102-Q203-9	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	MARTE 25	03102-Q204-7	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
Milan	MILAN 1	03102-Q283-7	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	100 % GF
	MILAN 2	03102-Q284-5	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
Roma	ROMA 1	03102-Q312-4	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	100 % GF
	ROMA 2	03102-Q313-2	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
	ROMA 3	03102-Q314-0	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	ROMA 5	03102-Q315-9	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	ROMA 11	03102-Q316-7	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	ROMA 12	03102-Q317-5	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	ROMA 13	03102-Q318-3	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	ROMA 14	03102-Q319-1	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	ROMA 15	03102-Q320-5	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
Rosario	ROSARIO 1	03102-P611-K	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	100 % GF
	ROSARIO 2	03102-P612-8	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 3	03102-P613-6	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 4	03102-P614-4	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 5	03102-P615-2	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 6	03102-P616-0	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 7	03102-P617-9	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 8	03102-P618-7	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 9	03102-P619-5	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 10	03102-P620-9	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	

Group	Name of concession	Number	Concession type	Status	Grant date	Expiry date	Area (ha)	Owner	Comments
	ROSARIO 11	03102-P621-7	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 12	03102-P622-5	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 13	03102-P623-3	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 14	03102-P624-1	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 15	03102-P625-K	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 16	03102-P626-8	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 17	03102-P627-6	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 18	03102-P628-4	Exploration Concession	Constituted	May-20	2 years	200	MGFSN	
	ROSARIO 19	03102-P629-2	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 20	03102-P630-6	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 21	03102-P631-4	Exploration Concession	Constituted	May-20	2 years	300	MGFSN	
	ROSARIO 22	03102-P632-2	Exploration Concession	Constituted	May-20	2 years	200	MGFSN	
	ROSARIO 23	03102-P633-0	Exploration Concession	Constituted	May-20	2 years	200	MGFSN	
	ROSARIO 24	03102-P634-9	Exploration Concession	Constituted	May-20	2 years	200	MGFSN	
	ROSARIO 25	03102-P635-7	Exploration Concession	Constituted	May-20	2 years	200	MGFSN	
	ROSARIO 26	03102-P636-5	Exploration Concession	Constituted	May-20	2 years	200	MGFSN	
Saturno	SATURNO 1	03102-Q264-0	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	100 % GF
	SATURNO 2	03102-Q265-9	Exploration Concession	Constituted	Jan-21	2 years	100	MGFSN	
	SATURNO 3	03102-Q266-7	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	SATURNO 4	03102-Q267-5	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	SATURNO 5	03102-Q274-8	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	SATURNO 6	03102-Q268-3	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	SATURNO 7	03102-Q269-1	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	SATURNO 8	03102-Q270-5	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	SATURNO 9	03102-Q271-3	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	SATURNO 10	03102-Q272-1	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	SATURNO 11	03102-Q273-K	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	SATURNO 12	03102-Q275-6	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	SATURNO 14	03102-Q276-4	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
	SATURNO 15	03102-Q277-2	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
	SATURNO 16	03102-Q278-0	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
	SATURNO 17	03102-Q279-9	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	SATURNO 18	03102-Q280-2	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
Turin	TURIN 1	03102-Q281-0	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	100 % GF
	TURIN 2	03102-Q282-9	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	TURIN 3	03102-Q107-5	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	TURIN 4	03102-Q108-3	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	TURIN 5	03102-Q109-1	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	TURIN 6	03102-Q110-5	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	TURIN 7	03102-Q111-3	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	TURIN 8	03102-Q112-1	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	TURIN 9	03102-Q113-K	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	TURIN 10	03102-Q114-8	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	TURIN 11	03102-Q115-6	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	TURIN 12	03102-Q116-4	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	TURIN 13	03102-Q117-2	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	TURIN 14	03102-Q118-0	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
Urano	URANO 1	03102-Q285-3	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	100 % GF
	URANO 2	03102-Q286-1	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	URANO 3	03102-Q287-K	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	URANO 4	03102-Q288-8	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	URANO 5	03102-Q289-6	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	URANO 6	03102-Q290-K	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
	URANO 7	03102-Q291-8	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
	URANO 8	03102-Q292-6	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
	URANO 9	03102-Q293-4	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
	URANO 10	03102-Q294-2	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
	URANO 11	03102-Q295-0	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
	URANO 12	03102-Q296-9	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
	URANO 13	03102-Q297-7	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
	URANO 14	03102-Q298-5	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	URANO 15	03102-Q299-3	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	URANO 16	03102-Q300-0	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	URANO 17	03102-Q301-9	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	URANO 18	03102-Q302-7	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	URANO 19	03102-Q303-5	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	URANO 20	03102-Q304-3	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	

Group	Name of concession	Number	Concession type	Status	Grant date	Expiry date	Area (ha)	Owner	Comments
	URANO 21	03102-Q305-1	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	URANO 22	03102-Q306-K	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	URANO 23	03102-Q307-8	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	URANO 24	03102-Q308-6	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
	URANO 27	03102-Q309-4	Exploration Concession	Constituted	Jan-21	2 years	100	MGFSN	
	URANO 28	03102-Q310-8	Exploration Concession	Constituted	Jan-21	2 years	200	MGFSN	
	URANO 29	03102-Q311-6	Exploration Concession	Constituted	Jan-21	2 years	300	MGFSN	
Venus	VENUS 1	03102-Q241-1	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	100 % GF
	VENUS 2	03102-Q242-K	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 3	03102-Q243-8	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 4	03102-Q244-6	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	VENUS 5	03102-Q245-4	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	VENUS 6	03102-Q246-2	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	VENUS 7	03102-Q247-0	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 8	03102-Q248-9	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 9	03102-Q249-7	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 10	03102-Q250-0	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 11	03102-Q251-9	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 12	03102-Q252-7	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 13	03102-Q253-5	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 14	03102-Q254-3	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 15	03102-Q255-1	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 16	03102-Q256-K	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 17	03102-Q257-8	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 18	03102-Q258-6	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 19	03102-Q259-4	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	VENUS 20	03102-Q260-8	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
Neptuno	NEPTUNO 1	03102-Q994-7	Exploration Concession	Constituted	Jul-21	2 years	200	MGFSN	100 % GF
	NEPTUNO 2	03102-R155-0	Exploration Concession	Constituted	Jul-21	2 years	100	MGFSN	
	NEPTUNO 3	03102-R156-9	Exploration Concession	Constituted	Jul-21	2 years	100	MGFSN	
	NEPTUNO 4	03102-R157-7	Exploration Concession	Constituted	Jul-21	2 years	200	MGFSN	
	NEPTUNO 5	03102-R158-5	Exploration Concession	Constituted	Jul-21	2 years	200	MGFSN	
	NEPTUNO 6	03102-R159-3	Exploration Concession	Constituted	Jul-21	2 years	200	MGFSN	
	NEPTUNO 7	03102-R160-7	Exploration Concession	Constituted	Jul-21	2 years	200	MGFSN	
	NEPTUNO 8	03102-R161-5	Exploration Concession	Constituted	Jul-21	2 years	200	MGFSN	
	NEPTUNO 9	03102-R162-3	Exploration Concession	Constituted	Jul-21	2 years	200	MGFSN	
	NEPTUNO 10	03102-R163-1	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 11	03102-R164-K	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 12	03102-R165-8	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 13	03102-R166-6	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 14	03102-R167-4	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 15	03102-R168-2	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 16	03102-R169-0	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 17	03102-R170-4	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 18	03102-R171-2	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 19	03102-R172-0	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 20	03102-R173-9	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 21	03102-R174-7	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 22	03102-R175-5	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 23	03102-R176-3	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 24	03102-R177-1	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 25	03102-R178-K	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 26	03102-R179-8	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 27	03102-R180-1	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 28	03102-R181-K	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 29	03102-R182-8	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 30	03102-R183-6	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 31	03102-R184-4	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 32	03102-R185-2	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 33	03102-R186-0	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 34	03102-R187-9	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 35	03102-R188-7	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 36	03102-R189-5	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 37	03102-R190-9	Exploration Concession	Constituted	Jul-21	2 years	300	MGFSN	
	NEPTUNO 38	03102-R191-7	Exploration Concession	Constituted	Jul-21	2 years	200	MGFSN	
	NEPTUNO 39	03102-R192-5	Exploration Concession	Constituted	Jul-21	2 years	200	MGFSN	
	NEPTUNO 40	03102-Q985-8	Exploration Concession	Constituted	Jul-21	2 years	200	MGFSN	

Group	Name of concession	Number	Concession type	Status	Grant date	Expiry date	Area (ha)	Owner	Comments
Epsilon	ÉPSILON UNO	03102-Q170-9	Exploration Concession	Constituted	Jan-21	2 years	300	Gold Fields Pedernales Ltda.	100 % GF
	ÉPSILON DOS	03102-Q171-7	Exploration Concession	Constituted	Jan-21	2 years	200	Gold Fields Pedernales Ltda.	
	ÉPSILON TRES	03102-Q172-5	Exploration Concession	Constituted	Jan-21	2 years	200	Gold Fields Pedernales Ltda.	
	ÉPSILON CUATRO	03102-Q173-3	Exploration Concession	Constituted	Jan-21	2 years	300	Gold Fields Pedernales Ltda.	
	ÉPSILON CINCO	03102-Q174-1	Exploration Concession	Constituted	Jan-21	2 years	100	Gold Fields Pedernales Ltda.	
	ÉPSILON SEIS	03102-Q175-K	Exploration Concession	Constituted	Jan-21	2 years	300	Gold Fields Pedernales Ltda.	
	ÉPSILON SIETE	03102-Q176-8	Exploration Concession	Constituted	Jan-21	2 years	300	Gold Fields Pedernales Ltda.	
	ÉPSILON OCHO	03102-Q177-6	Exploration Concession	Constituted	Jan-21	2 years	300	Gold Fields Pedernales Ltda.	
	ÉPSILON NUEVE	03102-Q178-4	Exploration Concession	Constituted	Jan-21	2 years	300	Gold Fields Pedernales Ltda.	
	ÉPSILON DIEZ	03102-Q179-2	Exploration Concession	Constituted	Jan-21	2 years	200	Gold Fields Pedernales Ltda.	
Fernando Sur	FERNANDO SUR 1, 1/60	031025353-7	Mining Concession	Constituted	Jan-15	Not expires	300	MGFSN	Option Agreement since 2019 for 5 years 2 % NSR royalty
	FERNANDO 1-D	03102Q133-4	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	FERNANDO 2-D	03102Q134-2	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	FERNANDO 3-D	03102Q135-0	Exploration Concession	Constituted	Dec-20	2 years	200	MGFSN	
	FERNANDO 4-D	03102Q136-9	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	FERNANDO 5-D	03102Q137-7	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	FERNANDO 6-D	03102Q138-5	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
	FERNANDO SUR 2-D	03102Q139-3	Exploration Concession	Constituted	Dec-20	2 years	300	MGFSN	
Ladera	LADERA 1 1 AL 30	03102-5659-5	Mining Concession	Constituted	Aug-16	Not expires	300	MGFSN	Option Agreement since 2021 for 5 years 2 % NSR royalty
	LADERA 2 1 AL 30	03102-5660-9	Mining Concession	Constituted	Aug-16	Not expires	300	MGFSN	
	LADERA 3 1 AL 30	03102-6183-1	Mining Concession	Constituted	Sep-19	Not expires	300	MGFSN	
	ANILLO 4A	03102-P592-K	Exploration Concession	Constituted	Jun-20	2 years	300	MGFSN	
	ANILLO 5A	03102-P593-8	Exploration Concession	Constituted	Jun-20	2 years	300	MGFSN	
	ANILLO 6A	03102-P594-6	Exploration Concession	Constituted	Jun-20	2 years	200	MGFSN	
	ANILLO 7A	03102-P595-4	Exploration Concession	Constituted	Jun-20	2 years	300	MGFSN	
	ANILLO 8A	03102-P596-2	Exploration Concession	Constituted	Jun-20	2 years	200	MGFSN	
	ESCUDO 9A	03102-P597-0	Exploration Concession	Constituted	Jun-20	2 years	300	MGFSN	
Total area (ha)							**9,.200**		

Notes: a) The Qualified persons opinion is that licenses and tenements are in good standing to enable execution of the life of mine plan and can be renewed or extended as required.

Source: Salares Norte CPR, 2021

4.3.1 Surface rights

The Government of Chile owns the surface rights to Salares Norte. In 2017, Gold Fields obtained a definitive easement to access the property. The land easement is 1,879.04 ha and covers the required footprint for the mine and process plant area, as well as an alternative tailings storage facility (TSF) / photovoltaic (PV) site, water well and pipeline route, camp and main access roads. The easement is valid for 30 years (until 24 February 2047) or the duration of the start-up, operation and closure of the mine.

An additional easement was requested in 2017 for 308.91 ha and covers extra mine tracking, area to the camp access gate, groundwater monitoring wells and an extension to the mine area. The easement was granted in August 2018 for 30 years or the duration of the start-up, operation and closure of the mine. Two additional provisional easements for 534.5 ha were also granted.

4.3.2 Mineral tenure description

National regulations establish that the State has absolute, exclusive, inalienable and imprescriptible ownership of all mines, including natural guano deposits, metal bearing sands, salt deposits, coal and hydrocarbon deposits and fields and other fossil substances except surface clays, regardless of property rights of natural or legal individuals over lands wherein they may be found.

Any person is, however, entitled to dig test pits and to remove samples in the search for mineral substances, as well as to establish a concession for the search or mining of substances over which, under organic constitutional laws, concessions may be granted.

Concessions are judicially processed and are valid for two years (exploration) or do not expire (exploitation). The form of protection for exploitation concessions is the annual patent payment.

The ownership of surface rights does not give preference or rights over minerals or mining concessions. This principle of total separation of ownership also implies that the owner of the land cannot oppose the granting of a mining concession on the same land. The property of the mining concessions can be executed before the State or third parties and can be freely assigned, mortgaged and, in general, subject to any legal contract as occurs with any other property in accordance with the Chilean Civil Code.

The holder of a mining concession has the right to impose easements to the superficial landowner who does not wish to do so through a summary procedure before the corresponding civil court. This includes cases where the Government is the owner of the land. Land easements are requested and generally granted after just compensation has been determined.

According to Government information, there are no land ownership claims or applications over the property. The Indigenous Populations Affairs Agency (Corporación Nacional de Desarrollo Indígena or CONADI) has confirmed that there are no claims by indigenous peoples for ownership of ancestral lands. CONADI also advised that there are no groups with aspirations for surface rights based on indigenous claims.

4.4 Ownership

Minera Gold Fields Salares Norte SpA. (MGFSN), in which Gold Fields indirectly holds a 100 % interest, owns the Salares Norte mining concessions (900 ha) and the adjacent Rio Baker mining concessions (900 ha).

Gold Fields acquired 100 % ownership of the Salares Norte mining concessions from SBX Asesorias e Inversiones (SBX), a private Chilean company, in 2012 and 100 % ownership of the adjacent Rio Baker mining concessions from Sociedad Legal Minera Rio Baker (SLM Rio Baker) in 2016. MGFSN has security of tenure for all current exploration and mining tenements that contribute to Salares Norte's Mineral Resources and Mineral Reserves.

4.5 Royalties, back-in rights, payments, or other agreements and encumbrances

MGFSN's ownership of the Salares Norte 25, 27 and 28 mining concessions are subject to a 2 % net smelter return (NSR) royalty payable to a subsidiary of Franco-Nevada. MGFSN retains the right to purchase one half of the NSR royalty for $6 million within two years following commencement of commercial production. MGFSN also has a right of first refusal for the purchase of the balance of the royalty.

MGFSN's ownership of the Rio Baker 1, 2 and 3 mining concessions are subject to a 2 % NSR royalty payable to SLM Rio Baker. MGFSN retains the right to purchase one quarter of the NSR royalty for $4 million and also has a first right of refusal on the purchase of the balance of the royalty.

There are no other Mineral Resources or Mineral Reserves at Salares Norte affected by royalty clauses in the respective Option Agreements signed since 2012.

Article 120 of the Mining Code establishes at the time the pertinent concession is established and in order to contribute to a convenient and unrestricted exploration and operation, surface properties will be subject to the following taxes:

- To the occupation, where appropriate, of mineral piles, slags, tailings and slags, mineral separation and processing facilities, communication systems, conduits, channels, dams and ponds, pipelines, homes, buildings and other auxiliary facilities and auxiliaries.
- To those encumbrances that are created in favour of the concessionaires of the electric power public services, in accordance with the corresponding laws, and

- To the right of way and occupation by roads, railways, aerodromes, oil pipelines, tunnels, inclined planes, cable cars, conveyor belts and any other system used to connect the concession to public roads, processing facilities, railway stations, aerodromes and settlements populated.

The foregoing implies that a third party could eventually constitute a mining easement on MGFSN's concessions provided that its objective is to contribute to a convenient exploration and operation, so MGFSN's task is to establish a security area that allows the protection of the Salares Norte property.

There are no other encumbrances or regulatory requirements that affect access, title, or the right or ability to perform work on the property.

4.6 Environmental liabilities

Item 20 discloses the remediation and reclamation guarantees that are pertinent to Salares Norte.

4.7 Permits

MGFSN (Minera Gold Fields Salares Norte SpA) holds exploitation concessions covering the Salares Norte mine development. Land access rights are in place through corresponding easements granted by the Government. Water rights needed for the operation were granted by the relevant water authorities and are environmentally approved. There are no known land ownership conflicts or claims with local or indigenous peoples.

The EIA was approved by Chilean authorities in December 2019 and details all potential environmental and social impacts for the construction, operation and closure of the mine, together with the corresponding mitigation actions and voluntary commitments to address them.

All sectorial permits for the project are approved, including permits for mining exploitation, processing, waste storage, tailings storage, water course modification and mine closure. With these approvals in place, the permitting effort until commencement of operations are mainly focused on obtaining specific construction permits, including sanitary permits, building permits, and final reception of the facilities.

Mineral rights and/or mining rights are subject to the necessary approvals and permits discussed in Item 20.

4.8 Other significant factors and risks

The short-tailed chinchilla present on the property and the chinchilla relocation plan is described in Item 20. MGFSN submitted a compliance program to the authorities for approval during December 2021which incorporates significant learnings from the initial chinchilla relocation campaign, and this remains under review by the authorities at the time of this report. MGFSN will continue to work with the authorities to improve and resume the relocation plan.

The current temporary suspension does not place the commissioning date of the project at risk. The development of the AA deposit as an open pit is dependent on the successful relocation of chinchillas from the remaining areas as identified in the EIA. The Mineral Resources and Mineral Reserves declared in this Technical Report assume that the chinchillas are successfully relocated and AA is developed as an open pit.

There are no other material factors or risks that affect access, title, or the right or ability to perform work on the property.

The Qualified Person is not aware of any other current or pending legal matters that may have an influence on the rights to explore or mine for minerals at Salares Norte. A review of recent Company public disclosure documents including the Company's annual report (for the year ended 31 December 2021) do not contain any statements by the directors on any legal proceedings or other material conditions (other than as set out above) that may impact on the Company's ability to continue mining or exploration activities at Salares Norte.

5 Accessibility, climate, local resources, infrastructure and physiography

5.1 Topography, elevation, and vegetation

Salares Norte is on the Altiplano (Andean Plateau) in the Atacama Region of Chile within the internally drained Salar Grande basin. Elevations on the property range from 4,200 m to 4,900 m above sea level. The current camp is 13 km southwest of the mine area at an elevation of 3,920 m.

The property is in an arid zone subject to extreme conditions and therefore the presence of vegetal species is restricted to specific places such as ravine bottoms or sectors protected from the wind or snow accumulation.

5.2 Access

The project area is accessed from the south (Copiapó) through route 31-CH up to the junction with route C-17, which leads to Diego de Almagro; after this intersection, route C-13 must be taken. If the project area is accessed from the north, route 5 must be followed up to the intersection with route C-13, which leads to the junction with route C-237, which must be followed up to route C-141-C17, which finally again joins route C-13.

5.3 Proximity to population centre and transport

Copiapó, the capital of the province and region, is an important support centre for mining. It has an airport with regular non-stop flights to Santiago. The closest inhabited towns are El Salvador and Diego de Almagro, 136 km and 183 km respectively southwest by road from the camp. Diego de Almagro is the largest with a population of 13,900 (2017 census). Both towns were built to support mining activities.

5.4 Climate and length of operating season

The Atacama Desert on the western slope of the Andes lies within a well-developed rain shadow. Most of the precipitation in the property occurs as winter snowfall (April to September), although episodic precipitation events occur during summer through the convective 'Invierno Altiplánico' phenomenon (November to May).

The climate of the area is described as tundra at high elevation with small amounts of precipitation. A tundra climate is characterised by low temperatures varying above and below 0 °C all year round. Temperatures in the summer months (December to February) generally do not exceed 10 °C. The daily range of temperature can exceed 15 °C. Winds are predominately from the west in the summer and the northwest for the remainder of the year. Wind speeds are generally between 2 m/s and 7 m/s.

5.5 Infrastructure

Site infrastructure currently consists of the administration office complex at the plant area, camp facilities and a microwave and satellite communication system. Construction has commenced on the heavy mining equipment workshop, warehouse, plant maintenance workshop, power station, tailings filtration plant, potable water plant, fresh water pumping and storage system, water treatment plant, fuel station and long-term evolution (LTE) communication system. Figure 5.1 shows the current and under construction infrastructure.

There is a significant movement of cargo to site. Seaborne cargo passes through Angamos (Mejillones) port (recommended) and Las Losas port in Chile. The Angamos port is located 708 km from site and the Las Losas port 527 km from site.

International air freight and air access is mainly via the Santiago International Airport. National air freight is through the Atacama Airport "Caldera" or Antofagasta Airport "Cerro Moreno".

A detailed road study was performed for the project by Mammoet during the FS. The study indicated that the roads from the ports to the Salares Norte site are generally good and have a sufficient road shipping envelope to transport all the required equipment.

The logistics for the construction phase is performed by expert logistics company DHL. The high volume of cargo and shipments is accommodated by the existing logistics infrastructure in Chile which is well maintained. The equipment with the largest shipping envelopes has already been delivered to site, including mine haul trucks, mine hydraulic excavator, SAG and ball mill shells and heads, and tailings filters.

During the operations phase, consumables will be transported to site using up to 28 tonne capacity trucks. No logistics constraints are foreseen.

Chile is a well-established mining jurisdiction with a very competent workforce. Although mining is primarily focussed on copper, there are several gold mines ensuring that sufficient skills exist in the local market to meet Salares Norte´s requirements. All critical management positions for the operation have been filled and large-scale recruitment for plant operations will commence during 2022. Mining is performed by experienced mining contractor, Ingeniería Civil Vicente S.A. (ICV).

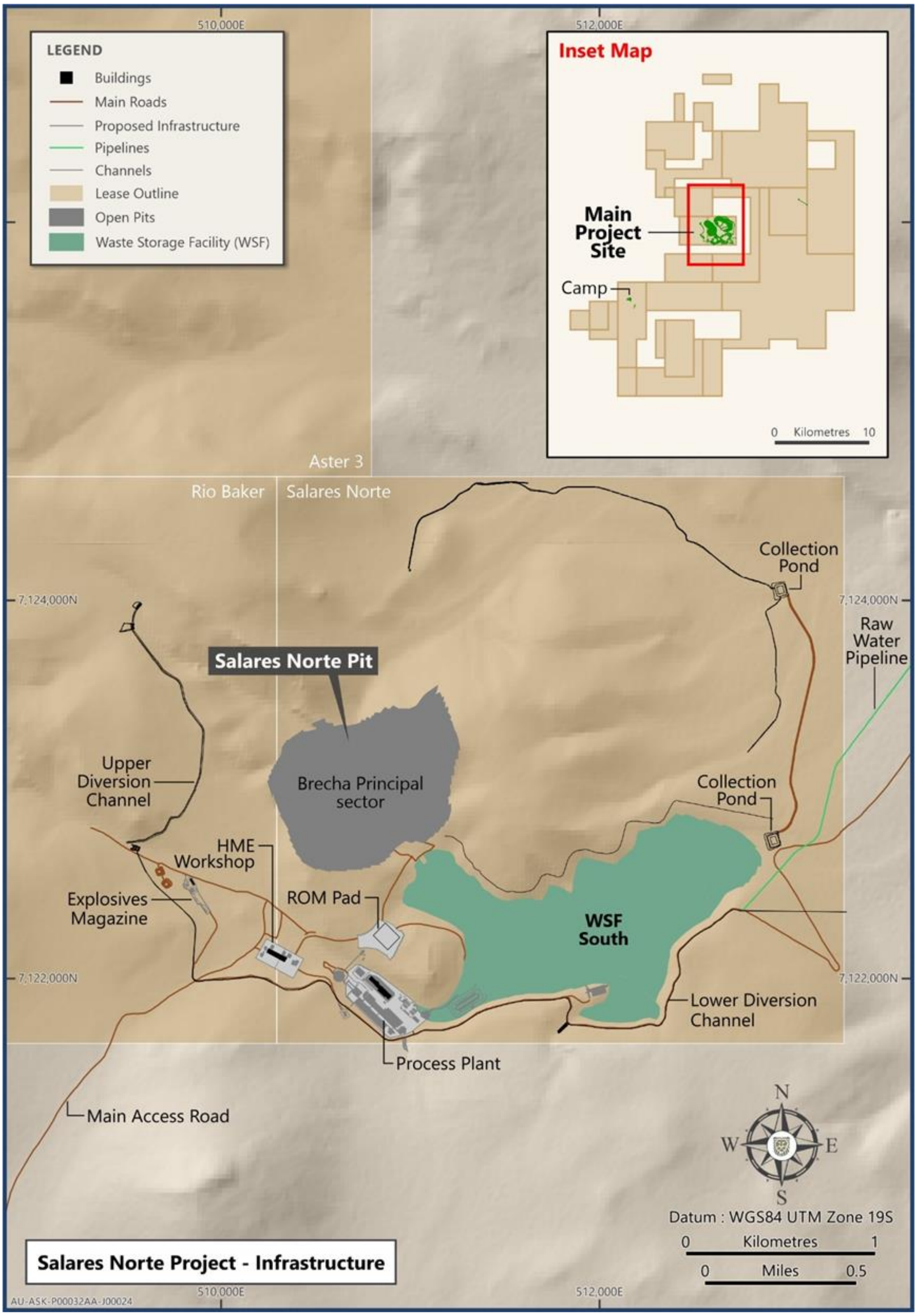
Preference will be given to the selection of candidates from areas in closest proximity to Salares Norte, and thereafter to widening zones of regional influence. Applicants from Diego de Almagro and Inca de Oro communities will be given highest priority, followed by candidates from the Atacama Region, but candidates from increasingly distant regions will be considered if qualifications are not met from the pool of available talent closer to the operation.

Personnel based at site will generally follow an 8 on, 6 off roster, which consists of two 12 hour shifts within 8 days of work. This is a common shift roster for remote sites in Chile. Personnel based in Santiago, Diego de Almagro and Copiapó will generally follow a 5 on, 2 off roster.

Infrastructure development progress is summarised:

- Detailed engineering completed during Q1 2021 and field engineering managed from site.
- Mine pioneering works completed and pre-strip 44 % complete with 22.8 Mt of waste material moved during 2021.
- Construction progress 55 % complete with major equipment installed, including the crusher, grinding mills, tailings filters and electrical rooms, and construction of the camp and plant administration complex completed; expected to be more than 90 % complete by the end of 2022.
- Heavy mining equipment workshop, main fuel station and fresh water supply pipeline scheduled for commissioning during Q1 2022.
- The 2022 operational plan will complete the first phase of open pit pre-stripping with selected material used for the construction of the TSF base and base for the run-of-mine stockpiles expected to be completed in Q3 2022. Mining will continue with ore stockpiled in readiness for the commencement of processing. First ore is expected to be exposed in August 2022.
- Basic engineering of a photovoltaic (PV) plant to provide up to 20 % of the renewable energy requirements for the future operation has been completed and a permit application will be filed during 2022.

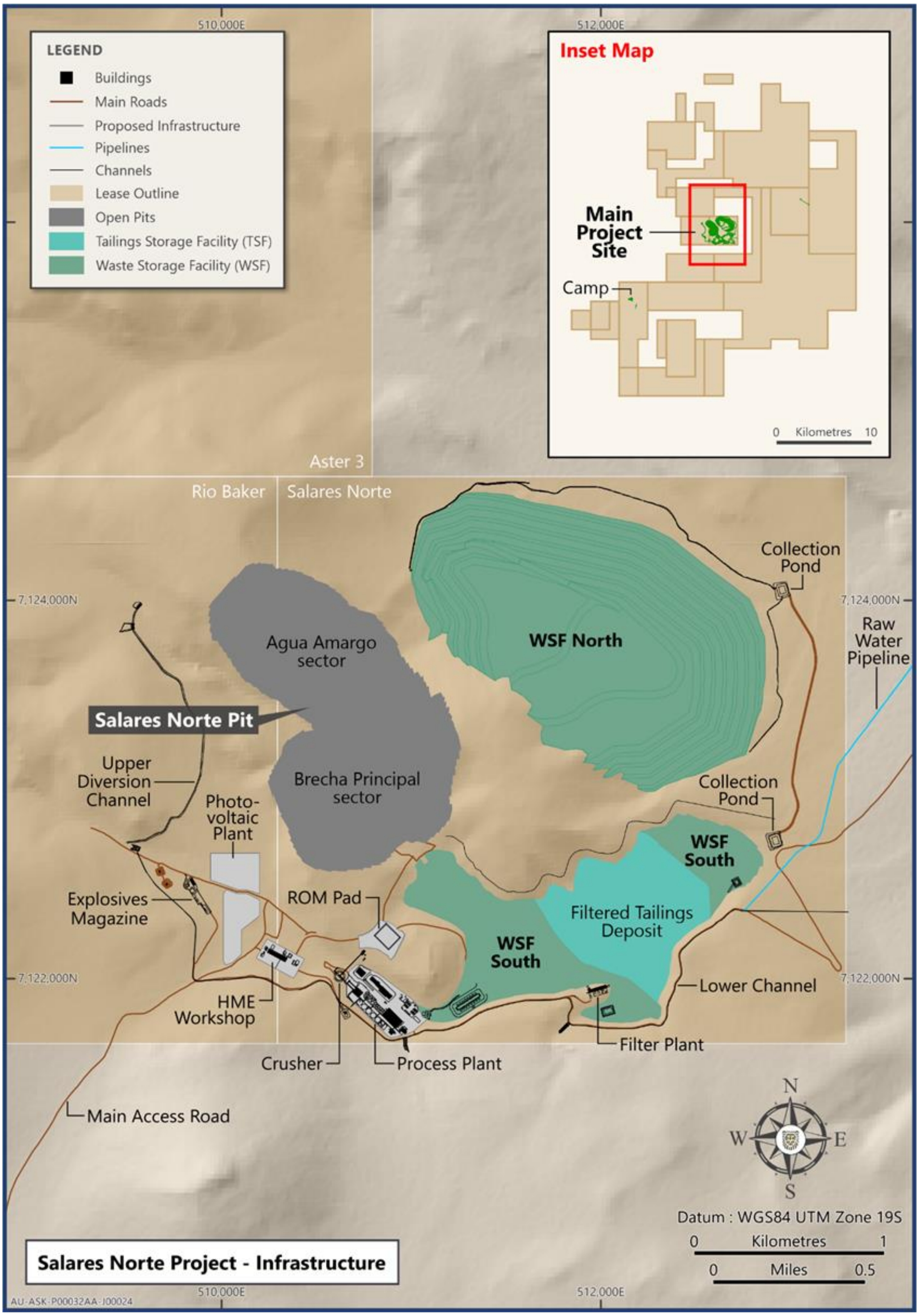
Figure 5.1: Salares Norte operating sites, infrastructure current and under construction and mineral leases



Source: Salares Norte CPR, 2021

Figure 5.2 shows the fully constructed infrastructure as expected post execution of the life of mine Mineral Reserve plan.

Figure 5.2: Infrastructure at the end of life of mine Reserve



Source: Salares Norte CPR, 2021

6 History

Gold Fields discovered the Salares Norte deposits in 2011 through a systematic greenfields exploration program focused on the northern end of the Maricunga metallogenic belt beyond the extent of the known Miocene precious metal deposits (Figure 6.1). Gold Fields selected the district based on a combination of conceptual models and metallogenic criteria. The identification of favourable spectral and geophysical targets, and surface geochemical anomalies followed by reverse circulation (RC) and diamond core (DD) drilling all contributed to the discovery.

The Maricunga metallogenic belt in the northern Andes of Chile is renowned for its porphyry gold-copper and epithermal gold-silver deposits. Gold Fields' initial exploration program in this region during 2006 targeted spectral anomalies associated with hydrothermal alteration identified from Landsat satellite imagery. First-pass exploration over the selected areas included geological mapping, surface geochemistry and geophysics.

During 2007, Gold Fields signed an option agreement to evaluate ten properties in the northern Maricunga metallogenic belt selected for their spectral anomalies. Four of these properties, including Salares Norte, were selected for follow-up exploration.

In September 2010, Gold Fields signed an option to purchase agreement for the Salares Norte property. In early 2011, Gold Fields drilled four scout RC drillholes for 935 m to test an outcropping breccia with anomalous surface geochemistry and coincident geophysical anomalies. The second hole intersected gold and silver mineralisation in oxidised and sulphide rock displaying quartz-alunite alteration, silicification and local vuggy silica.

During the 2012 season, Gold Fields drilled 13 DD holes near the discovery hole and intersected additional gold and silver mineralisation within an area at least 500 m long by 250 m wide confirming the presence of a robust mineralised system.

During the 2013 season, a further 91 holes (DD and RC) were drilled which further defined and expanded the discovery and identified other zones of mineralisation in the area. In late 2013, Gold Fields published a maiden Mineral Resource for the deposit. This model was used for an internal scoping study completed in 2014. A further update of the Mineral Resource was completed in May 2015 and incorporated into an updated scoping study.

Based on additional definition drilling completed in 2016 and a new geological model, Gold Fields updated the Mineral Resource model in 2016 and again in 2017. The most recent Mineral Resource estimate was completed in May 2018 for the feasibility study (FS) and declaration of a maiden Mineral Reserve.

Figure 6.1: Major gold and copper deposits of northern Chile and Argentina

Source: Salares Norte CPR, 2021

Gold Fields completed the FS in late 2018 based on developing Salares Norte as an open pit mine with crushing, milling, leaching and metal extraction using both Merrill-Crowe and CIP circuits at an average plant throughput of 2 Mt per annum. Following approval of the EIA on 18 December 2019 and completion of the funding strategy, the FNTP with the mine development was approved by the Board of Gold Fields in February 2020.

By the end of 2020, detailed engineering had progressed to 97 %, procurement to 87 % and adjudication of construction contracts to 95 %. Bulk earthworks for the plant, mining contractor mobilisation and pioneering for the mine commenced during Q4 2020. Purchase orders for all major equipment were placed and offsite fabrication started on several critical packages. All major contracts, including mining services, bulk earthworks, water diversion channel construction, electromechanical erection of the process plant and power supply, were adjudicated and mobilised to site. All sectorial permits required to start construction and mining activity were secured during 2020.

The open pit development and processing facility construction are on schedule and within budget for first gold in 2023.

Through to June 2018, Gold Fields had drilled 169,982 m in the Salares Norte area comprising 497 DD and 123 RC drillholes. Of these totals, 120,719 m (431 holes) were used to inform the May 2018 Mineral Resource estimate.

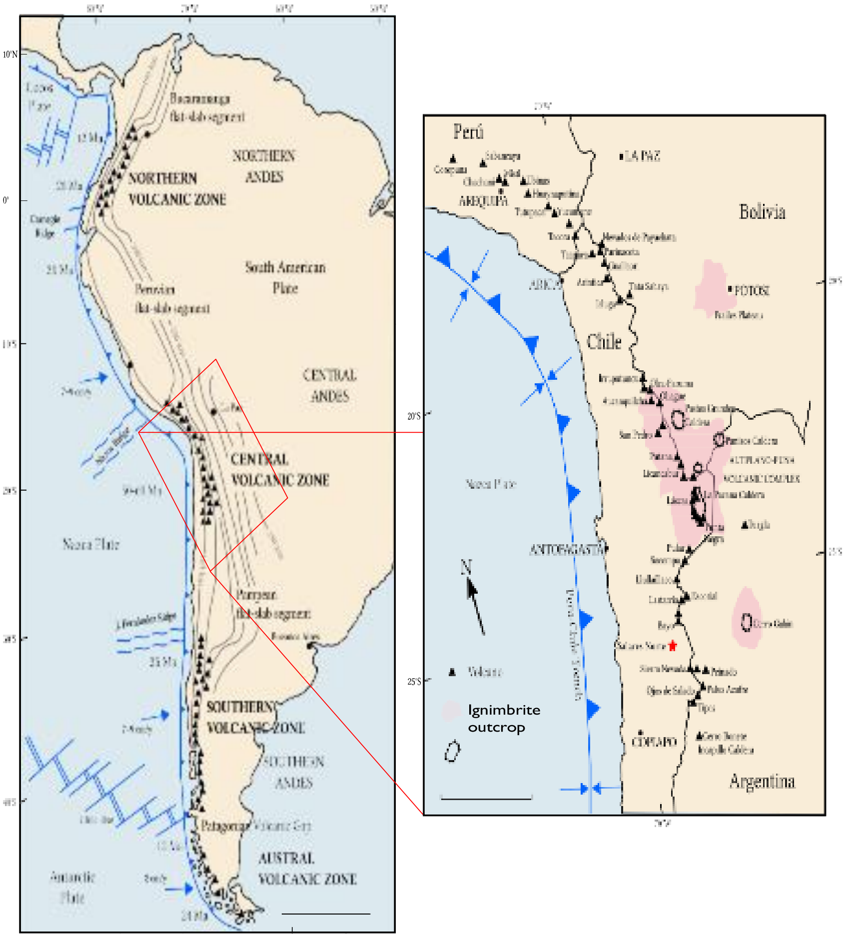
From September 2018 to October 2021, 206 drillholes (DD) with 68,710 m were drilled in Salares Norte and its surroundings. Drilling was focused on the Aster 2 (4,001 m), Low Baker (1,799 m), SN Near Mine (1,166 m), Agua Amarga (6,290 m), Helada Mayweather (3,600 m), Brecha Sur (1,181 m), Horizonte (37,961 m), Brecha Oeste (2,074 m), Aguila (660 m), Aster 3 (2,875 m), Fernando Sur (3,403 m), Pedernales (3,087 m) and Filo Valle (613 m) targets.

7 Geological setting and mineralisation

7.1 Regional geology setting

Salares Norte is near the southern end of South America's Central Volcanic Zone, an extensive belt of Quaternary volcanoes extending from 16°S in southern Peru to 27°S in the Ojos del Salado/Tres Cruces volcanic complex located along the Chile-Argentina border (Figure 7.1). Mineral deposits within the belt lie along the transition zone between the northern steep subducting slab (north of 25°S) and the southern flat subducting slab (south of 27°S).

Figure 7.1: Schematic tectonic and volcanic maps of South America and the Central Volcanic Zone



Source: Salares Norte CPR, 2021

From a regional metallogenic perspective, Salares Norte is at the northernmost end of the Maricunga metallogenic belt. The Maricunga metallogenic belt is more than 200 km long and 35 km wide, characterised by Late Oligocene–Early Miocene and Middle Miocene magmatism with associated epithermal (less common) and gold-rich porphyry style (predominant) deposits.

7.2 Local geology setting

The immediate area surrounding Salares Norte is dominated by volcanic and pyroclastic rocks ranging in age from Late Oligocene–Early Miocene to Quaternary (Figure 7.2).

The volcanic stratigraphy comprises an upper, relatively coarse, porphyritic dacite unit that is related to the presence of small domes of Late Miocene age (9.7 to 9.9 Ma). The impermeable dacite unit unconformably overlies a fine-grained basaltic andesite lava flow unit (IFAB) which is 100 to 150 m thick and dated as Mid-Miocene (15.3 Ma) in age, (Figure 7.3). The basal porphyritic andesite unit at AA (ICPA_B) is identical to that intersected at depth under BP and is unconformably overlain by the basaltic andesite flow unit. This unit is dated as Mid-Miocene in age (16.4 to 16.5 Ma), representing the oldest lithology intersected by drilling at Salares Norte.

Several types of breccia are recognised at Salares Norte. The origin of the different breccias is interpreted to be associated with different processes resulting in phreatomagmatic breccia, phreatic (hydrothermal) breccia, tectonic breccia and volcanic breccia.

The IFAB constitutes the main host rock for the polymictic and monomictic breccias. Where mineralised, these breccias are overprinted by late hydrothermal alteration dated as Late Miocene in age (5 to 6 Ma).

The polymictic breccias are fine to medium grained, include a variety of breccia facies (e.g., laminated to massive) and vary from a few meters up to more than 40 m thick. The presence of a primary fabric in the fine-grained basaltic andesite and the fact that the breccias mostly take advantage of the upper and lower contacts of this unit suggests that mechanical (rheological) characteristics of the IFAB were favourable in controlling the lateral development of the breccias and the subsequent flow of the hydrothermal fluids responsible for the alteration and mineralisation (Gigola 2017).

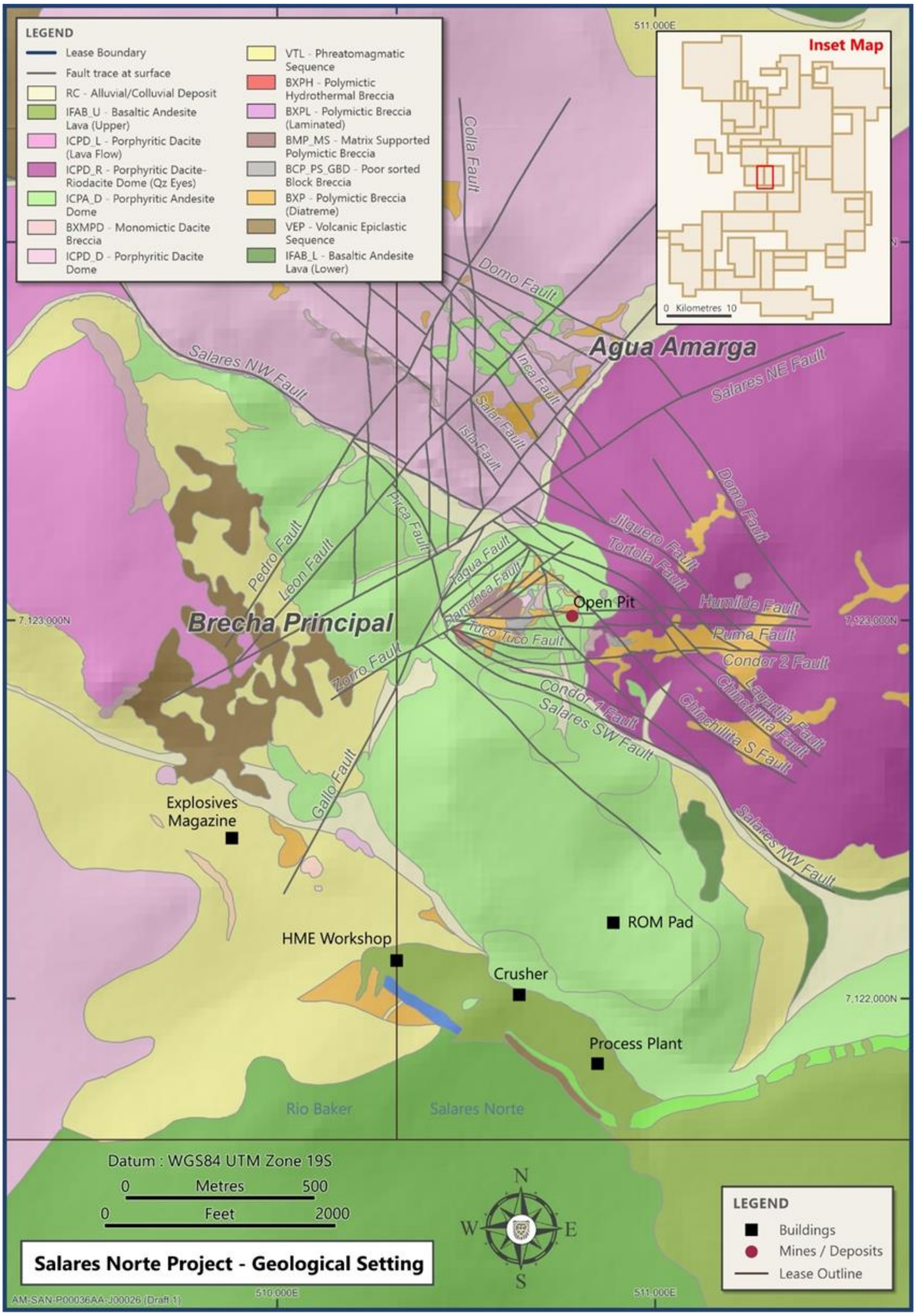
The permeable polymictic breccia horizons are preferentially mineralised; however, monomictic breccias and non-brecciated IFAB intervals are also moderately to strongly mineralised when affected by strong quartz-alunite alteration and silicification.

The hydrothermal polymictic breccia (BXPH) generally has a coarse chaotic texture with angular-to-rounded clasts and is altered with diverse facies due to re-brecciation and superimposition of hydrothermal cement. This overprinting event consists of a fine matrix of granular silica that can vary according to the intensity of massive alunite-silica and alunite jarosite.

Laminated polymictic breccias (BXPL) facies with evidence of later hydrothermal brecciation (and hydrothermal cement) are defined as BXPHL. They include laminated fine-grained polymictic breccia facies that differ from chaotic breccia facies that exhibit little to no selection.

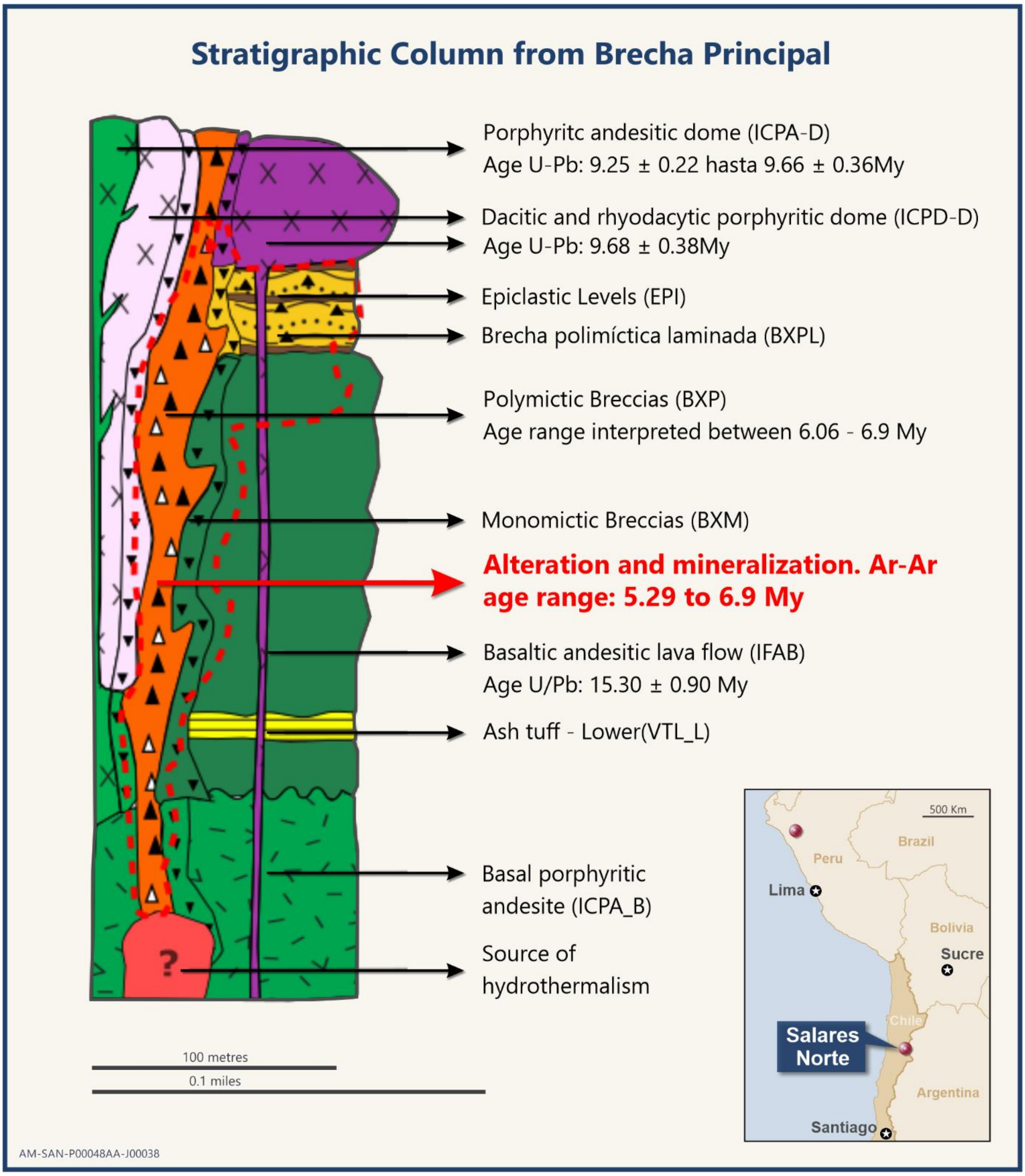
Monomictic breccias (BXMHAB) with fine-grained andesite clasts represent the most mineralised monolithologic breccia-type at AA, usually forming halos that surround the polymictic breccia bodies. They display much less matrix than the polymictic breccias and are frequently clast supported, with little matrix and often with clasts only separated by minor hydrothermal cement.

Figure 7.2: Local geology of Salares Norte



Source: Salares Norte CPR, 2021

Figure 7.3: Salares Norte stratigraphic column

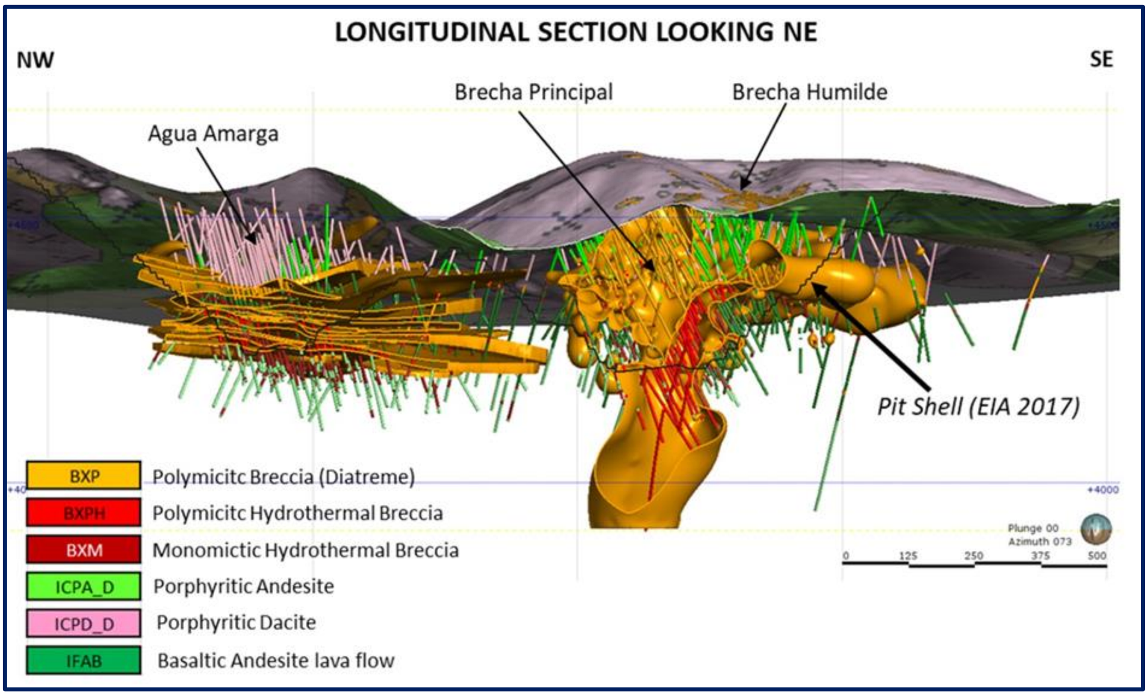


Source: Salares Norte CPR, 2021

7.3 Alterations and Mineralisation

The hydrothermal alteration and mineralisation styles observed at Salares Norte are typical of high-sulphidation epithermal deposits. Most low-grade gold mineralisation is related to alunite-quartz alteration. High-grade mineralisation is hosted in rocks with strong silica alteration, predominantly in polymictic breccia interpreted to have formed by phreatomagmatic explosions with overprinting of phreatic/hydrothermal breccias Figure 7.4. A smaller portion of the mineralisation is hosted by fine-grained fragmental units including laminated facies. These were originally interpreted as tuffs but are now thought to represent, at least in part, fine-grained micro-breccia sills.

Figure 7.4: Longitudinal section looking northeast illustrating the 3D geometry of the Salares Norte breccia complex



(drillhole traces also shown)

Source: Salares Norte CPR, 2021

The high gold grade-related advanced argillic alteration (mainly alunite-quartz alteration with minor development of strong silica alteration and residual vuggy silica) is surrounded by zones of intermediate argillic alteration (i.e., illite-smectite) and overlain by remnants of steam-heated alteration (alteration zones preserved in the highest level of the deposit). The distribution of the breccia, hydrothermal alteration and the mineralisation is spatially related to the emplacement of a series of andesitic and dacitic domes.

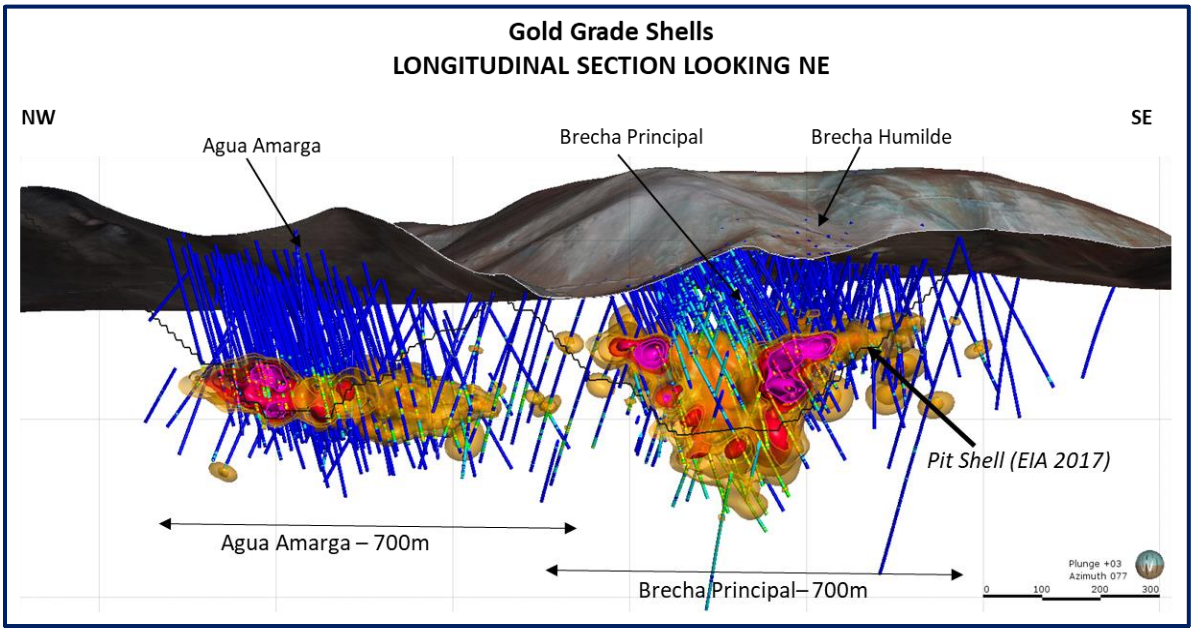
Two separate mineralised zones have been defined by drilling: BP and AA. These zones are about 500 m apart and on the southwest and northwest margin of a dacite dome respectively. The upper limit of mineralisation at BP is about 4,370 m above sea level, while AA is about 4,300 m.

Localised high-grade gold mineralisation (>10 g/t Au) is related to a late pulse of chalcedonic cream to grey-coloured silicification, which overprints a background of earlier disseminated low-grade mineralisation (from 0.5 to 10 g/t Au and 10 to 50 g/t Ag, (Figure 7.5). Gold-mineralised, zinc-rich, intermediate sulphidation-style quartz veinlets tend to occur as a halo around alunite alteration, but so far appear to be of minor economic significance.

At BP, the main breccia bodies are elongated to strongly elongated, with a northeast–southwest to east–west orientation. The BP body is observed at surface to a depth of 450 m in drill core and remains open at depth. The shape of the breccia, as defined by current drilling, is like an inverted cone (Figure 7.4).

The AA body is strongly elongated northwest–southeast and is characterised by stacked, tabular, flat-lying polymictic breccia bodies surrounded by monomictic breccia. Drilling to date has not identified a root zone that extends to depth.

Figure 7.5: Longitudinal section looking northeast showing gold grade iso-shells

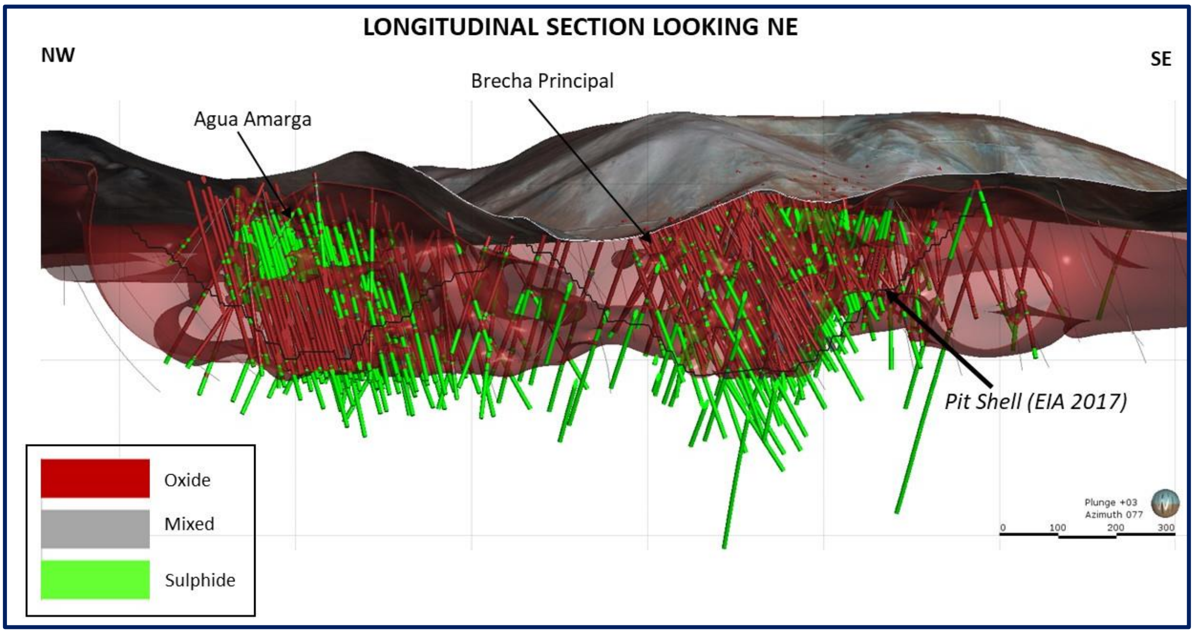


(drillhole traces are shown)

Source: Salares Norte CPR, 2021

Surface and downhole structural studies confirm that steep northwest, east-northeast, and east–west-trending structures control brecciation, fluid flow and mineralisation. Oxidation is locally deep, attaining 300 m depth along permeable lithologies and faults (i.e., breccia). More than 90 % of the defined economic gold mineralisation is in oxide material (Figure 7.6).

Figure 7.6: Longitudinal section looking northeast illustrating the 3D geometry of the modelled oxide and sulphide zones



Note : Drillhole traces are shown

Source: Salares Norte CPR, 2021

7.4 Structural framework

Four main groups of faults and lineaments are mapped in the deposit area. The first group trends northwest-southeast and is indicated by drainage orientations and by the distribution of steam-heated alteration and silicified, structurally controlled breccias (ledges) which are exposed on the dacitic dome.

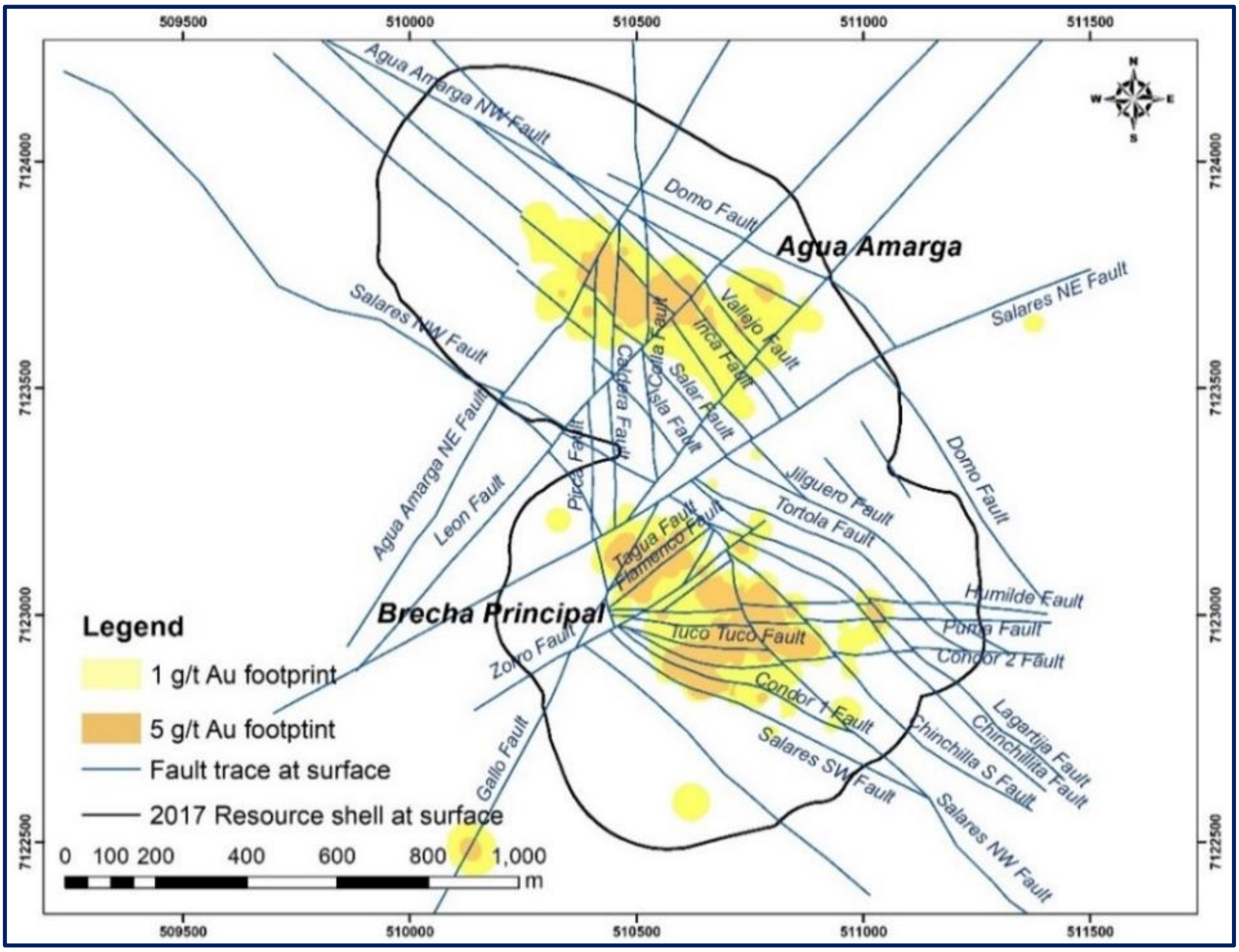
At BP, the Salares NW Fault and Salares SW Fault are the two main northwest-southeast trending structures. At least three sub-parallel splays have been mapped to the east of the Salares NW Fault (Figure 7.7). The most easterly Lagartija Fault appears to define the eastern boundary of mineralisation.

At AA, the mineralised breccia system trend northwest-southeast and is also associated with a group of sub-parallel northwest-southeast trending structures (Domo and Agua Amarga NW Faults), which are steeply southwest dipping to sub-vertical. Both the Domo and Agua Amarga NW Faults are important as they constrain the alteration and mineralisation. The Isla, Jardin, and Inca NW Faults are interpreted conduits for the alteration and mineralisation.

The northwest-southeast faults are intersected by a second group of northeast–southwest lineaments. The Salares NE Fault is partially defined by the main drainage along the northern contact of the dacite dome and marks the boundary between BP and AA.

A third group of east-west trending structures are only observed in the BP area. A fourth group of north-south trending structures are interpreted from AA modelling.

Figure 7.7: Salares Norte – plan of major structures for mineralising fluid flow



Source: Salares Norte CPR, 2021

8 Deposit types

Two broad stages of mineralisation are recognised at Salares Norte: an early porphyry mineralisation/barren epithermal lithocap stage and a later fertile high-sulphidation epithermal stage with evidence of overprinting of the mineralising events.

The main (fertile) epithermal mineralisation stage, related to high-sulphidation fluids, is the most important stage given that it is associated with the gold and silver mineralisation discovered to date. This main mineralisation stage is subdivided into three discrete events, which have been determined based on cross-cutting relationships and mineralogical observations, followed by supergene oxidation (Baumgartner and Benn, 2013).

Event 1: High-sulphidation gold mineralisation likely to be associated with the main advanced argillic alteration. It is characterised by the presence of pyrite, rutile, scarce enargite, and covellite (where not oxidised). The mineralisation is disseminated and the gold occurs as minute grains in quartz, pyrite, as liberated grains and probably as solid solution in pyrite. Gold grades in this type of alteration are 1 to 2 g/t and silver grades are 10 to 50 g/t on average. The silver-gold ratio in this type of mineralisation averages 10:1. Gold is generally present in the native form and as electrum to a lesser extent, with sizes of 0.3 to 30 µm. A gold deportment study (Di Prisco, 2013) indicated that the average grain size of gold (and silver minerals) in the high-sulphidation gold mineralisation (oxide zone) is 3.2 µm, with silver minerals consistently much coarser than gold minerals.

Event 2: **Intermediate-sulphidation mineralisation** (gold-silver±lead episode) that is structurally controlled and occurs as cement in the breccia and veins and veinlets. It is characterised by silver sulphosalts including proustite, smithite, pyrargyrite, stephanite, acanthite, argento-tennantite, and is accompanied by boulangerite, pyrite, and iron-poor sphalerite. Lead is generally present in boulangerite ($Pb_5Sb_4S_{11}$) and only scarce galena is observed. This mineralisation is accompanied by pyrite, quartz, and locally alunite. The presence of alunite indicates that the fluids were acidic and oxidising. Gold grades range from 1 to 3 g/t and silver grades in the order of 100 to 300 g/t. Lead and zinc grades are uneconomic and range from 0.1 to 0.4 % and 0.1 to 0.5 %, respectively.

Event 3: **High-grade gold-silver** event characterised by areas with a fine-grained silica infill cement, pink and grey coloured rock in the sulphide zone and a cream colour in the oxide zone. The texture appears as flooding and contains mainly fine-grained quartz accompanied by alunite and pyrite (± barite) in the sulphide zone and alunite and jarosite in the oxide zone. Gold is difficult to observe even in some high-grade samples from the oxide or sulphide zones due to its small size. Gold grades associated with this mineralisation event are typically in the order of tens to hundreds of grams per tonne, and locally up to more than 1 kg/t. Silver grades do not always correlate with gold but typically exceed 100 g/t and locally more than 1 kg/t. The maximum gold assay is 2,850 g/t (over a 1.2 m downhole width) and the maximum silver assay is 168,700 g/t (over a 1.35 m downhole width).

Event 4: **Late-stage supergene oxidation** event affecting a large part of the deposit, oxidising parts of the sulphide mineralisation. This event is characterised by the development of plumbo-jarosite, argento-jarosite, chlorargyrite, iodargyrite, and capgaronnite. Silver and gold were probably recrystallised, as some textures evidence. The supergene oxidation did not achieve completion with remnants of pyrite present in most of the oxidised samples.

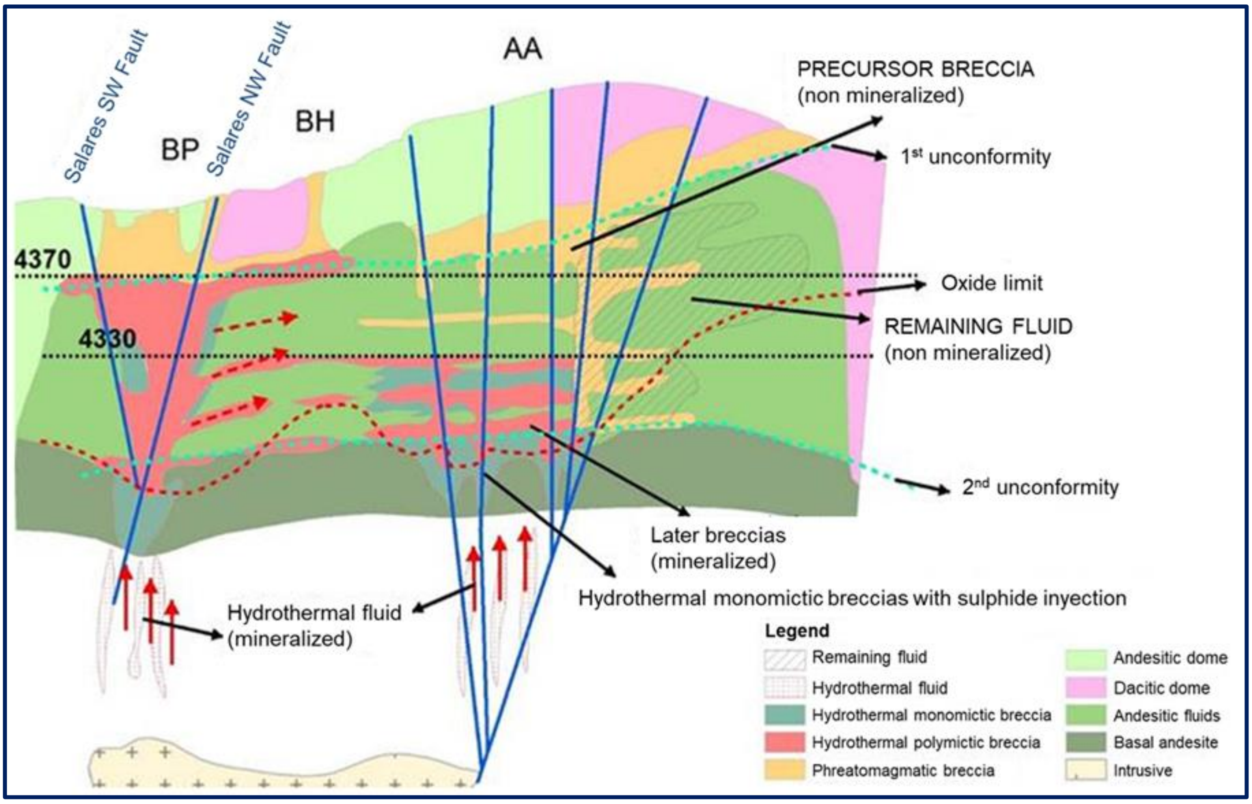
At BP, the structural model speculates that the Salares NW Fault and Salares SW Fault (Figure 7.7) are master faults that formed a structural jog in sinistral movement, which created several tensional east–west faults generating zones of opening to the emplacement of breccia bodies. Following the breccia body emplacement and overprint by intense hydrothermal activity, the northwest–southeast and the east–west dilational faults may have reactivated to generate a reopening that controlled the late high-grade gold and silver mineralisation.

At AA, the structural controls on mineralisation are mainly the northwest corridor and northeast secondary corridor; however, the intersection of these structural corridors allowed the concentration of hydrothermal fluids to generate alteration and mineralisation. The lithostratigraphic control also produces an outline of the lower grade mineralisation, which is a tabular, sub-horizontal body that trends northwest–southeast, sub-parallel to an array of faults mapped at the surface.

The host rocks and structural ground preparation was key for the metal distribution and control of the evolution of the high sulphidation system. The weakly reactive and neutralising basal porphyritic andesite (ICPA_B) and a discordant unit of basaltic andesitic lavas hosting permeable, sub-horizontal levels of monomictic and polymictic breccias acted as a favourable horizon for the hydrothermal fluids.

The northwest structures generated spaces for the phreatomagmatic activity. These sub-vertical explosive centres reached the surface and outflow facies locally covered the andesitic lavas, developing laminar levels of phreatomagmatic origin with different effusive explosions that produced district maars, tuff ring deposits, pyroclastic levels and brecciated tuffs proximal and distal to these effusive centres. This was followed by sub-vertical dome activity that reached surface and subsequent hydrothermal activity associated with the gold mineralisation (Figure 8.1).

Figure 8.1: Schematic model of Salares Norte looking to northwest showing main lithological and hydrothermal fluid events



Source: Salares Norte CPR, 2021

As in most epithermal deposits, the location of the paleo-groundwater table and its vertical variations are considered to have played an important role on the gold and silver distribution.

The immediate area surrounding the Salares Norte deposit is considered to have high potential to host other epithermal deposits of Miocene age. This interpretation is based on the following criteria:

- The presence of a well-mineralised epithermal deposit at Salares Norte, which includes both low-grade disseminated mineralisation and high gold ± silver grades (locally bonanza grades) associated polymictic breccias and structurally controlled zones.
- Key exploration guides that led to the discovery are similar to other high-sulphidation systems in the Andes:
  - Phreatomagmatic breccias associated with large advanced-argillic and steam-heated alteration zones centred on the intersection of prominent northwest and northeast structures.
  - Anomalous pathfinder geochemistry including As, Bi, Hg, Pb, Sb, and Te.
  - Discrete magnetic lows associated with the alteration zones.
  - Resistors in CSAMT and IP resistivity data suggesting silicified bodies at depth.
- The presence of widely represented Miocene magmatism corresponding to three different events: Early Miocene, Middle Miocene and Late Miocene. Each of these three stages of magmatism have large gold ± silver deposits spatially and genetically associated with them in the Maricunga metallogenic belt.
- Most Andean districts with similar aged mineralisation host clusters of deposits within a radius of about 20 km (e.g., Yanacocha, La Coipa, El Indio).
- The district broadly coincides with the intersection of the main Middle and Late Miocene arcs (oriented north-northeast) and a prominent northwest–southeast-oriented structural and volcanic corridor.

9 Exploration

Exploration activities at Salares Norte during 2021 were focused on ore body delineation to firm up Mineral Resources and Mineral Reserves estimations. Salares Norte is a production stage property with a Mineral Resource and Mineral Reserve base, Salares Norte is not disclosing any exploration targets.

District-scale exploration by Gold Fields since 2008 has included geologic mapping, spectral alteration mapping, heliborne aeromagnetic and radiometric surveys, and stream sediment geochemical sampling. Seven target areas were identified within a radius of 20 km of Salares Norte referred to as Horizonte, Pedernales, Rio Baker, Aster 3, Aster 2, Helada, Mayweather, Fernando Sur and Filo Valle (Salares Norte Near Mine), (Figure 9.1). Target definition work included detailed geologic and alteration mapping, grid soil and lag sampling, ground magnetics, controlled-source audio-frequency magnetotellurics (CSAMT) and induced polarisation (IP)/resistivity geophysical surveys.

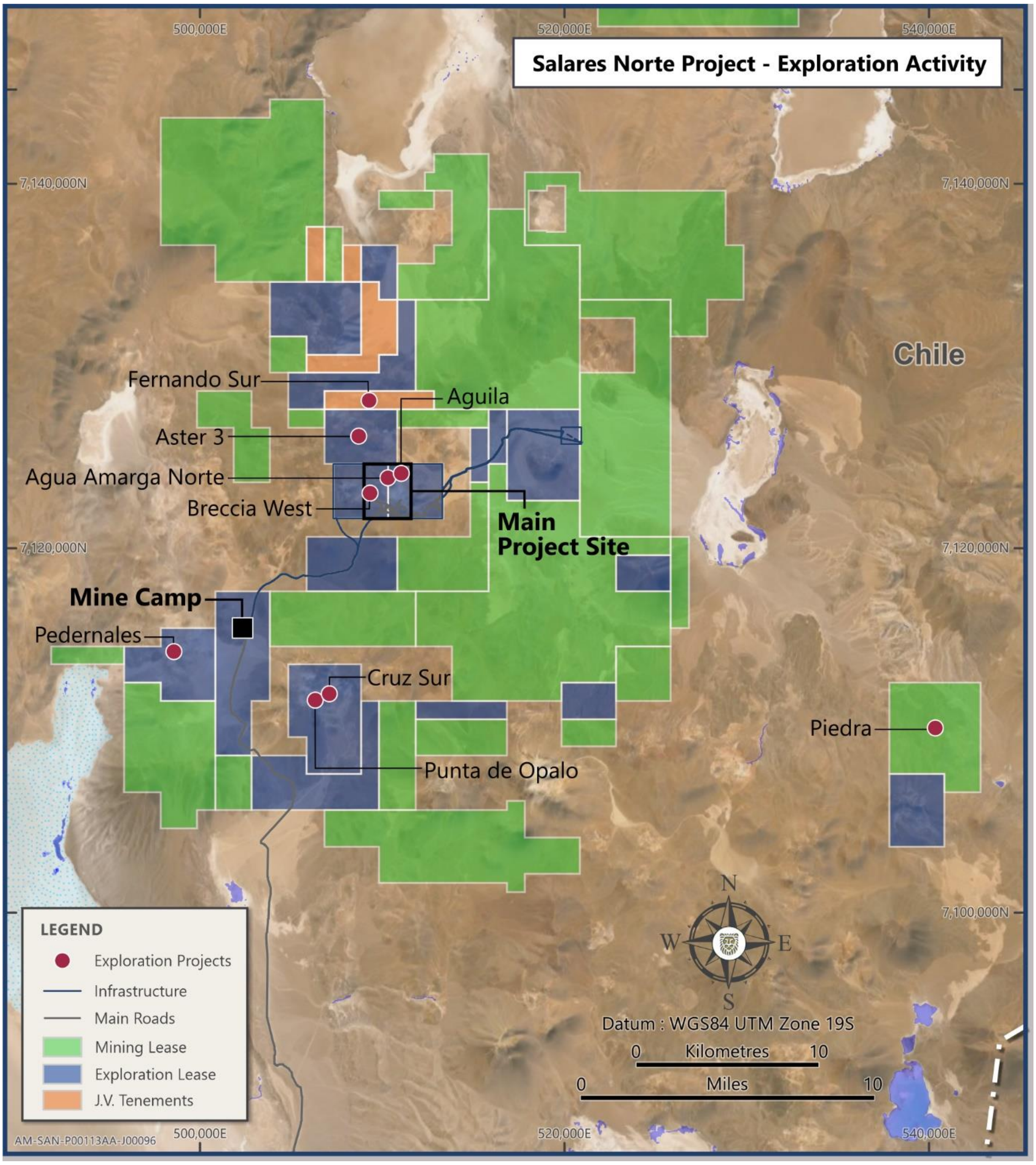
In 2021, 21,603 m was drilled in 71 diamond drillholes on five of the target areas. While some of the initial drill results warrant follow-up drilling, the Qualified Person considers that none of the targets are material to the Salares Norte property at this time.

MGFSN has approved a budget to continue systematic follow-up work on these targets and any new targets that are generated from the ongoing district-wide exploration over the next three years.

The Qualified Person's opinion of the 2021 exploration programs and results is:

a. All procedures and parameters applied to the surveys and investigations are appropriate for the style of mineralisation being prospected.
b. The exploration programs have confirmed continuity of geology and controls on gold mineralisation in key areas.
c. There were no material variations encountered during the 2021 exploration programs.
d. Based on the 2021 exploration and results, a 2022 exploration budget has been approved to retain traction on the programs and to progress leading projects.

Figure 9.1: Salares Norte – exploration activity showing projects and exploration leases



Source: Salares Norte CPR, 2021

10 Drilling

10.1 Type and extent

Up to June 2018, Gold Fields drilled 497 DD and 123 RC holes for 169,982 m in the Salares Norte area. Most of this drilling (431 holes) targeted the Mineral Resource areas of BP (242 holes) and AA (189 holes), with additional drilling completed for sterilisation (73 holes), geotechnical (79 holes), metallurgical (7 holes) and water monitoring (7 holes).

Within the BP Mineral Resource area, the holes were drilled along two section lines oriented 40 °–220 ° and 160 °–340 °. These orientations were selected to test the two principal structural directions (northwest–southeast and east-northeast–west-northwest) interpreted to control the mineralisation (Figure 10.1).

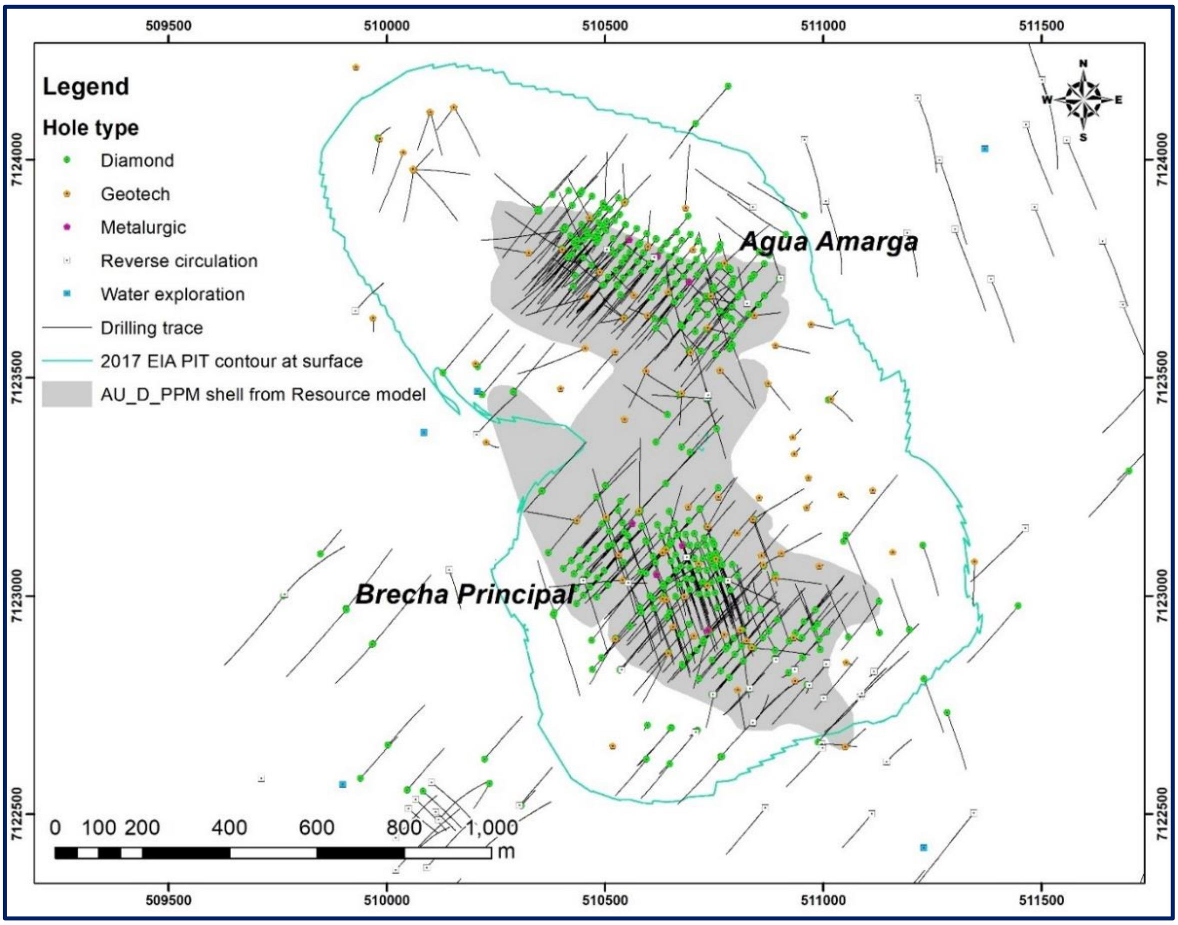
Within the AA Mineral Resource area, most of the holes were drilled along section lines oriented 40°–220°, orthogonal to the dominant trend of mineralisation. Seventeen holes were drilled on section lines oriented 310°–130° or longitudinal to the dominant trend to confirm continuity in this direction.

Most of the drillholes in both deposits were drilled with dips of -60 ° to -65 °. The average drillhole depth is 325 m with a maximum depth of 700 m.

Perfo Chile Ltda was engaged to complete the initial RC drilling program in 2011. Drillhole diameters were 5.375” (136.5 mm). During Phase 2, Geo Rock (truck-mounted GE-1200 diamond drill) and ESP (track-mounted UDR-200 diamond drill) were engaged for the 2011–2012 drilling campaign. For the 2012–2013 campaign, up to three track-mounted UDR- 200 diamond drills from ESP and a truck-mounted Schramm T-685 RC drill rig from Terraservice (5.375” diameter) were contracted.

During 2014, up to three track-mounted UDR-200 diamond drill rigs were contracted from ESP. For the 2014–2015 drilling, an additional Schramm T685 RC drill rig was contracted from Terraservice, two truck-mounted LF-230 diamond drill rigs from FORACO and one truck-mounted Schramm 106 RC drill rig from FORACO. The 2015–2016 program used up to four DE-710 diamond drills from AC Perforaciones, two Schramm T-685 RC drills from FORACO and two UDR-200 diamond drills from ESP.

Figure 10.1: Salares Norte drillhole collars and deposit footprint



Source: Salares Norte CPR, 2021

For Phase 7 (2017) and Phase 8 (2017–18) up to four DE-710 diamond drills from AC Perforaciones, up to two Schramm T-685 RC drills from FORACO and up to four truck-mounted LF-230 diamond drills from FORACO were used.

Approximately 90 % of the DD holes were drilled with HQ-size core (63.5 mm diameter), with the holes reduced to NQ-size core (47.6 mm diameter) in poor ground conditions. Metallurgical holes were drilled with PQ-size core (85 mm diameter). RC drilling was used to reduce uncertainty in grade or other metallurgical parameters over areas where the geology was previously assessed by DD drilling. Wet RC samples were excluded from the Mineral Resource estimation process due to issues of sample bias in deep, wet drillholes.

Exploration focus for the project has now largely moved away from resource and reserve definition to the exploration of targets outside of the known resource areas. District scale exploration during 2021 was primarily focused over the Horizonte (formerly known as Pircas), where a total of 13,808 m of DD drilling was completed. Additional drilling in the district included 3,447 m at Pedernales, 3,403 m at Fernando Sur (JV with Pan Pacific Copper), 249 m at Aster 3 and 2,942 m at the Filo Valle Target immediately southwest of the AA deposit. Table 10.1 summarises the number of holes drilled and samples collected by area during 2021.

Table 10.1: Salares Norte drilling by area during 2021

Zone	Type	Drillholes	Samples	Metres
Horizonte	Diamond drilling	47	12,101	13,808.15
Pedernales	Diamond drilling	10	2,699	3,446.50
Fernando Sur	Diamond drilling	9	2,752	3,402.75
Filo Valle (Salares Norte Near Mine)	Diamond drilling	10	2,613	2,942.20
Aster 3	Diamond drilling	1	294	248.80
Total		77	20,459	23,844.40

Source: Salares Norte CPR, 2021

None of the 2021 district exploration drilling results outside of the Salares Norte Mineral Resource are considered by the Qualified Person to be material to the property or the mineral reporting at this stage.

10.2 Procedures

Exploration sample collection

Diamond core samples are cut in half on-site using a diamond blade rock saw. Half of the core for each interval is placed in a labelled plastic sample bag with sample tags (one within the sample and the other stapled at the top of the bag) and sent for analysis. The remaining core is retained in the core box for future reference. Sample intervals range from 0.5 m to 2 m. In general, this definition is based on geological criteria (lithology / alteration) and the weight of the sample. In barren zones, samples are generally taken every 2 m. In mineralised zones, the sample length varies between 0.5 and 1.0 m depending on geological criteria.

Dry RC samples first go through a cyclone and are collected in a 60 kg bag, which corresponds to a 2 m section of drilling. The samples are split in the field by a riffle splitter, obtaining 3 samples. Wet RC samples also go through a cyclone and are collected using a rotating cone splitter. Wet RC sample assay data is not used for Mineral Resource estimation. Future RC resource definition holes will be closely monitored to ensure appropriate sample handling and terminated upon encountering wet conditions.

Resource drilling sample collection

For DD core:

- Samples are marked up in a range of 0.2 m-1.5 m depending on the style of mineralisation and lithological contacts.
- Once logged and photographed, the core is split using an automated Almonte core saw and broken at the points demarcated by the geologist and half-cut lengthwise along the core orientation line.
- One half is submitted for analysis and the other half-core with the orientation line is correctly placed back into the core tray for storage.
- Each individual sample is bagged together with a numerically unique sample ticket and dispatched to the on-site SGS Salares Norte laboratory for the sample preparation (i.e., crushing and pulverising). The pulverised samples are then sent to the SGS Salares Norte laboratory for assaying.
- The sampler retains a duplicate ticket for each sample dispatched for assay which is entered into an Excel spreadsheet containing the hole ID, sample interval and sample length, lithology and dispatch date. The sample details are verified and then merged into the master database.
- The halved core not sent for assay is retained in UV resistant plastic core trays stored under cover in a designated core shed at Salares Norte. The core trays are designed for stacking and as such are not kept on racks. New core sheds are periodically added to ensure sufficient storage space is available for the future retention of core.

For RC chips:

- Samples in 1 m intervals are returned via the drill string to a cyclone and manually collected in polythene sample bags.
- The resulting sample is passed through a Gilson riffle splitter until the desired 5-8 kg sample for analysis is achieved.
- In situations where the total sample recovery from the cyclone is less than 8 kg, the bulk of the sample is submitted to the laboratory.
- Only dry RC samples are accepted at Salares Norte. In the event of wet samples, the hole is either stopped (in the case of RC only rigs) or continued to the desired depth with DD core drilling (in the case of a dual-purpose rigs). Following sample splitting, the 5-8 kg sample for assay is bagged and secured in an individually labelled sample bag together with the sample ticket of the same designation and returned to the core yard for dispatch to the laboratory.
- Sample pulp rejects are returned to the core yard following assaying and are retained in boxes corresponding to the drillhole from which they were derived. The boxes are stored on shelving in shipping containers situated on a concrete plinth at the core yard under a corrugated and galvanised steel roof to ensure weather proofing.
- All samples are transported to the laboratory in cages with two locks under a security escort.
- A despatch sheet is prepared by the designated QAQC Person, which include the number of samples, the method of analysis required and the types of samples.
- The number of samples is confirmed by the Laboratory representative by signing on the sample sheet attached to the despatch sheet.

Survey

All drillhole collars are surveyed using a differential global positioning system (DGPS) unit. The DGPS base station is tied into the national Chilean grid to ensure the coordinates were accurate and precise. Instruments used for downhole survey were Gamma and Tele Viewer.

Logging

DD core and RC chips are geologically logged on site. An initial ‘quick log’ capture by a senior geologist ensures the quality and consistency of logging. Detailed digital logging using GV Mapper software captures lithology, alteration type and intensity, mineralisation type and intensity, weathering and other qualitative characteristics such as colour, texture and hardness.

All structures are measured and characterised. The core is also subjected to spectral analysis using a TerraSpec Explorer® spectrometer to assist with the characterisation of alteration.

Geotechnical logging captures a standard suite of characteristics such as rock quality designation (RQD), joint and fracture type, orientation to core axis, morphology and frequency. All core boxes are photographed before sampling.

The True Core instrument is used for core orientation, which is carried out each time the core is extracted (every 1.5 m to 3.0 m). Core recovery percentages are obtained by dividing the sum of all the recovered segments by the total length of the drillhole.

Total historic average core recovery for all DD holes at the Salares Norte project is 93.08 %. Total average core recovery for all the drillholes from the 2021 campaign is 94 %.

Drill core, RC cuttings and sample rejects are stored in the Salares Norte camp facilities.

No drilling, sampling or recovery factors have been detected that could materially affect the accuracy and reliability of the drilling results.

Density

In-house dry bulk density (density) measurements for 23,618 samples of HQ and NQ half core collected by the exploration geologists were carried out by the water immersion method with wax coating. The sample size was nominally 10 cm and selected every 10 m in non-mineralised material and every 5 m in mineralised material.

The half core samples are weighed and dried, with the dried weight used to calculate the natural moisture content of each sample. The half core is coated with paraffin wax and weighed again to determine the weight of the paraffin wax (the density of the wax is known). The sample is weighed again while suspended in water.

Where:

W1 = Weight of the dry sample suspended in air.

W2 = Weight of sample covered with wax suspended in air.

W3 = Weight of sample covered with wax immersed in water.

DP = Density of paraffin wax = 0.79 g/cm³

The results of the bulk density measurement by lithology are summarised in Table 10.2.

Table 10.2: Bulk density results by lithology

Lithology		Average density	Number of samples	Max	Min
Monomictic Basaltic Andesite Breccia	(BXMAB)	2.31	805	2.94	1.33
Hydrothermal Monomictic Basaltic Andesite Breccia	(BXMHAB)	2.36	1,167	3.33	1.43
Hydrothermal Monomictic Porphyritic Andesite Breccia	(BXMHPA)	2.35	527	2.91	1.4
Hydrothermal Monomictic Porphyritic Dacite Breccia	(BXMHPD)	2.32	109	2.74	1.61
Monomictic Porphyritic Andesite Breccia	(BXMPA)	2.3	613	2.86	1.37
Monomictic Porphyritic Dacite Breccia	(BXMPD)	2.22	984	3.48	1.11
Polymictic Breccia	(BXP)	2.23	3,688	3.4	1.07
Hydrothermal Polymictic Breccia	(BXPH)	2.36	3,594	3.25	1.08
Hydrothermal Laminated Polymictic Breccia	(BXPHL)	2.21	221	2.92	1.28
Hydrothermal Polymictic Breccia Superior	(BXPHS)	2.29	635	2.83	1.2
Laminated Polymictic Breccia	(BXPL)	2.17	299	2.8	1.42
Porphyritic Andesite Basal	(ICPA_B)	2.43	1,871	3.21	1.27
Porphyritic Andesite Dome	(ICPA_D)	2.28	1,684	3.12	1.07
Porphyritic Dacite Dome	(ICPD_D)	2.2	3,704	4.11	1.04
Fine Basaltic Andesite	(IFAB)	2.32	3,830	3.66	1.07
Ash Tuff	(VAST)	2.25	43	2.63	1.8

Source: Salares Norte CPR, 2021

The Qualified Person's opinion of the density work is:

a. The bulk density testing is adequate for the intended purpose and the tonnage estimation based on the defined bulk densities appear to have little bias thus far.

The Qualified Person's opinion of the 2021 exploration and Mineral Resource extension drilling is:

a. All drilling and exploration field activities are supervised to ensure health and safety and maintain appropriate technical standards.
b. The drillhole surveys are adequate by type and length for the intended purpose.
c. Utilising orientated core significantly enhances recorded information to assist with 3D modelling.
d. The drillhole database and subsequent modelling aligns to core recovery losses and should not cause material errors.
e. Post QAQC screening and validation exploration results are incorporated into the estimation of Mineral Resources; the categorisation of Mineral Resources is described in Item 14.1.12.
f. Validated exploration results are used in the 31 December 2021 Mineral Resource estimation.
g. Individual exploration drillhole information is not viewed as significant or material to the Mineral Resource and Mineral Reserve reporting at Salares Norte and consequently exploration data is not presented.
h. All exploration activities, including drilling, database management, validation and QAQC, prior to incorporating relevant data into the resource modelling and estimation process, is viewed as sufficient, appropriate, technically assured and suitable to support Mineral Resource estimates.

11 Sample preparation, analyses, and security

11.1 Sample preparation

Bagging and transportation of samples to the laboratory is well controlled with adequate security and custody measures in place. The chain of custody procedure is as follows:

At the core yard, the samples are labelled (unique and correlative numbering) and deposited in bags which are sealed and grouped in sacks. The sacks are arranged on pallets and secured on the truck. A photographic record of the samples and the load is made. The samples always have a responsible person present at each of the stages.

At the laboratory, the samples are recorded in a laboratory information management system (LIMS) with the same numbering established by MGFSN to ensure they can be tracked through the preparation and analytical stages.

Sample preparation is carried out at ALS Minerals in Copiapó, Antofagasta and Santiago in Chile and Lima in Peru. The Chilean laboratory has 17025 accreditation from the Standard Canadian Council (SCC) accreditation house with the number of accreditation 151191. The mechanical preparation of samples at Copiapó is undertaken at the Lima laboratory with 17015 of Lima (SCC) accreditation, a laboratory that performs the MS81, Hg and S analyses for Gold Fields, (Table 11.1).

Once sorted, the samples are placed in paper-lined, stainless steel trays and dried at 70 °C in a forced-air oven. Dry samples are rolled into the sample preparation line and crushed in jaw crushers to 70 % passing 10 mesh (2 mm). The crushed samples are split using a stainless steel riffle to 1 kg and pulverised to 85 % passing 200 mesh (75 µm) for analysis. The remaining pulp and coarse rejects are returned to Gold Fields for archival and QAQC purposes.

Table 11.1: Analytical laboratory accreditation

Laboratory	**Certificate number** **Accreditation number**	**Independent testing inspection**
ALS Global	Certificate N° 43500. ISO 9001:2015 – OHSAS 18001:2007 OI 199 NCh-ISO 17020:2012. Certificate A1-8000-01F6-289D-ECE2 OI 200 NCh-ISO 17020:2012 (International ISO 9001:2015). Certificate A1-8000-01F6-2880-1CE2	ABS Quality Evaluations, Inc. Management System Certification. U.S.A. Instituto Nacional de Normalización (INN) Instituto Nacional de Normalización (INN)
Laboratory 2 Bureau Veritas	ISO 9001, NCh-ISO17020, NCh-ISO17025, NCh-ISO17065, ISO14001, OHSAS18001. Accreditation certificates and certificate number have not been obtained until the closing date of this report.	Have not been obtained until the closing date of this report
Laboratory SGS Chemex	ISO 9001, ISO 45001, ISO 14001, ISO 27001, ISO 22301, ISO 37001. Accreditation certificates and certificate number have not been obtained until the closing date of this report.	Have not been obtained until the closing date of this report
Verification Laboratory 1		

Source: Salares Norte CPR, 2021

11.2 Sample analysis

Analysis for gold, silver and other elements is carried out at ALS Minerals in La Serena and Santiago (Chile), Lima (Peru) and Vancouver (Canada). Two secondary laboratories were previously used for the umpire check analysis: Bureau Veritas (Ex-ACME) Laboratories in Santiago and Vancouver. More recently, SGS Chemex in Lima was the umpire laboratory. Approximately 5 % of the samples are sent for umpire analysis.

The ALS Minerals laboratories in La Serena, Santiago and Vancouver, Bureau Veritas (previously ACME) Laboratories in Santiago and Vancouver, and SGS Chemex, Lima are ISO certified (ISO 9001, NCh-ISO 17020, ISO 17021, NCh-ISO 17025, NCh-ISO 17065) and OHSA certified (OHSAS 18001, Table 11.1). Collectively these laboratories analyse all Mineral Resource and umpire samples.

ALS Minerals assays for gold by 50 g fire assay with an atomic absorption spectroscopy (AAS) finish (method Au-AA24). Silver and other elements (ICP-MS: Ag + other 48 elements: Al, As, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cs, Cu, Fe, Ga, Ge, Hf, Hg, I, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Rb, Re, S, Sb, Sc, Se, Sn, Sr, Ta, Te, Th, Ti, Tl, U, V, W, Y, Zn and Zr) are analysed using a four-acid digestion and an inductively coupled plasma mass spectrometry (ICP-MS) finish (method ME-MS61). ALS Minerals also analyses total sulphur using the LECO analysis (method S-IR08) and mercury (method ME-MS61 m).

ALS Minerals modifies the analytical approach for gold and silver on the following detection limits:

- For gold grades >5 g/t the AAS method is replaced with a gravimetric finish.
- For silver grades >100 g/t the four-acid digestion method is replaced with ore grade Ag by four acid digestion and inductively coupled plasma atomic emission spectroscopy (ICP-AES) finish. Eight samples with greater than 10,000 g/t Ag were re-analysed at ALS in Vancouver using a special method for analysis of precious metals in concentrates (method Ag-CON01).

Gold Fields has conducted studies comparing the standard fire assay approach with screen fire assay (SFA) and comparing AAS with the gravimetric finish. These studies indicate an appropriate grade threshold for switching from AAS to a gravimetric finish is around 5 g/t Au. Switching to an SFA approach is done for all samples >10 g/t Au. There were 1,654 SFA analyses in the drillhole database to 2018.

11.3 Quality control procedures

Gold Fields has established QAQC protocols for monitoring and controlling data quality. These protocols are integrated into the data collection and storage process. All data used in the Mineral Resource estimates are subject to these protocols.

Field duplicates, blanks and site-derived certified reference material (CRM) are routinely inserted into batches sent to the laboratory to measure analytical accuracy. The analysis of the field duplicates and CRMs indicate no issues of poor precision or bias.

The protocol for drill sample batches (75 samples) is:

- 68 original samples
- 3 standards (low, medium, and high grade)
- 2 blanks (coarse blanks)
- 2 field duplicates (quarter core).

Laboratory sample preparation is routinely monitored through the submission of coarse crush and pulp reject duplicate samples, blanks samples, and the submission of samples for umpire analysis. Analysis of these results indicate no issues of bias or contamination. As part of the protocols, one pulp is separated each 20 samples and sent to SGS Peru (umpire checks) and two coarse laboratory duplicates by batch are sent for chemical analysis.

One hundred bulk density samples were randomly selected for umpire analysis at ALS Patagonia S.A. Based on umpire results, a bias in early in-house data was observed and corrected using a regression equation correction to the full specific gravity database. This bias affects a small proportion of the total database.

External audits are performed to validate integrity and reliability of the data. The last two database audits were conducted by GeoSpark Consulting Inc. in 2018 and 2020 (Will Vallat, M.Sc., and Caroline Vallat, P. Geo., APEGBC).

The Qualified Person's opinion on the sample preparation, analyses and security is:

a. The sample collection, preparation, sample analyses and security procedures have been reviewed. These elements are found to be adequate with effective supervision and in line with industry conventional or leading standards. No material bias is indicated that could potentially impact the sampling preparation and analyses.

b. The certificates have been verified and is of the opinion that the analytical laboratories have effective process and protocol in place to ensure quality control and assurance to minimise any material errors.

c. Sample security enforcement and custody measures are reliable with low consequence if in the unlikely event of security protocols failure.

d. All the procedures are appropriate to ensure the validity and integrity of the analytical results.

12 Data verification

The execution of the exploration programs was completed to industry best practice and is aligned with numerous standards and procedures developed by Salares Norte and Gold Fields over a number of years. The process consists of procedures, audits and sign-off documents for all key elements that input into the generation of a Mineral Resource model to ensure full compliance. The key components of the geological data acquisition framework include:

- Validity – Controls to ensure the validity of key activities.
- Accuracy – Controls to establish the accuracy of data inputs and outputs.
- Completeness – Controls to ensure the completeness of the process followed.
- Timing – Preventative and detective controls to identify potential risk and deviation of quality.
- Segregation of duties/sign-off – Key members of the senior team are responsible for different aspects of the process.

All geological data received from Geologists, Samplers and Laboratories are verified through the following process:

- acQuire® Data Entry, which is used to capture the Geological Data has libraries that screen out erroneous data that might have mistakenly been captured.
- Sufficient functionality exists within SQL Server and acQuire® to verify and validate data. The Database Manager uses these tools daily to validate all data captured. Any erroneous data is either corrected or removed.
- Once the necessary validation is complete, the Database Manager signs-off on the entries.

The Qualified Person is of the opinion that the data verification process and protocols are adequate to minimise any material errors, are in line with industry leading standards and underpin the integrity of the data and ensure technical assurance.

12.1 Data management

The geological data is stored centrally on the site server and processed and integrated into the DataShed® database in Santiago and Lima before it is returned for the site geological team to review and validate. Gold Fields has developed a comprehensive data management system based on the Maxwell Geoservices® Data Model with customisations for Salares Norte and specific geological data. The database is relational to ensure the validation of data upon entry, with a normalised assay management system uploading laboratory data from digital files. DataShed® software is the front end to the SQL database ensuring definition of tasks, permission management, and database integrity.

Project geologists enter all geological, geotechnical and sampling data manually using GV Mapper® software. The database administrator uploads this data via the DataShed® interface. The project geologist validates the uploaded data, flagging it as validated within the database.

The database administrator uploads assay results from standard laboratory SIF files. These files include detailed information including the batch number, analytical methods, units, detection limits, elements assayed and all laboratory quality assurance and quality control (QAQC) data for each batch.

Database rules, library tables, triggers, and stored procedures control the integrity of data. The database rejects data that does not meet defined rules on import. The database stores rejected data separately in buffer tables until corrected. Any data with a code not existing in a library table cannot be entered. The DataShed® database has a custom extension to query the database for incorrect collar locations, overlapping intervals and missing or incorrect downhole surveys.

Database procedures ensure the integrity of data. Original assay certificates are stored in the Santiago office. A digital certified PDF version is stored on the Lima, Santiago and Salares Norte servers. The servers are backed-up regularly.

12.2 Drilling

Data obtained from the drillholes is stored in electronic format using DataShed® software.

DataShed® Data Entry Software is used to capture RC and DD logging data in the field, which is imported into DataShed®. Before anyone can have access to the data, a data access form is filled in for approval by the Mineral Resource Manager. DataShed® has a security system that is used to manage access and the type of data that can be accessed.

Validation checks of the data during both data capture and import are completed using the DataShed® database reference validation tables.

Geologists export data and send data Database Geologist for import. The database captures the following primary data elements:

- The collar positions of all RC and DD drillholes.
- Meta-data of drillholes.
- Downhole survey data.
- Geological (lithological, sedimentological and structural) logging data.
- Assay data.

The Qualified Person's opinion of the data management is:

a. The data management process and protocols are adequate to minimise any material errors.

Regular validation of the database and data management process is aligned with standard industry practices, and is monitored quarterly through embedded risk and control matrix (RACM) measures and reviews.

Drillhole data validation is completed using Datamine® or Leapfrog® software including checks for unique collar locations, overlapping intervals, excessive downhole deviation, and matching total drill depth within all tables. Errors are reviewed and either corrected or the hole is flagged and excluded from use in the estimation. All issues identified are corrected in the DataShed® database.

Where multiple drilling techniques are used in a resource estimate (DD and RC), a comparison of the data within a common volume is carried out. If potential biases are noted, these are investigated to establish potential reasons and actions. Where drilling data is historic, available QAQC data is assessed. Where historic drilling data lacks QAQC, a comparison of recent and historic drilling may be made to assess data quality and suitability for use. A decision may be made to include or exclude the poorer quality data and to apply an appropriate resource classification.

The Qualified Person is of the opinion that the drilling protocols described in this report are adequate to minimise material errors and provide the necessary technical assurance.

12.3 Sampling

Core cutting sheets are generated in DataShed®, and once populated during the logging and sampling process, are re-imported. Some data, such as core logging and underground development face sampling, is entered or edited manually into the DataShed® database table forms or data entry objects. A unique sample dispatch is generated in DataShed® and emailed to the laboratory. Returned assays from the laboratory are linked to this dispatch and are emailed as a SIF file. These files include detailed information about the batch, methods, units, detection limits and elements assayed. The file also includes all QC data in the sequence of analysis.

The Qualified Person is of the opinion that the sampling protocols are adequate to minimise material errors and the analytical procedures reflect industry standard practice or better and are appropriate for resource estimation.

12.4 Spatial data Surveys

QAQC of spatial survey data includes manual checking of survey results and some re-surveying. All drillhole collars were resurveyed during June 2013 which validated the earlier surveys. All drillhole collars since 2013 were surveyed by internal personnel using a differential global positioning system (DGPS) unit with the results checked and validated by a licensed surveyor.

The oxidised rocks hosting the gold-silver deposits do not contain magnetic material that would be detrimental to downhole survey readings. Downhole surveys of diamond drillholes appear reasonable; however, future advanced studies would benefit from validation of the magnetic surveys using gyroscopic methods.

The Qualified Person is of the opinion that the survey protocols are adequate to minimise material errors.

12.5 Sample analysis

The Salares Norte QAQC procedure is reviewed every two years. Assay certificate verification and assay laboratory audits are completed as per Salares Norte embedded risk and control matrix (RACM) requirements requiring a minimum quarterly review.

The Qualified Person is of the opinion that the sample analysis protocols are adequate to minimise material errors.

12.6 Geological modelling

Geological interpretation has the potential to impact materially on the estimated quantity and quality of a Mineral Resource and Mineral Reserve. Incorrect assumptions regarding volume and geological and/or grade continuity has the potential to overestimate contained metal. However, support from expert geologists, site and corporate peer reviews, external reviews, and the Model Change Authorisation (MCA) process ensure that the geological interpretation is one that most geologists would independently arrive at.

The Qualified Person's opinion of the geological modelling is:

a. The geological modelling protocols are adequate to minimise material errors.

b. The controls have been reviewed and the adequacy is reasonable and that material bias or errors are not expected.

c. The systems to reduce human and procedural errors, checks and balances are adequate and minimise material errors.

d. The protocols are adequate as reviewed and the Mineral Resource models are based on verified data and the resource block models generated and as provided to the planning engineers are deemed industry leading practice and appropriate for mine planning and scheduling.

12.7 Digital data

All digital data associated with the Mineral Resource estimates is recent and was collected by Gold Fields. The data and associated QAQC information are managed through Datashed® software, which is the front end to the SQL database. The DataShed® interface includes features to assure data integrity including access permission, data quarantining and library lookup tables in addition to the standard practices and procedures for data collection and validation described in Item 10.2. A QAQC and Database Administrator is responsible for the integrity and management of the data. Data verification steps include:

- Data migration of certificates with final assays sent by laboratory.
- Checking that all samples have results.
- All requested elements contain instrumental readings.

QC of blank samples for gold and silver. The values must not exceed 0.05 ppm and 0.25 ppm, respectively. Any deviation from these values is considered a failure and a re-analysis is requested to laboratory to discard a possible contamination of samples.

- The QC of standards considers two range for alerts: 2 Std_Dev for warnings and 3 Std_Dev for failures.
- Accepted range for field duplicates is 10 % between sample results (original and its duplicate), any gold and/or silver deviation of values reported by lab is reviewed and evaluate the need for a re-analysis.
- Accepted range for coarse duplicates is 10 % between sample results (original and its duplicate).

Additional data validation work performed includes:

- The comparison of analytical methods such as AAS versus gravimetric finish and fire assay versus SFA to ensure the methods are appropriate for gold analysis.
- Twinning of four DD and RC drillholes. Based on these studies, wet RC samples were excluded from the Mineral Resource estimate.
- Manual and automated checking of the database is conducted. Laboratory certificates and field logging data are available. External audits are performed to validate integrity and reliability of the data. The last two database audits were conducted by GeoSpark Consulting Inc. in 2018 and 2020 (Will Vallat, M.Sc., and Caroline Vallat, P. Geo., APEGBC).
- For umpire checks the maximum accepted bias between ALS vs SGS results is 5 %.

13 Mineral processing and metallurgical testing

13.1 Testing and procedures

13.1.1 Background

As at 31 December 2021, construction of the 2 Mt per annum gold-silver processing plant was in progress with commissioning in 2023. Approximately 90 % of the defined economic gold-silver mineralisation is oxidised. In the areas that have not been oxidised, the mineralisation is refractory in nature (low metallurgical recoveries using conventional gold processing techniques) due to the association or locking with the sulphide minerals.

Gold mineral particle size is relatively fine, with very little coarse gold identified in the geological and mineralogical samples analysed.

For metallurgical domaining purposes, the main ore types are:

- Oxide – argillic alteration
- Oxide – silicification alteration
- Mixed – containing part oxide/sulphide material
- Sulphides – mixed alteration.

Due to the variability in metallurgical response, and of gold and silver grades, sample selection for informing plant design and performance is based on selecting and testing many variability samples, being (mostly) individual DD core or coarse reject composites of single continuous mineralisation intercepts representing individual geological domains, by pit, lithology, and alteration.

For the oxidised ore samples, it was not possible to identify any specific geological or geochemical characteristics that could be used to estimate gold or silver recoveries other than contained gold or silver head grades of the samples. Metallurgical recoveries by conventional laboratory CIL testing methodology were variable, but generally high for gold and medium for silver.

Within the sulphide domain, metallurgical recoveries of the samples by conventional CIL were consistently low for both gold and silver, indicating the refractory nature of the contained precious metals in this domain.

With respect to ore hardness and mill throughput, variability testwork was undertaken, and results show an increasing hardness with silica content (silicification alteration), and lower hardness with more alunite (argillic alteration).

Metallurgical parameters used in the FS were estimated based on the results from the testwork campaigns, as described in Item 13.1.2 to Item 13.1.6.

13.1.2 McClelland Laboratories Inc (McClelland) 2013

In 2013, McClelland in Nevada, USA conducted testwork on 55 composite samples collected from nine BP DD holes. McClelland is operated by a company independent of Gold Fields and is accredited (TL-466-Certificate).

The samples represented oxide (44 samples), mixed (four) and sulphide (seven) material types. Testwork included:

- Detailed head sample characterisation, including multi-element analyses and cyanide shake tests.
- Mineralogical examination by SGS Mineral Services on selected samples.
- Diagnostic leach tests on selected samples.
- Bottle roll kinetic cyanidation leach tests.
- Residence times including 24, 48 and 72 hours.
- Agitation leach CIL tests on selected samples.

- Grind variation tests at P_{80} 150, 74 and 37 µm.
- Cyanide variation tests at concentrations of 0.05, 0.1 and 0.2 % NaCN.
- Coarse bottle roll tests at 12.5 mm size for heap leach amenability.
- Bond ball mill work index (BWI) on selected samples.
- Caro's acid cyanide destruction testing on leach tailings from six composites.
- Slurry rheology, viscosity, thickening, and filtration determinations on six composites.

13.1.3 Plenge 2015 – Agua Amarga

In 2015, C.H. Plenge & Cia S.A. (Plenge) in Lima, Peru conducted testwork on 12 coarse reject composites from AA. One sample was sulphide and the remainder were oxide samples. The Plenge metallurgical testing laboratory is independent of Gold Fields.

Testwork included:

- Head assay suite.
- XRD bulk mineralogy.
- Bottle roll kinetic CIL tests at P80 74 µm, pH 10.5, 40 % solids, 30 g/L carbon and cyanide concentrations of 0.05 % and 0.1 % NaCN at 24 and 48 hour residence times.

13.1.4 Plenge 2015 – Brecha Principal

Plenge conducted a second testwork campaign in 2015 on 30 BP samples. Two were sulphide and the remaining samples were oxide samples. The program included:

- Head assay suite.
- XRD bulk mineralogy.
- BWI.
- Bottle roll kinetic CIL tests at P_{80} 74 µm, pH 11, 4 % solids, 30 g/L carbon and cyanide concentrations of 0.05 % and 0.1 % NaCN at 24 and 48 hour residence times.
- Kinetic cyanidation tests on selected samples.
- Diagnostic leach tests.

13.1.5 ALS 2016

In 2016, ALS Metallurgy in Santiago, Chile conducted testwork on 20 BP variability samples and one AA sample for the preliminary feasibility study. Twenty samples were subjected to comminution testing. The samples included one sulphide, one mixed and 18 oxide types. ALS Metallurgy, Chile is independent of Gold Fields.

Testwork included:

- Head assay suite.
- Comminution parameters.
- Bottle roll leach kinetics.
- CIL, leach-CIP defined time leach tests.
- Grind series.
- Residence time series.

- Optimisation tests on composites:
  - Grind series leach kinetic tests at P_{80} 75, 106 and 150 µm sizes
  - Cyanide concentration CIL tests at 0.025, 0.05 and 0.1 % NaCN
  - Dissolved oxygen series
  - Agitation leach CIL series for pulp solids at 40, 45 and 50 %
  - Gravity recoverable gold (GRG) testing
  - Site water tests
  - Cyanide detox tests.
- Composite sample preparation for slurry rheology, viscosity, thickening, and filtration determinations.

The grinding circuit design by Orway Mineral Consultants as part of the pre-feasibility study (PFS) was carried over to the FS as was the rheology, thickening, and filtration testing by FLSmidth & Co. A/S.

13.1.6 McClelland 2017–18

In 2017–2018, McClelland conducted testwork on 60 variability samples (17 BP from the ALS comminution testing and 43 AA from the 2016 drilling program), six high-grade silver samples from BP and 13 lithology-alteration composites. The testwork program included:

- Head assays and sample characterisations including carbon and sulphur speciation, 4 acid ICP, XRD, specific gravity, BWI and XRF.
- Bottle roll leach kinetics and leach-CIP testing of 10 lithology-alteration composites (four environmental composites and six metallurgical composites compiled from the 43 AA variability samples and 17 BP samples) with variation of the cyanide concentration profile.
- Agitation leach and leach-CIP testing of the six metallurgical composites with variation of the slurry density.
- Slurry viscosity and oxygen uptake tests on the ten lithology-alteration composites.
- Process simulation testing on the 13 lithology-alteration composites including leaching, decantation after leaching, zinc precipitation, CIP, and cyanide detox of CIP tailings with selective use of site water.
- Detailed study of zinc precipitation.
- Detailed study of cyanide detoxification using SO_2 and air.
- Diagnostic leach testing on selected samples.
- Mercury mitigation and arsenic precipitation testing on the tailings from the six metallurgical composite samples.
- Final tails viscosity testing.

Additional pilot carbon elution testing was carried out by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia.

Carbon adsorption testing and modelling of CIP and CIL was conducted at SGS Lakefield, Canada using two low-grade composite samples prepared specifically to generate representative CIP feed after cyanide leaching. Additional modelling of CIP and CIL was undertaken by Curtin University in Australia. Thickening and filtration testing was conducted on composite samples ground to the correct size and slurried to design pH.

Complementary mineral and element deportment studies for gold, silver, mercury, and arsenic were carried out by Advanced Mineral Technology Laboratory Ltd (AMTEL), Canada. Additional testing to confirm comminution design and costs was carried out in 2017 by ASMIN Industrial Ltda in Santiago, Chile.

13.2 Relevant results

13.2.1 Sample head assays

As a component of the testwork programs, samples submitted for recovery and hardness analyses were subjected to detailed head analyses. For reporting purposes, the individual results were averaged within the defined metallurgical domains and shown in the summary tables below.

The following observations are made from Table 13.1 concerning the averages of the metallurgical domain sample results:

- All domains show significant enrichment of sulphate sulphur.
- All domains show depletion of carbon species (carbonate and organic carbon).
- Oxide domain contains remnant sulphide sulphur at relatively lower concentrations.
- Mixed and sulphide domains are significantly elevated in sulphide sulphur concentrations.

Table 13.1: Salares Norte deposit samples analyses by domain – sulphur and carbon speciation

Species	UOM	Agua Amarga		Brecha Principal		
		Oxide		Oxide		Sulphides
		Argillic alteration	Silicified alteration	Argillic alteration	Silicified alteration	Mixed alteration
Sulphur speciation						
S_Elemental	%	0.01		0.05	0.03	0.50
S_Sulphate	%	2.53	0.67	3.69	2.30	4.47
S_Sulphide	%	0.39	0.19	1.30	0.56	5.37
S_Total	%	2.76	0.86	4.54	2.32	9.36
Carbon speciation						
C_Total	%	0.05	0.05	0.04	0.05	0.03
C_Organic	%	0.03	0.04	0.03	0.03	0.03

Source: Salares Norte CPR, 2021

Potentially relevant from a cyanidation perspective, the following observations are made from Table 13.2:

- Overall, the metallurgical samples contain elevated concentrations of silver (Ag), arsenic (As), antimony (Sb), tellurium (Te) and mercury (Hg).
- The sulphide samples contain comparatively elevated concentrations of the base metals, copper (Cu), nickel (Ni) and zinc (Zn).

Table 13.2: Salares Norte deposit samples analyses by domain

Species	UOM	Agua Amarga		Brecha Principal		
		Oxide		Oxide		Sulphides
		Argillic alteration	Silicified alteration	Argillic alteration	Silicified alteration	Mixed alteration
Al	%	3.13	0.71	4.67	2.30	6.88
Ca	%	0.06	0.05	0.11	0.10	0.12
Fe	%	1.79	1.17	2.80	2.24	3.83
K	%	1.25	0.34	1.60	1.04	2.11
Mg	%	0.01	0.01	0.01	0.01	0.06
Na	%	0.24	0.07	0.35	0.19	0.34
Si	%			31.50	40.80	24.23
Ti	%	0.48	0.44	0.29	0.36	0.32
Au	ppm	3.21	6.98	4.38	23.55	1.73
Ag	ppm	25	59	66	126	37
Cl	ppm			2198	3623	286
F	ppm			1720	213	571
Ag	ppm	27	56	71	137	42
As	ppm	1186	931	943	541	797
Ba	ppm	516	1373	475	678	118
Be	ppm	0.13	0.05	0.34	0.20	0.45
Bi	ppm	31	46	80	122	19
Cd	ppm	0.06	0.04	0.36	0.27	4.48
Ce	ppm	24	6	38	22	32
Co	ppm	2.04	1.77	1.12	1.11	35
Cr	ppm	129	183	36	63	44
Cs	ppm	0.77	0.58	0.90	1.07	1.42
Cu	ppm	10	19	19	16	457
Ga	ppm	20	7	35	19	46
Ge	ppm	0.07	0.05	0.11	0.07	0.10
Hf	ppm	3.34	3.73	0.95	0.94	0.48
Hg	ppm	8.72	17.63	4.55	11.91	4.46
La	ppm	12.74	3.53	17.67	10.53	15.75
Li	ppm	2.80	3.20	7.87	5.77	6.46
Mn	ppm	22	29	21	47	53
Mo	ppm	5.79	8.25	3.72	5.68	6.35
Nd	ppm			7.72	9.57	7.74
Ni	ppm	4.96	7.28	1.76	2.49	38.60
P	ppm	553	168	681	394	447
Pb	ppm	754	385	1405	759	981
Rb	ppm	4.56	2.39	7.61	5.25	17.67
Re	ppm	0.001	0.001	0.003	0.002	0.029
Sb	ppm	216	235	236	317	56
Sc	ppm	4.39	2.95	4.47	2.85	7.28
Se	ppm	3.19	4.00	4.61	2.16	2.60
Sn	ppm	3.78	4.66	4.83	6.04	6.95
Sr	ppm	554	228	520	274	342
Ta	ppm	0.65	0.40	0.55	0.45	0.58
Te	ppm	6.50	4.55	8.99	5.52	3.30
Th	ppm	5.40	1.96	6.40	5.44	5.93
Tl	ppm	0.92	0.36	2.12	1.99	12.97
U	ppm	1.94	1.65	1.51	1.44	1.51

Species	UOM	Agua Amarga		Brecha Principal		
		Oxide		Oxide		Sulphides
		Argillic alteration	Silicified alteration	Argillic alteration	Silicified alteration	Mixed alteration
V	ppm	45	17	66	44	90
W	ppm	7	6	12	10	12
Y	ppm	4.19	4.13	1.84	1.26	2.51
Zn	ppm	5	4	34	22	452
Zr	ppm	123	134	20	22	16

Source: Salares Norte CPR, 2021

13.2.2 Mineralogy

Four metallurgical samples were submitted to AMTEL, London and Canada for gold, silver, arsenic, and mercury deportments, with the samples defined as follows:

- ALS Comp C7 – Brecha Principal (BP) pit, oxide, silicification alteration.
- ALS Comp C10 – Brecha Principal (BP) pit, oxide, argillic alteration.
- ALS Comp C15 – Brecha Principal (BP) pit, sulphide, silicification alteration.
- ALS Comp C18+C19 – Agua Amarga (AA) pit, oxide, silicification alteration.

A summary of the gold, silver, mercury, and sulphide minerals identified by the AMTEL testwork is shown in Table 13.3. The variability in form of gold minerals is relatively low; however, there are many different silver and mercury minerals occurring, particularly with the relative contribution of the different silver minerals varying with sample also. Pyrite is the dominant sulphide mineral, with high concentration in sample C15 (BP, sulphide).

Table 13.3: Salares Norte deposit samples Au, Ag and Hg mineralogy analyses results

		Sample ID	**C7**	**C10**	**C15**	**C18+C19**
		Pit/ deposit	**BP**	**BP**	**BP**	**AA**
		Sample type	**Oxide**	**Oxide**	**Sulphide**	**Oxide**
		Sample alteration	**Silicified alteration**	**Argillic alteration**	**Silicified alteration**	**Silicified alteration**
		Gold grade (ppm)	6.28	2.06	1.84	9.46
		Silver grade (ppm)	825	23	196	23.6
		Mercury grade (ppm)	55.4	2.9	1.9	11
Minerals		**Chemical formula**	**No. of mineral grains identified and counted**			
Gold minerals	Native Au	[Au >80, Ag <20]	290	734	373	909
Silver minerals	Acanthite	Ag_2S		5	230	434
	Imiterite + capgarronite	Ag_2HgS_2 + AgHgClS	109	7	4	180
	Ag sulfosalts	Ag_x $(Sb,Bi,Pb)_y$ S_z		6	39	22
	Ag halides	Ag (Cl>Br>>I)	2663	242	1	44
	Native silver	Ag				5
Mercury minerals	Cinnabar	HgS		3	1	138
	Imiterite	Ag_2HgS_2		2	1	112
	Capgarronite	AgHgClS	187	5		100
	Corderoite	$Hg_3Cl_2S_2$	28			
			Weight %			
Sulphide minerals	Pyrite	FeS_2	0.03 %	0.99 %	12 %	0.09 %
	Covellite	CuS			0.01 %	
	Enargite	Cu_3AsS_4			0.13 %	
	Galena	PbS			<0.01 %	

Source: Salares Norte CPR, 2021

A summary of the gold deportment (from a cyanide leaching perspective) is shown in Table 13.4. There are relatively low contents of enclosed or sub-microscopic gold (i.e., difficult to leach) in the three oxide samples; however, significant contribution of sub-microscopic gold occurs in the C15 (sulphide) sample. Most free gold minerals are very fine, being less than 7 µm.

Table 13.4: Salares Norte deposit samples gold deportment (from a leach perspective) results

Sample ID		**C7**	**C10**	**C15**	**C18+C19**
Pit/ deposit		**BP**	**BP**	**BP**	**AA**
Sample type		**Oxide**	**Oxide**	**Sulphide**	**Oxide**
Sample alteration		**Silicified alteration**	**Argillic alteration**	**Silicified alteration**	**Silicified alteration**
Gold deportment form		**Gold weight %**			
Free gold grains	>7µm	1 %	18 %	2 %	5 %
	<7µm	80 %	56 %	11 %	45 %
Exposed gold mineral grains	On free oxides/sulphides	1 %	2 %	11 %	16 %
	On composites and high SG rock	4 %	6 %	5 %	13 %
	On rock	12 %	9 %	2 %	12 %
Enclosed gold mineral grains	In free oxides/sulphides	<1 %	<1 %	4 %	<1 %
	In composites	<1 %	1 %	3 %	2 %
	In rock	<1 %	5 %		3 %
Submicroscopic Au:	With free sulphides/oxides	1 %	1 %	40 %	<1 %
	Associated sulphides/oxides	1 %	2 %	22 %	2 %

Source: Salares Norte CPR, 2021

13.3 Recovery estimates

Due to the variability in both gold and silver leach recoveries, process recoveries were developed based on the results from all variability metallurgical testwork campaigns. Head-grade dependent gold and silver recovery estimation models were generated from the testwork data, with additional allowances made for anticipated plant losses in commercial operation, via losses in the form of tailings gold in solution, and fine circuit carbon.

The leach tests used for the development of the recovery estimation models were all carried out as CIL, with a grind size of P_{80} of 75 µm, 1,000 ppm NaCN concentration and with 48 hours leach residence time; conditions that are reasonably consistent with the selected plant flowsheet (leach, CCD, Merrill-Crowe, CIP) and design criteria. No gravity recovery step was included in the laboratory testwork since the plant design does not include a gravity recovery circuit.

Table 13.5 shows a summary of the samples used for the development of the gold and silver recovery estimation models as developed by Brittan Process Consulting in October 2018.

Table 13.5: Salares Norte deposit variability samples recovery summary for gold and silver

Domain	No. of samples	Average calculated head grade	Average final tails grade	Overall recovery
Gold leach test results		**Au (g/t)**	**Au (g/t)**	**%Au**
Brecha Principal - Oxide	95	9.03	0.47	94.8
Agua Amarga - Oxide	58	4.33	0.36	91.7
BP & AA - Sulphides	11	1.89	1.16	38.5
Silver leach test results		**Ag (g/t)**	**Ag (g/t)**	**%Ag**
Brecha Principal - Oxide	106	205.80	105.74	48.6
Agua Amarga - Oxide	54	33.33	14.46	56.6
BP & AA - Sulphides	12	26.42	21.08	20.2

Source: Salares Norte CPR, 2021

Table 13.6 shows the gold and silver recovery estimation models developed from the testwork results. Mixed ore is considered a blend of oxide and sulphide for recovery purposes. The variability in gold oxide ore recoveries showed a tendency to consistently have about 85 % of the samples cluster around mid-90 % recovery, and the balance of 15 % of the samples cluster around 85 % recovery, depending on sample grade. The recovery models account for this variability. Residual gold locked in remnant sulphides is likely responsible for at least some of this variability.

Table 13.6: Salares Norte recovery estimation models for gold and silver by deposit and ore type

Deposit	Metal	Ore type	Head grade range	Recovery estimation formulae (%Au, %Ag)
BP	Gold	Oxide	Au ≤ 35 g/t	97.2 – 10.4 * Ln(Au+1) / Au
			Au > 35 g/t	96.1
AA	Gold	Oxide	All	91.0
BP & AA	Gold	Sulphide	Au ≤ 10 g/t	70.7 – 58.6 * Ln(Au+1) / Au
			Au > 10 g/t	56.6
BP	Silver	Oxide	Ag ≤ 650 g/t	74.7 – 45.5 * Ln(Ag+1) / Ag
			650 < Ag ≤ 10,600 g/t	98.9 – 1.98 * (Ag+1)^1.39 / Ag
			Ag > 10,600 g/t	25.3
AA	Silver	Oxide	Ag ≤ 180 g/t	67.6 – 98.9 * Ln(Ag+1) / Ag
			180 < Ag ≤ 1,500 g/t	64.7
			1,500 < Ag ≤ 10,600 g/t	98.9 – 1.98 * (Ag+1)^1.39 / Ag
			Ag > 10,600 g/t	25.3
BP & AA	Silver	Sulphide	All	16.9

Note: Au - Gold head grade, Ag - Silver head grade.

Source: Salares Norte CPR, 2021

13.4 Processing factors or deleterious elements

13.4.1 Ore hardness

The sizing of the SAG and ball mills in the grinding circuit was based upon the metallurgical sample hardness test data set shown in Table 13.7. The overall circuit configuration was designed and/or reviewed independently by Fluor, Orway Mineral Consultants and DMCC Pty Ltd, and reviewed and checked internally by Gold Fields.

A summary of the hardness test data and Gold Fields estimated circuit capacity is included in Table 13.7, which indicates the following based upon the sample tested:

- The second hardest and largest material source is the silicified oxide ore from the Brecha Principle (BP) pit, with capacity estimated at 256 t/hr or 2.0 Mt per annum.
- The single hardest, but relatively limited material source is the silicified oxide ore from the Agua Amarga (AA) pit samples, with estimated capacity of 216 t/hr or 1.7 Mt per annum on average.

Table 13.7: Salares Norte sample hardness data and mill throughput estimates, by deposit and ore type

Sample ID	Pit (AA/BP)	Bore hole (BH) number	BD depth		Ore type	Alteration type	Rock SG (t/m³)	SAG Work Index, Mia (kWhr/t)	Ball Work Index, Mib (kWhr/t)	Circuit capacity (tph)	Annual rate (Mt/a)
			From (m)	To (m)							
C18	AA	SNMET005	223.0	235.0	Oxide	Silicified	2.38	19.1	33.2	179	1.4
C19	AA	SNMET005	235.0	245.0	Oxide	Silicified	2.33	20.0	27.6	210	1.7
C20	AA	SNMET005	245.0	263.6	Oxide	Silicified	2.34	18.2	21.1	261	2.1
Average	**AA**				**Oxide**	**Silicified**	**2.35**	**19.1**	**27.3**	**216**	**1.7**
C1	BP	SNMET001	103.1	111.5	Oxide	Argillic	2.20	10.6	15.7	313	2.5
C3	BP	SNMET001	144.3	153.0	Oxide	Argillic	2.56	17.1	20.4	274	2.2
C4	BP	SNMET001	158.1	172.1	Oxide	Argillic	2.40	15.7	24.6	232	1.9
C5	BP	SNMET001	174.7	189.9	Oxide	Argillic	2.41	14.3	22.9	246	2.0
C8	BP	SNMET002	197.9	217.5	Oxide	Argillic	2.43	11.9	17.5	312	2.5
C9	BP	SNMET002	229.9	250.0	Oxide	Argillic	2.47	10.7	17.0	313	2.5
C10	BP	SNMET003	182.4	200.3	Oxide	Argillic	2.18	10.1	22.0	260	2.1
C14	BP	SNMET004	266.3	290.8	Oxide	Argillic	2.39	14.5	16.2	313	2.5
C16	BP	SNMET005	198.8	207.3	Oxide	Argillic	2.45	12.3	16.5	313	2.5
C17	BP	SNMET005	207.3	215.3	Oxide	Argillic	2.44	13.1	17.9	304	2.4
Average	**BP**				**Oxide**	**Argillic**	**2.39**	**13.0**	**19.1**	**288**	**2.3**
C2	BP	SNMET001	128.8	136.8	Oxide	Silicified	2.51	15.8	23.7	240	1.9
C7	BP	SNMET002	169.4	177.4	Oxide	Silicified	2.20	14.8	28.4	203	1.6
C11	BP	SNMET004	227.6	242.3	Oxide	Silicified	2.59	18.4	20.1	280	2.2
C12	BP	SNMET004	253.4	260.7	Oxide	Silicified	2.61	15.3	20.3	276	2.2
C13	BP	SNMET004	260.7	266.3	Oxide	Silicified	2.52	20.8	20.2	281	2.2
Average	**BP**				**Oxide**	**Silicified**	**2.49**	**17.0**	**22.5**	**256**	**2.0**
C6	BP	SNMET001	189.9	204.8	Sulphide	Argillic	2.49	10.1	12.5	313	2.5
C15	BP	SNMET004	328.9	351.0	Sulphide	Silicified	2.71	22.7	23.6	256	2.1
Average	**BP**				**Sulphide**	**Mixed**	**2.56**	**16.6**	**19.6**	**275**	**2.2**

Note: Value estimated by Gold Fields using constrained/modified Morrell Total Power Method targeting a final grind size of P_{80} 75 µm.
Assuming a mill runtime of 91.3 % (8,000 hr/annum).

Source: Salares Norte CPR, 2021

Some key considerations concerning the circuit design include:

- A relatively low mill runtime of 91.3 % (8,000 hr/annum) is assumed, due to the relatively difficult local operating conditions (e.g., weather and altitude) and the absence of an emergency crushed ore stockpile, due to plant footprint space limitations and topography challenges.
- The SAG and ball mills are equipped with the same sized (4,000 kW) motors to allow a common spare to be purchased and held on-site.
- Due to the relatively fine grind target size (P_{80} of 75 µm) and the relatively high BWI of the samples tested means that the circuit capacity is predicted to be largely constrained by the available ball mill power
- The selected 4,000 kW motor was based on the minimum size estimated as being required for the ball mill duty, and the 4,000 kW motor for the SAG mill is potentially oversized.
- Higher mill throughputs (than those estimated and indicated in Table 13.7) may be possible by optimising power duties between the mills (reducing the size distribution of the SAG mill discharge stream transferring to the ball mill), and/or blending the softer argillic altered ores with the harder silicified ores.

- The grinding circuit is equipped with SAG discharge pebble recycle conveying, but no pebble crusher.

13.4.2 Deleterious elements

The Salares Norte deposit is relatively complex and there are several species that can impact plant performance and design.

Silver

The grade of silver at Salares Norte is relatively high compared to other typical gold deposits and occurs at about 10 times higher concentrations than gold. The high silver grade has significantly impacted the plant design and it will play an important role for operations once the plant is commissioned.

Within the plant, silver typically will follow gold by leaching with cyanide, precipitating with zinc powder within the Merrill-Crowe circuit, adsorbing onto carbon in the CIP circuit, and then into the gold room (i.e., retorts, fluxing and smelting). The high silver grade increases the volume of zinc precipitates, carbon treatment rates for stripping and regeneration, and increases the volume of doré bars produced which will comprise mostly silver.

The plant design has allowed for management of up to ~100 g/t Ag by the metal recovery circuits. Blending of crusher/mill feed to manage to this silver grade limit on a relatively short-term basis will ultimately be required and is assumed.

Silver can be difficult to elute from activated carbon recovered from the CIP circuit. The design of the elution circuit has allowed for three elution cycles within the modified Split-Anglo American Research Laboratories (Triple AARL) carbon stripping sequence, to improve confidence in achieving efficient silver removal from the carbon.

A geological model of the silver concentrations and distributions within the deposits is available for use in forecasting and to inform mill feed blending strategy.

Mercury

The grade of mercury at Salares Norte is relatively high compared to other typical gold deposits, and occurs at approximately the same concentration as gold does. Some of the contained mercury is cyanide-soluble, so therefore the high mercury grade has impacted the plant design and will have an on-going impact for operations once the plant is commissioned. The inclusions in the plant design with the aim to safely manage and recover the leachable mercury includes:

- Selection of the Merrill-Crowe circuit – which precipitates (with zinc powder) most of the cyanide-leached mercury ahead of recovering the mercury from the precipitate in dedicated mercury retorts.
- Mercury retorts – which allows for safe removal and recovery of the mercury from the zinc precipitate.
- Carbon regeneration kiln design and off-gas scrubbing – some of the mercury leached by cyanide will load onto activated carbon in the CIP circuit following the CCDs and Merrill-Crowe circuit. The carbon regeneration kiln is designed to minimum volume and leakage of kiln off-gas, with removal by capture of mercury from the off-gas using sulphur impregnated carbon (SIC) prior to exhausting to atmosphere.
- Mercury waste storage building – a dedicated mercury waste storage building is included in the plant design to allow the safe short-term storage of mercury prior to shipment off-site for permanent retirement.

A geological model of the mercury concentrations and distributions within the deposits is available for use; however, mercury is notable for its volatility and therefore difficulty in consistently achieving accurate laboratory concentration analysis.

Sulphide sulphur

The Salares Norte deposits contain low concentrations of remnant sulphide sulphur in the oxide ores, and very high concentrations in the sulphide ores.

Refractory gold associated with remnant sulphide in the oxide ores is relatively minor at approximately 1 % to 2 % (see Table 13.4); however, significant refractory gold content occurs within sulphides in the sulphide ore. It will be important for the operation to minimise mining of ores associated with the sulphide ore type. Geological information concerning the oxide and sulphide ore boundary is available.

13.4.3 Metallurgical risks

In the opinion of the Qualified Person, the completion of feasibility level metallurgical testwork programs assessing core samples selected from future Salares Norte mineralisation areas provides a reasonable platform for estimating the associated metallurgical and processing Modifying Factors underpinning the 2021 Mineral Reserves. However, uncertainties remain and some key potential areas of risk and uncertainty are discussed below.

Sample representativity

Metallurgical sample selection is an important aspect of the process of developing Mineral Resources into Mineral Reserves. The results of the testwork undertaken on those samples are often used directly as input into plant performance estimates that are then used for the life of mine and Mineral Reserve financial evaluations. It is important that the metallurgical samples are representatively selected to cover a suitable range of gold head grades, to consider the different geological lithologies and domains expected to be encountered, and to appropriately incorporate internal and external material dilution expected during the mining process. Individually testing different head grades ranges and geological domains improves the ability to see the metallurgical response variability of the orebody, which improves the ability to make better judgements and estimates about how the material could perform in the processing plant.

Whilst effort and care are taken with the sample selection process, there are practical constraints to samples numbers due to core availability and testwork cost, and therefore it is not possible for the Qualified Person to guarantee that the proposed Mineral Reserves have been fully representatively sampled for the full life of the asset, and therefore some inherent uncertainty will remain. The uncertainty may be considered mitigated to some extent since no factors other than sample grades emerged as statistically significant in determining metallurgical recoveries, based upon analysis of the available results data sets. The sample grade ranges were well covered in sample selection and no statistically significant effect of alteration or domain was observed.

Should the oxide ore as mined differ in respect of the distribution of gold locked in remnant sulphides from that experienced in the testwork variability samples, then the recoveries could be higher or lower than the model forecasts.

Laboratory test methods and scale-up

The laboratory test results require scale-up to estimate performance through the industrial processing facility. The metallurgical testing regime adopted has been specifically tailored to provide results that aim to represent the as-designed processing facility reasonably and practically.

Cyanide leach (CIL) recoveries achieved in the laboratory are assumed to be achievable within the proposed plant. Overall laboratory recovery results are model fitted to bounded sample head grade relationships with allowances for tailings solution and fine carbon losses incorporated. The resulting models are assumed to be reasonably achievable at plant scale.

Hardness properties are applied to the Morrell Total Power method by Gold Fields to check the capacity of the designed grinding circuit, that has been designed and/or reviewed by independent specialists Orway Mineral Consultants, Fluor and DMCC Pty Ltd. However, there remains potential risk associated with the delivery of these metallurgical testing results associated with the differences between laboratory methods and full-scale processes, and miscellaneous and unidentified errors associated with undertaking the testing.

The selected laboratories (McClelland, Plenge, SGS, ALS Metallurgy) that have undertaken the metallurgical testwork are well-regarded within the gold mining industry and have an established history of performing well with Gold Fields. No pilot-plant testing of the full recovery circuit (leach, CCD, zinc precipitation, CIP) has been carried out and the metallurgical properties are based on bench scale test results concerning the individual unit processes only. The sample requirements (only available as drill core) and cost for pilot testing are considered as being prohibitive.

However, given that both Merrill-Crowe and leach/CIP processes have long histories of industrial application, it is the opinion of the Qualified Person that pilot-plant testing is not required for the estimation of plant Modifying Factors for the 2021 Mineral Reserves. However, the potential effects of the build-up of soluble components in the process water circuits due to the recycling of water from the proposed thickeners and tailings filters is difficult to predict without substantial pilot plant testing of the full flowsheet, and therefore this water recycle may introduce some unknown operational performance risks. Such related issues would need to be resolved as, and if, they develop and occur in practice.

Despite reasonable efforts and care in the application of scale-up factors and modelling methods, there remains some inherent uncertainty in actual performance of the industrial facility predicted from a small-scale laboratory tests.

14 Mineral Resource estimates

14.1 Mineral Resource estimation criteria

The Salares Norte Mineral Resource estimate involves modelling of the geology including gold and silver estimation domains, block modelling, estimation of grades and density, and classification and constraining for reporting. Specialised software used for Mineral Resource estimation includes:

- Leapfrog Geo® (Leapfrog) version 3.1.2 for geological modelling.
- Datamine Studio RM® (Datamine) version 1.4.126.0 for drillhole table desurvey, drillhole categorical coding, sample compositing, block model construction and visual validations.
- Isatis® version 2018 for drillhole and grid preparations, exploratory data analysis, decluster weighting, Gaussian anamorphosis, variography, estimation, simulation, recoverable resource modelling, confidence classification and validations.
- R 3.5.1 and associated packages for data manipulation, statistical analysis, data visualisation, model verification, and grade-tonnage analysis.
- Geovia Whittle® (Whittle) version 4.7.4 for generating pit shells to constrain the Mineral Resource.
- Geovia GEMS® (GEMS) version 4.8.2 for mining model construction and resource reporting.

14.1.1 Geological model and interpretation

The geological model is based on Gold Fields' current interpretation of the geology of the Salares Norte deposits. A variety of geological characteristics are used to create 3D models of lithology, alteration, weathering, structure, and gold and silver mineralisation.

The models are developed by sectional interpretations using geological information collected from drillholes, surface mapping and assay data. The 3D models (solids and surface) are built using implicit modelling of drillhole data (logging and assays), surface mapping, and interpreted lines and points in Leapfrog. The models are used to build a block model representing the deposits which are used for the estimation of gold and silver grade, dry bulk density and other variables.

The lithology model captures the key lithologic units comprising volcanic and volcaniclastic rocks intruded by the porphyritic dacitic and andesitic dome complex and crosscut by monomictic and polymictic breccias. These solid models are used to code drillholes and the block model.

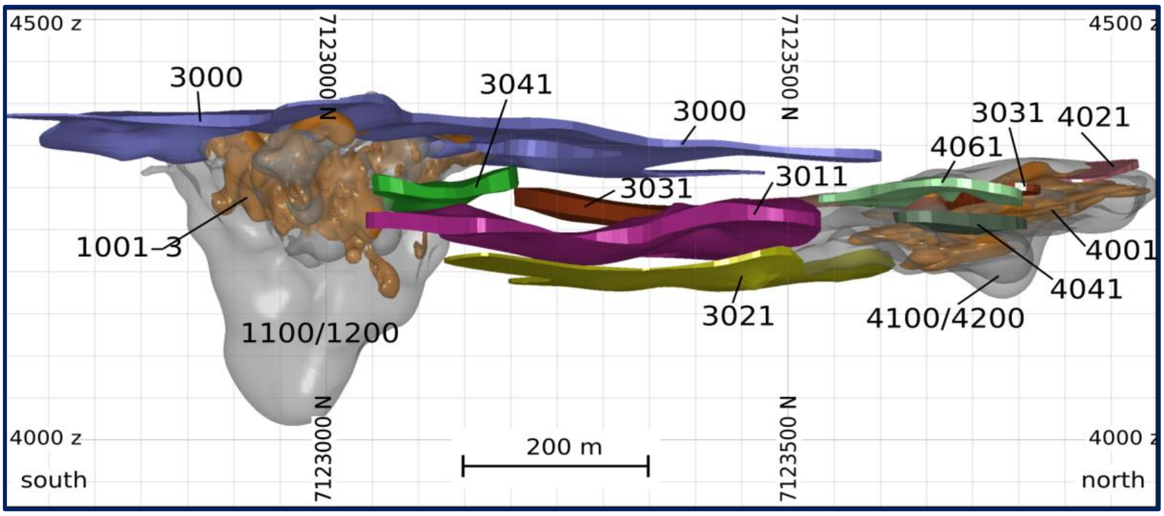
The hydrothermal alteration model captures the key alteration facies that host most of the gold and silver mineralisation types. The advanced argillic assemblage is the dominant alteration, surrounded by intermediate argillic alteration and illite-rich alteration at depth. The silica alteration ranges from massive silica, cream silica, to vuggy silica.

Weathering zones are modelled as oxide, sulphide and mixed where there is insufficient data and volume to model separately. The geometry of the oxidation at Salares Norte is irregular, including perched sulphide domains on the top of oxidised material. This reflects host rock and structural controls on permeability, which in turn influences the geometry and extent of the paleowater surface.

Mineralisation domain models are based on gold and silver grades, and consider important controls such as oxidation, lithological hosts, alteration type and intensity and feeder faults. When constructing 3D models of mineralisation, certain grade thresholds are used to produce spatially continuous zones that conform to the underlying geological controls. Grade thresholds are selected based on analysis of log-probability plots and the threshold relationships to expected spatial volumes.

Mineralisation domains for AA and BP are broadly characterised as low-grade breccia, low-grade lithological, and high-grade sub-domains (Figure 14.1).

Figure 14.1: Salares Norte - projection of mineralised domain models



Source: Salares Norte CPR, 2021

The low-grade breccia domains are associated with monomictic and polymictic breccias closely related to sub-vertical feeder structures at BP (domains 1100 and 1200) and horizontal bodies constrained within andesitic lavas at AA (domain 4100 and 4200). The low-grade lithological domains are the result of hydrothermal fluids interacting with favourable flat-dipping stratigraphic horizons and laminated breccia (domains 3000, 3011–41 and 4021–61). The high-grade sub-domains are internal to the broader main mineralisation domains and are modelled using the interpretation of breccia geometry, silica alteration and grade shell envelopes.

14.1.2 Block modelling

The block model prototype (Table 14.1) is designed to accommodate maximum likely pit shapes. A selective mining unit (SMU) size (the smallest volume of material on which ore and waste classification is determined) of 10 mX x 10 mY x 5 mZ was determined. The block model was constructed in Datamine by filling geological model wireframes and assigning numeric codes from the wireframes using Datamine's TRIFIL process.

Filling for alteration, lithology and material type models is done at the SMU resolution without sub-blocking and only blocks whose centroids fall inside the wireframe are created and coded.

Filling for gold and silver estimation domains is done with 1 mX x 1 mY x 1 mZ sub-blocks. Low-grade silver and gold domains are coded using the same geological models. High-grade domains are then coded using separate gold and silver models, which replace the low-grade coding where intersected. This model is then regularised (diluted) to the SMU block size.

Table 14.1: Block model prototype

Model prototype	Units	Easting	Northing	Elevation
Corner origin	m	509,700	7,122,200	4,000
Centroid origin	m	509,705	7,122,205	4,002.5
Range	m	1,800	2,180	720
Parent block size	m	10	10	5
Number of blocks	No.	180	218	144

Source: Salares Norte CPR, 2021

Aluminium, arsenic, copper, and mercury are estimated by panel-scale simple kriging (SK). Sulphate, sulphide sulphur and total sulphur are estimated by panel-scale co-SK.

The latest light detection and ranging (LiDAR) topographic survey data processed to a 1 m resolution is used to define blocks at the topographic interface. The blocks contain a field which quantifies the proportion of the block that is below topography.

14.1.3 Bulk density

Density is estimated by panel-scale SK where there are sufficient data and assigned elsewhere. Aluminium, arsenic, copper, and mercury are estimated by panel-scale SK. Sulphate, sulphide sulphur and total sulphur are estimated by panel-scale co-SK

14.1.4 Compositing

Compositing to 2 m intervals is done within the estimation domains and uses the Datamine COMPDH process. This process has an optional model (MODE=1) that allows for minor adjustments to the length of composites to prevent small samples at the end of the compositing run.

14.1.5 Top cuts

Mineralisation domain coding was applied to the composite sample data for analysis and modelling of the gold and silver distribution and spatial continuity (variograms). Observations of descriptive statistics and sample grade distribution confirm that the domaining strategy successfully separated high-grade and low-grade sample populations. The gold and silver sample distributions have a strong positive skew, typical of precious metal deposits. There are a few samples with extreme values several orders of magnitude greater than the mean value. These extreme values have a disproportionate effect on the domain statistics and the estimated block grades.

Top cut values were determined by domain from inspection of statistical plots of declustered composite grades and point anamorphosis function plots. Selected top cuts and their effect on descriptive statistics are shown in Table 14.2. Care has been taken to apply top cuts that affect the least number of samples and do not impact on the mean grade but reduce the variance and coefficient of variation (CV) of the data. In poorly drilled domains the effect of top cutting is more pronounced.

Table 14.2: Top cutting declustered statistics for gold composites

Domain	N	n′	p′ (%)	Top cut (g/t Au)	x̄ (g/t Au)	x̄′ (g/t Au)	CV	CV′
1001	1,449	9	0.62	200	14.01	12.75	3.96	1.77
1002	36	1	2.78	20	6.68	6.68	0.58	0.58
1003	385	4	1.04	200	18.53	17.61	2.35	1.90
1100	4,115	6	0.15	40	1.74	1.74	1.62	1.50
1200	2,071	3	0.14	20	0.96	0.91	2.74	1.52
3000	703	7	1.00	10	1.31	1.19	1.88	1.26
4001	1,355	5	0.37	75	8.41	8.31	1.14	1.02
4100	2,918	7	0.24	10	1.22	1.21	1.07	0.88
4200	386	NA	NA	NA	1.01	1.01	0.83	0.83

Note: n - count of samples, n′ - count and percentage of samples affected, x̄ - mean, x̄′ - top cut mean, CV - coefficient of variation, CV′ - top cut coefficient of variation. All statistics for declustered 2 m composites using hard domain boundaries.

Source: Salares Norte CPR, 2021

Analysis of histograms and descriptive statistics for dry bulk density data revealed no outliers requiring top or bottom cuts to the data.

14.1.6 Variography

Raw, omni-directional, experimental variograms and cross-variograms had good structure for the main low-grade domains. Despite this, attempts to calculate directional variograms produced erratic and unusable results. A Gaussian transformation of the data was necessary to produce directional variograms that could be modelled. Point Gaussian transformation and modelling was applied to the top cut and declustered composite data.

Directional Gaussian variograms were created for gold and silver in each of the mineralised domains. Downhole variograms were used to aid in interpreting the nugget effect and short scale variogram structure.

In general, directional variograms were noisy and difficult to model. The large, low-grade oxide domains 1100 and 4100 have good variograms that display mostly isotropic spatial variance. The small, high-grade sub-domains have erratic variograms. Orientation for these domains was interpreted to follow expected grade trends. Much of the structure for sub-domain variograms was interpreted from combining sub-domain data. The Qualified Person considers that the interpreted variograms fairly reflect spatial continuity. Back-transformed variogram model parameters for gold are shown in Table 14.3.

Table 14.3: Main gold domain back-transformed gold variogram model parameters

Domain	γ_0	γ_0 (%)	γ_1	h_1 (m)	γ_2	h_2 (m)	Rotation
1001	147	30	244	20, 12, 12	108	88, 45, 38	210, 0, 0
1002	2.7	20	6.0	24, 10, 9	4.5	73, 53, 34	210, 0, 0
1003	241	27	395	18, 18, 5	265	116, 80, 27	090, 0, 0
1100	3.4	46	3.0	24, 24, 24	0.98	206, 124, 87	205, 0, 0
1200	0.63	35	0.67	26, 18, 13	0.48	154, 132, 88	205, 0, 0
3000	0.81	35	1.0	62, 52, 9	0.52	146, 100, 47	180, 0, 0
4001	16	23	31	10, 10, 8	24	36, 36, 5	115, 10, -90
4100	0.22	19	0.43	19, 14, 5	0.49	58, 44, 17	295, 0, 0
4200	0.16	22	0.23	40, 25, 33	0.33	151, 100, 24	295, 0, 0

Note: $\gamma 0$, $\gamma 1$, and $\gamma 2$ are sill variances. h1 and h2 are ranges for the major (U), semi-major (V), and minor (W) axes. Rotation is for azimuth, dip, and pitch and is in degrees using the Isatis Geologist Plane convention.

Source: Salares Norte CPR, 2021

The Qualified Person's opinion is that the variography is a practical reflection of the spatial continuity of the respective mineralisation grades; their application to the geostatistical analysis is adequate to minimize uncertainty and to derive appropriate resource block models for use by the planning engineers, to complete mine design and production scheduling.

14.1.7 Grade estimation

Gold and silver grade was estimated by SK with local means at panel and SMU-scale within mineralisation domains. The panel estimates where post-processed with uniform conditioning (UC). UC information was localised to SMUs by localised uniform conditioning (LUC) using the SMU SK estimates for grade trend mapping. For information effect calculation in the recoverable resource estimation, a future grade control drilling pattern of 10 mX x 10 mY with a vertical sample increment of 5 m was assumed.

Local mean grades were used in the SK of panels and SMUs for all gold and silver domains. Local means were estimated by a moving window averaging approach in panels with the same dimensions used for SK. The Isatis Quick Interpolation process with the Moving Average option was used following which, the panel estimates were transferred to the SMU for SMU estimation using the Isatis Migrate Grid to Point process.

Vertical dimensions were limited for the panels and search ellipsoids at AA to counter vertical trends observed in swath plots and to match the flatter geometry. Search neighbourhoods for local means were designed to produce a robust local mean using as much of the local data as possible while minimising trend affects (Table 14.4). The search ellipsoids were all flat (i.e., no rotation and no anisotropy in the horizontal axes).

Table 14.4: Major domain gold local mean search parameters

Domain	Panel (m^3)	Radii (m)	Sectors	Minimum samples	Optimal samples
1001	x70 y70 z12	60, 60, 12	8	10	150
1002	x50 y50 z12	60, 60, 12	8	10	150
1003	x50 y50 z12	60, 60, 12	8	10	150
1100	x70 y70 z12	60, 60, 12	8	10	150
1200	x70 y70 z12	60, 60, 12	8	10	150
3000	x50 y50 z6	80, 80, 12	8	10	150
4001	x50 y50 z6	80, 80, 12	8	10	150
4100	x50 y50 z6	80, 80, 12	8	10	150
4200	x90 y70 z12	80, 80, 12	8	10	150

Note: Radii is for the major (U), semi-major (V), and minor (W) search ellipsoid axes; Sectors is the number of sectors for the search ellipsoid; 'minimum' is the minimum number of samples per sector; 'optimal' is the optimal number of samples per sector.

Source: Salares Norte CPR, 2021

A domain declustered average grade was assigned for the local mean where the search neighbourhood is not sufficient for estimation of a local mean.

Top cuts were used to control the influence of extreme values on the estimation of local means.

The SK estimation parameters and panel size were adjusted for best estimation quality as measured by kriging efficiency and slope of the regression from ordinary kriging (OK) and weight of the mean. As with the local mean estimation, the panel and search ellipsoid vertical dimensions were restricted to counter observed vertical trends in some domains.

14.1.8 Selective mining units (SMUs)

Another factor in the selection of panel size, apart from quality, geometry, and trend, is having enough SMUs in each panel for the LUC process. For the key domains of the deposit, the number of SMUs in each panel ranged from 21 for 4001 to 126 for 4100, with most having 50 or more. This was considered sufficient for the LUC process.

14.1.9 Model validation

Validation of the estimates involved comparing the kriged grades and LUC grades with input sample data and modelling assumptions. The final estimates (kriged and LUC) should have a similar domain mean grade and similar grade trends as the sample data. The UC and LUC estimates should have similar domain variance and grade-tonnage cut-off characteristics as the modelled support correction for SMUs.

Specific validation of the estimates was by comparison of:

- Sample and model grades in plans and sections to ensure estimated grades matched the general trend and magnitude of the input sample composites.
- Declustered sample grade means with panel SK and LUC grade means by domain to ensure the domain average grades are close to the sample mean grades.
- Panel SK and panel OK estimates to ensure no bias or error exists between the alternative panel kriging methods.

- Panel SK grade with the average LUC grade of each panel to ensure that the LUC processing reproduces the more accurate panel grade.
- Theoretical UC and LUC grade-tonnage curves to ensure the modelled support correction is reproduced at various cut-off grades.
- Sample grade with panel SK and LUC estimated grade swath plots in easting, northing, and elevation axes to ensure that local grade trends are reproduced in the estimates.

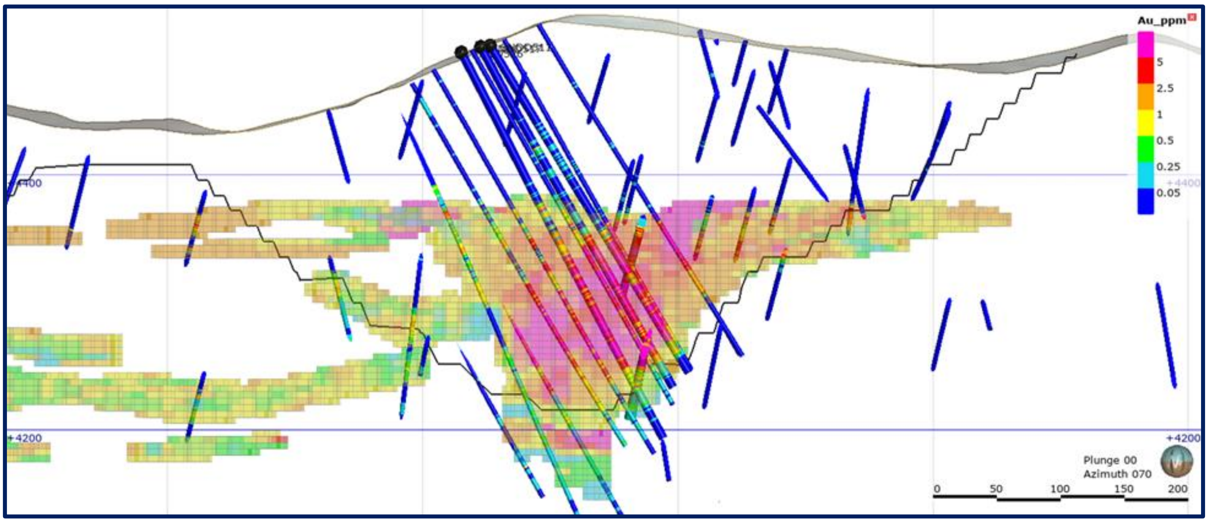
No issues were identified. Well-sampled zones (i.e., indicated classification) compared well to input sample data and modelling assumptions.

Conditional simulation of gold and silver grade was performed to verify confidence classification. Turning bands conditional simulation was used to produce a set of 60-point simulation realisations for each domain.

During 2018, Gold Fields drilled several sections of infill DD holes at BP and AA designed to test assumptions regarding the high-grade domain boundary position, boundary type, and spatial grade continuity at likely mining selectivity scale. This drilling was intended at a likely grade control spacing (10 m x 10 m); however, the challenges of drilling through deep and intensely altered cover meant that some holes could not be completed. Of the planned 18 holes, 13 were completed.

Despite not completing all the planned drilling, the Qualified Person considers there is sufficient data to draw conclusions about the nature of short-scale, high-grade mineralisation behaviour sufficient to support a feasibility level of study. Grade control-spaced drillholes at AA and BP (Figure 14.2) confirmed the location of the high-grade domain boundaries, the general grade of high-grade mineralisation and the estimated grades. This drilling also confirmed the model of high-grade gold domains at AA and BP at the current indicated level of confidence.

Figure 14.2: Brecha Principal infill drilling comparison with block model



Note: BP section 4382NE with infill drillholes shown as thicker lines

Source: Salares Norte CPR, 2021

14.1.10 Cut-off grades

Cut-off grades are influenced by the operating strategy, design, and scheduling, and are therefore calculated annually. As Salares Norte is a polymetallic deposit, a net smelter return (NSR) cut-off is used rather than a metal grade cut-off. A variable cut-off is applied since the process recoveries vary by gold and silver grade and processing costs vary based on the aluminium grade (hardness), and weathering (oxide/sulphide) but not by gold and silver grade.

The NSR ($/t ore) is the revenue expected from the process feed, taking into consideration process recoveries, metal prices, gross royalties, transport costs of the concentrate to the smelter, treatment and refining charges, and other deductions at the smelter. The NSR cut-off refers to the revenue that a block of ground ($/t ore) must be able to generate to cover the cost of the Modifying Factors and qualify as ore. Modifying Factor costs include incremental ore mining, stockpile handling, processing, tailings handling, plant sustaining capital, and administrative.

The NSR revenue is calculated by block, due to the variable grade recovery, using the following formula:

NSR (g1, g2) = [g1*P1*SR1*(V1 - TCRC1)] + [g2*P2*SR2*(V2 - TCRC2)]

Where:

- g is metal grade (g/t Au and g/t Ag)
- P is the metal plant recovery (%)
- SR is the metal smelter recovery (%)
- V is the metal price per unit sold ($/oz)
- TCRC is the applicable smelting, refining, royalty, and transport charges ($/oz).

Cost of the Modifying Factors is calculated by block, due to the variation in costs from grade, hardness, and weather, using the following formula:

$NSR_{cut} = (OMC – WMC) + (PC_1 + PC_2 + WT) + (OGA – WGA)$

Where:

- OMS is ore mining cost ($/t processed)
- WMC is waste mining cost ($/t mined)
- PC1 is the cost of processing oxide material ($/t processed)
- PC2 is the additional cost associated with processing sulphide material ($/t processed)
- OGA is the annual overall administrative costs ($/t processed/year)
- WGA is the average annual administrative costs associated with waste mining ($/t processed/year).

Costs are expected to vary over time due operational changes at the plant and mine, such as the cessation of mining and processing from stockpiles. To account for these changes, high-value and low-value cut-off grades were defined using the same formula but different costs and the same process recoveries. With this approach the high-value material can be processed first to maximise the net present value of the project.

Mineral Resources are reported in-situ for material in a pit shell having positive value after the Modifying Factor costs are applied. Reporting is based on the averages of the material within the pit shell. cut-off grades and costs are reported based on the tonne weighted average of the material rather than being calculated based on the average feed grades and recoveries.

After applying the following modifying factor costs the average NSR revenue cut-off grade for the Mineral Resource, exclusive of Mineral Reserves, was $44.32/t processed based on the following Modifying Factors:

- Metal prices: gold $1,500/oz, silver $20.00/oz
- Royalty: 1 % NSR
- Process recoveries: gold 87.3 %, silver 58.6 %
- Refining cost: gold $3.22/oz, silver $1.37/oz

- Incremental mining, & stockpile and tailings handling: $4.40/t treated
- Processing costs: $29.12/t treated
- Sustaining capital costs: $1.18/t treated
- Administrative costs allocated to processing: $9.64/t treated
- Total administrative costs: $19.28 million/annum
- Mining costs: $2.48/t mined, excluding administration allocated to mining ($0.14/t mined).

Gold Fields conducts an annual review of metal prices for Mineral Resource and Mineral Reserve reporting to monitor any significant changes that would warrant re-calibrating the price deck for strategic and business planning purposes. This review takes into account prevailing economic, commodity price and exchange rate trends, together with market consensus forecasts and Gold Fields' strategy and expectations for the mine operations. For more information on the rationale applied to deriving the Mineral Resource and Mineral Reserve metal price deck refer to Item 19.

14.1.11 Reasonable prospects of economic extraction

The open pit Mineral Resources are constrained to an optimal shell defined at a Mineral Resource gold price of $1,500/oz Au and $20/oz Ag and relevant unit costs and Modifying Factors to demonstrate reasonable prospects of economic extraction. Optimisation of the resource pit shell is carried out using the Lerchs-Grossman algorithm in Geovia Whittle software.

Pit slopes for shell generation were based on the geotechnical parameters developed for the March 2019 FS by SRK Consulting or SRK (refer to Item 16.2). These recommendations incorporate information from additional drilling and studies completed in 2017 and 2018.

The Modifying Factors used in the shell generation are based on open pit mining and a combined CCD circuit and Merrill-Crowe and CIP processing at 2 Mt per annum. Mineral Resources are stated on an in-situ basis so mining dilution and losses are not included in the reporting, but they were accounted for in the pit shell generation.

The average mine operating cost is $2.48/t mined, including sustaining capital and administrative costs allocated to mining. Sustaining capital and operating costs for the mine are based on the current contract for contractor mining. Operating cost inputs are the same for BP and AA, since the same mining method and type of equipment are used, and the pit exit elevation is the same. Equipment capital costs are included in the contractor cost resulting in low mine sustaining capital cost.

Haulage costs were adjusted based on the elevation difference to the pit exit. Mineralised and waste material have the same fixed mine operating costs with the total costs difference attributable to variable haulage costs. Cost for grade control, and stockpile and tailings rehandle are included in the total Whittle processing costs and cut-off grade estimation.

The diluted grade models were used in the shell generation so the impact of dilution on the shell size would be accounted for. Losses were not included in the grade models or added in shell generation because the diluting material is expected to be partially mineralised. This assumption was based on an analysis of the ore-waste continuity in the model. For Mineral Resource reporting, the in-situ grade models were used so mining dilution would not be included in the determination of tonnes and grade above the cut-off.

Process recoveries and operating costs are based on a combination of the FS and detailed engineering cost estimates at a processing rate of 2 Mt per annum. The average processing cost was $29.12/t treated, of which $23.21/t treated was a fixed cost and $5.91/t treated was variable, based on gold, silver and aluminium head grades. Average recovery was 87.3 % for gold and 58.6 % for silver. The average grade-dependent cost and recoveries were based on the average of the aggregated block values rather than calculated from the average grade. There is a difference in the results from these two calculation methods since the equations are non-linear and the range in grades and split between oxide and sulphide.

Incremental mining costs of $0.72/t treated were included to cover grade control. With accelerated mining, all mineralised material is stockpiled either on the run-of-mine pad or in grade stockpiles. These re-handle costs were included in the Whittle processing costs at $1.10/t treated. Tailings disposal costs of $2.56/t treated are based on a dry stack TSF that is combined with the WSF. Sustaining capital costs of $1.18/t treated were included for plant, facilities and TSF. Administration costs included the operation of the camp, transportation, security and management. Since the administration costs decrease when mining stops, the total average cost of $25.8 million per annum was split between the plant ($19.28 million or $9.64/t treated) and the mine ($6.5 million). These costs are based on a combination of the FS and detailed engineering cost estimates.

The Qualified Person has concluded that reasonable prospects for economic extraction have been demonstrated through the application of an appropriate level of consideration of the potential viability of the Mineral Resources. These considerations include a reasoned assessment of the geological, engineering (including mining and processing parameters), metallurgical, legal, infrastructural, environmental, marketing, socio-political and economic assumptions which, in the opinion of the Qualified Person, are likely to influence the prospect of economic extraction.

Although all permitting may not be finalised for some Mineral Resources, there is no reason to expect that these permits will not be granted based on existing processes and protocols.

Wherever the mineral resources are stated as being exclusive of mineral reserves: mineral resources that are not mineral reserves do not have demonstrated economic viability.

14.1.12 Classification criteria

Salares Norte's in-situ Mineral Resources are classified as either Indicated or Inferred in accordance with the CIM Definition Standards for Mineral Resources & Mineral Reserves.

Classification reflects confidence in tonnage, gold and silver grade and metal estimates for annualised open pit ore production at ~2 Mt per annum. All domains are well-constrained with geological wireframes and extrapolation beyond drilling is minimal.

Based on extensive infill drilling and improved geological understanding, the indicated portions of the BP and AA deposits are substantial. The indicated classification was based on drillhole spacing and grade error from a simulation study (Table 14.5). Drillhole spacing is determined by measuring the mean distance to the four nearest drillholes for each SMU. Simulation grade error is based on annual production volume. For BP, indicated has a drillhole spacing of <30 m and grade error of <20 %. For AA, stricter criteria was used due to more complex geology: <25 m drilling and <15 % grade error.

Table 14.5: Drillhole spacing and estimation quality statistics for Mineral Resource classification

Measure	Deposit	Classification	x_{min}	x_{max}	$\bar{x}$
Drillhole spacing (m)	AA	Indicated	6.11	36.6	20.4
		Inferred	11.1	66.8	32.6
	BP	Indicated	6.80	51.8	21.9
		Inferred	10.6	85.7	44.6
	All	Indicated	6.11	51.8	21.4
		Inferred	10.6	85.7	38.9
Grade error (%)	AA	Indicated	3.86	22.6	9.14
		Inferred	4.79	46.8	16.2
	BP	Indicated	6.36	37.5	16.6
		Inferred	10.1	49.4	25.2
	All	Indicated	3.86	37.5	14.0
		Inferred	4.79	49.4	20.9

Note: Xmin - minimum, Xmax - maximum, $\bar{x}$ - mean. Grade error for BP is based on the latest simulation study, not the study that was used to classify the Mineral Resource at BP.

Source: Salares Norte CPR, 2021

The Qualified Person is of the opinion that:

a) Inferred Mineral Resource has a reasonable chance of converting to Indicated Mineral Resource with continued exploration, additional empirical data and evolving geoscientific modelling. An Inferred Resource must be drilled to a spacing of 100 m x 100 m, increasing to 40 m x 40 m on more complex or poorly understood structures.

b) Indicated Mineral Resources must be drilled to better than 80 m by 80 m on mined structures, and 40 m x 40 m (usually 20 m x 20 m at Salares Norte) on un-mined structures.

c) A Measured Mineral Resource must be grade control drilled to 8 m x 5 m at Salares Norte and must be fully developed along strike of within one bench of the pit floor. The Measured Mineral Resource has sufficient geoscientific confidence to allow for detailed Mineral Reserve scheduling and estimation.

d) The Mineral Resource demonstrates reasonable prospects for economic extraction over the indicated study time frame.

e) When in full operation, routine mine reconciliation reporting, on at least a quarterly basis utilising the Group's Mine Reconciliation Reporting standard, will provide future empirical data to monitor and endorse the classification criteria applied.

f) The Mineral Resource gold price of $1,500/oz is at a 15 % premium to the reserve price with the differential being in general alignment with Gold Fields standard practice for setting the Mineral Resource price. The 15 % premium is to provide information on Salares Norte's resource potential at higher gold prices and to indicate possible future site infrastructure, permitting, licensing, SLO, mining footprint and infrastructure requirements.

g) The Qualified Person's opinion is that, whilst effort and care are taken with the resource estimation and classification processes, increase in geological knowledge and available data will reduce the level of uncertainty, and therefore some inherent uncertainty will remain

14.2 Mineral Resources as of 31 December 2021

The Salares Norte Mineral Resources exclusive of Mineral Reserves as at 31 December 2021 are summarised in Table 14.6. The Mineral Resources are 100 % attributable to Gold Fields. All grades and tonnages reported are in-situ.

Table 14.6: Salares Norte - summary of gold and silver exclusive Mineral Resources as at 31 December 2021 based on a gold price of $1,500/oz and silver price of $20/oz

	Resources (exclusive of Mineral Reserves)					NSR cut-off ($/t NSR)	Metallurgical recovery (%)	
	Tonnes (kt)	Grade (g/t)	Gold (koz)	Grade (g/t)	Silver (koz)			
		Au		Ag			Au	Ag
Open Pit Mineral Resources								
OP Measured Mineral Resources								
OP Indicated Mineral Resources	8,009	2.1	537	28	7,130	47.48	92.7	67.6
OP Measured + Indicated Mineral Resources	8,009	2.1	537	28	7,130	47.48	92.7	67.6
OP Inferred Mineral Resources	2,650	1.7	142	11	928	47.48	92.7	67.6

Notes:
a) Mineral Resources are exclusive of Mineral Reserves. Rounding of figures may result in minor computational discrepancies.
b) Quoted at an appropriate in situ cut-off grade and are confined revenue factor 1 pits. The cut-off grade varies by deposit, depending on the respective costs, depletion schedule and ore type. Mining dilution and expected mining recovery are included in the generation of the shell used to constrain the resource but not in the Mineral Resource statement since that is on an in-situ basis. The average cut-off grade NSR values applied to the Mineral Resources are $47.48 per tonne processed.
c) Metallurgical recovery factors have not been applied to the Mineral Resource estimates. The approximate metallurgical recovery factor is gold 92.7 % and silver 67.6 %. The metallurgical recovery is the ratio, expressed as a percentage, of the mass of the specific mineral product recovered from ore treated at the process plant to its total specific mineral content before treatment. Salares Norte mining operations vary according to the mix of the source material (e.g., oxide, transitional, fresh and ore type blend).
d) The metal prices used for the 2021 Mineral Resources are based on a gold price of $1,500 per ounce and a silver price of $20 per ounce. The gold price used for Mineral Resources approximates 15 % higher than the selected Mineral Reserve price. The gold price used for Mineral Resources is discussed in Item 19.
e) Mineral Resources consider estimates of all costs, the impact of modifying factors, processing recovery and Environmental, Social and Governance (ESG) criteria to demonstrate reasonable prospects for economic extraction.
f) The Mineral Resources are estimated at a point in time and can be affected by changes in the gold price, US Dollar currency exchange rates, permitting, legislation, costs and operating parameters
g) Salares Norte is 100 % attributable to Gold Fields and is entitled to mine all declared material located within the property's mineral leases and all necessary statutory mining authorisations and permits are in place or have reasonable expectation of being granted.

Source: Salares Norte CPR, 2021

The level of confidence in the Mineral Resource estimation is at a feasibility study level. However, there are still risks and uncertainties that could result in future changes to the Mineral Resource statement.

14.3 Audits and reviews

Gold Fields requires routine internal and external (independent) auditing of processes related to the estimation of Mineral Resources and Mineral Reserves to identify material errors and/or omissions or improvements. This includes sample data collection, database storage, QAQC, geological logging, interpretation and modelling, grade-tonnage estimation and confidence classification, mining studies, and Mineral Resource and Mineral Reserve reporting.

The reviewing experts examine selected data and conduct independent analysis to confirm the results. Where appropriate, the reviewing experts confirm compliance of process and reporting to the relevant codes. Most audits are undertaken annually or at key milestones with identified issues addressed in ongoing updates. When in full operating mode Salares Norte will be subject to external Mineral Resource and Mineral Reserve audits performed on a rolling minimum three-year cycle as per Company controls.

External audits related to this declaration of Mineral Resources and Mineral Reserves include:

- Geoscientific data collection, data storage, QAQC, and verification of database assay records against laboratory certificates (GeoSpark Consulting Inc, 2018).
- Field geology practices, logging, sectional interpretation, and geological modelling including site visits (Gigola, 2016 and 2017).
- Mineral Resource estimation, reporting and confidence classification (Optiro, 2019). This audit was supported by an earlier site visit (Optiro, 2017).
- Mineral Reserve estimation including the FS and processes for estimation of Modifying Factors, metallurgical recoveries and geotechnical parameters (Optiro, 2019).

Gold Fields Corporate Technical Services (CTS) provides ongoing internal peer review of the geoscientific data collection, geology interpretation and modelling, resource modelling and mining and metallurgical studies.

Issues identified during audits have been or are being addressed in ongoing updates. No critical or 'fatal flaw' type issues have been identified to date.

Gold Fields uses K2Fly RCubed® propriety software in combination with SharePoint to ensure accuracy, governance and auditability in the reporting of Mineral Resources and Mineral Reserves.

14.4 Comparison with 31 December 2020 to 31 December 2021 Mineral Resource

No Exclusive Mineral Resources were disclosed in 2020. For Inclusive Mineral Resources please refer to the Gold Fields Supplement to the Integrated Annual Report. Reporting of Exclusive Mineral Resources in this document is chosen to align with Gold Fields SK-1300 reports. Exclusive Mineral Resources have not been disclosed on any stock exchange previously; however, in the Qualified Persons opinion the 2021 to 2020 resource comparison changes are not material.

15 Mineral Reserve estimates

15.1 Mineral Reserve estimation criteria

15.1.1 Level of assessment

Salares Norte's Mineral Reserves are that portion of the Mineral Resources which, as technical and economic studies have demonstrated, can justify extraction at 31 December 2021.

Most of the technical study information is based on the FS but some has been updated based on detailed engineering and the status of contracts and permits. Therefore, the technical information and modifying factors used in the Mineral Reserve estimates are at feasibility study level supported by operational knowledge in the mine area and actual construction experience.

Each of the major project studies, PFS and FS were conducted to increase the project understanding and reduce the risks. The PFS was based on BP and was delivered in accordance with corporate guidelines except that a Mineral Reserve was not reported. A FS was started based on BP but after the discovery of AA, it was changed to an FS with AA included at a conceptual level. Since the deposits were not evaluated at the same level, the FS was conducted based on corporate guidelines for a FS but it did not meet the accuracy requirements of an FS so a Mineral Reserve was not reported. The FS was conducted based on mining BP and AA and was delivered in accordance with corporate guidelines for a feasibility study allowing for the maiden Mineral Reserve statement. At the completion of the FS maiden Reserve the plant engineering was at 27 % and now it is at 100 %.

Mine planning for the FS was based on open pit mining of the BP and AA deposits, a constant process plant throughout rate of 2 Mt per annum and a peak total material movement of 44 Mt per annum which is consistent with the current mining operations and construction. During the remaining life of mine, 313 Mt is mined, consisting of 20.8 Mt of material to the process plant and 292.4 Mt of waste, resulting in an overall strip ratio of 13.9:1. Pioneering, pre-stripping and mine operations activities are performed by a specialised mining contractor. Blasting operations are also undertaken by a contractor.

To improve project economics, the mine plan is based on an accelerated mining strategy with all ore stockpiled and re-handled to feed the crusher. This strategy provides flexibility to manage gold and silver grades for improved recoveries especially during the first years of operation. As a result, the mine and process plant are decoupled with the remaining mine life (from 2022) at eight years (one for pre-stripping plus seven for operations) and a plant operating life of 11 years plus one more year for construction.

The Qualified Person's opinion of the 2021 Mineral Reserve estimate is:

a) The Modifying Factors are based on reasonable and appropriate assumptions and models to derive the reserves from the resources and minimise any estimation errors. The Modifying Factors are aligned with standard industry technical practice.

b) Infrastructure, environmental, permitting, closure, utilities and baseline studies are all aligned to support the stated Mineral Reserves.

c) The Indicated and Measured Mineral Resource is sufficient in geoscientific confidence to complete final life of mine designs and scheduling.

d) The reported reserve is a 'point in time' or snapshot of the life of mine plan as at 31 December 2021. It is supported by a technically valid and economically viable open pit mine design and schedule. The techno-economic work does not exceed the estimated accuracy of ± 25 % and or require more than 15 % contingency for both operating and capital costs.

e) Environmental compliance and permitting requirements have been assessed in detail with supporting baseline studies and relevant internal impact assessments completed. Detailed tailings disposal, waste disposal, reclamation, and mine closure plans are incorporated into the life of mine plan.

f) The life of mine plan, in toto, is completed to a minimum feasibility level of study.

15.1.2 Recent mine performance

The recent performance of the Salares Norte mine is summarised in Table 15.1.

Table 15.1: Salares Norte - recent operating statistics

		Units	2021	2020
Open pit mining	Total mined	kt	22,800	0
	– Waste mined	kt	22,800	0
	– Ore tonnes mined	kt	-	-
	Strip ratio (waste: ore tonnes)	ratio	-	-
	Gold mined grade	g/t	-	-
	Silver mined grade	g/t	-	-
Processing	Tonnes milled	kt	-	-
	Gold head grade	g/t	-	-
	Silver head grade	g/t	-	-
Produced	Gold sold	koz	-	-
	Silver sold	koz	-	-
	Plant recovery (Au)	%	-	-
	Plant recovery (Ag)	%	-	-
Financials	Average Au price received	$/oz	-	-
	Average Ag price received	$/oz	-	-
	Net operating cost	$ m		-
	Capital expenditure	$ m	360	112
	All-in Cost (AIC)	$/oz	-	-

Note: The operating statistics are based on fiscal year measurements.
Salares Norte commenced with waste stripping in 2021.

Source: Salares Norte CPR, 2021

15.1.3 Key assumptions and parameters

Reporting of the Salares Norte Mineral Reserve from the Mineral Resource model involved the following steps:

- Completion of the FS in March 2019.
- Pit shell optimisation to confirm the validity of the FS pit design.
- Updating part of the Modifying Factors from the FS based on current knowledge, including construction and pre-strip status.
- Mine and mill production scheduling based on the application of Modifying Factors and confidence in the classification methodology.

Mining costs are based on accelerated mining with all mineralised material stockpiled on the run-of-mine pad in terms of grade ranges. This approach was selected because of the pre-stripping requirement and to maximise the early supply of high-grade ore to the process plant.

Sustaining capital and operating costs for the mine are based on the FS results and pricing in the contractor mining contract. Operating cost inputs are the same for BP and AA since the same mining method and type of equipment are used and the pit exit elevation is the same. Mining costs were based on the current contract rates. Equipment capital costs are included in the contractor cost resulting in a low sustaining capital cost. The average mine operating cost is $2.05/t mined excluding grade control costs. When mine sustaining capital cost and administrative costs allocated to mining are included, the cost increases to $2.46/t mined.

Processing costs are determined in part by the weathering profile whereby oxide ore consume less reagents than mixed or sulphide ore. Operating costs are also related to the ore grade due to their influence on the amount of zinc and other reagents required in the Merrill-Crowe plant, the quantity of carbon to be processed, the ounces of doré to be smelted and other grade-dependent costs. Ore hardness will also dictate the process operating costs through its effect on grinding energy consumption. Costs reflecting site utilities, water supply, run-of-mine pad re-handling, tails disposal and sustaining capital were accounted for separately and are not included in the process operating costs in Table 15.2.

Table 15.2: Processing operating costs

Process cost parameter	Value
Fixed unit costs at 2 Mt/a ($/t treated)	24.76 / 20.10
Grade dependent cost function	(0.277×(Au+Ag)^0.589)
Ore hardness dependent cost function	6.087/(1+0.0938×Al)
Additional cost for sulphide & mixed material ($/t treated)	3.60

Note: Au and Ag are gold and silver grades in g/t; Al is aluminium grade in %.

Source: Salares Norte CPR, 2021

On-going pre-stripping and mine development are based on the FS phase and ultimate pit designs. Table 15.3 summarises the base case input parameters used for the Whittle analyses to select a shell for the confirmation of the validity of the FS ultimate pit design. The FS Whittle shell generation and selection methodologies were used for the confirmation shell. Both the FS and 2021 confirmation shell were driven based on the high-value cut-off grade material, since the costs associated with the low-value material cannot be supported for an extended period. Other than metal price, these same parameters were used to generate the shell used to constrain the Mineral Resource estimate. Shell generation in both cases was based on the diluted block model grades but the Mineral Resource estimate was reported based on the in-situ block model grades.

Table 15.3: Pit optimisation – base case parameters

Parameter		Units	Value
Process plant		Mt/a	2
Au price		$/oz	1,300
Ag price		$/oz	17.50
Discount rate – annual		%	5.9
Mine economic parameters	Pit exit elevation	masl	4,435
	Whittle reference mining cost	$/t mined	2.154
	Mining cost by depth (up)	$/tkm	0.481
	Mining cost by depth (down)	$/tkm	0.228
	Average total unit cost	$/t mined	2.46
	Life of mine sustaining capital cost	$ million	5.9
	Mine sustaining capital cost	$/t mined	0.02
	G&A allocated to mining	%	22.4
	G&A allocated to mining	$ million/annum	6.51
	G&A allocated to mining	$/t mined	0.14
Whittle process cost & recoveries	Oxide base unit cost	$/t treated	24.76
	Additional mixed, sulphide costs	$/t treated	3.60
	Feed grade-dependent costs	$/t treated	
	Grind power cost – Al-dependent	$/t treated	
	Grade control	$/t treated	1.07
	Stockpile re-handle quantity	%	100
	Stockpile re-handle cost	$/t treated	0.70
	G&A allocated to processing	%	77.6
	G&A allocated to processing	$ million/annum	22.6
	G&A allocated to processing	$/t treated	11.28
	TSF re-handle cost	$/t treated	2.65
	Total fixed processing cost – oxide	$/t treated	40.46
	Total fixed processing cost – sulphide	$/t treated	44.06
	Life of mine sustaining capital cost	$ million	3.3
	Plant/facilities sustaining capital cost	$/t treated	1.64
	Whittle fixed processing – oxide	$/t treated	42.10
	Whittle fixed processing – sulphide	$/t treated	45.70
	Au recovery - variable head grade	%	Refer Item 13.3
	Ag recovery - variable head grade	%	Refer Item 13.3
Whittle selling costs	Au pay for	%	99.87
	Total Au treatment-refining	$/oz	2.96
	Au royalty	%	1
	Au royalty	$/oz	12.97
	Non-discretionary Sustaining Capital	$/oz	10.09
	Total Au selling cost	$/oz	26.02
	Ag pay for	%	99.5
	Total Ag treatment-refining	$/oz	1.36
	Ag royalty	%	1
	Ag royalty	$/oz	0.16
	Total Ag selling cost	$/oz	1.52
Pit slope angles	Slope angles	°	See Item 15.1.5

Source: Salares Norte CPR, 2021

Nested pit shells were generated for a range of revenue factors (RF) using the diluted indicated model grades for oxide and sulphide mineralisation, high-value cut-off grades, and the pit optimisation base case parameters (Table 15.3). Material classified as Inferred Mineral Resource was considered as waste for the shell generation.

Table 15.4 summarises the results of the high-value base case optimisation run for select pit shells. Shell 35 (RF 0.96, $1,248/oz Au) was selected, to confirm that the ultimate pit design is still valid because of the higher incremental strip ratio and minimal additional return associated with the higher RF 1.0 shell.

Table 15.4: Pit optimisation results

Pit shell	RF	Gold ($/oz)	Material (Mt)	Strip ratio	Feed (Mt)	Feed		Recovered		Recovered		Undis. CF Value ($M)
						(Au g/t)	(Ag g/t)	Au (%)	Ag (%)	Au (koz)	Ag (koz)	
1	0.22	286	109.4	12.8	8.0	7.63	79.58	94 %	70 %	1,839	14,250	1,915
5	0.24	312	112.9	12.6	8.3	7.57	78.34	94 %	70 %	1,906	14,665	1,981
10	0.34	442	119.1	12.1	9.1	7.33	75.84	94 %	70 %	2,018	15,530	2,084
15	0.44	572	128.5	11.5	10.3	6.86	74.34	94 %	70 %	2,143	17,321	2,186
20	0.54	702	141.8	11.3	11.5	6.48	75.78	94 %	70 %	2,254	19,680	2,274
24	0.62	806	145.2	11.2	11.9	6.35	75.35	94 %	70 %	2,283	20,252	2,291
25	0.64	832	324.7	18.8	16.4	6.22	63.79	93 %	69 %	3,054	23,071	2,655
26	0.66	858	330.6	18.5	16.9	6.09	64.49	93 %	69 %	3,091	24,145	2,676
30	0.74	962	346.9	18.5	17.8	5.95	64.81	93 %	69 %	3,170	25,456	2,712
31	0.84	1,092	355.7	18.5	18.3	5.88	64.05	93 %	68 %	3,212	25,714	2,725
32	0.94	1,222	378.6	18.5	19.4	5.71	62.91	93 %	68 %	3,300	26,634	2,739
35	0.96	1,248	381.2	18.5	19.5	5.68	62.77	93 %	68 %	3,310	26,796	2,740
36	0.98	1,274	393.4	18.8	19.9	5.64	62.19	93 %	68 %	3,345	27,024	2,741
40	1.00	1,300	393.8	18.8	19.9	5.64	62.10	93 %	68 %	3,347	27,041	2,741
41	1.10	1,430	409.7	18.9	20.6	5.54	61.06	93 %	68 %	3,398	27,460	2,738
46	1.20	1,560	428.3	19.2	21.2	5.45	61.18	92 %	68 %	3,440	28,294	2,726
Discounted	1.00	1,300	380.5	18.5	19.5	5.68	62.75	93 %	68 %	3,309	26,800	2,739

Note: RF - revenue factor; Recovered - process recovery; Undis.CF Value - undiscounted cashflow value for 2 Mt/a plant.

Source: Salares Norte CPR, 2021

To confirm the selection of pit shell 35, an alternative Whittle run using the “discounted” technique was conducted where the value of each bench is discounted at a 7.5 % annual rate with an advance rate of nine benches per annum (135 m). The resulting discounted RF 1.0 discounted shell is approximately the same as the selected base case pit shell 35 (Table 15.4), thus confirming the selection.

The key Modifying Factors used to estimate the Mineral Reserves are provided in Table 15.5. These are based on a combination of the FS, detailed engineering, and vendor contracts. Mining costs are based on contractor mining and include operating and sustaining capital costs. Non-mining costs include operating costs for processing, tailings disposal, administration, stockpile re-handle, and grade control. Sustaining capital for the process and tailings facilities are also included in the non-mining costs.

Table 15.5: Salares Norte – summary of material modifying factors

Factor	Units	Value
Gold price	$/oz	1,300
Silver price	$/oz	17.50
Strip ratio	waste:ore	13.8
Mine call factor	%	100
Mining recovery factor	%	100
Mining cost	$/t mined	2.10
Net smelter return (NSR) cut-off	$/t treated	47.69
Plant recovery – gold	%	92.7
Mill recovery – silver	%	67.6
Plant throughput	Mt/a	2

Note: Mining costs are excluding grade control costs since these are included in the NSR cut-off grade.

Source: Salares Norte CPR, 2021

As noted in Item 14.1.10, Gold Fields conducts an annual review of metal prices for Mineral Resource and Mineral Reserve reporting to monitor any significant changes that would warrant re-calibrating the price deck for strategic and business planning purposes. This review considers prevailing economic, commodity price and exchange rate trends, together with market consensus forecasts and Gold Fields' strategy and expectations for the mine operations. For Salares Norte, the Mineral Reserve metal prices are gold at $1,300/oz and silver at $17.50/oz.

15.1.4 Cut-off grades

As with the Mineral Resource cut-off, the Mineral Reserve cut-off is determined on a NSR basis. The cut-off value is influenced by the operating strategy, design and scheduling, and are therefore calculated annually.

The cut-off value used for the open pit Mineral Reserve estimate are calculated using the same methodology described in Item 14.1.10. This resulted in an average revenue cut-off grade of $47.69/t processed based on 1 % royalty, average process recoveries of 92.7 % for gold and 67.6 % for silver, refining costs of $2.96/oz for gold and $1.36/oz for silver and average process costs of $31.19/t treated, $4.40/t treated for grade control, and stockpile and tailings re-handle, and administrative costs of $10.64/t treated or $21.3 million per annum. Average mining costs were $2.10/t mined. There are slight differences in these, relative to the Mineral Resource, due to the impact of the variation in the material composition, in terms of weathering and grades for gold, silver and aluminium, which impacts process recovery and operating costs. Differences in metal prices contribute to the differences in selling and revenue.

The average NSR cut-off value used for the open pit Mineral Reserve estimate is $47.69/t ore.

15.1.5 Mine design

Selective mining unit

As part of the FS, NCL Ingeniería y Construcción SpA (NCL) conducted a SMU analysis to determine the block size for resource modelling and the bench height for mining. Height is critical because a high vertical development rate is required for the upper waste portion of the deposit and the ore zone requires a selective mining process to minimise dilution of ore feed to the plant.

Detailed analyses were conducted on six different block height models generated (5, 6, 7, 12, 14, and 15 m). Bench heights above 15 m were not evaluated in detail because they require a step change in equipment. These blocks were then combined as required to evaluate three different mining scenarios:

- Scenario 1: 15 m benches in waste and three 5 m flitches in ore
- Scenario 2: 14 m benches in waste and two 7 m flitches in ore
- Scenario 3: 12 m benches in waste and two 6 m flitches in ore.

Preliminary mine plans and cashflow models were developed for the three scenarios. The plans used the same sequencing strategy, based on a maximum of nine benches per year, increasing the total movement rate in the pre-production stage and prioritising the advancement of BP Phase 3 where the higher grades are located. As a result of this analysis, the decision was made to mine waste on 15 m benches and mine ore on three flitches at 5 m within each bench.

With 15 m benches, the required development rate is achieved by mining nine benches per year with less risk. Mining the 15 m benches in 5 m flitches in the ore zone allows production to be maintained while minimising dilution and loss. The SMU for the model was set at 10 mX x 10 mY x 5 mZ to accommodate both bench heights. This configuration supports medium-sized diesel equipment which is in line with employing a contract miner.

Dilution and mining losses

In-situ and diluted grades are included in the block model. The in-situ grades reflect the actual estimated grades for the portion of the block which falls within the estimation domain. A proportion field was also included in the model to account for the percentage of the block within an estimation domain. Diluted grades were calculated based on weight averaging the in-situ grade and the remaining portion of the block at a zero grade. For mine planning and Mineral Reserve estimation, the diluted gold and silver grades were used. No additional dilution and ore loss was applied.

Pit design parameters

Key parameters used in the open pit design are shown in Table 15.6 and Table 15.7. These parameters are based on mining on 15 m benches with waste mined in a single pass and ore benches split into three 5 m flitches.

Table 15.6: Mine design parameters – general

Mine design parameters	**Unit**	**Value**
Haul road width	m	20–32
Maximum haul road grade	%	10
Bench height	m	15 (5 m flitches at ore)
Nominal minimum mining phase width	m	100
Continuous inter-ramp vertical height	m	variable
Safety berm	m	30

Source: Salares Norte CPR, 2021

Table 15.7: Mine design parameters – geotechnical

Parameter		Batter height (m)	Batter angle (°)	Berm width (m)	Inter-ramp angle (°)	Max. slope height (m)
Brecha Principal (BP)	East zone DB	30	70	11.0	54	150
	West zone DB	30	75	15.5	52	150
	Northeast zone SB	15	70	7.5	47	120
	West zone SB	15	75	9.0	49	120
	East zone SB	15	60	9.0	40	45
	East zone SB (SH)	15	55	8.5	38	45
	Central zone SB (SH)	15	55	8.5	38	45
Agua Amarga (AA)	Northeast zone DB	30	70	11.0	53	150
	South zone DB	30	75	16.0	51	150
	Northeast zone SB	15	70	9.0	46	120
	Southwest zone SB	15	75	11.0	45	120
	West zone SB (upper)	15	75	11.0	46	120
	West zone SB (middle)	15	75	9.5	48	120
	West zone SB (lower)	15	55	8.5	38	45
	Southeast zone SB 15	15	60	12.5	35	120
	South zone SB (SH)	15	60	9.0	40	45

Note: SB - single bench, DB - double bench, SH - steam heated

Source: Salares Norte CPR, 2021

The haul road width of 32 m accommodates the selected 180 tonne trucks for dual lane traffic. A maximum road gradient of 10 % was incorporated into the designs. In the lower portion of the pit, the haul roads were changed to single lane and the width reduced to 20 m, where there were fewer than 12 trucks per hour based on the traffic analysis and for a maximum of four benches.

When the maximum allowable height of a geotechnical zone is reached, a 30 m wide safety berm is included in the design, as per the geotechnical recommendations.

Material characteristics

The material characteristics used for equipment productivity calculations are summarised in Table 15.8. Density values are based on the average block model values for the various materials within the mine production schedule.

A material moisture content of 3 % and a swell factor of 30 % was deemed appropriate based on NCL's experience in the region.

Table 15.8: Material characteristics

Parameter	Units	Ore	Waste type 1	Waste type 2
Dry bank density	t/m³	2.32	1.91	2.23
Material handling swell	%	30	30	30
Moisture content	%	3	3	3
Dry loose density	t/m³	1.78	1.47	1.72
Wet loose density	t/m³	1.84	1.51	1.77

Source: Salares Norte CPR, 2021

Mine configuration

Adjustments to the pit design were made based on the initial geotechnical recommendations and final stability analysis. Steam heated material is exposed in the east wall of BP, so the inter-ramp slope height was limited and additional safety berms were included. The pit is approximately 1,750 m long and 1,000 m wide and covers approximately 123 ha. There are two pit bottoms at 4,195 m above sea level in BP and at 4,210 m above sea level in AA. The north side of the AA portion has the highest wall at approximately 470 m.

Two WSFs are located at the south and north ends of the pit. WSF South is built during pre-stripping of waste and during operation, ore stockpiles and the TSF will be constructed on it. WSF North is developed throughout the mine life.

Two pit exits provide access to the south to the run-of-mine pad, stockpile area and primary crusher and to the north to WSF North, which is the primary waste disposal site starting in Year 1.

All ore is re-handled from the run-of-mine pad or stockpiles to the crusher with a front-end loader. A 100,000 tonne capacity run-of-mine pad area at 4,520 m above sea level will receive the highest grade ore coming from the mine. There will also be five ore stockpiles on WSF South with the following grade ranges.

- High Gold Stockpile (HG): Au 5.5 g/t; Ag 0 g/t
- Intermediate Gold – High Silver (IGHS): 3.0 g/t Au < 5.5 g/t; Ag 100 g/t
- Intermediate Gold – Low Silver (IGLS): 3.0 g/t Au < 5.5 g/t; Ag <100 g/t
- Low Gold – High Silver (LGHS): Au <3.0 g/t; Ag 100 g/t
- Low Gold – Low Silver (LGLS): Au <3.0 g/t; Ag <100 g/t

The heavy mining equipment (HME) workshop is located to the west of the process plant in an area that does not interfere with the Rio Baker exploration target. Explosives will be stored at the powder magazine located to avoid interference with the HME access road and Rio Baker exploration target. Sizing and layout of the magazine considers the production schedule and Chilean regulatory requirements.

The final mine site layout as expected on completion of the life of mine plan is shown in Figure 15.1.

Mine phase design

Six mining phases were developed based on a sequence analysis, which mines BP initially by progressing through four consecutive operational phases from northwest to southeast. Mining then moves to AA, which is mined in two phases advancing from northwest to southeast. Phase 6 is the final expansion of AA which results in the merging of the AA and BP pits.

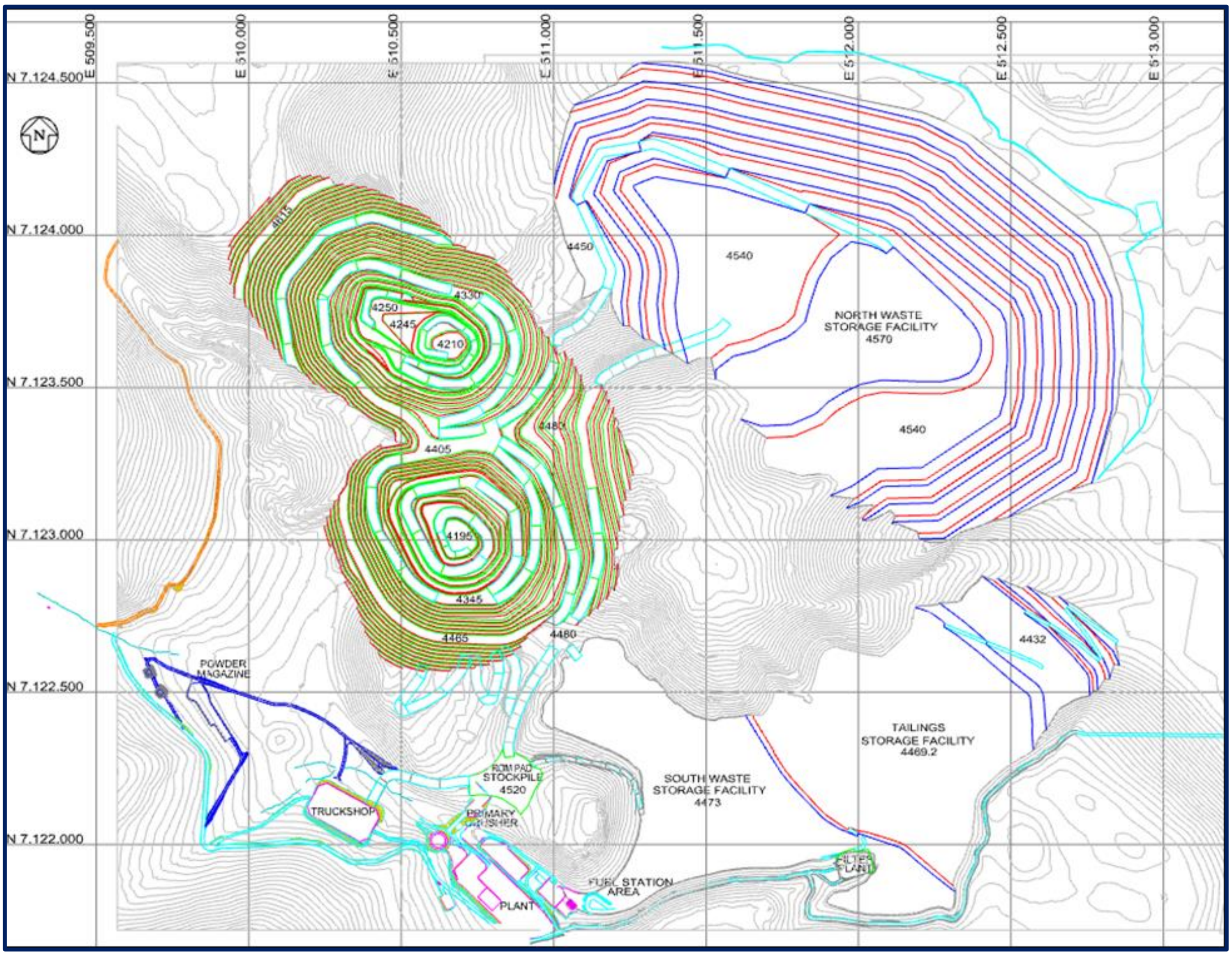
Ore stockpiling strategy

All mined ore will be hauled to either the run-of-mine pad or one of five grade stockpiles. Ore will be re-handled, with a front-end-loader and 40 tonne rucks as required to feed the primary crusher. The plant feed strategy is based the highest-grade material available from the mine or stockpiles sent to the primary crusher, but with a limit on the silver head grade of 80 g/t for the first wo years and 90 g/t for the third year.

A run-of-mine stockpile close to the crusher is used for the high-grade ore coming from the mine and blending purposes. It has a capacity of 100,000 tonne, corresponding to approximately 2.4 weeks of plant feed. The criteria adopted for the high-grade ore coming from mine is that half of it will go to the run-of-mine pad area and the other half will go to the appropriate grade stockpiles on WSF South.

Stockpile capacity is based on including inferred material as ore and having space available for future resource additions. The stockpiles reach maximum capacity of 8.9 Mt at the end of the mine life in Year 7.

Figure 15.1: Final mine site layout



Source: Salares Norte CPR, 2021

Drill and blast

According to the recommended drill patterns, blasting powder factors range between 91 g/t and 149 g/t for waste and 209 g/t for ore. Drilling requirements were estimated using a drill fleet consisting of production and auxiliary diesel equipment. Production rigs are capable of drilling up to 271 mm diameter holes and auxiliary (pre-splitting) holes up to 165 mm.

Blasting is done by a separate contractor who is responsible for the supply, storage, management of facilities, equipment, loading and the blasting services. Contractor quotations were used to develop the consumable and cost estimates.

15.1.6 Mine planning and schedule

Mine and process plant production schedules are based on an update of the FS schedules, to reflect the end-of 2021 status. A plant production schedule was developed to support the reporting of Mineral Reserves based on the inferred material going to stockpile as waste.

Scheduling for the mine was based on meeting economic and operational criteria. The goal of the mine schedule is to complete the pre-stripping during 2022 and have sufficient exposed and stockpiled ore to meet the plant feed requirements for commissioning and initial production. Pre-stripping commenced during 2021 and a total of 22.8 Mt was moved during the calendar year. The remaining pre-strip of 27.8 Mt is scheduled to be completed during 2022.

Plant feed requirements are based on taking a full year (Year 1) to ramp-up to full production of 2 Mt per annum, starting in Year 2. During Year 1, the plant feed requirement is 1.3 Mt (64 % of full production).

Table 15.9 summarises the mine production schedule.

Table 15.9: Mine production schedule

period	Ore (kt)	Ore (Au g/t)	Ore (Ag g/t)	Other (kt)	Waste total (kt)	Total (kt)
Y-1	138	4.12	3.44	-	36,262	36,400
Y01	4,210	6.14	62.62	-	35,790	40,000
Y02	3,218	6.90	84.19	-	39,782	43,000
Y03	3,118	3.86	58.38	-	40,882	44,000
Y04	2,553	5.41	51.62	-	41,447	44,000
Y05	1,915	3.05	108.45	-	42,085	44,000
Y06	2,065	5.31	21.99	-	37,788	39,854
Y07	3,545	4.68	31.24	-	13,286	16,830
Total	20,763	5.19	58.41	-	287,321	308,084

Source: Salares Norte CPR, 2021

The mine production schedule was based on a maximum mining rate of 44 Mt per annum without exceeding a vertical development rate of nine benches (135 m) per phase per year. These limits in combination with the orebody geometry result in the mine production exceeding the required plant feed rate allowing the operation to use a stockpile strategy which brings high-grade ore forward.

During the remaining pre-strip period, a total of 32.7 Mt will be mined. Waste is hauled to WSF South to construct the platforms for the TSF, run-of-mine pad and stockpiles. Waste is hauled to WSF North starting in Year 1.

15.1.7 Processing schedule

Process plant scheduling takes into consideration the ramp-up period, Year 1 and the stockpiling strategy of the highest-grade ore available from the mine or in the stockpiles sent to the primary crusher, provided it meets the maximum silver grade constraints of 80 g/t during Years 1 and 2, 90 g/t in Year 3 and 100 g/t thereafter.

Table 15.10 summarises the mill feed and metal production schedule.

Table 15.10: Processing schedule

Period	Tonnage (kt)	Grade		Recovered		Produced	
		Au (g/t)	Ag (g/t)	Au (%)	Ag (%)	Au (koz)	Ag (koz)
Y-1	0	0.00	0.00	0 %	0 %	0	0
Y01	800	8.23	69.84	94.5 %	68.0 %	200	1,267
Y02	1,976	9.21	67.73	94.9 %	70.0 %	555	3,051
Y03	2,000	9.09	75.19	95.3 %	71.0 %	554	3,431
Y04	2,000	9.20	64.30	94.8 %	71.1 %	562	2,945
Y05	2,000	4.60	79.53	94.4 %	70.4 %	278	3,646
Y06	2,000	5.54	56.60	91.3 %	70.1 %	324	2,379
Y07	2,000	7.27	38.79	0.0 %	0.0 %	426	1,490
Y08	2,000	2.02	90.25	79.2 %	64.2 %	103	3,726
Y09	2,000	1.68	28.00	85.7 %	61.6 %	92	1,110
Y10	2,000	1.11	59.02	89.1 %	69.2 %	64	2,627
Y11	1,987	1.03	19.97	86.1 %	55.0 %	57	701
Total	20,763	5.19	58.41	92.1 %	67.2 %	3,214	26,374

Source: Salares Norte CPR, 2021

15.1.8 Classification criteria

Salares Norte's Mineral Reserves are classified as either Proven or Probable in accordance with the CIM Definition Standards for Mineral Resources & Mineral Reserves.

Criteria for the declaration of the Mineral Reserve include:

- Confidence classification assumes annual production-scale estimation and open pit mining.
- The mine and mill production schedules were used as the basis of the Mineral Reserve estimate.
- Mineral Reserves are classified as Probable and are based on Indicated Mineral Resource. Measured Mineral Resources have not been defined so Proven Mineral Reserves are not included in the estimate.
- Mineral Reserves are reported using run-of-mine grades and tonnage as delivered to the processing facilities and are therefore fully diluted.
- A NSR cut-off of $47.69/t treated.

15.1.9 Economic assessment

The basis for establishing economic viability is discussed in Item 22.

15.2 Mineral Reserves as at 31 December 2021

The Salares Norte Mineral Reserves as at 31 December 2021 are summarised in Table 15.11. The Mineral Reserves are 100 % attributable to Gold Fields. The point of reference for the Mineral Reserves is ore delivered to the processing facility.

Table 15.11: Salares Norte - summary of gold and silver Mineral Reserves as at 31 December 2021 based on a gold price of $1,300/oz and a silver price of $17.50/oz

	Tonnes (kt)	Grade (g/t)	Gold (koz)	Grade (g/t)	Silver (koz)	Cut-off grades ($/t NSR)	Metallurgical recovery (%)	
		Au		Ag			Au	Ag
Open Pit Mineral Reserves								
OP Proven Mineral Reserves	0	0	0	0	0	0	0	0
OP Probable Mineral Reserves	20,763	5.2	3,467	58.4	38,990	47.69	92.7	67.6
Total Salares Norte Mineral Reserves 2021	20,763	5.2	3,467	58	38,990	47.69	92.7	67.6
Total Salares Norte Mineral Reserves 2020	21,079	5.1	3,476	57.9	39,263			
Year on year difference (%)	-1.5%	1.3%	-0.3%	0.8%	-0.7%			

Notes:
a) Rounding of figures may result in minor computational discrepancies.
b) Quoted as mill delivered metric tonnes and run of mine grades, inclusive of all mining dilutions and metal losses except plant recovery. Metallurgical recovery factors have not been applied to the reserve figures. The approximate metallurgical recovery factor is 92.7 % for gold and 67.6 % for silver. The metallurgical recovery is the ratio, expressed as a percentage, of the mass of the specific mineral product recovered from ore treated at the process plant to its total specific mineral content before treatment. The recoveries for Salares Norte will vary according to the mix of the source material (e.g., head grade, oxide, fresh and deposit) and method of treatment.
c) The metal prices used for the 2021 life of mine Mineral Reserves are based on a gold price of $1,300 per ounce and a silver price of $17.50/oz. Open pit Mineral Reserves at Salares Norte are based on optimised pits using appropriate mine design and extraction schedules. The gold and silver prices used for Mineral Reserves is discussed in Item 19.
d) Dilution relates to planned and unplanned waste and/or low-grade material being mined and delivered to the process plant. The grade estimation process utilises a mining dilution of 13 % which is equivalent to 1.8 m of over-excavation of the ore/waste contact.
e) The mining recovery factor relates to the proportion or percentage of ore mined from the defined orebody at the metal prices used for the declaration of Mineral Reserves. This percentage will vary from mining area to mining area and reflects planned and scheduled reserves against actual tonnes, grade and metal mined, with all modifying factors and mining constraints applied. A mining recovery factor of 100 % is applied since the diluting material is expected to contain metal and the lack of operational empirical information.
f) The cut-off grade varies by open pit, head grade, respective costs, depletion schedule, and ore type. The overall average cut-off grade value applied in the planning process is a net smelter return of $47.69/t NSR.
g) An ounces-based mine call factor (metal called for, over metal accounted for) of 100 % has been applied at Salares Norte. The Mineral Reserves are estimated at a point in time and can be affected by changes in the gold price, US Dollar currency exchange rates, permitting, legislation, costs and operating parameters.
h) Salares Norte is 100 % attributable to Gold Fields and is entitled to mine all declared material located within the property's mineral leases and all necessary statutory mining authorisations and permits are in place or have reasonable expectation of being granted.

Source: Salares Norte CPR, 2021

The Salares Norte Mineral Reserves are the economically mineable part of the Indicated Mineral Resources based on the current understanding of the project and the FS completed in 2019, and a Mineral Reserve gold price of $1,300/oz and a silver price of $17.50/oz to justify their economic viability at 31 December 2021 (refer to Item 22 for details on the economic analysis).

The EIA for the mine development was approved in December 2019 and the project was formally approved for construction by the Gold Fields Board in April 2020. All sectorial permits required for the commencement of the construction of the processing facility and pre-stripping of the mine have been secured. Permitting applications are ongoing in support of advancing the project through to construction and production.

Extensive sensitivity analyses have been conducted on the impact to tonnes and contained and recovered metal from changes in price, costs, and grade. These analyses have shown that metal price has the greatest impact, mainly from the conversation of low-grade material between ore and waste. Since BP is less sensitive, it reduces the project risk by providing 73 % of tonnes and 75 % of recovered gold. Increases in costs or decreases in gold price decrease Mineral Reserves at the project. Based on the analyses that have been conducted, the risks associated with the Modifying Factors are within industry standards.

There is an elevated risk with AA because of the requirement to relocate the chinchillas in the area. If this cannot be achieved, AA would not be viable so it would no longer contribute to the Mineral Reserve. However, because of the high-grades at BP the project would still be viable but the project life would be reduced.

The development of AA as an open pit is dependent on the successful relocation of the chinchillas in this area. If the relocation cannot be executed, then AA will not contribute to the Mineral Reserve. Production until year 6 is not subject to any changes in Agua Amarga.

15.3 Audits and reviews

In addition to Gold Fields' routine internal peer review and auditing of processes relating to the estimation of Mineral Resources and Mineral Reserves as disclosed in Item 14.3, the 31 December 2021 Mineral Reserve estimate, including the FS and processes for estimation of Modifying Factors, metallurgical recoveries and geotechnical parameters, was externally (independently) audited by Optiro in 2019.

Issues identified during audits have been or are being addressed in ongoing updates. No critical or 'fatal flaw' type issues were identified.

15.4 Comparison with 31 December 2020 to 31 December 2021 Mineral Reserve

The net difference in Mineral Reserves between 31 December 2020 and 31 December 2021 is gold -9 koz or -0.2 % (Table 15.12) and silver 2.2 Moz or +5 % (Table 15.13).

Table 15.12: Net difference in gold Mineral Reserves between 31 December 2020 and 31 December 2021

Proven and Probable Reserve	**Unit**	**Change**	**Run-of-mine gold**
As at 31 December 2020	koz		3,476
Mining depletion	koz	-	
Economics	koz	-0.3 %	-9
Discovery	koz	-	
Conversion	koz	-	
Inclusion / exclusion	koz	-	
As at 31 December 2021	koz	-0.3 %	3,467

Source: Salares Norte CPR, 2021

Table 15.13: Net difference in silver Mineral Reserves between 31 December 2020 and 31 December 2021

Proven and Probable Reserve	**Unit**	**Change**	**Run-of-mine silver**
As at 31 December 2020	Moz		43.662
Mining depletion	Moz	-	
Economics	Moz	+5 %	2.173
Discovery	Moz	-	
Conversion	Moz	-	
Inclusion / exclusion	Moz	-	
As at 31 December 2021	Moz	+5 %	45.835

Source: Salares Norte CPR, 2021

Changes in the Mineral Reserve estimate since 2020 are due to economics, a $100/oz increase in gold price from $1,200/oz to $1,300/oz and increases in mining, administration, and processing costs based on detailed engineering, vendor contractors, and current labour costs from NSR $43.16/t processed to $47.69/t processed.

16 Mining methods

16.1 Mining methods

Mining at Salares Norte will be carried out using conventional open pit methods. The life of mine plan is based on a contractor mining model. Grade control drilling will precede production drilling and blasting.

Waste will be mined on 15 m benches in a single pass with ore benches split into three 5 m flitches. With 15 m benches, the required development rate is achieved by mining nine benches per annum. Mining the 15 m benches in 5 m flitches in the ore zone also allows production to be maintained while minimising dilution and loss. The average mining rate is 39 Mt/a with the maximum mining rate of 44 Mt/a achieved in Years 3 to 5.

Mine equipment and facility requirements are based on working seven days per week, 365 days per year with 15 days lost due to weather conditions. Each day consists of two 12-hour shifts. Four mining crews will rotate to cover the operation (two working and two off) and an 8 x 6 roster. Reserve and TSF re-handling are performed by the mining contractor while the mine is operating using the mine equipment, with the associated costs assigned to processing. When all the process feed is from stockpiles, the ore and TSF re-handling will be done by the plant staff using owner equipment.

The Qualified Person considered the following factors when selecting the open pit mining method:

a) The geotechnical and rock behaviour models.

b) The hydrological surveys and models.

c) The Modifying Factors including strip ratios and the open pit cut-off grades.

d) The mining fleet configuration and equipment specifications.

e) Practical mining rates, selective mining unit dimensions, mining dilution and mining recovery.

16.2 Geotechnical parameters

The geotechnical rock mass assessment for the open pit area was based on geotechnical logging obtained from 304 drillholes (81,260 m of drill core) obtained between 2013 and 2019. This comprised 72 geotechnical drillholes (14,197 m), 225 geological drillholes (67,063 m) and 7 metallurgical drillholes (1,748 m).

The geotechnical parameters were collected by MGFSN according to the core logging geotechnical procedure prepared by SRK. SRK reviewed and validated the geotechnical database and found it adequate for the feasibility study and stability analysis of the open pit. The collected parameters were used to estimate the geotechnical rock mass quality according to the Bieniawski rock mass rating (RMR), Laubscher RMR, Q System and geological strength index (GSI) geotechnical classification systems.

The structural domains assessment was performed by analysing the structural data obtained from 289 drillholes: 16 of them oriented by Televiewer, 177 oriented using conventional methods and 96 holes oriented by both Televiewer and conventional methods.

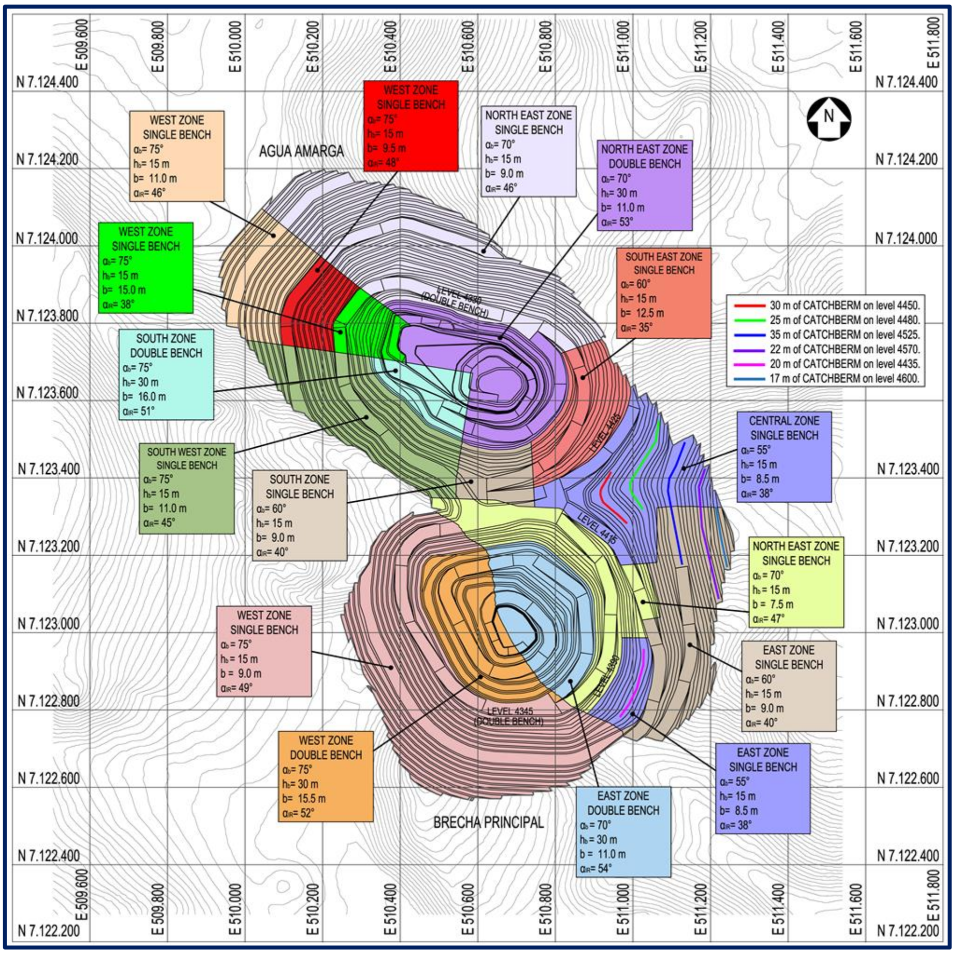
The definition of the basic geotechnical units was performed by SRK, which separates the rock mass present at Salares Norte into basic geotechnical units, each one with a specific geotechnical characteristic. These were determined according to available geological and geotechnical information and the results of laboratory tests.

The strength and deformability were estimated based on laboratory testing on 865 samples carried out by SGS Lab Chile (2017-2018). Of these, 244 (172) samples were tested by uniaxial compression (UCS), 458 (292) by triaxial compression (TX) and 163 (90) by indirect traction (TI, also referred to as the Brazilian test). This testing campaign also included 29 density, 173 elastic modulus, 147 Poisson modulus and 95 direct shear measurements.

SRK was responsible for processing and compiling laboratory results for analysis and final geotechnical design, but also the hands-on supervision of the sample preparation and test validation at the laboratory.

SRK developed the geotechnical design based on geotechnical information obtained from investigations and also performed detailed stability analysis on the preliminary design and updated the geotechnical sectors and slope recommendations for the final pit design as shown in Figure 16.1.

Figure 16.1: Ultimate pit design geotechnical sectors



Note: αb - bench angle, hb - bench height, b - berm width, αIR - inter-ramp angle (toe to toe).
Source: Salares Norte CPR, 2021

The implementation of the design requires controlled blasting and pre-splitting techniques. Additionally, the maximum inter-ramp height shall not exceed 150 m in the double bench zones, 120 m in oxide and sulphide zones, and 45 m in the steam-heated zones (alteration zones preserved in the highest level of the deposit). Practical experience indicated that it is not advisable to use higher inter-ramp heights, mainly because it makes slope management and slope control difficult and worsens any eventual stability problem that could affect the inter-ramp slope.

The Qualified Person’s opinion of the 2021 geotechnical work is:

a) Salares Norte has completed all appropriate testing for the current life of mine reserve and continues to test all new significant areas.

b) The quality of the sample preparation and test validation is adequate to provide robust data for modelling.

c) Geotechnical structural domains and lithologies are based on core logging and modelling following industry leading procedures and methodologies.

d) The quality of the geotechnical studies, modelling and design outcomes is adequate to support the Mineral Resource and Mineral Reserve estimates.

16.3 Hydrological models

Groundwater within the mine-process plant area moves from west to east following the general topography, mainly through a low permeability fractured rock media composed mostly from basaltic andesites (K ~ 10^{-4} m/d to 10^{-2} m/d), with some areas in which flow occurs through more permeable ignimbrites (K ~ 1 m/d to 10 m/d). Advanced argillic alteration is identified around the AA and BP deposits, which coincides with a hydrothermal breccia unit, conceptualised as a very low permeability zone (K ~ 10^{-5} m/d to 10^{-4} m/d). Sub-vertical geological structures cut across the hydrothermal breccia in the northwest-southeast, east-west, north-south and southwest-northeast directions, adding an important amount of transmissivity in the northwest-southeast and east-west directions.

The total recharge in the study sub-basin is estimated to be 20 ℓ/s (SRK, 2019), with an average recharge rate of 4.9×10^{-5} m/d (18 mm/a) and an average infiltration coefficient of 0.13. The relatively low recharge explains the existence of a rather deep groundwater system (70 m to 146 m below ground level). The natural recharge discharges entirely to the west into the Salar Grande plain as groundwater flow through andesites and ignimbrites. Groundwater divides are assumed to exist to the north, west and south of the study area in accordance with the catchment limits. The piezometric data shows relatively stable groundwater levels, indicating that the current groundwater system is in equilibrium. No anthropogenic influence exists around the study area to the date of this study.

The hydrogeological units were defined according to the identified lithological units, after analysing the influence of the alteration and mineralisation processes on the hydraulic parameters. The hydrogeological units correspond to groups of lithological units as indicated in Table 16.1, which also shows the associated hydraulic conductivity ranges and storage estimated values. The hydraulic conductivity values are mainly based on field estimates derived from hydraulic testing presented in Item 18.4.1. Given that no long-term transient response has been observed, storage ranges are based on typical values taken from bibliographic sources.

For effects of the numerical model, the hydrogeological units were incorporated using zones associated to the lithological units to address the heterogeneity of the hydraulic properties.

Table 16.1: Hydrogeological units and estimated hydraulic parameter ranges

Hydro-geological units	Associated lithological units	Hydraulic conductivity (m/d)		Specific yield (%)		Specific storage (ℓ/m)	
		Min	Max	Min	Max	Min	Max
UH-3	Unconsolidated sediments and ignimbrite	1.0E-01	10	1	15	1.00E-05	1.00E-03
UH-4a	Basaltic and porphyritic andesite, and porphyritic dacite	1.0E-04	1.0E-02	0.05	1	1.00E-08	1.00E-06
UH-4b	Hydrothermal breccia	1.0E-05	1.0E-04	0.05	1	1.00E-08	1.00E-06
UH-4c	Basal andesite		< 1.0E-04	0.05	1	1.00E-08	1.00E-06
E-1	NW-SE and W-E faults	1.0E-02	1	0.5	1	1.00E-08	1.00E-06
E-2	SW-NE and N-S faults		< 1.0E-02	0.5	1	1.00E-08	1.00E-06

Source: Salares Norte CPR, 2021

Based on numerical modelling the maximum calculated groundwater inflows of around 2.6 ℓ/s are expected during the excavation period for AA and BP as a whole, with long term values of 1.4 ℓ/s and 0.4 ℓ/s. The inflows into BP are expected to be around four times higher than for AA, given the higher frequency, extension and continuity of transmissive northwest-southeast and east-west geological structures around the BP area and to its slightly higher excavation depth below the pre-mining water table.

Given that a pseudo steady state regime starts developing after the end of the excavation process, the reduction in passing groundwater flow into the Salar Grande plain ends up being roughly equal to the groundwater inflow into the pit lakes (i.e., 1.4 ℓ/s and 0.4 ℓ/s). These reductions are considered neglectable with respect to the Salar Grande total recharge, estimated to be 500 ℓ/s . It is concluded that the excavation process will have a neglectable effect on the hydrogeology of the Salar Grande basin.

In addition, the 2018 hydrogeological study completed by SRK as part of the Salares Norte FS indicated that the high evaporation rate will be approximately the same as the groundwater inflow rates, resulting in a dry operation. Dewatering measures are not required as part of the design of the operation. However, it will be important to define the potential location of accumulation ponds where groundwater inflows to the pit can be stored and evaporated or used for dust suppression.

The Qualified Person's opinion is that all appropriate geotechnical and hydrogeological parameters have been suitably considered and risk assessed to support the mining method selection and extraction sequencing at Salares Norte and this information is embedded in the sites ground control management plan which is routinely updated as new empirical information becomes available.

16.4 Mining fleet and labour requirements

Major mine equipment requirements are summarised in Table 16.2. Ancillary equipment to support mining activities include an excavator, lube truck, service truck, lowboy truck, tyre handler and a mobile crane. All major mine equipment is diesel.

Drill and blasting is performed by a separate contractor who is responsible for the supply, storage, management of facilities, equipment, loading and blasting services.

Table 16.2: Total mining equipment requirements, per year

Mining equipment	Y-1	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
Front end loader 994K	2	3	3	3	3	3	3	1					
Hydraulic PC5500 backhoe	2	2	2	2	2	2	2	1.7					
Haul truck CAT 789D	13	18	18	18	18	18	18	10					
Flexi Roc D65 Drill	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5					
Pit Viper 271 Drill	2	2	2	2	2	2	1	0.25					
Front end loader 980K		3	3	3	3	3	3	3	3	3	3	3	2
Haul truck 40 t		3	6	3	3	3	3	2	4	3	3	3	2
Bulldozer D10T2	3	3	3	3	3	3	3	3					
Wheel dozer 834k	2	2	2	2	2	2	2	2					
Motor grader 16M3	2	2	2	2	2	2	2	2					
Water truck 777GWT	2	2	2	2	2	2	2	2					

Source: Salares Norte CPR, 2021

The loading fleet consists of two 28 m³ hydraulic excavators and three 24 m³ front-end loaders (FEL) that are also used for general mine services such as cleaning waste piles, finishing benches and situations where hydraulic shovels are less productive. This fleet was selected based on the productivity required for waste removal to reach the ore in each phase. Approximately 93 % of the total 308 Mt mined is waste, so efficient loading is critical to achieving the forecast production and costs.

Ore and tailings re-handling is performed with a dedicated fleet of 7 m³ FELs. Ore re-handling consists of moving ore from the run-of-mine pad or grade stockpiles to the crusher. Tailings is moved from the filter plant to the TSF.

Loading and re-handle fleet requirements are based on productivity and operating hours calculated using industry standard operational metrics and methodologies. Detailed estimates were developed for each equipment type and period.

Waste and ore are hauled from the pit is by 180 tonne trucks. Re-handling of ore from the stockpiles and tailings from the plant to the TSF will be done by a dedicated fleet of 40 tonne trucks.

For both fleets, production capacities and operating hours were calculated on an annual basis taking into consideration the truck size, haulage profiles, cycle times, availability, utilisation, lost time and other relevant factors. These estimates were developed for each combination of material type and loading unit.

As part of the FS, a congestion analysis was conducted using an Arena® simulation model. This analysis showed that the production targets are achievable with the planned fleets.

Ancillary equipment supports the major production units to provide a safe and clean working environment. Primary duties assigned to the ancillary equipment include:

- Mine development work including access roads, drop cuts, temporary service ramps and safety berms.
- Waste rock storage area controls, including maintaining access to the dumping areas and the operating surface.
- Ore stockpile area controls, including maintaining access to the stockpile area and operating surfaces.
- Maintenance and clean-up of the mine and waste storage areas.
- Maintenance and clean-up of water diversion channels around the dumps and pit.

Mine personnel include all salaried and hourly employees working in mine supervision, technical services, administration, operations and maintenance split between Gold Fields and the mining contractor. In Year-5 the personnel requirement peaks at 406.

MGFSN staff are responsible for mine management, including managing the contractor, engineering, geology, administration, regulatory compliance and other technical services. Mine contractor staff are responsible for supervising the mine operation from pioneering through to the end of the plant life. After mining is complete, MGFSN will be responsible for ore and tailings re-handle.

Equipment operators comprise most of the hourly employees. Maintenance of the mining equipment is the responsibility of the mining contractor from pre-production through the end of the operation of the process plant.

17 Recovery methods

17.1 Flow sheet and design

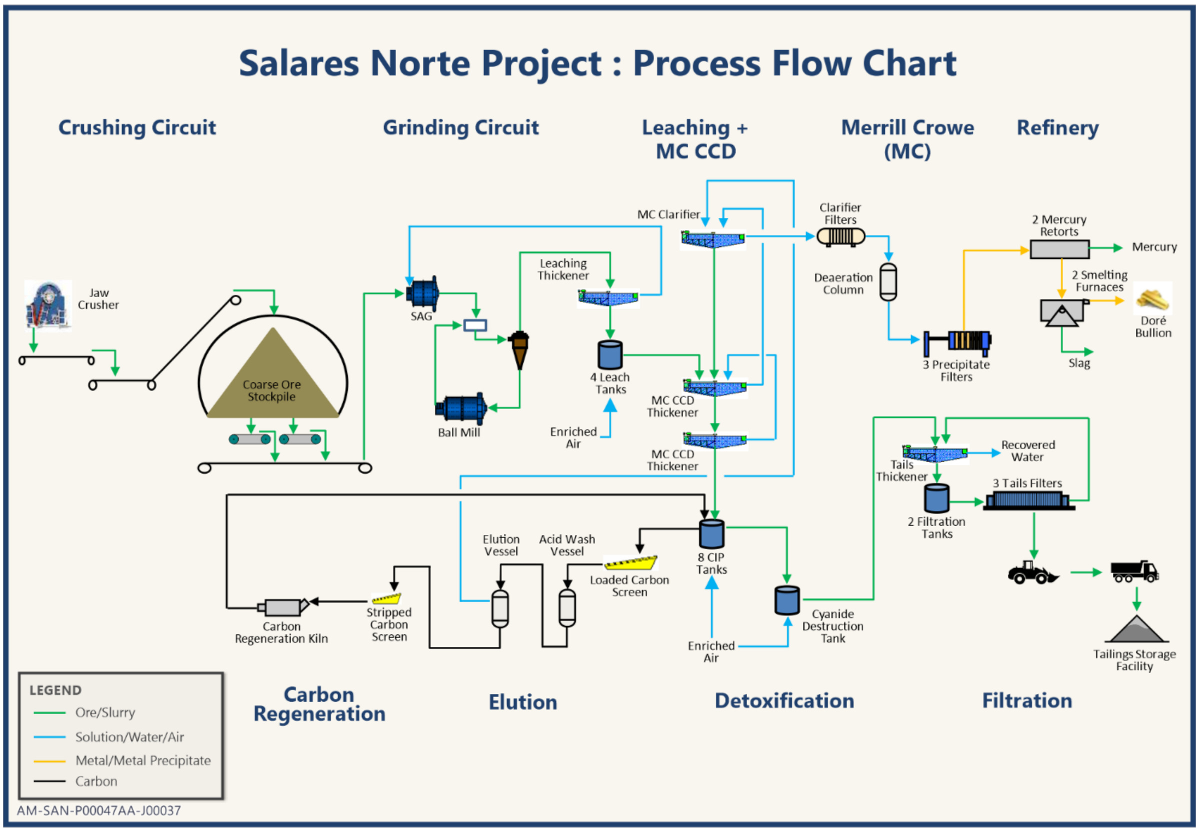
The selected process flowsheet incorporates cyanide leaching with Merrill-Crowe recovery from pregnant solution after CCD, followed by a scavenger CIP circuit. With the sulphide mineralisation being refractory, virtually all the material treated in the process plant through most of the mine life will be oxide. The oxide mineralisation is characterised mineralogically by mostly fine and free gold yielding high gold cyanide leach extractions. The silver also leaches readily in cyanide solution.

Heap leaching was discarded as a primary processing option due to the high grades of the mineralisation, water demands and long-term maintenance of heap facilities, which all weigh against a heap leach process in comparison with a conventional milling circuit.

For standard milling practice, the high gold and silver grades along with the high silver-gold ratio (about 10:1) would traditionally indicate the use of Merrill-Crowe zinc precipitation as the process of choice. At the same time, given the high mineralisation grades, which will cause high pregnant solution grades, achieving low tails solution losses of gold and silver will be challenging for a Merrill-Crowe circuit within reasonable capital cost bounds. Tails solution losses are a key financial driver of the process route and project economics. Use of activated carbon with CIP is the prime way to ensure low tails solution losses. This contributed to selecting a flowsheet option comprising leaching with removal of pregnant solution to Merrill-Crowe zinc precipitation, followed by CIP used as a CCD tails scavenger.

The Salares Norte plant, located south of the main pit at an elevation of around 4,500 m, is designed to process 2 Mt/pa. A schematic flowsheet of the hybrid circuit is shown in Figure 17.1.

Figure 17.1: Hybrid leach-CIP flowsheet



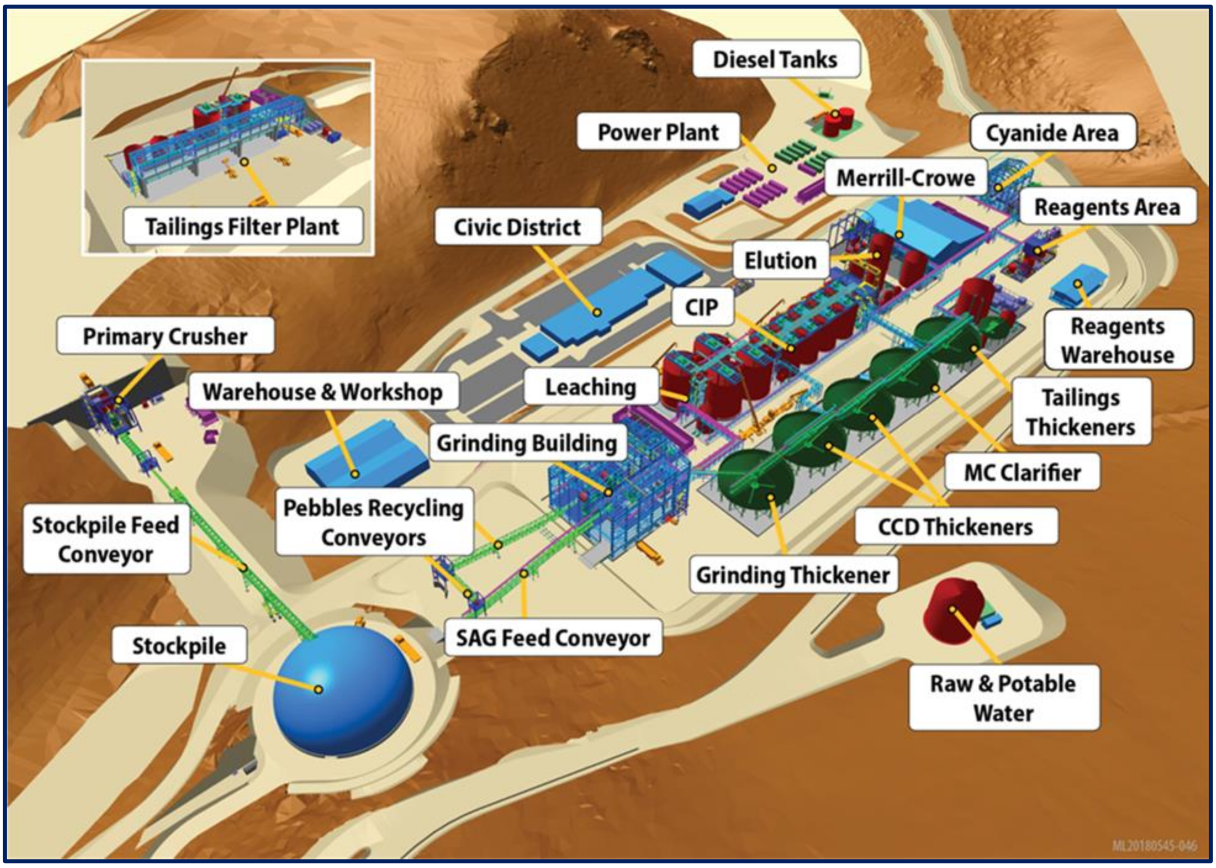
Source: Salares Norte CPR, 2021

Process unit operations comprise:

- Single-stage primary crusher.
- 2,900 tonne live capacity coarse ore stockpile.
- Grinding circuit with SAG mill and ball mill.
- Leaching thickener and four leach tanks.
- Merrill-Crowe feed preparation circuit with two CCD thickeners.
- Merrill-Crowe clarifier, deaeration columns and precipitate filters.
- Refinery smelting furnaces and retorts.
- CIP scavenging circuit with eight CIP tanks.
- Carbon stripping and regeneration.
- CIP tails cyanide detoxification (detox) circuit.
- Detoxified solution clarifier.
- Tailings thickener and filtering plant.

The layout of the plant facilities is shown in Figure 17.2.

Figure 17.2: Layout of process plant facilities



Source: Salares Norte CPR, 2021

Crusher and stockpile

Primary crushing reduces the ore to an 80 % passing 150 mm product size. The crusher discharge conveyor discharges onto the stockpile feed conveyor to the coarse ore stockpile. The stockpile can maintain feed to the plant for up to 12 hours after any shutdown of the crusher. The stockpile is covered with a dome to avoid wind dispersion of dust from stockpiled ore.

Two reclaim feeders inside a tunnel under the stockpile discharges onto the SAG mill feed conveyor. Dust generation at several points in the system is mitigated by a water “dry fog” dust suppression system. The SAG mill feed conveyor has a belt scale for measuring and recording the SAG mill feed with the regulation of feed flow controlled through the feeder speed.

Grinding circuit

The grinding circuit comprises one SAG mill and one ball mill in SAB configuration (pebble recirculation to SAG without pebble crushing).

The SAG mill product plus the ball mill product combines into the cyclone feed box, where the water content of the slurry is adjusted by addition of mill water. The cyclones produce the required classification of 80 % passing 75 µm, with 35 % solids in the cyclone overflow product. The cyclone underflow with the remaining water is fed to the ball mill, with the product sent to the cyclone feed box to close the classification loop. The nominal circulating load in the ball mill loop is 241 % of fresh feed. The maximum ball charge is 15 % for the SAG mill and 36 % for the ball mill.

Leaching

The grinding product (cyclone overflow) is thickened to 55 % solids in a 30 m diameter, leach-feed high-rate thickener. Thickener overflow is recirculated to the mill water tank in the grinding circuit and the thickener underflow is pumped to the leach circuit. A metallurgical sampler periodically removes a sample to determine the circuit feed grade.

The leaching circuit consists of four reactors in series of 3,539 m^3 capacity (effective) each providing a total residence time of 34.7 hours with slurry diluted to 45 % solids. Milk of lime is used to adjust the pH to 10.5. Sodium cyanide (NaCN) is added to the first leach tank and to the following two tanks in the train as required. The leach reaction requires oxygen for which air enriched to 90 % O_2 is sparged through the agitator shaft into the leach tank. The enriched air supply is estimated to be 2.7 kg O_2 per tonne of ore.

Counter current decantation (CCD) washing circuit

Leached slurry is washed in the CCD circuit for solid-liquid separation in two 30 m diameter, high-rate thickeners arranged in series, each of which produces a thickened slurry underflow at 55 % solids to feed to the next stage. Barren solution from the Merrill-Crowe process is added to the second thickener to act as the wash water. The overflow from the second thickener is used as the wash water for the first thickener.

Pregnant, metal-rich, unclarified solution is recovered from the first CCD overflow and clarified in a conventional 30 m diameter thickener in preparation for the precious metal precipitation with zinc powder in the Merrill-Crowe facility.

CIP and acid wash, elution, regeneration circuit

Approximately 10 % of the dissolved gold and silver not recovered through CCD is scavenged by CIP. The CCD tailings slurry is diluted to 45 % solids and contacted with activated carbon in a series of eight CIP tanks of 1,360 m^3 capacity (effective) each. CIP residence time is approximately 27 hours, which allows for some additional leaching of gold and silver. Tailings from the CIP circuit are sent to the cyanide detoxification stage.

The loaded carbon is treated on a semi-batch schedule in an elution facility of 13 t carbon capacity per batch using Triple AARL technology. The pregnant solution obtained from the Triple AARL process is fed to the clarification stage of the Merrill-Crowe circuit.

The stripped carbon from the elution column is sent to a diesel-fired carbon regeneration kiln where the carbon activity is restored in a slightly reducing steam environment at 650 °C. The carbon discharged from the regeneration kiln is quenched with water before being returned to the CIP circuit.

Merrill-Crowe circuit

The clarified solution from the CCD washing stage, together with the solution from the carbon elution, is processed in the Merrill-Crowe circuit. After removal of suspended solids and deaeration, zinc powder is added for gold and silver cementation. The resulting suspension of precious metal precipitate is pressure filtered using diatomaceous earth as a filtering aid.

The wet precipitate from the pressure filter discharge contains 70 % solids and is transferred to two retort ovens and heated to 650 °C to volatilise mercury. The vaporised mercury is condensed and captured in mercury flasks. The exhaust gases from the retort ovens are passed through an activated sulphide-carbon adsorption column and released to the atmosphere below the required emission levels. The dried, mercury-free metal precipitate is smelted to produce doré bullion.

Cyanide detoxification circuit

Cyanide detoxification of tails converts cyanide to cyanate for environmentally safe discharge of tails and to provide low-cyanide process water. Tailings from the CIP circuit are detoxified in a single 1,360 m^3 agitated tank reactor where milk of lime is used to control the pH, copper sulphate is added as a catalyst and sodium metabisulphite added with enriched air to oxidise weak-acid-dissociable cyanide (WAD CN) to less than 15 ppm.

Tails dewatering

The detoxified tailings are dewatered to maximise water recovery and to prepare the tailings for dry tailings disposal. The first stage of dewatering is by thickening using a 30 m diameter high-rate thickener. Thickener underflow at 55 % solids is filtered using three vertical plate pressure filters, while the thickener overflow is recycled to the process. The moist filter cake is hauled by 40 t trucks for disposal and compaction in the TSF.

The filtrate reports to a tank designed also to eventually receive water recovered from the TSF and WSF.

Reagents, water, air, and oxygen

The main reagents used include lime, sodium cyanide, zinc dust, lead nitrate, hydrochloric acid, sodium hydroxide, sodium metabisulphite, copper sulphate, diatomaceous earth, flocculent, antiscalant and fluxes. The plant has the capacity to store 14 days of consumption for each reagent and process consumable.

Raw water is used for the preparation of some reagents, carbon elution, dust suppression, the water purification plant, fire network, process water replenishment and gas cleaning. Raw water also feeds a potable water plant with capacity to produce 120 m^3 per day.

Dry compressed air is provided for general utility use. The compressed air generation facility includes three air compressors, one air dryer and two air receivers, one for plant consumption and the other for plant instrumentation. Generation onsite of highly enriched air (90-93 % O_2) is by a vacuum pressure swing adsorption plant. Enriched air is used for leaching, CIP and cyanide detoxification. The vacuum pressure swing adsorption package uses air compressors, air intercoolers, air dryers and two adsorption columns. An enriched air accumulator maintains a constant pressure to the consumption points.

Specifications of the major plant items are summarised in Table 17.1.

Table 17.1: Specifications of major equipment items

Area	Description	No.	Specification (width length throughput)
Primary crushing, run-of-mine pad	Jaw crusher	1	1,160 mm × 1,400 mm × 130 mm CSS

Area	Description	No.	Specification (width length throughput)
Conveying system	System	1	142 m L
	Crusher discharge conveyor	1	36 in. W, 31 m L, 386 t/h
	Stockpile feed conveyor	1	36 in. W, 31 m L, 386 t/h
Coarse ore stockpile	Stockpile	1	2,900 t live, 10,880 t total
	Belt feeders	2	48 in. W, 11.5 m L, 275 t/h
	SAG mill feed conveyor	1	36 in. W, 135 m L, 296 t/h
Grinding plant	SAG mill	1	6.7 m × 4.4 m EGL, 4.0 MW
	Ball mill	1	5.5 m × 8.5 m EGL, 4.0 MW
	Cyclone feed pump	2	1,403 m³/h, 275 kW (1 standby)
	Cyclone pack	1	20 in. D, 5 operating, 3 standby
Leaching	Leach tank	4	3,539 m³, 16.0 m D, × 17.6 m H
	Leach agitator	4	2 impeller, 5 m D, 13.9 m H
	Leaching thickener	1	30 m D, high-rate
Precious metal recovery	Merrill-Crowe CCD thickener	2	30 m D, high-rate
	Merrill-Crowe Clarifier	1	30 m D, conventional
	Clarifier leaf filter	3	107 m²
	Deaeration column	1	3.11 m D, 6.22 m H
	Precipitate filter	3	186 m³
	Barren solution tank	1	1,455 m³, 11 m D, 15.31 m H
C adsorption, acid wash, elution, C regeneration	CIP tanks	8	1,360 m³, 11.6 m D, 12.8 m H
	Acid wash column	1	29 m³
	Elution column	1	29 m³, diesel heater, 3 exchangers
	Pregnant solution tank	1	450 m³
	Diesel C reactivation kiln	1	13 t/day
Refinery	Mercury retort oven	2	10 tray, 2,573 kg, 155 kW
	Diesel furnace smelter	2	0.65 m³
Cyanide detox. and tailing dewater	Cyanide destruction tank	1	1,360 m³, 11.6 m D, 12.8 m H
	Agitator	1	4.4 m D, 12.5 m H
	Detox. solution clarifier	1	14 m D, conventional
	Tailing thickener	1	30 m D, high-rate
	Filtration tank	2	1,533 m³, 11 m D, 16.3 m H
	Filtration tank agitator	2	1 impeller, 3.6 m D, 11 m H
	Tailings filter	3	18.25 m³
Reagents	Milk of lime preparation	1	18.5 t/day
	NaCN preparation	1	7 t/day
	Metabisulphite preparation	1	15 t/day
	Flocculant preparation	1	0.53 t/day

Source: Salares Norte CPR, 2021

Engineering design, as well as accounting for plant utilisation and availability, has incorporated design factors to allow for the variability of ore metal content and recovery to accommodate processing in those years when the metal production reaches maximum and minimum values according the life of mine processing schedule.

In the opinion of the Qualified Person, the process plant as designed is considered conventional and reasonably robust. Whilst the combination of both Merrill-Crowe and CIP is not commonly practiced, each type of recovery process has a long history of industrial application, and the combination for Salares Norte is aimed to increase metal recovery from leach solutions and improve robustness to deal with the high concentrations and silver, gold, and mercury in the ores.

17.2 Process plant performance

There has been no process plant throughput to date. The absence of operating experience of the Salares Norte plant to be commissioned in 2023, means that operating sustainably at 2 Mt/a as assumed by the life of mine plan, has not yet been demonstrated in practice.

Theoretical assessments (industrially benchmarked) using the available measured ore hardness samples test results, internally by Gold Fields and several different reputable practitioners, indicate that such a throughput is possible with the current proposed design.

To sustain the planned throughput may require blending of some harder ores (e.g., AA silicified alteration) with relatively softer ores (e.g., BP argillic alteration). Upon obtaining operating experience from 2023 onwards, it will be possible to better confirm and optimise throughput estimation models, including allowing for prevailing gold and silver prices, and relevant process operating costs.

17.3 Processing risks

Industrial mineral process plants consist of a series of dedicated unit processes, e.g., crushing, grinding, leach, CCD, Merrill-Crowe, CIP, and carbon elution. There is inherent risk associated with catastrophic failure of one (or more) of the key equipment items associated with these unit processes, whereby such failure could lead to a significant period of plant downtime until repairs are completed, resulting in the inability of the processing plan to be achieved and/or higher operational costs incurred than anticipated.

Catastrophic failures could be associated with the structural, mechanical, or electrical components of the key processing equipment items. Key equipment items could include the crushers, grinding mills, thickeners, or leach/CIP tanks.

Risk minimisation activities to reduce the likelihood of such occurrences, and adopted by Salares Norte includes:

- Dedicated on-site maintenance department which undertakes condition monitoring activities, preventative maintenance, and repairs.
- Critical spares (e.g., spare mill motor, bearings, and gearboxes).
- Contingency operational plans (e.g., engage a contract/mobile crushing plant, leach/CIP tank by-passing).
- Fire suppression systems.
- Insurances.

The processing facility will be managed and operated by dedicated teams of personnel, who are required to make many operational and maintenance decisions every day. These decisions can directly impact the performance of the plant while processing the future Mineral Reserves and the associated decisions made by plant operating personnel, are outside the responsibility and accountability of the Qualified Person.

For example, a decision to process ores at a higher throughput could result in a coarser grind size from the grinding circuit, resulting in a lowering of the plant recoveries. Similarly, the choice to operate the leaching circuit at lower free cyanide or dissolved oxygen concentrations to reduce consumables usage rates, could result in lower plant recoveries being achieved than anticipated. Conversely, recoveries may potentially be increased by operating at higher than planned leaching reagent concentrations and/or finer grind sizes.

The process flowsheet incorporates tailings filtration for the purpose of reducing plant net water consumption and to improve the geochemical and geotechnical stability of the final tailings.

Despite incorporating initiatives into the overall plant design to counter the potential of increasing soluble species, all the potential effects of the build-up of soluble components in the process water circuits is difficult to predict without substantial pilot plant testing of the full flowsheet, and therefore some unknown operational performance risks may remain. Such related issues would need to be resolved as, and if, they develop and occur in practice.

The Qualified Person's opinion is that all appropriate parameters have been suitably considered and risk assessed to support the processing and recovery methods incorporated in the Salares Norte life of mine plan. The processing flow sheet, plant design, equipment and specifications are all within acceptable industry standards. Meeting all requirements for energy, water, process materials and staff are viewed as reasonable.

17.4 Process plant requirements

The key process plant requirements for the first five years of the Mineral Reserve life of mine plan are summarised in Table 17.2.

Table 17.2: Process plant – key requirements summary

Items	Units	2022	2023	2024	2025	2026	2027	2028
Ore processed	kt	-	800	2,000	2,000	2,000	2,000	2,000
Plant power draw	MWhr	-	38	96,931	97,196	94,119	95,068	93,176
Sodium cyanide	t	-	1,004	2,510	2,510	2,510	2,510	2,510
Grinding media	t	-	786	1,964	1,964	1,964	1,964	1,964
Lime	t	-	2,414	6,053	6,171	6,849	7,298	5,941
Caustic	t	-	479	1,297	1,334	1,033	1,239	1,030
Activated carbon	t	-	45	112	112	112	112	112
Hydrochloric acid	t	-	141	381	392	304	364	303
Sodium metabisulphite CN detox	t	-	1,683	4,271	4,448	5,920	7,929	4,153
New raw water	kℓ		310,450	310,450	310,450	310,450	310,450	310,450
Plant employees	No.	218	218	224	224	224	218	218
Plant contractors	No.	60	60	60	60	60	60	60

Source: Salares Norte CPR, 2021

18 Project infrastructure

18.1 Non-process infrastructure

Details on each major item of non-process infrastructure (NPI) is discussed in Item 18. The NPI is summarised in Table 18.1 and the site infrastructure layout is shown in Figure 5.1 and Figure 5.2. The Qualified Person is of the opinion that the infrastructure for the Salares Norte mining operation is fit for the life of mine Mineral Reserve estimation and that the Mineral Reserve quantities have been tested and satisfied dump and tailings disposal capacities.

Table 18.1: NPI summary

Item	Description
Mine facilities	HME workshop, 5 bays truck shop
	Explosives magazine, 2 separated platforms (preparation/storage)
	fuel station
Raw, fire, and potable water	1 potable water plant, 120 m³/d
	1 raw water storage tank 2,500 m³ total (incl. 685 m³ fire water reserve)
Compressed air	3 air compressors (2 operating + 1 standby), 1,128 Nm³/h at 800 kPa, 250 kW
Power generation	25.4 MW thermal power generation plant
	21 generators, 1,250 kVA each, derated to 772 kW at 4,500 masl
Fuel system	2 diesel tanks (700 m³ each)
Maintenance workshop	11 maintenance shop and warehouse (32 x 42 m)
Camp	16,000 m² roofed, 1,650 beds
Civic district	4,300 m², 270 people
Main gate	1 main access gate, 56 km of main access road
Onsite roads	6.3 km permanent – construction, 3.1 km construction, 6 m wide
Light vehicles fuel station	1 fuel station near the camp site
	1 fuel station near the civic district
Power supply to water wells	2 x 1,250 kVA diesel generators derated to 772 kW (1 operational + 1 standby)
	Located 12.2 km east from process plant
	1 diesel tank 25 m³
Water wells and pipeline	1 well water pump, 90 m³/h, 75 kW
	1 well water pump, 180 m³/h, 150 kW
	3 raw water transfer pumps, 60 m³/h, 90 kW each
	1 water recovery pond, 500 m³
Main access road	Approximately 56 km up to the camp (non-paved)
	6 m wide plus 0.5 m berm each side

Source: Salares Norte CPR, 2021

18.2 Tailings storage facilities (TSF)

The design of the filtered TSF was performed by SRK. The TSF is located above WSF South in the Anaranjada gully at an elevation of 4,432 m. The design capacity of the TSF is 24.1 Mt with the upper level at 4,473 m. The design therefore provides sufficient capacity for the 20.8 Mt of tailings associated with the Mineral Reserves declared in this report. The TSF will operate over 11 years and accommodate the base case process plant production rate of 2 Mt per annum. This configuration was chosen to reduce the footprint and native soil impact, and the TSF location was selected considering geological, hydrogeological conditions and to provides protection from wind on three sides of the deposit.

The stacking strategy consists of transporting the filtered tailings from the filter plant to the TSF by trucks, depositing, spreading and compaction. This operation will be performed by the mining contractor under the supervision of MGFSN. An Engineer of Record (EoR) will be appointed prior to the construction of the TSF.

The base of the tailings deposit (intermediate platform of WSF South), the slopes of the hills and inclined surfaces of the WSF on which the tailings are supported will be covered with a geomembrane. This will provide a barrier between the facilities (waste and tailings) and prevent the infiltration of potential seepage from the TSF into the WSF. Placement of the geomembrane will be in stages as the tailings deposit grows. The facility is also fitted with and underdrain above the liner draining into a collection pond. It is expected to be dry over the operational life of the mine.

The final configuration of TSF is shown in Figure 15.1.

18.3 Waste storage facilities (WSF)

WSF South is designed for 20 m lifts and a 38° angle of repose. A 15 m berm is included between each lift to maintain an overall slope of 1:2 to facilitate reclamation and long-term stability. The design also includes a 10 m ramp at the base of the facility for service access to the toe. WSF North is designed for 30 m lifts and a 38° angle of repose. A 20 m setback between each lift maintains an overall slope at 1:1.95 to facilitate reclamation and long-term stability. The design also considers a 30 m ramp at the base of the facility for service access to the toe.

Wrap-around dumping on existing topographic contours will be used. This approach results in flatter slopes similar to bottom-up dumping, but without the long initial haul cycles. Storage capacity is based on a swell factor of 30 % after natural compaction and assumed densities of 1.47 t/m³ for steam-heated material and 1.72 t/m³ for all other types of waste.

Pre-stripping will generate approximately 50.6 Mt of waste rock over a period of two years. Approximately 48 Mt of this waste is trucked to WSF South to generate two horizontal platforms at elevations of 4,432 m and 4,473 m. Filtered tailings from the process plant are hauled to the lower platform with ore stockpiles located on the upper platform. The remaining 2 Mt of pre-stripping is hauled to WSF North. After Year-1, all waste is hauled to WSF North.

Waste placement will be performed by the mining contractor under the management of MGFSN. The final configuration of WSF is shown in Figure 15.1.

18.4 Water

18.4.1 Hydrogeology

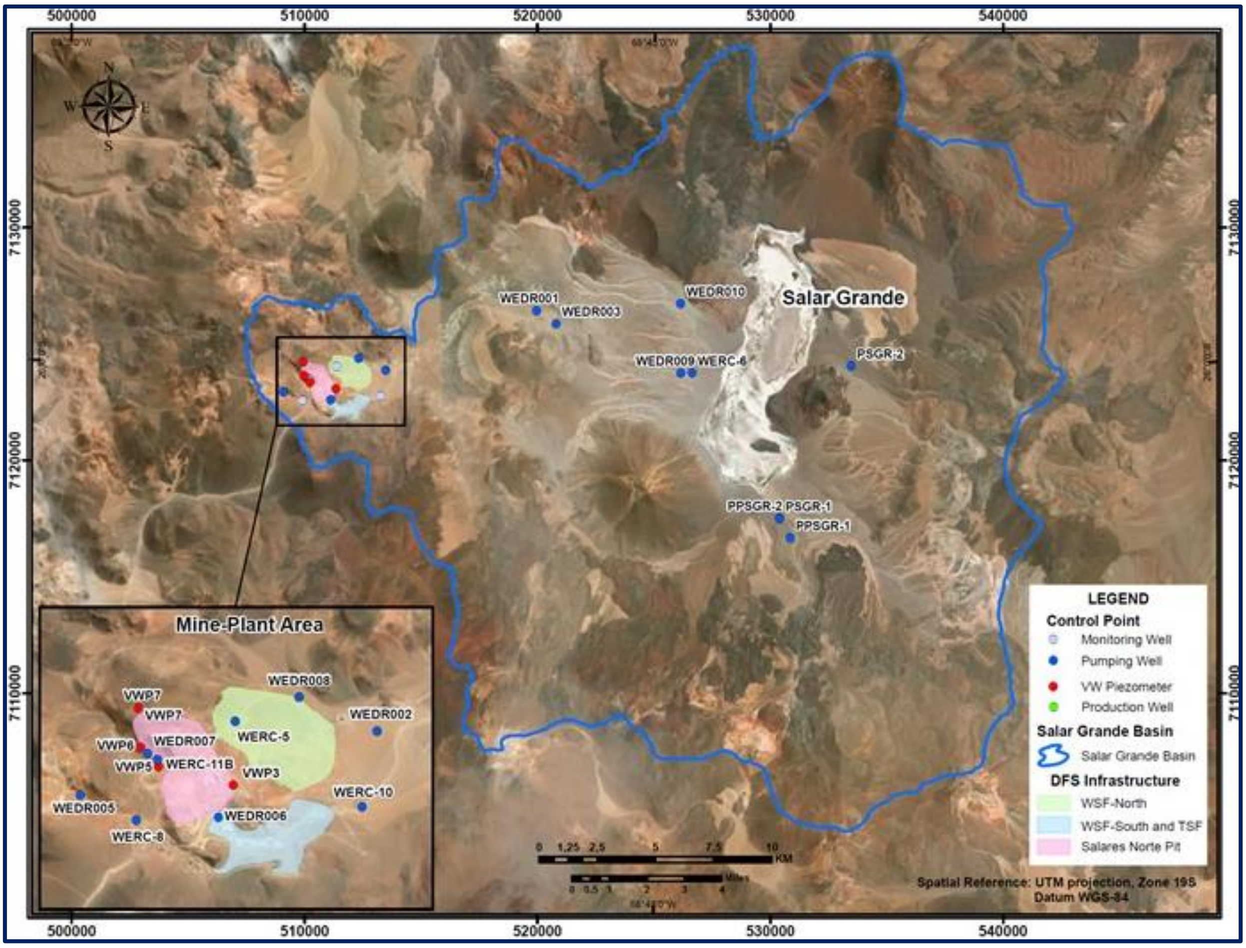
Salares Norte is in the Salar Grande hydrogeological basin classified as an arreica basin. The basin has an area of 733.9 km² and is characterised by the presence of the Salar Grande salt flat, which occupies an approximate area of 31.6 km². The open pit, waste storage facilities and processing facility are in the western sector of the basin at an average elevation of 4,500 m above sea level.

The objectives of the hydrogeological investigation included determining the potential impact of groundwater extraction for the future operation from wells WEDR001 and WEDR003 on the Salar Grande salt flat as well as the impact of the future pit on the groundwater regime. Hydrogeological investigation included the drilling of boreholes for groundwater monitoring and hydraulic tests, geophysics and hydrogeochemistry analysis.

Figure 18.1 shows the Salar Grande basin including projected facilities, water extraction and monitoring wells, and the Salar Grande salt flat. Table 18.2 lists the monitoring and pumping wells and hydraulic tests were conducted in four sectors of the Salar Grande basin, namely the mine and process plant area, groundwater extraction area, Salar area and the area to the south and east of the Salar.

As part of the water exploration program, Geodatos completed 49.2 km of transient electromagnetic (TEM) geophysics in the Salar Grande basin during 2012. This program led to the discovery of the groundwater wells for the project (WEDR001 and WEDR003). In 2017, Geodatos performed an additional 35 km of TEM geophysics along eight profiles. These profiles covered different sectors of the basin, with special emphasis on the mine and process plant area. The geophysics information was used to generate the 3D geological model and correlate the groundwater occurrence with the most conductive zones.

Figure 18.1: Hydrogeology – monitoring and pumping wells



Source: Salares Norte CPR, 2021

Table 18.2: Monitoring and pumping wells developed for the project since 2012

Point	East (m)	North (m)	Elevation (amsl)	Depth	Type
PPSGR-1	530.843	7.116.682	4.034,68	252	
PPSGR-2	530.392	7.117.525	4.004,84	180	
PSGR-1	530.396	7.117.505	4.005,33	220	
PSGR-2	533.470	7.124.052	4.101,98	181	
WEDR001	519.963	7.126.431	4.169,41	209	Pumping wells (2013-2017)
WEDR002	513,483	7,123,878	4,323.65	243	
WEDR003	520.796	7.125.874	4.164,59	258	
WEDR005	509,067	7,122,936	4,612.59	250	
WEDR006	511,119	7,122,608	4,453.52	220	
WEDR007	510,067	7,123,548	4,500.59	200	
WEDR008	512,322	7,124,378	4,333.99	200	
WEDR009	526.151	7.123.754	4.038,12	182	
WEDR010	526.704	7.125.478	4.025,14	141	
WERC005	511,370	7,124,024	4,368.42	125	Monitoring wells (2016-2017)
WERC006	526.136	7.122.609	4.038,53		
WERC008	509,899	7,122,568	4,533.70	175	
WERC010	513,257	7,122,760	4,355.03	173	
WERC011B	510,214	7,123,461	4,474.74	130	
VWP1	511,049	7,122,654	4,465.30	272	Vibrating wire piezometers (2018)
VWP3*	511.344	7.123.079	4.458,57	395	
VWP5	510,232	7,123,350	4,488.90	350	
VWP6	509,968	7,123,636	4,520.00	300	
VWP7	509,934	7,124,220	4,682.70	400	

Source: Salares Norte CPR, 2021

As part of the exploration and condemnation drilling program, MGFSN logged the occurrence of water in 53 RC drillholes and this information was used by SRK to define a groundwater occurrence surface. The results indicated that the elevation of the wet samples in the wells decreases to the east, with the highest differences occurring in the pit zone to subsequently stabilise towards the eastern border of the mine and process plant area.

Drilling performed as part of hydrogeological investigation program since 2012 are shown in Figure 18.1. Hydraulic tests were conducted in four sectors of the Salar Grande basin, namely the mine and process plant area, groundwater extraction area, Salar area and the area to the south and east of the Salar.

18.4.2 Vibrating wire sensors in mine area

During the 2018 drilling campaign, vibrating-wire sensors were installed under supervision of SRK to monitor pore pressures in specific zones as a function of the degree of fracturing of the corresponding geological unit and the intersected structures. Five wells were completed for this purpose, with vibrating-wire sensors installed in four of them (VWP-1, VWP-5, VWP-6, VWP-7).

During the drilling of each of these wells, Lugeon tests were carried out to provide hydraulic conductivity estimates for the sectors with hydrogeological concern (structures or fractured zones). In general terms, the vibrating-wire piezometers were observed to present downward hydrostatic conditions or vertical gradients, with no presence of significant upward flows.

18.4.3 Local hydrogeological behaviour in the mine area

In order to obtain the hydraulic conductivity values derived from the transmissivity estimations, the saturated thickness was estimated by SRK. Using the groundwater occurrence elevation surface generated from the available data for the wells where this surface intersects and using the potentiometric surface for the wells that are not intersected by the groundwater occurrence surface, it was possible to obtain the saturated thickness for each of the wells. Table 18.3 presents the results of hydraulic conductivity estimations for the tested wells. Low permeability conditions were found throughout the site with hydraulic conductivity values that range between $7x10^{-4}$ m/d and $7x10^{-3}$ m/d, except for well WEDR006 with a value in the order of $2x10^{-1}$ m/d.

Table 18.3: Hydraulic conductivity in the mine and process plant area

Well	Geological unit	Transmissivity (m^2/d)	Estimated saturated thickness (m)	Hydraulic conductivity (m/d)
WEDR006	IFAB (Basaltic andesite)	6.00E+00	48	1.00E-01
WEDR007	IFAB/IFAB (andesite)	1.00E-01	51	2.00E-03
WEDR008	IFAN (andesite)	5.40E-01	76	7.00E-03
WERC-8	IFAB (Basaltic andesite)	5.00E-02	10	5.00E-03
WERC-10	IFAB (Basaltic andesite)	4.00E-02	32	1.00E-03
WERC-11B	IFAB (Basaltic andesite)	5.00E-02	22	2.00E-03
WEDR002	IFAB (Basaltic andesite)	2.50E-01	93	3.00E-03

Source: Salares Norte CPR, 2021

18.4.4 Piezometric surface in the mine and process plant area

Measurements between 2016 and 2018 indicate that the piezometric levels remain under a stabilised condition, with no seasonal changes once stabilisation is attained after drilling. SRK developed a piezometric surface for the mine and process plant area based on this information. The piezometric surface indicates that groundwater flow moves in an easterly direction, with slight local variations related to northwest-southeast trending structures, especially in the open pit area. The average hydraulic gradient was approximately 4.5 %, with a higher gradient being detected in the open pit area (6 %), potentially associated with the presence of units with lower permeability, such as the volcanic breccia and the presence of clay associated with argillic alteration. In addition, it is likely that the subvertical north-south trending structures may behave as barriers, contributing to a steeper gradient in the pit area.

The Qualified persons opinion of the 2021 hydrology is:

a) Salares Norte has reliance on appropriate hydrological studies conducted at all relevant locations

b) Hydrology is not viewed as presenting a material risk to Salares Norte or the December 2021 Mineral resource and Mineral reserve estimates.

18.4.5 Water supply

Raw water is obtained from two water wells (WEDR001 & WEDR003) located between the mine-process plant area and the Salar Grande, approximately 8 km east of the processing facility and 8 km west of the Salar Grande. The water is transferred into a 280 m³ raw water tank and pumped to the process plant via a 12 km-long pipeline with three centrifugal pumps.

The 2,500 m³ raw water tank next to the process plant includes a dedicated volume for fire water (685 m³). The tank is installed on a platform 26 to 30 m above the plant facilities. From there, raw water is distributed by gravity to all consumption points at the mine. The potable water plant and fire water pumping system are located on the same platform.

Raw water from the wells satisfies the quality requirements for most of the process and the non-process consumers without treatment. Only potable water requires treatment to produce 110 m³ of water per day.

It is the opinion of the Qualified Person that the current plans meet all legal and other requirement obligations and are adequate to address all water related issues related to the life of mine plan.

18.4.6 Surface water management

A surface water management system is designed to prevent flood damage to infrastructures or potential contamination and consists of two subsystems, one for the non-contact water and other for the contact water.

The non-contacted water channels have two components:

- Diversion channels, comprising an upper and lower diversion channel.
- North contour channel.

The diversion and the north contour channels are perimeter channels, which are designed to collect runoff from upstream of the infrastructure. Water is diverted by these channels and return to the natural watercourse downstream of the infrastructure.

The contacted water management system consists of collection ditches and drains at WSF North, WSF South and the TSF. The objective of this system is to capture, manage and store the water contacted with these materials to avoid contaminated water seepage into the basin. Contact water collection ponds are designed to collect storms of 100 years of return period and verified with storms of 150 years of return period.

MGFSN will implement a water monitoring plan to monitor the variables of the hydrogeological models and the hydraulic works operation to ensure there are no effects on the quantity and the quality of the water in the basin beyond what is environmentally assessed and authorised.

18.5 Power

The definitive power supply will consist of a 26 MW hybrid microgrid operated exclusively in island mode. The microgrid comprises 16 MW of diesel-powered generation that will be established before commissioning of the processing facility and 10 MWp (approximately) of photovoltaic (PV) power that will be introduced once the process plant reaches steady state operations, forecasted to be towards the end of the first year of operation. The power system will be installed, owned and operated by a third-party power provider.

Diesel-powered generation is a proven solution for remote mine sites without grid connection and the systems provides sufficient flexibility to be expanded should a shortfall in generating capacity be experienced during operations.

18.6 Accommodation

The camp facilities are located 12 km from the main project site. The camp expansion to 1,441 required for the peak construction phase is complete. The camp includes the following areas and services:

- Potable and sewage water plants.
- Kitchen and lunchroom.
- Polyclinic.
- Permanent bedrooms for operations.
- Temporary bedrooms for construction workers.
- Permanent main access gate.
- Permanent administration building.
- Permanent recreational rooms.
- Permanent kiosk.
- Permanent gymnasium.
- Permanent multiuse court with synthetic grass, fences, and lighting.
- Access control building.

18.7 Site access

Site access infrastructure is listed in Table 18.1.

18.8 Other infrastructure

18.8.1 Medical facilities

Salares Norte will have two polyclinics facilities that comply with health and safety regulations applicable in Chile, for working in elevations of over 3,000 m. The main polyclinic facility and rescue unit is located close to the process plant. The polyclinic will provide first aid for minor injuries and/or stabilisation for injured personnel before transportation to medical facilities in the nearest city. A secondary polyclinic at the camp will be a smaller, focused on verifying the health condition of workers and visitors.

18.8.2 Heavy mining equipment (HME) workshop

The HME workshop has five service bays for maintenance and routine servicing, divided into two bays for the front-end loader and auxiliary equipment and three bays for haul trucks up to 180 t capacity. The HME platforms also has a washing bay (and water recycling infrastructure), tyre handling and storage area, offices, warehouses and changing room. The facility is located to the west of the plant at an elevation of 4,525 m with a total building area of approximately 2,500 m².

18.8.3 Explosives facilities

The bulk explosives facility and the magazine are located away from the other mining support facilities to the west of the HME workshop. Raw materials, such as ammonium nitrate and primary explosives used in the explosive manufacturing process, will be brought to site by road, and stored in silos at an explosives facility site until required.

A detonator magazine made from two maritime containers is surrounded by earthen screening mounds, security fencing and small industrial explosive magazine (similarly built). These are required as separate units situated in close proximity of the main explosives plant, all within a secure area surrounded by fencing and managed accordingly.

Blasting will be performed by a specialised contractor and is planned that these facilities will be built by the contractor.

18.8.4 Compressed air

Compressed air is required for instrumentation and plant air for maintenance services and will be supplied from three compressors with power of 250 kW each. For the primary crushing plant, it is estimated that a compressor with 55 kW of power is required for dust suppression. The compressed air requirement for tailings filters will be sized according to the filter supplier.

18.8.5 Diesel

Diesel is required for the power generation plant, process plant, bore field and camp. All diesel tanks are installed inside a containment area to avoid spillage to the environment. Two temporary diesel fuel stations are in operation at the plant and the camp and will remain in use while the permanent fuel station located to the south of the open pit is constructed.

The fuel bay and fuel farm is located near the stockpile areas, at the southwest end of WSF South. According to the mine production plan, the peak fuel consumption is 8,600 m^3 per quarter (including the fuel for ANFO) and the fuel farm storage capacity 1,400 m^3.

19 Market studies and contracts

19.1 Market studies

Most gold production is used for jewellery and for investment purposes, in the latter case because the market views it as a store of value against inflation. In addition, certain physical properties of gold, including its malleability, ductility, electric conductivity, resistance to corrosion and reflectivity, make it the metal of choice for several industrial and electronic applications.

Supply of gold consists of new production from mining, the recycling of gold scrap and releases from existing stocks of bullion. Mine production represents the most important source of supply, typically comprising 75 per cent. each year. Annual demand requires more gold than is newly mined and the shortfall is made up from recycling. Management believes that long-term gold supply dynamics and global economy trends will support the gold price at levels above or aligned to $1,300 per ounce in the long-term.

The market for gold is relatively liquid compared to other commodity markets, with London being the world's largest gold trading market. Gold is also actively traded via futures and forward contracts. The price of gold has historically been significantly affected by macroeconomic factors, such as inflation, exchange rates, reserves policy and by global political and economic events, rather than simple supply/demand dynamics. Gold is often purchased as a store of value in periods of price inflation and weakening currency. The price of gold has historically been less volatile than that of most other commodities.

19.2 Metal prices

A review of metal prices for planning purposes is undertaken annually to monitor any significant changes in price trends or exchange rates that would warrant re-calibrating the price deck before the Strategic Planning process transitions into the Business Planning cycle.

This review of the metal price deck has taken account of the prevailing economic, commodity price and exchange rate (Fx) trends, together with market consensus forecasts, in addition to consideration of the Gold Fields' strategy and expectations for the operations.

Gold Fields' strategy is to:

- Mitigate annual volatility by holding planning metal prices as long as warranted to support stability in mine planning, notably regarding open pit shell selections.
- Maintain appropriate margins on spot and long-term price forecasts to support the Group's Balanced Score Card metrics.
- Protect against accelerating mining sector inflation.
- To confirm a separate gold price to be used specifically for the Operational Plan (budget) two-year revenue streams and cashflows in Q3 each year.

The outcome of the pricing analysis was to use a gold price of $1,300/oz and $17.50/oz for Mineral Reserves and $1,500/oz for gold and $20.00/oz for silver Mineral Resources for the December 2021 disclosure of estimates (Table 19.1).

Table 19.1: Metal price deck

Metal	Units	December 2021 Metal price deck	
		Mineral Reserve 31 Dec 2021	Mineral Resource 31 Dec 2021
Gold	$/oz	1,300	1,500
Silver	$/oz	17.50	20.00

Source: Salares Norte CPR, 2021

The above price deck comparison to market long-term forecasts assessed at the time of analysis is consistent with the Issuer's approach to retaining good discipline in support of the Company strategy; this approach ensures Gold Fields' Mineral Resources and Mineral Reserves have less volatility year-on-year and that the Company is protected against possible downside scenarios if the gold price falls up to ~25 % in any specific year. Ensuring sufficient capacity to maintain our margins at prices that could be incrementally lower than the spot price ranges seen in 2021 is also important. Equally, with annual mining sector inflation estimated at $30-40/oz, we need to ensure we mitigate this escalation risk in the life of mine plans and Mineral Reserve estimates.

Sensitivity analysis on gold price for project financial evaluation is done to provide flexibility/range analysis for all regional studies and site growth opportunities and investment purposes.

The Mineral Resource gold price premium to the Mineral Reserve price is circa 15 % and the differential is in general alignment to our peer group and industry standard practice. The Mineral Resource price premium is to provide information on each operation's potential at higher gold prices and to indicate possible future site infrastructure and mining footprint requirements.

Salares Norte (AGL) and MKS (Switzerland) S.A manage the refinement and sale of gold between the two companies.

Gold Fields' treasury department in the corporate office in Johannesburg, South Africa sells all the refined gold produced by the operating company. On collection of the unrefined gold from a mine site, the relevant operating company will notify Gold Fields' treasury department of the estimated refined gold content, expressed in troy ounces, available for sale. After such confirmation, the treasury department sells the refined gold to authorised counterparties at a price benchmarked against the London Bullion Market Association PM gold auction price.

Gold Fields may periodically use commodity or derivative instruments to protect against low gold prices with respect to its production. Variations in gold price, currency fluctuations and world economics can potentially impact on the revenue received. No derivative instruments are in place at the date of this report.

The Qualified Person has relied on information provided by the Company in preparing its findings and conclusions regarding market studies related to gold sales from Salares Norte. Refining services are based on well-established long-term agreements and expediting gold sales over the life of the asset does not represent any significant uncertainty. Service contracts, lease agreements and goods contracts e.g., diesel, cyanide and cement, necessary to develop the property as planned, are in place and have the capability to support the full projected cashflow period.

19.3 Metal Price history

Gold prices London Metals Exchange afternoon close

- Gold spot 30 December 2021 - $1,805.85/oz
- Gold spot 24-month average - $1,784.45/oz (for period ending 31 December 2021)
- Gold spot 36-month average - $1,653.71/oz (for period ending 31 December 2021)
- Gold spot 60-month average - $1,497.48/oz (for period ending 31 December 2021)

Silver prices London Metals Exchange afternoon close

- Silver spot 31 December 2021 - $23.08/oz)
- Silver spot 24-month average - $20.52/oz (for period ending 31 December 2021)
- Silver spot 36-month average - $16.23/oz (for period ending 31 December 2021)
- Silver spot 60-month average - $17.23/oz (for period ending 31 December 2021)

19.4 Product specification

The doré bars produced at Salares Norte will have a mass between 25 kg and 35 kg and will comprise 12 % gold and 88 % silver by weight on average.

19.5 Marketing strategy

Once the mine is in production, Gold Fields' treasury department in Johannesburg, South Africa will sell all gold and silver produced by Salares Norte. On collection of the unrefined doré from the mine site, MGFSN will notify Gold Fields' treasury department of the estimated refined gold and silver content, expressed in troy ounces, available for sale. After such confirmation, the treasury department will sell the refined gold and silver to authorised counterparties at a price benchmarked against the LBMA (previously known as the London Bullion Market Association) gold PM auction price.

19.6 Supply and market considerations

Global supply of gold consists of new production from mining, the recycling of gold scrap and releases from existing stocks of bullion. Mine production represents the most important source of supply, typically comprising 75 % each year. Annual demand requires more gold than is newly mined and the shortfall is made up from recycling.

Most of the gold produced is used for jewellery and for investment purposes, in the latter case because the market views it as a store of value against inflation. In addition, certain physical properties of gold, including its malleability, ductility, electric conductivity, resistance to corrosion and reflectivity, make it the metal of choice in a number of industrial and electronic applications.

The supply sources for silver are a similar that for gold, with mining production accounting for approximately 80 % of the annual supply and recycling for the balance. Silver is mainly used for used in industrial applications, photography, jewellery and physical investment.

19.7 Distribution and shipping

Doré bars will be produced and stored in a secure gold room at site before shipment by road to the regional airport in Copiapó or the international airport in Santiago. From here the doré will be shipped by air to an international refinery in North America, India or Europe.

The shipment will be performed by a reputable contractor, specialising in the handling and transportation of precious metals produced by mining companies. The security contractor will be responsible for insuring the shipment from the time the metal is accepted at the gold room until it is delivered to the refinery.

Smelters may impose a minimum shipment volume, typically in the order of 2,000 kg of doré per shipment. Given the forecast production schedule, it is expected that Salares Norte will dispatch on average two doré shipments per month, each between 2,000 kg and 4,000 kg in mass.

19.8 Treatment charges and refining charges, payables and deductions

Treatment charges and refining charges (TCRC) included in the economic analysis are in line with current market conditions. These costs include estimation of smelter treatment and refining charges, transport and insurance costs from Salares Norte to potential refineries.

The following treatment and refining charges have been considered:

- Gold treatment and refining charges: $1.27/oz.
- Silver treatment and refining charges: $1.27/oz.

In addition, the following metal payable rates for refining are included in the financial model:

- Gold payable content: 99.87 %.
- Silver payable content:99.50 %.

Although the ore contains mercury as a deleterious element, the process flowsheet includes two retorts to recover any mercury from the precipitate prior to smelting. The product is therefore expected to be free from deleterious elements and should not attract any penalty from the refinery.

20 Environmental studies, permitting and and social or community impact

Climate change is an integral part of the Mineral Reserve generation process and incorporating relevant costs associated with climate change, primarily decarbonisation, mitigation and adaptation to the changing climate, is a key theme for the Company. Integration of these key elements into the Mineral Reserve process is being carried out progressively and simultaneously across all of Gold Fields' sites.

20.1 Environmental studies

The baseline study for Salares Norte commenced in March 2015 and was completed during the first half of 2018. The baseline study covered meteorology, air quality, geology, soil, hydrogeology, water, flora, fauna, archaeological and historical sites, transport, roads, social and communities. The baseline study formed an integral part of the EIA. The baseline for the key environmental components of the Salares Norte area of influence are summarised in the following items.

20.1.1 Physical environment

Air quality

From the results of the air quality monitoring at the camp station during the period from 1 October 2015 to 30 June 2017, the following observations were made. Between January and December 2016, the average PM10 concentration was 41 µg/m³N, and the Percentile 98 of 24-hour concentrations recorded was 127 µg/m³N, both under the values established in the Suprem Decret N° 59/1998 (S.D. N° 59/1998). Regarding PM2.5, the average concentration for the same period recorded was 5 µg/m³N, and the Percentile 98 of 24 hour concentrations recorded was 13 µg/m³N, lower than the values established in the S.D. N° 12/2011. During the sampling period between October 2015 and June 2017, the daily average concentration of MPS exceeded the value established in the reference standard on five occasions. Carbon monoxide (CO), sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) indicated that the levels monitored at the camp station are low. The mean CO value was 0.1 mg/m³N and the maximum hourly value was 5.3 mg/m³N, lower than the values established in the S.D. N° 115/2002. The SO_2 concentrations also registered low values for the period, with an average concentration of the period of 2 µg/m³N, lower than that established in the S.D. N° 113/2002.

Noise and vibrations

The main sources of noise recorded in urban areas corresponded to vehicular traffic on local roads and high-flow routes in the coastal sector, while the main source of noise in rural areas corresponded to the interacting wind with the morphology of the sector. For the vibration measurements, all the measured values were below the perception threshold of 65 vibration decibels (VdB).

Natural risks

In the Atacama Region, the convergence of the Nazca plate (oceanic) and the South American plate (continental) triggers a subduction process between both plates, with the Nazca plate moving beneath the South American plate. This process generates energy release resulting in seismic movements at the surface.

The Copiapó seismic-tectonic segment in which the property is located, is part of the northern section of the so-called flat-slab, which is a segment in the coupling zone between the Nazca tectonic plate and the South American tectonic plate at a lower subduction angle. Therefore, there is no active volcanism.

The Copiapó seismic-tectonic segment is characterised by earthquakes with large single ruptures and occasional energy release through intermediate to large seismic groups (Barrientos, 2007). Along this section, earthquakes with a magnitude greater than 6.0 are concentrated offshore and parallel to the coast, with low-angle thrust stress mechanisms. Earthquakes associated with stress fault mechanisms are observed within the continent, in a lower number than those occurring offshore (Barrientos, 2007). Both types of earthquakes occur in the coupled subduction region between the Nazca and South American plates. Most destructive earthquakes recorded in Chile have their focal sites concentrated close to the shoreline.

Given existing geological and structural conditions, new events of relevant magnitude could be generated in this sector of the country. Depending on their magnitude, these events could generate activity in the property area, mainly consisting of landslides or rockfalls, circumscribed to the areas with the steepest topographic gradients.

During the development of the FS for the Salares Norte project, a seismic risk study for the area was prepared.

The risk of mass removal is low and is concentrated in the mine area where there are greater topographic slopes. Volcanoes were identified but are inactive in the vicinity of the property.

Soils

The soils of the area are in the edaphic zone corresponding to the desert zone of Chile and correspond to the Entisols order. The soils are class VIII of Use Capacity (i.e., they do not present value for agricultural, livestock or forestry use).

Hydrogeology

The following hydrogeological units are identified within the Salar Grande basin:

- UH-1: Evaporite deposits that form the Salar.
- UH-2: Quaternary alluvial deposits with powers that do not exceed 30 m.
- UH-3: Sequences of tuffs located in the center of the basin and eastern edge.
- UH-4: Igneous volcanic rocks (andesites and dacites) underlying the UH-3.

The underground flow advances from different sectors towards the Salar, being the main flow the one that advances from the western limit by the UH-3 (permeability of 50 m/d) with east direction towards said Salar. This flow presents variations due to the existence of impermeable domes belonging to the UH-4, which locally modifies the direction of the flow.

The discharge of the underground flow occurs on the edge of the Salar Grande by means of the outcrops of the waters of lower salinity that overlay the brine, which rises when approaching the Salar, originating the formation of said slopes. This operation causes the storage of water in specific areas due to the topography of the land, forming permanent and shallow lagoons detected on the banks of the Salar.

The surface waters of the Salar maintain a sodium chloride composition; however, seasonal variations in salinity are related to evaporation when stored on the surface. The Salar Grande basin was defined as a closed hydrogeological basin of the arreica type, where annual precipitation would reach 136.5 mm.

Water quality

Surface waters sampled from different lagoons in the Salar vary between salty and brine with a sodium chloride composition similar to that of the groundwater.

Samples taken from the western edge (SN3B and SN5B) have lower electrical conductivity, with values less than 100 mS/cm, than the samples taken from the eastern edge (SN1B, SN2B and SN4B), which mostly exceed 100 mS/cm. The variation in salinity is related to the degree of evaporation existing at different times of the year. The surface waters sampled from the Salar Grande lagoons had significant concentrations of arsenic, boron, chloride, lithium and sulphate, which exceed the limit of these compounds for irrigation water in Chilean Standard 1333.

20.1.2 Terrestrial ecosystems

Flora and vegetation

For the terrestrial vascular flora, 19 species were identified during the campaigns carried out between 2015 and 2017. No species were identified in the conservation category.

Fauna (wild animals)

There were 18 species of terrestrial fauna identified in the area of influence. The short-tailed chinchilla, the vicuña and the culpeo fox were the only species identified in the conservation category. The short-tailed chinchilla is a critically endangered species present on the property and the EIA highlighted the alteration and loss of habitat of the chinchilla, which is a critically endangered species in Chile. To mitigate such impact, a plan was developed and approved by the EIA authorities. The plan involves establishing a compensation and conservation area outside the mining area, declaring no-go zones, and relocating a small fraction of the chinchilla population that lives in future mining zones to a new location. The relocation program commenced in 2020. Two areas (out of nine) needed for the life of mine development have been released. Four chinchillas were relocated as part of this activity; however, two chinchillas passed during the process, resulting in the temporary suspension of the relocation program at the end of 2020 and the initiation of a sanctioning process by the relevant authorities against Salares Norte in November 2021. In response, MGFSN submitted a compliance plan to the authorities for approval during December 2021. The compliance plan, which incorporates significant learnings from the initial relocation campaign, remains under review by the authorities at the time of this report. MGFSN will continue to work with the authorities to improve and resume the relocation program.

The temporary suspension of the chinchilla relocation program does not put at risk the commissioning date of the project, nor the plant feed schedule for the initial five years of operation; however, the development of AA as an open pit is dependent on the successful relocation of chinchillas.

20.1.3 Continental aquatic ecosystems

The continental aquatic ecosystems occur exclusively in the Salar Grande in the form of hydric grasslands and bodies of water, which are related through surface and subsurface flows of water that feed them. In general terms, the Salar Grande has a low richness and abundance of organisms, and is an ecosystem that is under strong pressure from physical factors such as the hypersalinity of the water, solar radiation, sediments with active transport (lagoons permanently change shape and bathymetry) and strong winds.

20.1.4 Cultural heritage

Eleven archaeological sites were identified in the area of influence. These sites are characterised by the presence of structures of varying complexity. The probability that the project affects palaeontological heritage in the areas reviewed was determined as zero.

20.1.5 Landscape

In the area of influence, five landscape units of low diversity were identified. The main differentiating attributes were the relief and geomorphological structure. For the rest of the evaluated landscapes, most present low visual quality with little visible fauna and the absence of vegetation of scenic interest.

20.1.6 Protected areas and priority sites for conservation

Within the area of influence, a Priority Conservation Site is registered in the category of "Wetlands declared priority sites". A 49.1 km section of the access road to Salares Norte (Access Road - Camp sector) passes through the priority site "Salar de Pedernales and its surroundings".

The main road and transportation route to Salares Norte corresponds to existing roads prior to the declaration of the Priority Conservation Site. These roads are located on public property and are open for public use. The project's area of influence is located outside any other areas placed under official protection.

20.1.7 Natural and cultural attractions

The project site has less tourism development compared to the rest of the region. Given the geographical characteristics of the area (difficult access), there is no interaction between the tourist attractions, circuits, routes and associated activities with the works at Salares Norte.

20.1.8 Use of the territory

The area of influence does not currently have an instrument in force for the "Plan of Territorial Regulation" nor does it have territories declared "Indigenous Development Areas" that regulate, define and/or manage land uses in the area.

20.1.9 Human environment

The urban population is concentrated in the Diego de Almagro commune and in the city of El Salvador, a mining enclave located in the foothills of the Andes.

In the rural sectors of the Diego de Almagro commune, there are three indigenous communities of the Colla ethnic group. Colla settlements are located within the territory in a scattered manner and can be permanent or temporary. The former is characterised by the existence of houses built with stones, while the temporary settlements are linked to population.

20.2 Waste disposal, monitoring and water management

A total of 170 rock samples from exploration DD holes were selected for geochemical characterisation of materials representative of the mine facilities at closure (WSF North and South, open pit and filtered TSF). Of these, 146 samples corresponded to waste material, 16 to ore and the remaining 8 samples for laboratory control.

The samples were tested at AGQ Laboratory in Santiago, accredited under ISO 17025. SRK oversaw the test results and defined the kinetic tests applied to the rock and tailings samples.

The rock samples selected for these studies were from BP and were determined as representative of the geological formations and waste material present at AA. In addition, MGFSN provided 12 synthetic composite samples representative of the tailings produced by laboratory metallurgical testwork from BP and AA drillhole samples.

The sequential analytical methodology applied to the geochemical characterisation consisted of the following tests:

- Chemical and mineralogical characterisation: Whole rock analysis (by XRF), metal and metalloid multi-element analysis (by ICP-MS), S and C speciation by infrared combustion (LECO) and mineralogical analysis (by XRD).
- Characterisation of the mine water generation potential and metal and metalloid leaching capacity (ABA test, NAG test, paste pH, Shake Flask Leaching Test and SPLP).
- Estimation of reaction and solute release rates by Humidity Cell Kinetic Test (HCT).

By escalating the results and based on the hydrochemical modelling, the evolution of the chemical quality of the contact water from the WSFs (runoff) and the two pit sectors (pit lakes) was estimated. No seepage will be generated by the TSF, as it will be lined.

The geochemical characterisation of the materials associated with the facilities upon closure revealed high acidic water generation potential due to the presence of acidic sulfates related to the jarosite and alunite family in the oxide zones and sulfides in the unoxidised zones of the deposit. Therefore, contact water from the facilities (pit lakes and runoff along the slopes of the WSF) will correspond to saline or very saline sulfate, and acidic solutions in the short to long term if proper mitigating actions are not implemented.

20.2.1 Tailings storage facilities (TSF)

The natural leachate from the TSF would provide contact water from saline and alkaline leachates rich in Fe and As to low or moderately saline and acidic leachates rich in other metallic species such as Al, Cu, Fe, Zn, Ba, and Mn. Under these conditions, acidic seepage could mobilise (or accelerate the mobilisation of) the trace metals contained in the waste materials deposited in the WSF South in the absence of any mitigating measures. However, under the conditions projected for the facility during the operational as well as closure and post-closure phases, tailings contact water would be saline and basic with high concentrations of SO_4, Fe, Na, Ca, and As, among others.

The mitigation steps taken to prevent infiltration from the TSF include:

- Filtering of the tailings with vertical plate filters to reduce the moisture content to less than 20 % prior to placement on the TSF. The elimination of surface water from the facility retards the transport of reaction products. Seepage gradients are greatly diminished by eliminating surface water. Based on infiltration modelling performed by SRK a negligible amount of seepage is expected.
- Despite the low seepage and infiltration rates the TSF is equipped with an underdrain and geomembrane over the entire basal area to capture any moisture migrating through the TSF and to prevent saturated conditions.
- The tailings will be compacted in 30 cm layers resulting in reduced permeability of the facility.
- The process flowsheet includes a cyanide detoxification in which CN wad will be reduced by INCO process from around 500 ppm to below 15 ppm. This will reduce ongoing leaching of metals in the TSF.

20.2.2 Waste storage facilities (WSF)

In general, the results indicate that runoff water flowing along the slopes of the WSFs during snowmelt periods, in the absence of any mitigating measures, are acidic (with pH values between 2 and 3) and saline or very saline, with variable contents of metallic species. Hydrochemical typologies were differentiated in both WSFs, because of the type and mass of the exposed material:

- WSF North: saline to very saline, calcium-sodium chloride-sulfate to chloride-sodium, slightly sulfate water with moderate to very high metal contents (Fe, Al, Mn, Cu, and Co, among others).
- WSF South: saline, calcium-sodium sulfate to calcium sulfate, slightly sulfate water with lower concentrations of metallic species than WSF North runoff.

Runoff water from the WSFs will be captured using collection trenches, which in turn will discharge the contact water into an evaporation pond designed for each WSF, and based on modelling by SRK are not expected to infiltrate into the groundwater system. At mine closure, the evaporation ponds will be decommissioned and mitigation measures will consist of the placement of a cover on the crest and slopes of WSF North and South constructed with non-acid generating granular material existing in the area. Both the operational and closure mitigating measures were designed by SRK.

20.2.3 Pit lake

Modelling indicated that the pit lakes in AA and BP will reach hydrodynamic equilibrium at approximately year 100; however, the content of major ions will not stabilise over the same timeframe. This is typical of pit lakes that behave as water sumps (i.e., evaporation is the only water outflow) and there are examples across the world showing that hydrochemical stabilisation occurs over a much longer period than hydrodynamic stabilisation. Based on estimations, the pit lake water will be saline to very saline, from calcium-sulphate to sodium-sulphate, and will have high concentrations of metallic species, such as Fe, Al, and Mn, among others.

It was concluded that the pit lakes will behave as water sumps and are not expected to have an impact on the chemical quality of the groundwater in the surrounding area (within the perimeter exceeding transport conditions which would be regulated by solute diffusion). No specific mitigating measure was adopted.

20.2.4 Monitoring of the tailings and waste storage facilities

The chemical and physical monitoring systems for the WSFs and TSF were designed by SRK. The scheme includes the implementation of an online data management system, which will allow the management of data and readings in real time using a network platform that integrates the maximum number of instruments placed in situ and where alert levels can also be defined. Water management

The non-contact water management system was designed by SRK. It consists of three channels (Upper Diversion Channel, Lower Diversion Channel and North Contour Channel) and a diversion work in WSF North. Figure 20.1 presents a general plan view of the site, showing the layouts of the diversion channels, the North Contour Channel, and the diversion work for WSF North.

In order to verify the quality of the groundwater in the mine-process plant area, the physio-chemical parameters and piezometric levels will be monitored to identify changes in the composition described in the water quality baseline. The measurement parameters will include temperature, pH, electrical conductivity and the oxide-reduction potential. The quality and composition of the groundwater will be verified by sampling and subsequent analysis at an accredited laboratory.

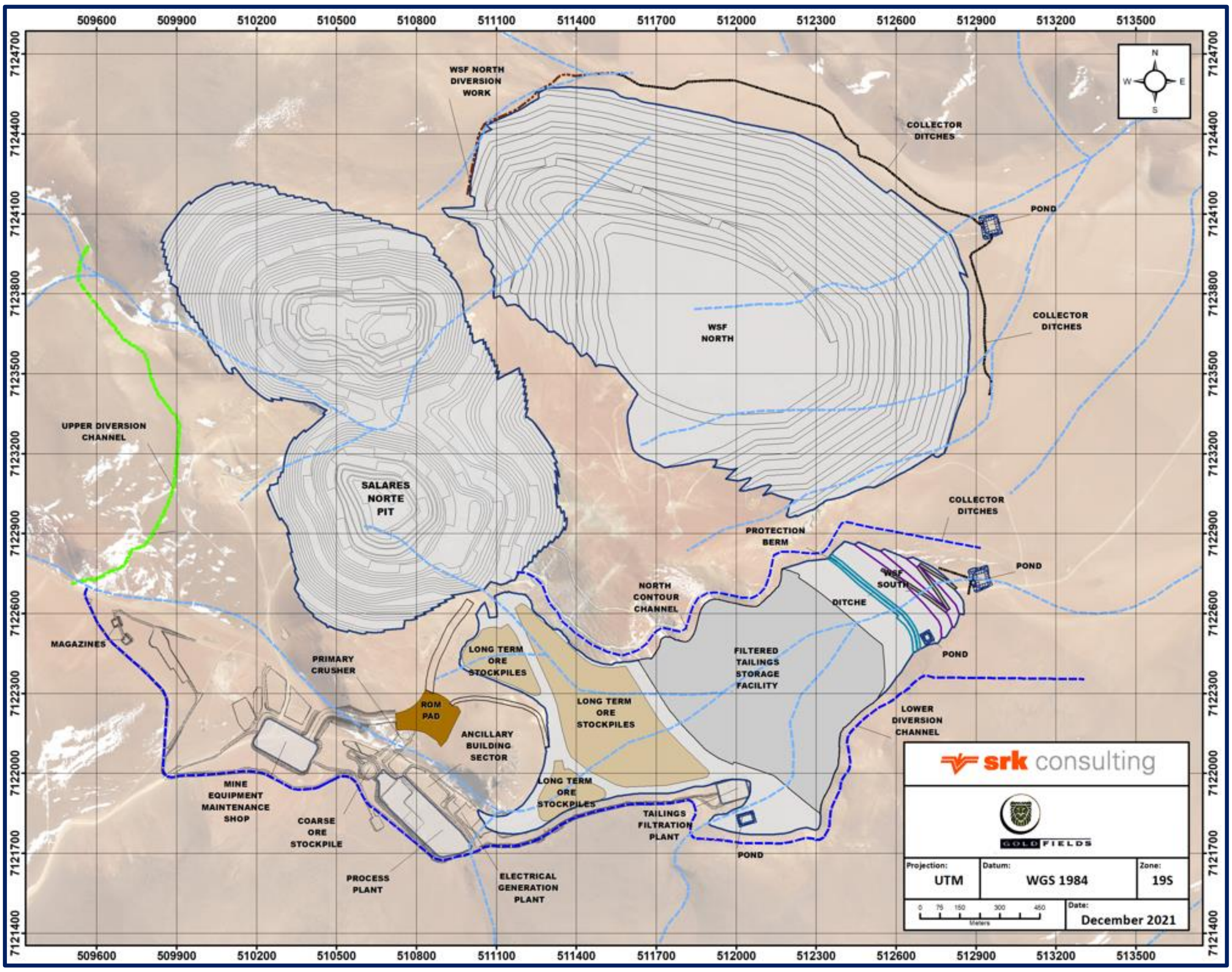
The mine-process plant area includes seven monitoring points that include wells and piezometers. The Qualified Person is of the opinion that the water balance management and monitoring practices industry leading practice and are adequate for the life of mine Mineral Reserve estimate.

20.2.5 Salar Grande

The greatest environmental sensitivity in the general region is the Salar Grande salt flat in the Salar Grande basin. The development of continuous pumping during operations from two water production wells (WEDR001 and WEDR003) located 8 km to the west of the salar will cause variations in the piezometric level in a radius of influence within the Salar Grande basin (Figure 20.1).

Hydrogeological modelling was performed by SRK, who developed a conceptual and numerical model of the Salar Grande basin with the aim of determining the potential impact of groundwater extraction from WEDR001 and WEDR003 on the Salar Grande salt flat. A separate conceptual and numerical model was developed for the mine-process plant area, which is a sub-basin of the Salares Grande basin to determine the potential inflow of groundwater into the pit and to perform pit lake modelling.

Figure 20.1: Non-contact water management system



Source: Salares Norte CPR, 2021

Water level measurements were periodically taken from the wells in the Salar Grande basin over several years to define the piezometric surface. Several detections of saturated samples from exploration RC holes were used to build a water occurrence elevation surface, which was analysed against geological, structural and geotechnical data and compared to the piezometric map. Electrical conductivity logging was also carried out.

A total of 83 chemical variables were analysed in the Salar Grande basin groundwater samples from five wells, classified as field parameters, general parameters, anions and cations, organic parameter, inorganic parameters, total metals, and microbiological parameters. Analysis was performed by SGS (Chile) and by Hidrolab. Both laboratories are accredited under NCh-ISO 17025.

Knight Piésold performed conductivity measurements and temperature logging on wells within the basin under MGFSN supervision. A total of 31 water samples were sampled for isotopic analysis, of which 15 comprise groundwater taken from wells, 14 of surface water collected from existing lagoons in the salar and two from snow collected within the basin. The sampling was carried out in two campaigns by Knight Piésold and MGFSN and sent to the University of Arizona (USA) for analysis. The results from these tests indicate that groundwater and surface water within the Salar Grande basin have the same origin, associated with rainfall that recharged the aquifer with a difference in its isotopic signal associated with the different degrees of evaporation that these waters may experience.

The piezometric levels did not indicate seasonal variations, suggesting that the aquifer stores a large volume of water to the point that annual recharge is insignificant compared to the total volume stored. Only daily variations were detected at the edge of the salt flat related to evaporation processes.

The underground water advances from different sectors of the basin towards the salar, which is the lowest point in the basin, with the main flow advancing from the western limit trough the UH-3A (permeability between 1 and 100 m/d) and heading east towards the salar. This flow varies due to the existence of impermeable domes belonging to the UH-4, which locally modifies the direction of flow.

In the sector containing wells WEDR001 and WEDR003, groundwater forms a semi-confined aquifer advancing with a hydraulic gradient of 2.5 % and formed only with fresh water without the presence of brine.

Downstream of the impermeable domes located to the east of the pumping wells, the underground fresh water flow advances with a lower hydraulic gradient (0.5 %) to the salar where a saline wedge and underlying brine has been distinguished.

The discharge of the subterranean flow occurs in the Salar Grande through outcrops of water in the edges that come from groundwater of lower salinity found on the brine, causing the formation of permanent lagoons due to existing topographic variations. A part of the outcropping underground flows evaporate without reaching these lagoons on the western edge of the salar.

The Salar Grande basin was defined as a closed hydrogeological basin of the arreica type, with annual precipitation estimated at 136 mm. Recharge to the underground system is associated with infiltration of water from precipitation, that reaches 510 ℓ/s. Discharge from the underground system corresponds to evapotranspiration from the saline crust, plains and core of the salar, and outcropping flows on its edge. Discharges are estimated at between 312 and 321 ℓ/s for the evapotranspiration of the saline crust, core and vegas, and between 191 and 199 ℓ/s for the outflowing flow. Groundwater storage in the Salar Grande basin varies between 642 and 1,238 Mm^3, with the largest volume to the west of the salar.

A numerical model was developed in accordance with the requirements of the SEA modelling guide with an error of 1 %, adequately representing the dynamics of levels observed in the basin area. The transient condition of the model was calibrated using the results of a 72 hour pump test.

The following conclusions were made from the various studies:

- A 50 year simulation scenario was established, which considered 17 years of operation and closure and 33 years post-closure. The simulated post-closure time was carried out to evaluate the situation of the basin after 50 years of project start.
- Based on the simulation scenario, the decreases in the salar area due to extraction of flow in the central sector would only affect the western limit of the salar. The maximum decreases for this sector would occur at the beginning of the post-closure period (year 19 of the simulation) and would be less than 8 cm.
- The maximum drops in the wells on the edge of the salar are of similar magnitude to the daily level variations recorded due to evaporation processes identified in the conceptual model.
- The recovery at the end of 50 years from the start of the project of the piezometric levels of the wells on the edge of the Salar implies differences between the model with the project and without the project of less than or close to 1 cm, that is, these wells have practically recovered their initial level.
- The total flow pumped during the 17 years of operations and closure reaches a volume of 14.2 Mm^3, which corresponds to a maximum of 2.2 % of the total groundwater stored in the Salar Grande basin, which is between 642 Mm^3 and 1,238 Mm^3.
- The numerical results show that the maximum reduction in the stored volume is reached in year 14, at the end of the operations period. This reduction is 8 Mm^3, which corresponds to 1.1 % of the stored volume without considering pumping. At the end of 50 years, this reduction is 0.1 % of the total before pumping began.

- Regarding the potential variations in the lagoons due to the influence of pumping, the following was concluded:
    - The decrease in the potential lagoon-forming flow due to pumping would reach a maximum value of approximately 4 ℓ/s of the total without extraction, which would imply a reduction of 2 % with respect to the total area of the lagoons.
    - At 50 years, the difference in the flow that emerges in the subsystems related to the lagoons is 1.0 % with respect to the same flow before the start of the project, and is considered to have recovered to its initial rate.

Variations in the depth of the piezometric level and brine will be measured at the intervals specified in the EIA.

20.3 Permitting

The Chilean Constitution guarantees the right to a pollution-free environment. Law #19,300 (1994) amended by Law #20,417 (2010) provides the basis for the legal environmental system in Chile. The Laws regulate issues of importance for investment projects such as the Environmental Impact Assessment (EIA) system, strategic environmental assessment, liability for environmental damage, air and water quality and emission standards and prevention and decontamination plans, among others.

The main environmental regulatory bodies are:

- The Ministry of the Environment, acting as the adviser to the President in the design and implementation of environmental policies, plans and programs, and the protection and conservation of biological diversity and of renewable natural and water resources.
- The Environmental Assessment Service (SEA - Servicio de Evaluación Ambiental) that manages the Environmental Impact Assessment System (SEIA - Sistema de Evaluación de Impacto Ambiental).
- The Superintendence of Environment (SMA), which oversees and enforces the compliance with environmental laws and regulations and imposes relevant sanctions if applicable.
- The Environmental Court that oversees the resolving of environmental disputes.

Under the Chilean environmental permitting framework, certain exploration activities may be exempt from entering the evaluation system SEIA if they remain under the assessment threshold. Otherwise, all relevant environmental and social impacts are verified through an Environmental Impact Declaration (DIA - Declaración de Impacto Ambiental) or an EIA depending on the circumstances and location of a project. Salares Norte was subject to the EIA process and system from the exploration phase onward. The SEA will issue a Resolution of Environmental Qualification (RCA) on approval of the EIA application. The EIA for Salares Norte was approved on 18 December 2019 through RCA 153/2019. The RCA is a ‘global’ environmental permit, which certifies that a project complies with all applicable environmental laws and regulations. It entitles the project owner to obtain the required additional governmental environmentally related permits (PAS) detailed in the RCA from the respective public agencies prior to commencing project construction activities.

MGFSN holds exploitation concessions that cover the Salares Norte mine site. While these concessions grant MGFSN the right to exploit minerals, other permitting is required before mining, construction and operations commence. These permits are mostly associated with environmental impact and water access.

All sectorial permits required to commence pre-stripping and construction have been secured. With these approvals in place, the permitting effort until commencement of operations are mainly focused on obtaining specific construction permits, including sanitary permits, building permits and final reception of the facilities, among others.

The sectorial permits are summarised in Table 20.1.

Table 20.1: List of Salares Norte sectorial permits

Number	Purpose	Permit	Registered holder	Status	Grant date	Expiry date	Fines
Res. Ex. N° 153	Project	Autorización ambiental Proyecto Salares Norte (RCA)	Gold Fields Salares Norte SPA	Approved	18-Dec-2019	2037	-
Res. Ex. Nº797	Tailings storage facility	Autorización Proyecto De Depositación De Relaves	Gold Fields Salares Norte SPA	Approved	4-Apr-2020	N/A	-
Res. Ex. Nº1293	Waste Storage Facility	Autorización Botadero De Estériles (Norte y Sur)	Gold Fields Salares Norte SPA	Approved	11-Aug-2020	N/A	-
Res. Ex. N°1897	Exploitation Method	Método De Explotación (Incluye acopios de mineral)	Gold Fields Salares Norte SPA	Approved	16-nov-20	N/A	-
Res. Ex. N°1623	Process Plant	Aprobación Proyecto Plantas De Tratamiento De Minerales	Gold Fields Salares Norte SPA	Approved	07-oct-20	N/A	-
Res. Ex. N°1958	Closure Plan	Autorización Plan De Cierre	Gold Fields Salares Norte SPA	Approved	25-nov-20	N/A	-
DGA Resolution Nº 864	Water Diversion Channel	Solicitud De Modificación De Cauces Naturales O Artificiales	Gold Fields Salares Norte SPA	Approved	31-Dec-2019	N/A	-
DGA Resolution Nº 868	Water Diversion Channel	Solicitud De Modificación De Cauces Naturales O Artificiales	Gold Fields Salares Norte SPA	Approved	31-Dec-2019	N/A	-
DGA Resolution Nº 867	Water Diversion Channel	Solicitud De Modificación De Cauces Naturales O Artificiales	Gold Fields Salares Norte SPA	Approved	31-Dec-2019	N/A	-
DGA Resolution Nº 866	Water Diversion Channel	Solicitud De Modificación De Cauces Naturales O Artificiales	Gold Fields Salares Norte SPA	Approved	31-Dec-2019	N/A	-
DGA Resolution Nº 865	Water Diversion Channel	Solicitud De Modificación De Cauces Naturales O Artificiales	Gold Fields Salares Norte SPA	Approved	31-Dec-2019	N/A	-
DGA Resolution N° 761	Water containment	Autorización Para Efectuar Obras De Regularización O Defensa De Cauces Naturales	Gold Fields Salares Norte SPA	Approved	25-nov-20	N/A	-
DGA Resolution N° 806	Water containment	Autorización Para Efectuar Obras De Regularización O Defensa De Cauces Naturales	Gold Fields Salares Norte SPA	Approved	3-Dec-2020	N/A	-
Ordinario 1212/2020	Site SN3	Excavaciones, Traslado De Arqueología, Paleontología O Antropología Y Patrimonio Histórico	Gold Fields Salares Norte SPA	Approved	31-mar-20	N/A	-
Resolución 160, 162, 163, 164, 165, 166, 167/2020	General	Permiso Para La Caza O Captura De Los Ejemplares De Animales De Especies Protegidas	Gold Fields Salares Norte SPA	Approved	3-Apr-2020	N/A	-

Note: The Qualified Person has selected permits to demonstrate permitting verification.

The Qualified Person is of the opinion that the licences and permits are in good standing and that any current or future licensing or permitting can and will be obtained for the Mineral Reserve or the Mineral Resource.

The Qualified Person is of the opinion that Salares Norte has a good standing with licensing. authorities, community groups and that licensing is not expected to be material to the Mineral Reserves or Mineral Resources.

Salares Norte will be conducting continuous rehabilitation. and the Qualified Person is of the opinion that the closure estimates, funding provisions and duration are reasonable and practical.

Source: Salares Norte CPR, 2021

20.3.1 Water legislation

Water rights in Chile are fully protected as private property and can therefore be bought, sold, mortgaged or transferred like other forms of real property. Chilean law states that water is owned by the State. The holder of water rights has the right to use, enjoy and dispose of this resource.

In general, water rights are granted when an administrative resolution is issued by the General Directorate of Water (DGA - Dirección General de Aguas) and once the rights are registered at the Water Registry of the corresponding Real Estate Registrar.

In March 2017, MGFSN secured water rights over six wells in the Salar Grande basin with a combined flow of 114.27 ℓ/s. Additional rights for a combined flow of 78.4 ℓ/s over two wells were approved in December 2019 and registered in favour of Gold Fields.

20.4 Terrestrial fauna

The environmental relevance of terrestrial fauna is high due to occurrences of species listed in special conservation categories (as per the RCE and Hunting Law) and species which exhibit any kind of singularity according to the SEA "Guide for Descriptions of Soil, Flora and Fauna Components of Terrestrial Ecosystems" as governed by the SEIA system. In addition, the mine site is in an environment for fauna as delimited by chinchilla exclusion areas that will be affected by the construction of facilities.

The effects arising from the construction and operations of the mine will lead to the loss of environment for fauna. This assumes there will be an increase in the sound level principally during construction, with consequential effects on special conservation species and regional endemic species in the area.

One significant impact identified as part of the EIA relates to the alteration and loss of habitat of chinchilla, a critically endangered species in the area. To mitigate the impact, a plan was developed in the EIA and approved by the authorities that involves establishing a compensation and conservation area outside the mining area, declaring no-go zones and relocating chinchillas if their habitat overlaps with future mining areas. The environmental permit for this purpose is "Protected species capture and relocation: Resolutions N°160, 162, 163, 164, 165, 166, 167/2020" approved on 3 April 2020.

Chinchillas from two of nine areas identified for relocation in the EIA were relocated during 2020. Of the four chinchillas relocated from these two areas, two were successfully introduced into their new habitat and the 12-month monitoring period has been completed. However, the other two chinchillas passed away during the initial 30-day adaptation process and the relocation plan was suspended by the authorities at the end of 2020, followed by the initiation of a sanctioning process against Salares Norte during November 2021. In response, Salares Norte submitted a compliance program to the authorities for approval during December 2021. The compliance program, which incorporates significant learnings from the initial relocation campaign, remains under review by the authorities at the time of this report. MGFSN will continue to work with Authorities to improve and resume the relocation plan.

20.5 Social and community

Salares Norte is located a significant distance from any major population centers, with the nearest being Diego de Almagro, 180 km away. No Indigenous People inhabit or exist in the area surrounding the mine site (land use and ceremonial areas included). The closest indigenous community is 70 km from the site.

The sites of cultural heritage are near Route C-13, a road used by the vehicles traveling to Salares Norte and RCA-153 (Environmental Permit for Salares Norte) states that these will be impacted by Gold Fields works, actions or activities.

Stakeholders in the Atacama Region are familiar with mining as it forms the backbone of the regional economy. Several deposits have been discovered and mined in the region. Many people are connected to the mining industry, either through direct employment or through secondary support services.

Because of Salares Norte's remote location, high geographic elevation, harsh weather conditions, scarcity of drinking water and poor soils, there are no human settlements in the direct area of influence of the mine. There are also no sustained human activities like crop cultivation or livestock herding in the area.

Risks associated with intrinsically difficult issues such as population relocation, livelihood displacement, and disputes over land ownership or water competition/pollution that may threaten the social licence to operate are therefore assessed as low to low-moderate.

There are no indigenous peoples' territorial claims over the area and CONADI has indicated that the area of the property is not within any of the aspirational territories of indigenous peoples based on ancestral rights. The surface rights in the property are owned by the Government. The Government has confirmed that there are no claims over the surface area by indigenous or non-indigenous parties.

The nearest four indigenous communities, located some 70 km from the site, are engaged. Only the Colla Comuna Diego de Almagro indigenous community is potentially impacted by the project. The required anthropological baseline, impact assessment and mitigation were reported in the EIA. The community was engaged from as early as 2015 and declined to participate in the indigenous consultation process conducted by the environment authority during the EIA process.

An independent assessment of compliance of the Salares Norte EIA against the IFC Performance Standards and the related Equator Principles was completed. This included a review of the EIA against IFC Guidance Note 7: Indigenous

People, ILO Convention 169: Indigenous and Tribal Peoples, Article 6 and relevant Chilean law relating to consultation with Indigenous People. IFC Guidance Note 7 and the ILO Convention are referred to also in the ICMM Position Statement on Mining and Indigenous People. The assessment confirmed that the approach taken in the EIA was consistent with these requirements and no gaps were found.

Artisanal miners have not been seen in the area even though informal mining is common in the region, albeit operating at lower altitudes and in areas with less severe climates and closer to population centers.

In general terms, the most debated topics in the Atacama Region are:

- Lack of new investments with high social impact, including mining projects.
- Closure of mining operations without replacement in sight.
- Water competition and rapid, steady depletion of water resources in the region, due to a long drought registered in the country.
- Need for economic reactivation after the COVID-19 social impact.

MGFSN has a relationship with the local communities since 2015, when it commenced early engagement mainly focused on providing support to families and local organisations as consequence of flooding in the Atacama Region. The objective of the stakeholder engagement strategy has been and is to ensure support from stakeholders for the continuity of MGFSN's operations, growth in the country and the region, promoting the image of Gold Fields aligned with its vision, purpose and values.

The following are the main regional stakeholders:

- Host community
  - Atacama Region / Chañaral Province/ Diego de Almagro commune
  - Functional and territorial organisations.
- Colla Indigenous Communities
  - Comuna Diego de Almagro
  - Chiyagua
  - Runa Urka
  - Geoxcultuxial.
- Government
  - Regional
  - Local.
- Interested groups
  - Industry Associations (regional)/ other companies
  - Universities / Institutes
  - NGOs
  - Media.

To fulfill the objective and engage with all stakeholders, communication, community, and government action plans are developed every year aligned with Gold Fields values, purpose and vision and focus on communications, community and government relationships.

As part of the engagement strategy and action plans, several legal and community commitments have been established by MGFSN with different host community organisations. The legal-community commitments established in its environmental permits consider several voluntary commitments mainly designed to:

- Reduce potential impact of road use: signalling, speed monitoring, identification of Colla significant cultural sites.

- Reduce impact on Colla communities: information and training on Colla cultural heritage, signalling.
- Information: provide regular information on the advance of the project and significant situations.
- Ensure grievance management.
- Host community employment > 15 %.
- Implementation of Transapell for the transportation of hazardous substances.

Additionally in the case of Colla communities, there are specific agreements signed that include the development of annual social development projects with each of the communities. There is a Long-Term Agreement signed with "Comuna Diego de Almagro" Colla community and Yearly Agreements with the Chiyagua; Geoxcultuxial; Salomón Gerónimo y Familia and; Runa Urka.

20.6 Mine closure

The internal closure plan for Salares Norte was developed by SRK, in accordance with MGFSN guidelines, including the legal commitments assumed by MGFSN in the MCP approved by SERNAGEOMIN (Resolution No. 1958/2020).

The specific closure objectives for the facilities are:

- Clean and demolish the buildings and structures posing a risk for third parties.
- Delimit and signal any hazardous areas to prevent third-party entry to them and block, obstruct, or seal the access routes to such areas.
- Remove hazardous and/or toxic waste, substances and materials remaining on site and manage it in accordance with current regulations.
- If there are contaminated soils due to the spillage of hazardous substances, remove or treat the affected material on site, handling it in accordance with current regulations.
- For remnant facilities, control (if required) any aeolian and water erosion that may generate facility instability, the release to the environment of any toxic substances, or any other undesired consequences.
- For remnant facilities, control the release of any toxic substances due to long-term drainage and/or leaching caused by potential precipitation events.
- Minimise ancillary facilities during post-closure.
- Allow the inspection and maintenance of surface water management works.
- Maximise natural water conservation.
- Ensure the chemical stability of facilities and mine waste materials.
- Ensure the physical stability of remnant mine facilities.
- Ensure stability against erosion due to surface runoff and the effluents generated during closure and post-closure.

The closure works include:

- The redesign of the system channels to be able to convey the Probable Maximum Flood (PMF) in order to protect physical and chemical stability of the waste facilities post closure.
- Closure of the site remnant facility access roads by means of safety berms. Closure of access roads to the WSF North and South, filtered TSF and camp by means of safety berms.
- Closure of the collection ponds associated with the WSFs as well as the collection pond and the storage pond associated with the filtered TSF by means of the following activities: HDPE removal, pond backfilling with material from the area, perimeter fence removal, and scrap transport and disposal (fence).

- Warning signs installed at the pit access points and perimeters, the WSFs, and the filtered TSF, the layout of non-contact water management system channels, and access roads to the site and the fresh water extraction area. This signage will be installed every 400 m.
- Closure or plugging of water abstraction wells by means of the installation of a concrete plug. This plug will be implemented in both wells.
- Closure of the contact water collector channels existing in WSF North and South by means of ditch backfilling with materials from the area.
- A perimeter enclosure around the open pit. The layout of the perimeter enclosure has been estimated considering a 100 m buffer zone, with a projected length of 5.84 km.
- A cover installed on the surface (crest and slopes) of WSF North and South. The objective of this cover is to avoid exposure of materials with an acid generation potential by means of a store-and-release cover in accordance with the recommendations contained in International Network for Acid Prevention "Technical Guidance Document – Global Cover System Design", published in November 2017.
- A 30 cm thick cover installed on the filtered TSF crest area, considering the use of granular material. The objective of this cover is to control the generation of particulate material from the facility.
- Concrete demolition consisting of the removal of all existing concrete and steel structures and piping from the process plant and support facilities by means of mechanised demolition. This closure measure considers the loading, transport, and final disposal of non-hazardous industrial waste at an authorised site outside the mine.
- As a result of facility demolition and dismantling, hazardous and non-hazardous waste will be generated. In accordance with national legislation, hazardous waste must be disposed of in an authorised safety deposit (Supreme Decree D.S. No. 148). The disposal of hazardous waste considers the loading and transport outside of the mine in trucks authorised for such purposes and final disposal in authorised safety landfills.
- In those areas where facility dismantling is carried out, such as ore stockpile areas, among others, surface contouring will be carried out. This contouring will consist of the use of grading equipment on the surface to avoid any sectors where water accumulation could occur.

During the closure phase (i.e., during the period in which the closure measures are implemented, estimated to be two years), the monitoring activities considered as part of the voluntary environmental commitments assumed by MGFSN during the environmental assessment phase will be carried out.

Post-closure measures correspond to monitoring and maintenance activities associated with remnant closure works. During the post-closure period (i.e., after closure measures and activities have been implemented), the monitoring activities considered as part of the voluntary environmental commitments assumed by MGFSN for the closure phase will be maintained. The period over which post-closure monitoring activities will be carried out is 10 years. Although the models indicate that there will be no seepage from the facilities, this monitoring period has been estimated in accordance with MGFSN´s internal policies.

Maintenance of the pit perimeter berm, the installed signage and the non-contact water management system has been considered. Periodical inspections consist of a visual inspection throughout the non-contact water channel length, twice a year, preferentially before and after the snowmelt period (October-February), with the purpose of identifying any potential repairs and/or cleaning work that may be required.

The level of accuracy of the closure estimate is at scoping study level. Based on SERNAGEOMIN´s guidelines, contingency for a scoping study range from 25 % to 30 % (Ref 27). Therefore, 25 % of the sum of direct costs and indirect costs has been adopted for contingencies.

The closure measures proposed for the Salares Norte mine facilities are presented in Table 20.2. Additionally, the voluntary environmental commitment consisting of water monitoring during the closure phase has been incorporated as a closure measure.

The Salares Norte life of mine is 11 years with gold and silver production commencing in 2023. Therefore, the beginning of the closure phase is considered to start from year 14 and is estimated to last over a 2 year period as shown in Table 20.2, starting with remnant facilities, the process plant and ancillary facilities followed by the fresh water abstraction area and finally the camp. However, because ore extraction from the pit ends by year 7, closure of the facilities associated with extraction has been committed from year 8. Closure of extraction facilities considers the open pit and the explosives handling area, which will be implemented during the first semester of operational year 8 as indicated in Table 20.2. Conversely, and according to MGFSN internal definitions, progressive closure of the WSF North and WSF South is considered between years 9 and 13.

The Qualified Person considers that the current policies in place address all issues associated with local individuals and groups.

The Qualified Person is of the opinion that the closure estimates and duration are reasonable and practical and appropriate plans, including a commitment to continuous rehabilitation, and funding provisions are in place, as regulated, to support execution of the 2021 life of mine plan and to meet the closure liabilities.

Table 20.2: Salares Norte closure plan and budget

WBS	Facility / Activity	Cost ($ M)	Operation													Closure		Post closure									
			1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**
			2023	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**	**2045**	**2046**	**2047**
1100	Salares Norte Pit	0.25	-	-	-	-	-	-	-	0.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1200	WSF-North	4.95	-	-	-	-	-	-	-	0.83	0.83	0.83	0.83	0.83	0.82	-	-	-	-	-	-	-	-	-	-	-	-
1300	WSF-South	0.54	-	-	-	-	-	-	-	0.09	0.09	0.09	0.09	0.09	0.09	-	-	-	-	-	-	-	-	-	-	-	-
1400	Filtered tailings storage facility	0.35	-	-	-	-	-	-	-	-	-	-	-	-	-	0.31	0.05	-	-	-	-	-	-	-	-	-	-
1500	Non-contact water management system	2.39	-	-	-	-	-	-	-	-	-	-	-	-	-	1.20	1.20	-	-	-	-	-	-	-	-	-	-
2100	Run-of-mine stockpiles	0.07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	-	-	-	-	-	-	-	-	-	-
2200	Crushing and coarse ore stockpiling	1.31	-	-	-	-	-	-	-	-	-	-	-	-	-	0.83	0.47	-	-	-	-	-	-	-	-	-	-
2300	Process plant (wet area)	9.62	-	-	-	-	-	-	-	-	-	-	-	-	-	6.40	3.22	-	-	-	-	-	-	-	-	-	-
2400	Ancillary facilities	2.63	-	-	-	-	-	-	-	-	-	-	-	-	-	1.77	0.87	-	-	-	-	-	-	-	-	-	-
2500	Explosives management area	0.14	-	-	-	-	-	-	-	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2600	Fresh water abstraction area	0.25	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00	0.25	-	-	-	-	-	-	-	-	-	-
2700	Camp	0.54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.54	-	-	-	-	-	-	-	-	-	-
3100	General-monitoring during the closure phase	0.04	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.02	-	-	-	-	-	-	-	-	-	-
4100	Post-closure monitoring	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
4200	Post-closure maintenance	5.94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.94	-	-	-	-	-	-	-	-	-
5000	Indirect costs	30.97	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	3.49	3.49	3.49	3.49	3.49	5.95	5.36	-	-	-	-	-	-	-	-	-	-
Subtotal		**60.23**	**0.28**	**0.28**	**0.28**	**0.28**	**0.28**	**0.28**	**0.28**	**1.58**	**4.41**	**4.41**	**4.41**	**4.41**	**4.39**	**16.48**	**12.05**	**5.96**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**
Closure engineering, design and implementation plan (5 % (DC+IC))		3.01	-	-	-	-	-	-	0.18	0.22	0.22	0.22	0.22	0.22	0.82	0.60	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
Contingencies (25 % (DC+IC))		15.06	-	-	-	-	-	-	0.88	1.10	1.10	1.10	1.10	1.10	4.12	3.01	1.49	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
Total		**78.30**	**0.28**	**0.28**	**0.28**	**0.28**	**0.28**	**0.28**	**1.33**	**2.90**	**5.73**	**5.73**	**5.73**	**5.72**	**9.34**	**20.10**	**13.84**	**5.97**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.03**	**0.02**

Source: Salares Norte CPR, 2021

21 Capital and operating costs

The Salares Norte capital and operating cost estimates are based on the 2018 FS, however, updates have been incorporated where new information is available. The process plant is currently undergoing construction in the Atacama Region in Chile, with the aim to commission in 2023. The construction period has coincided with the unexpected outbreak of a global pandemic (COVID-19), which is having a direct impact on the availability of construction staff, services, materials and equipment supply, both in terms of cost and schedule. Capital costs developed for the process plant was developed, finalised, and approved prior to the COVID-19 pandemic, and therefore have not considered related impacts, which will affect the construction completion timing and capital cost. Such impacts are beyond the reasonable predictability and control of the Qualified Person.

21.1 Capital costs

The Salares Norte life of mine capital cost estimate is divided into the following phases:

- Pre-development phase, before final notice to proceed FNTP (completed).
- Initial (or Development phase) - from FNTP to commissioning.
- Sustaining capital phase.

Some non-material updates have been made to the FS estimates:

- The FNTP date was moved forward to 2021 resulting in a reduction of pre-development capex from $80.5 million to $46.6 million. This amount was transferred to initial capex to cover the work program for Q2 2020.
- The FS capital cost was increased from $833.8 million to $860.7 million to cover the work program for Q2 2020.
- The sustaining capex was revised from $83 million to $89 million to include earthworks for the future PV plant that was outside the scope of the FS.

Direct, indirect and owner cost estimates were derived from first principals based on vendor quotations and experience on other projects. A contingency of 15 %, comprising cost and schedule contingency, was applied to the estimates. Escalation is not included which is reported as at 2018.

Pre-development expenditure from the end of the FS (2019) to FNTP (2020) was $46.6 million. This was used to advance engineering, procurement and for the owner's team. This value is lower than the $80.6 million forecast in the FS as the FNTP was moved forward, resulting in a transfer of capex from the pre-development phase to the initial phase. The pre-development capital cost expenditure does not include district exploration activities which is outside the scope of the development of Salares Norte.

In addition to construction of the process plant and associated infrastructure and facilities, the initial capital cost for the mine includes $155.0 million for pre-stripping of 50.7 Mt (50.6 Mt waste and 0.1 Mt ore). Most of the waste is used to build WSF South, the platform for the ore stockpiles and TSF.

Sustaining capital costs are influenced by the strategy of using contractor mining and the adoption of the dry stack tailings methodology. The sustaining cost for the mining fleet is adsorbed into the mining unit cost, and the TSF capital cost only includes expansion of the dry stack liner system without the need for periodic embankment raises throughout the life of the operation. The higher cost of filtered tailings is reflected in the operating cost.

NDSC is a special provision made for "non-negotiable" projects that will not yield an economic return. No allowance was made for:

- Discretionary projects as these will be justified separately on their respective value proposition.
- Inflation and exchange rate variations.

The forecast life of mine capital costs are summarised in Table 21.1.

Table 21.1: Capital costs

Capital cost item	Units	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Development capital (mine and plant)	$ million	310.0	78.7										
Mining – capitalised waste	$ million	17.0	68.0	79.9	68.7	83.2	89.4	87.3	33.8				
Sustaining capital (incl. TSFs)	$ million		26.4	11.4	11.9	7.5	7.4	6.8	7.8	3.3	3.2	3.1	0.5
G&A capital	$ million												
Exploration	$ million												
Capital	$ million	327.0	173.1	91.4	80.6	90.7	96.9	94.0	41.6	3.3	3.2	3.1	0.5

Notes: This capital summary estimate is for the Mineral Reserve life of mine schedule.

No exploration capital included as the Mineral Resource is 97 % in the Indicated category and the remaining conversion is expected to be achieved through grade control drilling which is included in operating costs.

Source: Salares Norte CPR, 2021

21.2 Operating costs

21.2.1 Mining operating cost

Mine operating costs are based on a contractor mining strategy using Q4 2018 vendor quotations inclusive of:

- Mining and transport of ore to the run-of-mine pad and stockpile areas.
- Mining and transport of waste to WSF South during the pre-production period and to WSF North after Year-1.
- Maintaining all mine work areas, in-pit haul roads, external haul roads and waste storage areas.

Mine operating costs excluding pre-stripping costs are summarised in Table 21.2 on a total and per tonne mined basis.

Table 21.2: Mine operating costs summary

Item	$ million	$/t mined
Loading – Run-of-mine	80.5	0.29
Hauling – Run-of-mine	186.5	0.67
Drilling	17.3	0.06
Blasting	37.4	0.13
Ancillary	67.7	0.24
Support	22.5	0.08
G&A mining contractor	37.0	0.13
Mine equipment lease	104.5	0.37
Grade control	8.5	0.03
Owner cost	34.3	0.12
Contractor fee	40.9	0.15
Contractor indirect	2.3	0.01
Mine capital items	3.0	0.01
Total	642.3	2.29

Source: Salares Norte CPR, 2021

Ore and tailings re-handle cost estimation was done with the mine operating cost estimate as this is the responsibility of the mining contractor using a smaller dedicated fleet of equipment. The total re-handle cost for ore is $61.3 million ($2.25/t ore) and $59.9 million ($2.70/t ore) for tailings.

21.2.2 Processing operating costs, consumables and reagents

The operating cost of the process plant represents a significant cost element to the overall financial evaluation of the Mineral Reserves life of mine plan. The processing facilities use relatively large quantities of power, reagents, and consumables, including fuels, cyanide, grinding steel media, lime, caustic, etc.

The estimation of future processing costs is required as input into the cut-off-grade calculations and economic assessments of the Mineral Reserves and Mineral Resources. Estimates of the processing costs require assumptions to be made concerning consumables consumption rates, unit prices and inflation rates.

Metallurgical testing undertaken on the samples from future reserves together with plant mass balances, provide reasonable guidance of potential reagent consumption rates and mill throughput expectations, and this information is considered and reviewed by the process metallurgists and the Qualified Person.

Consumables, commodity pricing and inflation are subject to external influences that are outside the control or predictive capability of the Qualified Person.

Further to this, operational decisions made by plant management, or unexpected variances in the nature of the ores being processed could unexpectedly impact reagent and consumables usage rates. Such variances are outside the control or predictive expectations of the Qualified Person.

The following is stated in Section 11.3.9 (Accuracy of Estimate) in the March 2019 FS:

Quantities of reagents and consumables were estimated from the mass balance plus consumption indexes. These indexes were derived from models representative of the testwork results and generally satisfying all scenarios of consumption, which provides reasonable coverage for most of cases.

The combined accuracy for the operation cost is estimated in the -10/+15 % range. The operational cost includes various factors over quantities and/or unit cost to cover a contingency requirement and is estimated at approximately 10 %".

Processing costs cover the cost of all material, labour, services and activities required for ore processing and metal production. The detoxification and dewatering of tailings and the supply and storage of all process consumables and reagents are also included. The scope of processing costs also includes all auxiliary activities such as plant maintenance, water bore operation, raw water supply, potable water production and supply to all site areas, contacted water management and sewage treatment for all areas excluding the camp.

Table 21.3 summarises the breakdown of life of mine operating costs for ore processing.

Table 21.3: Processing operating costs summary

Item	$/t treated
Services	0.55
Consumables	10.37
Labour	4.91
Energy	10.56
Maintenance	2.16
Total	28.54

Source: Salares Norte CPR, 2021

Consumables costs include crushing and grinding liners, grinding media, reagents for all processes, activated carbon, diesel for process firing and diesel for auxiliary equipment. The labour cost includes expenses for operations and maintenance staff.

The energy cost includes the nominal energy consumption for all operations and auxiliary equipment. The maintenance cost includes estimates for spares purchasing and expenses for repairing services and consumables.

21.2.3 Operating cost summary

The operating cost estimate is derived from first principles, and is based on vendor quotations and experience on other projects. An overall contingency of 9 % was applied to the estimates, which is reported as at Q4 2018. The accuracy of the estimate has improved compared with the FS as the actual mining contract rates and power contract rates have been considered in this update.

Table 21.4 summarises the life of mine average operating costs for mining and processing. The G&A cost was estimated on an annual basis. Post life of mine costs are summarised in Table 21.5.

Table 21.4: Life of mine operating costs summary

Operating cost item	Units	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Mining	$ million		26.4	14.6	33.8	15.6	7.0	12.1	34.9	0.0	0.0	0.0	0.0
Processing	$ million		27.9	69.4	70.4	69.6	69.7	69.8	69.1	72.9	70.1	67.6	58.1
G&A	$ million		39.8	32.2	32.2	31.9	31.9	32.0	30.5	25.3	24.8	21.0	12.7
Other operating costs	$ million		-6.3	-2.3	-2.1	-1.0	0.2	-0.1	-2.9	3.7	3.7	3.7	3.7
Operating costs	$ million		87.8	113.8	134.2	116.1	108.7	113.7	131.6	101.9	98.6	92.3	74.5

Notes: This operating cost summary estimate is for the Mineral Reserve life of mine schedule.
Other operating costs include gold-in-process movements.

Source: Salares Norte CPR, 2021

Table 21.5: Post life of mine costs

Operating cost item	Units	2035	2036	2037	2038	2039	2040-2047
Post Mineral Reserve life of mine closure	$ million	9.34	20.10	13.84	5.97	0.03	0.03

Source: Salares Norte CPR, 2021

Table 21.6: Breakdown of ESG* expenditure included in tables 21.2, 21.3 and 224.2

Sources	Units	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Progressive Closure**	$ million						1.0	2.6	5.4	5.4	5.4	5.4	9.0	
Decarbonisation***	$ million	0.3	5.0	1.0										

Notes: * ESG stands for Environmental, Social and Governance (i.e., Sustainability items).
** Costs included under "Other operating costs" in Table 22.1, cost of guarantee not included in this table.
*** PPA Contractor will spend in the order of $13 M during 2023 / 2024, which in incorporated into unit rate over 10 year period.

Source: Salares Norte CPR, 2021

The Qualified Person's opinion on capital and operating costs is summarised below:

a) The financial schedule is aligned with the life of mine plan to ensure the provision of capital is linked to when the major budgeted items require to be funded.

b) The capital and operating cost estimation levels of accuracy improve on the minimum PFS requirements as they are based on the FS.

c) Gold Fields perform post investment reviews across all major capital studies and share key learnings.

d) Gold Fields' two-year business planning cycle captures operating and capital costs along with key physicals and revenue. The business plans are aligned with the Issuer's strategic direction and equate to the first two years of the life of mine plan.

e) Capital expenditure, once sanctioned, must follow the company's capital reporting standard. Monthly and quarterly reviews are held to assess capital programs, operating unit costs, mine physicals, plan execution and revenue streams.

Operating costs during 2023 are lower than the life of mine average as the process plant is in ramp-up phase and only 800 kt of ore are processed. Between 2024 and 2029 the operating cost profile fluctuates mainly due to the ratio of capitalised waste to operational waste mined during each period. From 2030, the operating cost decreases as the mine operations close and only stockpiled ore is fed to the plant, resulting in a lower G&A than for the initial years.

The following items are excluded from the operating costs estimate:

- Any impact of foreign exchange rate fluctuations.

22 Economic analysis

22.1 Key inputs and assumptions

The economic analysis for Salares Norte is based on the December 2018 FS, with updates where new information is available (mining contract cost, power cost and metal prices). The Mineral Reserve life of mine plan to 2033 includes the following assumptions:

- All inputs in 31 December 2018 money terms, which is consistent with the economic analysis date.
- Gold Fields' Salares Norte operation is considered a separate unit for taxation purposes.
- Discounted cashflow (DCF) applied to post-tax in-country, pre-finance cashflows and reported in financial years ending 31 December.
- Intercompany interest is not applied.
- The Mineral Reserves disclosed in Item 15.2.
- The mining and processing schedule disclosed in Item 15.1.6.
- Process recoveries disclosed in Item 13.3.
- Capital costs disclosed in Item 21.1.
- Operating costs disclosed in Item 21.2.

Other key input parameters and assumptions for the economic analysis are summarised in Table 22.1.

The life of mine physical, operating cost and capital cost inputs, including rehabilitation, leasing and closure costs, and revenue assumptions for the economic analysis are summarised in Table 22.2.

Table 22.1: Input parameters and assumptions for economic analysis

Parameter	Value / Comments
Metal prices	$1,300/oz Au, $17.50/oz Ag
Payable metal content	Au: 99.87 %, Ag: 99.50 %
Treatment charges	Au and Ag: $1.27/oz sold
Exchange rate	Chilean peso or CLP:USD 700:1
Third party royalties	1 % NSR, buyback 1 % of the current 2 % vendor royalty in Year-1 for $6 million
Depreciation	Financial: units of production
	For special mining tax: normal
	For corporate income tax: accelerated
Working capital	Minimum cash level: $10 million
	Inventories: 2 months of mining and processing costs
	Accounts receivable: 17 % of net revenue for 2 months
	Accounts payable: 2 months of mining, processing and G&A costs
Taxes	Aligned to latest Chilean Tax Reform of 2014:
	Mining tax: 0 % to 14 % of mining operating margin
	Corporate income tax rate: 27 % (8 % withholding tax on dividends paid outside of Chile not included)
	Accelerated recovery of VAT, paid during pre-production stages
Loss carry forward	Allowed
Discount rate	5.9 %
Free cashflows	All yearly free cashflows are assumed to occur in January
Present values	All present values are discounted to 1 July 2022 (mid-year)

Source: Salares Norte CPR, 2021

Table 22.2: Life of mine physical, operating cost and capital cost inputs and revenue assumptions

Sources	Units	2022	2023	2024	2025	2026	2027	2028
Open pit (gold)								
Life of mine processed	koz		211.6	585.2	584.4	591.6	296.0	356.0
Plant recovery	%		95%	95%	95%	95%	94%	91%
Sold (payable content)	koz		200	555	554	562	278	324
Open pit (silver)								
Life of mine processed	koz		1787.6	4275.7	4808.6	4127.2	5109.5	3641.5
Plant recovery	%		70.5%	71%	71%	71%	71%	65%
Sold (payable content)	koz		1260.3	3035.7	3414.1	2930.3	3627.8	2367.0
Costs, revenue and cash flow								
Net revenue	$ million	0.0	280.3	769.4	774.2	775.9	419.7	458.6
Operating costs	$ million	0.0	94.1	116.1	136.3	117.1	108.6	113.9
Capital costs	$ million	327.0	173.1	91.4	80.6	90.7	96.9	94.0
Other	$ million	32.7	-32.3	27.7	1.6	6.4	2.5	12.6
Royalties (third party)	$ million		2.8	7.7	7.7	7.8	4.2	4.6
Government levies	$ million	0	0	0	0	0	0	0
Interest (if applicable)	$ million	0	0	0	0	0	0	0
Total Costs (Excl Tax)	**$ million**	359.7	237.7	242.9	226.3	222.0	212.1	225.1
Taxes	$ million		1.1	55.8	92.8	162.3	54.0	63.3
Cash flow	$ million	-359.7	41.5	470.7	455.2	391.6	153.6	170.2
Discounted cash flow at 5.9% (NPV)	$ million	-359.7	39.2	419.7	383.3	311.3	115.3	120.7
	Units	**2029**	**2030**	**2031**	**2032**	**2033**		

Open pit (gold)						
Life of mine processed	koz	467.6	129.7	107.8	71.4	65.7
Plant recovery	%	91%	79%	86%	89%	86%
Sold	koz	426	103	92	64	57
Open pit (Silver)						
Life of mine processed	koz	2471.4	5793.4	1780.7	3788.4	1268.8
Plant recovery	%	60%	64%	62%	69%	55%
Sold	koz	1482.9	3707.8	1104.0	2614.0	697.8
Costs, revenue and cash flow						
Revenue	$ million	576.0	193.5	137.8	124.9	84.7
Operating costs	$ million	134.5	98.2	94.9	88.6	70.8
Capital costs	$ million	41.6	3.3	3.2	3.1	0.5
Other	$ million	13.3	12.8	6.5	6.5	-9.0
Royalties (third party)	$ million	5.8	1.9	1.4	1.2	0.8
Government levies	$ million	0	0	0	0	0
Interest (if applicable)	$ million	0	0	0	0	0
Total Costs (Excl Tax)	**$ million**	195.2	116.2	105.9	99.4	63.1
Taxes	$ million	105.3	3.3	0.0	0.0	0.0
Cash flow	$ million	275.5	74.0	31.9	25.6	21.6
Discounted cash flow at 5.9% (NPV)	$ million	184.5	46.7	19.1	14.4	11.5

Source: Salares Norte CPR, 2021

22.2 Economic analysis

Salares Norte’s net present value (NPV) at a discount rate of 5.9 % is $1,279 million based on discounting the cashflow in Table 22.2 to the date mid-year 2022. The corresponding internal rate of return (IRR) is 22.3 %. From the start of operations, the payback period is less than 3 years.

22.3 Sensitivity analysis

Sensitivity analyses were performed to ascertain the impact on NPV to changes in gold and silver price gold and silver grade, capital and operating costs as summarised in the following tables.

Table 22.3: NPV sensitivity to changes in gold price

Discount rate	-15 %	-10 %	-5 %	0 %	+5 %	+10 %	+15 %	+25 %	+31 %
Gold price ($/oz)	1,105	1,170	1,235	1,300	1,365	1,430	1,495	1,625	1,700
NPV ($ million)	945	1,058	1,169	1,279	1,389	1,497	1,606	1,821	1,944

Source: Salares Norte CPR, 2021

Table 22.4: NPV sensitivity to changes in gold grade

Grade	-15 %	-10 %	-5 %	0 %	+5 %	+10 %	+15 %
NPV ($ million)	945	1,058	1,169	1,279	1,389	1,497	1,606

Source: Salares Norte CPR, 2021

Table 22.5: NPV sensitivity to changes in silver price

Silver price	-15 %	-10 %	-5 %	0 %	+5 %	+10 %	+15 %
NPV ($ million)	1,243	1,255	1,267	1,279	1,291	1,303	1,315

Source: Salares Norte CPR, 2021

Table 22.6: NPV sensitivity to changes in silver grade

Grade	-15 %	-10 %	-5 %	0 %	+5 %	+10 %	+15 %
NPV ($ million)	1,245	1,257	1,268	1,279	1,290	1,301	1,313

Source: Salares Norte CPR, 2021

Table 22.7: NPV sensitivity to changes in capital costs

Capital costs	-15 %	-10 %	-5 %	0 %	+5 %	+10 %	+15 %
NPV ($ million)	1,362	1,334	1,309	1,279	1,252	1,225	1,198

Source: Salares Norte CPR, 2021

Table 22.8: NPV sensitivity to changes in discount

Discount Rate	4 %	5.9 %	6 %	8 %	10 %
NPV ($ million)	**1,339**	**1,279**	**1,273**	**1,160**	**1,058**

Source: Salares Norte CPR, 2021

The Qualified Person has the following opinion:

a) The key assumptions, input parameters and methods applied to the economic analysis are realistic, appropriate and suitable for life of mine financial modelling.

b) The techno-economic model is correctly based on the Mineral Reserve life of mine plan physicals.

c) The discounted cashflow has economic viability as confirmed by an NPV of $1,279 million at a discount rate of 5.9 %.

d) The economic analyses for the Mineral Reserves exclude all Inferred Mineral Resource material.

e) The life of mine NPV is more sensitive to changes in gold price, grade and operating cost and less sensitive to changes in capital cost (lower capital cost over the life of mine) and discount rate (shorter mine life remaining).

The results of the sensitivity analysis demonstrate that the project is most sensitive to changes in metal prices followed by operating cost. The project is not sensitive to changes in development capital as most of the capital has been sunk to date. The project is robust with a 15 % decrease in gold price still resulting in positive NPV of $945 million at a discount rate of 5.9 %.

23 Adjacent properties

The Qualified Persons is not aware of any adjacent properties that may influence the life of mine Mineral Reserve or Mineral Resource at Salares Norte.

24 Other relevant data and information

The Qualified Person is not aware of any additional information or explanation necessary to provide a complete and balanced presentation of the value of the Salares Norte property.

Gold Fields' commitment to materiality, transparency and competency in its Mineral Resources and Mineral Reserves disclosure to regulators and in the public domain is of paramount importance to the Qualified Person and the Issuer's Executive Committee and Board of Directors continue to endorse the Company's internal and external review and audit assurance protocols. This Technical Report should be read in totality to gain a full understanding of Salares Norte's Mineral Resource and Mineral Reserve estimation and reporting process, including data integrity, estimation methodologies, Modifying Factors, mining and processing capacity and capability, confidence in the estimates, economic analysis, risk and uncertainty and overall projected property value.

However, to ensure consolidated coverage of the Company's primary internal controls in generating Mineral Resource and Mineral Reserve estimates the following key point summary is provided:

a) A comprehensive quality assurance and quality control (QAQC) protocol is embedded at Salares Norte and all Gold Fields operations. It draws on industry leading practice for data acquisition and utilises national standards authority accredited laboratories which are regularly reviewed. Analytical QAQC is maintained and monitored through the submission of sample blanks, certified reference material and duplicates and umpire laboratory checks.

b) Corporate Technical Services (CTS), based in Perth, comprises subject matter experts across the disciplines of geology, resource estimation, geotechnical, mining, engineering, modernisation, capital projects, processing, metallurgy, tailings management and Mineral Resource and Mineral Reserve reporting governance. The CTS team budget for regular site visits to all operating mines when emphasis is placed on-site inspection and direct engagement with the technical staff to drive protocols and standards and enable on-site training and upskilling. CTS provides technical oversight and guidance to the operating Regions and mines and ensures an additional level of assurance to the Mineral Resource and Mineral Reserve estimates to supplement the mine sites and Regional technical teams.

c) Independent audit review of fixed infrastructure is conducted annually with the appointed insurance auditor focussed on plant, machinery and mine infrastructure risks. An effective structural and corrosion maintenance program with benchmark inspections is in place supported by equipment condition monitoring major critical component spares. Focus areas include the primary jaw crusher, ball mill shell or motor failure, structural failure of plant or conveyor, process tank failure and large transformer failure. Critical spares are well resourced and there are no large items not supported by on-site spares holdings.

d) Mobile equipment is largely owned and well maintained by the mining contractor and there is some spare capacity in the fleet or within the contractor's group, or hire units are readily available in the region.

e) Processing controls will include the preparation of quarterly plant metal accounting reconciliation reports by the mine site once in production mode, which will be reviewed by the Regional Metallurgical Manager and VP Metallurgy in the CTS team. Any monthly reconciliation variance outside the limits provided within the Gold Fields Plant Metal Accounting Standard is flagged for follow up assessment and remediation if warranted.

f) Salares Norte has a tailings management plan that promotes risk minimisation to operators and stakeholders over the lifecycle of each tailings storage facility (TSF). Salares Norte's TSFs are operated in accordance with the company TSF Management Guidelines which are aligned with the International Council on Metals & Mining's (ICMM) Position Statement on preventing catastrophic failure of TSFs (December 2016). Active TSFs are subject to an independent, external audit every three years, as well as regular inspections and formal Facility safety reviews by formally appointed Engineers of Record (EoR). Further improvements in tailings management are expected through achievement of compliance with the new independently developed Global Industry Standard for Tailings Management (GISTM) issued in 2020.

g) The integration of Environmental, Social and Governance (ESG) themes into the estimation process continues as an important consideration for modifying factors, reasonable prospects for economic extraction (RPEE) assessments and to underpin the integrity of the Mineral Resources and Mineral Reserves. The company's ESG

Charter, issues and priorities are fully considered in the life of mine plan with particular emphasis on tailings management, integrated mine closure planning, security of energy and water and the social and regulatory licence to operate.

h) Gold Fields also follows an embedded process of third-party reviews to provide expert independent assurance regarding Mineral Resource and Mineral Reserve estimates and compliance with relevant reporting rules and codes. In line with Gold Fields policy, every material property is reviewed by an independent third-party on average no less than once every three years, or when triggered by a material year on year change. Certificates of compliance are received from the companies that conduct the external audits which are also configured to drive continuous improvement in the estimation process.

i) Importantly, Gold Fields endorses a well embedded risk and control matrix (RACM) configured to provide an annual assessment of the effectiveness of the Issuers' internal controls concerning the life of mine planning process and Mineral Resource and Mineral Reserve estimation and reporting.

j) The internal controls include coverage of the following (inter alia):

  - Reasonableness of parameters and assumptions used in the Mineral Resource and Mineral Reserve estimation process
  - Reasonableness of the interpretations applied to the geological model and estimation techniques
  - Integrity in the mine design and scheduling, including reasonableness of the mine planning assumptions, modifying factors, cut-off grades, mining and processing methods and supporting key technical inputs such as year on year reconciliation, geotechnical, mining equipment, infrastructure, water, energy and economic analysis
  - Provision of the necessary skills, experience and expertise at the mine sites and the Regions to undertake and complete the work with the required level of technical ability and competency, including professional registration as a Qualified Person
  - Alignment with the SK 1300 rule and NI 43-101 (guidance and instruction) for the reporting of Mineral Resources and Mineral Reserves
  - Review of the disclosure of the Issuers' Mineral Resources and reserves process.

k) Because of its inherent limitations, internal controls may not prevent or detect all errors or misstatements. Also, projections of any valuation of effectiveness to future periods are subject to risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with policies and procedures may deteriorate.

RCubed® is a proprietary cloud-based reporting system adopted by Gold Fields in 2021 to enhance the level governance and data security concerning Mineral Resource and reserve reporting across all company properties. It ensures transparency and auditability for all data verification checks, information stage gating, the approvals process and confirmation of Qualified Person credentials. The RCubed® reporting system is being incorporated into the risk and control matrix RACM matrix to support the December 2021 Mineral Resource and Mineral Reserve reporting.

25 Interpretation and conclusions

25.1 Conclusions

The views expressed in this Technical Report are based on the fundamental assumption that the required management resources and management skills are in place to achieve the Mineral Reserve life of mine plan projections for Salares Norte.

Climate change is an integral part of the Mineral Reserve generation process and incorporating relevant costs associated with climate change, primarily decarbonisation, mitigation and adaptation to the changing climate, is a key theme for the Company. Integration of these key elements into the Mineral Reserve process is being carried out progressively and simultaneously across all of Gold Fields' sites. Salares Norte is constructing a 26 MW solar plant to contribute to decarbonisation.

The construction of Salares Norte was approved by Gold Fields based on the results from the 2018 FS and approval of the EIA. Mine pre-stripping activities and construction of the process plant is in progress. Mineral Reserves currently support an 11 year life of mine plan that values the Salares Norte operation at $1,279 million at the Mineral Reserve gold price of $1,300/oz and silver price of $17.50/oz.

The Qualified Person considers that, with respect to all material technical-economic matters, it has undertaken all necessary investigations to ensure compliance with NI Technical Reporting, in terms of the level of disclosure. The Qualified Person confirms that the disclosures in this report are appropriate, based on current information available, prevailing legislation and corporate guidance.

The life of mine plan for Salares Norte has been reviewed in detail by the Qualified Person for appropriateness, reasonableness and viability. The Qualified Person considers that the techno-economic and financial model are based on sound reasoning, engineering judgement and a technically achievable mine plan, within the context of the risk associated with the gold mining industry.

The Mineral Reserve estimates contained in this report should not be interpreted as assurances of the economic life or the future profitability of Salares Norte. Mineral Reserves are only estimates based on the factors and assumptions described herein, thus future Mineral Reserve estimates may need to be revised. For example, if production costs increase or product prices decrease, a portion of the current Mineral Resources, from which the Mineral Reserves are derived, may become uneconomic and would therefore result in a lower estimate of Mineral Reserves. The life of mine plans include forward-looking technical and economic parameters and involve a number of risks and uncertainties that could cause actual results to differ materially.

A risk associated with the estimation of gold and silver grades and metal are the assumptions regarding the nature of the high-grade domains (size, shape, boundary conditions, and grade continuity). The estimation is sensitive to these assumptions as shown by various sensitivity studies. Much of this uncertainty has been tested through close spaced grade control drilling of several sections at BP and AA. This drilling indicates that the model of the high-grade boundaries is robust and suitable for feasibility studies. Further grade control drilling is required to accurately define ore-waste boundaries during mining.

The business of gold mining by its nature involves significant risks and hazards, including environmental hazards and industrial accidents. General hazards associated with open pit gold mining operations include:

- Flooding of the open pit.
- Collapse of open pit walls.
- Accidents associated with the operation of large open pit mining and rock transportation equipment.
- Accidents associated with the preparation and ignition of large-scale open pit blasting operations.
- Catastrophic failure of a TSF.
- Ground and surface water pollution, including as a result of potential spillage or seepage from TSFs.
- Production disruptions due to weather.

Gold Fields is at risk of experiencing any of these environmental or industrial hazards. The occurrence of any of these hazards could delay or halt production, increase production costs and may result in a liability for Gold Fields.

25.2 Risks

25.2.1 Risk assessment

Risk assessments were undertaken as part of the various studies completed for Salares Norte. The most recent review and update of the strategic and operational risks register was conducted in December 2021 as part of the risk management plan. This resulted in updating the risk register and associated risk treatment plans while adding newly identified risks as applicable.

Risks were assessed considering the study, construction and operations phases of the project. Where possible, effort is made to mitigate or eliminate these risks during the study phases and upfront engineering.

The strategic risks classified as high or medium identified and evaluated during 2021 include:

- COVID-19 pandemic extending for more than one year, impacting construction.
- Motor vehicle accidents / people transportation accidents.
- Environmental breach affecting the RCA.
- Failure on project delivery with more than a 20 % increase in cost or schedule due to events not related to the COVID-19 pandemic.
- Significant impact of azonal vegetation in the Salar Grande, above that declared in the EIA.
- Cancellation of option to capture and relocate chinchillas impacting the ability to develop AA as an open pit.
- Potential changes in tax regime.
- Uncapped profit sharing.
- Socio-political conflict escalation.
- Impacts of the New Constitution in Chile.
- Difficulties in commissioning that generates a failure in planned ramp-up.
- Impact to protected species in exclusion areas (chinchillas).

Effective monitoring of the risks, severity and probability, and the application of risk treatment plan controls are fundamental for a successful risk management program. The Salares Norte management team will continue to monitor the key risks, as well as the rest of the registered strategic risks as their severity and likelihood rating evolve over time.

Many of these risks, particularly those related to permitting, environmental, social and their mitigating controls, are strongly dependent on external stakeholders over which MGFSN does not have direct control. MGFSN will continue to monitor stakeholder requirements and engage with local communities to facilitate their involvement and alignment with the operation's objectives.

The chinchilla relocation program in the EIA is comprehensively covered in Item 20.4. MGFSN will continue to work with Authorities to improve and resume the relocation plan.

The current temporary suspension does not place the commissioning date of the project at risk. It is important to note that the development of AA as an open pit is dependent on the successful relocation of chinchilla from the remaining areas as identified in the EIA. The Mineral Resources and Mineral Reserve declared in this report assumes that the chinchillas will be successfully relocated and AA is developed as an open pit.

All strategic risks rated high and medium are summarised in the Table 25.2.1 below.

Table 25.1: Salares Norte strategic risks

Rank	Risk	Cause & Description	Consequences	Existing controls
1	Pandemic situation expansion for 1 year or more (Endemic status)	* Contagions continue with temporary quarantines to control peak of contagions. Planning becomes difficult, uncertainty of what will happen next week.	* Decreased productivity * Possible stoppage of the Project / Exploration * Logistic difficulties to move people and supplies in and out of the project * Lack of basic supplies (fuel and others) * Project delay * Cost will increase	Work plan in an extended pandemic situation. Feasibility analysis of the project under partial quarantine conditions. Analyse other remote working systems for the long term. Run scenarios of project postponement vs building in slow motion. Understand cost impact of both options. Restructuring of contractual responsibilities (purchases and contracts). Decision of collective vacations, personal on-site. Implementation of covid social plan. Implementation of Gold Fields Health Protocol. Contract plan, advancing contracts and purchases. Storage negotiation and long-term guarantees for Gold Fields were included. Change roster turn shift. Expansion of camp and dining room capacity. Use of negative PCR to go up to the field. Analyse overestimating the staffing of contractors to make up for casualties before the shift. Optimise shift change processes (capacities, schedules). Evaluate new ways to quickly undertake tests, to avoid possibility of no workers going to site (pool-test). PAAT 1 & PAA3 installed (fuel assurance). Acceleration of components that are ready, to the site, to avoid possible future problems in routes / logistics. Evaluate plan to guarantee critical path of the project (plant) (Esta semana revisión permanente de la ruta crítica; float 30 días). On site vaccination plan. Availability of the 3rd bed for contractors, informed (also in accordance with SINTEC 3rd bed). Antigen test, seeking medical criteria for lowering suspects (no vaccination and others)
2	Motor Vehicle Accidents / People Transportation Accident	* There is an intense exposure to vehicle accidents due to remote project location, most of the time on gravel roads or off-road tracks. High altitude is also a factor	* Multiple fatalities * Community property damage * Gold Fields reputational loss * Mine stoppage	1 PEOPLE: Theorical-Practical Conduction Exam at High Mountain [certificated]; [Viena Test] Cognitive skills evaluation, motriz, memory, attention; Control of internal driver's licence; sleepiness control (FIT2000). 2 EQUIPMENT: Vehicle inspections [pre-use check list]; periodical maintenance certification or equipment certification; preventive maintenance audit. 3 ENVIRONMENT: Road maintenance; signalling maintenance. 4 PROCEDURE: Update and diffusion of Driving Internal Regulation; Geocerca in main road [speed control Communication device for emergency. 5 ORGANISATION: Personnel transportation by bus, from and to the project; review and update of internal licensing procedure; 4x4 course. 6 OTHERS: GPS; georeferencing; Virtual Copilot; Black box; panic button; sleepiness cameras; Mobileye System (For internal vehicles). 7 New contracts incorporate the existing controls. 8 Anti-collision system for mine equipment. 9 Fatigue system for mine equipment, under evaluation. Q2 2021 (R. Lizana). (se cerraron los test y se confirmó el sistema, en proceso de implementación). 10 Updated action plan for recent incidents of internal transport. 11 Civil liability insurance 12 Manual of community relations. 13 Fluid communication with communities. 14 Grievance mechanism. 15 Intermediate point of control. 16 Comprehensive evaluation of current systems in conjunction with Claudia Morales area. (Salvo voice alert en evaluación). 17 Wenco System (dispatchers monitoring operational parameters of truck operation (speed, circuit)). 18 Periodic audits of all Gold Fields contractors focused on existing controls in driving.
3	Environmental Breach	*Not complying with the RCA * Not following procedures * Negligence * Chinchillas 70 % survivor (1 year)	* Fines * Cost increase * Project cancellation * Project loss	1 Environmental plan. 2 Procedures, training. 3 Following of Environmental Checklist Matrix, twice per year. 4 Send environmental report to authorities. 5 SIGEA implementation for compliance monitoring of environmental commitments / obligations. 6 Regular monitoring of commitments.

Rank	Risk	Cause & Description	Consequences	Existing controls
				7 Constant relationship with local government and stakeholders. 8 Environmental compliance clause in all contracts. 9 RCA compliance audits. 10 Communication plans associated with the environment. 11 In the bidding process, for an audit that would simulate an inspection of government entities (Feb. 22) (falta difundir los resultados del informe y el análisis de los GAP encontrados).
4	Failure on project delivery (More than 20 % cost or schedule) (Situaciones distintas a las de pandemia Risk 1). This risk groups the different causes analysed in the construction / operation risk matrix.	* Cost overrun * Project delay * Poor quality	* Less gold production in 2023 * Payback time is delayed * Loss NPV	1 Construction risk register was developed and is regularly tracked. 2 Mitigations are those related to the robust Project Controls systems (Cost and Schedule) provided by Fluor, those that are aligned with the industry's best practices and that are supervised by the Gold Fields owner's team. All the details of this risk are linked to the construction risks. 3 Complete the detail engineering before the end of the year, before the start of construction processes (punch list in process). 4 Claims committee on place. 5 Develop final estimate at the end of the project (En coordinación con Fluor, con información a junio) (Agendando reuniones para revisar los paquetes a cargo del owner y del alcance Fluor). 6 External peer review (H1.2021). 7 Evaluation of reduction of scope to contractors with low performance and re-tender or award to another in land with better indicators. 8 Active participation in 3WLA of main contractors to anticipate deviations in the master schedule. 9 Mitigation plan to be presented by main contractor.. 10 Mitigation plan to risk reduction schedule to be presented to the Steering Committee and Capital Committee (aprobado y en trackeo de implementación). 11 Constant participation in POD meetings, meetings by areas, which feed information for the weekly Sponsor meeting.
5	Significant impact of azonal vegetation loss than that declared in the EIA	* Due to pumping water for operation, there is a descend in the water table impacting then vegetation at the west border of the lagoon (Salar Grande)	* Pumping reduction * Need to irrigate the area * Operational restrictions - throughput reduction	1 A numerical hydrological model has been developed showing a moderate descent after closure. 2 Additional water pump tests to improve the confident of the infiltration parameter were used in the model. 3 Root study developed. 4 Water model updated. 5 Water use reduction strategies were analysed. 6 Peer review of hydrogeological model. Completed by Hidromas. 7 Parameters to be measured for the baseline study were validated with the authority. 8 Look for additional water rights in a different sector to avoid impact on the same lagoons (2021). 9 Presentation of water exploration permit. 10 Obtaining water exploration permits (M. Diaz) (Dec. 21) (aprobado).
6	Cancellation of option to capture and relocate Chinchillas; reducing the area of exploitation of the mine	* Refusal of authority to carry out the capture and relocation plan of Chinchilla	* Not being able to exploit 100 % of Agua Amarga and use "Roquerío 5"	1 Communication of the Capture Plan, execution from August 6-7, 2020. TBC. 2 MUT 2 Actions. 3 Community communications plan 4 Government relations plan. 5 MUT Completed. 6 Integrated Plan of the chinchilla (May 21). 7 Plan / Protocol for manual and mechanised removal in areas of chinchilla presence for capture. 8 Integral Chinchilla Strategy: Stakeholders, technique, legal. 9 PDC Presentation.
7	Changes in Tax regime	* Impacts not anticipated in the model * Change in legislation, as a consequence of the Social Agenda proposed by the government.	* NPV loss * 100 % increase in mining tax ($30 M - $50 M)	1 Sensitivity analysis. 2 Stability agreement. 3 Permanent monitoring of regulatory activities. 4 National mining society active participation. 5 Member of the mining council. 6 Business case modeling for new options for "Bills of law" that apply to mining taxation (Volver a correr el modelo con nuevos supuestos, in impuesto especifico). 7 Permanent scenario analysis worst cases.
8	Bonus without the ceiling of 4 minimum salaries	* Change in the legislation that implies a greater distribution of profits through gratification, without the current cap	* Gross margin impact	1 Member of the mining council. 2 Legislative and regulatory monitoring.
9	Social political conflict escalation	* Insufficient or unrealised government actions	* Union activities increase * Regulatory uncertainty	1 Stakeholder Engagement and Community Relations Plan (IFC and Equator Principles gap analysis) 2 Environmental Qualification Resolution

Rank	Risk	Cause & Description	Consequences	Existing controls
		* New constitution agreement derail * Political use of the social movement * Lack of economic growth * Rising unemployment	* Road blocks * Stress increasing * Logistic difficulties * Upset and uprising communities due to the use of the CH-31 route in an emergency situation.	3 Host community, including indigenous, relationship and agreements 4 SED Project 5 Local procurement and employment plan. 6 Legislative Monitoring 7 Goldfields ESG Policies & Guidelines 8 Ensure low water consumption authorised for the project 9 Run project evaluation in different scenarios 10 Permit strategy with a strong regulatory engagement plan including remote meetings 11 Adapts project transportation & logistics plan to be prepared for the use of alternative routes in case of main route blockage (Restricciones a algunos tipos de vehículos en las rutas alternativas) 12 Robust pre-development works strategy. Take advantage of the opportunities provided by the early start of the construction phase. 13 Member of the mining council. 14 Independent country risk analysis.
10	Impacts of the New Constitution in Chile	* Regulatory changes	* Cost increase * Restrictions on mining property * Restrictions on obtaining water rights	1 Tax invariance agreement. 2 Gold Fields Standards (ESG). 3 Member of the mining council. 4 Legislative and regulatory monitoring.
11	Difficulties in commissioning that generates a failure in planned ramp-up	* Poor transition between construction and commissioning * Poor pre-commissioning and commissioning planning * Poor development of the operational readiness plan (ORP)	* NPV Loss (5 %) * Loss of cashflow in year 1 (20 %)	1 1) ORP (procedures, hiring, training); pre-commissioning and commissioning plan (vendors included). 2 Pre-commissioning and commissioning plan (vendors included). 3 Early recruitment of operations personnel to participate in pre-commissioning and commissioning activities. 4 Gold Fields Commissioning Manager Recruitment. 5 Weekly commissioning / operations meeting (Edgardo, Richard). 6 Periodic meeting (Operational readiness). 7 Weekly meeting of the Gold Fields commissioning team and pre-commissioning Fluor.
12	Impact to protected species in exclusion areas (Chinchillas)	* Bad signalling * Lack of training * Communication failure	* Fines * Project closure * Additional Compensation needed * Additional cost * Loss of habitat * Authority considers insufficient management plan of exclusion areas	1 Control of Protected Areas. 2 Hired recognised consultants CEA. 3 Performing monitoring campaigns. 4 Include fauna topic in the project induction for new hiring positions. 5 Signalling installation before to construction start. 6 Permanent monitoring of exclusion areas. 7 Security buffer and internal specific work permits. 8 Safety parapets. 9 Monitoring options with cameras or sensors. 10 VHF tracking. 11 Update work protocols for work near the exclusion area. 12 Weekly relocation activity report. 13 Study to identify vulnerable access points to the exclusion area. (15 February 2021).

Source: Salares Norte CPR, 2021

26 Recommendations

The Gold Fields Board approved the FS for Salares Norte in February 2020 and provided the FNTP for construction of the mine in April 2020. Construction commenced in the final quarter of 2020 and first gold production is scheduled in 2023.

The main action points for Salares Norte are to complete the pre-stripping and construction of the processing facility and associated infrastructure as per the FS:

- Execute the operational readiness plan relating to recruitment, training, systems implementation.
- Complete construction of the processing facility.
- Execute a grade control program to verify ore access.
- Complete pre-stripping (currently 44 % complete).
- Ensure risk mitigation in accordance with the risk management strategy.
- Continue progressing with the district exploration program (20 km around Salares Norte) and regional (>20 km around Salares Norte), with the aim of increasing knowledge and potential to further extend mine life. Some $4.27 million has been allocated for this during 2022 and the results from this campaign will inform the exploration strategy during 2023 and beyond.
- Chinchilla relocation plan and execute. The approval of this plan is essential for developing the AA Mineral Reserve. If the plan is not approved, the NPV disclosed in this report will be reduced by approximately 20 % - 25 %; however, this may be mitigated by alternative extraction methods.
- Execute the voluntary monitoring program as committed in the EIA.

There is no additional work program for Salares Norte as at 31 December 2021 for the Mineral Resource and Mineral Reserve statement and disclosure.

27 References

The primary reference documents that have written consent by the appointed Gold Fields Lead Qualified persons for this Technical Report are:

Primary reference is the Salares Norte SAMREC Competent Person Report 31 December 2021 for Mineral Resources and Mineral Reserves. This report has written consent from Paul Gomez and Diego Verdugo who are the Gold Fields appointed Qualified Person for Salares Norte Gold Mine. Richard Lizana has accepted responsibility for the SAMREC Competent Person Report 31 December 2021 for Mineral Resources and Mineral Reserves as a whole.

The Salares Norte Competent Person Report 31 December 2021 for Mineral Resources and Mineral Reserves is referred to in this document as "Salares Norte CPR 2021".

28 Glossary of technical terms and abbreviations

$	United States dollars unless otherwise stated
°C	Degrees Celsius
µm	micron or micrometre
2D, 3D	two-dimensional, three-dimensional
%	percent
AAS	Atomic absorption spectroscopy analytical technique
AC	Air core drilling technique
Ag	Silver
Ai	Abrasion index laboratory test
All-in costs or **AIC**	A non-IFRS measure which means all-in sustaining costs plus additional costs relating to growth, including non-sustaining capital expenditure and exploration, evaluation and feasibility costs not associated with current operations.
All-in sustaining costs or **AISC**	A non-IFRS measure which means operating costs excluding amortisation and depreciation, plus all costs not included therein relating to sustaining current production including sustaining capital expenditure.
ANCOLD	Australian National Committee on Large Dams
As	Arsenic
ASL	Above sea level
Au	Gold
bcm	bank cubic metres
Brownfield	Exploration conducted in areas where mineral deposits have already previously been discovered and is also termed near mine or extensional exploration.
BWi	Bond ball mill work index laboratory test
Capex	Capital expenditure
CCD	Counter-current decantation
Cu	Copper
Cut-off grade	The lowest grade of mineralised rock which determines whether it is economic to recover its precious or base metal content by further concentration.
CIL, CIP	Carbon-in-leach, carbon-in-pulp
CIM	The Canadian Institute of Mining, Metallurgy and Petroleum
CN	Cyanide
CPR	Competent Person’s Report
CRM	Certified reference material
CTS	Gold Fields Corporate Technical Services team
CO, CO_2	Carbon monoxide, carbon dioxide
dB	Decibel(s)
DCF	Discounted cash flow
De-stress	By mining a two-metre slice through the orebody package an optimal position is achieved to ensure a destressed window of 50 to 60 m above or below the associates stope to provide the necessary safe geotechnical stress conditions for extraction.
DD	Diamond core drilling technique

Dilution	Low or zero grade (waste) material that is mined during the course of mining operations and forms part of the reserve.
Dissolution	The process whereby a metal is dissolved and becomes amenable to separation from the gangue material.
dmt	Dry metric tonne(s)
doré	Unrefined gold and silver bullion bars which will be further refined to almost pure metal.
DTM	Digital terrain model
EIA	Environmental impact assessment
Electrowinning	The process of removing mineral from solution by the action of electric currents, known as electrolysis.
EM	Electromagnetic geophysical technique
EMP	Environmental Management Plan
EMS	Environmental Management System
EoR	Engineer of Record
EPA	Environmental Protection Agency
ESG	Environmental, social and governance
ESIA	Environmental and social impact assessment
FA	Fire assay analytical technique
FCF	Free cash flow
Fe	Iron
Feasibility Study or **FS**	A Feasibility Study is a comprehensive technical and economic study of the selected development option for a mineral project that includes appropriately detailed assessments of applicable modifying factors together with any other relevant operational factors and detailed financial analysis that are necessary to demonstrate, at the time of reporting, that extraction is reasonably justified (economically mineable). The results of the study may reasonably serve as the basis for a final decision by a proponent or financial institution to proceed with, or finance, the development of the project. The confidence level of the study will be higher than that of a Pre-feasibility Study.
FIFO	Fly-in/fly-out
Footwall	The bottom side of a geological structure or mineral deposit
FOS	Factor of safety
Fx	Foreign exchange rate
g, µg, mg, kg, g/t	Gram(s), microgram(s), milligram(s), kilogram(s), grams per tonne
Ga	Giga annum or billion years
G&A	General and administration
Gangue	Commercially valueless or waste material remaining after ore extraction from rock.
GC	Grade control
GPS, DGPS	Global positioning system, Differential global positioning system
Grinding	Reducing rock to the consistency of fine sand by crushing and abrading in a rotating steel grinding mill.
ha	Hectare(s)
Hangingwall	The top side of a geological structure or mineral deposit
HME	Heavy mining equipment
HSE, HSEC	Health, safety and environment, Health, safety, environment and community
Hypogene	Ore or mineral deposits formed by ascending fluids occurring deep below the earth's surface, which tend to form deposits of primary minerals, as opposed to supergene processes that occur at or near the surface and tend to form secondary minerals.
ICMC	International Cyanide Management Code
ICP	Inductively coupled plasma analytical technique

ILR	InLine Leach Reactor
Indicated Mineral Resource	An Indicated Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of modifying factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.
Inferred Mineral Resource	An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.
Initial assessment	A preliminary technical and economic study of the economic potential of all or parts of mineralisation to support the disclosure of Mineral Resources. The initial assessment must be prepared by a Qualified Person and must include appropriate assessments of reasonably assumed technical and economic factors, together with any other relevant operational factors, that are necessary to demonstrate at the time of reporting that there are reasonable prospects for economic extraction. An initial assessment is required for disclosure of Mineral Resources but cannot be used as the basis for disclosure of Mineral Reserves.
In situ	Within unbroken rock or still in the ground.
IP	Induced polarisation geophysical technique
ISO	International Organization for Standardization.
km, km^2	kilometres, square kilometres
Kriging	A geostatistical estimation technique used in the evaluation of Mineral Reserves.
L, kL, L/s	litre(s), kilolitres, litres per second
lb	Pound(s)
Leaching	Dissolution of gold from the crushed and milled material, including reclaimed slime, for adsorption and concentration onto the activated carbon.
Level	The horizontal tunnels of an underground mine used to access the workings or orebody.
Life of mine or **LoM**	The expected remaining years of production, based on production schedules and Proven and Probable Mineral Reserves.
Life of mine plan or **LoM plan**	A design and financial/economic study of an existing operation in which appropriate assessments have been made of existing geological, mining, metallurgical, economic, marketing, legal, environmental, social, governmental, engineering, operational and all other modifying factors, which are considered in sufficient detail to demonstrate that continued extraction is reasonably justified. This is completed to a minimum pre-feasibility level of study.
LHD	Load haul dump
LHOS	Long-hole open stoping
LIMS	Laboratory information management system
London afternoon fixing price	The afternoon fixing by the new electronic London Bullion Market Association, or LBMA price-discovery process. The price continues to be set twice daily, at 10:30 and 15:00 London time.
m, mm, cm, m^2, m^3	metre(s), millimetre(s), centimetre(s), square metre(s), cubic metre(s)
M	Million(s)
Ma	Mega annum or million years
MCP	Mine Closure Plan
Measured Mineral Resource	A Measured Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of modifying factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Mineral Resource has a higher level of confidence than that applying to either

	an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve.
Metallurgical recovery factor	The proportion of metal in the ore delivered to the mill that is recovered by the metallurgical process or processes.
Metallurgy	The science of extracting metals from ores and preparing them for sale.
Mill delivered tonnes	A quantity, expressed in tonnes, of ore delivered to the metallurgical plant.
Mine call factor or **MCF**	The ratio, expressed as a percentage, of the specific product accounted for at the mill (including residue), compared to the corresponding specific product 'called for' based on an operation's measuring and valuation methods.
Mineralisation	The presence of a target mineral in a mass of host rock. A concentration (or occurrence) of material of possible economic interest, in or on the earth's crust, for which quantity and quality cannot be estimated with sufficient confidence to be defined as a Mineral Resource. Mineralisation is not classified as a Mineral Resource or Mineral Reserve and can only be reported under exploration results. The data and information relating to it must be sufficient to allow a considered and balanced judgement of its significance and the process or processes by which a mineral or minerals are introduced into rock, resulting in a potentially valuable deposit. Mineralisation generally incorporates various terms, including fissure filling, impregnation and replacement, among others.
Mineral Reserve	The economically mineable part of a Measured and/or Indicated Mineral Resource converted into Proven and Probable Mineral Reserves. It includes diluting minerals and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-feasibility or Feasibility level as appropriate that include application of modifying factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified. The reference point at which Mineral Reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to clarify what is being reported.
Mineral Resource	A concentration or occurrence of solid material of economic interest in or on the earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling. Gold Fields reports **Inclusive Mineral Resource** (IMR) which is the entire Mineral Resource from which the Mineral Reserve has been generated and **Exclusive Mineral Resource** (EMR) which is the Mineral Resource remaining after the Mineral Reserve has been generated. It should not be expected that IMR-Mineral Reserve is numerically equal to EMR as Mineral Reserve has had modifying factors applier and Mineral Resources have not. While some of the EMR may be converted to Mineral Reserves through additional drilling or other means, there it should not be expected that all of the EMR can be converted to Mineral Reserves.
Modifying factors	Modifying factors are considerations used to convert Mineral Resources to Mineral Reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.
MSO	Mineable shape optimiser
NaCN	Sodium cyanide
Net smelter return or **NSR**	The volume of refined mineral sold during the relevant period multiplied by the average spot mineral price and the average exchange rate for the period, less refining, transport and insurance costs.
NI 43-101	National Instrument 43-101 Standards of Disclosure for Mineral Projects published by the Canadian Securities Administrators.
NO_2	Nitrogen dioxide
NPV	Net present value
NSR	Net smelter return
OHS	Occupational health and safety
Open pit or **OP**	Mining where the ore is extracted from a surface mining operation or "pit". The geometry of the pit may vary with the characteristics of the orebody.
Opex	Operating expenditure
Ore	A mixture of material containing minerals from which at least one of the minerals can be mined and processed profitably.
Orebody	A well-defined mass of material of sufficient mineral content to make extraction economically viable.

Ore grade	The average amount of mineral contained in a tonne of mineral-bearing ore expressed in grams per tonne (g/t), or percent (%) per tonne.
Ounce or **oz, koz, Moz, oz/a**	One troy ounce which equals 31.1035 grams, kilo-ounces (or thousand ounces), million ounces, ounces per annum.
Overburden	The soil and rock that must be removed in order to expose an ore body.
$\mathbf{P_x}$	Percentage (x) of material passing a specified size.
Pa, kPa, MPa	pascal(s), kilopascals, megapascals. A unit measurement of stress or pressure within the earth's crust used to profile tectonic stress, which can impact ground stability and ground support requirements in underground mining.
Paste fill or **back fill**	A technique whereby cemented paste fill is placed in mined-out voids to improve and maintain ground stability, minimise waste dilution and maximise extraction of the ore.
pH	Scale used to specify the acidity or basicity of an aqueous solution.
ppb, ppm	Parts per billion, parts per million
Pre-feasibility Study or **PFS**	A comprehensive study of a range of options for the technical and economic viability of a mineral project that has advanced to a stage where a preferred mining method, in the case of underground mining, or the pit configuration, in the case of an open pit, is established and an effective method of mineral processing is determined. It includes a financial analysis based on reasonable assumptions on the modifying factors and the evaluation of any other relevant factors which are sufficient for a Qualified Person, acting reasonably, to determine if all or part of the Mineral Resource may be converted to a Mineral Reserve at the time of reporting. A Pre-feasibility Study is at a lower confidence level than a Feasibility Study.
Probable Mineral Reserve	The economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the modifying factors applying to a Probable Mineral Reserve is lower than that applying to a Proven Mineral Reserve.
Prospecting or exploration right	Permission to explore an area for minerals.
Proven Mineral Reserve	The economically mineable part of a Measured Mineral Resource. A Proven Mineral Resource implies a high degree of confidence in the modifying factors.
PV	Photovoltaic
QAQC	Quality assurance quality control
RC	Reverse circulation drilling technique
Refining	The final stage of metal production in which final impurities are removed from the molten metal by introducing air and fluxes. The impurities are removed as gases or slag.
Rehabilitation	The process of restoring mined land to a condition approximating its original state.
RF	Revenue factor(s)
RL	Reduced level
RO	Reverse osmosis
RQD	Rock quality designation
Run of mine or **RoM**	When used with regard to grade, is a term to describe the average grade of the ore mined.
SAMREC Code 2016	The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves, 2016 Edition
Seismicity	A sudden movement within a given volume of rock that radiates detectable seismic waves. The amplitude and frequency of seismic waves radiated from such a source depend, in general, on the strength and state of stress of the rock, the size of the source of seismic radiation, and the magnitude and the rate at which the rock moves during the fracturing process.
Semi-autogenous grinding or **SAG mill**	A piece of machinery used to crush and grind ore which uses a mixture of steel balls and the ore itself to achieve comminution. The mill is shaped like a cylinder causing the grinding media and the ore itself to impact upon the ore.
Shotcrete	A sprayed concrete or specialist cement type product applied through a hose or similar device and pneumatically projected at high velocity on the surface of excavations, as a geotechnical ground support technique to reinforce the stability of underground faces.

Slimes	The finer fraction or tailings discharged from a processing plant after the valuable minerals have been recovered. Also see 'Tailings'
Slurry	A fluid comprising fine solids suspended in a solution (generally water containing additives).
Smelting	Thermal processing whereby a mineral is liberated from molten beneficiated ore or concentrate, with impurities separating as lighter slag.
SMU	Selective mining unit
SO_2	Sulfur dioxide
SOX	Sarbanes-Oxley Act of 2002
Spot price	The current price of a metal for immediate delivery.
Stockpile or **SP**	A store of unprocessed ore, which is material resulting from mining or processing operations.
Stope	The underground excavation within the orebody where the main mineral production takes place.
Stratigraphic	The study of rock layers (strata) and layering (stratification) and is primarily used in the study of sedimentary and layered volcanic rocks. Stratigraphic modelling is often important in profiling the regional and local geology that has played a controlling role in mineralisation and orebody generation.
Stripping	The process of removing overburden (waste material) to expose the ore for mining.
Sulphide	A mineral characterised by the linkages of sulphur with a metal or semi-metal, such as pyrite (iron sulphide). Also a zone in which sulphide minerals occur.
Supergene	Ores or ore minerals formed where descending surface water oxidises the primary (hypogene) mineralised rock and redistributes the ore minerals, often concentrating them in zones. Supergene enrichment occurs at the base of the oxidised portion of the ore deposit.
Tailings	Finely ground rock from which the bulk of valuable minerals have been extracted by metallurgical processes. Also see 'Slimes'.
Tailings storage facility or **TSF**	A dam used to store by-products or tailing from mining operations after separating the ore from the gangue.
TCRC	Treatment charges and refining charges
TDS	Total dissolved solids
Tonne or **t, kt, Mt, t/a, Mt/a**	One tonne is equal to 1,000 kilograms (also known as a "metric" tonne), kilo-tonnes (or thousand tonnes), million tonnes, tonnes per annum, million tonnes per annum.
Tonnage	The quantity of material where the tonne is an appropriate unit of measure. Typically used to measure reserves of mineral-bearing material, or quantities of ore and waste material mined, transported or milled.
Underground or **UG**	Mining where the ore is extracted from an underground mining operation.
V, kV, kVA	Volt(s), kilovolt, kilovolt-ampere
W, kW, kWh, MW	Watt, kilowatt, kilowatt-hour, megawatt
WAD CN	Weak acid dissociable cyanide
Waste	Rock mined with an insufficient mineral content to justify processing.
Waste storage facility or WSF	A rock dump used to store accumulations of waste or low-grade material derived in the course of mining.
wmt	Wet metric tonne(s)
wt%	weight percent
XRD	X-ray diffraction analytical technique
XRF	X-ray fluorescence analytical technique
Yield	The actual grade of ore realised after the mining and metallurgical treatment process.