NI 43-101 Technical Report for the Sadiola Gold Project, Mali Prepared for Allied Gold Corp and Mondavi Ventures Ltd (to be renamed Allied Gold Corporation) by Datamine Australia Pty. Ltd. (Snowden Optiro) Project Number DA18199

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This Technical Report contains “forward-looking information” and within the meaning of applicable Canadian securities legislation which involves a number of risks and uncertainties. Forward-looking information includes, but is not limited to: information with respect to the future prices of gold, information with respect to strategy, plans, expectations or future financial or operating performance; Mineral Resource and Mineral Reserve estimates; the timing and amount of estimated future production, costs of production, capital expenditures, costs (including capital costs, operating costs and other costs) and mine life; rates of production; annual revenues; requirements for additional capital; government regulation of mining operations; environmental risks; unanticipated reclamation expenses; title disputes or claims; limitations on insurance coverage; mining and recovery methods; mining and mineral processing and rates; tailings design and capacity; any other information that expresses future plans and expectations or estimates of future performance. Often, but not always, forward-looking information can be identified by the use of words such as “plans”, “expects”, or “does not expect”, “is expected”, “budget”, “scheduled”, “estimates”, “forecasts”, “intends”, “anticipates”, or “does not anticipate”, or “believes”, or variations of such words and phrases or state that certain actions, events or results “may”, “could”, “would”, “might” or “will” be taken, occur or be achieved.

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Such factors and assumptions underlying the forward-looking information in this Technical Report includes, but is not limited to: risks related to political and economic instability in Mali; risks associated with community relationships; risks related to estimates of future production, cash flows and costs; risks inherent to mining operations; shortages of critical supplies; the cost of non-compliance and compliance costs; volatility in the price of gold; risks related to compliance with environmental laws and liability for environmental contamination; the lack of availability of infrastructure in Mali; security risks to Allied and its assets; risks of pandemics and endemics; risks related to the ability to obtain, maintain or renew regulatory approvals, permits and licenses including renewing the establishment convention with Mali on favourable terms; uncertainty with and changes to the tax regime in Mali; the imprecision of Mineral Reserve and Mineral Resource estimates; deficient or vulnerable title to concessions, easements and surface rights; inherent safety hazards and risk to the health and safety of employees and contractors; risks related to Allied’s workforce and its labour relations; key talent recruitment and retention of key personnel; the adequacy of insurance; uncertainty as to reclamation and decommissioning; the uncertainty regarding risks posed by climate change; the potential for litigation; and risks due to conflicts of interest.

There may be other factors than those identified that could cause actual actions, events or results to differ materially from those described in forward-looking information, there may be other factors that cause actions, events or results not to be anticipated, estimated or intended. There can be no assurance that forward-looking information will prove to be accurate, as actual results and future events could differ materially from those anticipated in such information. Accordingly, readers are cautioned not to place undue reliance on forward-looking information. Unless required by Canadian securities legislation, the authors, Mondavi and Allied undertake no obligation to update the forward-looking information if circumstances or opinions should change.

1 SUMMARY

This Technical Report was prepared in accordance with NI 43-101 for Allied Gold Corp (Allied) and Mondavi Ventures Ltd. (to be renamed Allied Gold Corporation) (Mondavi).

This Technical Report is to support the disclosure of Exploration Results, Mineral Resources and Mineral Reserves for the Sadiola Gold Project (Sadiola or the Property), a mineral exploration, development and production property located in the Republic of Mali, West Africa and was authored by Messrs. Allan Earl, Matt Mullins, Gordon Cunningham and Peter Theron of Snowden Optiro, a business unit of Datamine Australia Pty Ltd (Snowden Optiro).

The effective date of this Technical Report is 12 June 2023.

Unless otherwise specified, all units of currency are in United States Dollars ($). All measurements are metric except for troy ounces (oz).

1.1 Property description and ownership

Allied's Sadiola Property is an operating open pit gold mine and established 5 Mt/a processing operation with associated tailings and waste storage, administration, accommodation, workshops, warehouse and storage facilities with reliable sources of power, water and personnel. Mining operations are focussed on cutbacks of the existing open pits.

The Property is 77 km south of the regional city of Kayes and about 440 km northwest of the capital city of Bamako. Sadiola is accessed via sealed road for 500 km from Bamako to Kayes and then 80 km along a single carriageway, sealed road. The Property can be accessed via the port of Dakar in Senegal by either rail or road to Kayes. A compacted laterite airstrip is operated for bullion dispatch and employee transport using light aircraft to and from Bamako. The majority of personnel are sourced from the local community with senior and expatriate staff flying in and out of Bamako.

The Property is within the Sudanese-type climatic zone, with an intense wet season from May to October and dry season from November to April. Approximately 90% of rainfall occurs between the months of June and September. Sadiola operates year-round with limited disruption to open pit operations during short-term, high rainfall events.

Average monthly temperatures are consistently above 25°C; however, there is significant variation, with peaks of 45°C recorded on site. In the dry season, north-easterly trade winds blow from the Sahara Desert over West Africa, resulting in dry weather conditions and dusty winds referred to as Harmattan winds. In the wet season, the prevailing wind direction is from the south and southwest, referred to as monsoon winds.

The Mining Code is the governing legislation for Mali's minerals and mining sector. The exploration and exploitation of minerals in Mali is subject to the Mining Code by decree.

Sadiola's operating company Société d'Exploitation des Mines d'Or de Sadiola SA (SEMOS) acquired the Sadiola Exploitation Permit in December 1994. Allied took control of SEMOS on 1 January 2021 by purchasing AngloGold Ashanti Limited's (AngloGold) and IAMGOLD Corporation's 80% interest in SEMOS. The Government of Mali holds a 20% stake in SEMOS.

The surface rights have been purchased and are sufficient for most of the proposed development; additional surface rights will be required for the solar power plant.

SEMOS' economic framework is governed by the provisions of the 1991 Mining Code through to 2037. A corporate income tax rate of 30% on net profits and a variable Government royalty of 6.0% of revenue, comprised of a 3% ad valorem tax and a 3% tax on the contribution for the services rendered, is applicable. Allied has committed to a 0.25% royalty for community development and environmental escrow for mine closure at $0.67/t ore after commissioning of a new process plant to treat harder primary ores (the Sadiola Expansion Project). The closure costs at 31 December 2022, excluding retrenchment, are estimated at $89.6 million.

SEMOS' current Exploitation Permit is valid until 31 July 2024. The permit renewal application was submitted to the Government on 20 July 2022 and is expected to be approved ahead of requirements to secure tenure for at least a further ten years, with renewals of equal duration available until all reserves have been mined out.

The Environmental and Social Impact Assessment (ESIA) for the proposed Expansion Project has been approved, while the grid power connection ESIA has been submitted with approvals targeted for Q3 2023. Secondary permits are pending, including for construction and clearing.

Based on agreements with the previous owners (IAMGOLD and AngloGold Ashanti):

- $1.0 million is payable to International Finance Corporation (IFC), upon approval of the Sadiola Expansion Project.
- $24.9 million is payable to the previous owners upon production from the new process plant at each milestone of 250 koz and 500 koz. The aggregate payment of $49.8 million is considered a corporate charge and has been excluded from the financial model (Financial Model).

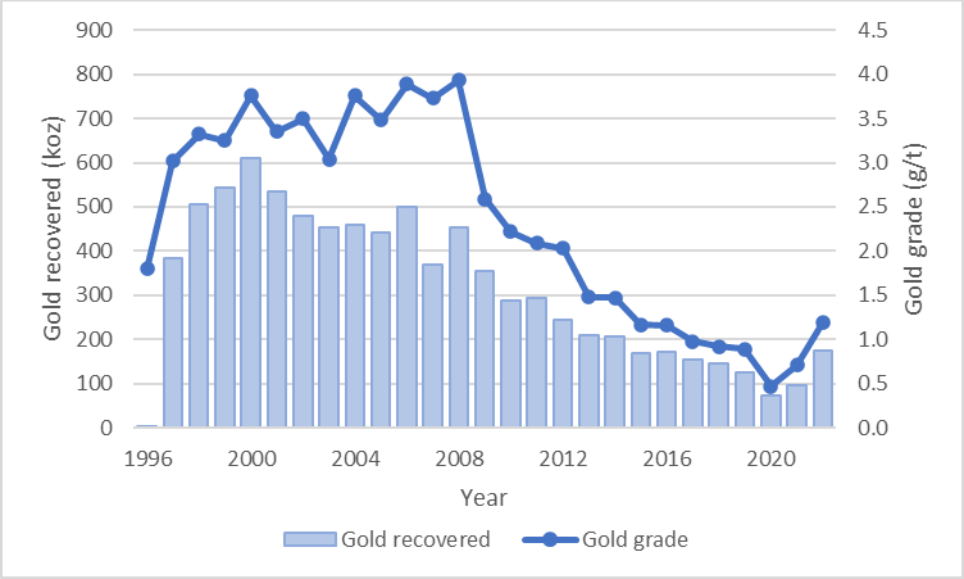
The 2022 feasibility study for the Sadiola Expansion Project (2022 FS) identified the following risks that may affect SEMOS' right or ability to perform work on the Property:

- Civil unrest in the country and local community which may lead to critical supply chain interruptions. The risk is considered mitigated with six weeks' storage of supplies on site.
- Risk of a terrorist attack in Bamako, the capital city of Mali and the location of the international airport. An additional charter flight has been implemented to reduce the time spent in Bamako by employees. Increased security presence and precautions have been implemented at Bamako and at site.

1.2 History

The Sadiola gold mine poured its first gold on 20 December 1996 and since start-up, the mine has produced more than 8.4 Moz of gold. Mining was suspended in April 2018 and the process plant continued to treat low-grade stockpiles up until Q2 2021. Allied restarted mining in 2021 and the process plant currently treats 5.0 Mt/a of oxide and transitional ore. Previous annualised gold production from 1996 to 2022 is summarised in Figure 1.1.

Figure 1.1 Sadiola process plant production (1996 – 2022)



Source: Allied, Sadiola FS, September 2022

The 2022 FS documents Allied's mine plan including:

- Using the existing process plant to treat 5.0 Mt/a of oxide and transitional material with the replacement of the oxygen plant in 2023.
- Installing a new process plant and upgrading some infrastructure to treat up to 10 Mt/a of harder fresh and oxide ore.
- A 19 year life of mine plan (LOMP) which has depleted the 2022 FS Mineral Reserves and incorporates some minor updates to the 2022 FS capital costs, closure costs and timing of the expansion.

1.3 Geological setting, mineralisation and deposit types

The Sadiola gold deposits are hosted in the Kofi Formation in the northern portion of the Kédougou-Kéniéba Inlier on the eastern side of the Senegal Mali Shear Zone (SMSZ). The Kofi Formation comprises impure limestones, sandstones, black shales, pelites and greywackes as well as minor felsic to intermediate hypabyssal intrusions which have been intruded as numerous felsic to intermediate dykes and stocks. To the southwest of the main Sadiola deposit, the Kofi Formation is capped by intermediate to mafic diorites. Seven kilometres east of the Sadiola deposit, the carbonate sequence is overlain by sandstones of the Neoproterozoic Taoudeni Basin that form a prominent escarpment along the strike of the inlier.

The bulk of gold mineralisation within the Property is associated with the Sadiola trend in the west and the Farabakouta East (known locally as FE) trend in the east. Gold mineralisation associated with the Sadiola trend is along the north-striking Sadiola Fracture Zone (SFZ) in faulted contact between greywacke to the west and carbonate on the east over a 4 km strike, with mineralisation mostly hosted by carbonates. The SFZ dips steeply towards the west, with localised moderately east-dipping flexures. The interaction of north-northeast to northeast trending splays on the north-trending shear results in a shallow south-plunge of the elevated mineralisation at the shear junctions. The greywacke-carbonate contact also hosts intrusive lenses of diorite forming a significant "cap" to the mineralisation. Subsequent movement along the SFZ has sheared and deformed the diorite, which has also become mineralised. Towards the northern end of the Sadiola Main pit, gold mineralisation occurs as discrete lenses and/or shoots within the carbonate structures.

Gold mineralisation within the FE trend occurs along a contact between weathered carbonates on the western flank and overlying graphitic metapelites. The contact is brecciated and folded over a 10 km strike. In the southeast, mineralisation dips approximately 45° northwest and along the western and northern portions, the unit dips shallowly eastward.

There are four mining areas at Sadiola:

- The Sadiola trend, including Sadiola Main pit, FNA, FN3, FNBC and Sirimana East and West. The SFZ hosts the main Sadiola deposit and the Far North (FN) pits to the north over a 2,500 m drilled strike length that remains open to the north, south and at depth. At surface, the mineralisation was up to 200 m wide within the oxide zone and has been mined down to 200 - 220 m below surface. Mineralisation width at this depth is reduced to <100 m but mineralisation continues at least to 600 m and remains open at depth.
- Tambali, about 2 km south-southwest of the Sadiola pit, contains gold mineralisation in greywacke that lies adjacent to a faulted, barren carbonate footwall. Tambali is 1.5 km long, from 100 m to up to 350 m wide and extends to 300 m depth. The mineralised lenses in the greywacke are sub-vertical in the centre of the Tambali trend, and shallowly west-dipping along the eastern flank. It is currently unknown how Tambali connects to the Sadiola mineralisation. The Tambali pits were mined from 2013 to 2014 and again from 2021 to 2022. The host rocks comprise moderately sorted wacke-arenite with minor siltstone interbeds and quartz feldspar porphyries. Mineralisation is also found in a deformation-related quartz vein set and is anomalously high in arsenic and antimony.
- The FE3 trend in the east of the Property, where mineralisation is structurally controlled by east-dipping structures (thrust planes). These planes are crosscut by north-northeast trending sub-vertical shears, oblique to the strike, which upgrade the mineralisation locally. FE3 mineralisation is 1,200 m long and 200 m wide in the pit floor, but it is irregularly developed at the current level of exposure (100 m below surface). The mineralisation lies at the contact of pelite / greywacke overlying carbonate with a degree of karst collapse at the immediate contact.
- Sekekoto is approximately 5 km south-southeast of the Sadiola Main pit along a northwest-trending contact between carbonate and greywacke / arkose units where gold mineralisation occurs in laterite and supergene horizons and in the underlying saprolite over a 320 m strike. Mineralisation dips steeply to the northeast in saprolite to 120 m below surface, where it contacts a post-mineralisation diorite that is barren. The structurally controlled mineralisation is hosted by de-carbonated silty carbonates and greywackes and is spatially associated with complex weathering and alteration patterns.

1.4 Exploration

The geology of Sadiola comprises a predominantly sedimentary sequence that has a well-developed laterite regolith of several metres in thickness developed across the Property, such that detailed field mapping and structural data collection have not been possible. Reliance has been placed on remote and ground geophysical data acquisition as well as extensive geochemical sample collection programs.

Geochemical tools used effectively in the past have comprised soil sampling, termite mound sampling and locally shallow auger traverses. Airborne magnetics and radiometric, electromagnetic spectrum and ground gravity were acquired over the entire Property area. Gradient and pole-dipole induced polarisation (IP) (both as discrete small area grids) were conducted over known mineralised trends to characterise the mineralisation already identified, but this has yet to be extended to new target areas.

Since 2021, Allied has focused its exploration activities close to the existing Sadiola Main pit.

1.5 Drilling

Over 212,000 m of diamond core drilling (DD) and 669,000 m of reverse circulation drilling (RC) have been undertaken by various drilling companies, including grade control drilling. A total of 220 (33 DD and 187 RC) drillholes for 19,468 m have been drilled by Allied since January 2021. Approximately 80% of the total metreage drilled was in the Sadiola Main pit area.

DD was by conventional wireline method with PQ (85 mm), HQ (63.5 mm) and NQ (47.6 mm) dual and triple-tube core barrels. RC used 115 mm dual-tube drill rods. Allied's DD holes were drilled with a PQ collar, and once in competent rock, continued in HQ to the end of hole. The holes were inclined predominantly between -50° and -70° and the depths of the DD holes ranged from 24 m to 620 m. Occasionally short re-drills were needed to remedy core loss near surface.

Core recovered was placed in core trays, with the depth interval marked on core blocks at the end of each run as measured by the driller, and an orientation line drawn from the oriented core survey marks.

Geological logging incorporated lithology, structure, alteration mineral species, frequency of veining and its make-up with the orientation of all fabric facilitated by using oriented core. These data provide adequate information to be considered fit for the purpose of Mineral Resource estimation.

1.6 Sampling, analysis and data verification

The RC chip samples were collected from the drill rig cyclone every metre for the entire length of each hole. The chip samples were split into representative portions using a 75:25 riffle splitter and placed into consecutively numbered sample bags for dispatch to the assay laboratory. Standards, blanks and duplicates were inserted into the sample number sequence at 1:20 (4 quality control quality assurance samples and 16 regular samples within 20 samples) in the required intervals. Sieved reference rock chip samples were collected in chip trays for logging; these were photographed, and the trays retained in the core shed facility.

After logging, the diamond core was photographed whole on a tray-by-tray basis with the metre marks, orientation line and cut line visible. Once photographed, the core was cut in half along the marked cut line (displaced from but parallel to the orientation line) using a diamond saw. Samples for analysis were collected consistently from the same half of the core and placed into consecutively numbered sample bags.

Analytical facilities previously used included the SEMOS onsite laboratory, as well as independent laboratories SGS Bamako, SGS Kayes and SGS Booysens. All were used by AngloGold up to 2021 and favoured 30 g fire assay charges. Since Allied's involvement, the SEMOS onsite laboratory has been maintained for grade control whilst independent Bureau Veritas in Bamako has undertaken fire assay analysis on 50 g charges for exploration samples, with sample preparation completed by the SEMOS laboratory.

AngloGold engaged an external analytical auditor (Bekker Consultants, RSA) in July 2017 to review the laboratory operations of both SEMOS and SGS Bamako, AngloGold's external umpire laboratory at that time. Allied has undertaken one physical audit of the Bureau Veritas Bamako facility and two of the SEMOS laboratory using Allied's consulting staff chemist, who is not attached to either laboratory. Both reviewers expressed their satisfaction with practiced approach to sample preparation and the cleanliness with which the sample preparation facilities were maintained. The wet chemistry process used fume hoods to beneficial effect, with the air extraction system working well to ensure no negative impacts to staff members. Firing of the charges in crucibles was orderly and methodical, which ensured no confusion over the button order prior to cupellation. Both laboratories showed a proficiency with their fire assay protocols. No additional audits of the laboratories have been undertaken by a person or company independent of Allied.

Allied has maintained quality assurance quality control (QAQC) management of both the Bureau Veritas and SEMOS laboratories. Database managers review all assays as they arrive from the laboratories to judge their suitability for addition to the database, and each month, assays received in the prior 30 days are output through Datashed's QAQC Reporter software that summarises the laboratories' performance for distribution to the field offices and Allied's Resource Manager in Perth. Data are quarantined until vetted for QAQC.

The original AngloGold Fusion database was migrated to a Datashed structured query language (SQL) system for Allied's Mineral Resource estimation.

The individual deposit databases were reviewed by the Qualified Person. A certain amount of overlap between the different databases was noted, which is a function of boundary changes over time to prospect area designations. The new drilling information generated between June 2021 and February 2022 was verified separately.

The topography has been used to limit the Mineral Resources. The oxidation surfaces were visually reviewed in Leapfrog, and there were no obvious issues. The surfaces are horizontal, planar and irregular, consistent with the oxidative nature of the formation of these surfaces.

An external data management company audited the AngloGold database with the identified errors rectified.

1.7 Mineral processing and metallurgical testing

The 2015 to 2022 production data was used to forecast metallurgical performance in the existing CIP gold process plant. Metallurgical testwork on primary ore was conducted between 2002 and 2010 by the previous owners and an additional program was implemented during 2022.

The 2022 program was conducted at ALS Metallurgy in Perth (managed by DRA and MineScope) and consisted of eight master composites and 131 variability composites from 31 DD holes covering oxide (saprolite), transition (greywacke) and primary mineralisation (calcite marble, shear, greywacke, diorite).

The metallurgical testwork included mineralogy, grind size selection, comminution tests and leach tests including whole-of-ore leaching tests (without gravity recovery option), ball mill grinding work index tests, flotation tests, thickening and rheology tests, tailings detoxification and evaluation of the metallurgical variation in different ore types. Testwork indicated that a conventional grinding and leaching process plant design was appropriate to treat the primary mineralisation achieving metallurgical recoveries of approximately 75% in average.

The 2022 testwork also showed that the presence of some sulphide bearing minerals had a significant impact on the gold recovery for the fraction of gold not amenable to conventional leaching, with mineralogy studies confirming that about 25% of the total gold remains locked mainly in arsenopyrite and pyrite. A geometallurgical model is being developed to increase the understanding of the distribution of these minerals in the orebody and testwork is progressing aimed at increasing recovery for the portion of gold not recoverable by the conventional leaching circuits.

The throughput and gold recovery estimates detailed in Table 1.1 are as indicated from the testwork performed during 2009, 2010 and the recent 2022 work.

Table 1.1 Estimated throughput and gold recovery in new process plant

Ore type	Gold recovery (%)	Throughput (Mt/a)
Laterite	90.0	12.16
Saprolite	92.0	20.88
Siliceous oxide	85.0	12.16
Soft sulphide	75.5	12.16
Primary – porphyry	74.7	6.72
Primary – greywacke	74.7	6.72
Primary – diorite	82.3	6.76
Primary – calcite marble	70.7	8.76
Primary – shear	74.3	7.88
Blast oxide	85.0	12.16
Blast primary	75.5	12.16
Transitional	82.8	12.16

Source: Allied, Sadiola FS, September 2022

1.8 Mineral Resource estimates

The December 2022 Mineral Resource estimate is based on four block models generated using Surpac and MineSight modelling and Micromine software and the Datashed database. Similar evaluation methodologies were used for each of the five areas for which Mineral Resource estimation was undertaken (Sadiola Main, Tambali, FE3, and Sekekoto) as follows:

- Database compilation into a useable and verifiable format.
- Geological modelling and wireframing.
- Interpretation, definition and wireframing of mineralised domains.
- Geostatistical analysis and variography, by domain.
- Block modelling, grade and bulk density estimation.
- Model validation.

Geological modelling was carried out where sufficient reliable drillhole logging and pit mapping information were available.

All mineralised envelopes were modelled using a 0.20 g/t Au envelope for Sadiola Main and Tambali or 0.30 g/t envelopes for FE3 and Sekekoto with a minimum downhole sample interval length of 2 m and a maximum of 2 m internal dilution in all cases.

Statistical analysis and variography were completed on individual mineralised envelopes where there were sufficient data. Where data were insufficient, mineralised envelopes with similar orientation and geology were grouped together to assist in the generation of variograms ensuring that each domain represents a single grade population of consistent orientation. Hard boundaries were used on all domains and sub-domains for the estimation process.

An analysis of the raw assay data for the main sample types throughout the deposits was undertaken in the 2022 FS to determine the correlation between the different drillhole types. All drillholes were used for the wireframe interpretation but only RC and DD holes were used for compositing, geostatistical analysis and resource estimation.

Top cuts were applied where necessary to reduce the influence of extreme grades during grade estimation.

Ordinary block Kriging (OK) was selected as the preferred grade interpolation method as it uses information directly related to the underlying variability of the data to guide the estimation process.

Mineral Resource classifications were assigned using a combination of geological, grade and geostatistical criteria.

The 31 December 2022 Mineral Resource estimate reported above a 0.5 g/t Au cut-off for the four gold deposits within the Sadiola Property (Table 1.2) are contained within optimised Lerchs-Grossmann pit shells based on estimated operational costs and recovery assumptions at a gold price of $1,800/oz. Mineral Resources are reported inclusive of Mineral Reserves.

Table 1.2 Sadiola Mineral Resources as of 31 December 2022 at a 0.5 g/t Au cut-off (100% equity basis)

Area	Measured			Indicated			Total Measured and Indicated			Inferred		
	Mt	Au g/t	Au koz	Mt	Au g/t	Au koz	Mt	Au g/t	Au koz	Mt	Au g/t	Au koz
Sadiola Main	0.1	0.80	2	193.9	1.50	9,659	194.0	1.55	9,661	6.8	1.10	240
FE3				5.5	1.65	293	5.5	1.66	293	1.2	1.85	71
Tambali				1.5	0.96	46	1.5	0.95	46	3.0	1.06	103
Stockpiles	13.1	0.91	384				13.1	0.91	384			
Sekekoto				1.4	0.99	44	1.4	0.98	44	1.0	0.98	33
Total	**13.2**	**0.91**	**385**	**202.3**	**1.50**	**10,042**	**215.5**	**1.50**	**10,427**	**12**	**1.15**	**446**

Notes:

- *Data is reported to significant figures to reflect appropriate precision and may not sum precisely due to rounding.*
- *Mineral Resources are inclusive of Mineral Reserves.*
- *Mineral Resources are reported within a $1,800/oz optimum pit at a 0.5 g/t Au cut-off and depleted to 31 December 2022*
- *Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.*

Sadiola's Mineral Resources and Mineral Reserves were initially classified in the 2022 FS in accordance with the guidelines of the JORC Code (2012). The confidence categories assigned under the JORC Code (2012) were reconciled to the confidence categories in the CIM Definition Standards for Mineral Resources and Mineral Reserves (the 2014 CIM Definition Standards). As the confidence category definitions are the same, no modifications to the confidence categories were required. Mineral Resources and Mineral Reserves in this Technical Report are reported in accordance with the 2014 CIM Definition Standards.

1.9 Mining and Mineral Reserves

The current Sadiola mine consists of two open pit operations (Sadiola Main and FE3) which continue to mine oxide and transitional ore to feed the existing oxide processing facility at a rate of 5.0 Mt/a. The Tambali Mineral Reserve was depleted in 2022. Mining will expand to 10 Mt/a when a new process plant commences in Q1 2026.

Mineral Reserves were estimated for the Sadiola Main and FE3 open pits using typical open pit drill, blast, load and haul mining assumptions. Measured and Indicated Mineral Resources were converted to Proven and Probable Mineral Reserves with the application of appropriate modifying factors. Inferred Mineral Resources were set to waste.

1.9.1 Mine design

Whittle 4X software was used to optimise pit shells at a $1,500/oz base gold price. A revenue factor of 0.88 was chosen for the Sadiola Main pit design, corresponding to a gold price of $1,320/oz. A 5% ore loss and 8% dilution were applied at Sadiola Main, and an 11% ore loss and 25% dilution were applied at FE3 by applying a block model regularisation process. Cut-off grades were applied to 11 differing rock types encountered during mining, including oxide, laterite, saprolite, transitional and primary. The cut-off grade was determined within Whittle 4X using the formula: cut-off grade = (dilution x processing costs) / (net price x recovery) and ranged from 0.31 g/t to 0.73 g/t Au.

To develop geotechnical parameters for the mine optimisation and designs, Allied's geotechnical engineer and an independent geotechnical engineer assessed earlier geotechnical reports, optimisation reports, recent mining performance and the 2021 geotechnical drilling and testwork results from Sadiola Main. The overall slope angles (OSA) applied in the optimisation were 35° in oxide and transition and 43° to 49° in Sadiola Main fresh rock.

Groundwater inflows to each of the mining stages were estimated using a groundwater model which has been informed by historical performance as well as additional drilling and pumping tests completed in 2022. A combination of existing and new dewatering bores will be used for dewatering of aquifers in Sadiola Main as the pit is deepened.

Mining of the Sadiola Main and FE3 Mineral Reserves will be carried out by conventional open pit extraction methods until 2038, after which low-grade stockpiles will be treated until 2041. Mining will use 300 t class excavators and 91 t class haul equipment for mining of oxide ore and the continued mining of primary ore. Studies show that there is no material upside benefit realised by using larger equipment.

The existing mining contractor has three fleets of Caterpillar 6030 excavators and Caterpillar 777 trucks. Additional mining equipment fleet will be required over the life of mine (LOM) including five additional excavators and 32 trucks.

Material aspects of mine planning and mine design are:

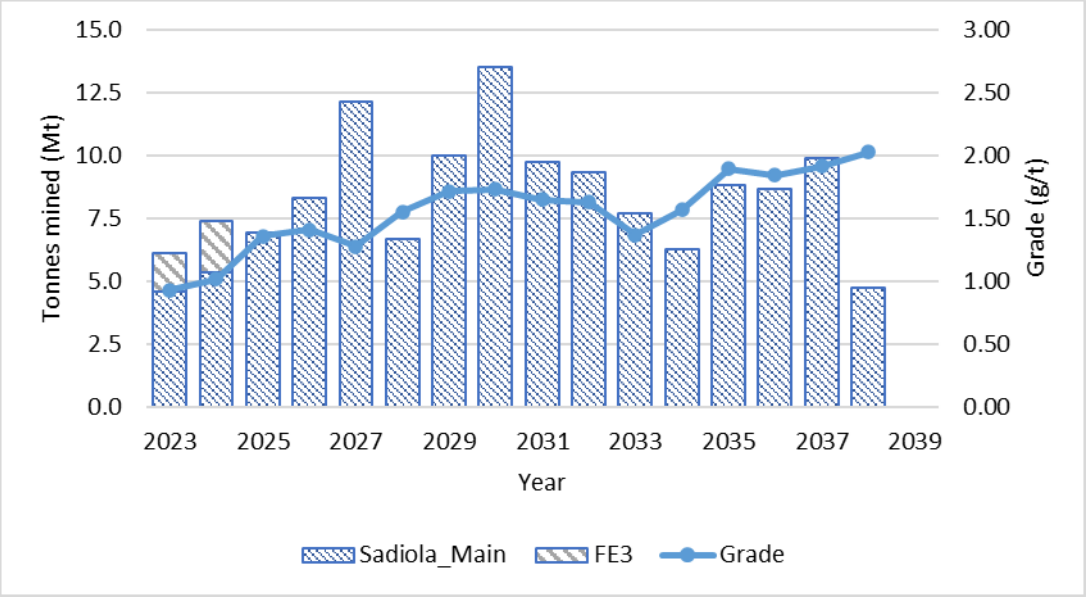
- Mining will occur in existing pits for all existing mining areas; no greenfields pits will be established.
- Dewatering of pits and storage of some water will be required.
- Ore extraction from the pits will initially be focused on oxide ores until Q4 2025 with primary ores targeted from 2026 onward.
- A new tailings storage facility (TSF) will be required from Q1 2026 onward. FE3 North pit needs to be mined out before that time.
- Mining will be carried out by contractors over the entire LOM.
- Geotechnical risks exist in the large Sadiola Main pit which have been mitigated by additional geotechnical testwork, staged mining, radar monitoring and two separate ramps.

The current or existing pits have been designed and laid out from a geotechnical and practical mining perspective. This reduces the need to recontour or rehabilitate mining areas prior to extraction, nor is excess additional pre-stripping required to access ore. Bench designs have been considered for waste and ore with the current design parameters including 20 m wide catch berms every 50 m in the oxide zone and 80 m in the primary zone. The existence of faults in the open pits is known and have been accounted for in the designs.

1.9.2 Mining and processing schedule

The LOM plan schedules a total material movement of 136.2 Mt of ore and 476.9 Mt of waste for a 613.1 Mt total material movement which is mined over a 16-year period. Mining has been designed and scheduled for total ex-pit tonnages moved and is expected to ramp up to 48 Mt/a in 2025 before decreasing in 2034. Most of the ore will come from the Sadiola Main pit, with ore production scheduled to ramp up from 6.1 Mt/a in 2023 to an average of about 9.3 Mt/a from 2026 to 2035 before the pits are depleted in 2038 as shown in Figure 1.2. The average strip ratio (waste t:ore t) is 3.5 over the LOM.

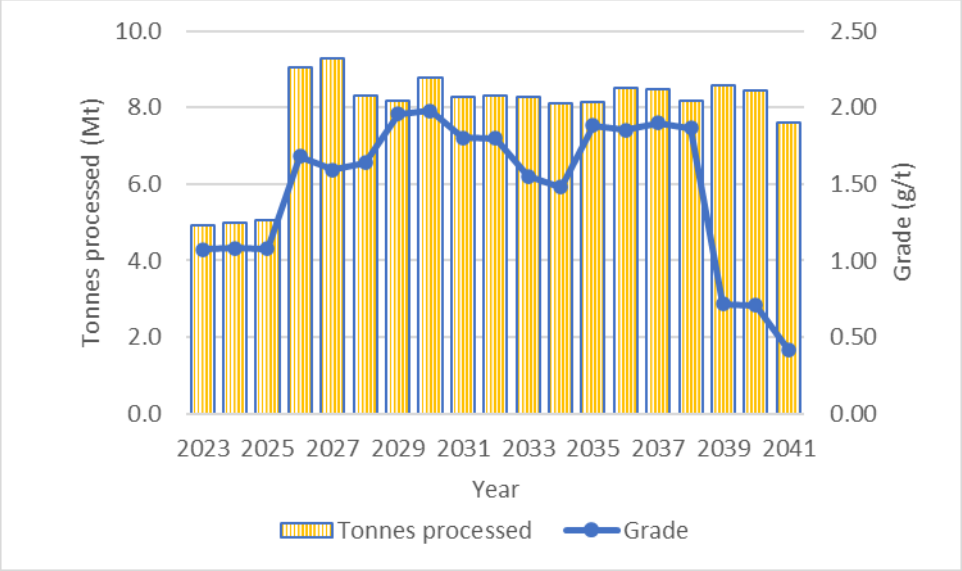
Figure 1.2 Sadiola ore mining schedule



Source: Allied, Sadiola LOMP, December 2022

The new process plant will have a nominal capacity of 8.0 Mt/a treating primary ore or 10.0 Mt/a treating up to 30% oxide ore with the balance being substantially primary ore. Ore processing is scheduled to continue at the current oxide plant feed capacity of 5 Mt/a before increasing to an average of 8.5 Mt/a from 2026 to 2039 following commissioning of the new plant in 2026 as shown in Figure 1.3.

Figure 1.3 Sadiola annual throughput rate



Source: Allied, Sadiola LOMP, December 2022

1.9.3 Mineral Reserve estimates

The Proven and Probable Mineral Reserve as of 31 December 2022 is summarised by classification and mine area in Table 1.3.

Table 1.3 Sadiola Mineral Reserves as of 31 December 2022 (100% equity basis)

Area	Proven			Probable			Total		
	Mt	Grade (g/t)	Au (koz)	Mt	Grade (g/t)	Au (koz)	Mt	Grade (g/t)	Au (koz)
Sadiola stockpiles	13.1	0.91	384				13.1	0.91	384
Sadiola Main				132.7	1.58	6,737	132.7	1.58	6,737
FE3				3.6	1.11	129	3.6	1.11	129
Total	**13.1**	**0.91**	**384**	**136.4**	**1.57**	**6,866**	**149.5**	**1.51**	**7,250**

Note: Data is reported to significant figures to reflect appropriate precision and may not sum precisely due to rounding. Mineral Resources are inclusive of Mineral Reserves

The Mineral Reserve:

- Reflects that portion of the Mineral Resource which can be economically extracted by open pit methods.
- Considers the modifying factors and other parameters including but not limited to the mining, metallurgical, social, environmental, statutory and financial aspects of the project.
- The Proven Mineral Reserve estimate is based on Measured Mineral Resources and the Probable Mineral Reserve is based on Indicated Mineral Resources.
- Includes 5% ore loss and 8% dilution applied at Sadiola Main and 11% ore loss and 25% dilution applied at FE3 by applying a block model regularization process.
- A base gold price of $1,500/oz was used for the pit optimisation, with the selected pit shells using values of $1,320 (revenue factor 0.88) and $1,200/oz (revenue factor 0.80) for Sadiola Main and FE3, respectively, depleted to December 31, 2022.

- The cut-off grades used for Mineral Reserves reporting were informed by a $1,500/oz gold price and vary from 0.31 to 0.73 g/t Au for different ore types due to differences in recoveries, costs for ore processing and ore haulage.

The Qualified Person has not identified issues in the 2022 FS that materially affect the Mineral Reserves in a detrimental sense. Factors that may materially impact the Mineral Reserve estimates in the longer term include:

- Changes to pit optimisation input assumptions such as:
  - An increase in mining dilution
  - Increased operating cost assumptions
  - Lower metallurgical recoveries
  - Lower than forecast long-term gold prices.
- Changes to the regulatory environment under which the 2022 FS was developed.

1.10 Processing methods and infrastructure

The existing process plant is a conventional carbon in pulp (CIP) circuit and is designed to treat soft oxide and 25% transitional ore. The existing plant consists of primary crushing for oxide ore, secondary crushing for transitional ore, grinding to 80% passing (P_{80}) 75 µm using two SAG mills and a ball mill, pre-oxidation, cyanidation and carbon adsorption for 24 hour leach residence time, followed by electrowinning and smelting to produce gold doré at an average of 92% recovery from oxide ore.

The planned new process plant is a conventional carbon in leach (CIL) circuit and is designed to treat 8 Mt/a of the harder primary ore and up to 10 Mt/a with 30% oxide in the feed. The plant consists of primary and secondary crushing, grinding to P_{80} 75 µm using a SAG mill, pebble crusher and ball mill, pre-oxidation, cyanidation and carbon adsorption for 24 hour leach residence time, followed by electrowinning and smelting to produce gold doré. The average gold recovery from the fresh ore is forecast to be 74%.

The CIP tailings are treated with the addition of sodium metabisulphite (SMBS), copper sulphate and oxygen to reduce the contained cyanide to <50 ppm weak acid dissociable (WAD). The treated tailings are pumped to the TSF.

Existing infrastructure includes an accommodation village, laboratory, offices, warehouse, maintenance workshop, a 1.8 km airstrip, a 55 km water pipeline from the Senegal River and a diesel power station with 21 x 1 MW gensets.

Additional infrastructure required for the expansion includes an 89 km overland 225 kV power line to connect the site to the national grid, 36 MW of solar panels from an independent power provider and a backup diesel power station. The power supply system will provide power from approximately 75% renewable sources**.**

1.11 Permitting, environmental and social

1.11.1 Permits

Permits are in place for the existing operation.

Environmental and social baseline studies undertaken for the Sadiola Expansion Project include:

- Air quality monitoring to include particulate matter.
- Noise monitoring.
- Testing of pre-mining groundwater at numerous shallow wells in villages to the north and west of the Sadiola Main pit.

- A vegetation survey over an area of 220 ha in the main mining areas as part of the 2021 and 2022 ESIA studies.
- Environmental and social monitoring during 2020 including rainfall, dust deposition and water quality.

SEMOS has programs to evaluate the efficiency of resource use and pollution prevention. Data recorded includes annual water and energy consumption, greenhouse gas emissions and volumes of waste generated. SEMOS also reports monthly on, among others, land acquisition activities, local employment data, incidents and engagement activities.

The Sadiola Expansion Project was approved in August 2022 and is valid for three years. The powerline ESIA was submitted in March 2023 and regulatory approvals are targeted by Q3 2023. Additional permits required to be in place prior to construction and operation of the Sadiola Expansion Project include:

- Construction Permit for the construction of any installations of industrial or commercial use.
- Water Management Permit to divert any watercourses.
- Bush Clearing Permit for any land clearance activities.
- Radiation Permit for the transportation, storage and use of radiation sources (i.e. components in the process plant).

Land acquisition and compensation for affected assets (i.e. farms, crops, houses or other structures) must be completed ahead of project implementation. Following the land use surveys for the powerline corridor, land acquisition and compensation costs will be confirmed.

1.11.2 Environmental

Tailings storage facilities

Existing TSF

The current Sadiola TSF has mostly received tailings material derived from the processing of oxide ores and will continue to receive tailings until 2025, after which in-pit storage (TSF2) at the FE pits is planned until 2041.

The existing TSF is a cycloned valley infill facility which has been in operation since 1996. The starter wall was constructed of compacted laterite and raised in an upstream direction using cyclone underflow tailings for wall building.

In April 2022, Knight Piésold carried out a formal audit of the TSF with no material findings. In July 2022, Knight Piésold was appointed Engineer of Record for the TSF.

New TSF

A new TSF (TSF2) is required from Q1 2026. A TSF site selection study undertaken by Knight Piésold considered four options. The most favourable option was the use of a combination of in-pit and above ground tailings disposal at FE3 and FE4. The in-pit tailings deposition (with tailings detoxification) has been re-approved by the regulator.

TSF2 is designed to have a total disposal capacity of 140 Mt, as compared to 134 Mt in the processing schedule from 2026. Approximately 123 Mt of tailings will be accommodated by in-pit storage with the balance (17 Mt) stored in an above-ground facility encompassing FE3 North, FE3 South and FE4 pits. A perimeter embankment will be constructed using downstream raises to a final elevation of approximately 13 m above the pit crest, depending on the settled density achieved for the tailings. Additional capacity is available for mine life extensions. The liner for the above-ground facility will include a low permeability compacted in-situ soil liner. Seismic loading and factors of safety (FoS) are in line with ANCOLD guideline.

Mining of FE3 North will be complete in 2025 and can accept material from the new process plant until 2028, allowing sufficient time for the possible mining of FE3 South and FE4. Both FE4 and FE3 South can receive in-pit tailings from 2029 to 2035.

In 2022, Knight Piésold undertook a suite of testwork on primary tailings. The results indicated:

- The tailings were classified as acid consuming.
- Several elements were enriched, with arsenic and antimony being highly enriched. The tailings facility was designed to minimise the loss of tailings solids through dust.

Waste rock dumps

Waste rock will be disposed in waste rock dumps (WRD) located adjacent to the open pits. The area to the east of the Sadiola open pit was selected as a dump location to minimise haulage distances and to keep the haulage cost low (i.e. being close to the pit exit) while reducing the likelihood of sterilising future mineralisation.

Geochemical testwork has demonstrated a low risk of acid generation from the WRDs. Any minor proportions of potentially acid forming material would be placed centrally within the waste dumps.

Arsenic exceeded release guideline concentrations in 38% of samples and this was distributed across all lithologies, pits and rock types. Additional kinetic testwork is being carried out to confirm the results. Fresh and transitional waste will likely be encapsulated with an outer facing of oxide waste and trials of wetlands and laterite filters for closure may be required to control the release of these metals.

It is envisaged that a cover system of benign waste and a growth medium will be required to rehabilitate the waste rock landform at closure.

Permits to discharge water from mining pits are in place subject to the assessment of water quality. Some water may require storage onsite and re-use due to elevated concentrations of arsenic, fluoride and molybdenum.

1.11.3 Social

Current mine activities occur within the Sadiola Rural Commune. The commune comprises 46 villages. Eight of these are situated within 4 km of the mine and are considered directly or indirectly affected by ongoing mining activities. Sadiola is the largest village and is the regional administration centre of the Commune.

Several key environmental and social plans are implemented on site, including environmental and social management and monitoring, local development (developed in collaboration with the local development committees), mine closure and stakeholder engagement.

1.11.4 Closure provisions

Allied engaged Kewan Bond (Pty) Ltd (Kewan) as an independent consultant to review and update the mine closure estimate. The closure cost at the end of 2022, excluding retrenchment, was estimated at $87.6 million. Allied has committed to provide bank guarantee at a rate of $0.67/t mill feed processed by the Sadiola Expansion Project, which is to cover closure costs at the end of the mine life.

1.12 Costs and economic analysis

1.12.1 Capital costs

LOM capital costs for Sadiola (Table 1.4) are estimated at $702.4 million (from 1 January 2023) to a current planned completion of ore processing in 2041, with closure costs continuing to 2044. The estimate has an accuracy range of ±15%. The LOM capital costs include a 12% contingency.

Table 1.4 Sadiola LOM capital cost estimate ($M)

Item	Total
New plant expansion	378.1
Mining mobilisation-demobilisation	15.7
Sustaining capital	219.0
Closure and rehabilitation costs	89.6
Total	**702.4**

Source: Allied, LOMP, December 2022

1.12.2 Operating costs

Operating costs for Sadiola comprise mining, processing, and general and administration (G&A) and are estimated at $5,093 million over the LOM as summarised in Table 1.5. The operating cost estimate is considered to have an accuracy of ±15% with the following breakdown:

- Operating costs and royalties total $34.10/t ore.
- Mining costs total $3.09/t rock mined (ore plus waste).
- Processing costs and administration costs total $17.64/t ore processed.
- Selling costs total $25 million and government and community royalties total $538 million.
- The all-in sustaining cost, excluding the process plant expansion and mine closure costs, over the LOM is approximately $970/oz.

Table 1.5 Sadiola operating cost summary ($M)

Area	Total
Mining	1,895.07
Processing	2,081.42
Site administration	553.99
Selling cost	24.68
Royalty	538.22
Total	**5,093.38**
Total unit cost ($/t ore)	34.10
Unit mining cost ($/t rock)	3.09
Unit processing and G&A ($/t ore)	17.64

Source: Allied, LOMP, December

1.12.3 Financial model

The following taxes and royalties have been included in the Financial Model:

- A corporate tax rate of 30% on net profits.
- Five year tax holiday for production from primary ore: 2026 to 2030.
- Exemption from customs duties on operating consumables: 2026 to 2028.
- Exemption from customs duties on the Sadiola Expansion Project capital items: Q4 2023 to Q1 2026.
- Variable Government royalty of 6.00% of revenue, comprised of a 3% ad valorem tax and a 3% rate on the contribution for services rendered.
- Community development fund of 0.25% of revenue (from commissioning of the Sadiola Expansion Project).

- Depreciation for Patente tax: 7 years.

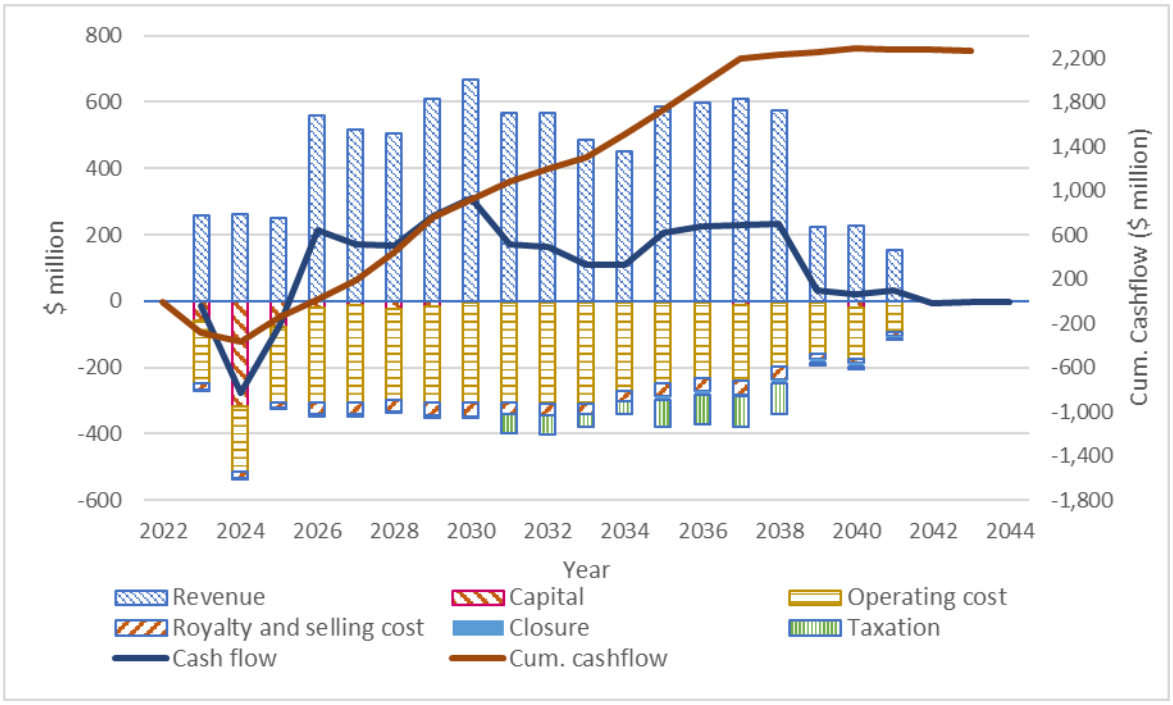
A long-term gold price of $1,500/oz was used for the Sadiola Mineral Reserve estimate with the economic analysis based on a long-term gold price of $1,568/oz using consensus estimates published by J.P. Morgan in 2022. The assumption represents the lower of the three-year trailing average price of $1,650/oz, the current spot price and the long-term consensus gold price.

Refining and bullion transport costs are based on current contracts with Brinks Transport and Rand Refinery.

Since 2021, mining has been undertaken by PW Mining under contract. The mining costs used in the 2022 FS are based on the contract rates for the oxide pits and budgetary rates received from PW Mining for the deeper pits targeting the harder primary ore.

The net cash flow of the Sadiola Expansion Project (100% basis, post-tax) has been estimated at $2,269 million. The annual cash flow forecast is shown in Figure 1.4. The NPV (100% basis, post-tax) has been estimated at $1,271 million with an internal rate of return (IRR) of 40%. The discount rate applied was 5% (real) with a long-term gold price assumption of $1,568/oz. At 80% ownership, Allied's share of the NPV5% is $1,029 million. The payback period for the Sadiola Expansion Project is 24 months from commissioning in Q1 2026.

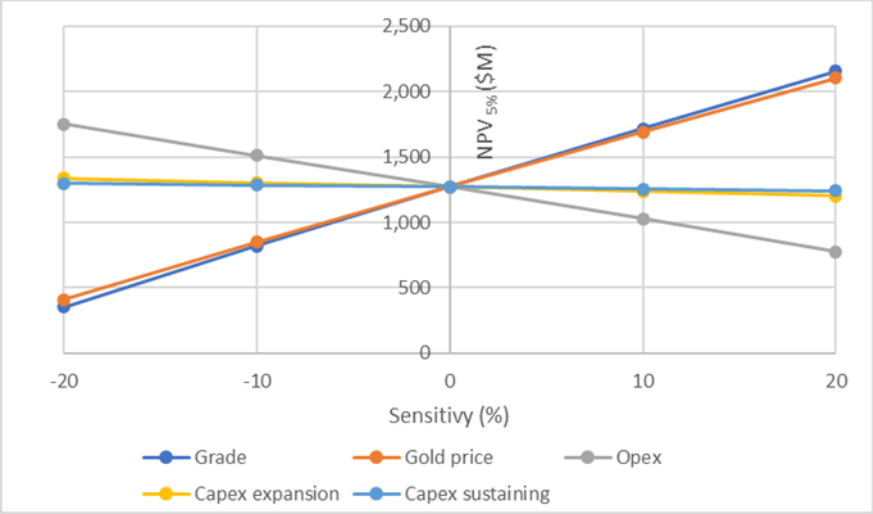
Figure 1.4 Sadiola LOM cash flow summary



Source: Sadiola LOMP, December 2022

The sensitivity analysis shows that the most significant and material drivers for the Project are not generally within the control of Allied but influenced by markets and geology. These include gold grade and gold price as shown in Figure 1.5. The other key value drivers relate to operating and capital costs, which are more controllable aspects of the Project, and the discount rate assumption.

Figure 1.5 Sadiola Expansion Project NPV5% sensitivity ($M)



The sensitivity of the Project value to higher discount rates is shown in Table 1.6.

Table 1.6 Sadiola 2022 FS – LOM discount rate sensitivity

Discount rate	Project NPV ($M)
5%	1,271
7.50%	964
10%	736
12.50%	564

1.13 Other relevant data and information

1.13.1 Exploration upside

Allied's current near mine exploration targets are focused on identifying additional oxide and transition zone mineralisation at Sekekoto, Sadiola Main Stage 6 extension, FE4, S12 and Tambali South.

1.13.2 Staged development

In H1 2023, DRA carried out an engineering cost study (ECS) to investigate various options to enable primary ore to be treated in the existing circuit and defer the full Sadiola Expansion Project in order to manage Allied's capital allocation, de-risk the full expansion and develop additional optimisation opportunities, including cost reductions and improvements in recoveries. The ECS recommended tertiary crushing of primary ore and installation of a pre-purchased 7 MW ball mill together with the existing circuit. Mill modelling showed that 3 Mt/a of primary ore and 2.75 Mt/a of oxide ore could be treated through the upgraded circuit (Stage 1 Expansion).

The Stage 1 Expansion option scope of work is summarised as:

- The addition of tertiary crushing to the existing secondary crushing circuit, operated under contract.
- The addition of a variable speed belt feed hopper to feed the refurbished, pre-purchased 7 MW ball mill.
- Grinding of primary ore to P_{80} 75 µm using the 7 MW ball mill and one of the existing 2.5 MW primary mills. The cyclone overflow at 40% solids would be pre-oxidized and leached in one train of the existing CIP circuit.

- Crushing and grinding of oxide ore to P_{80} 75 µm using the existing 2.5 MW primary mill and 2.5 MW regrind mill. The cyclone overflow at 32% solids would be pre-oxidized and leached in one train of the existing CIP circuit.
- Six leach tanks (three tanks from each train) converted to CIL tanks to increase recovery. Launders would be upgraded to sustain the additional flowrates.
- Tailings combined for cyanide detoxification and then pumped to the TSF. A water treatment plant may be required to maintain the arsenic and antimony within acceptable limits.
- Carbon recovered from each CIP circuit would be treated in the existing elution circuits for subsequent electrowinning and smelting to produce gold doré.
- The additional 10 MW of power would be provided by a contractor.

Capital costs for the Stage 1 Expansion were estimated by DRA at $61.6 million. Operating costs were based on the existing plant performance with $5/t included for tertiary crushing and contract power at a blended tariff of $0.24/kWh based on a long term diesel price of $0.80/L. Discussions are progressing with power supply contractors to implement synergies with the existing 21 MW power station and use a hybrid diesel solar power system to reduce operating costs.

The preliminary implementation schedule shows 12 months to construct the Stage 1 Expansion, with the ball mill refurbishment and installation being the critical path. The Stage 1 Expansion option would be commissioned in Q1 2025. Feed grades from Mineral Reserves are expected to average 1.44 g/t Au between 2025 to 2028, with recoveries expected to average 75% over the same period, resulting in production levels of approximately 200 koz/a.

The Sadiola Expansion Project would be commissioned in Q3 2028 and produce approximately 400 koz/a from 2029 to 2032, reducing to about 300 koz/a for the remainder of the LOM from Mineral Reserves. This phased approach allows Allied to execute its growth plan with lower execution risks and a disciplined capital allocation approach, while providing the opportunity to advance the studies aimed to increased metallurgical recoveries presented in Item 1.13.3.

At the time of reporting, a Feasibility Study was underway to increase the accuracy of the Stage 1 Expansion option scope of work and cost estimates. The results of the Feasibility Study are expected during Q3 2023.

1.13.3 Flotation and concentrate leaching

The 2022 FS compared conventional cyanide leaching with cyanide leaching of a finely ground concentrate, which showed similar recoveries and justified the selection of the conventional CIL flowsheet.

Allied has continued studying potential optimisation paths for the Sadiola Expansion Project, including the opportunity to improve metallurgical recoveries as complementary solutions to the selected CIL flowsheet. One option that has produced the best results is to produce a pyrite-arsenic rich flotation concentrate ahead of the CIL circuit and treat the concentrate separately to recover gold from the semi-refractory components of the orebody.

DRA and MineScope carried out a Scoping Study to compare the following four flowsheet options:

- Option 1: Flotation and cyanidation of flotation products.
- Option 2: Ultra-fine grinding (UFG) and cyanidation.
- Option 3: Albion® processing and cyanidation.
- Option 4: Pressure oxidation and cyanidation.

Testwork since the 2022 FS shows that recovery can be increased by 3% using ultra-fine grind technology, 15% using ferric leaching to mimic Albion® atmospheric leach technology or 19% using pressure oxidation.

The study shows that significant upside could be realised from the atmospheric leaching Albion® process given its higher overall recovery compared with ultra-fine grinding and lower complexity, risk and cost compared to pressure oxidation.

Additional testwork is underway to confirm the results of the Scoping Study, with the objective of implementing in conjunction with the Sadiola Expansion Project.

1.13.4 Underground potential

Allied considers there is strong underground potential at Sadiola Main. Orelogy carried out a conceptual study for an underground development, which demonstrated the potential for an underground mine below the Sadiola Main open pit using longhole open stoping.

Allied has purchased its own drill rigs capable of drilling to 1,500 m depth. Drilling to test underground potential is targeted to commence in Q4 2023.

1.14 Conclusions and recommendations

A detailed work plan to advance the Sadiola Expansion Project to the next phase has been prepared. The work plan comprises the following activities:

Geology and resources

- Infill drilling and resource modelling to increase confidence in the Inferred Resource portions of the estimates at Tambali Deeps, Sekekoto, S12 and Tambali South.
- FE4: Update the resource model with the 2022 drilling and incorporate the graphitic shear zones. Carry out follow-up drilling when the pit is dewatered, which is targeted for 2024.
- Sadiola Underground: Commence drilling to confirm the width and depth of the host shear zone which has potential for future underground development.

Mining and reserves

- Hydrogeology: Dewater the Sadiola Main and FE3 pits in time for mining and install additional monitoring holes and carry out pump tests to confirm the hydrogeological model.
- Geotechnical: Carry out follow-up drilling to confirm pit design parameters for future cutbacks and depth extensions.

Metallurgy and processing

- Continue the flotation concentrate leaching testwork, which may represent a future enhancement option.
- Complete the portable XRF assaying of the analytical sample pulps and relogging of core to increase the geo-metallurgical understanding of the deposits.
- Prepare the geo-metallurgical model to optimise the mine plan.
- Commission the oxygen plant in Q3 2023 to maximize production from higher grade transitional ores.
- Progress engineering studies for the staged expansion to confirm the way forward and then implement the process plant upgrade.

Infrastructure

- Finalise negotiations with EDM to confirm the grid power tariff.
- Implement the power supply upgrades.

Tailings and water management

- Progress the existing TSF raise and conversion from cyclones to conventional spigot deposition during 2023.
- Progress the buttress around the existing TSF to continue deposition until 2025.
- Implement the designs for the Sadiola Main east waste dump and associated road, power and water diversions.
- Progress a kinetic geochemical testwork program on waste samples.
- Undertake a detailed dam break assessment of the existing TSF.

Environmental and social

- Realise regulatory approvals for the grid connection.

Legal and land tenure

- Complete the extension of the Exploitation Permit from July 2024.

2 INTRODUCTION

This Technical Report was prepared in accordance with the Canadian Securities Administrator's NI 43-101 for Allied Gold Corp (Allied) and Mondavi Ventures Ltd (to be renamed Allied Gold Corporation) (Mondavi).

Upon completion of the reverse take over (RTO), Allied will be a Canadian-based gold producer with a portfolio of three operating gold mines, a development project and exploration properties in Africa, principally Mali, Côte d'Ivoire and Ethiopia.

This Technical Report is to support the disclosure of Exploration Results, Mineral Resources and Mineral Reserves for the Sadiola Gold Project (Sadiola or the Property), a mineral exploration, development and production property located in the Republic of Mali, West Africa, and was authored by Messrs. Allan Earl, Matt Mullins, Gordon Cunningham and Peter Theron of Snowden Optiro, a business unit of Datamine Australia Pty Ltd (Snowden Optiro).

All of the Qualified Persons are eligible members in good standing of a recognized professional organization (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 each Qualified Person is undertaking as disclosed in Table 2.1 at the time this Technical Report was prepared.

Table 2.1 Responsibilities of each Qualified Person

Qualified Person	Employer	Qualifications and affiliation	Details of site inspection	Responsibility
Mr Allan Earl	Snowden Optiro	AWASM, FAusIMM	25 to 29 April 2022 4 days on site	Snowden Optiro's Qualified Person responsible for this report (Item 1 - 6, 15 -16, 19, 21.1.2, 21.2.1, 21.2.3-4, 22 -26
Mr Matt Mullins	Snowden Optiro	BSc (Hons) (Geology) FGL, FGSSA, FAusIMM, FSAIMM		Item 7 -12, 14
Mr Gordon Cunningham	Snowden Optiro	BEng (Chemical), Pr.Eng (ECSA), FSAIMM		Item 13, 17, 18, 21.1, 21.1.3, 21.2.2
Mr Peter Theron	Prime Resources	BEng (Civil), Pr.Eng. (ECSA), GDE (Hons), MSAIMM		Items 20, 21.1.4

The information, conclusions, opinions and estimates contained in this Technical Report are based on the following parameters:

- Unless otherwise stated, information made available to the Qualified Persons by Allied as at the effective date of this Technical Report.
- Assumptions, conditions and qualifications as set forth in this Technical Report.

The Qualified Persons have reviewed such information to verify it using their professional judgement and have no reasons to doubt its reliability and have determined it to be adequate for the purposes of this Technical Report. Except as specified below, the authors do not disclaim any responsibility for the information, conclusions, and estimates contained in this Technical Report.

The Qualified Persons reviewed information and documents provided by Allied via a virtual data room. The primary information source was Mr Earl's site inspection in April 2022 and the "Sadiola Feasibility Study Report" dated September 2022 and appendices (2022 FS) which included internal company reports, technical reports, diagrams and maps, spreadsheets and correspondence prepared by Allied's external consultants.

Allied updated the Sadiola Mineral Resources and Mineral Reserves to December 2022 in a report "Group Resources and Reserves for 31 December 2022". This report depleted the 2022 FS Mineral Reserves and Mineral Resources to 31 December 2022 and included spreadsheets showing revised timing to implement the Sadiola Expansion Project.

The Sadiola Mineral Resources and Mineral Reserves were initially classified using the 2012 edition of the Australasian Joint Ore Reserves Committee Code (JORC Code 2012). The confidence categories assigned under the JORC Code (2012) were reconciled to the confidence categories in the CIM Definition Standards for Mineral Resources and Mineral Reserves (CIM Definition Standards, 2014). As the confidence category definitions are the same, no modifications to the confidence categories were required. Mineral Resources and Mineral Reserves in this Technical Report are reported in accordance with the CIM Definition Standards.

Further information was received from the Allied representatives listed in Table 2.2 via teleconference and email correspondence in response to queries submitted by the Qualified Persons of this Technical Report.

Table 2.2 Allied information sources

Name	Designation
Mr Matthew McInnes	Senior Vice President, Studies
Mr Jonathon Yelland	Senior Vice President, Mining
Ms Neala Gillespie	Senior Vice President, HSE
Mr John Cooke	Vice President, Resources
Mr Scott Brindley	Study Manager
Ms. Sarah Ross	Head of Legal (Operations)
Mr. Jordan Baechler	SVP Corporate Finance
Ms Louise Westgate	EIA Manager
Mr Shane Fieldgate	Senior Resource Geologist

The Qualified Persons listed in Table 2.1 are responsible for this Technical Report and declare that they have taken all reasonable care to ensure that the information contained in this report is, to the best of their knowledge, in accordance with the facts and contains no material omissions.

In preparing this report, the Qualified Persons have extensively relied on information collated by other parties. Each of the Qualified Persons have critically examined this information, made their own enquiries, and applied their general mineral industry competence to conclude that the information presented in this Technical Report complies with the definitions and guidelines of the CIM.

Each of the Qualified Persons believe that their opinions must be considered as a whole, and that selection of portions of the analysis or factors considered by them, without considering all factors and analyses together, could create a misleading view of the process underlying the opinions presented in this Technical Report. The preparation of a Technical Report is a complex process and does not lend itself to partial analysis or summary.

Except for the purposes legislated under applicable securities laws, any use of this Technical Report by any third party is at that party's sole risk.

A draft copy of this Technical Report was provided to Allied for review on omission and factual accuracy. The Qualified Persons who have authored this Technical Report do not disclaim responsibility for the contents of this report.

The effective date of this Technical Report is 12 June 2023. As at the effective date of this Technical Report, none of the Qualified Persons had an association with Allied or its individual employees, or any interest in the securities of Allied or any other interests that could reasonably be regarded as capable of affecting their ability to give an independent unbiased opinion in relation to Allied's assets.

Snowden Optiro will be paid a fee for the preparation by its Qualified Persons of this Technical Report based on a standard schedule of rates for professional services, plus any expenses incurred. This fee is not contingent on the outcome of the Technical Report, and neither Snowden Optiro nor the Qualified Persons will receive no other benefit for the preparation of this report.

Unless otherwise specified, all units of currency are in United States Dollars ($). All measurements are metric except for troy ounces (oz).

3 RELIANCE ON OTHER EXPERTS

The Qualified Persons have not performed an independent verification of the land title and mineral tenure information, as summarised in Item 4 of this Technical Report, nor have they verified the legality of any underlying agreement(s) that may exist concerning the permits or other agreement(s) between third parties, as summarised in Item 4 of this Technical Report. The Qualified Persons have relied on information provided by the legal department of Allied and disclosed in an independent legal assessment by Santis Partners 4 May 2023 in this regard.

The Qualified Persons have relied on the Allied personnel listed in Table 2.2 for guidance on applicable legal, political, environmental and tax matters from the Sadiola mining and processing operation, mine and country security, and other risks.

This Technical Report includes certain non-GAAP financial measures which the authors believe, together with measures determined in accordance with international financial reporting standards (IFRS), provide investors with an improved ability to evaluate the underlying performance of Allied. Non-GAAP financial measures do not have any standardized meaning prescribed under IFRS, and therefore they may not be comparable to similar measures employed by other companies. The data is intended to provide additional information and should not be considered in isolation or as a substitute for measures of performance prepared in accordance with IFRS. The non-GAAP financial measure included in this Technical Report include free cash flows and all-in sustaining costs.

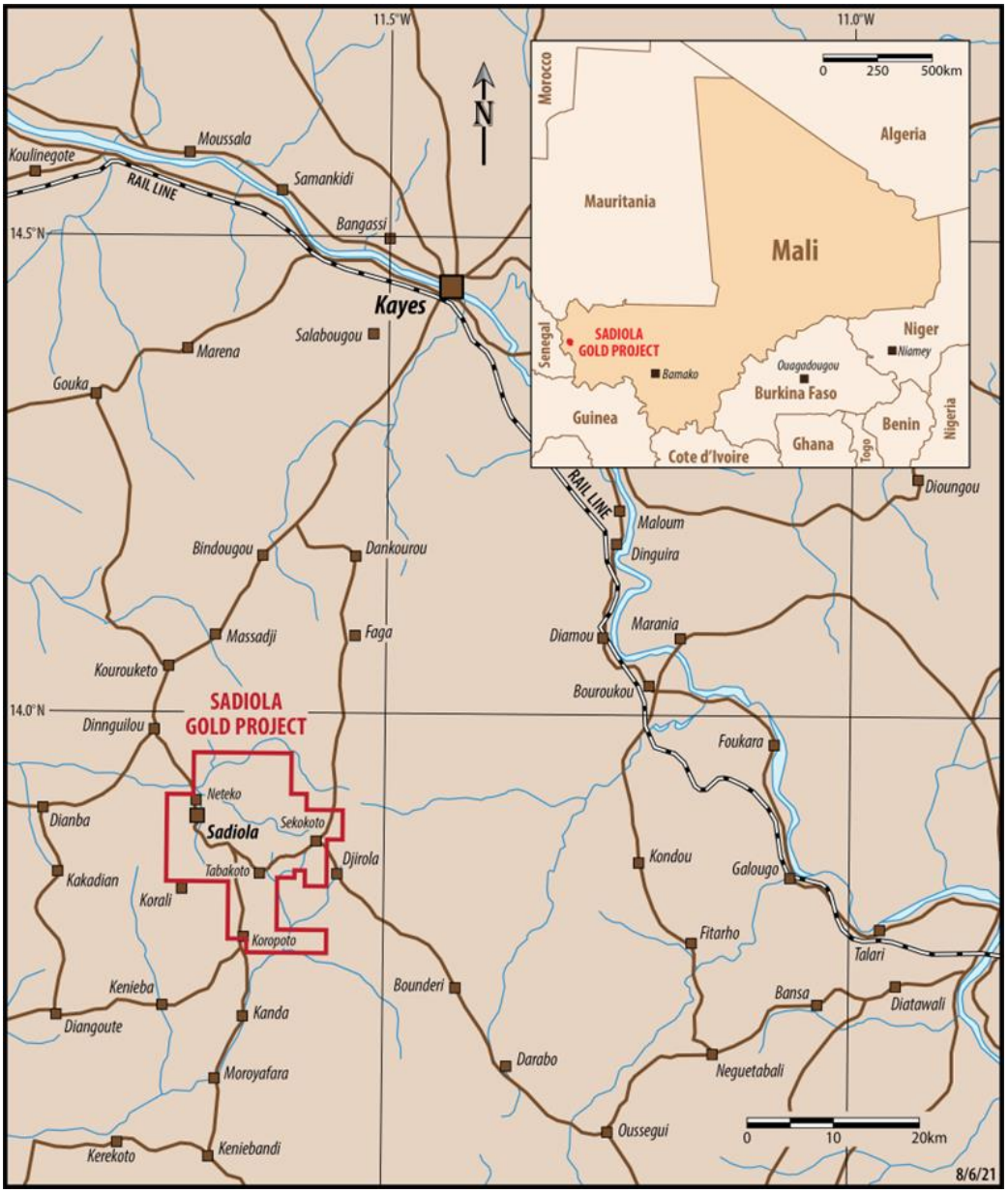
4 PROPERTY DESCRIPTION AND LOCATION

Sadiola, located in the Kayes district of the Republic of Mali, West Africa, is an operating open pit gold mine with a 5 Mt/a processing facility that, since start-up in 1996, has produced over 8.4 Moz of gold from oxide and transition zone ore sourced in three open pits. Allied acquired an 80% interest in the Property on 1 January 2021.

4.1 Area and location

Sadiola (Latitude: 13° 52' 60" N; Longitude: -11° 41' 60" W) is an open pit gold mine which has been operating since 1996. Sadiola lies 77 km south of the regional capital of Kayes and about 440 km northwest of the capital city of Bamako (Figure 4.1). The area of the Property, as shown within the red Exploitation Permit boundary, is 302.6 km^2.

Figure 4.1 Sadiola Exploitation Permit location



Source: Allied, Sadiola FS, September 2022

4.2 Type of mineral tenure

4.2.1 Legal framework

The Mining Code (Law 2019-022) is the governing legislation for Mali's minerals and mining sector. The exploration and exploitation of minerals is subject to the Mining Code by decree (#2020-0177/PT-RM). Through stabilisation provisions in investor-state agreements, certain mining operations in Mali remain governed by the previous Mining Codes (1970 through 2012).

Mining regulations distinguish between three distinct phases – exploration, research, and exploitation. The following provides a summary of the Mining Code 2019 that applies to Sadiola's operating company, SEMOS:

- Authorizations and permits:
  - Exploration Permits (*Permis de Recherche* or "PR"): Grants exclusive rights to explore within the permitted area for a duration of no more than three years, renewable twice for periods that may not exceed two years.
  - The Large Mine Exploitation Permits (*Permis d'Exploitation* or "PE"): Grants exclusive rights to exploit mineral substances within the permitted area, as well as the right to transport or to arrange the transport of the extracted product, the right to trade the product on internal or external markets, and to export it. It also allows the right to establish necessary facilities to process the ore and product. An operating licence is valid for 30 years and is renewable for successive periods of up to 10 years. The State has a 10% free participation and may negotiate an additional participation of up to 10% more.
- Mining Convention: The Mining Code (Article 16) requires holders of an Exploitation Authorisation to enter into an agreement referred to as a *Convention d'Établissement* or a Mining Convention with the State. The purpose of the Mining Convention is to set the conditions that apply to exploration and mining operations, specifically the applicable tax and customs regime, local content requirements, training obligations, and State equity participation. The Mining Convention has an initial duration of 20 years, renewable for successive periods.
- ESIA: Under Article 64 of the Mining Code, mining activities fall within Environmental Assessment Regulations requiring submission of an environmental and social impact assessment (ESIA).
- Rehabilitation: A Closure and Rehabilitation Plan, including the valuation of closure costs, must be submitted and approved by the Mines Administration.
- Local development: Article 160 of the Mining Code requires a community development plan to be prepared in collaboration with local communities and local and regional authorities and be updated every two years (Article 151 of the Mining Code). Article 84 of the Mining Code requires holders of Exploitation Permits to contribute to a fund at the rate of 0.25% of net smelter returns. While SEMOS is not subject to this community development royalty per the conditions of amendment 1 of the SEMOS Mining Convention, it has voluntarily committed to the 0.25% royalty for community development from the commissioning of the new 10 Mt/a process plant, as part of the Sadiola Expansion Project.
- Local content and training: Mining companies must maximize supply of goods and services from Malian providers and conduct training for Malian small and medium-sized enterprises per a National Procurement Plan. The Mining Code and decree imposes quotas regarding the ratio of foreign to Malian employees and requires the creation of two-year skills transfer plan for each expatriate worker.
- Third party rights: Articles 76 and 77 of the Mining Code guarantee a right to fair compensation for the land's occupants and legal owners. Land which is to be impacted by mining disturbance is the subject of a compensation process. Compensation will be paid following the signing of a memorandum of understanding by the mining companies, the occupants, and the legal owners.

Mali's Constitution created a three-tiered administrative system of governance comprising regions, prefectures, and communes (rural and urban). Each region and prefecture are administered by elected councils, comprised of municipal councillors for the regions and district members for the prefectures. Each commune is headed by a council elected through a community election organised by the Malian Government. A Mayor is then nominated from the elected council. Within these elected bodies, the Malian Government appoints State representatives to represent national interests and control the application of Government laws; these are Prefects for the prefectures and Sub-Prefects for the communes.

The Property is situated within the Kayes Prefecture and the Sadiola Rural Commune. Administration changes are being considered by the Government which may result in the mine being included the Diamou Prefecture within the Kayes region.

The Sadiola Rural Commune comprises 46 villages, of which Sadiola village is the administrative centre. Each village is headed by an elected chief and council; the main responsibilities of which are general village affairs and maintaining cohesion and harmony among residents. Growth of the villages is administered by the Sub-Prefect and the Mayor, with newcomers to the area having to obtain permission from the chief for land when wishing to move into the village.

4.2.2 SEMOS Exploitation Permit

The original Sadiola Exploration Permit was issued to German company, AGEM, in 1990. Based on a feasibility study completed in 1993, an Exploitation Permit was issued by Decree 94-257 PM/RM on 1 August 1994 for a period of 30 years.

AGEM subsequently transferred its rights in Sadiola to SEMOS, a Malian registered public company (*Société Anonyme* or SA) constituted in December 1994, pursuant to Decree 94-440 PM/RM. The permitted area was subsequently extended to 302.6 km^2 by Decree 00-080 PM/RM (Table 4.1 and Figure 4.2).

Table 4.1 Sadiola Exploitation Permit details

Permit no.	Type	Holding company	Area (km^2)	Grant date	Expiry date
PE008/94	Permis d'Exploitation (Exploitation Permit)	Société d'Exploitation des Mines d'Or de Sadiola SA	302.6	1 Aug 1994	31 Jul 2024

Source: Allied, Sadiola 2022 FS, September 2022

SEMOS' current Exploitation Permit is valid until 31 July 2024. The full permit renewal application was submitted to the Government on 20 July 2022 in advance of the regulatory deadline.

Under Article 143 of the 2019 Mining Code Implementing Decree, the Ministry of Mines must review the permit renewal application and issue a recommendation to the Prime Minister within three months of the date of submission. This 3 month period can be extended if the Ministry requests clarification, additional documentation or an amendment to the applicant's convention terms, in which case the 3 month period is suspended until the applicant has responded to such request.

Notwithstanding that the regulatory deadline for approval has passed, SEMOS received no requests for clarification, additional documentation or an amendment to the Convention terms within the permitted objection period, and as such is entitled to renewal of the permit.

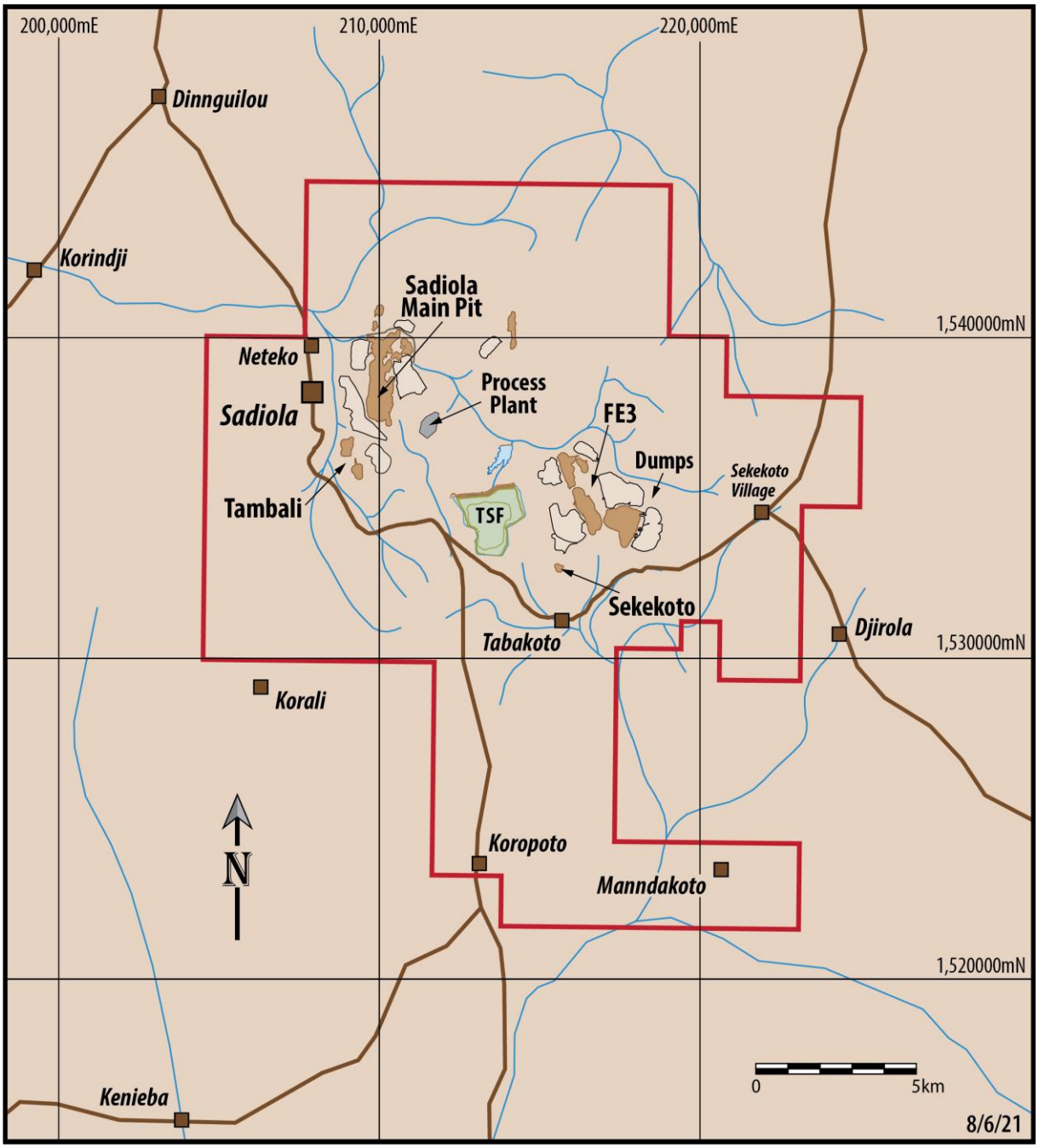
Based on informal feedback from the Government, Allied understands that the Mines Ministry has recommended SEMOS' permit for renewal and the confirmation decree is pending.

Allied is confident that the Exploitation Permit will be renewed in a timely manner to secure tenure at least a further ten years, with renewals of equal duration available until all reserves have been mined out.

The author has prepared this Technical Report upon the understanding that the Exploitation Permit and Mining Convention held by SEMOS are currently in good legal standing. The Qualified Person has not independently verified Allied's legal tenure over its tenements and has relied on an independent review prepared for Allied by Santis Partners. Among other things, this review provides an opinion on Allied's mineral permits, material conditions and agreements.

The author is not qualified to provide a legal opinion on the status of the Exploitation Permit and Mining Convention but has reviewed the licence documents and is satisfied that Allied currently has good and valid title to the Exploitation Permit required to explore, undertake project development and operations on the Property in the manner proposed.

Figure 4.2 Sadiola Exploitation Permit and site layout



Source: Allied, Sadiola 2022 FS, September 2022

4.3 Issuer's interest and surface rights

Allied acquired an 80% shareholding in SEMOS on 1 January 2021. SEMOS is a Malian registered (SA) company, majority owned by Allied through various subsidiaries. The Government of Mali holds a 20% stake in the company (Table 4.2).

Table 4.2 Shareholdings in SEMOS

Shareholder	Shares held	Equity interest	Comments
Allied Gold Mali Corp.	40,000	40%	Allied Gold Mali Corp. is 100% owned by Allied Gold Corp Limited
Allied Gold Mali Ltd	40,000	40%	Allied Gold Mali Ltd is 100% owned by Allied Gold Mali Corp.
State of Mali	20,000	20%	15% free-carry and non-dilutable, 5% acquired for fair market value and participatory
Total	**100,000**	**100%**	

Source: Allied, Sadiola FS, September 2022

The occupation of the surface of the land (surface rights) in the Exploitation Permit area is subject to indemnification to the landowner and the lawful occupier. For this purpose, the holder of a mining right must conclude an agreement with the landowner or the lawful occupier. Such agreement contains, inter alia, the amount of the indemnity payable by the holder to the landowner or the lawful occupier. The Mining Administration oversees monitoring of the process (Mining Code 2019). Figure 16.1 shows that most of the proposed development is within the compensated surface rights; additional surface rights will be required for the solar power plant.

4.4 Royalties, back-in rights, payments, agreements, encumbrances

The Mining Convention, as modified by various amendments, provides that SEMOS's economic framework will remain governed by the provisions of the 1991 Mining Code through to 2037, as summarised in Table 4.3. In addition, it confirms SEMOS' commitment to complying with certain provisions of the 2019 Mining Code relating to local procurement and employment, community development and environmental standards.

Table 4.3 Summary of SEMOS economic framework

	Source	Existing and construction	Expansion first 3 years	Expansion – Y4 and Y5	Expansion – post 5 years
Corporate income tax	Oxide ore	30%	30%	30%	30%
	Sulphide ore	N/A	0	0	30%
Government royalty	All ore	6.00%	6.25%	6.25%	6.25%
Customs duties on operating consumables	All ore	Yes	No	Yes	Yes
Customs duties on diesel	All ore	No	No	No	No
Customs duties on capital items	Oxide ore	Yes	Yes	Yes	Yes
	Primary ore	No	No	Yes	Yes

Source: Allied, Sadiola FS, September 2022

As part of the SEMOS Mining Convention, Allied has voluntarily committed to the 0.25% royalty for community development and environmental escrow for mine closure at $0.67/t ore, after the commissioning of the 10 Mt/a process plant.

Based on agreements with the previous owners (IAMGOLD and Anglo Gold Ashanti):

- $1.0 million is payable to International Finance Corporation (IFC), a previous owner of Sadiola, on the approval of the Sadiola Expansion Project.

- $24.9 million is payable to the previous owners upon production from the new process plant at each milestone of 250 koz and 500 koz. The aggregate payment of $49.8 million payment is considered a corporate charge and has been excluded from the financial model (Financial Model).

4.5 Environmental liabilities

The ESIA for the Sadiola Expansion Project was approved in August 2022. The approval conditions are relatively standard with the project to be implemented in accordance with the Environmental and Social Management Plan (ESMP).

An ESIA process for the grid connection component of the Sadiola Expansion Project was initiated in March 2022. The terms of reference for the ESIA process were approved by the Direction Nationale de l'Assainissement du Contrôle des Pollutions et des Nuisances (DNACPN) in June 2022 with regulatory approvals targeted for Q3 2023.

The Mining Code requires five-yearly submission of the Mine Closure Plan (MCP) to regulatory authorities. An updated MCP for SEMOS was submitted in March 2020. The closure costs as of 31 December 2022, excluding retrenchment, are estimated at $89.6 million.

4.6 Permits

Permits are in place for the existing operation. The ESIA for the Sadiola Expansion Project was approved in August 2022 and is valid for three years. The powerline ESIA has been submitted with approvals targeted for Q3 2023.

Refer to Item 20.4 for further details on the relevant permits.

4.7 Other significant factors and risks

Significant factors and risks that may affect access, title or the right or ability to perform mining and exploration work on the property include:

- Civil unrest in the country and local community may lead to critical supply chain interruptions. The risk is mitigated with six weeks' storage of supplies maintained on site.
- There is a credible risk of a terrorist attack in Bamako, the capital city of Mali and the location of the international airport. An additional charter flight has been implemented to reduce the time spent in Bamako by employees. Increased security presence and precautions have been implemented at Bamako and site.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Topography, elevation and vegetation

Around Sadiola, the terrain is gently undulating with elevations ranging from 120 m to 200 m above sea level. Vegetation cover ranges from forests along streams, sparse woodland savannas on shallow soils and laterites, and wooded savanna. The water drainage network is characterised by low flows that closely match rainfall patterns.

5.2 Accessibility

Sadiola is accessed via sealed road for 506 km from Bamako to Kayes and then 80 km along a single carriageway sealed road. The secondary roads network around the Property area is passable for most of the year but can become inaccessible during the wet season. Sadiola can also be accessed by light aircraft.

5.3 Proximity to population centre and transport

Kayes is serviced by rail and air from Bamako, where Mali's main international airport is located. Sadiola is also equipped with an 1,800 m long, compacted laterite airstrip which is operated for bullion dispatch and employee transport using light aircraft to and from Bamako. The Property can be accessed via the port of Dakar in Senegal by either rail or road to Kayes. Other ocean freight inbound routes exist via Lomé in Togo and Abidjan in Côte d'Ivoire.

Sadiola is within the Sadiola Rural Commune, for which Sadiola is the administrative centre. The commune comprises 46 villages. Eight of these are situated within 4 km of the mine and are considered directly or indirectly affected by ongoing mining activities. The estimated population of these communities is 16,000.

5.4 Climate and length of operating season

The site is located within the Sudanese-type climatic zone, with an intense wet season from May to October and dry season from November to April. Approximately 90% of rainfall occurs between the months of June and September. Site-specific rainfall data from 1994 to 2021 show significant variability in annual rainfall, ranging from 583 mm in 2001 to 1,208 mm in 2012.

Average monthly temperatures are consistently above 25°C; however, there is significant diurnal variation, with peaks of 45°C recorded on site. In the dry season, north-easterly trade winds blow from the Sahara Desert over West Africa, resulting in dry weather conditions and dusty winds referred to as Harmattan winds. In the wet season, the prevailing wind direction is from the south and southwest, referred to as monsoon winds. Sadiola operates year-round with limited disruption to open pit operations during short-term, high rainfall events.

5.5 Infrastructure

Sadiola is an established gold mining and processing operation with associated tailings and waste storage, administration, accommodation, workshop, warehouse and storage facilities with reliable sources of power, water and personnel. Mining operations are focused upon the cutbacks of existing pits. The majority of the proposed development is within the compensated surface rights; additional surface rights will be required for the future solar power plant. The mine has been operating since 1996 and has sufficient support infrastructure to continue to operate at the current production level. The current and proposed infrastructure upgrades for the Sadiola Expansion Project are discussed in Item 18.

6 HISTORY

Records of mining at Sadiola date back 300 years, and the extent of the historical workings suggests that mining may have started up to 1,000 years ago.

Between 1987 and 1989, a regional geochemical survey known as Mali Ouest 1 was carried out for the Government of Mali by German company, Klöckner INA (Klöckner) as part of an aid program financed by the European Development Fund. In addition to the 48,000 samples collected during this first-pass program, detailed geochemical sampling near the villages of Sadiola and Dinnguilou confirmed high gold, arsenic and antimony anomalies.

In January 1990, exploration rights to the Sadiola area were granted by the Government of Mali to German company, AGEM, and Klöckner was hired to conduct a gold exploration program, which identified the presence of a significant oxide gold deposit.

During 1991, Watts Griffis and McOuat Limited (WGM) was retained by IAMGOLD to review the work of Klöckner, prepare a preliminary economic assessment (PEA) of Sadiola and make recommendations for further work. The PEA delivered positive indications and WGM recommended a large exploration drilling program to delineate and confirm the Sadiola gold resource. During 1991 and 1992, WGM assumed responsibility for the ongoing exploration effort.

In October 1992, a joint venture agreement with Anglo American Corporation was signed for the construction and management of any mine development at Sadiola. A feasibility study on the Sadiola gold deposit was presented to the Government of Mali in December 1993.

In August 1994, the Government of Mali issued an Exploitation Permit. SEMOS was incorporated on 14 December 1994 as a joint venture company to hold the Sadiola permit, exploit the Sadiola gold deposits, and carry out exploration activities within the Sadiola area.

Sadiola poured its first gold on 20 December 1996. Mining of oxide ore commenced at the Main pit, followed by the FE3 pit in April 2001 and Tambali in July 2013 (Figure 4.2). Since start-up, the mine has produced more than 8.4 Moz of gold. Mining was suspended in April 2018 and the process plant continued to treat low-grade stockpiles until Q2 2021 when Allied restarted mining. Historic gold production is shown in Figure 6.1.

SEMOS completed what was termed a sulphide feasibility study in 2010 and the project was initiated in 2012 with the ordering of long-lead items in advance of full project approval. The sulphides project was subsequently put on hold due to political risk and a sharply falling gold price. As of 2016, $155 million had been expended, mostly on engineering and the purchase of the mining fleet and major processing equipment. The mining fleet has been sold; however, the processing equipment is held in storage by SEMOS at multiple locations across the globe.

Allied took control of the operation on 1 January 2021 after purchasing AngloGold's and IAMGOLD's 80% interest in SEMOS.

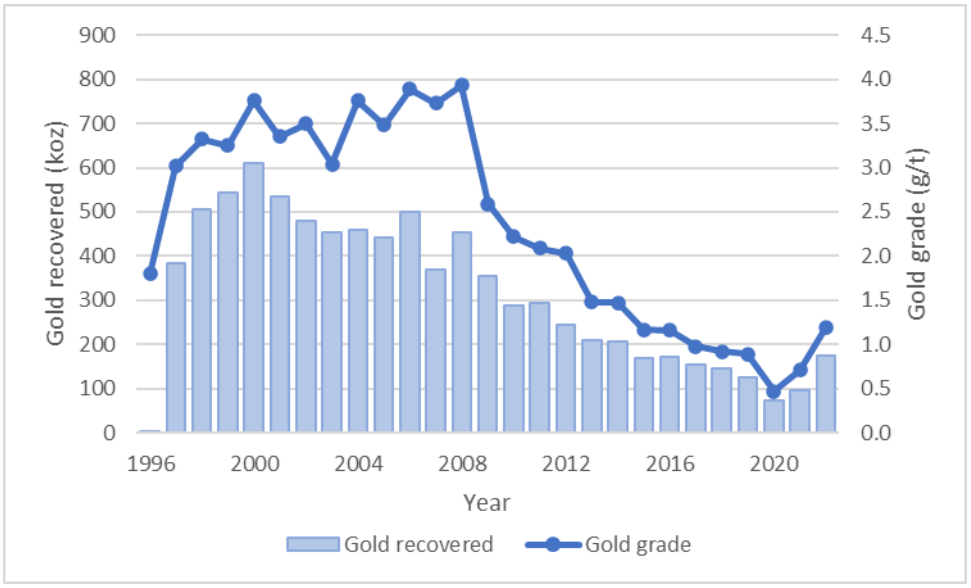
A pre-feasibility study (PFS) was completed by Allied in November 2021 based on upgrading the existing process plant and infrastructure to treat 8 Mt/a of primary ore through cutbacks of the existing pits.

In September 2022, Allied completed the Sadiola Expansion Project Feasibility Study (2022 FS), which documents Allied's mine plan including:

- Using the existing process plant to treat 5.0 Mt/a of oxide and transitional material with the replacement of the oxygen plant in 2023
- Installing a new process plant and upgrading some infrastructure to treat up to 10 Mt/a of the harder primary and oxide ore.

In December 2022, Allied published its Sadiola LOMP which is based on commissioning the Sadiola Expansion Project in Q1 2026 and the 2022 FS Mineral Reserves depleted to 31 December 2022. The FS capital costs were re-profiled with construction scheduled to commence in Q4 2023. The LOMP forecast mining a Proven and Probable Mineral Reserve of 149.5 Mt at 1.51 g/t (7.25 Moz) to produce 5.48 Moz over a 19-year mine life using conventional open pit mining methods.

Figure 6.1 Sadiola process plant production (1996 – 2022)



Source: Allied, Sadiola FS, September 2022

The recent production performance at Sadiola from 2017 to 2022 is summarised in Table 6.1.

Table 6.1 Sadiola recent production performance

Parameter	Units	2021	2022
Waste tonnes mined	Mt	19.2	30.6
Ore tonnes mined	Mt	3.6	8.2
Tonnes milled	Mt	4.6	4.9
Feed grade	g/t Au	0.71	1.19
Recovery	%	91.9	92.2
Gold production	koz	96	175
Mining costs	$/t rock	3.03	2.75
Processing costs	$/t ore	13.5	16.34
G&A costs	$/t ore	6.86	6.96

Source: Allied, Sadiola FS, September 2022

There have been numerous Mineral Resource estimates reported by the previous owners prior to 2021. These historic estimates are not considered to be material as they have been either superseded by the December 2022 Mineral Resources, or have been depleted by mining.

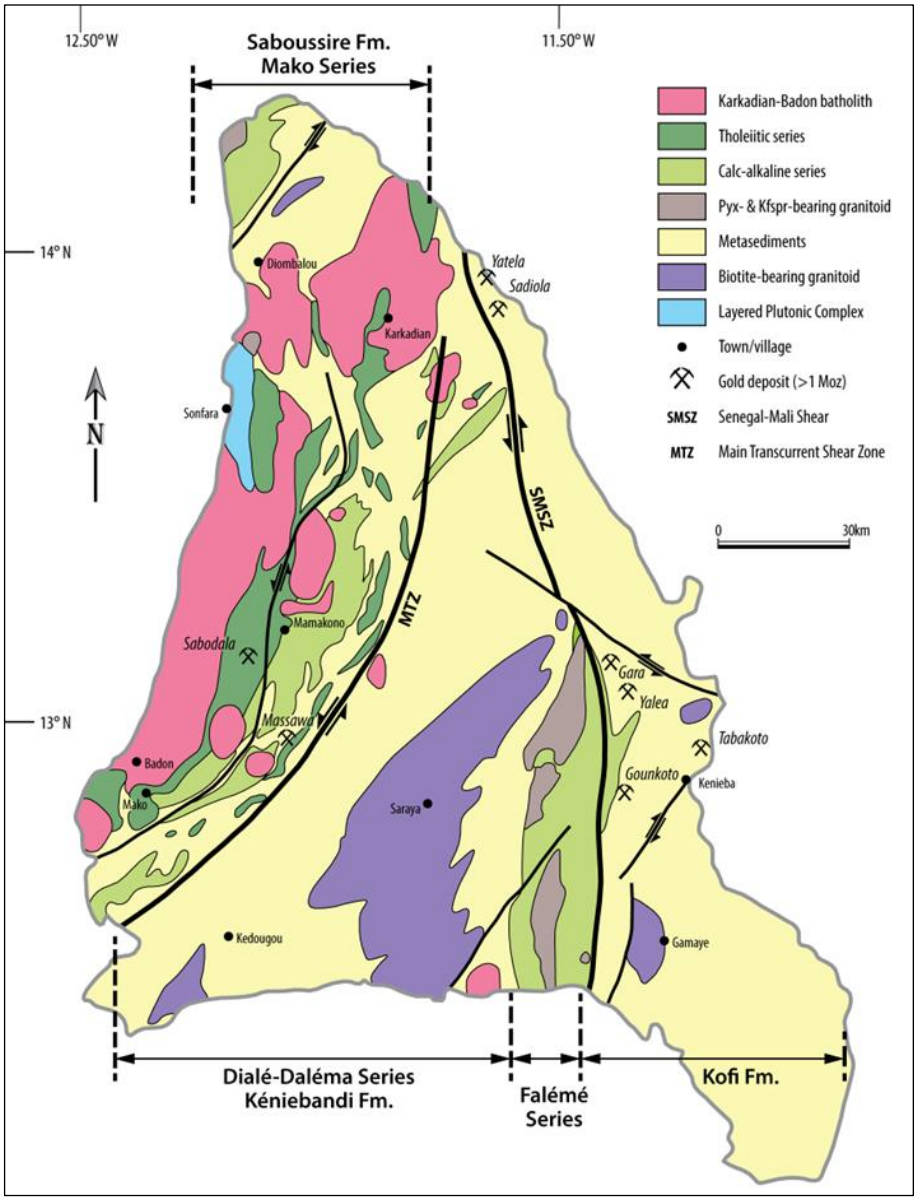
7 GEOLOGICAL SETTING AND MINERALISATION

7.1 Regional geology

The Sadiola deposits are located within the Malian portion of the Kédougou-Kéniéba Inlier, a major Paleoproterozoic-Birimian inlier along the northeast margin of the Kénéma-Man Shield (Figure 7.1). The Kédougou-Kéniéba Inlier is bounded on the western margin by the Hercynian-aged Mauritanides (Carboniferous, 300 Ma) and unconformably overlain by Neoproterozoic sandstones of the Taoudeni intra-cratonic basin on all other sides.

The geology of the Kédougou-Kéniéba Inlier differs from all other Birimian granite-greenstone terranes because of the abundance of carbonate rocks in the sequence. The inlier is divided into four geological domains separated by two regional-scale lineaments; the Main Transcurrent Zone (MTZ) and the Senegal-Mali Shear Zone (SMSZ) as shown in Figure 7.1.

Figure 7.1 Location of the Sadiola mine in the Kédougou-Kéniéba Inlier



Source: Allied, Sadiola FS, September 2022

At least four episodes of deformation, termed D1 to D4 from earliest to latest, affected the rocks in the region. Little is known about the D1 event because of pervasive overprinting by subsequent deformation in the structurally permissive rocks. The SMSZ and MTZ are interpreted to have formed as transpressional faults during D2, coeval with the development of a penetrative north-northeast trending cleavage.

Multi-stage mineralisation comprised an early arsenic-rich sulphide stage followed by a gold-antimony stage. The ore is associated with gold-arsenic-antimony + copper-tungsten-molybdenum-silver-bismuth-zinc-lead-tellurium. The similar relative timing and structural setting of the deposits with respect to other world-class orogenic gold systems of the Kédougou-Kéniéba Inlier suggest that gold mineralisation in the region formed during a period of transcurrent tectonics coeval with calc-alkaline magmatism (ca. 2090–2060 Ma) after the cessation of the fold and thrust tectonics (Masurel et al., 2015).

The bulk of the gold mineralisation is associated with the D3 event characterised by sinistral displacement coupled to hydrothermal fluid circulation along regional-scale shear zones and local north-northeast trending fault arrays connected to structural/lithological traps in the Kofi Basin sediments.

The D4 event is a late dextral reactivation of the north and north-northeast trending structures between 2060 Ma and 2050 Ma. Carbonates and the detrital sedimentary rocks of the Kofi Series in the Sadiola area have been subjected to regional greenschist facies metamorphism. Thin, amphibolite facies mineral assemblages are observed locally in the contact aureoles surrounding late Eburnean (2080 Ma) syn-kinematic granitoids.

7.2 Local geology

The Sadiola deposits are hosted in the Kofi Formation on the northern portion of the Kédougou-Kéniéba Inlier, on the eastern side of the SMSZ. The Kofi Formation comprises impure limestones, sandstones, black shales, pelites and greywackes as well as minor felsic to intermediate hypabyssal intrusions intruded as numerous felsic to intermediate dykes and stocks. Southwest of the main Sadiola deposit, the Kofi Formation is capped by intermediate to mafic diorites. Seven kilometres east of the Main pit, the carbonate sequence is overlain by sandstones of the Neoproterozoic Taoudeni basin that form a prominent escarpment along the strike of the inlier.

7.3 Mineralisation

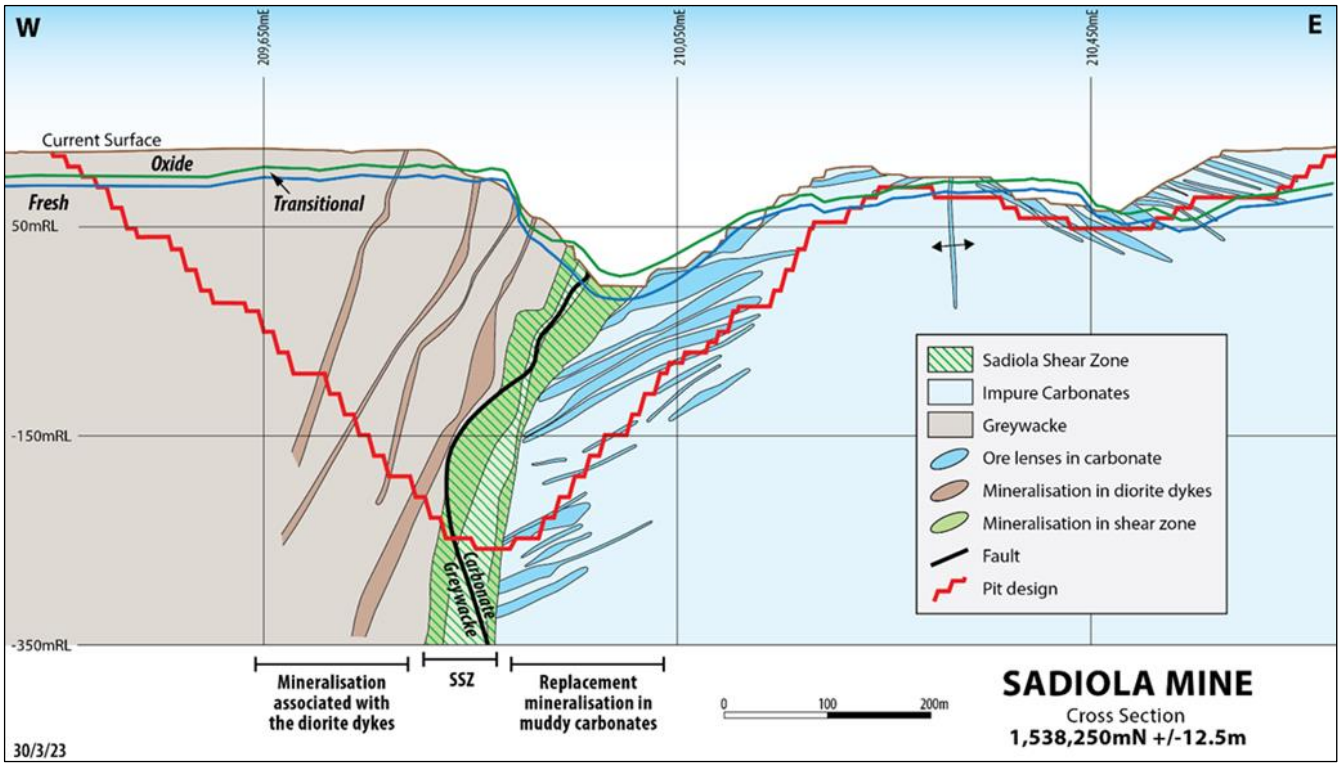
Currently known gold mineralisation within the Sadiola Exploitation Permit is hosted within two major trends, the Sadiola trend in the west of the permit area and the Farabakouta East (known locally as “FE”) trend in the east.

On the Sadiola trend, gold mineralisation is associated with the north-striking Sadiola Fracture Zone (SFZ) that exploits the faulted contact between the greywacke to the west and the carbonate on the east along a 4 km strike, with mineralisation mostly hosted by the carbonate. This zone is also associated with third order north-northeast to northeast trending mineralised fault splays. The SFZ dips steeply towards the west, with localised flexures to the east, whereas the north-northeast to northeast trending splays dip moderately towards the southeast. The intersection of the splays on the plane of the north-trending shear results in a shallow south-plunge to the elevated mineralisation at the junctions.

The greywacke-carbonate contact was also exploited by intrusive lenses of diorite, which formed a significant “cap” to the mineralisation. Subsequent movement along the SFZ has sheared and deformed the diorite, which also become mineralised. Towards the northern end of the Sadiola Main pit, gold mineralisation occurs as discrete lenses and/or shoots within the carbonates along north-northeast trending structures.

Figure 7.2 shows a typical cross section within the Sadiola Main pit.

Figure 7.2 Sadiola Main pit mineralisation typical cross section



Source: Allied, Sadiola FS, September 2022

Within the north-northeast striking FE trend, gold mineralisation occurs along the contact between carbonates of the western flank footwall and the overlying graphitic metapelites. The contact is brecciated and folded, which may indicate a possible unconformable relationship between the strata. Gold mineralisation is hosted within the weathered carbonates, in a horizon that stretches over at least a 10 km strike. At the southeast end of the horizon, the mineralisation dips approximately 45° northwest because of fault complications, but along the western and northern portions, the unit dips shallowly eastward.

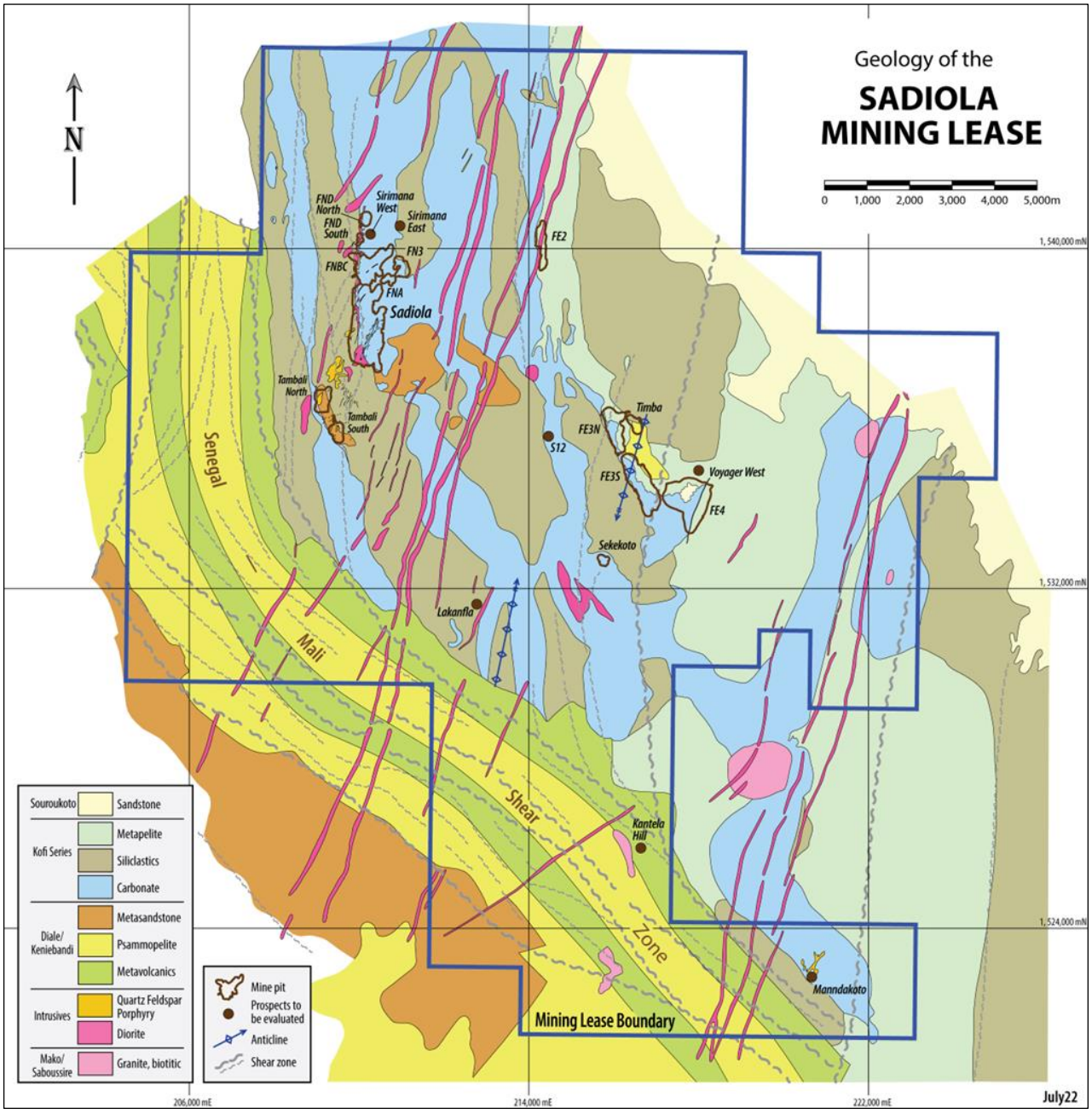
Sadiola comprises the following mining areas and prospects (Figure 7.3):

- The Sadiola trend, including Sadiola Main pit, FNA, FN3, FNBC and Sirimana East and West. The SFZ hosts the main Sadiola deposit and the Far North (FN) pits to the north over a 2,500 m drilled strike length that remains open to the north, south and at depth. At surface, the mineralisation was up to 200m wide within the oxide zone and was mined down to 200 – 220 m below surface. Mineralisation width at this depth is reduced to <100 m but continues at least to 600 m and remains open at depth. To the south of the current pit, the down-plunge extension has not been drill tested.
- Tambali, 2 km south-southwest of the Sadiola pit, occurs in greywacke that lies adjacent to a faulted, barren carbonate footwall. Tambali is 1.5 km long (with a 500 m long lens recently discovered on the southern end which is still being drill tested), from 100 m to 350 m wide and extends to 300 m depth. The mineralised lenses in the greywacke are sub-vertical in the centre of the Tambali trend, and shallowly west-dipping along the eastern flank. It is currently unknown how Tambali connects to the Sadiola mineralisation. The Tambali pits were mined from 2013 to 2014 and again from 2021 to 2022. The host rocks comprise moderately sorted wacke-arenite with minor siltstone interbeds and quartz feldspar porphyries. Mineralisation is also found in a deformation-related quartz vein set and is anomalously high in arsenic and antimony.
- The FE3 trend in the east of the Property, where mineralisation is structurally controlled by east-dipping structures (thrust planes?). These planes are crosscut by north-northeast trending sub-vertical shears, oblique to the strike, which upgrade the mineralisation locally. FE3 mineralisation is 1,200 m long and 200 m wide in the pit floor, but it is irregularly developed at the current level of exposure (100 m below

surface). The mineralisation lies at the contact of pelite / greywacke overlying carbonate with a degree of karst collapse at the immediate contact.

- Sekekoto approximately 5 km south-southeast of the Sadiola Main pit along a northwest-trending contact between carbonate and greywacke / arkose units where gold mineralisation occurs in laterite and supergene horizons and in the underlying saprolite over a 320 m strike. Mineralisation dips steeply to the northeast in saprolite to 120 m below surface, where it contacts a post-mineralisation diorite that is barren. The mineralisation is interpreted to be 150 m wide on the current pit floor. The structurally controlled mineralisation is hosted by de-carbonated silty carbonates and greywackes and is spatially associated with complex weathering and alteration patterns.

Figure 7.3 Geology of the Sadiola Exploitation Permit



Source: Allied, Sadiola FS, September 2022

Gold mineralisation is mesothermal or shear-hosted and is mostly associated with lens-shaped breccia zones with both arsenic and antimony-dominated sulphide assemblages of arsenopyrite, pyrrhotite, pyrite, stibnite and gudmundite (sulphide content of between 0.5-3%).

Hydrothermal alteration assemblages include calc-silicate, potassic, chlorite-calcite, carbonate and silicification.

Supergene processes acting on the mineralisation resulted in enrichment of gold in the oxidized lateritic and saprolitic material. The saprolite zone extends to 200 m depth, especially along the permeable structures and sheared fabric of the SFZ, which facilitated groundwater ingress and the oxidation of the primary sulphides.

The saprolitic oxide portion of the deposits are underlain by relatively soft material representing the transition zone and un-weathered hard, primary mineralisation that contains traces of sulphides. The transition zone occurs as a continuous unit of variable but modest thickness.

Allied has estimated Mineral Resources at Sadiola Main, Tambali, FE3 and Sekekoto. The Mineral Resources were estimated in June 2021 for all deposits and updated in February 2022 for the Sadiola Main deposit. This update included additional drilling and re-interpretation conducted in the southern the northern parts of the deposit.

8 DEPOSIT TYPES

The Property covers a sedimentary package belonging to the Kofi Formation, which comprises argillaceous-banded carbonates and an overlying suite of arkose or greywacke where the variable content of feldspar grains is the most abundant detrital mineral rather than quartz or lithic fragments. Irrespective, both lithologies may be mineralised.

There has been debate within published literature as to the ultimate source of the gold in western Mali and its mode of emplacement. Gold deposits on the eastern flank of the SMSZ show features typical of orogenic gold deposits, such as the geological setting, late orogenic timing post-peak metamorphism, the structural preparedness of the sites and deposit geometry. Yet the alteration assemblages (calc-silicate, sericite-chlorite-biotite, silica-carbonate and late tourmalinization) and ore fluids (initially reduced becoming more acidic and carbonic-rich as they cooled) are variable along the belt. Elsewhere in the Kofi Formation, stable isotopes have shown that the variability derives from multi-fluid sources with magmatic, evaporitic and regional metamorphic fluids all likely making a contribution.

The presence of impure carbonate rocks at Sadiola was critical to gold mineralisation because the interaction of hydrothermal fluid, from whatever source, with the silty argillaceous bands, led to sulphidation and played a key role in gold precipitation by decreasing its solubility in the fluid. The multi-stage ore development is interpreted to reflect the cooling regime of an initially elevated temperature (~400°C) reduced hydrothermal fluid rather than separate mineralisation styles developed at distinct crustal levels and/or times (Masurel et al., 2017). The best line of evidence for a single although protracted mineralisation event is that the complex ore paragenesis and speciation of gold – refractory gold, particulate native gold and subsequent gold-antimony compounds – are spatially and temporally correlated with a single potassic hydrothermal alteration assemblage (Masurel, op. cit.).

The late orogenic switch from fold and thrust tectonics to transcurrent tectonics along the SMSZ would have promoted high fluid flow and the delivery of those hydrothermal fluids to high crustal levels, which equally would be consistent with the intrusion of the voluminous calc-alkaline granitoids at ca. 2080–2060 Ma as are present in the district.

Tambali mineralisation occurs wholly within greywackes, yet it shares features typical of Sadiola. The higher-grade mineralisation is associated with shearing along the north-northeast to northeast-trending faults in both Tambali pits. Sulphide mineral development and quartz-carbonate veining appear to be deformed and stretched along the main planar shear fabric. Geometric and kinematic analysis of the deformation indicates that the structures, which controlled the main mineralisation at Tambali, are compatible with sinistral shearing under local northwest-southeast compression, just as is the case in the Sadiola deposit.

Mineralisation on the Farabakouta line (FE) of open pits in the east of the Property comprises a hybrid deposit style of Sadiola and Tambali. The FE pits comprise greywackes thrust over carbonates, with a dark argillaceous unit, sometimes carbonaceous, developed on the contact. Mineralisation lies within the carbonate units, which may be karstic.

9 EXPLORATION

Being a predominantly sedimentary sequence that has a well-developed laterite regolith of several metres in thickness developed across the Property, detailed field mapping and structural data collection have not been possible. Reliance has been placed on remote and ground geophysical data acquisition as well as Property-extensive geochemical sample collection programs.

Geochemical tools used effectively in the past have comprised soil sampling, termite mound sampling and locally shallow auger traverses. The most successful tools used by SEMOS have proven to be soil and termite mound sampling, although various quadrants of the Property area were undertaken on a piecemeal annualised basis without levelling data from one year to the next, resulting in line bursts; nonetheless, both are still valuable datasets for the targeting potentially blind deposits beneath the lateritic cover.

Airborne magnetics and radiometrics, electromagnetic induction and ground gravity were acquired over the entire Property area. Gradient and pole-dipole induced polarization (IP) (both as discrete small area grids) were conducted over known mineralised trends, presumably to characterise the mineralisation already identified, but this has yet to be extended to new target areas. None of these datasets was provided to Allied as raw data, only as image files suitable for import to GIS packages.

The best legacy data obtained was the IP chargeability and gravity images. The sulphide concentration in the sequence (e.g. Tambali) mapped out as a chargeable high in bedrock, with which gold mineralisation is typically associated, and has proven to be the case from Allied's exploration drilling. From the gravity, it can be observed that gold associated with sulphide bodies generally lie within deep gravity lows. The airborne magnetic and radiometric data provided insights on the general geology, but nothing uniquely identifiable on the ground.

SEMOS engaged with the Centre for Economic Targeting at the University of Western Australia and Curtin University in Perth, Western Australia, where the company had extensive research undertaken by PhD students and lecturers of those institutions to unravel the geological history of the region and paragenesis of the mineralisation and alteration.

Allied's exploration has focused on near-mine drilling to target extensions of Mineral Resources and Mineral Reserves.

10 DRILLING

A considerable amount of drilling has been undertaken by previous operators on the Property since the 1990s and, consequently, Allied's digital database contains information for multiple drillhole types across multiple projects.

Allied has largely used the AngloGold drilling, sampling and assay data for estimating Mineral Resources and has unified the geological models and previously reported Mineral Resource estimates for Sadiola Main and Sirimana as part of a larger re-estimation of the Sadiola Main pit gold resources. Allied undertook corroborative drilling along the Sadiola Main deposit for metallurgical and geotechnical programs as well as grade control drilling for the southeast section of the Sadiola Main pit. The updated Mineral Resource estimate was incorporated in the 2022 Mineral Reserve estimate.

10.1 Type and extent

Both diamond core (DD) and reverse circulation (RC) drilling have been undertaken by various drilling companies on Sadiola. This includes grade control drilling for all deposits except for Sekekoto. The summary of the drilling database by deposit and type is shown in Table 10.1 and Table 10.2 respectively, with 80% of the total metreage drilled at the Sadiola Main pit area.

Table 10.1 Summary of Sadiola Property drilling by deposit

Dataset	Set name	Drillholes	Metres	Drillholes %	Metres %
DOGO	Dogofile	29	2,551	0.14%	0.28%
FBA	Farabakouta Alluvials	334	9,079	1.61%	1.00%
FE2	FE2	1	119	0.00%	0.01%
FE3	FE3	3	154	0.01%	0.02%
FE6	FE6	2	114	0.01%	0.01%
FN2	FN2	346	34,444	1.67%	3.81%
FN3	FN3	821	67,930	3.97%	7.51%
FN3_AGC	Farabakouta North3 – A Grade Control	12,581	225,695	60.78%	24.95%
FNE	FNE	201	15,363	0.97%	1.70%
MEDI	Medine	64	4,964	0.31%	0.55%
MLSFN	Allied Sadiola Farabakouta North Block	22	1,880	0.11%	0.21%
MLSSM	Allied Sadiola Main Block	96	14,842	0.46%	1.64%
MLSTA	Allied Sadiola Tambali Block	1	102	0.00%	0.01%
NET	Netekoto	528	9,795	2.55%	1.08%
Paleo	Allied Paleochannel drilling check	45	1,176	0.22%	0.13%
S13	Farabakouta North	43	4,410	0.21%	0.49%
SAD_PIT	Sadiola Pit	4,652	447,344	22.47%	49.44%
SADN_FN	Sadiola North_FN	507	31,001	2.45%	3.43%
SADNW	Sadiola North West	15	1,608	0.07%	0.18%
SIRI	Sirimana	48	1,945	0.23%	0.21%
TS1	Tambali	360	30,247	1.74%	3.34%
Total		**20,699**	**904,762**	**100.00%**	**100.00%**

Source: Sadiola Main Deposit, Model Development and Mineral Resource Estimate. February 2022

Table 10.2 Summary of Sadiola Property drilling by type

Drill type	Number	Metres
RC	18,828	669,658
DD	1,198	212,559
Total	**20,026**	**882,217**

Source: Sadiola ML_20220225 database

Rotary air blast (RAB) holes were drilled over various exploration targets before 2009. As exposure was restricted because of laterite cover, these holes were typically shallow (less than 50 m) to test the oxide mineralisation below the laterite interface. RAB drill results have been excluded from resource estimation.

DD drilling was by the conventional wireline method with HQ (63.5 mm) and NQ (47.6 mm) dual and triple-tube core barrels to optimise core recovery in soft, friable saprolites. Core recovery was recorded by the responsible geologists and within the hard rock, it was estimated that about 95% of DD holes had drill recoveries greater than 99%. Most of the DD drilling was done in and around the Sadiola, Tambali, FE and Sekekoto pits.

RC drilling, using 115 mm dual-tube drill rods, has been undertaken since the 1990s by the previous operators over the entire Sadiola permit area. All grade control samples are collected by RC drilling. No DD drilling was undertaken from 2013 to 2021 which was all RC. Allied restarted drilling in 2021 and has used both DD and RC. Occasionally, core recovery proved difficult in the karstic environment of soft saprolite over hard carbonates, and in this situation, RC provided a more representative sample. RC recovery is routinely at 90%, and for this reason is used as a pre-collar to enable diamond core completion.

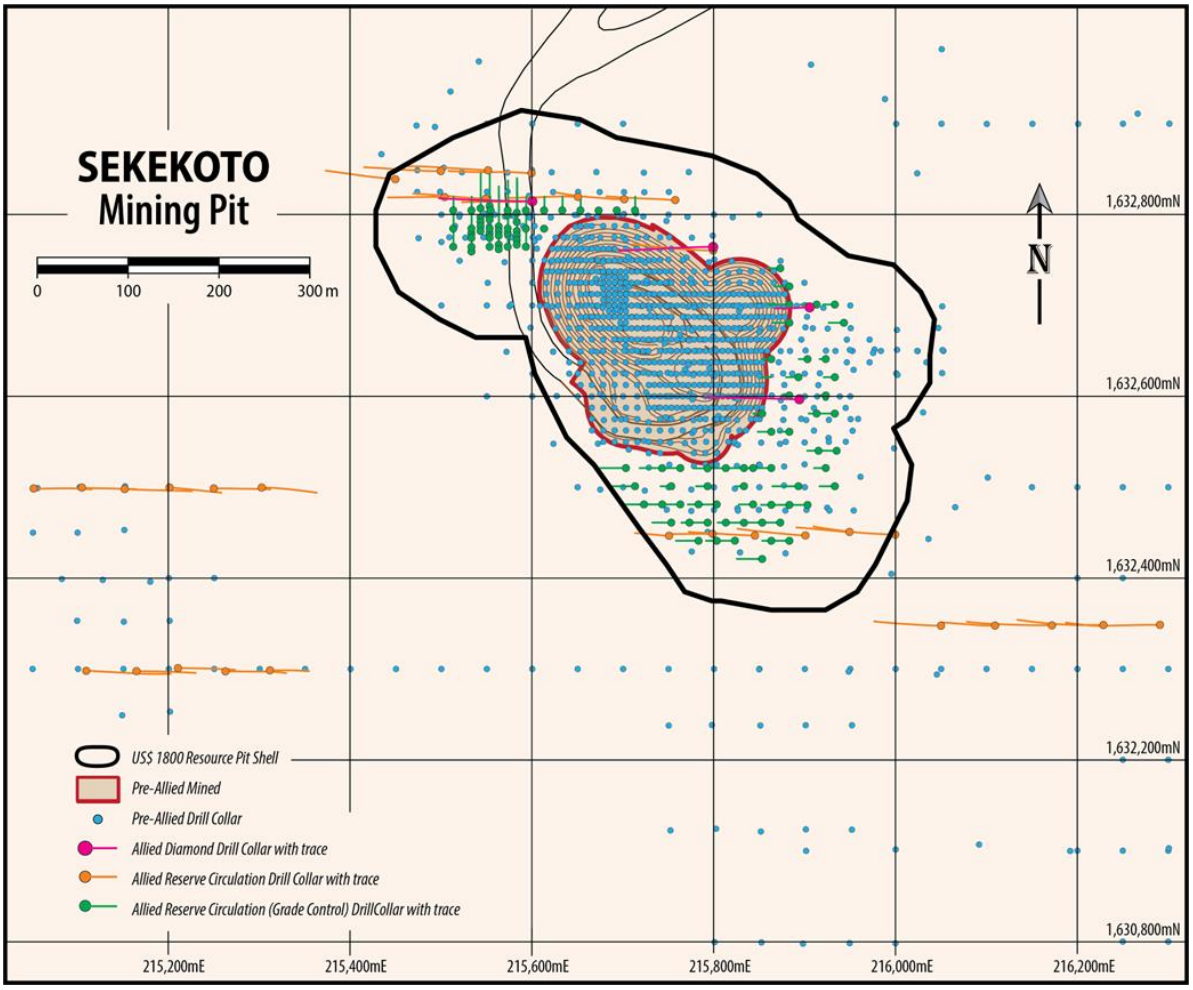
Holes that do not have a drillhole type (“NR”, Channel “CH”, Trench “TR” and Water Bore “WB”) were not used in the block model interpolation or resource estimation process; however, these were used to guide mineralised lode interpretation and wireframe generation work.

The RC grade control drilling at Sadiola Main was completed on a 5 m x 5 m (YX) drill spacing to a vertical depth of 10 m in the mined-out areas prior to Allied taking ownership of the Property. The exploration RC drilling was on a 25 m x 25 m (YX) drill spacing in the main mineralised areas and were drilled from surface at various declinations. The spacing of the RC drillholes increases with depth directly under the mined areas from approximately 25 m x 25 m (YX) to up to 150 m x 150 m (YX) to a depth of 800 m below the surface. This is largely due to the primary mineralisation not being a target for the former owners.

The deeper DD holes were drilled to a vertical depth of 800 m from surface to target the primary mineralisation on a grid spacing of approximately 100 m x 50 m (YX) in the southern part of the main deposit. The holes were usually drilled on a northing section as an east-west fan from the surface. Some of the deeper diamond drillholes were collared from within the pit.

Drilling activities by Allied since January 2021 has been focused on the Sekekoto pit (Figure 10.1) and the Sadiola Main pit (Figure 10.2) to increase geological confidence, obtain primary core for metallurgical testwork and geotechnical analysis and testing the deposit limits at depth.

Figure 10.1 Sekekoto drilling activities

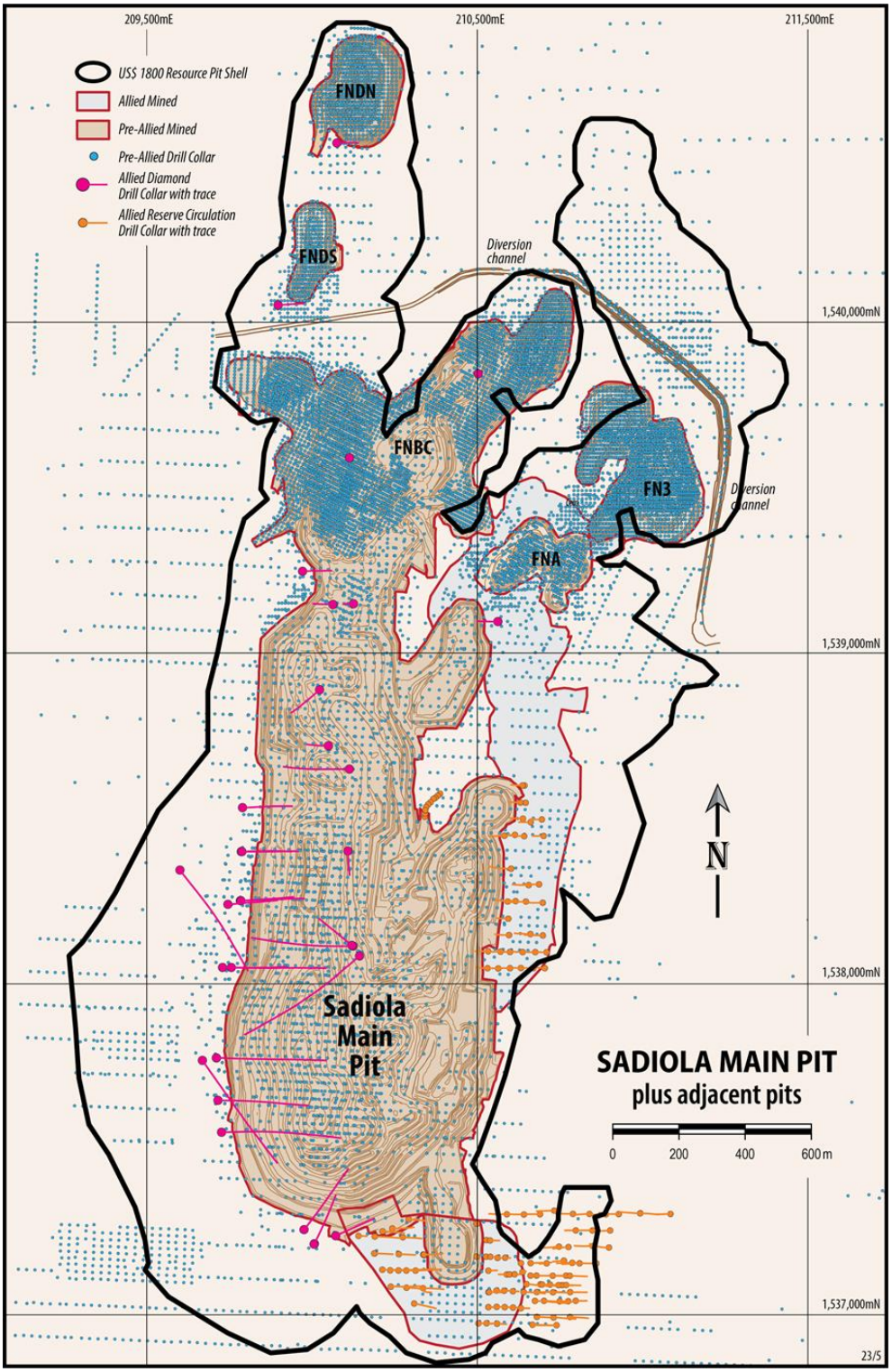


Note: Outer black outline around the existing pit is the $1,800/oz pit shell

Source: Allied

Drilling at Tambali is ongoing at the time of reporting with a targeted extension of oxide resources, referred to as Tambali South. Exploration and advance grade control drilling at Sekekoto and FE3 and resource modelling is ongoing at the time of reporting, ahead of planned mining in 2023.

Figure 10.2 Sadiola Main drilling activities



Note: Outer black outline around the existing pit is the $1,800/oz pit shell

Source: Allied

A total of 220 (33 DD and 187 RC) drillholes for 19,468 m (Table 10.3) have been drilled by Allied since the January 2021 resource update at Sadiola Main. Most of the RC drillholes were drilled in the southern Stage 6 area of Sadiola Main pit to infill and validate the westerly dipping lodes and to follow-up the newly identified additional mineralisation to the east of the Stage 6 area (Figure 10.2).

Table 10.3 Summary of Allied drilling since January 2021

Drill type	No. of drillholes	Metres	Comments	Drillholes
DD	7	2,285	Geotechnical	SADD001-6; 1A
DD	26	7,316	Metallurgical	SADD007-30; 33; 8A
RC	10	114	FN Area	SARC001-10
RC	74	6,875	Stage 6 Area	SARC034-86; 71A; 135-158
RC	103	2,878	Grade control	ST6G0002-0057; 137–167; 174; 176; 178–180; 187; 189; 191–192; 195; 197–198; 202; 207; 209; 219; 233; 235; 237; 278–281; 286–288; 295
Total	**220**	**19,468**		

Source: Sadiola Main Deposit, Model Development and Mineral Resource Estimate. February 2022

The DD drillholes were used for geotechnical and metallurgical purposes. The geotechnical drillholes were not sampled and so are not included in the estimation. Both the metallurgical and geotechnical drillholes have been spaced along the Sadiola Main deposit at an approximate 100 m separation by northing. Most of the RC grade control drilling was drilled down to a vertical depth of 22 m on a 20 m x 10 m (YX) drill spacing in two areas:

- In the most south-eastern (Stage 6) part of the existing Sadiola Main pit.
- To the east of Stage 6 over the newly interpreted mineralisation.

The major change to the interpretation of the mineralisation between the two models occurred in the southern (Stage 6) part of the Sadiola Main deposit, brought about by recognition of the supergene layers between surface and 100 mRL. Previously, the westerly-dipping lodes had been interpreted to extend to the surface in the January 2021 interpretation. In the revised interpretation, there are up to three supergene layers at the surface and the westerly lodes were cut back so they did not reach the surface. The new drilling in the Stage 6 area has confirmed the westerly dip of the mineralisation.

The metallurgical and geotechnical drillholes also confirmed the earlier interpretation of the mineralisation and its orientation.

10.2 Procedures

10.2.1 Surveying

Sadiola historically used three grid systems – a local grid, WGS84_Zone29N and pt58. Transformations are available that allow changes from one system to another.

All collar locations are surveyed by the SEMOS mine survey team to within 0.20 m by differential global positioning system and the collar locations utilized for subsequent natural surface determinations by the Sadiola mine survey team. The Qualified Person understands the mine grid has been independently verified as being accurate and all phases of drilling have been surveyed.

Holes are also surveyed downhole with Sperry-Sun downhole camera survey equipment, superseded by a Reflex ACT II system which provides azimuth, dip and magnetic readings for each sample point. Survey data is collected on average every 30 m downhole.

A topographic surface prior to mining is available and has been used to check collar elevations of drillholes across open cut pit areas.

Light detection and ranging (LiDAR) and drone surveys provide the current topography of the site, including waste dumps, so that open pits can be removed from resource models generated from the raw, pre-mining data. Similarly, drainage, existing waste dumps, roadways and local villages can be avoided with regards to future expansion and new exploration.

Topographic surfaces were also created for the interfaces between the various weathering zones.

10.2.2 Drilling

RC drilling provides a larger and more homogenous sample than core drilling; however, the resolution of the geology is lower. The RC chip samples were collected by Allied from the drill rig cyclone every metre, for the entire length of each hole. The chip samples were split into representative portions using a 75:25 Jones riffle splitter and placed into consecutively numbered sample bags for dispatch to the assay laboratory. Standards, blanks and duplicates were inserted into the sample number sequence at 1:20 (four quality control quality assurance (QAQC) samples and 16 regular samples within 20 samples) in the required intervals. Sieved reference rock chip samples were collected in chip trays for logging; these were photographed, and the trays retained in the core shed facility.

Diamond core holes are drilled with a PQ collar, and once in competent rock, continued in HQ to end of hole. The holes are inclined predominantly between -50° and -70°. The depths of the DD holes range from 24 m to 620 m. Occasionally short re-drills are needed to remedy core loss near surface.

Core recovered was placed in core trays, with the depth interval marked on core blocks at the end of each run as measured by the driller, and an orientation line drawn from the oriented core survey marks (“Reflex ACT III RD” method).

The core logging is conducted at the exploration geology facility. After logging, the core was photographed whole on a tray-by-tray basis, wet and dry, with the metre marks, orientation line and cut line visible. Once photographed, the core was cut in half along the marked cut line (displaced from but parallel to the orientation line) using a diamond saw. Samples for chemical analysis were collected consistently from the same half of the core and placed into consecutively numbered sample bags.

The Qualified Person is of the opinion that the drilling, sampling and record compilation procedures are of a high standard to support Mineral Resource estimation.

10.2.3 Data management

By September 2020, the original AngloGold Fusion database was migrated to a Datashed structured query language (SQL) system for Allied’s Mineral Resource estimation, with various add-on tables incorporated over the period (e.g. downhole survey method, collar location method, and trace element data). Grade control data were added after the exploration holes were validated and audited.

Within Allied’s Datashed database, drillhole ID, collar coordinates (DGPS), dip, azimuth, downhole surveys (multi-shot camera, Imdex ACT III), end-of-hole, drilling method, lithology, structural fabric and gold grades by the metre are recorded. Some sections of DD core record arsenic and antimony levels but these instances are sporadic.

Geological logging incorporates lithology, structure, alteration mineral species, frequency of veining and its make-up with the orientation of all fabric facilitated by use of oriented core. These data provide adequate information to be considered fit for the purpose of Mineral Resource estimation.

The Qualified Person exported the collars, surveys, assays, lithologies and zone-code tables for Sadiola Main, Tambali, FE3 and Sekekoto to Microsoft Excel for further review.

Drillhole Z collars were checked by the Qualified Person in Leapfrog for coincidence with the topography surface, and where expected, were found to be coincident with the original topography.

Downhole drillhole surveys used standard procedures as previously described.

The individual deposit databases were reviewed by the Qualified Person. A certain amount of overlap between the different databases was noted, which is a function of boundary changes over time to prospect area designations. The new drilling information generated between June 2021 and February 2022 was verified separately.

10.2.4 Results

Allied has focused much of its drilling activity on extensions to the oxide resources whilst also developing a geo-metallurgical model of the transition and primary material within Sadiola Main zone. Infill and step out drilling have met with notable success at Tambali within the existing pits and discovery of a southward extension, the southward extension of Sadiola Main and along the eastern flank of the Main pit. To the north, Sirimana was identified as an extension of the AngloGold pit FN3 which extends towards the Mine village. Sekekoto mineralisation was extended to the northwest and southeast for short distances, and as part of that drill out a new mineralised trend has been located to the southwest. Drilling at Timba has also identified a strike extension to the southeast.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Sampling

This section is a description of the sampling preparation and analysis undertaken by AngloGold prior to 2021 and Allied from 2021 onwards.

11.1.1 AngloGold

Majority of the samples (95%) used in the resource evaluation are exploration and grade control drill chips from RC drilling (aircore drilling was used in grade control and some exploration holes prior to 2010).

Exploration RC rigs were fitted with cyclones providing routine samples on a 2 m basis. Subsamples were split at the rig using a three-tiered riffle splitter yielding a 2.0–2.5 kg sample.

Grade control RC holes were sampled on a 2 m basis with a rotary cone splitter producing an automatic subsample (Sandvik Rotaport sampling systems).

RC samples too wet to pass through the riffle splitters were dried in an oven overnight and later split using a three-tier riffle system.

The following measures were taken to reduce the chance of sample contamination:

- The sample bags were tied to prevent adjacent sample spill over.
- The cyclone was scraped and cleaned every 30 m or when excessive water passed through the cyclone. The grade control rigs had an automatic cleaning system for the cyclone using compressed air. The exploration drill rig cyclones were cleaned manually.
- The splitter was cleaned using compressed air after every 2 m sample passed through. Scrapers and or brushes were also used to loosen any material stuck in the splitter fins.
- At the drill rig, the individual samples were placed in large plastic bags with the sample numbers listed. Samples were transported by the exploration department to the assay laboratory in a covered vehicle. At the laboratory the large bags were opened, and the number of samples reconciled against the submission list.

RC sampling recoveries were measured for advanced grade control drilling. Exploration drilling sampling recoveries were measured from December 2015.

Core from the DD holes were also used in resource evaluation. Core was logged and split in half by diamond saw along the orientated core axis at the onsite core farm. One half was bagged and dispatched for density determination and assay while the other half remained in the core tray as a record and for check samples. The sampling interval of the core was 1 m and/or based on geological boundaries.

RC drillholes were logged at the drill site. Most historical holes only penetrated the saprolite material, so drill logs are superficial. Drill core, of HQ and NQ diameter, was geologically logged with emphasis on lithology and mineralisation, as internal fabric was rarely present.

During 2013, a total of 90,000 m of core was imaged with a specially built hyperspectral scanner to produce shortwave infrared and colour images of the core. A subset of 28,624 m (232 random selected drillholes) was further processed to produce customized feature extractions and mineral presence maps to qualify alteration minerals for use in mining and geo-metallurgical studies. Images and quantitative data are stored as subset of the geological database.

11.1.2 Allied

Allied followed the protocols established by AngloGold for the drill processes across the site, with some notable changes:

- Allied RC drilling used 1 m intervals rather than 2 m.
- RC drilling did not use a Rotaport splitter mounted on the rig but caught all the sample from the cyclone in a large plastic bag which was subsequently split at the drill rig through a three-tiered riffle splitter.
- The RC sample geology was logged at the drill rig.
- DD core diameter was increased to be more representative: Allied used PQ and HQ core diameters for all DD core drilling.
- DD core was collected from the rig daily and delivered to the Kouloukan office site where it was logged, photographed and processed.
- Core was halved by diamond saw on a line offset from the orientation line so that the orientated core could be kept as the reference sample in the core tray.
- Allied's target for the diamond rigs at Sadiola Main was the transition and fresh ore, and recovery was generally 98–100%. At other sites where oxide material was cored (such as Sekekoto), recovery of the friable saprolite was variable, being 60–80%. For this reason, core was not extensively used at this site and RC was widely applied to ensure good representativity of samples in the oxidized material.

11.2 Laboratories

This section outlines the procedures followed and laboratories used to provide sample assays for the periods up to 2021 under AngloGold and from 2021 to the present under Allied. Analytical facilities used comprise the SEMOS onsite laboratory, as well as the independent laboratories SGS Bamako, SGS Kayes and SGS Booysens. All were used by AngloGold up to 2021 and favoured 30 g assay charges. Since Allied's involvement, the SEMOS onsite laboratory has been maintained for grade control whilst independent laboratory Bureau Veritas in Bamako has undertaken fire assay analysis on 50 g charges for exploration samples, with sample preparation completed by the SEMOS laboratory.

11.2.1 SEMOS onsite facility

All AngloGold exploration and grade control drill core and RC chips were submitted to and analyzed by the owned and operated SEMOS onsite laboratory. The laboratory is not accredited but participates in the bi-annual Geostats Survey of International Laboratories. The laboratory provided fire assay, aqua regia, moisture and density determinations.

11.2.2 SGS Bamako

This is an independent laboratory located in Bamako, Mali. It was accredited by the South African National Accreditation System (SANAS) with International Organization for Standardization and International Electrotechnical Commission (ISO/IEC) 17025:2005 on 7 September 2015. The laboratory's unique accreditation number is T0652, valid to 2025. SGS Bamako acted as referee laboratory for Sadiola pulp duplicates and the annual check assays as part of the quality control (QC) process.

11.2.3 SGS Kayes

All samples from pre-2013 (exploration RC chips, diamond core and soil samples) were submitted to SGS Kayes which closed at the end of 2013. SGS used a 30 g aliquot for primary material and 50 g for oxide material in the fire assay. The laboratory participated in the biannual Geostats Survey of International Laboratories but was not accredited.

11.2.4 SGS Booysens

Located in South Africa, SGS Booysens was routinely used by AngloGold as an umpire laboratory for processing check assays. It is accredited by SANAS under ISO/IEC 17021:2011.

11.2.5 Bureau Veritas Mali

Located in Bamako, Mali, Bureau Veritas Mali (BVML) was utilized for the primary analysis of exploration samples generated by Allied since July 2021. The laboratory is not accredited but this situation is currently under review. Allied carried out audits of the laboratory.

11.3 Sample preparation and analysis

At all laboratories, both drill core and RC cuttings are dried in an oven (typically for 8 hours at 105° C), then passed through a jaw crusher to reduce the maximum chip size to <3 mm. For gold by fire assay, a riffle splitter is used to reduce the sample size to 500 g which is then pulverised for a minimum of three minutes in a Labtech LM2 chrome steel pulverizer to achieve 80% passing 75 µm. Depending on the laboratory and material type, 30 g or 50 g of material were extracted for fire assay, with a flame atomic absorption spectroscopy (AAS) finish. Allied uses 50 g charges as the standard weight for its exploration sample analysis.

Rejects and pulps are stored in the exploration core yard at SEMOS until all QAQC results (including third-party laboratory checks) have been evaluated. Many (but not all) have been stored in a company warehouse on site for potential additional assay requirements.

SEMOS, SGS and BVML operate a Laboratory Information Management System (LIMS), although SEMOS facility has technical issues from time to time. Users extract the analytical results from the LIMS in both CSV and PDF format. These data have been extracted as part of the drillhole database and form the basis of Allied's resource estimation work.

11.4 Quality control quality assurance procedures

AngloGold's standard QAQC measures comprised the routine insertion of QC materials into the sample stream (Table 11.1) as well as regular audits and job observations. QC material comprised certified reference materials (CRM), blanks, field and pulp duplicates and pulp reject repeats from previous sample submissions. These programs were run in addition to the normal QC insertions and monitoring undertaken in-house by the SEMOS laboratory and SGS Bamako. The CRMs are commercially certified standards prepared and supplied by Rocklabs Limited in 2,500 g jars for a variety of gold grade ranges. Since October 2015, a rotary splitter was used to repackage the CRMs into 35 g sachets.

Table 11.1 Type and insertion rate of QC samples at Sadiola

Material	Type	Amount (%)	
		Grade control	Exploration
Blanks	Coarse and pulp	1	5
Standards	CRM/SRM	2	5
Duplicates	Rig/pulp	1	5
Check assays	Pulp	5% blank (minimum of 10)	5
		5% CRM/SRM (minimum of 10)	5

Source: Sadiola FS, September 2022

Allied maintained the same processes as AngloGold in terms of QAQC, although Allied ceased using Rocklabs manufactured CRMs in favour of Geostats and OREAS naturally occurring and matrix-matched ore sample CRMs.

11.4.1 SEMOS QAQC to 2018

Field duplicates

From 2004 to 2014, a total of 20,120 field duplicates were analyzed for precision and bias. The duplicates generally did not show any bias. The correlation coefficient was 0.85 indicating a strong linear correlation between the primary and duplicate samples.

The half absolute difference (HAD) plot has half absolute relative difference (HARD) thresholds plotted diagonally and indicates that 82% of the data has a HARD of 20% or less. The AngloGold threshold was for 90% of the field duplicates to have a HARD of 20% or lower but was not routinely achieved. This is reasonable for a deposit of this style and is probably related to nuggetty gold.

Blanks

Blank material is sourced from the Souroukoto sandstone located near the SEMOS village. This material was used historically and has been demonstrated to be barren. The material is crushed to <6 mm and samples of approximately 1 kg are inserted into the exploration and grade control sample streams.

Ten types of blanks, comprising 40,351 analyses, were used by Sadiola from 2000 to 2014 to determine if contamination was occurring during the sample preparation and assaying processes. The blank assays were plotted over time, with the plot indicating an upper limit, set to a nominal value of 10 times the SEMOS laboratory detection limit of 0.01 g/t Au to account for the high analytical variability often observed close to a detection limit.

A total of 218 samples, equating to 0.5% of the blanks, plot above the upper limit. This indicates that negligible contamination occurred during the sample preparation and analytical processes and would not have adversely affected the overall accuracy of the samples used for resource estimates.

An improvement was noted in the lower grade ranges from April 2011 to present. This improvement coincided with the discontinuation of the CBLANKS (“coarse blanks”), which showed poorer results compared to other blank materials.

Certified reference materials

A variety of CRMs have been used as part of Sadiola’s independent QAQC program. Four CRMs (SN38, OXD37, OXD74 and SE58) were analyzed during the mining of the Sadiola Main deposit. The CRM grades ranged from 0.42 g/t to 8.57 g/t Au, providing a sufficient range of values to determine the accuracy of the assays undertaken.

Almost 94% of the CRM results were within the two standard deviation control limits and 96% were within the three standard deviation limits, indicating good analytical accuracy and precision had been achieved during assaying prior to 2015. The average of assays for each CRM was typically within 5% relative difference, indicating good analytical accuracy and low analytical bias. However, it is noted that the five highest grade CRMs, with expected grades greater than 8 g/t Au, displayed a consistent negative bias, although the bias was still within 5% relative difference. This suggests that higher grade values may have been underestimated slightly in the assay process. The overall analytical accuracy of the CRMs is satisfactory, especially post-2009, and will not adversely affect the accuracy of the resource estimates.

11.4.2 Allied QAQC

Allied’s samples uses the sample preparation facilities at SEMOS and the resultant pulps are now dispatched to BVML, for analysis of 50 g charges by fire assay with an AAS finish. For grade control, analysis is completed at SEMOS laboratory.

The first batches of assays that were sent by Allied to the SEMOS laboratory contained CRMs that were not labelled correctly or did not have any supplemental statistical information. Therefore, the inserted CRMs could not be used to validate the laboratory performance. Subsequently, all assay grades over 0.25 g/t Au from the affected drillholes (SADD001-014, SADD016, SADD019-020 and SARC013-017) were sent to BVML for re-assaying and the selected umpire samples from BVML were sent to the ALS laboratory in Perth.

Allied's QAQC protocol requires insertion of a CRM, a blank, a coarse duplicate and a pulp duplicate at a rate of 1:20 samples. Results are reviewed by the database personnel immediately on the release of assays; if issues are identified with a batch, it is quarantined until the issue is rectified. This may include re-assay of batch portions as indicated by a poor CRM result. Allied follows a best practices approach to QAQC, as did AngloGold, although Allied initiated a randomized CRM insertion protocol, as the laboratory was showing an awareness of the routine insertion protocol. Following a trial period, further observations and adjustments, this procedure has improved QAQC procedures and given greater confidence to ROM assays. Photographs are taken of the CRM packet with the sample ticket and sample bag to provide validation for the sample insertion should the laboratory disagree with the Company's commentary.

11.5 Security

The SEMOS laboratory is situated adjacent to the main offices of the mine, and although it is run by mine personnel, it is done on an arms-length basis. Samples are delivered to the laboratory by geological staff.

When constructing the facility, AngloGold put in place dedicated facilities for each "user" to focus on sample security and to reduce the potential for cross contamination:

- Exploration: 2 x 20 ft drying ovens, two Boyd RSD combo units (3 mm product) feeding to four LM2 ring pulverizers in their own dedicated shed, 300 samples/day.
- Grade control: 7 x 20 ft drying ovens, three Boyd RSD combo units feeding to 10 LM2 ring pulverisers, located away from exploration facilities, 900 samples/day.
- Process plant products: Two side-by-side dedicated wet rooms for C, CN and filter cake analysis through two dedicated AAS machines, and a VGA unit with the potential to assay for antimony and arsenic on the AAS liquor.

11.6 Qualified Person's opinion

An inspection of the SEMOS sample preparation facilities during the site visit showed they are well organized and recognize the potential for cross-contamination from ore grade samples vs grade control and exploration.

The flux material is an off-the-shelf product and going forward may not be suitable for fresh rock that may contain sulphides (potential for boil overs), and this was the reason SEMOS opted for 30 g sample charges. The sample preparation facility is a first-class facility. Security is excellent with different sections of the laboratory compartmentalised to avoid cross-contamination.

The very nature of the work, especially under pressure, suggests that additional oversight would be advisable to avoid unintended sample swaps and ensure frequent cleaning of jaws and mills. Blanks typically assay appropriately (<0.03 ppm maximum permissible) but inadvertent swaps do occur, and these necessitate investigation and correction, usually by part-batch re-assay. Allied's Perth-based database team identifies QAQC issues immediately the results are released by the laboratory.

The Qualified Person responsible for this section of the Technical Report is of the opinion that the sampling, analytical and QAQC procedures are of a high standard to support Mineral Resource estimation. The SEMOS facility is well maintained, and routine housekeeping ensures no contamination issues between incoming samples. Routine but randomly timed audits by a qualified independent chemist advises that there are no other known analytical factors identified that could materially impact the accuracy and reliability of the results.

12 DATA VERIFICATION

12.1 Survey

For Sadiola, downhole survey techniques were not reviewed; however, a visual inspection of drillholes showed consistent deviations. The deepest hole in the Sadiola area is the vertical SP12 at 3,594 m (which is sporadically mineralised for its entire length at 0.9 g/t Au).

For Tambali, many drillholes show no deviation, although holes routinely steepen as they extend to depth. The deviation has similarly been noted in recent Allied metallurgical drilling, but not to any degree to cause concern regards the resource estimation.

Deviations at FE3 and at Sekekoto were not considered to be out of the ordinary. Several topographic surfaces were reviewed by the Qualified Person for each deposit:

- The original topographic surface prior to mining.
- The current topography used for limiting Mineral Resources.
- The base of full oxidation surface.
- The top of fresh rock.
- The optimised pit based on Measured, Indicated and Inferred Resources at a $1,800/oz gold price.

The topographic surfaces were reviewed in Leapfrog for consistency.

The original surface was mainly used to check drillhole collars where the surface had not been altered by mining and other activities. As mentioned above, these were found to be reasonably situated.

The topography has been used to limit the Mineral Resources as reviewed in this report. No issues were found with these surfaces.

The oxidation surfaces were visually reviewed in Leapfrog, and there were no obvious issues. The surfaces are horizontal, planar and irregular, consistent with the oxidative nature of the formation of these surfaces.

12.2 Drilling and sampling

No verification was possible on the previous AngloGold drillholes. Allied vetted the AngloGold database and had an external third-party data management company audit the data. Identified errors were rectified. Allied has advised that drillholes always have a qualified geologist set the rig up on its correct azimuth and declination as well as supervise the drilling process, orderly splitting activity and consecutive number use for the calico sample bags.

12.3 Sample analysis

When Allied began site operations at Sadiola, there was a notable capability gap in the SEMOS laboratory facility, mainly due to inadequate staffing levels. As a result, BVML was engaged to analyse exploration samples, as turnaround time was not as critical as for grade control in advance of the mining fleet. Allied has maintained this relationship to date.

AngloGold engaged an external analytical auditor (Bekker Consultants, RSA) in July 2017 to review the laboratory operations of both SEMOS and SGS Bamako, AngloGold's external umpire laboratory at that time. Allied has undertaken one physical audit of the BVML facility and two of the SEMOS laboratory using Allied's consulting staff chemist, who is not attached to either laboratory. Both reviewers expressed their satisfaction with practiced approach to sample preparation and the cleanliness with which the sample preparation facilities were maintained. The wet chemistry process used fume hoods to beneficial effect, with the air extraction system working well to ensure no negative impacts to staff members. Firing of the charges in crucibles was orderly and methodical, which ensured no confusion over the button order prior to cupellation. Both laboratories showed a proficiency with their fire assay protocols.

No additional audits of the laboratories have been undertaken by a person or company independent of Allied.

Allied has engaged a former general manager of commercial assay laboratories in Zimbabwe and Côte d'Ivoire and now based in Belgium to undertake audits of the BVML laboratory and the SEMOS laboratory at Sadiola to ensure compliance with Allied's analytical requirements. Exploration samples are prepared at Sadiola through the exploration sample stream and then assayed at the BVML facility.

When Allied began site operations at Sadiola, there was a notable capability gap in the SEMOS laboratory facility, mainly due to inadequate staffing levels. As a result, BVML was engaged to analyse exploration samples, as turnaround time was not as critical as for grade control in advance of the mining fleet. Allied has maintained this relationship to date.

Allied has maintained QAQC management of both BVML and SEMOS laboratories. Database managers review all assays as they arrive from the laboratories to judge their suitability for addition to the database, and each month, assays received in the prior 30 days are output through Datashed's QAQC Reporter software that crystallises the laboratories' performance for distribution to the field offices and Allied's Resource Manager in Perth. Data are quarantined until vetted for QAQC.

12.4 Qualified Person's opinion on adequacy of the data

The Qualified Person considers that the data quality is adequate to support the estimation of the Sadiola Mineral Resources. This opinion is based on the review of the QAQC data supplied by Allied, the production history of Sadiola and observations made by Mr Earl during the site inspection with respect to drilling, sampling and sample preparation.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

The Sadiola gold process plant commenced production during 1997, treating oxide ore with a gravity circuit added in 2007. Since 2018, the plant was treating stockpiled low-grade and mineralised waste rock until 2021 when Allied restarted oxide mining operations. The nominal capacity of the twin stream oxide gold plant is 5.0 Mt/a.

The future of the mine is exploitation of the harder primary ore at depth, which was identified by previous owners. Some major equipment was purchased in 2011, but never installed. The 2022 FS is based on the pre-purchased equipment being installed for the plant expansion with the original oxide plant being decommissioned and eventually demolished.

13.1 Metallurgical testwork – oxide

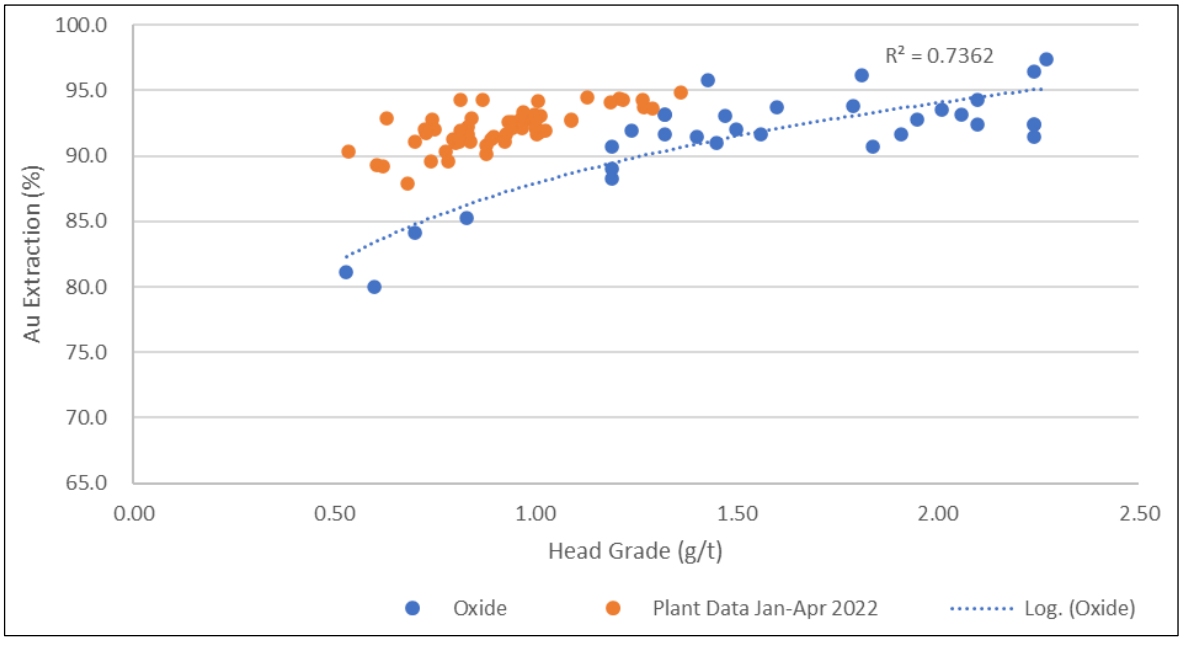
Three types of weathering are recognized at Sadiola, namely laterite, oxide and primary, with a further sub-classification of primary into soft or hard. The oxide plant design was based on the soft oxide and soft primary ores plus laterite material. A portion of hard oxides and transition has been treated in the plant, provided that these feed stocks are crushed ahead of milling. The oxide materials are amenable to crushing through a mineral sizer.

The original oxide testwork was completed prior to 1997 and was used to design the existing plant. The historical performance to date is considered appropriate for forecasting the metallurgical performance of the oxide and transition ores.

The 2015 to 2022 data was analyzed in detail by Allied and this data was used to predict future performance.

In addition to the plant performance data, different ore types and sources were subjected to standard testwork at the SEMOS laboratory during routine plant operation and these results have been assessed and their impact included in the production forecast. This testwork has shown a relationship between head grade and recovery for the various oxide ore types as shown in Figure 13.1.

Figure 13.1 Head grade and recovery relationship



Source: Sadiola FS, September 2022

The oxide data (blue dots) indicate that as the head grade decreases, the tails value remains almost constant and thus recovery decreases as indicated. This relationship implies that a finer grind size would be required to increase recovery above the average 92%.

The plant data from January to April 2022 shows a moderate uplift of around 2% in recoveries against the testwork data.

13.1.1 Plant throughput and recovery estimate

Based on analysis of the historical database and historical testwork, the oxide plant performance is summarised in Table 13.1. This forecast assumes that all hard ores are crushed to <50 mm with the upgraded hard rock crusher installation in Q3 2021. The additional categories of ore, as listed, have been identified during the review.

Table 13.1 Oxide processing throughput and recovery forecast

Ore type	Gold recovery %	Throughput	
		t/h	Mt/a
Laterite	90.0	500	4.0
Saprolite	92.0	640	5.1
Siliceous oxide	85.0	500	4.0
Soft sulphide	75.5	600	4.8
Blast oxide	85.0	500	4.0
Blast sulphide	75.5	480	3.8
Transitional	82.8	520	4.2

Source: Allied, Sadiola FS, September 2022

Based on the feed blend, the treatment rate and gold recovery can be reliably predicted, subject to the ratio of ore types treated. The mine planning and processing schedule is based on a similar breakdown of ore type to that indicated in Table 13.1. The budgeted existing plant treatment rate is 5.0 Mt/a for 2023 to 2025 and the treatment schedule should be achievable, provided that the plant runtime is approximately 8,000 hours per annum.

The forecast gold recovery for 2023 to 2025 based on the feed blend ratio, and the historical performance, is expected to be between 82.1% and 89.2%, provided that the target grind is maintained.

The Qualified Person endorses the use of historical plant data, provided that the operational standards are maintained and the feed blend is understood.

13.2 Metallurgical testwork – primary

Metallurgical testwork on primary ore has been conducted between 2002 and 2010 by the previous owners and an additional program was implemented by Allied during 2022. The original testwork was performed at several reputable metallurgical laboratories in Canada, USA, and South Africa. Allied's process consultant (MineScope) completed a detailed independent review of all the historical data and the 2022 FS testwork to develop the process design criteria, in conjunction with DRA, in support of the process options and the 2022 FS flowsheet.

The original testwork was based upon the three main ore types associated with the primary zone, namely calcitic marble, greywacke and porphyry. Allied identified an additional brecciated (shear) zone which was inadequately characterised in previous programs.

In 2009, several holes were drilled into Sadiola Main (north, middle and south) to intercept the three main lithologies aimed at creating a better understanding of the complete characterisation suite of mineralogy, geochemistry, physical and metallurgical parameters. A total of 58 samples were investigated, grouped into six clusters plus two un-clustered samples. AngloGold estimated that these samples represented 22 Mt of primary ore out of the 115 Mt in the current Sadiola mine plan. Allied undertook additional testwork to improve the characterisation of the primary ore.

The 2022 program was conducted at ALS Metallurgy in Perth (managed by DRA and MineScope) and consisted of eight master composites and 131 variability composites from 31 DD holes covering oxide (saprolite), transition (greywacke) and primary ores (calcite marble, shear, greywacke, diorite), representing almost 150 Mt of mining inventory. This program identified the major ore types, and the representation is summarised in Table 13.2.

Table 13.2 Variability sample representation

Ore type	Sample no.	Mining inventory	
		Tonnes (Mt)	Sample/Mt
Calcite Marble	60	71.0	1.0
Shear	33	25.8	0.9
Greywacke	20	11.5	1.7
Diorite	8	8.5	1.1
Oxide	5	21.7	0.2
Transition	3	11.3	0.4
Total	**129**	**149.9**	**0.9**

Source: Allied, Sadiola FS, September 2022

The Qualified Person is of the opinion that the representation of one sample per ~1.0 Mt is fair and reasonable size for a feasibility study.

13.2.1 Mineralogy

Four distinct particulate gold species were identified during this evaluation, namely:

- Pure native gold, with negligible silver content
- Native gold containing variable amounts of silver
- Electrum
- Aurostibite ($AuSb_2$), being common.

Gold species can either be free, attached or encapsulated in sulphides or silicates. Arsenopyrite and berthierite (the dominant antimony-rich phase) are present with very fine particulate gold (<10 µm) associated with the arsenopyrite. There is a good correlation between gold and sulphides in the greywacke and the diorite ore types, but much lower correlation in the calcite marble.

Analysis of the spatial distribution of the gold/electrum to aurostibite ratio required a better understanding and this was investigated during 2022, together with more liberation influences for both leaching and flotation. The 2022 mineralogical studies and diagnostic leach testwork indicated:

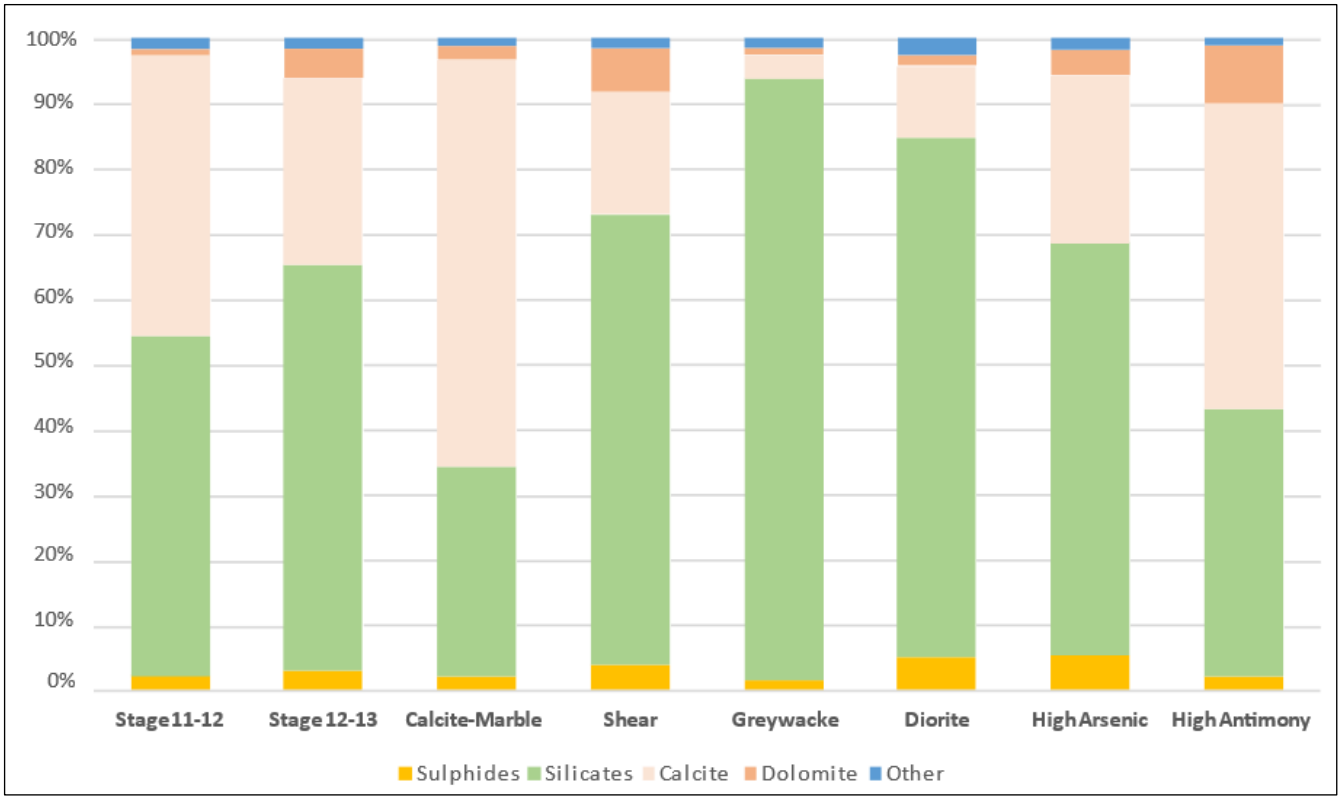
- Gold is predominantly present as native gold (<20 µm) but locked with other minerals such as arsenopyrite, carbonates, silicates and pyrite.
- Aurostibite is less than 0.01% of the mass whilst pyrrhotite is 1.0%, arsenopyrite at 0.6% and pyrite at 0.4%.
- The gold deportment to aurostibite suggests that the formation has predominantly occurred in the footwall (or calcite marble lithology).

- Laser ablation shows that refractory gold comprises about 25% of total gold, the vast majority being locked in arsenopyrite as solid solution gold.
- Diagnostic leach tests shows that majority of the gold in the leach residues is locked in sulphide minerals (i.e. arsenopyrite), with the gold locked in silicates typically less than 3% of the residual gold in the leach residues.

13.2.2 Selected samples

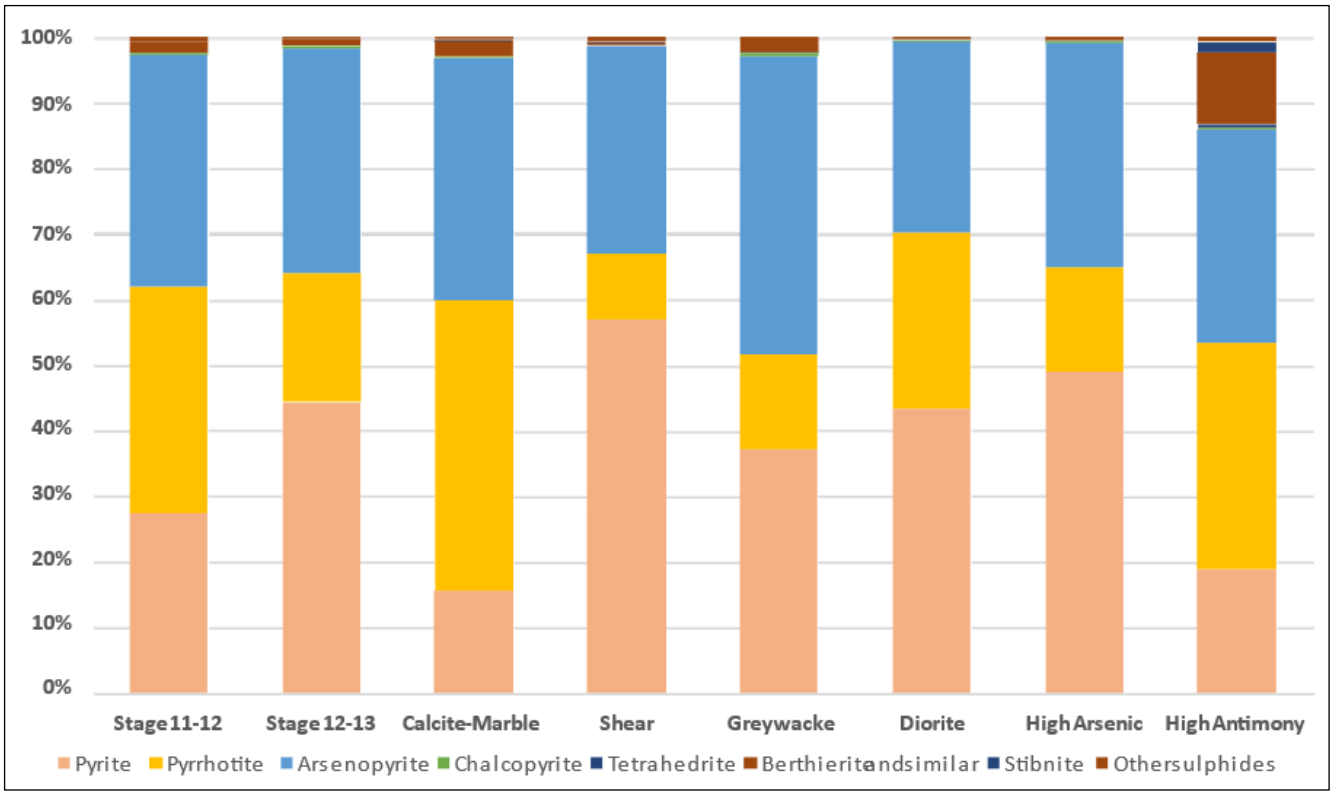
The 2022 mineralogy program incorporated eight composite samples including gravity recovery, QEMSCAN, optical microscopy and x-ray diffraction (XRD). The bulk mineralogy for the composites is indicated in Figure 13.2 and shows that the silicate content is highly variable as indicated during the earlier studies. The sulphide mineralogy deportment is indicated in Figure 13.3, which shows the major sulphide components are pyrite and arsenopyrite with variable pyrrhotite content.

Figure 13.2 Sadiola composite – bulk mineralogy



Source: Allied, Sadiola FS, September 2022

Figure 13.3 Sadiola composite – sulphide mineralogy



Source: Allied, Sadiola FS, September 2022

Table 13.3 summarises the head assays of eight composite samples that were used for the 2022 optimisation leach testwork with leaching testwork subsequently carried out on the 131 variability testwork samples based on the flowsheet design conditions.

Table 13.3 2022 composite samples head assays

Composite	Au (g/t)	Ag (g/t)	As (ppm)	Sb (ppm)	S_{Tot} (%)
Stage 11-12	2.00	0.3	2 400	223	0.64
Stage 12-13	2.91	0.9	2 800	266	0.80
Calcite Marble	1.96	<0.3	2 130	239	0.48
Shear	2.36	0.6	3 270	322	1.14
Greywacke	1.17	0.3	1 670	36	0.46
Diorite	2.17	0.9	3 540	32	1.62
High As	2.19	0.3	4 650	71	1.58
High Sb	1.92	0.6	1 720	1 345	0.62

Source: Allied, Sadiola FS, September 2022

The gold grade for the 2022 program at 2.0 g/t is generally higher than the LOM estimate at 1.5 g/t.

The Calcite Marble, Shear, high As and high Sb samples all reported significant refractory gold inclusions at 20%, 18%, 11% and 21% respectively, although these contents were not fully supported by cyanide leaching.

The Qualified Person is of the opinion that the samples selected are adequately representative of the deposit for the FS.

13.2.3 Comminution

Comminution evaluation was undertaken on 30 of the 58 variability samples during the 2009–2010 program, with the testwork summarised as follows:

- Rod Work index (RWi) indicates that the ore is of medium to hard hardness, ranging from 10.6 kilowatt hour per tonne (kWh/t) to 19.6 kWh/t, with the calcitic marble being the softer rock type at an average 14.4 kWh/t.
- Ball Work index (BWi) indicates that the ore is medium to hard, ranging from 11.5 kWh/t to 21.8 kWh/t, with the calcitic marble being the softer rock type at an average 13.4 kWh/t.
- Axb is unitless measure of ore competency and is used for sizing the SAG mill. The lower the Axb the more competent the ore. Average Axb and Drop Weight Index (DWi) results from SAG Mill Competency (SMC) tests are similar for all three ore types between 27 and 33 and DWi range of 8.1 kilowatt hours per cubic meter (kWh/m^3) to 10.4 kWh/m^3.
- The results indicate that all ore types are highly competent, and the overall forecast comminution power requirement is estimated and used in the operating cost model:
  - Calcite marble – 24.04 kWh/t
  - Diorite – 27.18 kWh/t
  - Greywacke – 30.51 kWh/t.
- Bond abrasion index values (Ai), ranging from 0.01 g to 0.43 g, indicate a low to medium propensity for wear on metal liners and mill balls:
  - Greywacke indicated to be the more abrasive material with an average 0.21 g
  - Calcitic marble samples indicated a low abrasion index with an average 0.06 g.

The 2022 comminution testwork program was completed with 102 additional samples which largely confirmed the 2010 results apart from a softer calcite marble result (which makes up 47% of the ore). The overall comminution parameters are indicated in Table 13.4.

Table 13.4 Comminution parameters (75th percentile)

Description	RWi (kWh/t)	BWi (kWh/t)	DWi (kWh/m^3)	Axb	Specific gravity (t/m^3)
Oxide	8.8	6.8	1.2	215.8	2.59
Transition	12.1	11.8	2.2	120.0	2.64
Primary – Calcite Marble	15.7	14.3	8.8	31.4	2.77
Primary– Greywackes	21.2	19.3	9.8	28.0	2.75
Primary– Diorite	20.5	19.2	10.1	27.5	2.78
Primary – Shear	20.4	17.2	8.6	32.6	2.80
Weighted average	**16.6**	**14.8**	**8.1**	**44.6**	**2.76**

Source: Allied, Sadiola FS, September 2022

The comminution modelling has shown a strong correlation between silica content and mill throughput with the hanging wall (silica-rich) greywackes milling slower than the footwall calcite marbles (lower silica). This relationship will be used in the future development of a geo-metallurgical model.

Grind size selection

Eight master composites were created from 122 variability primary ore samples to confirm the baseline leaching conditions, having reviewed the historical testwork. The leach results were analyzed, and an economic evaluation completed which indicated that the coarsening of the P_{80} grind from 53 µm to 75 µm is justified. This has been incorporated into the overall process design criteria.

The 2022 grind optimisation clearly showed that for all composites, the finer grind resulted in a reduced gold value in leach tailings but the economics of producing the finer grind for the ore blend as well as the additional capital cost were not financially viable when considering the marginal improvement in recovery reported for the composites.

13.2.4 Leaching parameters

The 2022 testwork confirmed the necessity of pre-aeration, relatively low pH at 9.5 and high lead nitrate dosages to reduce the impact of gold leaching passivation by antimony and sulphides. The relatively aggressive leaching conditions and the leaching kinetics realised on the master composite samples enabled the leaching residence time to be reduced to 24 hours from the 32 hours in the PFS.

The testwork indicated that most of the leaching was complete within the first 8 hours, whilst the balance required the 24 hours.

13.2.5 Whole-of-ore leach without gravity option

Gravity recovery was previously evaluated and yielded an average across all ore type of between 19.4% and 22.9% but with high variability, ranging from 4.3% to 69.3%. Whilst the variability is a concern, the average recovery does not warrant the inclusion of this technology in the process plant. This conclusion was confirmed during the 2022 testwork program with no apparent recovery benefit.

The “whole-of-ore” leach circuit option results were determined as the base case option with the following summary of results further updated with the 2022 program:

- Minimal organic or graphitic carbon is present in the ore.
- Gold extraction improves with increasing fineness of grind; the optimum size was selected as 80% <75 µm.
- Extraction differences were evident between the six composites and the 58 variability samples (when grouped by ore type) from previous work and the 131 samples and eight composites from 2022, which indicates variability of gold extraction spatially and by ore type.
- Bottle roll leach results indicated that acceptable cyanide and lime consumption would be obtained with a pre-oxidation step and 24 hours leach time with the addition of lead nitrate.
- A coarser primary grind in conjunction with extended pre-oxidation with higher lead nitrate additions and higher residual free cyanide has realised acceptable gold extractions at shorter CIL residence times with improved cost benefits.

As shown in Figure 13.4, the relationship between gold feed grade and tailings residue grade supports the use of constant recovery for each ore type (i.e. at 1 g/t Au = 0.255 g/t residue grade = 75.4% extraction; at 4 g/t Au = 1.02 g/t residue grade = 75.4% extraction).

Figure 13.4 Impact of gold head grade on recovery

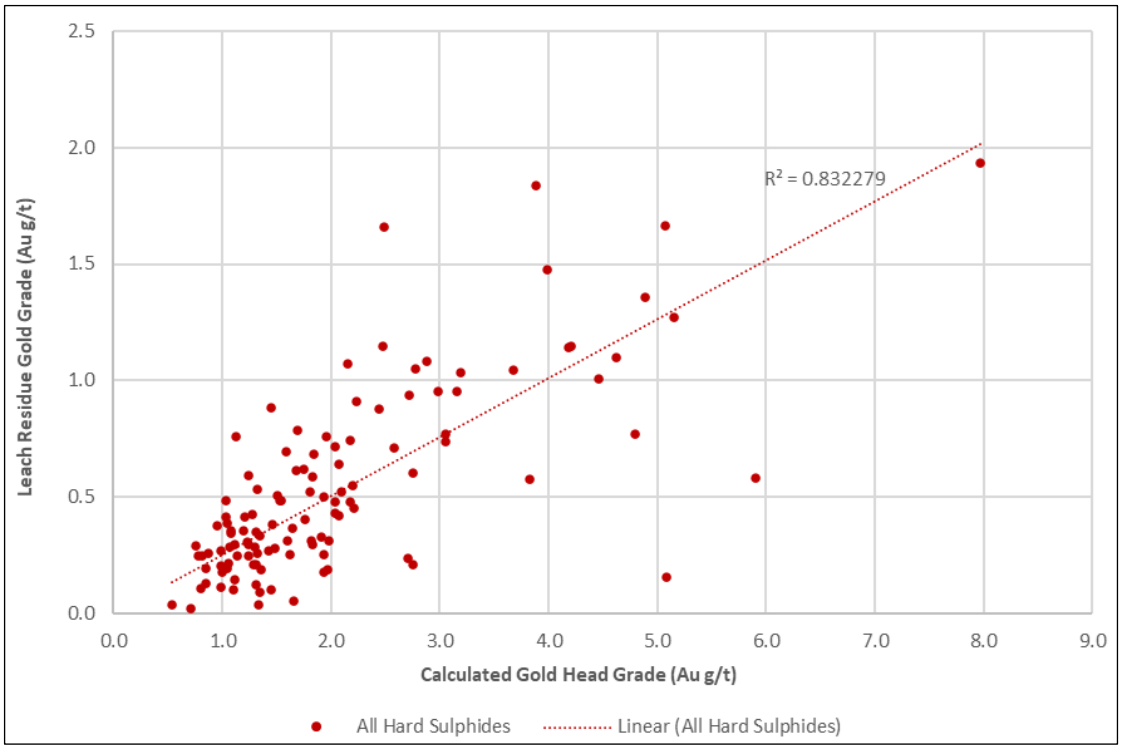
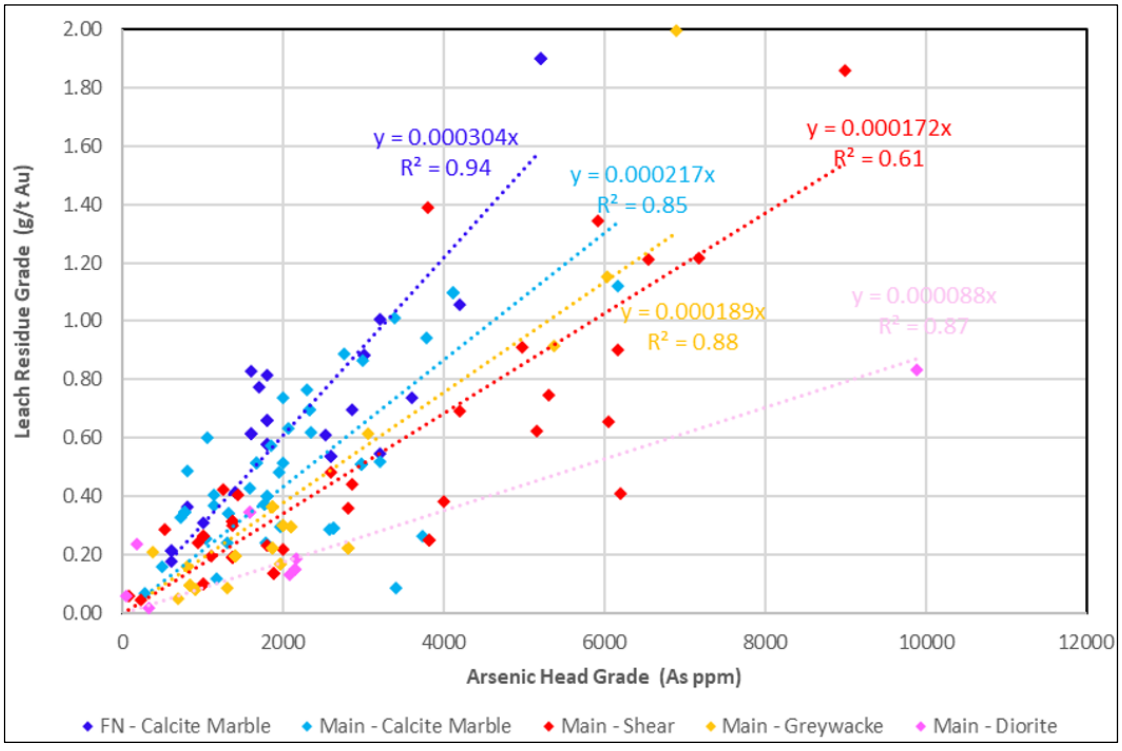


Figure 13.5 shows that the arsenic feed grade has a strong impact on gold extraction, particularly for the Calcite Marble in Sadiola Main and FN areas. Allied advises that additional ore type classification and geo-metallurgical work is being conducted as part of the next phase of the project.

Figure 13.5 Impact of arsenic on gold residue grade



Source: Allied, Sadiola FS, September 2022

13.2.6 Flotation option

Historical flotation testwork focused on gold recovery and carbonate rejection for BIOX leaching as well as ultra-fine grinding for cyanide leaching. A review of the historical metallurgical testwork by Allied and consultants indicated that the gold recovery with arsenopyrite and ultrafine grinding could result in a recovery between 76.0% and 80.6%.

Ultrafine grinding of flotation concentrates in 2022 confirmed negligible increase in recovery of cyanide recoverable gold, consistent with the 2009–2010 testwork. These results are also consistent with the 2022 laser ablation testwork, which showed that majority of the refractory gold is present as solid-solution gold within arsenopyrite.

This suggests that a more intensive leach technology on a flotation concentrate (e.g. Albion™ or roasting) would be required to unlock the refractory gold and increase the gold recovery to 90%.

The flotation and concentrate leaching option is not being considered in the current Sadiola Expansion Project but may be a future enhancement option, as discussed in Item 24.3.

13.2.7 Thickening and rheology

Variability was evident with the settling testwork, and a settling rate of 0.75 t/h per square metre was selected for the 2022 FS.

Whilst maintaining the settling rate, there may be concerns achieving the desired underflow density when treating higher tonnages with the 30% oxide material. Whilst the achieved solids content may decrease from 63–65% to 59%, the Qualified Person regards this as having a minimal impact upon the process design, as lime and flocculant addition can be changed to improve the solids content.

13.2.8 Tailings detoxification

Cyanide detoxification testwork results show that the required Cyanide Weak Acid Dissolvable (CNWAD) target of <50 ppm in the leach tailings can be achieved using the batch SO_2/air method. SO_2 stoichiometric ratios of 3:1 represent a SMBS consumption rate ranging from 0.62 kg/t to 0.71 kg/t. Lime consumption at this ratio ranges from 0.78 kg/t to 1.73 kg/t, whilst copper sulphate consumption ranges from 0.21 kg/t to 0.25 kg/t.

Arsenic and antimony precipitation testwork has been conducted on Stage 11–12 leach tailings slurry post cyanide detoxification.

The precipitation of arsenic was successful at “natural pH” and 0.8 kg/t iron (III) chloride, but to increase antimony precipitation from 46% to 95% acidic conditions are required to precipitate antimony (V). Precipitation testwork conducted on the tailings slurry supernatant achieved 96% antimony precipitation at “natural pH” and 0.8 kg/t of iron (III) chloride.

Precipitation will operate at natural pH (exiting cyanide detoxification) with a target discharge arsenic concentration of <2 mg/L and approximately 50% antimony precipitation.

A water treatment facility, located at the process plant, was included for treatment of TSF decant to remove more of the antimony from the decant return.

The Qualified Person is satisfied that the tailings will be adequately detoxified with the proposed method being employed.

13.2.9 CIL versus CIP

The two options that are considered for gold extraction are the CIP option or the CIL option. The former is more suitable for “clean” ores with no preg-robbing characteristics as used in the existing plant. Ores with preg-robbing potential would follow the CIL route. Both options were tested for the primary ores and the initial results indicated that CIL was superior on composite samples.

Both options were evaluated on 21 variability samples with low recoveries to assess if the improved gold extractions observed in the composite CIL tests were reproducible on individual lithology samples. The results of the CIL tests on the 21 variability samples did not replicate the improvements in gold extraction seen in the bulk composite CIL tests.

The design enables the hybrid CIP - CIL circuit to be converted to CIL, if justified, during operations.

Further review of these results is to be undertaken to better understand the reasons for the variation in residue grades and gold extractions observed in the bulk CIL tests.

13.2.10 Ongoing testwork

Geo-metallurgical investigations and modelling continue to refine and improve the plant performance:

- A geo-metallurgical model is being developed with silica, arsenic, antimony and sulphur included.
- Silica has been shown to provide a good basis of estimating throughput in the new plant.
- A combination of gold and arsenic head grades versus gold residue grade seems to provide the best recovery estimate for the geo-metallurgical model with investigations continuing.
- Additional diagnostic testwork is being carried out to better understand the variability in gold extraction between the Sadiola Main and FN pits calcite marble samples.

Preliminary flotation testwork has been carried out on eight master composite samples, focused on recovering sulphides to a concentrate for ultrafine grinding. Ultrafine grinding of flotation concentrate provides negligible increase in recovery of cyanide recoverable gold, consistent with the 2009–2010 testwork. These results are consistent with the laser ablation testwork which shows that majority of refractory gold is present as solid-solution gold within arsenopyrite.

The flotation concentrate is likely to require an oxidation route to unlock the refractory gold and increase the gold recovery. It is noted that the layout includes flotation for future potential enhancement. The Qualified Person agrees with the additional testwork being completed to optimise the gold recovery relationship.

13.2.11 Design parameters selected for Sadiola Main

The key whole-of-ore direct leach testwork results from both the 2010 and the 2022 testwork programs are summarised and compared in Table 13.5 for the Sadiola Main deposit:

- Sadiola Main pit represents about 80% of the LOM ore.
- The average gold extraction in the 2022 testwork (75.4%) is marginally lower (by 0.8%) than that achieved in the 2010 testwork (76.2%). These results are despite the 2022 testwork adopting a coarser grind size, reduced CIL residence time and lower cyanide addition.
- The cyanide and lime consumptions from the 2022 testwork program are materially lower than the historical testwork program and this can be attributed to the lower initial cyanide addition rate and lower CIL pH adopted for the 2022 FS.

Table 13.5 Comparison of Sadiola Main whole-of-ore leach results

Ore type	Units	2009–2010 testwork	2022 testwork
Number of samples		35	96
Grind size	P_{80} µm	53	75
Acidity	pH	10.5	9.5
Lead nitrate	g/t	244	300
Cyanide addition	kg/t	0.6	0.7
Residence time	h	48	24
Head grade	g/t Au	1.67	2.12
Head grade	g/t As	2,210	2,552
Residue grade	g/t Au	0.40	0.52
Gold extraction	%	76.2	75.4
Lime consumption	kg/t	0.56	0.22
Cyanide consumption	kg/t	0.35	0.23

Source: Allied, Sadiola FS, September 2022

The results of the 2022 testwork have identified a coarser grind with reduced leach residence time will be appropriate for the gold plant, although the recovery may decrease marginally.

The Qualified Person notes that the reduced recovery is applied to a higher-grade sample. The relationship between head grade and recovery was established during the 2022 testwork which showed that while gold feed grade had negligible impact on extraction, arsenic had a more material impact (Figure 13.5). It is noted that the arsenic grades are higher in the 2022 testwork which accounts for approximately 3% extraction difference.

13.2.12 Plant throughput and recovery estimate

The throughput and gold recovery estimates detailed in Table 13.6 are as indicated from the testwork performed during 2009, 2010 and the recent 2022 work, and the interpretation by MineScope and DRA.

Table 13.6 Estimated throughput and gold recovery in new process plant

Ore type	Gold recovery (%)	t/h	Mt/a
Laterite	90.0	1,520	12.16
Saprolite	92.0	2,610	20.88
Siliceous oxide	85.0	1,520	12.16
Soft sulphide	75.5	1,520	12.16
Primary – porphyry	74.7	840	6.72
Primary – greywacke	74.7	840	6.72
Primary – diorite	82.3	845	6.76
Primary – calcite marble	70.7	1095	8.76
Primary – shear	74.3	985	7.88
Blast oxide	85.0	1,520	12.16
Blast sulphide	75.5	1,520	12.16
Transitional	82.8	1,520	12.16

Source: Allied, Sadiola FS, September 2022

The distribution of the variability samples indicates that the gold recovery from the calcite marble samples selected from Sadiola Main pit averaged 74.6% compared to the calcite marble samples selected from Sadiola FN (Stages 4 and 5) which averaged 63.1%. Allied's geo-metallurgical investigations were ongoing at the time of reporting.

It was anticipated that about 47% of the ore to be treated through the new plant will be calcitic marble, with 8% greywacke, and most of the balance comprising shear zone and oxide as per Table 13.7.

Table 13.7 Processing schedule – LOM totals and years 2023 to 2026

Ore type	Average gold grade (g/t)	Total (Mt)	% Total
Oxide	0.65	22	14%
Transition	1.40	11	8%
Porphyry	2.01	0.2	0%
Greywacke	1.37	11	8%
Diorite	1.63	9	6%
Calcite marble	1.58	71	47%
Shear zone	2.07	26	17%
Total	**1.50**	**150**	**100%**

Source: Allied, Sadiola FS, September 2022

The throughput and recovery estimates in Table 13.6 have been used in the processing schedule and Financial Model irrespective of the head grade being treated. The Qualified Person supports this approach until a grade-recovery relationship with arsenic can be confirmed. Testwork shows there is a strong relationship between head grade and tails values, which supports the constant recovery assumption for the 2022 FS and LOMP.

14 MINERAL RESOURCE ESTIMATES

The 2022 Mineral Resource estimate is based on four block models (Table 14.1) generated using Surpac and MineSight modelling and Micromine geological interpretational software and the AngloGold drill database migrated to Datashed format.

Table 14.1 Resource models used to derive the 2022 Mineral Resource estimate

Area/Pit	Model date
Sekekoto	December 2022
Sadiola Main, including Sirimana	March 2022
Tambali	30 Jun 2021
Combined FE3 and Timba	30 Jun 2021

Source: Sadiola PFS, November 2021; Sadiola Main Deposit, Model Development and Mineral Resource Estimate. February 2022

Similar evaluation methodologies were used for each of the four areas for which Mineral Resource estimation was undertaken (Sadiola Main, Tambali, FE3 and Sekekoto) as follows:

- Database compilation into a useable and verifiable format.
- Geological modelling and wireframing.
- Interpretation, definition and wireframing of mineralised domains.
- Geostatistical analysis and variography, by domain.
- Block modelling, grade and bulk density estimation.
- Model validation.

14.1 Mineral resource estimation criteria

14.1.1 Geological model and interpretation

Geological modelling was carried out where sufficient reliable drillhole logging and pit mapping information were available. The geological modelling considered rock type, alteration, intrusions, structural features or folding and fault zones. Also included in the modelling was information on material type characteristics including weathering and oxidation zones and relative levels of rock hardness. This data facilitated the manual construction of mineralised envelopes for grade estimation.

In all models, three surfaces were created to constrain the weathering surfaces:

- Base of laterite
- Base of complete oxidation
- Top of fresh rock.

At Sadiola Main, the weathering models are more detailed than at the other deposits with several different laterite and oxide surfaces identified and mapped.

14.1.2 Domaining

All mineralised envelopes were modelled using a 0.20 g/t Au envelope for Sadiola Main and Tambali or 0.30 g/t envelopes for FE3 and Sekekoto with a minimum downhole sample interval length of 2 m and a maximum of 2 m internal dilution in all cases. Each wireframe was assigned a unique numeric lode (wireframe) code.

- Sadiola Main: Five major domains with differentiation based on the dominant style of mineralisation and the relative spatial distribution of each. For Sadiola Main, the five main lodes had sufficient data to allow for statistical analysis to be completed. The rest of the individual sub-domains based on geological continuity did not contain enough data to allow for any meaningful statistical analysis and therefore the parameters from a nearby domain were applied.
- Tambali: Three major domains with differentiation based on the dominant style of mineralisation and the relative spatial distribution of each.
- FE3: 21 area domains which define different mineralisation zone orientations and some subtle spatial distribution of gold within those zones.
- Sekekoto: Four area domains which define different mineralisation zone orientations and some subtly different spatial distributions of gold within those zones.

Statistical analysis and variography were completed on individual mineralised envelopes where there were sufficient data. Where data were insufficient, mineralised envelopes with similar orientation and geology were grouped together to assist in the generation of variograms ensuring that each domain represents a single grade population of consistent orientation. Hard boundaries were used on all domains and sub-domains for the estimation process.

The interpreted sectional strings in all models were then connected in 3D to generate wireframes as “solid geometries” which were used in coding drillhole composites and block model files. Validation of the wireframes was completed before volumes were estimated and composites and block models coded.

Interpreted mineralised envelopes in the main deposits show good continuity of both grade and geology, as well as a coherent array of envelope orientations. Where the drill density decreases, grade and geological continuity became variable.

In general, grade distributions in the five deposits reviewed are consistent with the geological interpretation and with the wireframing of the lodes undertaken.

The mineralisation interpretations and domains are discussed in detail as follows.

Sadiola Main

At Sadiola Main, the geometry of the extensive soft, oxide gold deposit and supergene enrichment relates almost exclusively to the weathering history of the primary mineralisation. Intense tropical weathering has produced deep troughs of white to grey, decarbonated, kaolin-rich saprolite, locally abundant nontronite and relative gold enrichment. Penetration of groundwater has caused oxidation of the primary sulphides and the formation of sulphuric acid, further promoting deeper oxidation and kaolinization of the bedrock.

The variable permeability of the deposit, controlled by faulting, shearing and porosity, has led to the irregular “karst-like” weathering geometry from 30 m deep in the north to 220 m in the south. Weathering is deepest along the SFZ. The deeply weathered saprolite was protected from erosion by a capping of hardpan laterite (ferricrete).

Sadiola Main was subdivided into several lodes differentiated on the dominant style of mineralisation. The lodes were edited on 25 m sections, snapped to drillhole data, and used as the primary framework for the creation of wireframes. Lithological wireframes were also created based on the geological codes within the block model constraints.

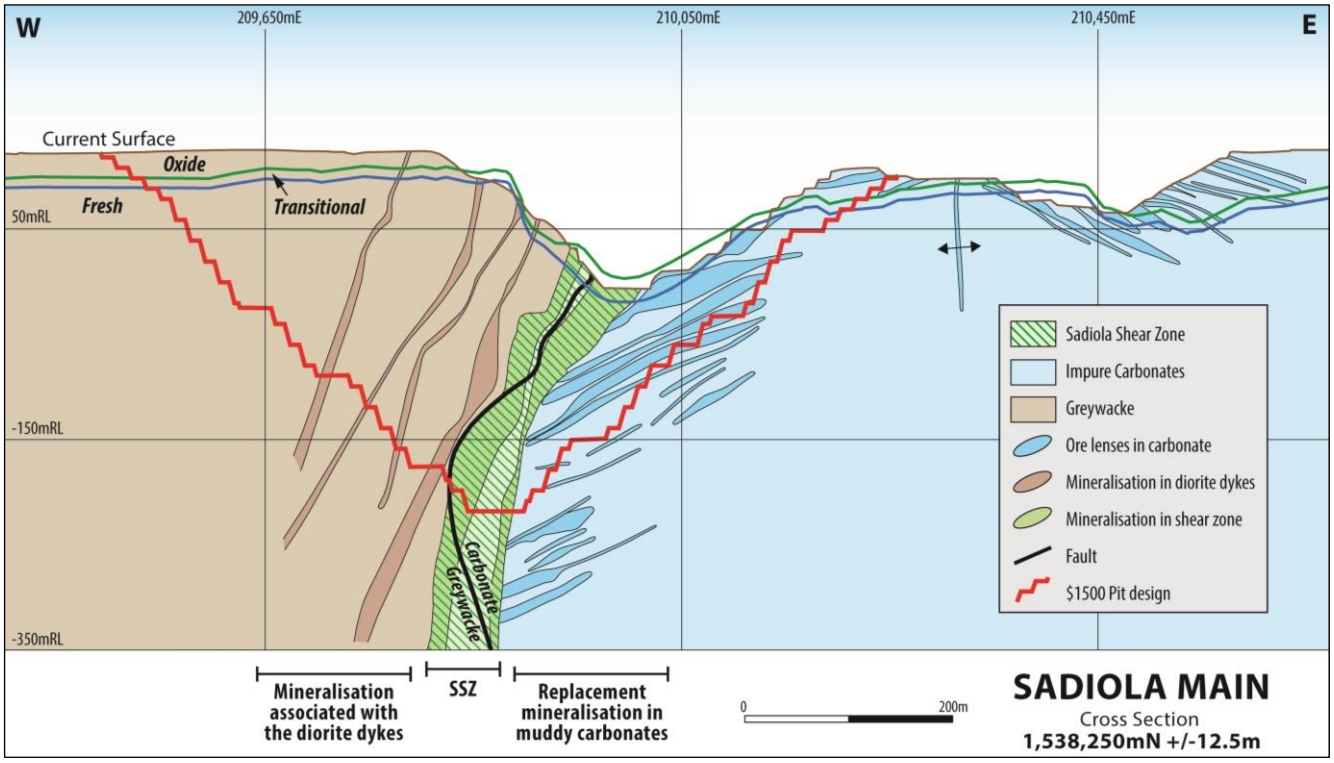
The drillhole composites were coded by lode and grouped by domain. The interpreted shapes were grouped into five major domains:

- 100’s series: Sub-vertical lodes dipping approximately 70–90° to the west.
- 200’s series: Westerly dipping lodes dipping approximately 25–45° to the west on the west of the anticline fold.

- 400's series: Flat supergene lodes only occurring in the oxide and laterite weathering profiles. Usually the surface expression of the primary mineralisation.
- 700's series: Easterly dipping lodes dipping approximately 25–30° to the east to the east of the anticline fold.
- 900's series: Historically mined paleochannel cutting all the above mineralisation in the northern half of the deposit and striking approximately 305°. Links up to an intermittent river/stream to the southeast, which has been diverted to the north of the deposit to facilitate bedrock mining.

The mineralisation wireframes are shown diagrammatically in Figure 14.1. The dominant domains are 100 and 200, located to the west, and largely confined the Sadiola Shear Zone (SSZ) mineralisation. The 400, 700 and 900 domains, comprising the north-easterly trending mineralised splays, are situated on the eastern side of the deposit.

Figure 14.1 Sadiola Main cross section showing mineralisation domains and weathering surfaces



Source: Allied, Sadiola FS, September 2022

A significant factor in the development of the remaining resources at Sadiola Main is the density of drilling below the fresh surface. Exploration and mining to date has been focused on oxide ore, and thus the density of drilling below this surface is lower.

The Qualified Person (Mr Mullins) undertook a detailed review of Sadiola Main drillhole composites vs gold grades and wireframe outlines, and the compositing and extraction by lode was shown to be consistent.

The Qualified Person also reviewed the updated modelling at Sadiola Main, focusing mainly on the Sirimana extensions to the immediate north, and noted that:

- In places the modelling/interpretation had not been snapped onto the drillhole intersections.
- Some mineralised intersections above the 0.2 g/t Au cut-off grade had been missed.
- Visual checks of the model against the sample data used to inform the estimates showed that the estimated blocks reasonably matched the sample data used to inform them, particularly in areas that had significant data to inform the estimates.

- Some of the modelled lodes' wireframes were not filled blocks (i.e. they did not have estimates).

Tambali

Although significant lithological information is available, the Tambali wireframes are primarily based on gold grade distribution.

The structural data (dip and dip direction) in the database was used to guide the orientation of the envelopes.

The Tambali wireframes have a similar appearance to the Sadiola Main deposit in that they consist of sub-vertical main structures (Domain 100), with westerly dipping shoots (Domain 200) that are capped by a supergene flat laterite and oxide capping (Domain 400). The main difference between Sadiola Main and Tambali is the host rock of each deposit, greywacke rather than carbonate.

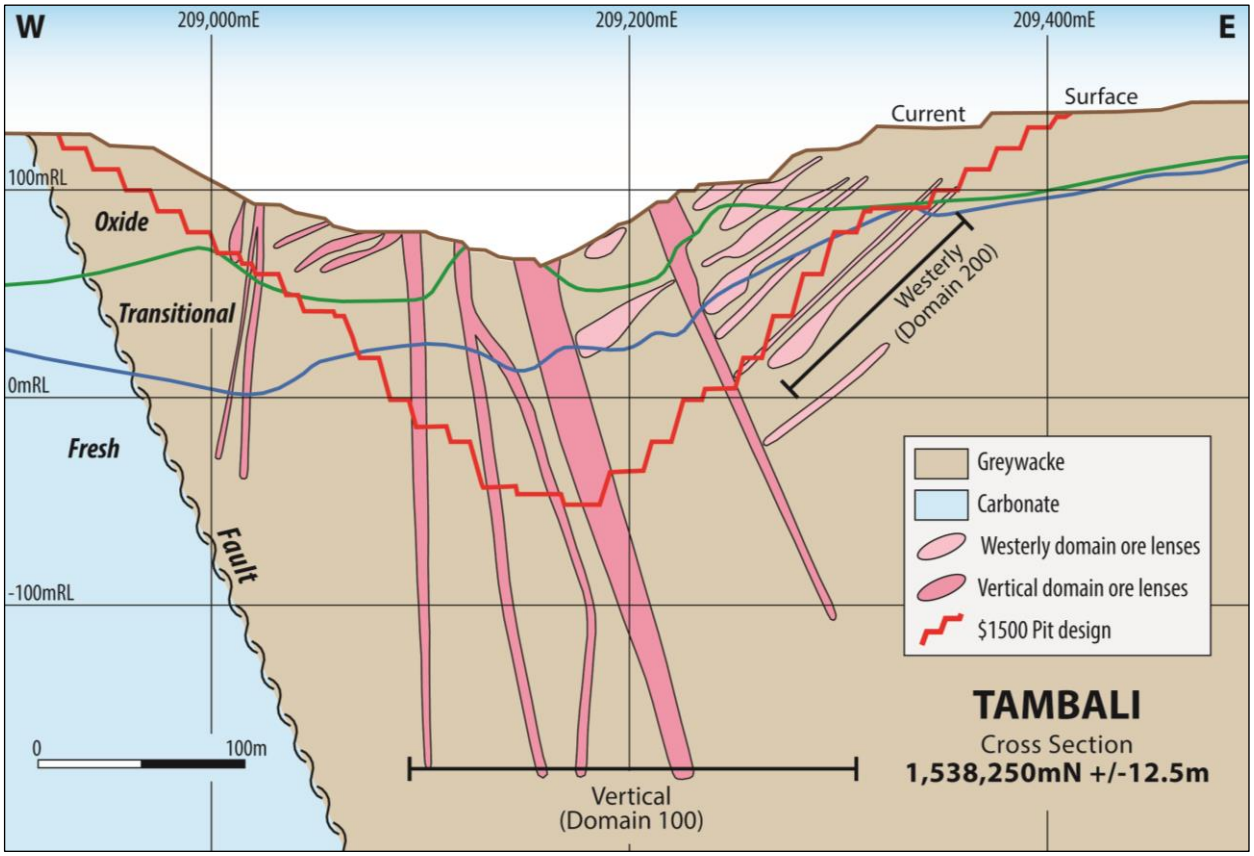
The drillhole data was assigned a domain code based on the wireframes, and the gold values were composited into 2 m lengths.

Each wireframe was assigned an individual domain depending on the series to which it belonged. The interpreted shapes at Tambali were grouped into three major domains:

- 100's series: Sub-vertical lodes dipping approximately 70–90° generally to the east.
- 200's series: Westerly dipping lodes dipping approximately 20–30° to the west.
- 400's series: Flat supergene lodes occurring only in the oxide and laterite weathering profiles, where they are usually the surface expression of the primary mineralisation.

Figure 14.2 is a north-looking view of the Tambali deposit.

Figure 14.2 Tambali cross section showing mineralisation domains and weathering surfaces



Source: Allied, Sadiola FS, September 2022

The Qualified Person undertook a detailed review of Tambali drillhole composites vs gold grades and wireframe outlines, and the compositing and extraction by lode were shown to be consistent.

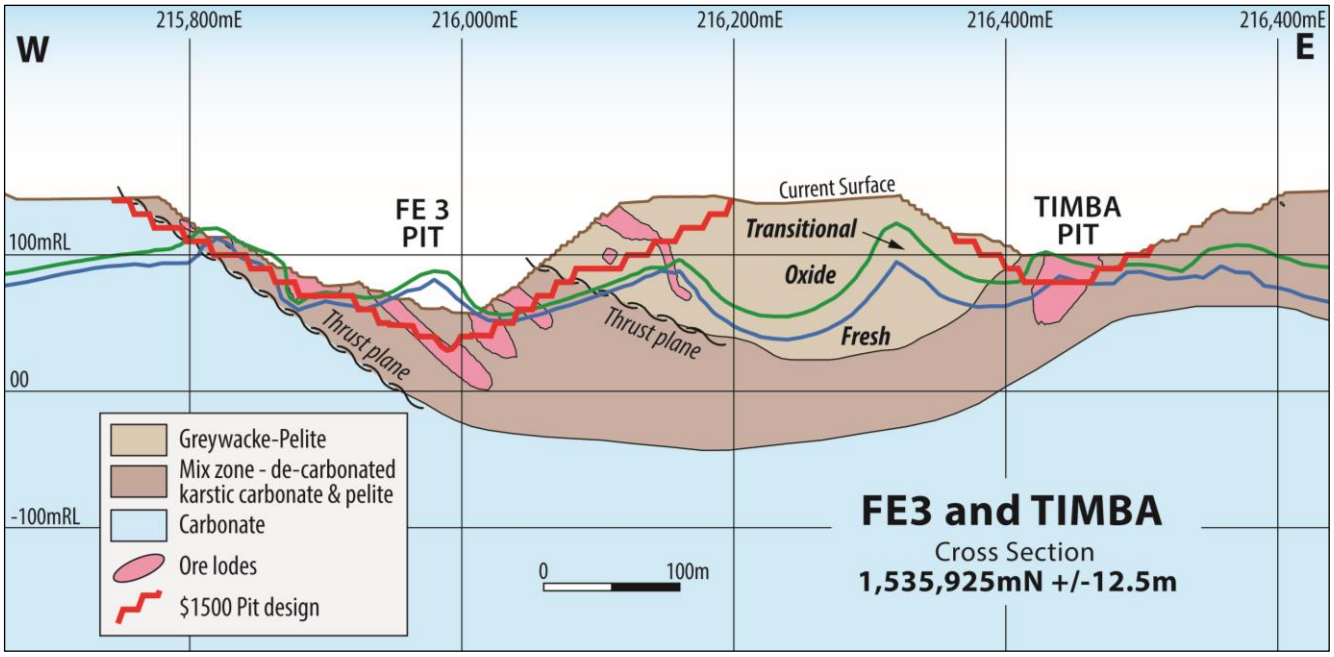
FE3

FE3 is subdivided into 21 domains which define different mineralisation zone orientations and the spatial distribution of gold within those zones. The initial interpretation of the mineralised zones was by digitized sections on an approximate 10 m Northing spacing. Locally, the section spacing is 20 m or more reflecting wider drilling spacing in some areas.

All mineralised envelopes were modelled using a nominal 0.30 g/t Au delineation envelope with a coincident aim of maintaining a minimum included downhole assay interval length of 2 m and a maximum of 2 m internal dilution.

The 21 domains were designated based on geographic distribution and anisotropic parameters. The domain distribution together with the mined-out areas are shown in Figure 14.3.

Figure 14.3 FE3 and Timba pits cross section showing mineralisation domains and weathering surfaces



Notes: Mineralisation domains – blue (above) and pink (below) current pit surface. Dark green dotted line shows the approximate Transitional to Fresh rock interface.

Source: Allied, Sadiola FS, September 2022

Drilling distribution is lower in areas that have not yet been mined and this is reflected in the resource classification.

Sekekoto

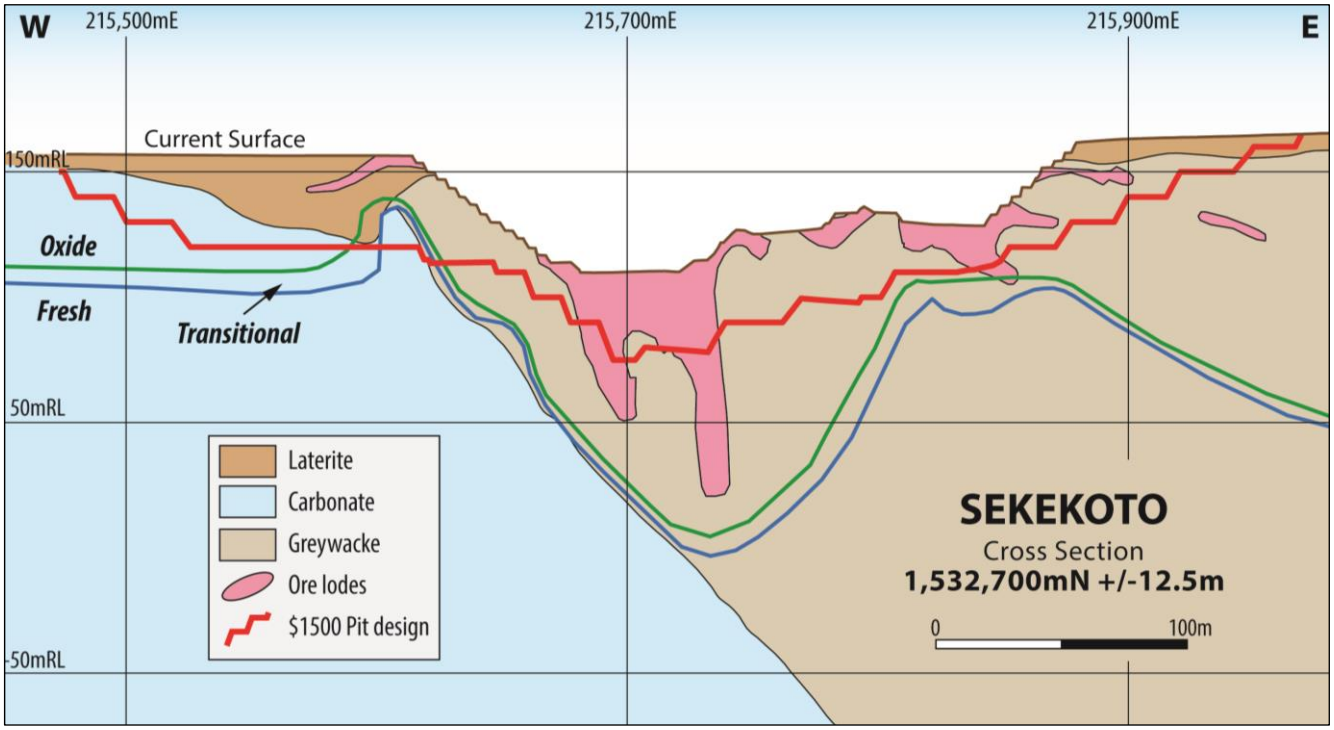
The Sekekoto wireframes have a variety of forms related to preferential deposition within stratabound and sometimes folded lithologies and within fault and brittle fracture breccia zones of variable orientation. The mineralisation wireframes developed to date are still largely based on gold grade distribution and verification of the orientation of the various Sekekoto lodes will be subject to confirmation by pit mapping where possible.

Figure 14.4 is a representative section showing the lithology and mineralisation interpretation at Sekekoto.

Weathering is deep (down to about 100–150 m at depth) and significant enrichment is noted in weathered rock. The mineralisation tends to be relatively steep close to the carbonate-greywacke contact and at depth but is flatter in the shallow weathered material (believed to be related to enrichment in the weathered zone).

As noted for the other pits, the drilling density is lower below the base of the current pit.

Figure 14.4 Sekekoto cross section showing mineralisation domains and weathering surfaces



Notes: Mineralisation lodes shown in pink – looking grid north.
Source: Allied, Sadiola FS, September 2022

14.1.3 Block modelling

For each deposit, Allied selected block models to cover the maximum extent of the modelled mineralisation and to provide waste block coverage to any areas that are un-mineralised. Where appropriate, selective sub-celling was used for definition at the geological and mineralisation boundaries together with the parent block size as shown in Table 14.2.

Table 14.2 Block cell sizes used in mineral resource estimation

Lode	Block size (m)	Sub-cell size (m)
Sadiola Main	10 x 10 x 3.33	2.5 x 2.5 x 1.6665
Tambali	10 x 10 x 3.33	1.25 x 1.25 x 1.6665
FE3	4 x 8 x 2	-
Sekekoto	10 x 5 x 3.33	1.25 x 1.25 x 1.6665

Source: Sadiola Pre-feasibility Study, November 2021; Sadiola Main Deposit, Model Development and Mineral Resource Estimate. February 2022

All the models were estimated using ordinary kriging (OK) into domains of similar geological and mineralisation characteristics.

14.1.4 Exploratory data analysis, compositing and top cuts

General distribution statistics

Allied undertook an analysis of the raw assay data for the main sample types throughout the deposits to determine the correlation between the different drillhole types. All drillholes were used for the wireframe interpretation but only RC and DD drillholes were used for compositing, geostatistical analysis and resource estimation.

Compositing

Allied analyzed the raw sample length statistics for Sadiola Main, Tambali and FE3 to determine the appropriate interval length. The analysis was undertaken on all samples contained within mineralised wireframes and showed that 90% of raw sample lengths, excluding grade control data, are 2 m in length, which was selected as the composite length.

Composites were flagged using the validated mineralisation wireframes according to the designated unique lode (wireframe) code. Composite run lengths started from the top of hole, with any residual (<1 m) composite at the hole end retained. The domain codes were flagged into the composite file field zone code.

Composites were reviewed against the raw sample statistics to ensure the process had not significantly impacted either the total length of sample or mean gold grade.

The Qualified Person concurs with the compositing procedures applied.

Top cuts

Top cuts were applied where necessary to reduce the influence of extreme grades during grade estimation. For analysis, some domains were grouped by geostatistical and geological similarities and the top cut was investigated for each individual wireframe within the domain. Everything over a coefficient of variation (CV) of 1.2 was deemed to require top cutting.

Top cuts were determined by assessing normal and log-histograms for extreme values and using a combination of mean variance plots and population disintegration techniques to reduce the CV to approximately 1.2. Top cuts were not applied at FE3 given the resource was estimated entirely within MineSight software.

The gold population distributions for each sub-domain within the main domain were interrogated to ascertain the relative numbers of high-grade outlier composites. Probability statistics for each domain generally showed a distinct break in the population distribution curve around the 99th percentile level. Observed probability distribution anomalies were then used as the basis to assign outlier grade distance restrictions for each area domain.

The Qualified Person has reviewed the top cutting applied for the Sadiola deposits and agrees the approach is appropriate.

14.1.5 Variography

Allied examined spatial continuity within each lode using Supervisor software. Variograms were calculated on normal scores transformed data, converting any skewed grade distribution to a standard normal distribution. For use in the block model interpolation estimation process, the normal score variogram models were back transformed, with the back transformed variogram model having a higher nugget value than the transformed variogram models and different sill values as a result, but the same range and orientation.

Where applicable, domains of similar orientation, geology and statistics were grouped for variogram modelling where an individual lode had insufficient samples for analysis.

Allied supplied the Supervisor files for review. FE3, being estimated using MineSight, does not have Supervisor files created.

Data has not been separated out above and below the fresh surface, and variograms have been calculated within each lode, even if it straddles the surface. This review has found that the variograms and anisotropies differ for data extracted above and below the fresh surface. However, it is acknowledged that the thrust of modelling was to capture samples only near and a small (arbitrary) distance across the current topographic/pit surface (to make the task more manageable and reduced emphasis on what has been mined to date).

The samples captured in wireframing in this way are not representative of the samples in the entire weathering profile, only small “segments” immediately adjacent to the pit surface “remnant” zones below the pit surface. Most of the mineralisation below the greater part of the pit area is transitional material (of questionable accuracy from logging interpretation etc.) and largely in the fresh bedrock.

This is material for local estimates but would not materially affect global estimates.

14.1.6 Kriging neighbourhood analysis

Kriging neighbourhood analysis (KNA) is the process of running a series of test grade estimates using variable estimation parameters and assessing which parameters result in the best quality estimate, using the geostatistical parameters of slope of regression and kriging efficiency. The higher the values for slope of regression and kriging efficiency, the better the quality of the estimate.

In the Qualified Person’s opinion, Allied’s approach and results are rigorous and reproducible for Sadiola Main, Tambali and FE3.

14.1.7 Grade estimation

Ordinary block kriging (OK) was selected as the preferred grade interpolation method for all three deposits as it uses information directly related to the underlying variability of the data to guide the estimation process. In the Qualified Person’s opinion, OK is the best linear unbiased estimator and considered appropriate for the styles of mineralisation being estimated by Allied at Sadiola.

14.1.8 Density

Two methods of density calculation have been used at Sadiola; Probe and Manual (the Archimedes method). Both methods were broken down by rock type and weathering profile to determine their appropriateness.

Probe method

This method involves lowering a geophysical logging probe down an open drillhole which consists of a focused gamma-gamma source, a natural gamma detector and a caliper. The caliper arm is used to hold the source and detector in contact with hole wall and readings are collected from one sector of the drillhole wall, usually at 10 cm intervals. The probe method is a wet bulk density and moisture should be subtracted from the result.

Manual (Archimedes) method

This method is also known as the water displacement method. This involves drying the sample and weighing it in air (W1), then weighing the sample in water (W2) by placing the specimen in a basket (within water) which is suspended from a balance. If the specimen is porous the dry specimen should be coated in wax before weighing and wetting.

Density values

The probe densities were used for the oxide and transitional material as the manually measured densities were considered too high (close to the fresh rock densities). The fresh rock densities were accepted from the manual method because there were numerous measurements when compared to those by the probe method.

As there were no measurements taken of the diorite in the oxide and transition profiles, the density value was taken from the siliclastics, as most of the diorites are hosted within the siliclastics. No density values were measured from the paleochannel material, so the laterite density value was used.

A nominal value of 1.20 t/cm^2 was used for any dumps and infill. It is recommended that this density is verified.

The density values are summarised in Table 14.3. The Qualified Person recommends that bulk density values be checked on a regular basis. The mean bulk density values used in the Sadiola Mineral Resource estimate are summarised in Table 14.4.

Table 14.3 Bulk density values by weathering and lithology

Weathering	Siliclastic		Carbonate		Diorite		Laterite/Paleochannel	
	Number	Density (t/m^3)	Number	Density (t/m^3)	Number	Density (t/m^3)	Number	Density (t/m^3)
Oxide	704	2.05	286	1.94	-	2.05	419	2.09
Transitional	146	2.38	14	2.09	-	2.38	-	-
Fresh	12,390	2.68	20,375	2.73	3,163	2.73	-	-

Source: Allied, Sadiola FS, September 2022

Table 14.4 Mean bulk densities used at Sadiola

		Sadiola Main	Tambali	FE3	Sekekoto
Laterite/Clay	Above laterite surface and hard-soft contact and above BOCO surface		1.93		
Saprolite (Soft Oxide)	Below laterite surface and hard-soft contact and above BOCO surface		1.95		
Silicified (Hard) Oxide	Below laterite surface and hard-soft contact and above BOCO surface	1.94–2.05	2.40	2.00	2.18
Soft Oxide	Below TOFR surface and above hard-soft contact		2.00		
Hard Oxide	Below TOFR surface and below hard-soft contact		2.65		
Transitional	Between bottom of oxide and TOFR surfaces	2.09–2.38	2.10	2.20	2.36
Fresh rock (sulphides)	Not oxidized; may contain fresh sulphides	2.38–2.73	2.65	2.70	2.69

Notes: BOCO – base of complete oxidation; TOFR – top of fresh rock.
Source: Allied, Sadiola FS, September 2022

The Qualified Person considers the density values used to be appropriate.

14.1.9 Model validation

Allied undertook visual validation of composite grades vs block grades section-by-section through the model. Sectional and elevation validation profiles were generated for each lode. The profiles compared the volume-weighted average of the block grades to the length-weighted mean of the input composite grades for northing, easting and elevation slices through the block model, and assisted in the assessment of the reproduction of local mean grades to validate grade trends in the model.

For both the Tambali and Sadiola models, a good local reproduction of the composite input grades was observed, with model grades (as expected) tending to be slightly lower, smoother or less variable than the local mean composite grades. At FE3, greater variability was identified, but certainly smoother than the individual composites.

Visual validation confirmed that the block model grades corresponded reasonably well with the drillhole sample composite grades.

The Qualified Person's review repeated the validation exercise, and whilst broadly agreeing with the results, considers there to be excessive smoothing in places. The Qualified Person recommends that the declustered input composite data be included with the swath plots as this reflects the declustering of the data by OK during the interpolation of grade.

Resolve Mining Solutions (Resolve), an Australian based mining consulting company, completed an independent peer review of the Sadiola Mineral Resource estimate in 2022. Resolve concluded that:

- The estimate is suitable for economic studies and mine planning purposes.
- Overall, the estimate is a well modelled, slightly conservative grade estimate.

14.1.10 Classification

Sadiola's Mineral Resources and Mineral Reserves were initially classified in the 2022 FS in accordance with the guidelines of the JORC Code (2012). The confidence categories assigned under the JORC Code (2012) were reconciled to the confidence categories in the CIM Definition Standards for Mineral Resources and Mineral Reserves (the 2014 CIM Definition Standards). As the confidence category definitions are the same, no modifications to the confidence categories were required. Mineral Resources and Mineral Reserves in this Technical Report are reported in accordance with the 2014 CIM Definition Standards.

Mineral Resource categories were assigned using a combination of geological, grade and geostatistical criteria and The Qualified Person considers this to be a valid approach.

The Resource was classified on the following basis:

- Measured is based on:
  - Areas of 20 m x 10 m (YX) RC grade control
  - Run number = 1 (*pass_au* attribute)
  - ≥80% sample fill (compared with the maximum number of samples) by using the *percentage_samp* attribute
  - ≥0.8 Conditional bias slope (*sor*) attribute.
- Indicated is based on:
  - Run number = 1 or 2 (*pass_au* attribute).
  - ≥50% sample fill (compared with the maximum number of samples) by using the *percentage_samp* attribute
  - ≥0.5 Conditional bias slope (*sor*) attribute.
- An area is classified as Inferred where the data density is sufficient to imply but too sparse to confirm geological and grade continuity.

14.2 Mineral Resources

The Mineral Resource estimate was reported above a 0.5 g/t Au cut-off for the four gold deposits within the Sadiola Property (Table 14.5) and are contained within optimised Lerchs-Grossmann pit shells based on likely operational costs at a gold price of $1,800/oz.

The information in this Technical Report that relates to Sadiola Mineral Resource estimation is based on information compiled by Mr John Cooke, Mr Shane Fieldgate and Mr Steve Hyland and fairly represents this information. Mr Cooke is a Fellow and Mr Fieldgate is a Member of the Australian Institute of Geoscientists (AIG) and Mr Hyland is a Fellow of the Australasian Institute of Mining and Metallurgy (FAusIMM). Mr Cooke is employed by Allied, through Chiron Exploration Pty Ltd, Mr Fieldgate is a consultant to Allied, and Mr Hyland is employed by Hyland Geological and Mining Consultants.

Messrs. Cooke, Fieldgate and Hyland have sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which they undertook to qualify as Qualified Persons as defined in the CIM Definition Standards (2014). Messrs. Cooke, Fieldgate and Hyland consent to the inclusion in this Technical Report of the matters based on this information in the form and context in which it appears.

The Qualified Person responsible for Item 14 (Mr Mullins) has critically examined this information, made his own enquiries, and applied his general mineral industry competence to conclude that the information is adequate for the purposes of this Technical Report and complies with the definitions and guidelines of the CIM. The Qualified Person considers the reported Mineral Resource to be a fair reflection of the exploration activity and modelling processes undertaken.

To the best of the Qualified Person's knowledge, at the time of estimation there were no known environmental, permitting, legal, title, taxation, socio-economic, marketing, political or other relevant issues that could materially impact the eventual extraction of the Mineral Resource.

Table 14.5 Sadiola Mineral Resources as of 31 December 2022 at a 0.5 g/t Au cut-off (100% equity basis)

Area	Measured			Indicated			Total Measured and Indicated			Inferred		
	Mt	Au g/t	Au koz	Mt	Au g/t	Au koz	Mt	Au g/t	Au koz	Mt	Au g/t	Au koz
Sadiola Main	0.1	0.80	2	193.9	1.50	9,659	194.0	1.55	9,661	6.8	1.10	240
FE3	0.0	0.00	0	5.5	1.65	293	5.5	1.66	293	1.2	1.85	71
Tambali	0.0	0.00	0	1.5	0.96	46	1.5	0.95	46	3.0	1.06	103
Stockpiles	13.1	0.91	384	0.0	0.00	0	13.1	0.91	384	0.0	0.00	0
Sekekoto	0.0	0.00	0	1.4	0.99	44	1.4	0.98	44	1.0	0.98	33
Total	**13.2**	**0.91**	**385**	**202.3**	**1.50**	**10,042**	**215.5**	**1.50**	**10,427**	**12**	**1.15**	**446**

Notes:

- *Data is reported to significant figures to reflect appropriate precision and may not sum precisely due to rounding.*
- *Mineral Resources are inclusive of Mineral Reserves.*
- *Mineral Resources are reported within a $1,800/oz optimum pit at a 0.5 g/t Au cut-off and depleted to 31 December 2022.*
- *Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.*

14.2.1 Reasonable prospects for eventual economic extraction

The Mineral Resource estimate satisfies the CIM Definition Standards (2014) criteria of "reasonable prospects for eventual economic extraction". The Mineral Resource estimate was reported within an optimised pit shell based on an $1,800/oz gold price and mining and processing parameters derived from the mining studies undertaken by Allied. A 0.5 g/t Au cut-off grade was used to report the Mineral Resource estimate within the optimised pit shell, the cut-off grade being within the range of the Mineral Reserve optimisation cut-off grades at $1,500/oz as shown in Table 15.2.

15 MINERAL RESERVE ESTIMATES

The Sadiola Mineral Reserve comprises the Sadiola Main and FE3. Mining is anticipated to be carried out through open pit extraction methods until 2038, after which low-grade stockpiles will be treated until 2041.

Mining will be contractor operated for the full duration of the project life. The 2022 FS is based on using 300-tonne class excavators and 91-tonne haul equipment used for initial mining of the oxide ore will be sufficient for the continued mining of primary ore, but notes that potential upside benefit could be realized by using larger equipment for the hangingwall overburden.

PW Mining Contractors has been contracted for the oxide mining and current contractor rates are applied to the mining of the pits, apart from Stages 12 and 13 at depth where budget rates have been applied.

Allied has considered owner mining but concluded that contractor mining provides economic advantages.

15.1 Key mine optimisation assumptions and parameters

Whittle 4X was used to optimise pit shells on NPV for each mining area based on key input parameters and modifying factors. The Mineral Resource for each mining area was re-blocked into SMUs with the SMU best suited to the proposed mining equipment and the corresponding ore loss and dilution is listed in Table 15.1.

Table 15.1 SMU sizes, ore loss and dilution by area

Area	SMU size	Ore loss	Dilution
Sadiola	5 x 10 x 3.33	5%	8%
FE3	5 x 10 x 2.5	11%	25%

Source: Allied, Sadiola FS, September 2022

Due to the varying nature of the mineralisation in each mining area, FE3 displayed higher dilution and ore loss factors than Sadiola Main due to the narrower mineralisation (<10 m in FE3 vs >50 m in Sadiola Main). The dilution and ore loss assumptions used in the Mineral Reserve calculation are considered reasonable by the Qualified Person (Mr Earl) based on the geological and mineralisation characteristics of each area.

Overall slope angles (OSA) used in the optimisation are listed in Table 16.1 and ranged from 35° in oxide and transition rock and 43° to 49° in fresh rock.

Cut-off grades vary by ore type due to variations in recoveries, costs for ore processing and ore haulage and gold price and recovery assumptions shown in Table 15.2. The cut-off grades were applied to 11 differing rock types encountered during mining, including oxide, laterite, saprolite, transitional and fresh. The cut-off grade was determined within Whittle 4X using the formula: cut-off grade = (dilution x processing costs) / (net price x recovery).

Table 15.2 Mineral Reserve pit optimisation key material assumptions

Parameter	Unit	Oxide	Transition	Fresh
Cut-off grade	g/t Au	0.31–0.41	0.44–0.49	0.62–0.73
Ore distribution	%	12	8	80
Recovery	%	90–92	75.5–85	70.7–82.3
Processing capacity	Mt/a	12.2–20.9	12.2	6.7–8.8
Gold price	$/oz	1,500	1,500	1,500
Costs	$/t (ore)	12.9–16.6	16.7–16.9	19.8–24.6
Refining costs	$/oz	4.50	4.50	4.50
Royalties	%	6.25	6.25	6.25

Source: Allied, Sadiola FS, September 2022

The Qualified Person considers the key input assumptions used in the pit optimisation process reasonable and generally of a conservative nature, particularly in terms of the transition and sulphide ore assumptions. The use of conservative estimates in determining a Mineral Reserve will provide potential future upside for Allied in terms of mining, processing and recovery. The use of Whittle software for the purposes of defining economic outlines for the Mineral Reserve estimation is considered appropriate and acceptable in the industry.

It is noted that ultimate "revenue factors" were determined in Whittle that represent the gold price that would represent the optimal NPV for the project, taking into consideration a reasonable balance between optimal ore extraction and limited waste stripping required. The ore tonnages and grade from the optimal pit shell would represent the optimal Mineral Reserve. The revenue factors for Sadiola that optimised NPV and risk were selected by Allied as summarised in Table 15.3.

Table 15.3 Sadiola pit optimisation revenue factor selection

Asset	Revenue factor	Effective gold price
Sadiola (Main)	0.88x	$1,320/oz
FE3	0.80x	$1,200/oz

Source: Allied, Sadiola FS, September 2022

The pits with the smallest resource base have the lowest revenue factors, as higher revenue factors would result in excessive waste dilution and would become sub-optimal. This lower revenue factor will allow for flexibility and upside for additional resource extraction potential.

15.1.1 Other modifying factors

Other modifying factors assessed included:

- The geotechnical work conducted at Sadiola, which is sufficient to support the reporting of the Mineral Reserve.
- Metallurgical and processing: Oxide recoveries are estimated from historical production results and primary recoveries are based on testwork results.
- Infrastructure: Infrastructure aspects for the Sadiola Expansion Project have been conducted to a feasibility study level and support the declaration of a Mineral Reserve.
- Economic and marketing: A flat forward gold price of $1,500/oz was used for the pit optimisation, LOM plan and Mineral Reserve estimate, which is marginally lower than the long-term consensus gold price.
- Legal: As disclosed in Item 4, the key licences and permits for the Sadiola Expansion Project have been obtained or there is a reasonable prospect for them to be obtained in a timely manner.
- Environmental: Sadiola complies with Malian legislation and alignment with good international practice in its approach to environmental management.
- Social: Key social matters have been identified in the 2022 FS and are being addressed. Allied intends full compliance with Malian legislation and alignment with international good practice. The planned Sadiola Expansion Project will not require relocation of any communities. No other material social issues have been identified that would impede the progress of the Project.

No risks issues have been identified regarding the modifying factors that would materially impede the conversion of Mineral Resources to Mineral Reserves.

15.2 Mineral Reserves

Sadiola's Mineral Reserves were estimated by Orelogy Consulting Pty Ltd (Orelogy) of Perth, Australia (Allied's mining consultant) in the 2022 FS and depleted to 31 December 2022 taking into consideration classifications and prospects of reasonable economic extraction through open pit mining methods.

Probable Mineral Reserves reported by Allied are summarised in Table 15.4 by classification and mine area. Inferred Resources were not included in the Mineral Reserve calculation.

Table 15.4 Sadiola Mineral Reserves as of 31 December 2022 (100% equity basis)

Area	Proven			Probable			Total		
	Mt	Grade (g/t)	Au (koz)	Mt	Grade (g/t)	Au (koz)	Mt	Grade (g/t)	Au (koz)
Sadiola stockpiles	13.1	0.91	384	-	-	-	13.1	0.91	384
Sadiola Main	-	0.66	-	132.7	1.58	6,737	132.7	1.58	6,737
FE3	-	-	-	3.6	1.11	129	3.6	1.11	129
Total	**13.1**	**0.91**	**384**	**136.4**	**1.57**	**6,866**	**149.5**	**1.51**	**7,250**

Note: Data is reported to significant figures to reflect appropriate precision and may not sum precisely due to rounding. Mineral Resources are inclusive of Mineral Reserves.

The classification categories of Probable and Proved Ore Reserves under the JORC Code (2012) are equivalent to the CIM categories of Probable and Proven Mineral Reserves (CIM Definition Standards, 2014).

The information in this Technical Report that relates to the 31 December 2022 Sadiola Mineral Reserve estimate is based on information compiled by Mr Steve Craig and fairly represents this information. Mr Craig is a Fellow of the AusIMM and is an employee of Orelogy. Mr Craig has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration and to the activity which he undertook to qualify as a Qualified Person as defined in NI 43-101.

The Qualified Person responsible for Item 15 (Mr Earl) has critically examined this information, made his own enquiries, and applied his general mineral industry competence to conclude that the information is adequate for the purposes of this Technical Report and complies with the definitions and guidelines of the CIM.

The 2022 Mineral Reserve represents about a 66% resource to reserve conversion of total gold. A small amount of Measured Resource at Sadiola Main (<0.1 Mt) was classified as a Probable Mineral Reserve.

The Qualified Person finds the overall Mineral Reserve estimate to be reasonable based on the modifying factors and other applicable criteria applied to the Mineral Resources and operation, respectively. The Financial Model is based on the Mineral Reserve and generates a positive cash flow at a $1,500/oz gold price.

The Qualified Person reported the open pit ore and waste volumes within final pit designs. The results aligned closely with the 2022 FS inventory and Mineral Reserves.

15.3 Known issues that may materially affect Mineral Reserves

The Qualified Person (Mr Earl) is unaware of any issues in the 2022 FS that materially affect the Mineral Reserves in a detrimental sense.

Factors that may materially impact the Mineral Reserve estimates in the longer term include:

- Lower than forecast long-term gold prices.
- Material changes to metallurgical recoveries.
- Changes to pit optimisation input assumptions.
- Increased operating cost assumptions.
- An increase in mining dilution.
- Changes to the regulatory environment under which the 2022 FS was developed.

16 MINING METHODS

Sadiola was commissioned in 1996 and has produced over 8.2 Moz of gold in that time. Sadiola ceased mining operations in March 2018 with processing of low-grade stockpiles continuing into 2021. Mining recommenced in 2021 with the mining of oxide ore from Tambali and Sadiola Main.

Currently Sadiola consists of two open pit mines, Sadiola Main and FE3, which continue to mine oxide and transitional ore to feed the existing oxide processing facility at a rate of 5.0 Mt/a. The Tambali Mineral Reserve was mined out in 2022. Mining will expand to 10 Mt/a when the processing of primary ore commences in Q1 2026.

Mining of FE3 North will be complete in 2025 and the open pit will be used to store tailings material from the new plant until 2028. FE3 South and FE4 can receive tailings material from 2029.

16.1 Geotechnical parameters

Geotechnical information used in the 2022 FS was primarily based on the geotechnical investigations at Sadiola which were undertaken in 2010 by SRK Consulting (SRK). Since 2010, little mining has taken place within the Sadiola Main pit, with most mining spread across the satellite pits. Various reports have been created since 2010, which provide valuable information for setting precedence within the primary pits and other satellite pit designs based on geotechnical analysis and empirical observations.

To develop geotechnical parameters for the mine optimisation and designs, Allied's geotechnical engineer and an independent geotechnical engineer (George, Orr and Associates) assessed earlier geotechnical reports, optimisation reports, recent mining performance and the 2021 geotechnical drilling and testwork results from Sadiola Main.

The overall geotechnical design parameters by oxide/rock type determined from the recent geotechnical studies are summarised in Table 16.1. Two ramps are required in the Sadiola Main pit to mitigate the risk from stack-scale wedge failures involving the interaction of the major lower angle NE-SW trending faults, potentially affecting ramp stability as discussed in Item 16.4.1.

Table 16.1 Sadiola overall slope angles

Parameter	Units	Laterite	Oxide	Transition	Tambali / FE3	Sadiola		
						Fresh North/ South-West / West	Fresh East	Fresh South-East
Batter Angle	°	70	70	70	75	75	75	75
Bench height	m	10	10	10	20	20	20	20
Stack angle	m	35	35	35	54.9	54.9	60	50
Berm width	m	10.65	10.65	10.65	8.7	8.7	6.2	11.4
Geotech berm width	m		n/a		n/a	20	20	20
Max. stack height	m		n/a		n/a	80	80	80
Overall slope angle	°	35	35	35	35	45.9	48.8	43.1

Source: Allied, Sadiola FS, September 2022

16.2 Hydrological parameters

Groundwater inflows to each of the mining stages were estimated by PSM Consulting using a groundwater model which was informed by historical performance as well as additional drilling and pumping tests completed in 2022.

16.2.1 Sadiola Main

The far north area of the Sadiola Main pit is flooded with approximately 4.3 GL of water. Dewatering of the Sadiola Main pit commenced in July 2022 and will take approximately 13 months to dewater with completion estimated in Q3 2023, ahead of requirements for mining. A minimum pumping rate of 265 m^3/h is required to maintain a six-month dewatering buffer ahead of mining.

A combination of existing and new dewatering bores will be used for dewatering of aquifers in Sadiola Main as the pit is deepened.

16.2.2 FE3

Previous mining at FE3 Pit 3 experienced high groundwater inflows. The pit is flooded with approximately 2.1 GL of water and requires dewatering to 70 mRL by Q1 2024 to maintain a six-month buffer ahead of mining. This will enable the six dewatering wells to be recommissioned. An additional four dewatering wells will be required at FE3 to dewater ahead of future mining.

16.3 Mining methods and equipment

Mining of the Sadiola Main and FE3 Mineral Reserves will be carried out conventional open pit extraction methods until 2038, after which low-grade stockpiles will be treated until 2041. Mining will use 300-tonne class excavators and 91-tonne class haul equipment for mining of oxide ore and the continued mining of primary ore. Studies show that there is no material upside benefit realized by using larger equipment.

A mining contractor has been contracted for the oxide mining and current contractor rates are applied to the mining of most of the pit stages apart from the deeper Sadiola Main Stages 12 and 13. Contractor budget costs were applied for mining of the primary orebodies. Allied has considered owner mining but concluded that contractor mining provides economic advantages.

The existing mining contractor has three fleets of Caterpillar 6030 excavators and Caterpillar 777 trucks. The additional mining equipment fleet over the LOM is highlighted by type in Table 16.2, inclusive of replacement equipment and is supported by a group of ancillary equipment and centrally located workshops.

Table 16.2 Mining equipment requirements

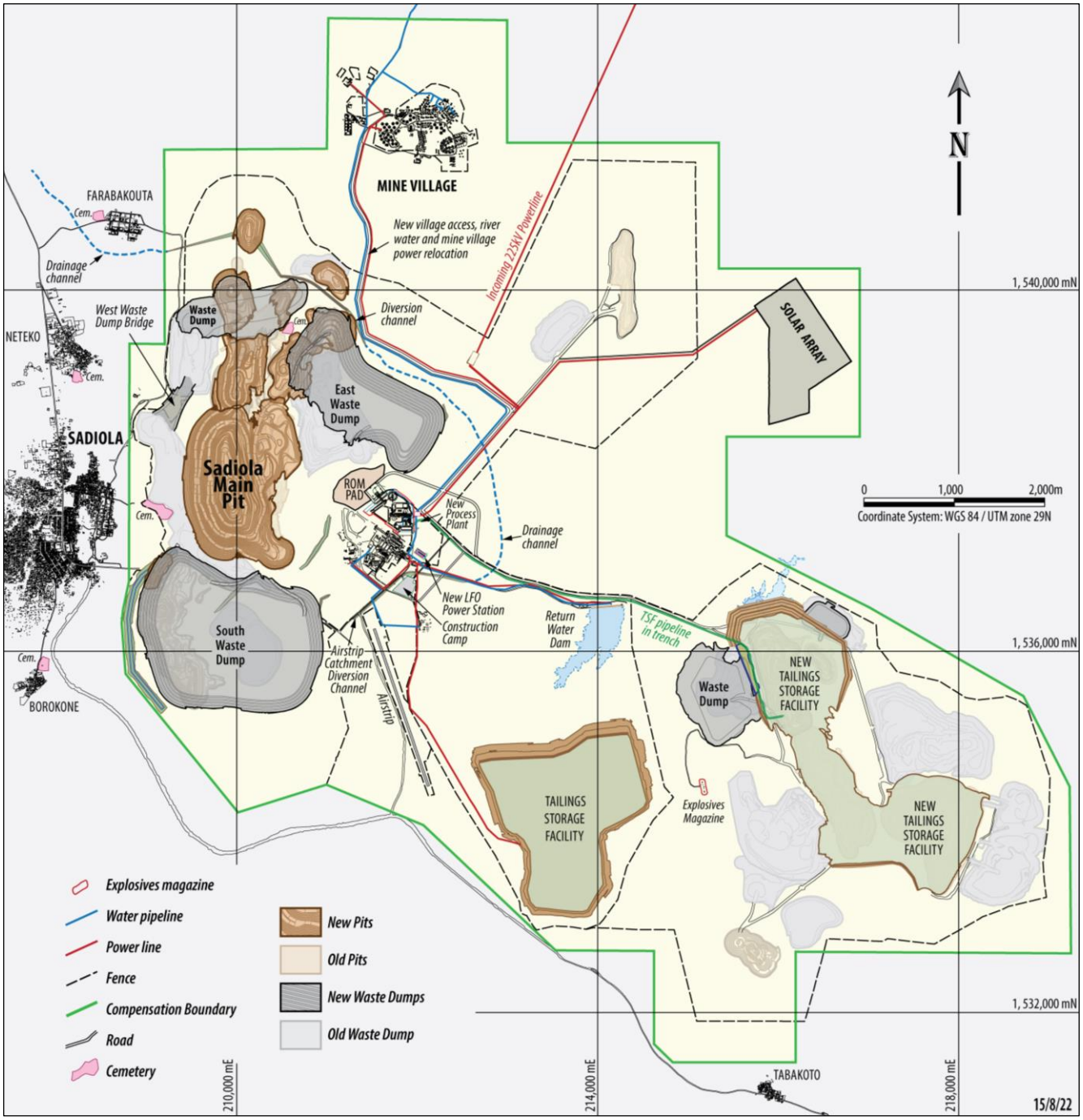
Equipment	Model	Additional fleet required	Total over LOM
Excavators	Cat 6030	5	8
	Cat 6015	0	2
	Cat 336	0	1
Trucks	Cat 777	32	56
Water trucks	Cat 777	3	6
Dozers	Cat D9	6	12
Graders	Cat 16M	3	6
Front-end loaders	Cat 988	3	5
Drill rigs	Sandvik DP 1500	9	18

Source: Allied, Sadiola FS, September 2022

16.4 Mine design

Figure 16.1 shows the positions of the current and future planned open pits and the new TSF (at FE3 and FE4) in relation to other mine infrastructure. For the purposes of the Technical Report, only open pit mining has been considered. While potential exists for additional extraction through underground methods, these have been considered by Allied to be at a conceptual level only and do not form part of this Technical Report.

Figure 16.1 Sadiola mine layout



Source: Allied, Sadiola FS, September 2022

Key material aspects of mine planning and mine design are as follows:

- Mining will occur in existing pits for all existing mining areas; no greenfields pits will be established.

- Dewatering of pits and storage of some water will be required.
- Ore extraction from the pits will initially be focused on oxide ores until Q4 2025 and primary ores will be targeted from 2026 onward.
- A new TSF will be required from ~Q1 2025 onward. FE3 North pit needs to be mined out before that time.
- Mining will be carried out by contractors over the entire LOM.
- Geotechnical risks exist in the large Sadiola Main pit which have been mitigated by additional geotechnical testwork, staged mining, radar monitoring and having two separate ramps.

16.4.1 Bench design, drilling and blasting and geotechnical considerations

The existing pits have been well designed and laid out from a geotechnical and practical mining perspective. This provides Allied with limited need to recontour or rehabilitate mining areas prior to extraction, nor is excess additional pre-stripping required to access ore. Bench designs have been considered for waste and ore and the current design parameters are outlined in Table 16.3 with 20 m wide catch berms every 50 m in the oxide zone and 80 m in the primary zone.

Table 16.3 Open pit bench design criteria summary

	Units	Saprolite oxide	Transition	Primary
Bench heights (ore and waste)	m	10	10	20
Batter angle (ore and waste)	°	70	70	75
Bench width	m	10.6	10.6	6.2–11.4 (dependent on design sector)
Inter-ramp angle		35°	35°	50–60° (dependent on design sector)
Waste drill pattern (127 mm diameter)	m	n/a	4.3 x 4.9	
Ore drill pattern (127 mm diameter)	m		3.2 x 3.7	
Waste powder factor	kg/t		0.7	
Ore powder factor	kg/t		0.7	

Source: Allied, Sadiola FS, September 2022

The Qualified Person (Mr Earl) considers the design criteria for drilling and blasting of waste rock and ore to be reasonable. The integrity and design of the existing pits provide good precedents for appropriate bench heights and design factors, and it is further noted that pre-splitting of benches has been factored in to ensure bench integrity is maintained for the life of the operation. This is particularly important in the large Sadiola Main pit where notable geotechnical factors need to be considered.

Given the elevated levels of water and rainfall, emulsion blasting has been proposed. While more expensive and challenging to use than conventional bulk explosives such as ammonium nitrate fuel-oil, it is important to ensure that limited re-drilling is required, and consistent fragmentation of blast-rock is maintained for loading and hauling. The rock formations at Sadiola are generally classified as R5 (Very Hard Rock).

As further described in Item 7, the geology of the Sadiola Main mining area comprises mainly carbonated pelitic marble to the east, and greywacke to the west, separated by an extensive 20 m to 60 m wide north-striking fracture zone, known as the Sadiola Fracture Zone (SFZ), which dips steeply at 72° to the west. The extensive fracturing around this zone is evident through the diorite and quartz-feldspathic intrusions that occur extensively within this region, in both the footwall and hangingwall. The existence of these faults is known and Allied's geotechnical testwork from 2,500 m of dedicated drilling was incorporated into the design parameters.

The Sadiola Main pit experienced several pit sidewall/bench failures in 2007 and 2008, particularly on the western side, but these occurred largely in the upper weathered zones.

Of material concern from a geotechnical perspective appears to be the occurrence of more faulting in the western side of the Sadiola Main pit and mineralisation. Continued mining predominantly toward this side would result in continued pushbacks to the west and into this faulted area for future pit shell stages 11 to 13. Further geotechnical drilling has been completed within the stage 13 pit to assess the risk of pit wall failure in this region. Based on the drilling and additional analysis, wall slopes have been validated with the following considerations to reduce the risk of pit wall failures from these faults which might potentially result in in lost production, increased costs, or safety incidents:

- Increasing bench widths in higher risk areas.
- Increasing the bench slope angle to 75° in hard rock.
- Limiting the total height of stack column/depth of the pit to 80 m but reducing the inter-ramp/overall slope angle to 35° in oxide and to 55° in hard rock for Sadiola Main.
- Use of wider geotechnical benches in the higher risk west and south-western areas.
- Use of a dual ramp system (limits hauling disruption should a failure occur).

Historically, the bench heights for the oxide ore in satellite pits were <3.5 m but will increase to 10 m (and further increase to 20 m in the more competent primary ore zones); however, consideration has been given to ensuring that the overall slope angles for these pits in the oxide and transition zones would not result in an overall FoS reducing below 1.2, which appears reasonable in terms of the current studies undertaken.

16.4.2 Pit design and layout

The open pit designs and staging in the 2022 FS have been informed by pit shells derived from the Whittle optimisation scenarios run. The choice and selection of equipment was also informed by the chosen mining block sizes that resulted in the dilution and waste loss parameters. The ultimate pit depths for each asset are summarised in Table 16.4.

Table 16.4 Sadiola mining stages and pit depth summary

Asset	Mining stages	Ultimate depth of pit below surface
Sadiola Main	11, 12 and 13	490 m
Sadiola (Far North area)	1 to 6	230 m
FE3	31 and 33	150 m

Source: Qualified Person analysis

The greatest proportion of ore is obtained from the Sadiola Main pit, which will be mined to a depth of 490 m and where strip ratios will increase from 2.2 to 5.3 over the LOM.

The Qualified Person considers the general mine plan and design on the project to be achievable as proposed. However, there are inherent risks relating to the geotechnical conditions and pit and bench designs may need to be modified to limit potential geotechnical risks that may be related to localised areas of faulting.

The Qualified Person has independently verified the open pit inventories listed in Table 16.5 and is satisfied that the scheduled mining total movement and grades are consistent with the proposed pit designs.

Table 16.5 Sadiola mining summary (ore by zone for each open pit)

Ore type	Units	Sadiola	FE3	Stockpiles	Total
Oxide	Mt	9.78	2.81	4.44	**17.03**
	g/t Au	0.82	0.92	0.60	**0.78**
	koz Au	257	83	85	**425**
Transitional	Mt	9.36	0.58	1.92	**11.86**
	g/t Au	1.51	1.68	2.33	**1.65**
	koz Au	455	32	143	**630**
Primary	Mt	113.48	0.23	1.24	**114.95**
	g/t Au	1.65	2.01	2.33	**1.66**
	koz Au	6,022	15	93	**6,130**
Low-grade stockpile	Mt			5.53	**5.53**
	g/t Au			0.35	**0.35**
	koz Au			62	**62**
Total	**Mt**	**132.62**	**3.62**	**13.13**	**149.37**
	g/t Au	**1.58**	**1.11**	**0.91**	**1.51**
	koz Au	**6,734**	**129**	**322**	**7,247**

Source: Allied, Sadiola LOMP, December 2022

16.4.3 Mining method, ramp design and equipment selection

The existing mine layout, ramp and haul road design took into consideration the potential future state of the mine with specific regard to the potential use of larger mining equipment. The fleet proposed by Allied comprises 300-tonne Caterpillar 6030B excavators and Caterpillar 777 (91-tonne payload) haul trucks.

The pit design caters for the potential use of 181-tonne payload Caterpillar 789 trucks. Given the ultimate depth of the Sadiola Main pit at 490 m, a gradient of 10% and ensuring haul roads were 3.0 to 3.5 times the width of the largest truck, approximately 8.4 km of haul road will be required. All ramps at Sadiola Main pit would be designed at 30 m wide to accommodate the larger Caterpillar 789 trucks, while haul roads for the smaller pits are designed at widths of 24 m for the Caterpillar 777 trucks. This design, together with the 2% camber, 1 m wide drain and 4.95 m safety bund will result in a 30 m wide ramp design.

The Qualified Person considers the design parameters and equipment proposed reasonable and generally conservative providing flexibility for production, particularly with the option to increase the truck sizes.

Sadiola is located adjacent to a large community to the west of the Property. While this is outside the control of Allied, it will potentially present several issues relating to safety, community interaction, dust and airborne pollution as well as other issues such as noise or water quality. Issues such as dust and noise, in particular, will need to be carefully managed. A number of these issues have already been mitigated by placing large waste bunds to help reduce noise and dust.

16.5 Mining and processing schedules

The main objectives of the mine schedule are to:

- Provide 5.0 Mt/a of oxide ore through to the end of Q1 2026 with up to 25% transitional ore.
- Deliver primary ore in Q1 2026 and then to maximize production through the new 10 Mt/a process plant, assuming a maximum feed of 30% oxide and transition.

From 2026, a high grading process is planned to maximize gold production from high-grade primary ore with ore split into three bins:

- Feed grade ore – >0.80 g/t Au.
- Medium-grade ore – 0.60 g/t to 0.80 g/t Au.
- Mineralised waste – 0.30 g/t to 0.60 g/t Au.

Any material <0.30 g/t Au is treated as waste.

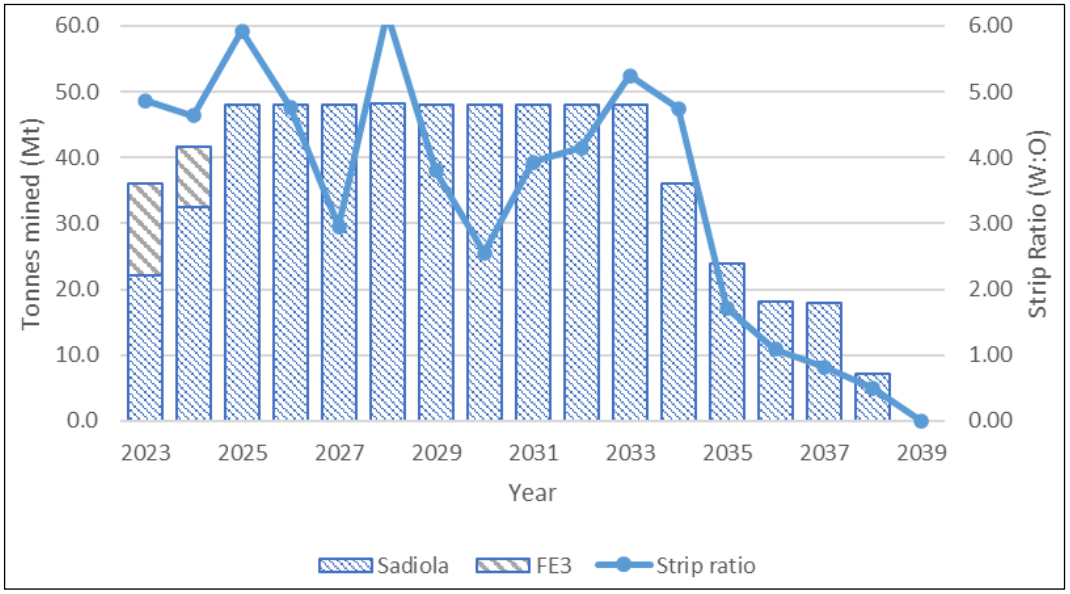
Due to a lack of oxide feed grade ore, a 25% transitional ore blend is required until Q1 2026. A new oxygen plant is being constructed (commissioning in Q3 2023) to achieve the plant recoveries in the production schedule (83% from transitional and 76% from soft primary). Grade control practices include sulphide assays in the transition zone to enable campaign treatment of the soft primary ore.

The Sadiola schedule is based on the following key parameters:

- Process plant operating at 8,000 hours per annum.
- Treating primary ore from Q1 2026 with the ramp-up of the 10 Mt/a process plant.
- Limiting vertical advance rates to less than 80 m per annum.
- Delaying waste stripping where possible and minimising stockpile rehandle.
- Limiting total ex-pit maximum material movement to 48 Mt/a to suit a fleet of four 6030 excavators and Caterpillar 777 trucks.

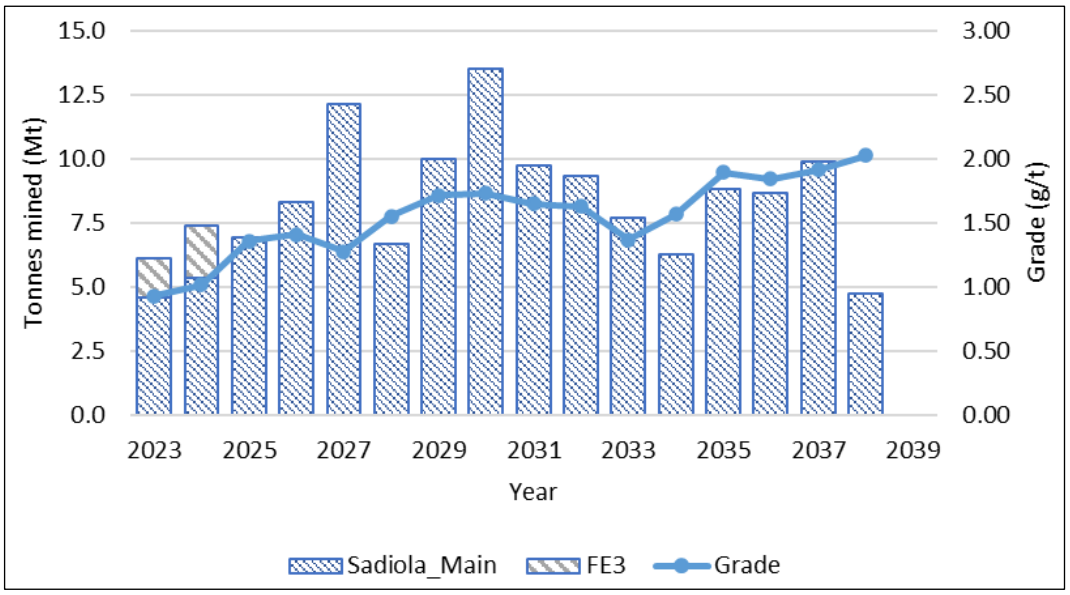
Mining has been designed and scheduled for total ex-pit tonnages moved and is expected to ramp-up to 48.0 Mt/a in 2025 before decreasing in 2034, as shown in Figure 16.2. Ore mining and extraction will follow this profile as pushbacks and pits are opened. Most of the ore will come from the Sadiola Main pit, as outlined in Figure 16.3, with ore production scheduled to ramp up from 6.1 Mt/a in 2023 to an average of about 9.3 Mt/a from 2026 to 2035 before the pits are depleted in 2038. The average strip ratio (waste t:ore t) is 3.5 over the LOM.

Figure 16.2 Sadiola ex-pit material mining schedule



Source: Allied, Sadiola LOMP, December 2022

Figure 16.3 Sadiola ore mining schedule



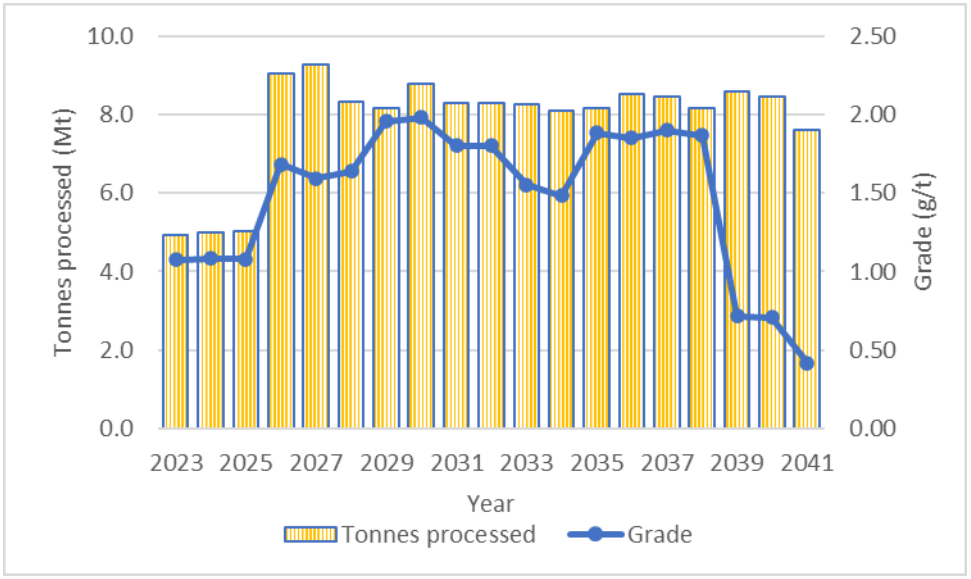
Source: Allied, Sadiola LOMP, December 2022

The new process plant will have a nominal capacity of 8 Mt/a treating primary ore or 10 Mt/a treating up to 30% oxide ore with the balance being primary ore. Ore processing is scheduled to continue at the current oxide plant feed capacity of 5 Mt/a before increasing to an average of 8.5 Mt/a from 2026 to 2039 following the commissioning of the new plant in 2026 as shown in Figure 16.4.

Medium-grade ore from the open pit is stockpiled and processed from 2039 to 2041. At full production between 2026 and 2038, the new plant delivers an average of about 350 koz annually, and 5,484 koz over the LOM as shown in Figure 16.5.

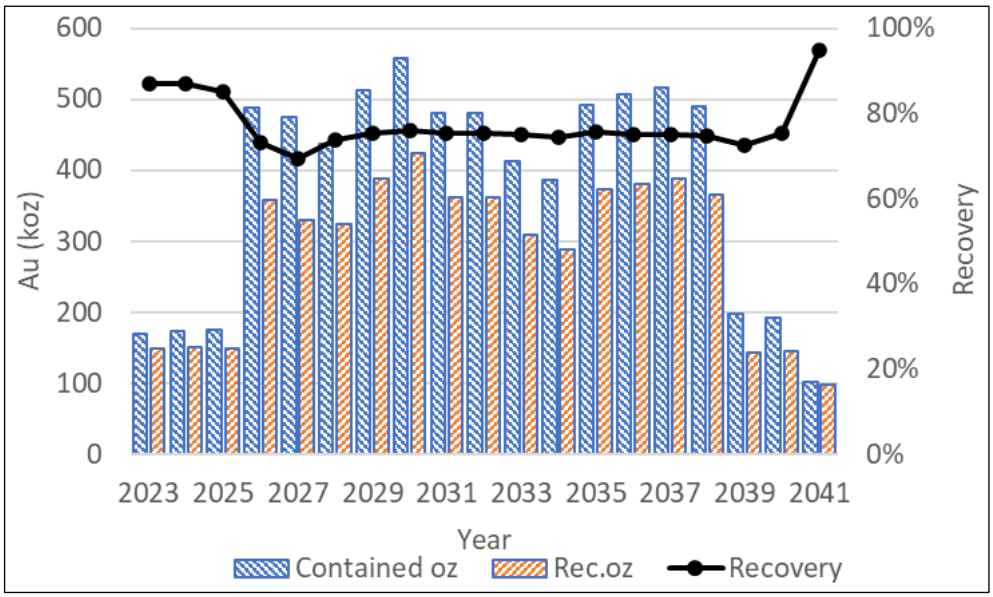
The recovery in 2041 is high at 95% based on DRA's calculation which shows that the gold in circuit will average 5,500 ounces which has been removed from the production in Q1 2026 and moved to 2041 when it would be recovered.

Figure 16.4 Sadiola annual throughput schedule (2023 to 2041)



Source: Allied, Sadiola LOMP, December 2022

Figure 16.5 Sadiola annual gold production schedule



Source: Allied, Sadiola LOMP, December 2022

The Qualified Person reviewed the detail supporting considers the 2022 FS mining and processing schedules and considers them to be reasonable and achievable.

17 RECOVERY METHODS

17.1 Existing process plant

The oxide plant was commissioned in 1997 with a gravity circuit installed in 2007. The plant flowsheet is typical of free-milling gold ore and consists of two parallel processing streams, sharing a common second stage grinding mill with a nominal capacity of 5 Mt/a. The plant was designed to treat oxidized and soft surface materials with minimal harder rock being presented and as such mineral sizers were incorporated into the original flowsheet. Due to an increasing proportion of harder rock being encountered during the last decade, mobile crushing facilities were incorporated to pre-crush the hard rock for blending with the oxide ore, prior to milling.

The overall process flowsheet is shown in Figure 17.1. Oxide ore (which is soft) is received at the mineral sizer feed bin either directly tipped from Cat 777 trucks or by loaders through a set of grizzly bars. Oversize and harder transitional ores are redirected to a secondary crush circuit for size reduction before being blended into the feed bin using belt feeder hoppers which controls the amount of harder material being treated.

The two primary SAG mills are 4.85 m diameter x 4.88 m in length with 2.5 MW motors, treating the nominal <300 mm ore at a rate of between 275 t/h and 325 t/h each. The one secondary mill is identical to the primary mills. The product from the closed-circuit hydro-cyclone cluster is 80% <75 µm.

A portion of the coarse hydro-cyclone underflow stream is directed to the gravity recovery circuit for the recovery of coarse free gold through an intensive cyanide leach reactor and an associated electrowinning cell. The historical gravity recovery is reported by plant management to be approximately 10% and has been turned off at times over the past 18 months to control milling water balance issues.

The hydro-cyclone overflow stream is screened to remove unwanted wood and plastic prior to being directed to the twin stream pre-leach oxidation tanks and cyanide leach vessels. The pre-oxidation tanks are injected with oxygen to assist with oxidation of some sulphide minerals ahead of the leach circuit. Each leach circuit consists of 10 x 1,470 m^3 leach tanks into which cyanide is added to dissolve the gold with a nominal residence of 23 hours. The leached slurry is directed to the twin stream CIP plant with each consisting of seven x 570 m^3 vessels operated in counter-current configuration with activated carbon to adsorb the dissolved gold. Each CIP vessel contains ~25 g/L activated carbon with an interstage screen and carbon transfer pump. The loaded carbon is removed from the first CIP vessel and transferred to the twin stream elution circuit.

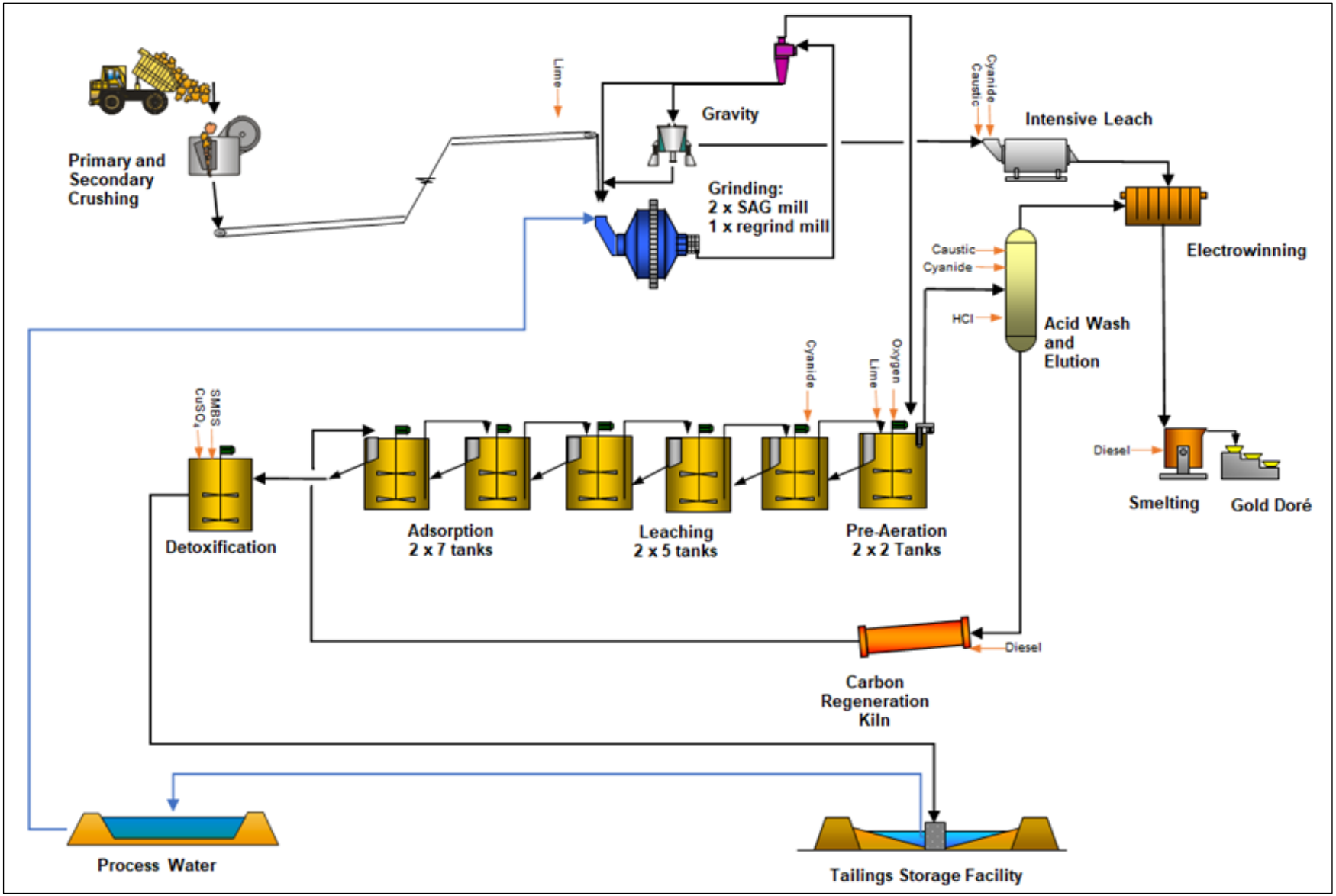
The elution circuit consists of 2 x 6-tonne acid wash and elution columns utilising the AARL elution process with carbon re-activation in two diesel-fired regeneration kilns. Regenerated carbon is returned to the last CIP vessel in each stream. The solution recovered from the elution process is directed to the electrowinning cells in the gold room for recovery and smelting into doré.

The CIP tailings are treated to remove contained cyanide with the addition of sodium metabisulphite, copper sulphate and oxygen to reduce the contained cyanide to <50 ppm WAD. The treated tailings are pumped to the fully contained TSF.

This process is similar to many gold operations in West Africa treating free-milling gold ores.

The recent production performance of the existing plant is summarised in Table 6.1. 2021 performance was impacted by treating mineralised waste and the ramp-up of mining operations.

Figure 17.1 Sadiola oxide process flowsheet



Source: Allied, Sadiola FS, September ,2022

17.1.1 Reagents and consumables

Milling consumables are steel grinding media – 80 mm to the primary mills and 50 mm to the regrind mill.

Reagents delivered and used on site include cyanide, hydrated lime, viscosity modifier, activated carbon, SMBS, copper sulphate, sodium hydroxide, hydrochloric acid with hydrogen peroxide.

Reagent produced on site – oxygen at 90% purity in a 20 t/d pressure swing adsorption plant. The existing oxygen plant is being replaced. Reagents are stored on site in a 1,900 m^2 shed with appropriate lead times, considering the logistical route from port to site.

17.1.2 Utilities

Water is pumped 55 km from the Senegal River for use in the process plant (process, fire, gland service and potable waters) and recirculated as appropriate from the TSF or from the mining operations.

Electric power is generated on site using diesel generation with the process plant being the main consumer. Compressed air is produced on site for plant consumption. Refer to Item 17.3 for details on energy, water and reagent usage.

17.1.3 ICMI compliance

The existing plant has a detox facility delivering solution containing less than 50 ppm WAD cyanide to the TSF. While Allied is not a signatory to the Cyanide Code, SEMOS currently is.

17.1.4 Qualified Person's comments on the existing plant

Allied reports that structural maintenance is being undertaken with the leach tank steelwork being repaired and corrosion protected, refurbishment of the elution plant, gold room facilities and other maintenance items. It has also been stated that one of the mills is showing signs of distress due to internal washaways and the regeneration kiln needs replacement. These factors are routine for a process plant which is 25 years old, with the most concerning aspect being the condition of some of the tank foundations as reported by independent consultants CEMS in 2021. Allied advises that the tank foundations are being rectified.

The Qualified Person is of the opinion that with adequate and appropriate refurbishment and ongoing maintenance, the existing plant will be able to perform as forecast for the required schedule period and beyond.

17.2 New process plant

Previous owners of Sadiola investigated the Expansion Project to treat 6.7 Mt/a of primary ore and procured some of the equipment for the gold process plant, but the project was not implemented. More recently, Allied developed production scenarios for up to 10 Mt/a for the Sadiola Expansion Project with a trade-off study including financial analysis and concluding that the optimum size would be a nominal 8 Mt/a process plant for primary material and 10 Mt/a incorporating a blend with up to 30% oxide material.

To realise cost and schedule savings, the design is based on re-using as much of the pre-purchased equipment as feasible with additional machinery and fabrication as required. No portions of the existing plant will be incorporated into the new facility. The basis and key inputs used for flowsheet development and process design are:

- Nameplate plant dry solids (hard or primary ore) throughput of 8 Mt/a and 10 Mt/a with up to 30% oxides and transitional material.
- Design utilisation of 70.8% for primary and secondary crushing, equivalent to 6,201 hours actual operating time per annum.

- Design utilisation of 91.3% for all other plant areas and services (such as grinding, leach and adsorption), equivalent to 8,000 hours actual operating time per annum.
- New primary crushing area, using the available pre-purchased primary crusher and apron feeder.
- New secondary crushing area, using an available pre-purchased Metso apron feeder.
- New crushed ore stockpile, using an available pre-purchased Metso apron feeder.
- New grinding area, using an available pre-purchased SAG mill and a newly procured ball mill.
- Grinding circuit base design using the following conditions:
  - Hard ore only, no oxide or transition ore
  - New dry solids feed rate 1,000 t/h
  - 75th percentile comminution parameters.
- New pre-oxidation, leach, and adsorption train using all the available eight pre-purchased tanks, agitators, intertank screens and other associated equipment (launders etc.).
- New cyanide detoxification and arsenic and antimony precipitation area.
- New tailings area and pipeline to TSF.
- New desorption area (acid wash, elution, regeneration), gold room and electrowinning.
- New bulk dry storage of all reagents.
- New reagent mixing, storage and dosing facilities for all reagents.
- Raw water supply from the existing pump stations and pipeline.
- Raw water storage in the existing raw water reservoirs.
- New raw water tanks, pumps and distribution, including fire water and gland water.
- New process water and cyanide process water tanks, pumps and distribution.
- New TSF decant water treatment for antimony removal.

The major equipment items are listed in Table 17.1 including the status of procurement. Minor equipment such as cyclones, dust collectors and screens have also been purchased. DRA, Bollore and Allied inspected the pre-purchased equipment during 2021–2022 to estimate refurbishment and transport costs, which were then included into the 2022 FS capital cost estimate.

Table 17.1 Key mechanical equipment

Item	Description	Status
Primary gyratory crusher	Metso Superior 54-75 MK-II – 600 kW	France, purchased
Apron feeders	1 x Metso AF5-72MN-22-125 HP; 3 x Metso AF5-72MN-20-75 HP	USA, purchased
SAG mill	Outotec 9.75 m x 5.0 m – 2 x 7 MW	France, purchased
Ball mill	FLS 26 ft diameter x 43 ft; 2 x 9 MW VFD drives	USA, purchased
Pebble crusher	Metso HP4 – 315 kW	France
Pre-leach thickener	FLS 40 m diameter, high density	South Africa, purchased
Leach and CIL tanks	11 off 16 m x 18.4 m – 3,500 m^3	Canada, 8 purchased including agitators and top of tank steel
Oxygen plant	Linde 20 t/d – 640 kW	France, purchased and being installed
Tailings thickener	FLS 40 m high density	Not purchased

Source: Allied, Sadiola FS, September 2022

17.2.1 Process flowsheet

The selected process for the recovery of gold from the primary ore at Sadiola is a conventional CIL circuit consisting of crushing, grinding to 80% passing (P_{80}) 75 µm, pre-oxidation, cyanidation and carbon adsorption, followed by electrowinning and smelting to produce gold doré at an average of 73% recovery from the hard primary ore. Plant tailings are thickened, detoxified and arsenic and antimony precipitated prior to disposal to a TSF. Figure 17.2 summarises the future plant flowsheet which includes the following:

- Primary and secondary crushing
- Crushed ore stockpile and reclaim
- Grinding and classification
- Pre-leach thickening
- Pre-oxidation, leaching and adsorption
- Acid wash and elution
- Electrowinning and gold room
- Tailings thickening
- Cyanide detoxification and arsenic/antimony precipitation
- Reagents
- Air and water services.

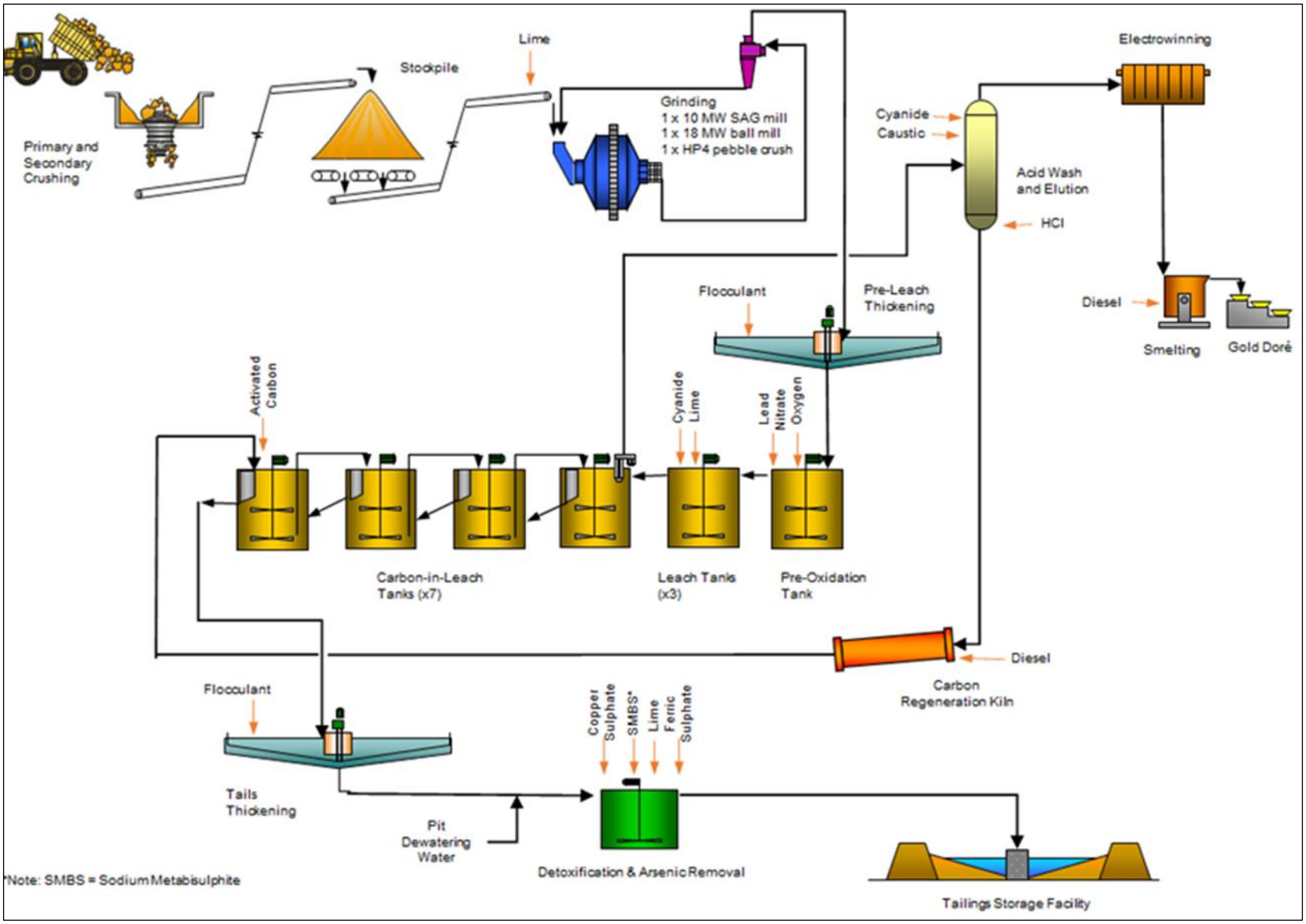
A detailed process design criteria with supporting process flow diagrams, mechanical equipment list and general arrangement drawings was developed by DRA in support of the developed process flowsheet, based on the selected treatment rate. The basic design criteria for the gold plant are indicated in Table 17.2.

Table 17.2 New plant summary design criteria

Description		Units	Design
Plant throughput	Primary	Mt/a	8.0
	Primary plus 30% oxide	Mt/a	10.0
Utilisation	Crushing	%	70.8
	Grinding/leach	%	91.3
Design throughput	Crushing	t/h	1,610
	Grinding/leach	t/h	1,250
Head grade	Gold/Silver	g/t	1.84 / 1.0
	Arsenic/antimony	%	0.40 / 0.15
Recovery	Gold/silver	%	76.0 / 60.0
Grind size	Target P_{80}	µm	75
Leach conditions	Leach density	% solids	52
	Tails thickener density	% solids	65
	Detoxification feed density	% solids	55
	Pre-ox residence time	h	3
	Leach and adsorption	h	24.6
	Detoxification	h	1
Tailings discharge limits	WAD cyanide	mg/L or ppm	50
	Arsenic	mg/L or ppm	0.5
	Antimony	mg/L or ppm	20

Source: Allied, Sadiola FS, September 2022

Figure 17.2 Future new plant flowsheet

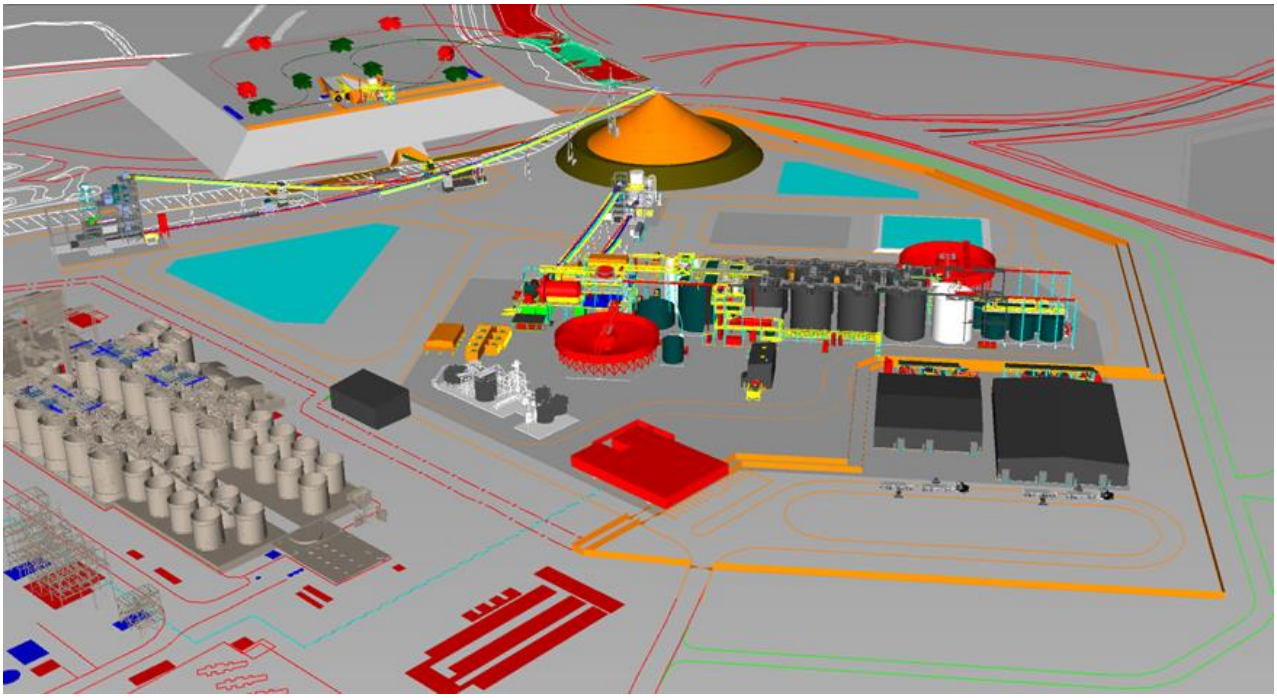


Source: Allied, Sadiola FS, September 2022

The new plant is to be located adjacent to the existing oxide plant but will not utilize any of the existing plant processing facilities to minimize tie-ins and downtime on the existing operations. The proposed plant location is shown Figure 17.3. The existing plant is on the left-hand side with the new plant being shown to the right of the existing plant. There is a new stockpile area at the top of the figure.

ROM ore is typically direct tipped into the primary crusher and conveyed to the open circuit secondary crusher and discharged onto the crushed ore stockpile. Apron feeders remove the crushed ore at a controlled rate to feed the open circuit 10 MW SAG mill with the closed-circuit pebble crusher. The SAG mill discharge is delivered to the separate hydro-cyclone clusters with the underflow in closed circuit with the new 18 MW ball mill; there is currently no gravity circuit incorporated in the new plant flowsheet. The hydro-cyclone product is screened and thickened to control the water balance and to maximize the re-use of residual cyanide within the cyanide leach circuit by back-dilution with tailings thickener overflow.

Figure 17.3 Proposed location of new plant in relation to existing plant



Source: Allied, Sadiola FS, September 2022

The leach circuit will consist of one pre-oxidation tank (each 3,500 m^3) for the addition of oxygen and lead nitrate into the first tank. Primary pH control is achieved by the addition of powdered lime to the mill feed conveyor with milk of lime added to the second tank for secondary pH adjustment as may be required. The leach circuit will consist of two leach tanks (each 3,500 m^3) in series with seven CIL tanks, also 3,500 m^3 capacity.

The leach tanks can be fitted with interstage screens and carbon transfer pumps, if justified during operations or if preg-robbing ores are encountered. Fresh and regenerated carbon is charged into the last CIL tank and pumped counter-current with the flow to the first CIL tank, where carbon will be pumped batch-wise to a new existing acid wash and elution circuit.

The CIL tailings will flow to the tailings thickener with the recovered solution being recycled to the pre-oxidation tank feed as dilution. The thickener underflow will be diluted with accumulated and contaminated open pit water prior to cyanide detoxification with arsenic and antimony precipitation in six new 670 m^3 tanks. Cyanide content will be reduced with the introduction of SMBS, copper sulphate and oxygen in the first two tanks whilst arsenic will be precipitated with ferric sulphate and antimony with lime to generate chemically stable precipitates. The final tailings will be pumped to the TSF.

The loaded carbon will be acid washed to remove calcium and base metals that may have been adsorbed prior to the high temperature and pressure elution process to desorb gold and silver. There are to be two x 10-tonne elution columns for acid wash and elution duty fabricated from duplex stainless steel. The desorbed gold and silver are electrowon onto cathodes and smelted to doré, prior to shipment to the refinery. Carbon regeneration will be conducted in a diesel fired rotary kiln with a 1,000 kg/h capacity.

This process will be identical to many gold operations in West Africa, although the gold recovery is forecast to be lower than typical oxide operations. The primary ore contains some fine gold which is refractory, and a portion is not amenable to cyanide leaching.

17.2.2 Reagents and consumables

The new plant will incorporate all the appropriate reagents that have been used in the oxide plant, namely cyanide, lime, activated carbon, caustic soda, hydrochloric acid, SMBS, copper sulphate, oxygen and smelting fluxes. In addition, there will be flocculant, lead nitrate and ferric sulphate. The existing reagent plant will be replaced as new to cater for the increased demand with the greater throughput.

Grinding media of 100 mm and 125 mm balls will be supplied for the SAG mill with 50 mm and 65 mm for the ball mills.

17.2.3 Utilities

The main utilities to be supplied will be electric power (provided from grid, diesel and solar), water (industrial, potable, clean and fire), compressed air, oxygen and blower air. These services will be upgraded and/or replaced as required to meet the increased demand.

17.2.4 Metallurgical accounting

Metallurgical accounting has been incorporated into the new plant's flowsheet and considers mass measurement and gold sampling within the plant.

17.2.5 Process control

The process control system is based upon a typical plant configuration with full plant control from a central control room. A constant data logging and trending facility is to be included. The planned control system consists of a PLC and SCADA. The automation backbone consists of a LAN, utilising ethernet and other proprietary control protocols.

The detailed process control philosophy is based on the process and instrumentation diagrams (P&IDs) developed during the 2012 and 2016 engineering, procurement and construction management (EPCM) phases and 2022 FS.

Online analysis of antimony in the leach feed is provided to optimise the addition of lead nitrate.

17.2.6 ICMI compliance

Whilst Allied is not a signatory to the Cyanide Code (the ICMI website states that Sadiola is currently a signatory), the new plant is being designed with the principles of the Cyanide Code in mind and includes cyanide detoxification of the tailings while minimising cyanide consumption.

17.3 Energy, water and process materials

17.3.1 Energy

The power consumed by the existing plant from 2017 to 2019 was collected from plant data and averaged 11.5 MW. This was multiplied by the average annual operating hours for the period (7,940 hours) to arrive at the forecast annual power consumption of 91 GWh/a.

The power consumption after the expansion is implemented was estimated by DRA based on:

- Installed power from the Mechanical Equipment List
- Drawn power, calculated by applying an appropriate factor to installed power
- Duty or standby operation
- Continuous or intermittent operation
- Operating time per annum.

The power consumption has been estimated at 33,072 kW for the new process plant with annual consumption of 261.5 GW/a. The grinding consumption varies dependent on the ore types being treated, ranging from 7.6 kWh/t when treating oxides to 16.8 kWh/t for the main ore type (calcite marble which represents 47% of future feed) to 23.4 kWh/t for diorite which represents 6% of future feed.

17.3.2 Water

A water balance, based on the operating hourly water demand for the future steady-state operation and seasonality, was established by Knight Piésold to ensure optimised water use and minimize water extraction from the Senegal River.

Approximately 4.5 GL/a of raw water is required for the expansion, peaking at 5.5 GL/a, which is less than the 8.0 GL/a licence and 6.8 GL/a maximum historically pumped. Processing of primary ore will use less fresh water than oxide processing.

17.3.3 Reagents and consumables

Table 17.3 summarises the consumption of reagents and consumables in the existing plant. Saprolite comprises approximately 80% of the existing plant feed.

Table 17.3 Existing plant consumption of reagents and consumables (kg/t)

Reagents and consumables	Laterite	Saprolite	Siliceous oxide	Soft primary	Blast oxide	Blast primary	Transition
Lime	1.55	1.55	1.55	3.20	1.55	1.10	3.00
Sodium cyanide	0.36	0.36	0.36	1.34	0.36	1.04	1.24
Lead nitrate	-	-	-	0.30	-	0.30	0.30
Hydrogen peroxide	0.25	0.25	0.25	2.05	0.25	2.05	2.05
SMBS	-	-	-	0.69	-	0.69	0.69
Copper sulphate	-	-	-	0.16	-	0.16	0.16
Carbon	0.05	0.05	0.05	0.07	0.05	0.07	0.07
Caustic soda	0.17	0.17	0.17	0.24	0.17	0.24	0.24
Hydrochloric acid	0.11	0.11	0.11	0.15	0.11	0.15	0.15
Mill media	0.60	0.45	0.80	0.60	0.80	1.20	0.60

Source: Sadiola FS, September 2022

Table 17.4 summarises the consumption of the key reagents and consumables in the future plant by ore type. Calcite marble comprises approximately 47% of the future plant feed.

Table 17.4 New plant consumption of key reagents and consumables (kg/t)

Reagents and consumables	Shear zone	Calcite marble	Greywacke and porphyry	Diorite
Sodium cyanide	0.26	0.22	0.20	0.25
Quicklime (CaO)	0.27	0.23	0.16	0.13
SAG mill balls	0.27	0.21	0.36	0.33
Ball mill balls	0.58	0.29	0.75	0.70

Source: Sadiola FS, September 2022

Table 17.5 summarises the consumption of general reagents and consumables. Diesel consumption for elution, carbon regeneration and the furnace were estimated by DRA to be 2,958 m^3/a.

Table 17.5 New plant consumption of general reagents and consumables

Reagents and consumables	Units	Consumption
Pre-leach thickener flocculant	g/t	10
Tailings thickener flocculant	g/t	30
Lead nitrate	kg/t	0.25
Copper sulphate	kg/t	0.21
SMBS	kg/t	0.85
Ferric sulphate	kg/t	0.40
Activated carbon	g/t	30
Hydrochloric acid	kg/t	0.10
Sodium hydroxide	kg/t	0.07
Sulphamic acid	g/t	2
Antiscalent	g/t	2
Borax	g/t	2
Silica	g/t	2
Sodium nitrate	g/t	2

Source: Sadiola FS, September 2022

17.4 Production (historical and forecast)

The oxide plant has almost 25 years of operational history and has produced over 8.4 Moz of gold during this period, peaking in 2000 with 610 koz from 5.3 Mt at 3.76 g/t Au and a recovery of 94.6%. Mining ceased in 2018 and low-grade stockpiles were treated until early 2021, followed by the resumption in mining. Some transitional ores have been treated, but these have been maintained as a low percentage of feed due to the lower gold recovery and reduced throughput characteristics.

17.4.1 Oxide plant

Allied completed a review of the plant performance for the period 2015 to 2022, the most recent mining production. Oxide production is forecast to continue until Q1 2026, after which the new plant commences operation. The oxide recovery forecast is based on historic results which, in the Qualified Person's opinion, is fair and reasonable.

17.4.2 New plant

The Sadiola Expansion Project forecast is based upon the throughput and recovery estimates shown in Table 13.6, which is based on the testwork completed in the 2022 FS and is considered representative of future plant feed, based on the testwork carried out at one sample per million tonnes. The forecast production and performance are shown in Table 17.6.

Table 17.6 New plant production forecast

Description	Unit	2023	2024	2025	2026	2027	2028	2029 to 2041
Oxide	Mt	3.72	3.86	3.85	1.01	0.73	0.03	9.36
Transition	Mt	1.20	1.14	1.19	0.96	0.75	0.46	6.16
Primary	Mt	0.00	0.00	0.00	7.07	7.79	7.82	92.27
Total	**Mt**	**4.92**	**5.00**	**5.04**	**9.04**	**9.27**	**8.31**	**107.80**
Feed grade	g/t Au	1.07	1.08	1.08	1.68	1.59	1.64	1.54
Recovery	%	87	87	85	73	69	74	76
Gold recovered	kg	4,600	4,696	4,616	11,121	10,246	10,050	125,243
	koz	148	151	148	358	329	323	4,027

Source: Allied, Sadiola LOMP, December 2022

17.4.3 Product quality

The product quality of the future doré production is not expected to vary significantly from the past production, although the base metal content may increase marginally.

18 PROJECT INFRASTRUCTURE

18.1 Power supply

Power for Sadiola is currently supplied from 21 x 1 MW medium-speed diesel generators which meets the average demand of 19.6 MW (peak demand is 20.6 MW). Approximately 36 MW (288 GWh/a) will be required for the processing of harder primary ore, the onsite buildings, ancillary activities and the accommodation village.

Sadiola is expected to be supplied with grid power in the future. EDM has confirmed that sufficient grid power is expected to be available from 2024 (including capacity from hydropower). Following formalisation of an agreement with EDM, an overhead line will be installed to transmit power from Kayes over 89 km. The construction of the 225 kV transmission line and required substations will be the responsibility of Allied.

To reduce power costs and greenhouse gas emissions, a 36 MW solar photovoltaic array is to be provided by an independent power provider. The solar power cost is based on six tenders received with a mid-point used to inform the cost estimates.

To mitigate power supply risks, a diesel power station is to be provided capable of running the entire 40 MW (maximum demand) operation from 2024. This power station would also cover any schedule overruns for the grid connection and make up any short-term shortfalls in grid power generation. EDM, the grid operator, has advised that power rationing will likely occur at night for four hours per day during the three hottest months (March, April and May).

Onsite power is distributed to the mining operations, processing plant facilities, buildings and support infrastructure, and the accommodation village via 6.6 kV and 11 kV overhead powerlines.

18.2 Fuel storage

Currently, approximately 3.5 ML of diesel are consumed per month by the mining fleet and for power generation. A three-week supply of approximately 2.0 ML of diesel is supplied and stored by Total (the current fuel supplier). The diesel fuel day tank for the mining fleet is filled from this tank. The capital cost estimate assumes that Allied will install a 1.0 ML diesel storage tank for the mining contractor and Total will install a 1.3 ML diesel storage tank for additional onsite supply to mitigate risk.

At the future onsite power station, eight x 50,000 L self-contained tanks will be installed by Allied. In the event of a major logistic supply disruption, diesel will need to be sourced from the 7 ML national strategic fuel depot in Kayes.

18.3 Water supply

18.3.1 Water handling philosophy

A water balance, based on the operating hourly water demand for the future steady-state operation and seasonality, was established to ensure optimised water use and minimize water extraction from the Senegal River.

Historical dewatering activities provided data and observations on permeability. It was noted that groundwater levels fluctuate seasonally at higher elevations following the rainy season, and the groundwater system in the mining area was altered by dewatering activities and residual drawdown around the pit lakes.

18.3.2 Raw water supply and storage

Sadiola is located within the Senegal River basin. The site occupies an area of approximately 10.8 km^2 within the sub-basin of the Falémé River, a tributary of the Senegal River, also part of the international border between Mali and Senegal. The site is mainly drained by tributaries of the Kobakoye River that drains into the Falémé River. The two main tributaries include the Farabakouta River in the north and the Khenden River in the south and west.

Local streams are ephemeral, and periods of water surplus and shortage occur in the wet and dry seasons, respectively.

Approximately 4.5 GL/a of raw water is required for the primary expansion, peaking at 5.5 GL/a, which is less than the 8.0 GL/a licence and 6.8 GL/a maximum historically pumped. Processing of hard primary ore will use less fresh water than oxide processing.

Raw water is currently extracted from the Senegal River. The 57 km pipeline supplies water from the pumping station located at Diamou to a raw water reservoir at the mine which can store approximately 90 ML. Water is treated prior to use on site and for the supply to three local villages, Sadiola, Neteko and Farabakouta. Stand-alone water supply systems for the villages are being commissioned.

Potable water is piped to the various consumption locations.

18.3.3 Dewatering, pumping and reclamation

A dewatering program has been established to sequentially dewater pits. Dewatering of the Sadiola Main pit has commenced. Stage pumping from the pit bottom to the surface will be required, and additional backup pumps will be purchased as part of sustaining costs. Advanced dewatering will target groundwater in storage below the current pit floor and in isolated compartments.

Whilst mine water will be discharged to the environment where water quality is suitable, Sadiola Main pit water is discharged into the FE2 pit for storage as the water has elevated arsenic levels.

TSF decant water is pumped to the return water dam before being pumped back to the process water dam in the plant.

18.3.4 Effluent disposal and wastewater remediation

The site is equipped with a bacteria-activated sewage treatment plant which processes all sewage generated at the processing facility, and a pre-digestion treatment system (which eliminates the need for a septic tank) at the accommodation camp.

18.4 Onsite access and security

The Sadiola security management framework is being upgraded with the engagement of a new security contractor, including drones and upgraded fencing.

Onsite access roads for light and heavy-duty vehicles link the open pits and ROM pads to and from the process plant. Secondary roads around the operation are generally passable, but access is reduced in the wet season.

The access road between the accommodation village and the process plant will need to be diverted for the Farabakouta Stream diversion for the East waste dump.

The operating areas are fenced off with 1.8 m high post fencing. The overall operating area, the mining production area and the accommodation village are staffed by security personnel.

18.5 Accommodation and medical facilities

The secured onsite accommodation village lies northeast of the mining area and is equipped with a guard house and a security boom gate. It is a fully serviced town that includes standalone self-catering villas, housing units, single quarters and cabins, a school for primary education, a clinic, a church, a mosque, a supermarket and recreation and sport facilities. Twenty of the houses are utilized by government officials (customs officers, forwarding agents and teachers). The accommodation village has a water treatment plant and two sewage treatment plants.

An additional modular 500-person accommodation camp, near the process plant, is proposed for the construction team.

Primary health care is available at the clinic on site, specifically at the accommodation village, and any critically injured staff are transported to the Sadiola Hospital.

18.6 Other infrastructure and auxiliary facilities

Permanent buildings include office and associated buildings, change house, mine and processing facility workshops, laboratory, security office and stores buildings. The exploration offices and core yard are situated 800 m from the administration offices.

18.6.1 Plant workshop

The plant warehouse is a pre-engineered steel structure with colour-bond cladding and a concrete-slab floor. It measures 42 m long x 23 m wide. A 42 m long x 6.6 m wide office block is located adjacent to the building under the same roofline and contains four offices/meeting rooms, ablution facilities and storage. The building is extended 48 m long x 18m wide for the capital store.

18.6.2 Buildings

The existing buildings and workshops are a mixture of brick and mortar, and galvanised sheeting structures with corrugated roofs.

The workshops, main warehouse and covered reagent storage are corrugated steel-framed construction on concrete platforms.

18.6.3 Communications

Telecommunications is provided via three Malitel towers, one of which is solar powered.

A microwave telephone system connects to the national grid at Kayes with back-up satellite communication. Two-way handheld radio communications are also available on site.

18.6.4 Workshops

The mine workshop, with service bays, is used for servicing onsite mobile fleet and light-duty vehicles. The service bays extend to an open-air area, in front of the truck shop, where simultaneous servicing and minor repairs can take place on a covered concrete apron. At the process plant, the existing maintenance shop is sufficiently equipped for maintenance and repairs.

18.6.5 Analytical laboratory

An analytical laboratory is available on site and is owner operated with some 93 staff. The laboratory handles all assays from environmental to exploration through grade control to mill control pulps and loaded carbon. There are three separate sample receipt and preparation sections for exploration, grade control and the process plant. Gold assaying uses 30 g fire assay with AAS finish.

Reviews have been initiated to convert to contractor-operated to target reduction in annual operating costs.

18.6.6 Logistics and gold shipment requirements

The mine has been operating since 1996 and has proven logistics routes and supply lines. The port of Dakar in Senegal is principally used for the delivery of international freight of equipment, reagents and consumables to site via Kayes. A route survey was conducted in 2022 to confirm that the oversized loads can be safety transported to site.

A 1.8 km airstrip is located south of the administration area and operated from the air control building. The airstrip is equipped with a hangar and waiting room owned and operated by the mine. This transit point is used for the transport of gold bullion, travelling employees and visitors.

19 MARKET STUDIES AND CONTRACTS

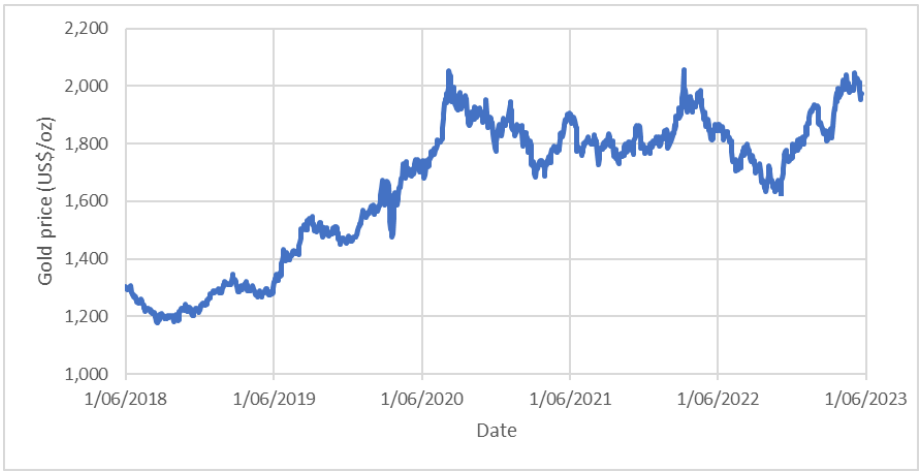
19.1 Market studies

Sadiola produces gold doré comprising approximately 80% gold. The doré produced from current and past operations indicates that any impurities in the gold bars should be non-deleterious and will not adversely affect production. The doré is readily marketable on an “ex-works” or “delivered” basis to several refineries and off-takers internationally, particularly in Europe and South Africa where Allied has contractual arrangements in place for its other operations.

The refiner is responsible for producing gold and silver bars that satisfy the London Bullion Market Association (LBMA) good-delivery standards. To satisfy these standards, the refiner must comply with LBMA regulations and operating practices. If the refiner under contract fails to meet these standards, a new refinery can be engaged in a reasonable timeframe. SEMOS does not take physical delivery of the refined gold and silver bars. Using business relationships developed with several financial institutions, the refinery transfers the gold bars at SEMOS’s instruction to a nominated off-taker.

Gold was one of the best performing major assets of 2020–2021 (Figure 19.1) driven by a combination of elevated risk compounded by the COVID-19 pandemic, low interest rates and positive price momentum. By early August 2021, the gold price reached a historical high of $2,067/oz. During H2 2022, the gold price decreased to $1,650/oz due to a strengthening US dollar but has since recovered to about $1,900/oz during Q1 2023.

Figure 19.1 5 year gold spot gold price



Source: S&P Capital IQ

Allied has used a long-term gold price of $1,500/oz for the Sadiola Mineral Reserve estimate and the Sadiola Expansion Project economic analysis is based on a long-term gold price of $1,568/oz based on consensus estimates published by J.P. Morgan in 2022. The assumption represents the lower of the three-year trailing average price of $1,650/oz, the current spot price and the long-term consensus gold price. Figure 22.3 shows the impact of gold prices on the Financial Model.

19.2 Contracts

Refining and bullion transport costs are based on current contracts with Brinks Transport and Rand Refinery.

Since 2021, mining has been undertaken by PW Mining under contract. The mining costs used in the 2022 FS are based on the contract rates for the majority of the pits and budgetary rates received from PW Mining for the deeper pits targeting the harder primary ore.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

20.1 Environmental studies

ESIA studies have been undertaken to inform the 2021 ESIA to restart operations, the 2022 ESIA for the Sadiola Expansion Project and the 2022 ESIA for the grid power connection. Previous expansion concepts were approved in 2011 and 2017 but both have since lapsed.

The Sadiola Expansion Project allows for:

- Extension of the main pit to the west and southwest (maximum 300 m) to a maximum depth of 440 m.
- Thickened and detoxified tailings pumped to the depleted FE4 and FE3 pits.
- New WRDs to be developed west, north and south of the main pit. WRDs to the west will join two existing WRDs to form a noise and dust barrier.
- A new WRD north of the main pit (and modifications to the East WRD), requiring diversion of a section of the Farabakouta Creek.
- Additional construction camp (construction requires approximately 1,200 people).
- Additional fuel storage.
- Redirection of road and electrical infrastructure near the mine village.
- Plant upgrades: Two-stage crusher and mill, pre-leach thickening, pre-oxidation, tailings thickening, cyanide detoxification and arsenic precipitation circuits.

An ESIA was compiled in 2012 for the power supply (an 87 km powerline route), and approved, but has lapsed. Environmental and social studies are underway to update the ESIA. The powerline ESIA was submitted in March 2023. Regulatory approvals are targeted by Q3 2023.

20.1.1 Environmental and social baseline conditions

Climate

The site is located within the Sudanese-type climatic zone, with an intense wet season from May to October and dry season from November to April. Approximately 90% of rainfall occurs between the months of June and September, with water shortages experienced from November to May. Site-specific rainfall data from 1994 to 2021 show significant variability in annual rainfall, ranging from 583 mm in 2001 to 1,208 mm in 2012.

Average monthly temperatures are consistently above 25°C; however, there is significant diurnal variation, with peaks of 45°C recorded on site. In the dry season, north-easterly trade winds blow from the Sahara Desert over West Africa, resulting in dry weather conditions and dusty winds referred to as Harmattan winds. In the wet season the prevailing wind direction is from the south and southwest, referred to as monsoon winds.

Air quality

Moderate to high rates of dust deposition are experienced throughout the year due to the Harmattan winds. Air emission sources include windblown dust from exposed surfaces, dust generated by vehicles on unpaved roads, and from biomass burning and household fuel burning. Dust deposition is monitored across the site and in the surrounding communities. Allied is expanding air quality monitoring to include particulate matter.

Noise

Noise monitoring was undertaken as part of the ESIA process for the Sadiola Expansion Project. Monitoring was undertaken at six locations; the villages of Sadiola (two locations), Nétéko, Farabakouta, and Borokoné located west of the site, and the mine village itself. Ambient noise levels at these locations did not comply with the daytime and night-time noise limits stipulated by the IFC. A review of the existing baseline noise level is being undertaken to include villages further afield to understand the influence of existing mine operations on noise levels at these villages.

Hydrology

The mine site is located within the sub-basin of the Falémé River, a tributary of the Senegal River (part of the international border between Mali and Senegal). The site is mainly drained by tributaries of the Kobakoye River that drains into the Falémé River. The two main tributaries include the Farabakouta River in the north and the Khenden River that flows from the south of the site and runs along the plateau to the west of the site. These two rivers join northeast of Nétéko village.

The Farabakouta River will need to be diverted in three locations to bypass the proposed East WRD. The designs for the diversions are in the approval stage.

Communities make use of three micro-dams along the Farabakouta River and tributaries, downstream of the mine, for rice cultivation, market gardening and fishing. The Borokone Dam on the Khenden River, as well as the Khenden River itself also supply water to the local community for domestic activities and agricultural production.

Surface water quality of runoff from operational areas as well streams and dams in the surrounding area is compared to Mali Water Quality Guidelines (2007). Without treatment, surface water is not suitable for human consumption. Surface water is used for agriculture and other domestic activities.

Surface water data between 2017 and 2021 illustrate that pH levels are typically within 6.5 to 9.5, except for two sites within the operational area that fluctuate outside this range. Iron, manganese, TDS and electrical conductivity (EC) are generally elevated. The elevated levels of minerals have been attributed to both the pre-existing geological and pedological characteristics of the area and impacts by industrial and artisanal mining practices. Sulphate concentrations exceeded the Malian standard at three sites throughout the monitoring period, one of which is outside the operational area. Increasing sodium concentrations were also observed over the monitoring period. Concentrations of copper, cadmium and free cyanide were within guideline levels across all sites.

Geohydrology

Groundwater flow direction in the Property area is generally from the south to the north-northwest. Transition zone aquifers and major structures are the most transmissive features of the groundwater system. The existing pits act as groundwater sinks, with multiple pit lakes having developed across the mining area following completion of mining and dewatering activities.

Communities generally rely on groundwater for domestic and agricultural purposes. Drinking water is sourced from village supply wells (30–130 m below ground level) and standpipes with water generally characterised by neutral pH, low electrical conductance (EC), and low TDS. A hydrocensus identified 184 locations where water is obtained. Most of these are within Sadiola town (72 locations) and Nétéko (33 locations). Villagers are responsible for the maintenance and management of the hydraulic equipment used to pump water, but a considerable proportion of equipment was not functional at the time of the hydrocensus.

Allied's hydrogeological consultant (PSM) reports that testing of pre-mining groundwater in numerous shallow wells in villages to the north and west of the Main pit reported a high metal content (including arsenic), possibly derived by background sulphide minerals (PSM, 2021). These results indicate that the metal content in the regional groundwater may have been elevated prior to the commencement of mining (PSM, 2021).

Groundwater quality is compared to Malian and IFC effluent discharge quality standards. Within the site and pits, iron concentrations regularly exceed the IFC limit, attributed to the underlying geological conditions. Arsenic concentrations are exceeded, mostly in the vicinity of the Tambali pits. Copper exceedances occur mostly around the return water dam and tailings penstock (PSM, 2021).

To date, impacts outside the mining area appear limited. Existing water quality monitoring data indicates the shallow groundwater has been impacted with elevated TDS and cyanide levels in the immediate vicinity of the current TSF and return water dam. However, the data currently indicates only limited plume development (elevated sulphates and nitrates) around the TSF (Golder Associates, 2015). The TSF overlies low permeability saprolite clay, which limits migration of potential contamination at source, and the shallow bedrock north of the TSF (downgradient) also forms a hydraulic barrier, limiting northward migration of the elevated sulphate and nitrate plume, which is ultimately largely confined to the TSF footprint. Migration off site is also potentially constrained by the drawdown cones formed by the pits (PSM, 2021). Allied intends to install six additional monitoring wells.

The Sadiola Main pit currently holds 4.3 GL of water that is not suitable for discharge. Pit-lake dewatering commenced in July 2022 with water being pumped to the process plant and the FE2 pit void.

Pit dewatering will use a combination of submersible pumps, dewatering pumps and in-pit dewatering wells. Further assessment and trials of depressurisation holes will be made as the pit is excavated and implemented as required to depressurise the wall slopes. Mine expansion to process primary ore will have a larger impact on the mining area due to a deeper and greater mining and TSF footprint. Water drawdown impacts have been assessed conceptually and further quantitative assessments are required. However, initial assessments indicate that drawdown impact on local communities and known water supply wells is likely to be small owing to the low permeability metagreywacke.

Use of the pits for in-pit tailings storage would impact on pit lake and groundwater recovery. The pits would transition to temporary recharge sources during operations and would therefore have potential to generate contaminated seepage to the surrounding groundwater environment. Seepage from the existing TSF towards Tabakato Village in the south has been identified as a potential risk as the surface groundwater contours show a distinct head under the existing TSF. Groundwater monitoring wells and a regular groundwater quality monitoring program have been proposed at both the existing and future TSF sites for early identification of contaminant migration.

The pit lakes are expected to remain after closure. Drawdown impacts will therefore persist into the post-closure period. For circumstances where the pit lakes transition from sinks to throughflow systems, the accumulated concentrations of salt and metals would enter flow paths downstream of the pit lakes as contaminants.

Biodiversity and land use

The Property is located within the West Sudanian savanna ecoregion which stretches from the Atlantic coast of Senegal to Nigeria's eastern border. The Property area and immediate surrounds are highly modified, although relatively undisturbed patches of natural vegetation are reported within the mining perimeter.

As part of the 2021 ESIA process for restart of operations, a vegetation survey was undertaken over an area of 220 hectares in the main mining areas. Shrub savannah is the main vegetation unit across the area, with varying characteristics:

- Tambali: Shrub savanna, characterised by four main tree and shrub species. Four protected species were identified.
- Farabakouta North: Shrub savanna, characterised by trees and shrubs typically between 6 m and 8 m in height. Dense wooded vegetation exists within the protected ancient Farabakouta cemetery. Three protected species and four species of economic value were identified.
- Farabakouta East (FE3): Shrub savanna, characterised by six main species.

- Tabakoto: Primarily shrub savanna, characterised by Combretaceae species along with several protected species that are poorly represented.

During the 2022 ESIA study, 54 bird species were identified and there was relatively low diversity of all other fauna. One species of conservation concern was identified; the African Spurred Tortoise which is listed as endangered on the IUCN Red List.

The UNEP World Conservation Monitoring Centre does not consider the Property area to be a likely or potential critical habitat.

20.1.2 Monitoring, auditing, and reporting

The mine Health, Safety, Environment and Community (HSEC) department undertakes regular audits of ESMP implementation to identify corrective measures required. SEMOS is also subject to external audits mandated by the regulatory authorities, voluntary certifications, and lender agreements. Annual audits of compliance with IFC Performance Standards are undertaken by a suitably qualified third party.

Environmental and social monitoring during 2020 included rainfall, dust deposition and water quality. The ESMP for restarting operations includes an environmental and social monitoring program, committing SEMOS to monitoring air quality, noise and vibrations, water quality, groundwater levels, landform rehabilitation and community health and safety.

SEMOS has also maintained programs to evaluate the efficiency of resource use and pollution prevention. Data recorded include annual water and energy consumption, greenhouse gas emissions, and volumes of waste generated. SEMOS also reports monthly on, among others, land acquisition activities, local employment data, incidents, and engagement activities. This data is reported in Allied's annual sustainability reports.

20.2 Tailings storage facilities

The current Sadiola TSF has mostly received tailings material derived from the processing of oxide ores. The existing TSF will continue to receive tailings until 2025 after which in-pit storage (TSF2) at the Farabakouta East (FE) pits is planned until 2041. Figure 16.1 shows the positions of the current and planned TSFs in relation to other mine infrastructure.

20.2.1 Existing TSF

The existing TSF is a cycloned valley infill facility which has been in operation since 1996. The starter wall was constructed of compacted laterite and raised in an upstream direction using cyclone underflow tailings for wall building.

In April 2022, Knight Piésold carried out a formal audit of the TSF with no material findings. In July 2022, Knight Piésold were appointed Engineer of Record for the TSF. As of July 2022, the TSF contains 122 Mt of tailings and is expected to operate until 2025 after which, the TSF will be decommissioned and rehabilitated.

Geochemistry

Geochemical investigations in 2000 indicated that oxide gravity concentrate tailings samples had elevated concentrations of sulphate and nitrate.

Geosyntec (2019) also tested tailings samples to assess the potential toxicity of the tailings to vegetation. A vegetative cover was recommended by Geosyntec as part of the final closure design for the current TSF. The leaching potential was determined using the US Environmental Protection Agency's Toxicity Characteristic Leaching Procedure. The constituents detected in the leachate included sodium, sulphate, and manganese, which are considered to pose minimal biotoxicity risk to vegetation (Geosyntec, 2019).

However, Geosyntec (2020) also provided water quality monitoring data from groundwater samples collected in the vicinity of the TSF and return water dam between 2015 and 2017. Data from the monitoring boreholes near to the TSF indicated that several parameters exceeded the IFC guidelines or Malian effluent standards.

Deposition and management

Since January 2006, the target cycloning underflow percentage for the TSF has been set at a minimum of 16%. However, cycloning operations have been able to produce an average of more than 23% underflow for wall building and the average underflow material properties were found to consistently meet, or exceed, recommended minimum grading requirements since May 1998.

During 2023, an upstream lift will be progressively installed, converting the cyclone discharge method to conventional spigots to promote better tailings beach consolidation. An upgraded decant return system will be installed in 2023 to simplify and maximize decant return.

Downstream buttressing is planned in 2024 to ensure sufficient factors of safety are maintained while the new process plant deposits primary tailings at 10 Mt/a in 2024. The buttressing will be composed of ROM waste directly from the FE3 North pit.

Between 2025 and 2027, the existing TSF will be decommissioned and rehabilitated. Closure of the TSF will require a cover system to isolate the tailings from the environment. The estimated cost of decommissioning and rehabilitation is $8.56 million.

Geotechnical testing

Cone penetrometer data was used to describe the layering and material properties for geotechnical characterisation and stability assessments at the current TSF. Tailings layers were then classified by grouping soils of similar strengths.

Three layers were identified consistently in the dataset:

- Top layer (8–14 m thick) has relatively high cone tip resistance (>2 MPa and state parameter generally < -0.05), interpreted as a dilative sand layer (underflow tailings). Drained parameters were adopted for this layer.
- Middle layer (4–7 m thick) has cone tip resistance around 1~2 MPa, interpreted as a silty/clayey layer with moderate shear strength.
- Bottom layer (8–16 m thick). This layer has very low cone tip resistance around 1 MPa, interpreted as a weak sensitive clayey material layer.

Vibrating wire piezometers were originally installed in sections around the TSF embankment in 2004 to monitor the phreatic head in the TSF. Piezometer data collected from January 2004 to April 2020 indicates that the phreatic surface within the TSF is consistently at, or below, the critical elevation to provide a FoS against full height slope stability failure above 1.3 short term undrained (Geosyntec, 2020).

The piezometer monitoring network was expanded in 2021.

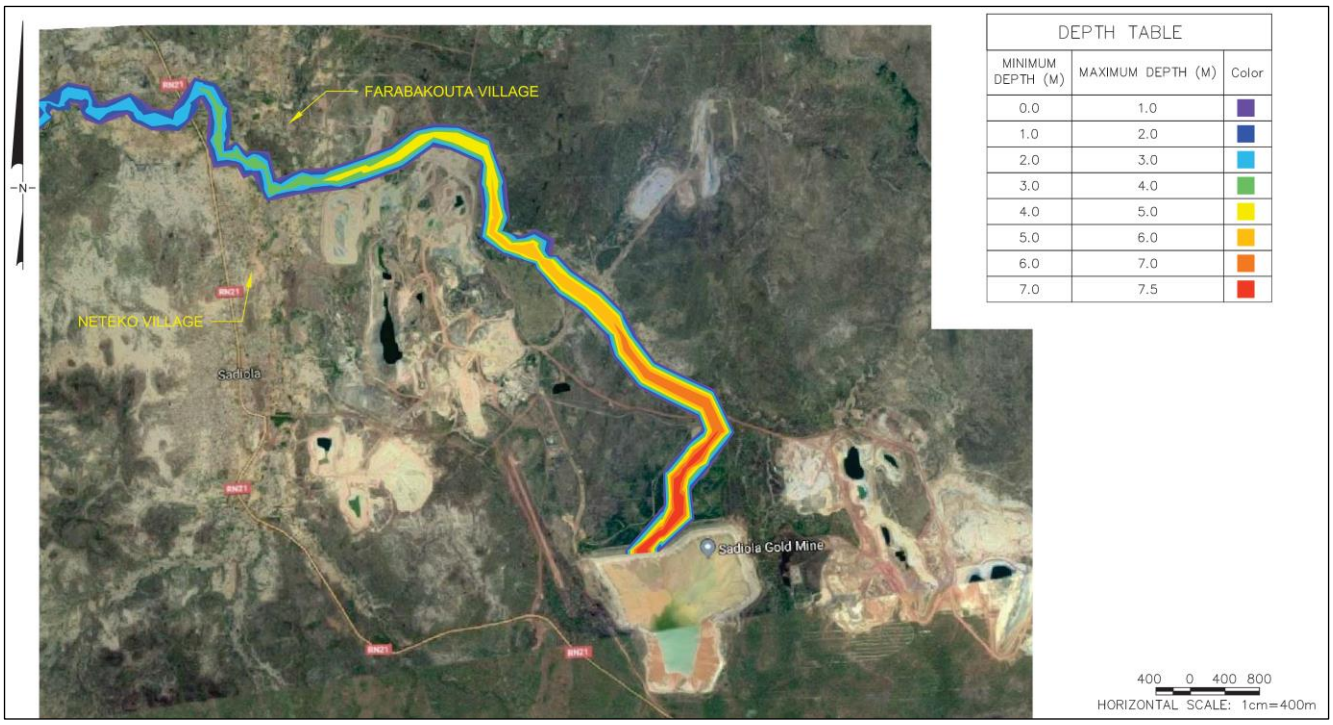
Dam break analysis

In July 2019, Geosyntec performed a dam break analysis for the Final Closure Plan of the TSF. Rheological testing on samples of tailings from the TSF were used to determine non-Newtonian flow characteristics of liquefied tailings and multiple failure modes were considered. A Microsoft Excel based pseudo 3D non-Newtonian fluid mechanics model was developed to predict the extent of potential inundation. Two sets of initial conditions to assess uncertainty in material properties and input assumptions were analyzed.

Initial results showed that a theoretical major TSF failure would result in a flow slide which would reach the area near Farabakouta Village within 5–10 minutes. However, the existing streambed is expected to largely contain the flow near the village (Figure 20.1). The surface topography downstream of the TSF has also been altered considerably by the mine pits and flow slides may naturally flow into a pit. The topography may be intentionally modified to create preferential flow paths into a pit, thereby limiting impacts of a possible flow slide to environmental contamination rather than injury or loss of life.

Knight Piésold is undertaking an updated dam break analysis which will account for changes in the mining infrastructure including, the east waste dump and diversion channel to be installed for the expansion.

Figure 20.1 Maximum extent of inundation under the low-viscosity scenario



Source: Dam Break Analysis Closure Plan for Existing Tailings Storage Facility; Geosyntec, 2019

Stability and buttress design

Historical assessments completed by the previous owners, using testwork results from site investigations in 1999, 2003, 2009, 2014 and 2017, showed sufficient FoS at greater than 1.3 for short term (undrained) conditions. In Q1 2021, Knight Piésold conducted a geotechnical investigation and stability analyses, and recommended the installation of buttresses to improve overall embankment stability. The recommended buttresses were completed in February 2022 and the FoS under all assessed conditions, for all critical embankment sections are now all equal to or greater than the minimum values recommended in the ANCOLD guidelines.

20.2.2 Future TSF

A new TSF is required from Q1 2026. A TSF site selection study, undertaken by Knight Piésold, considered four options. The most favourable option was the use of a combination of in-pit and above ground tailings disposal at FE3 and FE4. The in-pit tailings deposition (with tailings detoxification) has been re-approved by the regulator.

Mining of FE3 North will be complete in 2025 and can accept tailings until 2028, allowing sufficient time for the potential mining of FE3 South and FE4. Both FE4 and FE3 South can receive in-pit tailings from 2029.

Primary geochemical characterisation

Lorax Environmental Services (Lorax) conducted waste rock geochemical testing and analysis between 2010 and 2012. Static and kinetic tests were conducted on samples of existing waste material, drill core samples of material to be produced for the primary project and metallurgical test tailings samples of primary ore. Previous geochemical results indicated that acid rock drainage (ARD) potential at the Sadiola mine is largely governed by weathering type as follows:

- Soft primary minerals which have undergone hypergene leaching of the carbonate minerals and represents approximately 2% of the future ore.
- Hard primary minerals that have not lost carbonate minerals to hypergene leaching and have a considerably higher neutralization potential than the soft primary minerals. Hard primary weathering types make up approximately 80% of the of ore to be mined and therefore, tailings wastes are not expected to generate ARD.

In 2022, Knight Piésold undertook a full suite of tailings testwork on primary tailings. The results indicated:

- The tailings were classified as Acid Consuming; therefore, based on these results there is little risk of acid generation expected from the tailings and alkaline conditions are expected to be maintained in the tailings throughout operations and at closure.
- Several elements were enriched, with arsenic and antimony being highly enriched therefore, the tailings facility should be designed to minimise the loss of tailings solids through dust. The facility will require a cover system on closure to minimise uptake of metals by vegetation on the TSF and to isolate the tailings from the environment.
- Water quality does not allow the release of water from the mining operations due to elevated concentrations of arsenic, fluoride and molybdenum. Concentrations of total dissolved solids, arsenic, antimony, fluoride, molybdenum and sulphate exceeded international drinking water standards.

New TSF design (TSF2)

TSF2 (Figure 16.1) is designed to have a total disposal capacity of 140 Mt, as compared to the processing schedule which shows 134 Mt from 2026. Approximately 123 Mt of tailings will be accommodated by in-pit storage; the balance (17 Mt) will be stored in an aboveground facility encompassing FE3 North and South pits to a final embankment crest elevation of approximately RL154.5 m. As the modelled geochemistry indicates the material to be non-acid forming, the liner for the aboveground facility will include a low permeability compacted in-situ soil liner. Seismic loading and FoS are in line with the ANCOLD guidelines. Allied is also committed to implementing best practice in terms of tailings management and the new Global Industry Standards for Tailings Management (GISTM, 2020).

Void volumes for the FE3 and FE4 pits are approximately 24.3 Mm^3 and 43.7 Mm^3 respectively to an elevation of RL150 m (the lowest level around the perimeter of the FE3 pit). An above-ground perimeter embankment with a minimum set-back of 75 m from the pit crests was assumed.

The new TSF will be required by Q1 2026. Deposition of in-pit tailings will commence at FE3 North once mining of the pit is complete. The FE3 pits will accept material until 2028 which will allow for additional exploration to take place at FE4 prior to it being used to store tailings from 2029.

The deposition plan for in-pit storage seeks to maximize the drying of tailings and maintain a small supernatant pond in the most practical location. Conventionally thickened tailings (55% solids) in conjunction with tailings detoxification was selected. Once the pits are filled, deposition will occur from the perimeter embankment.

The aboveground facility will be developed to a final elevation of approximately 13 m above pit crest (depending on the settled density achieved) for the remainder of LOM and can accommodate extensions.

The perimeter embankments will have upstream and downstream slopes of 1V:3H and a crest width of 8 m. Cut-off trenches will be excavated to a depth of approximately 2 m into the natural subgrade and backfilled with low permeability fill. The TSF embankments will comprise zoned embankments constructed using selected mine waste, an upstream low permeability zone, and a downstream structural zone. If needed, a transitional material will be introduced between the two zones to ensure filter compatibility.

Prior to tailings disposal, the FE pit lakes will require dewatering. Depending on water quality, mine water will be discharged to the environment. Water from FE3 North is being discharged north to the Blue Dam and water from FE4 will be discharged south towards Tabakato.

Seepage management

The 2021 PFS proposed an under-drainage system to minimize tailings consolidation time and increase the rate of water recovery. However, further assessment has indicated that estimated tailings permeability of 10^{6} m/s is moderate, and 1 to 2 orders of magnitude less than the values assumed in the PFS seepage assessment. Hydrogeological modelling indicates that dewatered pits will act as a groundwater sink while in-pit tailings levels are below 125 masl and that the majority of tailings water seeping from FE3 North and FE4 would be intercepted by FE3 South pit until 2038. The benefits of the under-drainage system were considered marginal and not worth the investment and the system was removed from the final TSF design.

To manage seepage, dewatering of FE3 South should be continued for intercepting potential offsite migration of contaminants until it is required for tailings disposal in 2036. Between 2025 and 2038, a portion of seepage may not be captured by FE3 South; monitoring wells have been proposed to the north and south of TSF2 for early detection of contaminants. After 2038 seepage from TSF2 to the environment is expected. Studies have commenced to further understand contaminant transport from TSF2 and to develop mitigation strategies.

To reduce the potential contaminates in the tailings, cyanide detoxification to 50 ppm (WAD CN) as well as arsenic precipitation will be carried out before pumping to the in-pit TSF. Antimony precipitation testwork showed 15 ppm antimony in the tailings with a water treatment plant included in the flowsheet to reduce antimony in the tailings return.

A cut-off trench for the above-ground portion of the TSF2 will be located beneath the upstream toe of the perimeter embankment and will be cut to a depth of approximately 2 m (depending on ground conditions). A compacted soil liner of 200 mm thickness will be constructed from the in-situ soils, or suitable borrow material. The soil liner will tie into the low permeability zone of the embankment and will have a permeability of less than 1×10^{-8} m/s.

Decant water return and spillway

The expectant supernatant release is 135–240 m^3/h. The supernatant return system will consist of a floating barge-pump or submersible pump placed adjacent to the pit access ramp. The tailings delivery and decant return pipelines will be located within the same bunded corridor between the process plant and TSF2.

The primary TSF2 will operate as a below ground facility for majority of its operating life, during which it is unlikely that the storm storage capacity of the facility will be exceeded. The aboveground facility will have external embankments designed to contain 1:100-year storm events. However, a new spillway will be constructed along the southern embankment at each stage of aboveground construction.

Monitoring

A monitoring program for the TSF2 will be developed prior to commissioning. Knight Piésold (2022) indicates that monitoring will include:

- Groundwater monitoring boreholes and surface water sampling stations. A network of groundwater monitoring stations will be installed downstream of the TSF embankments for the early detection of

changes in groundwater level and/or water quality during the operating life and following decommissioning.

- Standpipe piezometers with bases located within the embankment to ensure that the phreatic surface within the embankment fill is measured, as opposed to natural groundwater level. Regular monitoring will ensure that changes in water levels remain below acceptable levels and the phreatic surface does not compromise the overall stability of the embankments.
- Survey pins will be placed on embankment crests to monitor embankment movement.

Stability assessment

The proposed downstream geometry and low height of the perimeter embankments indicate that the primary TSF2 will be stable under static and seismic loading. Under seismic loading the embankment deformation is expected to be considerably less than the available freeboard. The design is based on meeting and exceeding ANCOLD guidelines which includes FoS of 1.5 long term drained, and 1.3 short term undrained and 1.0 to 1.2 post seismic.

Dam break analysis

A preliminary dam break analysis for the primary TSF2 was undertaken by Knight Piésold in accordance with the ANCOLD guidelines. The Severity Level Impact of a breach of the facility was rated as “Major” due to the flow slide resulting from any significant breach halting mining operations for a significant period and affecting a significant downstream portion of the mining area.

The assessment indicated that the proposed TSF is rated as a “High C” consequence category facility for dam break and “Significant” consequence category facility for environmental spill (Knight Piésold, 2022). The design criteria applicable to these categories are drawn from the ANCOLD guidelines.

Seismicity

A site-specific seismic hazard assessment was carried out in 2022 for Sadiola in terms of the required ANCOLD earthquake guidelines. West Africa is a region of relatively low seismic activity, making estimation of an accurate maximum credible earthquake difficult. The nearest active fault is located near the southern coastline of Ghana/Côte d’Ivoire more than 1,000 km from the Property. Suitably conservative seismic design parameters have been used for the TSF analysis. Seismic ground motion parameters (including peak ground acceleration and earthquake magnitude) were estimated based on the probabilistic seismic hazard analysis.

20.3 Waste rock dumps

20.3.1 Waste rock dump design

Waste rock will be disposed in WRDs located adjacent to the open pits. The area to the east of the Sadiola open pit was selected as a dump location to minimize haulage distances and to keep the haulage cost low (i.e. being close to the pit exit) while reducing the likelihood of sterilising future ore. The waste dump construction and final landform are based on the following criteria:

- Waste dumps located fully within the mining lease boundary.
- The swell factor utilized to calculate the placed material in the dump is 25%.
- Dump face angle is 37° during construction in 10 m lifts with a continuous 17° slope on the final landform.
- Berm width of 19.5 m during construction.
- All topsoil and soft organic or saturated cohesive soils within the pit footprints will be stripped and stockpiled.
- Knight Piésold has designed and costed sediment control structures.

20.3.2 Waste rock characterisation

Historical geochemical testwork has demonstrated a minimal risk of acid generation or metalloid leaching from the WRDs. Any minor proportions of potentially acid forming material would be placed centrally within the waste dumps. It is envisaged that a cover system of benign waste and a growth medium will be required to rehabilitate the waste rock landform at closure.

Testwork undertaken to inform the 2022 FS included testwork on 176 samples:

- Acid base accounting: 47% of the samples were classified as Acid Consuming and 53% as Non-Acid Forming. One sample was classified as Potentially Acid Forming. Oxidation appeared to be the main driver of the acid formation potential. A much higher neutralising capacity is present in the fresh material such that 64% of the fresh samples were found to be acid consuming. This dropped to 13% in the transitional material and none of the oxide samples were found to be acid consuming. Therefore, waste rock to be mined is not anticipated to have acid conditions occurring on site and sufficient neutralising capacity will be available in the waste to neutralise any acid generated.
- Multi-element analysis: Samples had few element enrichments, predominantly limited to arsenic and antimony, which were significant or highly enriched in 85% and 74% of samples, respectively. Minor enrichments included silver, bismuth, molybdenum and sulphur. This has implications for closure of the dumps (which may need additional cover material to support plant growth) and during operations where the control of arsenic baring dust is required.
- Distilled water extract: The samples met most reference water quality values for dissolved metals in the release water, except for aluminium, arsenic, iron and antimony. Arsenic exceeded release guideline concentrations in the distilled water extract solutions in 38% of samples and this was distributed across all lithologies, pits and rock types. Kinetic testwork is progressing to confirm the (static) distilled water testwork. Fresh and transitional waste will likely be encapsulated with an outer facing of oxide waste and trials of wetlands and laterite filters for closure may be required to control the release of these metals.

Monitoring of groundwater wells and receiving waters around the existing TSF and WRDs did not indicate significant leaching from existing mine wastes.

20.4 Permitting

The following permits and authorisations listed in Table 20.1 have been approved for Sadiola. Several previous approvals are no longer valid, as these were either not implemented within three years of receipt of the approval or activities went on hold (without resumption) for a period of at least three years.

Additional permits are required to be in place prior to construction and operation of the Sadiola Expansion Study:

- Construction Permit for the construction of any installations of industrial or commercial use.
- Water Management Permit to divert any watercourses.
- Bush Clearing Permit for any land clearance activities.
- Radiation Permit for the transportation, storage and use of radiation sources (i.e. components in the process plant).

Work is underway to fulfil the requirements for each of these permit applications.

Land acquisition and compensation for affected assets (i.e. farms, crops, houses or other structures) must be completed ahead of project implementation. Following the land use surveys for the powerline corridor, land acquisition and compensation will be confirmed.

Table 20.1 Permits and authorisations obtained for Sadiola

Type	Name	Reference	Issue date	Expiry date
Exploitation Authorization	Sadiola Hill Gold Project	Decree 94-257 PM/RM, transferred to SEMOS by Decree 94-440 PM/RM	1 Aug 1994	30 Jul 2024
Exploitation Authorization		Decree 00-080 PM/RM, modifying permitted area of Decree 94-257 PM/RM	6 Mar 2000	30 Jul 2024
Resolution	Authorization for pumping 8,000,000 m^3 per year from the Senegal River for the Sadiola mine	00250 CM/SN/D	Jan 1994	N/A
Exploitation Authorization	Protected zone boundaries associated with the exploitation authorization	04-0797/MMEE-MATCL	6 Apr 2004	N/A
Environmental permit	Authorization to operate medical waste incinerator	DRACPN-Kayes	14 Oct 2009	N/A
Environmental permit	Hazardous waste landfill	11-034/MEA-SG	26 Apr 2011	N/A
Environmental permit	Approval to dewater the FE3, Tambali, Tabakoto and FN pits and discharge to the environment	2021-0013/GRK-CAB	14 Jan 2021	N/A
Environmental permit	Authorization to recommence mining at Tambali, Tabakoto, FE3, FNBC pits and associated activities	2021-0018	24 Mar 2021	N/A
Environmental permit	Authorization to develop the Sadiola Expansion Project	2022-0059	10 Aug 2022	N/A

Source: Sadiola FS, September 2022

20.5 Social and community

Approval of the original Sadiola project triggered relocation of the Sadiola and Farabakouta villages in 1999. This resettlement was undertaken in accordance with the World Bank Operational Directive 4.30.

Current mine activities occur within the Sadiola Rural Commune, for which Sadiola is the administrative centre. The commune comprises 46 villages. Eight of these are situated within 4 km of the mine and are considered directly or indirectly affected by ongoing mining activities: Sadiola, Nétéko, Farabakouta, Sirimana, Madina, Borokoné, Sekekoto, and Tabakoto. The estimated population of these eight villages in 2018 was 15,678; Sadiola was the largest village (10,631 people), followed by Nétéko (1,500 people) and Sekekoto (1,160 people).

The main ethnic groups are Bambara and Malinké who are indigenous to the area, and the Khasonké and Fulani who have been in the area for several generations. The 2017 ESIA also refers to Fulani pastoralists (considered indigenous peoples) grazing livestock within the commune seasonally. Ethnic tensions are generally not an issue despite the differences between these ethnic groups; however, social cohesion can be affected by other sources of tension, for example between herders, farmers, miners, gold washers, etc.

Islam is the predominant religion practiced in the area, with minority religions represented by Christianity and animism. Relations between the Muslim majority and other religious minorities are stable.

All communities are characterised by a lack of formal employment and a mixed livelihood strategy, consisting of subsistence and income-generating activities, largely reliant on the surrounding natural resources. Agriculture and livestock husbandry are the main community subsistence activities, with produce primarily for household consumption and any excess sold for income. The main crops are millet, sorghum, fonio, maize, rice and peanuts.

Artisanal mining has driven population influx to the area over the last 10 years. Following the closure of the nearby Yatela mine and the suspension of Sadiola mining from 2018 to 2021, an increase in artisanal mining has been observed. Majority of the artisanal miners use mercury in their operations. Artisanal mining has resulted in young people abandoning further education and other livelihood activities.

20.5.1 Community development

Between 2004 and 2018, SEMOS made annual contributions totalling approximately $5 million to a community fund aimed at promoting socio-economic development within the surrounding communities. Despite the significant financial contribution, the results were considered unsatisfactory and subsequent financial and technical audits resulted in these funding mechanisms being ceased.

In 2018, an alternative mechanism was adopted which involves direct funding of projects jointly identified by SEMOS and the Sadiola Municipality.

Between 2019 and 2021, SEMOS contributed approximately $1.5 million to community development in the area. The funds were used to support the development of education infrastructure, health infrastructure (i.e. health centre, ambulance, equipment), refurbishment of Diamou's water supply, installation of water supply systems in Sirimana and Sekekoto, agricultural projects and assistance to support the COVID-19 response.

In 2022, SEMOS contributed approximately $650,000 to community development. These funds continue to support projects focussed on upgrading social infrastructure and services within the Kayes Region and the Sadiola and Diamou rural communes. Across the rural communes, funds were used to complete the Sadiola community water supply project, install solar power at the Sadiola police station, install solar power at the community health centres, provide medical equipment and ultrasound devices, and install solar streetlights to reinforce public lighting. Within the region, the funds were used to rehabilitate the hospital maternity ward, provide maternity equipment and pharmaceutical products, and support the repair works at the penitentiary. This was supplemented by direct investments to various local initiatives through in-kind assistance, support, sponsorship for other vulnerable people, and other groups and associations.

20.5.2 Heritage

Several cultural heritage sites exist in the Property area and its surrounds. The 2021 ESIA for recommencement of mining activities concluded that no significant cultural heritage sites will be affected.

20.5.3 International good practice

Allied has developed a framework HSEC Management System in accordance with international good practice. The framework is supported by corporate policies including a Code of Conduct, HSEC Policy, Recruitment Policy, and Human Rights Policy. SEMOS has developed a formal management system for the site that was certified to ISO 14001. Certification lapsed in May 2021 and work is ongoing to ensure that the existing management system is aligned with Allied's expectations.

Several key environmental and social plans are implemented on site, including environmental and social management and monitoring, local development (developed in collaboration with the local development committees), mine closure, and stakeholder engagement.

A Stakeholder Engagement Action Plan was developed in February 2020. Ongoing stakeholder engagement to support operational activities is largely targeted at local regulatory authorities and communities.

A Community Grievance Mechanism has been developed in partnership with stakeholders. In 2021, 294 grievances were received. Majority of the grievances were related to damage to structures from blasting at Tambali pit and crop damage from sedimentation from Tambali WRD.

20.6 Closure provisions

The Mining Code requires five-yearly submissions of the MCP to regulatory authorities. An updated MCP and closure cost estimate for SEMOS was submitted on 17 March 2020.

Allied engaged Kewan Bond (Pty) Ltd (Kewan) as an independent consultant to review and update the mine closure estimate. Table 20.2 summarises the closure cost at the end of 2022, excluding retrenchment, which is estimated at $87.6 million.

Table 20.2 Closure provision for Sadiola gold mine ($ M) (after Kewan, 2022)

Area	$M
TSFs	8.81
WRDs	24.25
Dams and ponds	0.21
Low-grade stockpiles and ROM pads	2.21
Infrastructure demolition	11.73
Equipment resale and salvage	(6.98)
Open pit mines	0.92
Roads and service corridors	4.60
Exploration	0.16
Monitoring and maintenance	9.7
Closure studies and reports	0.5
Social closure	9.04
Project management	9.96
Mobilisation and demobilisation	0.89
Contingency	11.55
Total	**87.56**

Source: Allied, Sadiola FS, September 2022

Allied has committed to provide bank guarantee at a rate of $0.67/t of mill feed to the Sadiola Expansion Project, which is to cover closure costs when the mine ultimately shuts down.

21 CAPITAL AND OPERATING COSTS

21.1 Capital costs

LOM capital costs for Sadiola are estimated at $702.4 million (from January 2023) to a current planned completion of ore processing in 2041 and a mine closure date of 2044 as summarised in Table 21.1. The LOM capital costs include an overall 12% contingency.

Table 21.1 Sadiola LOM capital cost estimate ($M)

Item	Total	2023	2024	2025	2026	2027	2028	2029–2044
Plant expansion*	378.14	35.93	260.40	72.40	9.41	0.00	0.00	0.00
Mining mobilisation-demobilisation	15.70	0.24	2.59	0.00	0.05	0.60	0.88	11.34
Sustaining capital	218.99	23.62	54.26	7.60	10.12	11.59	23.73	88.07
Closure and rehabilitation costs	89.61	0.00	0.00	0.00	0.00	2.85	2.85	83.90
Total	702.44	59.79	317.26	80.00	19.58	15.04	27.46	183.31

**: excludes $13.43 million sunk capital*

Source: Allied, Sadiola LOMP, December 2022

The Qualified Person considers the overall capital cost provisions to be reasonable.

21.1.1 Sadiola Expansion

Capital cost estimates at ±10% accuracy were developed by Orelogy, DRA, ECG, PSM and Allied for the 2022 FS. A substantial portion of the capital cost relates to the Sadiola Expansion Project, which is estimated at $378.14 million, exclusive of $13.43 million of sunk capital as outlined in Table 21.2.

In 2022, the estimate was developed by DRA based upon a detailed work breakdown structure at a Q2 2022 base date. While the pre-purchased equipment is “free issued” to the project, transport to site and refurbishment of pre-purchased capital items were included in the 2022 FS capital estimate.

Table 21.2 Sadiola Expansion capital summary

Activity	Cost ($M)
Plant direct costs	143.25
Plant Indirect costs	79.36
Power supply	68.53
General infrastructure	8.15
Client costs	57.40
Contingency	21.45
Plant upgrade subtotal	**378.14**

Source: Allied, LOMP, 2022

The estimates include contingency at $21.5 million which represents 6% of the total costs, with an additional 5% growth allowance included in the direct costs.

The Qualified Person’s benchmarking of the process plant portion of the costs is $350–$375 million and is regarded as a fair and reasonable estimate for a complete 8.0 Mt/a free milling primary ore gold plant at a feasibility study level of accuracy.

21.1.2 Mining capital

Mining contractor mobilisation and demobilisation of the contractor's mining fleet was estimated at $15.7 million by Orelogy from first principles.

21.1.3 Sustaining capital

Sustaining capital totals $219 million including:

- $60.2 million to sustain the existing operation including the East Waste Dump, pit dewatering, raises for the existing TSF, oxygen plant and contingency. The oxygen plant is largely installed at the time of reporting.
- General costs of $90.1 million estimated by Allied in conjunction with SEMOS and its consultants.
- Relocation of the recently refurbished and replaced gensets (10 MW) to the new diesel genset yard in 2025 for consolidation of equipment before demolition of the existing plant at a cost of $2.4 million; estimated by ECG.
- Demolition of the oxide plant at a cost of $10.0 million based on advice from DRA.
- Hydrology costs of $5.6 million with pit dewatering costs from 2025 including drilling, installation of water bores for pit dewatering and monitoring, and five interception bores at FE3 and FE4 in pit tailings; estimated by PSM.
- FE3 North TSF costs of $1.4 million as estimated by Knight Piésold.
- FE4 TSF costs of $8.5 million as estimated by Knight Piésold.
- Redundancy costs of $18.0 million as estimated by SEMOS in March 2022.
- Contingency of 12% has been applied to sustaining capital.

The Qualified Person considers the overall capital cost provisions to be reasonable.

21.1.4 Closure cost

Closure costs estimated by Kewan Bond at $89.6 million, which includes the closure estimate (Table 20.2) and additional provisions for redundancy and social development post closure.

21.2 Operating costs

Operating costs at Sadiola comprise mining, processing, and G&A and are estimated by Allied and its consultants at $5,093 million over the LOM as summarised in Table 21.3.

Table 21.3 Sadiola operating cost summary ($M)

Area	Total	2023	2024	2025	2026	2027	2028	Remaining LOM
Mining	1,895.07	84.22	94.27	119.66	137.39	142.96	128.59	1,187.98
Processing	2,081.42	73.63	74.53	75.49	117.77	121.66	115.89	1,502.45
Site administration	553.99	32.00	30.00	30.00	30.00	30.00	30.00	371.99
Selling cost	24.68	0.67	0.68	0.67	1.61	1.48	1.45	18.12
Royalty	538.22	15.49	15.63	14.92	34.94	32.19	31.58	393.48
Total	**5,093.38**	**206.01**	**215.11**	**240.74**	**321.70**	**328.29**	**307.51**	**3,474.02**
Total unit cost ($/t ore)	34.10	41.86	43.04	47.85	35.44	35.26	36.87	32.23
Unit mining cost ($/t rock)	3.09	2.34	2.26	2.49	2.86	2.98	2.67	3.46
Unit processing and G&A ($/t ore)	17.64	21.46	20.92	20.94	16.35	16.35	17.57	17.39

Source: Source: Allied, Sadiola LOMP, December 2022

Operating costs and royalties total $34.10/t (per tonne of ore). Mining costs total $3.09/t rock mined (ore plus waste). Processing costs and administration costs total $17.64/t ore processed. Selling costs total $25 million and government and community royalties total $538 million.

The all-in sustaining cost, excluding the new plant expansion, over the LOM is approximately $985/oz or approximately $1,056/oz including all capital and closure costs.

21.2.1 Mining

Mining operating costs were split between oxide and fresh rock mining. Current contractor rates have been used as part of the forecast mining in the majority of pit stages, while budget rates have been applied to fresh rock at depth in Sadiola Main Stages 12 and 13.

Mining costs are based on a detailed material movement schedules as well as first-principles costing. The overall cost split is summarised in Table 21.4.

Table 21.4 Mining operating cost split ($M)

Operating cost	Total	2023	2024	2025	2026	2027	2028	Remaining LOM
Variable	**1,202.6**	46.51	54.97	77.28	92.77	94.38	83.49	753.20
Mining fuel	**324.8**	15.36	16.75	20.87	23.55	24.28	22.51	201.46
Dewatering	**5.4**	0.37	0.26	0.30	0.35	0.33	0.33	3.46
Fixed mining cost	**187.6**	11.92	11.84	10.88	9.88	11.92	11.92	119.23
Grade control	**25.1**	1.57	1.57	1.57	1.57	1.57	1.57	15.71
Contractor management fee	**96.0**	6.00	6.00	6.00	6.00	6.00	6.00	60.00
BME fixed	**53.6**	2.49	2.87	2.77	3.27	4.48	2.77	34.93
Total mining	**1,895.1**	**84.22**	**94.27**	**119.66**	**137.39**	**142.96**	**128.59**	**1,187.98**

Source: Allied, Sadiola LOMP, December 2022

The mining operating costs were developed by Orelogy and comprise:

- Variable mining costs, which are sourced from the established mining contractor's schedule of rates, the individual bench levels, the oxidation state and the location of the pit and associated waste dumps. Drill and blast costs are calculated for each oxide type and based on a 10 m bench height with subdrill using a 165 mm diameter holes.

- A fuel cost of $0.90/L in 2023 and $0.80/L for the remaining LOM. Consumption of fuel is governed by the volume of material moved, the mining and dump locations and the nature of the haul route.
- Mine dewatering which allow for horizontal weep holes as required to assist with depressurization of the Sadiola Main pit.
- Fixed mining costs for SEMOS owner's team.
- Grade control costs based on RC drilling using a 5 m x 10 m grid over an entire 30 m vertical height.
- Contract management costs including management fees incurred by the mining contractor for its supervision and management, labour and equipment maintenance activities and associated office support.
- The current blasting contractor (BME) with a fixed cost component covering its labour and support equipment.

Mining operational costs at Sadiola are forecast by Orelogy to be $3.09/t rock, which are maintained below $3.00/t until about 2028, after which there are increased costs corresponding to the increasing depth.

Given the project is at an operational stage, the overall cost assumptions appear reasonable to the Qualified Person.

21.2.2 Processing

Processing costs in the existing plant have been estimated by Allied for each ore type based on a review of existing unit costs. Fixed and variable operating costs in the new process plant were estimated by DRA for each ore type. To develop the processing cost estimate, Orelogy assigned the operating costs for each ore type based on the integrated mining and processing schedule.

The processing costs as summarised Table 21.5 comprise the following activities:

- Rehandling of stockpiled ore.
- Variable costs, which are mostly grinding media, lime, cyanide and cyanide detoxification reagent.
- Power costs included in variable costs for the existing plant.
- Fixed costs, which include labour, power for infrastructure, some consumables such as crusher and mill liners, gold room reagents and miscellaneous costs including software licences, laboratory, mobile equipment maintenance and crane hire.

Table 21.5 Sadiola LOM processing operating costs ($M)

Activity	Total	2023	2024	2025	2026	2027	2028	Remaining LOM
Rehandle	63.51	1.31	1.28	1.98	3.14	3.10	2.91	49.78
Variable	1,005.75	48.01	48.95	49.20	56.17	57.75	52.60	693.07
Power	422.30	0.00	0.00	0.00	24.89	27.24	26.82	343.36
Fixed	589.86	24.30	24.30	24.30	33.57	33.57	33.57	416.24
Total process	**2,081.42**	**73.63**	**74.53**	**75.49**	**117.77**	**121.66**	**115.89**	**1,502.45**
Process ($/t ore)	13.93	14.96	14.91	14.98	13.03	13.12	13.95	13.94

Source: Allied, Sadiola LOMP, December 2022

Existing plant

The existing plant forecast operating costs are based upon historical performance with the current power supply from the existing light fuel oil (diesel) generation plant. Variable costs (i.e. reagents, consumables, power) are estimated for each ore type and applied dependent on the processing schedule for each period.

Variable processing costs comprise:

- Reagent and consumable costs based upon consumption per ore type, with the transitional ores being the highest cost at about $10.00/t and the oxide cost at about $3.00/t treated. The blend of feed material results in the increase during the forecast period. It is noted that reagent and consumable prices are based on historical pricing. Grinding media has increased from $1,389/t to $1,550/t due to the impact of the war in Ukraine. Allied advised that pricing received in Q3 2022 was $1,484/t.
- Power costs are based upon the historical power demand of 11.46 MW for 7,940 hours per annum. The power draw does not significantly fluctuate with changes in blend. Rather throughput is varied, maintaining a consistent power consumption. The power costs are forecast at $0.27/kWh in 2023 and $0.24/kWh from 2024, which assumes diesel pricing of $0.90/L in 2023 and $0.80/L from 2024.

Fixed processing costs comprise:

- Plant labour based on current staffing and labour costs at 158 for operations, 83 for maintenance and 72 for laboratory permanent staff. The staffing numbers are higher than would be expected for a modern plant. The laboratory is owner operated and a review is being conducted to consider the economic and staffing benefits of outsourcing the service.
- Maintenance cost based upon historical data.

The Qualified Person regards the existing plant operating cost estimates as fair and reasonable.

New plant

The new plant primary ore fixed and variable operating costs were estimated by DRA for each ore type at ±10% with a base date of Q2 2022. To develop the LOM processing cost estimate, Orelogy assigned the operating costs for each ore type based on the integrated mining and processing schedule.

The operating cost estimate excludes custom duties for the period 2024 to 2026, based on the Mining Convention. Costs are then forecast to increase from 2027 as duties become payable.

Reagents and grinding media/wear components costs are based upon the design criteria consumption rates as developed from the 2022 FS testwork and historical prices. Grinding media costs were increased from $1,389/t to $1,500/t due to potential long-term impacts from the war in Ukraine. Allied advises that pricing received in Q3 2022 confirmed the pricing used in the 2022 FS.

Fixed costs include labour, power for infrastructure, some consumables such as crusher and mill liners, gold room reagents and miscellaneous costs including software licences, laboratory, mobile equipment maintenance and crane hire. Variable costs are mostly power, grinding media, lime, cyanide and cyanide detoxification reagents.

The mobile equipment fleet allocated to the plant is estimated at 39 vehicles. Mobile equipment fuel costs are estimated for the fleet of vehicles.

The labour complement for the new plant is estimated by DRA to increase from 241 to 254 persons. In addition, the laboratory staff were assumed to be reallocated to an outsourced facility, thus reducing the mine labour allocation of 72. Based on proposals received from laboratory providers, Allied anticipates this will require significantly fewer people.

Maintenance costs including mobile equipment are between 3% and 5% of the material supply cost, which is a reasonable approach and considerably lower than for the 25-year-old existing plant.

The Qualified Person considers the new plant cost estimate as fair and reasonable, subject to confirmation of the consumption of reagents and wear components plus power consumption and cost along with the proposed labour reduction and the outsourcing of laboratory services. The most significant impact upon operating costs will be the installation of the grid power connection and to a lesser extent, the solar farm. The Qualified Person regards the processing operating cost estimate as being within the accuracy reported by DRA.

Power and electricity cost

The total plant power demand considering the higher milling requirement is expected to increase from the existing plant at 18 kWh/t for oxide ore to about 36 kWh/t for primary ore in the new plant or 288 GWh/a. The milling power requirement per annum is based upon the primary ore types being considerably different as disclosed in Section 13.2.

Several power generation options for the Sadiola Expansion Project were analyzed by ECG based on the increased power consumption for processing. The cost of energy for grid power, and permutations and combinations of fossil-based fuels and solar hybrid options were considered and profiled based on risk of supply.

The hybrid grid with Independent Power Provider (IPP) solar delivered was selected as the primary supply. In parallel, a diesel power station capable of supplying the full load was selected to mitigate risks associated with grid availability, particularly if the powerline installation was delayed after the expansion which is scheduled to be commissioned in Q1 2024.

The 69% grid and solar, 25% renewable supply from IPP, and 6% diesel power generation has a cost of $0.141/kWh of which capital amounts to $68.5 million. Within this amount, $38.2 million is designated for grid connection, $23.2 million for the diesel gensets and $7.0 million for the solar IPP. An additional $0.2 million is included for land compensation and servitude/corridor from solar installation to the diesel gensets.

A delay in the installation and commissioning of grid power will increase the cost of the grid and solar (at 24% renewable supply from IPP) and diesel power generation option from $0.141/kWh to $0.151/kWh; hence a 7% cost increase is a function of a 16% grid power decrease taken up by diesel power.

In the same option, a decrease in grid power unit cost of 11.6%, will decrease the total unit cost from $0.141/kWh to $0.127/kWh, a decrease of 10%.

21.2.3 G&A and selling costs

G&A costs include general site management and support, Bamako office charges, and community costs. The G&A costs applied are based on historical costs with targeted reductions from $32 million in 2023 to $30 million per annum thereafter. It is noted that the 2023 G&A budget is $28 million.

A selling cost of $4.50/oz for transport and refining costs and the Patente tax (a local property tax) are applied in the Financial Model.

21.2.4 Royalty costs

Royalty costs total $518.9 million, equivalent to 6% of gold revenue based on the economic development parameters summarised in Section 4.4.

22 ECONOMIC ANALYSIS

22.1 Basis of analysis

The Sadiola Financial Model is based on the LOMP with inputs developed from the 2022 FS including detailed mine planning, technical studies, testwork and feasibility study level design and costing information.

The Financial Model takes into consideration Proven and Probable Mineral Reserves from Sadiola Main and FE3 plus existing stockpiled low-grade ore. Ore production is scheduled from the open pits from 2023 to 2038. Oxide and transitional ore will be processed in the existing process plant until Q1 2026. Construction of the new plant will commence in Q4 2023, with primary and oxide ore being processed in the new plant commencing Q1 2026.

22.1.1 Macro-economics and project fundamentals

The Financial Model is based on real dollar terms, which is considered appropriate for a project of this nature. While certain costs such as labour, power, water and other in-country costs are likely to be priced in local currency, it is recognized that a substantial portion of costs will either be directly US dollar denominated or inherently linked.

The Financial Model excludes any funding, debt, transaction or shareholder costs and thus represents the standalone, ungeared operational value of Sadiola on a 100% equity basis. There is a 20% minority shareholding in the Property owned by the Malian Government, but distributions made to shareholders are only made from positive free cash flows.

The operation was evaluated by Allied using a forward gold price curve (Table 22.1) derived from JP Morgan broker consensus price estimates in 2022, consistent with the base date of the capital and operating costs. Beyond 2025, a flat gold price of $1,568/oz was used over the long-term, which represents a price approximately 21% below the current spot gold price. It is noted that at the time of reporting, the consensus long term gold price has increased to $1,686/oz.

Table 22.1 Allied's consensus gold price forecast used in the Financial Model

Unit	2023	2024	2025	2026+
$/oz (real)	1,750	1,730	1675	1,568

Source: Allied, Sadiola LOMP, December 2022

The gold price forecast applied by Allied for Sadiola is consistent with that used for Allied's other properties and appears reasonable to the Qualified Person. The base date of all input assumptions in the Financial Model is 1 January 2023.

22.1.2 Gold inventory lockup

The gold inventory lockup within the new plant at the start of production in Q1 2026 has been calculated by DRA to be 5,500 ounces and is accounted for in the Financial Model.

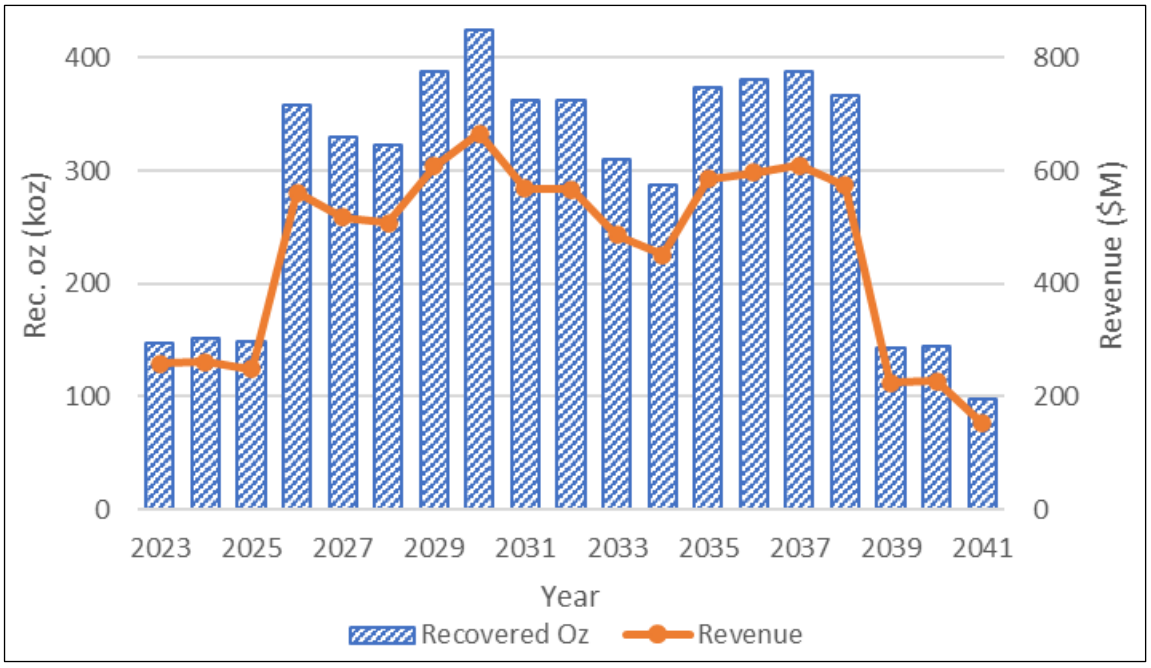
22.1.3 Key financial metrics

Processing of oxide ore will continue with the existing plant at 5 Mt/a until Q1 2026, whereafter most ore processed will be primary ore in the new plant at between 8 Mt/a or 10 Mt/a at a 30% oxide blend.

There is an increasing trend in grade and revenue in 2026 when the new plant is commissioned. Revenue ranges from $500 million to $660 million until 2038 due to grade variability and metal price assumptions. There is a reduction in revenue from 2033 as the deeper stages of the Sadiola pit are mined. Mining is completed in 2038 after which the low-grade stockpile is processed. Recoveries are forecast by Allied to decrease from 91% in 2022 to about 74% over the longer term.

The annual LOM recovered ounces and revenue profile are shown in Figure 22.1.

Figure 22.1 Sadiola annual recovered ounces and revenue



22.1.4 Capital costs

Capital cost inputs are discussed in Section 21.1.

22.1.5 Operating costs

Operating cost inputs are discussed in Item 21.2.

22.1.6 Taxes and royalties

Sadiola is subject to various taxes and royalties which have been included in the Financial Model, as summarised in Table 22.2.

Table 22.2 Sadiola taxes and royalties

	Rate	Amount $ M (LOM)
Government royalty	6.00–6.25%	538
Taxation	30%	591
Patente tax	0.25%	10

Source: Allied, LOMP, December 2022

The economic development parameters are based on:

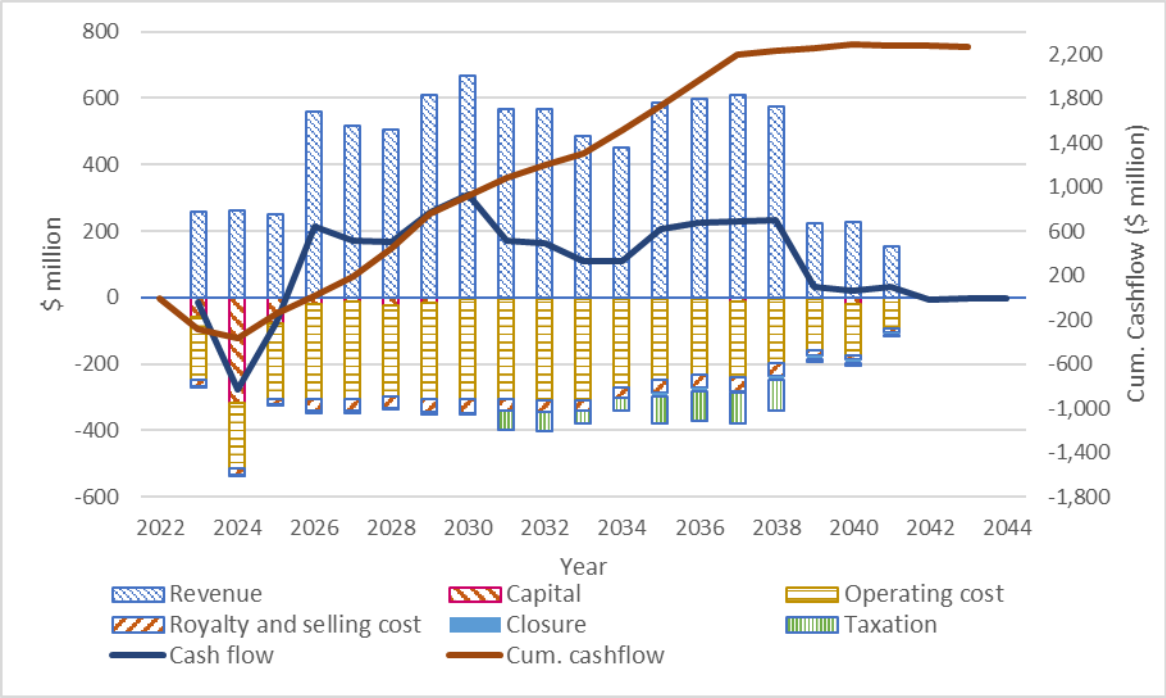
- A corporate tax rate of 30% on net profits.
- Five-year tax holiday for production from primary ore: 2026 to 2030.
- Exemption from customs duties on operating consumables: 2026 to 2028.
- Exemption from customs duties on the Sadiola Expansion Project capital items: Q4 2023 to Q1 2026.
- A variable Government royalty of 6.00% of revenue, comprised of a 3% ad valorem tax and a 3% rate on the contribution for services rendered.

- A community development fund of 0.25% of revenue from Q1 2026.
- Depreciation for Patente tax: 7 years.

22.2 Cash flow analysis

Figure 22.2 presents a summary of the cash flow for the LOMP based on the Mineral Reserves. Following the initial investment period, net free cash flow is forecast to remain between $100 million and $200 million per annum until 2030–2033 when there is a decrease in free cash flow driven by a temporary drop in lower-grade ore feed from the Sadiola Main pit. The grade is forecast to recover from 2034.

Figure 22.2 Sadiola LOM cash flow summary



Source: Sadiola LOMP, December 2022

The annual cash flows for the LOMP are presented in Table 22.3 and Table 22.4.

The LOM net cash flow of the Sadiola Expansion Project (100% basis, post-tax) is estimated at $2,269 million. The NPV of Sadiola (100% basis, post-tax) is estimated at $1,271 million with an IRR of 40%. The discount rate applied by Allied was 5% (real) with a long-term gold price assumption of $1,568/oz. At 80% ownership, Allied's share of the $NPV_{5\%}$ is $1,029 million. The payback period for the Sadiola Expansion Project is about 24 months from commissioning of the new plant in Q1 2026.

Table 22.3 Sadiola Expansion Project LOM cash flow model (2023–2031)

Item	Unit	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031
Processed	Mt	**149.37**	4.92	5.00	5.04	9.04	9.27	8.31	8.16	8.76	8.29
Processed grade	g/t	**1.51**	1.07	1.08	1.08	1.68	1.59	1.64	1.96	1.98	1.80
Contained gold	koz	**7,247**	169.84	173.82	174.47	488.58	475.30	437.68	513.07	557.94	480.24
Recovered gold	koz	**5,484**	147.88	150.98	148.41	357.54	329.43	323.13	387.52	424.48	362.63
Recovery	%	**75.7**	87.1	86.9	85.1	73.2	69.3	73.8	75.5	76.1	75.5
Gold price	$/oz	**1,580**	1,750	1,730	1,675	1,568	1,568	1,568	1,568	1,568	1,568
Financials											
[+] Revenue	$M	**8,666.19**	258.80	261.19	248.58	560.63	516.54	506.66	607.63	665.59	568.60
[-] Royalties	$M	**538.22**	15.49	15.63	14.92	34.94	32.19	31.58	37.87	41.48	35.44
[-] Mining costs	$M	**1,895.07**	84.22	94.27	119.66	137.39	142.96	128.59	145.88	150.77	151.93
[-] Processing costs	$M	**2,081.42**	73.63	74.53	75.49	117.77	121.66	115.89	116.14	119.85	116.69
[-] G&A	$M	**553.99**	32.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
[-] Selling costs	$M	**24.68**	0.67	0.68	0.67	1.61	1.48	1.45	1.74	1.91	1.63
[-] Capex new plant	$M	**378.14**	35.93	260.40	72.40	9.41	0.00	0.00	0.00	0.00	0.00
[-] Mining capex	$M	**15.70**	0.24	2.59	0.00	0.05	0.60	0.88	6.02	0.00	0.60
[-] Sustaining capex	$M	**218.99**	23.62	54.26	7.60	10.12	11.59	23.73	8.55	6.17	5.84
[-] Closure	$M	**89.61**	0.00	0.00	0.00	0.00	2.85	2.85	2.85	0.00	0.00
[-] Corporate tax	$M	**601.22**	6.55	6.35	2.75	5.81	2.77	2.82	3.30	4.13	56.47
[=] Net cash flow	**$M**	**2,269.14**	**-13.55**	**-277.53**	**-74.90**	**213.54**	**170.44**	**168.87**	**255.29**	**311.27**	**170.00**
Cumulative cash flow	**$M**		**-13.55**	**-291.08**	**-365.98**	**-152.43**	**18.00**	**186.87**	**442.16**	**753.43**	**923.43**

Source: Source: Sadiola LOMP, December 2022

Table 22.4 Sadiola Expansion Project LOM cash flow model (2032–2041)

Physicals	Unit	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Processed	Mt	8.30	8.26	8.11	8.14	8.51	8.46	8.16	8.58	8.45	7.61
Processed grade	g/t	1.80	1.55	1.48	1.88	1.85	1.90	1.86	0.72	0.71	0.42
Contained gold	koz	479.96	412.21	385.96	492.70	506.34	517.10	489.28	197.43	192.54	102.14
Recovered gold	koz	361.62	309.88	287.38	373.20	380.50	388.15	365.94	143.38	144.98	97.01
Recovery	%	75.34	75.17	74.46	75.75	75.15	75.06	74.79	72.62	75.30	94.98
Gold price		1,568	1,568	1,568	1,568	1,568	1,568	1,568	1,568	1,568	1,568
Financials											
[+] Revenue	$M	567.02	485.88	450.61	585.17	596.62	608.62	573.79	224.81	227.33	152.11
[-] Royalties	$M	35.34	30.28	28.08	36.47	37.18	37.93	35.76	14.01	14.17	9.48
[-] Mining costs	$M	157.73	158.44	120.19	96.46	79.60	81.46	45.52	0.00	0.00	0.00
[-] Processing costs	$M	116.03	115.99	115.95	117.78	119.10	118.89	117.13	122.96	122.44	83.50
[-] G&A	$M	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	11.99
[-] Selling costs	$M	1.63	1.39	1.29	1.68	1.71	1.75	1.65	0.65	0.65	0.44
[-] Capex new plant	$M	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[-] Mining capex	$M	0.00	0.00	0.00	0.00	0.00	4.72	0.00	0.00	0.00	0.00
[-] Sustaining capex	$M	5.75	5.75	5.75	5.75	5.75	6.51	5.75	5.75	20.76	0.00
[-] Closure	$M	0.00	0.60	2.44	9.54	8.12	4.57	12.58	14.03	8.23	7.17
[-] Corporate tax	$M	57.69	35.75	37.80	80.55	89.39	93.71	93.11	6.87	9.24	6.18
[=] Net cash flow	**$M**	**162.86**	**107.68**	**109.10**	**206.94**	**225.76**	**229.09**	**232.30**	**30.56**	**21.84**	**33.35**
Cumulative cash flow	**$M**	**1,086**	**1,194**	**1,303**	**1,510**	**1,736**	**1,965**	**2,197**	**2,228**	**2,250**	**2,283**

Source: Source: Sadiola LOMP, December 2022

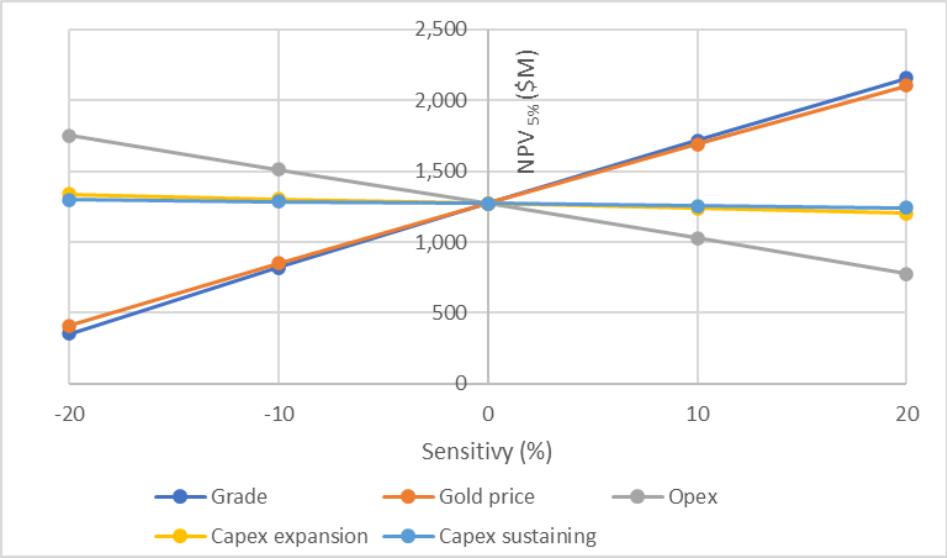
22.3 Sensitivity analysis

A sensitivity analysis was carried out on macro-economic factors such as gold pricing which showed a breakeven $NPV_{5\%}$ at a long-term gold price of $1,080/oz. There are several other key factors that could impact the project, including changes in operating costs, recoveries, plant performance, capital costs as well as possible changes in the timing of the start-up/commissioning of the project that would impact value.

The Qualified Person tested the sensitivity of the project to key value drivers; gold price assumptions, grade, operating costs and capital costs.

The sensitivity analysis considered a collective of key drivers to arrive at discrete “Upside” and “Downside” value impacts. The most significant and material drivers for the project are not generally within the control of Allied but influenced by markets and geology. These include gold grade and gold price. The other key value drivers relate to operating and capital costs, which are more controllable aspects of the project as shown in Figure 22.3.

Figure 22.3 Sadiola Expansion Project $NPV_{5\%}$ sensitivity (100% basis)



The sensitivity of the Project NPV to higher discount rates is shown in Table 22.5.

Table 22.5 Sadiola 2022 FS – LOM discount rate sensitivity

Discount rate	Project NPV ($M)
5%	1,271
7.50%	964
10%	736
12.50%	564

The outcome of the sensitivity analysis demonstrated that gold price and grade represent the most significant drivers of value and risk relating to the project. However, in considering a relatively pessimistic operating environment where all key revenue drivers are collectively in a -10% downside scenario and key cost drivers in a +10% increase, it is likely that Sadiola would still generate positive cash flow, maintaining a positive NPV of $126 million and IRR of 8% (100% basis).

Conversely, should price (e.g. gold maintaining a value of $1,800/oz (real)), there is potential for a $NPV_{5\%}$ of $1,900 million and IRR of 65% (100% basis).

23 ADJACENT PROPERTIES

The adjacent properties of Yatela, Fekola and Loulo-Gounkoto have the same stratigraphic relationship to the SMSZ as Sadiola, hosted by the Kofi Formation and comprising fine to coarse siliclastic sediments interbedded with primary limestone as massive, bedded units in the north that transition to calcareous cement in clastic rocks in the south. Diba is hosted in the sedimentary sequence west of the SMSZ and overlies interbedded mafic volcanics and sediments. Elsewhere in the Kédougou-Kéniéba Inlier are Massawa and Mako, but these gold deposits are hosted in a different stratigraphy.

23.1 Diba

Altus Elemental Royalties Corp. (Altus) owns the Diba Small Scale Mining Licence and the Lakanfla Exploration Licence, which are approximately 15 km southeast of Sadiola. The latest study on Diba and Lakanfla was a 2022 PEA carried out by Mining Plus (Altus Strategies Diba and Lakanfla Project Heap Leach Preliminary Economic Assessment, 27 July 2022) which indicated potential oxide and transition resources that could be treated at Sadiola.

23.2 Yatela

Yatela, approximately 25 km north of the Sadiola process plant, was a successful heap leach mine operated by AngloGold. Operations commenced in 2003 with mining ceasing in 2013. The heap leach pads continue to be irrigated, with the loaded carbon toll treated at Sadiola. Over 2 Moz was produced. The geology is different from Sadiola deposits in that it is an infilled karstic deposit, possibly similar to Altus's Lakanfla mineralisation north of Diba (Masurel, Q., 2016).

23.3 Fekola

The Fekola Mine of B2B Gold is hosted within the Kofi Formation in a stratigraphically similar setting to Sadiola on the border of eastern Senegal, western Mali and northern Guinea, 210 km south of Kayes. The Fekola deposit, including the Fekola North Extension has been outlined along strike for 3,280 m, can be up to 200 m wide and extends to the base of current drilling at 400 m depth. Gold mineralisation is dominantly hosted within bedrock and occurs with fine-grained disseminated pyrite in high strain zones and fold hinges. A NI 43-101 Technical Report dated 26 March 2019 cites an Indicated Resource of 87.1 Mt at 1.87 g/t Au for 5,240 koz.

23.4 Loulo-Gounkoto Complex

The Loulo-Gounkoto Complex is situated in western Mali adjacent to the Falémé River, which forms the international boundary with Senegal. The Complex is located 350 km west of the capital city of Bamako and 220 km south of the town of Kayes. The Complex hosts the Gara, Yalea, Loulo 3 and Gounkoto gold deposits within the Kofi Formation. Barrick reports that the coarser grainsize of sediments in the western Kofi Formation is a contributary factor to the gold mineralisation. The combined Measured and Indicated Resource for the Complex is reported at 92 Mt at 3.85 g/t Au for 9,100 koz in the NI 43-101 report by Barrick dated 17 March 2023.

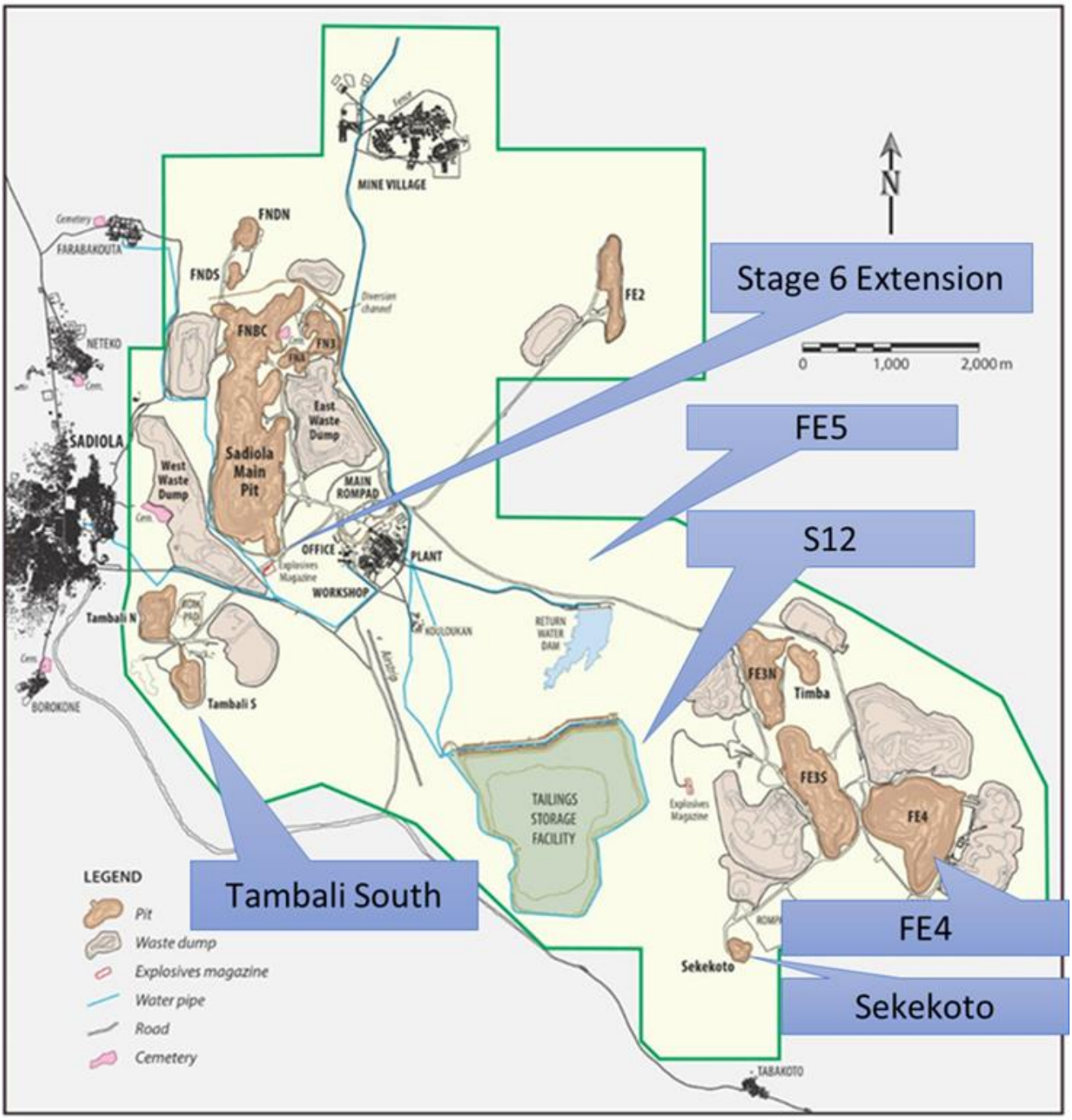
The Qualified Person has been unable to verify the information disclosed in this Item and cautions that the information is not necessarily indicative of the mineralisation on the Property that is the subject of this Technical Report.

24 OTHER RELEVANT DATA AND INFORMATION

24.1 Exploration potential

Figure 24.1 shows Allied's current near mine exploration targets focussed on identifying additional oxide and transition zone mineralisation.

Figure 24.1 Sadiola near mine oxide exploration targets



Source: Allied

- Sekekoto: Drilling is continuing to target additional oxide and fresh mineralisation at Sekekoto. Exploratory drilling has also identified new mineralisation to the west of the Sekekoto deposit, on a strike

orientation that suggests an intersection of the controlling structures from Sekekoto and Sekekoto West lies to the immediate north of the two deposits.

- S12 is a deposit adjacent to the existing TSF. Further engineering studies are required to confirm if the Mineral Resource proximal to the TSF is feasible to mine economically. The Sekekoto West mineralisation may prove to link with the S12 deposit, opening a new exploration trend south of the TSF. The extension northward of the S12 zone is being drilled based on geochemistry which suggests a potential continuation towards the return water dam.
- FE5 is an area to the south of the FE2 pit which potentially links to the on-strike extension of the mineralisation at the return water dam. The area has only been tested with RAB drilling and requires more thorough RC and diamond drilling to evaluate its potential.
- Stage 6 Extension: Additional mineralisation has been identified to the east of the Stage 6 pit at Sadiola Main. Additional drilling is required to target the conversion of Inferred Mineral Resources.
- FE4: Pit designs have been prepared to target the 130 koz at 1.6 g/t Au in Inferred Mineral Resource. Additional logging is required to confirm the location of the graphitic shear zones, which have demonstrated some preg-robbing tendencies.
- Tambali South which extends to the southeast of the existing pits. Drilling is progressing on the conversion of the Inferred Mineral Resources.

A significant termite mound geochemical anomaly has been identified northwest of the existing TSF but has not yet been drill tested.

24.2 Staged expansion development

In early 2023, DRA carried out an engineering cost study (ECS) to investigate various options to enable primary ore to be treated in the existing processing circuit and defer the Sadiola Expansion Project in order to manage capital expenditure allocation, de-risk the full expansion and develop optimisation opportunities. The ECS recommends the Stage 1 Expansion Option, which upgrades the existing processing circuit with tertiary crushing of primary ore and the installation the pre-purchased 7 MW ball mill. Mill modelling showed that 3.0 Mt/a of primary ore and 2.75 Mt/a of oxide ore could be treated through the Stage 1 Expansion Option.

The Stage 1 Expansion Option scope of work is summarised as:

- The addition of tertiary crushing to the existing secondary crushing circuit, operated under contract.
- The addition of a variable speed belt feed hopper to feed the refurbished, pre-purchased 7 MW ball mill.
- Grinding of primary ore to P_{80} 75 µm using the 7 MW ball mill and one of the existing 2.5 MW primary mills. The cyclone overflow at 40% solids would be pre-oxidized and leached in one train of the existing CIP circuit.
- Crushing and grinding of oxide ore to P_{80} 75 µm using the existing 2.5 MW primary mill and 2.5 MW regrind mill. The cyclone overflow at 32% solids would be pre-oxidized and leached in one train of the existing CIP circuit.
- Six leach tanks (three tanks from each train) converted to CIL tanks to increase recovery. Launders would be upgraded to sustain the additional flowrates.
- Tailings combined for cyanide detoxification and then pumped to the TSF. A water treatment plant may be required to maintain the arsenic and antimony within acceptable limits.
- Carbon recovered from each CIP circuit would be treated in the existing elution circuits for subsequent electrowinning and smelting to produce gold doré.
- The additional 10 MW of power would be provided by a contractor.

24.2.1 Stage 1 Expansion Option capital cost

Capital costs for the Stage 1 Expansion Option were estimated by DRA at $61.6 million as summarised in Table 24.1.

Table 24.1 Sadiola Stage 1 Expansion Option capital cost estimate

Activity	Cost ($M)
Tertiary crushing and milling	33.66
Power station	4.76
Leaching upgrades	4.54
Indirect costs	8.39
Contingency	10.27
Total	**61.62**

Source: Sadiola Staged Expansion Q2 2023 update study

The LOM capital costs for the Sadiola Stage 1 Expansion Option are estimated at $771.4 million (from January 2023) to a current planned completion of ore processing in 2042 and a mine closure date of 2048 as summarised in Table 24.2. The LOM capital costs include an overall 9% contingency.

Table 24.2 Sadiola Stage 1 Expansion Option LOM capital cost estimate ($M)

Item	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031–2044
Plant expansion*	**365.2**	0.0	63.3	2.3	198.5	130.5	32.3	0.0	0.0	0.0
Mining mob-demob	**15.3**	0.0	0.0	0.0	0.0	3.4	0.6	3.5	2.8	4.9
Sustaining capital	**223.6**	20.0	57.5	22.7	7.4	8.1	5.8	18.9	8.5	74.7
Closure and rehab costs	**105.6**	0.0	0.0	0.0	0.0	10.0	0.1	0.0	0.0	95.5
Total	**771.4**	20.0	120.8	25.0	205.9	152.1	38.9	22.4	11.3	175.1

** excludes $13.43 million sunk capital*

Source: Sadiola Staged Expansion Q2 2023 update study

24.2.2 Stage 1 Expansion Option operating cost

Operating costs for the Stage 1 Expansion Option are based on existing plant performance with $5/t included for tertiary crushing and contract power at a blended tariff of $0.24/kWh based on a long term diesel price of $0.80/L. Discussions are progressing with power supply contractors to implement synergies with the existing 21 MW power station and use a hybrid diesel solar power system to reduce operating costs.

Operating costs for the staged expansion over the LOM are summarised in Table 24.3. Operating costs and royalties total $35.07/t ore. Mining costs total $3.09/t rock mined (ore plus waste). Processing costs and administration costs total $18.62/t ore processed. Selling costs total $25 million and government and community royalties total $538 million.

The all-in sustaining cost, excluding the new plant expansion, over the LOM is approximately $1,000/oz or approximately $1,100/oz including all capital and closure costs.

Table 24.3 Sadiola Stage 1 Expansion Option LOM operating cost summary ($M)

Area	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031-2044
Mining	1,895.1	85.2	85.4	92.3	99.8	124.6	142.6	131.0	147.2	987.0
Processing	2,194.6	75.5	73.5	105.7	106.2	106.4	102.1	120.4	117.1	1,387.8
Site administration	586.4	32.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	344.4
Selling cost	24.7	0.7	0.7	1.0	0.9	0.8	0.9	1.9	1.8	16.0
Royalty	538.3	16.9	15.9	22.8	18.8	18.3	19.9	40.4	38.5	346.9
Total	**5,239.1**	**210.3**	**205.5**	**251.8**	**255.7**	**280.1**	**295.4**	**323.6**	**334.5**	**3,082.0**
Total unit cost ($/t ore)	35.07	42.80	40.92	43.97	44.84	49.80	46.88	36.82	40.13	31.15
Unit mining cost ($/t rock)	3.09	2.36	2.36	2.56	2.77	2.96	2.96	2.73	3.07	3.49
Unit processing and G&A ($/t ore)	18.62	21.87	20.61	23.69	23.89	24.24	20.96	17.11	17.64	14.03

Source: Source: Allied, Sadiola LOMP, December 2022

24.2.3 Stage 1 Expansion Option production schedule

The preliminary implementation schedule shows a 12 months construction schedule for the Stage 1 Expansion Option. The ball mill refurbishment and installation are the critical path.

Table 24.4 and Figure 24.2 shows the gold production schedule for the Stage 1 Expansion Option which is commissioned in Q1 2025 with the commissioning of the Sadiola Expansion Project deferred to Q3 2028. Feed grades from Mineral Reserves are expected to average 1.44 g/t Au between 2025 to 2028, with recoveries expected to average 75% over the same period, resulting in production levels of about 200 koz/a.

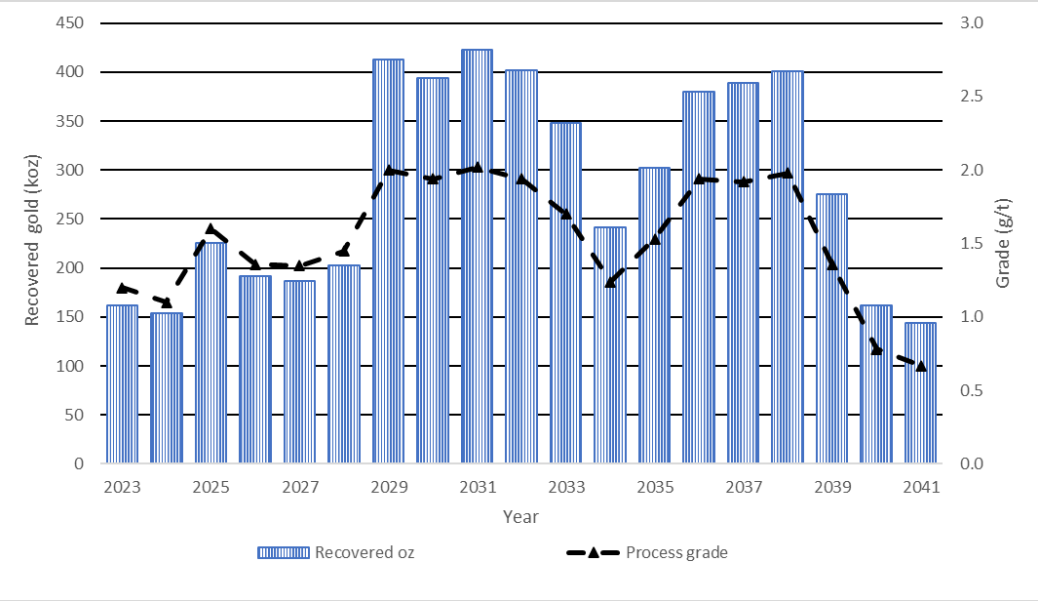
The Sadiola Expansion Project would be commissioned in Q3 2028 and produce about 400 koz/a from 2029 to 2032, reducing to about 300 koz/a for the remainder of the LOM Mineral Reserves. At the time of reporting, a Feasibility Study was underway to increase the accuracy of the Stage 1 Expansion Option scope of work and cost estimates. The results of the Feasibility Study are expected during Q3 2023.

Table 24.4 Sadiola Stage 1 Expansion Option LOM production profile

Item	Units	Total	2023	2024	2025	2026	2027	2028	2029	2030	2031–2044
Mining											
Ore Mined	Mt	**136.2**	6.0	6.5	6.7	4.9	7.9	10.7	8.8	10.5	74.1
Waste Mined	Mt	**476.9**	30.1	29.6	29.3	31.1	34.2	37.4	39.2	37.4	208.6
Total Mined	Mt	**613.1**	36.0	36.1	36.0	36.0	42.1	48.1	48.0	48.0	282.7
Strip Ratio		**3.5**	5.0	4.5	4.4	6.3	4.3	3.5	4.5	3.6	2.8
Processing											
Tonnes Milled	Mt	**149.4**	4.9	5.0	5.7	5.7	5.6	6.3	8.8	8.3	99.0
Processed grade	g/t	**1.51**	1.20	1.10	1.60	1.36	1.35	1.45	2.00	1.94	1.48
Contained gold	koz	**7247**	190	178	294	249	243	294	564	520	4713
Gold produced	koz	**5485**	162	154	226	192	187	203	413	394	3553

Source: Source: Allied, Sadiola LOMP, December 2022

Figure 24.2 Sadiola Stage 1 Expansion Option gold production



Source: Sadiola Staged Expansion Q2 2023 update study

24.3 Flotation and concentrate leaching

The 2022 FS compared conventional cyanide leaching with cyanide leaching of a finely ground concentrate, which showed similar recoveries and justified the selection of the conventional CIL flowsheet.

Allied has continued studying potential optimisation paths for the Sadiola Expansion Project , including the opportunity to improve metallurgical recoveries as complementary solutions to the selected CIL flowsheet. One option is to produce a pyrite-arsenic rich flotation concentrate ahead of the CIL circuit and treat the concentrate separately to recover gold from the semi-refractory components of the orebody.

DRA and MineScope carried out a scoping study to compare the following four flowsheet options:

- Option 1: Flotation and cyanidation of flotation products.
- Option 2: Ultra-fine grinding (UFG) and cyanidation.
- Option 3: Albion® processing and cyanidation.
- Option 4: Pressure oxidation and cyanidation.

As summarised in Table 24.5, flotation and concentrate leaching testwork has been successful in increasing gold recovery from the semi-refractory components of the primary ore by up to 19% using pressure oxidation (POX) and by 15% using ferric leaching to mimic Albion® atmospheric leach technology.

Table 24.5 Sadiola flotation and concentrate leaching testwork

Activity	Concentrate leach		Concentrate and flotation tailings leach		2022 FS flowsheet	
	Tailings grade (g/t)	Gold Extraction (%)	Tailings grade (g/t)	Gold extraction (%)	Gold extraction (%)	Extraction increase (%)
Unground	10.84	76.6	0.49	76.6	75.8	0.8
UFG – 25 um	9.5	79.5	0.44	79	75.8	3.2
UFG – 10 um	9.2	80.2	0.43	79.6	75.8	3.8
Ferric leach – 10 g/L Fe^{3+}, 24 hr	7.5	83.8	0.37	82.6	75.8	6.8
Ferric leach – 20 g/L Fe^{3+}, 24 hr	4.17	91	0.24	88.6	75.8	12.8
Ferric leach – 10 g/L Fe^{3+}, 8 hr	2.9	93.7	0.19	90.9	75.8	15.1
POX - acidic 2 hr	0.7	98.5	0.11	94.9	75.8	19.0
POX - alkaline 2 h	0.89	98.1	0.12	94.5	75.8	18.7

Source: Mine Scope Services, Sadiola refractory gold scoping study

The study showed significant upside could be realised from the atmospheric leaching Albion® process, given the higher overall recovery compared with UFG and lower complexity, risk and cost compared to pressure oxidation.

Additional testwork is underway to confirm the results of the study and associated upside, with the objective of implementing an economical and operational effective solution to improve gold recovery for the Sadiola Expansion Project.

24.4 Underground potential

Allied considers there is strong underground potential at Sadiola Main. Orelogy carried out a conceptual study for an underground development based on a projection of the Mineral Resource at depth, which demonstrated the potential for an underground mine using longhole open stoping.

Allied has purchased its own drill rigs capable of drilling to 1,500 m depth. Drilling to test the underground potential is targeted to commence in Q4 2023.

25 INTERPRETATION AND CONCLUSIONS

Sadiola is an operational mine which has produced over 8.4 Moz of gold from commissioning in 1996. Since taking operational control in January 2021, Allied restarted open pit mining in April 2021 and has progressively updated the LOM development plans in the 2020 Scoping Study, 2021 PFS, 2022 FS and December 2022 LOMP. The 2022 LOMP is based upon:

- Continuing to use the existing process plant to treat 5.0 Mt/a of oxide and transitional material.
- Continuing cutbacks to the existing pits to access the harder primary mineralisation to treat in a new process plant, while upgrading some of the existing infrastructure including a new TSF, WRD and power supply.

The Proven and Probable Mineral Reserves are estimated at 149.5 Mt at 1.51 g/t Au for 7,250 koz of contained gold as of 31 December 2022 from the existing Sadiola Main and FE3 open pits. The Mineral Reserves are reported on a 100% basis. Allied owns 80% of the holding company SEMOS, with the Government of Mali owning the remaining 20% shareholding.

This Technical Report summarises the 19-year LOMP which will deplete the 31 December 2022 Mineral Reserves by 2041.

The 302 km^2 Sadiola Exploitation Permit was granted in August 1994 and is valid until 31 July 2024. SEMOS has submitted the Exploitation Permit renewal documentation ahead of requirements. Based on discussions with the Government of Mali, Allied is confident that the Exploitation Permit will be renewed in a timely manner to secure tenure for at least a further 10 years, with renewals of equal duration available until all Mineral Reserves have been mined out.

The key risks identified are:

- Geotechnical: pit slope stabilities in Sadiola main sulphide pits may be compromised by potential localised failures in slopes. Additional geotechnical drilling and investigation was undertaken in 2021 as well as radar monitoring of the walls during operation to provide early warning. The pit design incorporates two ramps, which are both able to exit the pit to the north and south, and opening up pits in stages are also considered mitigation strategies. The risk is still rated as high after considering the mitigations due to the potential damage caused by a wall failure.
- Security: Civil unrest in the country leading to critical supply chain interruptions was mitigated with six weeks' storage of supplies on site. There is a credible risk of a terrorist attack in Bamako. An additional charter flight has been implemented, to reduce the time spent in Bamako. Increased security presence and precautions have been implemented at Bamako and site.
- Availability of construction contractors: There is a competing project in the region with earthworks and concrete installation at similar times. Discussions and tendering are progressing with West African contractors. Can self-perform if required.
- Pre-purchased equipment: to realise schedule and cost benefits the pre-purchased equipment is being used. Packing lists have been difficult to locate and are a work in progress. The intent is to inspect equipment when it arrives onsite, order replacement parts if required and provide extra materials for in-situ fabrication.
- Power supply: negotiations with EDM are progressing to conclude a long-term power purchase agreement to confirm availability of supply and the associated tariff; a lower tariff is targeted. If the grid connection is late to be installed a back-up diesel power station will be available to commission the plant.
- Waste rock geochemistry: while the 2022 testwork confirms low risk of acid rock drainage the static testwork shows risk of arsenic and antimony leaching from transition and fresh rock. Kinetic testwork will be undertaken to provide additional information on the material leaching characteristics as oxidation advances, to verify the current design assumptions.

The key identified opportunities are:

- Mineral Resource and Mineral Reserve extensions: resource modelling and exploration drilling is being carried out to confirm extensions of the mineralisation, with a focus on Sekekoto, Tambali South and depth extensions, FE4 and Sadiola North.
- Geometallurgical model: the 2022 DFS testwork and investigations have increased the geometallurgical understanding of the orebody. Strong relationships have been developed for silica vs throughput and arsenic vs recovery. A geometallurgical model will be developed to further optimise the mining and processing sequence to realise additional upside. At the time of reporting 15,000 samples have been assayed for arsenic and silica.
- Increased gold recovery: the increased geometallurgical understanding of the orebody has shown that approximately 25% of the gold is refractory (solid solution) within arsenopyrite. Testwork is ongoing to recover an arsenopyrite rich concentrate to increase gold recovery to 90% using the Albion leaching process. The layout allows for this future enhancement option.
- Underground: a 2021 scoping study shows potential for a future underground operation. Drilling to target mineralisation at depth is due to progress in 2023.

A conventional truck and excavator mining method is used at Sadiola. Pit optimisations were conducted to determine the optimal shape of the open pits based on current and forecast costs and recoveries at a gold price of $1,500/oz. The slope design criteria for the pits were established based on current slopes in oxides and transition and geotechnical investigations since 2010 on the deeper fresh rock zones of the pits. The current mining contractor uses three fleets of Caterpillar 6030 excavators and Caterpillar 777 trucks. The ramps, haul roads and crusher dump pocket are designed for the Cat 789 trucks if required in the future.

The existing process plant can treat oxide and transitional ores at 5 Mt/a. A plant upgrade is required to treat the harder primary ore which comprise 77% of the future ore tonnes. The design of the plant upgrade is based on metallurgical testwork carried out in 2010 and 2022. The average gold extraction in the 2022 testwork (75.4%) is marginally lower (by 0.8%) than that achieved in the 2010 testwork (76.2%). These results are despite the 2022 testwork adopting a coarser grind size, reduced CIL residence time and lower cyanide addition.

Analysis of the distribution of the variability samples indicates that the gold recovery from the calcite marble samples selected from Sadiola Main pit averaged 74.6% compared to the calcite marble samples selected from Sadiola FN (Stages 4 and 5) which averaged 63.1%. Geo-metallurgical investigations are ongoing at the time of reporting.

The proposed new process plant will be a conventional CIL circuit designed to treat 8 Mt/a of harder primary ore and up to 10 Mt/a with a 30% oxide ore blend in the feed. The new plant will consist of primary and secondary crushing, grinding to P_{80} 75 µm using a SAG mill, pebble crusher and ball mill, pre-oxidation, cyanidation and carbon adsorption for a 24-hour leach residence time, followed by electrowinning and smelting to produce gold doré at an average of 73% recovery from the primary ore.

Majority of the equipment for the new plant has been purchased, including the 54-75 gyratory crusher, apron feeders, 10 MW SAG mill, 18 MW ball mill, HP4 pebble crusher, 40 m diameter pre-leach thickener, eight (of 11) 3,500 m^3 leach tanks including agitators and top of tank steel and a 20 t/d oxygen plant. The oxygen plant, for the existing and new process plants, is being installed at the time of reporting with commissioning expected in Q3 2023.

Plant tailings are detoxified prior to disposal to an existing TSF. The initial earthen starter wall of the TSF was constructed in 1996 of compacted laterite and has since been raised using cyclone underflow tailings in an upstream configuration. A new TSF, within the mined-out void of the FE3 North pit is proposed to be used from Q1 2026 with FE4 pit to be used from 2029. The new TSF is designed for 150 Mt, which is excess of the current Mineral Reserve. In-pit tailings disposal has been approved by the regulatory authorities.

Existing infrastructure includes an accommodation village, laboratory, offices, warehouse, maintenance workshop, a 1.8 km airstrip, a 55 km water pipeline from the Senegal River and a diesel power station with 21 x 1 MW gensets.

Additional infrastructure required for the expansion includes an 89 km overland 225 kV powerline to connect the site to the national grid, 36 MW of solar panels from an Independent Power Provider and a back-up diesel power station. The power supply system will provide power from approximately 75% renewable sources.

Capital cost estimates at ±10% accuracy were developed by Orelogy, DRA, ECG, PSM and Allied in the 2022 FS. Plant upgrade costs are estimated at $378.14 million, excluding sunk capital in 2022. LOM capital costs (inclusive of plant upgrade, sustaining capital and mine closure) are estimated at $702.44 million to a current planned mine closure date of 2044.

Operating costs at ±10% accuracy were developed by Orelogy, DRA and Allied in the 2022 FS. The LOM operating costs are estimated at $5,093 million:

- Operating costs and royalties total $34.10/t ore.
- Mining costs total $3.09/t rock mined (ore plus waste).
- Processing costs and administration costs total $17.64/t ore processed.
- Selling costs total $25 million and Government and community royalties total $538 million.
- The all-in sustaining cost, excluding the plant expansion, over the LOM is approximately $985/oz or $1,056/oz including all capital and closure costs.

SEMOS has demonstrated a comprehensive understanding of the regulatory framework and application thereof, as evidenced by the successful record of obtaining and maintaining the necessary approvals. The ESIA for the Sadiola Expansion Project has been approved and is valid until Q3 2025. The ESIA for the grid power connection is targeted for approval in Q3 2023, in parallel with tariff negotiations.

This Technical Report is based on the Sadiola Expansion Project being commissioned in Q1 2026. The production schedule shows that gold production will average 150 koz per annum for 2023 to 2025, increasing to 365 koz per annum for 2026 to 2032, after the expansion is implemented.

The LOM net cash flow of the Sadiola Expansion Project (100% basis, post-tax) is estimated at $2,269 million based on consensus gold price forecasts provided by Allied. The NPV of Sadiola (100% basis, post-tax) is estimated at $1,271 million with an IRR of 40%. The discount rate applied was 5% (real) with a long-term gold price assumption of $1,568/oz. At 80% ownership, Allied's share of the $NPV_{5\%}$ is $1,029 million. The payback period for the Sadiola Expansion Project is 24 months from commissioning in Q1 2026.

A Preliminary Economic Analysis shows that it is feasible to stage the expansion and defer the commissioning of the Sadiola Expansion Project from Q1 2026 to Q3 2028. Further engineering and cost studies are underway to confirm the timing of the expansion for approval in Q4 2023.

Mineralogical and leaching testwork has shown that about 25% of the gold is locked as solid solution gold within arsenopyrite minerals. Initial flotation and concentrate leaching testwork have been successful in increasing the gold recovery from the primary ore to 90%. Further testwork and engineering is progressing to realise this upside.

26 RECOMMENDATIONS

Allied has prepared a detailed work plan to advance the Sadiola Expansion Project to the next phase. The work plan comprises the following activities:

26.1 Geology and resources

- Infill drilling and resource modelling to upgrade the Inferred Resource estimates at Tambali Deeps, Sekekoto, S12 and Tambali South.
- FE4: Update the resource model with the 2022 drilling and incorporate the graphitic shear zones. Carry out follow-up drilling when the pit is dewatered, which is targeted for 2024.
- Sadiola Underground: Commence drilling to confirm the width and depth of the shear zone which has potential for future underground development.

26.2 Mining and reserves

- Hydrogeology: Dewater the Sadiola Main and FE3 pits in time for mining and install additional monitoring holes and carry out pump tests to confirm the hydrogeological model.
- Geotechnical: Carry out follow-up drilling to confirm pit design parameters for future cutbacks and depth extensions.
- Mine design: Update the 6040/789 vs 6030/777 trade-off study for the stripping of the Sadiola Main hangingwall.

26.3 Metallurgy and processing

- Continue the flotation concentrate leaching testwork, which may represent a future enhancement option.
- Complete the portable XRF assaying of the analytical sample pulps and relogging of core to increase the geo-metallurgical understanding of the deposits.
- Prepare the geo-metallurgical model to optimise the future mine plan.
- Commission the oxygen plant in Q3 2023 to maximize production from higher grade transitional ores.
- Progress engineering studies for the Stage 1 Expansion to confirm the way forward and then implement the process plant upgrade.

26.4 Infrastructure

- Finalise negotiations with EDM to confirm the grid power tariff.
- Implement the power supply upgrades.

26.5 Tailings and water management

- Progress the TSF raise and conversion from cyclones to conventional spigot deposition during 2023.
- Progress the buttress around the existing TSF to continue deposition until 2025.
- Implement the designs for the Sadiola Main east waste dump and associated road, power and water diversions.
- Progress a kinetic geochemical testwork program on waste samples.

- Undertake a detailed dam break assessment of the existing TSF.

26.6 Environmental and social

- Realise regulatory approvals for the grid connection.

26.7 Legal and land tenure

- Complete the extension of the Exploitation Permit from July 2024.

The Property is an existing operation with capital and operating costs discussed in Item 21 to sustain the operation. The Sadiola Expansion Project is required to treat the harder primary ores at an estimated cost of $378 million. Engineering studies are ongoing to evaluate a staged expansion approach to manage capex allocation, de-risk the full expansion and develop optimisation opportunities.

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28 GLOSSARY, ABBREVIATIONS AND UNITS

28.1 Glossary

Term	Explanation
Adsorption	Adsorption is a process that occurs when a gas or liquid solute accumulates on the surface of a solid or a liquid (adsorbent), forming a molecular or atomic film (adsorbate).
amphibolite	A granular metamorphic rock consisting mainly of hornblende and plagioclase.
amphibolite facies	Moderate to high temperature and low pressure regional metamorphic facies. Characterised by the presence of amphibole.
anisotropy	The variability of data varying along a spatial direction.
antimony	Antimony is a chemical element with the symbol Sb (from Latin: stibium) and atomic number 51. A lustrous gray metalloid, it is found in nature mainly as the sulfide mineral stibnite (Sb2S3).
arenite	A sedimentary rock consisting primarily of sand size particles.
arsenic	A chemical element with symbol As and atomic number 33. Arsenic occurs in many minerals, usually in combination with sulfur and metals, but also as a pure elemental crystal. Arsenic is a metalloid.
arsenopyrite	Most common arsenic mineral and principal ore of arsenic.
batter	The incline section of the wall in an open pit mine is called the “batter”, an excavator digs to a “batter angle” to achieve a dig wall to the design batter angle.
bench	A bench may be defined as a ledge that forms a single level of operation above which mineral or waste materials are mined back to a bench face. The mineral or waste is removed in successive layers, each of which is a bench.
berthierite	Berthierite is a sulfide of iron and antimony with formula $FeSb_2S_4$. It is steel grey in colour with a metallic lustre which can be covered by an iridescent tarnish. Because of its appearance it is often mistaken for stibnite.
biox	The bacterial oxidation (BIOX) process for the pre-treatment of refractory ores ahead of conventional cyanide leaching for gold recovery.
bismuth	Bismuth is a chemical element with symbol Bi, may occur naturally, although its sulphide and oxide form important commercial ores.
bismuthinite	Bismuthinite is a mineral consisting of bismuth sulphide ($Bi2S_3$). It is an important ore for bismuth. The crystals are steel-grey to off-white with a metallic lustre.
breccia	Fractured or broken rocks, cemented or formed into a solid layer.
brecciated	Converted into or resembling a breccia.
brecciated siltstone	A siltstone containing small fragments of breccia.
brecciation	Converted into or resembling a breccia.
carbonate	A class of sedimentary rocks composed primarily of carbonate minerals. The two major types are limestone and dolomite.
carbonate rock	A sedimentary rock generally formed in shallow marine conditions which is characterised by the presence of varying amounts of calcium carbonate or magnesium carbonate. Coral reefs and/or marine creatures may contribute to the constituents in the rock.
Carboniferous	A geological period comprising rocks aged between 345 and 280 million years before the present day.
chlorite	A group of mostly green minerals of varying composition often found as alteration products of ferromagnesian minerals.
coeval	Having the same date or origin.
comminution	Reduction in the particle size of crushed rock in a process plant.
composite	A sample comprised of several smaller samples.

Term	Explanation
craton	An old stable portion of the earth's crust, generally of Archaean age.
cyanidation	A metallurgical technique for extracting gold by converting the gold to a water soluble complex. It is the most commonly used process for gold extraction. One common process for the recovery of the solubilised gold from the solution is carbon in leach.
Datamine	A software package used to create 3D geological models.
desorb	Desorption is the physical process where a previously adsorbed substance is released from a surface.
detrital	Rock in small particles or other material worn or broken away from a mass, as by the action of water or glacial ice.
diorite	A speckled, coarse-grained igneous rock consisting essentially of plagioclase, feldspar, and hornblende or other mafic minerals.
dolomite	A carbonate rock consisting of calcium magnesium carbonate.
Eburnean	The Eburnean orogeny, or Eburnean cycle, was a series of tectonic, metamorphic and plutonic events in what is now West Africa during the Paleoproterozoic era about 2200–2000 million years ago.
electrowinning	Electrowinning, also called electroextraction, is the electrodeposition of metals from their ores that have been put in solution via a process commonly referred to as leaching.
elution	In analytical and organic chemistry, elution is the process of extracting one material from another by washing with a solvent.
feldspar	An important group of rock-forming minerals which make approximately 60% of the Earth's crust. Feldspars crystallise from magma in both intrusive and extrusive rocks.
felsic	Silicate minerals, magmas, and rocks which are enriched in the lighter elements such as silica, oxygen, aluminium, sodium, and potassium.
ferricrete	Ferricrete is a hard, erosion-resistant layer of sedimentary rock, usually conglomerate or breccia, that has been cemented into a duricrust by iron oxides.
flotation	A metallurgical concentration method whereby bubbles of air are used to separate crushed sulphide particles from waste rock of a different density or different physical characteristics.
footwall	The underlying side of a fault, orebody or mine workings.
fragmentation	The process or state of breaking or being broken into fragments.
friable	Easily crumbled or pulverised.
geology	Geology is a science which is concerned with the solid Earth, the rocks of which it is composed, and the processes by which they change over time.
granite	A coarse grained intrusive felsic igneous rock.
granite-gneiss	Metamorphosed igneous rocks or their equivalent.
graphite	A mineralised form of carbon.
graphitic	Pertaining to rocks containing graphite. Graphite is carbon derived from carbonaceous material of organic origin. Common in metamorphic rocks such as gneisses, marbles, and schists.
greenschist facies	Assemblage of minerals formed during regional metamorphism. The rocks of the greenschist facies form under the lowest temperatures (300° Celsius) and pressure (1 to 4 kilobars) conditions usually produced regional metamorphism.
greenstone	Zones of variably metamorphosed mafic to ultramafic volcanic sequences with associated sedimentary rocks that occur within Archaean and Proterozoic cratons between granite and gneiss bodies.
greywacke	A variety of sandstone generally characterised by its hardness, dark color, and poorly sorted, angular grains of quartz, feldspar, and small rock fragments set in a compact, clay-fine matrix.
grizzly	Large grid mesh used to screen rock samples at a specific size.
gudmuntite	An iron antimony sulphide, FeSbS.

Term	Explanation
hangingwall	The overlying side of a fault, orebody or mine workings.
hercynian	The Hercynian, or Variscan, orogenic belt evolved during the Devonian and Carboniferous periods, from about 419 to 299 million years ago.
hydrocyclone	A hydrocyclone is a high-throughput gravity separation device used for separating slurry particles based on particle weight. For example, particles of comparable size but different specific gravity, or particles of different size but identical specific gravity.
hydrogeology	The branch of geology concerned with water occurring underground or on the surface of the earth.
hydrology	The branch of science concerned with the properties of the earth's water, and especially its movement in relation to land.
hypabyssal	A subvolcanic intrusive igneous rock that is emplaced at depths less than 2 km within the crust and has intermediate grain size and often porphyritic texture between that of volcanic rocks and plutonic rocks.
hyperspectral	Hyperspectral deals with imaging narrow spectral bands over a continuous spectral range, producing the spectra of all pixels in the scene.
hypogene	A geological process, and its resultant features occurring within and below the crust of the Earth.
inlier	An inlier is an area of older rocks surrounded by younger rocks. Inliers are typically formed by the erosion of overlying younger rocks to reveal a limited exposure of the older underlying rocks. Faulting or folding may also contribute to the observed outcrop pattern.
intrusion	The action or process of forcing a body of igneous rock between or through existing formations, without reaching the surface.
intrusive rock	Intrusive rock, also called plutonic rock is an igneous rock formed when magma is forced into older rocks at depths within the Earth's crust, which then slowly solidifies. It may later be exposed at the surface by erosion. Examples include granite, gabbro, diorite and dunite.
kaolinite	A clay mineral which forms from the chemical weathering of feldspar and other aluminium silicate minerals. The chemical composition is $Al2Si_2O_5(OH)_4$.
karst	A type of landscape where the dissolving of the bedrock has created sinkholes, sinking streams, caves, springs, and other characteristic features. Karst is associated with soluble rock types such as limestone, marble, and gypsum.
laterite	A soil residue composed of secondary oxides of iron, aluminium or both.
leach or leaching	The action of a chemical on a mineral or substance where the substance becomes soluble is removed from the host material.
LiDAR	LiDAR, which stands for Light Detection and Ranging, is a remote sensing method that uses light in the form of a pulsed laser to measure ranges.
liquefaction	Liquefaction takes place when loosely packed, water-logged sediments at or near the ground surface lose their strength in response to strong ground shaking.
lithological	The study of the general physical characteristics of rocks.
lithology	The study and description of rocks, including their mineral composition and texture.
mafic igneous rocks	Silicate minerals, magmas, and volcanic and intrusive igneous rocks that have relatively high concentrations of the heavier and darker minerals.
magma	Hot molten or semi-fluid rock below which originates from within the Earth's crust from which igneous rock is formed on cooling. When magma cools and solidifies beneath the Earth's surface, it forms what are known as intrusive rocks. When it reaches the Earth's surface, it flows out as lava and forms extrusive (or volcanic) rocks.
mesothermal	A hydrothermal mineral deposit formed at considerable depth.
metamorphism or metamorphic	Alteration of the minerals, texture and composition of a rock caused by exposure to heat, pressure and chemical actions.
metapelite	Metamorphic mudstone.

Term	Explanation
mineralisation (mineralised)	The process by which a mineral or minerals are introduced into a rock, resulting in a valuable deposit.
mineralogy or mineralogical	The study of minerals: formation, occurrence, properties, composition and classification.
Neoproterozoic	The Neoproterozoic Era is the unit of geologic time from 1 billion to 541 million years ago.
nitrates	Nitrate is a polyatomic ion with the chemical formula NO^{-}_{3}. Salts containing this ion are called nitrates.
nontronite	Nontronite is the iron-rich member of the smectite group of clay minerals. Nontronites typically have a chemical composition consisting of more than ~30% Fe_2O_3 and less than ~12% Al_2O_3 (ignited basis).
ore	Mineralised material which is economically mineable at the time of extraction and processing.
Ore Reserve	An 'Ore Reserve' is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined. Appropriate assessments and studies have been carried out and include consideration of and modification by realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction could reasonably be justified. Ore Reserves are sub-divided in order of increasing confidence into Probable Ore Reserves and Proven Ore Reserves. (JORC, 2012).
ore sorting	A generic term for one of several techniques for separating rocks based upon one or a combination of physical, chemical or electrical properties, e.g. density, brightness, conductance.
ore zone/orebody	Zone of mineralised material.
orogeny/orogenic	The process of mountain building, and may be studied as a tectonic structural event, as a geographical event and a chronological event, in that orogenic events cause distinctive structural phenomena and related tectonic activity, affect certain regions of rocks and crust and happen within a timeframe.
overburden	The material that lies above an area that lends itself to economical exploitation, such as the rock and soil overlying an orebody.
oxidation, oxidized	The addition of oxygen to the metal ion, generally because of weathering.
oxide	A binary compound of oxygen with another element or group.
paleochannel	A paleochannel is a remnant of an inactive river or stream channel that has been filled or buried by younger sediment.
Paleoproterozoic	The first of the three sub-divisions (eras) of the Proterozoic occurring between 2500 Ma and 1600 Ma (million years ago).
pelitic	Pertaining to or derived from pelite (mudstone).
piezometers	A device used to measure liquid pressure in a system by measuring the height to which a column of the liquid rises against gravity, or a device which measures the pressure (more precisely, the piezometric head) of groundwater at a specific point
porphyry	Porphyry is a textural term for an igneous rock consisting of large-grained crystals such as feldspar or quartz dispersed in a fine-grained silicate rich, generally aphanitic matrix or groundmass. The larger crystals are called phenocrysts.
prospect	Search for mineral deposits, especially by drilling and excavation.
Prospecting Licence	Authorisation granted by a government to an individual permitting the person to prospect for minerals.
pyrite	Iron disulphide, (FeS_2).
pyrrhotite	An iron sulphide mineral (FeS).
reconciliation	Measured assessment of the forecast and review of its correctness.
rheology	Rheology is the study of flow and deformation of materials under applied forces.

Term	Explanation
saprolite	A soft, typically clay-rich, thoroughly decomposed rock, formed in place by chemical weathering of igneous, sedimentary and metamorphic rocks.
savannah	A grassy plain in tropical and subtropical regions, with few trees.
silicates	Minerals consisting of silica combined with metal oxides, forming a major component of the rocks of the Earth's crust.
silicified	The introduction of, or replacement by silica, generally resulting in the formation of fine-grained quartz.
siltstone	A type of sedimentary rock where the individual particles are predominantly between <0.05 mm in size.
sinistral	Refers to the horizontal component of movement of blocks on either side of a fault or the sense of movement within a shear zone.
smelter	An installation or factory for smelting a metal from its ore.
spectrometry	An instrumental method for identifying the chemical constitution of a substance by means of the separation of gaseous ions according to their differing mass and charge (called also mass spectroscopy).
spectroscopy	Spectroscopy is the study of the interaction between matter and electromagnetic radiation.
Stibnite	Stibnite, sometimes called antimonite, is a sulphide mineral with the formula Sb_2S_3. This soft grey material crystallises in an orthorhombic space group. It is the most important source for the metalloid antimony.
stockpile	A stockpile is a pile or temporary storage location used during mining operations for storing large quantities of material.
strata	Plural form of stratum, or multiple beds or layers of rock.
stratabound (stratiform)	Rocks or mineralisation which sits within and conformable with sedimentary layered rocks.
strike	Geological measurement – the direction of bearing of bedding or structure in the horizontal plane.
sulphate	A sulphate is a salt of sulphuric acid, containing the anion $SO4_{2-}$ or the divalent group —OSO_2O.
sulphide	Economic minerals comprising a metal (such as lead, iron, zinc) and sulphur.
supergene	A mineral deposit or enrichment formed near the surface.
supernatant	The supernatant is the clear liquid that lies above the solid residue after centrifugation, precipitation, crystallization or settling.
Supervisor	A geostatistical software package used for geospatially analysing data.
surficial	Of, relating to, or occurring on or near the surface of the earth.
Surpac	A software package used to create 3D geological models
tails/tailings	The residue from a mineral processing plant, generally pulverised waste rock.
tellurium	Tellurium is a chemical element with the symbol Te and atomic number 52. It is a brittle, mildly toxic, rare, silver-white metalloid. Tellurium is chemically related to selenium and sulphur, all three of which are chalcogens. It is occasionally found in native form as elemental crystals.
topography	Topography is the study and description of the physical features of an area, e.g. its hills, valleys, or rivers, or the representation of these features on maps.
topsoil	The top layer of soil.
turbidites	A sedimentary rock deposited by a turbidity current.
variography	Definition of the three-dimensional grade continuity of drillhole samples by estimating and modelling the relationship between grade similarity and distance in every direction and at every sample spacing.
wireframe	A surface or 3D volume formed by linking points together to form triangles. Wireframes are used in the construction of block models.

28.2 Abbreviations and units

Abbreviation	Description
$	United States of America dollar(s)
$M	United States of America dollars (million)
°	degree(s)
°C	degree(s) Celsius
%	percent
µm	micrometre or micron
a	annum or year
AARL	Anglo American Research Laboratories
AAS	atomic absorption spectroscopy
Ag	silver
Ai	abrasion index
AIC	all-in cost
AIG	Australian Institute of Geoscientists
AGEM	AGEM Gmbh, an exploration company established in Germany
Al_2O_3	alumina
Allied	Allied Gold Corp Limited
Altus	Altus Elemental Royalties Corp.
ANCOLD	Australian National Committee on Large Dams
AngloGold	AngloGold Ashanti
ARD	acid rock drainage
As	arsenic
Au	gold
AusIMM	Australasian Institute of Mining and Metallurgy
BVML	Bureau Veritas Mali
CEMS	CEMS Consulting
CIL	carbon-in-leach
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
CIP	carbon-in-pulp
cm	centimetres
CNWAD	cyanide weak acid dissolvable
CRM	certified reference material
CV	coefficient of variation
DD	diamond
DNACPN	Direction Nationale de l'Assainissement du Contrôle des Pollutions et des Nuisances
DWi	Drop Weight Index
EC	electrical conductivity
ECSA	Engineering Council of South Africa
EDM	Energies de Mali
EPCM	Engineering, procurement and construction management
ESIA	Environmental and social impact assessment
ESMP	Environmental and social management plan
FE	Farabakouta East
FoS	factor of safety
FSAIMM	Fellow of SAIMM
G&A	general and administration
g, g/t, g/L	gram(s), grams per tonne, grams per litre
GISTM	Global Industry Standards for Tailings Management

Abbreviation	Description
GL, GL/a	gigalitres, gigalitres per annum
GW	gigawatts
GWh, GWh/a	gigawatt hours, gigawatt hours per annum
h	hour(s)
HAD	half absolute difference
HARD	half absolute relative difference
HSEC	health, safety, environment and community
IAMGOLD	IAMGOLD Corporation
ICMI	International Cyanide Management Institute
IFC	International Finance Corporation
IP	induced polarisation
IPP	independent power provider
IRR	internal rate of return
ISO/IEC	International Organization for Standardization and International Electrotechnical Commission
JORC Code	Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (2012 Edition)
Kewan Bond	Kewan Bond (Pty) Ltd
kg, kg/t, kg/h	kilogram(s), kilograms per tonne, kilograms per hour
Klöckner	Klöckner INA
km, km^2	kilometres, square kilometres
KNA	kriging neighbourhood analysis
koz	thousand ounces (troy)
kt	thousand tonnes
kV	kilovolts
kW	kilowatts
kWh/m^3, kWh/t	kilowatt-hours per cubic metre, kilowatt-hours per tonne
L	litre(s)
LAN	local area network
LBMA	London Bullion Market Association
LiDAR	light detection and ranging (survey)
LIMS	laboratory information management system(s)
LME	London Metal Exchange
LOM	life-of-mine
LOMP	life-of-mine plan
Lorax	Lorax Environmental Services
LSE	London Stock Exchange plc
M	million(s) or mega
m, m^2, m^3	metre(s), square metres, cubic metres
MCP	Mine Closure Plan
mg/L	milligrams per litre
MICA	Mineral Industry Consultants Association
ML	million litres
mm	millimetres
Mm^3	million cubic metres
Moz	million ounces (troy)
Mt, Mt/a	million tonnes, million tonnes per annum
MVA	megavolt ampere (million volt-ampere)
MW	megawatt (million watts)
MTZ	Main Transcurrent Zone

Abbreviation	Description
NI 43-101	National Instrument 43-101
NPV	net present value
OK	ordinary kriging
oz	ounce(s) (troy)
P&ID	process and instrumentation diagram
PE	Permis d'Exploitation
PEA	preliminary economic assessment
PFS	pre-feasibility study
PLC	programmable logic controller
ppm	parts per million
PR	Permis de Recherche
PRR	Prospectus Regulation Rules
RTO	reverse takeover transaction
QAQC	quality assurance and quality control
QC	quality control
RAB	rotary air blast
RC	reverse circulation
Resolve	Resolve Mining Solutions
RL	Reduced level (height above sea level)
ROM	run-of-mine
RPEEE	reasonable prospects for eventual economic extraction
RPO	recognized professional organization
RTO	Reverse takeover
SA	Société Anonyme
SAG	semi-autogenous grinding
SAIMM	South African Institute of Mining and Metallurgy
SANAS	South African National Accreditation System
Sb	antimony
SCADA	supervisory control and data acquisition
SEM	La Société des Energies de Mali
SEMOS	Société d'Exploitation des Mines d'Or de Sadiola SA
SFZ	Sadiola Fracture Zone
SMBS	sodium metabisulphite
SMC	SAG Mill Competency
SMSZ	Senegal-Mali Shear Zone
SMU	selective mining unit
SQL	structured query language
SRK	SRK Consulting
SSP	Sadiola Sulphide Project
SSZ	Sadiola Shear Zone
t, t/a, t/cm^2, t/d, t/h, t/m^3	tonne(s), tonnes per annum, tonnes per square centimetre, tonnes per day, tonnes per hour, tonnes per cubic metre
TDS	total dissolved solids
TSF	tailings storage facility
VALMIN	The VALMIN Code (2015 Edition)
WAD	weak acid dissociable
XRD	x-ray diffraction
XRF	x-ray fluorescence
WRD	waste rock dump

29 CERTIFICATES

CERTIFICATE of QUALIFIED PERSON

I, Allan Earl, Executive Consultant of Snowden Optiro, Level 19/140 St Georges Terrace, Perth Western Australia, do hereby certify that:

a) I am the co-author of the technical report titled **NI 43-101 Technical Report for the Sadiola Gold Project, Mali** and dated effective 12 June 2023 (the 'Technical Report') prepared for Allied Gold Corp and Mondavi Ventures Ltd (to be renamed Allied Gold Corporation).

b) I graduated with an Associateship in Mining Engineering from the Western Australian School of Mines in 1977.

c) I am a Fellow of the AusIMM, with membership number 110247.

d) I have worked as a mining engineer continuously for 45 years since graduation. I have been involved as a mining and resource evaluation consultant for over 20 years, and work has included: scoping studies, prefeasibility studies, feasibility studies and reserve estimation for open pit and underground gold mines for at least five years of these years.

e) I have read the definition of 'qualified person' set out in National Instrument 43-101 ('the Instrument') and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements of a 'qualified person' for the purposes of the Instrument.

f) I made a current visit to the Sadiola Gold Mine from 25 to 29 April 2022.

g) I am responsible for the preparation of Items 1 – 6, 15 - 16, 19, 21.1.2, 21.2.1, 21.2.3-4, 22 – 26 of the Technical Report.

h) I am independent of the issuers as defined in section 1.5 of the Instrument.

i) I have had prior involvement with the property that is the subject of the Technical Report having reviewed the 2021 Sadiola Project prefeasibility study.

j) I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

k) As of the effective date of this Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Perth WA this 12 June 2023

"Signed"

Allan Earl AWASM, FAusIMM

Executive Consultant

CERTIFICATE of QUALIFIED PERSON

I, Matt Mullins, Executive Consultant of Snowden Optiro, Level 19/140 St Georges Terrace, Perth Western Australia, do hereby certify that:

a) I am the co-author of the technical report titled **NI 43-101 Technical Report for the Sadiola Gold Mine, Mali** and dated effective 12 June 2023 (the 'Technical Report') prepared for Allied Gold Corp and Mondavi Ventures Ltd (to be renamed Allied Gold Corporation).

b) I graduated with a B.Sc. (Hons) Geology, Rhodes University and B.Sc. Geology and Applied Chemistry (Majors) with Physics, Mathematics and Computer Science (Minors), Rhodes University.

c) I am a Fellow of the AusIMM and a Registered Professional Natural Scientist.

d) I have worked as a geologist with over 40 years in early-stage geological and opportunity assessments; resource modelling; estimation and reporting, mine planning; strategic resource development; project evaluation and economic modelling and analysis. I have specific experience in geostatistical resource estimation, technical audits, due diligence studies and mine valuation studies, technical training and mentoring with significant exposure to international gold deposits.

e) I have read the definition of 'qualified person' set out in National Instrument 43-101 ('the Instrument') and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements of a 'qualified person' for the purposes of the Instrument.

f) I have not made a site visit to the Sadiola Gold Mine.

g) I am responsible for the preparation of Items 7 – 12 and Item 14 of the Technical Report.

h) I am independent of the issuers as defined in section 1.5 of the Instrument.

i) I have not made a site with the property that is the subject of the Technical Report.

j) I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

k) As of the effective date of this Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at London UK this 12 June 2023

"Signed"

Matt Mullins

Executive Consultant

CERTIFICATE of QUALIFIED PERSON

I, Gordon Cunningham, Associate Principal Consultant of Snowden Optiro, Level 19/140 St Georges Terrace, Perth Western Australia, do hereby certify that:

a) I am the co-author of the technical report titled **NI 43-101 Technical Report for the Sadiola Gold Project, Mali** and dated effective 12 June 2023 (the 'Technical Report') prepared for Allied Gold Corp and Mondavi Ventures Ltd (to be renamed Allied Gold Corporation).

b) I graduated from the University of Queensland with a B. Eng. (Chemical) in 1975.

c) I am a member in good standing of the Engineering Council of South Africa and am registered as a Professional Engineer – Registration No. 920082. I am a Fellow in good standing of the South African Institute of Mining and Metallurgy – Membership No. 19584.

d) I have worked as a metallurgist in production for more than 20 years since my graduation. I have worked as a corporate Consulting Metallurgist for 5 years, an independent metallurgical consultant for 2 years and for Turnberry Projects for 21 years as a Project and Principal Engineer and Director, primarily associated with mining and metallurgy projects.

e) I have read the definition of 'qualified person' set out in National Instrument 43-101 ('the Instrument') and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements of a 'qualified person' for the purposes of the Instrument.

f) I have not made a visit to the Sadiola Gold Mine.

g) I am responsible for the review of metallurgy, processing, infrastructure and costs - Items 13, 17, 18, 21.1, 21.1.3, 21.2.2 of the Technical Report.

h) I am independent of the issuers as defined in section 1.5 of the Instrument.

i) I have had prior involvement with the property that is the subject of the Technical Report having reviewed the 2021 Sadiola Project prefeasibility study.

j) I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

k) As of the effective date of this Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Hilton South Africa this 12 June 2023

"Signed"

Gordon Cunningham B. Eng. (Chemical), Pr. Eng. (ECSA), FSAIMM

Associate Principal Consultant

CERTIFICATE of QUALIFIED PERSON

I, Peter Jonathan Theron, Director and Principal Consultant of Prime Resources (Pty)Ltd, The Workshop, 70-7th Avenue, Parktown North, Johannesburg, South Africa, do hereby certify that:

a) I am the co-author of the technical report titled **NI 43-101 Technical Report for the Sadiola Gold Project, Mali** and dated effective 12 June 2023 (the 'Technical Report') prepared for Allied Gold Corp and Mondavi Ventures Ltd (to be renamed Allied Gold Corporation).

b) I graduated from the University of Pretoria with a B. Eng. (Civil) in 1985 and from the Witwatersrand University with a Graduate Diploma in Engineering (GDE) in 1995.

c) I am a member in good standing of the Engineering Council of South Africa and am registered as a Professional Engineer – Registration No. 950329. I am a Member in good standing of the South African Institute of Mining and Metallurgy – Membership No. 703496.

d) I have worked as a civil and environmental engineer continuously since graduation from university in 1986. My relevant experience for the purpose of the Technical Report is over 35 years of consulting in the field of tailings design , waste management and environmental studies

e) I have read the definition of 'qualified person' set out in National Instrument 43-101 ('the Instrument') and certify that by reason of my education, affiliation with a professional association and past relevant work experience, I fulfil the requirements of a 'qualified person' for the purposes of the Instrument.

f) I have not visited the Sadiola Gold Project.

g) I am responsible for the preparation of Items 20 and 21.1.4 of the Technical Report.

h) I am independent of the issuers as defined in section 1.5 of the Instrument.

i) I have had prior involvement with the property that is the subject of the Technical Report having reviewed the 2021 Sadiola Gold Project prefeasibility study.

j) I have read the Instrument and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

k) As of the effective date of this Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all the scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Hermanus, South Africa this 12 June 2023

"Signed"

Peter J Theron B. Eng. (Civil), GDE, Pr. Eng. (ECSA), MSAIMM

Associate Principal Consultant