Colosseum Scoping Study Delivers Positive Outcomes

Approved progression to Project Selection Stage ahead of BFS

Dateline Resources Limited (**ASX:DTR**)(**Dateline, DTR** or **the Company**) is pleased to announce the release of the Scoping Study (**Study**) for its flagship, 100% owned Colosseum Gold Project (**Project**), based on the June 2024 Mineral Resource Estimate (**MRE**), located in San Bernardino County, California, US. The Dateline Board has endorsed this Study and has approved progression to the Project Selection Stage (**PSS**) ahead of a Bankable Feasibility Study (**BFS**).

The Study confirms Colosseum as a robust gold mine development that delivers value for shareholders. Recent drilling at the North Pipe and depth extensions outside the MRE at the South Pipe offer opportunities for potential extensions to the mine life, based on infill and extensional drilling to convert into mineral resources.

Highlights

- Two development and production cases were assessed:
	- o **Case 1** assessed an underground and open pit operation, with sub level caving followed by open pit mining at a rate of 1Mtpa
	- o **Case 2** focused only on open pit mining methods, with a processing rate of 2Mtpa
- Development of an open pit only mining operation is preferred (Case 2)
- Measured and Indicated mineral resources account for 81% of plant feed in Case 2
- Scoping Study indicates Case 2 production at 75koz per annum for 8.4 years

Dateline's Managing Director, Stephen Baghdadi, commented:

"*The Scoping Study indicates robust project outcomes using a US\$2,200 per ounce gold price. The production and development cases assessed were benchmarked against 16 projects with sufficient published information on capital costs and 38 projects for operating costs.*

"Although two cases were assessed, the Company is most likely to progress Case 2 to BFS and has commenced discussions with suitable groups in the USA that are capable of completing the BFS.

"The Company will explore ways to further enhance the project economics and capital expenditure during the BFS stage"

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Capital Structure (ASX: DTR)

Shares on Issue 1.45B Top 20 Shareholders 63.8% Board & Management 33.9%

Board of Directors

Mark Johnson AO Non-Executive Chairman **Stephen Baghdadi** Managing Director

Greg Hall Non-Executive Director **Tony Ferguson** Non-Executive Director **Bill Lannen** Non-Executive Director

Colosseum Gold-REE Project* (100% DTR, California, USA) 27.1Mt @ 1.26g/t Au for 1.1Moz Au Over 67% in Measured & Indicated Mineralisation open at depth Mining studies underway Rare earths potential with geology similar to nearby Mountain Pass mine * ASX announcement 6 June 2024

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Table 1: Colosseum Gold Mine Scoping Study – Estimates of Inputs and Outcomes.

Note: The following table should be read in conjunction with the cautionary statement below

*** The results presented in Table 1 are estimates only, based on an estimated level of accuracy of +/- 35%, as per the Cautionary Statement below**

Cautionary Statement

The Study has been undertaken to assess viability of developing the Colosseum Gold Project by constructing an open cut mine ± underground mine and processing facility to produce gold doré.

It is a preliminary technical and economic study of the potential viability of the Colosseum Project. It is based on technical and economic assessments that are not sufficient to support the estimation of Ore Reserves. Further exploration and evaluation work and appropriate studies are required before Dateline will be in a position to estimate any Ore Reserves or to provide any assurance of an economic development case.

The Study is based on the material assumptions highlighted throughout this announcement. While the Company considers all the material assumptions to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated by the Study will be achieved.

These include assumptions about the availability of funding. To achieve the potential project development outcomes indicated in the Study, funding in the order of US\$152 million is needed (DTR presently has U.S. market capitalisation of approximately US\$10 million). Investors should note that there is no certainty that the Company will be able to raise funding when needed, however the Company has concluded it has a reasonable basis for providing the forward-looking statements included in this announcement and believes that it will be able to fund the development of the project. This is based on a ratio of initial capital expenditure to market capitalisation of 15 : 1.

It is also possible that such funding may only be available on terms that may be dilutive to, or otherwise affect the value of the Company's existing shares. It is also possible that the Company could pursue other strategies to provide alternative funding options. Given the uncertainties involved, investors should not make any investment decisions based solely on the results of the Study.

There is a low level of geological confidence associated with Inferred Mineral Resources and there is no certainty that further exploration work will result in the determination of Indicated or Measured Mineral Resources or that the production target itself will be realised.

The Study is based on the June 2024 Mineral Resource Estimate 1 1 , is based on low-level technical and economic assessments, and is insufficient to support estimation of Ore Reserves or to provide assurance of an economic development case at this stage, or to provide certainty that the conclusions of the Study will be realised.

The Study has been completed to a level of accuracy of +/-35% in line with industry standard accuracy for this stage of development. The Company has reasonable grounds for disclosing a Production Target, given that in the first five years of production, 89% of the mill feed is scheduled from the Measured and Indicated Resource category, which exceeds the economic payback period for the Project by 1.75 years.

Approximately 55% of the Life of Mine Production Target is in the Measured Mineral Resource category, 26% is in the Indicated Mineral Resource category and 19% is in the Inferred Mineral Resource category. There is a lower level of geological confidence associated with Inferred Mineral Resources, and while the Company considers all the material assumptions in this Study

¹ ASX Announcement 6 June 2024 – 1.1Moz gold for updated Colosseum Mineral Resource

to be based on reasonable grounds, there is no certainty that they will prove to be correct or that the range of outcomes indicated will be achieved.

The Mineral Resources underpinning the production target in the Study have been prepared by a Competent Person in accordance with the requirements of Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code (2012)). The Competent Person's Statement is found in the Mineral Resources section of the Study. For full details of the Mineral Resource Estimate, please refer to Dateline's ASX Announcement dated 6 June 2024.

Dateline confirms that it is not aware of any new information or data that materially affects the information included in that release. All material assumptions and technical parameters underpinning the estimates in that Announcement continue to apply and have not materially changed.

Note that unless otherwise stated, all currency in this Announcement is US dollars.

About Dateline Resources Limited

Dateline Resources Limited (ASX: DTR) is an Australian publicly listed company focused on mining and exploration in North America. The Company owns 100% of the Colosseum Gold-REE Project in California.

The Colosseum Gold Mine is located in the Walker Lane Trend in East San Bernardino County, California. On 6 June 2024, the Company announced to the ASX that the Colosseum Gold mine has a JORC-2012 compliant Mineral Resource estimate of 27.1Mt @ 1.26g/t Au for 1.1Moz. Of the total Mineral Resource, 455koz @ 1.47/t Au (41%) are classified as Measured, 281koz @1.21g/t Au (26%) as Indicated and 364koz @ 1.10g/t Au (33%) as Inferred.

The Colosseum is located less than 10km north of the Mountain Rare Earth mine. Work has commenced on identifying the source of the mantle derived rocks that are associated with carbonatites and are located at Colosseum.

Scoping Study Authors & Competent Person Statements

This Scoping Study is as defined in Clause 38 of the JORC Code 2012. It refers to the Mineral Resource Estimate announced by Dateline Resources Limited (DTR) on 6 June 2024 but the Production Targets presented do not constitute Ore Reserves as defined in the JORC Code 2012.

Apart from the Mineral Resource Estimate, the PDS has been completely compiled by Australian Mine Design and Development Pty Ltd (**AMDAD**) with information supplied by Dateline, generated by AMDAD or publicly sourced.

The principal author of the report and supervisor of the work conducted by AMDAD is Mr John Wyche BE(Min Hon) BComm FAusIMM CP. Mr Wyche is a Fellow of the Australasian Institute of Mining and Metallurgy. He has 37 years of relevant experience in hard rock gold mining.

Mr Wyche does not hold shares or any other form of equity in Dateline Resources Limited.

1. Executive Summary

- The Scoping Study (**Study**) for the Open Pit Only scenario (Case 2) assesses the mining and processing of 16.55Mt of ore grading 1.30g/t Au over an initial 8.4 year mine production life (the **Production Target**)
- Mining would be via open pit methods only, with 16.55Mt of ore and 56.75Mt of waste mines at a waste:ore strip ratio of 3.4:1
- Over the mine life, the project would produce 635koz of gold
- The Scoping Study was undertaken at a gold price of US\$2,200 per ounce
- The mine plan includes open pit mining from the south pipe and the north pipe at Colosseum
- An alternative 'underground and open pit' scenario was modelled using sub-level caving as the underground mining method. Whilst it also generated a positive outcome, it was not as good as the 'open pit only' scenario
- The mine plan and associated infrastructure has been modelled within the existing area where the Company holds vested Mining Rights and an approved Plan of Operation.
- The Scoping Study provides sufficient confidence to move to a Project Selection Stage (**PSS**) ahead of a Bankable Feasibility Study (**BFS**)

Colosseum Mine is located at 35°34'13"N 115°33'58"E in San Bernardino County in the state of California, USA. It is 14km from the California Nevada state boundary. The site is accessed by 16.5km of road from Interstate Route 15. The first 6.2km is sealed and the remaining 10.3km is unsealed.

The Colosseum mine is in a mining region rich in history with activity commencing in the 1860's when exploration commenced, leading to the discovery of the Colosseum mine in 1865. Various small scale mines were operated intermittently up until the 1970s and 1980s, when large scale exploration took off. Open pit mining and processing on site occurred from 1989 to 1993, with 344koz of gold produced during the period. The mine closed due to a low gold price environment, with a majority of the defined 1.1Moz reserve remaining unmined.

Little work occurred on site from 1994 to 2021 apart from the removal and partial remediation of the processing plant area.

Dateline acquired 100% of the Colosseum Gold Project from Barrick Gold Corporation in March 2021 and committed to the first modern exploration and development program. All available exploration and production data was compiled into a digital database and used for exploration planning and the estimation of a mineral resource estimate (**MRE**) to JORC-2012 standard.

As part of the acquisition of Colosseum, Dateline also acquired the Vested Mining Rights (**Mining Rights**) and an approved Plan of Operation over the project, which allows for mining to recommence based on existing approvals. The Study has been prepared on the basis that a future development would comply with the requirements of the Mining Rights.

The Case 2 mine plan for the Study involves open pit cutbacks of both the south pipe and north pipe at Colosseum, utilising standard mining methods. The mine plan includes:

• 55% of mineral resources in the Measured Category,

- 26% in the Indicated Category, and
- 19% in the Inferred category.

During the first five years of operation, Inferred mineral resources comprise <11% of the mine feed.

The open pit mine plan uses the existing June 2024 MRE. Note that this excludes the positive results of drilling in the north pipe in the September 2024 quarter due to time constraints. The mine plan uses Multiple Indicator Kriging (**MIK**) for the block model type and applies a mining recovery of 95% and a mining dilution factor of 10%. This process has resulted in a total Production Target of 16.55Mt of ore grading 1.30g/t Au containing 692koz of gold. The Production Target comprises 81% of Mineral Resources classified as Measured/Indicated and 19% as Inferred.

The proposed processing flowsheet comprises of a 2x scaled up version of the carbon in pulp (**CIP**) processing plant that successfully operated at Colosseum between 1989 and 1993. This would result in the processing of 2Mtpa of ore at Colosseum. The Company is confident that the footprint for the proposed 2Mtpa processing plant would fit within the area approved by the Plan of Operation.

When in full production, the mine is forecast for 8.4 years and produce at a rate of 75koz per annum of gold doré for direct sale.

The operations will utilise a drive in-drive out (**DIDO**) workforce with personnel recruited from nearby towns. There is no requirement for the construction of accommodation in the Study.

The Project operations are scheduled to reach full commercial production in month 13 with the estimated pre-production capital cost being US\$138 million. When in full production, the average monthly operating costs for the operation are US\$7.4 million. During this period, capital costs per month average US\$252k, fluctuating between US\$229k up to US\$422k. The estimated total unit operating costs over the life of the Project are US\$45/t milled with total capital costs of US\$165 million over the life of mine plus a \$30 million provision for mine closure.

The total unit operating costs were calculated as US\$18.60 per ore tonne for mining, US\$20 per tonne processed for milling (including power) with other ancillary costs being US\$6.60/t. Annual power costs at commercial production average US\$75.1M.

Using a US\$2,200/oz gold price, the estimated Colosseum Gold Mine economic factors are:

- US\$398M free cashflow generated over an 8.4 year period
- Total pre-production capital expenditure and working capital requirements of \$152.7m
- All In Sustaining Cost of gold production is US\$1,490/oz.
- NPV at an 6.5% discount rate for the Project is US\$235M
- Internal rate of return (IRR) of 31%.

From the current defined Production Target of 16.55Mt ω 1.30 g/t Au, full operation mine production can be achieved for 8.4 years. There are exploration results that have been returned outside the MRE, which if confirmed by further drilling, have the potential to provide substantial upside and high probability of mine life extending beyond the Scoping Study projected life.

These additional Mineral Resources will be assessed and ultimately exploited, if viable, to provide an increase in the production cashflow and mine life of the Project.

Table 2: Colosseum Gold Mine Scoping Study Inputs and Outcomes

*** The results presented in Table 2 are estimates only, based on an estimated level of accuracy of +/- 35%, as per the Cautionary Statement.**

Opportunities being explored to enhance potential returns

The Company is exploring the potential to sell the previously mined waste material as aggregate, to be used in cement and asphalt in support of the nearby increasing demand of the growing Las Vegas market. Samples have been sent to Aztech Labs for aggregate suitability analysis. If the waste material is suitable and can be sole as aggregate, this may improve project economics.

Gold Market

Gold is a critical element with unique properties that enhance portfolio diversification, serve as a store of value, and provide a hedge against systemic risk. In 2024, gold prices reached unprecedented highs, peaking at \$2,721 per ounce. This increase is partly due to significant central bank demand, particularly from emerging markets like China, India, and Turkey.

Gold prices are heavily influenced by global economic conditions, including inflation rates and geopolitical tensions. Despite the Federal Reserve's tightened monetary policy, gold has continued to rise, indicating strong underlying demand and investor confidence in gold as a safe haven.

Historically, gold has responded to various global events, including financial crises and changes in monetary policy. The current trend reflects past periods where gold has strengthened amidst global uncertainties, indicating a recurring pattern of investor behaviour during economic stress.

Figure 1: Gold Price – 12-month spot price vs Study Price (US\$2200/oz)

As can be seen i[n Figure 1,](#page-7-0) the recent spot price of ~US\$2,650/oz is more than 20% above the price used in the Study.

2. Project Description and Location

Colosseum Mine is located at 35°34'13"N 115°33'58"E in San Bernardino County in the state of California, USA [\(Figure 2\)](#page-8-0). It is 14km from the California Nevada state boundary.

Figure 2: Colosseum Gold Mine location

Colosseum is located at the northern end of the Clark Mountains (se[e Figure](#page-9-0) 3 an[d Figure](#page-9-1) 4). The project area is approximately 1,000 metres north to south and 600 metres east to west with surface elevations ranging from 1,680 metres above sea level in the south to 1,810 metres in the north. The average surface elevation of 1,700 metres is 600 to 700 metres above the alluvial fans and dry lake beds east and west of the mountain range.

Topography in the mine area is steep and irregular. It is gentler to the south of the project area where the process plant and tailings storage facility were located from 1988 to 1993. All drainage over the project area is to the west.

The project is within the Mojave Desert. The climate is arid. Vegetation is sparse consisting of salt bush, pinyon pines and similar species.

The North and South Pipes were mined as two adjacent pits from 1998 to 1993. Operations were suspended in 1994, and the equipment and processing facility dismantled and moved from the site. The South Pit remains as a 130 metre deep void with the bottom 26 metres flooded to the standing groundwater level. Mining in the North Pit was suspended before it went substantially below ground level, so the benches are still open out onto the western slope of the range.

Waste rock from both pits was dumped on the western side of the range, which drops away immediately west of the pit crests, and in a small area immediately north of the North Pit. The waste rock appears to have been end dumped as it now sits at angle of repose with no benching or contouring.

The tailings storage facility from the former operation remains as a broad flat area south of the mine. The containment wall, overflow spillway and downstream holding dams remain in place.

Figure 3: Clark Mountains looking north to Colosseum

Figure 4: Looking south to Clark Mountains

3. Mining Scenarios

Two potential mine plans were considered in this Study:

- **CASE 1 - UNDERGOUND & OPEN PIT- Underground mining of the South Pipe and opencut mining of the North Pipe and a small zone west of the South Pipe**. Mill feed is set at 1.2 million tons per year (1.09 Mtpa) to match the actual throughput from 1988 to 1993. Underground mining of the South Pipe is used to provide high grade feed early in the mine life to boost gold production and early cash flows. The North Pipe and a small, shallow zone west of the South Pipe are mined by opencut methods. Initially the opencut is mined at a rate to make up the difference between the underground production rate and the mill feed rate. After the underground is depleted the opencut mining rate is increased to meet the full mill feed rate.
- **CASE 2 - OPEN PIT ONLY - Opencut mining of both the North and South Pipes.** Preliminary pit optimisations indicated maximum value can be achieved by opencut mining of the whole deposit. The mill feed rate was set at 2 Mtpa as this can be achieved with a moderate size mining fleet and benchmark studies indicate the initial project capital cost may be within a practical range for DTR. Amendments to existing approvals may be required to operate a 2 Mtpa mine but the process plant would still be a scaled up and modernised version of the plant that operated successfully from 1998 to 1993.

A more thorough analysis of the production rate under either scenario would be required in a future Feasibility Study. In keeping with the goals of this Study, the two cases were selected to identify and examine practical aspects of different mining methods and to assess the relative values of production at the rate of the former operation and a higher rate more aligned to the potential project scale.

Case 2, the 'Open Pit Only' scenario produced a more robust outcome from an economic and risk-based perspective and is detailed in the following sections. A summary of the 'Underground and Open Pit' scenario is included for reference in Appendix 1.

Opencut Mining

Examination of the drillhole database and mineral resource block model shows gold mineralisation in the South and North Pipes consists of higher-grade zones (>1.0 g/t Au) within broader zones of 0.3 to 1.0 g/t Au. The low costs and high selectivity achievable with opencut mining compared to underground mining make a much larger proportion of the deposit amenable to mining by opencut methods. Most of the currently defined resource is near surface which makes opencut mining a realistic alternative to underground methods.

Opencut Mining Method Selection

The main options for opencut mining consist of:

- **Continuous mining** using tools like the Wirtgen or Vermeer surface miners. These machines can be highly selective in stratified deposits with relatively low strength rock. However, in more complex steeply dipping orebodies with higher waste to ore ratios they are often too slow and too expensive and must be used in conjunction with other methods for the waste rock mining.
- **Bulk mining** using face shovels or front-end loaders on high benches to dig blasted rock is a low cost option where the ore zones are broad laterally and vertically and the target

commodity has relatively low unit value. This is typically used in large operations such as iron ore or large scale copper mines. However, in orebodies like Colosseum the costs associated with mis-classifying material as ore and sending it to the mill (increased process cost) or as waste and sending it to the waste rock emplacement (lost revenue) can be very large.

Selective mining using hydraulic backhoes on low benches to dig blasted rock is the most common opencut method in small to medium scale gold mines. Benches are blasted at 5 to 6 metre heights and mined in 2 to 3 metre high 'flitches'. Hydraulic excavators in backhoe configuration provide an effective combination of selectivity and productivity and are capable of efficiently mining the waste rock as well plus additional tasks such forming final walls or drop cutting ramps.

Selective mining using hydraulic backhoes was selected as the opencut mining method for the Study.

Opencut Mining Operations

Colosseum would be a small to medium scale opencut gold mine. Annual material movements would be:

• 2.0 Mtpa mill feed and an average of 6.5 Mtpa waste rock peaking at 8.6 Mtpa in Years 3 to 6.

Apart from some areas around the pit crests, which would mine through old waste rock emplacements, all material would require drilling and blasting.

Grade control would be critical to achieving maximum recovery of the resource with minimal dilution.

Most of the waste rock would have to be placed external to the pits. External waste rock emplacement would increase the disturbed area and would require care in design, formation and rehabilitation.

Grade control

The most appropriate grade control system needs to be investigated and defined by the DTR Geological team. For the purpose of the Study, AMDAD has assumed that grade control sampling would be undertaken by reverse circulation (**RC**) drilling in advance of the mining benches:-

- Samples would be analysed in a laboratory at Site and the assayed grades applied to the grade control block model to define ore zones for mark out.
- Drill holes angled at approximately 60°, with conceptual drillhole line spacing of 7.5m and collars spaced 5m along each line.
- 60m hole depth to cover five 10m benches.

Grade control and marking out of ore zones would commence in the half-year prior to mine production. At this time, the grade control procedures would be trialled and evaluated. As well as the methods for sampling, an assessment would be made regarding the adequacy of visual control for digging of marked out ore zones at night, using lighting plants, and whether ore mining would generally only be undertaken during daylight hours.

Optimisation of hole spacing will involve a trade-off between increase in accuracy of the orebody model and the cost of drilling, sampling and assaying. Optimisation of hole depth must consider hole deviation and the impact on effective spacing versus the benefit of gaining the data well in advance of the mining bench.

The RC grade control drilling will also define ore and waste types in conjunction with the waste rock management plan and closure plan.

Soil testing will address rehabilitation constraints (nutrient, erodibility, dispersion risks).

Waste rock classification, primarily by sulphur %, may also involve the use of a portable x-ray fluoroscope (**pXRF**).

Drill and Blast (D&B)

It is anticipated that all materials mined in the open cut, except areas where the pits mine through existing waste rock emplacements, would require some level of drilling and blasting (D&B) for productive excavation. D&B performance will be affected by faults and other fracturing, and by water.

The drilling and blasting operations would entail the following:

- Drilling and blasting will generally be conducted on 5-metre high benches but may be conducted on 10 metre benches in the broader upper benches.
- Blastholes will be drilled using a DTH hammer diesel powered drill rig.
- Geological logging, mapping and drill penetration rates from the previous bench, from the resource drilling and from a historical drill penetration rate study (Amselco 1984) will be used to predict conditions on the active bench for blast pattern design.
- Blast patterns will be sized as large as possible to minimise the frequency of blasts and would aim for a minimum of approximately 80 kt on a 5-metre bench or 200 kt on a 10-metre bench.
- Blasts will typically be fired as choke blasts to minimize disruption to the mining cycle, and to limit lateral movement of ore boundaries.
- As recommended by the 1980's rock mechanics study (Amselco, 1984):-
	- \circ controlled blasting will be employed with smaller diameter blast holes, closer spacing, and the use of delays to minimize the back break and damage to the final open cut wall from blasting.
	- \circ Some experimental controlled blasting would be undertaken to determine the procedure to be used on the final bench faces.
- Blastholes will be loaded predominantly with Ammonium Nitrate/Fuel Oil (**ANFO**) mixture by a mobile explosives manufacturing unit (**MEMU**).
- In the uncommon event of wet conditions after a significant storm or due to groundwater, emulsion explosives would be used.
- Conventional non-electric initiation products would be used for most blasts.
- Blast design, including initiation, will be prepared to comply with vibration and air pressure guidelines.
- Stemming material will be obtained by crushing and screening of suitable aggregates sourced from hard rock at or near the project.
- A comprehensive blasting procedure will be implemented as part of the mine safety management plan to ensure the safety of personnel and equipment in and around the mine during blasts. This will be developed during the blast study proposed for the DFS program. A blast would be delayed or postponed if climatic or other conditions did not comply with the procedure.
- The orientation of some blasting benches relative to the project facilities, the geology and structure may pose a fly-rock risk for personnel and infrastructure. To address this risk, the mine facilities area, Run of Mine (**ROM**) crusher and critical processing infrastructure will need to be designed to lie outside a defined blast radius from the open cut. Blast procedures must specifically address this fly-rock risk with precautions in addition to pre-blast clearance procedures that would include careful logging of drilling and appropriate adjustment of charging and stemming to mitigate the risk.
- Blasts would be fired on dayshift only. The exclusion zone for personnel around the blast would depend on the specifics of the shot and the material; however, it is expected to typically be around 500 m.

A blasting study will be conducted during the Definitive Feasibility Study (**DFS**) to inform an appropriate blast design to meet acceptable standards and limits, including:-

- Confirmation of powder factors
- Preparation of typical blast designs,
- Investigation of fly-rock risk,
- Definition of the exclusion radius,
- Provision of preliminary blasting procedures
- Provision of data for blast vibration analysis
- Assessment of explosives/AN storage and transportation

Loading and Hauling

Blasted waste rock and ore will be loaded and hauled by a mining fleet likely to comprise an 90t to 120t class diesel-hydraulic excavator loading 55 t articulated dump trucks. An example would be a 107t Komatsu PC1250SE-8R excavator loading 55 t Volvo A60H ADTs.

The different ore types and waste rock types will be mined and stockpiled separately.

Mill feed will be hauled to the ROM area and either direct tipped into the primary crusher or placed in a stockpile adjacent to the ROM pad.

Waste rock will be hauled to the waste rock emplacements adjacent to the pits (see Waste Rock Emplacements section).

Water Management

The site is characterized by very low precipitation. Nevertheless, a significant rainfall event could result in considerable surface runoff and flows in the water courses within the project area. This may represent a risk to safe mining operations and to contamination of local waterways. These risks must be managed by adherence to a detailed Water Management Plan that will be

developed during the DFS program. It will address the requirements for and impacts of the following facets of mining operations:-

- Management of surface water and groundwater to separate clean water and contact water, and prevent contamination of local water courses and groundwater, including:
- Diversion of clean water around the mine workings and infrastructure areas
- Control of contact-water laden with sediment or chemical leachates, using bunds, drains, channels, piping and containment ponds
- Trafficability and operability of the mining fleet on roads and benches
- Potential for submergence of working areas at the bottom of the open cut
- Impact of water on explosives charging
- Stability of open cut walls
- Stability of waste rock emplacement (**WRE**)

Ancillary Functions

Mining support, or ancillary, functions and methods are listed below:

- A bulldozer would maintain open cut bench floors, clean-up around the excavator, doze off waste rock at the WRE, maintain and profile the WRE as required.
- A grader would maintain roads, with a compactor used to construct roads,
- A water cart would be used for dust suppression,
- A smaller excavator in the range of 30 t to 50 t would be used for:
	- o Batter scaling
	- o Forming windrows
	- o Digging small sumps and drains
	- o Moving pumps
	- o Secondary breakage of oversize rock after blasting using a rock breaker attachment
	- \circ Slope maintenance and removal of material from minor wall slips will be completed by excavator, wheel loader and trucks as required,
- A mobile crane would be required for bucket changes, component changes and positioning dewatering pumps,
- A crushing and screening plant would provide aggregate for road sheeting and blasthole stemming,
- A small wheel loader or integrated tool carrier would load this plant, load stemming into blastholes, and facilitate tyre handling,
- A service truck would refuel and lube the excavators and drill rig, and
- Other ancillary equipment would include forklift, boom lift, flatbed truck, lighting plants and bus.

Waste Rock Management

The waste rock management systems approved for the former operation would be the minimum standard for the proposed resumption of mining. Specific measures to be considered for the proposed mine plan include:

- Stripping of any topsoil material if required from the WRE footprint(s) to enhance the stability of the WRE foundations and to provide soil and vegetation for rehabilitation.
- Construction of diversion systems around the WREs to minimise surface runoff water from flowing onto the WRE surfaces and or permeating the WRE material.
- Construction of containment ponds at the down-grade toes of the WREs, where appropriate, to collect sediment and water which has been in contact with eth waste rock materials.
- Construction of other drainage control measures within the WRE footprints and around the WRE perimeters including bunds, drains and drop structures to direct runoff water and seepage water towards the containment ponds.
- Waste rock types would be sampled and analysed by site geologists to allow the segregation and selective transport, handling and containment of potentially acid forming (PAF) materials with non-acid forming (**NAF**) materials.
- PAF materials would be encapsulated by NAF material and, where possible, include low permeability capping on each WRE bench.
- Low permeability capping to be achieved by compaction through traffic of haul trucks, to reduce rain infiltration and to promote stability.

Further details of the proposed WREs are included further in the report.

Waste Rock Acid Generation Potential

According to U.S. EPA (1993), the previous operator at Colosseum tested waste rock material using the acid-base accounting method for determining acid generating potential and advised that the results indicated that waste rock is not acid generating. Therefore, for the purpose of the DPS, no allowance has been made for any specific measures for management of potentially acid forming (**PAF**) waste rock. However, the DFS program would include geochemical test work to confirm that there is no PAF risk for waste rock.

Existing Waste Rock Emplacements

Waste rock previously excavated from the two open pits is stored in contiguous emplacements surrounding the South Pit and North Pit, as shown in [Figure](#page-16-0) 5 below.

No liners underly the waste piles, and the dumps exist typically at their natural angle of repose except where the previous operator graded the waste rock to provide access, to maintain the waste dump surface for receiving rock, or where there has been limited rehandling and/or profiling after completion of the previous mining and processing operation.

The existence and nature of runoff controls at the waste rock piles is not known.

No underdrain or sediment collection dams were proposed for these piles, according to the Environmental Impact Statement (**EIS**). The EIS presented the following rationale for this decision (Bureau of Land Management, et al., 1985a):

- The slope of the waste rock surface will direct storm water runoff flow back toward the open pits;
- Due to low annual precipitation and high annual evaporation, percolation of storm water runoff is unlikely, and;
- In the event of storm water infiltration, any leachate created would contain the same compounds as the surrounding host rock; no sulphides were to be disposed of in the waste rock piles.

Figure 5: View looking north-east showing existing mined waste rock within green line

Open Cut Pit Optimisation

Whittle[™] pit optimisation was used to define the starter and final pit shapes for the Study.

Pit Optimisation Inputs

The pit optimisation inputs are designed to provide operating, cost and revenue values across the entire zone of target mineralisation and surrounding ground which are representative of the final operating parameters but general enough to allow the software to define the shape of the highest value pit cone.

Table 3: Pit Optimisation Inputs and Estimates

Mineral Resource Block Model

The mineral resource was estimated as a median indicator kriged model with grade increments of:

- 0.30 to 0.50 g/t Au
- 0.50 to 0.75 g/t Au
- 0.75 to 1.00 g/t Au
- 1.00 to 1.25 g/t Au
- 1.25 to 1.50 g/t Au
- 1.50 to 1.75 g/t Au
- 1.75 to 2.00 g/t Au
- 2.00 to 2.25 g/t Au
- 2.25 to 2.50 g/t Au
- 2.50 to 2.75 g/t Au
- 2.75 to 3.00 g/t Au
- 3.00 to 3.50 g/t Au
- 3.50 to 4.00 g/t Au
- 4.00 to 5.00 g/t Au
- 5.00 g/t Au

Grades were estimated into 10x10x5 metre panels, and each grade increment estimate included an estimate of the proportion of the panel above the bottom grade of the increment. The model also includes an e-type estimate of the average gold grade of the whole panel (a zero cut-off grade). The pit optimisation software treats each grade increment as a parcel within each panel and so works down to the grade increment containing the economic cut-off grade.

The model classes each panel as Measured, Indicated or Inferred resources but also includes estimates for panels where distance from samples or other reasons reduce estimation confidence to lower than Inferred. The pit optimisation, and Study generally, only consider panels with Measured, Indicated or Inferred resources.

Mining Loss and Dilution

In determining the marginal economic cut-off grade to see which panels contain potential 'ore', the pit optimisation software applies nominated mining ore loss and dilution factors. It is difficult to spatially model mining loss and dilution in MIK models. AMDAD ran some rudimentary analyses to model 'edge' dilution of 0.3 to 0.5 metres at the cut-off grade in each panel and the resulting adjusted grades and panel proportions were used as the basis of global allowances of 10% dilution at zero grade and 95% mining recovery.

Spatial Constraints

Two spatial constraints were applied:

- The optimised pit shell must be within the Patented and Unpatented Claims boundaries.
- In the alternative 'underground plus open pit' scenario, the pit optimisations assumes that no mineralisation remains within the estimated subsidence cone following underground mining of the South Pipe.

Figure 6: Spatial Constraints for Case 1 (UG & Open pit scenario)

Mill Feed Rate

The mill feed rate is set to 2,000,000 tonnes pa to provide the best economic outcome based on the level of Measured and Indicated mineral resources considered in this Study.

Opencut Mining Costs

Opencut mining costs are made up of:

- Load and haul costs. Varies with depth and position in the deposit due to changing haul lengths.
- Drill and blast costs. Applies to rock but not to fill where the pits mine through existing waste rock emplacements.
- Management, technical and supervisory (**MTS**) costs. Allocated to ore and waste on tonnes mined.
- A range of other costs such as grade control and environmental management. Some specific ore costs and some general allocations.

To capture these costs in a way that could be used by the pit optimisation throughout the deposit, AMDAD ran a trial pit optimisation using a single cost per tonne for ore and for waste. A production schedule was run for the resulting pit shells, simple haul routes were estimated, and a first principles mining cost estimate was prepared in a similar manner to the model described i[n Table](#page-52-0) [16.](#page-52-0)

AMDAD graphed the estimated load and haul costs for each period against the average mining bench level for that period to derive the following chart in which the dots represent the modelled ore and waste load and haul costs per tonne and the crosses were assigned as the values for use in the pit optimisation.

L&H Cost per tonne by Bench Elevation

As a check that the estimated costs per tonne by bench level are representative of the first principles cost estimate, mill feed and waste tonnes in the production schedule each period were multiplied by the costs per tonne from the pit optimisation inputs for the average mining bench level in that period. The following figure shows a chart of cumulative mining costs over the mine life estimated from first principles and from the optimisation inputs. The optimisation inputs case closely follows the first principles estimate.

Cumulative Mining Costs

Figure 8: Check on Mining Costs for Pit Optimisation

Process and Site Costs

Process and General and Administration costs per ROM tonne were estimated from benchmarking of other gold projects. See Section 10.

Gold Price

A fixed gold price of US\$2,200/oz was set based on the average forecasts from five reputable banking and commodity forecast groups. See Section 10.

Discount Rate

Whittle™ pit optimisation uses a discount rate to allow selection of pit shells on a maximum discounted cashflow basis to assess pit staging. The optimisation runs used 10%. This is higher than in the final economic analysis in Section 10.

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Pit Optimisation Results

Whittle™ pit optimisation produces a series of nested shells to match a range of nominated revenue factors. A revenue factor (**RF**) is a multiplier applied to the metal price. RF = 1.00 for the base case price. RF's less than 1.00 force the optimisation to form smaller shells targeting the parts of the deposit with highest value per tonne mined. RFs greater than 1.00 produce larger shells with lower value per tonne mined.

The software reports the operating cashflow (total revenue from recovered product less total operating costs and realisation charges) for each shell produced.

Looking at the undiscounted cashflows will always show RF = 1.00 to have the highest value when values are calculated at the base case inputs. By definition RF =1.00 means the software has sought out the pit cone with the highest base case value. Smaller shells could increase value by pushing deeper and wider, as long as the incremental mining cost is less than the net value of additional recoverable product. Larger shells will always have lower undiscounted value because the incremental mining cost of each shell outweighs the net value of additional recoverable product.

The same shells can also be reported as values discounted at the nominated rate. The software does this by effectively scheduling the shell from top to bottom at whatever mining rate is required to meet the nominated mill feed rate, noting that cones are wider at the top and so have more waste per tonne of mill feed at top than at the bottom. If a maximum mining rate is nominated the software will not exceed it, even if the mill would be underfed. Selecting the highest discounted cashflow (**DCF**) shell is generally a more realistic approach to pit optimisation than using the highest undiscounted value because it recognises that higher early mining costs to meet the mill feed tonnage in early periods may reduce the present value compared with smaller shells.

Using DCF also assists selection of pit staging. Nominating a starter shell smaller than the maximum single stage DCF shell defers the cost of pushing back to the larger shells and will generally results in maximum value staged DCF final shell closer to the undiscounted case.

The maximum DCF value staged pits were selected as the bases of the mine plan scenarios.

Table 4: Pit Optimisation Results, based on modelled and estimated inputs

The values shown in [Table 4](#page-22-0) are estimates of operating cashflows excluding capital costs. They are approximate because they:

• Are derived from optimised shells rather than practical pit design,

- Use general mining costs per tonne by elevation rather than first principles cost estimation, and
- Do not account for detailed practical scheduling issues.

The main purpose of the values is to provide a relative value ranking of the shells.

Figure 9: 'Open Pit Only' scenario Optimisation Results

Practical Opencut Design

The optimised pit shells are used to guide design of practical pits including berms and ramps and smoothing out shapes in the pit walls and floors which cannot be mined using standard commercially viable methods.

Pit Wall Design

The open cut slope design in the Feasibility Study report by Amselco (1984) is significantly steeper than the walls that were actually mined. Until a geotechnical assessment is conducted for the DFS, the Study adopts a flatter design based on the as-mined slopes which have stood without major failures for over 30 years. The wall slopes are shown in the following figure and table.

Figure 10: Pit Wall Slope Design

Some upper sections of the pit walls will cut into existing waste rock dumps. Where walls are cut into fill the batter slope is reduced to 37° and the berm width is increased to 10 metres.

Table 5: Pit Wall Slope Design Assumptions

Slope Parameter	Design
Batter angle	
Rock	55°
Fill	37°
Face height	
Rock	15 metres
Fill	15 metres
Berm width	
Rock	5 metres
Fill	10 metres
Inter-ramp slope	
Rock	46.4°
Fill	26.6°

When 18-metre wide ramps are included the average overall wall slope in rock reduces to 43.2°.

Pit Ramps

The pit ramps are designed to accommodate Volvo A60H 55 tonne payload articulated dump trucks. These units are narrower than comparable rigid body trucks and can negotiate steeper grades at similar up ramp speeds. These factors significantly decrease waste volumes and allow mining of smaller benches at the base of the pit recovering ore which may not be mineable with wider rigid body trucks. The following table provides the calculation of ramp widths.

Table 6: Pit Ramp Design Criteria

Pit Design

The pit design mines the North Pipe in two pit stages and a small pit on the western side of the existing South Pit.

Access to the north pit would be down the western side of the existing South Pit. Initially ore and waste from the upper benches would be hauled directly off the benches and across the existing low grade stockpile area to the ROM stockpile area and the East WRE. As the pit becomes deeper all material mined would exit the pit along a ramp cut into the upper eastern wall of the existing South Pit. This would provide access to the ROM area and the East and West WREs.

Ore and waste from the small West Pit would be hauled south around the existing South Pit to the ROM area, the East WRE and the West WRE. The West Pit must be completed before the West WRE, which includes backfilling of the South Pit above the underground mine, reaches the West Pit exit at RL1745.

The third stage of mining would be a push back of the existing South Pit to mine the South Pipe mineralisation below the existing pit and the small zone to the west of it. Stage 3 would use the same pit exit as Stages 1 and 2.

Figure 11: Stage 1 Pit

Figure 12 : Stage 2 Pit

Figure 13: Stage 3 Pit

Waste Rock Emplacements (WRE)

Waste rock emplacements for the proposed opencut mine would differ from the 1988 to 1992 operation in that they would be:

- Placed from bottom up rather than from a high tip head so the final landforms can meet design criteria,
- Formed in 10-metre high lifts with 1 in 2 slopes on the final faces separated by 10 metre wide berms to give an overall final slope of 1 in 3,
- Placed to conform more with the surrounding terrain,
- More compacted resulting in lower permeability and reduced total volume,
- Easier to access for rehabilitation work,
- Better able to retain soil, vegetation and moisture on the berms and shallower faces, and
- More amenable to access and habitation by wildlife.

The WREs will be totally within the Unpatented Claims areas and will be designed to facilitate drainage management, erosion controls and containment of any silt run off.

Because the emplacements will be formed from the bottom up, topsoil can be harvested in advance of waste rock placement and placed directly on final faces as they are completed.

Tailings Co-disposal

In order to minimise the overall impact of the project on the site, the Study proposes co-disposal of filtered tailings with the waste rock. The tailings would be filtered to 85% solids by weight and backhauled to the waste rock emplacements by the mine haul trucks. Further work would be required in the DFS to confirm technical, environmental and commercial viability of co-disposal but if proven it offers the following advantages over dam style tailings storage facilities (TSF):

- Greatly reduced surface disturbance because tailings take up void spaces within the body of a WRE instead of lying flat in a valley containment,
- Less prone to wind and rain erosion of the fine tailings material,
- Reduced initial cost because there is no need to build an engineered TSF wall and drainage system, and
- Lower risk of failures impacting downstream ecosystems.

Details of filtered tailings placement with the waste rock would require further planning but in general would entail:

- De-toxification of the tailings to reduce cyanide content to lower than the currently approved limit for storage in the TSF.
- Filtering to 15% moisture.
- Back hauling in mine trucks to the waste rock emplacements.
- Placement, mixing and encapsulation of the tailings in the body of the waste rock emplacement well away from final faces.

All of the WRE would include downstream silt traps and collection dams to capture erosion and water from the WREs. These would be monitored in a similar manner to the existing dams in Curtis Canyon below the former operation TSF.

WRE Design Criteria

Proposed designs for the WREs seek to create stable landforms amenable to revegetation and access to native fauna. Wherever possible they would be placed on currently disturbed ground so the net impact would be an improvement to the current existing WREs.

Design parameters for the WRE's include methodology for estimating the required storage volume and shape of the final landforms.

Table 7: Waste Rock Emplacement Design Criteria

The volume of filtered tailings is based on the dry volume of tailings plus the volume of water to bring it up to 15% moisture by weight.

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WRE Design

Four WREs are proposed for the 'Open Pit Only' scenario.

Figure 14: Waste Rock Emplacements

The East WRE would hold all the waste rock from the upper benches of Stages 1 and 2 from the North Pit with access to the lower lifts through the site of the existing low-grade stockpile on the east side of the existing South Pit.

As the North Pit becomes deeper a ramp would be cut into the top of the eastern wall of the existing South Pit to haul mill feed to the ROM area. When the East WRE is full, waste rock would be hauled north west across the ridge between the North and South Pits to the North WRE. This access would be maintained as the South Pit gradually cuts into the North Pit.

As mining progresses in the South Pit pushback of existing void, the South Pit ramp would be designed to join into the ROM access ramp from the North Pit and use the same pit exit point. Waste rock from the South Pit would be placed in the South WRE along with waste rock from the bottom benches of the North Pit once the North WRE is full.

Mining in the North Pit would be completed before the South Pit. The South Pit would still require over 3 Mm³ of waste rock storage after completion of the North Pit. All of this would be placed in the mined out North Pit.

Opencut Mining Fleet

The proposed opencut mining fleet would be based on hydraulic excavators in backhoe configuration loading haul trucks. For the purpose of the DFS articulated haul trucks are assumed as opposed to rigid body units. This is because they can run at similar speeds on narrower, steeper ramps and work on narrower benches. The load and haul fleet would be supported by bulldozers, graders, water carts and blast hole drills and charging equipment plus a range of smaller equipment such light vehicles, pit pumps and lighting plants.

Mining Rosters

Mining was scheduled on the basis of 2 x 12 hour shifts per day, 7 days per week for a maximum of 14 shifts per week. Potential work hours for each machine type were estimated against this roster after allowance for public holidays, weather stoppages, on-shift delays such as shift and meal breaks or wait on blasting, machine mechanical availability and machine utilisation.

Three possible rosters were assumed:

- 14 shifts per week (2 x 12 hrs, 7 days per week)
- 10 shifts per week (2 x 12 hrs, Monday to Friday)
- 5 shifts per week (1 x 12 hrs, Monday to Friday)

Allowing for some alternation between these rosters over the mine life assists in matching fleet capacity to required mining rates.

Load and Haul Fleet

Trial schedules provided an estimate of required mill feed and waste rock mining rates. Loader/truck combinations were tested to define matches with the required productivity. Selection was also governed by the following assumptions:

- For most of the mine life there should be at least two excavators in operation to help ensure continuity of mill feed.
- For efficient operation at the required dig rates in blasted hard rock, the excavator should be at least in the 90 tonne class.

The loader/truck combinations selected are:

Table 8: Loader Truck Combinations

Haulage of mill feed, and waste rock is typically the largest component of the mining cost because it requires the largest number of units and the largest number of operators and maintenance crew. Truck fleets were modelled for the Study by defining mill feed and waste rock haul routes from each mining bench to the ROM or WREs and using the haul modelling tools in MineSched software to estimate speeds and truck hours through each period over the mine life. The software tracks growth of the WREs as well as changing mine face positions to provide a realistic assessment of required truck hours which in turn is used to estimate truck fleet numbers.

A further adjustment was made to the truck fleet to allow for haul back of filtered tailings to the WREs.

Another key to reducing mining cost is to maximise fleet utilisation. The machines have fixed costs associated with ownership and labour. If the machine is not working the fixed costs are still incurred even though it is not contributing to revenue generating work.

The Study mitigates fixed ownership costs by selecting loader / truck combination which match the required production rates as closely as possible.

Labour fixed costs are controlled by alternating between rosters. This is probably only realistic if a mining contractor is used so the workforce can be allocated to other work during periods of 10 or 5 shift rosters.

Blast Hole Drilling and Charging Fleet

Track mounted rotary percussive drills were selected based on the powder factor and blast hole sizes reported from the former operation. The assumed blast pattern uses 152mm diameter holes blasting 5-metre high benches. Drilling rates per metre are based on similar operations and include moving and set up between holes.

Explosives supply was assumed to be a 'down the hole' service so the charging unit would be provided by the explosives supplier.

Support Fleet

The load and haul fleet would be supported by:

- Face bulldozers for clean-up and bench levelling around the excavators.
- WRE bulldozers to spread truck dumped waste rock and tailings and form final WRE faces.
- A grader and water truck to maintain haul roads, benches and stockpile areas and to control dust.
- Lighting plants for night operation.

- Pit pumps to remove ground and rainwater from the mining benches.
- A range of other intermittently used equipment such as light vehicles, service trucks, tip truck, small loader and a crane

The Study estimates operating hours, fleet sizes, operator numbers and operating costs for all the major equipment items and applies contingency factors to allow for the smaller intermittently used items.

Tailings / Stockpile Loader

Operating hours were estimated for a large wheel loader to load truck with filtered tailings to back haul to the WREs and to load the crusher from stockpile in periods when the trucks aren't able to direct dump.

The following table shows examples of the types of machines adopted for the Study.

Table 9: Examples of suitable machinery used in the Study for Case 2 (Open Pit Only)

Load Haul Fleet

Trial schedules for the 'Open Pit Only' scenario showed a good match to required material movement using 1 x 120 tonne excavator and 1 x 94 tonne excavator both loading 55 tonne payload trucks.

The project would operate on a full 14 shift per week roster for most of the mine life. There would be a 15-month period, mostly in Year 2, where the roster drops to 10 shifts per week. By Year 7, mining would be near the base of the pits where the waste to ore ratio is low so the roster would drop to 10 shifts per week and then 5 shifts per week over the final year.
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Figure 15: Annual Material Movement

Figure 16: Truck Fleet

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The truck fleet would build to a maximum of 12 units and be held at this level for most of the mine life. The excess capacity of the fleet would be used for hauling filtered tailings back to the WREs.

Production Schedule

Underground and opencut mining and mineral processing were scheduled on a monthly basis to assess practical sequencing issues such as underground development in advance of stoping, opencut bench advance rates and run of mine stockpile sizes. Production quantities and grades were summarised annually as shown i[n Table 10.](#page-38-0)

Open Pit Only Scenario

Mining would commence in Stage 1 of the North Pit in Month 6 of Year 0. Most of the opencut mining in Year 0 would be waste rock. Opencut mill feed production would increase from Month 1 of Year 1 to meet the full process feed rate of 2.0 million tonnes per year.

Stage 2 of the North Pit would commence early in Year 1 so that it would be deep enough to supply the majority of the mill feed when Stage 1 is completed in mid-way through Year 4.

The South Pit would commence mid-way through Year 3 so the pushback to the existing South Pit would be deep enough to access the mill feed below that pit by the time the North Pit is completed mid-way through Year 7. Mining would then continue in the South Pit until the middle of Year 9.

Mill feed delivery rates from the opencut mine would be matched to the target processing rate of 2.0 million tonnes per year. A ROM stockpile would be maintained adjacent to the crusher feed hopper as a buffer between mining and processing. The ROM stockpile size would be between 20 to 30 thousand tonnes over the mine life. This represents approximately five days of feed to the mill.

Total opencut mining quantities for Case 2 would be 16.6 million tonnes at 1.30 g/t Au and 56.8 million tonnes of waste rock.

Processing was scheduled at 2.0 million tonnes (2.2 million tons) per year commencing in Month 1 of Year 1. A three month ramp up period to the full mill feed rate was allowed in Year 1. Estimated gold production over the first six years would average 67 koz per year. The last 18 months of production would have much higher-grade mill feed from the base of the South Pit resulting in over 100 koz of gold per year.

Total estimated gold production over the mine life at the estimated head grade and process recovery would be 635 koz.

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Table 10: Life of Mine Estimated Production Schedule

Production Schedule by Resource Category

The production targets for this study include 19% Inferred resources, which have low geological confidence. The following figures show tonnes mined by resource category to assess the resource risk.

Inferred mineral resources make up 19% of the estimated mill feed tonnes.

Figure 17: Tonnes Mined by Resource Category

Figure 18: Proportion of tonnes Mined by Resource Category

4. Metallurgy

Gold Recovery

This study assumes a gold process recovery of 92% based on:

- Life of mine production records showing an average of 91% recovery.
- 1984 metallurgical test work results averaging 91.4%
- Assumed improvements in gold processing since 1993.

(Source: Lac Minerals Inc., Operating Information Sheets)

Operational records do not include details on ore types processed from 1988 to 1993. Given the location of mining it is likely most of the ore processed was oxide. The drill hole data and resource models available to AMDAD at September 2024 do not provide detail on degree of oxidation in the proposed mine plan. It is possible that it may include partially oxidised or fresh sulphides. The 1984 Amselco Feasibility Study referred to metallurgical test work by Hazen research which included oxide and sulphide mineralisation. The report states "whole ore cyanidation produced high recoveries on both sulphide and oxide ores".

Some of the reports mention copper in the mineralisation and the 1980s test work was to have included analyses to mitigate excessive cyanide consumption. However, the Amselco feasibility Study notes "results of test work at Hazen indicated copper would not be a problem".

Other Process factors

A future DFS would need to conduct metallurgical test work to confirm the gold recoveries, grinding characteristics, reagent consumption and other process factors for the ore to be processed in a future mine. Available production records are not comprehensive enough for detailed process design and there is no certainty that the deeper mineralisation will perform the same as ore processed from 1988 to 1993.

5. Mineral Processing

Gold Processing Plant

This Study does not include any analysis or assessment of the gold processing plant. All processing assumptions are based on performance of the carbon in pulp (**CIP**) plant that operated successfully at Colosseum from 1988 to 1993. That plant had a design capacity of 3,400 tons per day and ran at an average throughput of 1.2 Mtons (1.09 Mtonnes) per year.

The DFS would examine process options in detail to incorporate improvements in gold processing technology since 1993.

The main change assumed for the Study is that all tailings would be filtered to 85% solids by weight to facilitate co-disposal with the mine waste rock.

In order to understand how the process plant would work with the mining operation AMDAD:

- Digitised the layout of the 1993 process plant and placed it in the same position on the proposed mine plans.
- Scaled the footprints of existing process plants in the 1 to 2 Mtpa range and compared them to the footprint of the 1993 Colosseum plant to confirm that process plants for Cases 1 and 2 could fit in the available area.
- Scaled the footprint of a comparable size process plant incorporating a tailings filter to assess the additional area required.

These checks confirmed at a scoping level of confidence that a 1 or 2 Mtpa process plant with a tailings filter can be accommodated in the available area at Colosseum.

The following figures show the flowsheet and layout of the 1993 process plant and how it would fit into the mine plan proposed for the PDS.

Figure 19: 1993 process Plant Overlaid on Mine Plan

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Figure 20: CIP Process Flow Chart 1988 to 1993

Figure 21: Schematic process Site Layout 1988 to 1993

Tailings Management

The Study assumes that process tailings will be filtered to 85% solids and trucked back to the WREs for co-disposal with the mine waste rock. Tailings and waste rock analyses for the 1982 EIS concluded that with cyanide destruction neither the tailings or waste rock present any danger to surrounding water sources. The tailings and waste rock were assigned as Class 3 waste.

Detailed assessment of co-disposal methods and environmental impact would be required in the DFS. However, the general procedure would be:

- Thicken the tailings in a standard thickener to around 55% to 60% solids by weight.
- Use a belt or plate press filter to increase the solids density to 85%. At this density the tailings filter cake should be handleable by loaders and trucks.
- Stack filtered tailings in a sheltered bay to prevent erosion by wind or rain.
- Use a large wheel loader to periodically load the filtered tailings onto mine trucks which would divert to active WRE benches on route back to the mining faces.

- Dump the filtered tailings on the active WRE bench but well back into the body of the WRE away from future final faces.
- The dumped tailings would be encapsulated within the mine waste rock. This may involve methods such as formation of cells in the WRE benches which are periodically buried in waste rock or paddock dumping of alternate waste rock and tailings piles which are then mixed together by the WRE bulldozer.

Tailings placement would be designed to make the fine tailings take up void spaces in the placed waste rock to reduce permeability of the WRE and fully encapsulate the tailings in waste rock to ensure it is not open to erosion by wind or rain.

6. Infrastructure and Services

Accessibility

The site is accessed by 16.5km of road from Interstate Route 15 [\(Figure](#page-45-0) 22). The first 6.2km is sealed and the remaining 10.3km is unsealed.

Proximity to significant locations:

- Las Vegas, Nevada is 76km north along Interstate Route 15 from the Colosseum turn off.
- Ivanpah Solar Facility straddles the Colosseum access road. This 392 MW solar farm includes molten salt heat storage which, combined with supplementary natural gas generation, delivers 24 hour per day electricity supply. A potential power line route from the Ivanpah substation to Colosseum is approximately 10.4km.
- Primm, Nevada is 8km north along Interstate Route 15 from the Colosseum turn off. It is a resort town just inside the Nevada state line.
- Jean, Nevada is 28km north along Interstate Route 15 from the Colosseum turn off. Jean hosts a commercial warehousing facility and light aircraft airport.
- The Mountain Pass rare earths mine is 10km south of Colosseum.

Figure 22: Colosseum Gold Mine access

Power Supply

The former operation accessed grid power from a 33 kV powerline owned by Southern California Edison (**SCE**). There are several high voltage lines (500 kV and 287 kV) 3 km north of the mine, but it may not be feasible to take supply from these. The Ivanpah Solar Facility is located in the Ivanpah Valley 8 km west of the mine. A sub-station at the facility is linked into a 115 kV powerline owned by SCE.

For the purpose of the Study, it is assumed that a new 60 kV powerline will be built from the Ivanpah sub-station to the mine site.

Water Supply

The former operation extracted water from wells in the Ivanpah Valley. AMDAD is not aware if this source is still available. Other aquifer alternatives discussed in the original EIS include Shadow Valley 16 km to the west and Mesquite Valley 30 km to the north.

Employee Accommodation

The Study assumes Colosseum employees will commute daily from their own accommodation. No allowance has been made for permanent employee accommodation and messing.

Other

Other facilities at the mine site would include:

- Mine and process plant workshops and stores,
- Diesel fuel storage,
- Explosives magazine,
- Emergency diesel generator,
- Offices including communications facilities,
- First aid facility,
- Helicopter pad (for emergencies),
- Change house and ablutions,
- Sewage treatment.
- Environmental monitoring and controls, and
- Site security.

Figure 23: Site Access

7. Market Studies and Contracts

Gold Price Forecast

A fixed gold price of US\$2,200/oz is used for the Study. This is based 40% on the spot gold price of US\$2,500/oz at the start of September 2024 and 60% on the long-term average of publicly available forecasts from reputable sources.

Table 12: Published Gold Price Forecasts

Gold would be sold in doré produced on site. The drillhole assays and the production records do not show any metals other than gold. It is likely the doré would contain some silver, but the Study does not assign and credits for this.

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8. Approvals and Sustainability

Environmental and Social/Community impacts for Colosseum were addressed for the operation by a Draft EIS (Bureau of Land Management 1985a) and Final EIS (Bureau of Land Management 1985b). Environmental and Social/Community commentary was also provided by the U.S. EPA (1993). Mining and processing from 1988 to 1993 were run in accordance with the EIS and Plan of Operations and Reclamation Plan for the Colosseum Project, 21 July 1986.

Dateline notes that when mining and processing operation were suspended in 1993 the EIS and Plan of Operations remained in place and would apply to resumption of activities at Colosseum. These documents would be DTR's minimum standard for the project.

9. Capital and Operating Costs

Basis of Estimates

Capital and operating costs in this Scoping Study are estimated at an order of magnitude level of confidence. The following table summarises the basis of capital and operating cost estimates in each project area.

Table 13: Basis of Cost Estimates

Opencut Mine

Mining fleet capital and hourly operating costs, labour rates and explosives costs are taken from a US mining cost database.

Diesel fuel costs are published costs for Eastern California for August 2024.

Explosives "down the hole" service charges are based on current Australian contracts.

Fleet productivity estimates and haulage models for the Case 1 and Case 2 production schedules were used to develop monthly equipment hours. These were used to estimate fleet sizes and operator numbers. The maintenance workforce was assumed to be 0.6 x operator numbers.

Blasthole drill hours, fleet and workforce numbers and explosives consumption was estimated for a blast pattern in non-fill material based on the powder factor used from 1988 to 1992.

Fleet ownership costs are based on 60-month lease terms with a 10% residual to take ownership of each unit.

Fleet operation, including operator, maintenance and supervisory labour costs, but excluding explosives costs, was assumed to be by a contractor and a 15% margin was added to these costs.

Mining fleet costs include approximately 10% contingency for equipment and 5% for labour to cover items such as light vehicles, service trucks, minor earthworks machines and a crane which are not fully utilised and do not have full time operators.

Explosives supply was assumed to be on a "down the hole" basis and a monthly service fee was applied for provision of the explosives charging truck and crew.

Mine management, technical and supervisory staff were estimated appropriate for the operation. Staff costs are taken from published West Coast USA salary data.

Additional costs estimated include grade control and environmental management.

Process and Infrastructure

Process and infrastructure capital and operating costs were estimated by reviewing published studies and company reports and the US cost database cost models to define costs as a function of process plant feed rate.

Benchmarking of capital costs included **16 projects** with sufficient published information on the breakdown between process plant, tailings, infrastructure and indirect costs (EPCM, Owner's costs and contingency) to be adjusted for direct comparison to Colosseum. Four feed rates from the cost database were used.

Benchmarking of operating costs included **38 projects** and four from the cost database. General and administration costs were estimated as a function of the benchmarked process operating cost.

The benchmarked study and report dates range from 2017 to 2024 and were in US, Canadian or Australian dollars. They were adjusted to 2024 using published global inflation rates and then to US\$ using current exchange rates at August 2024.

Tailings facility costs were removed from the process costs and capital and operating costs for filtered tailings were added back. The filtered tailings capital and operating costs are based on a Canadian project currently in development.

The following table summarises the benchmarked capital and operating costs adjusted to a filtered tailings operation at Colosseum in 2024 US\$.

Table 14: Summary of Process and Infrastructure Cost Estimates

Additional process costs were added for:

- A large wheel loader to load filtered tailings onto mine trucks for haul back to the WREs. This includes capital costs (ownership) and operating costs (lease, diesel, maintenance and labour).
- Operating costs for the additional mine truck hours for the tailings haul back. The mine fleet has sufficient capacity to include haul back so no additional trucks were required.

Capital Costs

Opencut Mine

Capital costs for opencut mining include:

- Mobilisation and commissioning charges for each mining fleet item,
- Residual payments for each fleet item at the end of the 60-month lease period, and
- Pre-production (Year 0) operating costs.

Opencut mining fleet lease costs are included in operating costs.

Opencut mine facilities such as workshops are included in Site Infrastructure capital costs.

Table 15: Opencut Capital Cost Estimates

Process and Infrastructure

Benchmarking data for the Process and Infrastructure capital costs presented [Table 14](#page-50-0) are shown in the following chart. The red triangles show total Process and Infrastructure capital costs assumed for Colosseum at a range of annual process feed rates.

Figure 24: Benchmarking of process and infrastructure capital cost

Additional capital costs specific to Colosseum were estimated:

- Powerline and substation US\$4,703,024
- Access road upgrade US\$1,030,000

Total estimated construction capital costs for Process and Infrastructure in Year 0 are:

• Open Pit Only US\$137,683,024

Sustaining Capital

An amount of 2% of the Process and Infrastructure cost per year was allowed for sustaining capital. Life of project sustaining capital amounts estimated are:

• Open Pit Only US\$23,176,642

Mine Closure Costs

Estimated amounts were allowed for mine closure costs:

• Open Pit Only US\$30,000,000

These allowances are not based on estimates of the activities involved other than noting that they are well in excess of six months of mining costs at full production. Closure costs will have to cover all activities listed in the Reclamation Plan.

Operating Costs

Opencut Mine

The following tables show the opencut mine operating cost estimates by area and by input.

Table 16: Estimated Opencut Operating Costs by Area

Table 17: Estimated Opencut Operating Costs by Input

Process and Infrastructure

The following chart shows benchmarked data for the basic process cost per tonne of mill feed adjusted to 2024 US\$. The red triangles show process operating costs assumed for Colosseum at a range of annual process feed rates.

Figure 25: Benchmarking of process operating costs

The estimated cost of operating the tailings filter, which is based on published costs for a similar scale plant, were added to the basic benchmarked process cost and modelled tailings haul back costs per period were added to the total.

Table 18: Estimated Process Operating Costs

General and Administration Costs

General and administration (**G&A**) costs cover items such as operations management, human resources, accounts, safety, community relations, communications and mining tenement costs. These can vary greatly from site to site and consist of a mix of fixed and variable costs. To estimate a representative cost for the Study, G&A costs from the benchmarked studies and reports were plotted against the benchmarked process costs as shown in the following chart.

DATELINE RESOURCES

Figure 26: Benchmarking of General and Administration Costs

While the data shows poor correlation there is a general trend of decreasing G&A cost per mill feed tonne as the feed process rate increases. On this basis, G&A costs for the Study were estimated as:

US\$0.37 – (Benchmarked basic process cost per tonne x 0.0089)

The resulting estimated G&A costs per mill feed tonne are:

• Open Pit Only US\$6.63

Gold Realisation Charges

The following gold realisation costs are based on published reports and the US mining cost database. The royalty payment is part of the purchase arrangement from Barrick Gold.

Table 19: Gold Realisation Charges – estimates and assumptions

10. Economic Analysis

Cautionary Statement

Economic analyses in this Study are to provide a preliminary assessment of project viability for the two scenarios modelled being 'Underground & Open Pit Mining' and 'Open Pit Only' as support for decisions on proceeding to a DFS.

The economic outcomes presented are not intended as a Mineral Asset Valuation under the Valmin Code 2015. The authors of this study are not Valmin Practitioners.

Cashflows in this study are based on:

- Production targets which are not Ore Reserves as defined in the JORC Code (2012) and which include up to 19% Inferred mineral resources,
- Capital and operating cost estimates which include a high proportion of benchmarked and factored costs,
- A high proportion of assumed or historical operating inputs in disciplines where the authors of the report are not experts.

There is a high likelihood that the financial outcomes in this study will not be realised in any future project and should not be relied on.

Basis of Cashflow Models

Cashflows are presented as earnings before interest, taxes, depreciation, and amortisation (EBITDA). No analysis of financing costs or corporate taxation are included.

Discounted Cashflow Results

Revenue from gold sales less estimated capital and operating costs applied against the production schedule for the 'Open Pit Only' scenario are presented as net cashflows on undiscounted and discounted bases.

Selection of Gold Price

A fixed gold price of US\$2,200/oz is used for the Study. See Section 11.

Selection of Discount Rate

Discounted cashflows (DCF) use a discount rate of 6.5%. This rate was selected as a pre-tax estimate of the weighted average cost of capital using the long term US lending rate current in September 2024 and assuming a debt to equity ratio of 80:20. The debt to equity ration in the future may vary from this.

Economic Outcome

The estimate life of mine EBITDA net cashflow would be **US\$397M undiscounted** or **US\$235M discounted**.

The operating life would be **8.4 years**.

Project payback on an EBITDA basis would be **3.3 years undiscounted** or **4.2 years discounted.**

23 October 2024

Figure 27: Net Cashflows

Sensitivity Analysis

The net present value of the discounted cashflows was tested against ±15% variations in key factors. The model is most sensitive to gold price and recovery. It shows similar sensitivity to mining and processing operating costs but are less sensitive to capital costs or discount rates.

The 'Open Pit Only' scenario remains positive within the full range of sensitivities tested.

These results do not consider combined effect of changes to multiple inputs.

Figure 28: NPV Sensitivity Analysis in US\$

Table 20: Sensitivity Analysis – Estimate of variance for each variable

The sensitivity analysis has been estimated by varying one input parameter at a time, leaving all others unchanged. There is the potential that a change in one parameter will result in other parameters changing, either naturally or by changes to decisions. The sensitivity analysis is provided as a guide only and may not reflect actual variations in practice.

As illustrated above, the project is most sensitive to the gold price and gold recovery. The current spot gold price at the date of this Study is approximately 20% higher than the gold price assumed in the Study.

The sensitivity analysis indicates that the project still produces a positive NPV even at a gold price of US\$1,870/oz (US\$2,200 x 85%). US\$1,870/oz is approximately 68% of the level of the current spot price for gold.

Funding

The Company's 100% owned Colosseum Project is in a tier one jurisdiction and regarded as low risk. Historical production records demonstrate in excess of 91% gold recoveries and the project has very strong economics that provide a robust platform for Dateline to source traditional financing through debt and equity markets. There is, however, no certainty that Dateline will be able to source funding as and when required.

To achieve the various outcomes indicated in the Scoping Study, pre-production funding in excess of US\$153M may be required. Typical project development financing would involve a combination of debt and equity. Dateline has formed the view that there is a reasonable basis to believe that requisite future funding for development of the Colosseum Project will be available when required.

There are grounds on which this reasonable basis is provided including:

- The Project is in a tier one jurisdiction, with simple non-refractory metallurgy allowing for an industry standard CIL process plant and has a rapid payback of only 3.3 years from commercial process production;
- The very strong pre-tax cashflows of US\$398M and rapid payback would support a significant level of conventional debt financing for the Project development;
- The Company has a strong track record of raising equity funds as and when required to further the exploration and evaluation of its assets; and

The Dateline Board and management has extensive experience in mine development, financing and production in the resources industry.

11. Mining History

Mining history for Colosseum up to 1994 is taken from information compiled on the Mindat website, the USGS and a paper by Gregg Wilkersen.

1860 to 1994

1860 – 1875

Exploration in the Clark Mountain district began in the late 1860s. The district was organized on July 18, 1865, by John Moss, owner of several mines, including the historic Colosseum Mine, which was discovered in 1865.

1900 – 1906

Developed by Devereaux Brothers, Ivanpah Consolidated Mining Co.

1923 – 1938

Purchased by C.H. Gowman, September 1923; operated by Colosseum Mines, Inc. from 1923 to February 1938. The historic Colosseum Mine was developed as underground workings in the West breccia pipe within the lower portion of the gold zone and constitutes the largest historic gold mine within the district. No recorded production occurred until the 1930s, with production of about 615 ounces gold. Recorded production for the mine also indicates that \$45,000 (1930s value) in gold and copper was produced prior to 1940. The main historic developments at the mine consist of:

- An adit at 5700 feet accessing 470 feet of drifts.
- An adit at 5877 feet accessing 725 feet of drifts and 250 feet of raises,
- A vertical stope in the central interior of the rubble breccia portion of the West breccia pipe, and
- Semicircular workings on the westernmost edge of the West pipe.

Note that these workings would have been removed in the South Pit between 1988 and 1992.

1938 – 1942

Under lease to Harold Chase and Walter Lineberger, of Santa Barbara from February 1938 to February 1942; 30 unpatented claims, 2 patented claims, Colosseum No. 1 and Colosseum No. 2; 640 acres. The mine was closed in 1942 as a non-essential industry during World War II

1970s - 1985

During this 15 year period the Colosseum property was held by California Gold Properties, which leased some of the older claims and located an additional 176 claims. A series of exploration ventures on the Colosseum property was conducted by Draco Mines, Placer AMEX, and Amselco Exploration using modern methods. Amselco leased the property from Draco Mines in 1982 and conducted extensive drilling and feasibility studies between 1982 and 1984. This work resulted in delineation of ore reserves associated with the southwestern most of two felsite intrusive breccia pipes to a depth of 750 feet. Amselco began the required permit applications in 1983, and a Final EIR/EIS was approved in July 1985.

1986 - 1982

The property was acquired by Dallhold Resources Inc., a subsidiary of Bond Gold International, in September 1986. In November 1986, Royal Resources acquired a 25% interest in the property. Modern operations began in 1986 with mineable reserves estimated to be 10,539,000 tons (9.56 million metric tonnes) with an average grade of 0.062 oz Au/ton (2.13 g/t), for a total of 653,418 oz contained gold. Construction of a 3,400 tons per day (3,084 tonnes per day, or 1.25 Mtpa) carbon-in-pulp, cyanide mill started in November 1986 and was completed in September 1987. Open pit mining commenced in mid-1987 and the mine and mill reached full capacity by early 1988. The mining facilities occupied 284 acres with another 3,316 acres held as private land and unpatented mining claims. Mining was conducted in two open pits, the South Pit mining the west pipe and the North Pit mining the east pipe. Most of the mining facility was on unpatented Federal land under the jurisdiction of the Bureau of Land Management (BLM); but two patented claims are located in the South Pit area.

1989 - 1993

Lac Minerals acquired the properties of Bond International Gold, Inc in 1989. Colosseum Inc., a subsidiary of Lac Minerals Ltd, continued to operate the Colosseum Mine until mining was suspended on July 10, 1992. Processing of low grade stockpiles continued until May 1993.

Gold production ran for 5.5 years compared to the original 9 year mine plan. From January 1988 to May 1993:

- 6.59 million tonnes of ore was mined at a waste to ore ratio of 3.97.
- 5.84 million tonnes of ore was milled at an average grade of 2.02 g/t Au.
- 345 koz of gold was poured.

Approximately 750,000 tonnes remains in a low grade stockpile on the east side of the South Pit. A sampling program is required to confirm the grade of this stockpile.

Figure 29: Colosseum gold process plant in 1992

1994 to 2024

Lac Minerals was acquired by Barrick Gold Corporation in 1994. The Colosseum Project lay dormant until Dateline Resources Limited (DTR) acquired it from Barrick Gold in March 2021.

Since the acquisition, DTR has:

- Collated all available exploration and production data,
- Validated the historical drill hole data and converted to the current UTM grid,
- Conducted a confirmatory drilling program on the West Pipe (South Pit),
- Reviewed and updated the geological interpretation,
- Produced two Mineral Resource Estimate updates (July 2022 and June 2024) to bring the Mineral resource up to 1.1 Moz,
- Conducted preliminary mining studies, and
- Progressed discussions and negotiations with relevant stakeholders to establish the status of approval and permits required to re-start mining and processing operations.

12. Geology and Exploration

The Colosseum deposit is located at the southern end of the Sevier foreland thrust belt in the southern Basin and Range Province, SW USA. The project lies within in the Clark Mountain Mining District in the northeast portion of the Clark Mountain Range. The district includes the Mountain Pass rare earth mine 10 kilometres south of the Colosseum Mine, numerous abandoned copper mines, and scattered fluorite, antimony, and tungsten prospects. Most gold and silver deposits in the district are within the northeast quadrant of the district north of Clark Mountain and are associated with emplacement of a felsic breccia complex into Precambrian basement rocks.

The deposit itself is associated with the emplacement of a breccia complex into Precambrian gneissic basement rocks. The complex is comprised of two felsite breccia pipes that form a northeast-southwest elongate zone, which contains mineralised zones of disseminated auriferous pyrite. (Se[e Figure 30](#page-61-0) below)

Gold at the Colosseum deposit is generally sub-microscopic and associated with sulphide mineralisation, chiefly pyrite. It occurs as free gold, with minor alloyed silver. Gold is primarily in contact with pyrite, in fractures in the pyrite or along pyrite grain edges. It also occurs as isolated particles in quartz and other gangue minerals but spatially always close to pyrite but rarely as particles encased in euhedral pyrite.

Figure 30: Geology Map for the Colosseum Gold Project (source unknown)

Deposit Types

The Colosseum deposit style is a hydrothermal breccia pipe with a combination of epithermal mineralisation at original higher levels and mesothermal mineralisation at the lower levels.

Exploration

Historical work was completed by various mining companies since 1972.

- Draco Mines (1972-1974)
- Placer Amex (1975-1976)
- Draco Mines (1980)
- Amselco (1982-1984
- Dallhold Resources/Bond Gold (1986-1989
- Lac Minerals (1989-1994)

All the companies were reputable, well-known mining/exploration companies that followed the accepted industry standard protocols of the time.

All meaningful and material data has been included in a previous report by H&SC (2024a).

3D geophysical interpretations have recently been created from historical data. The outcomes have suggested possible additional exploration targets close to the existing set of deposits.

Future work would be for a feasibility study. If required, additional drilling may be needed for metallurgical and geotechnical purposes.

Processing and interpretation of the geophysical data is ongoing. Current work is on a follow-up program involving IP or MT surveys to test deeper and with greater resolution.

Drilling

A total of 616 holes for a total of 59,137 metres have been drilled in the Colosseum Mine area. The historical drilling was completed from 1972 to 1991 and includes 599 holes for a total of 55,609 metres. Most of the historical drilling was done using RC and conventional rotary methods. An inventory of known drilling in the area totals 5,166 metres in 262 Air Trac holes, 6,611 metres in 31 core holes, 40,288 metres in 273 RC holes and 3,543 metres in 33 rotary/percussion holes.

Between April 2022 and April 2024, DTR drilled 17 diamond core holes (with one abandoned hole) along existing haul roads within the South Pit, for a total of 3,527.65 metres. The majority of this drilling is aimed at confirming mineralisation grades at depth and to better define lateral margins to the deposit.

All the Colosseum drillhole data is used in developing the Mineral Resource model, with the exception of one historic drillhole, CP-2, which is an exploration hole testing an IP anomaly and is outside the area of the Mineral Resource.

Since April 2024, DTR has drilled two holes in the North Pipe. The first hole intersected a moderate grade zone (0.5 to 2.0 g/t Au) at depth on the eastern side of the North Pipe. The second hole intersected high grade mineralisation within the body of the currently defined resource.

These holes are not included in the June 2024 MRE. When the next MRE update is run they may result in some localised increase of estimated gold grade.

13. Mineral Resource Estimates

DTR's consultants modelled the mineral resource in 2022 and 2024.

The July 2022 MRE used Ordinary Kriging (**OK**) and was mainly based on historic drilling (1991 and earlier) and five holes drilled by DTR in 2022. It was included in the Australian Securities Exchange (**ASX**) release "813,000 ounce Mineral Resource estimate for Colosseum Gold Project" dated 6 July 2022.

The June 2024 MRE used Multiple Indicator Kriging (**MIK**). It added seven holes drilled in 2023 and a further two drilled in 2024. The June 2024 MRE was reported by DTR in the ASX release "1.1 million ounces of Gold at the Colosseum" dated 6 June 2024.

This section on Mineral Resource Estimates is taken from the June 2024 MRE.

For clarity, where older geological reports refer to the East and West breccia pipes, current reports and mine plans refer to the South Pipe or Pit (formerly West Pipe) and the North Pipe or Pit (formerly East Pipe).

Estimation Methodology

Recoverable MIK was used to complete the gold grade estimation using HSC's inhouse GS3M modelling software. The geological interpretation, such as it is, block model creation and validation were completed using the Surpac mining software. HSC considers MIK to be an appropriate estimation technique for the type of mineralisation and extent of data available.

The drillhole database was composited, with no constraints, to 1m intervals covering the whole of the prospect. The 1m composite interval may lead to a smoothing out of the variance but is unlikely to have a significant impact on the global estimates. A minor amount of peripheral, isolated data was removed from the composite file. A total of 54,313 composites were generated from the drillhole database, using the Surpac 'best fit' option and modelled for gold only. Two drilling domains were employed, one for the South Pit (domain 1) and another for the North Pit (domain 2), reflecting a difference in intensity of drilling and assay grades.

Metal variogram maps of gold for domains 1 and 2 indicated weak results, which points to a lack of structure to the gold data. Overall grade continuity was very modest with a weak E-W trend for domain 1 coupled with a steeply west plunging feature in the XZ plane and a vertical plunge in the YZ plane. For domain 2, a WNW trend was interpreted with a subvertical plunge in both the XZ and ZY planes.

Grade interpolation was unconstrained, except by the search parameters and the variography, in acknowledgement of the gradational nature to the margins of the gold mineralisation and the abundance of buffering low grade peripheral values.

No base of oxidation was used. No cover surface was created as the mineralisation is outcropping and is exposed in many places along its ridge line and flanks and where previous open pit mining had occurred.

A fundamental concept behind MIK method is that it generally precludes the need for top cutting. However, in this case, two extreme consecutive samples from one drillhole were top cut to 500g/t.

Block dimensions are 10m by 10m by 5m (E, N, RL respectively) with no sub-blocking. The selective mining unit (**SMU**) is 5m by 5m by 2.5m. The north and east dimensions were chosen as they are a close to the nominal drillhole distances in the detailed drilled area of the South Pit. The vertical dimension was chosen as a compromise between the two deposits, a reflection of the sample spacing, possible mining bench heights and to allow for flexibility in potential mining scenarios after discussions with independent mining consultants AMDAD.

Both domains were modelled as a combined dataset with soft boundaries and separate conditional statistics. A total of 5 search passes were employed with progressively larger radii and/or decreasing data point criteria. The initial search parameters for domain 1 were 20m by 20m by 35m with a minimum of 16 data and 4 octants increasing to a final Pass 5 search of 60m by 60m by 120m with a minimum of 8 data and 2 octants. For domain 2, the initial search was 25m by 25m by 25m with the same data requirements expanding to a Pass 5 search of 70m by 70m by 70m with a minimum of 8 data and 2 octants. The slightly different search dimensions are a function of the mineralisation in each pit.

The maximum extrapolation for the Mineral Resources is the Pass 5 search.

No other elements were modelled, therefore there are no assumptions about correlation between variables. No by-products are anticipated from production. No assessment has been made for any deleterious elements.

Drillhole spacing ranges from 10 to 15m in the core of the two domains but at a variety of directions giving rise to relatively close spaced samples. Downhole sampling was generally at 5 feet (and 2 feet) intervals.

The mineral resource estimates are controlled by the data point distribution, the variography, block size and the search ellipse. Conventional use of wireframes to control the mineralisation was not considered necessary in this case.

The new block model was reviewed visually by HSC, and it was concluded that the block model fairly represents the grades observed in the drillholes. HSC also validated the block model using a variety of summary statistics and statistical plots. No issues were noted. Validation confirmed the modelling strategy as acceptable with no significant issues.

Comparison with the 2022 mineral resource estimates indicated a larger tonnage for the 2024 Mineral Resource by 27% and at a very slightly higher gold grade. None of this is unexpected based on the different modelling strategy and the additional drilling data.

Tonnages are estimated on a dry weight basis and moisture content has not been determined.

The historic mining operation exploited both the South and North Pits but there are no meaningful production figures available to allow for any reconciliation with the new Mineral Resources.

Density

No historical density data was supplied.

53 density measurements were supplied by the Company from their recent drilling. Samples consisted of single pieces of core 10-15cm long and density was measured using an immersion in water technique i.e. the Archimedes Principle of weight in air / (weight in air minus weight in water). The average density value was

2.66t/ $m³$ with a range of 1.96 to 3.37t/ $m³$. Density values tended to show an increase with hole depth.

A default density of 2.65t/m³ was used for the Mineral Resources and is considered reasonable.

Cut Off Grades

The recoverable MIK resources are reported at a gold cut-off of 0.5g/t based on the outcome of a recently completed pit optimisation study by independent mining consultants AMDAD of Brisbane. The cut-off grade at which the mineral resource is quoted reflects the intended bulkmining approach. Consideration of 'reasonable prospects of eventual economic extraction' has utilised an optimised pit shell with a revenue factor of 1.3 at a US\$2,400/oz gold price with preliminary estimates of mining costs and pit wall slopes.

Classification Criteria

The classification of the recoverable Mineral Resources is based on the data point distribution which is a function of the drillhole spacing and the search parameters. Search Pass 1 equals Measured Resource, Search Passes 2 & 3 equal Indicated Resources and Search Passes 4 & 5 equals Inferred Resource.

Other aspects have been considered in the classification including the host geology and style of mineralisation, validation of the historic drilling, sampling methods and recoveries, the QAQC programmes and results and comparison with previous resource estimates.

HSC believes the confidence in tonnage and grade estimates, the continuity of geology and grade, and the distribution of the data reflect Measured, Indicated and Inferred categorisation. The estimates appropriately reflect the Competent Person's view of the deposit.

Mineral Resource Estimate

The Mineral resource Estimate for June 2024 was reported by DTR in the ASX release "1.1m oz gold for updated Colosseum Resource Estimate" dated 6th June 2024.

Table 21: June 2024 Mineral Resource Estimate

The new recoverable Mineral Resources for the Colosseum gold deposit are reported for a gold cut-off grade of 0.5g/t constrained to the block centroid being above the optimised pit shell and below the current topographic surface.

Colosseum MIK V2c Grade Tonnage Curves

Figure 31: Grade Tonnage Curve for the June 2024 MRE

Figure 32: Gold Block Grade Distribution for the Colosseum Mineral Resources (HSC), (view looking down to NNW)

Competent Person Statement – Mineral Resources

The mineral resources underpinning the production target in this Study for the Colosseum gold deposit were prepared by Mr Simon Tear who is a Member of The Australasian Institute of Mining and Metallurgy (MAusIMM) and who has sufficient experience relevant to the style of mineralisation and type of deposit under consideration and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the "JORC Code"). Mr Tear is a Director of H&S Consultants Pty Ltd and he consents to the inclusion in the report of the Mineral Resource in the form and context in which they appear.

14. Ore Reserve Estimates

An Ore Reserve has not been prepared for this Study.

The Colosseum Gold Mine Study is an order of magnitude technical and economic study of the potential viability of the Colosseum Mineral Resources. It includes appropriate assessments of realistically assumed Modifying Factors together with any other relevant operational factors that are necessary to demonstrate at the time of reporting that progress to a DFS can be reasonably justified. However, the Study is based on low-level technical and economic assessments and is insufficient to support estimation of Ore Reserves or to provide assurance of an economic development case at this stage, or to provide certainty that the conclusions of the Study will be realised.

Additionally, the outcome of the Study is partially (14-19%) supported by Inferred Mineral Resources, which cannot convert to Ore Reserves for this level of study.

15. Risk Assessment and Forward Work

Risk Assessment

The table below provides a preliminary listing of key risks identified for the project as the basis for defining a program of work for a DFS.

Table 22: Summary of Key Risks

23 October 2024

23 October 2024

23 October 2024

23 October 2024

Processing Risks

Infrastructure Risks

ESG Risks

23 October 2024

Business Risks

16. Forward Work - Definitive Feasibility Study

This Study has been prepared at a scoping study level of confidence. However, it deals with a project which:

- Operated from 1988 to 1993,
- Had extensive metallurgical test work pre-1988,
- Is extensively drilled,
- Has recently drilled core available for metallurgical, geochemical and geotechnical test work,
- Has high walls exposed for geological and geotechnical mapping,
- Has existing road access which can be upgraded,
- Is in close proximity to services and labour sources, and
- Has an existing framework of approvals.

With this level of information available it is reasonable to build on the findings of this Study to move to a DFS with minimal further work. The proposed path to project development decision based on a DFS is:

- A short Project Selection Study (**PSS**). This study would:
	- o Confirm status of all key project approvals,
	- \circ Engage with key experts for the DFS and confirm or adjust key inputs for the DFS such as process and infrastructure capital and operating costs. This would still be at an order of magnitude level of confidence, but it would replace benchmarked estimates in the Study with estimates aligned to current South West USA experience.
	- o Select project definition based on either Case 1 (underground and opencut) or Case 2 (opencut only). DTR would make this selection based on commercial outcomes of this Study and the PSS updates and other strategic criteria.
	- Set the detailed scope of work, program for the DFS and engage experts for each area.
- A Definitive Feasibility Study (**DFS**). This study would:
	- o Be based on one Scenario (Open Pit Only),
	- \circ Start with a throughput analysis to optimise the mill feed rates assumed for the Study,
	- o Include any updates to the Mineral Resource model,
	- o Include any further analytical test work identified during the PSS such as process performance test work, tailings and waste rock characterisation, geotechnical assessment, updates to hydrology and geohydrology and updates to environmental and social impact assessments,
	- o Include optimisation of the mine plan and fleet and commencement of negotiations with mining contractors and explosives suppliers,
	- o Include optimisation of the process flow sheet and equipment selection.
	- \circ Identify and confirm availability of site access, power supply and water supply.
- o Define and estimate all aspects of the project across mining, processing, infrastructure and environmental and social impact to enable the majority of the project construction cost to be estimated at AACE Class 2.
- Define and estimate all aspects of the project across mining, processing, infrastructure and environmental and social impact to enable the majority of the project operating costs to be estimated at ±15% accuracy.
- \circ Update gold price and other commercial inputs with industry accepted forecasts.
- \circ Include a financial model prepared by a qualified practitioner with experience in US corporate law and taxation and with sufficient sensitivity analyses to support an investment decision for the project,
- o Confirm all approvals and permits required for the project to re-commence and, where possible, start application processes for any that need to be updated or renewed,
- o Include a project implementation plan, and
- o Be prepared in conjunction with an Ore Reserves Estimate as defined in the JORC Code 2012.

The proposed two stage approach is to ensure that when the DFS commences the entire project team is focussed on a single, clearly defined scope of work. This is essential to ensure the DFS delivers a reliable basis for the project investment decision and that is completed within the estimated time and budget.

A key decision during the DFS would be if any further drilling is required. Reasons for drilling could include:

- Upgrading Inferred resources in the Study mine plans to at least Indicated status for inclusion in the Ore Reserve,
- Geotechnical and hydrogeological assessment, or
- Obtaining samples for metallurgical test work.

Cores drilled through mineralisation and waste since 2021 are available and the geology is clearly exposed in the existing South Pit walls. If this information can be used instead of new holes it save time and expense for the DFS.

This announcement has been authorised for release on ASX by the Company's Board of Directors.

For more information, please contact:

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About Dateline Resources Limited

Dateline Resources Limited (ASX: DTR) is an Australian publicly listed company focused on mining and exploration in North America. The Company owns 100% of the Colosseum Gold-REE Project in California.

The Colosseum Gold Mine is located in the Walker Lane Trend in East San Bernardino County, California. On 6 June 2024, the Company announced to the ASX that the Colosseum Gold mine has a JORC-2012 compliant Mineral Resource estimate of 27.1Mt @ 1.26g/t Au for 1.1Moz. Of the total Mineral Resource, 455koz @ 1.47/t Au (41%) are classified as Measured, 281koz @1.21g/t Au (26%) as Indicated and 364koz @ 1.10g/t Au (33%) as Inferred.

The Colosseum is located less than 10km north of the Mountain Rare Earth mine. Work has commenced on identifying the source of the mantle derived rocks that are associated with carbonatites and are located at Colosseum.

Forward Looking Statements

Certain statements contained in this Announcement, including information as to the future financial or operating performance of Dateline and its projects may also include statements which are 'forward-looking statements' that may include, amongst other things, statements regarding targets, estimates and assumptions in respect of mineral reserves and mineral resources and anticipated grades and recovery rates, production and prices, recovery costs and results, capital expenditures and are or may be based on assumptions and estimates related to future technical, economic, market, political, social and other conditions. These 'forwardlooking statements' are necessarily based upon a number of estimates and assumptions that, while considered reasonable by Dateline, are inherently subject to significant technical, business, economic, competitive, political and social uncertainties and contingencies and involve known and unknown risks and uncertainties that could cause actual events or results to differ materially from estimated or anticipated events or results reflected in such forwardlooking statements.

Dateline disclaims any intent or obligation to update publicly or release any revisions to any forward‐looking statements, whether as a result of new information, future events, circumstances or results or otherwise after the date of this Announcement or to reflect the occurrence of unanticipated events, other than required by the Corporations Act 2001 (Cth) and the Listing Rules of the Australian Securities Exchange (ASX). The words 'believe', 'expect',

'anticipate', 'indicate', 'contemplate', 'target', 'plan', 'intends', 'continue', 'budget', 'estimate', 'may', 'will', 'schedule' and similar expressions identify forward‐looking statements.

All 'forward‐looking statements' made in this Announcement are qualified by the foregoing cautionary statements. Investors are cautioned that 'forward‐looking statements' are not a guarantee of future performance and accordingly investors are cautioned not to put undue reliance on 'forward‐looking statements' due to the inherent uncertainty therein.

Dateline has concluded that it has a reasonable basis for providing these forward-looking statements and the forecast financial information included in this Announcement.

To achieve the range of Colosseum Gold Project outcomes indicated in the Study, funding of in the order of an approximately US\$152 million will likely be required by the Company.

Based on current market conditions and the results of studies undertaken, there are reasonable grounds to believe the Project can be financed via a combination of equity and debt, as has been done for numerous comparable projects in the US and other jurisdictions in North America in recent years. Debt may be secured from several sources including Australian banks, US banks, international banks, the high yield bond market, resource credit funds, and in conjunction with product sales via hedging agreements. It is also possible the Company may pursue alternative funding options, including undertaking a corporate transaction, seeking a joint venture partner or partial asset sale.

There is, however, no certainty that Dateline will be able to source funding as and when required. At this point, no formal funding discussions have commenced with potential financiers of the Colosseum Gold Project.

This ASX Announcement has been prepared in compliance with the current JORC Code (2012) and the ASX Listing Rules. All material assumptions, including sufficient progression of all JORC modifying factors, on which the production target and forecast financial information are based have been included in this ASX Announcement.

Appendix 1: Alternative Underground + Open Pit Case (Case 1)

The Study also considered an alternative scenario of Underground and Open Pit mining. This scenario did not produce as attractive returns as the Open Pit Only scenario and included additional risks.

The Company resolved to proceed with investigations into the viability of the Open Pit Only scenario. The following section provides a brief summary of the 'Underground and Open Pit Mining' scenario for completeness.

Underground Mining Method Selection

Underground mining at Colosseum would target the higher grade gold mineralisation remaining below the existing South Pit utilising sub-level caving (**SLC**).

Sublevel Caving (SLC)

SLC is a form of caving where most of the ore mined is blasted and the rest is comprised of dilution that enters the zone of blasted material. SLC is a relatively low-cost mining method which suits the size and grade of resource available for underground mining.

The proposed SLC layout has a 20m vertical interval between levels. Each level has a single access from the main decline. Development on each level is comprised of a main access, footwall drive, truck loading arrangement, return air and parallel SLC ore drives 15m apart and expansion slot development at the end of each SLC ore drive.

Production follows a top-down sequence:-

- On each level production starts with a vertical expansion slot developed at the end of each SLC ore drive using drill and blast methods.
- SLC uphole rings are drilled and blasted starting with the rings closest to the expansion slot then retreating towards the footwall drive.
- Diesel powered load-haul-dump units (LHDs) transfer broken rock from the drawpoints to a truck loading location on each level. Trucks then haul the broken rock to the ROM area on the surface via the main decline.

Underground Optimisation and Mill Feed Definition

AMDAD used the resource block model from the June 2024 MRE in SurpacTM and CAE Mineable Shape Optimiser (**MSO**) software to prepare a conceptual underground extraction shape.

Table 23: Optimisation parameters (USD)

*The opencut mining rate is set to keep the mill at 1.089 Mtpa. Opencut mining would continue at the full processing rate of 1.089 Mtpa after the underground mine is depleted.

The SLC mining inventory was created using by the following steps:-

- Preparation of conceptual stope shapes and estimation of mineable quantities using the MSO program, with reference to mining, processing, and economic inputs.
- Add extra SLC shapes within the overall set of SLC shapes produced by MSO so that the total mining inventory is a combination of the two sets of shapes.
- Evaluation of these quantities in an Excel spreadsheet to define scheduled development and production quantities, and thereafter project cashflow and net DCF.

The MSO results were re-evaluated within an Excel spreadsheet to confirm economic viability once access costs were considered. This evaluation resulted in a number of marginal SLC shapes and shapes within the opencut void being excluded from scheduling. A small number of these shapes were retained and are included in the total "mining inventory" as open stopes if they cover the additional cost of being mined by long hole open stoping separate to the SLC.

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The SLC stope shapes for Case 1 are shown below:-

Figure 33: SLC Mining Shapes

The following table shows the progression from the MSO defined shapes through practical and economic rationalisation ('Mining Inventory') to ROM tonnes after adjustments for mining loss and dilution. The table includes mill feed tonnes from the SLC, adjacent open stopes and inmineralisation development.

No specific SLC flow modelling software was used to generate an estimate for the tonnes and grades mined from the SLC rings. The tonnes reported inside the SLC shapes for each sublevel are based on the proportion of blasted material mucked from that level, referred to as 'primary draw', and further reducing proportions mucked from the levels below. In addition, each sublevel has between 10% and 25% dilution added at 0.5g/t grade. The resulting draw of tonnes and metal from the entire SLC is 102% of tonnes and 86% of metal. The recovery of blasted SLC rings is only 86% due to the poor overlap of SLC rings from sublevel to sublevel.

Underground Development Design

A development centreline design was prepared based on the defined SLC and auxiliary stope shapes. The development concept is outlined below:-

- the existing open pit ramp is used as the entry point for a main decline developed at 1 in 8 down,
- lateral development at 20m vertical intervals for each sublevel
- stockpile bays, loading bays and ventilation development as required.

The following table lists the development required for each case.

Table 25: Underground Development Quantities

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[Figure 34](#page-84-0) below shows the development concept:

Figure 34: Underground Development Design – 3D view looking SW

Underground Mine Workforce

The proposed workforce associated with the underground operation is listed in the table below. The technical roles listed are total required and operators are number required per shift.

Table 26: Underground Mine Technical and Management Workforce

Pit Design for 'Underground and Open Pit' scenario

This scenario mines the North Pipe in two pit stages as per the 'Open Pit Only' scenario detailed in the Study.

'Underground and Open Pit' scenario - Load Haul Fleet

The 'Underground and Open Pit' scenario material movement rates vary over the mine life with the opencut initially supplementing underground production and then operating at low waste to ore ratios from the North and West Pits (see [Table 27](#page-86-0)). Efficient matching of the fleet to the required dig rate is further complicated by the relatively low mill feed rate compared to the potential capacity of the excavators.

The following charts show the variability in material movement quantities over the mine life and the strategy for managing the truck fleet against these quantities.

Figure 35: Annual Material Movement – 'Underground and Open Pit' scenario

Figure 36: Truck Fleet -'Underground and Open Pit' scenario

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End of year ROM Stockpile Waste: Mill Feed Ratio **Underground Mine**
Mill Feed
Gold grade Process Plant Feed Gold grade
GOLD PRODUCED **Opencut Mine**
Mill Feed
Gold grade
Waste tonnes Total Mined
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Table 27: Life of Mine Production Schedule – Underground and Open Pit scenario

Underground Mine Capex

The capital cost includes both underground development outside the orebody and specific items or groups of capital costs. The capital cost for this scenario was estimated at US\$48.9 million.

Appendix 2: Colosseum Table 1 (JORC Code 2012)

Section 1 Sampling Techniques and Data

(Criteria in this section apply to all succeeding sections.)

Draco Mines – 1979-1980

Draco completed 26 rotary percussion holes (CH-24 to 52) totalling

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Section 2 Reporting of Exploration Results

(Criteria listed in the preceding section also apply to this section.)

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Section 3 Estimation and Reporting of Mineral Resources

(Criteria listed in section 1, and where relevant in section 2, also apply to this section.)

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Section 4 Estimation and Reporting of Ore Reserves

(Criteria listed in section 1, and where relevant in sections 2 and 3, also apply to this section.)

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Criteria JORC Code explanation Commentary – NO ORE IS ESIMATED FOR COLOSSEUM

qualitative discussion of the factors which could affect the relative accuracy and confidence of the estimate.

The statement should specify whether it relates to global or local estimates, and, if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used.

Accuracy and confidence discussions should extend to specific discussions of any applied Modifying Factors that may have a material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage.

It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.

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