Novo Resources Corp.

Preliminary Economic Assessment on the Beatons Creek Gold Project, Western Australia

Prepared for Novo Resources Corp.

Effective Date: 5 February 2021

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Important Information:

Preliminary Economic Assessment on the Beatons Creek Gold Project, Western Australia, Australia

The following Preliminary Economic Assessment has been prepared for Novo Resources Corp. to support the economic analysis of the potential viability of the Mineral Resources at the Beatons Creek Gold Project. This report describes the Beatons Creek Gold Project located 1,190 km north-northeast of Perth in the east Pilbara region of Western Australia (WA), Australia.

Prepared for

Novo Resources Corp.

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Effective date of report: 5 February 2021

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1.1. INTRODUCTION

Novo Resources Corp. (Novo), a company listed on the Toronto Stock Exchange (TSX), is a mineral exploration company focused primarily on the exploration and development of conglomerate gold projects in the Pilbara region of Western Australia. One of Novo's projects in the Pilbara region is the Beatons Creek Gold Project (referred *to as* 'the Beatons Creek Project').

Novo commissioned Optiro Pty Ltd (Optiro) to prepare a Preliminary Economic Assessment (PEA) and corresponding NI43-101 Technical Report (Technical Report) for the Beatons Creek Project.

This Technical Report has been written to comply with the reporting requirements of National Instrument 43-101 *Standards of Disclosure for Mineral Projects* (NI 43-101 or the Instrument) and has an effective date of 5 February 2021.

1.2. PROJECT OVERVIEW AND HISTORY

The Beatons Creek Project is located in the north western part of Western Australia in the East Pilbara Shire, between the major regional centres of Newman and Port Hedland. The Beatons Creek Project area is situated west of the town of Nullagine (population c. 200). By road, Nullagine is 296 km southeast of Port Hedland, nearly 170 km north of Newman and 1,370 km north-northeast of Perth.

The Beatons Creek Project consists of auriferous conglomerate reefs hosted by the Hamersley Basin of late Archaean-Paleoproterozoic age within the East Pilbara granite-greenstone terrain of the Early to Late Archaean Pilbara Craton on the north western part of Western Australia. The auriferous conglomerates of the Beatons Creek Project are hosted by the Lower Fortescue Group sedimentary sequence and appear at different stratigraphic levels in the Fortescue Group within the Nullagine sub-basin, occurring in the mid-to-upper parts of the Hardey Formation.

Various operators have conducted work on the Beatons Creek Project since 1968, but limited information pertaining to tenement and land acquisition deal structures are available for this period. Novo activities for development of the Beatons Creek Project have been during the period from 2011 to 2015.

The Beatons Creek Project area is held through 16 granted and predominantly contiguous tenements totalling 159.7 km^2; the tenements include Exploration, Prospecting and Mining Leases held by Nullagine Gold Pty Ltd (12 Exploration and Prospecting Licences); by Grant's Hill Gold Pty Ltd (four Exploration and Prospecting Licences and one Mining Lease); and Beatons Creek Gold Pty Ltd (three Mining Leases) for durations of four, five and 21 renewal years. Nullagine Gold Pty Ltd, Grant's Hill Gold Pty Ltd, and Beatons Creek Gold Pty Ltd are all wholly-owned subsidiaries for Novo Resources Corp. (Novo).

Novo has obtained all environmental approvals required to commence mining of the Beatons Creek Project, including mining proposal and mine closure plans, haulage licences, waste disposal licences, native vegetation clearing permits and groundwater abstraction rights.

All of the Beatons Creek Project tenements are within the boundaries of native title claims (both registered and unregistered) and/or native title determinations. Registered native title claimants and holders of native title are entitled to certain rights under the Future Act Provisions in respect of land in which native title may continue to subsist. Novo may be liable to pay compensation to the relevant native title holders for the impact of a tenement on native title.

Optiro is satisfied that all tenements are valid under the Native Title Act (NTA). Novo has pre-existing native title and heritage agreements with the Palyku people and the Njamal people over the Beatons Creek Project.

Ad valorem royalty is applicable to the Beatons Creek Project, as prescribed by the WA Mining Act 1978. Ad valorem is calculated as a proportion of the 'royalty value' of the mineral. The current rate of royalty payable, within Western Australia, for gold metal produced after 30 June 2000 is 2.5% of the royalty value of the gold metal produced.

In addition to the State Government royalty, there are third party royalties payable on gold production from the Beatons Creek Project. These royalties are payable to IMC Resources Gold Holdings Pte Ltd and native title holders. The individual terms of these royalties are considered commercial-in-confidence but amount to a total royalty of 4.75% payable on gold production.

Nullagine, the only town in the area, is located on the Marble Bar Road which connects Newman to Port Hedland. The road is part gravel and part asphalt over its length. Access to the Beatons Creek Project area which lies adjacent to and west of the town, is via road from Newman or Port Hedland with the preferred route being from Newman. Newman has multiple daily flights to and from Perth (approximate 2-hour flight). The town of Nullagine also has a small, unsealed airstrip suitable for small aircraft charter operations.

The East Pilbara region has an arid continental climate with very large daytime temperature variations (>13.2°C) throughout the year. December and January are the hottest months with average maximum temperatures above 40°C and record highs over 48°C. June and August are the coldest months with average maximum temperatures below 30°C and average minimum temperatures are 12 to 13°C. The region is influenced by both northern (tropical cyclone) and southern (temperate) rainfall systems, which bring rains in the summer and winter months, respectively. However, rainfall in the region is generally light and infrequent. Nullagine has an average annual rainfall of 357 mm, mostly falling between January and March. Because a high proportion of the rainfall can be from a small number of large storms, flooding near major river and creek systems is not unusual and roads can become impassable for short periods. Field work is generally conducted between late autumn and early spring (April–September), when temperatures and the likelihood of heavy rains are both lowest.

Alluvial gold was first discovered in Nullagine in 1888, and by 1893 Nullagine had become the principal alluvial gold field in the region. A hard-rock source for alluvial deposits at Nullagine was identified in 1888, while the township was formerly declared in 1889. Most estimates suggest total gold production from 1897 (when Gold records commenced) was <10,000 t of material for <4,000 oz gold at average grades of 15 to 20 g/t gold (Maitland, 1919).

The mineral potential of the Pilbara Craton has in recent history been generally downplayed and, as a result, the region has been much less extensively explored than many other Archaean cratons throughout the world.

From 1968 to 1982 uranium was the major focus of the Fortescue Group. There was some sporadic gold and diamond exploration however the Nullagine sub-basin remained under-explored.

Since 1983, exploration activities have largely concentrated on the Nullagine sub-basin, principally in the immediate area of the Beatons Creek goldfield near Nullagine.

1.3. GEOLOGY AND MINERALISATION

Gold mineralisation occurs within the Beatons Creek conglomerate member of the Hardey Sandstone formation, which constitutes part of the Fortescue Group (MacLeod and others, 1963). Gold is present as fine (<100 µm) to coarse (>100 µm) particles within the matrix of multiple, narrow stacked and un-classified ferruginous-conglomeritic reef horizons, which are interbedded with un-mineralised conglomerate, sandstones and grits with minor intercalations of shale, mudstone, siltstone and tuffs. The mineralisation lateral extent has been identified as ranging up to 2 km.

Gold occurs as free particles up to several millimetres across within the ferruginous matrix of mineralised conglomerates and is closely associated with detrital pyrite and authigenic nodules (2 to 65 mm in diameter), which are locally referred to as buckshot pyrite.

A number of gold-bearing conglomerates have been identified at several stratigraphic levels, from surface to approximately 200 m depth, within the Beatons Creek Member of the Hardey Formation in the Nullagine sub-basin.

1.4. EXPLORATION, DRILLING, SAMPLING AND ANALYSIS

Exploration activities conducted by Novo consist of surface geological mapping, trench chip-channel sampling of surface outcrops, diamond core drilling and RC drilling conducted between 2011 and 2018. A bulk sampling program was undertaken during 2018. Historical exploration activities include geochemical and geophysical surveys, geologic mapping and drilling by various operators between 1968 and 2007.

The presence of extensive surface exposures of gold-bearing conglomerates provided an opportunity to undertake an extensive trench sampling program to compliment RC drilling and to provide data to support resource estimation. Where it was possible to access a full profile of the conglomerate horizon from top to bottom, samples were collected at approximately 20 m to 70 m spacing along strike from small trenches dug with an excavator. Forty kilogram samples were collected over a broad face to obtain reasonable representation. The 2018 program used an excavator on all trenches to ensure the hanging-wall and foot-wall contacts were exposed and cleaned using an air compressor prior to sampling across the full profile. Samples were placed into polyweave bags for shipment from the Nullagine freight yard to Intertek Laboratory Services in Perth on a weekly basis.

From 2011, a total of 724 RC drill holes were drilled for a total of 36,130 m. In 2013 and 2018 Novo completed 35 diamond drill holes for a total of 4,960 m for the purposes of grade, geological, metallurgical, geotechnical and density testwork.

Mineral Resources were estimated from 3,909 samples, sourced from 2,422 samples from reverse circulation holes, 302 samples from diamond core holes, and 1,185 trench ‘channel’ samples. The majority of assays used for the estimate were determined using the LeachWELL (cyanide leaching) technique, with the 2018 diamond drilling and trench programs also analysing the LeachWELL residues by fire assay.

RC drilling from the 2013 and 2017 programs were not included in the resource estimate as these displayed highly variable recoveries. During 2013, there was no dust suppressor in use, and in 2017 the excessive use of high pressure compressed air may have resulted in excessive dust loss.

The sample preparation, analyses and security procedures implemented by SGS, MinAnalytical and Intertek in Western Australia meet standard practices and are monitored using control samples. The data collected is acceptable and of adequate quality and reliability to support the estimation of Mineral Resources.

1.5. MINERAL PROCESSING, METALLURGICAL TESTING AND RECOVERY METHODS

A metallurgical testwork program was undertaken on oxide and fresh material from Grant's Hill (M1 and M2 reefs) and reported in the Technical Report released by Novo in October 2020. Latter testwork on the South Hill (CH1 and CH2 reefs) has been reported in section 13 of this report.

Comminution testwork on the Grant's Hill oxide ore indicated an average crushing work index of 7.4 kWh/t, and an average Bond ball mill index of 14.2 kWh/t. Oxide A*b values average 86.7 and the averaged Bond abrasion Index is 0.26.

Comminution testwork shows that the Beatons Creek Project fresh material is competent with an average Bond ball mill work index of 18.8 kWh/t for both Grant's Hill and South Hill. SMC test data for Grant's Hill indicates that the fresh mineralisation is moderately competent with an average A*b of 47.8 and a range of 38.0 (hard) to 56.6 (soft). No SMC testing was completed for South Hill.

The results from the South Hill test work are broadly consistent with the earlier work reported for Grant's Hill. The fresh ore is hard and is cyanide leach amenable with a high proportion of gravity recoverable gold.

In 2020 Novo acquired all of the outstanding shares of privately held Millennium Minerals Limited (Millennium) and via this transaction Novo became the owner of a processing plant now known as the Golden Eagle Mill. It is proposed to process ore through this mill, which was designed for a feed rate of 1.5 Mt/a, although it is understood to have operated in excess of this feed rate at times in the past. Feed rate varies dependent on the physical properties of the material treated.

The Golden Eagle Mill process plant includes the following unit processes. A comminution circuit with a single stage jaw crusher (approx. 400 t/h capacity), a single stage SAG mill of 6.7m diameter x 5.65m EGL with a 4 MW motor and a grinding capacity of approximately 180 to 190 tph to 150 µm . Gravity Gold recovery is via centrifugal concentrator and intensive cyanidation leach reactor. Leaching in two leach tanks followed by seven carbon in leach tanks, with oxygen addition in the first three tanks. Tailings are thickened to 55% solids prior to disposal in a tailings storage facility (TSF) and return of decant water. Stripping of loaded carbon is in a split (Anglo American Research Laboratories) column. Gold recovery is via electrowinning cells. Ancillary facilities are present for the bulk delivery, storage and distribution of reagents. Air and water services are reticulated throughout.

1.6. MINERAL RESOURCES

Oxide and fresh open pit versus underground Mineral Resources have been estimated by multi-pass ordinary kriging of top-cut drillholes and channel samples. The Indicated and Inferred Mineral Resources are given in Table 1.1.

Table 1.1 Beatons Creek Project Mineral Resource estimate reported at 28 February 2019 (Dominy and Hennigh, 2019)

Open Pit Mineral Resources (oxide and fresh mineralisation)

Classification	Cut-off grade (g/t)	Tonnes	Gold grade (g/t)	Contained gold (oz)
Indicated	0.5	6,645,000	2.1	457,000
Inferred	0.5	3,410,000	2.7	294,000

Open Pit Mineral Resources (oxide mineralisation only)

Classification	Cut-off grade (g/t)	Tonnes	Gold grade (g/t)	Contained gold (oz)
Indicated	0.5	4,500,000	1.9	272,000
Inferred	0.5	765,000	1.8	44,000

Open Pit Mineral Resources (fresh mineralisation only)

Classification	Cut-off grade (g/t)	Tonnes	Gold grade (g/t)	Contained gold (oz)
Indicated	0.5	2,145,000	2.7	185,000
Inferred	0.5	2,645,000	2.9	250,000

Underground Mineral Resources (fresh mineralisation)

Classification	Cut-off grade (g/t)	Tonnes	Gold grade (g/t)	Contained gold (oz)
Indicated	-	-	-	-
Inferred	3.5	885,000	5.3	152,000

Total Mineral Resources (oxide and fresh mineralisation, open pit and underground)

Classification	Cut-off grade (g/t)	Tonnes	Gold grade (g/t)	Contained gold (oz)
Indicated	0.5	6,645,000	2.1	457,000
Inferred	0.5, 3.5	4,295,000	3.2	446,000

Notes:

1. Open pit Mineral Resources contain oxide and fresh mineralisation within an optimised shell and constrained within a mineralised wireframe. A cut-off grade of 0.5 g/t gold was applied.
2. An optimised Whittle pit shell was estimated with the following indicative parameters:
   (a) US$1,311 (AU$ $1,850) / troy ounce
   (b) Metallurgical recoveries of 95% oxide and 90% fresh
   (c) SGs applied: Oxide 2.40 t/m^3 and fresh 2.85 t/m^3 based on measurements taken on drill core
   (d) US$2.40 / tonne mining cost for oxide and US$3.68 / tonne for fresh
   (e) US$17.00 / tonne oxide and US$19.00 / tonne fresh processing cost
   (f) US$3.00 / tonne general and administrative costs.
3. Underground Mineral Resources contain fresh mineralisation outside the optimised shell. Underground resources are constrained to discrete areas of contiguous mineralisation. A cut-off grade for underground resources of 3.5 g/t gold has been applied.
4. Totals may not sum due to rounding.

Mineral Resources were estimated from 3,909 samples, sourced from 2,422 samples from reverse circulation holes, 302 samples from diamond core holes, and 1,185 trench 'channel' samples. Top-cuts were defined for each reef using histograms and probability plots to determine where high-grade distribution tails became erratic and deviated from lognormal. Sampled intervals from all data sources were composited to 1 m. The lag (reef) wireframes were constructed in Micromine by Novo staff; a summary of their extents is shown in Figure 1.1. The colours indicate the different lag (reef) extents and show the stacking of the lags, the influence of the incised topography and the effects of faulting.

Composites from oxide and fresh domains for each reef were used for estimation. Resulting block grades are shown in Figure 1.2.

Figure 1.1 Extents of geological wireframes

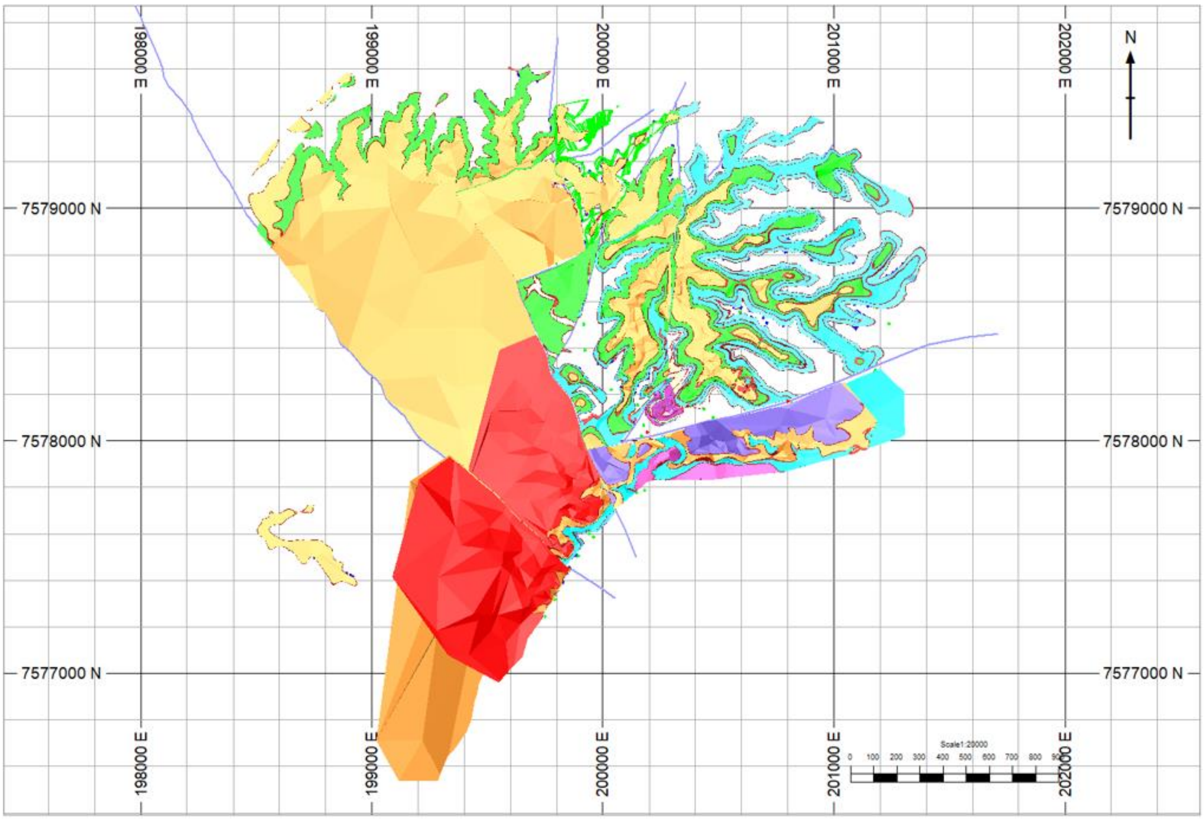
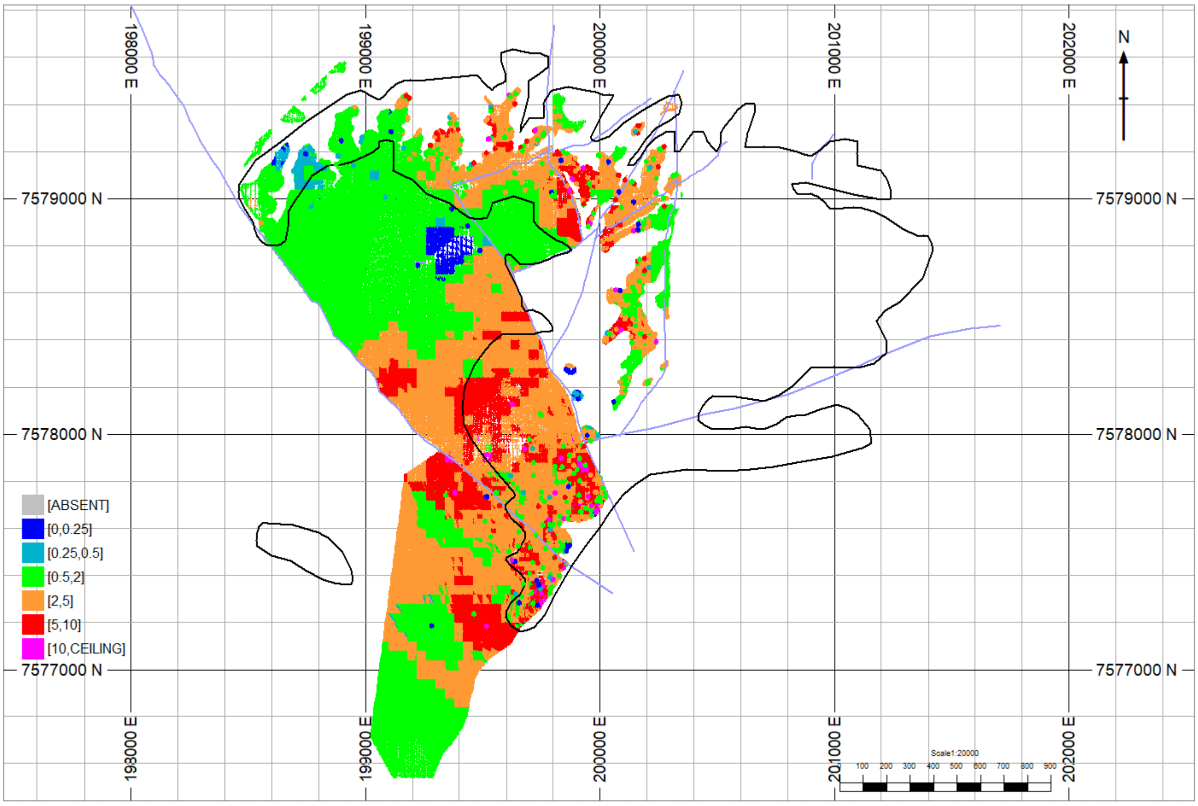


Figure 1.2 Plan view showing estimated block gold grades in the M1 reef



Resource classification was assessed by estimation pass, and included consideration of data type, quality and distribution, and SG measurement availability. Reasonable prospects for eventual economic extraction (RPEEE) via open pit mining have been evaluated within a potentially exploitable shell. RPEEE via underground mining has been considered outside of that pit shell. Mineralisation located within the optimised pit shell (Indicated and Inferred Mineral Resources) was subjected to a 0.5 g/t gold cut-off. Underground Mineral Resources outside of the optimised shell and constrained to discrete areas of contiguous mineralisation was reported at a 3.5 g/t gold cut-off. Estimates have been verified by visual review, swath plots, volume-to-tonnage comparisons and sensitivity analysis.

The terms “Mineral Resource”, “Inferred Mineral Resource” and “Indicated Mineral Resource” have the meanings given in the CIM Definition Standards on Mineral Resources and Mineral Reserves adopted by the Canadian Institute of Mining, Metallurgy and Petroleum Council (CIM, 2014). Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability; it is uncertain if applying economic modifying factors will convert Measured and Indicated Mineral Resources to Mineral Reserves. The estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, socio-political, marketing, or other relevant issues, however, no material issues are known at this time. The quantity and grade of reported Inferred Mineral Resources in this estimation are uncertain in nature and there has been insufficient exploration to define these Inferred Mineral Resources as an Indicated or Measured Mineral Resource. It is uncertain if further exploration will result in upgrading them to an Indicated or Measured Mineral Resource category.

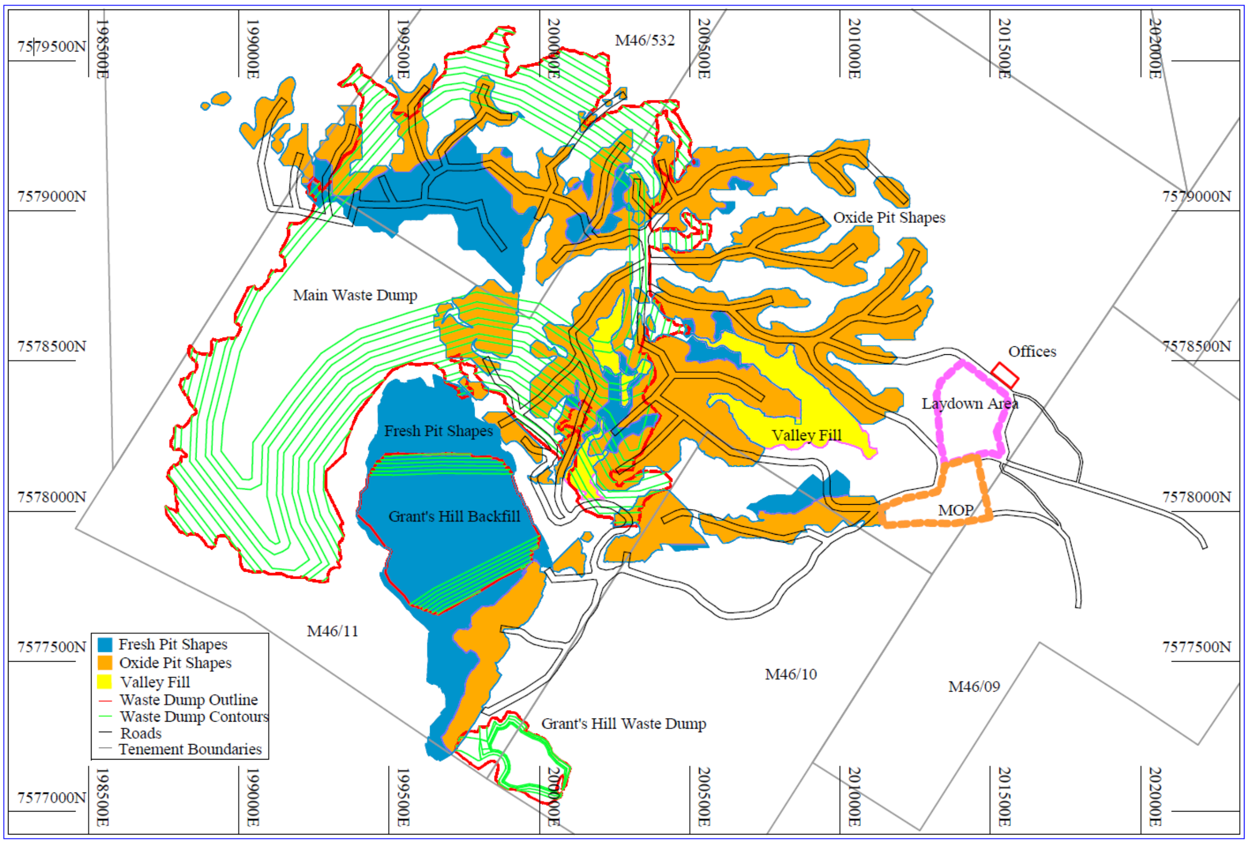
1.7. MINING

The gold-bearing conglomerates (mineralised reefs) at the Beatons Creek Project are generally flat lying and have an average thickness of about 1.5m. The mineralised reefs vary in thickness and grade continuity across the mining area. The terrain is undulating with the mineralised reefs daylighting on the flanks of ridges.

Small scale surface and underground mining has been undertaken on the Beatons Creek Project site as early as the late 1800s and more recently some alluvial mining operations have worked the area.

The conceptual mine development will be the first large-scale mining operation undertaken on the leases. The conceptual mine design and site layout used to prepare the PEA production schedule is shown in Figure 1.3.

Figure 1.3 Beatons Creek site layout

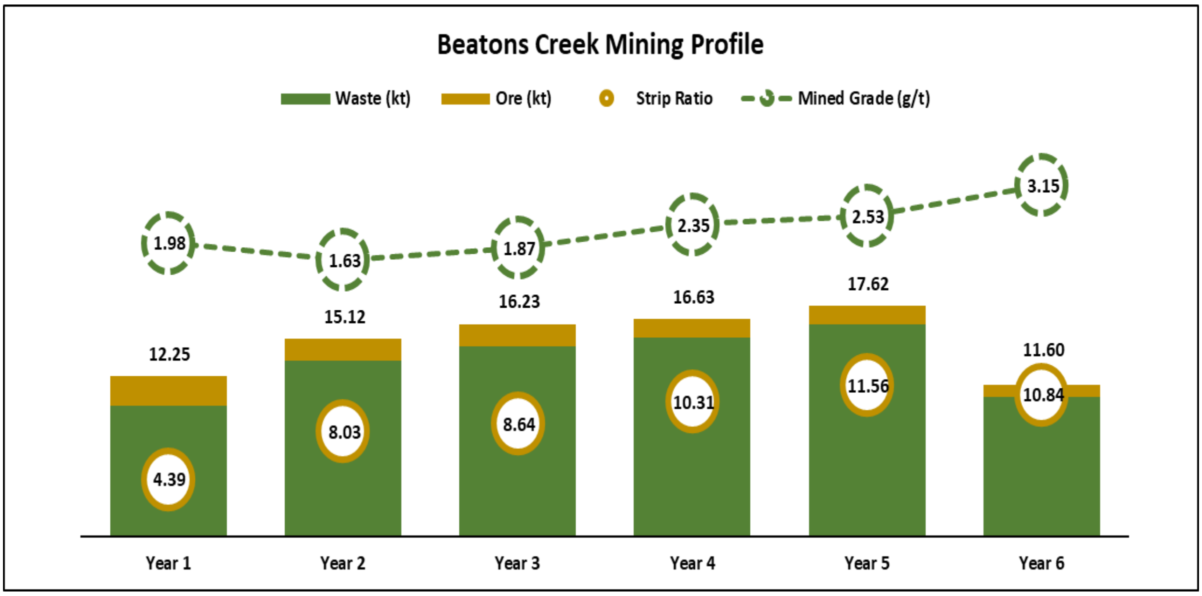


The potential mine development utilises conventional open pit mining methods involving hydraulic excavators in backhoe configuration for loading trucks. It is assumed that drilling and blasting will be required for the mining of most of the oxide waste and all the fresh mineralised reefs and waste. Dozers are planned to be used to rip oxide waste to assist excavator productivity, push-up mineralised material and push waste to adjacent valley-fill areas.

Plant feed will be trucked to a Mine Ore Pad (MOP) from which it can be road-hauled to the nearby Golden Eagle Mill.

A conceptual mine plan and production schedule have been developed for the PEA and is shown in Figure 1.4.

Figure 1.4 Beatons Creek mining profile



The development of this plan included several technical aspects:

- pit optimisation analysis to select the optimal shell for the mine design
- creation of a conceptual mine design, including haul road layout and waste dumping strategies
- selection of mining phases to facilitate production scheduling
- preparation of life-of-mine (LOM) production and processing schedules
- estimation of mining equipment fleet and manpower requirements.

1.8. INFRASTRUCTURE

Vehicle access to the mine and processing facility is via the part sealed Newman to Port Hedland road (State Route 138, Marble Bar Road). The 600 m unsealed access road to the Beatons Creek mine is located 800 m north from the Nullagine township. The Golden Eagle Mill is 8.9 km south from the township. The 3.5 km access road crosses a creek floodway which is dry most of the year.

The workforce will be employed on a fly in fly out basis. The airstrip to be utilised by Novo is still under consideration. Newman has a commercial airport with frequent services to and from Perth. Several private airstrips closer to Nullagine may be options, however, access to them will need to be negotiated. The existing airstrip at Nullagine is unsealed, further investigation and potential upgrade would be required if considered for regular use. The operations workforce will be transferred from the preferred airport to the plant site by a bus service provided by Novo.

Beatons Creek mine infrastructure (offices, crib, toilets) would be established adjacent to the proposed Beatons creek MOP pad. Mobile equipment maintenance facilities would be placed adjacent to the Golden Eagle mill.

The existing Golden Eagle mill includes the process plant, administration buildings, workshop, warehouse, laboratory, power station, communications network, water supply and storage, water treatment and wastewater treatment as well as a nearby 230 room accommodation village.

Power is provided by an on-site power station comprising ten by 1 MW diesel generators and transmitted via 11 kV overhead transmission line to the processing plant and the village. The TSF decant pumps are powered by local gen-sets. The facility is owned and operated by a contractor.

An existing fuel farm comprises of six diesel storage tanks with a total storage capacity of 560 kL. It is used to supply the power station and provide mobile equipment refuelling.

Water supply for the plant site is via borefield networks, pit dewatering and tailings decant, with some capture of suitable stormwater. A raw water pond and process water pond provide storage at the process plant. Potable water for the site and accommodation village will be supplied by existing RO plants.

Plant sewage is treated via a fully contained wastewater treatment plant and treated effluent is disposed into the rock ring of the TSF per license conditions.

The Golden Eagle Mill has a decommissioned tailings storage facility (TSF1) and an active facility (TSF2). TSF2 is ready for use in a re-commencement of mining, having recently received an embankment raise and pipework installation. TSF 2 has two cells and it is planned to combine these with a central decant. It is planned to raise the wall of this TSF to provide an initial 3.5 years of operation.

1.9. ENVIRONMENT

Environmental studies in this PEA have focussed on the Project mining area at Beatons Creek noting no further disturbance is required at the Golden Eagle Mill or TSF2.

The site lies predominantly within the Pilbara Bioregion in the north-west of Western Australia which is characterised by vast coastal plains and inland mountain ranges with cliffs and deep gorges. The Beatons Creek Project area is located within the Capricorn and Mosquito land systems of the Pilbara Region. Most of the area lies between 200 m to 500 m above sea level in the Beatons Creek Project region. Two large rivers, the Nullagine and the Oakover, flow northwards across the area and eventually join to form the De Grey River. The annual evaporation of 3,600 mm is ten times the total annual rainfall and vegetation is sparse distant from the major rivers.

Soils within the site area primarily consist of stony soils, with some areas containing loams and clay. Soil samples have been collected from the mine area to assess suitability in rehabilitation.

The Beatons Creek Project is located west of the Nullagine River, a major, ephemeral watercourse in the Nullagine area. Five water catchments have been identified as part of surface water assessment and the surface water identified is generally fresh.

Hydrological modelling for operations and closure has been undertaken for the approved Mining Proposal (MP) and Mine Closure Plan (MCP) and will require updating to encompass the mining of the revised footprint associated with the PEA mine schedule. The Beatons Creek Project is located within a Proclaimed Surface Water Area under state government acts. This requires Department of Water and Environmental Regulation (DWER) approval to be sought before interference with any watercourse.

Groundwater quality is brackish to saline, with elevated concentrations of metals and pH generally neutral to acidic, with elevated acidity in the vicinity of former mine workings. The watercourse at the proposed mine appears to be a different watercourse to the town of Nullagine. The Beatons Creek

Project is located within a Public Drinking Water Source Area (PDWSA) (Priority 1), Nullagine Water Reserve. The Priority 1 protection areas are defined to ensure that there is no degradation of the water source. Activities at the proposed mine therefore need to be conducted in accordance with a protection plan. The PEA mine schedule includes mining of significant volumes of Potentially Acid-Forming (PAF) waste material and mining activities below the groundwater table. The compatibility of these activities within the P1 PDWSA and impacts as a result of mining below the water table (and associated drawdown) will require discussion with DWER.

The approved MP identifies mineralisation at the site as being in an oxide and sulphide zone. Waste characterisation has determined that the oxide comprises two different material types: NAF oxide and alunitic oxide. The alunitic oxide is a source of solution aluminium acidity, although it is significantly less than the strong acidity generated from pyritic PAF waste rock, it cannot be placed on the outside of landforms or in drainage lines. It is understood this material contains sulphides and this PAF material will require encapsulation. NAF Oxide will be stockpiled separately from the other products to be used to encase the PAF material. Mining below the groundwater table and mining of significant volumes of PAF material within the P1 PDWSA will require discussion with DWER.

Tailings from Beatons Creek Project material (to be disposed at the Golden Eagle Mill TSF2) are limited largely to oxide ore and contain the mineral alunite. These tailings are considered to be functionally classified as NAF. Tailings from fresh rock material show long lag PAF material, due to trace amounts of pyrite. Further characterisation of tailings generated from this material will be required.

The Beatons Creek Project area is lightly vegetated, with a ubiquitous ground cover of Spinifex grass and scattered shrubs. Larger trees are confined to the immediate vicinity of drainage lines. A detailed Level 2 flora survey was completed in 2014 which identified three flora species of conservation significance protected under the *Biodiversity Conservation Act.* A small number of Priority 1 flora are located within the southern operations of the Beatons Creek Project however, given the number of records of the species at sites outside of the impact area, this is not expected to have a significant impact on the species. Given the timing since the previous survey, updated database searches to identify any new records or change in conservation listings since the 2014 surveys should be completed.

A detailed fauna survey was completed in October 2014 and five species of conservation significance were directly observed during the field survey. Subsequent to the October 2014 survey, targeted surveys for two of the species were undertaken and it was concluded there would be no significant impact to these species as a result of the Beatons Creek Project. Given the timing since the previous survey, updated database searches to identify any new records or change in conservation listings since the 2014 surveys should be completed.

A Short Range Endemic (SRE) desktop review restricted to tenement M46/352 concluded it was unlikely the Beatons Creek Project will affect the conservation status of any SRE species in the local region.

A desktop assessment of subterranean fauna (stygofauna and troglofaunal) was undertaken to evaluate the risk associated with the mining of the oxide deposits above the groundwater table. Given the species are distributed in the regionally interconnected groundwater system of the Mosquito Creek Formation Aquifer there is no impact anticipated. However, as mining progresses below the groundwater table and more than 70% of the material to be mined is PAF, further consideration of the potential risks and impact on subterranean fauna species associated with mining below the groundwater table and mining (and disposal) of PAF material should be completed.

As at the effective date of this report, Novo has Mining Act approval via a Mining Proposal (MP) and Mine Closure Plan (MCP) (Reg ID 89975) from DMIRS for alluvial operations, mining of oxide deposits, disposal of PAF and bulk sample processing of oxide ores. These approvals cover specified tenements (ML's). The initial MP is for a two-year period. The Beatons Creek Project also has an EP Act Part V approval for the processing of ore, a clearing permit (CPS 7440/3) for 270 ha of native vegetation clearing and a ground water abstraction licence. Further information on the extent, restrictions and tenure of these licences may be found in section 20.3.2 of this report.

A MP and MCP was approved For the Golden Eagle mill which included a revised TSF2 design to that previously approved and haulage and processing of mineralised material from the Beatons Creek Project for gold processing at the Golden Eagle Mill with tailings discharge to TSF2. DWER licences for the TSF conversion and upgrade has been obtained. It is noted these licences refer to oxide material from Beatons Creek and further assessment for Fresh rock is required.

Two registered Native Title claims exist across the Beatons Creek Project area; the Njamal and Palyku groups. Novo has been engaged with these groups to discuss the Beatons Creek Project. Heritage surveys have been conducted across the project area and two heritage/cultural sites were identified. These have been excised from the disturbance footprint and will not be disturbed unless approval is obtained under the Act. The approved MP includes a commitment that the Beatons Creek Project will not impact upon any heritage values and acknowledges that both claimant groups support the proposed development and associated protection measures for all heritage considerations that will be implemented by Novo.

The Nullagine townsite is located 1 km southeast of Beatons Creek. To ensure no impact to the Nullagine community from the Beatons Creek Project, an air quality assessment and noise emission modelling was undertaken. The modelling confirmed that with sufficient controls air quality and noise emissions will comply with acceptable levels.

The Beatons Creek Project has an environmental management system, a PAF Management Procedure and a Groundwater quality management plan in place.

The approved MCP includes a closure work program for achieving the closure outcomes, with implementation strategies and timeframes for each domain and/or feature of the mining operations, closure designs for landforms and contingencies for premature or early closure or suspension of operations. A revised MCP, covering the mining of PAF until Year 6 will need to be developed and submitted to DMIRS for approval to ensure adequate encapsulation of PAF material at closure and in the long term to ensure all water resources are protected. Novo will continue to pay 1% of the overall Beatons Creek Project rehabilitation liabilities annually to the WA *Mining Rehabilitation Fund 2016* (MRF).

1.10. CAPITAL AND OPERATING COSTS

The Beatons Creek Project capital cost (mining, processing and infrastructure) estimate developed for the PEA is based upon an Engineering, Procurement and Construction (EPC) approach for the process plant restart and infrastructure refurbishment, and contract mining for mine development. The mining pre-production capital costs and operating costs are based on the selected mining methods.

A summary of the LOM capital costs for the projected life of the production schedule from Year 1 to Year 6 is provided in Table 1.1Table 1.2. The schedule assumes mining operations commence during Year 1. Mining capital costs involve mobilising and establishing the mining contractors and pre-production waste stripping in Year 1 on site at Beaton's Creek are provided in Table 1.3.

Table 1.2 LOM Capital Cost Summary

Facility	Cost ($'000)
Mining pre-production	1,975
Camp refurbishment	560
Processing plant refurbishment	6,225
Borefield upgrade	4,500
PAF waste rock encapsulation	37,500
Mine closure provision	8,800
Estimate Total (±35%)	**59,560**

Table 1.3 Mining pre-production capital cost

Item	Cost ($'000)
Load and Haul fleet mobilisation	430
Drill and Blast mobilisation	190
Road haulage mobilisation	50
Sit preparation including offices, access, security, communications	750
Pre-stripping	1,230
Estimated total	**1,975**

Sustaining capital costs for the projected life of the production schedule from Year 1 to Year 6 are provided in Table 1.4. Note that the TSF design and government approvals will be required for the lifts proposed for Years 3 to 6.

Table 1.4 LOM sustaining capital cost summary

Facility	Year 1 ($'000)	Year 2 ($'000)	Year 3 ($'000)	Year 4 ($'000)	Year 5 ($'000)	Total ($'000)
Process Plant		262	262	262	262	1,050
TSF2 lifts (Cell 1&2, 2 m)	1,500	1,500	1,500	1,500	1,500	7,500
Estimate Total (±50%)	**1,500**	**1,762**	**1,762**	**1,762**	**1,762**	**8,550**

Processing and infrastructure operating costs have been estimated from historical site data and are summarised in Table 1.5. If the material treated is different from that processed previously then the operating costs will change accordingly. If the mill throughput is reduced below the scheduled rate by the proportion of fresh ore, then the processing unit cost rate will increase.

Table 1.5 Processing operating costs

Description	Unit	Quantity
Employee Overheads	$'000/a	4,249
Other Fixed Costs	$'000/a	2,588
Maintenance Cost – Fixed	$'000/a	8,783
Variable Cost	$/t	6.51
Total Operating Cost	$/t	17.18

Mining operating costs have been developed on the basis of Novo providing management and technical support (Geology, Mining Engineering and Survey) with specialist, individual contracts for each of:

- grade control drilling
- production drill and blast
- load and haul of waste and plant feed
- road haulage of plant feed to the ROM pad.

All costs for contract mining activities have been developed from detailed budget estimates from reputable service providers with experience of operating in the Pilbara region. The costs are comprised of fixed and variable components with the resultant unit cost provisions are summarised in Table 1.6.

Table 1.6 Mining unit costs

Cost Item	$/t mined	$/t processed
Grade Control	0.20	2.25
Drill and Blast	0.40	3.74
Load and Haul	1.50	14.10
Road Haulage	0.70	3.75
Mine Management and Technical Services	0.80	7.47
Total	**3.60**	**31.31**

1.11. ECONOMIC ANALYSIS

The PEA is preliminary in nature. It includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorised as Mineral Reserves. There is no certainty that the results of the PEA will be realised.

The economic analysis is based on a discounted cash flow model. The model includes the life of-mine production plan, operating costs, capital costs and market assumptions discussed in this Technical Report, in addition to financial assumptions introduced in this section. Net present value (NPV) is calculated in the model and reported after taxes. Internal rate of return (IRR) and payback period is not reported here as the capital costs are largely sunk through Novo's previous acquisition of Millennium and these measures are therefore mostly irrelevant.

The high-level economic assessment of the proposed open pit operation of the Beatons Creek Project is expected to generate an after tax NPV of approximately US$250 M at 5% discount rate.

Key results of the economic analysis over the life of mine are provided in Table 1.7. Cash cost and AISC costs per ounce of production and unlevered free cash flow is show in Figure 1.5 and Figure 1.6.

Cash costs are a non-IFRS measure reported on an ounce of gold sold basis. Cash costs include mining, processing, refining, general and administration costs and royalties, but exclude depreciation, reclamation, income taxes, capital, and exploration costs for the LOM. AISC is a non-IFRS measure reported on a per ounce of gold sold basis that includes all cash costs noted above as well as sustaining capital and closure costs, but excludes depreciation, capital costs, and income taxes. These measures have no standardised meaning under IFRS.

Table 1.7 Key outputs of the PEA

Item	Unit	PEA output
Mine life	Years	6.5
Processing rate	Mtpa	1.5
LOM average grade	g/t gold	2.16
LOM average mill recovery	%	95
LOM average gold production	koz gold pa	101
LOM sustaining capex	$M	36.2
LOM cash cost	US$/oz gold	702
LOM AISC	US$/oz gold	974
LOM gold price	US$/oz gold	1,700
LOM exchange rate	A$:US$	0.75
After-tax NPV (5%)	US$M	250

Figure 1.5 Cash Cost and AISC

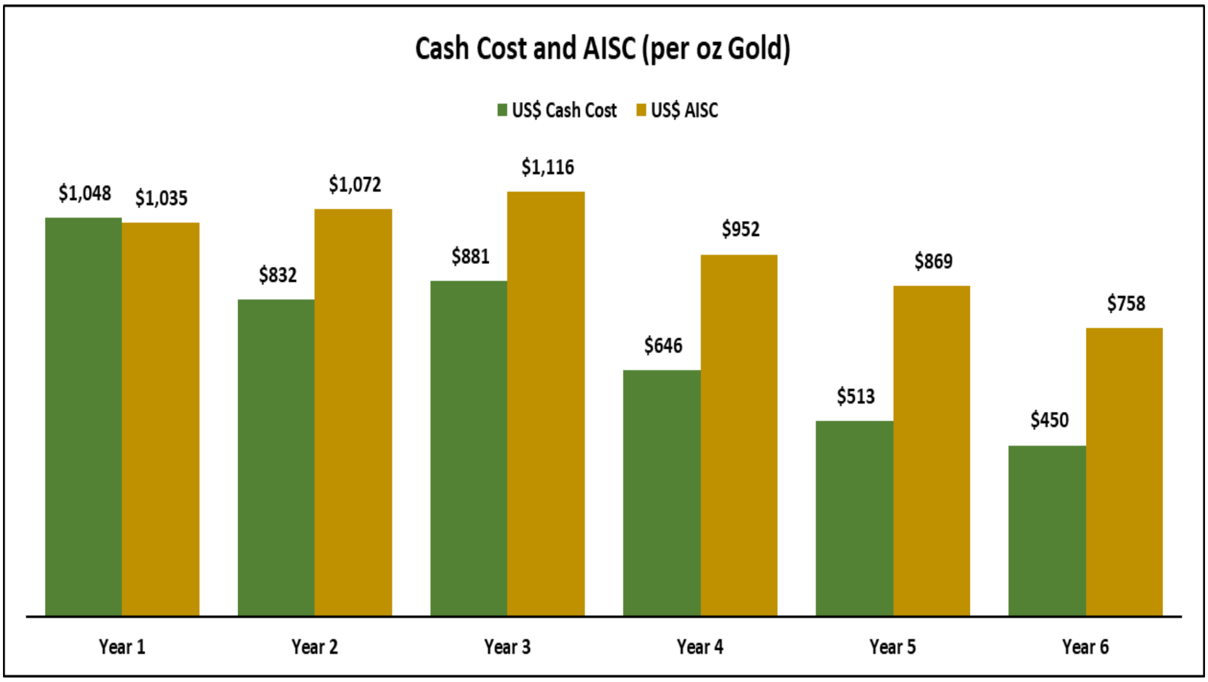
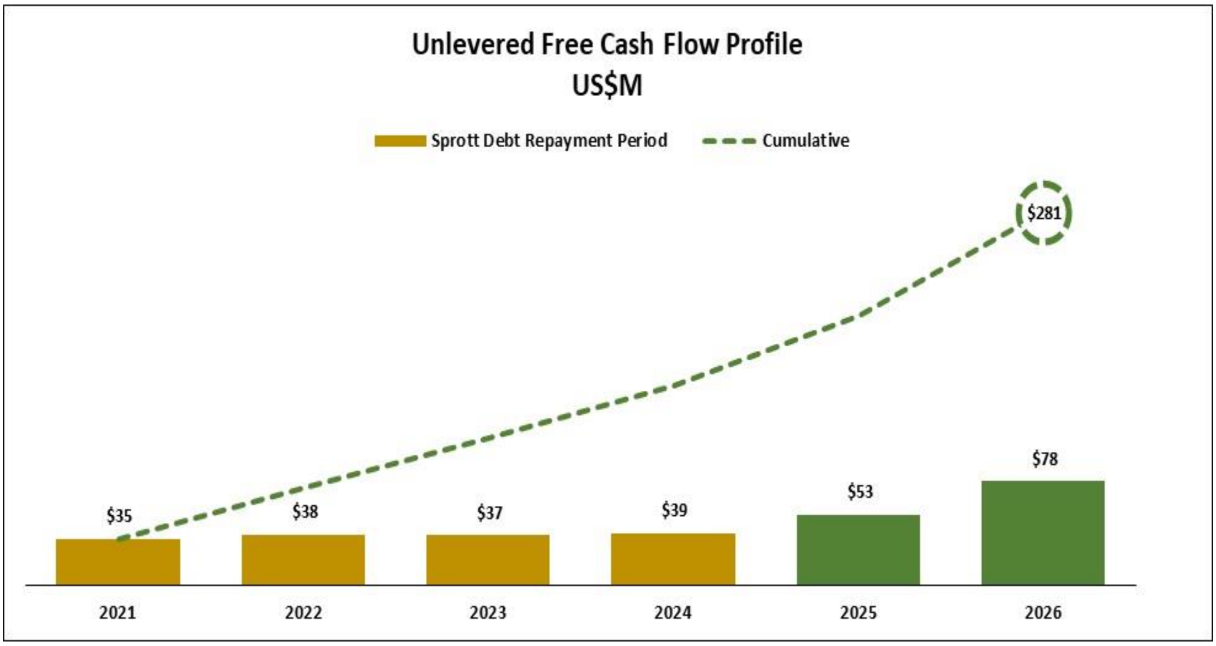


Figure 1.6 Unlevered free cash flow summary



1.12. CONCLUSIONS AND RECOMMENDATIONS

The preliminary economic analysis indicates that the Beatons Creek Project shows an attractive financial return and should be progressed to the next stage of study. The PEA shows an after tax NPV of US$250 M, a LOM cash cost of US$702 M and a LOM AISC of US$974 M.

The mineralisation controls at the Beatons Creek Project are well understood but the nature of the gold mineralisation is highly nuggety with coarse gold particles regularly visible. Accordingly, the definition of Measured Mineral Resources at the Beatons Creek Project cannot be justified.

The PEA mining schedule Table 16.5includes provisions for a production ramp-up in Year 1 and then maintains a Total Material Movement capacity of up to 17.6 Mtpa (plant feed + waste). This production capacity supports the plant throughput of 1.5 Mtpa. Total plant feed over the LOM comprises 4,745 kt at 1.7 g/t of oxide and 4,741 kt at 2.6 g/t of fresh (total feed of 8,894 kt at 2.2 g/t gold).

Overall, the PEA mining schedule includes:

- About 10% of the oxide plant feed is based on Inferred Mineral Resources.
- About 56% of the fresh plant feed is based on Inferred Mineral Resources.

On the basis of the outcomes of this PEA, the following recommendations for further work are made:

- Infill drilling to improve confidence and reclassify current Inferred Mineral Resources to Indicated Mineral Resources or better.
- Undertake further metallurgical testwork on fresh mineralisation.
- Undertake further waste characterisation, particularly for AMD potential on fresh inter-reef material.
- Continue environmental and permitting activities for full fresh rock mining approval.
- Complete a PFS or FS.

2. INTRODUCTION

2.1. SCOPE OF THE REPORT

Optiro Pty Ltd was commissioned by Novo Resources Corp. (Novo or the Company) to prepare a Preliminary Economic Assessment (PEA) and corresponding NI43-101 Technical Report (Technical Report) for the Beatons Creek Gold Project. Novo is a company listed on the Toronto Stock Exchange (TSX). Novo was incorporated on October 28, 2009 under the laws of British Columbia pursuant to the Business Corporations Act (British Columbia) under the name Galliard Resources Corp. The Company changed its name to Novo Resources Corp. on June 27, 2011.

The head office of the Company is located at 880 - 580 Hornby Street, Vancouver, BC, Canada V6C 3B6. The Company's registered office is located at 595 Burrard Street, Suite 2900, Vancouver, BC, Canada V7X 1J5. The Company's operational office is located at Level 1, 680 Murray Street, West Perth, Western Australia 6005.

The Company is a mineral exploration company focused primarily on the exploration and development of conglomerate gold projects in the Pilbara region of Western Australia.

This report comprises a preliminary economic assessment (PEA) that includes an economic analysis of the potential viability of the Mineral Resources within the Beatons Creek Project. This PEA includes Inferred Mineral Resources, and as such:

- the PEA is preliminary in nature
- includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorised as Mineral Reserves
- there is no certainty that the PEA will be realised.

Optiro cautions that the PEA is preliminary in nature. No mining study has been completed and the Mineral Resources reported here are not Mineral Reserves and do not have demonstrated economic viability. There is no certainty that the PEA will be realised.

This report provides a description of the Preliminary Economic Assessment (PEA) for the development of the Mineral Resources at the Beatons Creek Project located approximately 170 km north of Newman, 230 km southeast of Port Hedland and 1,190 km north-northeast of Perth in the east Pilbara region of Western Australia (WA), Australia.

This Technical Report has been written to comply with the reporting requirements of National Instrument 43-101 *Standards of Disclosure for Mineral Projects* (NI 43-101 or the Instrument) and has an effective date of 5 February 2021.

2.2. AUTHORS

The principal authors of this technical report are Mr Jason Froud (MAIG), Mr Ian Glacken (FAusIMM, FAIG), Mr Andrew Grubb (FAusIMM) and Mr William Gosling (FAusIMM). The contributions of each to this Technical Report are detailed in Table 2.1. Jason Froud, Ian Glacken, Andrew Grubb and William Gosling meet the requirements and definition of a Qualified Person, being members of an Accepted Foreign Association, as defined in Appendix A of the NI 43-101 documentation. Jason Froud is a

Member of the Australian Institute of Geoscientists (MAIG), Ian Glacken is a Fellow of the Australasian Institute of Mining and Metallurgy (FAusIMM) and a Fellow of the Australian Institute of Geoscientists (MAIG), Andrew Grubb is a Fellow of the Australasian Institute of Mining and Metallurgy (FAusIMM) and Willian Gosling is a Fellow of the Australasian Institute of Mining and Metallurgy (FAusIMM) and a registered member of The Society for Mining, Metallurgy and Exploration, Inc. (SME). The Qualified Person Certificates for Mr Jason Froud, Mr Ian Glacken, Mr Andrew Grubb and Mr William Gosling are included in Section 28.

Table 2.1 Beatons Creek Gold Project Technical Report – authors and contribution

Name	Position	Qualifications and memberships	NI 43-101 contribution
Jason Froud	Principal, Optiro Pty Ltd	*BSc (Hons), Grad Dip (App Fin), MAIG*	Principal author Qualified Person, Mineral Resources
Ian Glacken	Director, Optiro Pty Ltd	*BSc (Hons), MSc (Mining Geology), MSc (Geostatistics), FAusIMM, FAIG, MIMMM, CEng*	Qualified Person, Mineral Resources
Andrew Grubb	Director - Mining Optiro Pty Ltd	*BE (Mining), FAusIMM*	Qualified Person, Mining
William Gosling	Process Manager, GR Engineering Services Ltd	*BE (Extractive Metallurgy), FAusIMM, Registered Member (SME)*	Qualified Person, Processing

The QPs were assisted by Novo personnel including Kas De Luca (General Manager – Exploration), Alwin Van Roij (Senior Geologist) and Chris Goti (General Manager – Environment) who provided assistance in the writing and compilation of this Technical Report.

2.3. PRINCIPAL SOURCES OF INFORMATION

Information used in compiling this Technical Report was derived from reports and data sourced from various authors by Novo and their consultants. This report draws upon previous Mineral Resource estimates carried out by Novo, with the most recent being current as of February 2019 (Dominy and Hennigh, 2019).

Optiro has made all reasonable enquiries to establish the completeness and authenticity of the information provided. In addition, a final draft of this report was provided to Novo along with a written request to identify any material errors or omissions prior to lodgement.

For this Technical Report, common measurements are given in metric units. All tonnages shown are in metric tonnes (1,000 kg), precious metal grade values are given in grams per tonne gold (g/t Au), and precious metal quantity values are given in troy ounces (oz) (31.10348 g). All references to dollars in this Technical Report are to Australian dollars (A$) unless otherwise noted.

2.4. SITE VISIT

The Qualified Person, Mr Jason Froud visited the Beatons Creek Project on 22 September 2020 and from 1 to 2 October 2019. The Qualified Person, Mr Ian Glacken visited the Beatons Creek Project on 7 September 2017. The Qualified Person, Mr Andrew Grubb, visited the Beatons Creek Project on 14 September 2018, 9 December 2020, 13 December 2021 and 19 April 2021. The Qualified Person, Mr Bill Gosling visited the Beatons Creek Project on 19 April 2021. During the various site visits, the QPs have inspected the 2018 bulk sampling program, areas of infill drilling, pre-production areas, toured proposed mining areas and verified the site layout provisions. Mr Grubb also inspected the previous trial mining areas, mineralisation exposures and the proposed haulage route to the Nullagine processing plant and ROM pad area. Field verification also included a review of the Nullagine processing plant, tailing dams, offices, accommodation and other surface infrastructure. A review and assessment of the mineralisation styles, alteration and geological setting for the deposit was also undertaken by Mr Glacken as well as site visits to the relevant laboratories and discussions with Novo geological and processing staff.

2.5. INDEPENDENCE

Optiro is an independent consulting and advisory organisation which provides a range of services related to the minerals industry including, in this case, technical study and reporting, but also resource evaluation, corporate advisory, mining engineering, mine design, scheduling, audit, due diligence and risk assessment assistance. The principal office of Optiro is at 16 Ord Street, West Perth, Western Australia, and Optiro's staff work on a variety of projects in a range of commodities worldwide.

The principal authors and Qualified Persons are full-time employees or associates of Optiro and do not hold any interest in Novo or their respective associated parties, or in any of the mineral properties which are the subject of this report. Fees for the preparation of this report are charged at Optiro's standard rates, whilst expenses were reimbursed at cost. Payment of fees and expenses is in no way contingent upon the conclusions drawn in this report.

The Qualified Persons are independent of Novo pursuant to Section 1.5 of the Instrument.

3. RELIANCE OF OTHER EXPERTS

This report has been compiled by the Principal authors, who are employees of Optiro and independent of Novo. Information that is of a general nature has been reprised from the work of other consulting groups or individuals or from exploration and mining company documentation.

The authors have relied on statements and documents provided by Christopher Goti MSc: (Environmental Manager and Novo employee).

With regard to section 4, direct written input and opinion into sub-sections 4.2, 4.3, 4.4 and 4.5 were provided by Mr. Goti as follows:

- limitations of environmental liabilities associated with past operations
- water quality characterisation
- compliance requirements to continue exploration activities
- permitting requirements to initiate future mining
- tenements location, legal standing and surface access agreements
- leasing, royalty and purchase agreements relating to the concessions.

The authors consider that the information used to prepare this report, its conclusions and recommendations are valid and appropriate considering the nature of the project and the purpose for which the report is prepared.

4. PROPERTY DESCRIPTION AND LOCATION

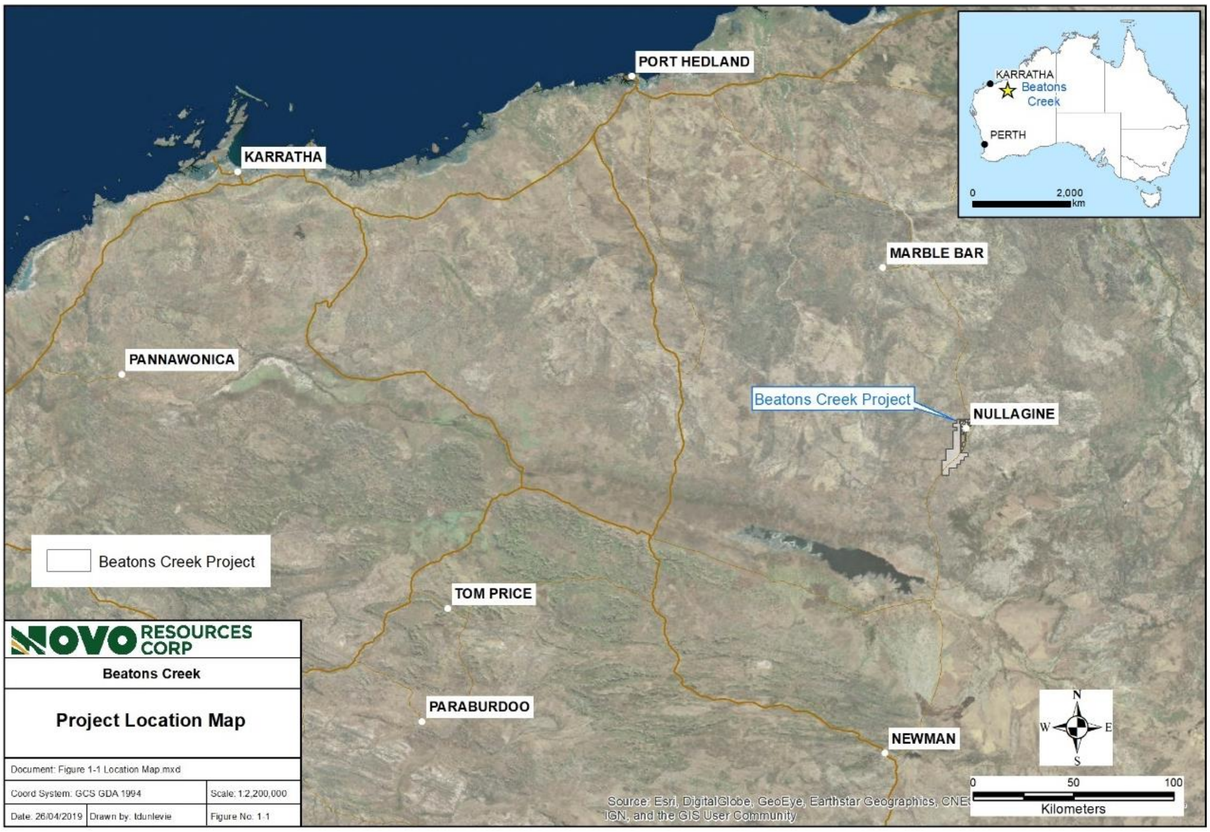
4.1. LOCATION

The Beatons Creek Project is situated in the East Pilbara Shire, which is one of the four local government areas in the Pilbara region of Western Australia. The East Pilbara Shire has an area close to 380,000 km^2 and is the third largest municipality in the world.

The Beatons Creek Project area is located between the major regional centres of Newman and Port Hedland, in the north western part of Western Australia (Figure 4.1). The project area is west of the town of Nullagine, with a population of about 200 inhabitants, and is located 1,360 km north-northeast of Perth by road. Nullagine is 296 km southeast of Port Hedland and 170 km north of Newman by road.

The Beatons Creek Project area is held through 16 granted and predominantly contiguous tenements totalling 159.7 km^2; the tenements include Exploration, Prospecting and Mining Leases. The property is located near a privately-owned railroad used to transport iron ore from Newman to Port Hedland.

Figure 4.1 Location map



4.2. TENEMENTS AND OWNERSHIP

The Beatons Creek Project area is covered by a group of tenements registered under three of Novo's wholly owned Australian subsidiaries, Nullagine Gold Pty Ltd, Beatons Creek Gold Pty Ltd and Grant's Hill Gold Pty Ltd. Certain tenements are still entitled to third parties from whom Novo acquired said tenure. While these tenements are legally and beneficially held by Novo, title does not pass to Novo until the Western Australian Office of State Revenue (OSR) completes its review of associated transactions. The OSR is still reviewing submissions for certain tenements subject to a binding terms sheet executed between Novo, Nullagine Gold Pty Ltd, and Mark Creasy and entities controlled by him (please see Novo's news release dated June 15, 2020 for further details). The tenements are held as listed in Table 4.1 and depicted in Figure 4.2Figure 4.2. The status of the tenements is listed in Table 4.1.

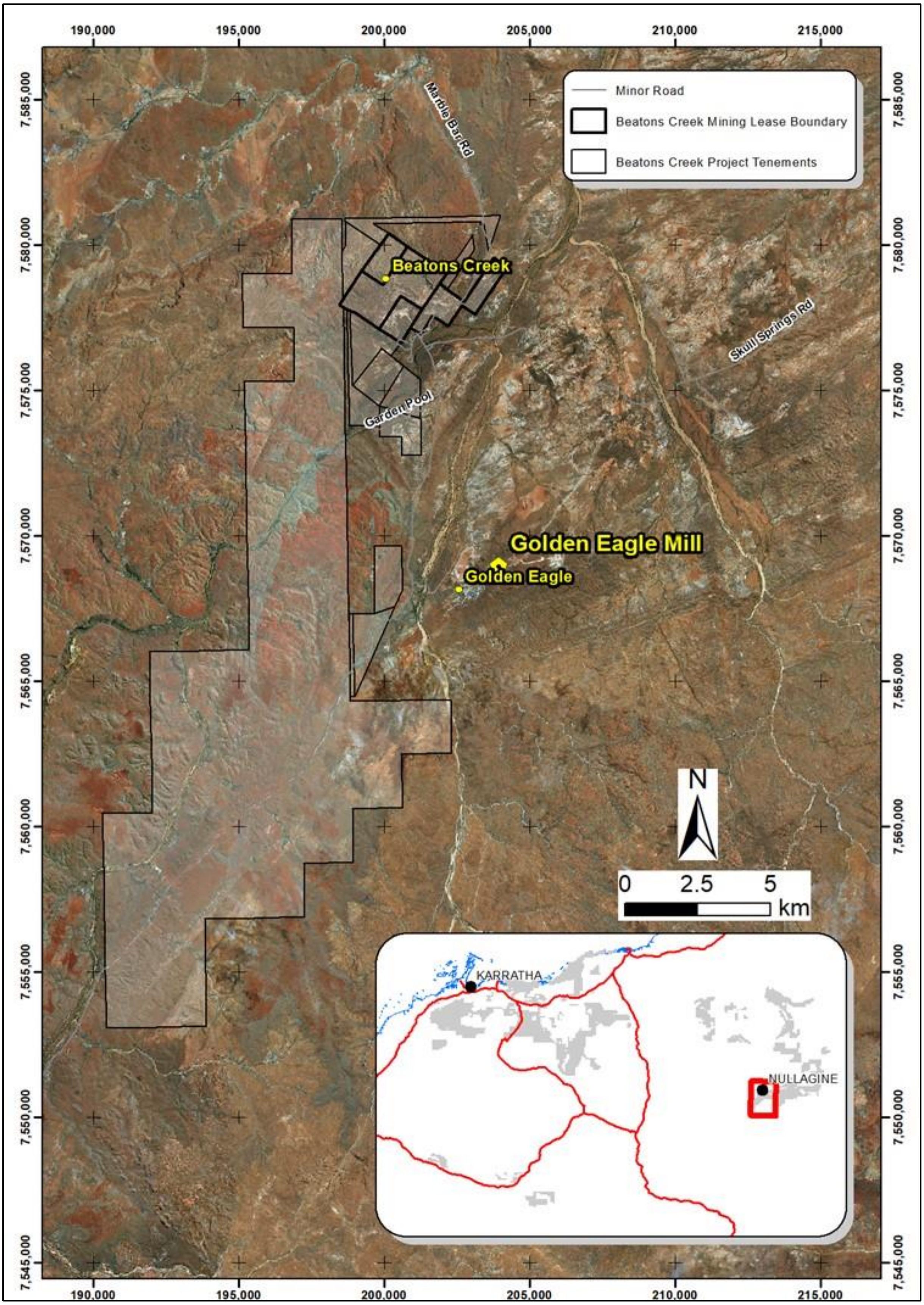
The Beatons Creek Project holds a total land coverage of 159.7 km^2, which require an annual expenditure commitment of A$293,200, in addition to rental payments of A$50,465 for 2021.

Prospecting tenements are held for eight years, exploration leases are held for five years and mining leases are held for 21 years, all with the potential for extension.

Table 4.1 List of tenements comprising the Beatons Creek Gold Project area (expenditure in A$)

Tenement Number	Tenement Status	Tenement Type	Area km²	Expenditure Commitment	Rent	Grant Date	Expiry Data	Term	Registered Holder	DIA Registered Sites
E46/797	Granted	Exploration Lease	133.39	$126,000	$25,830	22/04/2010	21/04/2022	10 Years (Renewal)	WITX Pty Ltd	Yes
M46/10	Granted	Mining Lease	1.21	$12,200	$2,440	12/12/1984	11/12/2026	21 Years (Renewal	Beatons Creek Gold Pty Ltd	Yes
M46/11	Granted	Mining Lease	4.65	$46,500	$9,300	17/01/1985	16/01/2027	21 Years (Renewal	Beatons Creek Gold Pty Ltd	Yes
M46/9	Granted	Mining Lease	2.48	$24,800	$4,960	6/03/1985	5/03/2027	21 Years (Renewal	Beatons Creek Gold Pty Ltd	Yes
M46/532	Granted	Mining Lease	1.34	$13,500	$2,700	8/05/2019	7/05/2040	21 Years (Renewal	Beatons Creek Gold Pty Ltd	No
P46/1743	Granted	Prospecting Lease	1.43	$8,000	$600	6/02/2013	5/02/2021	8 Years	WITX Pty Ltd	Yes
P46/1744	Granted	Prospecting Lease	2.00	$8,000	$600	6/02/2013	5/02/2021	8 Years	WITX Pty Ltd	Yes
P46/1789	Granted	Prospecting Lease	1.71	$6,880	$516	15/03/2013	14/03/2021	8 Years	WITX Pty Ltd	Yes
P46/1790	Granted	Prospecting Lease	1.65	$7,320	$549	22/02/2013	21/02/2021	8 Years	WITX Pty Ltd	No
P46/1791	Granted	Prospecting Lease	1.73	$6,960	$522	19/07/2013	18/07/2021	8 Years	WITX Pty Ltd	No
P46/1792	Granted	Prospecting Lease	0.63	$2,520	$189	19/07/2013	18/07/2021	8 Years	WITX Pty Ltd	No
P46/1808	Granted	Prospecting Lease	1.98	$7,960	$597	15/12/2016	14/12/2024	4 Years (Renewal)	WITX Pty Ltd	No
P46/1809	Granted	Prospecting Lease	1.97	$7,920	$594	15/12/2016	14/12/2024	4 Years (Renewal)	WITX Pty Ltd	Yes
P46/1810	Granted	Prospecting Lease	0.39	$2,000	$120	5/05/2016	4/05/2024	4 Years (Renewal)	WITX Pty Ltd	Yes
P46/1821	Granted	Prospecting Lease	1.59	$6,360	$477	3/03/2015	2/03/2023	4 Years (Renewal)	Beatons Creek Gold Pty Ltd	No
P46/1822	Granted	Prospecting Lease	1.56	$6,280	$471	4/03/2015	3/03/2023	4 Years (Renewal)	Beatons Creek Gold Pty Ltd	No
Total			**159.72**	**$293,200**	**$50,465**					

Figure 4.2 Beatons Creek Project tenements map



4.3. LEGISLATION AND PERMITTING

All exploration and mining activity in WA must be conducted under an authority from the WA Department of Mines, Industry Regulation and Safety (DMIRS), the WA State Government department responsible for Mineral Resources. The following information is of a general nature and has been sourced from the DMIRS website. There are seven different types of mining tenements prescribed under the Mining Act 1978:

- Prospecting Licences (Sections 40 to 56, PL)
- Special Prospecting Licences for Gold (Sections 56A, 70 and 85B)
- Exploration Licences (Sections 57 to 69E, EL)
- Retention Licences (Sections 70A to 70M)
- Mining Leases (Sections 70O to 85A, ML)
- General Purpose Leases (Sections 86 to 90)
- Miscellaneous Licences (Sections 91 to 94, L).

Those categories of relevance to Novo are described below.

PROSPECTING LICENCES

The maximum area for a prospecting licence is 200 hectares. Prospecting licences must be marked out unless otherwise specified. There is no limit to the number of licences a person or company may hold, but a security (A$5,000) is required in respect of each licence. The term of a prospecting licence is four years, with the provision to extend for one further four-year period. The holder of a prospecting licence may, in accordance with the licence conditions, extract or disturb up to 500 tonnes of material from the ground including overburden, and the Minister for Mines and Petroleum may approve extraction of larger tonnages. Prescribed minimum annual expenditure commitments and reporting requirements apply.

MINING LEASES

The maximum area for a Mining Lease applied for before 10 February 2006 is 1,000 hectares. After that, the area applied for relates to an identified orebody as well as an area for infrastructure requirements.

An application for a Mining Lease must be accompanied by one of the following:

- a Mining Proposal completed in accordance with the Mining Proposal Guidelines published by DMIRS
- a statement of mining operations and a mineralisation report that has been prepared by a qualified person
- a statement of mining operations and a resource report that complies with the JORC Code and that has been made to the Australian Securities Exchange Ltd.

There is no limit to the number of mining leases a person or company may hold. The term of a mining lease is 21 years and may be renewed for further terms. The lessee of a mining lease may work and mine the land, take and remove minerals, and do all the things necessary to effectually carry out mining operations in, on or under the land, subject to conditions of title. Prescribed minimum annual expenditure commitments and reporting requirements apply.

MISCELLANEOUS LICENCES

There is no maximum area for a miscellaneous licence. A miscellaneous licence is for purposes such as a roads and pipelines, or other purposes as prescribed in Regulation 42B. There is no limit to the number of miscellaneous licences a person or company may hold. The term of a miscellaneous licence is 21 years and it may be renewed for further terms. A miscellaneous licence can be applied for over (and can 'co-exist' with) other mining tenements.

GENERAL PURPOSE LEASES

Unless granted special approval by the Minister for Mines and Petroleum a general purpose lease can only be a maximum of 10 hectares. A general purpose lease is for purposes such as operating machinery, depositing or treating tailings etc. A person or company may hold an unlimited number of general purpose leases. The term of a general purpose lease is 21 years, and it may be renewed for further terms. A general purpose lease application requires a statement accompanying the application to include either a development and construction proposal or a statement setting out specific intentions for the lease.

NATIVE TITLE

Native title rights and interests are those rights in relation to land or waters that are held by Aboriginal or Torres Strait Islander peoples under their traditional laws and customs, and which are recognised by the common law. Native title was first accepted into the common law of Australia by the High Court of Australia's decision in Mabo (No 2) in 1992.

Australian law recognises that, except where native title had been wholly extinguished by the historical grant of freehold, leasehold and other interests, native title exists where Aboriginal people have maintained a traditional connection to their land and waters substantially uninterrupted since sovereignty. The rights and interests vary from case to case but may include the right to live and camp in the area, conduct ceremonies, hunt and fish, build shelter, and visit places of cultural importance. Some native title holders may also have the right to control access.

Australian law also requires that native title approval be obtained before mining applications can commence.

All of the Beatons Creek Project tenements are within the external boundaries of native title claims (both registered and unregistered) and/or native title determinations. Registered native title claimants and holders of native title under the determinations are entitled to certain rights under the Future Act Provisions in respect of land in which native title may continue to subsist. Novo may be liable to pay compensation to the determined native title holders for the impact of a tenement on native title. The amount of compensation will be determined in accordance with the Native Title Act, 1993 (NTA) and will be affected by the specific circumstances of each case.

Tenements granted before 1 January 1994 were retrospectively validated under the NTA (and associated Western Australian validation legislation). For tenements granted between 1 January 1994 and 23 December 1996 (Intermediate Period Acts), for the initial grant of each of these tenements to be valid under the NTA, it must have been granted in accordance with the Future Act Provisions or, if the Future Act Provisions were not followed, the initial grant must meet the requirements to be an Intermediate Period Act. For tenements granted after 23 December 1996, these tenements were granted in accordance with the Future Act Provisions and as such are valid under the NTA. Furthermore, renewals of mining tenements made after 23 December 1996 must comply with the Future Act Provisions in order to be valid under the NTA.

Optiro is satisfied that all tenements are valid under the NTA. Novo has pre-existing native title and heritage agreements with the Palyku people and the Njamal people over the Beatons Creek Project.

Native title claims and Aboriginal heritage issues may delay or otherwise affect Novo's ability to pursue exploration, development and mining on the Beatons Creek Project. The resolution of native title and Aboriginal heritage issues is an integral part of exploration and mining operations in Australia and Novo is committed to managing any issues that may arise effectively. However, in view of the inherent legal and factual uncertainties relating to such issues, no assurance can be given that material adverse consequences will not arise.

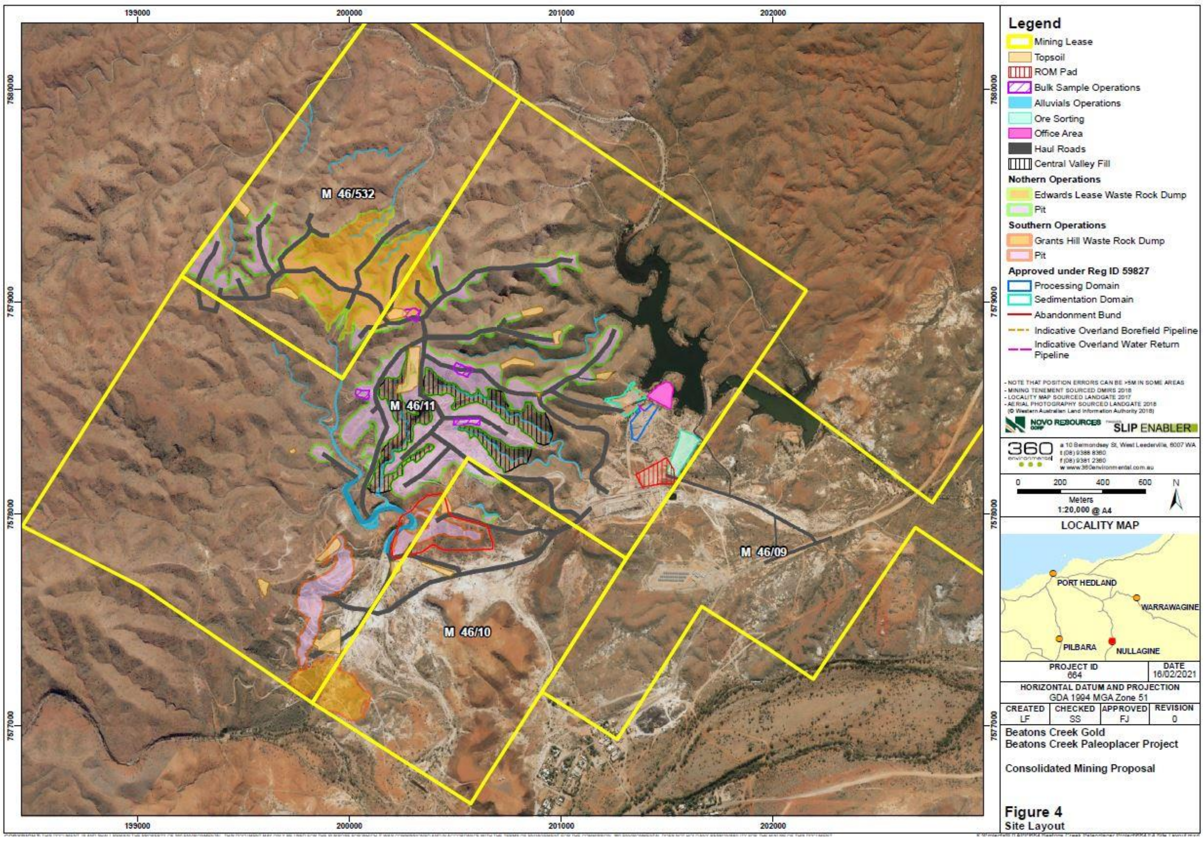
4.4. ENVIRONMENTAL AND PERMITTING

Novo has obtained all environmental approvals required to commence mining of the Beatons Creek Project, including:

- Mining proposal and mine closure plan to mine and subsequently rehabilitate based on Novo's earlier 2015 resource model (oxide with some fresh mineralisation included) from DMIRS.
- Haulage from the Beatons Creek Project to the Nullagine processing plant from DMIRS and the Shire of East Pilbara.
- Processing and disposal of material from the Beatons Creek Project from the Nullagine processing plant from Department of Water and Environmental Regulation (DWER).
- EP Act Part V Native Vegetation Clearing Permit (NVCP).
- Rights in Water and Irrigation Act 1914 (RIWI Act) (Regulating Authority – DWER) permitting groundwater abstraction.

The map in Figure 4.3 shows the activities sought for permission under the mining proposal and mine closure plan.

Figure 4.3 Activities for permission under DMIRS mining proposal approvals



Extensive baseline environmental assessments for all relevant parameters for this project to receive regulatory approvals (including ground and surface water monitoring, geochemical characterisation of all rock types and their interaction with ground and surface water, noise, dust and social impact modelling) have been completed as of late 2020. On-going groundwater quality monitoring will take place on a quarterly basis and be reported annually, or whenever water quality thresholds are exceeded, to demonstrate to regulators that the operations of the Beatons Creek Project are not negatively impacting groundwater, which lies within a 'Priority One Public Drinking Water Source Area'.

Novo engages its key stakeholders, including native title parties, the Nullagine Township and its residents, and government regulators on the status of the Beatons Creek Project and plans for its development. The support of key stakeholders and protection of groundwater quality in the area are the most sensitive matters that will affect any plan to mine at the Beatons Creek Project. Novo has dedicated considerable resources towards ensuring these matters are managed adequately.

Novo is obligated to contribute an annual 1% levy of the total estimated rehabilitation costs at the Beatons Creek Project to the DMIRS mining rehabilitation fund.

4.5. ROYALTIES

Mineral royalties are collected under the Mining Act 1978, the Mining Regulations 1981, or the various State Agreement Acts that have been negotiated for major resources projects. Under the Mining Act 1978, royalties are payable on all minerals.

Western Australia has a three-tiered royalty system that was introduced in 1981. It applies one of three royalty rates depending on the form in which the mineral is sold (ore, concentrate or final form), and the extent to which it is processed. Western Australian mineral royalty rates are prescribed under either the Mining Regulations 1981 or the various State Agreement Acts. State Agreements are essentially contracts ratified by Act of Parliament between proponents of major resources projects and the Government of Western Australia.

Of the two systems for collection of mineral royalties in Western Australia, only the ad valorem royalty is applicable to the Beaton's Creek project. Ad valorem is calculated as a proportion of the 'royalty value' of the mineral. The royalty value is broadly calculated as the quantity of the mineral in the form in which it is first sold, multiplied by the price in that form, minus any allowable deductions (in some cases, an alternative to 'royalty value' applies e.g. nickel). The ad valorem or value-based rate of royalty, which applies under the Mining Regulations 1981, is based on the following principles:

- bulk material (subject to limited treatment) – 7.5 per cent of the royalty value
- concentrate material (subject to substantial enrichment through a concentration plant) – 5.0 per cent of the royalty value
- metal – 2.5 per cent of the royalty value.

The 'royalty value' components used to calculate the 'royalty value' are defined under Regulation 85 of the Mining Regulations. The current rate of royalty payable, within Western Australia, for gold metal produced after 30 June 2000 is 2.5% of the royalty value of the gold metal produced.

In addition to the State Government royalty, there are various other third party royalties payable on gold production from Beaton's Creek. These royalties are payable to IMC Resources Gold Holdings Pte Ltd and native title holders. The individual terms of these royalties are considered commercial-in-confidence but amount to a total royalty of 4.75% payable on gold production.

4.6. RISK FACTORS AND CAUTIONARY STATEMENT WITH RESPECT TO FORWARD LOOKING INFORMATION

Except as discussed in this report, the authors are not aware of any significant risk factors that may affect access, title, rights, environmental issues or ability to perform and develop work on the property.

This report contains "forward-looking information" within the meaning of Canadian securities laws. Forward-looking information in this report includes, but is not limited to, information with respect to the future price of minerals, particularly gold; the results of the PEA , including, without limitation, estimated production, expected life of mine, costs, including cash costs and all-in sustaining costs, NPV, average annual cash flow and various other financial and production metrics; the estimation of mineral resources; the realisation of mineral resource estimates; capital expenditures; currency exchange rates; government regulation of exploration, development, and mining operations; and environmental risks. Estimates outlined herein are based on numerous key factors as discussed herein. Forward-looking information is characterized by words such as “plan”, “expect”, “budget”, “target”, “schedule”, “estimate”, “forecast”, “project”, “intend”, “believe”, “anticipate” and other similar words or statements that certain events or conditions “may”, “could”, “would”, “might”, or “will” occur or be achieved. Forward-looking information is inherently subject to a variety of risks and uncertainties and other known and unknown factors that could cause the actual results to be materially different from any future results expressed or implied by the forward-looking information. Such factors include: the fluctuating price of gold; success of exploration, development and operations activities; health, safety and environmental risks; risks relating to foreign operations and expropriation or nationalisation of operations; uncertainties inherent to economic studies, including the PEA; the absence of any pre-feasibility or feasibility level studies for the Beatons Creek Project; variations in the estimation of mineral resources; uncertainty relating to mineral resources; the potential of cost overruns; risks relating to government regulation; risks relating to native title and Aboriginal heritage; risks relating to the construction and development of new operations; seasonality and unanticipated weather conditions; currency exchange rates (such as the United States dollar and the Australian dollar versus the Canadian dollar); risks relating to potential litigation; as well as those risk factors discussed or referred to herein, in the Company’s annual management’s discussion and analysis, the Annual Information Form and other documents which are available under the Company’s profile on the Canadian System for Electronic Document Analysis and Retrieval (“**SEDAR**”) website at www.sedar.com.

5. ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1. ACCESSIBILITY

The Beatons Creek Project area is adjacent to and west of the town of Nullagine (population approx. 200), which is located 1,370 km north-northeast of the state capital, Perth by road. Nullagine is 296 km southeast of Port Hedland and 170 km north of Newman by road.

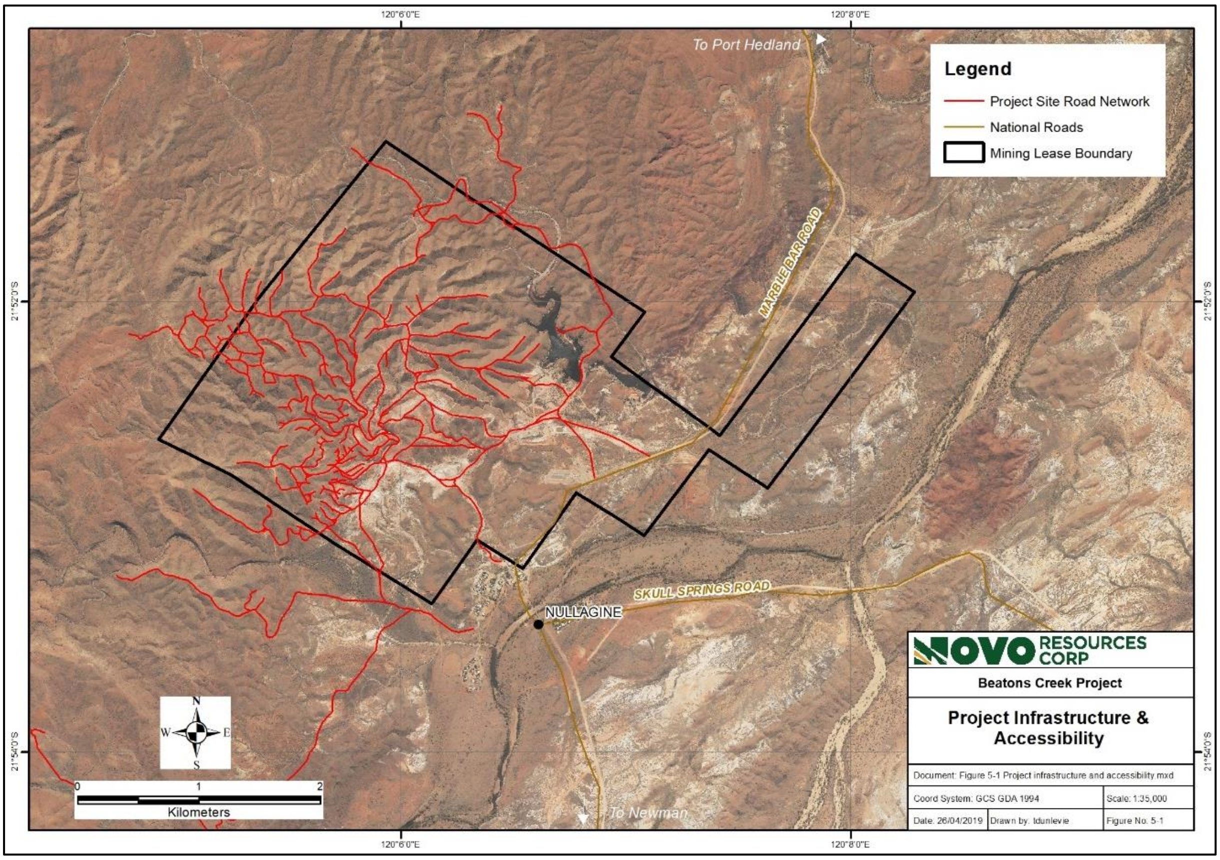
Nullagine is the only town in the broader area and located on the partly sealed Marble Bar Road from Newman to Port Hedland. Frequent air services connect the towns of Port Hedland and Newman with Perth. Access to the project area is by road from either Port Hedland (population approx. 14,000) or the iron ore mining camps of Newman (population approx. 4,200) and Roy Hill. The Beatons Creek Project area is adjacent to and west of the town of Nullagine.

The Beatons Creek Project area is near and to the west of the privately-owned Newman to Port Hedland railroad used to transport iron ore. Access within the area is mainly by poor-quality pastoral and mining tracks.

5.2. PHYSIOGRAPHY

A Tertiary surface of pene-planation extends over most of Western Australia. Earth movements during Pliocene uplifted the peneplain to form the Great Plateau of Western Australia. In the Pilbara, this surface is referred to as the Hamersley Surface. In the Nullagine area it is generally represented by laterite or pisolitic ironstone deposits and is separated from eroded parts of the plateau by breakaways or cliffs (Figure 5.1).

Figure 5.1 Project infrastructure and accessibility



Most of the area lies between 200 m to 500 m above sea level in the Beatons Creek Project region. Two large rivers, the Nullagine and the Oakover, flow northwards across the area and eventually join to form the De Grey River. The Oakover River flows along the axis of a major Proterozoic syncline but the Nullagine River's course bears little relation to currently exposed geology, suggesting that it is superimposed (as are several other major rivers to the west). The area can be divided into seven physiographic provinces: plateau, dissected plateau, range, low granite hills, plain, valley, and desert.

Average annual evaporation of the Pilbara region is about 3,600 mm, which is ten times the total annual rainfall. Away from the few major rivers with permanent surface pools or shallow groundwater, vegetation is relatively sparse. The project area is lightly vegetated, with a ubiquitous ground cover of Spinifex grass and scattered shrubs of Hakea, Acacia and Grevillia. Larger trees, including Eucalyptus and Melaleuca species, are confined to the immediate vicinity of drainage lines.

5.3. CLIMATE

The East Pilbara region has an arid continental climate characterised by very high summer temperatures and large daytime temperature variations (>13.2°C) throughout the year. December and January are the hottest months with average maximum temperatures above 40°C and record highs over 48°C. From October to February the average monthly maximum temperature exceeds 36°C. Maximum temperatures above normal body temperature occurs for 6 months of the year. The lowest temperatures occur in the winter months between June and August when average maximum temperatures are below 30°C and average minimum temperatures are 12 to 13°C.

The East Pilbara region is influenced by both northern (tropical cyclone) and southern (temperate) rainfall systems, which bring rains in the summer and winter months, respectively. However, rainfall in the region is generally light and infrequent. Nullagine has an average annual rainfall of 357 mm, mostly falling between January and March. Little rain usually falls between July and November, with September and October the driest months. Except for a few isolated pools, creeks are generally dry throughout most of the year, but can rise rapidly and flood large areas after heavy rains (predominantly during the summer months). Because a high proportion of the rainfall can be from a small number of large storms, flooding near major river and creek systems is not unusual. The Nullagine River is subject to flooding, and the town of Nullagine is located in a Floodplain Management Area.

Considering the remote nature of the project area, field work is generally conducted between late autumn and early spring (April–September), when temperatures and the likelihood of heavy rains are both lowest.

5.4. LOCAL RESOURCES AND INFRASTRUCTURE

Existing infrastructure in Nullagine (e.g., airstrips, medical centres, shops and accommodation) is sufficient to support a mining operation.

NBN Internet access is available onsite. Telephonic communications are currently restricted to the Telstra 4G Mobile network or a satellite phone. Nullagine’s three-megawatt diesel-solar power plant is conveniently situated on M46/9. This plant currently has excess capacity as well as potential to expand by adding a one-megawatt diesel generator.

The Beatons Creek Project has appropriate sites to accommodate mining and waste rock disposal.

A component of workforce requirements could be filled from either Newman or Port Hedland and other nearby towns and supplemented by fly-in/fly-out arrangements from Perth via Newman or Port Hedland.

6. HISTORY

Gold was first discovered in the East Pilbara in 1888 and the township of Nullagine was established in the following year. In common with the rest of the Pilbara, gold mining within the area flourished in the early part of the century, but subsequently declined in importance. Over the last 20 years, much of Australia's manganese production has come from mining centres in the eastern part of the area.

6.1. OWNERSHIP HISTORY

Various operators have conducted work on the Beatons Creek Gold Project since the 1960s (Table 6.1), but limited information pertaining to tenement and land acquisition deal structures are available for this period. Novo activities for development of the Beatons Creek Project from 2011 to 2015 have been described in previous technical reports (TetraTech, 2015; 2018).

Currently, Novo controls mineral rights held by 16 tenements which cover 159.7 km^2, including four Mining Lease Licenses, one Exploration license and 11 Prospecting Licenses. Novo has commitments for annual expenditures of A$293,200 in addition to rental obligations for A$50,465 to hold the Licenses in good standing. Table 4.1 shows Novo's valid tenements.

Table 6.1 Summary of past exploration relevant at Beatons Creek

Year	Activity	Company
1968 to 1982	Various uranium (± gold) exploration programs in Fortescue Group, Nullagine sub-basin.	Cominco Exploration, Esso Australia, Essex Minerals, Otter Exploration–Marathon Petroleum
1968 to 1974	Uranium exploration in Hardey Formation, central Nullagine Sub-basin. Program included airborne and ground radiometrics, and follow-up drilling (14 DDH for 1,851 m).	Cominco Exploration Pty Ltd (Simpson, 1969)
1974	Uranium exploration in Hardey Fm, central Nullagine Sub-basin. Program included airborne and ground radiometrics, and follow-up shallow percussion drilling (11 holes (depths <120 m) for 1,291 m).	Esso Australia Ltd (Harrison, 1974)
1978 to 1981	Uranium exploration in Hardey Fm, central Nullagine Sub-basin. Program included 23 core and percussion holes for 1,887 m).	Essex Minerals Co (Wilson, 1979); Otter Exploration NL / Marathon Petroleum Australia
1983 to 1985	Strip mining and treatment of colluvial and alluvial deposits adjacent to hard-rock conglomerate-hosted gold deposits at Beatons Creek. Exploration of Beatons Creek conglomerate involved geological mapping, sampling, diamond and RC drilling.	Metana Minerals NL
1983	Beatons Creek drilling - WW series (DDH): 2 holes, 150 & 1,066 m on M46/11.	Metana Minerals NL
1984 to 1985	Beatons Creek drilling: CDH-series (DDH): 9 holes totalling 350 m on M46/11.	Metana Minerals NL
1984	Beatons Creek: B-series (RC): 77 holes, 17-38 m, total 1,982 m on M46/11.	Metana Minerals NL
1984	District-scale geological mapping (T.S. Blake) and two diamond drill holes (total 1,019 m) in Hardey Formation W and SW of Nullagine.	AMB-JV (Australis Mining/Bass Strait Oil & Gas)

Year	Activity	Company
1984	Two DDH (total 592 m) test subsurface continuity of auriferous package beneath upper Hardey Fm cover, 1 km SW of Beatons Creek historic workings.	Ivanhoe Gold
1984	Surface & down-hole (DDH IN2) IP.	Scintrex (for Ivanhoe Gold)
1984	Single 549 m DDH, 7 km SW of Nullagine.	South Eastern Petroleum NL /Zanex Ltd / Western Resource Projects NL
1985 to 1990	Geological mapping and data compilation, trenches, shallow RAB drilling at Beatons Creek.	Sons of Gwalia
1986	Two DDH (total 1,200 m) as follow-up earlier Ivanhoe drill holes.	Minsaco (JV with Ivanhoe Gold)
1987 to 1988	Short-lived continuation of alluvial gold mining operations at Beatons Creek.	Black Horse Mining
1992 to 1993	Single 161.5 m inclined RC/DDH in lower Kylena Basalt, upper Hardey Formation.	Alkane
1993	Diamond (±gold) exploration western limb of Nullagine syncline.	Ocean Resources
2001 to 2010	Creasy Group tenements comprising Nullagine Project area staked.	Creasy Group
2001	Wedgetail acquire significant package of tenements in Nullagine area previously held under option.	Wedgetail Exploration
2001	Beatons Creek workings, COM-series RAB holes: 21 by 20 m RAB holes on M46/9.	Wedgetail Exploration
2002	Geological compilation, soil sampling on M46/10-11.	Wedgetail Exploration/Mining
2006	Prospecting / rock sampling at Beatons Creek.	Newmont
2006	Beatons Creek (M46/10, 11) soil sampling.	Wedgetail Exploration/Mining
2006 to 2007	Beatons Creek (M46/11) RC check drilling, 20 hole BCRB0001 – BCRC0020.	Wedgetail Exploration/Mining
2007	Beatons Creek (M46/11) RAB scout drilling: 173 holes, depths 5 to 40 m, TD 5 to 10 m below base of oxidation.	Wedgetail Exploration/Mining
2010	In-loop EM surveys on Creasy ground. Four lines (total 14.9 km) across eastern margin of sub-basin.	Galliard Resources
2010	Millennium Minerals (formerly Wedgetail Mining) announce 25% increase in reserve for Nullagine Gold Project (Late Archaean Mosquito Creek Belt, immediately east of Nullagine Project area).	Millennium Minerals
2011	MOU for Galliard 70% interest in Creasy Group tenements comprising the Nullagine Project area.	Creasy Group
2011	Novo Resources (formerly Galliard Resources) / Millennium Minerals announce binding letter agreement providing Galliard with exclusive right to earn 70% interest (as to gold and minerals associated with gold) in Beatons Creek Mining Leases 46/9, 46/10 and 46/11.	Millennium
2015	Novo Resources announces purchase of 100% interest in the Beatons Creek Mining leases 46/9, 46/10 and 46/11 from Millennium Minerals.	Novo Resources / Millennium

6.2. EXPLORATION HISTORY

Alluvial gold was first discovered in Nullagine in 1888, and by 1893 Nullagine had become the principal alluvial gold field in the region. A hard-rock source for alluvial deposits at Nullagine was identified in 1888, while the township was formerly declared in 1889.

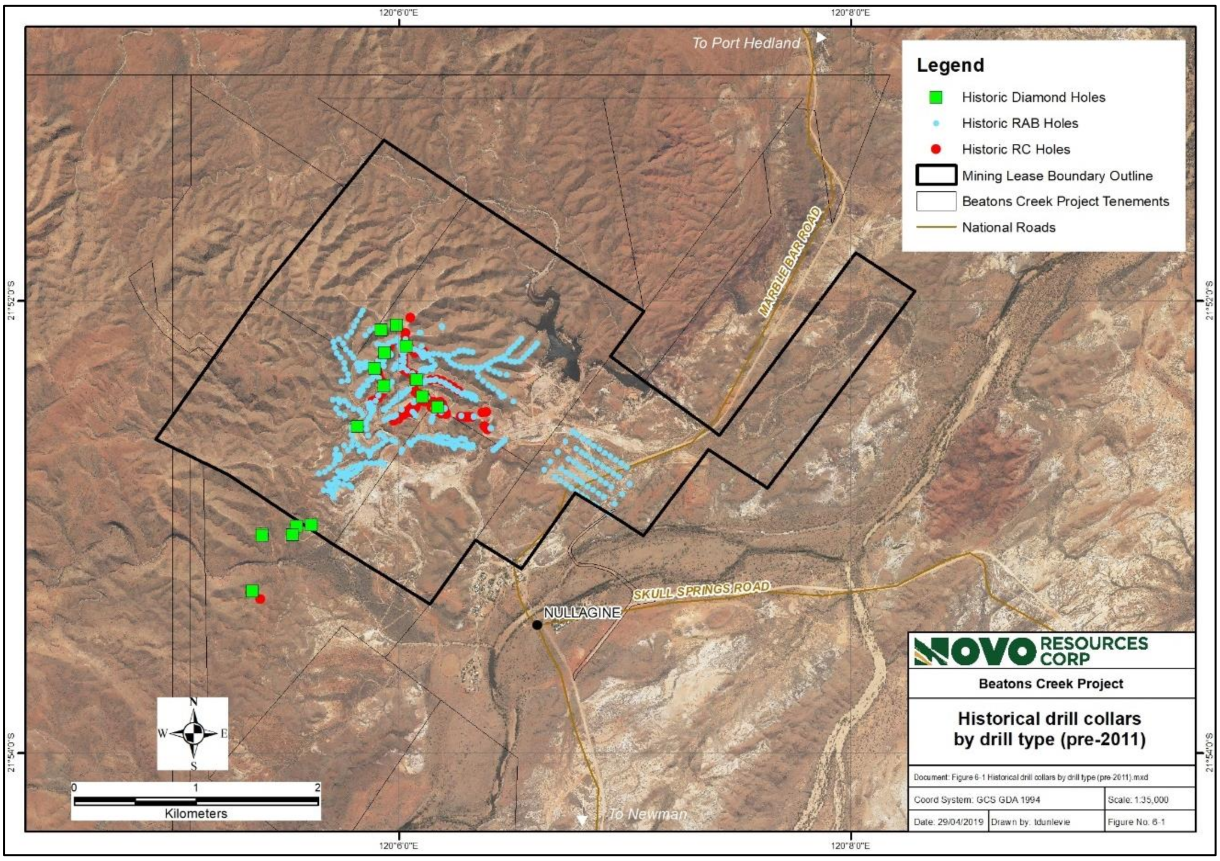
The mineral potential of the Pilbara Craton has in recent history been generally downplayed and, as a result, the region has been much less extensively explored than many other Archaean cratons throughout the world, including South Africa, Canada, Brazil and the Yilgarn Craton to the south.

Since 1983, exploration activities have largely concentrated on the Nullagine sub-basin, principally in the immediate area of the Beatons Creek goldfield near Nullagine. Several deeper diamond holes were drilled in adjacent parts of the Nullagine sub-basin during the mid-1980s.

6.2.1. PREVIOUS EXPLORATION IN THE BEATONS CREEK PROJECT AREA

Although the major focus of Fortescue Group was uranium exploration between 1968 and 1982, with sporadic gold and diamond exploration subsequently, the Nullagine sub-basin also remains under-explored. A chronological summary of significant past exploration activities at Beatons Creek is presented in Table 6.1. Figure 6.1 shows historical drill collars by drill type (RC, DD and RAB), drilled prior to Novo's evaluation of the project.

Figure 6.1 Historical drill collars by drill type (pre-2011)

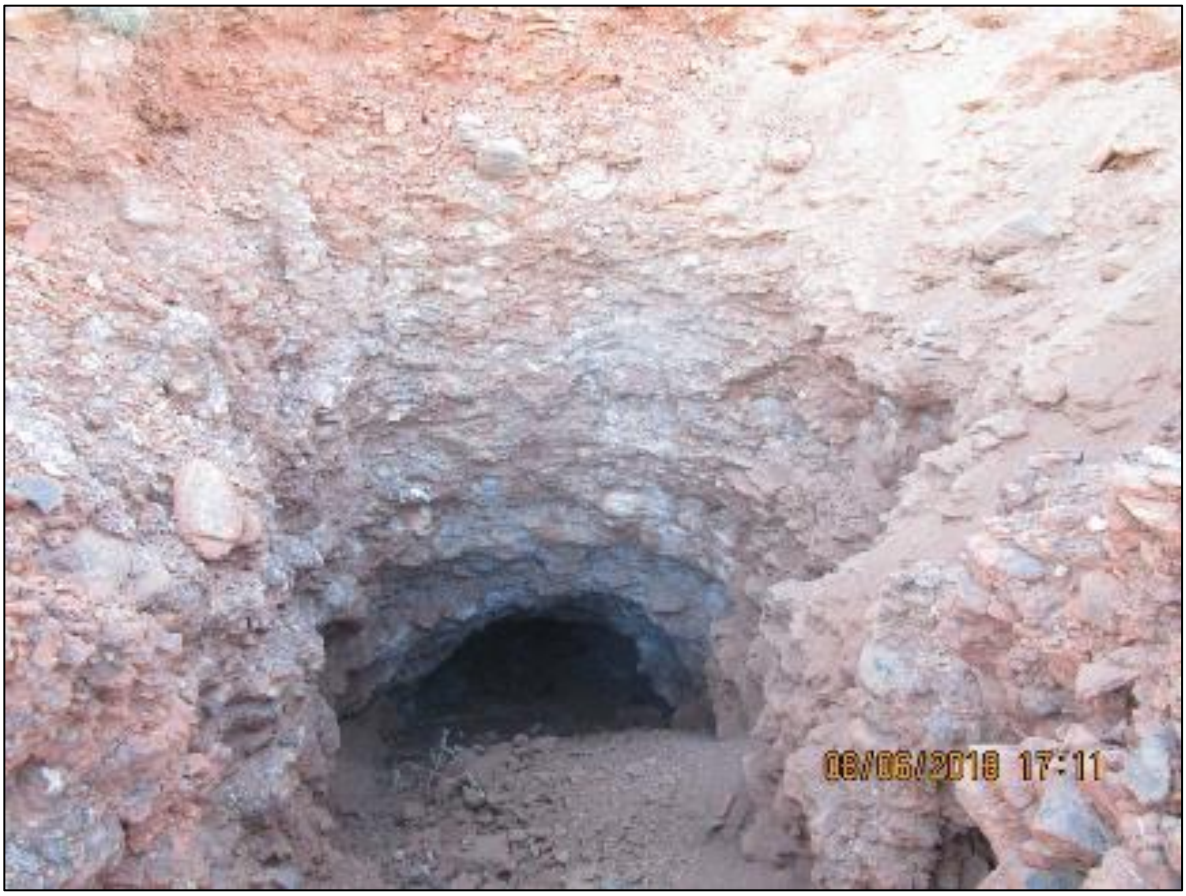


6.2.2. HISTORICAL PRODUCTION FOR THE BEATONS CREEK AREA

There are no official records of gold production at the Beatons Creek Project prior to the establishment of the Western Australian Mines Department in 1897 (Maitland, 1919), and individual accounts of official production post-1897 also vary. Most estimates suggest total production was <10,000 t of material for <4,000 oz gold at average grades of 15 to 20 g/t gold (Maitland, 1919).

Post-1897 production records indicate abrupt decreases in grade within the first few years of operation at most of the mines. Although local rich pockets of mineralisation were mined between 1907 and 1912, organised mining at the Beatons Creek Project had largely ceased by 1904 (Maitland, 1919). Most of the historic adits at the Beatons Creek Project area are only about 1 m high (Figure 6.2).

Figure 6.2 Historical mine working No. 198



7. GEOLOGICAL SETTING AND MINERALISATION

The Beatons Creek Project is located in the Pilbara region in north-west Western Australia. The ~3.65 to 2.85 Ga Pilbara Craton is an example of a granite-greenstone-terrane, with ovoid to circular composite granitoid complexes separated by synformal, enveloping greenstone packages in the east and more linear granitoid-greenstone belts in the west. The region comprises two main tectonostratigraphic components: an older 'basement' of granite-greenstone terrane, formed between about 3.65 and 2.9 Ga, unconformably overlain by a supracrustal sequence, the Mount Bruce Supergroup, laid down between about 2.8 and 2.3 Ga in the Hamersley Basin.

From oldest to youngest these sequences are:

- George Creek Group (3.24 to 3.05 Ga)
- Cleaverville Formation (3.02 Ga)
- De Grey Group (2.99 to 2.94 Ga)
- Hamersley Basin succession (Mt Bruce Supergroup) (2.78 to 2.3 Ga).

The basement lithostratigraphy of the East Pilbara granite-greenstone terrane is formed of moderately to strongly deformed mafic volcanic and intercalated felsic volcanic and sedimentary rocks. These rocks occupy a series of arcuate synclinoria belts between less-deformed complexes of granitoids. The surrounding granite batholiths range in size between 25 to 110 km in diameter and were largely emplaced prior to 2.92 Ga. Some were subsequently intruded by small, highly reduced, post-tectonic, tin-bearing granites between 2.88 and 2.84 Ga.

A number of gold mineralising events have emplaced numerous deposits in various settings in the basement granite-greenstone terrain. These gold sources have long been considered a likely source for auriferous placer deposits hosted in the Fortescue Group near Nullagine (Maitland, 1919; Finucane, 1935; Noldart and Wyatt, 1962; Hickman, 1983; Thorne and Trendall, 2001).

Fortescue Group and overlying Hamersley groups (Figure 7.1, Figure 7.2 and Figure 7.3) form the Mt Bruce Supergroup; a sequence of mafic and felsic volcanics and sedimentary rocks up to 6.5 km thick (Thorne and Trendall, 2001; Blake, 1993, 2001) and exposed over a wide area in the Pilbara Craton.

Thorne and Trendall (2001), divide the Fortescue Group into four major depositional sequences. The entire succession is interpreted to reflect increasing amounts of subsidence in an overall extensional setting. These four units are summarised as follows:

- Unit 1 (basal) – Consists primarily of the ≤2.5 km thick Mount Roe Basalt which consists of sub-aerial and sub-aqueous (<2%) basaltic lavas and locally intercalated sub-aqueous volcaniclastics (<5%). Sub-aqueous units in the Mount Roe Basalt are interpreted to have been deposited in a lacustrine, rather than marine, setting (Thorne and Trendall, 2001). Widespread north-northeast trending medium- to coarse-grained, dolerite and gabbro mafic dykes of the Black Range Suite in the East Pilbara terrane, are interpreted feeders to the Mount Roe Basalt (Williams, 1998; Thorne and Trendall, 2001).
- Unit 2 – Primarily the Hardey Formation, which unconformably overlies Unit 1 and is up to 3 km thick, and consists of a diverse association of sedimentary, mafic and felsic

volcanic rocks (and high-level intrusions), which were deposited in continental to shallow-marine settings. This unit hosts the gold mineralisation at Nullagine and Marble Bar.

- Unit 3 consists of the basal Kylena (sub-aerial basalt), Tumbiana (marginal to shallow marine sedimentary rocks), and uppermost Maddina (sub-aerial basalt) formations. Although deposited in a largely sub-aerial environment, Unit 3 marks a widespread coalescence of individual sub-basins across the Pilbara craton (Thorne and Trendall, 2001). Where the Fortescue Group directly overlies granitic basement, the Kylena (Basalt) Formation, which is typically the lowermost unit (Figure 7.1; Hickman, 1983; Thorne and Trendall, 2001).
- Unit 4 – The Jeerinah Formation marked the onset of a major marine transgression across the Hamersley Basin (which continued into deposition of the overlying Hamersley Group). In the north Pilbara Craton, the Jeerinah Formation predominantly consists of argillaceous rocks; however, basaltic lavas and volcaniclastic rocks dominate in the south. The Fortescue Group is disconformable overlain by marine sedimentary sequences (shale, banded iron formation and carbonate) of the 2.6 to 2.3 Ga Hamersley Group (Figure 7-1 and Figure 7.2).

Figure 7.1 Geological map of the Hamersley Basin showing the burial metamorphism zones of Smith et al (1982). Zone 1 – prehnite-pumpelyite zone, Zone 2 – prehnite-pumpellyite-epidote zone, Zone 3 – prehnite-pumpellyite-epidote-actinolite zone; Zone 4 – actinolite zone

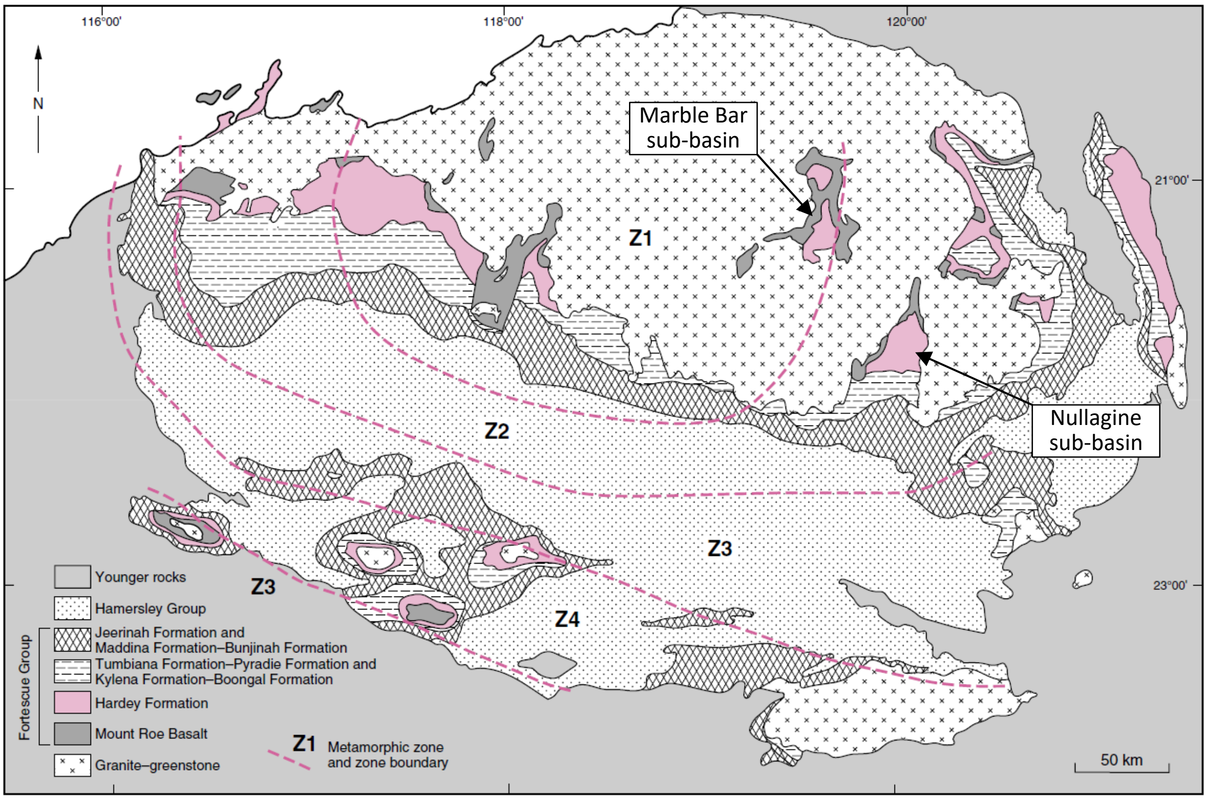


Figure 7.2 Comparison between Hamersley Basin and Witwatersrand Basin tectono-stratigraphy (after Nelson et al., 1992, 1999; Martin et al., 1998; Thorne and Trendall, 2001)

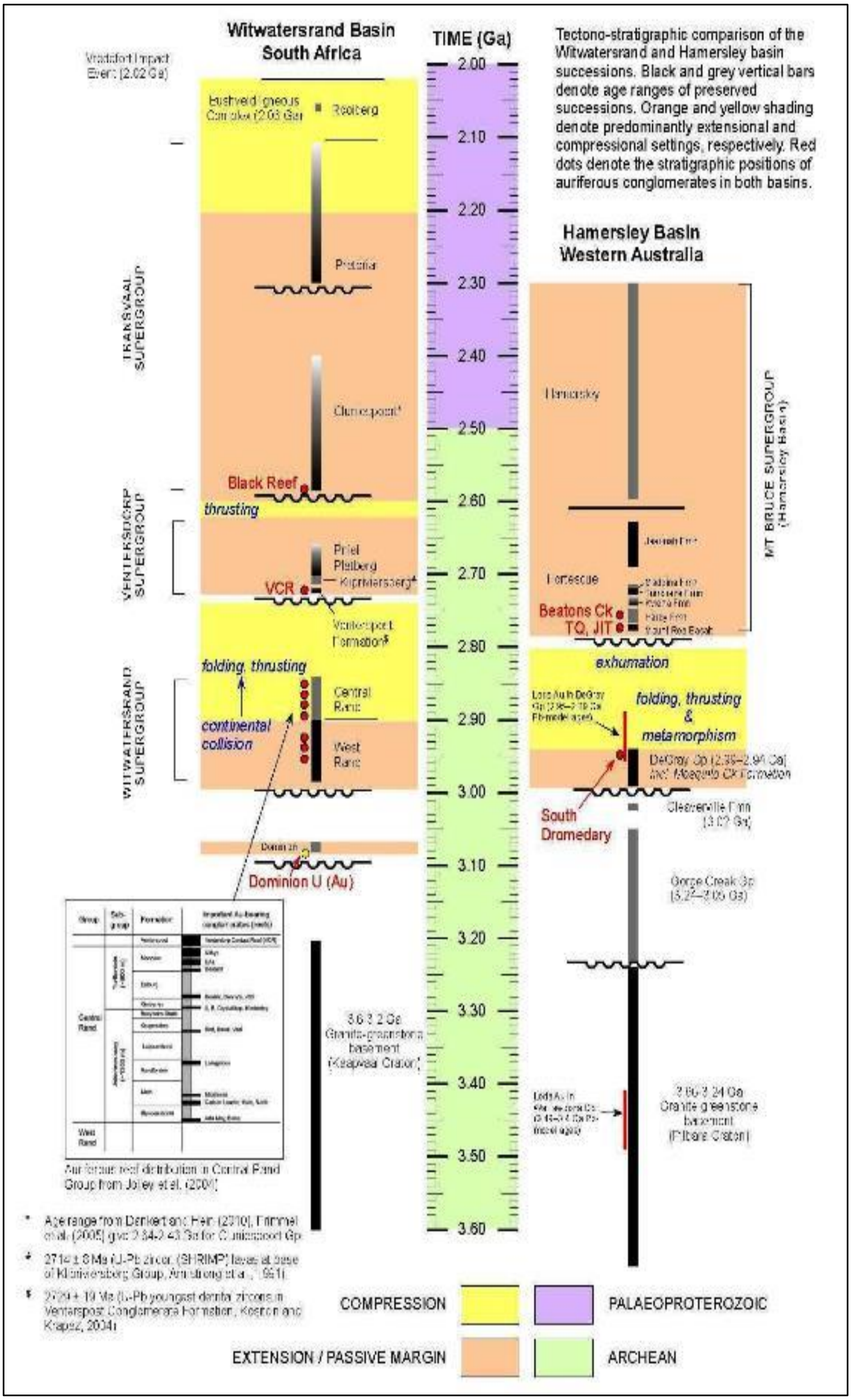
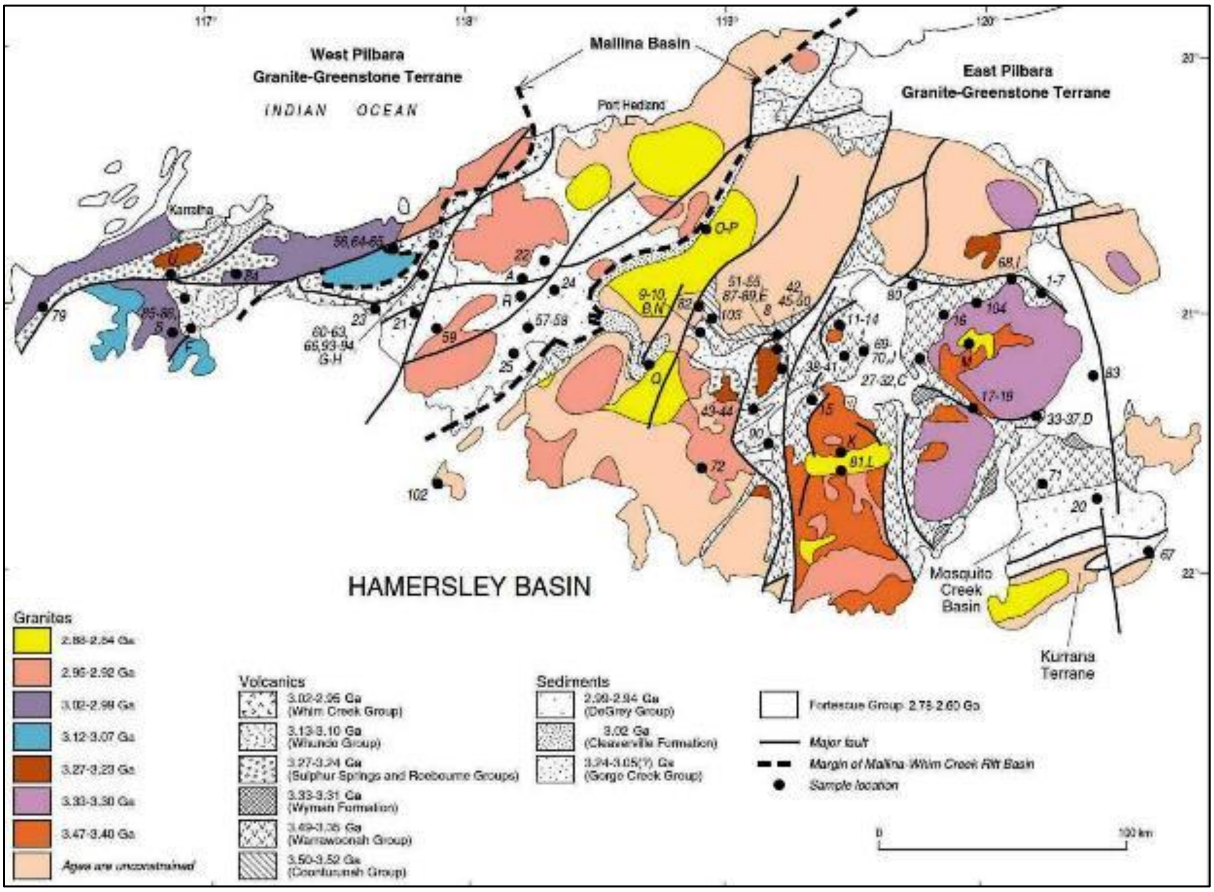


Figure 7.3 Summary map showing the age and distribution of the granites, greenstone successions and sedimentary basins in the north Pilbara Craton (From Huston et al., 2002a)



7.1.1. REGIONAL STRUCTURE AND METAMORPHISM

The Pilbara Craton is one of the best preserved and least dismembered Archaean terrains in the world. Nonetheless, it had a complex structural evolution involving at least 13 deformation events between ±3.46 Ga and 2.75 Ga (Huston et al., 2001, 2002a). In the north Pilbara Craton, the Fortescue Group basin fill has only undergone minor deformation and low-grade metamorphism (Figure 7.1).

In the Beatons Creek Project area, the Fortescue Group is gently folded by two generations of folds and cut by a complex array of mostly small displacement normal faults (Blake, 2001). Fortescue Group strata generally dip at <20°, although steeper dips (up to ~45°) occur locally along the eastern margin of the Nullagine sub-basin (Farrell and Blake, 1984). In the Nullagine sub-basin assemblages reach prehnite–pumpellyite–epidote facies (Figure 7.1). These assemblages indicate maximum temperatures <300°C (Smith et al., 1982; Thorne and Trendall, 2001).

7.1.2. LOCAL GEOLOGY

The Nullagine sub-basin or Nullagine Synclinorium is a >60 km long, north-northeast trending half-graben formed in response to west-northwest-east-southeast directed extension during the initial stages of continental break-up (Blake, 1984a, b, 1993; Farrell and Blake, 1984; Carter and Gee, 1988; Blake, 2001, Blake et al., 2004). Widespread mafic dykes of the Black Range Suite (interpreted feeders to the Mount Roe Basalt) mostly trend north-northeast also implying west-northwest-east-southeast directed extension during lower Fortescue Group deposition (Williams, 1998; Thorne and Trendall, 2001; Blake, 2001; Blake et al., 2004). The Nullagine sub-basin opens into the Hamersley Basin to the south and is partly bound by syn-depositional normal faults along its eastern margin (Farrell and Blake, 1984, Blake, 1993). Progressively younger Fortescue Group strata on-lap basement rocks towards the south (Farrell and Blake, 1984; Blake 1984a, 1993, 2001).

The Fortescue Group unconformably overlies a wide variety of older Archaean rocks around the perimeter to the Nullagine sub-basin (Figure 7.3). Along much of the northeast margin to the sub-basin the Fortescue Group unconformably overlies the Mosquito Creek Formation, which occupies a 30 km by 65 km ENE trending belt east of the town of Nullagine.

The Mosquito Creek Formation correlates with the De Grey group and is interpreted to extend for at least 20 km beneath the Fortescue Group cover. The Mosquito Creek Formation is host to numerous small to moderate sized disseminated, vein- and shear-hosted mesothermal gold deposits, interpreted to have formed at ca. 2.90 Ga (Figure 7.3, Pb/Pb model age, Huston et al., 2002a).

The basal unit of the Fortescue Group, the Mount Roe Basalt, is discontinuously exposed in the north, and along the north western margin of the Nullagine sub-basin, where it is up to 50 m thick (Hickman, 1979; Blake, 2001). Although the Mount Roe Basalt is not exposed at surface in the project area (Figure 7.4), it may occur locally at depth beneath the Hardey Formation cover.

In the Nullagine sub-basin, the Hardey Formation either unconformably overlies the Mount Roe Basalt or older Archaean basement, and consists of up to 1,700 m of mostly terrigenous clastic sedimentary rocks deposited in braided fluvial, lacustrine and alluvial fan settings (Blake, 1993; Blake et al., 2004). In the north of the project area, the base of the Hardey Formation is intruded by the up to 1,500 m thick, 2,766 ±2 Ma dacitic Spinaway Porphyry (Blake et al., 2004). The upper contact of the Spinaway Porphyry is erosional; however, the Hardey Formation sandstones immediately above this contact are intruded by rhyolite of identical age to the Spinaway Porphyry indicating the time-break across the unconformity was small (Blake et al., 2004).

Blake (2001) subdivides the Hardey Formation above the Spinaway Porphyry in the Nullagine sub-basin into two unconformable packages, P3 and P4 (Figure 7.5). Auriferous conglomerates exposed in the Beatons Creek area near Nullagine occur in Package P4 of the Fortescue Group (Blake, 2001; Blake et al., 2004, i.e., Taylor Creek Sequence Unit 3b), not at the base of the Hardey Formation as stated in some earlier Mines Department and Geological Survey reports (e.g. Hickman, 1983). A felsic tuff near the base of a relatively well-stratified sequence immediately overlying the auriferous conglomerates (±300 m below the top of P4) is dated 2752 ±5 Ma (U-Pb zircon, Blake et al., 2004) and provides a minimum age constraint on their formation.

Figure 7.4 Geology map for the Beatons Creek Project area

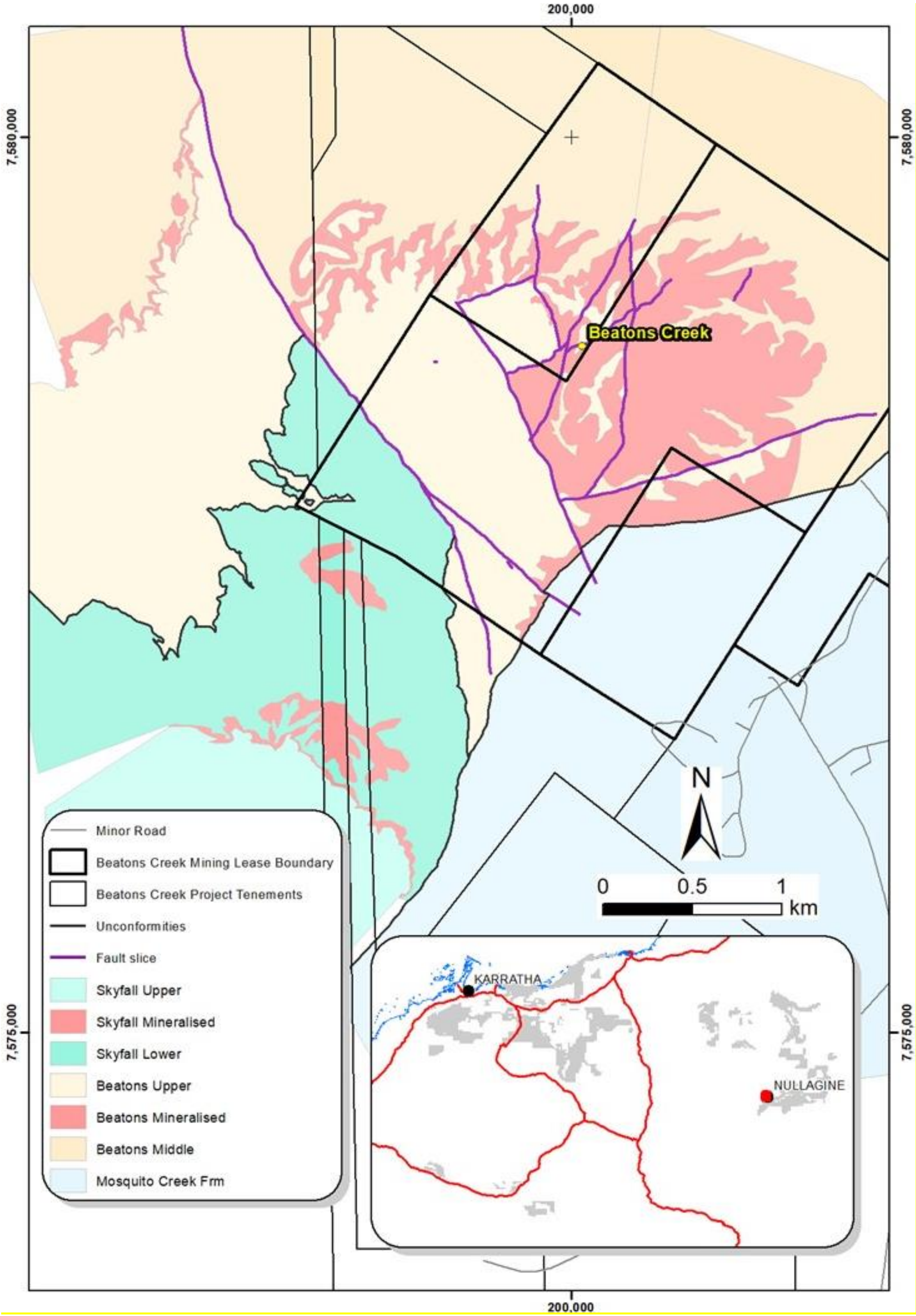
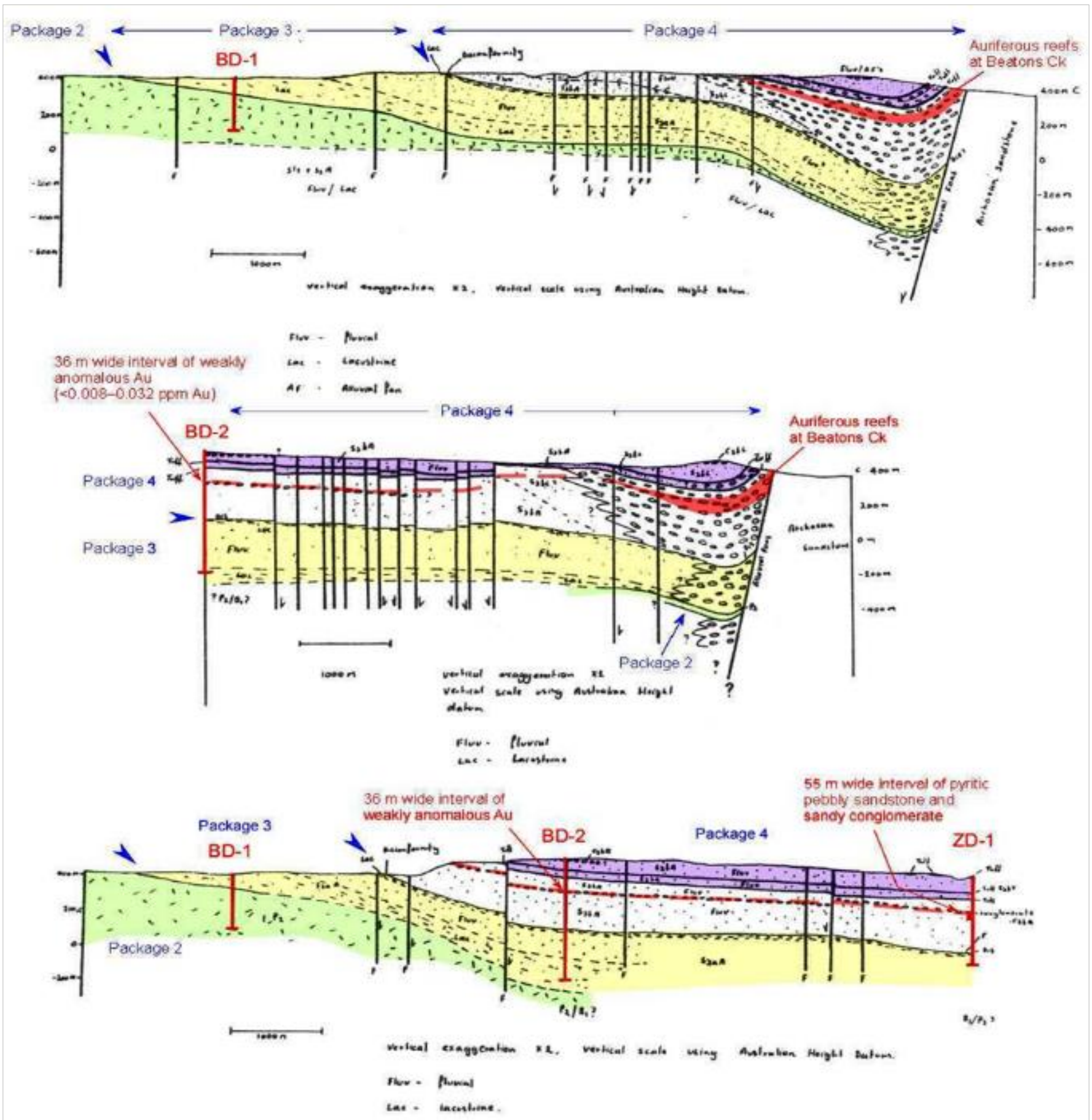


Figure 7.5 Interpretive cross-sections by T.S. Blake (ca. 1984) near the eastern margin of the Nullagine sub basin. Subdivision P3 in yellow, and P4 (including auriferous zone) in white and red. Based on correlation of sequences in DDH BD-1, BD-2, BD-3 and ZD-1



7.1.3. PROPERTY GEOLOGY

Diamond drilling during the 2018 field season confirmed the Nullagine sub-basin subdivision of the Hardey Formation by Blake (2001). Mineralisation is restricted to a ~200 m sequence of poorly-stratified, poorly-sorted, polymictic, pebble-to-boulder ferruginous conglomerate sequence (P4), which is restricted to an area within a few kilometres of Nullagine (Figure 7.4). The underlying sequence (P3) is of similar composition, but generally finer and including sandstone beds and minor tuffs. The overlying sequence was not separated by Blake and resembles the lower sequence (P3). These beds are characterised by a more regular sediment input and range between sandstone to pebble-conglomerates with a number of extensive tuff horizons.

Recognition of the cyclical deposition of the 'Beatons Creek Member' (Blake 2001) allowed for a more detailed stratigraphy to be defined. Detailed logging of drill core and downhole wireline data, and mapping has recognised various depositional cycles and their sub-units, with an updated mine sequence stratigraphy now recognising the following packages (Table 7.1). Exploration mapping has further added to the overlying 'Skyfall' sequence, with additional overlying and prospective cyclical depositional sequences yet to be mapped in detail. All additional sequences yet identified contain a comparable 'mineralised unit' of polymictic cobble to boulder conglomerate and elevated pyrite. In Skyfall, continuous marine lags have also been recognised, with a small section part of the current Resource estimate.

Table 7.1 Mine stratigraphy as defined by diamond drilling

Code	Unit Name	Description
SU	Skyfall Upper	Sandstones and pebble to cobble conglomerate. Contains tuffs and minor granulestone beds
SX	Skyfall Mineralised Unit	Cobble conglomerate with occasional Boulders. Hosts to lag horizons (marine reworking). Low level disseminated pyrite with occurrences of 'buckshot pyrite' concentrations
SL	Skyfall Lower	Sandstones, including hummocky cross beds, coarsening upwards to pebble to cobble conglomerate.
BU	Beatons Upper	Sandstones and pebble to cobble conglomerate. Contains tuffs and minor granulestone beds
BX	Beatons Mineralised Unit	Cobble conglomerate with occasional Boulders. Hosts to mineralised or unmineralised lag horizons (marine reworking). Low level disseminated pyrite with occurrences of 'buckshot pyrite' concentrations
BM	Beatons Middle	Pebble to cobble conglomerate with occasional boulders. Low level disseminated pyrite with minor occurrences of (channelised) concentrations of pyrite
BL	Beatons Lower	Granulestone and local beds of angular felsic clasts constrained proximal to the Mosquito Creek contact. Minor channelised concentrations of pyrite

The Beatons Upper unit represents a relatively lower depositional energy level and contains sandstones, granulestones and pebble conglomerates. Minor cobble conglomerates show an occasional increase in energy and likely represent more channelised basin fill. Individual beds are extensive. A number of tuff horizons (1 m to 5 m in thickness) are easily recognisable in outcrop, drill core, geochemistry, and downhole televiewer data and form marker beds.

The Beatons Mineralised unit and Beatons Middle unit share similar characteristics, and match with Blake's P4 unit. This forms the ~200 m thick package comprised of a monotonous sequence of pebble-to-boulder conglomerate with occasional thin interbeds of sandstone. Conglomerate clasts comprise sandstone, siltstone, quartz and dromedary boulders-conglomerates in their own right and resembling the Dromedary Hills Mosquito Creek conglomerate unit towards the east. Additional minor clasts of chert, possible stromatolites and 'mineralised clasts' are also evident.

Regular 0.5 m to 2 m thick horizons show cobble to boulder conglomerates with increased resistive clasts and increased pyrite and represent fluvial channels (proximal to the depositional fan) or zones of marine reworking. Gold-bearing ferruginous conglomerates are restricted to these channels or marine lags and generally constrained to the 40 m thick Mineralised Unit at the top of the sequence.

Fluvial type conglomerates and marine lags generally have a clearly defined top and base and represent a higher energy environment conducive to concentrating gold, as well as detrital pyrite and resistive clasts.

The Beatons Lower unit is locally extensive but forms a marked change from the Beatons Middle unit. The Lower unit is characterised by angular and poorly sorted felsic clasts and are likely a local feature derived from a local source. The Mosquito Creek Formation has a number of intrusive felsic units, which is likely what caused a local influx of this material.

More distal historical diamond holes show a general lower energy package of sandstones and conglomerates below the Middle unit. Due to the depth to reach this unit and the limited potential for mineralisation, further detail of the deeper sequences is not known.

7.2. PROPERTY MINERALISATION

Gold mineralisation within the Beatons Creek conglomerates occurs as fine grains, larger flakes, and rounded particles up to several millimetres across, but rarely exceeding 2 mm. Coarse and fine gold is spatially related to higher concentrations of pyrite, and there seems to be a correlation with gold and the 'buckshot pyrite' clast size. Coarse gold particles are regularly visible (circled by blue marker in Figure 7.6 and in core in Figure 7.7), and fine gold can readily be panned from crushed matrix material with large pyrite concentrations.

Figure 7.6 Gold particles shown within blue circles amongst buckshot pyrite (black dots) from a ferruginous channel conglomerate (South Hill area)

Figure 7.7 Gold in drill core (left: BCDD18-002, 60.8 to 61.3 m, 7.3 g/t gold and right, BCDD18-001, 6.12 to 6.6 m, 4.3 g/t gold)

Mineralisation is restricted to fluvial type channel conglomerates or marine lag reworked conglomerates and readily recognisable from outcrop and drill core. The wider Beatons Mineralised unit and Beatons Middle unit contain minor disseminated pyrite, but the background mineralisation is generally no more than 0.1 g/t gold.

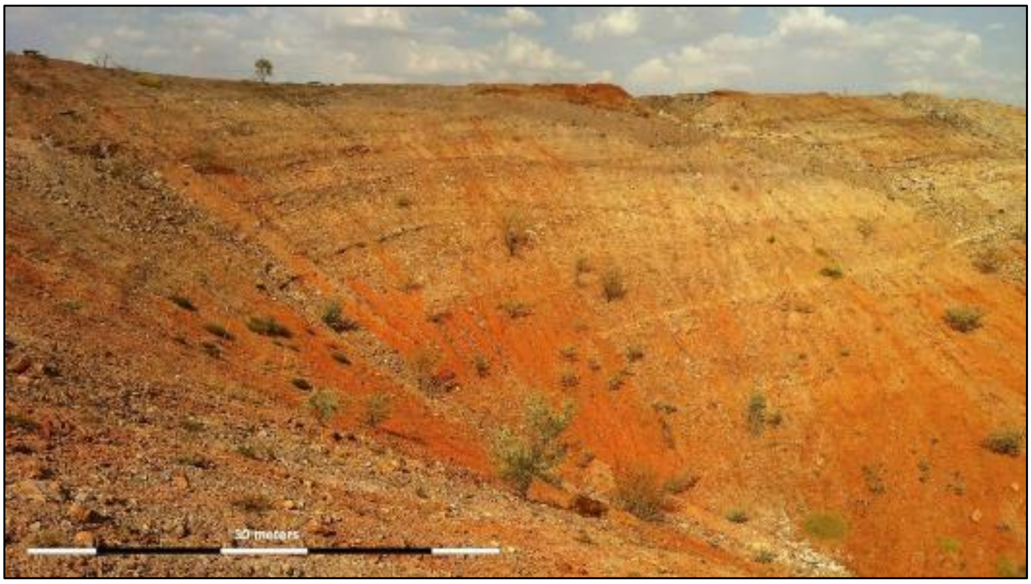
7.2.1. CHANNEL MINERALISATION

Fluvial type channel conglomerates are typically clast-supported, heterolithic, pebble-to-cobble conglomerate with occasional boulders (Figure 7.8). Imbrication of clasts is commonly evident indicating a general north to northwest flow direction in the project area, and trough cross bedding and channels are commonly evident, suggesting a braided river environment (Figure 7.9).

Individual channels are often ~50 m across and can be traced over hundreds of metres. Thickness varies between 0.5 m to several metres. Clasts are dominantly sandstone, conglomerate, siltstone and shale likely locally derived from the nearby Mosquito Creek formation (+70%), and clasts of several types of metamorphic rocks and granite derived from the basement are less common (<10%), but ubiquitous. White and grey vein clasts are also ubiquitous making up around 10% to 20% of the clast population; sand and silt dominate the matrix and spotty clusters of detrital pyrite (up to 1 cm diameter); as well as fine (<1 mm) rounded and box-work pyrite are common in matrix material, up to 10% of the rock.

Figure 7.8 Fluvial type conglomerate exposed in 2018 bulk sampling program (thickness c. 1.8 m)

Figure 7.9 Channel trough cross-bedding in a sequence of fluvial type conglomerates on the southern margin of Golden Crown



7.2.2. MARINE LAG MINERALISATION

Marine Lag (sometimes referred to as 'armoured lags') are typically tightly packed, clast supported cobble-to-boulder conglomerate (Figure 7.10 and Figure 7.11). Individual boulders can exceed 1 m diameter and comprise a heterolytic composition, but are dominated by hard, resistant, siliceous dromedary boulders, vein quartz and chert. Sandstone and locally derived shale clasts are less common in marine lags and commonly tucked between or under larger siliceous boulders. Imbrication is rare and individual beds are 0.3 m to 1.5 m thick and sheet-like, being continuous over hundreds of metres with the main two marine lags continuous over 2.5 km. Sand and silt flakes of yellow shale comprise the matrix, with ubiquitous and abundant detrital pyrite (up to 3 cm diameter) common in matrix material and can comprise up to 20% of the rock (Figure 7.12).

Figure 7.10 Tightly packed armoured lag type ferruginous conglomerate with quartz boulders (M1 - Edwards Lease)

Figure 7.11 Armoured lag type conglomerate comprising elongated quartz boulders (M1 – Golden Crown)

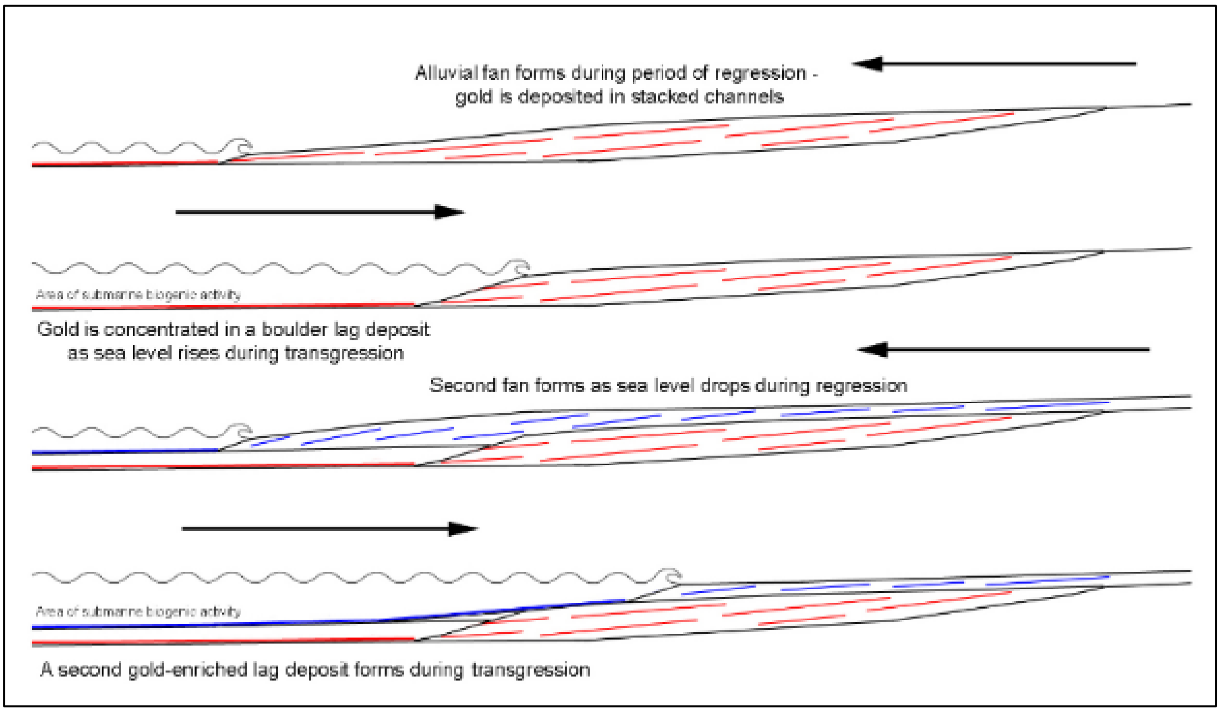
Figure 7.12 Detrital pyrite and dromedary boulder (bottom right) in 2018 PQ drill fresh mineralised core (85 mm diameter)

8. DEPOSIT TYPE

Both fluvial and marine lag-type conglomerates are interstratified, indicating the depositional facies in which they formed were laterally proximal. The depositional environment for these conglomerates is interpreted to have been a river fan delta along a coastline as shown in Figure 8.1. During periods of low-stand, a braided river delta prograde seaward, depositing channelised fluvial type conglomerates.

As sea levels rose, wave action winnowed out fine, light sediment leaving behind a transgressive armoured lag deposit of large siliceous boulders and heavy minerals including gold. It is in this environment that the economic conglomerates at the Beatons Creek Project likely formed. This process repeated several times to create the interbedded conglomerates exposed currently (Figure 8.1).

Figure 8.1 Sequence of two regressive and transgressive tracks from top to bottom



The Palaeoplacer deposition model employed by Novo for the Beatons Creek Project is based predominantly on detrital gold sourced from the nearby Mosquito Creek Formation and deposited locally. Mineralisation is further concentrated by reworking an already endowed sequence of conglomerates by marine processes as described above.

Similarities with other conglomerate hosted deposits of similar age lends credence to the mineralisation model used. The presence of significant concentrations of rounded detrital pyrite was also a factor in reef and model identification, with the best exploration success primarily driven by understanding the sedimentary processes and their effect on concentrating gold. A clear correlation between high depositional energy (in channels) and amount of reworking (for marine lags) and gold content allows for a fairly straightforward depositional model to be successfully employed.

Some comparable conglomerate hosted deposits debate around potential hydrothermal mineralisation either as the sole mineralising event or as an overprint (Phillips and Meyers, 1989; Phillips and Law, 1994; Barnicoat et al., 1997). Despite local remobilisation of pyrite (and potentially gold) within the matrix, possibly due to dewatering during burial or low level metamorphism, no evidence of hydrothermal overprinting has been documented at Beatons Creek or elsewhere in the Pilbara.

Other debate around organic or microbially-mediated syn-sedimentary gold precipitation (or entrapment) (Hallbauer, 1975a,b; Mossman et al., 2008) is likely of less relevance at the Beatons Creek Project due to the limited amount of organic carbon (kerogen or stromatolites) in the system, but may play an important part with other conglomerate hosted gold targets in the wider Pilbara region (e.g., Virgin Creek).

Exploration by Novo has been successful in delineating the extent of marine lag mineralisation in areas beyond 100 m below surface. High density costean sampling across the full mineralised sequence has subsequently better defined the domains where channel mineralisation is common, with most dominant channels now well defined by sampling and drilling.

9. EXPLORATION

Exploration activities conducted by Novo consist of surface geological mapping, trench chip-channel sampling of surface outcrops, diamond core drilling and RC drilling conducted between 2011 and 2018. Drilling activities are discussed in Section 10 of this Technical Report. A bulk sampling program was undertaken during 2018 (Figure 9.1).

Historical exploration activities include geochemical and geophysical surveys, geologic mapping and drilling by various operators between 1968 and 2007, which are discussed in more detail in Section 6 of this Technical Report.

Due to the presence of extensive surface exposures of gold-bearing conglomerates, Novo recognised an opportunity to do an extensive trench sampling program to compliment RC drilling to provide data to support resource estimation. Sampling was undertaken between late September and mid-November 2014, through July 2015 and during 2018 (Figure 9.2).

Figure 9.1 Measuring a trench bulk sample

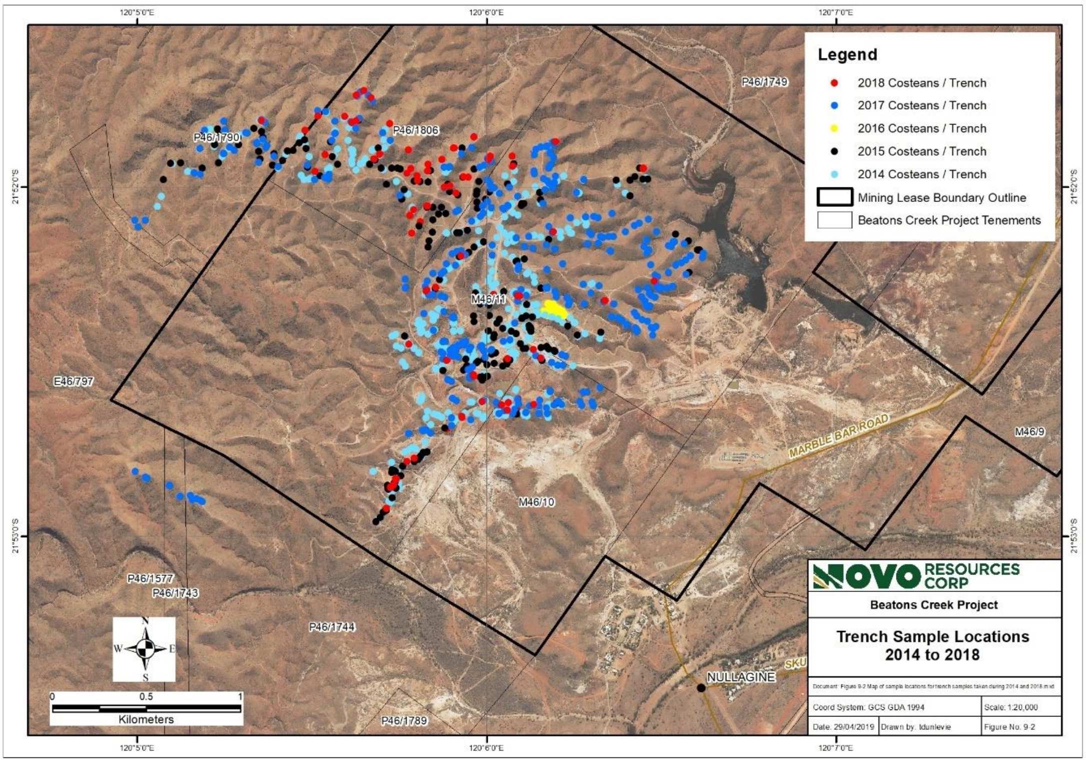
Where outcropping conglomerate horizons are present and it was possible to access a full profile of the conglomerate horizon from top to bottom, samples were collected at approximately 20 m to 70 m spacing along strike from small trenches dug with an excavator. The sampling process involved using an electric Kanga jackhammer to loosen material and catch it on a tarp. Rather than taking narrow channel samples, material was collected over a broad face approximately 0.5 m to 1 m wide to get a reasonable representation of material including boulders and matrix. Each sample weighed 40 kg to

65 kg and was placed in two polyweave bags. The sample interval size did not exceed 1 m vertical thickness. If a conglomerate horizon was less than 1 m thick, one sample was collected from the top to the bottom of the layer. If its thickness exceeded 1 m, then two or more samples were collected.

Several challenges were experienced during this program. Due to uncertainties about which conglomerate horizons contained gold, many samples were collected from horizons that were later recognised to be subordinate or barren. Additionally, copious amounts of dust generated by the excavator in some cases coated outcrops, thus making it difficult to see contacts. It was also recognised that some trenches did not fully expose targeted conglomerate horizons, thus limiting the ability to adequately sample them. Where possible, these trenches were resampled prior to resource estimation. The 2018 program differed in that an excavator was used on all trenches to ensure the hanging-wall and foot-wall contacts were exposed and cleaned using an air compressor prior to sampling across the full profile.

Trench samples were individually placed in polyweave sacks (bulka bags) and bundled and stacked on pallets for transport. Sample shipments were made from the Nullagine freight yard to Intertek Laboratory Services in Perth on a weekly basis.

Figure 9.2 Map of sample locations for trench samples taken since 2014



A large bulk sampling program took place in July 2016, during which a 29,560-tonne lot was excavated from a single site on a Golden Crown marine lag. Processing of the lot proved to be problematic, due to impact crusher breakdowns and inefficiencies that led to the need for unplanned modifications. As a result, only 9,680 t of material was processed.

During 2018, Novo undertook diamond core drilling, trench sampling, and bulk sampling.

10. DRILLING

Novo commenced exploration in late 2011. Since then, a total of 724 RC drill holes were drilled for a total of 36,130 m. The purpose of the RC drilling was to improve resource definition of the narrow auriferous reefs in the Beatons Creek formation, particularly near Grant's Hill, Golden Crown, and Edwards Lease target areas (see Figure 14.2). Drill holes were spaced at approximately 20 m to 50 m along ridges and spurs across the oxide target area.

Various drill contractors were employed by Novo over the course of this drilling effort, including Orbit Drilling (Hydco 350 DR14 rig) in 2011; McKay Drilling (Schramm T685W rig) in 2012; Castle Drilling (Atlas Copco L8-64 rig) for 2013 and 2014, and Three Rivers Drilling (Schramm T450 rig) in 2017. RC holes were collared using a 5.5 inch (137.5 mm) bit in the regolith zone, followed by a 5.25 inch (131.2 mm) diameter bit for the remainder of the holes. Samples were taken at 1 m intervals down the hole, although during 2011 and early 2012, 4 m composites were initially taken with a spear to determine where more definition was required.

Castle Drilling utilised an Atlas Copco ROC L8-64 track-mounted drill with vacuum dust suppression that minimises the loss of fines. This drill is used widely across the region due to its ability to achieve better recoveries of cuttings and fines. Upon review of data, drill recoveries during the 2013 and 2017 programs appeared to be compromised.

In 2013 and 2018, Novo completed 35 diamond drill holes for a total of 4,960 m for the purposes of grade-geological, metallurgical, geotechnical and density testwork. Core recoveries were good, and density data retrieved from this drilling was used in the 2019 Technical Report.

The 2011 to 2018 drilling is shown in Figure 10.2.

Figure 10.1 Fresh mineralised core intersection from DH13-007 with massive pyrite

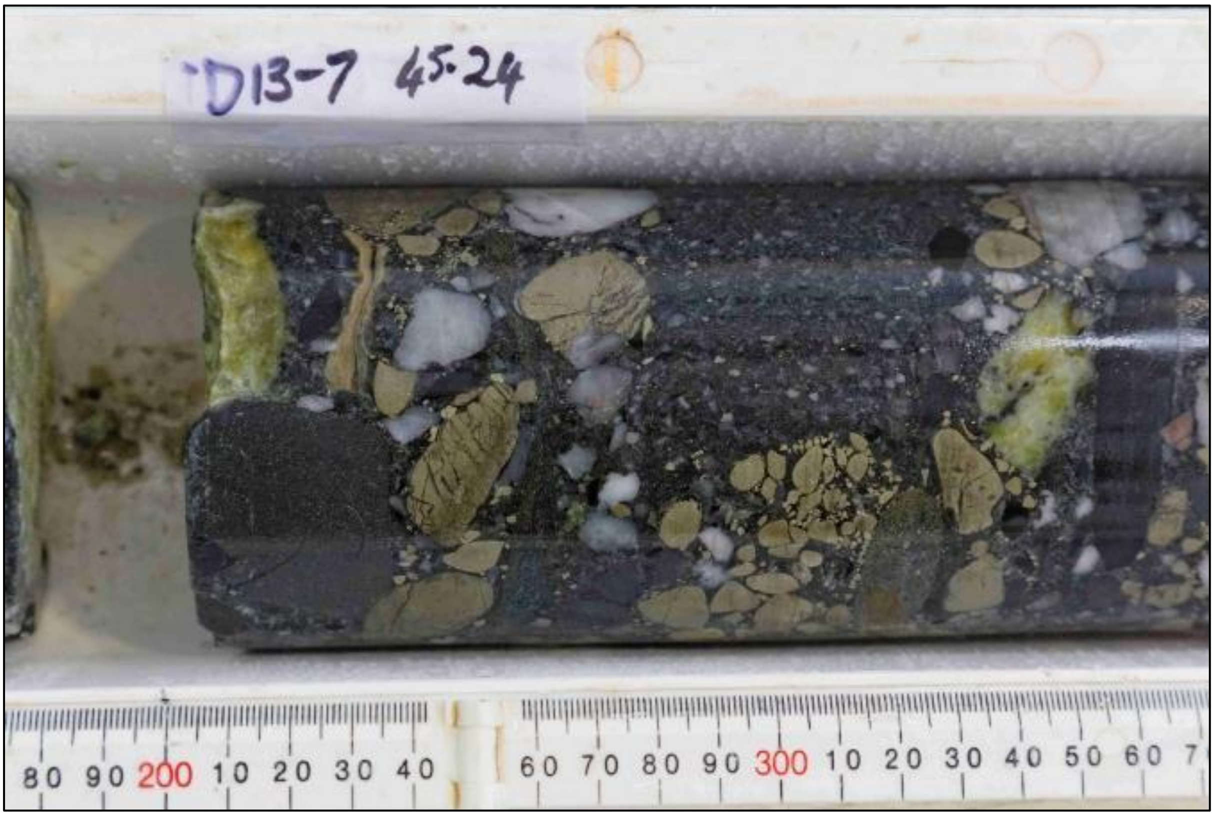
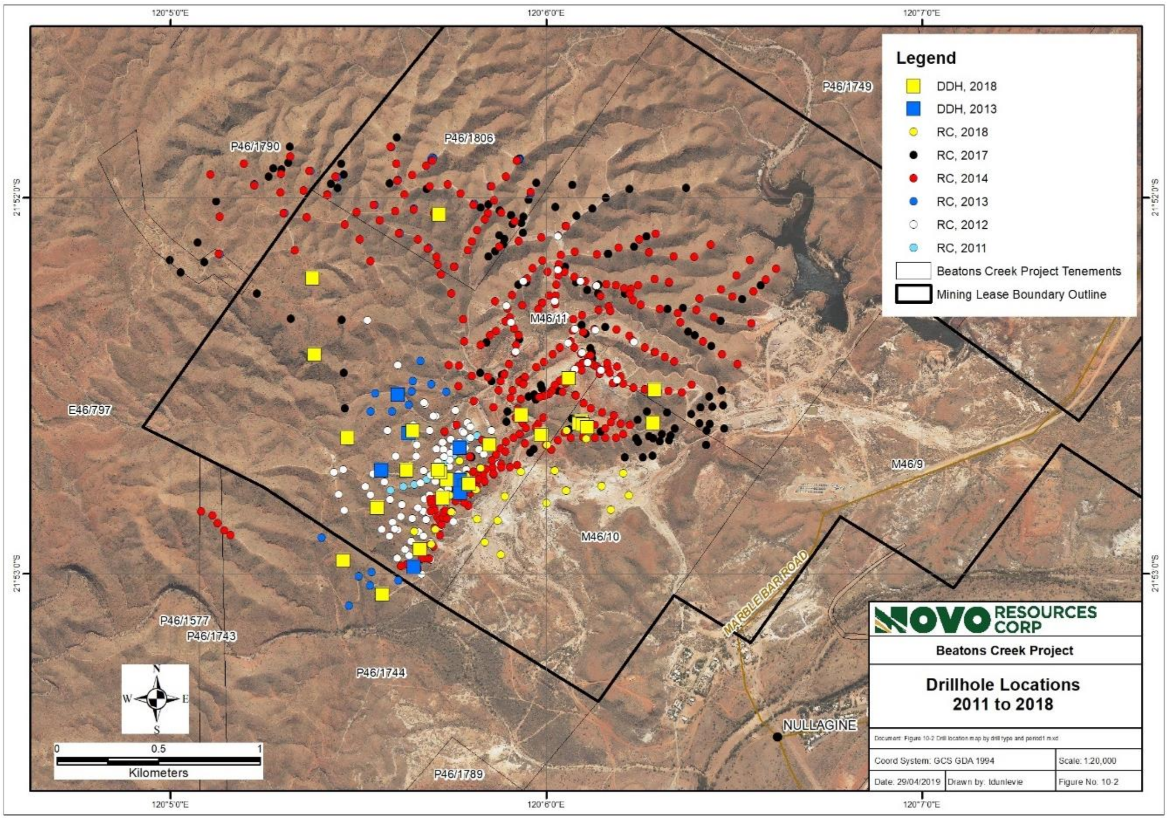


Figure 10.2 Drill location map by drill type and period



10.1. DRILL COLLARS

The protocol employed by Novo for staking and surveying drill collars has been consistent throughout all drilling campaigns. Collar coordinates are with reference to the GDA 1994 MGA Zone 51 Grid Datum. Planned holes are set out using a hand-held GPS device by Novo field staff. The azimuths are usually set out using a compass and flagging tape/pickets for the rig to line up with fore-sights and back-sights. The vertical inclination is then set by the driller using a clinometer, which is confirmed by the geologist or field staff onsite prior to commencement of drilling, to ensure quality control is maintained.

Following the completion of drilling, drill collar casings are left in the ground with a plug in each, stating hole ID, coordinates and orientation. There is often a wooden stake with the above information next to each collar point for ease of identification. Collars are also plugged to prevent local fauna from falling down the holes.

Drilled and plugged collars are ultimately re-surveyed with high-precision equipment to provide final confirmation of individual drill collar locations.

Final collar surveys for drilling conducted between 2011 and 2013 were undertaken by Survey Group using a differential GPS (DGPS) device. Survey Group established a survey control point approximately 100 m north of Grant's Hill.

In 2014, Novo purchased a Real Time Kinematic (RTK) system, consisting of an EPOCH 50 Single Receiver Kit, a Trimble Geo 7 Series handheld GPS, and an XDL Rover 2 radio. This system provides sub-centimetre accuracy both vertically and horizontally. In 2014, Novo established additional survey control points (referencing the 2012 control point) across the project area to create a reliable standardised survey grouping. All 2014 to 2018 drill collars, bulk samples and trench samples were surveyed using the RTK system by Novo personnel.

10.2. DOWNHOLE SURVEYS

Considering the vertical nature of the drill holes, as well as the relative shallow average depth of drilling, down-hole surveys were not collected for any of the RC holes drilled between 2011 and 2017. The average hole depth was about 50 m, and the deepest hole was 235 m. Down-hole surveys are standard practice and it is recommended that downhole surveys be considered for all future drilling, particularly for holes >100 m in length.

All 2018 diamond holes were surveyed using an Eastman single shot camera at 30 m intervals.

10.3. GEOLOGICAL LOGGING

Geological logging was undertaken on-site by a qualified geologist(s) familiar with the project who closely monitored the drilling and sampling procedures.

The logging process is described as follows:

- Logging of RC chips is done using wet sieving techniques and samples of each interval are retained in chipping trays which are stored on site. The chips are logged in the field next to the collar site.
- Logging of drill core takes place on a core yard facility built on site, with core orientated, metre marked and washed for logging.
- The geologic logs record regolith, lithology, structure, texture, grain-size, alteration, oxidation, mineralisation, quartz percentage and sulphide types and percentages by sample interval.
- Information recorded during the infields logging activities are captured directly onto paper logging sheets. This information is then transcribed into digital format by the Novo staff. Diamond logging is completed directly into the digital Geobank Mobile logging system.

10.4. SAMPLING METHODOLOGY

Sampling protocols employed by Novo during all RC drilling campaigns are summarised below.

RC drilling utilises a 5.25 or 5.5 inch hammer bit to pulverise material at the drill face. RC chips are collected at regular 1 m intervals via a cyclone and fixed splitter attached to the side of the rig or trailer mounted. This arrangement is air-cleaned on a regular basis by the drill crew to limit cross sample contamination. This is closely monitored by the supervising geologist.

During earlier drilling programs (a component of 2006, all of 2011, and up to and including BCRC12-028 in 2012), 4 m composites were generated by spear-sampling for preliminary assay testwork. Composite results over a reported threshold value were subsequently resubmitted per individual metre. All speared composite data is excluded from the resource, and no composite data remains within the resource area.

For the programs prior to 2014, a standard calico split generated a nominal 3 kg sample for Fire Assay, with the remainder of the sample retained on site in a green bag. For the 2014 and 2017 RC program a modified Jones splitter was used to collect and split material from the cyclone into a 50/50 split, generating a 15 kg to 20 kg sample. The half split to be analysed at the lab was collected in woven cloth bags, and the other half split was placed in a green plastic bag and left at the drill site. The weight of the rejected split was compared to the selected split for every tenth hole to check that samples were adequately being split at the drill site, which also allowed for a basic estimation of overall drill recovery.

Diamond drilling was conducted to generate PQ drill core. Core is orientated, marked up and validated against driller core blocks prior to measuring core recoveries. An Almonte core cutter was used to cut core into equally sized halves, consistently sampling on one side of the orientation line.

Samples were typically 1 m in length, although varied based on geological contacts. A minimum sample length of 0.5 m ensures sufficient sample for further analysis. A maximum sample length was set as 1.1 m.

QA/QC samples were inserted at regular intervals (see Section 11), with samples then transported by road to the Intertek Laboratory in Perth for sample preparation and analysis.

10.5. 2013 AND 2017 RC DRILLING PROGRAMS

The 2017 RC drilling was conducted by Three Rivers Drilling (Schramm T450 rig), with 129 holes drilled for a total of 5,139 m. Recoveries were as low as 6%, ranging up to 80%, particularly in the oxide zone. Similarly, review of recoveries for 2013 RC drilling showed that excess material loss was encountered. Investigation of drill equipment used, showed that the rig operated without dust suppression with a high potential for fines loss.

All 2014 RC drilling was carried out using an Atlas Copco ROC L8-64 track-mounted drill with vacuum dust suppression to minimise fines loss. The 2014 program was well managed, with good spatial coverage of the project area. This program has been used to compare the 2013 and 2017 RC drill programs.

Figure 10.3 shows a statistical comparison between all RC programs, where the 2013 and 2017 display the lowest overall grades.

Figure 10.3 Box and whisker plot showing the statistics for the RC drilling program by year.

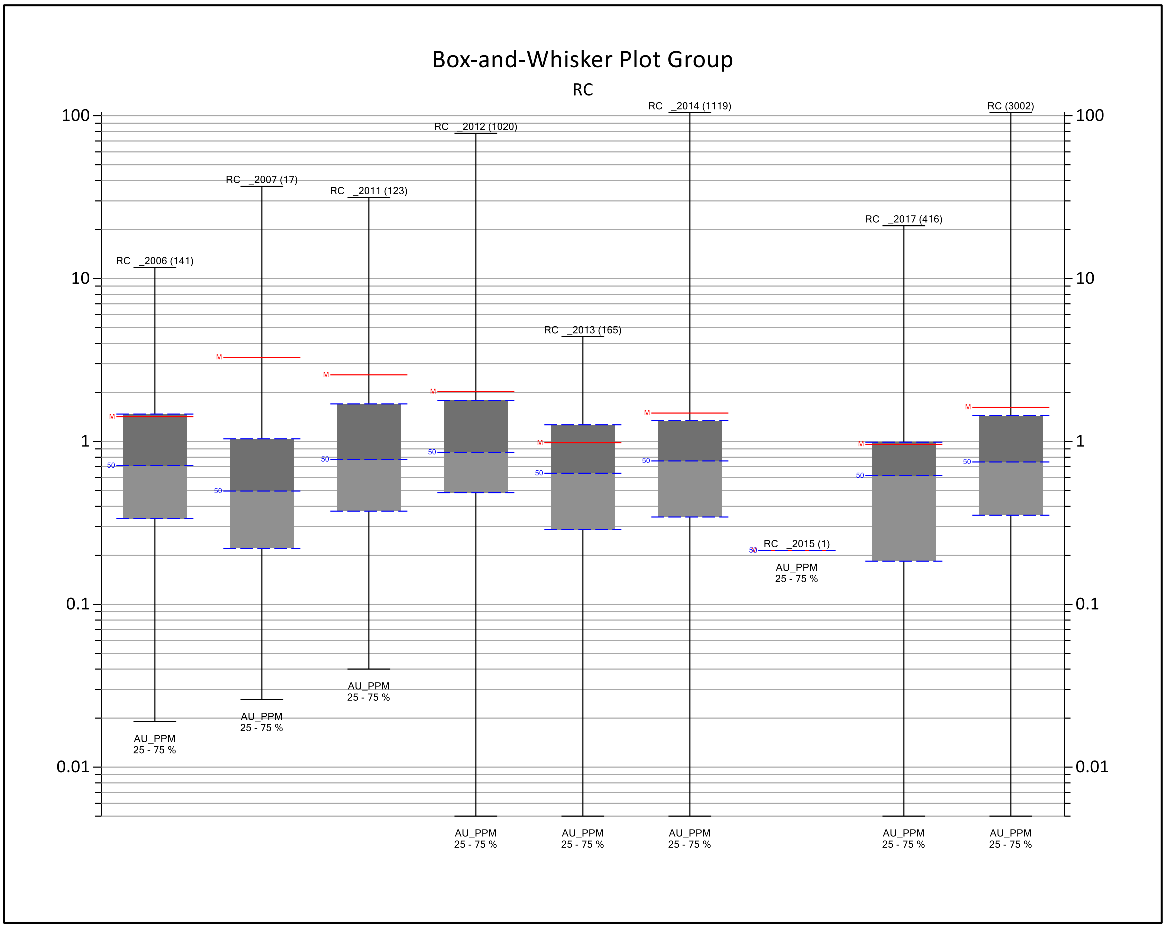
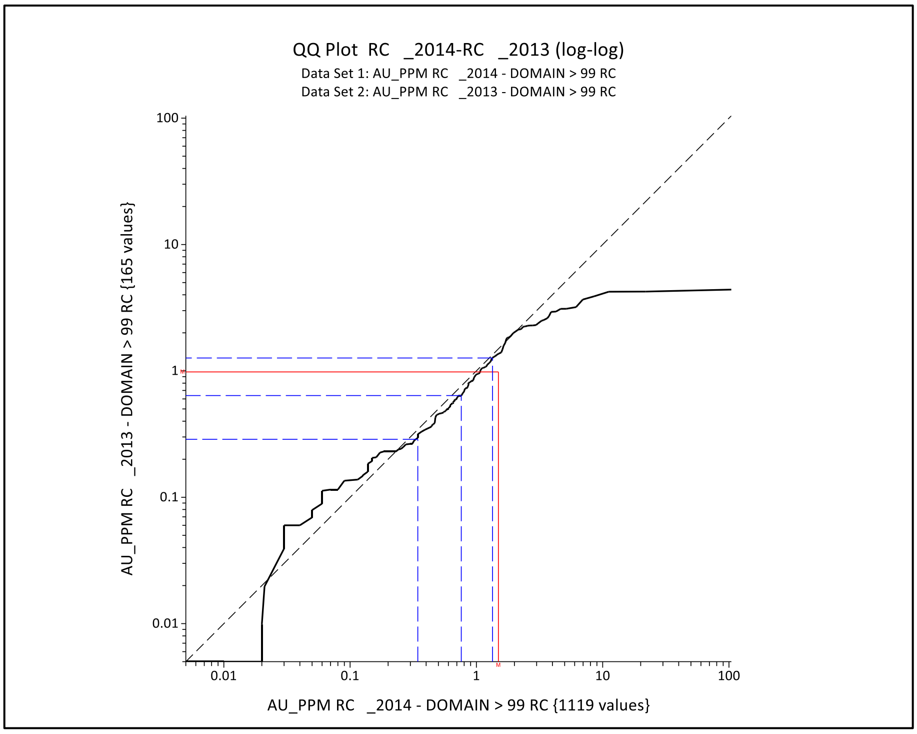
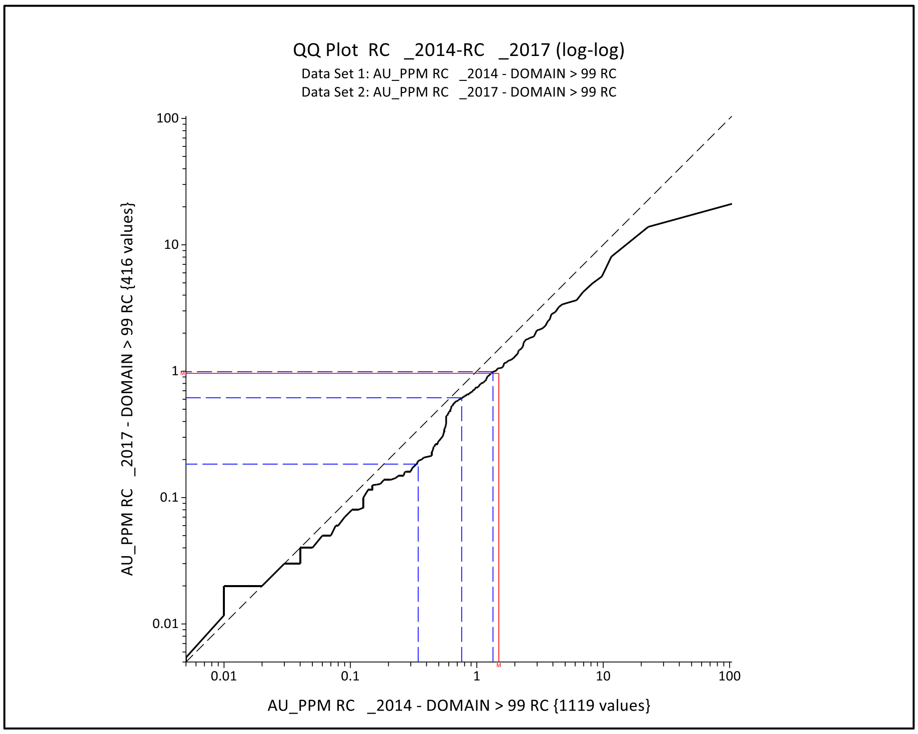


Figure 10.4 shows QQ plots comparing the 2014 RC data (N = 1,119) with the 2013 (n = 165) and 2017 (N = 416) data. The plots show poor compatibility compared to the 2014 program, where the 2013 and 2017 data are lower grade.

Based on this analysis, and knowledge of poor and highly variable sample recoveries, the 2013 and 2017 RC holes were excluded from the 2019 estimate. Previous estimates also excluded these data. Where mineralisation was encountered in the 2013 and 2017 RC holes, their location was used to inform the reef wireframe, but excluded from the grade estimate.

Figure 10.4 QQ plots comparing grades of the 2013 vs. 2014 and 2017 vs. 2014 RC drilling programs




QQ Plot RC _2014-RC _2017 (log-log)
Data Set 1: AU_PPM RC _2014 - DOMAIN > 99 RC
Data Set 2: AU_PPM RC _2017 - DOMAIN > 99 RC
AU_PPM RC _2017 - DOMAIN > 99 RC {416 values}
AU_PPM RC _2014 - DOMAIN > 99 RC {1119 values}
100
10
1
0.1
0.01
0.01
0.1
1
10
100

11. SAMPLE PREPARATION, ANALYSIS AND SECURITY

11.1. TRENCH CHANNEL SAMPLING METHODOLOGY

Where outcropping conglomerate horizons are present, channel samples were collected from trenches at 20 m to 70 m spacing along strike. Sample interval size did not exceed one vertical metre. If a conglomerate horizon was <1 m thick, a sample was collected from the top to the bottom of the layer. If horizon thickness exceeded 1 m, two or more samples were collected.

Samples were collected from outcrops where it was possible to access a full profile of the conglomerate horizon from top to bottom or exposed in small trenches using an excavator or dozer. Samples were collected using a Kanga drill to loosen material, and a tarpaulin to catch the material from the drill. Samples were collected over a broad face approximately 0.5 m to 1 m wide to provide a better representation of material including boulders and matrix. From 2018, a line was marked perpendicular to the profile, and a channel sampled mimicking a diamond drill hole to reduce sample extraction bias. A 40 kg to 65 kg sample was collected and split between two polyweave bags.

Field duplicates were collected at a rate of approximately 1 in 15 samples and were processed and analysed along with the original samples. Blank samples (3 kg of lab certified barren quartz sand) were inserted at an approximate rate of 1 in 15 trench samples.

Trench samples were individually placed in polyweave sacks (bulk bags) and bundled and stacked on pallets for transport. Sample shipments were made from the Nullagine freight yard to Intertek Laboratory in Perth on a weekly basis.

11.2. SAMPLE PREPARATION

Sample preparation, analyses and security measures followed by Novo meet reasonable practice for sample collection for both drilling and trench channel sampling. The results obtained from the sampling collection campaigns since 2011 are appropriate to support resource estimation.

Primary laboratory preparation and analysis was completed at Intertek-Genalysis Laboratory (Perth). Intertek is independent of Novo and an accredited facility that conforms to the following standards:

- The ISO/IEC 17025 accreditation ensures international standards are maintained in the laboratories' procedures, methodology, validation, QA/QC, reporting and record keeping.
- National Association of Testing Authorities Australia (NATA) has accredited Intertek Laboratory Services Pty Ltd, following demonstration of its technical competence, to operate in accordance with ISO/IEC 17025, which includes the management requirements of ISO9001:2000.
- This facility is accredited in the field of Chemical Testing for the tests, calibrations and measurements shown in the Scope of Accreditation issued by NATA (Accreditation No. 3244).
- Intertek also participates in several regular international, national and internal proficiency round robins and client specific proficiency programs.

11.3. RC DRILLING SAMPLE PREPARATION AND ANALYSIS

At the lab, samples were sorted, dried and weighed. The lab screened every 20th bag to ensure +95% <10 mm. Samples were further prepared and analysed using the following protocols:

- Crushing to 2 mm with a Boyd crusher.
- Rotary splitting out 9 kg, if applicable.
- Pulverising all 9 kg (85% <75 micron) – this had to be done in three 3 kg units due to the limited size of the pulveriser.
- Re-homogenising the three pulverised splits back to 9 kg of pulp.
- Re-splitting the 9 kg of pulp into three 3 kg bags.
- Subjecting one 3 kg pulp to a 6 hour LeachWELL followed by Inductively Coupled Plasma Mass Spectrometry (ICP-MS) analysis. Note, a few samples were subjected to 24-hour leach time.

Due to the large size of RC sample splits and the estimated long processing time and high preparation costs, the 2014 RC samples underwent a 'triage' approach to ascertain which samples contained gold and required full processing and analysis. The laboratory put each sample of raw drill cuttings through a riffle splitter to collect a 1 kg to 2 kg sub-sample. Without further processing, 1 kg of this split was subjected to a 6-hour LeachWELL and analysis. Samples reporting gold values of >0.15 g/t gold were selected for full processing and analysis.

Intertek performed pulp duplicate analyses on approximately 1 in 20 samples and inserted in-house standards at a rate of approximately 1 in 20. Both pulp duplicates and standards were introduced into the sample stream at random and were processed at the same time as the rest of the samples.

Over the course of the analytical program, Intertek notified Novo that several samples were either damaged or otherwise compromised. Novo re-collected material from the rejected splits at site and resubmitted the samples.

11.4. TRENCH CHANNEL SAMPLE PREPARATION AND ANALYSIS

An extensive channel sampling of trenches was conducted to complement the RC drilling. Trench samples provide data of location and thickness. Trench top and bottom coordinates were surveyed using a differential GPS (DGPS) device to provide accurate top and bottom control on true mineralisation thickness.

At the lab, samples were prepared and analysed using the following protocols:

- Drying and weighing.
- Crushing entire sample to 2 mm with a jaw crusher followed by a Boyd crusher.
- Rotary splitting out 9 kg.
- Pulverising all 9 kg (85% <75 micron). This had to be done in three 3 kg units due to the limited size of the pulveriser.
- Re-homogenising the three pulverised splits back to 9 kg of pulp.
- Re-splitting the 9 kg of pulp into three - 3 kg bags.

- Subjecting one 3 kg pulp to a 6-hour LeachWELL technique and ICP-MS analysis. Approximately one-third of trench samples were subjected to 24-hour leach time.

For the 2018 trench channel sampling program, the entire 50 kg sample was pulverised and then split into one 3 kg lot for LeachWELL.

Intertek performed pulp duplicate analyses on approximately 1 in 20 samples and inserted in-house standards at a rate of approximately 1 in 20. Both pulp duplicates and standards were introduced into the sample stream at random and were processed at the same time as the rest of the samples.

11.5. DIAMOND DRILL CORE SAMPLE PREPARATION AND ANALYSIS

Samples were sorted, dried and weighed at the Intertek laboratory. Samples were prepared and analysed using the following protocol:

- Crushing to 2 mm with a Boyd crusher.
- Pulverising all material to <75 micron with an 85% pass.
- RSD splitting the pulp to generate two 1 kg bags.
- Subjecting 1 kg pulp to a 24 hour LeachWELL followed by ICP-MS analysis. For any sample within the mineralised sequence two 1 kg pulps were assayed.
- Any LeachWELL result over 0.2 g/t gold triggered a fire assay on the LeachWELL residue to quantify any gold not dissolved during leaching.

Intertek performed pulp duplicate analyses on approximately 1 in 20 samples and inserted in-house standards at a rate of approximately 1 in 20. Both pulp duplicates and standards were introduced into the sample stream at random and were processed at the same time as the rest of the samples.

11.6. QUALITY ASSURANCE AND QUALITY CONTROL FOR SAMPLE ANALYSIS

Sample intervals from trench and drill hole sampling from 2011 on, and subsequently used for resource estimation were primarily tested by Intertek using the LeachWELL technique. Because of this, quality assurance and quality control (QA/QC) is discussed only for 2011-to-present sampling, QA/QC for fire assay analysis is discussed in previous reports.

Quality assurance (QA) measures involve the use of standard procedures for sample collection for both drilling and trench sampling, which include oversight by experienced geological staff during collection.

QC was undertaken across all programs at the Beatons Creek Project. Some early programs and the 2017 and 2018 trench-based channel samples suffered from a lack of standards or CRMs.

QC sample performance was monitored throughout the sampling campaigns by Novo, with no fatal matters being observed. In-stream testing of standards, blanks, and duplicates have demonstrated generally acceptable QC. QC performance is typical of a data collection program of this size. Overall QC failures are infrequent, and some relate to labelling mismatches between QC sample types.

Quality control (QC) measures implemented by Novo include CRMs, blanks, and duplicate sampling (Table 11.1). The standards listed in Table 11.2, display a global bias of -2%.

Standards are submitted in the sample stream at approximately one for every twenty non-control samples. Intertek developed certified material suitable for use as an instream LeachWELL standard and inserted the standards at the request of Novo. An example standard control analysis plot is shown in Figure 11.1.

Table 11.1 Quality control insertion

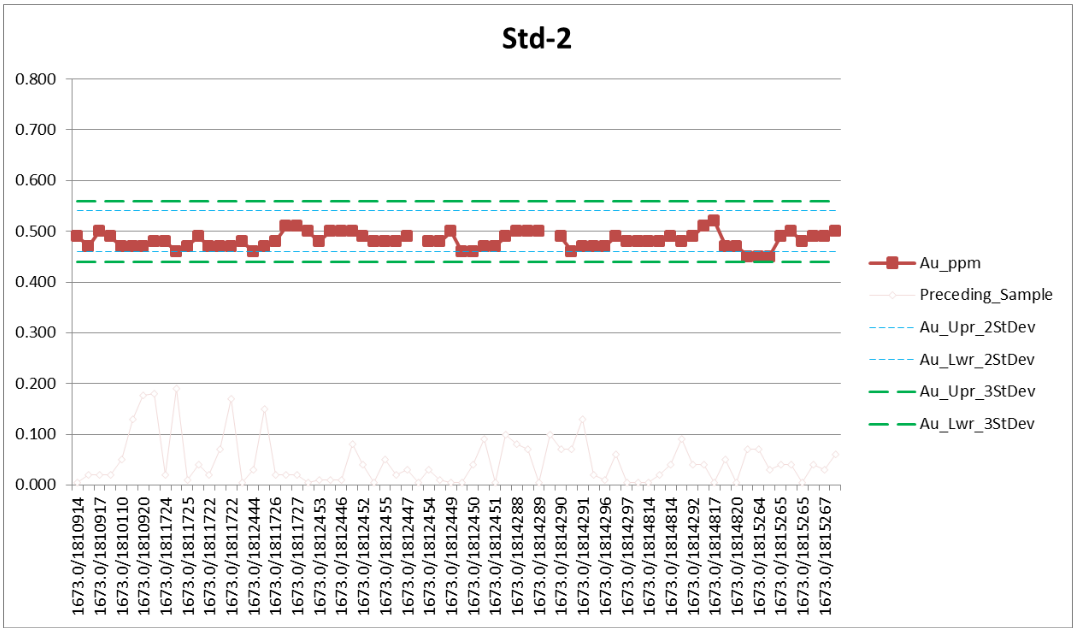
Stream	Global total samples	Standards	Blanks	Field duplicates	Pulp duplicates
2011, 2012, 2013 Drilling	19,859	871	308	837	0
2014 Trench	512	62	88	65	152
2014 Drilling	8,679	646	479	114	166
2015 Trench	222	15	17	9	152
2017 Trench	939	0	27	27	*939
2018 Trench	533	0	31	30	*533
2018 Drilling (diamond)	4,226	233	243	0	*679
Total	**34,970**	**1,827**	**1,193**	**1,082**	***2,621**
Rate	-	5.2%	3.4%	3.1%	*7.5%
	-	1 in 20	1 in 29	1 in 32	*1 in 13

For the 2015 and 2017 trench, and 2018 diamond drilling programs 2 or 3 BY 1 kg LeachWELL assays were undertaken on pulps giving effective pulp duplicate samples.

Table 11.2 Selected standard reference material performance

Standard	Certified grade (g/t gold)	Certified one SD (g/t gold)	Count	Determined mean grade (g/t gold)	Number outside ±3SD	Percent outside ±3SD
LW1	1.00	0.06	177	0.97	27	15%
LW1-2	1.00	0.18	69	0.93	3	4%
LW1-3	1.00	0.15	15	0.98	0	0%
LW1-4	1.02	0.15	79	0.96	0	0%
LW1-5	0.97	0.20	85	0.96	0	0%
LW1-6	0.97	0.06	78	0.96	14	18%
LW1-7	1.01	0.12	18	0.96	2	11%
LW3	2.92	0.15	203	2.89	0	0%
LW3-1	2.99	0.15	47	3.04	0	0%
LW3-2	3.08	0.15	37	2.90	0	0%
LW3-3	2.76	0.14	67	2.71	1	1%
LW3-4	2.89	0.14	91	2.79	0	0%
LW3-5	2.86	0.05	77	2.83	9	12%
LW3-6	2.89	0.07	20	2.92	2	10%
LW3-7	2.84	0.14	4	2.81	0	0%
LW5	5.23	0.16	186	5.15	0	0%
LW5-1	5.29	0.16	22	5.35	0	0%
LW5-2	5.29	0.11	96	5.22	9	9%
LW5-3	4.73	0.14	40	4.65	1	3%
LW5-4	4.93	0.15	86	4.73	0	0%
LW5-5	4.75	0.13	87	4.75	0	0%
LW5-6	5.04	0.19	8	4.81	0	0%
ALL	-	-	**1,592**	-	**68**	**4%**

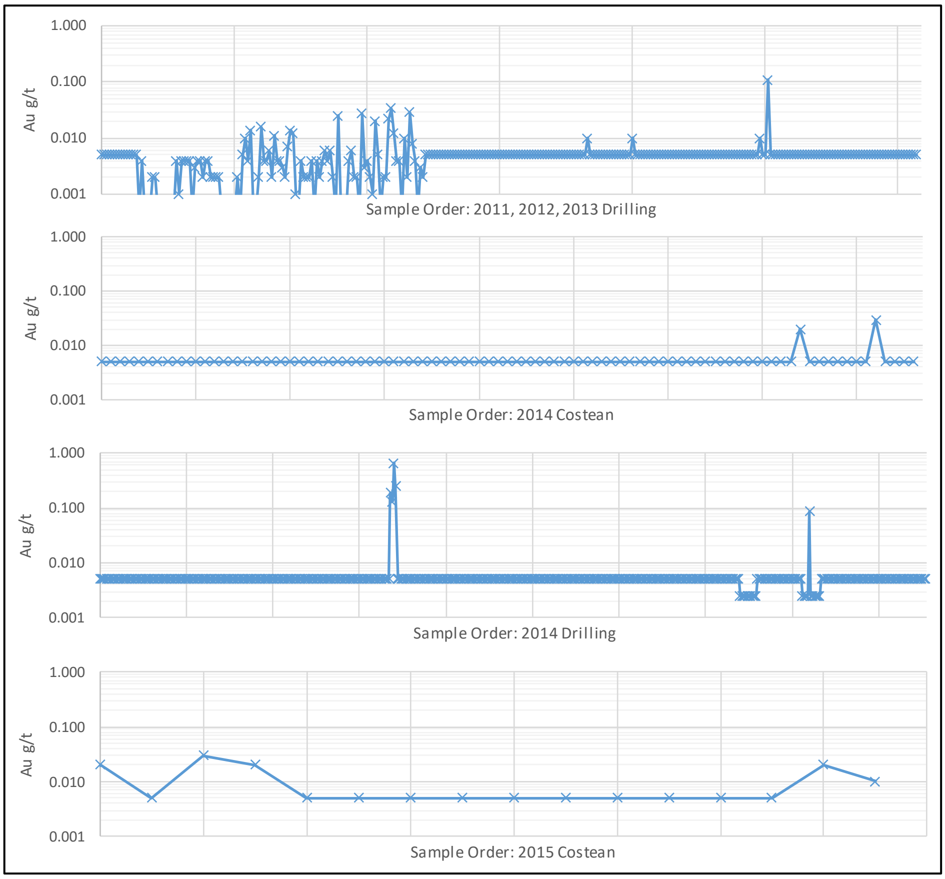
Figure 11.1 CRM G316-5 (0.5 g/t gold) run for the 2018 diamond drilling program



The CRM shown in Figure 11.1 displays a global bias of -3.5%, with a total of 79 CRMs submitted; six in the 2 to 3 standard deviation (SD) range and 73 <2SD.

Blank samples are submitted in the sample stream at approximately one for every thirty non-control samples. Washed sand was sourced from a supplier in Perth as blank material during 2011. It appears from the control chart in Figure 11.2, that blanks from the 2011 drill campaign had background concentrations of gold. These blanks were replaced with certified barren sand during the 2012 and 2013 programs. From 2014 onward, a mafic dyke near the town of Nullagine, which was known to be barren of gold, was used as a source of blank material. Blank performance is acceptable and routinely returns values at the analysis detections limit.

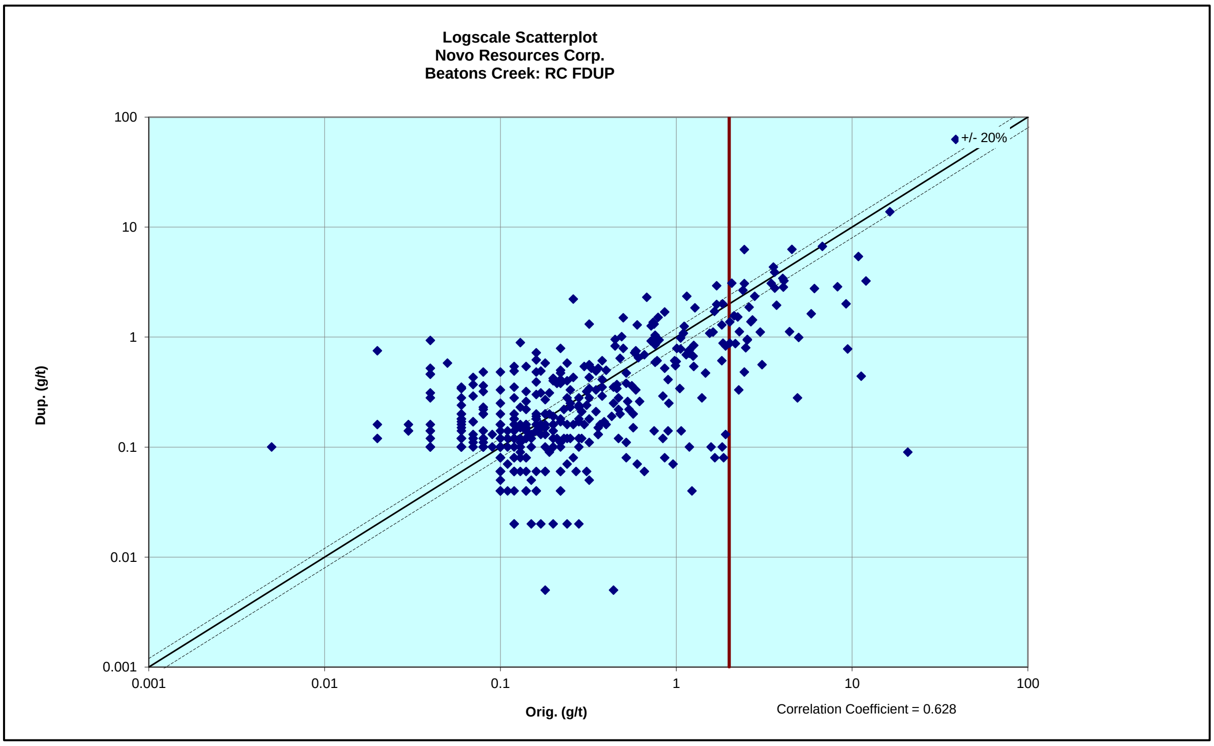
Figure 11.2 Blank control analysis



Field duplicates, a split of a collected sample at the collection site, are submitted in the sample stream at approximately one for every 30 non-control samples. The scatter plots (Figure 11.3), display the variance between duplicate pairs. Analysis of trench channel sample and RC rig field splits yields a pairwise (duplicate) coefficient of variation (COV) of 52% and 60% respectively. The pairwise COV for field duplicates comprises sample collection, preparation and analytical errors. A field duplicate performance of 50-60% is t often a feature of coarse gold-dominated deposits, where values could be >100% (Dominy et al., 2018).

Pulps have been analysed for non-control samples (Table 11.1). Figure 11.4 shows reasonable reproducibility of pulp duplicate pairs. Analysis of pulp duplicates yields a pairwise (duplicate) COV of 23%. The pairwise COV for pulp duplicates comprises analytical errors (including splitting error). A pulp duplicate performance of 23% is often a feature of a deposit with coarse gold, and where coarse gold is remains in the pulp. A more typical low-coarse gold value would be 10-15% (Dominy et al., 2018).

Figure 11.3 Field duplicate variability; upper RC duplicates (N = 427) and lower channel duplicates (N = 108). Data filtered at 0.1 g/t gold. All assays by LeachWELL



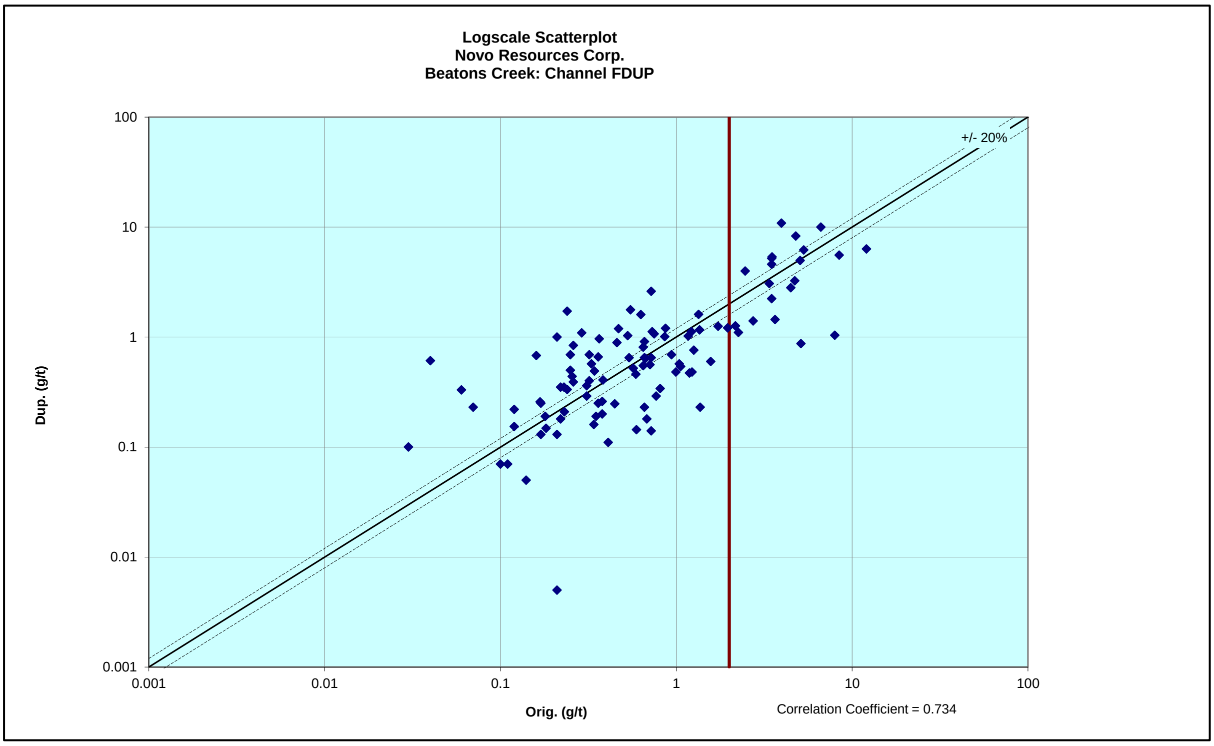
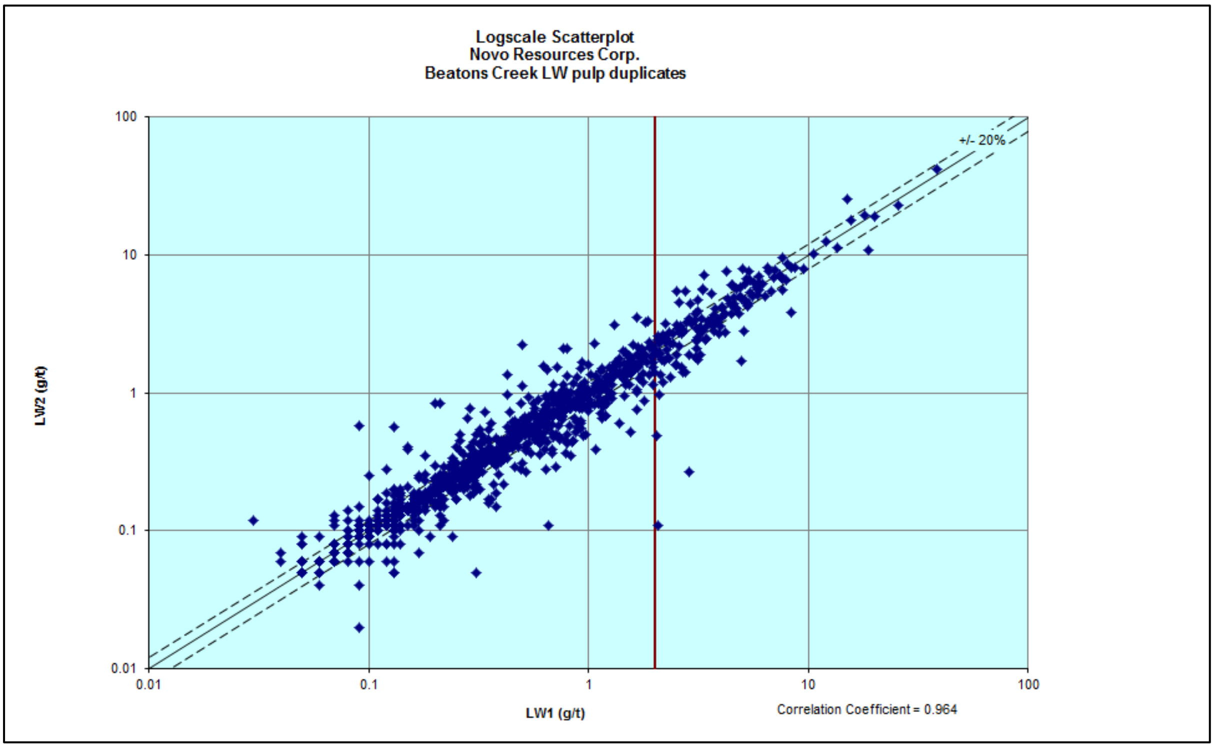


Figure 11.4 LeachWELL pulp duplicates (N = 1,050).



11.7. LEACHWELL ASSAY VALIDATION

For the drilling campaigns conducted between 2011 and 2012, 276 samples were analysed by LeachWELL, screen fire assay and fire assay methods. The correlation coefficient for LeachWELL and screen fire assay data was 50%, while the LeachWELL and fire assay data had a correlation coefficient of about 39%. For the purposes of comparison, the correlation coefficient between screen fire and fire assay was also calculated at 15%. This low correlation between methods is to be expected, as there is a significant difference in sample volumes (e.g., 1 kg versus 50 g).

To compare the different methods, QQ (quantile-quantile) plots were generated for the LeachWELL data against the distributions of screen fire and fire assay data (Figure 11.5 and Figure 11.6 respectively). Figure 11.5 shows the 565 samples that were sent for LeachWELL and screen fire assay plotted against each other. This indicates that the assay methods are producing broadly comparable results.

Figure 11.6 shows the populations of 276 samples that were sent for LeachWELL and fire assay plotted against each other with a correlation of 98%. This indicates that the assay methods are producing broadly comparable results. The sample sizes for LeachWELL and screen fire assays are 1 kg, while the fire assays were conducted on a 50 g sample.

Considering the coarse free nature of the gold at the Beatons Creek Project, Novo opted to continue using the LeachWELL analytical method, though with a sample mass of 1 to 3 kg.

Figure 11.5 QQ plot for LeachWELL vs. SFA

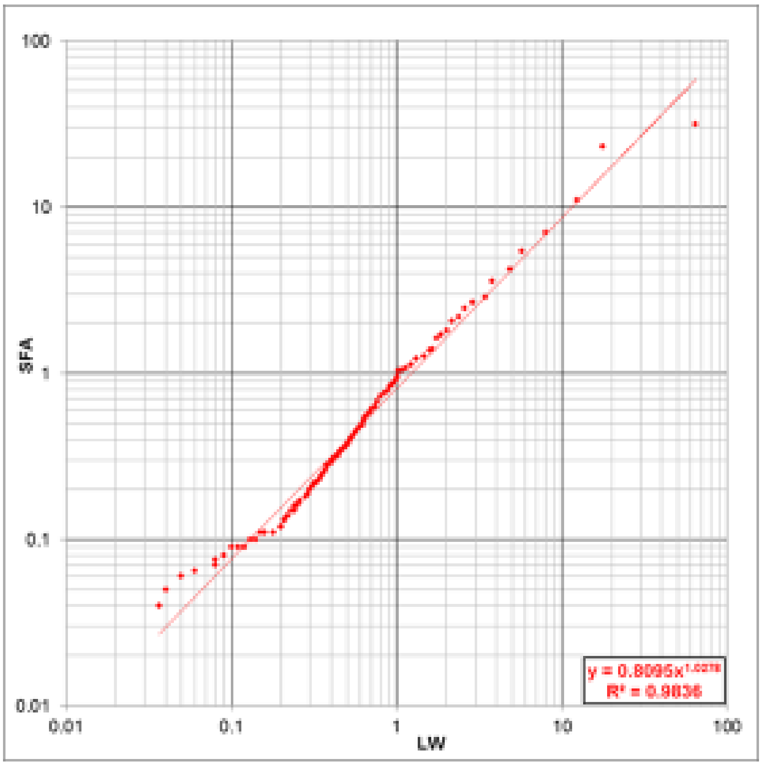
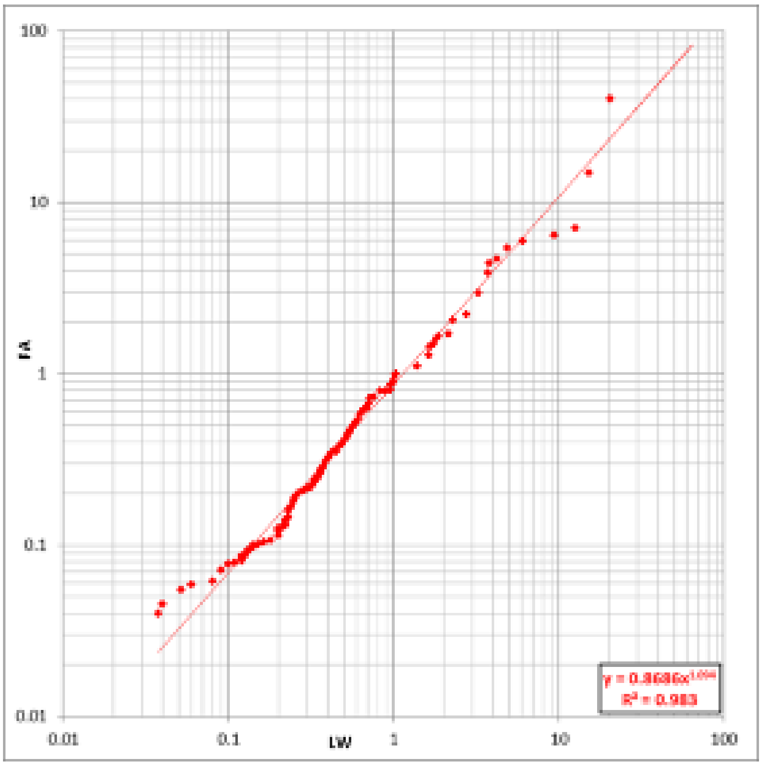


Figure 11.6 QQ plot for LeachWELL vs. FA

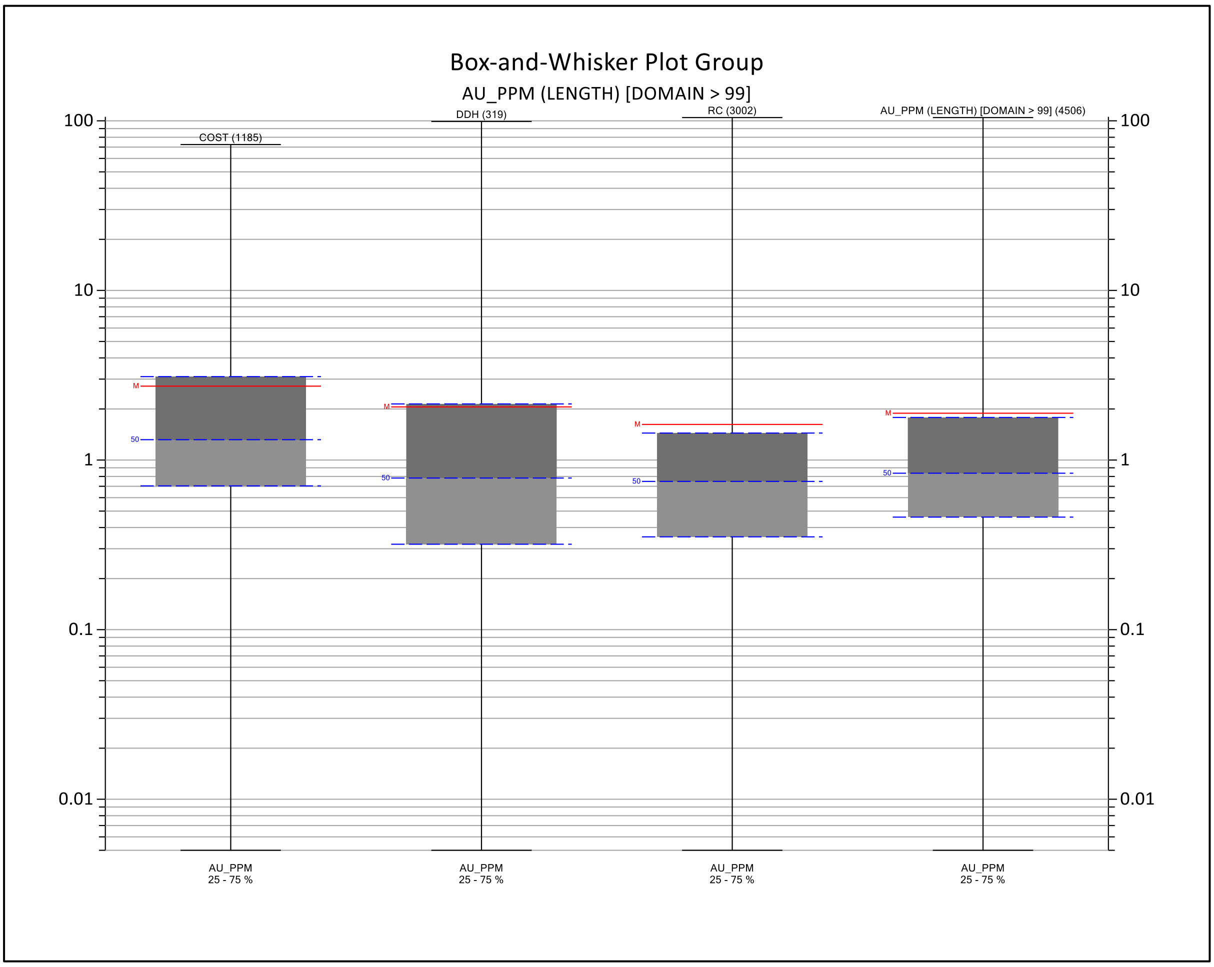


11.8. COMPARISON BY SAMPLE TYPE

Figure 11.7 shows a box and whisker plot comparing the gold grade by drill type. Trench channel (COST) samples have a higher mean grade compared to diamond core (DDH) samples, with RC samples showing the lowest grade. This is expected, given that the trench channel samples will possess a variable bias relating to sample collection. This bias relates to extraction error, where it is easier to sample the conglomerate matrix than the siliceous boulders. Diamond drilling allows accurate sampling of the reefs to their contacts, whereas RC drilling is based on fixed 1 m samples, which dilute the grade as it is impossible to select the tops and bases of the reefs.

Optiro considers that the representivity of samples informing the Mineral Resource, particularly RC samples, has not been established at this point. Future grade control drilling will need to establish appropriate procedures to ensure sample representivity.

Figure 11.7 Box and whisker plot comparing gold grade by sample type



12. DATA VERIFICATION

The Qualified Persons, Mr Jason Froud and Mr Andrew Grubb, most recently visited the Beatons Creek Project on 22 September 2020 and on 19 April 2021 respectively. During their site visits, they inspected areas of infill drilling, toured proposed mining areas and verified the site layout provisions. Mr Grubb also inspected the previous trial mining areas, mineralisation exposures and the proposed haulage route to the Nullagine processing plant and ROM pad area. Field verification also included a review of the Golden Eagle Mill processing plant, tailing dams, offices, accommodation and other surface infrastructure. A review and assessment of the mineralisation styles, alteration and geological setting for the deposit was also undertaken by Mr Glacken as well as site visits to the relevant laboratories and discussions with Novo geological and processing staff.

As part of this PEA, the drill hole database was reviewed, with various checks performed to verify the position of drill collars with respect to surface topography. Checks were undertaken on drill hole collars, survey, geochemistry, lithology and structure tables of the database for overlapping intervals and differences in final lengths. Standard QAQC checks were undertaken to confirm the performance of CRMs, standards and blanks with no material issues noted.

Furthermore, Optiro reviewed the workflow of the Mineral Resource estimates and the geological model, mineralisation domains and estimation parameters with Optiro's opinion further detailed in Section 6. The understanding of the mineralisation and the geological interpretations at the Beaton's Creek Project are well understood, with structural models being incorporated into the interpretation process. Weathering surfaces have also interpreted for oxidised, transitional and sulphide/fresh units from the available drill data. These have been extended beyond the lateral resource model limits and used within the estimation process.

The Mineral Resource estimates were validated graphically as well as spatially. Validation was primarily through:

- visual comparison of composite grades against the estimated block grades
- statistical comparison of global declustered composite grade against estimated grade
- swath plots comparing declustered composite grades, estimated grades, number of composites, and tonnage estimated.

Estimated grades for gold were compared to the composite grades by visual inspection in plan, long and cross-section views with the model block grades considered comparable to composite values and a fair representation of the supporting composite data.

Optiro considers that the data and observations from the drill holes were collected with industry standard practices and that the accompanying assay results are reasonable. The drilling and sampling data have been appropriately verified for the purpose of completing geological modelling and estimating the Mineral Resource estimates. Furthermore, the estimation approaches are considered to be appropriate by the QP for the mineralisation type.

It is the opinion of the QPs that the Beatons Creek Project sample data, grade estimation and assumed mining methods and recovery methods meet industry practice.

13. MINERAL PROCESSING AND METALLURGICAL TESTING

A metallurgical testwork program was undertaken on fresh material from Grant's Hill (M1 and M2 reefs) and South Hill (CH1 and CH2 reefs) as reported in the previous Technical Report released by Novo in October 2020. Only the Grant's Hill testwork was completed at the time of the previous Technical Report thus the remaining South Hill testwork is reported here.

Comminution testwork shows that the Beatons Creek Project fresh material is competent with an average Bond ball mill work index for South Hill of 18.8 kWh/t. No SMC testing was completed.

The weighted average head grade for the CH1 and CH2 composites were 0.69 g/t Au and 1.24 g/t Au respectively, which compares well to the assayed head grade of 0.84 g/t Au for CH1 and 1.44 g/t Au for CH2.

Geochemical analysis on the Grant's Hill composites indicates elevated levels of arsenic, mercury and antimony.

Size by assay results indicate that the majority of the gold is in the +150 µm fraction, with over 92% of the gold in the CH1 and CH2 composites residing in the coarsest fraction.

The single stage GRG test recovery was high at 61.3% and 69.8% for the CH1 and CH2 composites respectively. The recovery by size and stage data indicates that both the South Hill composites have a high percentage of coarse gold with 38% of the gold recovered in the plus 150 µm fractions for CH1 and 54% of the gold recovered in the plus 150 µm fractions for CH2.

The kinetic leach results for the South Hill composites indicates relatively fast leach kinetics with a no impact of grind size on leach extraction. The average 24 hour leach extraction for all six tests (regardless of grind size) was 60.1%.

The diagnostic leach data on the gravity tails for the two South Hill composites indicates that the majority of the gold is cyanide soluble with 65% and 67% extracted at a low cyanide concentration for CH1 and CH2 composites respectively. The remainder of the gold sample was not readily cyanide recoverable due to it being occluded, locked in silicates, refractory or sulphide solid solution gold.

The results from the South Hill test work are broadly consistent with the earlier work reported for Grant's Hill.

14. MINERAL RESOURCE ESTIMATES

14.1. RESOURCE DECLARATION

The most recent declaration of Mineral Resources for the Beatons Creek Project was in February 2019 (Dominy and Hennigh, 2019). Mineral Resources were classified and reported according to the CIM Definition Standards, as adopted in 2014 (CIM, 2014) and were declared above a cut-off grade of 0.5 g/t gold within an economic (RPEEE) pit shell, and outside of this, above a cut-off grade of 3.5 g/t gold reflecting likely underground extraction. The potential underground mineralisation was modelled in discrete reef structures which are considered to have reasonable prospects of being mined underground. The open pit resources contain both fresh and oxide mineralisation (Table 14.1) while the underground resources contain only fresh mineralisation (Table 14.2). Total Mineral Resources are documented in Table 14.3. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. The following estimates have an effective date of February 28, 2019**.** There has been no update to the Mineral Resource estimate from that date to the effective date of this report.

Table 14.1 Open pit Mineral Resources at the Beatons Creek Project

Classification	Weathering state	Cut-off grade (g/t Au)	Tonnes (x 1,000)	Grade (g/t Au)	Ounces gold (x 1,000)
Indicated	Oxide	0.5	4,500	1.9	272
Inferred	Oxide	0.5	765	1.8	44
Indicated	Fresh	0.5	2,145	2.7	185
Inferred	Fresh	0.5	2,645	2.9	250

Table 14.2 Underground Mineral Resources at the Beatons Creek Project

Classification	Weathering state	Cut-off grade (g/t Au)	Tonnes (x 1,000)	Grade (g/t Au)	Ounces gold (x 1,000)
Inferred	Fresh	3.5	885	5.3	152

Table 14.3 Total Mineral Resources for the Beatons Creek Project

Classification	Tonnes (x 1,000)	Grade (g/t Au)	Ounces gold (x 1,000)
Indicated	6,645	2.1	457
Inferred	4,295	3.2	446

The optimal pit shell used to constrain the open pit resources was generated at a gold price of US$1,311, reflecting the actual gold price in March 2019. Nominal metallurgical recoveries of 95% for oxide and 90% for fresh material were assumed. Mining costs of US$2.40/t were assumed for oxide material and US$3.68/t for fresh material. Corresponding assumed processing costs were US$17/t for oxide and US$19/t for fresh material, and a general and administrative cost of US$3/t was applied.

14.2. ESTIMATION WORKFLOW

The Mineral Resource estimation followed what may be considered as an industry standard workflow, including the following steps:

- data validation
- data preparation
- exploratory data analysis
- geological interpretation and modelling
- generation of mineralisation domains
- compositing of assay intervals
- consideration and treatment of extreme grades (top-cutting or capping)
- grade continuity (variogram) analysis
- creation of block models
- grade estimation
- model validation
- depletion by topography
- classification of estimates according to CIM Definition Standards
- application of RPEEE principles
- resource tabulation and reporting.

The estimate was completed using Datamine Studio RM v1.4.175, with all statistical and geostatistical analysis undertaken using Snowden Supervisor v 8.11.

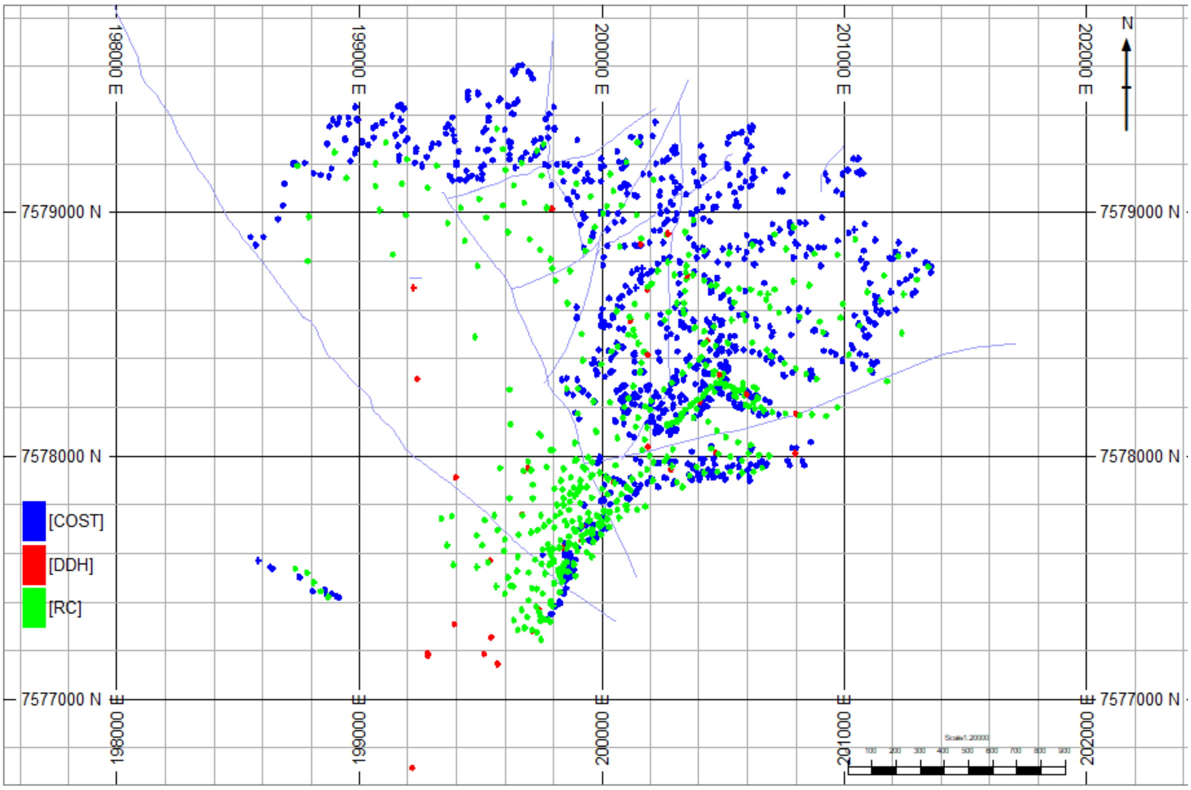
14.3. RESOURCE INPUT DATA

The drillhole data used for the Beatons Creek Project Mineral Resource estimate was exported from Novo's secure SQL database and provided in .csv format. A digital terrain model for the topographic elevation was provided by Novo, together with wireframe solids for each of the mineralisation domains (44 total, see Section 14.4). The topographic surface was constructed from LIDAR survey data, collected in 2015. The mineralisation wireframes were created in Micromine software and subsequently imported into Datamine Studio RM. Novo provided a weathering surface representing the top of the fresh material determined from downhole logging.

The project database comprises several generations of exploration drilling campaigns by various operators prior to acquisition by Novo. The database was reviewed and some data excluded. These data include rotary air blast (RAB) holes, a phase of RC drilling from 1984 without QAQC and potential survey errors, bulk samples collected in 2018 and other RC holes lacking appropriate subsample collection. Importantly, 51 holes from the 2017 RC campaign by Novo were excluded due to concerns around the collection of the sample.

The 2019 resource was estimated from 3,767 composites sourced from 2,423 RC samples (64%), 229 diamond core samples (6%), and 1,116 trench channel samples or costeans (30%). Figure 14.1 shows the location of the input data intervals in plan view for all samples.

Figure 14.1 Samples, drillholes and costeans (COST) used in 2019 resource estimate



14.3.1. DATA VALIDATION

Collars, surveys, assays, lithology and specific gravity data were imported into Datamine format from .csv sources. Records in the database were flagged as RESGRADE = 1 if they are to be used in the estimate. Validation details are provided below.

COLLARS

A collar to LIDAR topography analysis was undertaken to ensure that the drillhole collars had been picked up correctly. Eight collars were identified to have a collar to topography discrepancy of more than 2 m. Each was reviewed and it was determined that all eight collars in the database were correct and post-dated the LIDAR topographic survey, in areas where the trial pit was excavated or where significant earthworks had since taken place. No additional issues were identified.

SURVEYS

Downhole surveys were reviewed to ensure that no erratic survey measurements existed in the database. Many (but not all) of the drillholes are vertical. Each record was reviewed to determine if there were issues. No problems were identified.

ASSAYS

Analysis of 1,203 LeachWELL samples with fire assay tails was undertaken. In the database, there were a number of samples that were assayed by the LeachWELL method which did not have the tails assayed. Based on the analysis of all the fire assays tails, a correction factor was determined and applied to the remaining LeachWELL samples to retrieve a 'total' gold assay. Samples with any other assay method have not been corrected. The following correction factors were applied:

- for samples where the gold assay was greater than or equal to 0.10 g/t Au and less than 0.40 g/t Au, a correction factor of 1.15 was applied
- for samples where the gold assay was greater than or equal to 0.40 g/t Au and less than 2.00 g/t Au A correction factor of 1.10 was applied
- where gold was greater than or equal to 2.00 g/t Au a factor of 1.05 was applied.

All assay samples were reviewed for overlaps and duplicate records; no issues were identified.

LITHOLOGY

All lithology intervals were reviewed for overlaps and duplicate records, no issues were identified.

The data used in the 2019 Beatons Creek Project Mineral Resource estimate was reviewed with validation checks showing no material issues with the database supplied.

14.4. GEOLOGICAL AND MINERALISATION MODEL

The 2018 diamond drilling program aimed to establish a 3D structural framework to underpin an improved stratigraphical subdivision. The intention was to provide better geological control when generating grade shells. Diamond drilling and downhole televiewer data from previous RC holes also gave a more representative width of mineralisation as opposed to RC drilling intervals, which, mainly being on 1 m increments, tended to blur some of the reef boundaries.

The improved geological confidence generated two major domain boundaries. The dominant contact is the Mosquito Creek Formation marker, providing a solid boundary to the east. The second domain break separates the Golden Crown mineralisation from all other fault blocks to the west. Structural data, imbrication measurements, and analysis of the deposit stratigraphy show that all other fault blocks represent the same sequence, albeit offset. The Golden Crown block represents a different fan altogether.

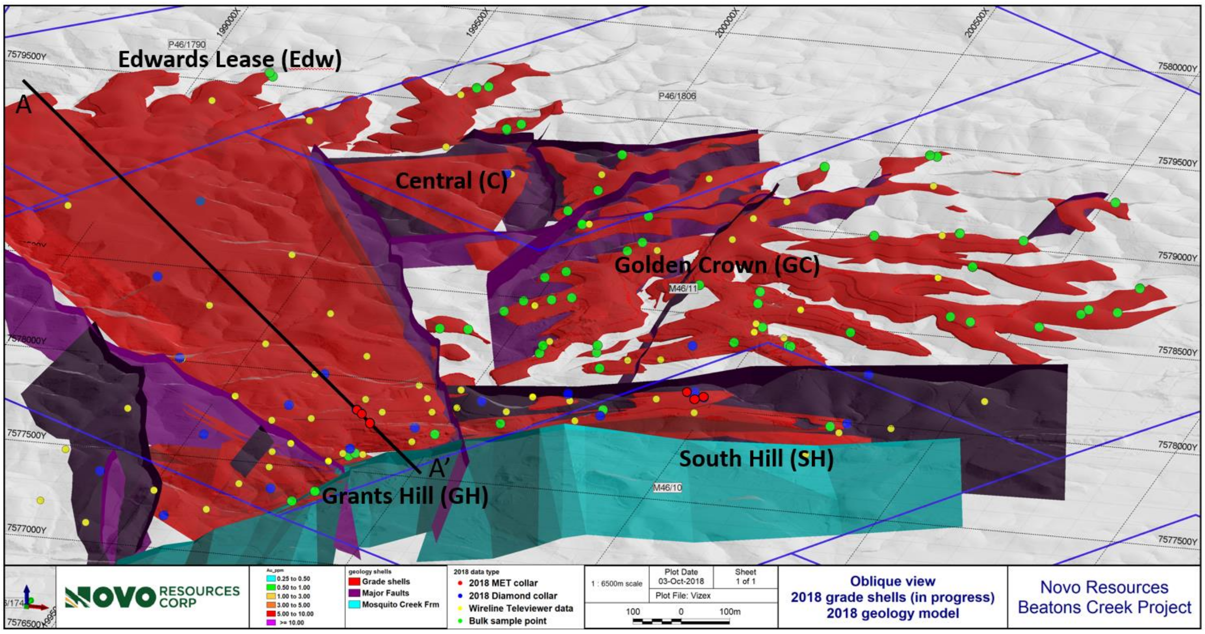
Channel mineralisation is restricted to close proximity to the Mosquito Creek contact and is the dominant mineralisation at South Hill. Channel mineralisation and marine lags are both present in the southern margin of Golden Crown and the south eastern margin of Grant's Hill and Grant's Hill South.

Marine lags are the only mineralisation style distal from the Mosquito Creek contact, with up to five lags identified at Grant's Hill and Golden Crown. Towards Edwards Lease, only two dominant marine lags continue. Marine Lags comprise the bulk of the mineralisation.

A 3D model of faults was generated, using strings along outcrop mapping projected through intersected faults in drilling to generate suitable wireframes. Key geological intervals (e.g., marker tuffs and the well-defined mine stratigraphy contacts) were modelled next, providing a framework to guide grade shell generation.

Grade shells were constructed by selecting an interval and coding it to the interpreted grade shell position. A DTM was then extracted from the top and base of that interval and all other intervals from other samples with the same code. This was then extended to intersect the nearest contact or fault boundary and turned into a solid wireframe (Figure 14.2).

Figure 14.2 Reef models, sample points and major estimation areas used in the geological model

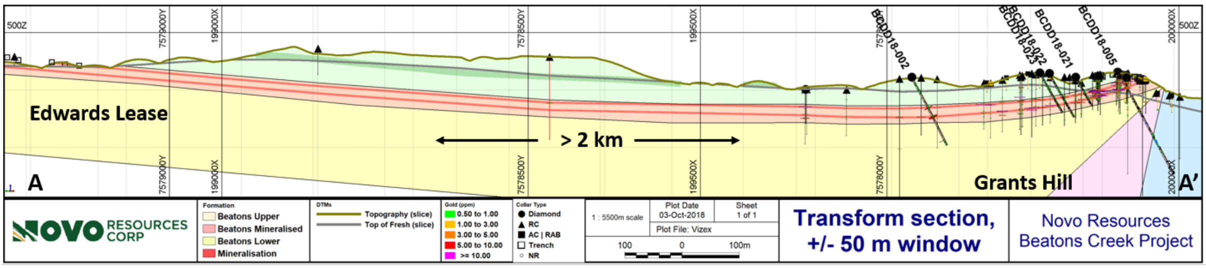


The initial round of grade shell generation focused on recent logging data to ensure that the mineralised position was appropriately modelled and on providing the best quality data. A second round of modelling focused predominantly on RC data, where the initial grade shell was fine-tuned by using the downhole assay data. A final round of modelling snapped all grade shells to each intersecting drillhole where no significant assay was intersected. Downhole logging was used to pick the interval most applicable to be treated as the continuation of mineralisation.

The geological model and associated grade shells are considered to be of high confidence. The preliminary shells within each fault block captured the bulk of mineralisation, with subsequent integration of other assay data only slightly adjusting the shape of the initial shell. The limited drill holes that did not return a significant assay still generally intersected the mineralised position, with assay results in the 0.1-0.5 g/t gold range. All drill holes intersecting the lags were used in the estimation.

All fault blocks, with the exception of Golden Crown, have the M1 and M2 defined as the most dominant and consistent lodes. These represent the two most consistent marine lags and are always located in the same stratigraphic sequence (with the M1 approximately 12 m below the lowest marker Tuff, and the M2 approximately 10 m below the M1). This initial framework provides significant support to the geological continuity of the system. The M1 and M2 lodes are able to be consistently modelled for over 2.5 km in strike (Figure 14.3).

Figure 14.3 Beatons Creek Project cross section showing key stratigraphy and the main reefs (M1 and M2)



Additional, parallel marine lags to M1 and M2, have been identified as M0, M3, M4 and M5 in the Grant's Hill, Grant's Hill South and Central domains, with the number denoting the stratigraphic sequence (i.e. M0 is the highest).

The Golden Crown block represents a different type of fan, with imbrication suggesting sedimentation from the east as opposed to the southeast. Five marine lags have been defined in this domain, along with an additional sequence of channel mineralisation towards the southern margin.

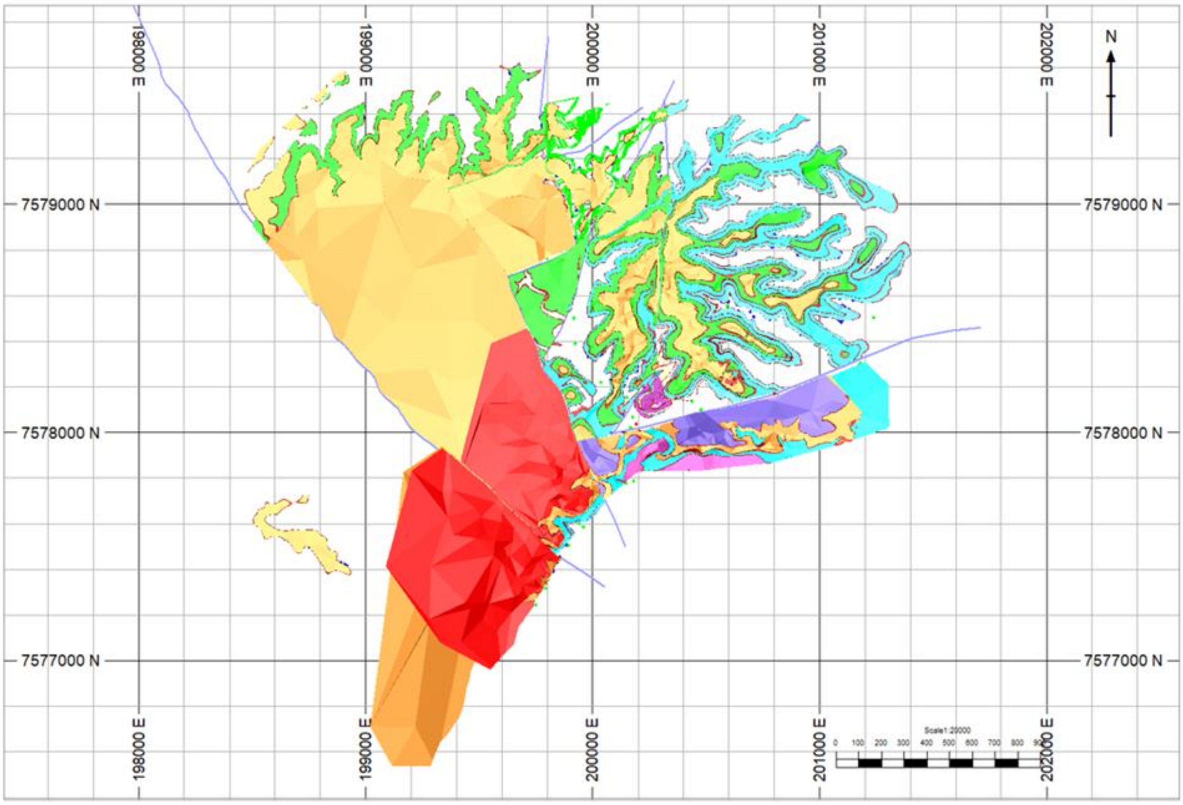
South Hill seems to solely contain channel mineralisation. These channels have potentially incised the Golden Crown domain, running parallel to the Mosquito Creek faulted contact, and are the likely source of sedimentary input into the Grant's Hill and Central domains.

Logging of oxidation state from diamond core and televiewer data was used to generate a triangulated surface of the boundary between oxide and fresh material. There are no significant amounts of transported material or transition zone material to warrant any additional surfaces to be modelled. The boundary between oxide and fresh was used to attribute blocks within the resource model for reporting and density allocation.

Figure 14.4 shows the spatial extent of the mineralisation wireframes used in the estimate, along with the key dividing faults. Each of the lags (reefs) has been assigned a different colour to show the relative distribution and stacking of the lags within the fault blocks. The colour coding shows the impact of the topography exposing stacked lags.

The resulting mineralisation wireframes were used to code the drillhole database by fault block, lag type, lag number and mineralisation domain. The domain was assigned based on individual wireframes with a domain identifier made up from adding together the fault block, lag type and lag number. Estimation domains were assigned based on grouping of domains of the same marine lag number across different fault blocks. The estimation domain (ESTDOM) is the field used for estimation, within which all analysis, estimation and validation was undertaken. The topographic surface wireframe was used to code all data below the topography, and the base of oxidation wireframe representing the top of the fresh material was used to code the data according to weathering status.

Figure 14.4 Plan view of the Beatons Creek Project solids showing faults and the extent of reef wireframes



14.5. DATA CONDITIONING

14.5.1. CONTACT ANALYSIS

Contact analysis was undertaken, reviewing the boundary between the oxide and fresh material for all the marine lags, South Hill channels, Golden Crown marine lags and Golden Crown channel lags. Analysis of each of the four Lag types showed there was no discernible grade difference or sharp grade transition across the oxide/fresh boundary. Therefore, for the purposes of estimation, oxide and fresh material have not been sub-domained.

14.5.2. COMPOSITING OF SAMPLES

Analysis of the raw samples within all the mineralisation domains indicated that the main sample length of the raw data is 1 m, with the average sample length being 0.91 m. This is predominantly due to the majority of samples being from RC holes with a downhole 1 m increment. Samples were composited to 1 m lengths within each domain using the Datamine function COMPDH and the parameter MODE = 1, ensuring that all residuals were incorporated into the composites, and subsequently no data lost. A minimum composite length of 0.25 m was applied; this removed 13 samples from the dataset which are approximately 0.1 m in length.

A comparison between the raw sample and composite sample statistics for each mineralisation domain showed that there was no reduction or increase in the grade of the mineralised intercepts due to compositing.

14.5.3. APPLICATION OF CAPS (TOP-CUTS)

Top-cuts, or caps, are typically applied in gold mineralisation to restrict the influence of high-grade samples. Composites within each of the domains were analysed to ensure that the grade distribution observed was indicative of a single population, with no requirement for additional sub-domaining. Each estimation domain was reviewed using histograms, log-probability plots and mean variance plots to identify whether extreme values exist which may influence the estimate. Where extreme grades were identified, the impact of top-cutting and the values at which top-cuts should be applied was assessed, and top-cuts selected to reduce the Coefficient of Variation (COV, or the ratio of the standard deviation and mean) to 1.5, as a general rule. Not all domains required a top-cut (Table 14.4).

14.5.4. CHOICE OF ESTIMATION METHOD

Given the relatively low degree of skewness and the presence of only a few samples with extreme grades, it was determined that the estimation of grades using ordinary kriging with a top-cut (cap) would be appropriate for estimation. Given the undulating nature of the wireframes, it was decided that dynamic anisotropy would be appropriate. Dynamic anisotropy is an estimation approach where the orientation of the search ellipsoid is varied for each estimation block based upon the derivation of a local dip and dip direction of the mineralisation. It results in much more robust and spatially-correct grade estimates.

Table 14.4 Details of top-cuts (caps) applied by estimation domain

Estimation domain	Number of samples		Mean grade (g/t Au)			Top-cut value	Standard deviation (g/t Au)		Coeff of Variation (COV)		Max uncut grade (g/t Au)
	Uncut	Top cut	Uncut	Top cut	% Diff		Uncut	Top cut	Uncut	Top cut	
10	209	2	1.01	0.99	-2%	10	1.86	1.28	1.84	1.30	28.75
11	762	12	3.93	3.66	2%	30	7.03	5.59	1.97	1.53	104.51
12	550	3	2.25	2.13	7%	25	4.14	3.06	2.07	1.44	78.11
13	277	1	1.27	1.25	2%	10	1.55	1.46	1.26	1.17	15.30
14	129	1	0.90	0.84	-7%	5	1.50	1.06	1.67	1.26	13.90
341	67	2	0.98	0.96	-1%	6.5	1.42	1.36	1.46	1.41	7.10
342	110	2	0.96	0.92	-4%	6	1.38	1.08	1.43	1.18	13.96
343	100	4	2.01	1.90	-6%	12	3.28	2.83	1.63	1.49	17.32
346	10	1	1.67	1.23	-26%	5	3.08	1.69	1.84	1.37	11.21
921	175	4	1.47	1.38	-7%	10	2.39	1.84	1.62	1.33	18.93
922	302	2	2.24	2.07	-7%	25	5.03	3.09	2.24	1.49	72.46
923	245	1	1.47	1.37	-7%	15	2.99	2.02	2.04	1.48	36.90
924	186	1	1.01	0.98	-3%	10	1.44	1.10	1.42	1.12	20.37
930	67	3	1.17	1.11	-5%	7	1.92	1.65	1.65	1.49	12.34
932	102	2	1.51	1.47	-2%	10	1.90	1.71	1.26	1.16	13.17
933	54	2	1.79	1.54	-14%	10	3.36	2.00	1.88	1.30	24.80
934	43	1	2.08	1.99	-5%	7.5	2.15	1.78	1.03	0.90	11.44
935	21	2	3.98	3.75	-6%	10	3.58	2.99	0.90	0.80	13.64
936	25	1	1.69	1.66	-1%	5	1.42	1.35	0.84	0.81	6.32
937	17	2	2.32	1.47	-37%	5	3.74	1.49	1.61	1.01	12.39

14.6. GRADE ESTIMATION AND VALIDATION

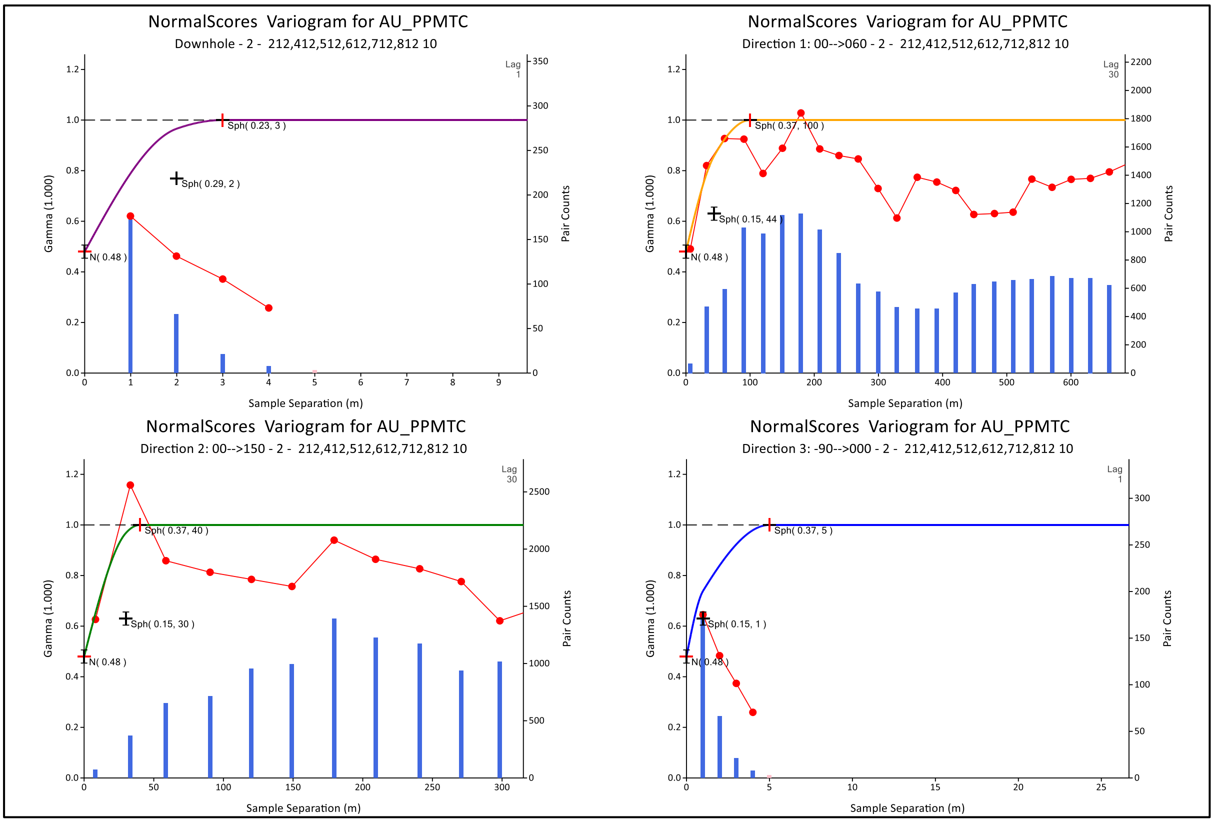
14.6.1. VARIOGRAPHY

Grade continuity analysis was undertaken in Snowden Supervisor software for the mineralised domains. Due to the positively skewed nature of the grade distributions, normal scores variograms were modelled. The normal scores models were back-transformed into Cartesian space prior to estimation.

Given the nature and narrowness of the marine lags, it was not possible to model a downhole variogram as many of the drillholes had a single sample intercept. An omni-directional variogram was therefore modelled on closely-spaced data for marine lag 1 (M1, ESTDOM = 11), which gave a transformed nugget value of 0.48 or 48% relative to the sill. The 0.48 nugget back transformed to approximately 60%. This high nugget value is to be expected given the mixed sample types (Trench, RC and DDH) and inherently nuggety nature of the conglomerate engendered by the coarse gold. The transformed 0.60 nugget value was applied to all variograms.

Variograms were modelled separately for Marine lag 1 (M1) and Marine lag 2 (M2). The remaining individual marine lags (M0, M3 to M6) did not have sufficient samples for modelling variography. The M1 variogram was used for the M0 lag. The M2 variogram was used for the lower marine lags M3, M4, M5 and M6. For the Golden Crown area, there were insufficient sample data for individual domain variography analysis, so data from all four marine lags was combined and used to model variograms. Similarly, data from the Golden Crown channels domains were combined for variography and data from all the South Hill channels combined for variographic analyses. A variogram was modelled for each of these groupings. The variogram for M2 (estimation domain 12) is provided, as an example, in Figure 14.5.

Figure 14.5 Example of variography for M2 reef (estimation domain 12)



14.6.2. DETERMINATION OF ESTIMATION PARAMETERS

A Kriging Neighbourhood Analysis (KNA) was undertaken on gold in the M2 marine lag (ESTDOM = 12) in order to determine the block size and estimation parameters for the block model and estimation. This marine lag was selected as it has the most extensive coverage. The KNA analysis was located in an area of good sample support.

Determining the optimal block size is the first step in the KNA process. A range of block sizes were tested, with the 20 m by 20 m by 1 m size giving a higher kriging efficiency than the 10 m by 10 m by 1 m block size previously used.

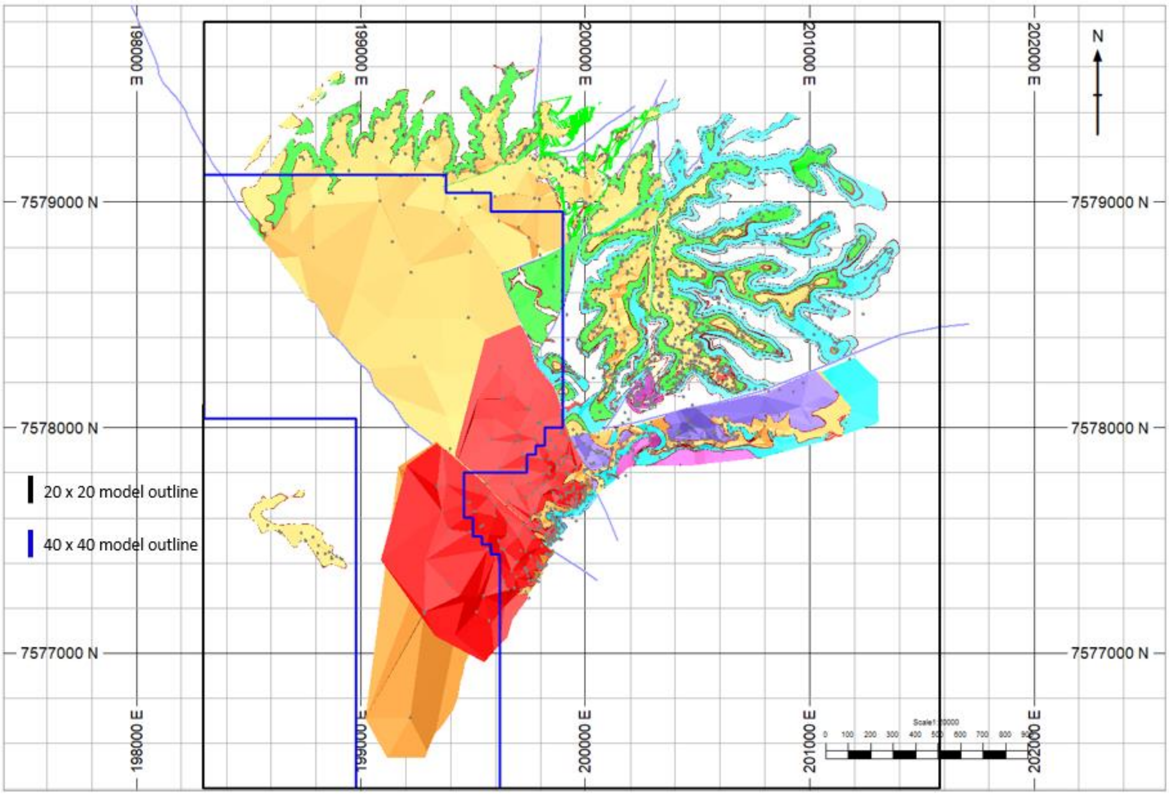
The number of informing samples was then determined. The number of informing samples was analysed using a block size of 20 m by 20 m by 1 m. A minimum of 5 and maximum of 22 was selected based on this analysis.

Search volumes were based upon the variogram ranges.

14.6.3. BLOCK MODEL CONSTRUCTION

Due to the variable drill spacing, two block models, with different parent block sizes, were constructed to cover the extents of the mineralisation. The predominant block model parent size was selected based on the kriging neighbourhood analysis (KNA) described in Section 14.6.2 and is approximately half the dominant drill spacing within the area selected for review. The more widely spaced drilling, 100 m by 100 m up to 200 m by 200 m, uses a block size of 40 m by 40 m by 1 m. The close-spaced drilling uses a block size of 20 m by 20 m by 1 m. For both block models, the sub blocking goes down to 2.5 m (X) by 2.5 m (Y) by 0.25 m (Z) for effective boundary definition. The same sub block size was selected to ensure a smooth combination of the models at the end. Importantly, estimation was only carried out inside the parent blocks. Figure 14.6 shows model extents outlined in black and blue, with the 40 m by 40 m area within the blue boundary. As with Figure 14.4, the colours indicate the different lags and show the stacking within the fault blocks and the effects of the incised topography.

Figure 14.6 Modelling area showing extents of the large and small block models, along with faults and domain solids



Both the 40 m by 40 m and the 20 m by 20 m block models were estimated using all of the data within the relevant domains. In domains which exist in both models a common data set was used. The estimated 40 m by 40 m model was then selected within the model area wireframe and added onto the 20 m by 20 m model prototype. The estimated 20 m by 20 m model was selected outside of the model area wireframe. The resulting 40 m by 40 m and 20 m by 20 m models were combined to form the final model.

14.6.4. ESTIMATION PARAMETERS

Ordinary Kriging (OK) was used as the interpolation method at Beatons Creek. The interpolations were constrained within the estimation domains and undertaken in four passes. All estimation domains were estimated using hard boundaries. Dynamic anisotropy was used for each domain. Dynamic anisotropy involves the estimation of the dip and dip direction of the mineralisation wireframes into the block model allowing both the search and variogram to be oriented locally according to the dip and dip direction of the mineralisation.

The estimation domains were coded based on the mineralisation wireframe domains. For the more extensive marine lags (M0, M1, M2, M3, M4, M5 and M6) that exist across fault block boundaries, the estimation domain was created to allow data coded for the same marine lags to be used across the faults. Between the fault blocks 200, 400, 500, 600, 700, 800, the offset is minimal, and the search ellipse allows data to be used across the boundaries. In other areas the offset ensures that data cannot be used across fault boundaries despite being from the same domain.

The main mineralisation estimation domains are M1 and M2 (ESTDOM 11 and 12, respectively). In general, the first search pass is half the variogram range, the second search pass is at the variogram range and the third pass up to three times the range. A fourth pass was included to fill un-estimated blocks after pass three; however, these blocks have not been reported as part of the Mineral Resource. A minimum of five samples and maximum of 22 samples were used for passes one and two, a minimum of two samples and maximum of 22 was used for the third pass and for the fourth pass, a minimum of one sample and maximum of 22 samples used. For all searches, a maximum of two samples per drillhole was applied.

14.6.5. ALLOCATION OF DENSITY

Specific gravity was measured using a standard wax-coated water immersion (Archimedes) technique on drill core. Specific gravity was assigned based on analysis of 676 measurements: 178 measurements from oxide material and 498 measurements from fresh material.

Specific gravity for mineralised oxide material was assigned based on 29 samples sourced from drill core within the mineralised domains (Table 14.5). Specific gravity for the fresh mineralised material was assigned based on 55 samples sourced from drill core within the mineralised domains.

Table 14.5 Summary of SG data and allocated densities

Material type	Oxide code	All data		Density assigned
		Number of measurements	Avg. Density (t/m^3)	t/m^3
Mineralised oxide	1000	29	2.37	2.40
Unmineralised oxide	1000	149	2.43	2.40
Mineralised fresh	2000	55	2.85	2.85
Unmineralised fresh	2000	443	2.76	2.75

14.6.6. MODEL VALIDATION

In addition to conducting validation checks at all stages of the modelling and estimation process along with ongoing peer review, final grade estimates and models were validated by undertaking whole-of-domain grade comparisons with the input top-cut and declustered drillhole composite, visual validation of block model plan sections and by grade trend (swath or profile) plots. In general, the model validated well. A domain-by-domain comparison between the declustered composites and the output block model grades for the 27 domains shows block grades generally within a reasonable margin of error (±10%) in the areas estimated in the first or second pass (Table 14.6).

Table 14.6 Domain by domain comparison between the declustered composites and the output block model grades for the 27 domains

Estimation domain	No. composites	Composite grade (cut) (g/t Au)	Declustered composite grade (cut) (g/t Au)	Estimated grade (model) (g/t Au)	% Diff est vs comp	% Diff est vs declustered comp
M0 / 10	118	1.12	0.96	0.98	-12.28	2.36
M1 / 11	457	4.01	3.71	4.28	6.58	15.45
M2 / 12	360	2.63	2.33	2.4	-8.77	2.65
M3 / 13	171	1.33	1.28	1.4	5.48	9.5
M4 / 14	90	0.81	0.63	0.63	-22.38	0.45
M5 / 15	43	0.68	0.64	0.72	5.99	11.81
M6 / 16	7	2.04	1.9	1.66	-18.55	-12.45
341	47	1.03	0.93	0.99	-4.05	6.27
342	86	0.92	0.85	0.81	-11.88	-3.88
343	70	1.96	1.51	1.41	-28.1	-6.71
344	21	0.74	0.7	0.86	15.85	22.14
345	11	1.3	1.38	1.36	4.98	-1.62
921	163	1.53	1.43	1.37	-10.44	-4.42
922	275	2.16	1.86	1.75	-19.09	-5.94
923	209	1.47	1.36	1.27	-13.13	-6.03
924	159	1.14	1.14	1.1	-3.84	-3.95
930	62	1.28	1.11	1.02	-20.27	-8.12
931	95	1.13	0.96	0.8	-28.95	-16.26
932	96	1.43	1.42	1.4	-1.84	-1.5
933	50	1.46	1.42	1.62	10.46	13.81
934	40	1.95	1.85	1.63	-16.3	-11.83
935	20	4.01	3.83	3.12	-22.26	-18.61
936	23	1.82	1.6	1.72	-5.55	7.53
937	15	1.41	1.15	1.05	-25.33	-8.32
938	11	1.02	1.06	1.15	13.48	8.94

Swath or profile plots were also generated and reviewed for the estimation domains. In general, the trend of the model follows the trend of the composites well. In areas of high drillhole data density, the block model grade is seen to closely mimic the declustered composite grade; however in areas of low drillhole data density and zones of extrapolation beyond the sampling, the block model grade deviates from the declustered composite grade. Some domains have very few samples which are able to impact the estimate. Scenario testing was undertaken to optimise the estimation based upon the validation results.

In domains where there is overestimation, it is generally towards the extrapolated extents of the mineralisation, in areas with less sample support. This relatively poor validation was reflected in the classification. Figure 14.7 shows the trend plot for M1 (ESTDOM 11), with naïve (raw) and declustered sample grades compared against volume-weighted model grades.

Visual validation, which compared model block grades and drillhole grades, was also carried out. An example of this, for the M1 reef (domain 11) is shown in Table 14.7.

Figure 14.7 Profile (swath) plots for domain 11 (search volumes 1 and 2 only)

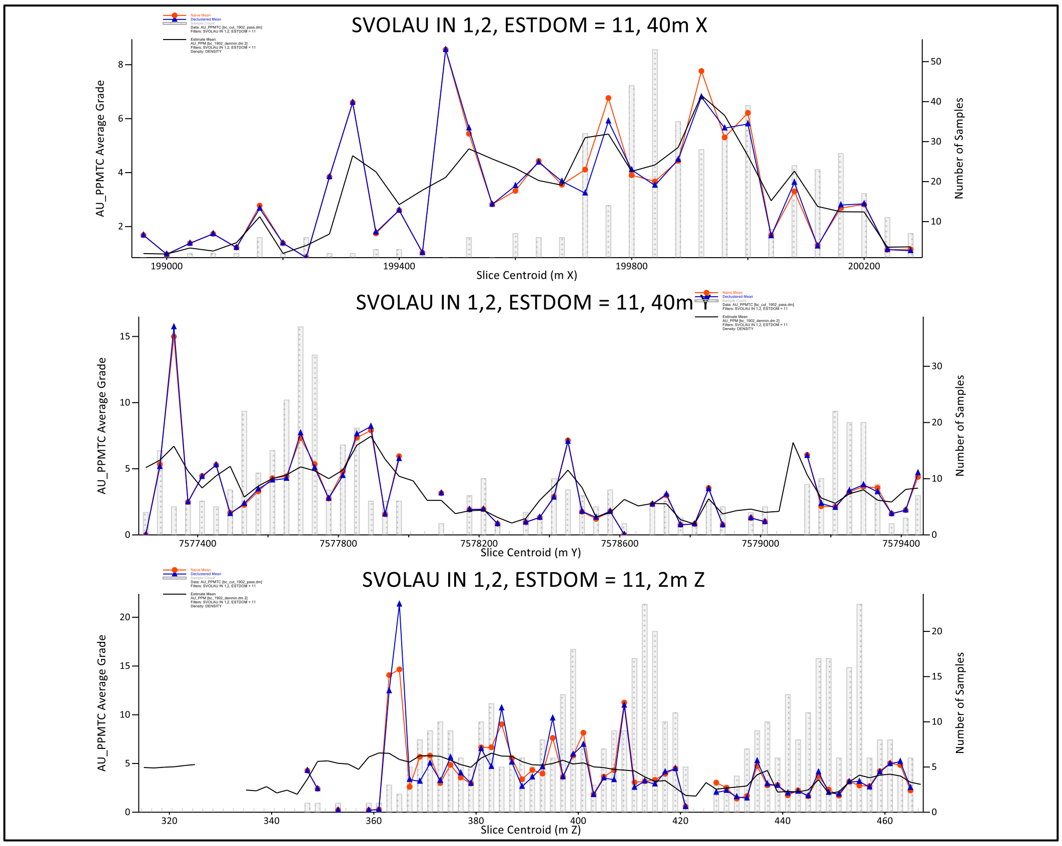
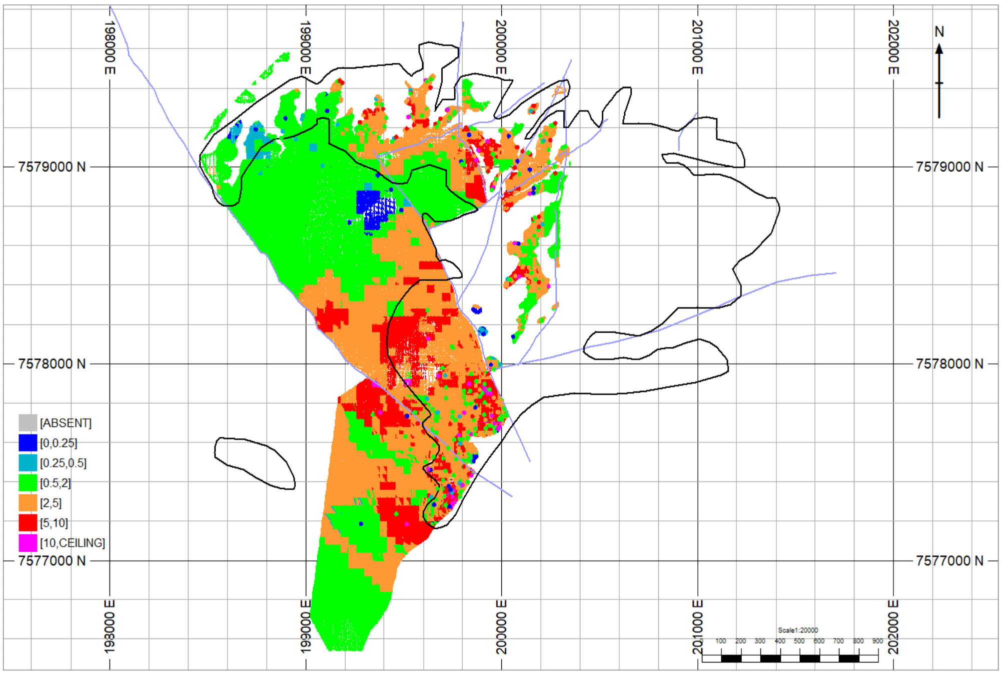


Figure 14.8 Visual validation for domain 11 (M1 reef); the black outline is the RPEEE pit shell



14.7. CLASSIFICATION AND APPLICATION OF RPEEE PRINCIPLES

14.7.1. CLASSIFICATION CRITERIA

Mineral Resources were classified according to the definitions published by the Canadian Institute of Mining, Metallurgy and Petroleum Definition Standards (CIM, 2014). The model was classified on a domain-by-domain basis. a selection string for each domain and for each classification category was created to delineate and code the model.

Both Indicated and Inferred Mineral Resources were defined at the Beatons Creek Project.

The definition of Measured Mineral Resources at the Beatons Creek Project cannot be justified based on the following arguments:

- Low quality control over a number of historical programs where CRMs (standards) were not submitted. For some programs where CRMs are present, their performance whilst not poor, is below expectation.
- The resource input grade data is very noisy, reflecting the coarse nature of the mineralisation – as reflected by a calculated nugget effect of 60%. This shows the influence of multiple data types with different supports (e.g., DD vs. RC vs trench channel) and sampling/assaying approaches (e.g., different submission weights, preparation routes and assays via fire assay, screen fire assay and LeachWELL).
- Duplicate sample pair analysis indicates poor precisions (of 55-77%) for RC field duplicates and trench channel field duplicates. Whilst not excessively high, this is generally indicative of high grade variability. Duplicate pulp splits from the trench channel program yield precisions of 23%; again not excessively high, but indicating variability at the pulp scale.

- SG data for the oxide zone is acceptable but shows variability which is represented by too few data points in the current Indicated Mineral Resource area.
- The block model was based on 20 m by 20 m by 1 m, and 40 m by 40 m by 1 m estimation blocks kriged using a 60% nugget effect. Such an estimate is highly smoothed, effectively removing any selectivity from the estimate.

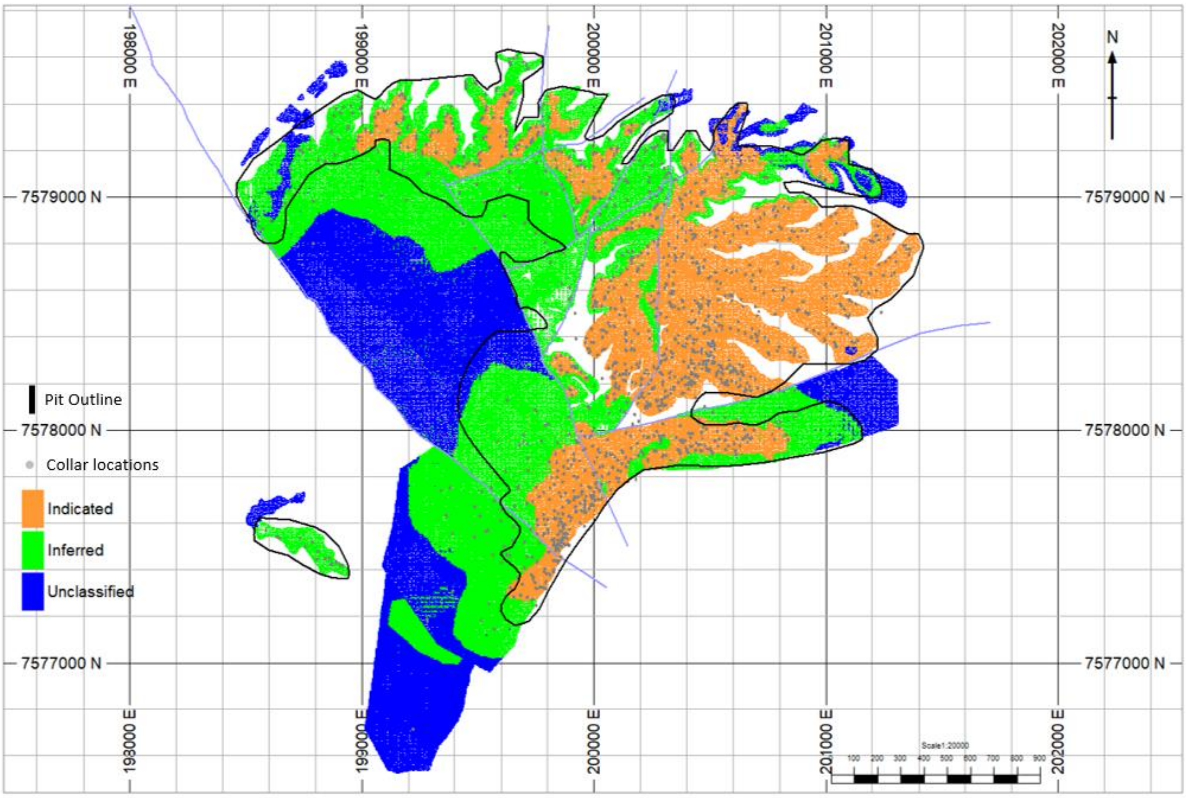
Areas classified as Indicated Mineral Resources are informed by relatively close-spaced drilling (ranging from less than 10 m by 10 m up to 40 m by 40 m spacing) and with grades estimated within the first or second search pass. Individual domains were reviewed and classified accordingly.

Areas classified as Inferred Mineral Resources are informed by drilling spaced from 40 m up to 100 m, and were estimated within the first or second, but generally the third estimation pass.

Individual domains were reviewed and classified accordingly. Areas that have estimated in the fourth pass were categorised as “unclassified” and have not been reported or used for the optimised pit shell.

Figure 14.9 shows the model coloured on resource classification. The approximate RPEEE pit outline is shown in black, with sample locations shown as grey dots.

Figure 14.9 Beatons Creek Project model coloured on Mineral Resource category (pit outline in black)



The principles of RPEEE required by the CIM Definition Standards were addressed by the generation of an optimal pit shell using the following key economic parameters:

- a gold price of US$1,311 (the actual gold price on 29 March 2019)
- metallurgical recoveries of 95% for oxide and 90% for fresh material

- a total mining cost of US$22.40 for oxide material and US$25.68 for fresh material.

Mineral Resources were reported above a cut-off grade of 0.5 g/t gold within the RPEEE shell. Material outside the pit shell, deemed to be extractable by underground means, was reported above a cut-off grade of 3.5 g/t gold without the application of any other criteria. Since the mineralisation is constrained to discrete reefs, it is anticipated that there are reasonable prospects that it can be mined by underground methods, together with dilution.

14.8. RESOURCE REPORTING

The resource was reported inside the RPEEE shell and above 0.5 g/t gold for open pittable material, and outside the shell and above 3.5 g/t for underground material. The total resources are summarised in Table 14.7; a breakdown by weathering state and by open pit versus underground is provided in Table 14.2 and Table 14.3.

Table 14.7 Total Mineral Resources for the Beatons Creek Project (oxide, fresh, open pit and underground)

Classification	Tonnes (x 1,000)	Grade (g/t Au)	Ounces gold (x 1,000)
Indicated	6,645	2.1	457
Inferred	4,295	3.2	446

14.9. BULK SAMPLE AND GRADE CONTROL PROGRAMS

A bulk sampling program was undertaken in 2018, designed to investigate the grade of relatively large (2t) samples, also to provide material for metallurgical testing within the oxide mineralisation. Over 45 bulk samples the weighted grade is 2.16 g/t Au, or 2.42 g/t Au if only samples above the resource cut-off grade were considered.

Each bulk sample was compared with the closest trench (costean) sample and the estimated block grade for the block containing the bulk sample location. Results are presented in full in Dominy and Hennigh (2019) but in summary both the trench sample grades and (to a lesser extent) the block model grades are higher than the associated bulk sample grade. There are a number of reasons for this apparent discrepancy, including the significant differences in sample support (volume) and the fact that the trench (costean) samples are more selective than the bulk samples. The block model, which relies heavily on the trench samples, shows higher grades than the samples.

Novo commenced a RC-based grade control program in late 2020 to test the local continuity of mineralisation and to contribute to a more localised grade control model. Sampling is being carried out on 0.5 m downhole intervals. At the effective date of the report no results were available from this program.

15. MINERAL RESERVE ESTIMATES

As no pre-feasibility or feasibility studies have been completed at this time, no Mineral Reserves have been estimated for the Beatons Creek Project.

16. MINING METHODS

16.1. SUMMARY

The gold-bearing conglomerates (mineralised reefs) at the Beatons Creek Project are generally flat lying and have an average thickness of about 1.5 m. The mineralised reefs vary in thickness and grade-continuity across the mining area. The terrain is undulating with the mineralised reefs daylighting on the flanks of ridges.

Small scale surface and underground mining has been undertaken on the Beatons Creek Project site as early as the late 1800s and, more recently, some alluvial mining operations have worked the area.

The conceptual mine development will be the first large-scale mining operation undertaken on the leases.

The potential mine development utilises conventional open pit mining methods involving hydraulic excavators, in backhoe configuration, loading trucks. It is assumed that drilling and blasting will be required for the mining of most of the oxide waste and all the fresh mineralised reefs and waste. Dozers are planned to be used to rip oxide waste to assist excavator productivity, push-up mineralised material and push waste to adjacent valley-fill areas.

Plant feed will be trucked to a Mine Ore Pad (MOP) from which it can be road-hauled to the nearby Golden Eagle Mill.

A conceptual mine plan and production schedule have been developed for the PEA. The development of this plan included several technical aspects:

- pit optimisation analysis to select the optimal shell for the mine design
- creation of a conceptual mine design, including haul road layout and waste dumping strategies
- selection of mining phases to facilitate production scheduling
- preparation of life-of-mine (LOM) production and processing schedules
- estimation of mining equipment fleet and manpower requirements.

The conceptual mine plan involves the excavation of three types of material:

Waste material: barren or very low-grade material (<0.5 g/t) that will be hauled to waste dumps outside of the open pit areas or backfilled into excavated open pit voids. Testwork has indicated that 45% of the waste proposed to be mined has been assessed as potentially acid forming (PAF) Fresh material. It is proposed that this PAF material is encapsulated within planned waste dumps. In addition, an estimated 25% of the oxide waste proposed to be mined will require encapsulation within final landforms.

Mineralised waste: material above the resource cut-off grade and below the economic cut-off grade (0.5-0.8 g/t) that will be hauled and stockpiled adjacent to the Golden Eagle Mill. Depending upon the prevailing gold price this material may be processed during periods of low plant feed supply, as incremental plant feed or once higher grade plant feed has been depleted.

Possible plant feed: material above the economic cut-off grade (≥0.8 g/t) that will be hauled and processed at the Golden Eagle Mill. The LOM production and processing schedule includes a high grade (HG) fraction (>1.7 g/t), which will be preferentially feed through the processing plant, and a medium grade (MG) fraction (0.8-1.7 g/t) which will be blended with the HG fraction or fed when HG material is not available.

The proposed mining method is based upon the experience gained during the trial mining of a large bulk sampling (2016) and the bulk sampling (2018) activities.

The trial mining of a large bulk sample (approximately 30 kt) was undertaken from a single site in the Golden Crown mining area utilising an 80 tonne excavator/backhoe and 40 tonne articulated dump trucks with the support of a D9 bulldozer. Approximately 10 kt of the bulk sample was processed providing a reconciled head grade of 1.88 g/t against the block model grade of 1.65 g/t.

The trial mining indicated that the oxide waste and gold bearing reefs could be free dug (without the need for drill and blast activities). In some areas light ripping was required to assist productivity.

Key aspects of the large bulk sampling exercise are shown in Figure 16.1 to Figure 16.3.

Figure 16.1 Trial mining – waste stripping

Figure 16.2 Trial mining – selective mining of gold-bearing conglomerate

Figure 16.3 Trial mining – conglomerate ore zone and underlying sandstone

The trial mining also indicated that equipment could be upgraded to 120 t excavator/backhoe and 100t dump trucks for waste removal and the smaller 80 t excavator/backhoe and 45 t articulated dump trucks being utilised for pioneer works and areas where greater selectivity was required.

The trial mining and bulk sampling activities confirmed that the top of the reef structures could be identified with a noticeable change in hardness from a soft sandstone to the top of the mineralised reef. Although the reefs had been modelled at a 1 m thickness they proved quite variable; up to 2 m thick in some areas down to 0.5 m thickness. Geologists found it relatively easy to distinguish the footwall contact between the reef and the underlying sandstone. It was concluded that dilution could be maintained at about 20% and the loss of mineralised material during extraction minimised to <5%.

16.2. PIT OPTIMISATION

16.2.1. RESOURCE MODEL

The resource model was utilised for the pit optimisation, pit design and development of the LOM production schedule.

16.2.2. GEOTECHNICAL STUDIES

No geotechnical field investigations have been completed at this stage of the Beatons Creek Project.

The potential mine excavations are generally fairly shallow often involving the excavation of the tops of ridges, ranging from 20 to 30 m in depth.

The fresh rock pits are generally less than 50 m in depth. The deepest potential excavation over the LOM is a small section of the Grant's Hill final pit which reaches a depth of 80 m.

An average slope angle of 50 degrees was used for the pit optimisations which is considered reasonable from observations of the fresh rock observed in available drill core.

16.2.3. HYDROGEOLOGICAL STUDIES

Detailed hydrogeological investigations have been undertaken as the Beatons Creek Project area lies within designated protection area for the Nullagine drinking water supply.

Except for the Grant's Hill final pit, open pit excavations are located above the water table. It is expected that pit dewatering of this final stage of the Grant's Hill pit can be achieved through in-pit sumps and utilised for dust suppression and mining purposes.

Existing groundwater and surface water abstraction licences are expected to provide sufficient water supplies for dust suppression and mining purposes.

16.2.4. MINING DILUTION AND ORE LOSSES

During the potential mining operations, some level of waste dilution and ore loss will occur. The amount of dilution that occurs will be dependent on the thickness and continuity of the mineralised zones being mined. Better understanding of the mineralised zones will be available following planned infill drilling and close-spaced grade control drilling.

Based upon the experiences gained from the large bulk sampling and bulk sampling activities, this PEA utilises provisions of 20% dilution and 2% mineralised material loss.

16.2.5. OPEN PIT MINING METHOD

The pit optimisation assumed that the potential open pits will be mined using conventional truck and excavator mining methods. Mining of waste and mineralised material will occur using 85 t (example: PC850) hydraulic excavators in backhoe configuration. Haulage of mineralised material and waste will be undertaken by 45 t articulated trucks (example: CAT 745).

At the time of the pit optimisation, it was assumed that all oxide material was free-digging, without the need for drill and blast, with some light ripping to assist excavator productivity. It was assumed that all fresh rock required drill and blast under predominantly dry hole conditions.

All mineralised material is hauled to the MOP from where it is road hauled 15 km to the Golden Eagle Mill.

Oxide waste is hauled to waste storage areas located adjacent to the Edwards and Grant's Hill pits. Some waste will be backfilled into valleys adjacent to the central pit areas. Fresh waste will be backfilled into depleted excavations and dedicated surface waste storage areas adjacent to the Grant's Hill pit if non-acid forming (NAF). Potentially acid forming (PAF) waste would be encapsulated within the oxide waste storage areas.

Waste rock at the Beatons Greek Project has been characterised into six (6) material types:

- topsoil
- non-acid forming oxide waste (NAF oxide)
- Alunitic oxide waste (Alu oxide)
- potentially acid forming Fresh Waste (PAF fresh)
- mineralised oxide waste
- mineralised fresh waste.

Topsoil will be stockpiled in separate locations around the Beatons Creek Project to be used in rehabilitation at the conclusion of mining.

NAF Oxide is stockpiled separately from the other products to be used to encase the other materials at the completion of each dump. PAF material will be contained within the Alu Oxide material with a final covering of NAF Oxide.

Where possible, mining would be scheduled to minimise the rehandling of NAF material to encapsulate PAF material, but some rehandle will be required. Based on the current understanding of the top-of-fresh horizon, the occurrence of Alu oxide and the boundaries between NAF and PAF oxide the material splits are:

- 26% NAF oxide
- 23% Alu oxide
- 51% PAF fresh
- <0.5% mineralised waste.

16.2.6. PIT OPTIMSATION INPUT PARAMETERS

A series of pit optimisation analyses were undertaken utilising the resource block model including the Indicated and Inferred Mineral Resource categories.

The pit optimisation process creates a series of nested pit shells each containing mineralised material that is potentially economically mineable according to a set of physical and economic parameters. The optimisations were run using the economic parameters shown in Table 16.1 and Table 16.2.

Table 16.1 Pit optimisation parameters

Parameter	Unit	Value	Comments
Gold Price	$/oz	1,400	
Resource Block Size	m	20 x 20 x 1	
	m	40 x 40 x 1	
Sub Blocks	m	2.5 x 2.5 x 0.25	
Rock Density			
Oxide - All	t/m^3	2.40	
Fresh - Waste	t/m^3	2.75	
Fresh - Mineralised	t/m^3	2.85	
Resource Categories		Indicated & Inferred	
Pit Slopes - All	Degrees	50	
Mining Dilution	%	20	
Mining Loss	%	2	
Mining Costs			
Load Haul Dump	$/bcm	See Table 16.2	
Diesel Fuel	$/L	0.66	Price includes $0.11/L rebate
Fuel Cost Oxide	$/bcm	0.86	
Fuel Cost - Fresh	$/bcm	0.99	
Dozer ripping - Oxide	$/bcm	0.73	Added to LHD below 5m depth
Drill & Blast - Fresh	$/bcm	1.84	Includes $0.35/bcm fuel cost
Road Haulage	$/t	1.50	15km at $0.10/t.km
Processing Costs	$/t	18.20	Oxide and Fresh
Processing Recovery	%	95.0	
General & Admin.	$/t	5.80	
State Govt. Royalty	$/oz	35.00	2.50%
Discount Rate	%	10	
Applied Cut-off Grade	g/t	0.9	

Load and haul costs are based on a haulage matrix which provides for the vertical rise (m) and the distance from centre of block to destination (m) as shown in Table 16.2.

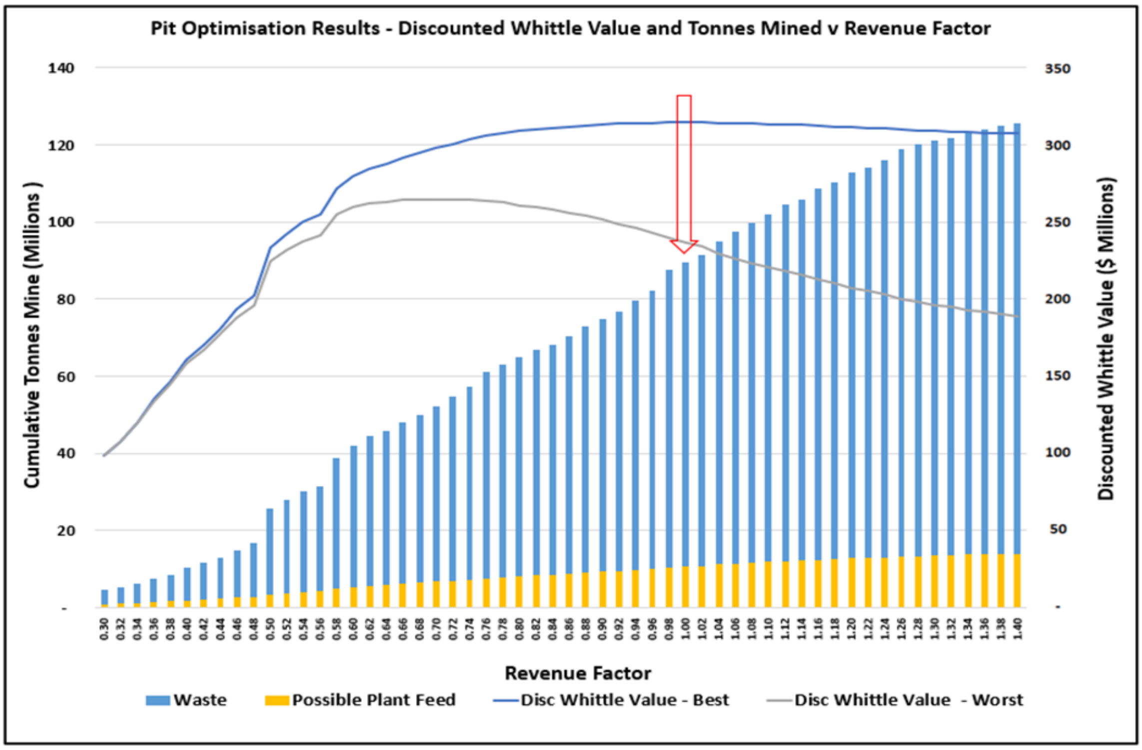
Table 16.2 Load and haul costs

Matrix of Load & Haul Costs ($/bcm)								
Vertical rise (m)	Horizontal haulage distance (m)							
	500	1000	1500	2000	2500	3000	3500	4000
Surf	$4.06	$4.53	$4.77	$5.24	$5.50	$5.96	$6.21	$6.67
5	$4.29	$4.53	$4.96	$5.24	$5.68	$5.96	$6.38	$6.84
10	$4.61	$4.72	$5.33	$5.46	$6.06	$6.20	$6.66	$7.12
15	$4.61	$4.91	$5.33	$5.64	$6.06	$6.37	$6.83	$7.29
20	$4.71	$5.44	$5.48	$6.17	$6.26	$6.73	$7.21	$7.69
25	$4.90	$5.44	$5.67	$6.17	$6.43	$6.92	$7.39	$7.86
30	$5.10	$5.44	$5.86	$6.17	$6.62	$7.10	$7.57	$8.04
35	$5.44	$5.54	$6.17	$6.31	$6.79	$7.27	$7.75	$8.23
40	$5.64	$5.94	$6.40	$6.73	$7.23	$7.73	$8.23	$8.72
45	$5.98	$6.41	$6.78	$7.21	$7.73	$8.25	$8.76	$9.27
50	$5.98	$6.78	$6.88	$7.40	$7.92	$8.44	$8.95	$9.46
55	-	$7.04	$7.34	$7.88	$8.41	$8.95	$9.49	$10.02
60	-	$7.04	$7.53	$8.07	$8.62	$9.16	$9.69	$10.21
65	-	$7.20	$7.74	$8.27	$8.81	$9.35	$9.89	$10.42
70	-	$7.39	$7.94	$8.47	$9.02	$9.56	$10.09	$10.62
75	-	$7.58	$8.13	$8.67	$9.21	$9.75	$10.29	$10.82
80	-	$8.04	$8.63	$9.19	$9.74	$10.31	$10.86	$11.41
85	-	$8.23	$8.84	$9.39	$9.95	$10.51	$11.07	$11.62
90	-	$8.40	$9.04	$9.60	$10.16	$10.72	$11.28	$11.83
95	-	$8.58	$9.25	$9.81	$10.37	$10.93	$11.49	$12.03
100	-	$8.75	$9.46	$10.02	$10.57	$11.14	$11.69	$12.24

Pit optimisation was undertaken by Auralia Mining Consulting utilising Gemcom Whittle optimisation software. The results of the pit optimisation analysis are shown graphically in Figure 16.4. The optimisations results are shown for pits at revenue factors ranging from 0.30 to 1.40.

The Discounted Whittle Value – Best results provide the highest cashflow and requires that each shell be mined sequentially. The Discounted Whittle Value – Worst results provide the lowest cashflow values and assumes that the deposit is mined on a bench by bench basis. The difference between the two outcomes for each scenario can be bridged, in part, by developing staged pit development wherever possible and balancing ore mineralised material production according to grade and haulage distances (for waste and mineralised material).

Figure 16.4 Pit optimisation results



The pit shell corresponding to 1.00 Revenue Factor (as indicated by the red arrow) was chosen as the basis for detailed pit design and production scheduling.

16.2.7. PIT DESIGNS

Open pit designs were developed by Auralia Mining Consulting in collaboration with Novo mining personnel.

Table 16.3 shows the pit design parameters applied to all designs.

Table 16.3 Pit design parameters

Parameter	Unit	Value
Slope Parameters		
Batter angle - oxide	Degree	50
Batter angle - fresh	Degree	70
Batter height - oxide	m	10
Batter height - fresh	m	15 to 20
Berm width - all	m	5
Ramp width	m	25
Ramp grade		1:9

The potential pit areas are shown in Figure 16.5, with the shallow oxide pits depicted overlying the deeper Fresh pits as well as the locations of representative cross sections which depict the different reef distributions across the possible mining area (Figure 16.6 to Figure 16.8).

Figure 16.5 Schematic showing mining areas and location of cross-sections

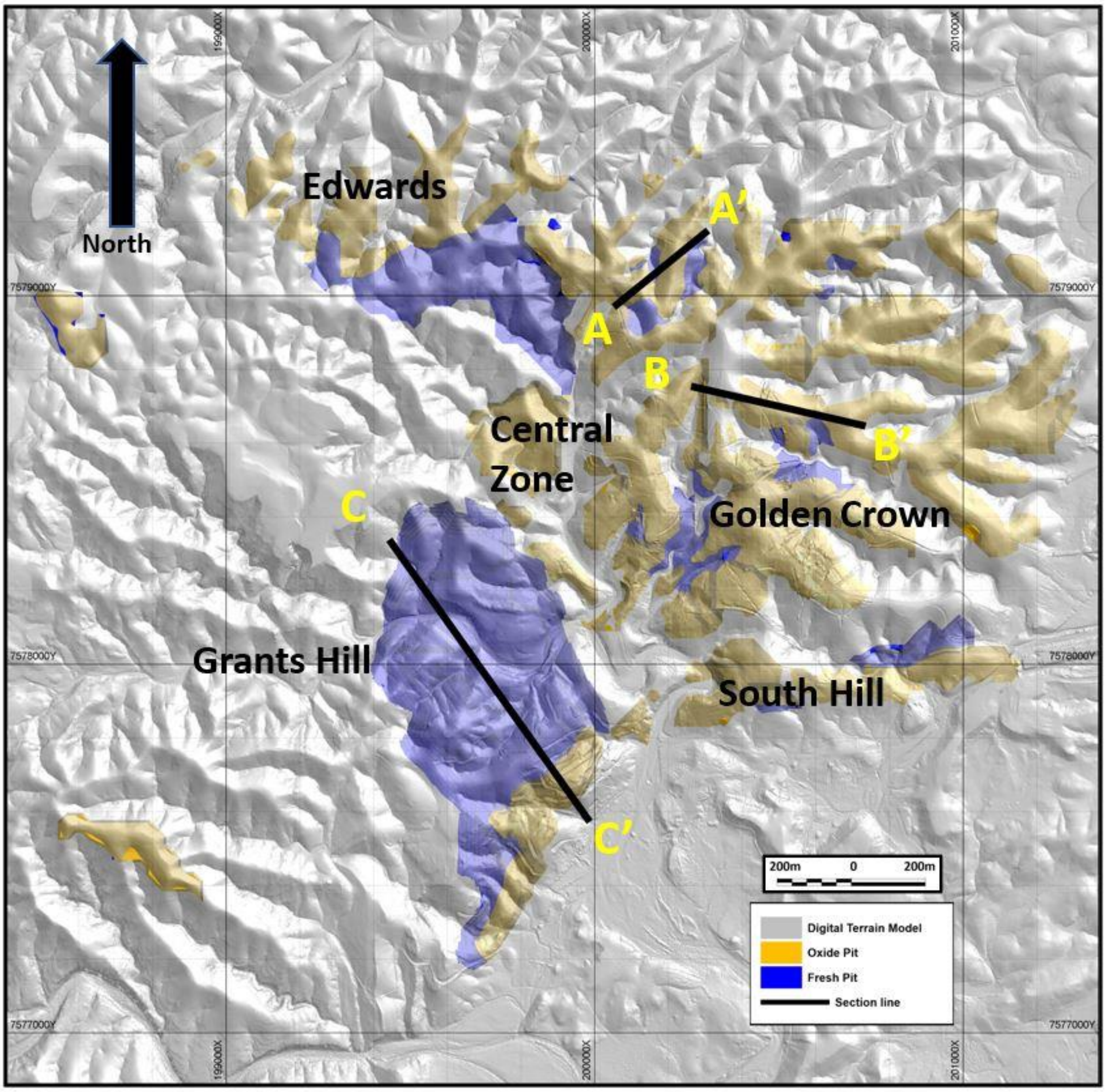


Figure 16.6 Section view of Edwards open pit area

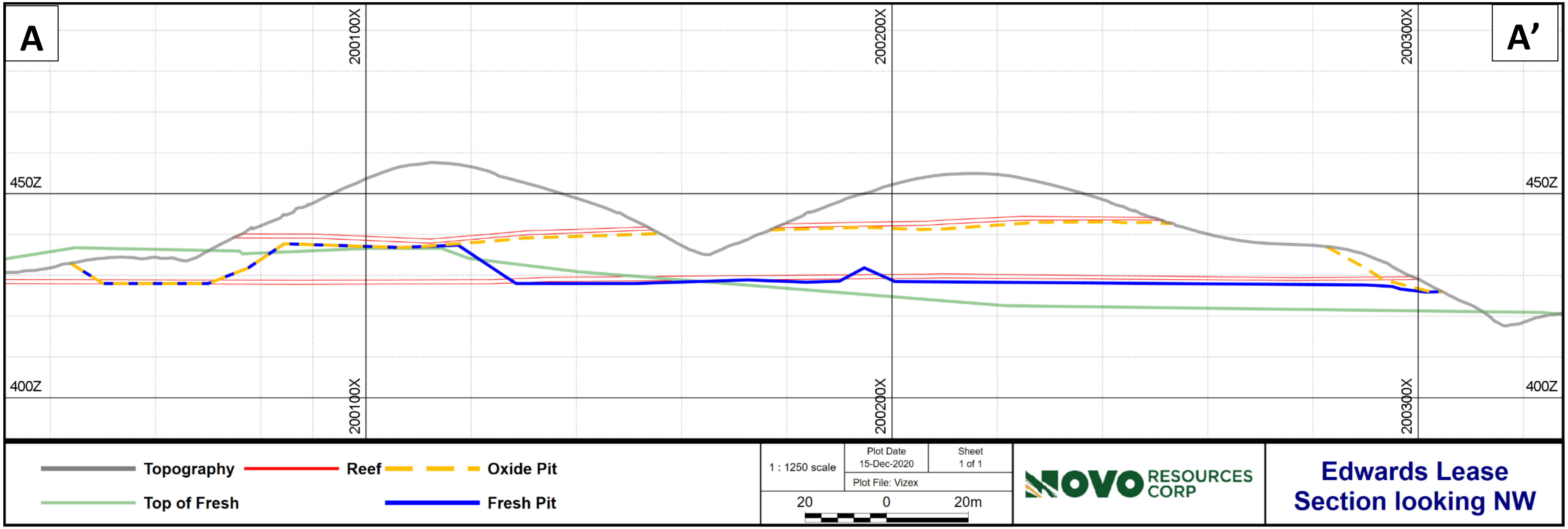


Figure 16.7 Section view Golden Crown pit area

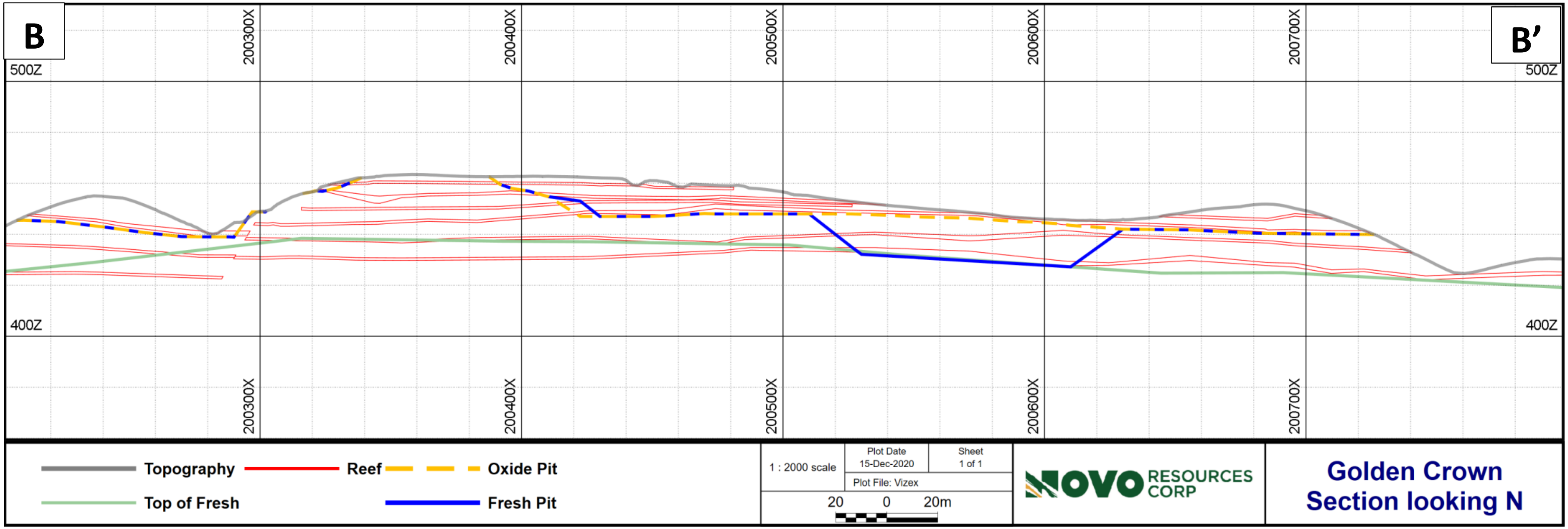
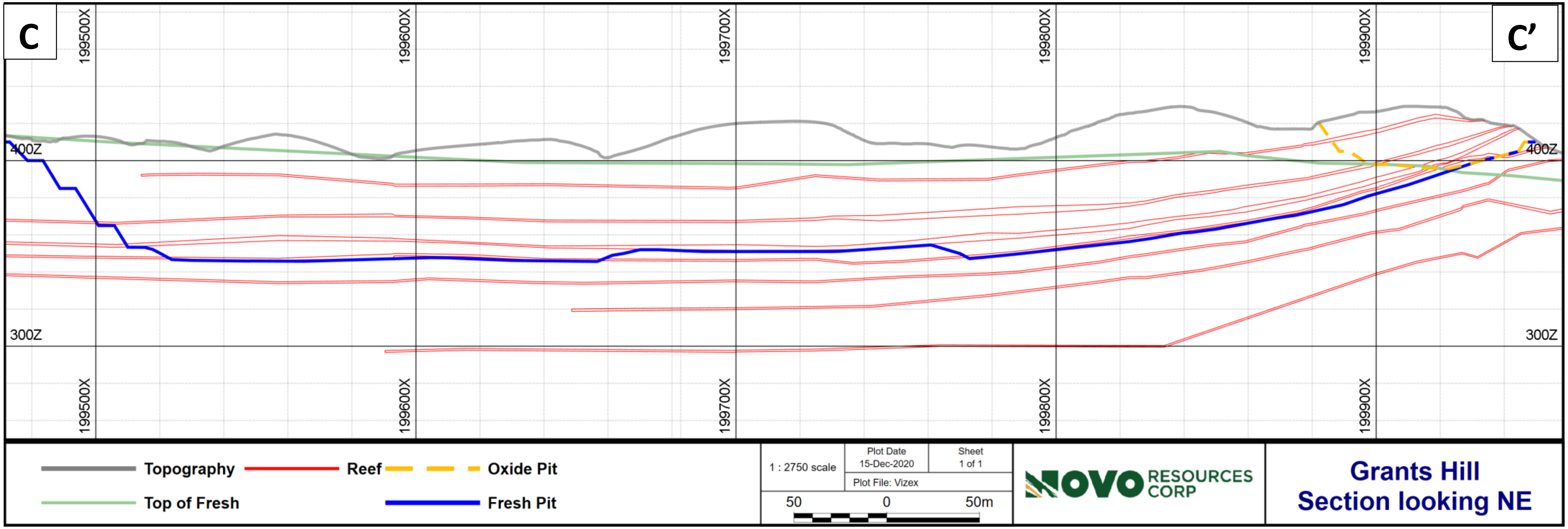


Figure 16.8 Section through Grant's Hill pit area

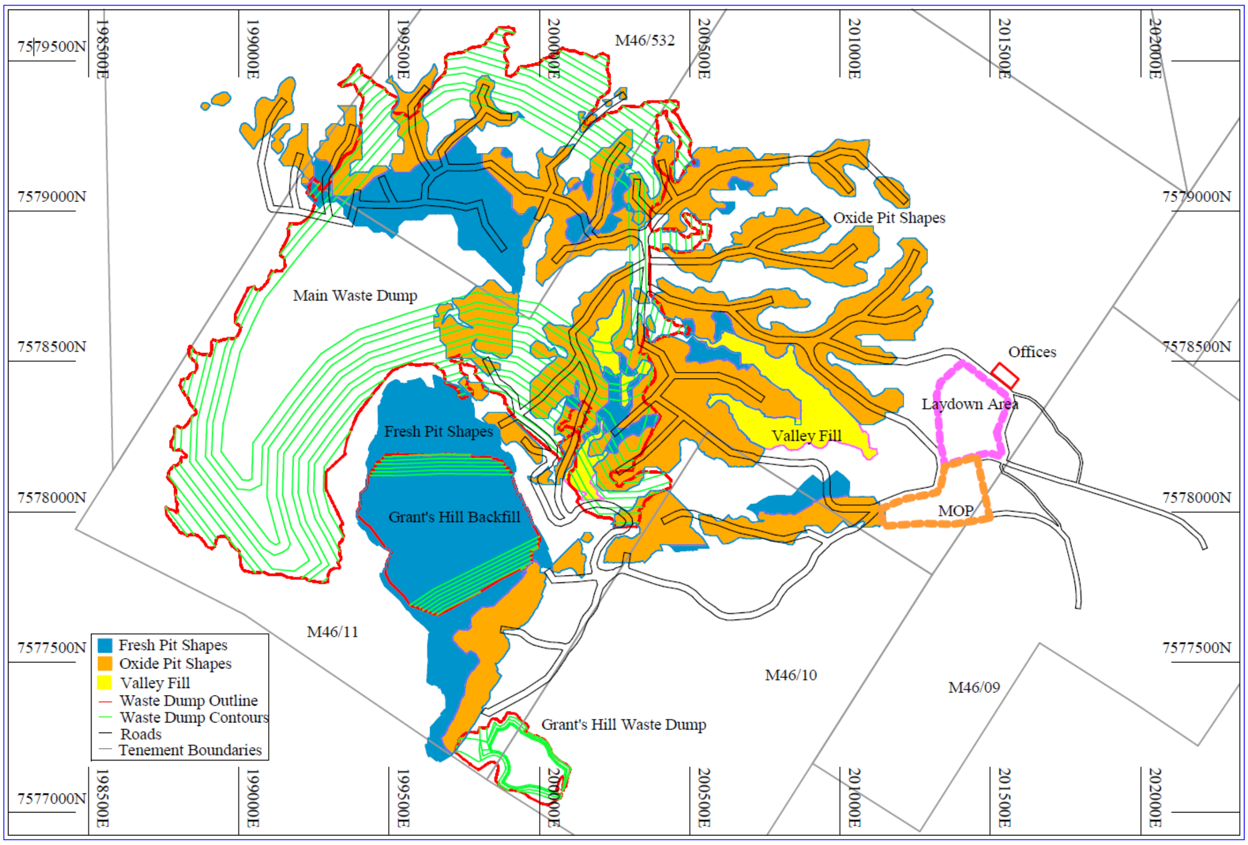


16.2.8. SITE LAYOUT

The conceptual mine design and site layout used to prepare the PEA production schedule is shown in Figure 16.9, which shows the proposed Oxide pits, Fresh pits, associated waste dumps (including valley-fill areas), haul roads, MOP and equipment laydown and service area and mine office. The mining areas extend over an area of about 2.5 km by 2.5 km.

The main mining equipment maintenance workshop is planned to be located adjacent to the Golden Eagle Mill.

Figure 16.9 Beatons Creek site layout



16.2.9. PRODUCTION SCHEDULE

MINING SEQUENCE

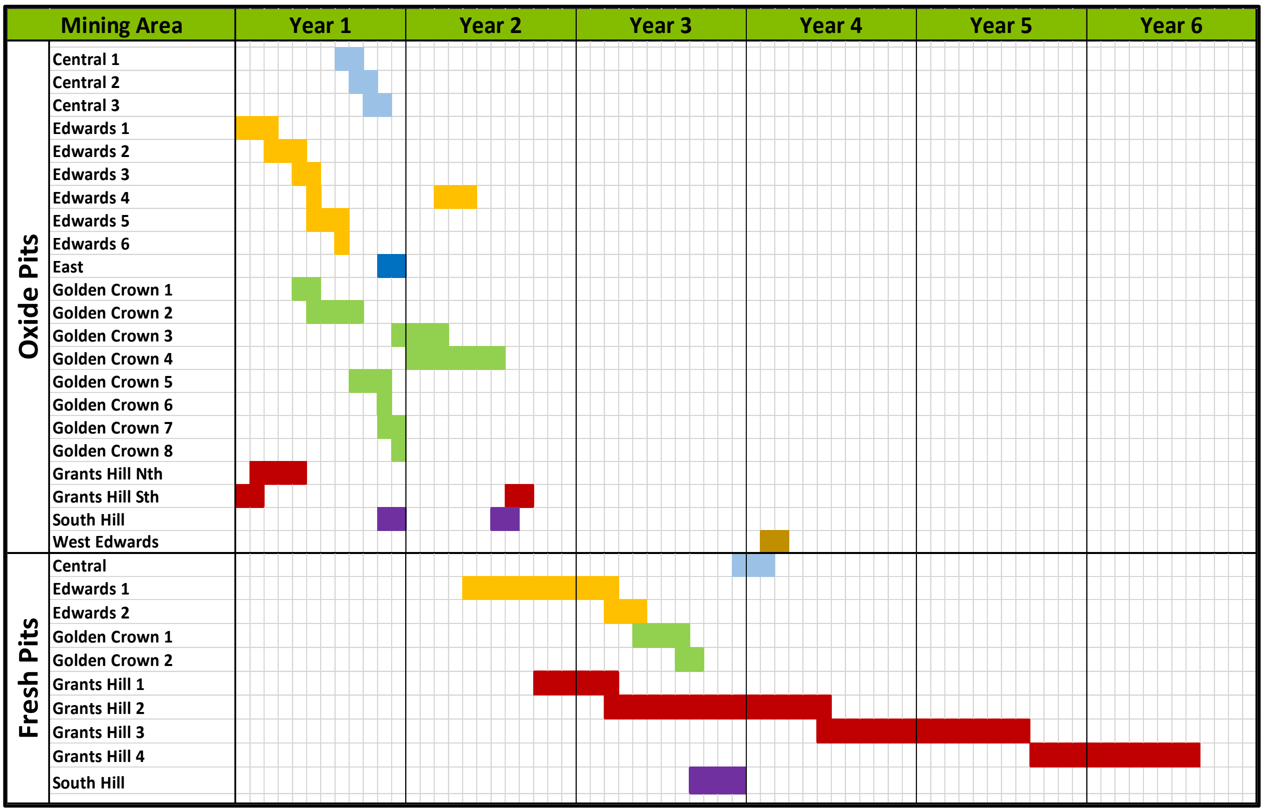
The PEA mine production schedule was developed by Auralia Mining Consulting in collaboration with Novo mining personnel and is based upon a mining sequence which focuses on oxide pit mining in Year 1, with initial operation in the northern Edwards area, the southern Grant's Hill area and moving into the Central and Golden Crown area. Some minor amounts of fresh plant feed are mined at the base of most oxide pits.

Year 2 involves the continuation of oxide operations and the commencement of fresh rock operations in the Edwards and Grant's Hill areas. Oxide mining is essentially complete in Year 2.

Years 3-6 involve the completion of Edwards and Golden Crown areas in Year 3 and the down-dip 4 stage development of the Grant's Hill Fresh pit to a final depth of about 80 m by the second half of Year 6.

The phased mining sequence and timing over the 6-year mine life is shown in Figure 16.10.

Figure 16.10 Phased mining sequence



WASTE STORAGE AREAS

Waste material from oxide pits will be directed towards the northern Edwards Waste Dump and southern Grant's Hill Waste Dump with some valley fill utilised in the central Golden Crown area.

It is proposed that NAF waste rock from the Fresh pits will be stored in waste dumps located around the mining lease. PAF waste material will be encapsulated within the oxide waste dumps or backfilled into completed pit areas. Costs include provisions for rehandling of sufficient oxide waste to enable encapsulation of PAF waste and Alunitic oxide waste. Production scheduling has attempted to minimise the amount of rehandling.

PRACTICAL CUT-OFF GRADE CALCULATION

Due to the staged nature of the PEA, a practical open pit cut-off grade was determined post-optimisation after updated costs became available.

The calculation of the open pit cut-off grade is shown in Table 16.4

The break-even cut-off grade was calculated to be 0.82 g/t. For practicality this was rounded to 0.8 g/t.

Table 16.4 Cut-off grade determination

Input components	Break-even COG
Plant feed surface haulage – Mine Pad to Mill ROM ($/t)	3.70
Processing cost ($/t)	17.18
Processing sustaining capital cost ($/t)	4.10
Administration site cost ($/t)	5.14
Total Cost per tonne ($/t)	30.12
Dilution (20%) less mining loss (2%)	18.0
Total cost per tonne processed ($/t)	35.54
Gold Price ($/oz)	1,700.00
Royalties (7.25%) ($/oz) (State Gov 2.5%; Others 4.75%)	123.20
Realised Gold Price ($/oz)	1,576.80
Process plant Recovery (%)	86.0
Realised Gold Price ($/g)	43.60
COG (on the ROM Pad) (g/t)	**0.82**

PEA MINING SCHEDULE

The PEA mining schedule (Table 16.5) includes provisions for a production ramp-up in Year 1 and then maintains a Total Material Movement capacity of up to 17.6 Mtpa (plant feed + waste). This production capacity supports the plant throughput of 1.5 Mtpa.

Mineralised Waste (0.5-0.8 g/t) material will be separately stockpiled adjacent to the Processing Plant ROM pad and opportunistically processed as required. Over the LOM, about 0.7 Mt at 0.54 g/t is expected to be stockpiled.

Key features of the PEA mining schedule include:

- about 10% of the oxide plant feed is based on Inferred Mineral Resources
- about 56% of the fresh plant feed is based on Inferred Mineral Resources.

The PEA is conceptual in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have to have the economic considerations applied to them that would enable them to be categorised as Mineral Reserves. There is no certainty that the PEA will be realised.

PEA PROCESSING SCHEDULE

During mining, plant feed material is separated on the basis of gold content (HG and LG) and material type (Oxide and Fresh) to enable a blended plant feed. Final blending is achieved on the ROM pad utilising front end loader (FEL) feeding the primary crusher. HG material (>1.7 g/t) is preferentially streamed through the plant whenever available with LG material (0.8-1.7 g/t) blended as required. The PEA processing and stockpiling schedules are shown in Table 16.6 and Table 16.7.

Table 16.5 PEA mine production schedule

Year	High Grade Mining				Low Grade Mining				Total Plant Feed Mined						Waste Mined (inc. Mineralised Waste)			Total Material Mined	Strip Ratio
	Oxide		Fresh		Oxide		Fresh		Oxide		Fresh		Total		Oxide	Fresh	Total		
	kt	g/t	kt	g/t	kt	g/t	kt	g/t	kt	g/t	kt	g/t	kt	g/t	kt	kt	kt	kt	t:t
1	1,220	2.8	24	3.2	1,028	1.0	3	1.2	2,248	2.0	27	3.0	2,274	2.0	9,695	90	9,785	12,250	4.4
2	728	2.2	85	2.3	844	1.1	17	1.2	1,573	1.6	101	2.1	1,674	1.6	12,392	949	13,341	15,119	8.0
3	236	2.3	550	3.1	438	1.0	461	1.1	674	1.4	1,011	2.2	1,685	1.9	8,554	5,787	14,341	16,233	8.6
4	138	1.6	916	3.0	92	1.1	324	1.1	230	1.4	1,240	2.5	1,470	2.4	6,110	8,862	15,072	16,629	10.3
5	6	1.5	1,056	3.0	14	1.0	327	1.1	21	1.2	1,382	2.5	1,403	2.5	3,349	12,796	16,146	17,621	11.6
6	-	-	884	3.4	-	-	96	1.1	-	-	980	3.2	980	3.2	-	10,539	10,539	11,604	10.8
Total	**2,329**	**2.5**	**3,514**	**3.1**	**2,416**	**1.0**	**1,227**	**1.1**	**4,745**	**1.7**	**4,741**	**2.6**	**8,984**	**2.2**	**40,100**	**39,124**	**79,224**	**89,455**	**8.4**

Table 16.6 PEA processing schedule

Year	Total Plant Feed					
	Oxide		Fresh		Total	
	kt	g/t	kt	g/t	kt	g/t
1	1,325	2.1	-	-	1,325	2.1
2	1,461	2.0	40	3.1	1,501	2.1
3	703	1.6	798	2.3	1,501	2.0
4	430	1.2	1,075	2.6	1,505	2.2
5	264	1.2	1,237	2.8	1,501	2.5
6	284	1.0	1,217	2.9	1,501	2.6
7	314	1.0	364	1.1	678	1.1
Total	**4,779**	**1.7**	**4,729**	**2.6**	**9,509**	**2.2**

Table 16.7 PEA stockpile schedule

Year	High Grade Stockpile			Low Grade Stockpile			Mineralised Waste Stockpile			Total Stockpiles		
	In	Out	Year End	In	Out	Year End	In	Out	Year End	In	Out	Year End
	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt	kt
1	1,244	700	545	1,030	590	440	191	35	156	2,465	1,325	1,141
2	813	1,180	178	861	321	981	104	-	260	1,778	1,501	1,418
3	786	860	103	899	641	1,239	207	-	467	1,892	1,501	1,810
4	1,054	930	227	416	575	1,081	87	-	554	1,557	1,505	1,862
5	1,062	1,138	152	341	363	1,059	72	-	626	1,475	1,501	1,836
6	884	1,024	12	96	477	678	85	-	710	1,064	1,501	1,400
7	-	-	12	-	678	-	-	-	710	-	678	723

16.2.10. MINING PRACTICES

It is assumed that mining activities at Beatons Creek will be undertaken by contract mining with technical oversight (management, geology, mining engineering and surveying) provided by Novo personnel.

The potential mine development utilises conventional open pit mining methods involving excavators, in backhoe configuration, loading trucks. Dozers are used where applicable to rip oxide material to enhance excavator productivity, to push waste to nearby valley-fill areas and to push-up mineralised material. It is assumed that drilling and blasting will be required for about 80% of the oxide waste and for all of the fresh mineralised reefs and waste.

GRADE CONTROL

The expected dilution (20%) and loss (2%) provisions are dependent upon a proposed grade control reverse circulation (RC) drilling programme and geological control of the excavation of all potential plant feed material.

Key features of the proposed grade control program include:

- 10 m x 10 m hole spacing on a staggered pattern
- 0.5 m samples through the mineralised zones (nominal 20 kg sample)
- sampling from 2 m above and below the mineralised zones
- RC chip logging
- mineralised material spotters to control the mining process
- face mapping to assist control and visual identification of the mineralised zones.

LOAD AND HAUL

Waste and plant feed material will be excavated utilising diesel powered hydraulic backhoes (1 by 120 t and 2 by 85 t units). The excavators will load either 90 t rigid haul trucks or 45 t articulated haul trucks depending upon the degree of selectivity required. The smaller equipment will also be utilised for the early stages of pit development including haul road construction.

Due to the configuration of the mineralised reefs, excavation will utilise mining flitch heights from 1m to 2.5 m.

DRILL AND BLAST

To assist excavator productivity, it has been assumed that 80% of the oxide pit material will require low powder factor drill and blast under dry hole conditions. Sufficient dozer capacity will be provided to lightly rip about 10% of the oxide pit material. The remaining 10% is assumed to be free dig material. It is assumed that 100% fresh rock requires drill and blast under predominantly dry hole conditions.

Drill and blast activities are expected to be performed with a hole diameter of 102 mm. Bench heights will be variable with a maximum of 5 m.

It is planned that dozers will be used to push some of the waste into nearby valley fill areas and to perform final clean-up off the top of the mineralised reefs.

WASTE STORAGE AREAS

Oxide waste will be contained within a northern waste dump (adjacent to the Edwards pit), two southern waste dumps (adjacent to the Grant's Hill pit) or backfilled into valleys in the central portion of the mining area (adjacent to the Golden Crown pits (Figure 16.9). Provision will be made to encapsulate PAF material within the main oxide waste dumps. A portion of the oxide waste will be rehandled if required for encapsulation of additional PAF material and for reclamation activities.

Fresh PAF waste will be backfilled into depleted excavations as a priority or placed in dedicated cells within the waste dumps around the mining leases.

OPEN PIT MINING EQUIPMENT

The estimated primary mining equipment requirement is summarised in Table 16.8.

Table 16.8 Open pit primary equipment

Equipment type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Excavator – 120t	1	2	2	2	2	2
Excavator – 85t	2	2	1	1	1	1
Dump Truck – rigid – 90t	8	10	10	10	10	10
Dump Truck – articulated – 40t	6	6	3	3	3	3
Dozer – 70t	2	3	3	3	3	3
Grader	1	1	1	1	1	1
Water Cart	1	1	1	1	1	1
Blast Hole Drill	2	2	3	3	3	3

SUPPORT FACILITIES

The Mine Office for operations and technical staff is planned to be located adjacent to the controlled site access point, the mobile equipment stand-by area and the MOP (Figure 16.9).

A mining equipment maintenance workshop and other support facilities (spare parts, diesel fuel and lubricants storage; washdown bay, etc) will be located adjacent to the Golden Eagle Mill.

OPEN PIT MINING PERSONNEL

The mining operation will require a peak open pit workforce of 169 persons. It is assumed that the management and technical staff will be part of the owner's team (19 persons). Contract personnel numbers were estimated for mine supervision, mine operations and maintenance (97 persons). Separate contractors are expected to supply drill and blast services (22 persons) as well as plant feed material haulage and crusher feed at the processing plant (31 persons).

Mine management, senior supervisors and technical staff are assumed to work 8-days on/6-days off roster while mine operators and maintenance personnel are assumed to work on a 2-weks on/1-week off basis. The mine operation is assumed to be a 7-days per week, continuous operation working two 12-hour shifts per day.

The open pit mining personnel are shown in Table 16.9 and

Table 16.10.

Table 16.9 Open pit mining personnel - Owner

Mining personnel	Peak number required
Owner – Mining Supervision and Technical Services	
Mining Manager	1
Mining Superintendent	2
Senior Mining Engineer	1
Mining Engineer	1
Senior Mine Surveyor	1
Mine Surveyor	1
Geology Manager	2
Senior Mine Geologist	2
Mine Geologist	4
Pit Technician	4
Total	**19**

Table 16.10 Open pit mining personnel - contractors

Mining personnel	Peak number required
Contractor – Open Pit Supervision and Production	
Project Manager	1
Safety Supervisor	2
Office Clerk	2
Senior Production Supervisors	3
Excavator Operator	10
Dump Truck Operator	37
Dozer Operator	7
Grader Operator	4
Water Cart Operator	4
Sub total	70
Contractor - Maintenance	
Maintenance Superintendent	1
Maintenance Clerk	1
Maintenance Supervisor	3
Heavy Duty Fitter	15
Boilermaker	1
Service Person	6
Sub total	**27**
Contractor - Other	
Drill and Blast Personnel	22
Plant Feed Haulage and Crusher Feed	31
Sub total	**53**
Total Contractor Personnel	**150**

17. RECOVERY METHODS

17.1. INTRODUCTION

The Golden Eagle Mill was designed for a feed rate of 1.5 Mt/a. Historically, the processing plant has operated well in excess of this rate. However, if the physical properties of the material treated are different from the material previously treated, the processing plant treatment rate may be affected. Figure 17.1 shows the existing plant layout.

Figure 17.1 Existing process plant layout

17.2. PROCESS DESCRIPTION

The processing plant consists of the following unit operations:

- Single stage crushing with a jaw crusher historically capable of processing approximately 400 t/h followed by a crushed ore stockpile.
- Single stage grinding to 150 µm utilising a SAG mill. The SAG mill is 6.7 m diameter by 5.65 m EGL with a 4,000 kW motor.
- Gravity gold recovery by a centrifugal concentrator and intensive cyanidation leach reactor.
- Leaching in two Leach tanks (two by 890 m^3) followed by carbon adsorption in 7 carbon-in-leach tanks (four by 890 m^3 and three by 777 m^3) with oxygen addition to the first three tanks.

- Tails thickening to 55% solids prior to disposal in tailings storage facility (TSF). Return of decant water for use in process.
- Stripping of loaded carbon using a split AARL (Anglo American Research Laboratories) in a single three tonne column. Regeneration of carbon in carbon regeneration kiln prior to return to adsorption circuit.
- Gold recovery from pregnant solution by electrowinning in three electrowinning cells.
- Bulk delivery of reagents, storage and distribution.

17.2.1. CRUSHING

The crushing circuit is a conventional single stage jaw crusher operating in open circuit. Product from the crushing circuit is conveyed to a primary stockpile. The circuit historically crushed 400 dry tonnes per hour of open pit and underground material to a product size P80 of 125 mm. The crushing plant is designed to operate with a utilisation of 45% to achieve the annualised plant capacity nameplate of 1.5 Mt/a.

The crusher feed is drawn from the ROM bin at a controlled rate by a variable speed apron feeder and discharged into the jaw crusher. A rock breaker is installed to break any oversize material. The jaw crusher is a 200 kW Metso C140 single toggle jaw crusher. The crusher product is discharged onto the stockpile feed conveyor. The stockpile feed conveyor discharges onto the primary stockpile. The primary stockpile has a storage capacity of 10,000 t.

17.2.2. COARSE ORE STORAGE AND HANDLING

Crushed ore is reclaimed from the primary stockpile via an apron feeder below the stockpile which discharges onto the mill feed conveyor. An emergency reclaim apron feeder is located at the stockpile area which also discharges onto the mill feed conveyor.

An 82 t capacity lime silo, fitted with a variable speed rotary valve and screw feeder doses lime onto the mill feed conveyor to provide pH control in the leaching and adsorption circuit. Delivered Quicklime is pneumatically transferred into the silo from triple or quad road train tankers.

17.2.3. GRINDING AND CLASSIFICATION

The grinding circuit consists of a single stage SAG mill and cyclone classification system. Historically, the circuit grinds 187 dry tonnes per hour of feed material to a product size P80 of 150 µm. The grinding circuit is designed to operate with a utilisation of 91%.

The SAG mill is a 6.7 m diameter (IS) by 5.65 m long (EGL) variable speed mill fitted with a 4,000 kW motor. The mill is designed to operate at a ball charge of 12 to 26% of total mill volume and is charged with 105 mm steel ball grinding media. The SAG mill product discharges through a trommel and the oversize is collected in the scats bunker.

The SAG mill trommel undersize flows by gravity into the mill discharge hopper. One of two centrifugal slurry pumps, arranged in a duty/standby configuration, transports the ground slurry to a cyclone cluster for classification. The cyclone cluster consists of eight by 400 mm diameter cyclones (six duty cyclones and two standby cyclones). Cyclone overflow gravitates to the trash screens. A portion of the cyclone underflow feeds the gravity circuit with the remainder returning directly to the mill feed chute.

The floor of the grinding area is serviced by a vertical spindle centrifugal sump pump for clean-up.

17.2.4. GRAVITY RECOVERY

The gravity circuit consists of a centrifugal concentrator treating a portion of the cyclone underflow. Gravity concentrate is intensively leached in a reactor to yield a pregnant solution from which precious metals are recovered by electrowinning.

A portion of cyclone underflow feeds the gravity circuit. The feed is screened on a 1.8 m wide by 3.6 m long, horizontal, wet vibrating screen. Screen oversize is returned to the mill feed. Screen undersize feeds a 1.02 m diameter centrifugal gravity concentrator. The tailings from the gravity concentrator returns to the mill discharge hopper.

Concentrate from the gravity concentrator discharges to the intensive leach reactor. The batch leach process is initiated on a daily basis. The leaching sequence is controlled by a programmable logic controller (PLC). After leaching, the residue is returned to the mill discharge hopper by a centrifugal slurry pump and the pregnant solution is forwarded to electrowinning. Electrowinning is carried out in a dedicated 600 mm by 600 mm electrowinning cell fitted with 9 cathodes and 10 anodes. Electrical current is supplied from a rectifier.

17.2.5. LEACHING AND ADSORPTION

After screening to remove trash, the cyclone overflow from the grinding circuit is leached with cyanide in a nine-stage hybrid Carbon in Leach (CIL) circuit.

The cyclone overflow will gravitate to trash screens consisting of two by 1.5 m wide by 4.5 m long, horizontal, wet vibrating screens used in duty and standby configuration.

Trash screen underflow reports to the leach feed distribution box that allows the slurry to be directed to either the first leach tank or the second leach tank. The hybrid CIL circuit consists of two leach tanks (two by 890 m^3) and seven adsorption tanks (four by 890 m^3 and three by 777 m^3). The design includes the ability to bypass any tank in the train should this be required.

Cyanide is dosed into the leach feed distributor. Pipe spargers are installed on the first three tanks to enable the injection of oxygen.

Carbon is suspended in all tanks except the first two tanks. Each of the adsorption tanks are fitted with a mechanically wiped, inter-tank screen with 1.0 mm aperture to retain carbon. Carbon is advanced through the CIL circuit counter current to the pulp, on a batch basis, by recessed impeller pumps. Loaded carbon from tank three is pumped to the loaded carbon recovery screen. The carbon recovery screen is a 1.5 m wide 3.1 m long, horizontal, wet vibrating screen with 1 mm apertures. Loaded carbon from the carbon recovery screen gravitates into the acid wash surge hopper.

The CIL area is serviced by a vertical spindle centrifugal slurry pump for clean-up.

17.2.6. CARBON HANDLING AND GOLD RECOVERY

The carbon handling and gold recovery system comprises of the following:

- 3 t mild rubber steel acid wash/carbon surge hopper;
- 3 t elution column
- 1,500 kW elution heater
- split AARL elution system
- LPG fired carbon regen kiln
- an electrowinning circuit of three 600 mm by 600 mm electrowinning cells with each cell fitted with 9 cathodes and 10 anodes and supplied by a rectifier
- A100 smelting furnace and crucible to produce gold doré
- secure gold room with a vault and safe for the storage of bullion.

The acid wash and rinse cycles are performed in the rubber lined acid wash/carbon surge hopper located beneath the carbon recovery screen. Following the rinse cycle the carbon in the hopper is dumped into the elution column.

The elution circuit is a split AARL.

The pre-soak and rinse water are delivered via two eluate filters to either one of the two pregnant solution tanks via a recovery heat exchanger to return heat to the strip solution from the eluate.

The pregnant liquor from the carbon elution is delivered to one of two dedicated electrowinning cells operating in parallel, by a pregnant solution pump. At the completion of the electrowinning cycle, the barren solution from the electrowinning cells is returned to the leaching circuit, by pumping it back via the barren solution pump.

At the completion of the elution cycle, barren carbon is educted from the elution column to the regeneration kiln feed hopper. The hopper is located on top of the carbon regen kiln, which in turn sits above CIL tank nine. The kiln can be bypassed and the elution column is educted directly into CIL tank nine. Prior to regeneration, the barren carbon is de-watered over a small carbon dewatering sieve bend screen above the kiln feed hopper. The rotary kiln feed chute drains any residual water from the carbon prior to it entering the kiln. At the end of the regeneration process, the regenerated carbon discharges onto the carbon sizing screen. The oversize carbon drops into CIL tank 9 and the undersize carbon reports to the carbon safety screen.

The gold from the gravity circuit and the elution circuit electrowinning cells is calcined and smelted using fluxes in an LPG powered smelting furnace to produce the final gold product doré bars, which are weighed and stored in the gold safe, located inside a concrete vault. The gold from the gravity circuit is refined separately from that of the elution circuit to allow for separate accurate metallurgical accounting of the gravity circuit.

17.2.7. TAILINGS THICKENING

Final tail from the CIL circuit gravitates to a 19 m diameter high-rate thickener via a carbon safety screen. The thickened tails are mixed with flocculant to increase settling rate and underflow density and pumped to the tails dam. The tailings thickener overflow gravitates to the process water dam for recycling to the process plant.

17.2.8. SULPHIDE GRAVITY RECOVERY CIRCUIT

The plant includes a sulphide gravity recovery circuit consisting of spirals, vertical UFG mills and other equipment. The circuit is by-passed and will not be required to treat material from the Beatons Creek Project.

17.3. REAGENT MIXING, STORAGE AND DISTRIBUTION

17.3.1. LIME

An 82 t quicklime silo delivers lime directly onto the mill feed conveyor via a rotary valve and a proportional controller with a set point related to the mill feed conveyor rate.

The quicklime is transferred to the silo from pressurised road tanker deliveries. The lime handling system consists of the following items:

- 82 t silo capacity, which stores and delivers the lime onto the SAG mill feed conveyor
- free standing structure, access platform and stairs
- pneumatic bin discharge activator, which mobilises the quicklime to discharge from the silo
- slide gate for isolation of the discharge point
- rotary valve, which controls the discharge rate of the lime to the mill feed conveyor
- dust collector installed on the top of the lime silo to contain the dust emissions during the pneumatic loading process including maintenance access.

17.3.2. CYANIDE

Cyanide is delivered as a 98% solid concentrate and sparged via a leased vendor sparging plant. The sparging plant is complete with a dissolution tank, a 45 m^3 cyanide storage tank and a sparging system pump which combines both the mixing recirculation and storage transfer duties.

Two cyanide recirculation pumps, operating in duty standby arrangement, deliver cyanide via a ring main to the CIL circuit and the intensive leach reactor. A separate cyanide dosing pump delivers cyanide from the ring main to the elution circuit in a controlled manner.

The cyanide mixing and storage tanks are contained within a concrete bund with a collection sump to recover spillage. The sump pump recovers minor spillage and clean up and delivers it to the CIL feed distributor.

17.3.3. SODIUM HYDROXIDE

Sodium hydroxide is delivered in liquid form in road tankers and stored in a 30 m^3 sodium hydroxide storage tank located in the same bunded containment as the cyanide sparging plant. A dosing pump draws the reagent from the sodium hydroxide storage tank and deliver it to the elution circuit and intensive leach reactor.

17.3.4. HYDROCHLORIC ACID

Hydrochloric acid is delivered in liquid form in road tankers and stored in a 30 m^3 concentrated HCL storage tank. The acid is transferred from the storage tank by an acid dosing pump, to the acid wash hopper for carbon acid wash cycle, after combining with the water pumped from the water tank, to create a 3% w/w HCl solution.

The concrete containment bund surrounding both tanks comply with the dangerous goods statutory requirements.

17.3.5. ACTIVATED CARBON

Activated carbon is delivered in 600 kg bulka bags. When required, carbon is lifted to the top of CIL tank nine and broken directly into the tank.

17.3.6. OXYGEN

Oxygen gas is manufactured on site using a pressure swing adsorption (PSA) plant.

17.3.7. FLOCCULANT

Flocculant is added to the tailings thickener by a vendor supplied flocculant mixing package.

17.4. AIR AND WATER SERVICES

Typical air and water supply and distribution services are provided for the plant.

17.5. PROJECTED ENERGY AND WATER REQUIREMENTS

Plant and infrastructure power consumption, averaged over the last five months of operation, was 3,610,000 kWh/month, equivalent to a continuous electrical load of 5.4 MW.

Water requirements are projected to be 0.7 m^3/t ore, or approximately 1,050 ML/annum for 1.5 Mt/annum throughput.

18. PROJECT INFRASTRUCTURE

18.1. ROADS AND SITE ACCESS

Vehicle access to the mine and processing facility is via the part sealed Newman to Port Hedland road (State Route 138 Marble Bar Road). The existing Nullagine airstrip is located 10.4 km from Nullagine.

Access to the Beatons Creek Project is along State Route 138, turning off onto an existing unsealed access road approximately 800 m north of Nullagine. The existing Beatons Creek Project facilities are 600 m off State Route 138.

The Golden Eagle Mill site is accessed from Nullagine by travelling approximately 8.9 km south along State Route 138 to the existing site access road. The process plant is approximately 3.5 km from the intersection. The plant site access road crosses the Cajuput Creek (tributary to the Nullagine River and DeGrey system) via a floodway. The creek is dry for most of the year. The frequency of road closure and its impact on operations will need to be investigated by Novo.

18.2. AIRSTRIP

The workforce will be employed on a fly in fly out basis. The airstrip to be utilised by Novo is still under consideration. Newman has a commercial airport with frequent services to and from Perth. Several private airstrips closer to Nullagine may be options, however, access to them will need to be negotiated.

The existing airstrip at Nullagine is unsealed, 1,600 m long and 30 m wide. It is understood that it would need to be investigated and refurbished, if necessary, to be CASA certified.

The operations workforce will be transferred from the preferred airport to the plant site by a bus service provided by Novo.

18.3. BEATONS CREEK MINE INFRASTRUCTURE

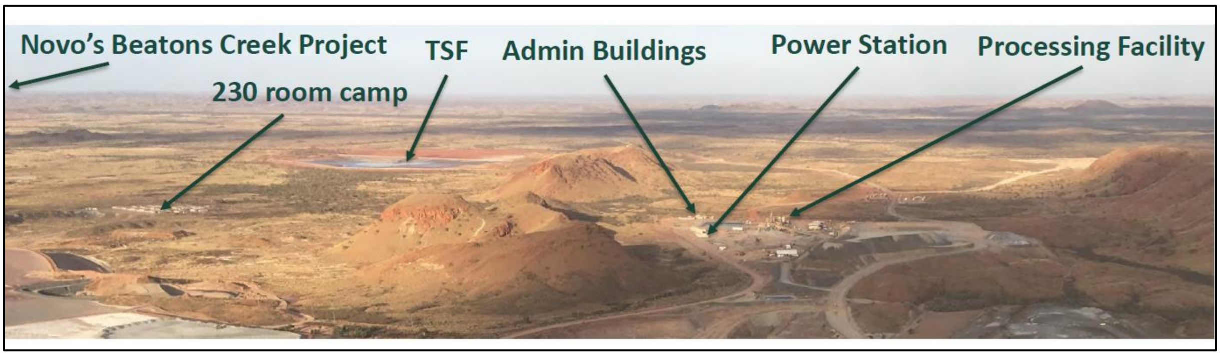
It is envisaged that the mine offices, crib rooms and toilets will be established in the vicinity of the existing Beatons Creek MOP pad. They will be powered by a local diesel generator. The mobile equipment workshop, fuel farm and wash down facilities will be located adjacent to the Golden Eagle Mill.

18.4. PROCESS PLANT SITE INFRASTRUCTURE

The plant site (Figure 18.1) includes the existing process plant facilities and associated infrastructure, tailings storage facility and the accommodation village.

Infrastructure supporting the process plant consists of administration buildings, workshop, warehouse, laboratory, power station, communications network, water supply and storage, water treatment and wastewater treatment.

Figure 18.1 NGP plant and infrastructure



The administration building area comprises the main administration office building, toilet block and a first aid, mine rescue and training building.

The existing process plant comprises comminution, gravity gold recovery, conventional CIL, elution, electrowinning and smelting, reagents, air and water services (Refer to Item 17 Recovery Methods). Six LPG tanks (7,500 L each) are installed to supply fuel for the gold recovery process equipment.

18.5. POWER STATION AND FUEL STORAGE

The plant site includes a diesel generator powerhouse equipped with ten by 1 MW diesel generators, which is owned and operated by Kalgoorlie Power Systems (KPS). Power is reticulated at 11 kV to the processing plant and via overhead transmission line to the village. The TSF decant pumps are powered by local gen-sets.

An existing fuel farm comprises of six diesel storage tanks with a total storage capacity of 560 kL. It is used to supply the power station and provide mobile equipment refuelling.

18.6. WATER SUPPLY

Water supply for the plant site is via borefield networks, pit dewatering and tailings decant, with some capture of suitable stormwater. The water supply is marginally sufficient to sustain plant production at approximately 1.5 Mt/annum. Alternative water sources may be required to support operations above 1.5 Mt/annum.

A raw water pond and process water pond have been constructed at the process plant site to store water for operations.

Potable water for the site and accommodation village will be supplied by existing RO plants.

18.7. SEWAGE TREATMENT AND DISPOSAL

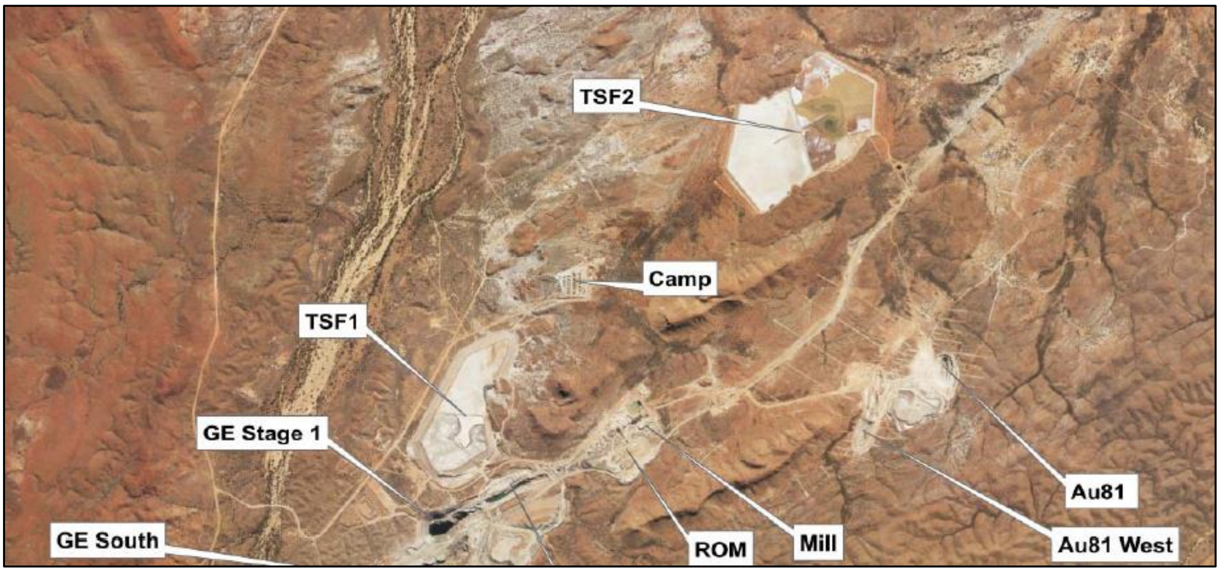
Plant sewerage for the existing facilities is treated via a fully contained/semi buried Biomax Waste Water Treatment Plant (WWTP) system, with a design capacity of 80,000 L per day. Based on past performance, the WWTP will be adequate to support the proposed operations.

DWER license conditions provide for the treated effluent to be disposed of into the rock ring of TSF1.

18.8. TAILINGS STORAGE FACILITY

The plant site has a decommissioned tailings storage facility (TSF1) and an active storage facility (TSF2).

Figure 18.2 TSF locations



TSF2 is ready for the re-commencement of operations and configured in two cells, with the active section (Cell 1) approaching the current deposition limit. Cell 2 has recently received an embankment raise, with pipework installed in readiness for operations. Water is continually recovered from the centrally located decant structures in each cell and recycled back to the process plant for process water make up.

Cell 1 and Cell 2 are planned to be combined into a single cell with a central decant. The current design allows to raise the TSF2 to 399 mRL, which is expected to provided storage capacity for the initial 3.5 years of operations.

18.9. ACCOMMODATION VILLAGE

An accommodation village has been constructed 4 km from the mine site. The village has 230 accommodation rooms which is understood to have adequate capacity for future operations. The village is currently being refurbished, ready for restart of operations.

Figure 18.3 Accommodation village

The village is equipped with facilities typical of remote FIFO operations including accommodation units, kitchen and dining room, recreation room, gym and laundries.

18.10. COMMUNICATIONS

Telecommunication facilities and Wi-Fi network are available at the Novo plant site. Mobile telephone communications are available at the Beatons Creek Project.

19. MARKET STUDIES AND CONTRACTS

Gold is a readily traded and liquid commodity and as such no specific market studies have been carried out. Internationally, gold is traded primarily via over-the-counter (OTC) transactions based on the London Bullion Market Association (LBMA) price. Twice daily, at 10:30 am and 3:00 pm (Greenwich time) the LBMA publishes the gold price in US dollars. Unlike most commodity markets, the forward market for gold is driven by spot prices and interest rate differentials, similar to foreign exchange markets, rather than underlying supply and demand dynamics. This is because gold, like currencies, is borrowed and lent by central banks in the interbank market.

For this PEA, the forward looking gold price was based on a fixed gold price of US$1,700 and an A$:US$ exchange rate of 0.75.

20. ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1. SUMMARY

A summary of the environmental studies, permitting and socio-economic considerations are provided in the following extensions. The focus of the environmental studies section is on the Beatons Creek Project as it is understood no further disturbance is required at the Golden Eagle Mill or TSF2.

20.2. ENVIRONMENTAL STUDIES

20.2.1. LANDSCAPE

The site lies predominantly within the Pilbara Bioregion, an area of approximately 178,500 km^2 within the north-west of Western Australia which is characterised by vast coastal plains and inland mountain ranges with cliffs and deep gorges (Bastin and the ACRIS Management Committee 2008).

The Beatons Creek Project area is located within the Capricorn and Mosquito land systems of the Pilbara Region (Van Vreeswyk et al., 2004):

- Capricorn: consists of hills and ridges of sandstone and dolomite supporting shrubby hard and soft spinifex grasslands; steep, rocky upper slopes, gently sloping stony footslopes and stony lower plains and valleys (Van Vreeswyk et al., 2004).
- Mosquito: the land system consists of stony plains and prominent ridges of schist and other metamorphic rocks supporting hard spinifex grasslands; past and present mining activity on the Mosquito land system has resulted in localised disturbance and degradation (Van Vreeswyk et al., 2004).

Northcote, et al (1960-68) describe the landforms in the Beatons Creek Project area as steep hills and low ranges associated with lithologies of dolomite, chert breccia, folded quartzites, shales and slates with extensive areas of rock exposures. Dominant soils are shallow, stony, earth loams (Northcote et al; 1960-1968).

20.2.2. TOPOGRAPHY

Most of the area lies between 200 m to 500 m above sea level in the Beatons Creek Project region. Two large rivers, the Nullagine and the Oakover, flow northwards across the area and eventually join to form the De Grey River. The Oakover River flows along the axis of a major Proterozoic syncline but the Nullagine River's course bears little relation to currently exposed geology, suggesting that it is superimposed (as are several other major rivers to the west). The area can be divided into seven physiographic provinces: plateau, dissected plateau, range, low granite hills, plain, valley, and desert.

Average annual evaporation of the Pilbara region is about 3,600 mm, which is ten times the total annual rainfall. Away from the few major rivers with permanent surface pools or shallow groundwater, vegetation is relatively sparse.

20.2.3. SOILS

Regional soil mapping indicates that soils within the site area primarily consist of stony soils, with some areas containing shallow red loams and to a lesser extent, shallow red/brown non-cracking clays (Van Vreeswyk et al. 2004).

Soil samples have been collected from the mine area to assess its suitability in rehabilitation works at closure.

20.2.4. SURFACE HYDROLOGY

The Beatons Creek Project is located west of the Nullagine River, a major, ephemeral watercourse in the Nullagine area which has a catchment area of 7,240 km^2. All creeks in the Beatons Creek Project are seasonal drainage lines, usually only flowing briefly following significant rainfall events.

A water holding dam is located on the eastern edge of M46/11. This dam was constructed by Metana Minerals N.L in 1982 and was used for their alluvial mining operations.

Five surface water catchments have been identified as part of surface water assessment:

- Catchments 1, 2 and 3 flow separately to the Nullagine River.
- Rainfall falling within Catchment 4 is retained within its boundary and existing reservoir.
- Catchment 5 drains northward to an unnamed seasonal creek, then to Taylor Creek and eventually connects into the Nullagine River.

Surface water is generally fresh, with less than 500 mg/L TDS.

Hydrological modelling for operations and closure has been undertaken for the approved MP-MCP and will require updating to encompass the mining the revised footprint associated with the PEA mine schedule.

The Beatons Creek Project is located within the Pilbara Proclaimed Surface Water Area under the *Rights in Water and Irrigation Act 1914* (RIWI Act). The RIWI Act requires persons proposing to interfere with the bed or banks of watercourses in proclaimed areas to apply to DWER for approval. The alluvial works involving scraping along ephemeral drainage lines and there is no reference to a Bed and Banks Permit being obtained, and this requirement should be considered.

20.2.5. GROUNDWATER

Groundwater levels at the site range from 20 to 50 mbGL and generally follow topography and surface catchments throughout the area (SRK 2018). Groundwater level contours have been mapped across the site and vary from ~375mRL at Grants Hill and increase to the northwest, to ~410 mRL near the Edwards WRD.

Groundwater quality has been recorded as brackish to saline, with elevated concentrations of metals, including exceedances of arsenic, copper, manganese, nickel zinc and iron and pH generally neutral to acidic, with elevated acidity in the vicinity of former mine workings. There is a distinct difference in composition of groundwater from the Nullagine Town Water bores and bores at the Beatons Creek

Project, suggesting that they are exploiting different groundwater systems with limited interconnectivity (SRK 2018).

The Beatons Creek Project is located within a Public Drinking Water Source Area (PDWSA) (Priority 1), Nullagine Water Reserve. The Priority 1 protection areas are defined to ensure that there is no degradation of the water source.

To ensure the protection of water resources, DWER advise that all activities within the water reserve should be conducted in accordance with the Nullagine Water Reserve Water Source Protection Plan (DoW, 2017) and mining activities be managed using current best practice and comply with DWER's Water Quality Protection Notes and Guidance.

The approved mining of the alluvial and oxide deposits (December 2020) was determined to comprise activities compatible to protect water quality within the PDWSA.

This was supported by hydrological investigations, which identified that water quality and stable isotope data suggest that there is no hydraulic connection between the Nullagine water supply bores and the proposed mine area, and significant hydraulic barriers in the form of the Beatons Creek Dam and the major fault located east of the dam, prevent flow from the site towards the water supply bores (SRK 2018).

The PEA mine schedule includes mining of significant volumes of Potentially Acid-Forming (PAF) waste material and mining activities below the groundwater table. The compatibility of these activities within the P1 PDWSA and the impact of mining below the water table (and associated drawdown) will require discussion with DWER.

The Beatons Creek Project has existing groundwater (GWL) and surface water abstraction licences. Consideration of amendments to the GWL to increase the abstraction rate or to add additional drawpoints (i.e. pits) will require consideration.

20.2.6. **MINE WASTE**

The approved Mining Proposal identifies mineralisation at the site as being in two distinct zones:

- oxide zone
- sulphide zone underlying the oxide horizon.

Waste characterisation has been undertaken at the Beatons Creek Project and has determined that the oxide comprises two different material types: NAF oxide and Alunitic oxide (Alu oxide). GCA (2019) identified that the Alunitic oxide is a source of solution aluminium acidity, and although it is significantly less than the strong acidity generated from pyritic PAF waste rock, it cannot be placed on the outside of landforms or in drainage lines which carry ephemeral surface-water flows generated during major wet spells.

Waste rock to be mined at the Beatons Greek Project comprises:

- non-NAF oxide

- alu oxide
- PAF fresh
- mineralised oxide waste
- mineralised fresh waste.

The fresh rock to be mined as part of the PEA production schedule has been classified as PAF. While detailed geochemical characterisation of this material (including Acid Metalliferous Drainage (AMD)) has not been viewed, it is understood this material contains sulphides and this PAF material will require encapsulation. No characterisation of the mineralised waste has been viewed. It comprises a small percentage of the total mine waste but the storage of this material to ensure no PAF runoff will also require consideration.

Based on the current understanding of the Top-of-Fresh horizon and the boundaries between NAF and PAF Oxide the material splits are:

- 26% NAF oxide
- 23% alu oxide
- 51% PAF fresh
- <0.5% mineralised waste.

NAF Oxide will be stockpiled separately from the other products to be used to encase the PAF material.

Where possible, the mine will be scheduled to minimise the rehandling of NAF material to encapsulate PAF material, but some rehandle will be required, particularly as the PAF fresh rock will be mined last.

The Beatons Creek Project has developed a 'Beatons Creek PAF Management Procedure' and this will need to be updated to ensure encapsulation of the high volumes of PAF material to be mined (short-term and long term), to ensure this material does not pose a risk to water resources.

The occurrence of PAF exposed within pit floor and walls following mining will require consideration to ensure there is no seepage of PAF material into the surrounding groundwater. The potential occurrence of PAF in the mined pits has been raised by Regulators, particularly given the Beatons Creek Projects location within a Priority 1 PDWSA.

The compatibility of mining below the groundwater table and mining of significant volumes of PAF material with the P1 PDWSA will require discussion with DWER. If the potential risks warrant formal assessment under Part IV of the *Environmental Protection Act 1986* (Section 20.3.2) will also require consideration.

20.2.7. **TAILINGS**

Tailings characterisation of Beatons Creek Project mineralised material (to be stored at the Golden Eagle Mill TSF2) has been limited largely to oxide ore. These tailings had total-S < 0.3 %, essentially all as SO4-S, with the sulphur primarily occurring as alunites. Soluble sulfates inhibit alunite dissolution via the "common-ion" effect and sulfate concentrations of several hundred mg/L in the tailings-pore-waters for Beatons Creek tailings greatly exceed the threshold of 20-40 mg/L needed for alunite stabilisation (Strategen 2020): As the alunites are stabilised by the sulfates, these tailings are considered to be functionally classified as NAF.

In comparison to the historical tailings, DWER (2021) considered that all the enriched elements in the tailings (As, Sb, Mo, Se) are already captured in the DWER Operating Licence.

Tailings from fresh rock mineralised material from the Beatons Creek Project show long lag PAF characteristics, due to trace amounts of pyrite. Further characterisation of tailings generated from this material will be required.

20.2.8. **VEGETATION**

The Beatons Creek Project area is lightly vegetated, with a ubiquitous ground cover of Spinifex grass and scattered shrubs of *Hakea*, *Acacia* and *Grevillea*. Larger trees, including *Eucalyptus* and *Melaleuca* species, are confined to the immediate vicinity of drainage lines.

A detailed Level 2 flora survey was completed in September 2014 at the Beatons Creek Project, which identified three flora species of conservation significance protected under the *Biodiversity Conservation Act 2016* (BC Act):

- *Acacia aphanoclada* (Priority 1)
- *Acacia cyperophylla var. omearana* (Priority 1)
- *Ptilotus wilsonii* (Priority 1).

A small number of Priority 1 flora are located within the southern operations of the Beatons Creek Project, however, given the number of records of the species at sites outside of the impact area, this is not expected to have a significant impact on the species.

Given the timing since the previous survey, updated database searches should be completed to identify any new records or change in conservation listings since the 2014 surveys to ensure compliance with the BC Act and *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The eastern half of the Beatons Creek Project is located within the buffer of the Mosquito Land System Priority Ecological Community (PEC) (Priority 3). This system encompasses an area of 1,840 km² within the Pilbara bioregion, and the Beatons Creek Project comprises <0.1% of this area. Thus, further development activities will have no significant impact on the environmental values of the PEC.

20.2.9. **TERRESTRIAL FAUNA**

A detailed fauna survey was completed in October 2014 and five species of conservation significance were directly observed:

- black-lined Ctenotus (*Ctenotus nigrilineatus*) listed as Priority 1 under the BC Act
- rainbow bee-eater (*Merops ornatus*) listed as Marine under the EPBC Act
- northern quoll (*Dasyurus hallucatus*) listed as Endangered under the EPBC Act and the BC Act

- Pilbara leaf-nosed bat (*Rhinonicteris aurantia*) listed as Vulnerable under the EPBC Act and the BC Act
- western pebble-mouse (*Pseudomys chapmani*) listed as Priority 4 by DBCA.

After the October 2014 fauna survey, targeted surveys for the Northern Quoll (October 2015) and Pilbara Leaf-nosed Bat (December 2014) were undertaken. The surveys concluded there would be no significant impact to these species as a result of the Beatons Creek Project.

At the time of survey, *Macroderma gigas* (Ghost Bat) was listed as a Priority 4 species on the DBCA Priority list. This species is now listed as vulnerable under both the BC Act and EPBC Act. No calls of this species were identified in the bat echolation survey, but it is acknowledged there were no detector sites in the Northern Operations area of the Beatons Creek Project. Novo considered there to be no suitable roost sites for the ghost bat and thus no key foraging habitat for the ghost bat.

As the biological surveys were undertaken more than seven years ago, it is recommended that database searches are completed to identify any additional records of conservation significant fauna in the local area since the surveys, and any changes to the conservation ratings to fauna species.

20.2.10. SHORT RANGE ENDEMIC

The Short Range Endemic (SRE) desktop review was completed by Bennelongia in 2018 for the northernmost section of northern operations on M46/532. The Beatons Creek Project comprises highly exposed hills and ridges that support only hummock grasslands and are not prospective for SREs. No listed invertebrates, confirmed or potential SRE's, were recorded at the Beatons Creek Project.

The highly exposed, widespread and uniform nature of habitat at the Beatons Creek Project, together with museum search results, suggest there is likely to be a depauperate community of terrestrial invertebrates present at the Beatons Creek Project. None would be actual SRE's, making it unlikely the Beatons Creek Project will affect the conservation status of any SRE species in the local region (Bennelongia 2018).

However, it is noted that the assessment was restricted to M46/352.

20.2.11. SUBTERRANEAN FAUNA

Subterranean fauna comprise two broad groups – stygofauna are aquatic and occur in groundwater, while troglofauna are air-breathing and occur in the unsaturated zone below the ground surface down to the water table.

A desktop assessment of stygofauna and troglofauna was undertaken by Pendragon Environmental Solutions Pty Ltd to evaluate the risk associated with the mining of the oxide deposits above the groundwater table (summarised in SRK (2018)). In line with EPA guidelines, a desktop assessment was considered appropriate due to the following:

- no salinisation is anticipated as the mined material is allocated above the water table

- low AMD risk associated with the waste material suggests negligible impact on local groundwater quality. It is noted this conclusion was made prior to the identification of the PAF alunite material.

Results suggest that any stygofauna present within the Beatons Creek Project site would be within the regionally extensive groundwater system of the Mosquito Creek Formation Aquifer (Section 6.5.2). SRK (2018a) considered that any stygofauna or troglofauna populations that may occur within the area are not restricted in their distribution as the system is regionally interconnected.

As mining development will occur below the groundwater table and more than 70% of the material to be mined as part of the six-year LOM is PAF, further consideration of the associated risks and their potential impact on subterranean fauna species should be completed.

20.3. PERMITTING

20.3.1. LEGAL FRAMEWORK

Both federal and state legislation regulate environmental impacts in WA. The key mining legislation in WA is the *Mining Act 1978* which provides the regulatory framework for onshore exploration and mining activities. A summary of the principal legislation and framework is provided in Table 20.1.

Table 20.1 Principal Legislation managing environmental impact

Legislation	Purpose
Mining Act 1978	Administered by WA Department of Mining, Industry Regulation and Safety (DMIRS) Mining Act controls the allocation of land for prospecting, exploration and mining purposes on all but Federal owned lands in WA. The Act also provides for environmental assessment, approval and closure of mining projects to enable them to proceed, operate and close.
Mining Rehabilitation Fund Act 2016	Administered by DMIRS. Annual contribution by operators of mines in WA (except those operating under State Agreement Acts) of 1% of the estimated total rehabilitation costs at each project with funds used to rehabilitate abandoned mine sites in the State.
Environmental Protection Act 1986 (EP Act) 1986 - Part IV	Administered by Department of Water and Environmental Regulation (DWER). EP Act provides standards for environmental protection within WA. It also ensures that environmental impact assessments are undertaken for those projects that "may have a significant impact on the environment" and the Minister for the Environment approves projects with conditions (Part IV).
Environmental Protection Act 1986 – Part V	Administered by DWER. DWER regulates industrial emissions and discharges to the environment through a works approval and licensing process, under Part V. DWER manages WA environment and the environmental impacts of the clearing of native vegetation through the provisions of the EP Act (Part V) and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).
Contaminated Sites Act 2003	Administered by DWER. Addresses contamination and legacy issues not regulated under the EP Act

Legislation	Purpose
Country Areas Water Supply Act 1947	Administered by DWER. Protects WA public drinking water sources, i.e. proclaimed catchment areas, water reserves and pollution areas (underground water pollution control areas). Public drinking water source areas (PDWSAs) are surface water catchments and groundwater areas that provide drinking water to cities, towns and communities throughout the state and are proclaimed under this Act.
Rights in Water Irrigation Act 1914	Administered by DWER. Act provides for the regulation, management, use and protection of water resources (surface and groundwater) of WA.
Biodiversity Conservation Act 2016	Administered by Department of Biodiversity, Conservation and Attractions (DBCA). Provides for species, subspecies or populations of native animals (fauna) to be listed as Specially Protected, Threatened (Critically Endangered, Endangered or Vulnerable) or Extinct in Western Australia. Provides for protection of flora species of conservation significance as well as Priority Ecological Communities (PEC)
Environmental Protection & Biodiversity Conservation Act (EPBC) 1999 (Commonwealth)	Administered by Commonwealth Department of Agriculture, Water and the Environment (DAWE). Australia's central piece of environmental legislation which provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places — defined in the EPBC Act as matters of 'national environmental significance' (MNES).
Aboriginal Heritage Act 1972	Administered by the Department of Planning, Lands and Heritage (DPLH). Protects all Aboriginal sites and objects in WA.
Native Title 1993 (Commonwealth)	Native Title determined by the Federal Court of Australia. Recognises the rights and interests of Aboriginal and Torres Strait Islander people in land and waters according to their traditional laws and customs

20.3.2. CURRENT PERMITTING

BEATONS CREEK PROJECT

Discussions should be held with DWER on the requirement for a s38 referral under the EP Act 1986 due to the potential risks to the P1 PWDSA associated with mining of PAF material (comprising 70% of material to be mined) below the water table. Ongoing liaison with DWER has been undertaken as part of the existing approvals, including advice sought from the EPA on the potential requirement for formal assessment as a result of the change in waste rock geochemistry (i.e. alunite). The EPA advised that a formal assessment was not required (August 2020). However, with mining below the water table and significant volumes of PAF material to be mined as part of the six year LOM, further discussion is required.

Novo has Mining Act approval via a Mining Proposal (MP) and Mine Closure Plan (MCP) (Reg ID 89975) from DMIRS for:

- Alluvial Operations - scraping of up to 20,000 t of alluvial material along twelve ephemeral creek lines on tenements M46/10 and M46/11 (8 ha) and processing via a gravity plant approved under Reg ID 59827 in the processing domain on M46/11.
- Northern operations on M46/10, M46/11 and M46/532 - mining of oxide deposits from Edwards Lease and Golden Crown.

- Southern operations on tenements M46/9, M46/10 and M46/11 – mining of two main oxide deposits from Grant Hills and Southern Hill.
- Associated waste rock disposal including provision for disposal of PAF in PAF cells in the Edwards WRD, and Grant Hills pits was included with processing of oxide ore from the northern and southern operations offsite.

The initial MP comprises a two-year mine life. Mining of fresh rock until year six will require a revised MP-MCP to be approved by DMIRS and it is understood this document is currently being finalised.

The Beatons Creek Project has an EP Act Part V approval for the processing of up to 30,000 tonnes for the Bulk Sample via Registration (R2424/2016/1). Approximately 10,000 t has been processed to date. As no processing or discharge of mine dewatering is required, no other Part V approvals are expected to be needed.

A clearing permit (CPS 7440/3) for 270 ha of native vegetation is current until 1 April 2022 at the Beatons Creek Project. An amendment application to extend the duration of this permit should be submitted and consideration should be given for clearing of additional areas of native vegetation to permit mine infrastructure for the six-year mine schedule.

RIWI Act approvals for surface water and groundwater abstraction:

- GWL (178635) allows for the abstraction of 90,000 kL/year from the fractured rock aquifer.
- Surface Water licence (SW183394) granted 22 September 2016 for the abstraction of 80,000 kL/year of water from the Dam.

The Beatons Creek Project has an existing groundwater abstraction licence (GWL 178635) and surface water licences (SW183394) and consideration of amendment to the GWL to increase the abstraction rate, or add additional drawpoints, to facilitate the PEA mine schedule should be completed.

The requirement for a permit to disturb Bed and Banks Permit, as the Beatons Creek Project is located within a Proclaimed Surface Water Area should be considered.

GOLDEN EAGLE MILL

A MP and MCP (Reg ID 90227) was approved in December 2020 which included a revised TSF2 design to that previously approved and haulage and processing of mineralised material from the Beatons Creek Project for gold processing at the Golden Eagle Mill with tailings discharge to TSF2.

A revised DWER Licence (L8675/2012/1) was issued on 3 February 2021 that included TSF2 conversion from a two to one single cell facility, TSF2 stage 1 raise construction, licence consolidation, update conditions to capture compliance matters resolved, and processing and discharge of mineralised material from the Beatons Creek Project into TSF2 (2 Mtpa).

The compliance matters, which all occurred prior to Novo's acquisition of the Golden Eagle Mill and have since been resolved, were:

- construction of TSF2 differently to what was approved and started operating the TSF prior to submitting compliance documents

- approved TSF design incorporated two decant structures whereas only one decant structure was constructed
- construction compliance documentation to TSF2 Cell 2 (5 February 2018) – non-compliant in relation to permeability across the base of TSF2 Cell 2
- since the start of operation by Millennium in 2010, 29 incidents/non-compliances have been recorded
- DWER site inspection in June 2018 identified further non-compliances
- in May 2020, Millennium was convicted in the Magistrates Court of Western Australia.

It is noted both the DWER Licence and MP refer to discharge of oxide tailings (from Beatons Creek Project mineralised material) to TSF2. It is recommended that further assessment of the tailings generated from the fresh rock material (part of the six-year mine life) should be undertaken to obtain data on any potential emissions/seepage/closure impacts.

Prior to construction of TSF2, the TSF2 project was referred to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) as a result of potential impact to the Bilby (protected under the EPBC Act). Approval for the Project was issued by the Federal Minister for the Environment on 17 January 2012 due to an assessment of Millennium's project triggering a controlled action for the potential impact of the project on Greater Bilby (*Macrotis lagotis*). As it is understood no additional clearing is required, no further approvals from DAWE are expected to be required.

The life of TSF2 with the current predicted final elevation of 399 mRL is expected to extend for the initial 3.5 years of the proposed operation. Two lifts are predicted with each lift being in two metre increments. There is potential for additional lifts to increase beyond 399 mRL. However, lifts above 399 m RL will require additional geotechnical testing such as cone penetrating testing (CTP) and analysis of vibrating wire piezometer (VWP) data to ascertain the consolidation of tailings and the phreatic surface within the embankments and across the tailings profile, and will require additional DMIRS and DWER approvals.

20.4. SOCIO-ECONOMIC CONSIDERATIONS

20.4.1. ABORIGINAL HERITAGE

Two registered Native Title claims exist across the Beatons Creek Project area; the Njamal and Palyku groups. These traditional owner groups have been engaged on a number of occasions to discuss the proposed activities associated with mining the Beatons Creek Project.

Several heritage surveys have been undertaken across the Beatons Creek Project area with both claimant groups and have formed part of the Native Title Agreements executed between Njamal, Palyku, and Novo in 2017. The surveys were undertaken by suitably qualified archaeologists and anthropologists.

The heritage surveys recorded two heritage/ cultural sites; these will not be disturbed and have been excised from the disturbance footprint until a Section 18 approval is obtained under the *Aboriginal Heritage Act 1972*.

The approved MP includes a commitment that the Beatons Creek Project will not impact upon any heritage values and acknowledges that both claimant groups support the proposed development and associated protection measures for all heritage considerations that will be implemented by Novo.

Native title claims and Aboriginal heritage issues may delay or otherwise affect Novo's ability to pursue exploration, development and mining on the Beatons Creek Project. The resolution of native title and Aboriginal heritage issues is an integral part of exploration and mining operations in Australia and Novo is committed to managing any issues that may arise effectively. However, in view of the inherent legal and factual uncertainties relating to such issues, no assurance can be given that material adverse consequences will not arise.

20.4.2. COMMUNITY

The Nullagine townsite is located east of Beatons Creek (1 km southeast of the southern operations area and therefore noted as the closest sensitive receptor).

To ensure no impact to the Nullagine community from the Beatons Creek Project, an air quality assessment and noise emission modelling was undertaken.

The assessment was conducted to determine if the town of Nullagine may have air quality impacts arising from fugitive particulate emissions at the Beatons Creek Project. The modelling confirmed that assuming sufficient controls (dust suppression) on haul roads are implemented, emissions from the proposed operations are predicted to result in ambient air concentrations well below the nominated ambient air quality criteria at Nullagine (Ramboll 2018). Once operations move from this ore body to the ore bodies further north, with the corresponding increase in distance from the nearest receptors and the decrease in distances required to transport the product and waste, it is expected that concentrations of particulates will decrease further (Ramboll 2018).

The noise assessment involving acoustic modelling of noise emissions determined that the predicted noise emissions comply with the 'assigned level' (as per the Noise Regulations) at all times (HTA 2018).

20.4.3. STAKEHOLDER CONSULTATION

Novo engages its key stakeholders, including native title parties, the Nullagine Township and its residents, and government regulators on the status of the Beatons Creek Gold Project and plans for its development.

A stakeholder consultation register details the consultation undertaken to date and a stakeholder engagement strategy has been developed and implemented to ensure ongoing consultation is undertaken.

20.5. KEY ENVIRONMENTAL OR SOCIAL ISSUES IMPACTS

Given the Beatons Creek Project's location in a P1 PDWSA, the key environmental issue for the Beatons Creek Project is ensuring management of PAF material during operations and at closure to ensure this material is suitably encapsulated.

Given the volume of PAF to be mined (~75% of total), mine scheduling and materials balance will be critical in ensuring the PAF material is encapsulated effectively and poses no risk to groundwater or surface water resources, particular the Nullagine Water Reserve.

20.6. ENVIRONMENTAL MANAGEMENT

The Beatons Creek Project has an environmental management system (EMS) manual in place that has been developed to align with the International Standard 14001:2015 and prepared as per specifications from the DMIRS Guidelines (2020).

The Beatons Creek Project has developed a 'Beatons Creek PAF Management Procedure' and this will need to be updated to ensure encapsulation of the high volumes of PAF material to be mined, so that this material does not pose a risk to water resources.

Novo has a Groundwater quality management plan which will be implemented which includes water quality trigger action levels from baseline water quality data (when available), as well as an action plan for managing any exceedances and potential impacts on the local groundwater system.

Ongoing groundwater and surface water monitoring will continue in accordance with the Beatons Creek Project's DWER Licences to ensure the Beatons Creek Project does not have any adverse impacts on local water quality.

Monitoring bores established around TSF2 will be used to monitor groundwater levels and water quality, to allow possible impacts of depositing tailings into TSF2 on the surrounding groundwater system to be assessed.

20.7. MINE CLOSURE

20.7.1. CLOSURE REQUIREMENTS

The DMIRS's objective for rehabilitation and closure is that: "*mining activities are rehabilitated and closed in a manner to make them physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting/non-contaminating, and capable of sustaining an agreed post-mining land use without unacceptable liability to the State*".

Any residual liabilities relating to the agreed land use are expected to be identified and closure management agreed to by the key stakeholders.

20.7.2. CLOSURE PLANNING

The WA *Mining Act 1978* defines a mine closure plan as a "*document that: (a) is in the form required by Part 1 'Statutory Guidelines for Mine Closure Plans (b) contains information of the kind required by the guidelines about the decommissioning of each proposed mine, and the rehabilitation of the land, in respect of which a mining lease is sought or granted, as the case may be*".

The MCP includes a closure work program for achieving the closure outcomes, with implementation strategies and timeframes for each domain and/or feature of the mining operations, closure designs for landforms and contingencies for premature or early closure or suspension of operations.

The MCP is considered a dynamic document that needs to be regularly reviewed and refined over time to ensure that it reflects the current knowledge relevant to the development and rehabilitation status of the Beatons Creek Project.

Novo has an approved MCP that covers the oxide mining (small amount of fresh rock) at the Beatons Creek Project (Reg ID 89775) and at the Millennium plant/TSF (Reg ID 90227).

A revised MCP, covering the mining of PAF until Year 6 will need to be developed and submitted to DMIRS for approval. A key component of the MCP will be to ensure adequate encapsulation of PAF material at closure and in the long term to ensure all water resources are protected.

Novo will continue to pay 1% of the overall Beatons Creek Project rehabilitation liabilities annually to the WA *Mining Rehabilitation Fund 2016* (MRF).

21. CAPITAL AND OPERATING COSTS

21.1. SCOPE OF OPERATING AND CAPITAL COST ESTIMATES

The Beatons Creek Project Capital cost (mining, processing and infrastructure) estimate developed for the PEA is based upon an Engineering, Procurement and Construction (EPC) approach for the process plant restart and infrastructure refurbishment, and contract mining for mine development. The mining pre-production capital costs and operating costs are based on the mining methods described in detail in Item 16 of this PEA.

21.2. ESTIMATE RESPONSIBILITIES AND ACCURACY

The estimate accuracy for the plant and infrastructure capital is ±35% based on the following:

- The process plant design criteria are known as the plant exists. Historical operating data for the plant exists for ore mined from unrelated deposits.
- The preliminary design costs and operating costs are based on past performance treating different ore types from other mines, in the same region, that may have similar physical properties to Beatons Creek material.
- The power services agreement for energy supply to the plant is assumed to be similar to the previous operating arrangement. A similar unit power rate has been applied into the operating cost estimate.
- A preliminary mining method has been developed.

GR Engineering Services (GRES) has compiled the costs for restarting and the process plant and associated infrastructure. Optiro have provided the costs for geological exploration and mining establishment and operations. Novo has provided owners costs and historical processing operating costs. The Sustaining Capital estimate is an order of magnitude (±50%). Limited engineering and planning have been done in this area of the estimate at this stage.

21.3. EXCHANGE RATES

Pricing for the restart estimates were obtained predominantly during the fourth quarter of 2020 (4Q20). Most pricing was provided in Australian dollars (A$). Where pricing was received in a foreign currency, it was converted to A$ using the foreign exchange rates set at 1Q21.

Foreign exchange rates applied to the capital and operating cost estimates are summarised in Item 22.

21.4. LOM CAPITAL COSTS

A summary of the LOM capital costs for the projected life of the production schedule from Year 1 to Year 6 is provided in Table 21.1. The schedule assumes mining operations commence during Year 1.

Table 21.1 LOM Capital Cost Summary

Facility	Unit	Cost
Mining pre-production	$'000	1,975
Camp refurbishment	$'000	560
Processing plant refurbishment	$'000	6,225
Borefield upgrade	$'000	4,500
PAF waste rock encapsulation	$'000	37,500
Mine closure provision	$'000	8,800
Estimate Total (±35%)	**$'000**	**59,560**

21.4.1. MINING CAPITAL COST

Mining capital costs involve mobilising and establishing the mining contractors and pre-production waste stripping in Year 1 on site at Beaton's Creek are provided in Table 21.2.

Table 21.2 Mining pre-production capital costs

Item	Unit	Cost
Load and Haul fleet mobilisation	$'000	430
Drill and Blast mobilisation	$'000	190
Road haulage mobilisation	$'000	50
Sit preparation including offices, access, security, communications	$'000	750
Pre-stripping	$'000	1,230
Total	**$'000**	**1,975**

21.4.2. ACCOMMODATION CAMP REFURBISHMENT

Renovation works to ensure the accommodation camp is safe and able to support operations includes testing and tagging of electrical equipment, servicing of utilities equipment and refurbishment of the camp kitchen. This camp refurbishment has an estimated total cost of $0.56 M.

21.4.3. PROCESS PLANT AND INFRASTRUCTURE

The Golden Eagle Mill and associated infrastructure was acquired by Novo. It is located adjacent to the Golden Eagle deposit and is proposed to be used to treat the future Beatons Creek material.

The plant was placed in care and maintenance by the previous owner, Millennium Minerals, in December 2019 and is in the process of being made ready for re-start by Novo.

Works to re-commission the processing plant to accept Beatons Creek material is estimated to cost approximately $6.225 M and includes:

- refurbishment of the grinding and classification circuit equipment, including screens, plate work, pumps, etc.

- an upgrade to the gravity circuit, including a larger diameter and higher capacity centrifugal concentrator and larger intensive leach reactor package
- refurbishment of the CIL leach tanks, including repairs to tank internals, blasting and coating.

The purchase of Nullagine Operations assets (previously owned by Millennium Minerals) are not included in the capital costs stated for this report.

The Tailings Storage Facility (TSF) has adequate storage capacity remaining from previous operations to enable operations to commence. The embankment lifts are included in sustaining capital.

Water constraints were an ongoing concern for the previous operations. Novo intends to invest $4.5 M during Year 1 and Year 2 to establish more reliable water sources for the project.

21.5. SUSTAINING CAPITAL

The estimate includes provision for the following sustaining capital:

- Sustaining capital for the mining operation is minimal with requirements satisfied by the general site provisions.
- Process plant major equipment replacement and minor projects: 0.5% of the asset replacement cost. Assuming an asset replacement cost of approximately $54 M, the annual sustaining capital value provision is $262 k/a.
- Tailings storage facility embankment lifts based on historical costs and a processing throughput rate of 1.5 Mt/a. Embankment lift timing is based on the existing dam having approximately 800,000 m^3 of remaining capacity. Construction on the first embankment lift will commence in mid-Year 1.

Sustaining capital costs for the projected life of the production schedule from Year 1 to Year 6 are provided in Table 21.3. Note that the TSF design and government approvals will be required for the lifts proposed for Years 3 to 6.

Table 21.3 LOM sustaining capital cost summary

Facility	Year 1 ($'000)	Year 2 ($'000)	Year 3 ($'000)	Year 4 ($'000)	Year 5 ($'000)	Total ($'000)
Process Plant		262	262	262	262	1,050
TSF2 lifts (Cell 1&2, 2 m)	1,500	1,500	1,500	1,500	1,500	7,500
Estimate Total (±50%)	**1,500**	**1,762**	**1,762**	**1,762**	**1,762**	**8,550**

21.6. CLOSURE COSTS

Provisions for PAF waste rock encapsulation and mine closure are shown in Table 21.4.

Table 21.4 Mine closure cost provisions

Provision	Year 1 ($ M)	Year 2 ($ M)	Year 3 ($ M)	Year 4 ($ M)	Year 5 ($ M)	Year 6 ($ M)	Year 7 ($ M)	Total ($ M)
PAF waste encapsulation	-	1.9	1.9	3.8	7.5	11.2	11.2	37.5
Mine Closure	-	-	-	-	-	2.5	6.3	8.8
Estimate Total (±50%)	**-**	**1.9**	**1.9**	**3.8**	**7.5**	**13.7**	**17.5**	**46.3**

21.7. CAPITAL COST EXCLUSIONS

Costs associated with the following items/activities have been excluded from the capital cost estimates and, where appropriate, included directly into the financial model in Item 22:

- Novo's acquisition of Millennium Minerals Limited
- exploration costs
- rehabilitation and closure costs
- re-commissioning of contractor owned equipment (e.g. the KPS power station)
- costs incurred by the owner prior to project implementation, including studies and early works engineering
- escalation
- financing and interest costs
- allowance for foreign currency exchange rate fluctuation from the nominated rates
- Goods and Services Tax (GST).

21.8. OPERATING COSTS

Novo is planning to potentially develop the Beatons Creek Project as an owner-operator operation with support from specialist contractors:

- Mining costs have been developed on the basis of utilising a contract miner, operating and maintaining their own fleet.
- The processing operating costs have been developed on the basis of owner-operator.
- The power station will be owned and operated by an independent power provider (IPP).
- The workforce will be employed under FIFO arrangements and accommodated in the existing Accommodation Camp on site. The camp will be managed and operated by a services contractor including flight services.
- The main and regional access roads will be maintained by the local government.
- The access roads and internal roads will be maintained by Novo.

The operating cost estimate for the life of mine operations is detailed by year and based on proposed production rates in Item 22.

21.8.1. MINING

Mining operating costs have been developed on the basis of Novo providing management and technical support (Geology, Mining Engineering and Survey) with specialist, individual contracts for each of: grade control drilling, production drill and blast, load and haul of waste and plant feed, and road haulage of plant feed to the ROM pad (refer to Item 16) and are summarised in Table 21.5.

All costs for contract mining activities have been developed from detailed budget estimates from reputable service providers with experience of operating in the Pilbara region. The costs are comprised of fixed and variable components which provide the input to the financial model detailed in Item 22 (Economic Analysis).

Table 21.5 Mining operating costs and key cost inputs

Description	Unit	Quantity
Mining Overheads		
Mining Overhead	$'000/a	2,489
Grade Control Drilling	$'000/a	3,750
Other Mining Service	$'000/a	18
Mining Contractor		
Employee Overheads	$'000/a	10.074
Load and Haul – Labour charges Maintenance	$'000/a	-
Load and Haul – Fixed (Equipment and Consumables)	$'000/a	13,911
Load and Haul – Variable Charge (WPH)	$/bcm total	0.94
Load and Haul – Fuel	$/bcm total	0.66
Drill and Blast Contractor		
Drill and Blast - Fixed	$'000/a	2,160
Drill and Blast – Variable (Waste) - Novo	$/bcm waste	0.66
Drill and Blast – Variable (Ore) - Novo	$/bcm ore	0.68
Haulage Contractor		
Surface Haulage - Fixed	$'000/a	1,305
Beatons Creek	$/t ore	2.88
Distance to Process Plant	Km	15
Fuel Burn	L/t.km	0.20
Diesel Fuel Purchase Cost	$/L	0.90

The resultant unit cost provisions are summarised in Table 21.6.

Table 21.6 Mining unit costs

Cost Item	$/t mined	$/t processed
Grade Control	0.20	2.25
Drill and Blast	0.40	3.74
Load and Haul	1.50	14.10
Road Haulage	0.70	3.75
Mine Management and Technical Services	0.80	7.47
Total	**3.60**	**31.31**

21.9. PROCESS PLANT AND INFRASTRUCTURE OPERATING COST ESTIMATE

Processing and infrastructure operating costs have been estimated from historical site data and are summarised in Table 21.7. If the material treated is different from that processed previously, then the operating costs will change accordingly. If the mill throughput is reduced below the scheduled rate by the proportion of fresh ore then the processing unit cost rate will increase.

Table 21.7 Processing operating costs

Description	Unit	Quantity
Employee Overheads	$’000/a	4,249
Other Fixed Costs	$’000/a	2,588
Maintenance Cost – Fixed	$’000/a	8,783
Variable Cost	$/t	6.51
Total Operating Cost	$/t	17.18

21.10. GENERAL AND ADMINISTRATION

General and administration costs of $5.14/t were estimated from historical site data. If the mill throughput is reduced below the scheduled rate by the proportion of fresh ore, then the general and administration unit cost rate will increase.

Site administration costs relate to the overall site rather than specifically to mining or processing. They include the areas of:

- administration staff salaries and associated costs (management, recruitment, safety and training)
- general costs.

General costs typically include the following:

- contractors air charters and accommodation
- insurance
- licences, permits and fees
- IT and communications
- local travel

- leasing and maintenance for administration vehicles
- financial costs (insurances, audit fees, legal fees and banking charges)
- consultants
- general freight costs
- general office expenses.

21.11. OPERATING COST EXCLUSIONS

The following have been excluded from this operating cost estimate and where appropriate have been included directly into the financial model (Item 22) for the Beatons Creek Project.

- pre-production costs (included in the capital cost estimate)
- third party or native title royalty agreements or ongoing compensation package costs
- corporate costs
- foreign exchange variations
- royalties
- mining rehabilitation fund levy
- closure costs
- escalation
- contingency
- depreciation and amortisation.

22. ECONOMIC ANALYSIS

This PEA is preliminary in nature. It includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorised as Mineral Reserves. There is no certainty that the results of the PEA will be realised.

The economic analysis is based on a discounted cash flow model. The model includes the life of-mine production plan, operating costs, capital costs and market assumptions discussed in this Technical Report, in addition to financial assumptions introduced in this section. Net present value (NPV) is calculated in the model and reported after taxes. Internal rate of return (IRR) and payback period is not reported here as the capital costs are largely sunk through Novo's previous acquisition of Millennium and these measures are therefore mostly irrelevant.

Returns are highly sensitive to input assumptions and should be viewed in the context of the sensitivity analysis provided in this section.

22.1. ASSUMPTIONS

All currency presented in this section is in US$ unless otherwise stated, however the financial model was prepared on an A$ basis and converted to US$. The cost estimate was prepared with a base date of Year 1, assumed to be 2021 and does not include any escalation beyond this date. For NPV estimation, all costs and revenues are discounted at 5% from the base date. The economic model is presented here on an annual basis but was constructed monthly.

A standard Australian corporate tax rate of 30% is applied along with an opening tax loss of US$75 million. Taxes are paid in the year they are incurred and no withholding taxes on repatriation to Canada are considered. The estimates of capital and operating costs have been developed specifically for this project and are summarised in Section 21 of this report. The economic analysis has been run with no inflation (constant dollar basis). Repayment of a US$35 million loan, drawn on 1 September 2020 with the principal repaid from 1 September 2022 (over four years) at 8% plus the greater of the three-month US LIBOR and 1% (Sprott Debt), is also included in the levered cash flow summary.

Metal prices and exchange rate assumptions for the base and spot price cases are discussed in Section 19. Royalty rates are discussed in Section 4.5.

22.2. ECONOMIC ANALYSIS

The high-level economic assessment of the proposed open pit operation of the Beatons Creek Project is expected to generate an after tax NPV of approximately US$250 M at a 5% discount rate. IRR and payback are not reported due to the sunk nature of most of the capital, making these measures largely irrelevant.

Key results of the economic analysis over the life of mine are provided in Table 22.1.

The mining, milling and gold production profiles are shown in

Figure 22.1 to Figure 22.3.

Cash cost and all-in sustain costs (AISC) per ounce of production and unlevered free cash flow is shown in and Figure 22.4 and Figure 22.5.

AISC in Year 1 is lower than the cash cost (Figure 22.4) due to the accounting treatment of sustaining capital. In Year 1 (and to a lesser degree Year 2), significant sustaining costs are accrued in the financial model due to the building of ore stockpiles which are depleted in later years.

Certain items presented are alternative performance or non-IFRS (International Financial Reporting Standards) measures. Alternative performance measures are presented to provide additional information. These non-IFRS measures are included as key performance measures that provide additional information to understand the costs associated with the Beatons Creek Project. These performance measures do not have a standard meaning within IFRS and, therefore, amounts presented may not be comparable to similar data presented by other mining companies. These performance measures should not be considered in isolation as a substitute for measures of performance in accordance with IFRS.

Cash costs are a non-IFRS measure reported on an ounce of gold sold basis. Cash costs include mining, processing, refining, general and administration costs and royalties, but exclude depreciation, reclamation, income taxes, capital, and exploration costs for the LOM. AISC is a non-IFRS measure reported on a per ounce of gold sold basis that includes all cash costs noted above as well as sustaining capital and closure costs, but excludes depreciation, capital costs, and income taxes. These measures have no standardised meaning under IFRS.

Table 22.1 Key outputs of the PEA

Item	Unit	PEA output
Mine life	Years	6.5
Processing rate	Mtpa	1.5
LOM average grade	g/t gold	2.16
LOM average mill recovery	%	95
LOM average gold production	koz gold pa	101
LOM sustaining capex	$M	36.2
LOM cash cost	US$/oz gold	702
LOM AISC	US$/oz gold	974
LOM gold price	US$/oz gold	1,700
LOM exchange rate	A$:USD	0.75
After-tax NPV (5%)	US$M	250

Figure 22.1 Beatons Creek mining profile

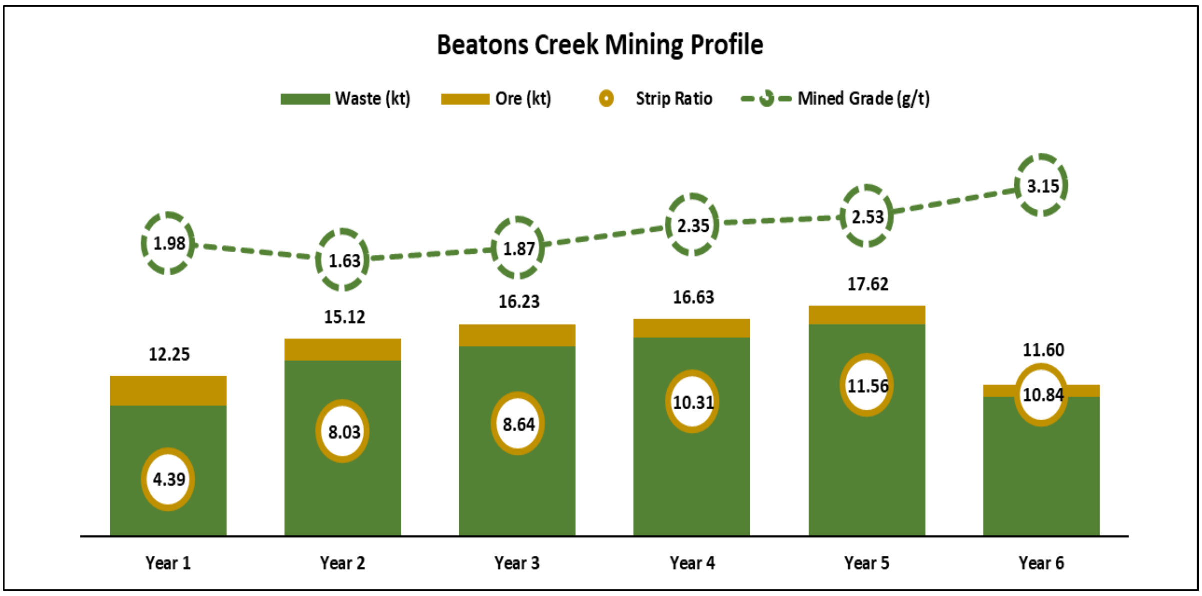


Figure 22.2 Beatons Creek milling profile

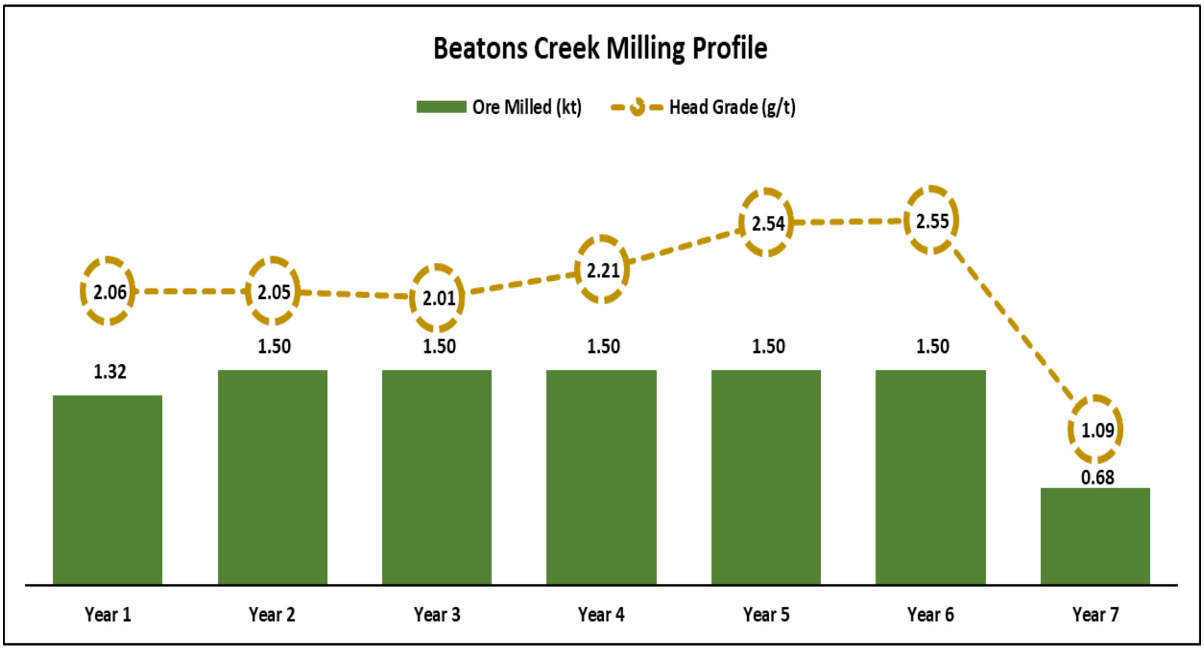


Figure 22.3 Beatons Creek production profile

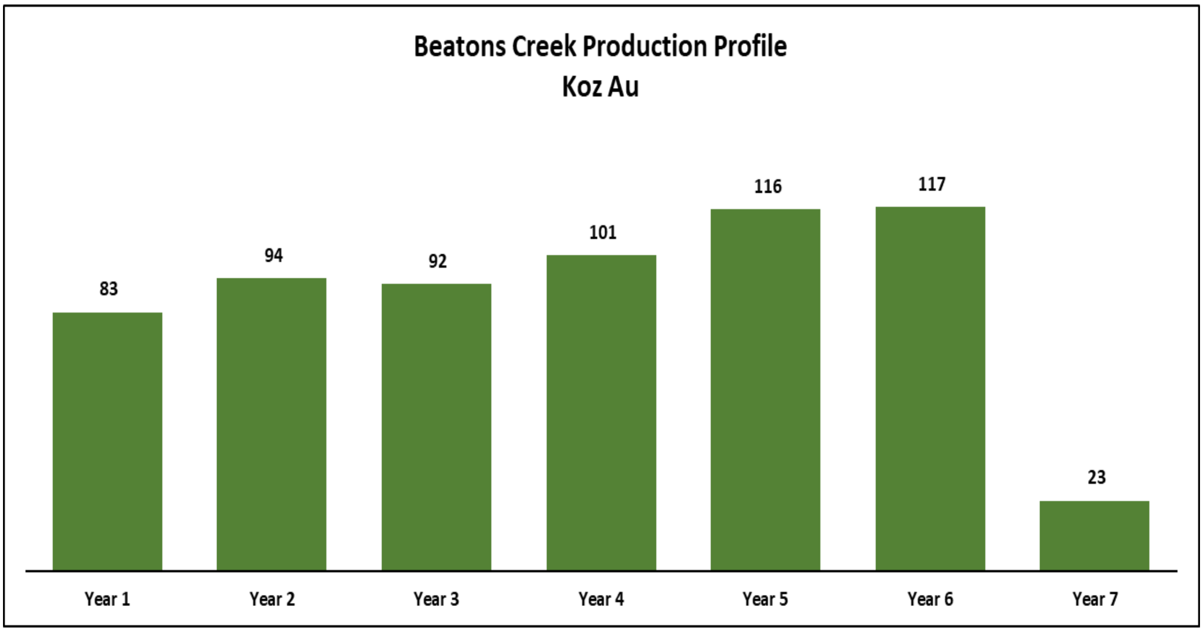


Figure 22.4 Cash Cost and AISC

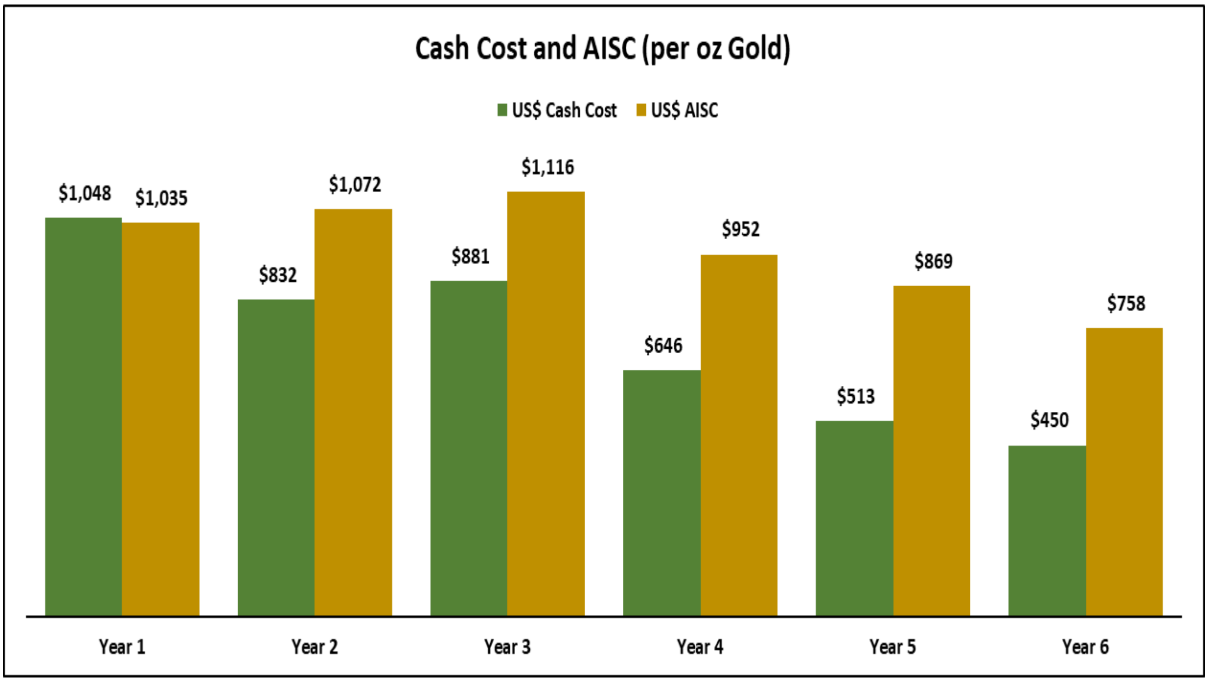
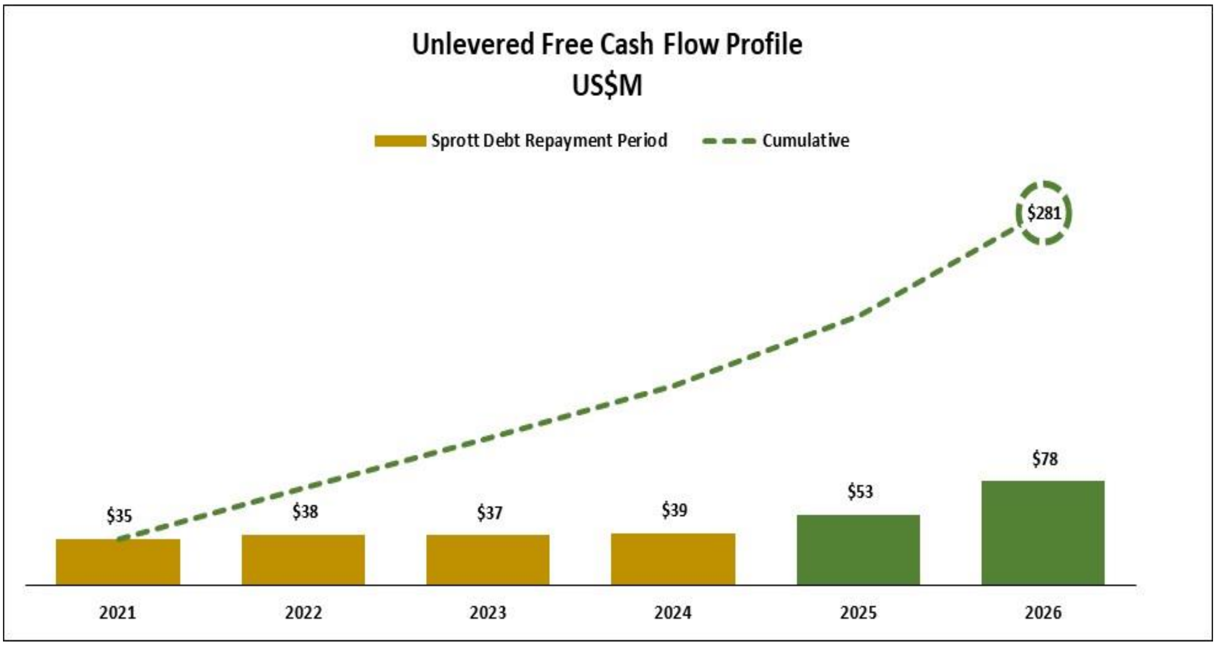


Figure 22.5 Unlevered free cash flow summary



22.3. SENSITIVITY ANALYSIS

Table 22.2 to Table 22.5 show the project NPV at a range of sensitivities for key parameters including operating costs, exchange rate (A$:US$), gold price/plant recovery/head grade and discount rate. Importantly, the project maintains a positive NPV for each of these sensitivities.

Table 22.2 NPV sensitivity to operating costs changes

	Sensitivity Range								
Operating costs	**-20%**	**-15%**	**-10%**	**-5%**	**0**	**+5%**	**+10%**	**+15%**	**+20%**
NPV at the base discount rate (5%) ($ M)	313	298	282	266	250	234	219	203	187

Table 22.3 NPV sensitivity to exchange rate

	Sensitivity Range								
Exchange rate	**-20%**	**-15%**	**-10%**	**-5%**	**0**	**+5%**	**+10%**	**+15%**	**+20%**
NPV at the base discount rate (5%) ($ M)	260	258	255	253	250	247	244	241	238

Table 22.4 NPV sensitivity to gold price/plant recovery/head grade

	Sensitivity Range								
Gold price	**-20%**	**-15%**	**-10%**	**-5%**	**0**	**+5%**	**+10%**	**+15%**	**+20%**
NPV at the base discount rate (5%) ($ M)	132	162	192	221	250	280	309	338	367

Table 22.5 NPV sensitivity to discount rate

	Sensitivity Range						
Discount rate	**0%**	**2.5%**	**5%**	**7.5%**	**10%**	**12.5%**	**15%**
NPV at various discount rates ($ M)	304	275	250	228	209	192	177

23. ADJACENT PROPERTIES

There are no adjacent properties relevant to this Technical Report.

24. OTHER RELEVANT DATA AND INFORMATION

Prior to the effective date of this PEA, Optiro notes that Novo's Board of Directors had supported management's recommendation to mine the Beatons Creek Project prior to completion of a feasibility study. As at the effective date of this report, Novo was in the late stages of commissioning the Golden Eagle Mill and continues to ramp up mining and production into Q2 2021.

The decision by Novo to produce at Beatons Creek was not based on a feasibility study to define Mineral Reserves demonstrating economic and technical viability and, as a result, there is an increased uncertainty of achieving any particular level of recovery of minerals or the cost of such recovery, including increased risks associated with developing a commercially mineable deposit. Historically, such projects have a much higher risk of economic and technical failure. There is no guarantee that anticipated production costs will be achieved. Failure to achieve the anticipated production costs would have a material adverse impact on Novo's cash flow and future profitability.

Up to the effective date of this report, Novo had announced or commenced the following work in relation to development and operational activities at the Beatons Creek Project:

- On 15 October 2020, announced development activities had commenced and refurbishment works on infrastructure acquired pursuant to the acquisition of Millennium Minerals Limited, which are proceeding on schedule. This included:
  - Executing a contract with GR Engineering Services to undertake refurbishment of the Golden Eagle processing infrastructure at an estimated cost of US$6.2 M (A$8.3 M).
  - Restoration of power to the Golden Eagle infrastructure, enabling refurbishment works to continue uninterrupted and for commissioning of the Golden Eagle offices, camp, and other infrastructure.
  - Contract award to Edwards Mining and Civil to undertake initial Beatons Creek site establishment works.
  - Contract award to Castle Drilling for initial grade control drilling works.
- On 15 October 2020, Novo announced civil works at the Beatons Creek Project were progressing to plan with the development of site road infrastructure, stripping of topsoil and the commencement of the first RC grade control drilling program. The grade control program comprised a close spaced (10 m by 10 m drillhole spacing and 0.5 m sample interval) RC drilling program designed to test the first three months of planned operational areas.
- On 18 November 2020, Novo announced Iron Mine Contracting Pty Ltd (IMCPL) had been awarded 'preferred contractor' status for the surface mining contract. Mobilisation of mining equipment to site was due to commence in December 2020.
- On 17 December 2020, Novo announced:
  - IMCPL had commenced ramping up activities.
  - Haulage of material to the Golden Eagle Mill would commence from 21 December 2020 once the main Newman to Marble Bar road was satisfactorily repaired.
  - As a result of a recent rain event, the site had in excess of six months water supply in the Golden Eagle pit adjacent to the plant to complement the site borefield supply.

    - IMCPL Mining equipment mobilised to site included 1 x D10 dozer, 1 x PC850 excavator, CAT 740B watercart, 14M grader and 3 x CAT 745 trucks, with additional fleet scheduled to arrive within a week.
- On 3 February 2021, Novo announced:
    - All regulatory approvals had been received from DMIRS and DWER to allow commissioning of Beatons Creek material and deposition of Beatons Creek tailings product into the Golden Eagle Mill's tailings storage facility. The Beatons Creek Project was reported as advancing towards commercial production, with plant commissioning activities currently underway.
    - IMCPL continued to ramp up excavation activities at Beatons Creek, with all major equipment now mobilised to site and all crews fully staffed.
    - Rivet Mining Services Pty Ltd (Rivet) was named as the Company's preferred haulage contractor for transportation of material from the Beatons Creek Project to the ROM pad at the Golden Eagle Mill, and crusher feed contractor to maintain the ROM pad and feed the crusher.
    - Plant refurbishment scopes of work were effectively complete. All tanks had been fully refurbished, key new gravity circuit componentry had been installed and all concreting works were complete. The Company reported that the plant had now entered the commissioning phase.

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25. INTERPRETATION AND CONCLUSIONS

This PEA is a high-level economic assessment but indicates that the Beatons Creek Project could generate an after tax NPV of approximately $250 M at a 5% discount rate. This financial result indicates that the Beatons Creek Project shows potential and should be progressed to the next stage of pre-feasibility study or feasibility study to demonstrate economic and technical viability of defined Mineral Reserves.

25.1. GEOLOGY AND MINERAL RESOURCES

The most recent declaration of Mineral Resources for the Beatons Creek Project was in February 2019. Mineral Resources were classified and reported according to the CIM Definition Standards and were declared above a cut-off grade of 0.5 g/t gold within an economic (RPEEE) pit shell, and outside of this above a cut-off grade of 3.5 g/t gold reflecting likely underground extraction. The total Mineral Resource comprises 6,645 kt at 2.1 g/t of Indicated material and 4,295 kt at 3.2 g/t of Inferred material.

The mineralisation controls at the Beatons Creek project are well understood but the nature of the gold mineralisation is highly nuggety with coarse gold particles regularly visible. The definition of Measured Mineral Resources at the Beatons Creek Project cannot be justified partly due to the following points:

- The resource input data is very noisy, reflecting the coarse nature of the mineralisation – as reflected by a measured nugget effect of 60%. This shows the influence of multiple data types with different supports and sampling/assaying approaches.
- Duplicate sample pair analysis indicates poor precisions (of 55 to 77%) for RC field duplicates and trench channel field duplicates. Whilst not excessively high, this is generally indicative of high variability. Duplicate pulp splits from the trench channel program yield precisions of 23%; again not excessively high, but indicating variability at the pulp scale.
- The block model was based on 20 m by 20 m by 1 m, and 40 m by 40 m by 1 m estimation blocks kriged using a 60% nugget effect. Such an estimate is highly smoothed, effectively removing any selectivity from the estimate.

Areas classified as Indicated Mineral Resources are informed by relatively close-spaced drilling (ranging from less than 10 m by 10 m up to 40 m by 40 m spacing) and with grades estimated within the first or second search pass. Individual domains were reviewed and classified accordingly.

Novo commenced a RC-based grade control program in late 2020 to test the local continuity of mineralisation and to contribute to a more localised grade control model to mitigate the Mineral Resource risk. Sampling is being carried out on 0.5 m downhole intervals. At the effective date of the report no results were available from this program.

25.2. MINERAL RESERVES

No Mineral Reserves have been estimated for the Beatons Creek Project and this PEA includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorised as Mineral Reserves.

The PEA mining schedule Table 16.5includes provisions for a production ramp-up in Year 1 and then maintains a Total Material Movement capacity of up to 17.6 Mtpa (plant feed + waste). This production capacity supports the plant throughput of 1.5 Mtpa. Total plant feed over the LOM comprises 4,745 kt at 1.7 g/t of oxide and 4,741 kt at 2.6 g/t of fresh (total feed of 8,894 kt at 2.2 g/t gold).

Overall, the PEA mining schedule includes:

- about 10% of the oxide plant feed is based on Inferred Mineral Resources
- about 56% of the fresh plant feed is based on Inferred Mineral Resources.

There can be no assurance that the Inferred Mineral Resources included in the PEA will be converted to higher levels of Mineral Resource classification. Whilst it is expected that a significant portion of the Inferred material will convert with on-going work, the dependence on Inferred Mineral Resources presents a material risk to the project.

25.3. PROCESSING AND INFRASTRUCTURE

The Beaton Creek Project is planned to utilise the existing Golden Eagle Mill and associated infrastructure. The past performance and operating cost of this processing plant is well documented and future performance can be predicted with reasonable confidence.

The Golden Eagle Mill was designed for a feed rate of 1.5 Mtpa. Historically, the processing plant has operated well in excess of this rate. However, if the physical properties of the material treated are different from the material previously treated, the processing plant treatment rate may be affected.

25.4. PERMITTING

All regulatory approvals have been received from the DMIRS and DWER to allow commissioning of Beatons Creek material and deposition of Beatons Creek tailings product into the Golden Eagle Mill's tailings storage facility.

25.5. COST ESTIMATES

The Beatons Creek Project capital cost (mining, processing and infrastructure) estimate developed for the PEA is based upon an EPC approach for the process plant restart and infrastructure refurbishment, and contract mining for mine development.

The estimate accuracy for the plant and infrastructure capital is ±35% based on the following:

- The process plant design criteria are known as the plant exists. Historical operating data for the plant exists for other mine ore.

- The preliminary design costs and operating costs are based on past performance treating different ore types from other mines, in the same region, that may have similar physical properties to Beatons Creek material once it is available.
- The power services agreement for energy supply to the plant is assumed to be similar to the previous operating arrangement. A similar unit power rate has been applied into the operating cost estimate.
- A preliminary mining method has been developed.

Capital and operating cost assumptions included in the PEA are considered to be relatively low risk due to existing processing plant and known past performance.

25.6. ECONOMIC ANALYSIS

The economic analysis contained in this report is based, in part, on Inferred Mineral Resources, and is preliminary in nature. Inferred Mineral Resources are considered too speculative to have the economic considerations applied to them that would enable them to be categorised as Mineral Reserves. There is no certainty that economic forecasts on which this PEA is based will be realised.

As at the effective date of this report, the Beatons Creek Project was reported as advancing towards commercial production, with plant commissioning activities currently underway. The decision by Novo to produce at Beatons Creek was not based on a feasibility study of Mineral Reserves demonstrating economic and technical viability and, as a result, there is an increased uncertainty of achieving any particular level of recovery of minerals or the cost of such recovery, including increased risks associated with developing a commercially mineable deposit. Historically, such projects have a much higher risk of economic and technical failure. There is no guarantee that that anticipated production costs will be achieved. Failure to achieve the anticipated production costs would have a material adverse impact on Novo's cash flow and future profitability.

26. RECOMMENDATIONS

The outcomes of this PEA indicate that the Beaton's Creek Project is expected to generate an after tax NPV of approximately US$250 M at a 5% discount rate. Based on the outcomes of this PEA, further work is warranted and the following recommendations for further work are made:

- Continue infill drilling to improve the confidence and reclassify current Inferred Resources to Indicated Resources or better. This work is required to underpin future studies and the potential future estimation of Mineral Reserves. A drilling allowance of 83,000 m has been made for a cost of A$12.7 M inclusive of all assaying and associated costs.
- Undertake further metallurgical testwork on fresh mineralisation. Fresh mineralisation is included in this PEA and this work is recommended to be completed prior to processing this material to better determine plant performance and recovery. It is anticipated that this work will require the drilling of approximately 550 m of PQ sized diamond drill holes to provide sufficient and representative samples to complete this work. An allowance has been made for four sets of testwork on four fresh reefs.
- Continue further waste characterisation, particularly for AMD potential with fresh inter-reef material. This work is currently on-going but requires completion prior to finalising further studies.
- Continue environmental and permitting activities.
- Pursuit of full fresh rock mining approval.
- Complete a PFS or FS.

The potential cost for further work is given in Table 26.1

Table 26.1 Cost breakdown of recommended work program

Item	Quantity	Unit cost	Cost
Infill drilling	83,000 m	A$150 /m	A$12.70 M
PQ diamond core drilling for metallurgical testwork	550 m	A$350 /m	A$0.20 M
Metallurgical testwork on fresh mineralisation	4	A$75,000	A$0.30 M
Finalise waste rock characterisation	-	-	A$0.06 M
Continue environmental and permitting activities	-	-	A$2.40 M
Full fresh rock mining approval	-	-	Included above
Complete a PFS or FS	-	-	A$0.25 M

27. REFERENCES

Arrowsmith, V., Parker, B. and Dominy, S.C. 2019. Beatons Creek Conglomerate Gold Project, Pilbara, Western Australia: Metallurgical Testwork Report. Unpublished report, Novo Resources Corporation, Draft dated 30th April 2019. pp. 69 plus Appendices.

Blake, T.S., 1984a. Evidence for stabilisation of the Pilbara Block, Australia: Nature, v. 307, p. 721–723.

Blake, T.S., 1984b. The lower Fortescue Group of the northern Pilbara Craton: stratigraphy and paleogeography, in Archaean and Proterozoic Basins of the Pilbara: Evolution and Mineralisation Potential: Geological Department and University of Extension, University of Western Australia, Publication 9, p. 123–143.

Blake, T.S., 1993. Late Archaean crustal extension, sedimentary basin formation, flood basalt volcanism and continental rifting: the Nullagine and Mount Jape Super sequences, Western Australia, in Archaean and Early Proterozoic geology of the Pilbara region, Western Australia: Precambrian Research, v. 60 (Special issue), p. 185–241.

Blake, T.S., 2001. Cyclic continental mafic tuff and flood basalt volcanism in the Late Archaean Nullagine and Mount Jape Super sequences in the eastern Pilbara, Western Australia: Precambrian Research, v. 107, p. 139–177

Blake, T.S., Buick, R., Brown, S.J.A., and Barley, M.E., 2004. Geochronology of a Late Archaean flood basalt province in the Pilbara Craton, Australia: constraints on basin evolution, volcanic and sedimentary accumulation, and continental drift rates: Precambrian Research, v. 133, p. 143–173

Carter, J.D., and Gee, R.D., 1988. Geology and exploration history of uraniferous and auriferous pyritic conglomerates, Western Australia: Western Australia Geological Survey, Report 23, Professional Papers, p. 17–36.

CIM, 2014. Definition Standards for Mineral Resources and Mineral Reserves; CIM: Montreal, QC, Canada, p. 9.

Dominy, S.C. 2018. Resource Development Programme – Beatons Creek Project, Nullagine, WA. Novo Resources Corporation: Perth, WA, Australia, April 2018. pp. 90.

Dominy, S.C. and Hennigh, Q.T., 2020. Amended and Restated NI 43-101 Technical Report: Mineral Resource Update, Beatons Creek Conglomerate Gold Project, Pilbara Region, Western Australia. Issue date: 22 October 2020.

Farrell, B.L. and Blake, T.S., 1984. A report on exploration activities on exploration Licence EL46/28 and EL46/30, Nullagine, Western Australia; Australis Mining NL, Bass Strait Oil and Gas (Holdings) NL: Unpublished open-file report (Item A15572), 156 p.

Hickman, A.H., 1979. Nullagine, Western Australia: Geological Survey of Western Australia. 1:250,000 Geological Series Explanatory Notes.

Hickman, A.H., 1983, Geology of the Pilbara Block and its environs: Western Australia Geological Survey, Bulletin 127, 268 p.

Huston, D., Blewett, R., Mernaugh, T., Sun, S-S. and Kamprad, J., 2001, Gold Deposits of the Pilbara Craton: Results of AGSO Research, 1998-2000: AGSO Record 2001/10, 74 p.

Huston, D.L., Sun, S.-S., Blewett, R.S., Hickman, A.H, Van Kranendonk, M., Phillips, D., Baker, D. and Brauhart, C.W, 2002a. The timing of mineralisation in the Archaean Pilbara terrain, Western Australia: Economic Geology, v. 97, p. 733–755.

Maitland, A.G., 1905. Further report on the geological features and mineral resources of the Pilbara goldfield, Geological Survey of Western Australia Bulletin 20, 127 p.

Martin, D.McB, Clendenin, C.W., Krapež, B. and McNaughton, N.J., 1998. Tectonic and geochronological constraints on late Archaean and Palaeoproterozoic stratigraphic correlation within and between the Kaapvaal and Pilbara Cratons. Journal of the Geological Society, London, v. 155, p. 311–322.

Nelson, D.R., Trendall, A.F., de Laeter, J.R., Grobler, N.J., and Fletcher, I.R., 1992. A comparative study of the geochemical and isotopic systematics of late Archaean flood basalts from the Pilbara and Kaapvaal Cratons: Precambrian Research, v. 54, p. 231–256.

Nelson, D.R., Trendall, A.F. and Altermann, W., 1999. Chronological correlations between the Pilbara and Kaapvaal Cratons: Precambrian Research, v. 97, p. 165–189.

NI 43-101. 2011. National Instrument 43-101, Standards of Disclosure for Mineral Projects; Canadian Securities Administrators: Montreal, QC, Canada, p. 44.

Noldart, A.J., and Wyatt, J.D., 1962. The geology of portion of the Pilbara Goldfield covering the Marble Bar and Nullagine 4-mile map sheets: Western Australia Geological Survey, Bulletin, 115.

Scott, R.J., 2011, Independent Technical Report on the Pilbara Palaeoplacer Project (Nullagine & Marble Bar Project Areas, Pilbara Region, W.A., Australia), prepared for Galliard Resources Group, unpublished.

SGS, 2019. Beatons Creek Bulk Sample Head Grade Calculation Programme. Unpublished Report by SGS Australia Pty Ltd for Novo Resources Corporation, Draft dated 30th April 2019. pp. 15 plus Appendices.

Smith, R.E., Perdrix, J.L., and Parks, T.C., 1982. Burial metamorphism in the Hamersley Basin, Western Australia: Journal of Petrology, v. 23, p. 75–102.

SRK, 2019. Beatons Creek Tailings Characterisation – Physical and Chemical Characterisation. Unpublished Report by SRK Consulting for Novo Resource Corporation, Draft dated 1st March 2019. pp. 19 plus Appendices.

TetraTech, 2015. NI 43-101 Technical Report Resource Update, Beatons Creek Project, Pilbara Region, Australia. Unpublished Report by TetraTech for Novo Resources Corporation, dated 1st October 2015. pp. 133.

TetraTech, 2018. NI 43-101 Technical Report Resource Update, Beatons Creek Project, Pilbara Region, Australia. Unpublished Report by TetraTech for Novo Resources Corporation, dated 20th November 2018. pp. 111.

Thorne, A.M. and Trendall, A.F., 2001. Geology of the Fortescue Group, Pilbara Craton, Western Australia: Geological Survey of Western Australia Bulletin 144, 249 p., 3 plates.

Tickner, J., Ganly, B., Lovric, B. and O'Dwyer, J. 2017. Improving the sensitivity and accuracy of gamma activation analysis for the rapid determination of gold in mineral ores. Appl. Radiat. Isot., 122, 28-36.

Williams, I.R., 1998. Geology of Muccan, 1:100,000 Sheet 2956: Geological Survey of Western Australia Geological Series Explanatory Notes.

28. CERTIFICATES OF QUALIFIED PERSONS

Jason Froud

As an author of the report "Preliminary Economic Assessment on the Beatons Creek Gold Project, Western Australia", dated effective 5 February 2021 (the "Technical Report") prepared for Novo Resources Corp, I hereby certify that:

1. My name is Jason Froud, Principal of Optiro Pty Ltd, with a business address at Level 1, 16 Ord Street, West Perth WA 6005, Australia.
2. I am a graduate of the University of Tasmania, Australia, with a Bachelor of Science degree with Honours in Geology completed in 1997.
3. I am a Member of the Australian Institute of Geoscientists (Member Number 6426).
4. I have over 25 years' experience in open pit and underground production, resource estimation, technical auditing, due diligence reviews, project valuation and evaluation and consulting. I have commodity experience in gold, iron ore, copper, mineral sands, uranium and phosphate. As a consultant, I carry out mineral project valuations, due diligence evaluations, reviews and audits.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 (the "Instrument") and certify that by reason of my education, affiliation with a professional association (as defined in the Instrument) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of the Instrument.
6. I visited the Beatons Creek Gold Project on 22 September 2020 and from 1 to 2 October 2019.
7. I have previously been engaged by Novo Resources Corporation to undertake several independent project reviews other than with respect to the Beatons Gold Project.
8. I am responsible for Sections 1 to 14, 19 to 27 and 29 to 30 of the Technical Report which has been compiled from work carried out by Novo Resources Corp. and reviewed by Optiro Pty Ltd.
9. As of the effective date of the report, to the best of my knowledge, information and belief, the Technical Report contains all relevant scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
10. I have no prior involvement with the Beatons Creek Project.
11. I am independent of Novo Resources Corp. pursuant to Section 1.5 of the Instrument.
12. I have read the Technical Report, the Instrument and Form 43-101F1 (the "Form") and the Technical Report has been prepared in compliance with the Instrument and the Form.

"Jason Froud"

Dated at West Perth, Western Australia, on 30 April 2021.

Jason Froud *BSc (Hons), Grad Dip (Fin Mkts), MAIG*

Ian Glacken

As an author of the report “Preliminary Economic Assessment on the Beatons Creek Gold Project, Western Australia”, dated effective 5 February 2021 (the “Technical Report”) prepared for Novo Resources Corp, I hereby certify that:

1. My name is Ian Glacken, Director of Geology of Optiro Pty Ltd, with a business address at Level 1, 16 Ord Street, West Perth WA 6005, Australia.
2. I am a graduate of Durham University, United Kingdom, in 1979, with a BSc (honours) in geology, of the Royal School of Mines, United Kingdom, in 1981 with an MSc in Mining Geology and of Stanford University, USA, in 1996 with an MSc in geostatistics. I have practised my profession continuously since 1981. For the purposes of the Technical Report, I have over 35 years’ experience in the minerals industry worldwide, with a heavy emphasis on gold, focussing on mining geology, geological management, Mineral Resource estimation, substantially in the Archaean of the Eastern Gold Fields of Western Australia.
3. I am a Fellow of the Australasian Institute of Mining and Metallurgy and of the Australian Institute of Geoscientists, and a Member of the Institution of Materials, Mining and Metallurgy (United Kingdom) and a Chartered Engineer of that organisation.
4. I have read the definition of “qualified person” set out in National Instrument 43-101 (the “Instrument”) and certify that by reason of my education, affiliation with a professional association (as defined in the Instrument) and past relevant work experience, I fulfil the requirements to be a “qualified person” for the purposes of the Instrument.
5. I visited the Beatons Creek Gold Project on 7 September 2017.
6. I have previously been engaged by Novo Resources Corporation to undertake several independent project reviews.
7. I am responsible for Section 14 of the Technical Report which has been compiled from work carried out by Novo Resources Corp. and reviewed by Optiro Pty Ltd.
8. As of the effective date of the report, to the best of my knowledge, information and belief, the Technical Report contains all relevant scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
9. I have previously been engaged as an independent reviewer of the May 2019 Mineral Resource estimate on the Beatons Creek Project.
10. I am independent of Novo Resources Corp. pursuant to Section 1.5 of the Instrument.
11. I have read the Technical Report, the Instrument and Form 43-101F1 (the “Form”) and the Technical Report has been prepared in compliance with the Instrument and the Form.

“Ian Glacken”

Dated at West Perth, Western Australia, on 30 April 2021.

Ian Glacken *BSc, MSc ,FAusIMM(CP), FAIG, MAIG, CEng*

Andrew Grubb

As an author of the report "Preliminary Economic Assessment on the Beatons Creek Gold Project, Western Australia", dated effective 5 February 2021 (the "Technical Report") prepared for Novo Resources Corp, I hereby certify that:

1. My name is Andrew Walter Grubb, Director of Mining Consultant of Optiro Pty Ltd, with a business address at Level 1, 16 Ord Street, West Perth WA 6005, Australia.
2. I am a graduate of the South Australian Institute of Technology, Adelaide, South Australia and hold a BEng (Mining) which was awarded in 1978.
3. I am a Fellow of the Australasian Institute of Mining and Metallurgy (membership number 105646).
4. I have over 35 years' experience in grassroots exploration; minesite establishment and commissioning; open cut and underground mining; operation and maintenance of medium and large scale ore processing operations; industrial relations; contractor control; occupational health and safety; environmental control and planning; minesite, general and corporate management. As a consultant I am active in the areas of operational optimisation, corporate/transaction services including due diligence and ore reserve audits.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 (the "Instrument") and certify that by reason of my education, affiliation with a professional association (as defined in the Instrument) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of the Instrument.
6. I visited the Beatons Creek Gold Project on 14 September 2018, 9 December 2020 and 19 April 2021.
7. I have previously been engaged by Novo Resources Corporation to undertake several independent project reviews other than with respect to the Beatons Gold Project.
8. I am responsible for Sections 15 to 16 and the mining portions of Section 21 of the Technical Report which has been compiled from work carried out by Novo Resources Corp. and reviewed by Optiro Pty Ltd.
9. As of the effective date of the report, to the best of my knowledge, information and belief, the Technical Report contains all relevant scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
10. I have no prior involvement with the Beatons Creek Project.
11. I am independent of Novo Resources Corp. pursuant to Section 1.5 of the Instrument.
12. I have read the Technical Report, the Instrument and Form 43-101F1 (the "Form") and the Technical Report has been prepared in compliance with the Instrument and the Form.

Dated at West Perth, Western Australia, on 30 April 2021.

"Andrew Grubb"

Andrew Grubb *BEng (Mining), FAusIMM*

William Gosling

As an author of the report "Preliminary Economic Assessment on the Beatons Creek Gold Project, Western Australia", dated effective 5 February 2021 (the "Technical Report") prepared for Novo Resources Corp, I hereby certify that:

1. My name is William George Gosling, Process Manager of GR Engineering Services Limited, with a business address at 71-73 Daly Street, Ascot WA 6104, Australia.
2. I am a graduate of the Western Australian Institute of Technology (WA School of Mines), Australia, with a Bachelor of Engineering in Extractive Metallurgy completed in 1985.
3. I am a Fellow of the Australian Institute of Mining and Metallurgy (Member Number 105699).
4. I have over 35 years' experience in the design and operation of mineral processing plants (including senior management roles), due diligence reviews and feasibility studies. I have commodity experience in gold, copper, lead, zinc, nickel and mineral sands. As a consultant, I responsible for design of mineral processing plants, due diligence evaluations, reviews and audits.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 (the "Instrument") and certify that by reason of my education, affiliation with a professional association (as defined in the Instrument) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of the Instrument.
6. I visited the Beatons Creek Gold Project on 19 April 2021.
7. I am responsible for Sections 13, 17, 18 and processing plant and infrastructure components of Section 21 of the Technical Report which has been compiled from work carried out by Novo Resources Corp. and reviewed by Optiro Pty Ltd.
8. As of the effective date of the report, to the best of my knowledge, information and belief, the Technical Report contains all relevant scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
9. I have no prior involvement with the Beatons Creek Project.
10. I am independent of Novo Resources Corp. pursuant to Section 1.5 of the Instrument.
11. I have read the Technical Resource, the Instrument and Form 43-101F1 (the "Form") and the Technical Report has been prepared in compliance with the Instrument and the Form.

Dated at West Perth, Western Australia, on 30 April 2021.

"William Gosling"

William George Gosling *BEng, FAusIMM*

29. GLOSSARY OF ABBREVIATIONS

Abbreviations	Explanation
%	percentage
°C	Degrees Celsius
µm	one millionth of a metre
A$	Australian dollar
AAS	Atomic Absorption Spectrometry
AIG	Australian Institute of Geoscientists
Ag	silver
As	arsenic
ASX	Australian Securities Exchange
Au	gold
A$	Australian Dollars
AusIMM	Australian Institute of Mining and Metallurgy
NGP	Nullagine Gold Project Gold Operation
CP	Chartered Professional of the AusIMM
CRM	Certified Reference Material
DD	Diamond drilling
g	grams
g/t	grams per tonne
Ga	Billion years
HG	High grade
hr	hour
km	kilometre
km^2	square kilometre
kt	kilotonnes
ktpa	kilotonnes per annum
kV	kilovolt
LOM	Life of Mine
LOMP	Life of Mine Plan
m	metre
M	million
m^2	square metre
m^3	cubic metres
Ma	million years
mm	millimetres
mm/hr	millimetres per hour
Mo	molybdenum
MOU	Memorandum of understanding
Moz	million ounces
MPa	megapascals, a unit of rock strength
mRL	metres Reduced Level
Mt	million tonnes
Mtpa	million tonnes per annum
MW	Megawatt, one million watts
Ni	nickel
NSR	Net smelter return
WA	Western Australia
oz	troy ounce (31.1035 g)
Pb	lead
QAQC	quality assurance, quality control
QP	Qualified Person, as defined in National Instrument 43-101
RAB	Rotary Air Blast drilling
RC	Reverse Circulation drilling
RL	Reduced Level
t	metric tonnes
t/m^3	tonnes per metre cubed
TSX	Toronto Stock Exchange
TSX-V	TSX Venture Exchange
US$	United States Dollars

30. GLOSSARY OF TERMS

Term	Explanation
3D geological model	Computerised representation of the geology, incorporating stratigraphy, structural features and other important geological features
adularia	A white or colourless glassy variety of orthoclase in the form of prismatic crystals. It typically occurs in metamorphic rocks.
aeromagnetic	A geophysical exploration technique which maps the magnetic signature of rocks from an aeroplane or drone.
alluvial	Associated with sedimentary processes involving water
alluvial gold	An accumulation of alluvium (sediment), sometimes containing gold in the bed or former bed of a river.
alteration	A change in mineralogical composition of a rock through reactions with hydrothermal fluids, temperature or pressure changes.
andesite	Andesite is an extrusive igneous, volcanic rock of intermediate composition.
anticline	A fold shaped like an arch.
antiform	An arched shape formed by folded or faulted rocks, with a crest (high point) and limbs.
assay	The process of determining the content of a mineral or metal through a range of physical or chemical techniques.
basalt	A fine -grained igneous rock consisting mostly of plagioclase feldspar and pyroxene.
basement	The surface beneath which sedimentary rocks are not found; the igneous, metamorphic, or highly deformed rock underlying sedimentary rocks.
basement/bedrock	In general terms older, typically crystalline rocks which are often covered by younger rocks.
basin	Large low-lying area, often below sea level, in which sediments collect
basin (sedimentary)	Refers to any geographical feature exhibiting subsidence (downward shift) and consequent infilling by sedimentation.
basin inversion	A phase of movement where rocks in a basin shape are lifted by tectonic forces to remove the basin.
block model	A model comprised of rectangular blocks, each with attributes such as grades, rock types, codes that represents a given mineral deposit.
breccia	Fractured or broken rocks cemented or formed into a solid layer.
brecciated	Converted into or resembling a breccia.
brecciated siltstone	A siltstone containing small fragments of breccia.
brecciation	Converted into or resembling a breccia.
bulk density	A property of particulate materials. It is the mass of many particles of the material divided by the volume they occupy. The volume includes the space between particles as well as the space inside the pores of individual particles.
Carboniferous	A geological period comprising rocks aged between 345 and 280 million years before the present day.
chalcopyrite	A copper ore ($CuFeS_2$).
CIM Definition Standards	The CIM Definition Standards on Mineral Resources and Reserves (CIM Definition Standards) establish definitions and guidance on the definitions for mineral resources, mineral reserves, and mining studies used in Canada. The Mineral Resource, Mineral Reserve, and Mining Study definitions are incorporated, by reference, into National Instrument 43-101 – Standards of Disclosure for Mineral Projects (NI 43-101). The CIM Definition Standards can be viewed on the CIM website at www.cim.org.
clastic	Composed of fragments or particles of various sizes.
core	See diamond drilling.
craton	An old stable portion of the earth's crust, generally of Archaean age
Cretaceous	A geological period after the Jurassic and before the Tertiary, containing rocks aged between 135 and 65 million years before the present.
cut-off grade	The grade that differentiates between mineralised material that is economic to mine and material that is not.
Datashed	Geological database.
deformation	Term used to describe changes in rocks after their formation, usually caused by tectonic forces.
diamond drilling	Drilling method that uses a rotating bit encrusted with diamonds to collect a cylinder of rock. Drilling fluids may be used.
dilational jogs	A structural feature which generates an opening or gap in a sequence of rocks which may then be prospective for the inflow of mineralising fluids.
dip	Geological measurement – the angle at which bedding or a structure is inclined from the horizontal.
dykes	A tabular igneous intrusive rock that cuts across the bedding or foliation of the country rock.

epithermal gold	Epithermal gold deposits form in hydrothermal systems related to volcanic activity exhaust shaft Ventilation shaft for removal of exhaust from underground workings.
exploration licence	Rights to explore for minerals in an area, granted by a government to an individual/company.
exploration licence application	Application of an individual/company to a government to obtain the rights to explore for minerals.
fire assay	The quantitative determination in which a metal or metals are separated from impurities by fusion processes and weighed to determine the amount present in the original sample
gabbro	A dense, mafic intrusive rock comprising of pyroxene, plagioclase feldspar, and often olivine
gabbro-anorthosite	An intrusive igneous rock characterised by predominance of potassium feldspar.
gabbronorite	A mafic intrusive rock.
galena	Lead sulphide, the main ore of lead.
grade cap (top cut)	Restriction of the influence of very high grades, designed to avoid over smoothing of these grades into too large an area.
grade control	The process of collecting geological, sample and assay information for the delineation of mineable ore boundaries; the minimisation of dilution and ore loss, and the reconciliation of the predicted grade and tonnage to the grade and tonnage mined and milled.
granitic intrusion	Granite rock which has been emplaced into the earth's crust.
gyro	A downhole survey tool which does not rely on the properties of a magnet, and thus gives a very accurate reading of the location of a drillhole at depth.
Gyro downhole survey	A method to measure orientation down the borehole.
igneous	Rock is formed through the cooling and solidification of magma or lava.
Indicated Mineral Resource	An Indicated Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. (CIM Standards, 2014)
Inferred Mineral Resource	An Inferred Mineral Resource is based on limited information and sampling gathered through appropriate sampling techniques from locations such as outcrops, trenches, pits, workings and drillholes. Inferred Mineral Resources must not be included in the economic analysis, production schedules, or estimated mine life in publicly disclosed Pre-Feasibility or Feasibility Studies, or in the Life of Mine plans and cash flow models of developed mines. Inferred Mineral Resources can only be used in economic studies as provided under NI 43-101. (CIM Standards, 2014)
intercept	Mineralised intersection in a borehole.
JORC Code	The JORC Code is an Australian reporting code which is applicable for companies listed on the Australian Securities Exchange. It provides minimum standards for public reporting to ensure that investors and their advisers have all the information they would reasonably require for forming a reliable opinion on the results and estimates being reported. The current version is dated 2012.
kriging	A geostatistical estimation method using a distance weighting technique which is based upon the relative spatial continuity of the samples.
lacustrine deposits	Lacustrine deposits are sedimentary rock formations which formed in the bottom of ancient lakes.
lithology	The study and description of rocks, including their mineral composition and texture.
lode	Ore zone.
mafic	Silicate minerals, magmas, and volcanic and intrusive igneous rocks that have relatively high concentrations of the heavier and darker minerals.
magnetic anomaly (high / low)	Magnetic signatures different from the background, made up of a high and a low (dipole) compared to the average field.
Measured Mineral Resource	A Measured Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. (CIM Standards, 2014)
mesothermal	A hydrothermal mineral deposit formed at considerable depth.
metallurgy	Study of the physical properties of metals as affected by composition, mechanical working and heat treatment.
mineralisation	The process by which a mineral or minerals are introduced into a rock, resulting in a valuable deposit.
mineralisation solid	See wireframe.
mineralised reef	Gold-bearing conglomerate
nugget	Naturally occurring, visible piece of native gold, either in situ or as a gold particle
nugget effect	A variability component reflecting the short-scale differences in grade for a set of assays.
Ordovician	A geological period after the Cambrian and before the Silurian periods, representing rocks between 500 and 440 million years ago.

orogeny	The process of mountain building, and may be studied as a tectonic structural event, as a geographical event and a chronological event, in that orogenic events cause distinctive structural phenomena and related tectonic activity, affect certain regions of rocks and crust and happen within a time frame.
orogeny/orogenic	Relating to tectonic forces resulting in large scale deformation of portions of the earth's crust.
oxidation, oxidised	The addition of oxygen to the metal ion, generally as a result of weathering.
palaeochannel	A palaeochannel is a remnant of an inactive river or stream channel that has been filled or buried by younger sediment.
plunge	The inclination of a fold axis or other linear structure measured in the vertical plane.
polygonal	A grade estimation technique whereby each block assumes the grade of the closest sample to the block centre.
porphyry	A variety of igneous rock consisting of large-grained crystals, such as feldspar or quartz, dispersed in a fine-grained feldspathic matrix or groundmass.
Pulp	Pulverised rock sample, generally with a size of 100 micron or finer.
range	The maximum distance within which a set of grades are correlated with itself.
reverse circulation drilling (RC)	Drilling method that uses compressed air and a hammer bit to produce rock chips.
sedimentary	Rock forming process where material is derived from pre-existing rocks by weathering and erosion.
shear	Type of fault.
shear zone	A shear zone is a tabular to sheet like, planar or curviplanar zone composed of rocks that are more highly strained than the rocks adjacent to the zone. Typically, this is a type of fault, and may form zones of much more intense foliation, deformation, and folding. En echelon veins or fractures may be observed within shear zones.
sillimanite	An alumino-silicate mineral with the chemical formula Al_2SiO_5. It is one of three alumino-silicate polymorphs, the other two being andalusite and kyanite. Polymorphism is the ability of a mineral to exist in more than one crystal structure.
Silurian	A division of the Palaeozoic era extending from 440 to 410 Ma.
single shot camera	A type of downhole survey equipment. It measures several parameters in one single shot, e.g. azimuth, inclination, temperature, magnetic field strength on, each lowering down the hole.
sphalerite	A mineral comprised of zinc and sulphur with iron – zinc sulphide, the main economic ore of zinc.
standard	See certified reference material.
Standard Operating Procedure	Document outlining the step-by-step instructions to control the methodology of complex, routine operations
strike	Geological measurement – the direction of bearing of bedding or structure in the horizontal plane.
strike-slip faulting	Tectonic process that leads to the formation of zones of lateral displacement within the lithosphere.
sulphide	Economic minerals comprising a metal (such as lead, iron, zinc) and sulphur.
syncline	A fold in strata where the rocks slope toward a central axis.
test work	A generic term for a wide range of metallurgical tests applied to rock samples designed to predict the performance of a processing plant.
thrust fault	A type of reverse fault where the fault plane slopes at a very low angle.
top cut	A process that reduces the effect of isolated (and possible unrepresentative) outlier assay values on the estimation.
transitional	The partially oxidised zone between oxidised and fresh material.
turbidites	a sedimentary rock deposited by a turbidity current.
turbidity current	A rapid, downhill gravity flow of water and sediment. Turbidity currents can be caused by earthquakes, collapsing slopes, and other geological disturbances. They are responsible for distributing vast amounts of unconsolidated clastic sediment into the deep ocean.
variography	Definition of the three-dimensional grade continuity of drillhole samples by estimating and modelling the relationship between grade similarity and distance in every direction and at every sample spacing.
vein	A tabular or sheet like body of one or more minerals deposited in openings of fissures, joints, or faults.
veinlet	A small or secondary vein.
volcanic	An igneous rock of volcanic origin.
volcaniclastic	Relating to or denoting a clastic rock which contains volcanic material
volcaniclastics	Sedimentary rocks derived from erosion of volcanic rocks.
volcanics	Sequence of strata formed from an erupting volcano.
wedge	A branch off a diamond drillhole providing a second orebody intersection from the main hole.